EMC® Solutions Enabler CLI

version 8.0.3

Command Reference

REV_01

EMC²

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Preface

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.

Contact your EMC representative if a product does not function properly or does not function as described in this document.

Note This document was accurate at publication time. New versions of this document might be released on the EMC Online Support site. Check the EMC Online Support site to ensure that you are using the latest version of this document.

Purpose

This reference guide provides man pages for all the SYMCLI commands in HTML format. It also includes information about environment variables, return codes, and options files.

Audience

This manual provides reference information for command-line users and script programmers that focus on configuring and managing storage on Symmetrix arrays.

Related documents

The following documents provide additional information about SRDF/TimeFinder Manager and Solutions Enabler:

- *EMC Solutions Enabler V8.0 Release Notes* — Describe new features and any known limitations.
- *EMC Solutions Enabler Installation Guide* — Provides host-specific installation instructions.
- *EMC Solutions Enabler CLI Command Reference* — Documents the SYMCLI commands, daemons, error codes and option file parameters provided with the Solutions Enabler man pages.
- *EMC Solutions Enabler SRDF Family CLI User Guide* — Describes how to configure and manage SRDF environments using SYMCLI commands.
- *EMC Solutions Enabler TimeFinder Family CLI User Guide* — Describes how to configure and manage TimeFinder environments using SYMCLI commands.
- *EMC Solutions Enabler SRM CLI User Guide* — Provides Storage Resource Management (SRM) information related to various data objects and data handling facilities.
- *EMC VMAX Family Security Configuration Guide* — Describes how to configure VMAX Family security settings.

The following documents provide additional hardware platform information:

- *EMC VMAX3 Family Documentation Set* — Contains documentation related to the VMAX 100K, 200K, and 400K arrays.
- *EMC Symmetrix VMAX Family (10K, 20K, 40K) Documentation Set* — Contains documentation related to the VMAX 10K, 20K, and 40K arrays.
- *EMC VMAX3 with HYPERMAX OS Release Notes* — Describe new features and any known limitations.
- *EMC VMAX Family Viewer for Desktop and iPad®* — Illustrates system hardware, incrementally scalable system configurations, and available host connectivity offered for VMAX arrays.
- E-Lab™ Interoperability Navigator (ELN) — Provides a web-based interoperability and solution search portal. You can find the ELN at https://elabnavigator.EMC.com.
- SolVe Desktop — Provides links to documentation, procedures for common tasks, and connectivity information for 2-site and 3-site SRDF configurations. To download the SolVe Desktop tool, go to EMC Online Support at https://support.EMC.com and search for SolVe Desktop. Download the SolVe Desktop and load the VMAX Family and DMX procedure generator.

Note You need to authenticate (authorize) your SolVe Desktop. Once it is installed, please familiarize yourself with the information under Help tab.

Conventions used in this manual

EMC uses the following conventions for special notices.

Every use of the word SYMCLI means Solutions Enabler.

CAUTION

CAUTION, used with the safety alert symbol, indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.

NOTICE

NOTICE is used to address practices not related to personal injury.

Note A note presents information that is important, but not hazard-related.

Typographical conventions

EMC uses the following type style conventions in this document:

Normal	Used in running (nonprocedural) text for: ◆ Names of interface elements (such as names of windows, dialog boxes, buttons, fields, and menus) ◆ Names of resources, attributes, pools, Boolean expressions, buttons, DQL statements, keywords, clauses, environment variables, filenames, functions, utilities ◆ URLs, pathnames, filenames, directory names, computer names, links, groups, service keys, file systems, notifications
Bold	Used in running (nonprocedural) text for: ◆ Names of commands, daemons, options, programs, processes, services, applications, utilities, kernels, notifications, system call, man pages Used in procedures for: ◆ Names of interface elements (such as names of windows, dialog boxes, buttons, fields, and menus) ◆ What user specifically selects, clicks, presses, or types
Italic	Used in all text (including procedures) for: ◆ Full titles of publications referenced in text ◆ Emphasis (for example a new term) ◆ Variables
`Courier`	Used for: ◆ System output, such as an error message or script ◆ URLs, complete paths, filenames, prompts, and syntax when shown outside of running text.
`Courier bold`	Used for: ◆ Specific user input (such as commands)
`Courier italic`	Used in procedures for: ◆ Variables on command line ◆ User input variables
‹ ›	Angle brackets enclose parameter or variable values supplied by the user
[ ]	Square brackets enclose optional values
|	Vertical bar indicates alternate selections -the bar means “or”
{ }	Braces indicate content that you must specify (that is, x or y or z)
...	Ellipses indicate nonessential information omitted from the example

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North America, Latin America, APJK, Australia, New Zealand: SVC4EMC (800-782-4362) and follow the voice prompts.

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Your suggestions will help us continue to improve the accuracy, organization, and overall quality of the user publications. Send your opinions of this document to: VMAXContentFeedback@emc.com.

CHAPTER 1
SYMCLI Commands

This chapter includes UNIX-style man pages for all SYMCLI commands. Commands are listed alphabetically.

symaccess

Performs Auto-provisioning Group operations on storage, initiator, and port groups. Allows you to create and manage masking views.

SYNOPSIS

```
symaccess -h
```

Storage Group

```
symaccess -sid ‹SymmID› -name ‹Group_name› -type storage
  [-reserve_id ResvID[,ResvID[,ResvID...]]]

 create

 create -g ‹DgName› [-std] [-bcv] [-vdev] [-tgt]

 create -file ‹DeviceFileName› [src] [tgt]

 create devs ‹SymDevStart:SymDevEnd› |
  ‹SymDevName[,SymDevName[,SymDevName...]]›

 create sg ‹SgName›[,‹SgName1›,‹SgName2›,..,‹SgNamen›]

 delete [-force][-noprompt]

symaccess -sid ‹SymmID› -name ‹Group_name› -type storage

 rename -new_name ‹NewGroupName›

symaccess -sid ‹SymmID› -name ‹GroupName› -type storage
  [-reserve_id ResvID[,ResvID[,ResvID...]]]
  [-ckd] [-celerra] [-rp]

 add -g ‹DgName› [-std] [-bcv] [-vdev] [-tgt] [-lun ‹addr›]

 add -file ‹DeviceFileName› [src] [tgt] [-lun ‹addr›]
```

```
  add devs ‹SymDevStart:SymDevEnd› [-lun ‹Addr›] |
    ‹SymDevName› [-lun ‹Addr›] |
    ‹SymDevName,SymDevName,SymDevName...›
    [-lun ‹Addr› | -lun ‹Addr,Addr,Addr...›]

  add sg ‹SgName›[,‹SgName1›,‹SgName2›,...,‹SgNamen›]
    [-lun ‹Addr›]

symaccess -sid ‹SymmID› -name ‹GroupName› -type storage
    [-reserve_id ResvID[,ResvID[,ResvID...]]] [-force]
    [-unmap [-celerra] [-rp]] [-ckd]

  remove -g ‹DgName› [-std] [-bcv] [-vdev] [-tgt]

  remove -file ‹DeviceFileName› [src] [tgt]

  remove devs ‹SymDevStart:SymDevEnd› | ‹SymDevName› |
    ‹SymDevName,SymDevName,SymDevName...›

  remove sg ‹SgName›[,‹SgName1›,‹SgName2›,...,‹SgNamen›]

symaccess -sid ‹SymmID› -target_sid ‹SymmID›

  copy -name ‹GroupName› -type storage
    [-reserve_id ResvID[,ResvID[,ResvID...]]]

symaccess -sid ‹SymmID› [-offline] | -file ‹backup_filename›

  list -type storage
    [-devs «‹SymDevStart›:‹SymDevEnd› |
    ‹SymDevName› | «‹SymDevName›,‹SymDevName›...»]
    [-name ‹GroupName›] [-v | -detail]

  show ‹GroupName› -type storage
```

Initiator Group

symaccess -sid ‹SymmID› -name ‹GroupName› -type initiator
[-consistent_lun]

create

create -wwn ‹wwn›

create -iscsi ‹iscsi›

create -file ‹InitiatorFileName›

create -ig ‹InitiatorGroupName›

symaccess -sid ‹SymmID› -name ‹GroupName› -type initiator

delete [-force] [-noprompt]

rename -new_name ‹NewGroupName›

symaccess -sid ‹SymmID›

rename -wwn ‹wwn› -alias ‹alias›

rename -iscsi ‹iscsi› -alias ‹alias›

replace -wwn ‹wwn› -new_wwn ‹NewWWN› [-noprompt]

replace -iscsi ‹iscsi› -new_iscsi ‹NewiSCSI› [-noprompt]

symaccess -sid ‹SymmID› -name ‹GroupName› -type initiator

add -wwn ‹wwn›

add -iscsi ‹iscsi›

add -ig ‹InitiatorGroupName›

add -file ‹InitiatorFileName›

symaccess -sid ‹SymmID› -name ‹GroupName› -type initiator

remove -wwn ‹wwn› [-login]

remove -iscsi ‹iscsi› [-login]

remove -ig ‹InitiatorGroupName› [-login]

remove -file ‹InitiatorFileName› [-login]

symaccess -sid ‹SymmID› ‹-wwn ‹wwn› | -iscsi ‹iscsi››
[-dirport ‹Dir›:‹Port›] -login

remove

symaccess -sid ‹SymmID› -target_sid ‹SymmID›

copy -name ‹GroupName› -type initiator

symaccess -sid ‹SymmID› -wwn ‹wwn› | -iscsi ‹iscsi›

set hba_flags ‹on ‹flag,flag,flag...› ‹-enable |-disable› |
off [flag,flag,flag...]›

symaccess -sid ‹SymmID› -name ‹GroupName› -type initiator

set ig_flags ‹on ‹flag› ‹-enable |-disable› |
off [flag]›

set consistent_lun ‹on | off [-force]›

symaccess -sid ‹SymmID› -wwn ‹wwn›

set lockdown ‹on ‹fcid› | off›

symaccess -sid ‹SymmID› -wn ‹wwn› | -iscsi ‹iscsi›

list logins [-dirport ‹Dir›:‹Port›] [-v]

symaccess -sid ‹SymmID› [-offline] | -file ‹backup_filename›

list -type initiator [-wn ‹wwn› | -iscsi ‹iscsi›]
[-name ‹GroupName›] [-detail | -v]

show ‹GroupName› -type initiator [-detail]

Port Group

symaccess -sid ‹SymmID› -name ‹GroupName› -type port

create

create -dirport ‹Dir›:‹Port›[,‹Dir›:‹Port›...]

delete [-force][-noprompt]

rename -new_name ‹NewGroupName›

symaccess -sid ‹SymmID› -name ‹GroupName› -type port
-dirport ‹Dir›:‹Port›[,‹Dir›:‹Port›...]

add [-celerra][-rp][-ckd]

symaccess -sid ‹SymmID› -name ‹GroupName› -type port
-dirport ‹Dir›:‹Port›[,‹Dir›:‹Port›...]
[-ckd][-force]

remove [-unmap [-celerra][-rp]]

symaccess -sid ‹SymmID› -target_sid ‹SymmID›

```
  copy -name <GroupName> -type port

symaccess -sid <SymmID> [-offline] | -file <backup_filename>

  list -type port [-dirport <Dir>:<Port>]
      [-name <GroupName>] [-detail | -v]

  show <GroupName> -type port
```

Masking View

```
symaccess -sid <SymmID> view -name <ViewName>
   [-reserve_id ResvID[,ResvID[,ResvID...]]]
   [-ckd] [-celerra] [-rp]

  create -sg <StorageGroupName> -pg <PortGroupName>
   -ig <InitiatorGroupName> [-lun <Addr>]

  create <-wwn <wwn> | -iscsi <iscsi>>
    -dirport <Dir>:<Port>[,<Dir>:<Port>...]
   < devs <SymDevStart:SymDevEnd> [-lun <Addr>] >  |
   < <SymDevName> [-lun <Addr>] > |
   < <SymDevName,SymDevName,SymDevName...>
   [ -lun <Addr,Addr,Addr...>] >

  create <-wwn <wwn> | -iscsi <iscsi>>
   -dirport <Dir>:<Port>[,<Dir>:<Port>...]
   <-g <DgName> [-std] [-bcv] [-vdev] [-tgt]> |
   <-file <DeviceFileName> [src] [tgt]>

symaccess -sid <SymmID> view -name <ViewName>
   [-reserve_id ResvID[,ResvID[,ResvID...]]]

  delete [-unmap [-celerra][-rp]][-ckd][-noprompt]

  rename -new_name <NewViewName>
```

symaccess -sid ‹SymmID› -target_sid ‹SymmID›

copy -name ‹ViewName› view [-ckd] [-celerra] [-rp]
[-reserve_id ResvID[,ResvID[,ResvID...]]]

symaccess -sid ‹SymmID› [-offline] | -file ‹backup_filename›
[-detail]

list view [-name ‹ViewName›] [-v]

show view ‹ViewName› [-ig ‹ChildInitiatorGroupName›]

CHAP

symaccess -sid ‹SymmID› -iscsi ‹iscsi›

enable chap

disable chap

set chap -cred ‹Credential› -secret ‹Secret›

symaccess -sid ‹SymmID› -dirport ‹Dir›:‹Port›

set chap -cred ‹Credential› -secret ‹Secret›

symaccess -sid ‹SymmID› [-dirport ‹Dir›:‹Port›]

enable chap

disable chap

delete chap

symaccess -sid ‹SymmID› | -file ‹backup_filename›

list chap [-dirport ‹Dir›:‹Port›] [-v]

Miscellaneous

symaccess discover hba [-rename] [-v]

symaccess list hba [-v]

symaccess -sid ‹SymmID›
-file ‹BackupFileName› [-noprompt]

backup [-symforce]

restore [-remove_ckd] [-disassociate] [-force]

symaccess -sid ‹SymmID› | -file ‹backup_filename› [-log]

verify

symaccess -sid ‹SymmID› [-offline] | -file ‹backup_filename›

list [-name ‹GroupName›] [-v | -detail]

list devinfo [-ig ‹InitiatorGroupName› [-detail]]

symaccess -sid ‹SymmID›

list assignment [-v] -devs ‹‹SymDevStart›:‹SymDevEnd› |
‹SymDevName› | ‹‹SymDevName›,‹SymDevName›...››

list no_assignments [-dirport ‹Dir›:‹Port›]

DESCRIPTION

The symaccess command provides the ability to perform the following actions:

- Create initiator, port, and storage groups.

- Create masking views, each one containing a single initiator, port, and storage group.

- Delete a masking view.

- Delete initiator, port, and storage groups when they are not part of a masking view.

- Rename masking views or initiator, port, or storage groups.

- Associate an ASCII name with the initiator as a convenience. To NULL the alias, use a slash (/) as input.

- Add or remove devices for a specifed storage group.

- Add or remove front-end director-ports for a specified port group.

- Add or remove initiators for a specified initiator group.

- Copy masking views or initiator, port, or storage groups from one Symmetrix array to another.

- Replace the host HBA without losing established permissions.

- Set HBA port flags on a per initiator basis. This feature allows the user to change some attributes for a different host type on the FA or SE for the specified initiator.

- Set the consistent LUN flag for an initiator group to force that any device masked to this group has the

same LUN for all ports.

- Display the login history table.

- Associate the Fibre Channel ID (FCID) of a switch in a fabric to the path from a host HBA to a Symmetrix array. This further restricts the path by which a host can connect to a Symmetrix array.

- Set, enable, disable, or delete CHAP credentials from the database for either the director/port or a specified iSCSI initiator.

- Back up the Auto-provisioning Group data to a user-named file on the host.

- Restore the Auto-provisioning Group data from a backup file stored on the host.

- List the host HBA information.

- List the group information.

- List the view information.

- Verifies that the AutoProvisioning Database is consistent.

ARGUMENTS

add Adds elements to the specified group.

backup Creates a file containing all of the group and view information currently on the array.

copy Copies views or groups from one Symmetrix

array to another.

create Creates a view or group of the specifed type.

delete Deletes the masking view or security information that was previously set for either a director/port or an iSCSI initiator.

disable Disables security information that was previously set for a director/port or an iSCSI initiator.

discover Discovers the WWN or iSCSI names of the HBAs on the host which has paths to the Symmetrix and writes the ASCII alias names to the login history table (if empty).

enable Enables security information that was previously set for a director/port or an iSCSI initiator.

list Lists the group, view, or security information.

remove Removes elements from the specified group.

rename Renames the ASCII name of a group or view, or renames the alias for the specifed initiator within a group and the login history table.

replace Replaces the WWN or iSCSI name within an initiator group with the specified new WWN or iSCSI name.

restore Restores all of the group, view, and security information from the specified backup file.

set Sets initiator attributes or CHAP credentials.

show Shows detailed information about the groups or views.

verify Checks the Auto-provisioning database to verify that it is consistent.

KEYWORDS

assignments Lists the currently assigned initiators for the specified devices.

chap Specifies the iSCSI CHAP credential.

consistent_lun
Sets the consistent LUN for the specified initiator group.

devinfo Lists the device information by initiator group.

devs Specifies devices to be added or removed.

hba Specifies the WWN or iSCSI name of the HBA on the host.

hba_flags Sets the HBA port settings for an initiator within a group for any settings that should differ from the current settings on the port.

ig_flags Sets the port settings for an initiator group for any settings that should differ from the current settings on the port.

lockdown Sets the FCID value for an initiator within a group.

logins Specifies the entries in the login history table.

no_assignment
Lists devices that are mapped, but not yet assigned within a masking view.

sg Indicates a list of storage group names.

src Limits the action to the source devices in a device file.

tgt Limits the action to the target devices in a device file.

view Indicates that the action will be performed on a view.

OPTIONS

-bcv Limits the action to the BCV devices of a device group.

-celerra Required to map and unmap Celerra devices.

-ckd Allows CKD devices to be masked. By default, CKD devices are blocked from masking but will be allowed if the devices are already mapped.

-consistent_lun
Sets the consistent LUN for the initiator group being created.

-detail Provides detailed information for the specified group or masking views.

-devs Applies Symmetrix device names to the action.

-dirport Specifies the director and port number.

-disable Disables the overridden HBA port flags on a per initiator basis.

-disassociate
Disassociates the storage group from a FAST policy if the contents of the group would contain invalid devices for FAST.

-enable Enables the overridden HBA port flags on a per initiator basis.

-file Specifies the filename. The file option can be used to specify a device, initiator, or backup file. -f is synonymous with -file.

-force Forces the deletion of the storage, port, or initiator group with or without members. For a storage group, it allows the removal of invalid devices from the storage group. For a restore, it forces the restore of a backup file.

-g Applies a device group name to the command.

-h Provides brief, online help.

-ig Specifies the initiator group name. The -ig option is synonymous with -initgrp.

-iscsi Specifies the iSCSI name.

-log Reports all of the inconsistencies found in the AutoProvisioning Database in the SYMAPI log.

-lun Specifies the LUN addresses to be used for the devices being added to a storage group, to the host HBA, or to a view. Supply a single LUN address for all devices to be added, or provide a list of LUN addresses equal to the number of device ranges in the list. For storage groups, LUN values may only be supplied after a storage group belongs to a view.

-name Specifies the group or view name.

-new_name Specifies the new name for the group or view.

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

-pg Specifies the name of the port group. -pg is synonymous with -portgrp.

-remove_ckd Skips over all CKD devices within the backup, which allows the backup to be restored if the CKD devices are no longer mapped.

-rename Forces the hostname/adapter or hostname/IP to be written out to both the login history table and the specified initiator within a group, even if one is present. Overwrites any existing alias in the record.

-reserve_id Specifies the device reservation IDs for the devices in the operation.

-rp Required to map and unmap devices tagged

for RecoverPoint use.

-secret Designates the secret value associated with the CHAP protocol's authentication data.

-sg Specifies the name of the storage group when creating a view. -sg is synonymous with -storgrp.

-sid Specifies the unique Symmetrix ID.

-std Limits the action to the source devices of a device group.

-symforce Forces the operation to execute when normally it would be rejected. On backup, it causes an inconsistent masking database to be backed up.
IMPORTANT: Use extreme caution with this option.

-target_sid Specifies the unique target Symmetrix ID.

-tgt Limits the action to the target devices of a device group.

-type Specifies one of the following group types:

Type	Description
storage	Indicates a storage group. It may contain up to 4,000 Symmetrix devices.
initiator	Indicates an initiator group. It may contain up to 32 fibre initiators, 8 iSCSI names,

the name of another
initiator group, or a
combination of them.

port Indicates a port group.
It may contain any number of
valid front-end ports.

-unmap Unmaps devices from ports.
When a device is removed from a storage group
that is part of a view, the device will get
unmapped from the ports contained in the port
group of that view.
When a port is removed from a port group that
is part of a view, all devices in the storage
group associated with the view will be
unmapped from this port.
When a view is dissolved, all devices in the
storage group associated with the view will be
unmapped from all ports in the port group of
that view.

If the devices are mapped to the same ports
through other views, those mappings will
remain in place.

-v Provides a more detailed, verbose listing.

-vdev Limits the action to the VDEV devices in a
device group.

-wwn Specifies a World Wide Name. Only one WWN
can be provided on the command line. Some
commands allow a file to be taken in as input.
Multiple WWNs can be provided in this file.

PARAMETERS

Addr The LUN address to be used for the corresponding device.

BackupFileName The backup file name to which operations will be performed.

ChildInitiatorGroupName
The child initiator group name. Changes the output to diplay the initiator and LUN information for the child initiator group.

Credential The CHAP protocol's credential name. For Microsoft users, the string should be between 8 and 256 characters.

DeviceFileName Name of the file where devices are listed. The device file can contain devices (SymDevNames) separated by new lines or device pairs (SymDevNames) listing a pair each line (the source device, followed by a target device).

Examples of device file format:

Example 1:

```
0026  0029
0015  0016
```

Example 2:

```
0001
0002
```

DgName The device group name.

Dir Applies a director number designation.

fcid A Fibre Channel ID associated with the switch.

flag Specifies the overridden HBA port flags or initiator group port flags from the following values in []:

Supported HBA port flags:

- Common_Serial_Number [C]
- Disable_Q_Reset_on_UA [D]
- Environ_Set [E]
- Avoid_Reset_Broadcast [ARB]
- AS400 [AS4]
- OpenVMS [OVMS]
- SCSI_3 [SC3]
- SPC2_Protocol_Version [SPC2]
- SCSI_Support1 [OS2007]

Supported initiator group port flags:

- Volume_Set_Addressing [V]
- Common_Serial_Number [C]
- Disable_Q_Reset_on_UA [D]
- Environ_Set [E]
- Avoid_Reset_Broadcast [ARB]
- AS400 [AS4]
- OpenVMS [OVMS]
- SCSI_3 [SC3]
- SPC2_Protocol_Version [SPC2]
- SCSI_Support1 [OS2007]

GroupsAndViewName

The group and view name.

GroupName The group name.

InitiatorFileName
The file which contains initiator names.
The format of the file is each initiator
on a new line which starts with 'WWN:' or
'iSCSI:' or 'IG:' depending on the type of
the initiator or initiator group name.
Any line which starts with '#' will be
considered a comment line.

Example of initiator file format:

```
WWN:10000000c94ef69c
iSCSI:iscsiname
IG:IgName
#WWN:10000000c94ef69d
```

InitiatorGroupName
The initiator group name.

iscsi An iSCSI name.

NewGroupName The new group name.

NewViewName The new masking view name for a
rename operation.

off Turn feature off.

on Turn feature on.

Port Applies a port number designation.

PortGroupName The port group name.

ResvID The device reservation ID.

Secret The CHAP protocol's secret value, which is 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.

SgName The storage group name.

StorageGroupName
The storage group name.

SymDevEnd The last Symmetrix device name in a sequence, such as 00B6.

SymDevName The Symmetrix device name.

SymDevStart The first Symmetrix device name in a sequence, such as 001C.

SymmID The 12-digit ID of the Symmetrix array.

ViewName The masking view name.

wwn The World Wide Name.

EXAMPLES

To create an initiator group named initexample, and to add WWN initiator 210000e08b04daac to it, enter:

```
symaccess -sid 234 -type initiator -wwn 210000e08b04daac
  -name initexample create
```

To create a storage group named storexample, and to add device 0026 to it, enter:

```
symaccess -sid 234 -type storage devs 0026
  -name storexample create
```

To create a port group named portexample, and to add director 7E and port 1 to it, enter:

```
symaccess -sid 234 -type port -dirport 7E:1
  -name portexample create
```

To add devices to a storage group named storexample, enter:

```
symaccess -sid 234 -type storage -name storexample
  add devs 0027
```

To add storage groups storgrp_1 and storgrp_2 to a storage group named storgrp_3 enter:

```
symaccess -sid 234 -type storage -name storgrp_3
  add -sg storgrp_1,storgrp_2
```

To remove WWN initiator 210000e08b04daac from an initiator group named initexample, enter:

```
symaccess -sid 234 -type initiator -wwn 210000e08b04daac
  -name initexample remove
```

To delete an initiator group named initexample, enter:

```
symaccess -sid 234 -type initiator -name initexample
  delete
```

To list all initiator, port and storage groups, enter:

```
symaccess -sid 234 list
```

To create a view named viewexample, containing initiator group initexample, port group portexample, and storage group storexample, enter:

```
symaccess -sid 234 -name viewexample -sg storexample
  -pg portexample -ig initexample create view
```

To delete a view named viewexample, enter:

```
symaccess -sid 234 -name viewexample delete view
```

To rename a view named viewexample to mvexample, enter:

```
symaccess -sid 234 rename view -name viewexample
  -new_name mvexample
```

To create a view, storage, port and initiator group named TEST, and to add devices to storage group TEST, initiators to initiator group TEST, and director ports to port group TEST, enter:

```
symaccess -sid 234 create view -name TEST -wwn
  210000e08b04daac -dirport 7E:1 devs 0026
```

To backup groups and views of Symmetrix ID 234 to a file backup_from_lab, enter:

```
symaccess -sid 234 backup -file backup_from_lab
```

To restore group and view information in file backup_from_lab to Symmetrix ID 234, enter:

```
symaccess -sid 234 restore -file backup_from_lab
```

symacl

Sets up or updates Symmetrix access control information.

SYNOPSIS

```
symacl -h

symacl <-file <CommandFile> | 'redirect stdin'>
      [-v | -noecho]

  preview

symacl -sid <SymmID> [-v | -noecho]
     <-file <CommandFile> | 'redirect stdin'>

  prepare

  commit [-force] [-restore]

symacl

  release -sid <SymmID> [-noprompt]

symacl [-sid <SymmID | ALL>]

  list [-v]

  list [-accpool | -accgroup | -acl]

  show accpool <PoolName> [-acl]

  show accgroup <GroupName> [-acl]

symacl

  backup -sid <SymmID> -file <CommandFile>
```

```
symacl -unique [-passphrase [<PassPhrase> |
        -file <PassFile>]] [-force]
```

DESCRIPTION

The symacl command allows the user to set up or update Symmetrix access control information. All information regarding access control of 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 array 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 help determine if a host has such an ADMIN privilege. The verbose list option can be used to check if a Symmetrix array was 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 before a commit. Use these actions in the debug of the command file entries or to ensure the commit action is not rejected. If you are the security administrator and you intend to release a lock on the command file session, you must either set the 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

Optionally on UNIX platforms, you can redirect a number of command operations to stdin to save keystroke entries and avoid using the command file.

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.

By default, in the client/server mode, the access ID displayed when using the -unique option belongs to the server host. If the option SYMAPI_CLIENT_SIDE_ACCESS_ID is enabled in the options file on the client, the access ID of the client host is displayed.

ARGUMENTS

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

commit Commits 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 of the changes specified in the command file.

release Releases any pending access control session lock and aborts the access control session.

show Shows detailed information about the access group or pool.

KEYWORDS

accgroup Returns the access IDs of a specified access group.

accpool Returns the Symmetrix devices in a specified access-controlled device pool.

OPTIONS

-accgroup Returns the access group information associated with a specific Symmetrix array.

-accpool Returns the access pools associated with a specific Symmetrix array.

-acl Displays access control entries in the list and show argument output. In addition, it can display all access control entries for a specified access group.

-file Specifies the command file containing the access control changes to be processed.

-force Forces a commit action, even if there are non-fatal errors encountered in the prepare stage. Use this option with discretion.

-h 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 Suppresses the automatic reply (prompt) to the user for confirmation before executing the indicated operation, when used with the release action.

-passphrase Specifies the passphrase used to generate the encrypted 24-digit access ID. The passphrase needs to be between 4-1000 characters and can contain following characters:
a-z A-Z 0-9 _ ! @ # $ % ^ & * () - . and a space character.
If a passphrase is not supplied on the command line, it must be provided using -file option.

-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 is read or modified. When ALL is 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. When used with list, a more detailed, verbose listing is provided.

Use the verbose list option to verify the specified Symmetrix complies with the requirements for host-based access control changes.

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 (31 character maximum).

Passfile The passphrase file name. The passphrase file name contains the passphrase used for generating the 24-digit access ID. The passphrase must be between 4-1000 characters and can contain following chars: a-z A-Z 0-9 _ ! @ # $ % ^ & * () - . and a space character.

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

redirect stdin The command line entries passed to stdin. Optionally, on UNIX platforms, you can redirect a number of command operations to stdin to save keystroke entries and avoid using a command file.

For example, to prepare a series of symacl commands on the command line 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
```

SymmID The 12-character ID that specifies the Symmetrix array.

COMMAND FILE SYNTAX

The following illustrateS the syntax for command file entries:

To create a new pool:

```
create accpool ‹PoolName›;
```

To add devices to a pool:

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

To remove devices from a pool:

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

To delete a pool:

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

To create a new access group:

```
create accgroup ‹GroupName›
```

To add 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›;
```

To remove an access ID from an access group:

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

To move an access ID to an access group:

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

To delete an access group:

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

To grant an access control entry:

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

To remove 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 KEYWORDS

ALL When used with the grant command,

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, removes the ACE for all devices.

When ALL is specified, the PoolName is not entered as part of the command.

NON-POOLED When used with the grant command, 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, removes the ACE.

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.

COMMAND FILE PARAMETERS

accessType The type of access desired for the pool or group. Possible values are:

```
Access Type
-----------    ---------
ADMIN          ECC
ADMINRD        ERASE
ALL            OPTMZR
BASE           POWRPATH
BASECTRL       QOS
```

BCV RCOPY
CACHCTRL RDF
CFGDEV RPA
CFGSYM SDDF
CHECKSUM SDR
CREATEDV SNAP
DIRCTRL VLOGIX

Note: 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 cannot be associated with access control device pools.

CHECKSUM access type is not available on Enginuity 5977 and higher.

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

GroupName The name of the access group (no spaces, case sensitive; alphanumeric characters, plus underscore, and dash). A maximum of 8 characters for Enginuity 5771 and lower; a maximum of 31 characters for Enginuity 5772 and higher.

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.

IdName The name of the access ID (no spaces, case sensitive; alphanumeric characters, plus underscore, and dash). A maximum of 8 characters for Enginuity 5876 and lower; a maximum of 31 characters for Enginuity 5977 and higher.

PoolName The name of the device pool (no spaces, case sensitive; alphanumeric characters, plus underscore, and dash). A maximum of 8 characters for Enginuity 5771 and lower; a maximum of 31 characters maximum for Enginuity 5772 and higher.

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

RETURN CODES

Code #	Code Symbol
0	CLI_C_SUCCESS
1	CLI_C_FAIL
2	CLI_C_DB_FILE_IS_LOCKED
19	CLI_C_GK_IS_LOCKED All GateKeepers to the Symmetrix array are currently locked.

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

To create an access pool named poola using a command file, enter:

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

Where add_new_pool.cmd command file contains:

```
create accpool poola;
```

To add devices to an access pool using a command file, enter:

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

Where add_new_devices.cmd contains:

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

To remove devices from an access pool using a command file, enter:

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

Where remove_devices.cmd contains:

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

To delete an access pool and all the ACEs associated with the access pool using a command file, enter:

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

Where delete_pool_aces.cmd contains:

```
delete accpool poola remove_aces;
```

To delete an access pool using a command file, enter:

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

Where delete_pool.cmd contains:

```
delete accpool poola;
```

Group Examples

To create an access group using a command file, enter:

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

Where add_new_group.cmd contains:

```
create accgroup groupa;
```

To add a user access ID to an access group using a command file, enter:

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

Where add_new_id_to_grp.cmd contains:

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

To add a host access ID to an access group using a command file, enter:

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

Where add_new_id_to_grp.cmd contains:

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

To add the default access ID to an access group using a command file, enter:

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

Where add_new_id_to_grp.cmd contains:

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

To remove an ID from an access group using a command file, enter:

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

Where remove_id_from_grp.cmd contains:

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

To move an ID to an access group using a command file, enter:

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

Where move_id_to_group.cmd contains:

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

To delete an access group, enter:

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

Where delete_group.cmd contains:

```
delete accgroup groupa;
```

To delete an access group and corresponding ACEs (if any exist) using a command file, enter:

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

Where del_grp_and_aces.cmd contains:

```
delete accgroup groupa remove_aces;
```

Add ACE Examples

To add an ACE, granting ADMIN privilege, using a command file, enter:

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

Where add_acl.cmd contains:

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

To add an ACE for all Symmetrix devices regardless of whether they are already in a pool and grant BASE access using a command file, enter:

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

Where grant_all_devs_acl.cmd contains:

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

To add an ACE granting BASE access for all Symmetrix devices that do not belong to an access pool, using a command file, enter:

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

Where add_not_in_pool_devs_acl.cmd contains:

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

Remove ACE Examples

To remove an ACE using a command file, enter:

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

Where remove_acl.cmd contains:

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

To remove all ACEs for groupa using a command file, enter:

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

Where remove_aces_for_group.cmd contains:

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

To remove all ACEs for poola using a command file, enter:

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

Where remove_aces_for_poola.cmd contains:

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

To remove an ACE setup of BASE access for all Symmetrix devices regardless of whether they are already in a pool, using a command file, enter:

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

Where rem_all_devs_acl.cmd contains:

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

To remove an ACE setup of BASE access for all Symmetrix devices not already in a pool using a command file, enter:

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

Where rem_not_in_pool_devs_acl.cmd contains:

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

symapierr

Translates a SYMAPI return code to a string.

SYNOPSIS

symapierr [-h] ‹ErrorCode›

DESCRIPTION

Returns a string with a detailed description of any return code generated by any SYMAPI function.

ARGUMENTS

None.

OPTIONS

-h Provides brief, online help information.

PARAMETERS

ErrorCode A numerical representation of an error.

RETURN CODES

Code #	Code Symbol
0	CLI_C_SUCCESS
1	CLI_C_FAIL

EXAMPLES

To return a string for error number 10, enter:

```
symapierr 10
```

The following will be output:

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

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 arrays 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.

SYNOPSIS

```
symaudit -h

symaudit list -sid ‹SymmID› [-text | -v]
  [-function_class [-exclude]
    ‹ClassName›[, ‹ClassName›, ...] ]
  [-action_code [-exclude]
    ‹ActionName›[, ‹ActionName›, ...] ]
  [-host ‹HostName›]
  [-vendor_id ‹VendorId›]
  [-application_id
    ‹AppIId›[, ‹AppIId›, ...] ]
  [-activity_id ‹ActivityId›]
  [-symdev_range ‹SymDevStart›:‹SymDevEnd›]
  [-start_date ‹date_time›] [-end_date ‹date_time›]
  [-record_num ‹RecordNumber›]
  [-n ‹RecordCount›]
  [-last_n ‹RecordCount›]
  [-user ‹UserName›]

symaudit monitor -sid ‹SymmID› [-text | -v]
  [-i Interval] [-c Count]

symaudit show -sid ‹SymmID›
```

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 criteria. The options include host name, application name, function class, and action code. A combination of filters can be used.

The monitor action polls the Symmetrix for new audit log records every Interval, defined in seconds, until the iteration Count is satisfied or the program is stopped. The command is run in the foreground. Verbose mode (-v) provides 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.

-activity_id Filters the audit log records to only show

records with the matching Activity ID.

-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 no time is specified, it will default to 0:0:0, the very beginning of the day. If the end_date and the -n options are omitted, the output continues until the end of file.

-exclude Filters out, or excludes, records that match the specified values.

-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 generated from the specified host return.

-i Specifies the repeat interval in seconds. The default interval is 30 seconds. The minimum interval is 5 seconds. For passive actions the minimum interval is 15 seconds. Passive actions are actions that do not acquire an exclusive lock.

-last_n Specifies the number of most recent records to display.

-n Specifies the number of records to display.

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

-sid Specifies the Symmetrix ID of the 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. If no time is specified, it will default to 0:0:0, the very beginning of the day.

-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 are returned.

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

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

-v Provides a more detailed, verbose listing.

-vendor_id Filters the audit log records so that only the records containing the specified vendor_id are returned.

PARAMETERS

ActionName The name of a control action associated with an audit log entry. These are not case sensitive. Possible actions are:

```
Action Names
-------------- -------------- --------------
Abort          AbortSnapshot  AbrtSnap
Activate       Acquire        Add
AllocateStart  AllcStrt       AllocateStop
AllcStop       Analyze        ArchiveLog
ArchLog        Associate      Assoc
AuthCtrl       AuthControl
BegBckup       BeginBackup    BeginRestore
BeginSnapshot  BegRestr       BegSnap
Bind           BlksIO         Block
BlockDirectIO  Break
Cancel         CheckPoint     Chkpt
Cleanup        ClearStats     ClrStats
CodeLoad       Commit         CompressStart
CompStrt       CompressStop   CompStop
Configur       Configure      Connect
Convert        CPAnalyze      CPAnalyz
Create         CreatePair     CrtPair
ORMOff         ORMOn          ORMSys
Deactivate     Deactiv        Delete
```

DeletePair DelPair Denied
Disable Disassociate Disassoc
DisConn Disconnect
Enable EndBackup EndBckup
EndRestore EndRestr EndSnapshot
EndSnap Erase ExpandDB
Expand
Failover Failback FASTMove
FASTSchedule FASTSchd FASTSwap
FileTrf Freeze FreeStart
FreeStrt FreeStop FSnapRes
FullEsta FullEstablish FullRstr
FullRestore FullSnapRestore
GcmOff GcmOn GenSwapList
GnSwpLst
HalfDeletePair HalfMovePair HMovPair
HalfSwap Halt HBAState
HDelPair Hold HostIO
HSwap
IncEstablish IncEsta IncRestore
IncRstr Initialize Init
Invalidate Invldate ISnapRes
Isolate IncSnapRestore
LedOn LedBlue LedBlueFlash
LedSlow LebSlowBlink Link
Lock Login Logout
Map Merge Migrate
Modify MovePair MovPair
MSCClnup MSCCleanup MSCSwitch
NotReady NotRdy
Offline Online OptmzrMove
OptMove OptSchd OptmzrSchedule
OptmzrSwap OptSwap Other
PerstOn PerstOff PhoneHome
PhonHome Pin PortAccess
PortAccs Prepare Protect
R1Update RDFSet Ready

Reassociate Reassoc Rebind
Reboot ReclaimStart RclmStrt
ReclaimStop RclmStop Reconfig
Reconfigure Recover Recreate
Refresh Relabel Release
Relocated Relocted ReLink
Remove
Rename Repair Replace
Reserve Reset Restart
Resume Rollback RWEnable
RWDisable RWDisabl
Scan Set SetCopy
SetGcmOff SetGcmOn SetNoCopy
SetORMOn SetORMOff SetORMSystem
SetPersistentOff SetPersistentOn
SetTTL
SnapCrea SnapCreate SnapTerm
Sparing Split StarDis
STARdisable StarEna STARenable
STARrefresh STARref STARrefresh
Start Stop Suspend
Swap Switch Sync
Syscalls
Terminat Terminate Thaw
TokenMgt
Unbind Unblock UnblksIO
Unhold UnblockDirectIO
UncompressStart UncoStrt
UncompressStop UncoStop
UnLink
Unlock Unpin UnProtct
Unprotect
Validate VolAccess VolAcces
VTOC
WRDisable WRDisab

ActivityId The Activity ID associated with the performed action in the audit log.

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

ClassName The name of a functional class area. These values are not case sensitive. Valid class names are:

```
Class Names
----------- ---------- ---------
Base        BCV        CfgChg
CGRDF       Checksum   Clone
DDF         DevMask    Dir
Erase       Maint      N/A
Migrate     Optmzr     Other
QoS         RCopy      RDF
Recovery    ResvCtrl   Security
Snap        UserFunc   Worm
Fast
```

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.

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

SymDevStart 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

Code #	Code Symbol
0	CLI_C_SUCCESS
1	CLI_C_FAIL
19	CLI_C_GK_IS_LOCKED All GateKeepers to the Symmetrix array are currently locked.

EXAMPLES

To show the time period and information for a specific array's audit log, enter:

```
symaudit -sid 04 show
```

The following output returns:

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

Symmetrix ID        : 000192606204

Starting date       : 04/26/2011 12:55:39
Ending date         : 05/11/2011 13:40:37
```

```
Starting record number  :  175500
Ending record number    :  237198
Total record count      :   61699
```

To list detailed audit log entries for a specific array within a certain time period, enter:

```
symaudit -sid 04 list -v -start_date 5/11:9:40
  -end_date 5/11:9:45
```

The following output returns:

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

 Symmetrix ID          : 000192606204

   Record Number        :   237178
     Records in Seq     :       1
     Offset in Seq      :       1
     Time               : 05/11/11 09:42:37
     Vendor ID          : EMC Corp
     Application ID     : SYMAUTH
     Application Version : 7.3.0.0
     API Library        : SEK
     API Version        : V7.3.0.0 (Edit Level: 1207)
     Host Name          : host_196
     OS Name            : SunOS
     OS Revision        : 5.8Generic
     Client Host        :
     Process ID         : 00001235
     Task ID            : 00000001
     Function Class     : ACCESS
     Action Code        : Set
     Text               : Starting a User Authorization
                          operation to modify settings:
                          Enforcement Policy [enforce]
     Username           : H:host_196\\ruggip
```

```
    Activity ID       : SE57a9e3d8d8

   Record Number       :   237179
    Records in Seq     :       1
    Offset in Seq      :       1
    Time               : 05/11/11 09:42:37
    Vendor ID          : EMC Corp
    Application ID     : SYMAUTH
    Application Version : 7.3.0.0
    API Library        : SEK
    API Version        : V7.3.0.0 (Edit Level: 1207)
    Host Name          : host_196
    OS Name            : SunOS
    OS Revision        : 5.8Generic
    Client Host        :
    Process ID         : 00001235
    Task ID            : 00000001
    Function Class     : ACCESS
    Action Code        : Set
    Text               : The User Authorization modify
                         settings operation SUCCEEDED
    Username           : H:host_196\\ruggip
    Activity ID        : SE57a9e3d8d8
```

To list all audit log entries matching several functional classes, enter:

```
symaudit -sid 04 list -function_class BCV, CGRDF, RDF
```

To list all audit log entries which are not of several action code types, enter:

```
symaudit -sid 04 list -action_code -exclude Init, Add
```

To list audit log entries made by a certain user from a certain host, within a given record range, enter:

```
symaudit -sid 04 list -user root -host myHost
 -record 200 -n 100
```

symauth

Sets up or updates Symmetrix user authorization information.

SYNOPSIS

symauth -h

symauth [-sid ‹SymmID›] [-noprompt]

enable

disable

symauth [-sid ‹SymmID›] [-noprompt]

set enforcement [advise | enforce]

symauth [-sid ‹SymmID›] [-offline]

list

list -users [-by_domain | -by_role | -by_user]

symauth

list -roles

symauth

list -components

symauth

show -username

symauth [-sid ‹SymmID›] [-v | -noecho] [-noprompt]
[-file ‹CommandFile› | 'redirect stdin']

preview

commit

symauth -sid ‹SymmID›

backup -f ‹BackupFile›

commit -restore -f ‹BackupFile› [-noprompt]

DESCRIPTION

This command allows the user to set up or modify Symmetrix user authorization information. All Symmetrix information authorization information for a Symmetrix array are stored on the array itself.

This mechanism allows an authorization role to be assigned to a user or group (of users). This role then controls access to the array and the types of management functions that can be performed on it.

The following roles are supported:

None No access allowed.

Monitor Ability to perform read-only / view operations.

PerfMonitor Ability to perform read-only / view operations and set performance monitors in UniSphere for Vmax with Performance Analyzer product.

Auditor Ability to view security information

and the Symmetrix audit log.

StorageAdmin Ability to perform any storage management operations.

SecurityAdmin Ability to perform security operations.

Admin Ability to perform any storage or security operations.

To support Storage Pool Manager functionality within the SMC product, the ability to limit access to an individual storage group or thin data pool is provided.

Only Virtualization Domain users or groups (ones whose name has the form 'V:Domain\\name') can be assigned a role of StorageAdmin for a specific storage group or thin data pool.

To change the Symmetrix user authorization information, enter the changes in a command file (CommandFile) and execute the preview and commit operations against the file.

The preview operation can be used after you first create the command file. It verifies the syntax and validity of the entries in the command file.

The commit operation performs the preview checks and then commits the contents of the command file to the Symmetrix user authorization database.

Note: It is not necessary to execute a preview action before a commit as the preview action is automatically performed during a commit.

The CommandFile is used to specify several commands, each of which is terminated with a semicolon (;). With the

exception of the names that can be used in the file (User, Group, ThinPool, StorageGroup etc.), the commands in the file are not case sensitive.

The following operations can be specified in the CommandFile:

- assign/reassign a user or group to a role
- delete the role assigned to a user or group
- remove a role assigned to a user or group if there are multple roles assigned
- set the enforcement mode

The enforcement mode can also be set directly on the command line.

On UNIX platforms, you can redirect commands from stdin (standard input) instead of using a command file by using the following syntax:

```
symauth -sid ‹SymmID› preview|commit ‹‹DELIM
assign user testuser to role monitor;
assign user testadmin to role admin;
DELIM
```

The backup operation saves the contents of the user authorization database from a Symmetrix array to the specified file.

The restore operation re-initializes the user authorization database on a Symmetrix array from a previously generated backup file. The specified file should have been created by an earlier backup operation - from the same or a different Symmetrix array. If the restoration image does not assign a role of Admin or SecurityAdmin to you, the final step in which Authorization is re-enabled for the array will fail.

Note: In this case, you may need to assign yourself one of those roles and then manually enable User Authorization. Alternatively, you can have someone else who does have Admin or SecurityAdmin privileges perform that operation.

The 'show -username' operation displays the user and group name that will be used for the currently logged in user.

If user authorization is disabled, users are granted full rights to the Symmetrix array. Otherwise, rights for users are calculated as follows.

Authorization entries contain either a User or Group name and a corresponding Role that corresponds to a set of rights. These names, as described below, can be either fully qualified or unqualified.

An example of an entry with a fully qualified name:

```
User    H:host1\\joe      Admin
Group   D:domain1\\sales  StorageAdmin
```

Examples of entries with unqualified names:

```
User    H:*\\joe          Monitor
Group   H:host1\\*        Monitor
User    joe               Monitor
```

Rights present in any User or Group entries that match a user's identity are granted to the user.

Unqualified User entries will only be used if there are no fully qualified User entries that match the user.

Unqualified Group entries will only be used if there are no fully qualified Group entries that match the user.

ARGUMENTS

backup Backs up the user authorization database for the specified Symmetrix array to the specified file.

commit After verification, commits the changes defined in the CommandFile and updates the authorization data on the Symmetrix array.

With the -restore option, a previously generated backup image is restored to the Symmetrix array.

disable Disables user authorization.

enable Enables user authorization.

list Lists user authorization information.

preview Verifies the syntax of the CommandFile.

set Sets the Symmetrix authorization mode.

show Shows your current UserName.

KEYWORDS

enforcement If authorization is enabled, this controls how the authorization rules are applied. There are two values:

```
Value     Description
--------  --------------
enforce   Authorization rules are enforced.
          If a user does not have the
          necessary rights (role),
```

operations will fail.
This is the default setting.

advise Authorization rules are checked but not enforced. Operations will succeed if the user does not have the necessary rights (role).

In both cases, authorization errors are written to both the SYMAPI log file and the Symmetrix Audit log.

OPTIONS

-by_domain Used in conjunction with list and -users. This option causes the list of known users (and groups) to be sorted by their domain.

-by_role Used in conjunction with list and -users. This option causes the list of known users (and groups) to be sorted by their assigned role.

-by_user Used in conjunction with list and -users. This option causes the list of known users (and groups) to be sorted by their UserName.

-components Lists the component types that are supported. Only used with list.

-file Specifies the CommandFile to be processed for changes to the user authorization database.

-h Provides brief online help information.

-noecho Blocks the printing of session status and

progress messages during preview and commit actions. Cannot be used with the -v option.

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

-offline Used in conjunction with list and -users. With this option specified, cached data will be returned instead of being retrieved from the Symmetrix. If there is no cached data available, no data will be displayed.

-restore Replaces the contents of the user authorization database from the specified file.

-roles Lists the various user authorization roles available on a Symmetrix array along with a short description of that role. Only used with list.

-sid Specifies the Symmetrix ID for which to read or modify authorization information.

-username Displays the currently logged on UserName and GroupName. Only used with the show argument.

-users Lists the users and groups currently defined on the Symmetrix array along with their corresponding role. Only used with the list argument.

-v Echoes the contents of the CommandFile to the output terminal when used with a preview or a commit action. Cannot be used

with the -noecho option.

PARAMETERS

BackupFile Name of a backup image generated by the backup command.

CommandFile Name of the file containing a set of authorization commands.

redirect stdin Command line entries passed to stdin. Optionally, on UNIX platforms, you can redirect a number of command operations to stdin to save keystroke entries and avoid using a command file.

For example, use the following syntax:

```
symauth -sid SymmID preview <<DELIM assign
user testuser role...;
DELIM
```

SymmID The 12-character ID that specifies the Symmetrix array.

COMMAND FILE SYNTAX

The following are the possible command syntaxes for the <CommandFile> entries.

Assign a user or group to an authorization role:

```
assign user <UserName> to role <RoleName>;
assign group <GroupName> to role <RoleName>;
```

Re-assign a user or group to a different authorization role:

```
reassign user ‹UserName› to role ‹RoleName›;
reassign group ‹GroupName› to role ‹RoleName›;
```

Delete a user or group authorization role:

```
delete user ‹UserName›;
delete group ‹UserName›;
```

Assign, re-assign or delete a user or group authorization role for a Symmetrix sub-component:

```
assign user ‹UserName› to role ‹RoleName›
      for ‹Comp› ‹CompName›;
assign group ‹GroupName› to role ‹RoleName›
      for ‹Comp› ‹CompName›;
reassign user ‹UserName› to role ‹RoleName›
      for ‹Comp› ‹CompName›;
reassign group ‹GroupName› to role ‹RoleName›
      for ‹Comp› ‹CompName›;
delete user ‹UserName› for ‹Comp› ‹CompName›;
delete group ‹UserName› for ‹Comp› ‹CompName›;
```

Anywhere ‹RoleName› is shown above it can be subsituted with up to four roles. The roles are added with "+" between them:

```
assign user ‹UserName› to role ‹RoleName›+‹RoleName›;
```

With multiple roles, the assign command can assign additional authorization roles to existing roles for users and groups. The syntax of the assign command is the same as when a new assignment is made:

```
assign user ‹UserName› to role ‹RoleName›+‹RoleName›;
```

With multiple roles, individual roles can be removed

using the remove command:

```
remove user <UserName> from role <RoleName>;
```

Set the authorization enforcement policy:

```
set enforcement [advise | enforce];
```

COMMAND FILE PARAMETERS

```
UserName      The name of a user.
              A name can consist of 3 fields:
               <Type>:<Qualifier>\\<Name>

               <Type>      The type of name - how it was
                           authenticated to the system.
               <Qualifier> The host or domain name that
                           the name was authenticated
                           on.
               <Name>      The user name.

              A <Qualifier> or <Name> consisting of a
              single '*' character is a wildcard - which
              will match any host/domain or user name.

              A fully qualified name is one in which all
              three fields are present - with no implicit
              or explicit wildcard characters.

              Examples of fully qualified names are:

               H:host\\joe     User "joe" logged into
                               the specified host.
               D:domain\\joe   User "joe" logged in
                               through the specified
                               Windows domain.
               domain\\joe     Interpreted the same as
```

"D:domain\\joe".

Examples of partially qualified names are:

H:host* Any user logged onto the specified host.

D:*\\joe User 'joe' logged in through any Windows domain.

D:\\joe Interpreted the same as "D:*\\joe".

joe User "joe" regardless of how they have logged in - any host or domain.

* Any user.

The following names indicate alternate authentication mechanisms - and are only relevant for users logged on through SMC.

V:domain\\joe User "joe" authenticated through the specified Virtualization Domain.

C:host\\joe User "joe" authenticated through the built-in SMC user database on the specified host.

L:host\\joe User "joe" authenticated through the LDAP server on the specified host.

Spaces can be included in the name by quoting ("") the entire name.

"H:host1\\User 123"

The fully qualified UserName and GroupName

of the user running the symauth command
can be obtained via:

symauth show -username

GroupName The name of a group. The syntax is the
same as for UserName above - but identifies
a group instead of a user.

RoleName The name of the role to assign to a
user or group. The following roles are
supported:
- Admin
- SecurityAdmin
- Auditor
- StorageAdmin
- Monitor
- PerfMonitor
- None

Role names are not case sensitive. Up to
four roles can be defined. The roles are
separated by "+".

Comp A type of component : either ThinPool
(Thin Data Pool) or StorGrp (Storage Group).

CompName The name of a Thin Pool or Storage Group.

Only Virtualization Domain users or groups
(with names of the form 'V:Domain\\name')
can be granted access to a specific
component.

RETURN CODES

Code # Code Symbol

```
------      -----------

 0        CLI_C_SUCCESS

 1        CLI_C_FAIL
```

EXAMPLES

To enable user authorization, enter:

```
symauth -sid 0123 enable
```

To disable user authorization, enter:

```
symauth -sid 0123 disable
```

To enforce user authorization checks, enter:

```
symauth -sid 0123 set enforcement enforce
```

To list the overall authorization state, enter:

```
symauth -sid 0123 list
```

To list the supported roles, enter:

```
symauth list -roles
```

To list the authorization roles assigned to users/groups, enter either of:

```
symauth -sid 0123 list -users
symauth -sid 0123 list -users -by_role
```

To list the authorization roles assigned to users/groups sorted by domain or host, enter:

```
symauth -sid 0123 list -users -by_domain
```

To list the authorization roles assigned to users/groups sorted by name, enter:

```
symauth -sid 0123 list -users -by_user
```

To display the UserName and GroupName for the current user, enter:

```
symauth show -username
```

The following examples display and change user authorizations using a command file.

To add an authorization role for a user or group using a command file, enter:

```
symauth -sid 0123 -file assign_user.cmd commit
```

Where assign_user.cmd contains:

```
assign user  John  to role Admin;
assign group Sales to role StorageAdmin;
assign user  Bob   to role StorageAdmin+Auditor;
```

To change the authorization role for a user or group using a command file, enter:

```
symauth -sid 0123 -file reassign_user.cmd commit
```

Where reassign_user.cmd contains:

```
reassign user  John  to role SecurityAdmin;
reassign group Sales to role Monitor;
reassign user  Bob   to role SecurityAdmin+Monitor;
```

To delete the authorization role assigned to a user or group using a command file, enter:

```
symauth -sid 0123 -file del_user.cmd commit
```

Where del_user.cmd contains:

```
delete user  John;
delete group Sales;
```

To remove authorization role(s) from a set of roles assigned to a user or group using a command file, enter:

```
symauth -sid 0123 -file remove_user.cmd commit
```

Where remove_user.cmd contains:

```
remove group Sales from role Monitor;
remove user  Bob   from role SecurityAdmin+Monitor;
```

symbcv

Performs support operations on one or more Symmetrix BCV (Business Continuance Volume) devices.

SYNOPSIS

```
symbcv -h

symbcv [-sid <SymmID>] [-offline] [-v]
    [-resv | -emulation] [-i <Interval>] [-c <Count>]

  list pd

  list [dev]

symbcv -g <DgName> [-offline] [-v]

  associate pd <PdevName> [<LdevName>]

  associateall [pd | -host <HostName>] [-sid <SymmID>]
    [-SA <# | ALL>] [-p <#>] [-N <#>]
    [-cap <#> [-captype <mb> | <cyl>]]
    [-R1 | -NOR1] [-R2 | -NOR2]
    [-sel_rdfg <SelRdfGrpNum>]
    [-devs <<SymDevStart>:<SymDevEnd> | <SymDevName>
      [,<<SymDevStart>:<SymDevEnd> | <SymDevName>>...]>]

  disassociate pd <PdevName> [-force]

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

  copy pd <PdevName> <DestDgName> [-force] [-rename]

symbcv -g <DgName> [-offline] [-sid <SymmID>]
    [[-rdf [-bcv]] | [-rrdf] | [-hop2]]
    [-rdfg <GrpNum> [-remote_rdfg <RemoteGrpNum>]]
```

```
    [-v]

  associate dev ‹SymDevName› [‹LdevName›] [-rdfg ‹GrpNum›]
    [-remote_rdfg ‹RemoteGrpNum›]

  disassociate dev ‹SymDevName› [-force]

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

  copy dev ‹SymDevName› ‹DestDgName› [-force] [-rename]

symbcv -g ‹DgName› [-offline]
    [[[-rdf] [-bcv]] | [-rrdf]] [-force] [-v]

  disassociate ld ‹LdevName›

  copy ld ‹LdevName› ‹DestDgName›[-rename]

  move ld ‹LdevName› ‹DestDgName›[-rename]

symbcv -g ‹DgName› [-offline] [-force]
    [-SA ‹# | ALL›] [-p ‹#›] [-N ‹#›]
    [-cap ‹#› [-captype ‹mb› | ‹cyl›]]
    [-R1 | -NOR1] [-R2 | -NOR2]
    [[[-rdf] [-bcv]] | [-rrdf]]
    [-remote_rdfg ‹RemoteGrpNum›] [-SA ‹#|ALL›] [-p ‹#›]
    [-sel_rdfg ‹SelRdfGrpNum›]
    [-devs ‹‹SymDevStart›:‹SymDevEnd› | ‹SymDevName›
       [,‹‹SymDevStart›:‹SymDevEnd› | ‹SymDevName››...]›]
    [-v]

  associateall [devs | -host ‹HostName›]

  rmall

  copyall ‹DestDgName› [-rename]
```

```
  moveall <DestDgName> [-rename]

symbcv -cg <CgName> [-offline] [-v]

  associate pd <PdevName> [<LdevName>]

  associateall [pd | -host <HostName>] [-sid <SymmID>]
    [-SA <# | ALL>] [-p <#>] [-N <#>]
    [-cap <#> [-captype <mb> | <cyl>]]
    [-R1 | -NOR1] [-R2 | -NOR2]
    [-sel_rdfg <SelRdfGrpNum>]
    [-devs <<SymDevStart>:<SymDevEnd> | <SymDevName>
       [,<<SymDevStart>:<SymDevEnd> | <SymDevName>>...]>]

  disassociate pd <PdevName> [-force]

  move pd <PdevName> <DestCgName> [-force]

  copy pd <PdevName> <DestCgName> [-force]

symbcv -cg <CgName> [-offline] -sid <SymmID>
    [[-rdf [-bcv]] | [-rrdf] | [-hop2]]
    [-rdfg <GrpNum> [-remote_rdfg <RemoteGrpNum>]]
    [-v]

  associate dev <SymDevName> [<LdevName>]

  disassociate dev <SymDevName> [-force]

  move dev <SymDevName> <DestCgName> [-force]

  disassociate ld <LdevName> [-force]

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

  copy ld <LdevName> <DestCgName> [-force] [-rename]
```

```
symbcv -cg ‹CgName› [-offline] [-sid ‹SymmID›]
    [-SA ‹# | ALL›] [-p ‹#›] [-N ‹#›]
    [-cap ‹#› [-captype ‹mb› | ‹cyl›]]
    [-R1 | -NOR1] [-R2 | -NOR2]
    [[-rdf [-bcv]] | [-rrdf] | [-hop2]]
[-rdfg ‹GrpNum›] [-remote_rdfg ‹RemoteGrpNum›]
    [-sel_rdfg ‹SelRdfGrpNum›] [-force]
    [-devs ‹‹SymDevStart›:‹SymDevEnd› | ‹SymDevName›
      [,‹‹SymDevStart›:‹SymDevEnd› | ‹SymDevName››...]›]
    [-v]

  associateall [devs | -host ‹HostName›]

  moveall ‹DestCgName›

  copyall ‹DestCgName›

  rmall
```

DESCRIPTION

The symbcv command performs operations on a BCV device. The BCV device can be addressed by its physical (host) name or by its device Symmetrix 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.

- Disassociating a BCV device from a composite group.

ARGUMENTS

associate Associates a Symmetrix BCV device with an existing group. Note that add can be substituted for associate.

associateall Associates all BCV devices with an existing group. Associateall only acts on BCV devices that are not associated with a group. The dev keyword specifies all Symmetrix devices, regardless of whether they are visible to the host. Note that addall can be substituted for associateall.

copy Copies one BCV device from one existing group to another existing group. The source and destination groups can be different group types.

copyall Copies all BCV devices from one existing group to another existing group. The source and destination groups can be different group types.

disassociate Disassociates a BCV device from a group. The group must exist, the BCV device must have been previously associated with the group, and the BCV device must be in a state that allows it to be disassociated. Note that remove can be substituted for disassociate.

list Lists all BCV devices that are configured on the Symmetrix arrays attached to this host, when used with the dev keyword (default).

Lists all BCV devices that are visible to this host, when used with the pd keyword.

move Moves one BCV device from one existing group to another existing group. The source and destination groups can be different group types.

moveall Moves all BCV devices from one existing group to another existing group. The source and destination groups can be different group types.

rmall Removes all BCV devices from an existing group.

KEYWORDS

dev Indicates a Symmetrix device name.

devs Indicates multiple Symmetrix device names.

ld Indicates a logical device name.

pd Indicates a physical device name.

OPTIONS

-bcv Indicates that the remotely attached BCV will be paired with the remote mirror of a locally attached BCV RDF device. This option can only be 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 display continuously.

-cap Sets a minimum device size to the selection criteria of devices.

-captype ‹mb | cyl›
Specifies the units of capacity, either megabytes or cylinders. The default is mb.

-cap Sets the BCV device capacity (size) in MB.

-cg Specifies the composite group name. Note that the -cg and -g options cannot be used at the same time.

-devs Specifies the ranges of BCV devices to add, remove, and move. For example, to associate BCV devices 00A to 00D, specify a range of 00A:00D.

-emulation Lists BCV devices that are clone emulated.

-force Forces BCV device(s) to be disassociated or moved from a group without querying the Symmetrix array for the device's BCV pair state(s).

-g Specifies the device group name. Note that the -cg and -g options cannot be used at the same time.

-h Provides brief, online help information.

-hop2 Indicates that the device is two hops away. For add and addall operations, if -hop2 is specified, both -rdfg and -remote_rdfg must also be specified.

-host Limits devices associated to those mapped to the host's front-end directors.

-i Sets the repeat interval in seconds.
The default interval is 30 seconds.
The minimum interval is 5 seconds.
For passive actions the minimum interval is 15 seconds. Passive actions are actions that do not acquire an exclusive lock.

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

-NOR1 Indicates that BCV RDF R1 devices should not be associated through the SRDF links.

-NOR2 Indicates that BCV RDF R2 devices should not be associated through the SRDF links.

-offline Obtains information from the Symmetrix host configuration database.

-p Supplies the front-end (SCSI or Fibre) director port number only to selected 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.

-resv Lists BCV devices that have SCSI reservations.

-rdf Indicates that the BCV is being remotely associated with the group. This option can be used when the BCV device is reachable by the SRDF links and the group is an RDF group.

-rdfg Indicates the Symmetrix RA (RDF) group number through which the remotely-associated BCV device is reached. It must be the same RA group of the group. This option can only be used with the -rdf or -rrdf options.

-remote_rdfg Indicates the Symmetrix RA (RDF) group number through which the remotely-associated RBCV device or 2BCV is reached. This option can only be used with the -rrdf and the -hop2 options.

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

-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, reachable by the SRDF links, is two hops away. The group must be an RDF group.

-SA Supplies the front-end (SCSI or Fibre) director number.

-sel_rdfg Indicates the Symmetrix RA (RDF) group number of the devices to be added by the an associateall operation.

-sid Supplies the unique Symmetrix ID.

-v Provides a more detailed, verbose listing.

PARAMETERS

Count Number of iterations to execute before exiting.

DestCgName Destination composite group in which to move the BCV device(s).

DestDgName Destination device group in which to move the BCV device(s).

DgName Device group name.

GrpNum RDF (RA) group number.

HostName Host name.

Interval Interval between polls, in seconds.

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

PdevName Physical device (host) name for the device, such as /dev/rdsk/c2t0d2s2

RemoteGrpNum Remote RDF (RA) group number.

SelRdfGrpNum Symmetrix RA (RDF) group number of the devices to be added when using an associateall operation.

SymDevName Symmetrix device name, unique to each

Symmetrix array, such as 01C.

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

SymDevStart Symmetrix device name, starting the contiguous range of selected devices, such as 00C.

SymmID 12-digit ID of the Symmetrix array.

RETURN CODES

Code #	Code Symbol
0	CLI_C_SUCCESS
1	CLI_C_FAIL
2	CLI_C_DB_FILE_IS_LOCKED
19	CLI_C_GK_IS_LOCKED All GateKeepers to the Symmetrix array are currently locked.

EXAMPLES

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

```
symbcv -g ProdDB associate pd /dev/rdsk/c2t0d2s2
```

To associate a BCV device with device group ProdDB, and name it ProdBCV001, enter:

```
symbcv -g ProdDB associate dev 00C ProdBCV001
```

To associate all BCV devices (that are not already associated with any group and are visible to this host) on the specified Symmetrix array with device group ProdDB, enter:

```
symbcv -g ProdDB -sid 87 associateall
```

To list all BCV devices that are visible to a host, enter:

```
symbcv list pd
```

To list all BCV devices regardless of whether they are visible to a host, enter:

```
symbcv list
```

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

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

To associate a BCV device with composite group MyCg, enter:

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

To associate a BCV device with composite group MyCg, enter:

```
symbcv -cg MyCg associate dev 00C -sid 87
```

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

```
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.
- Set online or offline one RDF (RA) director.
- Set online or offline one RA or FA director port.
- Display available network services entered in the network service file.
- Display existing UNIX gatekeeper and database semaphores.
- Display application and host registration information.
- Display feature registration information.
- Display host port connection information.
- Display mainframe CU image information.
- Display the state of major components in a configuration (environment data).
- Manage an authorization file.
- Display the list of Enginuity patches installed on the Symmetrix array.
- Verify the state of Virtual Provisioning thin devices.
- Change the lockbox password used to access it in attended mode.
- Reset the Stable System Values (SSVs) saved in the lockbox.
- Display a list of Guest OS containers on the Symmetrix array.
- Display the configuration of a specific Guest OS container on a Symmetrix array.

- Display IP Interface, iSCSI Target and IP Route Information.

SYNOPSIS

```
symcfg -h

symcfg [-version | -kit | -db]

symcfg

  discover [-pdev [-sid <SymmID>] | -sid <SymmID>]
    [-cache | -nocache]

  scan

symcfg

  sync [-sid <SymmID>] [-rdf | -bcv | -local | -dirsts |
    -snap | -cfgmgr | -rcopy | -env_data | -sg |
    -fast | -tier | -vpdata | -masking]

  remove [-sid <SymmID>] [-noprompt]

  release [-sid <SymmID>] [-force] [-noprompt] [-lockn #]

symcfg -sid <SymmID> [-i <Interval>] [-c <Count>]
    <-pool <PoolName>            |
     -g <DgName>                 |
     -sg <SgName>                |
     -cg <CgName>                |
     -devs <<SymDevStart>:<SymDevEnd> | <SymDevName>
       [,<<SymDevStart>:<SymDevEnd> | <SymDevName>>...]>

  verify -tdev
    <-bound | -binding | -allocating | -deallocating |
     -unbound | -unbinding | -reclaiming | -compressing |
```

```
    -uncompressing | -freeingall›

symcfg -sid ‹SymmID› [-i ‹Interval›] [-c ‹Count›]
    ‹-pool ‹PoolName›            |
    -devs ‹‹SymDevStart›:‹SymDevEnd› | ‹SymDevName›
      [,‹‹SymDevStart›:‹SymDevEnd› | ‹SymDevName››...]››

  verify -datadev
    ‹-draining | -drainwait | -disabled | -enabled |
    -deactivated | -nonpooled | -balancing›

symcfg -sid ‹SymmID› [-i ‹Interval›] [-c ‹Count›]
    -pool ‹PoolName›

  verify -poolstate
    ‹-enabled | -disabled | -balancing›

symcfg [-sid ‹SymmID›] [-offline]

  list [-DA  ‹# | ALL›] [‹-v | -port [-p ‹#›]›]

  list [-DX  ‹# | ALL›] [‹-v | -port [-p ‹#›]›]

  list [-dir ‹# | ALL›] [-address [-available] [-fibre]]
      [-p ‹#›]

  list [-dir ‹# | ALL›] [-v [-ALL]] [-p ‹#›]

  list [-dir ‹# | ALL›] [-port [-[no]virtual] [-p ‹#›]]

  list [-EA  ‹# | ALL›] [‹-v | -port [-p ‹#›]›]

  list [-EA  ‹# | ALL› [-p ‹#›]] [-address [-available]]

  list [-EF  ‹# | ALL›] [‹-v | -port [-p ‹#›]›]

  list [-EF  ‹# | ALL› [-p ‹#›]] [-address [-available]]
```

```
    list [-FA  <# | ALL> [-p <#>]] [-address [-available]]

    list [-FA  <# | ALL>]
        [<-v [-ALL] | -port [-[no]virtual] [-detail]
        [-p <#>]>]

    list [-RA  <# | ALL>  [<-v | -p <#>>] [-switched]
        [-rdfg <# | ALL>]

    list [-RE  <# | ALL>] [<-v | -port [-p <#>]>]

    list [-RF  <# | ALL>] [<-v | -port [-p <#>]>]

    list [-SE  <# | ALL>] [<-v | -port [-detail] [-p <#>]>]

  symcfg [-sid <SymmID>] [-offline]

    list -port -free

    <[-slot <#>] [-fc | -iscsi] [-speed <#>] | -dir <#>>

  symcfg [-sid <SymmID>]

    list -host_cache

    list -memory [-sid <SymmID>] [-offline]

    list -rdfg <# | ALL> [-dynamic | -static] [-offline]
     [-rdfa | -detail]

    list -status

    list -upatches

  symcfg [-sid <SymmID>] [-v]
```

```
list [-LRU <# | ALL>] [-offline]

list [-lock]

list [-lockn <# | RDFA | RDF | SRDF_MSCS | GNS |
            FAST | ALL>]

list [-ssid]

list [-connections [-sorthost] [-capacity] [-offline]
    [-ipv6]]

list [-applications [-client] [-host <HostName>]
     [-offline]]

list [-features [-class <ClassName>]
    [-disabled | -enabled]
    [-blocked | -unblocked]]

list [-cuimage]

list [-env_data [-service_state [not]degraded |
    [not]failed | [not]normal][-offline]]

list -container [-v]
    [-dir <# | ALL>]

show -container <ContainerName>

show -applications <AppID> [-client] [-host <HostName>]

show -cuimage <CuImage_Number> [-ssid_num <SSID>]

show -env_data <BayName> [-offline]

symcfg [-sid <SymmID>] [-offline]
```

```
    list [-bay_info]

symcfg [-v]

    list [-services] [-offline]

    list [-semaphores]

symcfg [-sid <SymmID>] [-offline] [-mb | -gb | -tb]
      [-i <Interval>] [-c <Count>]

    list [-pool [-snap | -rdfa_dse [-rdfg <GrpNum>]] [-v]
      [-fba] [-ckd] [-ckd3390] [-ckd3380] [-as400] [-all]]

    list [-pool -thin [-fba] [-ckd] [-all] [-v]]

    list [-pool -thin -detail [-fba] [-ckd]]

    list [-savedev [-fba] [-ckd3390] [-ckd3380] [-as400]
      [-nonpooled]
      [-devs <<SymDevStart>:<SymDevEnd> | <SymDevName>
        [,<<SymDevStart>:<SymDevEnd> | <SymDevName>>...]>]

    list [-datadev [-fba] [-ckd] [-nonpooled]
      [-devs <<SymDevStart>:<SymDevEnd> | <SymDevName>
        [,<<SymDevStart>:<SymDevEnd> | <SymDevName>>...]>]

    list [-tdev
      [-devs <<SymDevStart>:<SymDevEnd> | <SymDevName>
        [,<<SymDevStart>:<SymDevEnd> | <SymDevName>>...]>]
      [-pool <PoolName> | [-fba] [-ckd3390]
        [-bound | -unbound]]
      [-sg <SgName>] [-detail | -tier]]

    show -pool <PoolName> <-snap | -rdfa_dse | -thin>
      [-all] [-fba | -ckd3390 | -ckd3380 | -as400]
```

show -pool ‹PoolName› -thin -detail [-all]

symcfg [-sid ‹SymmID›] [-offline] [-gb | -tb]

list -slo [-detail] [-by_resptime] [-all] [-v]

list -srp [-detail] [-rdfa_dse] [-v]

list -srp -demand -type ‹slo | sg› [-detail]

list -tdev -srp
[-devs ‹‹SymDevStart›:‹SymDevEnd› | ‹SymDevName›
[,‹‹SymDevStart›:‹SymDevEnd› | ‹SymDevName››...]›]
[-sg ‹SgName›]

show -slo ‹SLOName›

show -srp ‹SRPName› [-detail]

symcfg -RA ‹#› [-p ‹#›] -sid ‹SymmID› [-noprompt] [-v]

online

offline

symcfg -FA ‹#› -p ‹#› -sid ‹SymmID› [-noprompt] [-v]

online

offline

symcfg

authorization list [-vmware] [-v]

authorization list [-hyperv] [-v]

```
authorization ‹add | update› -host ‹HostName›
  -username ‹UserName› [-password ‹PassWord›]
  [-namespace ‹NameSpace›] [-ahost ‹HostName›]
  [‹-vmport | -port› port] [-vmware]

authorization ‹add | update› -host ‹HostName›
  -username ‹UserName› [-password ‹PassWord›]
  [-hyperv]

authorization delete -host ‹HostName›
   -username ‹UserName›
  [-namespace ‹NameSpace›] [-vmware]

authorization delete -host ‹HostName›
   -username ‹UserName› [-hyperv]

symcfg [-sid ‹SymmID›] [-i ‹Interval›] [-c ‹Count›]
    [-percent ‹1-100› -action ‹ScriptFile› [-norepeat]]
    [-snap | -rdfa_dse | -thin] [-pool ‹PoolName›]
    [-mb | -gb]

monitor

symcfg -sid ‹SymmID›

set -led ‹ on | blue_flash ›

set -led ‹ on | slow_blink › -bay_name ‹BayName›

symcfg -lockbox [-password ‹PassWord›]

reset -ssv

setpw [-new_password ‹NewPassWord›]
```

DESCRIPTION

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

It includes the ability to rebuild the set of physical disks that are known to the host: (symcfg scan).

Directed-Symmetrix discovery is performed by specifying the SymmID, and if Symmetrix devices are freshly mapped to the host (and any host OS required scan operations are performed), the -pdev flag can be used to bring the new pdevs into the configuration database.

It can be used to view whether the specified Symmetrix array(s) have an exclusive Symmetrix lock. You can release a lock if it is determined to be hanging.

The symcfg command can be used to set one RDF RA director or one RA or FA port on a locally attached Symmetrix array to either online or offline. The symcfg command can also be used to display the LRU cache management configuration.

The symcfg command 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. The symcfg command can also list feature registration data, including usage information and capacity limits.

In addition, some arrays require authorization information to access the array. The symcfg authorization command is 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. The update option 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 director, the CU image information can be viewed.

Larger Symmetrix arrays contain a system bay and a set of drive bays. Environmental data and status for internal modules can be viewed/synched using the -env_data option. This requires Enginuity 5771 or above.

When the host is upgraded or when the lockbox file has been moved to another host, the host fingerprint may no longer match and the Stable System Values (SSVs) saved in the lockbox. They must be reset before the lockbox being accessible from Solution Enabler. To reset the SSVs in the lockbox, the password for the lockbox is required. To better protect the contents in the lockbox, a new password can also be set after its first creation with a default password.

ARGUMENTS

authorization Supplies and manages the connectivity information required to communicate with either:

- certain storage arrays
- the Virtual Infrastructure Service (Virtual Center Server or ESX).

The symcfg authorization command allows you to list, add, update, and delete this connectivity information.

This connectivity information consists of the following data:

Information	Option to Use
agent address	[-host]
user name	[-user]
password	[-password]
port	[-port]
alternate agent address	[-ahost]
namespace	[-namespace]

The agent address, user name, and password data information is required. While the the password can be entered via the command line option it is recommended to not specify the option on the command line and have the command prompt for the password. This is a more secure way of entering the password. The port and alternate agent address is useful for storage arrays.

The optional namespace parameter, if present, qualifies the agent address in some way. If it was provided when authorization information was originally defined, it must be provided during any subsequent update or delete operations.

discover Scans all devices on the host looking for Symmetrix devices and builds (or rebuilds) the Symmetrix host database. If the Symmetrix array is reconfigured by adding or removing devices that it sees, then run the discover command before

running sync to obtain accurate information.

This command interrogates all SCSI devices and can take a significant amount of time to complete. If you need to update the device configuration status information, the sync action is more efficient.

The -cache option attempts to recover the results of a previous SCSI interrogation from a running base daemon for increased speed. Configuration data is always retrieved from cache, if possible.

Note: If you had previously run discover and had subsequently removed Symmetrix array(s), a later execution of discover will not remove from the the database information relating to the removed Symmetrix array(s).

For selected Symmetrix array discovery, use the -sid option.

list Lists brief or detailed information about the Symmetrix configuration. Can also be used to view whether one or more Symmetrix arrays have an exclusive lock, host registration data, and application and feature registration data.

Using the -lock option with list, you can view whether one or more Symmetrix arrays have an 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 lists the GNS specific locks. The -lockn SRDF_MSCS lists the SRDF/CE for MSCS specific locks. The -lockn FAST command lists the FAST Hint Manager specific locks.

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

monitor Checks the total percent full of the devices in SNAP, RDFA_DSE or THIN pools and can optionally execute a script file if a specified percentage is encountered.

offline Sets one RDF RA director or one RA or FA director port on a locally-attached Symmetrix array to the offline status.

Note: Use caution when applying this action.

online Sets one RDF RA director or one RA or FA director port on a locally-attached Symmetrix array to the online status.

Note: Use caution when applying this action.

release Releases any existing Symmetrix exclusive locks from the specified Symmetrix array(s).

WARNING: Use this action ONLY if you are SURE that no operation using these locks is currently in progress.

remove Removes all information about the specified Symmetrix array from the host database. If there are more than one Symmetrix array attached, then information and definitions about all arrays are removed.

reset Resets the Stable System Values (SSVs) saved in the lockbox. This operation is required when the host fingerprint has changed, which usually occurs when the host is upgraded or the lockbox file has been moved to another host.

scan Results in a list of devices accessible to the host system. It should be initiated when the set of devices that a host can access has changed. Follow this action with a discover if the device changes are associated with Symmetrix devices. Also see the -pdev option.

set Used with -led to change the state of system bay or drive bay LEDs.

setpw Sets a new password for the lockbox.

show Shows detailed application registration data, CU image definitions, environment data, or a SAVE device pool for a specific system or drive bay.

sync Refreshes the Symmetrix configuration database file with data from the arrays. The Symmetrix configuration must have been previously discovered, using the discover action. If you reconfigure your Symmetrix

array by adding or removing devices that the host sees, you need to run a discover before a symcfg sync to obtain accurate information.

verify Without the -tdev and -datadev flags, verifies whether the Symmetrix configuration and the Symmetrix configuration database file are in sync.

With the -tdev flag, verifies whether one or more named device(s) (with the -devs flag), standard devices in a composite group (with the -cg flag), devices in a storage group (with the -sg flag), or all Symmetrix thin devices in a named pool are in a given state.

With the -datadev flag, verifies whether one or more named device (with the -devs flag) or all Symmetrix data devices in a named pool are in a given state.

OPTIONS

-action Selects a script to run when the specified percent value is encountered. The full pathname to the action script needs to be specified. The first argument passed to the script is automatically set to the percent value. This option requires the -percent option and is only valid with the monitor command.

-address Lists the Vbus, TID, and LUN addresses associated with devices mapped to the

front-end directors.

-ahost Specifies an alternate host name during authorization actions. To display this during a list operation, the -v (verbose) option must be applied.

-all If used with list -v on a front-end director, all port flags will be listed. If used with pool operations, both active and inactive information about the pools will be included in the display.

If used with 'list -slo', it specifies that all the SLOs configured in the array be listed.

-allocating Specifies that the applicable Symmetrix thin devices must be in the "allocating" state for the verification to return success.

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

-as400 Specifies pools or SAVE devices with emulation type AS400.

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

-balancing Verifies devices that are balancing.

-bay_info Displays the name of each system and drive

bay along with bay location information
and bay LED state.
Requires Enginuity level 5875 and higher.

-bay_name Specifies the system bay or drive bay for
control of the LED.

-bcv Refreshes (synchronizes) the configuration
database file with BCV information from the
Symmetrix array.

-binding Specifies that the applicable Symmetrix
thin devices must be in the "binding"
state for the verification to
return success.

-blocked Displays only blocked features.
Not compatible with -unblocked.

-bound When listing, lists devices that are bound
to a thin pool. When verifying, specifies
that the applicable Symmetrix thin devices
must be in the "bound" state in order for
the verification to return success.

-by_resptime When listing SLOs, display the list of SLOs
in sorted order by response time, it can be
abbreviated to 6 characters including the
'-' character.

-c Specifies the number (count) of times to
execute an exclusive lock or thin device
verification operation. If this option is
not specified but an interval (-i) is
specified, the program will loop
continuously. The looping may be terminated
during verification if all devices enter

the requested state.

-cache Attempts to recover the results of a previous SCSI interrogation from a running base daemon for increased speed. Configuration data is always retrieved from cache, if possible.

-capacity Shows the total Symmetrix storage space connected to each registered host, based on devices mapped to director/port. For a list of masked devices per host, use the symmaskdb list capacity command.

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

-class Displays only features in the specified class.

-client Directs the application registration list and show commands to reference the client application table, instead of referencing the SYMAPI-generated application table.

-ckd3380 Specifies pools or SAVE devices with emulation type CKD3380.

-ckd3390 Specifies pools or SAVE devices with emulation type CKD3390.

-compressing Specifies that the applicable Symmetrix thin devices must be in the "compressing" state for the verification to return success.

-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.

-container Applies the list or show action to display configuration information on Guest OS containers on the specified Symmetrix.

When used with the show command, this option takes an optional argument to specify the name of the container to be displayed.

-CUimage Lists or shows mainframe CU image information.

-DA Limits the action to a disk director number. To select all disk director numbers, specify ALL.

-datadev Displays information about or verifies the DATA devices.

-db Displays Symmetrix configuration database information.

-deactivated Specifies that the applicable Symmetrix data devices must be in the "deactivated" state for the verification to return success.

-deallocating Specifies that the applicable Symmetrix thin devices must be in the "deallocating" state for the verification to return success.

-demand Specifies a demand report be generated and and can be abbreviated to 4 characters.

-detail Displays detailed information for thin devices or RDF groups. Used with -port in order to request that FA-specific or SE-specific flag settings be displayed.

-devs Specifies a set of Symmetrix device ranges and/or individual Symmetrix devices.

-dir Limits the action to a director number. To select all director numbers, specify ALL.

-dirsts Refreshes the configuration database file with director status information from the specified Symmetrix array.

-disabled When displaying features, shows only disabled features. Not compatible with -enabled.

When verifying thin devices, specifies that the applicable Symmetrix data devices must be in the "disabled" state in order for the verification to return success.

-draining Specifies that the applicable Symmetrix data devices must be in the "draining" state in order for the verification to return success.

-drainwait Specifies that the applicable Symmetrix data devices must be in the "drainwait"

state in order for the verification to return success.

-DX Limits the action to the DX director. To select all DX director numbers, specify ALL.

-dynamic Lists dynamic RDF groups.

-env_data Displays or synchronizes the status of the major hardware modules comprising a Symmetrix system with Enginuity level 5771 or above. Verbose or summarized formats are available when displaying data.

-EA Limits the action to an ESCON director number. To select all ESCON director numbers, specify ALL.

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

-enabled Display only enabled features. Not compatible with -disabled.

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

-fast Refreshes (synchronizes) the configuration database file with FAST information gathered from the Symmetrix array.

-fba Specifies pools or SAVE devices with emulation type FBA.

-fc Use with -free in order to restrict the display of free ports to those which support the Fibre Channel interface type.

-features Lists the feature registrations and usage data. Where appropriate, capacity types and limits are also displayed. Usage information is displayed when the -v option is provided.

-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.

-free Use with -port in order to request a display of ports which are currently available to be associated with a director.

-freeingall Specifies that the applicable Symmetrix thin devices must be in the "freeingall" state for the verification to return success.

-gb Lists capacity in gigabytes.

-h Provides brief online help information.

-host Lists only application information for

the specified host or specifies a host name during authorization actions.

-host_cache Lists detailed information about host cache cards for each host associated with the specified Symmetrix. A list of devices registered for control by each host cache card is provided.

-hyperv Indicates that the supplied information is for Hyper-V Virtual Infrastructure Service. Used with the authorization action.

-i Specifies the repeat interval in seconds to execute an exclusive lock or thin device verification operation.
The default interval is 30 seconds.
The minimum interval is 5 seconds.
For passive actions the minimum interval is 15 seconds. Passive actions are actions that do not acquire an exclusive lock.

-ipv6 Specifies that the output display should not truncate IPv6 node names or addresses.

-iscsi Use with -free in order to restrict the display of free ports to those which support the ISCSI interface type.

-kit Lists the SYMAPI kit details.

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

-led Used with the set keyword to change the

state of system bay or drive bay LEDs.

-lock Displays whether the Symmetrix array has an exclusive lock.

-lockbox Manages accessibilty of the lockbox from Solution Enabler:

- reset SSVs saved in the lockbox.
- set a new password for the lockbox.

-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, SELs used by GNS by specifying GNS, or the SRDF/CE for MSCS locks by specifying SRDF_MSCS. To list all locks, specify ALL.

-LRU Lists the cache-slot allocation and allocation percentage of a specified LRU cache management group number, when used with the list action. Use ALL to list all the LRUs.

-masking Refreshes (synchronizes) the configuration database file with masking information gathered from the Symmetrix array.

-mb Lists capacity in megabytes.

-memory Displays information about the memory boards.

-namespace Specifies a namespace with authorization

operations.

-new_password The new password for the lockbox. This option has to be used in combination with the -lockbox option. If it is not specified on the command line the new password is prompted for. The characters entered are not displayed for additional security.

-nocache Bypasses the cache and rescans the devices for configuration information.

-nonpooled Lists or verifies devices that are ready to be assigned to a pool.

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

-norepeat Specifies that the action script should be run only once if the threshold has been met. Used with the action script option on the monitor command.

-novirtual Use with -port in order to restrict the display to physical ports only.

-offline Sets the operation to work in offline mode, utilizing the host configuration database exclusively.

-p Identifies a specific port number to be used.

-password The password associated with the user supplied by the -username option. The option is optional. If it is not specified on the command line the password is

prompted for. The characters entered are not displayed for additional security.

When this option is used in combination with -lockbox option, the input password is for the lockbox. If it is not specified on the command line the password is prompted for as above.

-pdev For a discover operation, this limits the work performed to collect only the pdev information. In cases where the Symmetrix configuration was changed, a full discovery is performed. When used with the -sid option, only pdevs for the specified Symmetrix array are updated.

-percent Causes the action script to be executed when the percent full argument is encountered.

-pool Specifies the pool type.

When used with the monitor command, this option takes an argument to specify the pool to be monitored.

-poolstate Verifies the state of the named thin pool.

-port Requests a display of port-level information.

When used with the authorization command, this takes an argument to provide the port at which the agent is listening.

When used with -free, lists information about ports available to be associated with a

director.

-RA Limits the action to an RDF director number. To select all RDF director numbers, specify ALL.

-rcopy Refreshes (synchronizes) the configuration database file with remote copy session information gathered from the Symmetrix array.

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

-rdfa Displays SRDF/Asynchronous information.

-rdfg If given an RDF group number, the particular RDF group is displayed; if ALL is specified, all RDF groups are displayed.

-rdfa_dse Displays SRDF/Asynchronous DSE pool information.

When used with 'list -srp', display only SRPs that can be used for RDFA DSE spillover.

-RE Limits the action to an RDF Gig-E director number. To select all RDF Gig-E director numbers, specify ALL.

-reclaiming Verifies devices that are currently being reclaimed from a thin pool.

-RF Limits the action to an RDF Fibre director number. To select all RDF Fibre director

numbers, specify ALL.

-savedev Displays information about the SAVE devices.

-SE Limits the action to a Gig-E director number. To select all Gig-E director numbers, specify ALL.

-semaphores Displays gatekeeper, database, and lock file semaphores.

-service_state Limits the display of environment data to include only modules that are in the specified service state.

-services Displays configured network services.

-sg Refreshes (synchronizes) the configuration database file with Storage Group (SG) information gathered from the Symmetrix array or specifies the name of the storage group to use.

-sid Specifies the unique Symmetrix ID.

-slo Display information about the SLOs.

-slot Use with -free in order to restict the display of free ports to those which reside on a specified slot.

-snap Refreshes (synchronizes) the configuration database file with updated TimeFinder/Snap information when used with sync.
If used with pools, displays Snap pool information.

-sorthost Sorts the -connections list by host,

rather than by Symmetrix ID.

-speed Use with -free in order to restrict the display of free ports to those of a specified maximum speed (Gb/sec).

-srp Display information about the SRPs.

-ssid Displays MVS subsystem information.

-ssid_num Identifies a specific SSID group indicating which group to display if a CU image contains multiple SSID groups.

-ssv Indicates to reset the Stable System Values (SSVs) saved in the lockbox.

-static Lists static RDF groups.

-status Displays status information referring to whether the configuration has changed and if the Symmetrix array was discovered during the last discover action.

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

-tdev Displays information about thin devices.

-thin Displays Virtual Provisioning thin pool information.

-tier Refreshes (synchronizes) the configuration database file with tier information

gathered from the Symmetrix array.

-unblocked Displays only unblocked features.
Not compatible with -blocked.

-unbinding Verifies devices that are currently
unbinding from a thin pool.

-unbound Lists or verifies devices that are
ready to be bound to a thin pool.

-uncompressing Specifies that the applicable Symmetrix
thin devices must be in the "uncompressing"
state for the verification to
return success.

-upatches Lists all Enginuity patches on this
Symmetrix array.

-username Indicates the name of the user to authorize.

-v Provides a more detailed, verbose listing.

-version Displays SYMCLI/SYMAPI version information.

-virtual Use with -port in order to restrict the
display to virtual ports only.

-vmware Indicates that the supplied information is
for a VMWare Virtual Infrastructure Service.
Used with the authorization action.

-vpdata Refreshes (synchronizes) the configuration
database file with virtual provisioning
information gathered from the Symmetrix
array.

PARAMETERS

AppID The application ID.

BayName The Symmetrix cabinet name.

BayName must conform to one of the patterns below. These will be accepted in either upper or lower case.

SB-x where x is a system bay number
DB-xy where x is a drive bay index
and y is the bay side (A, B, C, D)

These forms are consistent with bay names displayed in output returned by the "symcfg -env_data" and "symcfg -bay_info" list commands.

ClassName The class of features list. This string must match what is displayed as the feature class in the normal feature output. Class names with spaces must be enclosed in quotes.

ContainerName The name of the container to be displayed.

HostName The host name.

NameSpace The namespace used with Authorization actions.

NewPassWord The new password for the lockbox.

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

When used in combination with -lockbox option, the input password is for the lockbox.

PoolName The device pool name.

ScriptFile The full pathname of a script file to be executed.

SgName The storage group name.

SLOName The SLO name.

SRPName The SRP name.

SSID The subsystem number.

SymDev A single Symmetrix device name, such as 008A.

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.

UserName The username supplied during authorization actions.

RETURN CODES

Code #	Code Symbol
0	CLI_C_SUCCESS

1 CLI_C_FAIL

2 CLI_C_DB_FILE_IS_LOCKED

19 CLI_C_GK_IS_LOCKED
All GateKeepers to the Symmetrix array are currently locked.

Return codes for symcfg -lock

16 CLI_C_SYM_NOT_ALL_LOCKED
Only returned if not all the targeted Symmetrix arrays currently have an exclusive Symmetrix lock.

17 CLI_C_SYM_NONE_LOCKED
Only returned if none of the targeted Symmetrix arrays currently has an exclusive Symmetrix lock.

Return codes for symcfg verify

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

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, enter:

```
symcfg -cumage show 0
```

To display the status of modules comprising a storage array running Enginuity 5771 or above that are in a failed state, enter:

```
symcfg -env_data list -service_state failed
```

symcg

Performs operations on a Symmetrix composite group (CG).

SYNOPSIS

```
symcg -h

symcg [-i <Interval>] [-c <Count>] [-v]

  activate <CgName> [-noprompt]

  activateall [-noprompt]

  create <CgName>
    [-type REGULAR | RDF1 | RDF2 | RDF21 | ANY]
    [-apidb | -rdf_consistency]

  delete <CgName> [-force] [-symforce]

  export <CgName> [-file <FileName>] [-rdf]
    [-grpfile <GrpDbFileName>]

  exportall [-file <FileName>] [-rdf]
    [-grpfile <GrpDbFileName>]

  import <CgName> [-file <FileName>]
    [-apidb | -rdf_consistency] [-rename]

  importall [-file <FileName>]
    [-apidb | -rdf_consistency]

  list [-offline] [-v]
    [-apidb | -rdf_consistency]
    [-grpfile <GrpDbFileName>]

  list [-inactive]
```

```
  release <CgName> [-force] [-noprompt]
    [-sid <SymmID>] [-lock <#>]

  rename <OldCgName> <NewCgName>

  show <CgName> [-inactive] [-offline | -lock]
    [-grpfile <GrpDbFileName>]

symcg -cg <CgName> [-i <Interval>] [-c <Count>] [-v]

  add dg <DgName>[,<DgName1>,<DgName2>,...]

  add [pd] <PdevName> [<LdevName>]

  copy ld <LdevName> <DestCgName> [-force] [-rename]

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

  rename ld <OldLdevName> <NewLdevName>

  remove ld <LdevName> [-force] [-symforce]

  remove [pd] <PdevName> [-force] [-symforce]

  set <-name [<Name>] | -recovery_rdfg <GrpNum>>
    [-rdfg <<SymmID>:<<GrpNum>[,<GrpNum>,...]|all>[,...] |
      name:<RdfGroupName>[,<RdfGroupName>]>]

  show ld <LdevName>

symcg -cg <CgName> -sid <SymmID>
    [-i <Interval>] [-c <Count>] [-v]
    [-rdf | -hop2]
    [-rdfg <GrpNum> [-remote_rdfg <RemoteGrpNum>]]

  add dev <SymDevName> [LdevName] [-vdev | -tgt]
```

```
    remove dev <SymDevName> [-force] [-symforce]
     [-vdev | -tgt]

    remove dg <DgName>[,<DgName1>,<DgName2>,...]

symcg -cg <CgName> [-i <Interval>] [-c <Count>] [-v]
    [-sid <SymmID>]
    [-SA <# | ALL>] [-P <#>] [-N <#>]
    [-cap <#> [-captype <mb> | <cyl>]]
    [-rdf | -hop2] [-vdev | -tgt]
    [-rdfg <GrpNum> [-remote_rdfg <RemoteGrpNum>]]
    [-sel_rdfg <SelRdfGrpNum>]
    [-devs <<SymDevStart>:<SymDevEnd> | <SymDevName>
       [,<<SymDevStart>:<SymDevEnd> | <SymDevName>>...]>]

    addall [pd | devs [-rdf | -hop2]]
     [-R1 | -R2 | -R21 | -noRDF] [-v]

    rmall [-rdf | -hop2] [-force] [-symforce]
     [-R1 | -R2 | -R21 | -noRDF]

symcg -cg <CgName> [-i <Interval>] [-c <Count>] [-v]
    [-sid <SymmID>]
    [-SA <# | ALL>] [-P <#>] [-N <#>]
    [-cap <#> [-captype <mb> | <cyl>]]
    [<-vdev | -tgt> [-hop2] | -rvdev | -rtgt]
    [-rdfg <GrpNum> [-remote_rdfg <RemoteGrpNum>]]
    [-sel_rdfg <SelRdfGrpNum>]
    [-devs <<SymDevStart>:<SymDevEnd> | <SymDevName>
       [,<<SymDevStart>:<SymDevEnd> | <SymDevName>>...]>]

    copyall <DestCgName> [-force] [-symforce] [-rename]
     [-R1 | -R2 | -R21 | -noRDF]

    moveall <DestCgName> [-force] [-symforce] [-rename]
     [-R1 | -R2 | -R21 | -noRDF]
```

symcg -cg ‹CgName› [-i ‹Interval›] [-c ‹Count›]
[-noprompt] [-v]
[-rdfg name:‹Name›] [-hop2] [-star]

enable

disable [-force]

symcg -cg ‹CgName› [-i ‹Interval›] [-c ‹Count›]
[-noprompt] [-v] [-force]
[-bcv | -vdev | -tgt] [-rp] [-star][-sid ‹SymmID›]
[-celerra]

rw_enable [‹LdevName› [‹LdevName› ...]]

write_disable [‹LdevName› [‹LdevName› ...]]

symcg -cg ‹CgName› [-i ‹Interval›] [-c ‹Count›]
[-noprompt] [-v] [-force]
[-bcv | -vdev | -tgt] [-star][-sid ‹SymmID›]

host_active [‹LdevName› [‹LdevName› ...]]

pin [‹LdevName› [‹LdevName› ...]]

relabel [‹LdevName› [‹LdevName› ...]]

unpin [‹LdevName› [‹LdevName› ...]]

symcg -cg ‹CgName› [-i ‹Interval›] [-c ‹Count›] [-v]
[-noprompt] [-force]
[-bcv [-hop2] | -rbcv | -brbcv | -rrbcv |
-vdev [-hop2] | -rvdev | -tgt [-hop2] | -rtgt]
[-rp] [-star] [-sid ‹SymmID› |
-rdfg ‹‹SymmID›:‹‹GrpNum›[,‹GrpNum›,...]|all›[,...] |
name:‹RdfGroupName›[,‹RdfGroupName›]›] [-celerra]

not_ready [‹LdevName› [‹LdevName› ...]]

ready [‹LdevName› [‹LdevName› ...]]

hold [‹LdevName› [‹LdevName› ...]]

compress [‹LdevName› [‹LdevName› ...]] [-stop]

uncompress [‹LdevName› [‹LdevName› ...]] [-stop]

bind -pool ‹PoolName›

unbind

rebind -pool ‹PoolName›

allocate [LdevName [LdevName...]] [-persistent]

allocate [LdevName [LdevName...]] -stop

free [-all] [LdevName [LdevName...]]

free [-all] [LdevName [LdevName...]] -stop

reclaim [LdevName [LdevName...]] [-persistent]

reclaim [LdevName [LdevName...]] -stop

set -persistent [‹LdevName› [‹LdevName› ...]]

unset -persistent [‹LdevName› [‹LdevName› ...]]

set -orm ‹ system | on | off›
[‹LdevName› [‹LdevName› ...]]

symcg -cg ‹CgName› [-i ‹Interval›] [-c ‹Count›] [-v]
[-noprompt] [-symforce]

```
    [-bcv [-hop2] | -rbcv | -brbcv | -rrbcv |
     -vdev [-hop2] | -rvdev | -tgt [-hop2] | -rtgt ]
    [-rp] [-star] [-sid <SymmID> |
    -rdfg <<SymmID>:<<GrpNum>[,<GrpNum>,...]|all>[,...] |
      name:<RdfGroupName>[,<RdfGroupName>]>] [-celerra]

  unhold [<LdevName> [<LdevName> ...]]

  set -gcm [<LdevName> [<LdevName> ...]]

  unset -gcm [<LdevName> [<LdevName> ...]]

symcg -cg <CgName> [-i <Interval>] [-c <Count>]
    [-noprompt] [-v]
    -sid <SymmID>
    -devs <<SymDevStart>:<SymDevEnd> | <SymDevName>
      [,<<SymDevStart>:<SymDevEnd> | <SymDevName>>...]> |
      -file <FileName>
    -stg_rdfg <GrpNum>[,<GrpNum>]
    -cg_rdfg <CgGrpNum>[,<CgGrpNum>]
    [-stg_r21_rdfg <R21GrpNum> -cg_r21_rdfg <CgR21GrpNum>]

  modify -add [-force]

  modify -remove

symcg -cg <CgName> [-i <Interval>] [-c <Count>]
    [-noprompt] [-v] [-force]

  modify -recover
```

DESCRIPTION

The symcg command performs the following operations specific to composite groups: creating a new composite group; deleting, exporting, importing, listing, or 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 also performs the following control actions on some or all of the devices in a composite group: write_disable, rw_enable, ready, not_ready, hold, unhold, pin, unpin, compress, uncompress, relabel, set, unset, bind, unbind, rebind, allocate, free and reclaim. By default the actions will only be applied to the standard devices in the group. The -bcv and -tgt switches must be specified to operate on those types of devices.

ARGUMENTS

allocate Allocates storage in the thin pool.

activate Activates a specified composite group.

activateall Activates all of the inactive composite groups. Imports to Group Name Services (GNS).

add Adds a Symmetrix device or an existing device group to an existing composite group.

addall Adds all Symmetrix devices that are visible to this host, are not already members of a composite group, and belong to a specified Symmetrix array to the specified existing composite group. When the dev keyword is specified, devices that are not visible to the host are also added.

bind Binds the thin device(s) to the thin pool.

compress Starts data compression on thin device(s). When combined with the -stop option, data compression is stopped.

copy Copies one device from one existing composite group to another existing composite group. The source and destination composite groups must have compatible types.

copyall Copies all specified devices from one existing composite group to another existing composite group. The source and destination composite groups must have compatible types.

create Creates an empty composite group. If no type is specified, then the group will become a REGULAR group.

delete Deletes an existing composite group. If the composite group has members, 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 and the group is deleted.

If RDF consistency is enabled and cannot be disabled, the command will fail unless the -symforce option is used.

disable Disables RDF consistency for all device(s) in the CG or for all devices(s) in the rdfg name.

enable Enables RDF consistency for all device(s) in the CG or for all device(s) in the rdfg name.

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

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

free Frees storage in the thin pool.

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

host_active Sets the host active mode on device(s). The device(s) must be in a host passive mode for this operation to succeed.

If a device is host visible, the command will fail unless the -symforce option is used.

import Imports the composite group described by a text file that was created by the export action.

importall Imports all of the composite groups described by a text file that was created by the exportall action.

list Lists all of the composite groups that have been created for this host. If the -inactive option is specified, all of the

inactive composite groups will be listed.

modify Moves devices between the staging area and the RDF Consistency enabled CG, and updates the CG definition to reflect the change.

move Moves one device from one existing composite group to another existing composite group. The source and destination composite groups must have compatible types.

moveall Moves all specified devices from one existing composite group to another existing composite group. The source and destination composite groups must have compatible types.

not_ready Makes all of the devices in the composite group not ready. By default, all devices in the STD device list are acted upon.

pin Sets the device(s) to the user pinned state. User pinned device(s) will not be moved via FAST controller, but they can be moved via Optimizer or Symmigrate.

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

rebind Rebinds the device(s) to the thin pool.

reclaim Reclaims storage from the thin pool.

relabel Applies the defined label to the device. Please refer to the symlabel command to

learn how to define a device label.

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

remove Removes a Symmetrix device or device group from an existing composite group.

If RDF consistency is enabled, the command will fail unless the -force option is used.

If RDF consistency cannot be disabled, the command will fail unless the -symforce option is used.

rename 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 option is used.

If RDF consistency cannot be disabled, the command will fail unless the -symforce option is used.

rw_enable Enables all devices in the composite group for reads and writes. By default, all devices in the STD device list are acted upon.

set Associates a logical name or a STAR recovery RDF group number with an RDF (RA)

group(s) when combined with the -name or -recovery_rdfg option. Sets the persistent indicator for allocations on thin device(s) when combined with the -persistent option. Sets the Optimized Read Miss mode when combined with the -orm option. Sets GCM mode when combined with -gcm.

show Shows detailed information about the devices in a composite group.

unbind Unbinds device(s) from the thin pool.

uncompress Starts data decompression on thin device(s). When combined with the -stop option, data decompression is stopped.

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

unpin Unset the device(s) from the user pinned state.

unset Clears the persistent indicator for allocations on thin device(s) when combined with the -persistent option. Clears GCM mode when combined with -gcm.

write_disable Disables writes for all devices in the composite group. By default, all devices in the STD device list are acted upon.

KEYWORDS

dev Performs the action against a Symmetrix device given its Symmetrix device name.

devs Performs the action against multiple Symmetrix devices given their Symmetrix device names.

dg Performs the action against a device group given its device group name.

ld Performs the action against a Symmetrix device given its logical device name.

name Performs the action against the specified RDF group's logical name.

pd Performs the action against a Symmetrix device given its physical (host) device name.

OPTIONS

-add Specifies that the devices will be added to the RDF Consistency enabled CG from the staging area.

-all Used with the free operation in order to specify that all allocations associated with the indicated devices are to be freed, regardless of whether data has been written or not.

-apidb Lists the composite groups that are in the SYMAPI database. On a create or import, overrides the options file setting and stores the RDF CG in the SYMAPI database only.

-bcv Specifices all devices in the BCV device

list of a composite group.

-brbcv Specifies all devices in the BRBCV device list of a composite group.

-c Specifies the number (count) of times to attempt to acquire an exclusive lock on the Symmetrix host database and (for control operations) on the local and/or remote Symmetrix arrays.

The time to wait between attempts to acquire a needed lock is specified by -i (interval).

If neither -c nor -i is specified, operations will fail if unable to acquire a requested lock.

If -c is not specified, and -i is specified, the program will loop continuously until the operation has acquired the locks it needs and can start.

-cap Sets a minimum device size to the selection criteria of devices.

-captype ‹mb | cyl›
Specifies the units of capacity in megabytes or cylinders. If the unit of measurement is not specified, the default is mb.

-celerra Allows controls on Celerra FBA devices.

-cg Specifies the composite group name.

-cg_rdfg Specifies the RDF group(s) within the CG to

which devices will be added or from which devices will be removed. For a concurrent CG, two groups must be specified (separated by a comma). These RDF groups are associated (in order) with the RDF groups specified by the -stg_rdfg option.

-cg_r21_rdfg Specifies the RDF group connecting the R21 and R2 Symmetrix arrays of a cascaded CG. It is only valid for operations involving cascaded R1 devices. This RDF group is associated with the RDF group specified by the -stg_r21_rdfg option.

-orm Allows setting the Optimized Read Miss mode to system default, on, or off for the specified devices.

-devs Specifies the ranges of Symmetrix devices to add and remove.

-file For the import and export action, specifies the file to be used.

For the modify action, specifies the filename containing the list of devices to be acted upon. Only the SymDevName specified on the first column of each line is used.

-force Forces the deletion of a composite group, with or without members. Also used with disable to perform the action when devices are in unexpected RDF modes and states. When used with remove, if the device is enabled, it will be disabled and removed.

Also applies to the following actions: write_disable, rw_enable, ready, not_ready, hold, unhold, host_active and relabel.

-gcm Allows setting or clearing the device GCM mode.

-grpfile Specifies an alternate group database file for use in list, show, export and exportall actions.

-h Provides brief, online help information.

-hop2 Indicates that the device is two hops away.

If used for add/remove dev, addall, rmall, moveall, or copyall operations, then -rdfg, -remote_rdfg, and -tgt or -vdev must also be specified.

When holding or readying devices, the hop2 flag must be used with -bcv, -vdev, or -tgt.

If used for enable/disable operations, targets the operation at the group's second-hop devices in a Cascaded RDF relationship. For example, given an RDF1 group, the R21->R2 pair of the R1->R21->R2 relationship will be enabled or disabled.

-i Specifies the interval, in seconds, to wait between attempts to acquire an exclusive lock on the Symmetrix host database and, for control operations, on the local and/or remote Symmetrix arrays.

The default interval is 30 seconds.
The minimum interval is 5 seconds.
For passive actions the minimum interval is 15 seconds. Passive actions are actions that do not acquire an exclusive lock.

-inactive Lists or shows inactive composite groups.

-lock Displays whether the devices have any exclusive locks.

-name Specifies the RDF group name(s). Reset it by setting it to the null string (for example: symcg -cg w1 set -rdfg 13:55).

-noprompt Eliminates the prompt for user confirmation.

-noRDF Adds, copies, moves, or removes non RDF devices only.

-offline Obtains information from the Symmetrix host configuration database.

-persistent Used with set or unset it specifies operation on the persistent indicator. Used with allocate or reclaim it specifies the use of persistent storage.

-pool Specifies a Thin Pool Name.

-R1 Adds, copies, moves, or removes RDF1 (R1) devices only.

-R2 Adds, copies, moves, or removes RDF2 (R2) devices only.

-R21 Adds, copies, moves, or removes RDF21 (R21)

devices only.

-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.

When used in conjunction with -vdev, it indicates that the device is an RVDEV device. When used in conjunction with -tgt, it indicates that the device is an RTGT device.

-rdf_consistency
Creates or imports the CG, allowing it to be enabled for RDF consistency once devices have been added to the CG.

-rdfg Adds, removes, or controls devices that belong to the specified RDF (RA) group(s). For an add operation, this parameter is only valid with -vdev or -tgt. For control operations (ready, not_ready, hold, unhold), this parameter must be used with a remote device type (-rbcv, -brbcv, -rrbcv, -rvdev, -rtgt).

-recover Recovers the failed modify add or modify remove operation and puts the CG into a known state.

-recovery_rdfg
Specifies a STAR recovery RDF (RA) group.

This is a ones-based number. Reset it by setting it to zero.

-remote_rdfg Specifies the RDF (RA) group to access a two-hop device from the first hop.

-remove Specifies that the devices will be removed from the RDF Consistency enabled CG to the staging area.

-rename Specifies a new name for the CG.

-rp Indicates that the action is targeted for devices tagged for RecoverPoint.

-rrbcv Specifies all devices in the RRBCV device list of a composite group.

-rtgt Specifies all devices in the RTGT device list of a composite group.

-rvdev Specifies all devices in the remote VDEV device list of a composite group.

-sel_rdfg Indicates the Symmetrix RA (RDF) group number of the devices to be added via an addall operation.

-sid Specifies the unique Symmetrix ID.

-star Indicates that the action is targeted for devices in STAR mode.

-stg_r21_rdfg The RDF group connecting the R21 and R2 Symmetrix arrays in the staging area that is used to add or remove cascaded devices from a cascaded CG. It is only valid for

operations involving cascaded R1 devices. This RDF group is associated with the RDF groups specified by the -cg_r21_rdfg option.

-stg_rdfg Specifies the RDF group(s) that comprise the staging area. For a concurrent CG, two groups must be specified (separated by a comma). These RDF groups are associated (in order) with the RDF groups specified by the -cg_rdfg option.

-stop Specifies that the compress, uncompress, allocate, free or reclaim operation will be stopped.

-symforce Forces the operation (when used with remove or delete) if the device is enabled for consistency and it cannot be disabled.

Also applies to the following actions: unhold, set -gcm and unset -gcm.

-tgt Targets the indicated action at the devices in TGT list of the composite group.

-type Specifies the composite group type. Values are: REGULAR, RDF1, RDF2, RDF21, and ANY. The default type is REGULAR.

-v Provides a more detailed, verbose listing.

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

PARAMETERS

CgGrpNum The RDF (RA) group number of an RDF Group

within the enabled CG.

CgName The composite group name assigned by the user. The name must be unique to this host.

CgR21GrpNum The RDF (RA) group number connecting the R21 Symmetrix to the R2 Symmetrix of a Cascaded R1 CG.

DestCgName The destination composite group name for copy/copyall or move/moveall operations.

DgName The name of the device group to be contained by the composite group.

FileName For the import or export action, the text file name to be used.

For the modify action, the file name that contains a list. Only the SymDevName specified on the first column of each line is used.

GrpDbFileName Specifies an alternate group database file for use in list, show, export and exportall actions.

GrpNum The RDF (RA) group number.

LdevName The device logical name assigned by the user or automatically assigned when a device is added to a composite group.

NewCgName The new composite group name.

OldCgName The current composite group name.

PdevName The host physical name for the device (for example: /dev/rhdiskpower61).

R21GrpNum The RDF (RA) group number of the R1 Mirror of the R21 device.

RdfGroupName The logical name associated with the RDF (RA) group(s).

RemoteGrpNum The RDF (RA) group number from the first hop to the second hop.

SelRdfGrpNum The Symmetrix RA (RDF) group number of the devices to be added via an addall operation.

SymDevEnd The last Symmetrix device name in a sequence (for example: 00B6).

SymDevName The Symmetrix device name, unique per Symmetrix (for example: 001C).

SymDevStart The first Symmetrix device name in a sequence (for example: 001C).

SymmID The 12-digit ID of the Symmetrix array.

RETURN CODES

Code #	Code Symbol
0	CLI_C_SUCCESS
1	CLI_C_FAIL
2	CLI_C_DB_FILE_IS_LOCKED

19 CLI_C_GK_IS_LOCKED
All GateKeepers to the Symmetrix array
are currently locked.

FILES

The output file created by the export argument and read by the import argument has the following format:

```
<CG TYPE>
  S <SYMMETRIX_ID> <SYMMETRIX_DEVICE_NAME>
  B <SYMMETRIX_ID> <SYMMETRIX_DEVICE_NAME>
  R <SYMMETRIX_ID> <SYMMETRIX_RA_GROUP_NUM>
   <LOGICAL_DEVICE_NAME>
  Z <SYMMETRIX_ID> <SYMMETRIX_RA_GROUP_NUM>
   <LOGICAL_DEVICE_NAME>
  Y <SYMMETRIX_ID> <SYMMETRIX_RA_GROUP_NUM>
   <REMOTE_SYMMETRIX_RA_GROUP_NUM>
   <LOGICAL_DEVICE_NAME>
  D <SYMMETRIX_ID> <SYMMETRIX_RA_GROUP_NUM>
   <HOP_2_SYMMETRIX_RA_GROUP_NUM>
   <LOGICAL_DEVICE_NAME>
  V <SYMMETRIX_ID> <LOGICAL_DEVICE_NAME>
  W <SYMMETRIX_ID> <SYMMETRIX_RA_GROUP_NUM>
   <LOGICAL_DEVICE_NAME>
  E <SYMMETRIX_ID> <SYMMETRIX_RA_GROUP_NUM>
   <HOP_2_SYMMETRIX_RA_GROUP_NUM>
   <LOGICAL_DEVICE_NAME>
  T <SYMMETRIX_ID> <LOGICAL_DEVICE_NAME>
  X <SYMMETRIX_ID> <SYMMETRIX_RA_GROUP_NUM>
   <LOGICAL_DEVICE_NAME>
  F <SYMMETRIX_ID> <SYMMETRIX_RA_GROUP_NUM>
   <HOP_2_SYMMETRIX_RA_GROUP_NUM>
   <LOGICAL_DEVICE_NAME>
  N <SYMMETRIX_ID> <SYMMETRIX_RA_GROUP_NUM>
   <SYMMETRIX_RA_GROUP_NAME>
```

C ‹SYMMETRIX_ID› ‹SYMMETRIX_RA_GROUP_NUM›
‹SYMMETRIX_RECOVERY_RA_GROUP_NUM›
G ‹DgName›

In the output described above, the ‹CG TYPE› values are:

Symbolic Name	Value
SYMAPI_C_CGTYPE_NA	0
SYMAPI_C_CGTYPE_RDF1	1
SYMAPI_C_CGTYPE_RDF2	2
SYMAPI_C_CGTYPE_REGULAR	3
SYMAPI_C_CGTYPE_RDF21	4
SYMAPI_C_CGTYPE_ANY	5

The single-character codes that represent device types are:

Code	Description
S	Identifies an STD device.
B	Identifies a local BCV device.
R	Identifies an RBCV device.
Z	Identifies a BRBCV device.
Y	Identifies an RRBCV device.
D	identifies a HOP 2 BCV device.
V	Identifies a VDEV.
W	Identifies an RVDEV device.
E	Identifies a HOP 2 VDEV device.
T	Identifies a TGT device.
X	Identifies an RTGT device.
F	Identifies a Hop 2 TGT device.
N	Identifies an RA Group Name.
G	Identifies a DG

The parameters used to describe the devices include:

Parameter	Description

--- ---

‹SYMMETRIX_ID› The 12-digit identifier of the Symmetrix upon which the local STD devices resides.

‹SYMMETRIX_RA_GROUP_NUM›
The RDFG (RA) number that can be used in combination with the local Symmetrix ID to get to the remote Symmetrix.

‹REMOTE_SYMMETRIX_RA_GROUP_NUM›
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 that is one hop away.

‹HOP_2_SYMMETRIX_RA_GROUP_NUM›
The RDFG (RA) number that can be used in combination with the local and remote RA group numbers and the local Symmetrix ID to get to the Symmetrix that is two hops away.

‹SYMMETRIX_DEVICE_NAME›
The Symmetrix device number.

‹LOGICAL DEVICE NAME›
The name of the device in the group.

‹SYMMETRIX_RA_GROUP_NAME›
The RDFG (RA) group name.

‹SYMMETRIX_RECOVERY_RA_GROUP_NUM›

The RDFG (RA) recovery RDFG (RA) group number.

The file will have as many device description lines as the composite group has members.

Lines in the file that are blank or have a pound sign (#) in the first column will be ignored.

EXAMPLES

To create a REGULAR Symmetrix composite group called mycg1, enter:

```
symcg create mycg1
```

To list all of the Symmetrix composite groups in a detailed format, enter:

```
symcg -v list
```

To show information about composite group oracg, enter:

```
symcg show oracg
```

To export composite group oracg to a text file called 'oracg.txt', enter:

```
symcg export oracg -file oracg.txt
```

To delete Symmetrix composite group oracg, regardless of whether the group has devices in it, enter:

```
symcg -force delete oracg
```

To import composite group oracg from a text file, called 'oracg.txt', enter:

```
symcg import oracg -file oracg.txt
```

To add a device to Symmetrix composite group oracg, enter:

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

To remove a device from a Symmetrix composite group oracg, enter:

```
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.

SYNOPSIS

```
symchg  [-h]

symchg [-sid ‹SymmID›] [-v]

  create dev ‹SymDevName› [-type ‹read | write | rw›]

  mark   dev ‹SymDevName›

  delete dev ‹SymDevName› [-force]

  remove dev ‹SymDevName› [-force]

symchg ‹-g ‹DgName› | -cg ‹CgName›› [-bcv] [-v]

  create [ld ‹LdevName›] [-type ‹read | write | rw›]

  mark   [ld ‹LdevName›]

  delete [ld ‹LdevName›] [-force]

  remove [ld ‹LdevName›] [-force]

symchg -sg ‹SgName› -sid ‹SymmID› [-v]

  create [-type ‹read | write | rw›]

  mark

  delete [-force]
```

```
    remove [-force]

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

    create [-type <read | write | rw>]

    mark

    delete [-force]

    remove [-force]

  symchg [-sid <SymmID>] [-v]

    list

    list -session [dev]  [-type <read | write | rw>]

  symchg [-v]
    [-i <Interval>] [-c <Count>] [-reset | -multi]

    view dev <SymDevName> [-sid <SymmID>] [-native]

    view <-g <DgName> | -cg <CgName>> [-bcv]
        [-native | -log <LogFile>]

    view <-g <DgName> | -cg <CgName>> ld <LdevName>
        [-native]

    view -sg <SgName> -sid <SymmID> [-native |
        -log <LogFile>]

    view [-sid <SymmID>] -file <DevFile> [-native |
         -log <LogFile>]

  symchg -session [-v]
```

```
    view dev ‹SymDevName› [-sid ‹SymmID›]
    view ‹-g ‹DgName› | -cg ‹CgName›› [-bcv]

    view ‹-g ‹DgName› | -cg ‹CgName›› ld ‹LdevName›

    view -sg ‹SgName› -sid ‹SymmID›

    view [-sid ‹SymmID›] -file ‹DevFile›

  symchg [-ra ‹NumRAs›] [-rate ‹KB/s›]
       [-resync [‹mmmm|hh:mm›]]
    [-start ‹mmddyyyy hh:mm›] [-stop ‹mmddyyyy hh:mm›]
    [-backend] [-native] [-v]
    [-devs ‹‹SymDevStart›:‹SymDevEnd› | ‹SymDevName›
        [,‹‹SymDevStart›:‹SymDevEnd› | ‹SymDevName››...]›]

    report -log ‹LogFile› ‹-g ‹DgName› | -cg ‹CgName››
      [-bcv]

    report -log ‹LogFile› -sg ‹SgName› -sid ‹SymmID›

    report -file ‹DevFile› -log ‹LogFile› [-sid ‹SymmID›]
```

DESCRIPTION

The symchg command (also known as Change Tracker) timestamps and marks an area of Symmetrix disk storage occupied by a disk storage object using an SDDF bitmap. This allows the changes to a marked area to be viewed at a later time. You can mark storage objects such as Symmetrix devices, lists of Symmetrix devices in a device file or a storage group, 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-delimited format so the data to be imported into a spreadsheet for analysis. The results in the log file 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 the changed and cumulative tracks (by specifying -multi). The sum method is the default.

The symchg utility calculates 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 (RA) and the RA transfer rates. Two of these values are specified on the command line, and the third value is calculated.

ARGUMENTS

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

delete Removes the marked object from the symchg database and deletes the Change Tracker session.

list Lists all the disk storage objects that were marked. Lists all Symmetrix devices that have an established Change Tracker session.

mark Marks the area of disk storage to be monitored. A session must first be created for the device containing the object to be marked.

remove Removes the marked object from the symchg database without terminating the Change Tracker session.

report Generates a report on the amount of change for the specified object in the 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 the rate of change. Also shows whether a Change Tracker session exists for a specified disk device. The possible storage objects are specified by selecting a Symmetrix device name, logical device name, device group, or 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 Limits the action to the BCV devices of the device group.

-c Specifies 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 is displayed continuously at every

interval.

-cg Specifies the composite group name.

-devs Specifies a set of Symmetrix device ranges and/or individual Symmetrix devices for the report action.

-file Specifies the device list file.

-force Works with delete and remove operations.

With the delete operation, the -force option forces the cancellation of the Change Tracker session on each device and forces the removal of the devices from the symchg database. This action is performed even if one or more devices does not exist in the symchg database or if the object type does not match.

With the remove operation, the -force option forces the removal of the devices from the symchg database. This action is performed even if one or more devices does not exist in the symchg database or if the object type does not match.

-g Specifies a Symmetrix device group name.

-h Provides brief, online help information.

-i Specifies the repeat interval (seconds) between the executions of the view 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, the change information is displayed continuously at every interval.

-log Specifies a log file (owned by the user) that is read (report action) from or written (view action) to. The data written in log file are based on 32k track size.

-multi Reports changed tracks for both the Sum and the Delta methods. This option requires the -i or -c options.

-native Reports or views data based on native track size.

-ra Specifies the quantity of RA directors in your Symmetrix configuration for the report action.

-rate Specifies 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 Specifies the specified time window (in minutes or hours and minutes) to synchronize the SRDF pair to the report action.

-session Causes the list argument to list all of the physical devices with created Change Tracker sessions. Causes the view argument to show if a Change Tracker session exists for the devices that the object spans.

-sg Specifies the storage group name.

-sid Specifies a unique Symmetrix ID.

-start Specifies 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 Specifies 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.

-type Specifies the Change Tracker session type to be created or listed. If -type is not specified the default session type is write.

-v Provides a more detailed, verbose listing.

PARAMETERS

CgName The composite group name.

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

DgName The device group name. The name must be unique to this host.

LogFile The log file name.

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

SgName The storage group name.

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

SymDevName The Symmetrix device name, unique per Symmetrix, such as 01C.

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

SymmID The 12-digit ID of the Symmetrix array.

read The change Tracker read session.

rw The change Tracker read_write session.

write The change Tracker write session.

RETURN CODES

Code #	Code Symbol
0	CLI_C_SUCCESS
1	CLI_C_FAIL

EXAMPLES

To create a Change Tracker write session for Symmetrix device 17C, enter:

```
symchg create dev 017C
```

To create a Change Tracker read session for each Symmetrix

device in device group ProdDB, enter:

```
symchg create -g ProdDB -type read
```

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 logfile /tmp/logfile for device group ProdDB, performing 10 samples and resetting the changed information after each sample, enter:

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

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

```
symchg list
```

To list all of the devices with Change Tracker write session that are currently marked, enter:

```
symchg list -session
```

To list devices that are visible to the host with Change Tracker read sessions, enter:

```
symchg list -session dev -type read
```

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 Change Tracker session for Symmetrix device 14D, enter:

```
symchg delete dev 14D
```

To unmark all the Symmetrix devices associated with device group ProdDB without deleting the Change Tracker session for these devices, enter:

```
symchg remove -g ProdDB
```

symchksum

Performs Symmetrix checksum operations on the RDBMS database devices, RDBMS tablespace devices, or Symmetrix devices.

SYNTAX

```
symchksum [-h]

symchksum [-type ‹RdbType›] [-sid ‹SymmID›]
    [-range ‹SymDevStart›:‹SymDevEnd›]

  list [-v]

symchksum [-sid ‹SymmID›]

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

symchksum -type generic -sid ‹SymmID›
    [dev ‹SymDevName›] [-range ‹SymDevStart›:‹SymDevEnd›]

  enable

  disable

symchksum -type generic [-g ‹DeviceGroup›]

  enable

  disable

symchksum -type oracle [-db ‹DbName›] [-tbs ‹TbsName›]
    [-control] [-redo] [-h]

  enable [-reject_io] [-fractured_reject_io] [-discard]
    [-phone_home] [-v]
    [-check_dba] [-check_all_blocks] [-straddle]
```

[-suppress_feature ‹Keyword›[,‹Keyword›]]

disable [-v]

validate [-v]

verify [-v]

disable -force -sid ‹SymmID› dev ‹SymDevName›

DESCRIPTION

The symchksum command enables checksum checking on a set of Symmetrix devices. Relational databases or generic applications are selected using the -type option.

For the generic type, the feature is enabled or disabled on a device basis. Devices can be specified as a single device, a range of devices, or a group of devices. The generic type operations do not perform the checks or provide the options available with the relational type.

For relational types, the I/O of enabled extents on a specified device are checked by executing a specified checksum algorithm. When checksum errors are detected, an error is logged to the Symmetrix array. Users can decide whether to reject the I/O or have the Symmetrix phone home when a checksum error is detected.

By default, the symchksum command attempts to select the following tests:

- block checksum value (Checksum)
- blocksize verification (BlkSize)
- 3-bit magic number (MagicNumber) in Oracle data blocks (not available for redo logs)
- checks for non-zero data block addresses (NonZeroDba)

To suppress one or more of these operations, use the -suppress_feature option and supply the name of the feature. Multiple feature names can be separated by commas.

The following three operations can be manually enabled:

- Check all blocks in the I/O - This option causes magic number and non-zero data block address 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 this feature, use the -check_all_blocks option.

- 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. This options checks for straddle I/O. Do not use this feature if autoextend is used on the RDBMS datafiles. To select this feature, use the -straddle option.

- Compare data block addresses and target blocks of I/O (-check dba) - When this option is enabled, extended data is stored on each extent. This limits the ability of symchksum to collapse adjacent extents. To select this feature, use the -check_dba option.

If an I/O is not a multiple of the object blocksize, the user 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.

When extents are enabled with -discard, EMC Double Checksum writes blocks to disk until a failed block is detected. The -discard option divides a large I/O into smaller units of 32K bytes each. When a checksum failure

is detected, all blocks in that unit and subsequent units are discarded.

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

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

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

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.

The only checksum algorithm type supported is for Oracle RDBMS products. The Oracle instance must be configured to perform checksum checking when used with the Symmetrix checksum functionality.

The database user login information must be supplied with the SYMCLI_RDB_CONNECT environment variable. The user login information is specified in the following format: username/password@service. The username and password must be non-NULL.

To execute the symchksum utility, you must have the proper application software installed and the environment variables set.

You can specify the database type and database name with environment variables. The command line options take priority over the environment variables:

- SYMCLI_RDB_TYPE - database type, instead of -type
- SYMCLI_RDB_NAME - database name, instead of -db

Only one restrictor clause can be used at one time. Restrictors are -tbs, -redo, -control.

In Oracle, the database name does not need to be specified. The default will be taken from the instance represented by the connection arguments and environment variables. Client/server mode is not supported.

Note: For Oracle, the specified database user must have one of the following to run this utility:

- "select any table" privilege (Oracle 8i and earlier)
- SELECT_CATALOG_ROLE (Oracle 9i and later)
- DBA role
- SYSDBA system role

ARGUMENTS

disable Disables checksum checking on the extents of the specified devices.

enable Enables checksum checking on the extents of the specified devices.

list Lists all the devices that currently have

checksum checking enabled.

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

validate Validates if a specified database of tablespace devices can have checksum checking enabled.

verify Verifies if a specified database or tablespace has checksum checking enabled on all their devices.

KEYWORDS

BlkSize A default operation that checks I/O blocksize to block header.

Checksum A default operation that checks the computed checksum of the block where the checksum value is stored.

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

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

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 Specifies a relational database control

file.

-db Specifies a relational database name.

-discard Discards bytes in the current buffer and subsequent buffers when checksum failure is detected.

-force Forces checksum to disable.

-fractured_reject_io
Rejects I/O if it is not a multiple of the blocksize.

-g Specifies a device group.

-h Provides brief online help information.

-phone_home Phones home when a checksum error is detected.

-range Specifies a range of devices.

-redo Specifies the relational database redo logs.

-reject_io Rejects I/O when a checksum error is detected.

-sid Specifies the unique Symmetrix ID.

-straddle Checks for writes that straddle defined database extents.

-suppress_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.

PARAMETERS

DbName A relational database name.

RdbType An application type, such as Oracle or generic.

SymDevName A Symmetrix device name.

SymmID The 12-digit ID of the Symmetrix array.

TbsName A relational database tablespace name.

RETURN CODES

Code #	Code Symbol
0	CLI_C_SUCCESS
1	CLI_C_FAIL
18	CLI_C_ALREADY_IN_STATE The device(s) are already in the desired checksum state. Applicable only for checksum control actions.

Return codes for symchksum verify

14	CLI_C_NOT_ALL_VALID

Only returned if some of the specified RDBMS extents are checksum enabled.

15 CLI_C_NONE_VALID
Only returned if none of the specified RDBMS extents are checksum enabled.

EXAMPLES

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

```
symchksum -sid 3890 list
```

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

```
symchksum show dev 0A1
```

To enable Oracle checksum type checking on the extents of all the devices that define the current Oracle database instance, and when an error is detected, phone home, enter:

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

To enable Oracle checksum type checking on the extents of all the devices that define the specified Oracle tablespace, and when an error is detected, log that error, 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 when an error is detected, log that error, enter:

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

To verify that the specified Oracle tablespace has checksum checking for all devices that define it, enter:

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

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

```
symchksum -type Oracle disable
```

To disable checksum checking for all checksum extents on the specified Symmetrix device, enter:

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

To validate the Oracle tablespace, enter:

```
symchksum validate -tbs ACCOUNTING_1
```

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 Solutions Enabler Symmetrix Command Line Interface (SYMCLI) and the environment variables.

SYNOPSIS

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

Code #	Code Symbol
0	CLI_C_SUCCESS
1	CLI_C_FAIL

EXAMPLES

To obtain a list of all SYMCLI commands, enter:

```
symcli -v
```

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

```
symcli -env
```

symclient

Description of client server installation, management, and execution.

The client would be a SYMCLI command running on a local host.

The server would be the SYMAPI Server running on a remote host.

INSTALLATION

The SYMCLI installation procedure installs the client server SYMAPI server in the binaries directory. The executable is storsrvd. It also installs two files, netcnfg and symapinlck, in the configuration directory. On both a client host or server host the netcnfg file lists a network service available from that local host or network services available from one or more remote hosts. The symapinlck file is used as a lock file on a server host to guarantee a single port listener for a network service. To execute a remote SYMCLI session, both the client and server host netcnfg file should have the identical network service entry in it, to generate a TCP/IP network connection between them.

The netcnfg file is a template. The system administrator can use a text editor to add one or more network service entries to it. The syntax of the network service entry is as follows, on one line:

service-name domain-name network-protocol server-node-name server-network-address port-number

The domain-name should unspecified and substituted by a hyphen (-). An unspecified server-node-name or

server-network-address can be substituted by a hyphen (-). But at least one must be specified. Both service-name and port-number are mandatory. The currently supported network protocol is TCP/IP and its field is required.

Example:

```
SYMAPI_SERVER - TCPIP node001 12.345.670.89 7777
BACKUP_SERVER - TCPIP node002 -          6666
```

A comment line can be specified by a hatch (#) as the first character.

SERVER SYMAPI SERVER STARTUP

On the server host the storsrvd executable for a network service can be started either by a startup script or interactively, by command line:

```
stordaemon start storsrvd [-args -port Port]
```

SERVER SYMAPI SERVER SHUTDOWN

Either on a client host or the server host the storsrvd executable for a network service can be stopped either by a shutdown script or interactively, by command line:

```
stordaemon shutdown storsrvd
```

INVOKING CLIENT SERVER OPERATIONS

The following is a description of invoking a client server session using the SYMCLI commands.

To invoke a client server session, first start the

SYMAPI Server executable, storsrvd, on the remote host as already described.

Then set the environment variable SYMCLI_CONNECT to the desired service name, as entered in the netcnfg file, on the local host.

Then optionally set the environment variable SYMCLI_CONNECT_TYPE to the desired connection type: LOCAL, REMOTE. If REMOTE, operations will be executed on the remote server.
If LOCAL, they are executed locally and the SYMCLI_CONNECT environment variable is ignored.

Run any SYMCLI executable.

EXAMPLE:

```
setenv SYMCLI_CONNECT SYMAPI_SERVER
  /usr/symcli/bin/symcfg list
```

symclone

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

SYNOPSIS

```
symclone -h

symclone -g ‹DgName› [-v] [-noprompt] [-force]
    [-i ‹Interval›] [-c ‹Count›] [-star]
    [-preserveTGTLocks -lockid ‹lockNum›]
    [-tgt [-bcv] | -rdf [-bcv | -tgt] |
     -rbcv -tgt | -rrbcv | -hop2 [-tgt]]

  create [-opt | -exact] [-concurrent] [-skip]
    [[-nocopy | -vse] [-nodifferential]] |
    [[-copy | -precopy] [-differential | -nodifferential]]
    [‹LdevName› [[SYM | BCV] pd ‹PdevName›]...|
     ‹LdevName› [[SYM | BCV] dev ‹SymDevName›]...|
     ‹LdevName› [[SYM | BCV] ld ‹LdevName›]...]

  split [-skip]
    [‹LdevName› [[SYM | BCV] pd ‹PdevName›]...|
     ‹LdevName› [[SYM | BCV] dev ‹SymDevName›]...|
     ‹LdevName› [[SYM | BCV] ld ‹LdevName›]...]

  activate [-consistent [-both_sides]]
    [-preaction ‹ScriptFile›] [-postaction ‹ScriptFile›]
    [-not_ready] [-skip] [-concurrent]
    [‹LdevName› [[SYM | BCV] pd ‹PdevName›]...|
     ‹LdevName› [[SYM | BCV] dev ‹SymDevName›]...|
     ‹LdevName› [[SYM | BCV] ld ‹LdevName›]...]

  terminate [-symforce] [-skip] [-restored] [-not_ready]
    [‹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 [-consistent [-both_sides]]
    [-preaction <ScriptFile>] [-postaction <ScriptFile>]
    [-not_ready] [-skip]
    [-full [-opt|-exact] [-vse]] [-concurrent]
    [<LdevName> [[SYM | BCV] pd <PdevName>]...|
     <LdevName> [[SYM | BCV] dev <SymDevName>]...|
     <LdevName> [[SYM | BCV] ld <LdevName>]...]

  restore [-preaction <ScriptFile>][-postaction
    <ScriptFile>] [-full]
    [<LdevName> [[SYM | BCV] pd <PdevName>]...|
     <LdevName> [[SYM | BCV] dev <SymDevName>]...|
     <LdevName> [[SYM | BCV] ld <LdevName>]...]
symclone -g <DgName> [-offline] [-i <Interval>][-c <Count>]
    [-bcv | -rdf [-bcv] | -rbcv | -rrbcv | -hop2]

  query [<LdevName> [<LdevName>...]] [-multi] [-summary]

  verify [-created | -copied | -copyinprog |
    -copyonaccess | -copyonwrite | -precopy [-cycled] |
    -recreated | -restored | -restinprog | -split]
    [-force] [-concurrent] [-summary]
    [<LdevName> [[SYM | BCV] pd <PdevName>]...|
     <LdevName> [[SYM | BCV] dev <SymDevName>]...|
     <LdevName> [[SYM | BCV] ld <LdevName>]...]

symclone -g <DgName> [-force]
    [-tgt [-bcv] | -rdf [-bcv | -tgt] |
     -rbcv -tgt | -rrbcv | -hop2 [-tgt]]
```

```
  set mode <copy | nocopy | precopy>
    [<LdevName> [[SYM | BCV] pd <PdevName>]...|
     <LdevName> [[SYM | BCV] dev <SymDevName>]...|
     <LdevName> [[SYM | BCV] ld <LdevName>]...]

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

  create [-skip]
    [[-nocopy | -vse] [-nodifferential]] |
    [[-copy | -precopy] [-differential | -nodifferential]]

  split [-skip]
  activate [-consistent]
    [-preaction <ScriptFile>] [-postaction <ScriptFile>]
    [-not_ready] [-skip]

  terminate [-symforce] [-skip] [-restored] [-not_ready]

  recreate [-skip] [-precopy]

  establish [-consistent]
    [-preaction <ScriptFile>] [-postaction <ScriptFile>]
    [-not_ready] [-skip]
    [-full [-opt | -exact] [-vse]]

  restore [-preaction <ScriptFile>][-postaction
    <ScriptFile>] [-full]

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

  set mode <copy | nocopy | precopy>
```

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

  query [-multi] [-summary]

  verify [-created | -copied | -copyinprog |
    -copyonaccess | -copyonwrite | -precopy [-cycled] |
    -recreated | -restored | -restinprog | -split]
    [-force] [-concurrent] [-summary]

symclone [-sid <SymmID>] [-i <Interval>] [-c <Count>]
    [-offline]

  list [-copy | -nocopy | -precopy | -vse]

symclone -cg <CgName> [-v] [-noprompt] [-force]
    [-i <Interval>] [-c <Count>] [-star]
    [-tgt [-bcv] | -rdf [-bcv | -tgt] |
     -rbcv -tgt | -rrbcv | -hop2 [-tgt]]
    [-sid <SymmID> |
    -rdfg <SymmID>:<GrpNum>[,<GrpNum>,...]|<all>[,...] |
     name:<RdfGroupName>[,<RdfGroupName>,...]>]

  create [-opt | -opt_rag | -exact] [-concurrent] [-skip]
    [[-nocopy | -vse] [-nodifferential]] |
    [[-copy | -precopy] [-differential | -nodifferential]]
    [<LdevName> [[SYM | BCV] pd <PdevName>]...|
     <LdevName> [[SYM | BCV] dev <SymDevName>]...|
     <LdevName> [[SYM | BCV] ld <LdevName>]...]

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

  activate [-consistent]
```

```
    [-preaction <ScriptFile>] [-postaction <ScriptFile>]
    [-not_ready] [-skip] [-concurrent]
    [<LdevName> [[SYM | BCV] pd <PdevName>]...|
     <LdevName> [[SYM | BCV] dev <SymDevName>]...|
     <LdevName> [[SYM | BCV] ld <LdevName>]...]

  terminate [-symforce] [-skip] [-restored] [-not_ready]
    [<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 [-consistent]
    [-preaction <ScriptFile>] [-postaction <ScriptFile>]
    [-not_ready] [-skip]
    [-full [[-opt | -opt_rag] [-vse | -exact]]
    [-concurrent]
    [<LdevName> [[SYM | BCV] pd <PdevName>]...|
     <LdevName> [[SYM | BCV] dev <SymDevName>]...|
     <LdevName> [[SYM | BCV] ld <LdevName>]...]

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

symclone -cg <CgName> [-offline] [-i <Interval>]
    [-bcv | -rdf [-bcv] | -rbcv | -rrbcv | -hop2]
    [-c <Count>] [-sid <SymmID> |
    -rdfg <SymmID>:<GrpNum>[,<GrpNum>,...]|<all>[,...] |
     name:<RdfGroupName>[,<RdfGroupName>,...]>]
```

```
    query [-multi] [-summary]
     [LdevName [LdevName...]]

    verify [-created | -copied | -copyinprog |
     -copyonaccess | -copyonwrite | -precopy [-cycled] |
     -recreated | -restored | -restinprog | -split]
     [-force] [-concurrent] [-summary]
     [<LdevName> [[SYM | BCV] pd <PdevName>]...|
      <LdevName> [[SYM | BCV] dev <SymDevName>]...|
      <LdevName> [[SYM | BCV] ld <LdevName>]...]

  symclone -cg <DgName> [-force]
     [-tgt [-bcv] | -rdf [-bcv | -tgt] |
      -rbcv -tgt | -rrbcv | -hop2 [-tgt]]

    set mode <copy | nocopy | precopy>
    [<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.

You can perform all clone operations on a group or individual device basis.

Before you can copy a source device to a target device, the target device must have been previously associated with

the device group and the target device must be the same size as the source device.

ARGUMENTS

activate Activate an internal copy session with the devices in the device or composite group and one or more target devices 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 and one or more target devices 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 in the group and one or more target devices associated with the group. Specifying this argument without the -full option performs a recreate followed by an activate operation.

list Lists all copy sessions created on the Symmetrix array.

query Returns clone state information about one

or all device pairs in a group or device file.

recreate Copies only the tracks that changed since the last activate action to the target device. The session must have been created with the -differential option. You must issue a subsequent activate action to establish a new point-in-time copy.

restore Initiates a copy from the target device to a source device. When you specify this argument with the -full option, a full copy of the data currently on the target device will occur. The device must be in a Copied state for a restore to take place.

set mode Changes a session in the Created state to Precopy, Copy, or NoCopy. Once a session is in the Precopy state, you cannot change it to one of the other states.

split Splits a clone device pair that is in the Restored state. Once in the Split state, you can either recreate or restore the pair.

terminate Stops the existing internal copy session between the specified source and target devices in a group.

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

KEYWORDS

BCV Specifies a BCV target device.

dev Indicates a Symmetrix device name.

ld Indicates a logical device name.

Locks Locks on the target devices. The target devices must already be locked by the same lock holder ID. Requires -lockid.

name Indicates an RDF group's logical name.

pd Indicates a physical device name.

SRCDEVS Specifies to use the path names from the standard devices being controlled.

SYM Specifies a Symmetrix target device (STD or BCV).

OPTIONS

-bcv When used with the -rdf option, executes the operation on the remote BCV devices (RBCVs).

-both_sides Activates all locally and remotely associated clone pairs in an SRDF group.

-c Specifies the number (count) of times to display or to acquire an exclusive lock on the Symmetrix host database. If you do not specify this option and specify an interval (-i), the program will loop continuously to display or start the mirroring operation.

-cg Applies a composite group name to the command.

-concurrent When used with the verify argument, this option verifies the standard device and

multiple target devices. When used with the active commands, this option performs the operation on a pair with an additional target device.

-consistent Consistently activates the source and target pairs.

-copied Verifies that the copy session(s) are in the Copied state.

-copy Performs the device copy in the background. Normally, tracks are not copied unless the source device is written to, or the target device is read from or written to. When the create -copy operation executes, the state of the device pair is CopyInProgress. If all tracks are eventually moved to the target device, the state changes to Copied. When used with the list command, lists only sessions with background copy active.

-copyinprog Verifies that the copy session(s) are in the CopyInProg state.

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

-copyonwrite Verifies that the copy session(s) are in the CopyOnWrite 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.

-differential Creates a differential session, which you can recreate at a later time.

-exact Selects 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 and only applies to group operations.

-file Applies a device file to the command. The device file contains device pairs (SymDevnames) listing a pair per each line (the source device first, a space, and the target device last within each line entry). Device files can include comment lines that begin with the pound sign (#). A Symmetrix ID is required for this option. -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) for the specified operation.

-full Copies data from 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.

-hop2 Performs the specified action on the Symmetrix array two hops away.

-i Specifies the repeat interval, in seconds,

to display or to acquire an exclusive lock on the Symmetrix host database. The default interval is 30 seconds. The minimum interval is 5 seconds. For passive actions the minimum interval is 15 seconds. Passive actions are actions that do not acquire an exclusive lock.

When used with the verify action, the number of seconds specified indicates the interval of time (in seconds) to repeat the verify command 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. The lock number ID must be a hexadecimal number.

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

-nocopy Creates a session without a background copy. This option is not allowed with the -differential option. When used with the list command, lists only sessions with background copy inactive.

-nodifferential
Creates a non-differential session, which cannot be recreated without a full copy of the data.

-noprompt Requests to not return a prompt after you

enter a command. The default is to prompt for confirmation.

-not_ready Following the clone operation, for activate and establish leaves the target device(s) Not Ready to the host and for terminate leaves the target(s) in their prior Ready or Not Ready state.

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

-opt Applies the symclone create command to optimize the device pair selection (source and target devices) to achieve the highest copy speed between them. For remote BCV operations, use the -opt_rag option.

-opt_rag Applies to the full create or establish operations for remote device optimization to distribute the I/O load so that the remote adapters are not connected to the same devices of the selected pair. Requires that you also specify the -rdf or -rrbcv option.

-postaction Executes the script argument after a copy session has been activated.

-preaction Executes the script argument before a copy session has been activated.

-precopy Performs the device copy in the background before the activate starts. Normally, the copying of tracks does not start until the activate occurs. The precopy process

continuously runs in the background until the activate is called. Precopy implies -copy. When used with the list command, lists only sessions with precopy active.

-preserveTGT Performs the action without taking out device locks on the target devices. The target devices must already be locked by the same lock holder ID. Requires the -lockid option.

-rdf Performs the action on the remote Symmetrix array.

-rdfg Performs the requested action on a subset of the composite group defined by one or more Symmetrix/RA Group combinations supplied as the argument to -rdfg.

-restored With the verify command, verifies that the copy session(s) are in the Restored state. With the terminate command, terminates a restored VP Snap session.

-rrbcv Performs the action on the multi-hop Symmetrix array.

-sid Applies the command to the specified Symmetrix ID. Specify this option with the -file option to select the Symmetrix array on which to perform the operation, or specify this option with -cg option to restrict the operation to a single Symmetrix array.

-skip Skips the source locks action. This option will not lock the source devices if all of

the specified source devices are either locked or unlocked. Applicable only when the source device is a standard device (not a BCV).

-vse Sets the copy mode to VP Snap nodifferential. When used with the list command, lists only VP Snap sessions.

-split Verifies that the Copy session(s) are in the Split state.

-star Targets the action at devices in STAR mode.

-summary Shows device state summary.

-symforce Forces the operation to execute when normally it is rejected. Use extreme caution with this option.

-tgt Uses TGT devices as clone targets. When you use this option with the -rdf option, the operation will use RTGT devices.

-v Provides a more detailed, verbose listing.

PARAMETERS

CgName The composite group name.

DgName The device group name.

DeviceFileName The device file name. The device file contains device pairs (SymDevNames) listing a pair each line (the source device first, a space, followed by the target device name on each line).

GrpNum The RDF (RA) group number.

LockNum The hexadecimal value of the lock holder ID.

LdevName The device logical name of either the standard or the BCV device.

RdfGroupName The logical name associated with the RDF (RA) group(s).

PdevName The target or Symmetrix device physical (host) name.

ScriptFile The full pathname of a script file to execute.

SymDevName The target or Symmetrix device name.

RETURN CODES

```
Code #    Code Symbol
------    -----------

 0        CLI_C_SUCCESS

 1        CLI_C_FAIL

 2        CLI_C_DB_FILE_IS_LOCKED

 18       CLI_C_ALREADY_IN_STATE
          The device or device group is already in the
          desired Copy state.

 19       CLI_C_GK_IS_LOCKED
          All gatekeepers to the Symmetrix array are
```

currently locked.

22 CLI_C_NEED_FORCE_TO_PROCEED
Requires the force flag to proceed.

23 CLI_C_NEED_SYMFORCE_TO_PROCEED
Requires the symforce flag to proceed.
CAUTION: Extreme caution should be exercised when using this option.

Return codes for symclone verify

53 CLI_C_NOT_ALL_COPYINPROG
Not all source devices are in the CopyInProg state.

54 CLI_C_NONE_COPYINPROG
No source devices are in the CopyInProg state.

55 CLI_C_NOT_ALL_COPIED
Not all source devices are in the Copied state.

56 CLI_C_NONE_COPIED
No source devices are in the Copied state.

57 CLI_C_NOT_ALL_COPYONACCESS
Not all source devices are in the CopyOnAccess state.

58 CLI_C_NONE_COPYONACCESS
No source devices are in the CopyOnAccess state.

60 CLI_C_NOT_ALL_CREATED

Not all source devices are in
the Created state.

61 CLI_C_NONE_CREATED
No source devices are in the
Created state.

68 CLI_C_NOT_ALL_RECREATED
Not all source devices are in
the Recreated state.

69 CLI_C_NONE_RECREATED
No source devices are in the
Recreated state.

73 CLI_C_NOT_ALL_PRECOPY
Not all source devices are in
the Precopy state.

74 CLI_C_NONE_PRECOPY
No source devices are in the
Precopy state.

75 CLI_C_NOT_ALL_PRECOPY_CYCLED
Not all source devices have
completed one precopy cycle.

76 CLI_C_NONE_PRECOPY_CYCLED
No source devices have
completed a precopy cycle.

EXAMPLES

To create the 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 the standard device /dev/rdsk/c1t1d1s2 to device group ProdDB and name it act1, enter:

```
symdg add pd c1t1d1s2 act1
```

To associate the BCV device /dev/rdsk/c2t0d2s2 to device group ProdD and name it mybcv1, enter:

```
symbcv associate pd c2t0d2s2 mybcv1
```

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

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

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

```
symclone query
```

symconfigure

- Allows you to create and delete Symmetrix devices.

Allows you to modify Symmetrix devices, ports, RDF characteristics, and host assignments.

Provides SAVE device (SAVEDEV) and DATA device pool management.

Provides management and support for device reservations.

Provides a query option to allow monitoring the progress of a Symmetrix configuration change.

Provides an abort option for situations where the host connection to the configuration server was dropped and left a configuration change session in progress.

Provides a verify option to determine if the Symmetrix configuration complies with the requirements for host-based configuration changes.

Provides a list option to display information about the available space on the physical disks in the Symmetrix array.

Provides support to create gatekeeper devices and set disk group names and reset them back to their default names.

Provides support to create external disk

groups and add/remove external disks
to/from external disk groups.

Provides support for setting parameters on
Storage Resource Pools (SRPs).

SYNOPSIS

```
symconfigure -h

symconfigure -sid ‹SymmID› [-h] [-v]
    [-file ‹CmdFile› | 'redirect stdin' | -cmd "Cmd"]
    [-noprompt] [-noecho] [-i ‹Interval›] [-c ‹Count›]
    [-reserve_id ‹ResvID›[,‹ResvID›[,‹ResvID›]]]
    [-remote_reserve_id ‹ResvID›[,‹ResvID›[,‹ResvID›]]]

  preview

  prepare

  commit

symconfigure -sid ‹SymmID›

  abort -session_id ‹SessionID›

  verify

symconfigure -sid ‹SymmID› [-i ‹Interval›] [-c ‹Count›]
    [-session_id ‹SessionID›] [-v]

  query

symconfigure -sid ‹SymmID›
    ‹-v | -freespace [-units CYLINDERS | MB] ›

  list
```

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

symconfigure -sid <SymmID> [-expire <ExpirationDate>]
    [-f[ile] <CmdFile> | 'redirect stdin' | -cmd "Cmd"]
    [-noprompt] [-v]
    -owner <Owner> -comment "UserComment"
    [-enforce | -advise]

  reserve

symconfigure -sid <SymmID>
    -reserve_id <ResvID>[,<ResvID>[,...]]
    [-noprompt]

  release

symconfigure -sid <SymmID> -reserved

  list

symconfigure -sid <SymmID> -reserve_id <ResvID>

  show
```

COMMAND FILE (or -cmd) SYNTAX

Adding a new device for 5876 and below:

```
create dev count=<n>,
    size = <n> [MB | GB | CYL],
    emulation=<EmulationType>,
    config=<DevConfig>
    [, data_member_count=<n>]
    [, remote_config=<DevConfig>, ra_group=<n>
      [, remote_data_member_count=<n>]
      [, remote_mvs_ssid=<n>]
```

```
    [, dynamic_capability =
      <DYN_RDF | DYN_RDF1_ONLY | DYN_RDF2_ONLY>]]
  [, mvs_ssid=<n>]
  [, attribute=<CKD_META | SAVEDEV | DATADEV>
    [, in pool=<PoolName>]
    [, member_state=<ENABLE | DISABLE>]]
  [, meta_member_size = <n> [MB | GB | CYL]]
  [, meta_config = <STRIPED | CONCATENATED>]
  [, disk_group=<<n>| name:<DskGrpName>>
    [, remote_disk_group=<<n> | name:<DskGrpName>>]]
  [, binding to pool=<PoolName>
    [, preallocate size = <ALL>
      [, allocate_type = PERSISTENT]]
    [, remote_pool=<PoolName>]]
  [, mapping to dir <director_num:port>
    [starting] target = <scsi_target>,
    lun=<scsi_lun>, vbus=<fibre_vbus>
    [starting] base_address = <cuu_address>[,...]]
  [, device_attr =
    <SCSI3_PERSIST_RESERV | ACLX | DIF1 |
      AS400_GK>[,...]]
  [, device_name='<DeviceName>' [,number=<n | SYMDEV>]]
  [, sg=<SgName> [,remote_sg=<SgName>]];
```

Adding a new device for 5977 and above:

```
create dev count=<n>,
  size = <n> [MB | GB | CYL],
  emulation=<EmulationType>,
  config=<DevConfig>
  [, preallocate size = <ALL>
    [, allocate_type = PERSISTENT]]
  [, remote_config=<DevConfig>, ra_group=<n>]
  [, sg=<SgName> [, remote_sg=<SgName>]]
  [, mapping to dir <director_num:port>
    [starting] target = <scsi_target>,
    lun=<scsi_lun>, vbus=<fibre_vbus>
```

```
        [starting] base_address = <cuu_address>[,...]]
      [, device_attr =
       <SCSI3_PERSIST_RESERV | DIF1 |
        AS400_GK>[,...]]
      [, device_name='<DeviceName>'[,number=<n | SYMDEV> ]];
```

Adding a new spare disk:

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

Adding a gatekeeper device:

```
  create gatekeeper count=<n>,
      emulation=<EmulationType>,
      [, type=thin
        [, binding to pool=<PoolName>]]
      [, mvs_ssid=<n>, ]
      [, [mapping to dir <director_num:port>
        [starting] target = <scsi_target>,
        lun=<scsi_lun>, vbus=<fibre_vbus>
        [starting] base_address = <cuu_address>]...];
```

Adding a meta member:

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

Adding an RDF mirror:

```
  add rdf mirror to dev <SymDevName>[:<SymDevName>]
      ra_group=<n>, mirror_type = [RDF1 | RDF2],
      remote_dev = <SymDevName>,
      invalidate = <invalidate_opt>,
      start_copy = [YES | NO]
```

```
    [,rdf_mode = [sync|semi|acp_wp|acp_disk|async]];
```

Assigning PAV alias addresses to devices mapped to EA/EF (mainframe) ports for Enginuity 5671:

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

Assigning PAV alias addresses to devices mapped to EA/EF (mainframe) ports for Enginuity 5771+:

```
add pav alias to dev ‹SymDevName›[:‹SymDevName›],
    alias count=‹n›;
```

Assigning a PAV alias address range to a CU image:

```
add pav alias_range ‹n:n›
    to mvs_ssid=‹n›;
```

Configuring a device by copying a similar device:

```
configure [‹n.n› [MB | GB] | ‹n› devices]
    copying dev ‹SymDevName›
    [mapping to dir ‹director_num›:‹port_num›
    [masking hba [awwn=‹awwn› | wwn=‹wwn› |
            iscsi=‹iscsi› |
            aiscsi=‹aiscsi›]
            [host_lun=‹lun› |
             dynamic_lun]]]
    [,device_name=‹DeviceName›
     [,number=‹n | SYMDEV› ]]
    [overriding
        [size=‹n› [MB | GB | CYL]]
        [emulation=‹EmulationType›]
        [config=‹DevConfig›]
        [data_member_count=‹n›]
        [mvs_ssid=‹n›]
```

```
                [disk_group=<n>| name:<DskGrpName>]];
```

Converting a device's configuration:

```
convert dev <SymDevName>[:<SymDevName>] to
    <DevConfig>
    [emulation=CELERRA_FBA,]
    [ ra_group=<n>, remote_dev=<SymDevName>,
     invalidate=<invalidate_opt>,
     [remote_mvs_ssid=<n>],
     start_copy=<YES | NO> ]
    [mvs_ssid=<n>] [raidset = [TRUE | FALSE]];
```

Converting a metadevice's configuration:

```
convert meta <SymDevName>
    config=<meta_option>
    [, stripe_size=<meta_stripe_size>[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;
```

Converting a director's type:

```
convert dir <director_num> to type = <FA | RF>;
```

Deleting a Symmetrix device:

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

Deleting a spare disk:

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

Dissolving a metadevice:

```
dissolve meta dev <SymDevName>[:<SymDevName>]
  [[,<SymDevName>[:<SymDevName>]]...];
```

Forming a metadevice:

```
form meta from dev <SymDevName>,
    config=<meta_option>
    [, stripe_size=<meta_stripe_size> [cyl] ]
    [, count=<member_count>];
```

Mapping a device to an address, or mapping a range of devices to consecutive addresses by specifying a starting address:

```
map dev <SymDevName>[:<SymDevName>]
    to dir <director_num>:<port_number>,
    [starting] [target=<scsi_target>,] lun=<scsi_lun>
    [, vbus=<fibre_vbus>]
    [, awwn=<awwn> | wwn=<wwn> | iscsi=<iscsi> |
      aiscsi=<aiscsi> ]
    [, masking [host_lun=<lun> | dynamic_lun] ]
    [, emulation=CELERRA_FBA];
```

Mapping a range of devices to EA/EF (mainframe) ports:

```
map dev <SymDevName>[:<SymDevName>]
    to dir <director_num>:<port_number>,
    starting base_address=<cuu_address>
    [mvs_ssid=<n>];
```

Mapping a range of devices to an EA/EF (mainframe) port by using the same addressing from a different port for Enginuity 5671:

```
map dev ‹SymDevName›[:‹SymDevName›]
    to dir ‹director_num›:‹port_number›,
    copying dir ‹director_num›:‹port_number›;
```

Removing a metamember:

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

Removing the PAV alias addresses from devices mapped to EA/EF (mainframe) ports for Enginuity 5671:

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

Removing PAV alias addresses from devices mapped to EA/EF (mainframe) ports for Enginuity 5771 or higher:

```
remove pav alias from dev
    ‹SymDevName›[:‹SymDevName›], alias count=‹n›;
```

Removing PAV alias address range from a CU image:

```
remove pav alias_range from mvs_ssid=‹n›;
```

Removing an RDF mirror:

```
remove rdf mirror from
    dev ‹SymDevName›[:‹SymDevName›],
    ra_group=‹n›;
```

Setting a device's emulation type:

```
set dev ‹SymDevName›[:‹SymDevName›]
    emulation=‹EmulationType›;
```

Setting a device attribute:

```
set dev <SymDevName>[:<SymDevName>]
    attribute = [NO ]<DevAttr>;

set dev <SymDevName>[:<SymDevName>]
    identity = NO identity;
```

Setting a device identifier:

```
set dev <SymDevName>[:<SymDevName>]
    [device_name='<DevName>' | NO device_name]
    [[hp_identifier='<hp_id>' | NO hp_identifier] |
     [vms_identifier=<vms_id> | NO vms_identifier]];
```

Setting port characteristics:

```
set port <director_num>:<port_number>
    [ <flag_name>=<ENABLE | DISABLE> [, ...] ]
    [[gige] [primary_ip_address=<IPaddress>],
     [primary_netmask=<IPaddress>],
     [default_gateway=<IPaddress>],
     [isns_ip_address=<IPaddress>],
     [primary_ipv6_address=<IPaddress>],
     [primary_ipv6_prefix=<0-128>],]
    [fa_loop_id=<integer>] [hostname=<HostName>];

set port <director_num>:<port_number>,
    copying port <director_num>:<port_number>,
    [fa_loop_id=<integer>] [hostname=<HostName>];
```

Setting a Storage Resource Pool (SRP) parameter:

```
set srp <SRP Name>,
    <[resv_cap = <n | NONE>]
    [,rdfa_dse = <ENABLE | DISABLE>]
```

```
        [,description = 'SRP Description']›;
```

Setting a name to an Service Level Objective (SLO):

```
    set slo ‹SLOName›
        ‹name=NewSLOName | BASE NAME›;
```

Setting a Symmetrix configuration metric:

```
    set symmetrix
        ‹metric_name› = ‹metric_value›
        [, ‹metric_name› = ‹metric_value›];
```

Unmapping a device:

```
    unmap dev ‹SymDevName›[:‹SymDevName›] from dir
        ‹ ALL:ALL | ALL:‹port_number› |
         ‹director_num›:ALL |
         ‹director_num›:‹port_num› ›
         [, emulation=CELERRA_FBA]
        [, devmask_access = ‹remove | retain› ];
```

Unmapping a range of devices from EA or EF
(mainframe) ports:

```
    unmap dev ‹SymDevName›:[‹SymDevName›] from dir
        ‹ ALL:ALL | ALL:‹port_num› |
         ‹director_num›:ALL |
         ‹director_num›:‹port_num› ›
        [new_ssid=‹n›];
```

Reserving a device:

```
    reserve dev ‹SymDevName›[:‹SymDevName›];
```

Creating a snap, RDFA_DSE, or thin pool:

```
create pool <PoolName>,
    type = <snap | rdfa_dse | thin>
    [, max_subs_percent= <n>]
    [, rebalance_variance = <n>]
    [, max_dev_per_rebalance_scan = <n>]
    [, pool_resv_cap = <n>]
    [, vp_compression = <ENABLE>];
```

Deleting a snap, RDFA_DSE, or thin pool:

```
delete pool <PoolName>,
    type = <snap | rdfa_dse | thin>;
```

Setting thin pool attributes:

```
set pool <PoolName>,
    type = <thin>,
    <[max_subs_percent= <n | NONE>]
     [, rebalance_variance = <n>]
     [, max_dev_per_rebalance_scan = <n>]>
     [, pool_resv_cap = <n | NONE>]
     [, vp_compression = <ENABLE | DISABLE>];
```

Renaming a snap, RDFA_DSE, or thin pool:

```
rename pool <PoolName> to <NewPoolName>
      type = <snap | rdfa_dse | thin>;
```

Renaming a Storage Resource Pool (SRP):

```
rename SRP <SRP Name> to <New SRP Name>;
```

Adding a SAVEDEV to a snap or RDFA_DSE pool, or
adding a DATADEV to a thin pool:

```
add dev <SymDevName>[:<SymDevName>] to pool <PoolName>
    type = <snap | rdfa_dse | thin>
```

```
        [, member_state = ‹ENABLE | DISABLE› ];
```

Removing a SAVEDEV or DATADEV from a named pool:
(Once removed, the device is available and can be
added to any snap, RDFA_DSE, or thin pool.)

```
    remove dev ‹SymDevName›:[‹SymDevName›]
        from pool ‹PoolName›,
        type = ‹snap | rdfa_dse | thin›;
```

Enabling a SAVEDEV or DATADEV for use:

```
    enable dev ‹SymDevName›:[‹SymDevName›] in pool
        ‹PoolName›, type = ‹snap | rdfa_dse | thin›;
```

Disabling a SAVEDEV or DATADEV from use:

```
    disable dev ‹SymDevName›:[‹SymDevName›] in pool
        ‹PoolName›, type = ‹snap | rdfa_dse | thin›;
```

Activating a DATADEV for use:

```
    activate dev ‹SymDevName›:[‹SymDevName›] in pool
        ‹PoolName›, type = ‹thin›;
```

Activating an edisk for use:

```
    activate external_disk ‹wwn=‹wwn› | spid=‹SpindleID››;
```

Deactivating a DATADEV for use:

```
    deactivate dev ‹SymDevName›:[‹SymDevName›] in pool
        ‹PoolName›, type = ‹thin›;
```

Starting a drain operation on a DATADEV:

```
    start drain on dev ‹SymDevName›[:‹SymDevName›]
```

in pool ‹PoolName› type = ‹thin›;

Starting a drain operation on a external disk

```
start drain on external_disk ‹wwn=‹wwn› | spid=‹SpindleID››;
```

Stoping drain operation on a external disk

```
stop drain on external_disk ‹wwn=‹wwn› | spid=‹SpindleID››;
```

Stopping a drain operation on a DATADEV:

```
stop drain on dev ‹SymDevName›[:‹SymDevName›]
    in pool ‹PoolName› type = ‹thin›;
```

Starting a pool balancing operation on a thin pool:

```
start balancing on pool ‹PoolName›;
```

Stopping a pool balancing operation on a thin pool:

```
stop balancing on pool ‹PoolName›
```

Setting a disk group attribute:

```
set disk_group ‹DskGrpNum | name:DskGrpName›
   group_attribute_name = value
```

Creating a disk group:

```
create disk_group DskGrpName
   disk_location = ‹external›
```

Deleting a disk group:

```
delete disk_group ‹DskGrpNum | name:DskGrpName›
```

Adding an external device from the external array to a

disk group for 5876 and below:

```
add external_disk wwn=‹wwn›
    [to disk_group=‹DskGrpNum | name:DskGrpName›]
    encapsulate_data=‹NO | YES [pool=‹PoolName›]›
    [meta_member_size=‹n› [MB | GB | CYL]]
    [member_size_equal=‹YES | NO›] [dir=‹Director_num›];
```

Adding an external disk for 5977 and above:

```
add external_disk wwn=‹wwn›
    encapsulate_data=‹YES | NO ‹SRP=‹SRPName››
    [dir=‹Director_num›];
```

Removing an external device from a disk group:

```
remove external_disk ‹wwn=‹wwn› | spid=‹SpindleID››
    [force_remove=‹YES | NO›];
```

Associating a port to a director emulation:

```
associate port ‹port_num›[,‹port_num›...] to
    dir ‹director_num›;
```

Disassociating a port from a director emulation:

```
disassociate port ‹port_num›[,‹port_num›...] from
    dir ‹director_num›;
```

DESCRIPTION

The symconfigure command allows you to modify aspects of a Symmetrix configuration. A lock may be taken out by the specified Symmetrix configuration server while the configuration change session is active. A session is processed in a series of stages which may be monitored by using the query option.

EMC has restricted what state the Symmetrix configuration must be in before allowing changes to be applied from a host system. To determine if a Symmetrix array can be modified, use the verify command.

Not all stages in the change process must be executed. The user indicates which stages should be completed to allow command files to be debugged without reconfiguring the Symmetrix array. The preview argument verifies the syntax and correctness of each individual change defined, and then aborts the session.

The prepare argument performs the preview checks and also verifies the appropriateness of the resulting configuration definition against the current state of the Symmetrix array and then aborts the session.

The commit argument completes all stages and activates the changes within the Symmetrix array.

The definitions of changes may be placed into a command file, or provided with the command line argument -cmd, which is read and processed by the utility. Alternatively, stdin redirection can be used with "here documents" in UNIX shell scripts. Each change in the file is terminated by a semi-colon (;). The parsing of the file is case insensitive.

With Enginuity Version 5x69+, all different types of changes can be performed in the same session, except RDF changes and pool changes.

Earlier Enginuity versions allowed multiple changes to be made in one session, but all the changes had to be in the same class. An exception to this is that increasing and decreasing mirror protection could always be done

in the same session.

Mapping and unmapping devices includes options for modifying the device masking associated with those devices. See symmask and symmaskdb for additional information. On Symmetrix arrays running Enginuity 5874 and later, the masking options for mapping and unmapping commands are not supported. See the symaccess command for additional information.

The classes of changes available are:

Creating:
- Creating new Symmetrix devices
- Configuring new Symmetrix devices

Mapping:
- Mapping/unmapping a Symmetrix device to a front-end port
- Mapping/unmapping a range of devices that form a mainframe CU image to a front-end port
- Copying device mappings from one EA/EF port to another
- Adding or removing PAV aliases from mainframe devices

FBA metadevice handling:
- Forming/dissolving metadevices
- Adding/removing metamembers
- Converting meta types

CKD metadevice handling:
- Creating/deleting metadevices

Device configuring:
- Adding/removing BCV attributes
- Adding/removing DRV attributes

Increase mirroring (Enginuity 5874 use symmigrate):
- Adding mirror(s) to an existing device;

for example, converting 2-Way-Mir to 4-Way-Mir or
converting RDF1 to RDF1+Mir

Decrease mirroring (Enginuity 5874 use symmigrate):
- Removing mirror(s) from an existing device, resulting in
the creation of a new device;
for example, converting 4-Way-Mir to 2-Way-Mir

SAVEDEV and DATADEV pool management:
- Adding or deleting pools
- Adding or removing pool members
- Enabling or disabling pool members
- Renaming pools

Setting device attributes:
- Marking devices as available for use as dynamic RDF
devices, VCM/ACLX database devices, or RDB
checksum devices
- Enabling the SCSI3 Persistent Reservation option for
clustered devices
- Restoring a device's identity to its original value

Setting device emulation:
(Note: device emulation can be changed among FBA
emulation types only.)

Setting front-end port attributes:
- Setting/resetting SCSI or fibre-port flags
- Setting fibre FA loop ID
- Setting port connection's host name
- Setting Gig-E front-end port IP addresses and netmasks

Setting Symmetrix metrics, including the following:
- auto_meta
- auto_meta_config
- auto_meta_member_size
- dse_max_cap

- FBA_multi_access_cache (Obsolete in Enginuity 5874+)
- min_auto_meta_size
- pav_alias_limit
- pav_mode
- rdfa_cache_percent
- rdfa_host_throttle_time

Spare disk management:
- Adding a new spare disk
- Removing a spare disk

Disk group management:
- Setting and resetting disk group names

External disk management:
- Adding and removing an eDisk to and from an external disk group.

Port Asssociation/Disassociation:
- Association of port to director emulation
- Diassociation of port from director emulation

Storage Resource Pool (SRP) management:
- Setting the reserve capacity for the SRP
- Setting the SRP to be used for RDFA DSE allocations

The overall processing time for the application of the changes can vary from seconds to over an hour, depending on the class of the changes and the complexity of the Symmetrix configuration. RDF changes will also be applied to the remote Symmetrix array. Depending on the state of the RDF pairs, additional processing time will be needed if the devices are to be synchronized.

Pool sessions are executed directly within the Symmetrix array and do not communicate with the configuration server. The query and abort arguments are not available

for pool sessions.

Support for reserving devices and front-end mapping addresses for future, planned configuration changes is provided through the use of the reserve, release, list, and show commands. A reserve ID is assigned to a reservation for use with configuration change and masking operations. A reservation can be defined as requiring enforcement or as an advisory. Management of advisories varies with the application. Management of enforced reservations is done by the SYMAPI and requires the user to specify the reserve ID to be able to use the devices.

Devices are reserved by using the RESERVE argument. All standard configuration change commands that deal with devices can be used or a reserve command can be used to reserve devices.

The configure command option allows you to create new devices by copying an existing device, optionally changing some of the attributes and/or mapping the devices to a specified port. This allows a series of commands (create, map, convert, form) to be specified in a single command file entry. The port addresses for the mapping will be generated. If the device being copied is a metadevice, the newly created devices will also be metadevices. Mapping to EA/EF ports is not supported. In addition to mapping the configure command also supports masking options. On Symmetrix arrays running Enginuity 5874 and later, the masking options are not supported. See the symaccess command for additional information.

The list argument currently has two options (-v and -freespace). The -v option lists out configuration information that is not stored in the SYMAPI database and that needs to be retrieved directly from the configuration server.

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

Freespace is shown in units of cylinders by default. To have it converted to megabytes, use the -units MB option.

ARGUMENTS

abort Attempts to gain control of an existing session to abort it and free the configuration lock. On Enginuity 5874 and higher, if there is more than one session running, a user can use the -session_id option to abort a particular session.

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

list Lists the relevant details, depending on the option:

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

prepare Verifies the validity of the command file changes and their appropriateness for the specified Symmetrix array. The prepare action has no function for pool sessions.

preview Verifies the validity of the command file changes.

query Returns information about the status of a configuration change session. On Enginuity 5874 and higher, if there is more than one session running, a user can use the -session_id option to query a particular session.

release Releases the specified device reservation.

reserve Processes the command file to reserve the indicated devices and displays the resulting reserve ID.

show Shows the details of the specified device reservation.

verify Verifies that the configuration currently running in the specified Symmetrix array complies with the requirements for

host-based configuration changes.

OPTIONS

-advise Marks a device reservation as being an advisory to all users that the included devices have been scheduled for a pending configuration change or device masking change. Applications may allow the user to proceed with using these devices.

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

-cmd Specifies the list of commands containing the configuration change definitions. Each command must be terminated by a semicolon.

-comment Provides additional details about a device reservation request.

-enforce Marks a device reservation for enforcement, by requiring you to supply the device reservation ID to use the devices. This is the default behavior when reserving devices. Older applications may not be able to process reservation IDs.

-expire Sets the date and time for a reservation

to expire, which will cause it to be removed from the reservation database automatically.

-f[ile] Specifies the command file containing the configuration change definitions.

-h Provides brief, online help information.

-i Specifies the repeat interval for retrying the requested action. For a query, this option indicates how often to display the session's status. For a preview/prepare/commit, this option indicates how often to attempt to get the needed resources to start a new session. The default interval is 30 seconds. The minimum interval is 5 seconds. For passive actions the minimum interval is 15 seconds. Passive actions are actions that do not acquire an exclusive lock.

-noecho Blocks the printing of session status and progress messages during the configuration change session. For use with PREVIEW, PREPARE, and COMMIT actions. Cannot be used with the -v option.

-noprompt Bypasses the confirmation requests issued to the output terminal. Intended for use in script files.

-owner Specifies the individual or organization that owns the devices being reserved. This is a required field.

-remote_reserve_id

Specifies the identification number assigned to a reservation on a remote Symmetrix array.

-reserve_id Specifies the identification number assigned to a reservation.

-sid Identifies the Symmetrix (Symmetrix ID) configuration to change.

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

-version Lists the SYMCLI, SYMAPI, and configuration server version information. Also connects to the configuration server managing the the Symmetrix configuration to request its version. If a host is connected to more than one Symmetrix array, the -sid option is required.

PARAMETERS

CmdFile The name of an ASCII text file containing the set of commands to process.

ExpirationDate

The optional date and time for a device reservation to be expired. The default is no expiration. 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.

Owner The name of the owner of the reservation.

ResvID The device reservation ID.

SymmID The 12-character ID of the Symmetrix array.

UserComment The user comment detailing the device reservation.

COMMAND FILE (or -cmd) PARAMETERS

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

awwn The alias WWN which identifies the HBA by a user-specified alias.

base_address 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
When adding new members to an existing striped metadevice, or when reconfiguring the stripe format, if the data on the metadevice is to be protected, you must specify the name of a bcv_meta that matches the original metadevice in capacity, stripe count, and stripe size.

ckd_meta An option available when creating a device with an emulation type of CKD-3380 or CKD-3390. Indicates that the device should be a striped metadevice. CKD metadevices must

be created in sets of four devices.

count A positive integer.

cuu_address A base or alias address for a device being mapped to an EA or EF port. These are mainframe ports which 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.

cycle_time The minimum time to wait before attempting an RDF/A cycle switch. Possible values range from 1 to 60 seconds for Enginuity 5773+ and 5 to 60 seconds for Enginuity versions before 5773.

cylinders A positive integer. A cylinder for FBA emulation is:

- Enginuity 5671 and earlier: 960 512-byte blocks
- Enginuity 5771+: 1920 512-byte blocks

To convert a device size in blocks to cylinders for Enginuity 5671 and earlier, use the following:

cylinders = (number of blocks) / 960

To convert a size in megabytes to cylinders, use the following for Enginuity 5671 and earlier:

cylinders = megabytes * 1048576 / (512 * 960)

Devices that are going to be used as BCV, RDF, or metamembers 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.

With the exception of the two variable size emulation types of AS/400_M2107_099 and AS/400_M2107_050 supported in Enginuity 5875+ with SE 7.2, AS/400 devices have specific sizes that must be used:

Device Type	Size	Meta Minimum	Enginuity
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
AS/400_M6718_50	35720*	8930	5x68
AS/400_M2105_A02	35720*	8930	5x68
AS/400_M2105_A82	35720*	8930	5x68
AS/400_M2105_A84	143584*	8974	5671
AS/400_M9337_5AA	35720*	8930	5x67
AS/400_M9337_5AC	35720*	8930	5x67
AS/400_M2105_A04	143584*	8974	5x68
AS/400_M4326_50	71568*	8946	5x68
AS/400_M4327_50	143584*	8974	5x68
AS/400_M2105_A05	71568*	8946	5x68
AS/400_M2105_A85	71568*	8946	5x68
AS/400_M4328_50	143576*	17947	5771
AS/400_M2107_A06	143576*	17947	5771
AS/400_M2107_A07	287152*	17947	5771
AS/400_M2107_A86	143576*	17947	5771
AS/400_M2107_A87	287152*	17947	5771
AS/400_M2107_A02	17860*	4465	5773
AS/400_M2107_A04	71792*	17948	5773

AS/400_M2107_A05	35784*	8946	5773
AS/400_M2107_A82	17860*	4465	5773
AS/400_M2107_A84	71792*	17948	5773
AS/400_M2107_A85	35784*	8946	5773

* These device models cannot be created as a single volume, as they exceed the maximum size supported by the Symmetrix array. On Symmetrix arrays running Enginuity 5772 and earlier, they must be created as smaller devices and formed into a metadevice. On Symmetrix arrays running Enginuity 5773 or higher, users can directly create metadevices by enabling the auto meta feature.

da_interface The DA SCSI path (c, d, e, or f).

datadev An option available when creating a device, which indicates that the device should become part of the thin device pool for use with thin devices.

data_member_count
When creating a RAID-5 or RAID-6 device on a Symmetrix array with Enginuity 5772 and later. Set the value to 3 or 7 for RAID-5 (3+1) and RAID-5 (7+1) or, 6 or 14 for RAID-6 (6+2) and RAID-6 (14+2).

default_gateway
The gateway or router address for a front-end Gig-E port.

DevAttr A device attribute that restricts how a device can be accessed. These include:

- RDB_Cksum
- Dyn_rdf (can be either R1 or R2)
- Dyn_rdf1_only
- Dyn_rdf2_only
- VCMdb (Obsolete in Enginuity 5874+ and replaced by ACLX)
- ACLX (Supported in Enginuity 5874+)
- SCSI3_persist_reserv
- RCVRPNT_TAG (Supported in Enginuity 5875+)
- DIF1 (Supported in Enginuity 5876+)
- AS400_GK (Supported in Enginuity 5876+)

The use of the RAD attribute is no longer supported. EMC will be using this attribute in the mainframe environment.

DevConfig A valid SYMAPI device configuration. When used to apply or remove the BCV, DRV, or RDF attribute, if the device configuration would result in a change to the device's mirroring, the change will be denied.

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, but 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 symdevice. If the original or new device is unprotected, it cannot be mapped to a host.

This cannot be used to convert RDF1 devices to RDF2.

Configurations include:

- Unprotected
- 2-Way-Mir
- 3-Way-Mir (2)
- 4-Way-Mir (3)
- RAID-S (1)
- RDF1
- RDF2
- RDF1+R-S or RDF1-R-S * (1)
- RDF2+R-S or RDF2-R-S * (1)
- RDF1+Mir or RDF1-Mir
- RDF2+Mir or RDF2-Mir
- BCV
- 2-Way-BCV-Mir
- DRV (3)
- 2-Way-DRV-MIR
- RDF1+TDEV or RDF1-TDEV
- RDF2+TDEV or RDF2-TDEV
- RDF1-BCV *
- RDF2-BCV *
- RDF1-BCV+MIR or RDF1-BCV-MIR *
- RDF2-BCV+MIR or RDF2-BCV-MIR *
- VDEV
- TDEV
- DLDEV
- RAID-5
- RAID-6
- BCV+R-5 or BCV-R-5
- BCV+R-6 or BCV-R-6
- RDF1+R-5 or RDF1-R-5
- RDF1+R-6 or RDF1-R-6
- RDF2+R-5 or RDF2-R-5
- RDF2+R-6 or RDF2-R-6
- RDF1-BCV+R-5 or RDF1-BCV-R-5 *
- RDF2-BCV+R-5 or RDF2-BCV-R-5 *

- RDF1-BCV+R-6 or RDF1-BCV-R-6 *
- RDF2-BCV+R-6 or RDF2-BCV-R-6 *
- RDF1+DLDEV or RDF1-DLDEV
- RDF2+DLDEV or RDF2-DLDEV
- BCV+TDEV or BCV-TDEV (4)
- RDF1-BCV+TDEV or RDF1-BCV-TDEV(5)
- RDF2-BCV+TDEV or RDF2-BCV-TDEV(5)

* Not allowed for create device

(1) Not allowed for Enginuity 5771 or higher.

(2) Not allowed for Enginuity 5772 or higher.

(3) Not allowed for Enginuity 5874 or higher.

(4) Only allowed with 5874 Q2 2010 SR or higher.

(5) Only allowed with 5875 Q2 2011 SR or higher.

DevName A user-defined device name of up to 64 characters in length.

DeviceName The ‹DeviceName› is the user specified name with a maximum of 64 characters including the suffix. The legal characters for the device name include all alphanumeric, underscore(_) and period(.). The device name plus optional suffix can have a maximum of 64 characters. If using a numerical suffix, the device name will be limited to 50 characters (prefix) and the trailing numerical suffix number will be limited to 14 characters. If not using a numerical suffix, all 64 characters can be specified for the device name.

The maximum starting suffix is 1000000. The

‹n› in the number= option represents the user supplied number for the starting suffix while using SYMDEV will mean that the corresponding Symmetrix Device Number will be used as the suffix.

devmask_access
: When unmapping devices, this can be used to indicate whether a device masking database should be updated. (Not supported on Enginuity 5874 and higher.)

director_num The director number (for example, 16A).

DskGrpName A disk group name of up to 32 characters in length. If the name is reset, it goes back to its default name in the format DISK_GROUP_xxx, where xxx is the disk group number.

dynamic_lun Specifies to use the dynamic LUN addressing features, but does not require the user to give a LUN address for each device. The LUN addresses will be assigned based on what may already be in use for that host HBA.

encapsulate_data
: Option available when adding an eDisk, which indicates that the data that is currently in the external device be preserved (encapsulating).

When setting this option to NO, to not preserve the data, any data that is currently on the external device will be deleted.

EmulationType
: A valid SYMAPI emulation type, including:

- FBA
- CELERRA_FBA
- VME_512_FBA
- CKD-3380
- CKD-3390

(Enginuity 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

(Enginuity 5x68+):
- AS/400_M6718_50
- AS/400_M2105_A01
- AS/400_M2105_A02
- AS/400_M2105_A81 (Enginuity 5568 only)
- AS/400_M2105_A82 (Enginuity 5568 only)

- AS/400_M2105_A84
- AS/400_M2105_A04

- AS/400_M4326_50
- AS/400_M4327_50
- AS/400_M2105_A05
- AS/400_M2105_A85

(Enginuity 5771+):
- AS/400_M4328_50
- AS/400_M2107_A06
- AS/400_M2107_A86
- AS/400_M2107_A07
- AS/400_M2107_A87

(Enginuity 5773+):
- AS/400_M2107_A02
- AS/400_M2107_A82
- AS/400_M2107_A04
- AS/400_M2107_A84
- AS/400_M2107_A05
- AS/400_M2107_A85

(Enginuity 5875+):
- AS/400_M2107_099
- AS/400_M2107_050

(Enginuity 5876+):
- AS/400_D910_099

When changing a device's emulation, changes can only be among FBA emulation types.

fibre_vbus The virtual bus address. This is only used when mapping to an FA port using volume set addressing.

FlagName A SCSI, fibre, or iSCSI port flag name. SCSI port flags can be set on SA, SE, and FA ports, unless otherwise noted. FA port flags can only be set on FA and SE ports.

For Enginuity levels 5671 or greater:

SCSI port flags:
- Negotiate_Reset [N]
  (SA ports only)
- Soft_Reset [S]
- Environ_Set [E]
- HP3000_Mode [B]
  (Return Busy on Abort)

```
  (Not Supported 5874+)
 - Common_Serial_Number     [C]
 - Disable_Q_Reset_on_UA    [D]
 - Sunapee                  [SCL]
  (Not Supported 5874+)
 - Siemens                  [S]
  (Not Supported 5874+)
 - Sequent                  [SEQ]
  (Not Supported 5874+)
 - Avoid_Reset_Broadcast    [ARB]
 - Server_On_AS400          [A4S]
 - SCSI_3                   [SC3]
 - SPC2_Protocol_Version    [SPC2]
  (5670+)
 - SCSI_Support1            [OS2007]
  (5671+)

Fibre port flags:
 - Volume_Set_Addressing    [V]
 - Non_Participating+       [NP]
 - Init_Point_to_Point+     [PP]
  (Not Supported 5977+)
 - Unique_WWN+              [UWN]
  (Not Supported 5977+)
 - VCM_State                [VCM]
  (Not supported in Enginuity 5874+
   and replaced by ACLX)
 - Access_Logix             [ACLX]
  (Only supported in Enginuity 5874+)
 - OpenVMS                  [OVMS]
 - AS400                    [AS4]
 - Auto_Negotiate           [EAN]

 + Not available for GigE ports

force_remove Option available when removing an eDisk, set
        to YES for forced removal of eDisk when it
```

has IVTOC TRACKS.

format 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 Enginuity 5568 and above:
- CKD and FBA, use 512
- AS400 and tandem, use 520

For Symm 4:
With selective llf enabled:
- CKD and FBA, use 512
- AS400 and tandem, use 520

If no AS400 or tandem devices:
- CKD and FBA, use 512

If AS400 or tandem devices:
- CKD, use 512
- FBA, AS400 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.

group_attribute_name
The disk group attribute to be set. Possible values are:

```
Attribute Name     Description
---------------    -------------------------
disk_group_name    The new disk group name.
                   To reset a name to the
                   default disk group name
                   use: DEFAULT NAME
```

HostName The host name, 12 characters.

host_lun The LUN addresses to be used for each device that is to be added for the host HBA.

hp_id A user-defined HP device identifier less than or equal to 128 characters in length.

invalidate_opt
The RDF device to invalidate so that a full copy can be initiated from the remote mirror.

Allowed values are R1 (invalidate the source), or R2 (invalidate the target).

IPaddress A valid IPv4 or IPv6 address is expected.

iscsi The iSCSI name.

isns_ip_address
The IP address for the iSNS name server associated with a front-end Gig-E port.

max_subs_percent
The maximum limit (in %) for the pool subscription. If there is no limit, set to NONE.

max_dev_per_rebalance_scan
The maximum limit for the pool rebalance scan device range. It can be set in the range of 1 to 1024. The default value is 256.

member_count The total number of devices to add to the new

metadevice, including the head. To be used when the configuration server should select the members from the pool of unmapped devices. Only devices that match the specified head in size, emulation, protection, and attributes will be selected. Omit this option if you are going to select the members yourself using the add dev command.

member_size_equal
: Indicates that the meta members created on an eDisk will have the same size. Available when adding an eDisk with encapsulation.

meta_option The meta type configuration. Possible values are: CONCATENATED or STRIPED.

meta_stripe_size
: The metadevice stripe size, specified in 512 byte blocks, or cylinders. If specifying cylinders, the keyword cyl must follow the size field (for example, 2cyl).

If no stripe size is specified when creating a striped meta, 2 cylinders will be assigned.

For Enginuity 5x69+, 1920 blocks or 2 cylinders is the only stripe size allowed.

For earlier Enginuity levels:

Valid choices:

‹meta_stripe_size›	(=) Cylinders
1920	2
3840	4*

7680	8*
15360	16*
30720	32*
61440	64*

* Available with Enginuity 5x68 or earlier.

metric_name The Symmetrix metric to be set. Possible values are:

Metric Name	Description
auto_meta	Enables the auto meta feature. Can be enabled only if the other auto meta parameters min_auto_meta_size, auto_meta_config, and auto_meta_member_size are set to valid values. Possible values are ENABLE or DISABLE. Not applicable for CKD meta devices.
auto_meta_config	Specifies the default meta config when auto meta feature is enabled. Possible values are CONCATENATED, STRIPED, or NONE.
auto_meta_member_size	Specifies the default meta member size in cylinders when auto_meta feature is enabled.

Possible values range from 0 to the max size specified in the table below:

Enginuity	32K_compatibility	Max Cylinders
5773	Disabled	65520
5773	Enabled	131040
5874+	Disabled	262668
5874+	Enabled	525336

dse_max_cap The maximum capacity for DSE in GB. The value NOLIMIT is used to set an unlimited capacity.

fba_multi_access_cache Specifies that read requests can share cache slots in some conditions. Possible values are ENABLE or DISABLE. (Obsolete in Enginuity 5874+)

pav_alias_limit If PAV is enabled, specifies the maximum number of aliases that can be assigned to a device. Possible values are:

- Enginuity 5670: 1-7;
- Enginuity 5671: 1-15;
- Enginuity 5771: 1-255;
- Enginuity 5772: 1-255;

- Enginuity 5773+: 1-127.

min_auto_meta_size Specifies the size threshold that triggers auto meta creation. When users try to create a device greater than or equal to the min_auto_meta_size, and auto_meta is enabled, a meta will be created. Possible values are between 0 and the maximum value from the table below (the default value is the same as the maximum value):

Enginuity	32K_compatibility	Max/Default cyl
5773	Disabled	65521
5773	Enabled	131042
5874+	Disabled	262669
5874+	Enabled	525338

PAV_mode Enables the use of PAV (Parallel Access Volumes). Possible values are:

PAV_mode	Description
NONE	No PAV volumes can be configured in the Symmetrix array.

(Not available for customer use.)

STANDARD Standard PAV volumes with static aliasing can be configured.

DYNAMIC_STANDARD Standard PAV volumes with dynamic aliasing can be configured.

SIEMENS Standard PAV volumes with static aliasing modified for Fujitsu Siemens hosts.

(Not available for customer use.)

DYNAMIC_SIEMENS Standard PAV volumes with dynamic aliasing modified for Fujitsu Siemens hosts.

(Not available for customer use.)

rdfa_cache_percent The percentage of write pending cache that can be

used by RDF/A. Possible values are from 0 to 100 percent.

rdfa_host_throttle_time
: The number of seconds to throttle host writes to RDF/A devices when cache is full, before dropping RDF/A sessions. Throttling will delay a write from the host until a cache slot becomes free. Possible values are from 0 to 65535

metric_value
: Either a numeric or string value to be assigned to the specified metric.

meta_config
: Used with the create dev command to override the default Symmetrix-wide auto_meta_config. User can only override the meta_config when the Symmetrix-wide auto meta is enabled and the total device size is greater than the Symmetrix-wide min_auto_meta_size.

meta_member_size
: When it is used with the create dev command, it overrides the default Symmetrix-wide auto_meta_member_size. User can only override the meta_member_size when the Symmetrix-wide auto meta is enabled and the total device size is greater than the Symmetrix-wide min_auto_meta_size.

When it is used with the add external disk command, it allows user to chose the meta

member size when encapsulating data on the external disk.

minimum_cycle_time
The minimum time to wait before attempting an SRDF/A cycle switch. Values range from 5 to 59 seconds.

mtu The mtu field allows the user to specify MTU (maximum transmission unit) value in the range of 1500-9000 for the IP interface. The default value is 1500.

mvs_ssid See remote_mvs_ssid below.

network_id The network_id/namespace can be used for the purpose of isolating IP routing tables. It is used to support multiple IP addresses with same IP subnet on a SE director emulation. Valid values are from 0 to 16384. Default value is 0.

NewPoolName The new pool name. See PoolName.

pav alias See alias.

pool Pools can either contain SAVE devices or DATA devices. A SAVEDEV pool can be a SNAP pool, which is used for snap sessions or a RDFA_DSE pool which is used for RDF/A spillover. A DATADEV pool is used for thin devices.

PoolName A sequence of 1 to 12 alphanumeric or '-' (hyphen) or '_' (underscore) characters.

pool_resv_cap
Pool reserve capacity (in %) for the thin

pool. Valid pool_resv_cap percentage values range from 1 to 80.

port_num The port number.

primary_ip_address
The IPv4 address for a front-end Gig-E port.

primary_ipv6_address
The IPv6 address for a front-end Gig-E port.

primary_netmask
The IPv4 netmask for a front-end Gig-E port.

primary_ipv6_prefix
The IPv6 mask prefix for a front-end Gig-E port. Can be 0 - 128, indicating the number of initial bits in the subnet that are identical.

protect_data When adding members to an existing striped meta, you must specify whether the data on the existing metadevice needs to be protected. Valid settings are TRUE and FALSE.

ra_group A positive integer specifying the RDF group.

raidset When requesting a change to a member of a RAID-S group, this option indicates that all members of the group should be processed. 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.

rdfa_devpace_autostart

Specifies whether the SRDF/A device-level pacing feature is automatically enabled when an SRDF/A session is activated for the RDF group.

rdfa_dse When used with an SRP, enabling it will allow that SRP to be used for RDFA DSE spillover.

rdfa_dse_autostart
Specifies whether RDF/A DSE is automatically activated when an SRDF/A session is activated for the group. Valid values are ENABLE and DISABLE

rdfa_dse_threshold
The percentage of the Symmetrix array's write pending limit. Once the cache usage of all active groups in the array exceeds this limit, data tracks for this group start to spill over to disks.

rdfa_transmit_idle
Enables or disables the transmit_idle feature on the RDF group. Possible values are ENABLE or DISABLE.

rdfa_wpace_autostart
Specifies whether the SRDF/A write pacing feature is automatically enabled when an SRDF/A session is activated for the RDF group.

rdfa_wpace_delay
The maximum host I/O delay that the SRDF/A write pacing feature will cause. The value is specified in microseconds; the allowable values are from 1 to 1000000 (1 sec). The default value is 50000 usecs (50 ms).

rdfa_wpace_threshold
: The minimum percentage of the system write pending cache at which the Symmetrix array will start pacing host write I/Os for this RDF group. The allowable values are from 1 to 99 percent. The default value is 60%.

rebalance_variance
: The value (in %) for the pool Rebalance Variance. It can be set in the range of 1 to 50. Its default value is 1.

refresh_opt The RDF device to mark for refresh from the remote mirror. Allowed values are: R1 (mark the source device for refresh) or R2 (mark the target device for refresh).

remote_config
: When creating an RDF device, indicates the device configuration of the corresponding remote device.

remote_data_member_count
: When creating an RDF RAID-5 or RAID-6 device on Symmetrix arrays with Enginuity 5772 and later, the user should set the value to 3 or 7 for RAID-5 (3+1) and RAID-5 (7+1) respectively, or 6 or 14 for RAID-6 (6+2) and RAID-6 (14+2), respectively.

remote_dev A hexadecimal value specifying the Symmetrix device name.

remote_mvs_ssid
: When creating a device in a Symmetrix array that also contains CKD devices, an mvs_ssid value must be provided so the new FBA

devices are not seen as part of an existing SID group.

Only one mvs_ssid and remote_mvs_ssid 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 symdev. An attempt will be made to use the same mvs_ssid for the new device. If the mvs_ssid group is full, you will need to specify 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 devices 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.

remote_sg When creating an RDF device, indicates the remote storage group in which the remote device will be added upon creation. (supported on Enginuity 5977 and higher).

remove Used with devmask_access in an unmap command to indicate that any device masking access entries for this device and path should be removed. (Not supported on Enginuity 5874 and later.)

resv_cap Percentage of the capacity of the SRP that will be reserved for devices write IO activities. Valid values for the percentage are from 1 to 80, or NONE to disable it (supported on Enginuity 5977 and higher).

retain Used with devmask_access in an unmap command to indicate that any device masking access entries for this device and path should be retained. (Not supported on Enginuity 5874 and later.)

savedev An option available when creating a device, that indicates the device should become part of the SAVE device pool for use with virtual copy sessions or rdfa_dse.

scsi_id The disk's SCSI ID (a hex value).

scsi_lun The SCSI logical unit number (a hex value).

scsi_target The SCSI target ID (a hex value).

sess_priority
The priority used to determine which RDF/A sessions to drop if cache becomes full. Possible values range from 1 to 64, with 1 being the highest priority (that is, the last to be dropped).

SgName User specified storage group name in which the devices will be added upon creation (supported on Enginuity 5977 and higher).

spid Indicates the specific spindle ID of the target eDisk.

SRP Name User specified storage resource pool (SRP).

SLOName User specified service level objective (SLO).

NewSLOName New name for the user specified SLO.

start_copy Indicates whether an RDF pair should be synchronized after the configuration change is committed.

vms_id A user-defined VMS device identifier from 0 to 32766.

vp_compression
Enables or disables the compression feature on the thin device pool. Possible values are ENABLE or DISABLE.

wwn The World Wide Name.

RETURN CODES

Code #	Code Symbol
0	CLI_C_SUCCESS
1	CLI_C_FAIL
2	CLI_C_DB_FILE_IS_LOCKED
19	CLI_C_GK_IS_LOCKED All Gatekeepers to the Symmetrix array are currently locked.
48	CLI_C_CONFIG_LOCKED

A configuration change session cannot
be started because another application
has the Symmetrix configuration locked.

EXAMPLES

To add four new Symmetrix devices to Symmetrix array 12345 as two-way mirrored devices with a size of 1100 cylinders, using FBA emulation, and to create the hypers to support the new devices in disk group 3, enter:

```
symconfigure commit -sid 12345 -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 three new DATA devices as two-way-mirrored with a size of 1200 cylinders, using FBA emulation, and to add it in a thin pool tp_pool with member state enabled, enter:

```
symconfigure commit -sid 12345 -file addnewdatadevs.cmd
```

Where addnewdatadevs.cmd contains:

```
create dev count=3 size=1200,
  emulation=FBA, config=2-Way-Mir,
  attribute=datadev, in pool=tp_pool
  member_state=ENABLE;
```

To create 10 2 GB thin devices, bind them to a thin pool tp_pool, and preallocate 1 GB to each thin device, enter:

```
symconfigure commit -sid 12345 -file add_new_tdevs.cmd
```

Where add_new_tdevs.cmd contains:

```
create dev count=10, size=2 GB
 emulation=FBA, config=TDEV,
 binding to pool=tp_pool, preallocate size=1 GB;
```

NOTE: default unit for ‹size› and ‹preallocate size› are in CYL. User should ensure that units for ‹size› and ‹preallocate size› are either both defaulted or match.

To create a CKD metadevice of 1200 cylinders by first creating four Symmetrix devices of 300 cylinders and then forming a metadevice, enter:

```
symconfigure commit -sid 12345 -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 add 4 FBA thin devices of 1200 cylinders and map them to director 7E:0 and 8H:0 on a Symmetrix array with Enginuity 5874 and higher, use the create device command with the mapping clause. Note that the command can support more than one mapping definition:

```
create dev count=4, size = 1200 cyl, emulation=FBA,
 config=TDEV,
 mapping to dir 7E:0, starting lun = F04,
 mapping to dir 8H:0, starting lun = F14;
```

To create 4 devices of 1200 cylinders and set the SCSI3_persist_reserv device attribute on a Symmetrix array running Enginuity 5874 and higher, use the

create device command with the device_attr clause:

```
create dev count=2, size = 1200, emulation=FBA,
  config=2-Way-Mir,
  device_attr = SCSI3_PERSIST_RESERV;
```

Note: A create device command can also have both the mapping and device_attr clause, as in the example below:

```
create dev count=2, size = 30, emulation=FBA,
  config=unprotected,
  device_attr = SCSI3_PERSIST_RESERV
  mapping to dir 7E:0, starting lun = F02;
```

To create a striped metadevice in Symmetrix array 12345, using device 030 as the metahead and 031-033 as members, enter:

```
symconfigure commit -sid 12345 -file add_meta.cmd
```

Where add_meta.cmd contains:

```
form meta from dev 030 config=striped,
  stripe_size = 2 cyl;
add dev 031:033 to meta 030;
```

To verify the mapping command file is correct and later map the metahead to director 16A, port 0, SCSI target/lun 0/7, enter:

```
symconfigure preview -sid 12345 -file meta_map.cmd
```

Where meta_map.cmd contains:

```
map dev 030 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 122 to dir 03A:0, vbus=0A, target=0F, lun=3;
```

To map 40 devices to a mainframe port and assign a set of aliases (on Enginuity 5671), enter the following (the SSID of the devices will be changed during the mapping. 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 aliases on Enginuity 5671, enter:

```
symconfigure commit -sid 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 020-024 from all front-end directors, enter:

```
symconfigure commit -sid 12345 -file unmap_dev.cmd
```

Where unmap_dev.cmd contains:

```
unmap dev 020:024 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/ACLX for masking device visibility to host systems for director 03A, port 0, enter:

```
symconfigure commit -sid 3160 -file setup_fa_port.cmd
```

Where setup_fa_port.cmd contains:

For Enginuity 5773 and earlier:

```
set port 03A:0 VCM_State=enable;
```

For Enginuity 5874 and later:

```
set port 03A:0 Access_Logix=enable;
```

To set the RDF/A 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 setup the symmetrix auto meta parameters:

```
symconfigure commit -sid 3160 -file set_symm_metrics.cmd
```

Where set_symm_metrics.cmd contains:

```
set symmetrix auto_meta_config = concatenated,
        auto_meta_member_size = 65521;
```

To change the emulation type of three devices from FBA to CELERRA FBA, enter:

```
symconfigure commit -sid 3160 -file device_set.cmd
```

Where device_set.cmd contains:

```
set dev 01A:01C emulation=CELERRA_FBA;
```

To remove the device masking database attribute from a device masking database device, enter:

```
symconfigure commit -sid 3160 -file device_reset.cmd
```

Where device_reset.cmd contains:

For Enginuity 5773 and earlier:

```
set dev 01A, attribute = NO VCMdb;
```

For Enginuity 5874 and later:

```
set dev 01A, attribute = NO ACLX;
```

To reserve an unused disk as a spare disk, 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 spare disk, enter:

```
symconfigure commit -sid 3160 -file rem_spare.cmd
```

Where rem_spare.cmd contains:

```
delete spare disk=[ 02A, D, 1 ];
```

To configure 6 GB of available free space into BCVs matching an existing standard device and mapping them to port 14B:0, enter:

```
symconfigure commit -sid 3420 -file cfg_bcv.cmd
```

Where cfg_bcv.cmd contains:

```
configure 6 gb copying dev 07A,
  mapping to dir 14B:0, overriding
  config=bcv;
```

To create a new pool and move some SAVE devices from an existing pool into it, enter:

```
‹session 1›
```

```
    disable dev 01D:01F in pool FINANCE, type=snap;

 ‹session 2›
    create pool HR, type=snap;
    add dev 01D:01F to pool HR, type=snap,
        member_state=ENABLE;
```

To rename an existing pool HR of type snap to newHR, enter:

```
symconfigure commit -sid 12345 -file renamepool.cmd
```

Where renamepool.cmd contains:

```
rename pool HR to newHR, type=snap;
```

To rename an existing SRP TestAndDev to NewTestAndDev, enter:

```
symconfigure commit -sid 12345 -file renamesrp.cmd
```

Where renamesrp.cmd contains:

```
rename SRP TestAndDev to NewTestAndDev;
```

To reserve a set of devices for later conversion to BCV devices, enter:

```
symconfigure reserve -sid 3241 -file bcv.cmd
  -owner "LabMgr" -comment "Adding BCV devs to dept xxx"
```

Where bcv.cmd (the actual change definition) contains:

```
convert dev 030:03A to 2-way-bcv-mir;
```

or:

```
symconfigure reserve -sid 3241 -file reserve.cmd
  -owner "LabMgr" -comment "Adding BCV devs to dept xxx"
```

Where reserve.cmd (strictly a reservation file) contains:

```
reserve dev 030:03A;
```

To set a disk group name for disk group 2, enter:

```
  set disk_group 2, disk_group_name = MY_DISK_GROUP;
```

To reset the disk group name for disk group 2, enter:

```
  set disk_group 2, disk_group_name = DEFAULT NAME;
```

To create a disk group for external disks and give it the name my_external_disk_group, enter:

```
symconfigure commit -sid 3241 -file cmdfile.cmd
```

Where cmdfile.cmd contains:

```
create disk_group my_external_disk_group
      disk_location = external;
```

To delete a disk group with the name my_external_disk_group, create and commit a command file that contains:

```
delete disk_group name:my_external_disk_group;
```

To add an external disk to disk group my_external_disk_group with the encapsulating option, create and commit a command file that contains:

```
add external_disk wwn=60000970000194900306533030314341
    to disk_group=name:my_external_disk_group,
```

```
    encapsulate_data=YES;
```

To remove an eDisk, create and commit a command file that contains:

```
  remove external_disk
      wwn=60000970000194900306533030314341;
```

symconnect

Allows the administrator to setup or modify the Symmetrix security functionality, including CHAP authentication and Radius server.

SYNOPSIS

```
symconnect -h

symconnect -sid ‹SymmID› [-dir ‹#|all› -p ‹#|all›] [-v]
  list [chap | radius]
    [-iscsi ‹iSCSIName› | -initiator] [-dir_port]

symconnect -file ‹Filename› [-dir ‹#|all› -p ‹#|all›] [-v]
  list [-iscsi ‹iSCSIName› | -initiator] [-dir_port]

symconnect -sid ‹SymmID› -iscsi ‹iSCSIName›
    ‹-dir ‹#› -p ‹#› | -dir all -p all›

  set chap -cred ‹Credential› -secret ‹Secret›

  set radius

symconnect -sid ‹SymmID› -iscsi ‹iSCSIName›
    [-dir ‹#|all› -p ‹#|all›]

  enable ‹chap | radius›

  disable ‹chap | radius›

  delete ‹chap | radius›

symconnect -sid ‹SymmID› -dir ‹#› -p ‹#›

  set chap -cred ‹Credential› -secret ‹Secret›
```

```
set radius
  -server <ServerName> -ip <Ip> -key <Key>
   [-port <PortNum>]
  -rank <Primary | Backup1 | Backup2>
  [-c <Count> -i <Interval>]

symconnect -sid <SymmID> [-dir <#|all> -p <#|all>]

  enable chap

  disable chap

  delete chap

  enable radius [-rank <Primary | Backup1 | Backup2>]

  disable radius [-rank <Primary | Backup1 | Backup2>]

  delete radius [-rank <Primary | Backup1 | Backup2>]

symconnect -sid <SymmID> -file <Filename> [-noprompt]

  backup <chap | radius>

  restore <chap | radius>

  init <chap | radius>
```

DESCRIPTION

The symconnect command lists the security information from the Symmetrix array or a backup file. In addition, this command allows the following:

- CHAP credentials to be set, enabled, disabled, or deleted from the database for either the director/port or a specified iSCSI initiator.

- The use of a Radius server to be set, enabled, disabled, or deleted from the database for a specified iSCSI initiator.

- The Radius server information to be set, enabled, disabled, or deleted from the database for a director/port.

- The CHAP credential or Radius server information to be initialized, as well as backed up or restored, from a backup file.

- Enginuity level 5874 and above, all support for CHAP credential or Radius server information to be set, enabled or disabled for a given iSCSI initator through symaccess.

ARGUMENTS

backup Makes a copy of all the security data present in a backup file that can be used later for restore.

delete Deletes security information that was previously set for either a director/port or an iSCSI initiator.

disable Disables security information that was previously set for either a director/port or an iSCSI initiator.

enable Enables security information that was previously set for either a director/port or an iSCSI initiator.

init Initializes the security information.

list Lists the security information.

restore Restores the security information from a backup file.

set Allows security information to be established for either a director/port or an iSCSI initiator.

KEYWORDS

chap Specifies the iSCSI CHAP credential.

radius Specifies the iSCSI Radius server.

OPTIONS

-c Indicates the number of times to retry.

-cred Specifies the credential name associated with the CHAP protocol's authentication data.

-dir Confines the action to a director number.

-dir_port Lists all the information for the director/port.

-file Specifies a backup file name.

-h Provides brief, online help.

-i Repeats the interval in seconds.
The default interval is 30 seconds.
The minimum interval is 5 seconds.
For passive actions the minimum interval is 15 seconds. Passive actions are actions that

do not acquire an exclusive lock.

-initiator Lists all the information for initiators.

-ip Indicates an IP address.

-iscsi Specifies an iSCSI name.

-key Specifies the key associated with the Radius server data.

-noprompt Requests that no prompts are returned after the command is entered.

-p Identifies a specific port.

-port Identifies a Radius server port.

-rank Specifies the Radius server rank.

-secret Designates the secret associated with the CHAP protocol's authentication data.

-server Specifies the Radius server name.

-sid Supplies the Symmetrix serial number or ID.

-v Provides a more detailed, verbose listing.

PARAMETERS

A specific director or port number.

All All directors or ports.

Backup1 The first backup for the Radius server.

Backup2 The second backup for the Radius server.

Count The number of times to retry the Radius server.

Credential The CHAP protocol's credential name. For Microsoft users, the string should be between 8 and 256 characters.

Filename The name of a backup file.

Interval The time (in seconds) between retries of the Radius server.

Ip The IP address of the Radius server.

iSCSIName An iSCSI name.

Key The Radius server key.

PortNum A Radius server port, the default value is 1812.

Primary The primary Radius server to be used.

Secret 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.

ServerName The Radius server name.

SymmID The Symmetrix serial number or ID.

EXAMPLES

To set CHAP credentials for a host initiator so the array knows to challenge the host, enter:

```
symconnect -sid 847
 -iscsi iqn.1991-05.com.microsoft:laqa0227.lss.emc.com
 set chap -cred laqa0227credentials -secret mysecrets123
 -dir 15c -p 0
```

To set CHAP credentials for the array so that the array is able to respond to a challenge from the host, enter:

```
symconnect -sid 847 -dir 15C -p 0 set chap
 -cred MyPeerCredentials -secret MyPeerSecret1234
```

To list the CHAP records for a given director and port, enter:

```
symconnect -sid 847 -dir 15c -p 0 list chap
```

To set Radius server for a host initiator, enter:

```
symconnect -sid 847
 -iscsi iqn.1991-05.com.microsoft:laqa0227.lss.emc.com
 set radius -dir 15c -p 0
```

To list the Radius server records for a given director and port, enter:

```
symconnect -sid 847 -dir 15c -p 0 list radius
```

symdev

Performs operations on a specific Symmetrix device.

SYNOPSIS

```
symdev -h

symdev [-sid <SymmID>] [-offline] [-v] [-resv | -pgr]
      [-wwn | -wwn_encapsulated [-detail] ] [-all]

  list [ -FA <#|ALL> [-p <#>] |
    -SA <#|ALL> [-scsi] [-fibre] [-p <#>]]
    [-devs <<SymDevStart>:<SymDevEnd> | <SymDevName>
       [,<<SymDevStart>:<SymDevEnd> | <SymDevName>>...]>]
    [-cap <#> [-captype <mb | cyl>]] [-N <#>]
    [-vcm | -aclx] [-held] [-gige] [-[no]gcm]
    [-ficon] [-escon] [-dldev] [-dd]
    [-noport|-firstport|-multiport] [-[no]bcv|-drv]
    [-meta] [-nomember]
    [-spare] [-dynamic] [-vdev]
    [-savedev [-nonpooled]] [-raids]
    [-disk_group <DskGrpNum> | name:<DskGrpName>]
    [-disk_director <#|ALL>]
    [-ext_spid <SpindleID>]
    [-rg][-sec_raid] [-unprotected] [-sec_unprotected]
    [-raid1] [-sec_raid1] [-bcv_emulation]
    [-raid5 [-protection <3+1 | 7+1>]]
    [-raid6 [-protection <6+2 | 14+2>]]
    [-sec_raid5 [-sec_protection <3+1 | 7+1>]]
    [-sec_raid6 [-sec_protection <6+2 | 14+2>]]
    [-emulation fba|ckd|ckd3390|ckd3380|as400|celerra]
    [-star_mode] [-star_sync_target] [-star_async_target]
    [-[no]reserved] [-cyl] [-geometry_set]
    [-service_state [not]degraded | [not]failed |
              [not]normal]
```

```
[-tdev [-bound | -unbound]] [-datadev [-nonpooled]]
[-migr_tgt] [-pinned] [-host_passive] [-identity_set]
[-identity [-detail]] [-sg <SgName>] [-rp]
[-host_cache] [-dif1] [-as400_gk] [-fast]
[-orm system | on | off]
[-technology <EFD | FC | SATA>]
[-internal | -external | -encapsulated [-limited]]
[-R1] [-R2] [-R21] [-notrdf] [-rdfg <RdfGrpNum>]
[-rdfa]] [-half_pair] [-dup_pair]
[-insg | -notinsg]

list pd [ -FA <#|ALL> [-p <#>] |
 -SA <#|ALL> [-scsi] [-fibre] [-p  <# >]]
 [-devs <<SymDevStart>:<SymDevEnd> | <SymDevName>
    [,<<SymDevStart>:<SymDevEnd> | <SymDevName>>...]>]
 [-cap <#> [-captype <mb | cyl>]] [-N <#>]
 [-vcm | -aclx] [-held] [-gige] [-[no]gcm]
 [-ficon] [-escon]
 [-noport|-firstport|-multiport] [-[no]bcv|-drv]
 [-meta] [-nomember]
 [-spare] [-dynamic] [-vdev]
 [-savedev [-nonpooled]] [-raids]
 [-disk_group <DskGrpNum> | name:<DskGrpName>]
 [-disk_director <#|ALL>]
 [-ext_spid <SpindleID>]
 [-rg][-sec_raid] [-unprotected] [-sec_unprotected]
 [-raid1] [-sec_raid1] [-bcv_emulation]
 [-raid5 [-protection <3+1 | 7+1>]]
 [-raid6 [-protection <6+2 | 14+2>]]
 [-sec_raid5 [-sec_protection <3+1 | 7+1>]]
 [-sec_raid6 [-sec_protection <6+2 | 14+2>]]
 [-emulation fba|ckd|ckd3390|ckd3380|as400|celerra]
 [-star_mode] [-star_sync_target] [-star_async_target]
 [-[no]reserved] [-cyl] [-geometry_set]
 [-service_state [not]degraded | [not]failed |
            [not]normal]
 [-tdev [-bound | -unbound]]
```

```
    [-migr_tgt] [-pinned] [-host_passive] [-identity_set]
    [-identity [-detail]] [-sg <SgName>] [-rp]
    [-dif1] [-as400_gk]
    [-technology <EFD | FC | SATA>]
    [-host_cache]
    [-orm system | on | off]
    [-internal | -external | -encapsulated [-limited]]
    [-R1] [-R2] [-R21] [-notrdf] [-rdfg <RdfGrpNum>]
    [-rdfa] [-half_pair] [-dup_pair]
    [-insg | -notinsg]

symdev [-sid <SymmID>] [-offline]

  list -space <-DA <#|ALL> | -DX <#|ALL>> [-cyl] [-spindle]

  list -inventory

symdev [-sid <SymmID>] [-hyper <#|ALL>] [-spindle]
      [-firstport] [-host_cache]
      [-orm system | on | off] [-offline]

  list [-internal |
       [-DA <#|ALL>] [-interface <#|ALL>] [-disk <#|ALL>]]

  list [-external |
       [-DX <#|ALL>] [-encapsulated [-limited]]]

symdev [-sid <SymmID>] [-v]

  list -lock
    [-devs <<SymDevStart>:<SymDevEnd> | <SymDevName>
       [,<<SymDevStart>:<SymDevEnd> | <SymDevName>>...]>]

  list -identifier <device_name|hp_id|vms_id>
    [-devs <<SymDevStart>:<SymDevEnd> | <SymDevName>
       [,<<SymDevStart>:<SymDevEnd> | <SymDevName>>...]>]
```

```
symdev [-sid ‹SymmID›] [-offline] [-cyl]

  show ‹SymDevName› | -wwn ‹WWN›

symdev -sid ‹SymmID› [-force]
  release [-lock ‹#›] [-noprompt]
   [-devs ‹‹SymDevStart›:‹SymDevEnd› | ‹SymDevName›
      [,‹‹SymDevStart›:‹SymDevEnd› | ‹SymDevName››...]›]

symdev -sid ‹SymmID› [-noprompt] [-rp] [-star] [-celerra]

  rw_enable    ‹SymDevName›  [[-SA | -FA] ‹#|ALL›
   [-p ‹#›]]

  write_disable ‹SymDevName›  [[-SA | -FA] ‹#|ALL›
   [-p ‹#›]]

  ready       ‹SymDevName›

  not_ready    ‹SymDevName›

  hold        ‹SymDevName›

  unhold       ‹SymDevName›  [-symforce]

  set -geometry ‹SymDevName› -cyl ‹#› ‹-symm6 | -symm7 |
    -symm9 | -sec_trk ‹#› -trk_cyl ‹#››
    [-host_capacity ‹NumBlocks›]

  set -geometry ‹SymDevName› -host_capacity ‹NumBlocks›

  set -geometry ‹SymDevName› -default

symdev -sid ‹SymmID› [-noprompt] [-star]

  relabel        ‹SymDevName›
```

```
pin          <SymDevName>

unpin        <SymDevName>

host_active  <SymDevName> [-force]

set -persistent   <SymDevName>

unset -persistent <SymDevName>

set -orm < system | on | off >  <SymDevName>

set -gcm     <SymDevName>

unset -gcm   <SymDevName>

symdev -sid <SymmID> -file <FileName>
  [-noprompt] [-rp] [-star] [-celerra]

rw_enable    [-SA <#|ALL> [-p <#>]]

write_disable [-SA <#|ALL> [-p <#>]]

ready

not_ready

hold

unhold       [-symforce]

set -geometry -cyl <#> <-symm6 | -symm7 | -symm9 |
   -sec_trk <#> -trk_cyl <#>>
   [-host_capacity <NumBlocks>]

set -geometry -host_capacity <NumBlocks>
```

set -geometry -default

symdev -sid ‹SymmID› -file ‹FileName›
[-noprompt] [-star]

relabel

pin

unpin

host_active [-force]

compress [-stop]

uncompress [-stop]

bind -pool ‹PoolName›

unbind

rebind -pool ‹PoolName›

allocate [-persistent]

allocate -stop

free [-all]

free [-all] -stop

reclaim [-persistent]

reclaim [-stop]

set -persistent

```
    unset -persistent

    set -orm < system | on | off >

    set -gcm

    unset -gcm

  symdev -sid <SymmID> [-noprompt] [-rp] [-star] [-celerra]
   -devs <<SymDevStart>:<SymDevEnd> | <SymDevName>
      [,<<SymDevStart>:<SymDevEnd> | <SymDevName>>...]>

    rw_enable     [-SA <#|ALL> [-p <#>]]

    write_disable [-SA <#|ALL> [-p <#>]]

    ready

    not_ready

    hold

    unhold       [-symforce]

    set -geometry -cyl <#> <-symm6 | -symm7 | -symm9 |
       -sec_trk <#> -trk_cyl <#>>
       [-host_capacity <NumBlocks>]

    set -geometry -host_capacity <NumBlocks>

    set -geometry -default

  symdev -sid <SymmID> [-noprompt] [-star]
   -devs <<SymDevStart>:<SymDevEnd> | <SymDevName>
      [,<<SymDevStart>:<SymDevEnd> | <SymDevName>>...]>

    relabel
```

pin

unpin

host_active [-force]

compress [-stop]

uncompress [-stop]

bind -pool ‹PoolName›

unbind

rebind -pool ‹PoolName›

allocate [-persistent]

allocate -stop

free [-all]

free [-all] -stop

reclaim [-persistent]

reclaim [-stop]

set -persistent

unset -persistent

set -orm ‹ system | on | off ›

set -gcm

unset -gcm

symdev -sid ‹SymmID› -file ‹DevPairFile›
[-noprompt]

copy -geometry

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.

The symdev command also performs the following control actions on all or selected Symmetrix devices: write_disable, rw_enable, ready, not_ready, hold, unhold, pin, unpin, compress, uncompress, relabel, set, unset, bind, unbind, rebind, allocate, free and reclaim.

ARGUMENTS

allocate Allocates storage in the thin pool.

bind Binds the thin device(s) to the pool.

compress Starts data compression on thin device(s). When combined with the -stop option, data compression is stopped.

copy Copies the source device geometry to the target device geometry when the -geometry option is specified.

free Frees storage in the thin pool.

hold Sets the hold bit on a device. The hold bit is automatically placed on a target device during a TimeFinder/Snap operation.

host_active Sets the host active mode on device(s). The device(s) must be in a host passive mode for this operation to succeed.

list Lists all nonprivate 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 state for this operation to succeed.

pin Sets the device(s) to the user pinned state. User pinned device(s) will not be moved via FAST controller, but they can be moved via Optimizer or symmigrate.

ready Sets the device(s) to be Ready. The device must be in a User Not Ready state for this operation to succeed.

rebind Rebinds the device(s) to the thin pool.

reclaim Reclaims storage from the thin pool.

relabel Applies the defined label to the device. The device must be in a User Not Ready state for this operation to be accepted. Refer to the symlabel command to

learn how to define a device label.

release Releases the Device External Lock associated with one or more devices within a Symmetrix array.

Caution: Use the release lock action only if it appears that a Symmetrix lock is currently hung and there are no other operations in progress on the Symmetrix array (local or remote). Also, make sure that your application is authorized to use the specified lock number.

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 where the device is visible.

set Sets the device geometry when combined with -geometry option. Sets the persistent indicator for allocations on thin device(s) when combined with the -persistent option. Sets the Optimized Read Miss mode when combined with the -orm option. Sets GCM mode when combined with -gcm.

show Shows detailed information about a specific Symmetrix device, such as 000C.

unbind Unbinds device(s) from the thin pool.

uncompress Starts data decompression on thin device(s). When combined with the -stop option, data decompression is stopped.

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.

unpin Resets the device(s) from the user pinned state.

unset Clears the persistent indicator for allocations on thin device(s) when combined with the -persistent option. Clears GCM mode when combined with -gcm.

write_disable Sets the device(s) to be Write Disabled to the local hosts on the specified front-end director port(s).

OPTIONS

-aclx Lists all device masking devices in Symmetrix arrays running Enginuity 5874 and higher.

-all Lists all private devices (Vault devices, SAVE devices, DRV devices, SFS devices, and COVD devices) along with other Symmetrix devices.

When used with the free operation, specifies that all allocations associated with the indicated devices are to be freed, regardless of whether data has been written or not.

-as400_gk Lists the Symmetrix devices that have the as400_gk attribute set.

-bcv Lists the BCV device(s).

-bcv_emulation Lists clone emulated BCV devices.

-bound Lists devices bound to a Thin pool.

-cap Sets the device capacity to a specific value (in megabytes or cylinders) for the selection criteria to be listed. See the '-captype' switch to set the units used.

-captype Sets the capacity units to a specific value (either 'mb' or 'cyl') for the selection criteria to be listed.

-celerra Allows controls on Celerra FBA devices.

-cyl Lists the device capacity in cylinders, or specifies the device capacity when setting the device geometry. The default is megabytes (MB).

-orm When combined with the set action, allows setting the Optimized Read Miss mode to system default, on, or off for the specified device(s). When used with the list action, lists devices with Optimized Read Miss mode set to system default, on, or off.

-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 limit the list further, but the default is ALL unless otherwise specified.

-datadev Lists the data device(s).

-dd Lists the Symmetix devices that are identified as Data Domain devices.

-default Specifies the device's native geometry when setting the device geometry.

-detail Lists the full WWN of the device when displaying the external identity information. When used with the -wwn_encapsulated option, lists vendor information for the device.

-devs Specifies a set of Symmetrix device ranges and/or individual Symmetrix devices.

-dif1 Lists the Symmetrix devices that have the dif1 attribute set.

-disk Lists the Symmetrix devices that are mapped to a certain disk Target ID. The DA, interface, and hyper IDs can also be used to limit the list further, but the default is ALL unless otherwise specified.

-disk_director Lists the Symmetrix devices with hypers residing on spindles configured to the specified back-end disk director and engine to which that director belongs.

-disk_group Lists the Symmetrix devices whose hypers are contained on disks within the specified disk group.

-dldev Lists the diskless devices.

-drv Lists the DRV devices.

-dup_pair Lists the SRDF devices in duplicate pair configurations.

-DX Lists the Symmetrix devices that are mapped to a certain DX director number. The hyper IDs can also be used to limit the list further, but dfaults to ALL unless specified.

-dynamic Lists the dynamic SRDF devices capable of being formed into SRDF pairs. When used with -R1, lists RDF1-capable devices. When used with -R2, lists RDF2-capable devices. When used with both -R1 and -R2, lists RDF1-capable or RDF2-capable devices. When used without -R1 or -R2, lists RDF1-capable, RDF2-capable, and RDF1 or RDF2-capable devices.

-emulation Lists devices that match the corresponding emulation type.

-encapsulated Lists devices that are created on external spindles with encapsulation.

-escon Lists devices mapped to front-end Escon directors.

-external Lists the Symmetrix devices that are created on external spindles.

-ext_spid Lists the Symmetrix devices with hypers residing on the specified external spindle.

-FA Lists devices mapped to a specific fibre front-end director number.

-fast Lists the Symmetrix devices that are in FAST Managed Storage Groups.

-fibre Lists devices mapped to front-end fibre directors.

-ficon Lists devices mapped to front-end Ficon directors.

-file Specifies a file name with a list of devices to be acted upon. In copy geometry operations, the file must contain two SymDevNamed per line. Otherwise, the file must contain one SymDevName per line.

-firstport Limits 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 the use of device locks.

Also applies to the host_active option.

-gcm Allows setting or unsetting the device GCM attribute. Also lists devices with GCM attribute.

-geometry Specifies the operation that will set or reset the device geometry.

-geometry_set Lists all devices that have the device geometry set.

-gige Lists devices mapped to front-end GigE directors.

-h Provides brief, online help information.

-half_pair Lists SRDF devices in a half-pair configuration.

-held Lists Symmetrix devices in the device group that have device holds for a TimeFinder/Snap session.

-host_cache Lists Symmetrix devices which are registered for control by host cache cards.

-host_capacity Specifies the device host usable capacity in 512 bytes blocks. Supported only on Symmetrix arrays running Enginuity 5876 and above.

-host_passive Lists devices set with host passive mode.

-hyper Lists the Symmetrix devices that are mapped to a certain hyper ID. The DA, interface, and disk IDs or the DX can also be used to limit the list further, but the default is ALL unless otherwise specified.

-identifier Lists the Symmetrix device identifiers assigned to devices by the user or other applications. The user must choose one of the four identifier types currently supported to be displayed.

-identity Lists the external identity information for each device. The external identity will be displayed if the device has external

identity set. Otherwise, the device native identity will be displayed.

-identity_set Lists devices whose external identity has been changed as part of a federated live migration operation.

-insg Indicates that only devices contained within a Storage Group are listed.

-interface Lists the Symmetrix devices that are mapped to a certain DA director interface path. The DA, disk, and hyper IDs can also be used to limit the list further, but the default is ALL unless otherwise specified.

-internal Lists the Symmetrix devices that are created on internal spindles.

-inventory Returns a table listing the number of configured Symmetrix devices for each supported emulation type.

-limited Lists encapsulated devices that are geometry limited.

-lock Lists devices that have a device external lock, or identifies a lock to release.

-meta Lists meta-head devices.

-migr_tgt Lists the Symmetrix devices that are usable as a migration target.

-multiport Lists the Symmetrix devices that are mapped to multiple front-end director ports.

-N Sets the number of devices to list. The # specifies the maximum number of devices to return. The actual number returned may be less than the specified number if fewer devices exist. The default is to list all devices.

-nobcv Lists standard devices only; excludes BCV devices.

-nogcm Lists only devices that do not have GCM attribute.

-nomember Lists only devices that are not meta members. This includes non-meta devices as well as meta head devices.

-nonpooled Lists devices that are ready to be assigned to a pool.

-noport Lists the Symmetrix devices that are not mapped to any front-end director ports.

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

-noreserved Lists all Symmetrix devices that are not reserved as part of a device reservation (see symconfigure).

-notrdf Lists only devices that are not RDF devices.

-notinsg Indicates that only devices not contained within a Storage Group are listed.

-offline Displays the Symmetrix devices from the Symmetrix configuration database without

refreshing the data from the Symmetrix array.

-persistent Used with set or unset it specifies operation on the persistent indicator. Used with allocate or reclaim it specifies the use of persistent storage.

-pgr Lists the WWN and reservation key of Symmetrix devices that have SCSI3 persistent group reservations.

-pinned Lists the devices that were pinned.

-pool Specifies a Thin Pool Name.

-protection Applies to -raid5 or -raid6 only. Further filters raid devices based on protection types (3+1, 7+1, 6+2 or 14+2).

-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. When used with -dynamic, lists devices that are RDF1 capable (see -dynamic).

-R2 Lists RDF2 (R2) devices. When used with -dynamic, lists devices that are RDF2 capable. Also, see -dynamic.

-R21 Lists RDF21 (R21) devices.

-raid1 Lists RAID-1 devices.

-raid5 Lists RAID-5 devices.

-raid6 Lists RAID-6 devices.

-raids Lists RAID-S devices by RAID group number. The -raid option is synonymous with -raids.

-rdfa Lists devices that are RDFA-backed.

-rdfg Lists devices that belong to the specified RdfGroup.

-resv Lists all Symmetrix devices that have SCSI reservations.

-reserved Lists all Symmetrix devices that have device reservations (see symconfigure).

-rg Lists primary and secondary RAID group information for each device.

-rp Allows controls on devices that have been tagged for RecoverPoint use.

Lists the Symmetrix devices that are RecoverPoint devices.

-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).

-sec_protection
Applies to -sec_raid5 or -sec_raid6

only. Further filters devices with secondary RAID-5 or RAID-6 RAID groups based on protection types (3+1, 7+1, 6+2 or 14+2).

-sec_raid Lists devices with a secondary RAID group.

-sec_raid1 Lists devices with a secondary RAID-1 RAID group.

-sec_raid5 Lists devices with a secondary RAID-5 RAID group.

-sec_raid6 Lists devices with a secondary RAID-6 RAID group.

-sec_trk Specifies the number of sectors per track.

-sec_unprotected
Lists devices with a secondary Unprotected RAID group.

-service_state Lists devices that match the corresponding service state.

-sg Lists the Symmetrix devices that belong to a specified storage group.

-sid Specifies a unique Symmetrix ID.

-space Shows the available or unconfigured storage space for the specified list of disks.

Capacities refer to physical usage on-disk (spindle). Disks containing device hypers of different emulation types are listed with a Format of "Mixed." Disks containing no hypers (such as empty or spare) are not

included.

Note that the summary Total and Unconfigured values are repeated for each emulation type. These values refer to cumulative capacities for the listed disk(s) and are not specific to each emulation type.

-spare Lists devices that have a spare disk invoked against them during dynamic sparing.

-spindle Displays spindle information instead of the standard disk address information.

-star Indicates that the action is targeted for devices in STAR mode.

-star_async_target
Lists devices in STAR ASYNC target mode.

-star_mode Lists devices in STAR mode.

-star_sync_target
List devices in STAR SYNC target mode.

-stop Specifies that the compress, uncompress, allocate, free or reclaim operation will be stopped.

-symforce Requests that the Symmetrix force the operation to be executed when normally it is rejected. Use extreme caution when using this option.

-symm6 Specifies the Symmetrix 6 device geometry. It indicates 64 sectors per track and 15 tracks per cylinder.

-symm7 Specifies the Symmetrix 7 device geometry. It indicates 128 sectors per track and 15 tracks per cylinder.

-symm9 Specifies the Symmetrix 9 device geometry. It indicates 256 sectors per track and 15 tracks per cylinder.

-tdev Lists the thin device(s).

-technology Specifies the drive technology type of the primary local back-end storage for the device.

-trk_cyl Specifies the number of tracks per cylinder.

-unbound Lists devices that are not bound to a Thin pool.

-unprotected Lists unprotected devices.

-v Provides a more detailed, verbose listing.

-vcm Lists all of the device masking (or VCM) devices in the Symmetrix array. This option is obsolete in Enginuity 5874 and higher, and is replaced by -aclx.

-vdev Lists devices that are Symmetrix virtual devices.

-vnx Specifies the VNX device geometry. It indicates 16 sectors per track and 32 tracks per cylinder.

-wwn Lists the full WWN of all devices, or

select a device by its WWN.

-wwn_encapsulated
Lists the WWN of the backing external spindle for the device, if the spindle is encapsulated. Devices which are not backed by encapsulated external spindles will not be listed.

PARAMETERS

DevPairFile The name of the file that contains pairs of source and target device. One pair per line with the format of source device first, a space and the target device.

For example:
10A 20A
10B 20B

DskGrpName The disk group name.

DskGrpNum The disk group number.

EFD The Enterprise Flash disk drives.

FC The Fibre Channel disk drives.

FileName The name of the file that contains a list (one SymDevName per line) of devices to be acted upon.

NumBlocks The number of 512 bytes blocks.

RdfGroupNum The RDF Group number.

SATA The SATA disk drives.

SgName The storage group name.

SymDevName The Symmetrix device name, unique per Symmetrix, such as 01C.

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 12-digit ID of the Symmetrix array.

RETURN CODES

Code #	Code Symbol
0	CLI_C_SUCCESS
1	CLI_C_FAIL
19	CLI_C_GK_IS_LOCKED All GateKeepers to the Symmetrix array are currently locked.

EXAMPLES

To list all nonprivate Symmetrix devices that are configured in Symmetrix arrays connected to this host, enter:

```
symdev list
```

To show detailed information about Symmetrix device 00C in a Symmetrix array with the specified ID, enter:

```
symdev -sid 870 show 00C
```

To list the first 20 BCV devices starting at Symmetrix device 01F that are configured in a Symmetrix array enter:

```
symdev list -bcv -devs 01F -N 20
```

To list details about devices in the range from Symmetrix device (0000 to 000A) with device external lock of 9 locked, enter:

```
symdev list -sid 870 -lock 9 -devs 0000:000A -v
```

To release all Symmetrix devices in Symmetrix 870 that have a device external lock of 9, enter:

```
symdev -sid 3009 release -lock 9
```

symdg

Performs operations on a Symmetrix device group.

SYNOPSIS

```
symdg -h

symdg [-i <Interval>] [-c <Count>] [-v]

  create <DgName>
    [-type REGULAR | RDF1 | RDF2 | RDF21 | ANY]

  delete <DgName> [-force]

  rename <DgName> <NewDgName>

  export <DgName> [-delete] [-file <FileName>]
    [[-rdf [-rdfg <GrpNum>]] | [-sid <SymmID>]]
    [-grpfile <GrpDbFileName>]

  exportall [-delete] [-file <FileName>]
    [[-rdf [-rdfg <GrpNum>]] | [-sid <SymmID>]]
    [-grpfile <GrpDbFileName>]

  import <DgName> [-file <FileName>]

  importall [-file <FileName>]
  list [-sid <SymmID>] [-offline] [-v]
    [-grpfile <GrpDbFileName>]
  list [-inactive]

  show <DgName> [-inactive] [-offline | -lock ]
    [-grpfile <GrpDbFileName>]

  activate <DgName> [-noprompt]

  activateall [-noprompt]
```

```
dg2file <DgName> [-file <FileName>]
  [-ftype STD | R1BCV | STD_BCV |
        STD_R1BCV | STD_VDEV | BCV_VDEV]

file2dg <DgName> [-file <FileName>]
  [-type REGULAR | RDF1 | RDF2 | RDF21]

dg2cg <DgName> <CgName> [-rename] [-force]
  [-bcv [-hop2] | -nobcv | -rbcv | -rrbcv | -brbcv |
   -vdev [-hop2] | -rvdev | -tgt [-hop2] | -rtgt]
  [-apidb | -rdf_consistency]

dg2sg <DgName> <SgName> [-bcv | -vdev | -tgt ]


symdg -g <DgName> [-i <Interval>] [-c <Count>] [-v]
    [-offline]

add pd  <PdevName> [LdevName]

addall [-sid <SymmID>] [pd | -host <HostName>]
  [-SA <# | ALL>] [-p <#>] [-N <#>]
  [-cap <#> [-captype <mb> | <cyl>]]
  [<-rdf | -hop2> <-vdev | -tgt>
  [-rdfg <GrpNum> [-remote_rdfg <RemoteGrpNum>]]]
  [-sel_rdfg <SelRdfgNum>]
  [-devs <<SymDevStart>:<SymDevEnd> | <SymDevName>
     [,<<SymDevStart>:<SymDevEnd> | <SymDevName>>...]>]

list ld [-v] [-cyl] [-held] [-offline | -resv]

show ld <LdevName> [-geometry]

rename ld <LdevName> <NewLdevName>

remove ld <LdevName> [-force]
```

```
  move ld <LdevName> <DestDgName> [-force] [-rename]

  copy ld <LdevName> <DestDgName> [-force] [-rename]


symdg -g <DgName> [-i <Interval>] [-c <Count>] [-v]
    [-offline] [-sid <SymmID>]
    [<-rdf | -hop2> <-vdev | -tgt>
    [-rdfg <GrpNum> [-remote_rdfg <RemoteGrpNum>]]]

  add dev <SymDevName> [LdevName]

  addall devs
    [-SA <# | ALL>] [-p <#>] [-N <#>]
    [-cap <#> [-captype <mb> | <cyl>]]
    [-sel_rdfg <SelRdfgNum>]
    [-devs <<SymDevStart>:<SymDevEnd> | <SymDevName>
       [,<<SymDevStart>:<SymDevEnd> | <SymDevName>>...]>]

symdg -g <DgName> [-i <Interval>] [-c <Count>] [-v]
    [-offline] [-sid <SymmID>]
    [-SA <# | ALL>] [-p <#>] [-N <#>]
    [-cap <#> [-captype <mb> | <cyl>]]
    [-sel_rdfg <SelRdfgNum>]
    [-devs <<SymDevStart>:<SymDevEnd> | <SymDevName>
       [,<<SymDevStart>:<SymDevEnd> | <SymDevName>>...]>]
    [-R1 | -R2 | -R21 | -noRDF]

  copyall <DestDgName> [-force] [-rename]
    [<-vdev | -tgt> [-hop2] | -rvdev | -rtgt]

  moveall <DestDgName> [-force] [-rename]
    [<-vdev | -tgt> [-hop2] | -rvdev | -rtgt]

  rmall [-force]
    [<-vdev | -tgt> -rdf [-rdfg <GrpNum>] | -hop2]
```

symdg -g ‹DgName› [-noprompt] [-i ‹Interval›] [-c ‹Count›]
[-bcv | -vdev | -tgt] [-rp] [-star] [-celerra]

rw_enable [LdevName [LdevName...]] [-p ‹#›] [-SA ‹#|ALL›]

write_disable [LdevName [LdevName...]] [-p ‹#›]
[-SA ‹#|ALL›]

symdg -g ‹DgName› [-noprompt] [-i ‹Interval›] [-c ‹Count›]
[-bcv | -vdev | -tgt] [-star]

relabel [LdevName [LdevName...]][-force]

pin [LdevName [LdevName...]]

unpin [LdevName [LdevName...]]

host_active [LdevName [LdevName...]] [-force]

symdg -g ‹DgName› [-noprompt] [-i ‹Interval›] [-c ‹Count›]
[-bcv [-hop2] | -rbcv | -brbcv | -rrbcv |
-vdev [-hop2] | -rvdev | -tgt [-hop2] |
-rtgt] [-rp] [-star] [-celerra]

ready [LdevName [LdevName...]]

not_ready [LdevName [LdevName...]]

hold [LdevName [LdevName...]]

unhold [LdevName [LdevName...]] [-symforce]

compress [LdevName [LdevName...]] [-stop]

uncompress [LdevName [LdevName...]] [-stop]

bind -pool ‹PoolName›

unbind

rebind -pool ‹PoolName›

allocate [LdevName [LdevName...]] [-persistent]

allocate [LdevName [LdevName...]] -stop

free [-all] [LdevName [LdevName...]]

free [-all] [LdevName [LdevName...]] -stop

reclaim [LdevName [LdevName...]] [-persistent]

reclaim [LdevName [LdevName...]] -stop

set -persistent [LdevName [LdevName...]]

unset -persistent [LdevName [LdevName...]]

set -orm ‹ system | on | off › [LdevName [LdevName...]]

set -gcm [‹LdevName› [‹LdevName› ...]] [-symforce]

unset -gcm [‹LdevName› [‹LdevName› ...]] [-symforce]

symdg [-i ‹Interval›] [-c ‹Count›]

release ‹DgName› [-force] [-lock #] [-noprompt]

break -g ‹DgName› [LdevName] [-noprompt] [-vdev]

DESCRIPTION

The symdg command performs the following operations specific to device groups: creating new device groups, importing ASCII group files, exporting groups to files, deleting groups, translating groups to/from Symmetrix Manager files, renaming groups, and listing and showing information about a device group.

The symdg command also performs the following operations specific to a device in a device group: adding a device to a device group, adding all available devices to a device group, listing all devices in a device group, removing a device from a device group, removing/moving a device or all devices from a device group, renaming a device in a device group, and showing detailed information about a device in a device group.

The symdg command also performs the following control actions on some or all of the devices in a device group: write_disable, rw_enable, ready, not_ready, hold, unhold, pin, unpin, compress, uncompress, relabel, set, unset, bind, unbind, rebind, allocate, free and reclaim. By default the actions will only be applied to the standard devices in the group. The -bcv and -tgt switches must be specified to operate on those types of devices.

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.

add dev Adds any ungrouped Symmetrix device (given its Symmetrix device name) to an existing device group.

add pd Adds to an existing device group an ungrouped device by specifying its physical (host) device name.

addall devs Adds all ungrouped Symmetrix devices from a specified Symmetrix array to an existing device group.

addall Adds all ungrouped physical devices from a specified Symmetrix array to an existing device group.

allocate Allocates storage in the thin pool.

bind Binds the thin device(s) to the thin pool.

break Breaks SCSI device reservations on one or all devices in the device group.

compress Starts data compression on thin device(s). When combined with the -stop option, data compression is stopped.

copy ld Copies one standard device from one existing device group to another existing device group. The source and destination device groups must have compatible types.

copyall Copies all standard devices from one existing device group to another existing device group. The source and destination device groups must have compatible types.

create Creates an empty device group of type REGULAR, RDF1, RDF2, or RDF21. 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 file in the same format used by the EMC Symmetrix Manager (SM-CLI) from a DG. This action should not be used to make a backup copy of a device group; use export for that purpose.

dg2sg Adds selected members of a device group to a target storage group.

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.

exportall Creates a text file that details the members of the existing device groups. The device groups can later be recreated from this file using the importall command.

file2dg Creates a device group from an EMC Symmetrix Manager (SM-CLI) format device file.

free Frees storage in the thin pool.

hold Creates a hold on all available devices from an existing device group. When a hold is placed on a device, TimeFinder and Snap operations will be blocked.

host_active Sets the host active mode on device(s). The device(s) must be in a host passive mode for this operation to succeed.

import Creates a device group from data contained in a text file previously

created using the export command.

importall Creates device groups from data contained in a text file previously created using the exportall command.

list Lists all of the device groups that have been created for this host. If -inactive is specified, it lists all of the device groups from the inactive group list.

list ld Lists all of the available devices from an existing device group.

move ld Moves one standard device from one existing device group to another existing device group. The source and destination device groups must have compatible types.

moveall Moves all standard devices from one existing device group to another existing device group. The source and destination device groups must have compatible types.

not_ready Sets the device(s) to be Not Ready. The device must be in a User Ready status for this operation to succeed.

pin Set the device(s) to the user pinned state. User pinned device(s) will not be moved via FAST controller, but they can be moved via Optimizer or symmigrate.

ready Sets the device(s) to be Ready. The device must be in a User Not Ready status for

this operation to succeed.

rebind Rebinds the device(s) to the thin pool.

reclaim Reclaims storage from the thin pool.

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 for details about how to define a device label.

release Releases a device external lock associated with all devices within a device group.

remove ld Removes a standard device from an existing device group.

rename Renames an existing device group. Use a device group name that is unique to this host.

rename ld Renames a device within a device group.

rmall Removes all standard devices from an existing device group.

rw_enable Sets the devices to be Read and Write Enabled to their local hosts on the specified front director ports. If no ports are specified, then the devices will be Read and Write Enabled on all ports on which the devices are visible.

set Sets the persistent indicator for allocations on thin device(s) when combined

with the -persistent option. Sets the Optimized Read Miss mode when combined with the -orm option. Sets GCM mode when combined with -gcm.

show Shows information about a device group including: group type, Symmetrix ID, creation time, number of devices that are members, a list of associated gatekeeper devices, and a list of associated Business Continuance Volume (BCV) devices.

show ld Shows status information about a device in the device group.

unbind Unbinds device(s) from the thin pool.

uncompress Starts data decompression on thin device(s). When combined with the -stop option, data decompression is stopped.

unhold Releases devices that were previously set to the hold state.

unpin Unsets the device(s) from the user pinned state.

unset Clears the persistent indicator for allocations on thin device(s) when combined with the -persistent option. Clears GCM mode when combined with -gcm.

write_disable Sets the devices to be Write Disabled to their local hosts on the specified front director ports. If no ports are specified, then the devices will be Write Disabled on all ports

on which the devices are visible.

OPTIONS

-all Used with the free operation in order to specify that all allocations associated with the indicated devices are to be freed, regardless of whether data has been written or not.

-apidb Creates the device group in the SYMAPI configuration database only.

-bcv This flag may be used for one of the following reasons:

- Adds only BCV devices to the target device or storage group.

- Targets the operation to the specified BCV device(s) that are locally associated with the device group.

-brbcv This flag may be used for one of the following reasons:

- Adds only the BRBCV devices to the target device group.

- Targets the action at the specified remotely associated RDF BCV device(s) in the device group.

-c Specifies the number (count) of times to attempt to acquire an exclusive lock on the Symmetrix host database and (for RDF control operations) on the local and/or

remote Symmetrix arrays.

The time to wait between attempts to acquire a needed lock is specified by -i (interval).

If neither -c nor -i is specified, operations will fail if unable to acquire a requested lock.

If -c is not specified, and -i is specified, the program will loop continuously until the operation has acquired the locks it needs and can start.

-cap Sets a minimum device size to the selection criteria of devices.

-captype ‹mb | cyl›
Specifies the units of capacity in megabytes or cylinders. The default unit of measure is mb.

-celerra Allows controls on Celerra FBA devices.

-orm Allows setting the Optimized Read Miss mode to system default, on, or off for the specified devices.

-cyl Displays the device capacity in cylinders. The default unit of measure is megabytes (MB).

-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.

-devs Specifies the ranges of Symmetrix devices to add, remove, and move.

-file Specifies a file to write to or read from.

-force This flag may be used for one of the following reasons:

- 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).

- Applies force with the specified action on a device group that would otherwise be rejected. Forces standard devices to be removed or moved from a device group without querying the Symmetrix array for the device's BCV pair states (if any).

-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:

-ftype	Description
STD	Creates a file containing a list of all of the standard devices in the group.

R1BCV Creates a file containing a list of all of the R1 BCV devices in a group.

STD_BCV Creates a file containing a list of all of the 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 of the standard/R1 BCV pairs that are in the group. This is a subset of the list provided by the STD_BCV option, but it does not include devices that have never been paired.

STD_VDEV Creates a file containing a list of all of the standard/virtual device pairs that are in the group.

BCV_VDEV Creates a file containing a list of all of the BCV/virtual device pairs that are in the group.

-g Specifies a device group name.

-gcm Allows setting or clearing the device GCM mode.

-geometry Shows device geometry.

-grpfile Specifies an alternate group database file for use in list, show, export and exportall actions.

-h Provides brief, online help information.

-held Lists devices in the device group that have device holds.

-hop2 Indicates that the device is two hops away. If used, -vdev, -tgt, or -bcv must also be specified.

When adding, removing, moving, or copying devices, -rdfg, -remote_rdfg, and -tgt or -vdev must also be specified.

When holding or readying devices, the hop2 flag must be used with -bcv, -vdev, or -tgt.

-host Limits the devices added to only those mapped to the host's front-end directors.

-i Specifies the interval, in seconds, to wait between attempts to acquire an exclusive lock on the Symmetrix host database and (for RDF control operations) on the local and/or remote Symmetrix arrays.
The default interval is 30 seconds.
The minimum interval is 5 seconds.
For passive actions the minimum interval is 15 seconds. Passive actions are actions that do not acquire an exclusive lock.

-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 argument.

-N Sets the number of devices to add, remove, or move.

-nobcv Adds only STD devices to the target device group.

-noprompt Disables the prompt for confirmation feature. The default is to prompt the user for confirmation before executing the operation.

-noRDF Adds, copies, moves, or removes non RDF devices only.

-offline Obtains information from the Symmetrix host configuration database.

-p Specifies the front-end (SCSI or Fibre) director port number to only select devices that are primarily visible through this director port. By default, all ports are selected.

-persistent Used with set or unset it specifies operation on the persistent indicator. Used with allocate or reclaim it specifies the use of persistent storage.

-pool Specifies a Thin Pool Name.

-R1 Adds, copies, moves, or removes RDF1 (R1) devices only.

-R2 Adds, copies, moves, or removes RDF2 (R2) devices only.

-R21 Adds, copies, moves, or removes RDF21 (R21) devices only.

-rbcv This flag may be used for one of the following actions:

- Adds only RBCV devices to the target device group.

- Targets the action at the device group's locally associated RDF BCV devices that can be BCV paired with the remote mirrors of the standard RDF devices.

-rdf This flag may be used for one of the following actions:

- 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.

- Indicates that remote VDEVs or TGTs are being added to the group.

-rdf_consistency
Creates a CG and allows it to be enabled for RDF consistency after adding devices to the CG.

-rdfg This flag may be used for one of the following actions:

- Supplies the RA (RDF) group number to only add devices that belong to this RA group number.

- Indicates the Symmetrix RA (RDF) group number to reach the remotely associated BCV device.

-remote_rdfg Specifies the RDF (RA) group to access a two-hop device from the first hop.

-rename This flag may be used for one of the following actions:

- Assigns new logical device names to all added devices.

- Renames the standard device(s) to the default names as they are moved from their current device group to the destination device group.

-resv Lists devices in the device group that have SCSI reservations.

-rp Indicates that the action is targeted

for devices tagged for RecoverPoint.

-rrbcv This flag may be used for one of the following actions:

- Adds only the RRBCV devices to the target device group.

- Targets the action at the specified remotely associated remote BCV device(s) in the device group.

-rtgt This flag may be used for one of the following actions:

- Adds only RTGT devices to the target device group.

- Targets the indicated action at the devices in RTGT list of the device group.

-rvdev This flag may be used for one of the following actions:

- Adds only devices that are Symmetrix remote virtual devices to the target device group.

- Targets the indicated action at the specified remote VDEV device(s) that are associated with the device group.

-SA Specifies the front-end (SCSI or Fibre) director number to only select devices that are primarily visible through this director. Alternatively, if ALL (the default) is specified, all devices

satisfying any other selection criterion
will be selected.

-sel_rdfg Indicates the Symmetrix RA (RDF) group
number of the devices to be added via
an addall operation.

-sid This flag may be used for one of the
following actions:

- Lists the device group information for a
specified Symmetrix ID.

- Supplies the Symmetrix ID to add
only devices belonging to the specified
Symmetrix array.

-star Indicates that the action is targeted for
devices in STAR mode.

-stop Specifies that the compress, uncompress,
allocate, free or reclaim operation will
be stopped.

-symforce Forces the operation to be executed when
normally it would be rejected.

Caution: Extreme caution should be
exercised when using this option.

-tgt This flag may be used for one of the
following reasons:

* Adds only TGT devices to the target
device or storage group.

* Targets the indicated action at the

devices in TGT list of the device group.

-type Identifies the type of device group, either REGULAR, RDF1, RDF2, R21 or ANY. The default type is REGULAR.

-v Provides a more detailed, verbose listing.

-vdev This flag may be used for one of the following actions:

- Adds only devices that are Symmetrix virtual devices to the target device or storage group.

- Targets the indicated action at the specified VDEV device(s) that are associated with the device group.

PARAMETERS

CgName The target composite group name.

DestDgName The destination device group to which the standard devices are moved.

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.

GrpDbFileName Specifies an alternate group database file for use in list, show, export and exportall actions.

GrpNum The RDF (RA) group number.

HostName The name of the host system.

LdevName The logical device name that is named by the user or automatically assigned when a device is added to a device group.

NewDgName The renamed device group name.

SelRdfGrpNum The Symmetrix RA (RDF) group number of the devices to be added via an addall operation.

SgName The target storage group name.

SymDevEnd The last Symmetrix device name in a sequence, such as 00B6.

SymDevName The Symmetrix device name, unique per Symmetrix, such as 01C.

SymDevStart The first Symmetrix device name in a sequence, such as 001C.

SymmID The 12-digit ID of the Symmetrix array.

FILES

The export argument creates a group file (ASCII text) and the import argument 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> <DeviceParameters>
. . .
```

The following list describes the various parameters within the file:

Parameter	Description
<GroupType>	Specifies an integer value that defines the type of group for this group list. Possible values include:

Symbolic Name	Value
SYMAPI_C_DGTYPE_REGULAR	0
SYMAPI_C_DGTYPE_RDF1	1
SYMAPI_C_DGTYPE_RDF2	2
SYMAPI_C_DGTYPE_RDF21	3
SYMAPI_C_DGTYPE_ANY	4

<SymmID> Specifies the 12-digit ID of the Symmetrix array associated with the group.

<DeviceType> Defines the device type for the group member being exported or imported:

Type	Meaning
S	Standard Device (STD)
B	Local BCV Device (BCV)
R	Remote BCV Device (RBCV)
Z	BCV Remote BCV Device (BRBCV)
Y	Remote Remote BCV Device (RRBCV)
D	Hop 2 BCV Device (2BCV)

G Gatekeeper Device
V VDEV Device
W Remote VDEV Device (RVDEV)
E Hop 2 VDEV Device (2VDEV)
T Target Device
X Remote Target Device (RTGT)
F Hop 2 Target Device (2TGT)

‹DeviceParameters› Defines the device parameters:

```
Type  Parameters
----  --------------
 S   ‹SymmID› ‹LdevName›
 B   ‹SymmID› ‹LdevName›
 V   ‹SymmID› ‹LdevName›
 R   ‹SymmID› ‹LdevName› ‹RDFGrpNum›
 W   ‹SymmID› ‹LdevName› ‹RDFGrpNum›
 E   ‹SymmID› ‹RDFGrpNum›
     ‹HOP2RDFGrpNum› ‹LdevName›
 Z   ‹SymmID› ‹LdevName› ‹RDFGrpNum›
 Y   ‹SymmID› ‹RDFGrpNum›
     ‹RemoteRDFGrpNum›‹LdevName›
 D   ‹SymmID› ‹RDFGrpNum›
     ‹HOP2RDFGrpNum› ‹LdevName›
 G   ‹PdevName›
 T   ‹SymmID› ‹LdevName›
 X   ‹SymmID› ‹LdevName› ‹RDFGrpNum›
 F   ‹SymmID› ‹RDFGrpNum›
     ‹HOP2RDFGrpNum› ‹LdevName›
```

The parameters are:

```
Parameter       Description
---------       -----------
‹HOP2RDFGrpNum›  The RDF group number
                 of the device on an
                 array two hops from
```

the standard.

‹LdevName› A logical device name (for example: DEV002).

‹PdevName› The gatekeepers physical device name (for example: /dev/rdsk/c2t0d2s2). Appears for a gatekeeper (G) type only.

‹RDFGrpNum› The RDF group number of the standard device with which the BCV is paired.

‹RemoteRDFGrpNum› The RDF group number of the device on a remote array.

‹SymmID› The 12-digit ID of the Symmetrix array associated with the group.

RETURN CODES

Code #	Code Symbol
0	CLI_C_SUCCESS
1	CLI_C_FAIL

2 CLI_C_DB_FILE_IS_LOCKED

18 CLI_C_ALREADY_IN_STATE
The device or device group is
already in the desired state.
Applicable only for the rw_enable
and write_disable actions.

19 CLI_C_GK_IS_LOCKED
All GateKeepers to the Symmetrix
unit are currently locked.

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 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 the device group to a file named
oradg_rdf1.txt and then delete the device

group, enter:

```
symdg -file oradg_rdf1.txt -delete export oradg_rdf1
```

To recreate the device group from the file
oradg_rdf1.txt, enter:

```
symdg -file oradg_rdf1.txt import oradg_rdf1
```

To translate the device group into
a device file named devices.txt, enter:

```
symdg -file devices.txt -ftype STD_BCV dg2file oradg_rdf1
```

To delete Symmetrix device group oradg_rdf1, regardless of
whether the group has members or associated gatekeeper
or BCV devices, enter:

```
symdg -force delete oradg_rdf1
```

To recreate the device group from the device file
devices.txt, enter:

```
symdg -file devs.txt -type REGULAR  file2dg oradg_rdf1
```

To add the device group's BCV devices to a composite
group named oracg, enter:

```
symdg -bcv dg2cg oradg_rdf1 oracg
```

To add a Symmetrix host device to group ProdDB, and
assign a device logical name temp1, enter:

```
symdg -g ProdDB add pd /dev/rdsk/c2t0d2s2 temp1
```

To add a Symmetrix device to group ProdDB and assign
a device logical name temp2, enter:

```
symdg -g ProdDB add dev 01C temp2
```

To add to group ProdDB all devices that are primarily visible from this host on Port 0 (top port) of Symmetrix SCSI director 1, enter:

```
symdg -g ProdDB -SA 1 -p 0 addall pd
```

To add to group ProdDB all devices that are primarily visible from this host and fall in the following device range, enter:

```
symdg -g ProdDB -devs 000:00F addall pd
```

To list all devices in device group ProdDB, enter:

```
symdg -g ProdDB list ld
```

To rename device DEV001 to log1 in group ProdDB, enter:

```
symdg -g ProdDB rename ld DEV001 log1
```

To remove device log1 from device group ProdDB, enter:

```
symdg -g ProdDB remove ld log1
```

To show detailed information about device log1, enter:

```
symdg -g ProdDB show ld log1
```

To write disable device DEV001 on Symmetrix director 16A and Port 0, enter:

```
symdg -g ProdDB -SA 16A -p 0 write_disable DEV001
```

To relabel all BCV devices that are locally-associated with device group ProdDB, enter:

```
symdg -g ProdDB -bcv -v relabel
```

To add to group ProdDB, all VDEVs that are primarily visible from this host and fall in the following device range, enter:

```
symdg -g ProdDB -devs 000:00F addall pd -vdev
```

symdisk

- Reports on the configuration and status of disks (spindles) and their hypers for Symmetrix arrays.

SYNOPSIS

```
symdisk [-h]

symdisk [-sid <SymmID>] [-offline] [-cyl | -mb | -gb | -tb]
      [-disk_group <DskGrpNum | name:<DskGrpName> | ALL>
       [-all]] [-failed]

  list [-spindle [-internal]] [-isspare] [-nospares]
      [-v [-hypers] [-spare_info] [-gaps]]
      [-DA <# | ALL>] [-interface <# | ALL>]
      [-tid <# | ALL>]
  list [-spindle
        [-external [-detail] [-encapsulated [-free]]]]
      [-v [-hypers] [-gaps]]
      [-DX <# | ALL>]

symdisk [-sid <SymmID>] -external -spindle -state
      [-spid <SpindleID>]

  list

symdisk [-sid <SymmID>] -external -spindle -paths
      [-spid <SpindleID> |-DX <# | ALL> [-port <# | ALL>]]

   list -detail

   list [-offline]

symdisk -sid <SymmID> -external
      [-wwn <ExternalWWN> | -spid <SpindleID>]
      <-draining | -drained | -active | -disabled>
      [-i <Interval>] [-c <Count>]
```

```
  verify

symdisk [-sid <SymmID>] [-offline] [-cyl | -mb | -gb | -tb]

  list -dskgrp_summary [-v]
      [-disk_group <DskGrpNum | name:<DskGrpName> | ALL>]
       | -internal | -external]

  list -dskgrp_summary -by_engine [-v | -detail]
      [-disk_group <DskGrpNum | name:<DskGrpName> | ALL>]
       | -internal | -external]

  show <DiskAddress> [-gaps_only]

symdisk -sid <SymmID> [-offline] [-cyl | -mb | -gb | -tb]

  show -spid <SpindleID> [-gaps_only]

  show -wwn <ExternalWWN> [-gaps_only]
```

DESCRIPTION

The symdisk command allows access to the configuration information of the disks (spindles) that make up a Symmetrix array. It can be used to list all of the disks for 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 Target ID (TID). In addition, the -isspare flag may be used to select only those disks that are configured as spare disks.

Using the -v option will provide more detailed information. The -hypers flag can be used with -v to display additional

information about each of the logical hypers on a given disk (including which Symmetrix devices they make up).

ARGUMENTS

list Lists all disks. With the use of options, the list can be restricted. The -v and -hypers options will return additional information about each disk.

show Displays detailed information about the disk(s) that match the given DA, INT, and TID.

verify Verifies whether one or all disks are in a given state.

OPTIONS

-active The specified disk is ready to accept new writes.

-all Includes spare disks in the -disk_group disk listing. This option is specific to -disk_group and is not compatible with -dskgrp_summary.

-c Specifies the number (count) of times to execute the verify operation. If this option is not specified but an interval (-i) is specified, the program will loop continuously. The looping may be terminated during verification if all devices enter the requested state.

-cyl Displays the disk capacities in terms

of cylinders. The default is megabytes (MB).

-DA Indicates the disk director number. A value of ALL returns all disk directors.

-detail Displays detailed path information for external spindles. Alternatively, displays external array id and external device name information for external spindles.

-disabled Drain operation is incomplete for the specified disk.

-disk_group Lists the disks that are members of the specified disk group name or number. When used with the ALL qualifier, all disk groups are listed. When used with the -all option, any spare disks are also included in the disk group listing.

-by_engine When used with the -dskgrp_summary option, displays aggregate information about spindles configured to specific engines within a disk group. The default output is in table format with additional information provided when used with the -v (verbose) or -detail listing option. All engines supporting spindles are included in the listing unless otherwise restricted by additional filter options.

-draining Drain operation is in progress for the specified disk.

-drained Drain operation is complete for the specified disk.

-dskgrp_summary
Displays summary information for disk groups. The default output is in table format. When used with the -v option, the output is in expanded format (one field per line).

-DX Indicates the external disk director number. A value of ALL returns all disk directors.

-encapsulated Lists only encapsulated spindles.

-external Lists only external spindles.

-failed Lists only those spindles that have been flagged as failed.

-free Lists only those external encapsulated spindles that have no allocations on all of their datadevs or have no RAID groups existing on the spindle.

-gaps Lists the size and location of freespace gaps as they occur within the list of hyper information.

-gaps_only Shows only the gap information.

-gb Displays the disk capacities in gigabytes.

-h Provides brief, online help information.

-hypers Shows hyper information when used with -v.

-i Specifies the repeat interval in seconds to execute the verification operation. The default interval is 30 seconds.

The minimum interval is 5 seconds.

-isspare Indicates that only spare disks should be displayed.

-interface Indicates the disk interface number. A value of ALL returns all interfaces.

-internal Lists only internal spindles.

-mb Displays the disk capacities in megabytes.

-nospares Indicates that only internal disks (spindles) that are capable of being covered by a spare, but currently are not, should be displayed. This option is only supported on Enginuity version 5876 and above. No disks (spindles) will be displayed if this option is issued for a Symmetrix running a prior Enginuity version. In addition, this option is not applicable for external spindles (external spares do not exist) and no external spindles will be returned when this option is specified.

-paths Displays path information for external spindles. The default display provides a DX port summary, with counts representing DX ports which have connections. When combined with the -detail option, all paths are displayed, including multiple paths per DX port (if configured).

-sid Indicates a unique ID of the Symmetrix array.

-spare_info If the disk is a spare and it has been

invoked against a failed disk during dynamic sparing, this flag will return information about the failed disk. The -v option must also be specified. Note that this display is not applicable for permanent sparing.

-spid Indicates the specific spindle ID of the target disk.

-spindle Displays spindle information instead of the standard disk address information.

-state Reports the current state of the disk(s).

-tb Displays the disk capacities in terabytes.

-tid Indicates a target ID. A value of ALL returns all targets.

-v Provides a more detailed, verbose listing.

-wwn Display detailed information for the external spindle specified by ExternalWWN.

PARAMETERS

The number of the disk group, director, disk interface, or target ID.

ALL All of the directors, disk interfaces, target IDs, or disk groups.

DiskAddress The disk adapter, interface, and TID values in the format ‹XXX:YZ›, where XXX is the disk director, Y is interface, and Z is the TID. It is also acceptable to supply those same values in the format ‹XXX,Y,Z›.

DskGrpName The disk group name.

DskGrpNum The disk group number.

ExternalWWN The WWN of the target external spindle.

SpindleID The spindle ID of the disk in hex format.

SymmID The 12-digit ID of the Symmetrix array.

RETURN CODES

```
Code #    Code Symbol
------    -----------

 0      CLI_C_SUCCESS

 1      CLI_C_FAIL
```

EXAMPLES

To list all of the disks for Symmetrix 012345678901, enter:

```
symdisk list -sid 012345678901
```

To display additional verbose information about disk 01A:C3 and its hypers, enter:

```
symdisk list -sid 012345678901 -da 01A -interface C
  -tid 3 -v -hypers
```

To display detailed information about the disk whose DA is 16B, INT is D, and TID is 5, enter:

```
symdisk show 16B:D5
```

To display detailed information about the disk whose DA

is 16B, INT is D, and TID is 5 as shown in the previous example using an alternative input format, enter:

```
symdisk show 16B,D,5
```

To list all disks organized by disk group number, including spare disks, enter:

```
symdisk list -disk_group ALL -all
```

To list all disks with spindle information, organized by disk group number, including spare disks, enter:

```
symdisk list -disk_group ALL -all -spindle
```

To list all disks for Symmetrix 012345678901 with their spindle ID information, enter:

```
symdisk list -spindle -sid 012345678901
```

To display detailed information about the disk whose spindle ID is 0x11D0, enter:

```
symdisk show -spid 11D0
```

symdrv

Displays information for selected Dynamic Reallocation Volume (DRV) devices.

SYNOPSIS

symdrv [-sid ‹SymmID›] [-h] [-offline] [-v]

list [-cap ‹#›] [-i ‹Interval›] [-c ‹Count›]

DESCRIPTION

The symdrv command lists all the DRV 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 Specifies to display only those devices whose capacities match (in megabytes) that value.

-h Provides brief, online help information.

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

For passive actions the minimum interval is 15 seconds. Passive actions are actions that do not acquire an exclusive lock.

-offline Displays Symmetrix devices from the Symmetrix configuration database without refreshing the data from the Symmetrix array.

-sid Supplies the Symmetrix ID to limit the scope of the operation to the specified Symmetrix array.

-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

Code #	Code Symbol
0	CLI_C_SUCCESS
1	CLI_C_FAIL
19	CLI_C_GK_IS_LOCKED All GateKeepers to the Symmetrix array are currently locked.

EXAMPLES

To list all DRV devices that are configured on Symmetrix arrays attached to this host, enter:

```
symdrv list
```

symevent

Enables the monitoring and tracking of events on Symmetrix arrays.

SYNOPSIS

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 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 and 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).

When run against a Symmetrix at Enginuity 5671 or higher, event timestamps are calculated relative to the host (i.e., the same time zone) from which the command is issued. In client/server mode, this is the server host. For a Symmetrix array with an earlier Enginuity level, timestamps are relative to the time on the Symmetrix array, usually GMT/UTC.

Note: Beginning with Enginuity 5761, the Error Number is reported using a new numbering scheme. This allows the error numbers to remain constant across all future Enginuity releases.

ARGUMENTS

list Lists events which have occurred over time 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 Displays events sorted on the basis of reporting director.

-end Specifies a date and time before which to report on events. Used with the list argument.

-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 30 seconds.
The minimum interval is 5 seconds.
For passive actions the minimum interval is 15 seconds. Passive actions are actions that do not acquire an exclusive lock.

-sid Specifies a unique Symmetrix ID.

-start Specifies a date and time after which to report on events. Used with the list argument.

-v Provides a more detailed, verbose listing.

-warn Displays only events with a severity of Warning or greater.

PARAMETERS

Count The number of iterations to execute before exiting.

Date:Time The 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 The interval between polls, in seconds.

SymmID The 12-digit ID of the Symmetrix array.

RETURN CODES

Code #	Code Symbol
0	CLI_C_SUCCESS
1	CLI_C_FAIL

REPORTED EVENTS

The following list contains the reported events using the following format:

Event Code Symbol
Severity: ‹severity-level›
Event Code Text

DIAG_TRACE_TRIG
Severity: Informational
A Symmetrix diagnostic event-trace was triggered

DIAG_TRACE_TRIG_REMOTE
Severity: Informational
A diagnostic event-trace was triggered for a Symmetrix remotely attached via RDF links

TOO_MANY_SUSPHALT_CHAINS
Severity: Informational
Too many suspend/halt chains switching to Adaptive Copy Write Pending Mode

MEM_DISABLE_INVOKED

Severity: Informational
One or more memory banks were disabled due to cache errors

SPARE_INVOKED
Severity: Informational
A Spare Disk was invoked against a Symmetrix Disk

M2_RESYNC_WITH_M1
Severity: Informational
An M2 mirror of a Symmetrix Device is resynchronizing with the M1 mirror

M1_RESYNC_WITH_M2
Severity: Informational
An M1 mirror of a Symmetrix Device is resynchronizing with the M2 mirror

DISK_ADAPTER_DEAD
Severity: Fatal
A Symmetrix Disk Director is not responding

ALL_DEVICES_MIGRATED
Severity: Informational
All Symmetrix migration devices have completed the data migration

DEVICE_RESYNC_STARTED
Severity: Informational
A Symmetrix device resynchronization process has started

SPARE_INVOKED_REMOTE
Severity: Informational
A Spare Disk was invoked against the Disk of the R2 mirror in Symmetrix remotely attached via RDF links

RDF_SIM_MESSAGE
Severity: Informational
The RDF subsystem initiated a SIM message to a Symmetrix remotely attached via RDF links

RDF_ERROR
Severity: Error
The RDF subsystem has experienced an error

FC_OPTICAL_MOD_ERROR
Severity: Warning
A Fibre Channel optical module has experienced a problem

ALL_RDF_LINKS_DOWN
Severity: Warning
No RDF links in an RDF group are operational

ALL_RDF_LINKS_NOW_UP
Severity: Informational
All RDF links in an RDF group are now operational

BUS_PROBLEM
Severity: Informational
Bus Arbiter problem: primary arbiter has experienced a problem

TEMPERATURE_PROBLEMS
Severity: Warning
The Symmetrix is experiencing temperature problems

ALARM_SIGNAL
Severity: Warning
An alarm signal was set but no alarm was found

ALARM_SIGNAL_POWER
Severity: Warning

An alarm signal was set indicating a power subsystem error

MIRROR_NR
Severity: Warning
A device has a mirror that is Not Ready

MIRROR_WD
Severity: Warning
A Symmetrix device has a member or a mirror that is Write Disabled

RDF2_DEVICE_NR
Severity: Informational
One of the RDF2 devices was found to be Not Ready

SP_NOT_RESPONDING
Severity: Warning
The Symmetrix Service Processor is not communicating with the Symmetrix

SP_PHONEHOME_FAIL
Severity: Warning
The Symmetrix Service Processor could not complete a Call Home for service

12_VOLTS_ON
Severity: Warning
One of the Symmetrix subsystems is running in the abnormal 12-Volts mode

SENSE_CABLE_MISSING
Severity: Warning
A Symmetrix power subsystem Environment sense cable is missing

AC_LINE_INTERRUPTED

Severity: Warning
A Symmetrix power subsystem AC line interruption was detected

HIGH_CHARGE_MISSING
Severity: Warning
The Symmetrix battery system is not fully charged

LATCHED_ALARMS
Severity: Warning
A Symmetrix power subsystem discovered latched alarms

ONE_RDF_LINK_DOWN
Severity: Warning
A single RDF link in an RDF group is not operational

ONE_RDF_LINK_NOW_UP
Severity: Warning
A single RDF link in an RDF group is now operational after a 'Single Link Down' event

SP_PHONEHOME_SUCCESS
Severity: Informational
The Symmetrix Service Processor completed a Call Home for service

UNABLE_TO_SET_REGISTER
Severity: Warning
A Symmetrix communication subsystem was unable to set a shared register

DISABLED_MEMORY_BANK
Severity: Warning
A Symmetrix Director reported Disabled Memory Bank to a host

INVALID_ENVIR_BITS
Severity: Warning

A validity problem was detected during an environmental test

ENABLED_ENVIR_TESTING
Severity: Informational
An event was detected to enable environmental testing in diagnosis mode

COMM_BOARD_MISMATCH
Severity: Error
The Symmetrix communication board software data has a mismatch

OLD_BOARD_MISMATCH
Severity: Error
The Symmetrix communication board old information does not match current information

THERMAL_DET_FAILED_TEST
Severity: Error
The Symmetrix thermal tests detected a failure

THERMAL_EVENT
Severity: Error
A thermal event was detected in the Symmetrix

POWER_ON_TIME_FAILED_TEST
Severity: Error
The Symmetrix environment tests found inconsistencies in Power-on-Time

SP_CONNECT_TIME_NOT_FOUND
Severity: Error
The Symmetrix has no records of the last Service Processor connection time

SP_CONNECT_VIA_SERIAL_LINE

Severity: Informational
The Service Processor is currently communicating via a serial line

SYMREMOTE_CONNECTED
Severity: Informational
A SymmRemote session is currently connected to the Service Processor

SYMREMOTE_REJECTED
Severity: Informational
A SymmRemote session to the Service Processor was denied access

SYMREMOTE_DISCONNECTED
Severity: Informational
A SymmRemote session to the Service Processor was disconnected

SP_EXCESS_MEMORY_USAGE
Severity: Warning
The Service Processor software detected excessive memory usage

BATTERY_FAILED_TEST
Severity: Warning
Automatic battery tests detected failures

NO_COMM_TO_MII_DIR
Severity: Warning
The Service Processor could not communicate to a director

CANT_QUERY_MII_DIR
Severity: Warning
The Service Processor could not query a director

SP_COMM_TO_MII_DIR
Severity: Informational
The Service Processor is communicating via a local director

CANT_READ_ENVIR_SENSOR
Severity: Warning
The Service Processor failed to read an environmental sensor

UNRECOGNIZED_EPO_CARD
Severity: Warning
The Service Processor has detected a failed or unrecognized communication card

ENVIR_READING_OUT_OF_LIMIT
Severity: Warning
The Service Processor found environmental readings to be out of limits

HIGH_TEMP_DETECTED
Severity: Warning
The Service Processor detected high temperature

EXCESS_TEMP_DETECTED
Severity: Warning
The Service Processor detected excessive temperature

SP_DISK_FULL
Severity: Warning
The Service Processor disk is full

SMOKE_DETECT_MALFUNCTION
Severity: Warning
The Service Processor detected a malfunction in the smoke detector

SMOKE_DETECT_ALERT

Severity: Warning
The Service Processor detected a smoke detector alert

PHONEHOME_TRIGGER
Severity: Informational
A certain event triggered a Call Home for service

DB_CHECKSUM_TRIGGER
Severity: Informational
A Database Double Checksum detection event was triggered

RDF_CG_TRIGGER
Severity: Informational
An RDF CG trip event was triggered

SP_REBOOT_SUCCESS
Severity: Informational
The Service Processor has successfully rebooted

SAVEDEVS_FULL
Severity: Error
The save or data device pool is full

SRDFA_INACTIVE
Severity: Warning
SRDF/A is now inactive

SRDFA_ACTIVE
Severity: Informational
SRDF/A is now active

ACCESS_TO_NR_DEVICE
Severity: Warning
Access was attempted to a Not Ready device

SAVEDEVS_NEAR_FULL
Severity: Warning
The save or data device pool is almost full

SAVEDEV_NOT_RDY
Severity: Error
An active device in the Timefinder/Snap save device pool has gone Not Ready

DIRECTOR_DEAD
Severity: Fatal
A Symmetrix Director is not responding

TIMEOUT_R2_WP_LIMIT
Severity: Error
Timeout writing to an R2 device. Maximum writes pending is reached

RDFA_SESS_DROP_WPL_DSBL
Severity: Error
SRDF/A Session dropped, write pending limit reached. Host throttling disabled

RDFA_SESS_DROP_WPL_ENBL
Severity: Error
SRDF/A Session dropped, write pending limit reached. Host throttling enabled

RDFA_SESS_DROP_DEV_NR_OFF
Severity: Error
SRDF/A Session dropped, device not ready. Tolerance mode is off

RDFA_SESS_DROP_DEV_NR_CG
Severity: Error
SRDF/A Session dropped, device not ready through consistency group

RDFA_SESS_DROP_NO_RDF_LNK
Severity: Error
SRDF/A Session dropped, no RDF links operational

RDFA_SESS_DROP_TIMEOUT_MSC
Severity: Error
SRDF/A Session dropped, time out in MSC mode

RDFA_SESS_DROP_TIMEOUT_HA
Severity: Error
SRDF/A Session dropped, time out on an HA

RDFA_SESS_DROP_TIMEOUT_RA
Severity: Error
SRDF/A Session dropped, time out on an RA

GEN_CHECKSUM_TRIGGER
Severity: Informational
A Generic Double Checksum detection event was triggered

POWER_ZONE_COUNTDOWN_STARTED
Severity: Error
Power zone count down started. One of the power zones is down, count down (20 hours) for Vault-Shutdown is started

POWER_ZONE_5_HOURS_BEFORE_SHUTDOWN
Severity: Error
Power zone 5 hours before shutdown, one of the power zones is down. 5 hours before Vault shutdown

POWER_ZONE_ILLEGAL_STATUS
Severity: Error
Power zone down, illegal status, found file with old information

POWER_ZONE_DOWN_FAILED
Severity: Error
Power zone down failed

POWER_ZONE_WAIT_TIME_CHANGED_ON_GUI
Severity: Error
Power zone down - wait time changed on the GUI

RDFA_DROP_ISSUED_FROM_HOST
Severity: Warning
SRDF/A session drop requested [host software initiated]

RDFA_DEACTIVATE_ISSUED_FROM_HOST
Severity: Warning
SRDF/A session transition out of Asynchronous mode requested [host software initiated]

RDFA_PENDING_DROP_ISSUED_FROM_HOST
Severity: Warning
SRDF/A session drop at cycle boundary requested [host software initiated]

RDFA_CONSISTENT_DEACTIVATE_ISSUED_FROM_HOST
Severity: Warning
SRDF/A session transition from Asynchronous to Synchronous mode requested [host software initiated]

RDFA_DROP_ISSUED
Severity: Warning
SRDF/A session drop requested

RDFA_DEACTIVATE_ISSUED
Severity: Warning
SRDF/A session transition out of Asynchronous mode requested

RDFA_PENDING_DROP_ISSUED
Severity: Warning
SRDF/A session drop at cycle boundary requested

RDFA_CONSISTENT_DEACTIVATE_ISSUED
Severity: Warning
SRDF/A session transition from Asynchronous to Synchronous mode requested

DAE_PSA_M_FAN_FAULT
Severity: Error
Environmental Error: Power Supply A multiple Fan fault

DAE_PSA_S_FAN_FAULT
Severity: Error
Environmental Error: Power Supply A single Fan fault

DAE_PSA_FAULTED
Severity: Error
Environmental Error: Power Supply A faulted

DAE_PSA_SHUTDOWN
Severity: Error
Environmental Error: Power Supply A shutdown

DAE_PSB_M_FAN_FAULT
Severity: Error
Environmental Error: Power Supply B multiple fan fault

DAE_PSB_S_FAN_FAULT
Severity: Error
Environmental Error: Power Supply B single fan fault

DAE_PSB_FAULTED
Severity: Error
Environmental Error: Power Supply B faulted

DAE_PSB_SHUTDOWN
Severity: Error
Environmental Error: Power Supply B shutdown

DAE_LCC_A_TEMP_HIGH
Severity: Error
Environmental Error: Link Card Controller A temperature high

DAE_LCC_B_TEMP_HIGH
Severity: Error
Environmental Error: Link Card Controller B temperature high

DAE_SPS_INTRN_FAULT
Severity: Error
Environmental Error: Supplemental Power Supply internal fault

DAE_SPS_BAT_ENDLINE
Severity: Error
Environmental Error: Supplemental Power Supply battery end of line

DAE_SPS_LOW_VOLTAGE
Severity: Error
Environmental Error: Supplemental Power Supply low input AC Voltage

RDFA_SE_TRANS_IDLE
Severity: Error
SRDF/A Session entering transmit idle state

RDFA_SR_TRANS_IDLE
Severity: Warning
SRDF/A Session recovered from a transmit idle state

RDFA_TO_TRANS_IDLE
Severity: Error
SRDF/A Session dropped, transmit idle state timeout

RDFA_SD_NO_ONL_RA
Severity: Error
SRDF/A Session dropped, no online RAs

AUDIT_HIGH_ACTIVITY:
Severity: Warning
Entries are being written to the audit log at an unusually high rate

AUDIT_SFS_MIRR_OFF:
Severity: Error
Audit log has lost its redundancy due to an SFS mirror being offline

AUDIT_LOG_WRAPPED:
Severity: Warning
Audit log entries have been overwritten in an unusually short time period

RDFA_SE_DROP_WPL_CP:
Severity: Error
SRDF/A Session dropped, write pending limit reached on a cache partition

RDFA_NO_CYCLE_SWITCH:
Severity: Warning
There has been no SRDF/A cycle switching within the past hour

SRDF_JFC_STATE_CHANGE:
Severity: Warning
The job flow control setting has changed on RDF group

EXAMPLES

To list the events for a specific Symmetrix array, enter:

```
symevent -sid 54 list
```

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
```

symfast

Performs FAST operations on tiers, storage groups, policies, and the FAST controller.

SYNOPSIS

```
symfast -h

symfast -fp -sid <SymmID> [-i <Interval>] [-c <Count>]

   create -name <FastPolicyName> [-tier_name <TierName>
     [-max_sg_percent <MaxSgPercent>]]

   delete -fp_name <FastPolicyName> [-force]

symfast -fp -sid <SymmID> [-i <Interval>] [-c <Count>]
      -fp_name <FastPolicyName>

   add -tier_name <TierName>
      [-max_sg_percent <MaxSgPercent>]

   remove -tier_name <TierName>

   modify -tier_name <TierName>
        -max_sg_percent <MaxSgPercent>

   rename -name <NewFastPolicyName>
symfast -sid <SymmID> [-i <Interval>] [-c <Count>]
      -fp_name <FastPolicyName>

   associate -sg <SgName> [-priority <PriorityValue>]
      [-rdf_coordination <ENABLE | DISABLE>]

   disassociate -sg <SgName>

   modify -sg <SgName> [-priority <PriorityValue>
      [-rdf_coordination <ENABLE | DISABLE>]
```

```
symfast -sid <SymmID> [-i <Interval>] [-c <Count>]
      -sg <SgName>

   reassociate -fp_name <FastPolicyName>

symfast -sid <SymmID> [-i <Interval>] [-c <Count>]
      [-noprompt]

   enable [-dp | -vp]

   disable [-dp | -vp]

   set -control_parms
     [-approval_mode <AUTO_APPROVE | USER_APPROVE>]
     [-vp_data_move_mode <AUTO | NONE>]
     [-min_perf_period <PerfTime>]
     [-workload_period <WorkTime>]
     [-max_simult_devs <MaxSimultDevs>]
     [-max_devs <MaxDevs>]
     [-vp_reloc_rate <VPRate>]
     [-swap_notvisible_devs <ENABLE | DISABLE>]
     [-allow_only_swap <ENABLE | DISABLE>]
     [-pool_resv_cap <ResvPct>]
     [-vp_allocation_by_fp <ENABLE | DISABLE>]
     [-time_to_compress <NumDays | never>]
     [-fast_compression_rate <FastCompRate>]

symfast -plan -sid <SymmID> [-i <Interval>] [-c <Count>]
     [-noprompt]

   approve -id <PlanID> [-begin_at <TimeVal>]

   decline -id <PlanID>

symfast [-sid <SymmID>] [-offline]

   list -fp [-v] [-dp | -vp [-ckd | -fba]]
```

```
    list -association [-demand [-sg <SgName> |
        -fp_name <PolicyName>] [-mb]]


symfast -sid <SymmID> [-offline]

    list -demand [-v]
      <[-technology <EFD | FC | SATA | ALL>]
       [-external | -internal]>
      [-dp | -vp] [-allocated]

    list -control_parms

symfast -sid <SymmID>

    list -history [-v]
      [-start_date <TimeVal>] [-end_date <TimeVal>]

symfast -sid <SymmID> [-i <Interval>] [-c <Count>]

    list -plan [-v]

    list -state [-dp | -vp]

symfast [-sid <SymmID>] [-offline]

    show -association -sg <SgName> [-all] [-v]

    show -fp_name <FastPolicyName>
```

DESCRIPTION

The symfast command provides the ability to perform the following actions:

- Create a FAST policy.

- Delete a FAST policy.

- Add a tier to a FAST policy.

- Remove tiers from a FAST policy.

- Modify a FAST policy.

- Rename a FAST policy.

- Associate a FAST policy to a storage group.

- Dissassociate a FAST policy from a storage group.

- Modify a FAST policy and also its association.

- Set FAST control parameters.

- Enable the FAST controller.

- Disable the FAST controller.

- Query the FAST controller.

- Display FAST policies, associations, plans, history and reports. Plans and history are not displayed for FAST VP.

ARGUMENTS

add Adds a tier to the specified FAST policy.

approve Approves the FAST plan based on plan ID (not applicable to FAST VP).

associate Associates a storage group with a FAST policy.

create Creates a FAST policy.

decline Declines the FAST plan based on plan ID (not applicable to FAST VP).

delete Deletes the FAST policy.

disable Disables FAST controller.

disassociate
Disassociates a storage group from a FAST policy.

enable Enables the FAST controller.

list Lists the FAST policies, associations, plans, history, and reports. Plans and history are not listed for FAST VP.

modify Modifies the properties of a FAST policy or of an association between a policy and a storage group.

reassociate Re-associates the storage group to a different FAST policy.

remove Removes a tier from the FAST policy.

rename Renames the FAST policy.

set Sets FAST control parameters.

show Shows FAST policies or associations between policies and storage groups.

OPTIONS

-all Displays all of the devices in a storage group. Includes even those devices which are not managed by FAST.

-allocated Displays Max SG Demand in the FAST VP demand report based on the allocated capacity of thin devices under FAST control. By default, Max SG Demand displays based on the configured capacity.

-allow_only_swap Indicates that the FAST controller can only perform a full swap of devices and cannot move devices to unconfigured space. Valid values are ENABLE and DISABLE.

-approval_mode Specifies the mode of the FAST controller either in automatic(AUTO_APPROVE) or user approval mode (USER_APPROVE).

-association Displays FAST associations that exist between storage groups and FAST policies.

-begin_at Schedules the plan to run at a specific time.

-c Indicates the number (count) of times to attempt the action. If this option is not specified, and an interval (-i) is specified, the process will attempt -c number of times waiting for the database lock.

-ckd Indicates devices with CKD emulation.

-control_parms Specifies the control parameters for the FAST controller.

-demand Displays demand reports for FAST.

-dp Specifies that the operation be performed on FAST policies containing disk group-provisioned tiers.

-end_date Identifies the end date and time for reading the history entries.

-external Indicates the devices that are provisioned on external disk groups.

-fast_compression_rate
Indicates how aggressively FAST VP should compress the data. Valid range is between 1 and 10. Default value is 5.

-fba Indicates devices with FBA emulation.

-force Allows a non-empty FAST policy to be deleted.

-fp Indicates that the action is related to a FAST policy.

-fp_name Specifies a FAST policy name.

-h Provides brief, online help information.

-history Displays all data movement history including both FAST and Optimizer command history.

-i Specifies the repeat interval for retrying the requested action. This option indicates how often to attempt to get the needed resources to start a new session. The default interval is 30 seconds. The minimum interval is 5 seconds.

For passive actions the minimum interval is 15 seconds. Passive actions are actions that do not acquire an exclusive lock.

-id Specifies the plan ID number.

-internal Indicates the devices that are provisioned on internal disk groups.

-max_devs Specifies the maximum number of devices that can be moved in a 24-hour period.

-max_sg_percent Specifies an upper limit of space allowed for a tier in a policy as a percentage of total storage group capacity.

-max_simult_devs Specifies the maximum number of devices that can be moved simultaneously.

-mb Lists capacity in megabytes.

-min_perf_period Specifies the minimum amount of workload sampling that the FAST controller should complete before analyzing the samples for the first time.

-name Specifies the name of the FAST policy being created or the new name if a policy is being renamed.

-noprompt Requests no confirmation prompt before performing an action.

-offline Displays information about FAST policies and associations from the Symmetrix configuration database without refreshing the data from the Symmetrix array.

-plan Specifies that the action is related to FAST plans.

-pool_resv_cap Specifies the capacity from each DATA device pool that will be reserved for non-FAST activities. Possible values are 1 to 80.

-priority Specifies the priority of the association between storage group and a policy. The priority values can be 1 (highest), 2, or 3 (lowest).

-rdf_coordination
Specifies that RDF coordination is required on RDF devices in the associated storage group.

-sg Specifies a storage group name.

-sid Specifies the Symmetrix ID.

-start_date Identifies the start date and time for reading the history entries.

-state Displays the state of the FAST controller.

-swap_notvisible_devs
Enables or disables the FAST controller's functionality to use devices that are not visible to the host to do a full swap with devices in storage groups.
Valid values are ENABLE and DISABLE.

-technology Specifies the drive type. The currently supported types are EFD, FC, or SATA.

If the user specifies ALL, it includes EFD, FC, and SATA.

-time_to_compress
: Indicates how many days FAST VP will wait before start compressing data in the tier. Valid values are between 40 days to 400 days or never. Default value is never.

-vp
: Specifies that the operation be performed on FAST policies containing virtual provisioned tiers.

-vp_allocation_by_fp
: Indicates whether VP allocation comes from a bound pool or from any pool within the policy.

-vp_data_move_mode
: Specifies the Virtual Provisioning data movement mode of the FAST controller either in AUTO or NONE mode. In AUTO mode, the FAST controller performs data movement for thin devices without user intervention within the data movement window. In NONE mode, the FAST controller will not perform any data movement for thin devices.

-vp_reloc_rate
: Specifies the aggressiveness of the data movements for thin devices. The lower the value, the more aggressive FAST will be. Possible values are 1 to 10.

-tier_name
: Specifies the storage tier name.

-v
: Provides a more detailed, verbose listing.

-workload_period Specifies the amount of workload sampling that the FAST controller should maintain for the sample analysis. It is specified in units of time (hours).

PARAMETERS

ALL All the drive types (EFD,FC,SATA).

AUTO_APPROVE The automatic mode of the FAST controller.

Count The number of iterations to execute before exiting.

DISABLE Disables a FAST controller setting.

EFD The enterprise Flash disk drives.

ENABLE Enables FAST controller setting.

FastPolicyName The FAST policy name.

FC The Fibre Channel disk drives.

Interval The interval between polls, in seconds.

MaxDevs The number of devices that can be moved or swapped in a 24-hour period. Possible values are 2 to 200 devices.

MaxSgPercent The percentage of total logical device capacity in the storage group. Valid values are 1 to 100.

MaxSimultDevs The number of devices that can be moved or swapped simultaneously. Possible

values are 2 to 32 devices.

NewFastPolicyName The new FAST policy name.

PerfTime The minimum length of the time (in hours) to be used for performance analysis if the user does not want to wait until the entire workload period has elapsed.
Allowed values are:
Minimum: 2 hours
Maximum: Current value of the workload period parameters.

PlanID The plan ID number. The format is: mmddyyyy:hhmmss.

PriorityValue The priority of the storage group associated with the policy.

SATA The SATA disk drives.

SgName The storage group name.

SymmID The 12-digit ID of the Symmetrix array.

TierName The storage tier name.

TimeVal A specific date and time (MMDDYYYY:HHMMSS format).

USER_APPROVE The user approval mode of the FAST controller.

WorkTime A time in hours that the FAST controller should maintain for sample analysis.
Valid values are 2 to 672 hours.

RETURN CODES

```
Code #    Code Symbol
------    -----------

 0        CLI_C_SUCCESS

 1        CLI_C_FAIL

 2        CLI_C_DB_FILE_IS_LOCKED

 19        CLI_C_GK_IS_LOCKED
          All Gatekeepers to the Symmetrix array are
          currently locked.
```

EXAMPLES

To create a FAST policy, enter:

```
symfast -sid 207 -fp create -name DBPolicy
```

To create a FAST policy and add a tier to it, enter:

```
symfast -sid 207 -fp create -name DBPolicy
  -tier_name PrimeDBTier -max_sg_percent 30
```

To delete a FAST policy, enter:

```
symfast -sid 207 -fp delete -fp_name DBPolicy
```

To add a tier to a policy, enter:

```
symfast -sid 207 -fp add -tier_name ArchiveDBTier
  -max_sg_percent 10 -fp_name DBPolicy
```

To remove a tier from a policy, enter:

```
symfast -sid 207 -fp remove -tier_name ArchiveTier
```

```
-fp_name FinanceData
```

To modify policy tier capacity, enter:

```
symfast -sid 207 -fp modify -fp_name DBPolicy
  -tier_name PrimeDBTier -max_sg_percent 70
```

To rename a policy, enter:

```
symfast -sid 207 -fp rename -fp_name DBPolicy
  -name OraDBPolicy
```

To list policies containing DP tiers, enter:

```
symfast -sid 207 list -fp -dp
```

To list policies containing VP tiers, enter:

```
symfast -sid 207 list -fp -vp
```

To list all policies in a Symmetrix array, enter:

```
symfast -sid 207 list -fp
```

To show a policy in a Symmetrix array, enter:

```
symfast -sid 207 show -fp_name DBPolicy
```

To associate a storage group to a policy, enter:

```
symfast -sid 207 associate -sg OraSales
  -fp_name DBPolicy -priority 1
```

To list associations, enter:

```
symfast -sid 207 list -association
```

To show a association, enter:

```
symfast -sid 207 show -association -sg
  Finance2009
```

To enable the FAST controller, enter:

```
symfast -sid 207 enable
```

To set the control parameters of the FAST controller, enter:

```
symfast -sid 207 set -control_parms
  -approval_mode AUTO_APPROVE -min_perf_period 100
  -workload_period 200
```

To approve a plan, enter:

```
symfast -plan -sid 207 approve -id 04142009:130114
  -begin_at 07132009:9:45
```

To decline an approved or a running plan, enter:

```
symfast -plan -sid 207 decline -id 04142009:130114
```

To query the FAST controller state, enter:

```
symfast -sid 207 list -state
```

To list the FAST controller settings, enter:

```
symfast -sid 207 list -control_parms
```

To list the FAST controller plan, enter:

```
symfast -sid 207 list -plan
```

To display FAST data movement history, enter:

```
symfast -sid 207 list -history
```

To list the compliance report, enter:

```
symfast -sid 207 list -association -demand
```

To list the FAST tech demand report, enter:

```
symfast -sid 207 list -technology ALL -demand -dp
```

To list the FAST VP tech demand report, enter:

```
symfast -sid 207 list -tech ALL -demand -vp
```

symhost

Displays host configuration information and performance statistics.

SYNOPSIS

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 devices. Note that not all statistics are available for all hosts.

ARGUMENTS

show Shows detailed configuration information.

stats Shows performance statistics.

OPTIONS

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

-config Shows detailed configuration information.

-h Provides brief online help information.

-i Repeats the interval in seconds.

The default interval is 30 seconds.
The minimum interval is 5 seconds.
For passive actions the minimum interval is 15 seconds. Passive actions are actions that do not acquire an exclusive lock.

-type Specifies the type of performance information to display. The default is to display ALL statistics. Individual CPU, memory, and disk statistics can be selected by specifying one of the following:

```
-type    Description
-------  --------------------
CPU      Reports user, system, wait I/O,
         idle CPU time, interrupts,
         system calls, and context switch
         statistics for each processor
         and overall.

MEMORY   Reports system-wide page in-
         page out and swap in-swap out
         statistics.

DISK     Reports read, write, busy, and
         idle time statistics for each
         host disk.
```

PARAMETERS

None.

RETURN CODES

```
Code #      Code Symbol
------      -----------
```

0 CLI_C_SUCCESS

1 CLI_C_FAIL

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
```

```
H:M:S CPU  %User %Sys  %WIO  %Idle Int/s Calls/s  CtxSw/s
  A   B    C    D    E    F   G    H      I
```

A Time of day
B CPU number/id
C 100 * (CPU busy time in user mode / elapsed time)
D 100 * (CPU busy time in system mode / elapsed time)
E 100 * (CPU idle time for wait I/O / elapsed time)
F 100 * (CPU idle time / elapsed time)
G Interrupts per second
H System calls per second
I 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

H:M:S     Pi/s Ppi/s Po/s Ppo/s Si/s Psi/s So/s Pso/s
  A       B    C    D    E    F    G    H    I
```

A Time of day
B Page in requests per second
C Number of pages paged in per second
D Page out requests per second
E Number of pages paged out per second
F Swap in requests per second
G Number of pages swapped in per second
H Swap out requests per second
I 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

H:M:S  Disk  RW/s  R/s  W/s  KbRW/s KbR/s KbW/s %Busy %Wait
  A    B    C    D    E    F    G    H    I    J
```

A Time of day.
B Disk name
C Read and write requests per second
D Read requests per second
E Write requests per second
F KB read and written per second
G KB read per second
H KB written per second
I 100 * (disk active time / elapsed time)
J 100 * (non-empty wait queue time / elapsed time)

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.

SYNOPSIS

```
syminq [-h]

syminq [-sym] [-bcv] [-powerpath] [PdevName]
  [-symmids] [-la | -nocapacity]
   [-pdevfile] [-cache | -nocache]
   [-v [-nocapacity]]
   [-copa] [-wwn [-colons]]
   [-winvol] [-native] [-host_cache]

syminq [-clariion] [-powerpath] [PdevName]
   [-cids] [-la | -nocapacity]
   [-v [-nocapacity]]
   [-wwn [-colons]]

syminq [-hds] [PdevName]
   [-hids] [-la | -nocapacity]
   [-v [-nocapacity]]

syminq [-storworks] [PdevName]
   [-swids] [-la | -nocapacity]
   [-v [-nocapacity]]

syminq [-mapinfo] [PdevName]
   [-sym[-powerpath]|-clariion[-powerpath]|
    -hds|-storworks]
   [-cache | -nocache] [-colons] [-winvol]

syminq hba [-fibre | -scsi | -iscsi | -snia]
```

```
syminq -identifier <device_name|nice_name|hp_id|vms_id>
   [PdevName] [-sym [-bcv]| -clariion]
```

DESCRIPTION

The syminq command can issue a SCSI INQUIRY, and optionally a 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, HDS, or StorageWorks devices.

The syminq command also lists the HBAs in the local host, for fibre, SCSI, or both.

The option -cache attempts to recover the results of a previous SCSI interrogation from a running base daemon for increased speed.

ARGUMENTS

None.

OPTIONS

-bcv Displays Symmetrix BCV devices only.

-cache Attempts to recover the results of a previous SCSI interrogation from a running base daemon for increased speed.

-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.

-fibre Modifies the request for listing HBAs to include Fibre HBAs only.

-h Provides brief, online help information.

-hds Displays HDS devices only.

-hids Displays HDS IDs.

-host_cache Displays devices registered for control by host cache cards only.

-identifier Lists the Symmetrix device identifiers assigned to devices by the user or other applications. The user must choose one of the four identifier types currently supported to be displayed. If nice_name is specified, nice names for CLARiiON devices also display.

-iscsi Modifies the request for listing HBAs to include iSCSI HBAs only.

-la Lists physical device names, Symmetrix IDs, or CLARiiON IDs, only in a left-aligned format.

-mapinfo Displays target mapping information for devices mapped through Fibre HBAs.

-native Displays the native inquiry data if the inquiry data is altered.

-nocache Bypasses the cache and rescans the

devices.

-nocapacity Skips issuing a SCSI READ CAPACITY to the device(s).

-pdevfile Lists physical device names in a format for use as pdevfile entries.

-powerpath Displays EMC PowerPath devices only.

-scsi Modifies the request for listing HBAs to include SCSI HBAs only.

-snia Indicates the use of 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.

-symmids Displays Symmetrix IDs.

-v Provides a more detailed, verbose listing. Cannot be used with -copa or -la options.

-winvol Displays Windows volumes only.

-wwn Displays the device WWN.

PARAMETERS

hba The host bus adapter.

PdevName The host name for the device, such as /dev/rdsk/c2t0d2s3.

EXAMPLES

To issue 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/rdsk/c2t0d2s3
```

To issue a SCSI INQUIRY and READ CAPACITY to a device and display with more detailed, verbose information, enter:

```
syminq -v /dev/rdsk/c2t0d2s3
```

To list the SCSI HBAs in the local host, enter:

```
syminq hba -scsi
```

symioctl

Sends I/O control commands to a specified application.

SYNOPSIS

```
symioctl -type <DbType> [-h] [-noprompt]

  begin backup [<object> [<object>...]] [-checkpoint]

  freeze [<object> [<object>...]] [-checkpoint]

  checkpoint [<object> [<object>...]]

  end backup [<object> [<object>...]]

  thaw [<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 allows control actions to be sent to a specified application. This utility is intended to be used in conjunction with a split operation. The symioctl freeze command suspends updates from writing to disk. Once the freeze action completes, you can perform a TimeFinder or SRDF split. After the

split is complete, use the command symioctl thaw to resume normal application activity.

Additionally, for Oracle, Hot Backup control of all tablespaces to be backed up must be performed before and after a freeze/thaw command. The steps to split a group of BCV devices are:

1. symioctl begin backup
2. symioctl freeze
3. Split standard and BCV pairs. This may involve several steps depending on your environment.
4. symioctl thaw
5. symioctl end backup

For SQLServer 2000 or higher, the snapshot commands support the SQLServer BACKUP and RESTORE database with snapshot operations using the Virtual Device Interface (VDI). The database can be restored in recovery, norecovery, or standby mode.

The database user login information must be supplied using the SYMCLI_RDB_CONNECT environment variable. The user login information is specified in the following format: username/password@service. The username and password must be non-NULL. If the NT trusted authentication is used, the user login information is specified in the following format: @sqlservername.

The object list is not always required, as shown in the following table:

Action	RDBMS	Objects	List
Freeze/	Oracle	database server	No
Thaw	SQL Server	database name	Yes

```
                Informix     database server   No
                IBM DB2/UDB  database name     Yes
                Sybase       database name     No

  Checkpoint    Oracle       database server   No
                SQL Server   database name     Yes
                Informix     database server   No

  Begin/End     Oracle       tablespace        Yes
  Hot Backup

  Archive Log   Oracle       database server   No

  Begin/End     SQLServer    database name     No
  Abort/Restore
  Snapshot

Important Note: The user of the symioctl command
must have database administrator privileges.

To execute the symioctl utility, you must have
the appropriate application software installed and the
environment variables set.

You can specify the database type information from
an environment variable. The command line option
takes priority over the follwoing environment variable:
  Environment     Can be Used    To Specify
  Variable        Instead of
  ---------------  --------------  -------------------
  SYMCLI_RDB_TYPE  -type          Application type to
                                  perform requested
                                  action.

If an argument specified on the command line contains
special shell characters (e.g., $, ', \\, etc.), those
characters must be escaped with a backslash (\\).
```

If symioctl is being run in client/server mode, and the required RDBMS environment variables are set in the client's environment, they are sent to the server to be used.

For IBM UDB/DB2, if the user tries to freeze all user databases' I/O while one or more databases' I/O have already been frozen, the freeze operation will fail.

ARGUMENTS

abort snapshot
For SQLServer 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. This is an Oracle-specific command.

begin backup Places the specified tablespace objects into Hot Backup mode. This is an Oracle-specific command.

begin snapshot For SQLServer 2000 and higher. A BACKUP DATABASE TO VIRTUAL_DEVICE WITH SNAPSHOT SQL command is sent to SQLServer which will begin 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 meta-data to a file.

checkpoint Issues a checkpoint to the RDBMS.

end backup Ends the Hot Backup for the specified

tablespace objects. This is an Oracle-specific command.

end snapshot For SQLServer 2000 and higher. The "BACKUP DATABASE" SQL command for the specified database will complete, database writes will resume and the snapshot meta-data will be saved to the save-file (which is needed for a subsequent snapshot restore).

freeze Suspends I/O at the application layer. Each application has a slightly different behavior, but they all provide a mechanism to halt modifications while a split operation occurs.

restore snapshot
For SQLServer 2000 and higher. A "RESTORE DATABASE FROM VIRTUAL_DEVICE WITH SNAPSHOT" SQL command for the specified database is sent to SQLServer. The previously saved snapshot meta-data is used by SQLserver to logically restore the database. The -norecovery and -standby options allow the RESTORE to operate in NORECOVERY or STANDBY mode. The undo file for -standby option is automatically generated. It is in the same location as the savefile with the file name undo_(database name).ldf.

thaw Resumes I/O at the application layer.

OPTIONS

-checkpoint Requests a checkpoint prior to the specified action.

-h Provides brief, online help information.

-noprompt Turns off the prompt for user confirmation.

-norecovery Restores an SQLServer database with the NORECOVERY option.

-overwrite Allows the backup process to overwrite an existing save file. By default, existing save files are protected.

-standby Restores the SQLServer database with the STANDBY option.

-type Identifies the database type on which to perform the requested action. Types include: Informix, Oracle, SQLServer, IBMUDB, and Sybase.

PARAMETERS

object Database or tablespace name(s). If no objects are specified, the action defaults to all objects of the specified type database.

SaveFile For SQLServer 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. It is recommended that an absolute path (e.g. C:\\TEMP\\PUBS.SAV) be specified (especially for client/server) to ensure

that the file can be located for
protection or subsequent restores.

RETURN CODES

```
Code #    Code Symbol
------    -----------

  0       CLI_C_SUCCESS

  1       CLI_C_FAIL
```

EXAMPLES

The following example will backup and then restore the SQLServer pubs database on a group of BCV devices. The snapshot meta data will be saved in C:\\TEMP\\PUBS.SAV. The database login parameters will be set via the environment to be user = sa, passwd = pass and service = sqlserv. Do the following:

```
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 save file.
- - - - -
Restore the PUBS.SAV save file.
Shut down SQLServer.
Restore the standard devices from BCVs.
Restart SQLServer.
symioctl restore snapshot pubs SAVEFILE
  C:\\TEMP\\PUBS.SAV
```

To freeze all the I/O in the Oracle instance represented by the connection information without prompting for

confirmation, enter:

```
setenv SYMCLI_RDB_CONNECT "scott/tiger"
  symioctl freeze -type Oracle -noprompt -checkpoint
```

The database will perform a checkpoint prior to executing the freeze command. The database login parameters will be set via the environment to be user = scott and passwd = tiger.

To thaw all the I/O in the Oracle instance represented by connection information, enter:

```
setenv SYMCLI_RDB_CONNECT "scott/tiger@acme"
  symioctl thaw -type Oracle
```

The database login parameters will be set via the environment to be user = scott, passwd = tiger and service = acme.

To place all tablespaces in the Oracle instance represented by connection information into Hot Backup mode, enter:

```
setenv SYMCLI_RDB_TYPE oracle
  symioctl backup begin -noprompt
```

The database type parameter will be set via the environment.

To archive the current log of the Oracle instance represented by connection information, enter:

```
setenv SYMCLI_RDB_TYPE oracle
  symioctl archive log -noprompt
```

The database type parameter will be set via the environment.

To freeze I/O for the Informix database without prompting for confirmation, enter:

```
setenv SYMCLI_RDB_CONNECT "infadm/pass@infserv"
 symioctl freeze -type Informix -noprompt
```

The database login parameters will be set via the environment to be user = infadm, passwd = pass, and service = infserv.

To perform a checkpoint for the Informix database, enter:

```
setenv SYMCLI_RDB_TYPE informix symioctl checkpoint
```

The database type parameter will be set via the environment.

symipsec

Displays or sets parameters that control the behavior of IPSec encryption on Gigabit Ethernet connections.

SYNOPSIS

```
symipsec -h

symipsec -sid <SymmID> -dir <#>|ALL [-port <#>|ALL]

  list -priority <<Level#> | -all>

  list -stats -type <StatsType> [-local_addr <IPendPt>]
    [-priority <Level#>]

  list -spi

  show -priority <Level#> | -all

symipsec -sid <SymmID> -dir <#> [-port <#>]
  set spi <on <SpiStart> [ length <SpiLen> ] | off>

symipsec -sid <SymmID> -file <FileName> -dir <#> [-port <#>]

  preview

  commit
```

DESCRIPTION

The symipsec command allows you to display and set the values of control parameters for Symmetrix IPSec encryption and authentication support.

Commands for listing or retrieving policies, or retrieving statistics may be executed directly from the

command line. The results will be returned to the screen for viewing.

Commands for setting, modifying, or clearing policies may be placed in a command file, which will then be processed by this utility. Alternatively, stdin redirection can be used with "here documents" in UNIX shell scripts. Each command in the file has to be terminated by a semi-colon (;). There is no limit on the number of commands or the type of commands that can be placed in a command file.

Prior to making any changes, the preview argument can be used to verify that the command file is syntactically correct without applying the changes to the Symmetrix array.

When using the commit argument, commands are executed sequentially, and do not execute within the context of a session. Therefore, if there are three or more commands in the file and the second one fails, processing will abort, and the effects of the first command will remain.

The commands in the command file are not case sensitive however, the parameters entered are case sensitive.

ARGUMENTS

list Displays the priority number(s) for one or more policies. Optionally, can retrieve and display statistical information about IPSec processors or list the SPI range reserved for manual IPSec policies.

show Shows detailed information about one or

more policies.

preview Verifies the syntax of the changes specified in the command file.

commit Updates the Symmetrix with the changes defined in the command file.

set Reserves a range of SPI values for manual IPSec policies.

OPTIONS

-all Targets all policy level numbers.

-dir Targets a specific director.

-file Specifies the command file that holds the policy definitions.

-port Targets a specific Port. Currently, only port 0 is a valid value and the default.

-priority Targets a specific policy priority level number.

-local_addr Specifies a local endpoint IP address.

-stats Retrieves and displays statistical information about IPSec processors within the Symmetrix array.

-sid Targets a specific Symmetrix array ID.

-spi Lists reserved SPI (Security Parameter Indexing) range for the specified director.

-length Specifies the number of SPI values in the range to be reserved for manual IPSec policies.

-type Selects the type of statistics to retrieve.

-h Provides brief, online help information.

PARAMETERS

Specific director or port number. Optionally ALL may be supplied, during a policy list or show to select all applicable directors on the Symmetrix array.

FileName The target command file name that holds the policies.

IPendPt The local endpoint or IP address to obtain IKE errors from.

Level# The selected IPSec policy priority number (0-110). The value "ALL" may be supplied, during a policy list or show to select all policy level numbers.

SpiLen The number of values in the range to be reserved for manual IPSec policies. Default value is 1.

SpiStart The starting SPI value to be reserved for manual IPSec policies. Must be 0 to remove reservations or › 255 to set reservations.

StatsType The statistical type of report to return.
Possible values are:

- ike_errors
- ipsec_details

When retrieving IKE errors, the local address parameter must be supplied. Likewise, the priority level number must be provided when retrieving IPSec details.

SymmID The ID of the Symmetrix array (up to 12-digits).

COMMAND FILE SYNTAX

The following shows how to define and modify policies using command file entries.

When executing a command that changes the array configuration, the preview operation will syntax-check the command file for errors, and the commit operation will send the policy changes to the array.

Note that adding and modifying a policy are almost identical. The former requires that the policy not exist, and the latter requires that the policy already exists and will be overwritten.

Note: Currently, you can only define one proposal and one transform per policy declaration.

Remove an existing policy:

```
policy delete -priority Level#;
```

Add or modify a policy:

```
policy add|modify
 -priority Level#
 -action discard|secure|bypass
 [-assoc_ike_policy Level#]
  #(only if proposal_type is IPSEC)
 -local_addr IPaddr
    [-ipproto IPprotocol#|all][-ipport IPport#|all]
    [-mask IPaddr]
 -remote_addr IPaddr
    [-ipproto IPprotocol#|all][-ipport IPport#|all]
    [-mask IPaddr]
 [-remote_tunnel_addr IPaddr]
  #(only if esp_mode is 'tunnel')
 [-selectivity {destip|destport|srcport} SPECIFICITY]
  #(for policies with wildcarded ipaddr/port/proto only)
 -proposal_set
 -proposal_set_type auto|manual|ike
 [-key_format hex|ascii]
 [-presharedkey Keystring]
  #(if proposal_set_type is IKE only)
 [-inenc_key Keystring -outenc_key Keystring]
  #(if transform_type is ESP or IKE, and
  #propset_type is MANUAL)
 [-inauth_key Keystring -outauth_key Keystring]
  #(only if proposal_set_type is MANUAL
  # and auth_alg isn't NULL)
 [-in_spi SPI# -out_spi SPI#]
  #(only if proposal_set_type is MANUAL)
 [-in_nonce NONCE -out_nonce NONCE]
  #(only if proposal_set_type is MANUAL
  #and -enc_alg is one of the aes-cm modes)
 [-ike_mode main|aggressive]
  #(only if proposal_set_type is IKE)
 [-pfs on|off]
  #(only if proposal_set_type is IKE)
```

```
-proposal
-proposal_type ike|ipsec
-transform
-transform_type ike|esp
[-auth_alg null|sha1|md5|xcbc]
[-enc_alg null|des|3des|aes_128|aes_256|
  aes_cm_128|aes_cm_256]
  #(only if transform_type is ESP or IKE)
[-dhgroup 1|2|3|4]
  #(only if transform_type is IKE)
[-esp_mode tunnel|transport]
  #(only if transform_type is ESP)
[-lifetime [LifeParam1][,][LifeParam2]]
[-auth_method preshared_key|dsa|rsa]
  #(only if transform_type is IKE)
```

COMMAND FILE OPTIONS

```
-priority        Specifies the index number of the
                 policy to be retrieved or modified.
                 When packets arrive, policies with
                 lower numbered priorities are examined
                 first. Also, any IKE policies must have
                 a lower priority index number (higher
                 priority) than the corresponding
                 IPSec policy.

-action          Specifies the kind of action to run:
                 discard, secure, or bypass.

-assoc_ike_policy  For IPSec policies, specifies the IKE
                 policy that will set up and maintain
                 session details for this IPSec policy.

-local_addr      Specifies the local IP address.

-remote_addr     Specifies the remote IP address.
```

-ipproto Specifies the IP protocol number.

-ipport Specifies the IP port number.

-mask Specifies the IP address to mask.

-remote_tunnel_addr
Specifies the remote tunnel IP address.

-selectivity Specifies to use selectivity lists confined to destination or source points and optional specificity types/protocols for wildcarded proposals only. When a endpoint field's properties has been wildcarded, determines whether new connections will share an existing security association (selectivity POLICY), or if new connections will cause a new security association to be created (selectivity PACKET). Selecting PACKET results in a more secure configuration, since encryption keys won't be shared between connections, but consumes more resources. Selecting POLICY conserves security associations, when this is desired. Properties that may be wildcarded include IP address, IP port number, and IP protocol number.

-proposal_set Starts a proposal set declaration.

-proposal_set_type
Specifies the type of proposal to set for key management:
auto, manual, or ike

-key_format Specifies the format in which the keys provided in the policy are presented. Default value is hex. Note that ASCII strings will be half the length of hex strings, but security is slightly diminished, since 1/8 of the available hex key space is not available to ASCII strings.

-presharedkey Specifies the preshared key string. (Same secret string shared between security points.)

-inenc_key Specifies an encryption key string used for encrypting/decrypting incoming traffic. Must match the corresponding field on the remote endpoint. For manual IPSec proposals with a non-NULL ESP mode only.

-outenc_key Specifies an encryption key string used for encrypting/decrypting outgoing traffic. Must match the corresponding field on the remote endpoint. For manual IPSec proposals with a non-NULL ESP mode only.

-inauth_key Specifies a hash key string used for authenticating incoming traffic. Must match the corresponding field on the remote endpoint. For manual IPSec proposals with a non-NULL auth mode only.

-outauth_key Specifies a hash key string used for authenticating outgoing traffic. Must

match the corresponding field on the remote endpoint. For manual IPSec proposals with a non-NULL authenticate mode only.

-in_spi Specifies the Security Parameter Indexing (SPI) number for incoming traffic decode security associations. Applies to a manual proposal only.

-out_spi Specifies the Security Parameter Indexing (SPI) number for outgoing traffic encode security associations. Applies to a manual proposal only.

-in_nonce Specifies a random nonce value on incoming traffic to counter replay attacks.

-out_nonce Specifies a random nonce value on outgoing traffic to counter replay attacks.

-ike_mode For IKE phase 1 negotiations specifies the intensity of examination. Main mode is more intense and secure, but time consuming. Aggressive mode provides faster negotiations but exposes identies of the peers to eavesdropping.

-pfs Turns on, or off, Perfect Forward Secrecy (PFS) mode for IKE policies. (Typically, this should be left on, unless you have a special environment.)

-transform Specifies the start of a transform declaration.

-transform_type Specifies the type of transform to apply to the policy. Possible values are:

- ike -- IP Key Exchange
- esp -- Encapsulation Security Payload

Note that value ah for authentication header is not currently supported.

-auth_alg Specifies the authentication algorithm for IKE or ESP policy transform hash functions. Possible values are:

- null
- sha1
- md5
- xcbc

-enc_alg Specifies the encryption algorithm for IKE or ESP policy transforms. Possible values are:

- null
- des
- 3des
- aes_128
- aes_256
- aes_cm_128
- aes_cm_256

-dhgroup Specifies which Diffie-Hellman (dh) group to use for the symmetrical key generation. Groups 1 through 4 are supported.

-esp_mode Specifies the Ecapsulating Security

Payload (ESP) transform mode:

- tunnel
- transport

-lifetime Specifies the life of a policy with time and/or data size parameters.

-auth_method Specifies the authentication method for IKE transforms. Possible values are:

- preshared_key
- dsa
- rsa

COMMAND FILE PARAMETERS

Level# An unsigned 32-bit integer that specifies the priority level (policy index number 0-110).

IPaddr The local, remote, or remote-tunnel endpoint IP address.
In addition to the IP address, the mask and IP protocol options can also be specified here:

```
[-mask IPaddr]
#(mask not valid when using "ipaddr all")
[-ipproto IPprotocol#|all]
#(defaults to all)
[-ipport IPport#|all]
#(defaults to all)
```

Where:

- IPprotocol# is a protocol number. For example, 6 for TCP, or 1 for IPv4-ICMP.
- IPport# is an IP port number. For example, 3260 for iSCSI, or 1748 for RDF.

The CLI will determine if this is an IPv4 or v6 address by looking for the presence of dots ('.',v4) or colons (':',v6) in the address. If both are present in 'mixed-mode' form (e.g., ::FFFF:a.b.c.d), only the v4 section will be used.

When specifying the remote tunnel address, -mask, -ipproto, and -ipport are not supported.

SPI# Security parameter index number for Security Associations (SA's). An unsigned 32-bit integer greater than 255.

NONCE An unsigned 32-bit integer. Required when using AES counter mode. A nonce is a random value used to prevent replay attacks. It makes sure the sender is really participating in the conversation.

Keystring A string of concatenated hexadecimal digit pairs, without per-byte delimeters, that represent an encryption or authentication key. The following key length restrictions must be adhered to:

- MD5: exactly 16 bytes
- SHA1: exactly 20 bytes
- AES_CBC: exactly 16 bytes
- DES: exactly 8 bytes
- 3DES: exactly 24 bytes
- AES_128: exactly 16 bytes
- AES_256: exactly 32 bytes
- Preshared: between 1 and 64 bytes

SPECIFICITY

A string that defines what happens when a new packet matches this policy, and the policy contains a wildcard in the corresponding field (i.e., src/dest ip address, src/dest port, protocol). The following possible string values may only be specified when the corresponding object is wildcarded:

- packet: A new SA will be created to handle this connection. (fine-grained)

- policy: A single SA will be created that will handle all connections that match this policy (coarse-grained).

LifeParam Lifetime parameters concerning time and data size. Just one, or both values in any order, can be specified:

- a time value in minutes or hours (e.g., 90m or 5h)

- a data size value in megabytes or gigabytes (e.g., 50mb or 3gb)

If both are specified, apply a comma between parameters with no intervening space. The first limit reached will end life.

RETURN CODES

Code #	Code Symbol
0	CLI_C_SUCCESS
1	CLI_C_FAIL

2 CLI_C_DB_FILE_IS_LOCKED

19 CLI_C_GK_IS_LOCKED
All gatekeepers to the Symmetrix
array are currently locked.

EXAMPLES

To list the policy priorities on all directors within a specific Symmetrix, enter:

```
symipsec -sid 123456789012 -dir ALL -port ALL
  list -all
```

To show the policy details for a specific policy, enter:

```
symipsec -sid 123456789012 -dir 1A -port 0
  show -priority 20
```

To check the syntax of a command file, enter:

```
symipsec -sid 123456789012 -dir 1A -port 0
  -file /tmp/commandfile preview
```

To display IPSec SA details for a specific priority, enter:

```
symipsec -sid 123456789012 -dir 1A -port 0
  list -stats -type ipsec_details -priority 20
```

To add an IPSec iSCSI policy to the policy database, enter:

```
symipsec -sid 0039 -dir 1A -port 0 -file /tmp/ap commit
```

Where /tmp/ap contains:

```
policy add
  -priority 50 -assoc_ike_policy 40 -action secure
```

```
  -local_addr 172.23.195.20 -ipport 3260 -ipproto 6
  -remote_addr 50.60.70.80 -ipport 3260 -ipproto 6
  -selectivity destip packet -selectivity destport packet
  -proposal_set -proposal_set_type auto -proposal
  -proposal_type ipsec -transform -transform_type esp
  -encalg aes_cm_256  -lifetime 90m,5gb
;
```

To remove an IPSec policy to the policy database, enter:

```
symipsec -sid 0039 -dir 1A -port 0 -file /tmp/dp commit
```

Where /tmp/dp contains:

```
policy delete -priority 50;
```

symlabel

Performs device label operations on one or more devices.

SYNOPSIS

```
symlabel -h

symlabel -g <DgName> [-noprompt]

  define <LdevName> [label <Label>]

  undefine <LdevName> -type WNT

symlabel -g <DgName> [-type WNT] [-offline]

  list [-bcv | -vdev]

  show <LdevName>

symlabel [<SymDevName> | -range <SymDevStart>:<SymDevEnd>]

  define -type solaris -sid <SymmID>
```

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 symdg relabel command. For SYMCLI usage, you can define labels of devices in a device group in the SYMAPI configuration database. For WNT labels, you can list or show defined or actual labels for these devices and undefine device labels.

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 in a device group. If the offline option is used, it lists only the defined labels in the Symmetrix configuration database.

show For Windows only, shows the device label and information about a specified device in the device group.

undefine Removes the device labels that were previously defined in the Symmetrix configuration database. Only labels of type WNT can be undefined.

KEYWORDS

label Applies an 8-digit hexadecimal label for Windows or a device label for Solaris.

solaris Writes a Solaris type label on the device.

WNT Writes Windows type label on the device.

OPTIONS

-bcv Targets the indicated action at the specified BCV device(s) that are locally associated with the device group.

-g Specifies a device group name.

-h Provides brief, online help information.

-noprompt Disables the prompt flag. The default is to prompt the user for confirmation before executing the indicated operation.

-offline Obtains information from the Symmetrix host configuration database. Only defined labels will be displayed. If this option is omitted, the actual device label(s) will also be read from the device(s) and then displayed.

-range Applies the labeling action to a number of Symmetrix devices within a contiguous range.

-sid Supplies the Symmetrix ID to limit the scope of the operation to the specified Symmetrix array.

-type Specifies a device label type. Currently supports WNT and solaris types.

-v Provides a more detailed, verbose listing.

-vdev Performs the action on VDEVs that are locally associated with a device group.

PARAMETERS

DgName The device group name.

Label An 8-digit hexadecimal label for Windows.

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

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

Code #	Code Symbol
0	CLI_C_SUCCESS
1	CLI_C_FAIL
2	CLI_C_DB_FILE_IS_LOCKED
19	CLI_C_GK_IS_LOCKED All GateKeepers to the Symmetrix array are currently locked.

EXAMPLES

To define a device label for BCV device BCV001 in device group ProdDB, enter:

```
symlabel -g ProdDB define BCV001 label ABCDEF
```

To list the defined device labels for all BCV devices in device group ProdDB, enter:

```
symlabel -g ProdDB -bcv -offline list
```

To list both the defined and the actual device labels, for all BCV devices in device group ProdDB, enter:

```
symlabel -g ProdDB -bcv list
```

To undefine the device label for standard device DEV005 in device group ProdDB, enter:

```
symlabel -g ProdDB undefine DEV005
```

To write a Solaris label to device 0123 on Symmetrix 000190300343, enter:

```
symlabel define -type solaris -sid 000190300343 0123
```

To write Solaris labels to the range of devices 0123-01FF on Solaris 000190300343, enter:

```
symlabel define -type solaris -sid 000190300343
   -range 0123:01FF
```

symlmf

- This command is used to manage licenses with Solutions Enabler.

SYNOPSIS

```
symlmf  <LicenseKey>

symlmf  add    -type se -lic <LicenseKey>

        delete -type se -license <LicenseKey>

        list   -type se [-v] [-summary]

        add    -type emclm -sid <SymmID> -file <FileName>

        list   -type emclm -sid <SymmID>

        query  -type emclm -sid <SymmID>

        show   -type emclm -sid <SymmID>

        list   -type sym -sid <SymmID>
```

DESCRIPTION

symlmf is used to manage licenses with Solutions Enabler.
There are two types of licenses that are supported:

Traditional Solutions Enabler licenses - indicated by
a type of "se".

New style EMCLM licenses - indicated by a type of
"emclm".

For the traditional SE licenses:
The 'add' action can be used to register a license.

add -type se -lic ‹LicenseKey›

The existing format, without the '-type se add -lic' arguments, continues to be supported. The use of new syntax is encouraged since the older format may be deprecated in the future.

The 'delete' action can be used to delete a license.

delete -type se -license ‹LicenseKey›

The 'list' action can be used to display installed licenses.

list -type se [-v] [-summary]

For the new EMCLM licenses:

The 'add' action can be used to register licenses from a file on disk.

add -type emclm -sid ‹SymmID› -file ‹FileName›

The 'list' action can be used to display installed licenses.

list -type emclm -sid ‹SymmID›

The 'query' action can be used to display information about the current capacity of licensed features.

query -type emclm -sid ‹SymmID›

The 'show' action can be used to display the current licensing file of a particular Symmetrix.

show -type emclm -sid ‹SymmID›

For the Symmetrix features:
The 'list' action can be used to display only
licenses that apply to a particular Symmetrix.

list -type sym -sid ‹SymmID›

If symlmf is invoked with no arguments, it prompts you to
supply traditional style Solutions Enabler licenses. The
use of this method is discouraged since it may be deprecated
in the future.

The SYMCLI_CONNECT environment variable can be set to
connect to a remote Solutions Enabler server.

ARGUMENTS

add Register one or more licenses.
SE licenses are supplied on the command line
via the '-lic ‹LicenseKey›' option.

EMCLM licenses are supplied by supplying the
pathname to a license file on disk
('-file ‹FileName›').

delete Delete one or more SE licenses.
SE licenses are supplied on the command line
via the '-license ‹LicenseKey›' option.
EMCLM licenses may not be deleted.

list Displays information about SE or EMCLM
licenses that are currently installed.

query Displays information about Symmetrix features,
whether they have EMCLM licenses or are enabled
by other means and the capacities these

features are currently using.

show Displays the current licensing file of a particular Symmetrix.

OPTIONS

-file Specifies the path to a license file.

-license Specifies a traditional SE license key.

-sid Specifies Symmetrix serial number of the license.

-summary Provides a list of all license types enabled by the installed SE licenses.

-type Indicates the type of license to be operated upon. This takes a parameter of either "emclm" or "se".

-v Provides a more detailed, verbose listing.

PARAMETERS

FileName The path to a file.

LicenseKey A Traditional license key, with the following syntax:
1234-5678-9ABC-DEF0.

SymmID Symmetrix serial number of the license.

RETURN CODES

```
Code #    Meaning
------    -----------

  0     The operation succeeded.

  1     There was an error.  Perhaps an invalid
        key was supplied.
```

EXAMPLES

To add EMCLM Symmetrix licenses from a license file, enter:

```
symlmf add -type emclm -sid 000111222333
        -file /tmp/hk111222333.lic
```

To add an SE license from the command line, enter:

```
symlmf add -type se -license 1234-5678-9ABC-EDF0
```

or

```
symlmf 1234-5678-9ABC-DEF0
```

Note: The use of the above example should be discontinued as this method is being depreciated.

To delete an SE license from the command line, enter:

```
symlmf delete -type se -license 1234-5678-9ABC-EDF0
```

To display the currently installed SE licenses, enter:

```
symlmf list -type se
```

To display the currently installed SE licenses with more

information, enter:

```
symlmf list -type se -v
```

To display all the license types enabled by the currently installed SE licenses, enter:

```
symlmf list -type se -summary
```

To display the current licenses installed on a Symmetrix, enter:

```
symlmf list -type emclm -sid ‹SymmID›
```

To display the current capacity usage of licensed and non-licensed features on a Symmetrix, enter:

```
symlmf query -type emclm -sid ‹SymmID›
```

To display the current license file of a particular Symmetrix, enter:

```
symlmf show -type emclm -sid ‹SymmID›
```

To display the current Symmetrix based licenses of a particular Symmetrix, enter:

```
symlmf list -type sym -sid ‹SymmID›
```

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.

SYNOPSIS

```
symlv -g ‹VgName› [-type ‹VgType›] [-h] [-kb|-blocks|-mb]

  list  [-v]

  show  ‹LVolName› [-stripe_column]
    [-no_extents|-expand|-collapse|-pdev_extents]

  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...›]

symlv stats [-type ‹VgType› [-g ‹VgName› [-lv ‹LVolName›]]]
    [-i ‹Interval›] [-c ‹Count›] [-h]
```

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, such as, create, delete, extend, reduce, and remove on logical volumes.

In the lists of mirror physical extents and mirror physical devices for the logical volume, CLARiiON devices are distinguished from other device types by a (C) indicator.

Volume group name length restriction:
The volume group name field is limited to 63 characters. This length restriction is inclusive of the name and absolute path of the volume group even if the user only specified the volume group name itself. The behavior is undefined if the length is exceeded.

Logical volume name length restriction:
The logical volume name field is limited to 63 characters. The behavior is undefined if the length is exceeded.

When mapping objects in the ASM volume manager, three environment variables are required in order to contact the ASM instance:

```
Environment Variable   Description
--------------------   ------------------
SYMAPI_ASM_HOME        Oracle Home of ASM instance
SYMAPI_ASM_SID         Oracle Sid of ASM instance
SYMCLI_ASM_CONNECT     username/password of ASM instance
```

ARGUMENTS

add Adds mirror images to a logical volume of the specified type. The default VgType is assumed if a VgType is not specified. Not all VgTypes are supported.

create Creates a logical volume of the specified type. The default VgType is assumed if a VgType is not specified. Not all VgTypes are supported.

delete Deletes a logical volume of the specified type. The default VgType is assumed if a VgType is not specified. Not all VgTypes are supported.

extend Extends/grows a logical volume of the specified type to given size. The default VgType is assumed if a VgType is not specified. Not all VgTypes are supported. Size parameter should be greater than the current size of the logical volume.

list Lists all defined volumes in an existing logical volume group. The behavior is undefined if the volume group and volume name is more than 63 characters.

show Shows detailed logical-to-physical mapping information about a volume in the logical volume group.

stats Shows performance statistics about logical volumes. The default VgType is assumed if a VgType is not specified. Default VgType for AIX and SunOS is Veritas volume manager. For Linux it is LVM2 and for HPUX it is Native logical vol manager.

For windows default VgType for statistics is same as other operations.
Note that, on the Windows platform, you may need to first run the command "diskperf -yv" in order to obtain performance statistics. On SunOS, metadevices need to be mounted before trying to get I/O statistics.

reduce Reduces/shrinks a logical volume of the specified type to given size. The default VgType is assumed if a VgType is not specified. Not all VgTypes are supported. Size parameter should be lesser than the current size of the logical volume.

remove Removes mirrors of a logical volume of the specified type. The default VgType is assumed if a VgType is not specified. Not all VgTypes are supported.

OPTIONS

-blocks Displays size information in 512-byte blocks.

-c Specifies the number of times to poll for data.

-collapse Collapses the extents of a logical volume, if possible.

-expand Expands the extents of a logical volume, if possible.

-g Specifies a logical volume group name.

-h Provides brief, Online help information.

-i Specifies the repeat interval in seconds. The default interval is 30 seconds. The minimum interval is 5 seconds. For passive actions the minimum interval is 15 seconds. Passive actions are actions that do not acquire an exclusive lock.

-kb Displays the size information in Kilobytes.

-lv Specifies a logical volume name.

-mb Displays the size information in Megabytes. This is the default.

-mir Specifies the name of the mirror to remove.

-ncols Specifies the number of stripe columns.

-no_extents Specifies to not display extents information.

-nmirror Specifies 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 Specifies a list of the device names used for the operation. On the Solaris platform for SVM, the device pathname must be specified to create a metadevice (volume).

-pdev_extents Specifies physical device-level extents only. (Does not expand extents to reflect an underlying meta device configuration).

-RAID5 Defines a RAID5 logical volume type.

-size Defines 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
- m = size in Megabytes

On the Windows platform if the size specified is less than 1 Megabyte, a volume of size 1 Megabyte will be created. On the Solaris platform for SVM, the size option should not be specified for creating a volume. The volume size will be the same as the size of the device partition, on which the volume is created.

-stripe_column Displays the extent's stripe column number for striped volumes.

-striped Defines a striped logical volume type.

-strsize Specifies 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
- m = size in Megabytes

-type Specifies the volume group type.

-v Provides a more detailed, verbose listing.

PARAMETERS

Columns The number of stripe columns.
Count A positive integer.

Interval The interval between polls, in seconds.

LVolName A logical volume name. On the Solaris platform for SVM, the volume name should follow the SVM guideline of naming metadevices (e.g., d11,d12,etc.).

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 The logical volume stripe size in 512 byte blocks or size with the appropriate suffix specified.

VgName A specific logical volume manager's volume group name.

VgType The volume group type. Possible values are:

```
Group Type
------------        -------------
```

```
DEFAULT          LINUX_LVM
AIX_LVM          LINUX_POOL
AIX_VXVM         LINUX_VXVM
AS400_LVM        ORACLE_ASM
DYNIX_SVM        SUN_SOLSTICE
EMC_PVM          SUN_VXVM
HP_LVM           WIN_LDM
HP_VXVM          WIN_VXVM
```

Note: Statistics are not available for AIX_LVM, DYNIX_SVM, AS400_LVM and ORACLE_ASM.

RETURN CODES

Code #	Code Symbol
0	CLI_C_SUCCESS
1	CLI_C_FAIL

EXAMPLES

To list all volumes in the default volume group ProdVG, enter:

```
symlv -g ProdVG list
```

To display detailed logical-to-physical mapping information for the logical volume vol1 in the volume group ProdVG, enter:

```
symlv -g ProdVG show vol1
```

To create a simple volume called testlv of size 500m in the volume group named testvg, enter:

```
symlv -g testvg create testlv -size 500m
```

To list all volumes in the HP-UX VXVM volume group vg00, enter:

```
symlv -g vg00 -type HP_VXVM list
```

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 output key follows:

```
Volume Group Type : SunOS VxVM
H:M:S VgName LvName RW/s R/s W/s KbRW/s KbR/s KbW/s %Busy %Wait
  A    B      C     D  E  F  G     H    I    J     K
```

A Time of day
B Volume group name
C Logical volume name
D Read and write requests per second
E Read requests per second
F Write requests per second
G KB read and written per second
H KB read per second
I KB written per second
J 100 * (logical volume active time / elapsed time)
K 100 * (non-empty wait queue time / elapsed time)

symmask

Allows the administrator to set up and modify Symmetrix device masking functionality.

SYNOPSIS

```
symmask -h

symmask discover hba [-rename] [-v]

symmask list hba [-v]

symmask -sid ‹SymmID› ‹-wwn ‹wwn› | -awwn ‹awwn›› |
    ‹-iscsi ‹iscsi› | -aiscsi ‹aiscsi› -name ‹name›› |
    -host ‹hostname› -dir ‹#|all› -p ‹#|all›
    [-celerra] [-rp]
    [-reserve_id ‹ResvID›[,‹ResvID›[,‹ResvID›]]]

  add devs ‹SymDevStart:SymDevEnd› |
    ‹SymDevName› | ‹‹SymDevName›,‹SymDevName›...›
    [-dynamic_lun | -lun ‹Addr› | ‹‹Addr›,‹Addr›...›]
    [-noprompt] [-remove_unmapped] [-map]

  add -g ‹DgName› [-std] [-bcv] [-vdev] [-tgt] [-noprompt]
    [-dynamic_lun | -lun ‹Addr›] [-remove_unmapped]

  add -file ‹DeviceFileName› [src] [tgt] [-noprompt]
    [-dynamic_lun | -lun ‹Addr›] [-remove_unmapped]

  remove devs ‹SymDevStart:SymDevEnd› | ‹SymDevName› |
   ‹SymDevName,SymDevName,SymDevName...› [-unmap] [-force]

  remove -g ‹DgName› [-std] [-bcv] [-vdev] [-tgt] [-force]

  remove -file ‹DeviceFileName› [src] [tgt] [-force]

symmask -sid ‹SymmID› -wwn ‹wwn› | -awwn ‹awwn› |
```

```
    -iscsi <iscsi> | -aiscsi <aiscsi> | -host <hostname>

  set heterogeneous
    <on <host> | off> -dir <#|all> -p <#|all>

  set hba_flags
    <on <<flag>,<flag>...> <-enable | -disable> |
     off [<flag>,<flag>...] >
    -dir <#|all> -p <#|all>

symmask -sid <SymmID> -wnn <wnn> | -awwn <awwn> |
    -iscsi <iscsi> | -aiscsi <aiscsi>

  list logins [-dir all [-p all] | -dir # [-p <#|all>]]
   [-pdev <PdevName>] [-v]
  set lunoffset <on <offset> <base>|off> -dir <#> -p <#>

  set visibility <on|off> -dir <#> -p <#>

  replace <wwn | iscsi> [-noprompt]

symmask -sid <SymmID> <-wnn <wnn> | -awwn <awwn>> |
   <-iscsi <iscsi> | -aiscsi <aiscsi> [-name <name>]>

  delete [-dir all -p all | -dir # -p #] [-login]
    [-reserve_id <ResvID>[,<ResvID>[,<ResvID>]]]

symmask -sid <SymmID> -wnn <wnn> | -awwn <awwn>

  set lockdown <on <fcid> | off> -dir <#> -p <#>

symmask -sid <SymmID> -wnn <wnn> | -iscsi <iscsi>

  rename <awwn | aisci>

symmask -sid <SymmID> [-noprompt]
```

```
    refresh [-verify]

  symmask -sid ‹SymmID› -iscsi ‹iscsi› | -aiscsi ‹aiscsi›
    set authentication  -type ‹authentication_type›
      -credential ‹credential_name› -secret ‹secret_value›
    authentication  [ enable | disable | show ]
```

DESCRIPTION

The symmask command discovers the HBAs on the host and assigns ASCII or alias names to the login history table entries for those initiators that are not set.

This command also provides the following functions:

- Lists the hosts' HBA information.

- Adds devices to and removes devices from the device masking database (VCMDB).

- Displays the login history table.

- Sets a LUN offset. This feature was added to address the restrictions of LUN values allowed to be assigned to HBAs.

- Sets a heterogeneous host. This feature was added to allow the user to change some attributes for a different host type.

- Sets the HBA port flags. This feature is similar to the hetergeneous host feature, but the user is able to specify which settings are enabled and disabled.

- Sets volume visibility. This feature allows HP hosts to find all assigned devices, even if they are

assigned non-continuously.

- Replaces the host HBA without losing established permissions.

- Removes an initiator from the device masking database, along with all of the devices associated with that initiator.

- Associates the Fibre Channel ID (FCID) of a switch in a fabric to the path from a host HBA to a Symmetrix array. This further restricts the path by which a host can connect to a Symmetrix array.

- Associates an ASCII name with the initiator as a convenience. To NULL the alias, use a slash (/) as input.

- Refreshes Fibre Channel and Gige directors with the latest copy of the data in the device masking VCMDB.

- Manages the authentication data for connections using iSCSI paths.

ARGUMENTS

add Adds devices to the record in the database with the matching WWN, iSCSI name or the hostname part of the alias.

delete Deletes the record(s) matching the WWN or iSCSI name from the database.

disable Disables the use of authentication by the Symmetrix for the indicated host HBA.

discover Discovers the WWN or iSCSI names of the HBAs on the host and writes the ASCII

names to the login history table, if empty.

enable Enables the use of authentication by the Symmetrix for the indicated host HBA. The authentication data must have previously been established using the set command.

list Lists the requested data.

refresh Updates the fiber and gige adapters with changes to the database.

remove Removes devices from the record in the database with the matching WWN or iSCSI name.

rename Changes the ASCII name or alias in the database and the login history table.

replace Changes the WWN or iSCSI name in the database.

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 will not be displayed.

KEYWORDS

authentication
Indicates iSCSI authentication data is being managed.

devs Specifies devices to be added or removed.

hba Specifies the WWN or iSCSI name of the HBA on the host.

heterogeneous Sets the record in the database to hold information on the host type that may differ than the current setting on the corresponding FA.

hba_flags Sets the record in the database to hold information on the HBA port setting that may differ than the current setting on the corresponding FA.

lockdown Sets the FCID value in the database to correlate that entry with a specific path.

logins Specifies the entries in the login history table.

lunoffset Sets the record in the database to hold information of a LUN offset and base or starting values.

src Acts on only the source devices when used with a device file.

tgt Acts on only the target devices when used with a device file.

visibility Sets information in the device masking database to note that the host should find all devices, even if they are not contiguous.

OPTIONS

-aiscsi Specifies a user-given name, or alias iSCSI name.

-awwn Specifies a user-given name, or alias WWN.

-bcv Acts on only the BCV devices when used with a device group.

-celerra Allows controls on Celerra FBA devices.

-credential Specifies the credential name associated with the CHAP protocol's authentication data.

-disable Disables the overridden HBA port flags on a per initiator basis.

-dynamic_lun Specifies to use the dynamic LUN addressing features but does not require the user to give a LUN address for each device. The LUN addresses will be assigned based on what may already be in use for that host HBA.

-enable Enables the overided HBA port flags on a per initiator basis.

-file Applies a device file to the command. The device file contains device pairs (SymDevnames) listing a pair per each line (the source device first, a space, and the target device last within each line entry). Device files can include comment lines that begin with the pound sign (#). A Symmetrix ID is required for this option. -f is synonymous with -file.

-force Forces the SYMAPI server to allow actions that ordinarily would fail. The force flag should be used when removing devices that should not be masked, such as metamembers, or when a range of devices covers devices that may not be masked.

-g Applies a device group name to the command.

-h Provides brief, online help.

-host Specifies the host name.

-iscsi Specifies the iSCSI name.

-login Deletes the entries in the login history table and the entries in the masking database.

-lun Specifies the starting LUN addresses to be used for the devices being added to the host HBA. The user may supply a single starting LUN address for all devices being added, or a list of starting LUN addresses equal to the number of device ranges in the list.

-map Allows the user to map the devices while adding them to the masking database. This option is supported for Enginuity 5773 only.

-name Specifies the access logix record name. This option to be used along with -iscsi or -aiscsi option for Symmetrix arrays running Enginuity 5874.

-noprompt Requests that no prompts are returned after the command is entered. The default

is to prompt the user for confirmation.

-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.

-p Applies a port number designation.

-remove_unmapped
Assists the user to convert an existing device masking record to use the new dynamic feature in a single step. Records that currently contain unmapped devices are not able to be converted until those devices are removed. This option will allow the user to remove those unmapped devices at the same time as adding devices with dynamic addressing.

-rename Forces the hostname/adapter or hostname/IP to be written out to both the login history table and device masking VCMDB, even if one is present. Overwrites any existing alias in the record.

-reserve_id Specifies the device reservation IDs for the devices in the operation. For Enginuity 5874, device reservation IDs must be specified when a record is being deleted.

-rp Allows controls on devices tagged for RecoverPoint use.

-secret Specifies the secret associated with the CHAP protocol's authentication data.

-sid Specifies the unique Symmetrix ID.

-std Acts on only the standard devices when used with a device group.

-tgt Acts on only the target devices when used with a device group.

-type Specifies the type of authentication protocol being established, currently only CHAP is supported.

-unmap Allows the user to unmap the devices while removing them from the masking database. This option is supported for Enginuity 5773 only.

-v Provides a more detailed, verbose listing.

-vdev Acts on only the vdevs when used with a device group.

-verify Allows the user to compare the information in the database to what's currently on the local directors to all changes before the refreshed.

-wwn Specifies a World Wide Name.

PARAMETERS

A specific director or port number.

Addr The LUN address to be used for the corresponding device.

aiscsi A user-given name, in two parts separated by a slash (/).

all All directors or ports.

authentication_type
The security protocol. The only type supported is CHAP.

awwn A user-given name, in two parts separated by a slash (/).

base The base value of the offset value in hexadecimal.

credential_name
The CHAP protocol's credential name, a user-defined string of between 8 and 256 characters.

DeviceFileName The name of the file where device pairings are listed.

DgName The device group name.

fcid A Fibre Channel ID associated with the switch.

flag The overridden HBA port flags from the following values in []:

```
Port Flag              Value Indicator
---------------------  ---------------
Common_Serial_Number     [C]
Disable_Q_Reset_on_UA    [D]
Environ_Set              [E]
Siemens                  [S]
Volume_Set_Addressing    [V]
Avoid_Reset_Broadcast    [ARB]
AS400                    [AS4]
```

OpenVMS [OVMS]
SCSI_3 [SC3]
Sunapee [SCL]
Sequent [SEQ]
SPC2_Protocol_Version [SPC2]
SCSI_Support1 [OS2007]

host The host type from the following:

Valid Host Types
--- ---
AS400 AS400_LSE
BULL_AIX BULL_AIX_PP15
CELERRA 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
LINUX_DMP_VCS

hostname The host name.

iscsi An iSCSI name.

on Turn feature on.

off Turn feature off.

offset The hex value of the offset in LUN addressing.

PdevName A physical device name for the specified action.

ResvID A device reservation ID.

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.

SymDevEnd The end of a range of logical devices.

SymDevName A Symmetrix device to be added or removed.

SymDevStart The start of a range of logical devices.

SymmID The 12-digit ID of the Symmetrix array.

wwn The World Wide Name.

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 ‹FileName› [-v]

  list database [-dir all [-p all] | -dir ‹#›
    [-p ‹#|all›]][-wwn ‹wwn› | -awwn ‹awwn› |
     -iscsi ‹iscsi› | -aiscsi ‹aiscsi›]

symmaskdb -sid ‹SymmID› | -file ‹FileName›
  list devs [-wwn ‹wwn› | -awwn ‹awwn› |
    -iscsi ‹iscsi› | -aiscsi ‹aiscsi›]

symmaskdb -sid ‹SymmID›

  list assignment [-v] -devs ‹‹SymDevStart›:‹SymDevEnd› |
    ‹SymDevName› | ‹‹SymDevName›,‹SymDevName›...››

  list no_assignment [-dir all [-p all] |
     -dir ‹#› [-p ‹#|all›]]

  list capacity -host ‹HostName›

symmaskdb -sid ‹SymmID› [-noprompt] -file ‹FileName›

  restore [-skip_authentication]
    [-vcmdb_type ‹4 | 5›]

  backup
```

symmaskdb -sid ‹SymmID› -file ‹FileName›

init [-vcmdb_type ‹3 | 4 | 5›]

symmaskdb -sid ‹SymmID› [-noprompt]

convert [-vcmdb_type ‹4 | 5› -file ‹FileName›]

set no_direct_io |direct_io

remove -meta_member

DESCRIPTION

The symmaskdb command provides the following options:

- Lists the device masking VCMDB.

- Lists the devices assigned to an HBA in the device masking VCMDB.

- Lists which HBAs have been assigned to the given devices.

- Lists which devices mapped to a given director and port have not yet been assigned.

- Lists the capacity of 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 user-named file on the host.

- Initializes the device masking database and also

requires a user-named file on the host for an initial backup.

- Converts a Type 3 or Type 4 database to a Type 4 or Type 5. Type 4 databases require a database device of at least 48 cylinders, and Type 5 requires at least 96 cylinders.

- Blocks direct I/O writes to the database area.

- Removes metamembers from the device masking database, while keeping the metaheads in place.

ARGUMENTS

backup Specifies a backup of the database to be copied to a given file.

convert Converts the database from a Type 3 to a Type 4 or Type 5 database or converts the database from a Type 4 to a Type 5 database.

init Initializes the database.

list Lists various records in the database.

remove Removes the metamember devices.

restore Restores the database from a given file.

set Allows setting of the [no_]direct_io attribute.

KEYWORDS

assignment Names the HBAs that are assigned in the device masking VCMDB.

capacity Specifies the size of the device.

database Lists records within the device masking VCMDB.

devs Lists devices assigned by records in the device masking VCMDB.

direct_io Directly reads and writes from the host to the VCMDB device.

no_assignment Lists devices that are mapped, but not yet assigned, in the device masking VCMDB.

no_direct_io Blocks direct reads and writes from the host to the VCMDB device.

OPTIONS

-aiscsi Specifies a user-given name, or alias iSCSI name.

-awwn Specifies a user-given name, or alias WWN.

-devs Specifies a set of Symmetrix device ranges and/or individual Symmetrix devices.

-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 metamembers, other than the metaheads.

-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 Specifies the unique Symmetrix 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 Specifies the type of database. Possible values are:

Value	Description
3	24 cylinders, allowing up to 32 fibre or iscsi connections per port.
4	48 cylinders, allowing up to 64 fibre connections or 128 iscsi connections per port.
5	96 cylinders, allowing up to 64 fibre connections or 128 iSCSI connections per port.

-wwn Applies a World Wide Name (WWN).

PARAMETERS

A specific director or port number.

aiscsi A user-given name in two parts, separated by a slash (/).

all All fibre directors or ports.

awwn A user-given name, in two parts separated by a slash (/).

FileName The name of the device masking backup file.

HostName The host name.

iscsi The iSCSI name.

SymDevEnd The end of a range of logical devices.

SymDevName A Symmetrix device to be added or removed.

SymDevStart The start of a range of logical devices.

SymmID The 12-digit ID of the Symmetrix array.

wwn The system-generated World Wide Name.

symmigrate

Allows the physical disk space associated with a Symmetrix device to be changed to a different data protection scheme, or to be relocated to disks with different performance characteristics. The device can be migrated to use the storage of existing devices that do not contain live data or to unconfigured disk space.

Alternatively, a thin device may be migrated between thin pools or the data in a thin pool for a specified set of thin devices may be migrated to another thin pool.

SYNOPSIS

```
symmigrate -h
```

For configured space

Using device file input:

```
symmigrate [-v]
    [-i <Interval>] [-c <Count>] [-noprompt]
    -name <SessionName>
    -file <DevFile> -sid <SymmID>

   validate

   establish
```

Using target criteria:

```
symmigrate [-v]
    [-i <Interval>] [-c <Count>] [-noprompt]
    -name <SessionName>
    <-file <SrcFile> -sid <SymmID> |
```

```
    -sg <SgName>    -sid <SymmID> |
    -g <DgName>     [-bcv | -tgt]>
   -tgt_config -tgt_dsk_grp <DskGrp | name:<DskGrpName>>
   <-tgt_unprotected              |
    -tgt_raid1                    |
    -tgt_raid5 -tgt_prot <3+1 | 7+1> |
    -tgt_raid6 -tgt_prot <6+2 | 14+2>>

  validate [-outfile <OutputFile>]

  establish
```

For unconfigured space:

```
 symmigrate [-v]
   [-i <Interval>] [-c <Count>] [-noprompt]
   -name <SessionName>
   <-file <SrcFile> -sid <SymmID> |
    -sg <SgName>    -sid <SymmID> |
    -g <DgName>     [-bcv | -tgt]>
   -tgt_unconfig -tgt_dsk_grp <DskGrp | name:<DskGrpName>>
   <-tgt_unprotected              |
    -tgt_raid1                    |
    -tgt_raid5 -tgt_prot <3+1 | 7+1> |
    -tgt_raid6 -tgt_prot <6+2 | 14+2>>

  validate

  establish
```

Using a target thin pool:

```
 symmigrate [-v]
   [-i <Interval>] [-c <Count>] [-noprompt] [-force]
   -name <SessionName>
   <-file <SrcFile> -sid <SymmID> |
    -sg <SgName>    -sid <SymmID> |
```

```
        -g ‹DgName›    [-bcv | -tgt]›
        [-src_pool ‹PoolName›]
        -tgt_pool -pool ‹PoolName›

      validate

      establish

  General operations:

    symmigrate [-v] [-i ‹Interval›] [-c ‹Count›]
        -name ‹SessionName› -sid ‹SymmID›

      query [-detail | -summary]

      terminate [-noprompt]

      verify [-createinprog | -syncinprog    |
            -synchronized | -migrateinprog |
            -migrated | -failed | -invalid]
           [-summary]

    symmigrate [-v] [-i ‹Interval›] [-c ‹Count›]

      list [-sid ‹SymmID›] [-names] [-detail]

  DESCRIPTION

    The symmigrate command performs LUN migration operations
    on a set of source devices. The target disk spaces can be
    either configured disk spaces or unconfigured disk spaces.

    Both source devices and target devices can be specified
    by using a device file (containing pairs of devices).
    If a device file is not used, the source devices can be
    specified by using a device group, a storage group,
    or a source file (containing a list of source devices),
```

however, the target disk spaces must then be specified by using a disk group number.

The operations include validating the migration request and establishing a migration session for a set of source devices and target disk spaces.

ARGUMENTS

establish Starts a new session and begins the syncing process.

list Lists all the sessions for a given Symmetrix array, or for all Symmetrix arrays.

query Queries for the status of sessions.

terminate Removes a migrated session from the Symmetrix array. When using -sg, -dg, or -file to specify devices, those devices must exactly match the devices in the session with the supplied session name or an error will return.

validate Verifies that the information provided is currently allowed. No changes will be made to the device(s) and the command can optionally output a file containing the device pairs (using configured space).

verify Verifies that a session is in a specified state.

OPTIONS

-bcv Indicates that the control operation is

targeted at the BCV device in the device group.

-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 to start the control operation.

-createinprog Verifies that the migration device pairs are in the CreateInProg state.

-detail Lists detailed information for all migration sessions with information specific to the source devices and target devices or disks in each session.

-failed Verifies that the migration device pairs are in the Failed state.

-file Applies a DevFile or SrcFile to the command. A Symmetrix ID is required for this option. -f is synonymous with -file.

-force Allows a migration to occur in a thin migration when the source devices include different emulation types and not all of the emulations match the emulation of the target pool. In this case, only the devices with emulations that match the pool's emulation will be migrated.

-g Applies a device group name to the command to specify the source devices.

-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 30 seconds.
The minimum interval is 5 seconds.
For passive actions the minimum interval is 15 seconds. Passive actions are actions that do not acquire an exclusive lock.

-invalid Verifies that the migration device pairs are in the Invalid state.

-migrated Verifies that the migration device pairs are in the Migrated state.

-migrateinprog Verifies that the migration device pairs are in the MigrateInProg state.

-name Indicates a session name when establishing or validating a migration session.

-names Indicates that the list command should only show the session names for active migration sessions.

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

-outfile Specifies an output file for a command.

-pool Specifies the name of the pool to be used as target space.

-sg Applies a storage group name to the command

to specify the source devices.

-sid Identifies the Symmetrix ID for the operation.

-src_pool Specifies the name of the source pool to be used for a Virtual Provisioning migration when moving allocations from a source pool to a target pool.

-summary Displays a summary of the session information.

-synchronized Verifies that the migration device pairs are in the Synchronized state.

-syncinprog Verifies that the migration device pairs are in the SyncInProg state.

-tgt Indicates that the control operation is targeted at the TGT devices in the device group.

-tgt_config Indicates that the configured disk space will be used as the target disk space.

-tgt_dsk_grp Specifies the target disk group number or name (when preceeded by 'name:').

-tgt_pool Indicates that this is a Virtual Provisioning migration.

-tgt_prot Specifies the number of disks used to provide RAID-5 or RAID-6 protection.

-tgt_raid1 Indicates that the target protection type is RAID-1.

-tgt_raid5 Indicates that the target protection type is RAID-5.

-tgt_raid6 Indicates that the target protection type is RAID-6.

-tgt_range Applies a range of Symmetrix devices to a command to specify the target devices.

-tgt_unconfig Indicates that the unconfigured disk space will be used as the target disk space.

-tgt_unprotected
Indicates that the target protection type is unprotected.

-v Provides a more detailed, verbose listing.

PARAMETERS

Count The number of iterations to execute before exiting.

DgName The device group name.

DskGrp The disk group number.

DskGrpName The disk group name.

Interval Interval between polls, in seconds.

DevFile A text file that contains pairs of source and target devices. One pair per line in the file. If a line is too long, the line continuation character '\\' can be used.

Examples:

```
10    20
12    22
14    27
```

Or for a meta SRC device with non meta TGT devices:

```
15    28, 29, 30, 31, \\
      32, 33, 34, 39
```

SessionName A name for the migration session.

SgName The storage group name.

SrcFile A text file that contains only source devices. One device per line in the file.

Example:

```
9A
9E
9F
```

SymmID The 12-digit ID of the Symmetrix array.

RETURN CODES

Code #	Code Symbol
0	CLI_C_SUCCESS
1	CLI_C_FAIL
2	CLI_C_DB_FILE_IS_LOCKED

19 CLI_C_GK_IS_LOCKED
All GateKeepers to the Symmetrix array are currently locked.

23 CLI_C_NEED_SYMFORCE_TO_PROCEED
Requires the symforce flag to proceed. WARNING: Extreme caution should be exercised when using this option.

EXAMPLES

To migrate data by specifying source and target device pairs in a file, first define a pair file, such as input.txt with the device pair information. Pair file input.txt contains the following information:

```
10   20
11   21
12   22
13   23
```

To migrate data in the input.txt file defined above, validate the pairs defined in the file prior to establishing the data. In this example, the target protection type is RAID-5 (3+1), and the target disk group number is 1. Enter the following:

```
symmigrate validate -sid 123 -f input.txt
  -tgt_raid5 -tgt_prot 3+1 -tgt_dsk_grp 1
  -name DevFile

symmigrate establish -sid 123 -f input.txt
  -tgt_raid5 -tgt_prot 3+1 -tgt_dsk_grp 1
  -name DevFile
```

To migrate data on source devices that are in a file

(input.txt) to target devices that are configured,
create the input.txt file, as follows:

Source file input.txt contains:

```
10
11
12
13
```

To migrate data in the input.txt file defined above,
with the target protection type of RAID-5 (3+1)
and the target disk group number 3, enter:

```
symmigrate establish -sid 123 -f input.txt
  -tgt_raid5 -tgt_prot 3+1 -tgt_dsk_grp 3
  -tgt_config -name DGTargets
```

To list all migration sessions established on one
Symmetrix array, enter:

```
symmigrate list -sid 123 -detail
```

To monitor a migration session named 'mysession', enter:

```
symmigrate query -name mysession -sid 123 -i 5 -c 2
```

symmir

Performs Symmetrix BCV control operations on a device group, composite group, devices within the group, or on devices within a file.

SYNOPSIS

```
symmir -h

symmir -g <DgName> [-v] [-force] [-symforce] [-reverse]
    [-noprompt] [[-rdf] [-bcv] | [-rrbcv] | [-hop2]]
    [-i <Interval>] [-c <Count>]
    [-preserveTGTLocks -lockid <LockNum>] [-star]
    [-preaction <ScriptFile>] [-postaction <ScriptFile>]

  establish [-full [-opt | -opt_rag | -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] [-std_protect] [-skip]
    [-consistent [-both_sides]]
    [<LdevName> [BCV pd <PdevName>]...|
     <LdevName> [BCV dev <SymDevName>]...|
     <LdevName> [BCV ld <LdevName>]...]

symmir -g <DgName> [[-rdf] [-bcv] | [-rrbcv] | [-hop2]]
    [-offline] [-i <Interval>] [-c <Count>]
```

```
    query [[-attach] [-multi] [-protect] [-protbcvest]
      [-bg [-percent]]] | [-summary]
      [<LdevName> [<LdevName>....]]

    verify [-synchronized | -restored [-protect] |
      -split [-bg] | -syncinprog | -restinprog [-protect] ]
      [-concurrent] [-force] [-summary]
      [<LdevName> [BCV pd <PdevName>]...|
       <LdevName> [BCV dev <SymDevName>]...|
       <LdevName> [BCV ld <LdevName>]...]

    verify -bcv_mirrors [-ready | -syncinprog | -restinprog]
      [-concurrent]
      [<LdevName> [BCV pd <PdevName>]...|
       <LdevName> [BCV dev <SymDevName>]...|
       <LdevName> [BCV ld <LdevName>]...]

  symmir -g <DgName> [-v] [[-rdf] [-bcv] | [-rrbcv] |
      [-hop2]] [-i <Interval>] [-c <Count>] [-noprompt]

    attach
      [<LdevName> [BCV pd <PdevName>]...|
       <LdevName> [BCV dev <SymDevName>]...|
       <LdevName> [BCV ld <LdevName>]...]

    cancel [-force] [-skip] [-star]
      [<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>]...]

  symmir -cg <CgName> [-v] [-force] [-symforce] [-reverse]
      [-noprompt] [[-rdf] [-bcv] | [-rrbcv] | [-hop2]]
```

```
    [-i <Interval>] [-c <Count>] [-star]
    [-preaction <ScriptFile>] [-postaction <ScriptFile>]
    [-sid <SymmID> |
     -rdfg <SymmID>:<GrpNum>[,<GrpNum>,...]|<all>[,...] |
     name:<RDFGroupName>[,<RDFGroupName>,...]]

  establish [-full [-opt | -opt_rag | -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] [-std_protect] [-skip]
    [-consistent [-both_sides]]
    [<LdevName> [BCV pd <PdevName>]...|
     <LdevName> [BCV dev <SymDevName>]...|
     <LdevName> [BCV ld <LdevName>]...]

symmir -cg <CgName> [[-rdf] [-bcv] | [-rrbcv] | [-hop2]]
    [-offline] [-i <Interval>] [-c <Count>]
    [-sid <SymmID> |
    -rdfg <SymmID>:<GrpNum>[,<GrpNum>,...]|<all>[,...] |
     name:<RDFGroupName>[,<RDFGroupName>,...]]

  query [[-attach] [-multi] [-protect] [-protbcvest]
    [-bg [-percent]]] | [-summary]
    [<LdevName> [<LdevName>...]]

  verify [-synchronized | -restored [-protect] |
    -split [-bg]| -syncinprog | -restinprog [-protect]]
```

```
    [-concurrent] [-force] [-summary]
    [<LdevName> [BCV pd <PdevName>]...|
     <LdevName> [BCV dev <SymDevName>]...|
     <LdevName> [BCV ld <LdevName>]...]

  verify -bcv_mirrors [-ready | -syncinprog |
     -restinprog]
    [-concurrent]
    [<LdevName> [BCV pd <PdevName>]...|
     <LdevName> [BCV dev <SymDevName>]...|
     <LdevName> [BCV ld <LdevName>]...]

symmir -cg <CgName> [-v] [[-rdf] [-bcv] | [-rrbcv] |
    [-hop2]] [-i <Interval>] [-c <Count>] [-noprompt]
    [-sid <SymmID> |
     -rdfg <SymmID>:<GrpNum>[,<GrpNum>,...]|<all>[,...] |
     name:<RDFGroupName>[,<RDFGroupName>,...]]

  attach
    [<LdevName> [BCV pd <PdevName>]...|
     <LdevName> [BCV dev <SymDevName>]...|
     <LdevName> [BCV ld <LdevName>]...]

  cancel [-force] [-skip] [-star]
    [<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>]...]

symmir -sid <SymmID>
    <-file <DeviceFileName> [-noprompt] |
     -noprompt 'redirect stdin'>
    [-v] [-force] [-symforce] [-reverse]
```

```
    [-i <Interval>] [-c <Count>] [-star]
    [-preaction <ScriptFile>] [-postaction <ScriptFile>]
    [-preserveTGTLocks -lockid <LockNum>]

  establish [-full] [-protbcvest] [-skip]

  restore [-full] [-bypass] [-not_ready] [-protect]

  split [-diff] [-bypass] [-not_ready] [-skip]
    [-protect] [-std_protect] [-consistent]

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

  query [[-attach] [-multi] [-protect] [-protbcvest]
    [-bg [-percent]]] | [-summary]

  verify [-synchronized | -restored [-protect] |
    -split [-bg]| -syncinprog | -restinprog [-protect] ]
    [-concurrent] [-summary] [-force]

  verify -bcv_mirrors [-ready | -syncinprog |
    -restinprog] [-concurrent] [-force]

symmir [-sid <SymmID>] [-i <Interval>] [-c <Count>]
    [-offline]

  list

symmir -sid <SymmID>
     <-file <DeviceFileName> [-noprompt] |
      -noprompt 'redirect stdin'> [-v]
     [-i <Interval>] [-c <Count>]

  attach
```

detach

cancel [-skip] [-star]

DESCRIPTION

The symmir command performs mirroring operations on a device group, composite group, devices within the group, or on devices in a file.

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.

You can perform both the establish and restore operations fully (entire copy) or incrementally (only changed tracks are synchronized). By default, if you do not specify the -full option, the system will attempt an incremental establish or restore. Note that you cannot perform an incremental establish or restore if the BCV pair state is Never Established.

You can perform all of these operations on a group or individual device basis.

Before you can establish a BCV device with a standard device, the BCV device must have been previously associated with the device group and the BCV device must be the same size as the standard device.

You can perform all of these operations on a group, individual device, 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, you can 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 a pair of names per line.

For example, the following is the file format for listing BCV device pairs:

```
DEV001 bcv ld BCV001
DEV002 bcv ld BCV002
```

ARGUMENTS

attach Attaches a BCV device to a standard device as 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 SDDF session between the specified standard and BCV device(s). Once the SDDF session is cancelled, the corresponding BCV device goes into the SplitNoInc state, and the BCV pair can no longer be incrementally established or restored.

detach Detaches a BCV device from the standard device and disassociates (unmarks) the pair as the preferred pair when full establish or restore operations occur.

establish Establishes (mirrors) one or all standard devices in a device group with one or more

BCV devices associated with the group. Depending on 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 SyncInProg. When the operation completes, the state changes to Synchronized.

list Lists all the BCV sessions created on the Symmetrix array.

query Returns mirror state information about one or all device pairs in a group or device file.

restore Restores one or all standard devices in a device group from one or more BCV devices associated with the group. Depending on 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.

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.

verify Verifies whether one device pair is or all device pairs in a device group are in the Synchronized or Restored states.

KEYWORDS

BCV Specifies a BCV target device.

dev Indicates a Symmetrix device name.

ld Indicates a logical device name.

name Specifies to perform the action against the specified RDF group's logical name.

pd Indicates a physical device name.

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 mirror of a locally attached BCV RDF device and the remotely attached BCV device that is associated with the device group. You can only use this option with the -rdf option.

-bcv_mirrors Verifies that the mirrors of the BCV device(s) are in the indicated state. The default is to verify that the mirrors of the BCV device(s) are in the synchronized state. Alternatively, if you also specify the -syncinprog flag or the -restinprog

flag, then the system will verify the mirrors of the BCV device(s) against the state that corresponds to the specified flag. If you specify the -ready option, the system will verify that the mirrors are ready to the host.

-bg Applies to query and verify operations. With query, shows the BCV pairs that are still in the background split mode. With verify, verifies that the BCV pair(s) are in the Split state, and that they have completed splitting in the background. With verify, you can only use this option with the -split option.

-both_sides Splits all locally and remotely associated BCV pairs in an RDF 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. If you do not specify this option and specify an interval (-i), the program will loop continuously to display or to start the mirroring operation.

-cg Applies a composite group name to the command.

-concurrent When used with the verify argument, this option verifies the STD device and the two most recent BCVs. When used with the establish argument, this option establishes a second available BCV device.

-consistent Consistently splits the managed standard devices.

-diff Indicates that the split operation should initiate a differential data copy from the first (moving) mirror of the BCV device to the rest of the BCV mirrors when the split operation completes.

-exact Specifies to pair devices in the exact order that the standard and BCV devices have been added to the device group. This option applies to full establish or full restore operations.

-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). A Symmetrix ID is required for this option. -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) for the specified operation.

-full Requests a full establish or restore operation. The default is incremental.

-g Applies a device group name to the command.

-h Provides brief online help information.

-hop2 Performs the specified action on the

Symmetrix array two hops away.

-i Specifies the repeat interval in seconds to display or to acquire an exclusive lock on the Symmetrix host database.
The default interval is 30 seconds.
The minimum interval is 5 seconds.
For passive actions the minimum interval is 15 seconds. Passive actions are actions that do not acquire an exclusive lock.

-lockid Specifies the lock holder ID for preserving the target locks on the control operation.

-multi Shows all BCVs that can be incrementally established/restored to/from the standard device. This option only applies to a query command. This feature is available with Enginuity 5x66 or later.

-noprompt Requests to not return a prompt after you enter a command. The default is to prompt for confirmation.

-not_ready Performs the BCV control operation but leaves the target device(s) Not Ready. That is, each BCV device will be set Not Ready when the split completes. And each standard device will be set Not Ready on the initiation of the restore operation. This option only applies to a restore or split command.

-offline Specifies that the Symmetrix array 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 the 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 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 you also specify the -rdf option.

-percent When used with the -bg option in a query, this option specifies to show the percentage of progress in a background split operation.

-postaction Specifies to execute the script argument after an establish, restore, or split operation. You must specify the full pathname of the script.

-preaction Specifies to execute the script argument before an establish, restore, or split operation. You must specify the full pathname of the script.

-preserveTGTLocks

Specifies to not 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 Specifies to move all mirrors of the BCV device to join the mirrors of the standard device. Applies only with an establish or query command. Applies to two-way mirrored BCV devices. For query actions, displays whether the BCV devices were established with the -protbcvest flag.

-protect Specifies to write protect the BCV before initiating the restore operation. Must be used with the split command when splitting devices that were restored protected. For query actions, displays whether the restored BCVs were restored with the protect option. When used with verify (with -restored or -restinprog), verifies that the protected restore operation is completed.

-rdf Indicates that the BCV control operation is targeted at the remote mirror and the remotely attached BCV device is associated with the device group.

-rdfg Performs the requested action on a subset of the composite group defined by one or more Symmetrix/RA group combinations supplied as the argument to -rdfg.

-ready Verifies that all the BCV mirrors are ready to the host. You can only specify this option with -bcv_mirrors. This option is

useful after a reverse split to indicate the data on the BCV is available.

-remote Specifies to propagate the data to the remote mirror of the RDF device and to resume the RDF link if necessary. Applies only to a split of a BCV RDF1 device, or to a restore from a BCV to a STD RDF1 device. If you do not specify this flag, the default is to not propagate the data to the remote mirror of the RDF device.

-restinprog Verifies that the BCV pair(s) are in the RestInProg state.

-restored Verifies that the BCV pair(s) are in the Restored state.

-reverse Specifying this option with a split operation, indicates that the split operation should initiate a reverse data copy from the rest of the BCV mirrors to the first (moving) mirror of the BCV when the split operation completes.

Specifying this option with an establish or restore operation requests to verify that the BCV's non-moving mirror has valid data so that the next BCV split can be a reverse split.

-rrbcv Indicates that the BCV control operation is targeted at both the remote mirror of the remotely attached BCV device (RBCV) and the remotely attached remote BCV (RRBCV) device associated with the device group.

-sid Applies the command to the specified Symmetrix ID. Specify this option with the -file option to select the Symmetrix array on which to perform the operation or specify this option with -cg option to restrict the operation to a single Symmetrix array.

-skip Skips the source locks action. This option will not lock the source devices if all of the specified source devices are either locked or are unlocked.

-split Verifies that the BCV pair(s) are in the Split state.

-star Targets the action at devices in STAR mode.

-std_protect Specifying this option with the Split command checks that the STD device has either mirror protection (aside from the BCV) or RAID-5 protection prior to starting the Split operation.

-summary Shows device state summary.

-synchronized Verifies that the BCV pair(s) are in the Synchronized state.

-syncinprog Verifies that the BCV pair(s) are in the SyncInProg state.

-symforce Forces the operation to execute when normally it is rejected. On a Split, it causes the Symmetrix array to split a synchronizing BCV pair. On an Establish or Restore, it inhibits SYMCLI from verifying whether there are invalid tracks at the

source device. You should use extreme caution with this option.

-v Provides a more detailed, verbose listing.

PARAMETERS

CgName The composite group name.

DgName The device group name.

DeviceFileName The device Filename. The device file contains device pairs (SymDevNames) listing a pair each line (the source device first, a space, followed by the target device name on each line).

GrpNum The RDF (RA) group number.

LockNum The hexadecimal value of the lock holder ID.

LdevName The device logical name of either the standard or the BCV device.

Name The logical name associated with the RDF (RA) group(s).

PdevName The BCV or Symmetrix device physical (host) name.

ScriptFile The full pathname of a script file to execute.

SymDevName The Symmetrix device name for the BCV device. This name must be unique on the Symmetrix array. For example: 01C.

RETURN CODES

Code #	Code Symbol
0	CLI_C_SUCCESS
1	CLI_C_FAIL
2	CLI_C_DB_FILE_IS_LOCKED
18	CLI_C_ALREADY_IN_STATE The device or device group is already in the desired BCV state. Applies only to BCV control actions.
19	CLI_C_GK_IS_LOCKED All GateKeepers to the Symmetrix array are currently locked.
22	CLI_C_NEED_FORCE_TO_PROCEED Requires the force flag to proceed.
23	CLI_C_NEED_SYMFORCE_TO_PROCEED Requires the symforce flag to proceed. WARNING: Extreme caution should be exercised when using this option.
77	CLI_C_CONSISTENCY_TIMEOUT The operation failed because of a consistency window timeout.

Return codes for symmir establish

47	CLI_C_WONT_REVERSE_SPLIT There are either Write Pending

I/O in the Symmetrix cache for a BCV device, which will prevent the establish action from starting or the mirrors of the BCV are not synchronized. You can automatically repeat the action using the -i and/or -c flags.

Return codes for symmir restore

20 CLI_C_WP_TRACKS_IN_CACHE
There are write pending I/O in the Symmetrix cache for a standard device, which will prevent the restore action from starting. You can automatically repeat the action using the -i and/or -c flags

47 CLI_C_WONT_REVERSE_SPLIT
There is either write pending I/O in the Symmetrix cache for a BCV device, which will prevent the restore action from starting or the mirrors of the BCV are not synchronized. You can automatically repeat the action using the -i and/or -c flags.

Return codes for symmir verify

4 CLI_C_NOT_ALL_SYNCHRONIZED
Not all standard devices are

in the Synchronized or the Restored states.

5 CLI_C_NONE_SYNCHRONIZED
No standard devices are in the Synchronized or the Restored states.

10 CLI_C_NOT_ALL_SYNCHED
Not all standard devices are in the Synchronized state.

11 CLI_C_NONE_SYNCHED
No standard devices are in the Synchronized state.

12 CLI_C_NOT_ALL_RESTORED
Not all standard devices are in the Restored state.

13 CLI_C_NONE_RESTORED
No standard devices are in the Restored state.

25 CLI_C_NOT_ALL_SPLIT
Not all standard devices are in the Split state.

26 CLI_C_NONE_SPLIT
No standard devices are in the Split state.

27 CLI_C_NOT_ALL_SYNCINPROG
Not all standard devices are in the SyncInProg state.

28 CLI_C_NONE_SYNCINPROG

No standard devices are in the SyncInProg state.

29 CLI_C_NOT_ALL_RESTINPROG
Not all standard devices are in the RestInProg state.

30 CLI_C_NONE_RESTINPROG
No standard devices are in the RestInProg state.

EXAMPLES

To create the device group ProdDB as a REGULAR device group, enter:

```
symdg create ProdDB
```

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

```
setenv SYMCLI_DG ProdDB
```

To add the standard device /dev/rdsk/c1t1d1s2 to device group ProdDB and name it act1, enter:

```
symdg add pd c1t1d1s2 act1
```

To associate BCV device /dev/rdsk/c2t0d2s2 to device group ProdD 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 ld mybcv1
```

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 and skip any devices already split, 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 to three specified BCV pairs in group ProdDB, enter:

```
symmir -full establish DEV001 bcv ld BCV002 \\
                       DEV005 bcv ld BCV027 \\
                       DEV020 bcv ld BCV005
```

To split three device pairs in group ProdDB, enter:

```
symmir -force split DEV001 DEV005 DEV020
```

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

```
symmir query
```

symntctl

Implements the functionality available in the Symmetrix Integration Utility (SIU) on a Windows platform.

SIU consists of a number of software components that provide tools to augment the storage functionality of the Windows operating environment.

SYNOPSIS

symntctl -h

symntctl [-output xml_attribute | xml_element]

list -datastore

list -disk [-v]

list -volume [-v]
list -signature

show -datastore DatastoreName

show -pd diskN [-signature]

show -vol VolName [-g VolGroup]

show -guid VolGuid

show -sid SymId -symdev SymDev [-signature]

show -drive DriveLetter

show -path MountPnt

symntctl

flush -all

flush -drive DriveLetter

flush -path MountPnt

flush -vol VolName [-g VolGroup]

flush -guid VolGuid

symntctl [-drive DriveLetter] | [-path MountPnt]

mount -vol VolName [-g VolGroup]

mount -guid VolGuid

mount -sid SymId -symdev SymDev [-part PartitionNum]

mount -pd Pdev [-part PartitionNum]

symntctl ‹force›

umount -drive Driveletter

umount -path MountPnt

umount -vol VolName [-g VolGroup]

umount -guid VolGuid

umount -sid SymId -symdev SymDev [-part PartitionNum]

umount -pd Pdev [-part PartitionNum]

symntctl [-sig Signature] | [-erase] | [-initialize]

```
  signature -pd diskN
  signature -sid SymId -symdev SymDev

  signature -initialize

symntctl rescan

symntctl
  update -all

  update -sid SymId -symdev SymDev

  update -pd Pdev

symntctl

  mask -sid ‹SymmID› -symdev ‹SymDev› |
    ‹SymDevName›,‹SymDev› |
    ‹SymDevStart›:‹SymDevEnd›
    [-wwn ‹wwn› |-iscsi ‹iscsi›] [-no_refresh |
    -no_rescan | -no_discover] [-force]

  mask -pd ‹PdevName› [-wwn ‹wwn› |-iscsi ‹iscsi›]
    [-no_refresh | -no_rescan | -no_discover]
    [-force]

symntctl

  unmask -sid ‹SymmID› -symdev ‹SymDev› |
    ‹SymDevName›,‹SymDev› |
    ‹SymDevStart›:‹SymDevEnd›
    [-wwn ‹wwn› |-iscsi ‹iscsi›]
    [-no_refresh | -no_rescan | -no_discover]
symntctl [-set Flag] | [-clear Flag ‹-all›]

  flag -vol VolName [-g VolGroup]
```

flag -guid VolGuid

flag -sid SymId -symdev SymDev [-part PartitionNum]

flag -pd Pdev [-part PartitionNum]

flag -drive DriveLetter

flag -path MountPnt

DESCRIPTION

This command integrates and extends the Windows resource management functionality so that it operates more effectively with and on the Symmetrix Business Continuance storage devices.

ARGUMENTS

flag Sets and clears volume flags.

flush Flushes to disk all pending unwritten file system entries in cache.

list Lists all visible physical devices or volumes.

mask Removes access to the specified Symmetrix device on all HBAs of the host where the specified device is visible.

mount Mounts the specified volume to the specified drive letter or mount point.

rescan Scans the drive connections and discovers any new disks available to the system.

show Displays single disk or volume details.

signature Manipulates disk signatures.

umount Unmounts a volume from the drive letter and all mount points. The unmount process flushes any pending writes to the volume and takes the volume offline.

unmask Adds access to the specified Symmetrix device on all HBAs of the host that is connected to the specified Symmetrix array.

update Updates the partition table on a disk.

OPTIONS

-all Performs the action on all disks or volumes.

-clear Clears a volume flag (READONLY, HIDDEN, or NO_DEFAULT_DRIVE_LETTER).

-datastore Confines the list action to just displaying VMware datastores in the environment. Specifies a datastore name as the target of the show action.

-disk Confines the list action to just displaying disk configuration across the system.

-drive Specifies a drive as the target for the specified action.

-erase Erases the signature of the specified disk.

-force Requests that a volume's open handles be

ignored during the umount. These open handles will be broken.

-g Specifies a volume group as the target for the specified action.

-guid Specifies a volume's global unique identifier as the target for the specified action.

-initialize Assigns a signature to any disks found without a signature.

-iscsi Specifies the iSCSI initiator name.

-no_discover Prevents disk discovery during masking/unmasking actions.

-no_refresh Prevents VCM database update, disk rescan, and discovery during masking/unmasking actions.

-no_rescan Prevents disk rescan and discovery during masking/unmasking actions.

-path Specifies a device mount point as the target to the specified action. This directory path (of the form device:\dir) must be empty.

-pd Specifies a physical disk as the target for the specified action. Note that the host-visible disk identifiers of the form diskN can be viewed with the list -physical command.

-part Specifies the partition number of a disk.

-set Sets a volume flag (READONLY, HIDDEN, or NO_DEFAULT_DRIVE_LETTER).

-sid Specifies the ID of the Symmetrix array containing the device or volume on which the action is to be performed.

-sig Writes the signature passed in -sig to the specified disk.

-signature Specifies a disk signature.

-symdev Specifies the ID of the Symmetrix device on which the action is to be performed.

-vol Specifies a volume name as the target for the specified action.

-volume Confines the list action to just displaying volume configuration across the system.

-wwn Specifies the World Wide Name of the HBA.

PARAMETERS

diskN The number of the physical disk in the system of the form diskN.

DriveLetter The drive letter designation as viewed in the Windows directories (such as E:).

iSCSI The iSCSI initiator.

MountPnt A device mount point or directory path (for example, device:\dir).

PartitionNum The partition number (greater than, or

equal to one) on the Symmetrix device that is to be mounted. If omitted, this value defaults to one.

Signature An 8-digit hex number for each disk.

SymmID A 2 to 12-digit Symmetrix ID.

SymDev A 3 to 5-digit Symmetrix device ID.

VolGroup The name of the volume group.

VolName The volume name of the device.

VolGuid The global unique identifier (128-bit integer) of a volume.

WWN The HBA world wide name.

RETURN CODES

Code #	Description
0	Command is successful.
1	Command is not successful.
2	Applies to the openhandle command and indicates there is at least one open handle on the volume.

EXAMPLES

To flush buffers on Drive E, enter:

```
symntctl flush -drive E:
```

To list device information and configuration of disk2, enter:

```
symntctl show -pd disk2
```

To change a disk's signature, enter:

```
symntctl signature -pd disk2 -sig 1234ABCD
```

To mount a volume, enter:

```
symntctl mount -drive W: -vol volume2
```

or:

```
symntctl mount -path C:\\mt -vol volume2 -dg Api172Dg0
```

To unmount a volume, enter:

```
symntctl umount -drive W:
```

To remove a Symmetrix device from the host, enter:

```
symntctl mask -pd disk4
```

or:

```
symntctl mask -sid 000190300186 -symdev 3ED
```

To present a Symmetrix device to the host, enter:

```
symntctl unmask -sid 000190300186 -symdev 3ED
```

symoptmz

Displays or sets parameters that control the behavior of Symmetrix Optimizer and displays the current status of Symmetrix Optimizer.

SYNOPSIS

```
symoptmz -h

symoptmz -sid <SymmID>

  enable

  disable

  clear_stats

  query [-v]

  sync -version

symoptmz -sid <SymmID>

  list [-range <[SymDevStart]:[SymDevEnd]>]
    [-n <NumDevs>]

  show [-v] -swap_list | -activity_list
    [-manual | -generated ]

  show -parms [-dp | -vp] [-offline]

  show -composite [-dp | -vp]
  show [-v]  -swap_hist | -rollback_list

  read -log_type <RUNTIME | ERROR>
    [-start <DateTime>] [-stop <DateTime>]
```

release

symoptmz -sid ‹SymmID›
‹-file ‹CommandFile› |'redirect stdin'› [-v |-noecho]

preview

prepare

commit

DESCRIPTION

The symoptmz command can be used to display and set the values of control parameters for Symmetrix Optimizer.

For every invocation, symoptmz implicitly starts an Optimizer API session. It closes the session just before exiting. For actions that update Optimizer, symoptmz will implicitly acquire an Optimizer API Lock. It releases the lock just before exiting.

Stdin redirection can be used with "here documents" in UNIX shell scripts. Each command in the file has to be terminated by a semi-colon (;). There is no limit on the number of commands or the type of commands that can be placed in a command file. All the commands in a command file are executed in a single Optimizer session.
The commands in the command file are not case sensitive, however, the parameters entered are case sensitive.

Prior to making any changes, the preview argument can be used to verify that the command file is syntactically correct.

The prepare argument will perform some range checks, in addition to the syntax checks of preview. Note that

these changes are NOT submitted to the Symmetrix Optimizer.

In addition to performing the steps of preview and prepare, the commit argument will update the Symmetrix Optimizer with the modified parameters.

Users are highly encouraged to first run PREVIEW on their command files and ensure that there are no syntax errors. After the syntax errors are corrected, run the command files through PREPARE. This stage will perform some range checks on the supplied values. After the command file passes PREPARE, they may run COMMIT.

Symmetrix arrays running Enginuity 5874 only require the COMMIT action.

ARGUMENTS

clear_stats Clears disk statistics maintained by the Optimizer.

commit Updates Optimizer with the changes defined in the command file.

disable Disables the Optimizer algorithm processing.

enable Enables the Optimizer algorithm processing.

list Displays Optimizer specific attributes of Symmetrix devices.

prepare Performs extra range checks on changes specified in the command file.

preview Verifies the syntax of the changes specified in the command file.

query Queries Symmetrix Optimizer and displays the current state and version information of the Optimizer. If -v is specified, displays additional information about Optimizer version 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. Not supported in Optimizer Rev 8.1.

rollback Rolls back a Symmetrix configuration to that of a previous point-in-time.

show Shows information about the current Optimizer parameters. By default, displays control parameters.

sync Acquires version information from Optimizer. This argument is supported ONLY in conjunction with -version.

OPTIONS

-activity_list Displays all the swap lists and migrations currently known to Optimizer (an alias for -swap_list).

-composite Displays composite time windows. Composite time windows are generated by Optimizer by combining all known user-defined time windows.

-dp Specifies the data movement time windows for

standard devices.

-file Specifies the name of the command file containing changes to Optimizer.

-generated Specifies the Optimizer generated device swap plan.

-h Provides brief online help.

-log_type Defines the type of log file to be read. Types of log files supported are: RUNTIME and ERROR.

-manual Specifies the user defined device swap plan.

-n Specifies the number of devices to list or set.

-noecho Blocks the printing of session status and progress messages during the Optimizer change session. For use with PREVIEW, PREPARE, and COMMIT actions. Cannot be used with the -v option.

-offline Displays information from Symmetrix configuration database without refreshing the data from the Symmetrix array.

-parms Displays information about the control parameters of Symmetrix Optimizer. This is the default option for show.

-range Specifies the start and end Symmetrix device names.

-rollback_list Displays a list of possible rollback

points.

-sid Specifies the unique Symmetrix ID.

-start Identifies the log file entries whose time stamp is after this date and time that will be read.

-stop Identifies the log file entries whose time stamp is before this date and time that will be read.

-swap_hist Displays the history of the swaps known to Optimizer.

-swap_list Displays all the swap lists and migrations currently known to Optimizer.

-v Provides a more detailed, verbose listing.

-version Displays version information of Symmetrix Optimizer. The symoptmz command queries Optimizer for version information and caches it in the SYMAPI database. Subsequent symoptmz calls with -version would read the version information from the SYMAPI database for efficiency. If sync is specified with -version, any cached information from SYMAPI database is cleared and symoptmz re-queries Optimizer.

-vp Specifies the data movement time windows for thin devices.

PARAMETERS

CommandFile The name of an ASCII text file containing

the set of commands to process.

DateTime A specific date and time (MMDDYYYY:HHMMSS format).

ERROR The Optimizer error log.

NumDevs The number of devices to display or set.

RUNTIME The Optimizer activity log.

SymmID The 12-digit ID of the Symmetrix array.

SymDevEnd The last Symmetrix device name in a range.

SymDevStart The first Symmetrix device name in a range.

COMMAND FILE SYNTAX

Syntax of commands allowed in ‹command_file› are:

For setting control parameters:

```
set control_parms
        [swap_mode=‹AUTO | USER_OK›,]
        [min_perf_period=‹min_perf›,]
        [workload_period=‹workload›,]
        [max_simult_swaps=‹max_simult›,]
        [swap_rate=‹max_swaps›];
```

For setting time windows:

```
set time_window id=‹tw_id›,
        type=‹SWAP [, provisioning=‹VP | DP›]
        | PERF›,
        flag=‹INCLUDE | EXCLUDE›,
        period=‹ONCE | WEEKLY | WEEKLY_BY_DAY›,
```

```
            starting=‹date_time›,
            ending=‹date_time›,
            [days=‹day_list›,
             start_time=‹hh:mm›, end_time=‹hh:mm›];
```

Where ‹date_time› is in the form of MMDDYYYY:HHMMSS, and ‹day_list› is any comma-separated combination of MON, TUE, WED, THU, FRI, SAT, or SUN. For the case of WEEKLY, ‹day_list› should also include one of the following: MON_START, TUE_START, WED_START, THU_START, FRI_START, SAT_START, or SUN_START. Each of "*_START" represents the corresponding day of the week on which the time window starts. Refer to the example at the end of this man page.

Provisioning type can be specified only for swap time windows with Enginuity Version 5875 and higher.

For clearing time windows:

```
   clear time_window;
```

For setting manual swap lists with Enginuity version 5773 and earlier:

```
   set swap_list {Hyper1} with {Hyper2}
            [, {Hyper3} with {Hyper4},... ]
            [begin_at=‹time_val›];
```

{HyperN} is of the form {DDD,I,T,HH} where:

- DDD is the director Identifier,
- I is the Director Interface,
- T is the Target ID, and
- HH is the Hyper Number.

time_val is in the form of MMDDYYYY:HHMMSS.

For setting manual swap lists with Enginuity version

5874 and higher:

```
set dev_swap ‹SymDevName1› with ‹SymDevName2›
      [, ‹SymDevName3› with ‹SymDevName4›, ...]
      [begin_at=‹time_val›];
```

time_val is in the form of MMDDYYYY:HHMMSS.

For managing swap lists:

```
set swap ‹APPROVE | DECLINE›
            [begin_at=‹time_val›,]
            TIMESTAMP=‹time_val›
            [,ROLLBACK];
```

Where time_val is in the form of MMDDYYYY:HHMMSS.

For setting swap priority:

```
set swap_priority TO ‹NO_SWAP | NORMAL | HIGH› for
            dev ‹SymDevStart›[:‹SymDevEnd›];
```

For setting advanced parameters:

```
set advanced_parms [max_rollback = ‹max_days›,]
            [hot_spot = ‹TRUE | FALSE›];
```

The migration feature is not available with Enginuity 5874 and higher. Use symmigrate to migrate devices.

For initiating a migration with Enginuity 5773 and earlier:

```
migrate
  dev[s] ‹SymDevStart1›[:‹SymDevEnd1›]
   [,‹SymDevStart2›[:‹SymDevStart2›],...]
  TO disk[s] {disk1} [,{disk2},...]
  [unmapped=TRUE] [unmasked=TRUE]
  [begin_at=‹time_val›];
```

```
migrate
  device_group ‹DgName›
  TO disk_group_num ‹disk_group_num›
  [unmapped=TRUE] [unmasked=TRUE]
  [begin_at=‹time_val›];

migrate
  device_group ‹DgName›
  TO disk[s] {disk1} [,{disk2},...]
  [unmapped=TRUE] [unmasked=TRUE]
  [begin_at=‹time_val›];

migrate
  dev[s] ‹SymDevStart1›[:‹SymDevStart1›]
    [,‹SymDevStart2›[:‹SymDevStart2›],...]
  TO disk_group_num ‹disk_grou_num›
  [unmapped=TRUE] [unmasked=TRUE]
  [begin_at=‹time_val›];

{diskN} is of the form {DDD,I,T} where
    DDD is the director Identifier,
    I   is the Director Interface, and
    T   is the Target ID
```

time_val is in the form of MMDDYYYY:HHMMSS.

See the Symmetrix Optimizer documentation for a description of the parameters and their legal values.

While 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 and performance time windows are treated as one set.

RETURN CODES

```
Code #    Code Symbol
------    -----------

 0        CLI_C_SUCCESS

 1        CLI_C_FAIL

 2        CLI_C_DB_FILE_IS_LOCKED

19         CLI_C_GK_IS_LOCKED
           All gatekeepers to the Symmetrix
           array are currently locked.
```

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 -sid 123456789012
```

To display the current Optimizer swap lists for a specific Symmetrix array, enter:

```
symoptmz show -sid 123456789012 -swap_list
```

To define a sets of time windows, enter:

```
symoptmz commit -sid 123456789012
  -file define_timewindow.cmd
```

Where define_timewindow.cmd contains:

```
set time_window id =MySwapTimeWondow type=swap
  flag=include period=once
  starting=04152009:00000
  ending=12302009:000000
  days=Sun start_time=04:00 end_time=12:00;
set time_window id = MyPerfTimeWindow type=perf
  flag=exclude period=WEEKLY_BY_DAY
  starting=01142009:000000
  ending=12302009:000000
  days=SAT start_time=04:00 end_time=12:00;
```

To set the control parameters, enter:

```
symoptmz commit -sid 123456789012
  -file set_cntrlparms.cmd
```

Where set_cntrlparms.cmd contains:

```
set control_parms swap_mode=auto
  swap_rate=30 max_simult_swaps=32
  min_perf_period=200 workload_period=300;
```

To set the swap priority of a range of Symmetrix devices, enter:

```
symoptmz commit -sid 123456789012
  -file set_swap_priority.cmd
```

Where set_swap_priority contains:

```
set swap_priority to high for dev 0078:0092;
```

To swap twp devices with the same size, enter:

```
symoptmz commit -sid 123456789012
```

```
-file swap_device.cmd
```

Where swap_device.cmd contains:

```
set dev_swap 00C1 with 00C2;
```

sympart

Displays partition information about a host device.

SYNOPSIS

```
sympart [-h] [-v] [-kb|-blocks|-mb]

    show <HostDevName>

    list [-count FirstNMatches]
        [-device_type DeviceType]
        [-label PartLabel] [-type PartType]
        [-exclude]
```

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

list — Lists partition information of all devices connected to the host. List can be filtered using filter options.

show — Shows detailed partition information for the specified host device.

OPTIONS

-blocks — Displays the partition offset and size information in 512-byte blocks.

-count Lists only first N matches found.

-device_type Lists partition information for only the specified device type.

-exclude Excludes partitions meeting filter criteria and lists others.

-h Provides brief, online help information.

-kb Displays the offset and size information in kilobytes.

-label Lists information of devices with the specified partition label.

-mb Displays offset and size information in megabytes. This is the default.

-type Lists information of partitions with the specified partition type.

-v Displays partition data in an expanded (verbose) format.

PARAMETERS

DeviceType The device type.
[SYMMETRIX | CLARIION]

FirstNMatches The number of partitions, such as 10.

HostDevName The physical (host) device name, such as c2t0d2s2.

PartLabel The partition label of the physical device.

[MBR | GPT | VTOC | EFI]

PartType The partition type:

[PART_UNASSIGNED | PART_BOOT |
PART_ROOT | PART_SWAP |
PART_USR | PART_FULL_DISK |
PART_STAND | PART_VAR |
PART_HOME | PART_ALT_SECTOR |
PART_CACHE | PART_RESERVED |
PART_VX_PUBLIC | PART_VX_PRIVAT |
PART_EXTENDED | PART_FAT12 |
PART_FAT16 | PART_FAT32 |
PART_FAT32_X13 | PART_HUGE |
PART_IFS | PART_LDM |
PART_NTFT | PART_OS2BOOT |
PART_PREP | PART_UNIX |
PART_XENIX_1 | PART_XINT13 |
PART_XINT13_EX | PART_VALID_NTFT |
PART_UNUSED | PART_XENIX_2 |
PART_VERSION6 | PART_SYSTEM_V |
PART_VERSION8 | PART_VERSION7 |
PART_BSD_4_1 | PART_BSD_4_2 |
PART_ADVFS | PART_LSMPUBLIC |
PART_LSMPRIVAT | PART_LSMSIMPLE |
PART_LSMNOPRIV | PART_DATABASE |
PART_RAWDATA | PART_DRD |
PART_CNX | PART_CDFS |
PART_LINUX | PART_LINUX_LVM]

RETURN CODES

Code #	Code Symbol
0	CLI_C_SUCCESS
1	CLI_C_FAIL

EXAMPLES

To display partition information in kilobytes about a physical device on a SunOS system, enter:

```
sympart -kb show c2t0d2s2
```

To display partition information in blocks about a physical device on a Windows system, enter:

```
sympart -blocks show PHYSICALDRIVE9
```

To list all of the partitions of the devices connected to the host, enter:

```
sympart list
```

To list all of the partitions of the Symmetrix devices connected to the host, with the size and offset displayed in kilobytes, enter:

```
sympart list -kb -device_type symmetrix
```

To list all of the partitions of the devices with the partition style GPT on a Windows system, enter:

```
sympart list -label GPT
```

To list all of the partitions of the devices with the partition style GPT or MBR on Windows systems, enter:

```
sympart list -label "GPT|MBR"
```

To list all of the partitions of the devices with the partition style EFI on SunOS system, enter:

```
sympart list -label EFI
```

sympd

- Performs operations on a device given the
device's physical (host) name.

SYNOPSIS

```
sympd  -h

sympd [-offline] [-sid <SymmID>] [-v]

  list [-resv]

  list [-SA <#|ALL>] [-p <#>] [-scsi] [-fibre]
    [-escon] [-ficon] [-gige] [-iscsi_port <#>]
    [-powerpath] [-vcm | -aclx] [-pdevfile] [-cyl]

sympd [-offline] [-sid <SymmID>] [-v]

  list [-DA <#|ALL>] [-interface <#|ALL>]
    [-disk <#|ALL>] [-hyper <#|ALL>]
    [-spindle]

  list [-DX <#|ALL] [-spindle]

  list [-vm]

sympd show <PdevName> [-geometry]

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 listing devices by Symmetrix ID, and showing device information given the device's physical name, such as /dev/rdsk/c3t0d3s2.

The export option writes the current list of physical device names visible to the host to a file. It stores other information about the physical device, such as its Symmetrix ID, device number, and director/port.

The verify option compares the current list of physical device names to the ones stored in the specified file for any differences.

ARGUMENTS

export Stores the physical device information to a specified file.

list Lists all Symmetrix devices visible to this host.

show Shows the status information about a Symmetrix device that is visible to this host.

verify Compares the current physical device information to the information stored in a specified file.

OPTIONS

-aclx Lists the device masking (ACLX) devices. This option is supported in Enginuity 5874 and higher.

-cyl Lists the device capacity in cylinders. The default is in megabytes (MBs).

-DA Lists the host-visible Symmetrix devices that match DA, interface, disk, and hyper values. Interface, disk, and hyper values default to ALL if not specified.

-disk Lists the host-visible Symmetrix devices that match disk, DA, interface, and hyper values.

-DX Lists the host-visible Symmetrix devices that match the DX director number. Default to ALL if not specified.

-escon Lists the devices mapped to the ESCON front-end directors.

-fibre Lists the devices mapped to the Fibre front-end directors.

-ficon Lists the devices mapped to the FICON front-end directors.

-file Names the file to store or compare physical device information.

-geometry Shows device geometry feature.

-gige Lists the devices mapped to the Gig-E front-end directors.

-h Provides brief online help information.

-hyper Lists the host-visible Symmetrix devices that match hyper, DA, interface, and disk values.

-interface Lists the host-visible Symmetrix devices that match interface, DA, disk, and hyper values.

-iscsi_port Specifies the iSCSI target port number.

-offline Obtains information from the Symmetrix host configuration database.

-p Specifies a front-end (SCSI or Fibre) director port number.

-pdevfile Lists the device names in a format for use as pdevfile entries.

-powerpath Lists the host-visible EMC PowerPath devices, their Symmetrix configurations, and their alternate paths.

-resv Lists all Symmetrix devices that are visible to this host and have SCSI reservations.

-SA Lists the front-end (SCSI or Fibre) director number.

-scsi Lists the devices mapped to the SCSI front-end directors.

-sid Filters the display of visible Symmetrix devices by the specified Symmetrix array.

-spindle Displays spindle information instead of the standard disk address information.

-v Provides a more detailed, verbose listing.

-vcm Lists the device masking (VCM) devices. This option is obsolete in Enginuity 5874 and higher and replaced by the -aclx option.

-vm Displays the virtual machine device name. This option only displays valid virtual machine names on VMWare ESX server environments.

PARAMETERS

FileName The name of the file containing the list of devices.

PdevName The host name for the device, such as /dev/rdsk/c2t0d2s3.

RETURN CODES

Code #	Code Symbol
0	CLI_C_SUCCESS
1	CLI_C_FAIL
19	CLI_C_GK_IS_LOCKED All GateKeepers to the Symmetrix array are currently locked.

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/rdsk/c2t0d2s3
```

To list only Symmetrix devices visible to this host that are mapped to all Fibre Channel directors on port 0, enter:

```
sympd -sa all -p 0 -fibre list
```

NAME

symqos

- Provides Quality of Service controls on specified devices.

The maximum Open Replication bandwidth percentages for selected ports can also be viewed or changed with symqos.

SYNOPSIS

```
symqos -h

symqos -g ‹DgName› [-bcv | -nobcv]

  set ‹BCV|RDF|MIR|CLONE|VLUN›
   ‹pace|priority ‹URGENT|‹Value›|STOP››
   [LdevName]

  query

  list

symqos ‹-sg ‹SgName› |
      -devs ‹‹SymDevStart›:‹SymDevEnd› | ‹SymDevName›
          [,‹‹SymDevStart›:‹SymDevEnd› | ‹SymDevName››
           . . .]›

  set ‹BCV|RDF|MIR|CLONE|VLUN›
     ‹pace|priority ‹URGENT|‹Value›|STOP››
     -sid ‹SymmID››

  list [-sid ‹SymmID›]

symqos [-sid ‹SymmID›]

  list
   [-devs ‹‹SymDevStart›:‹SymDevEnd› | ‹SymDevName›
```

```
      [,<<SymDevStart>:<SymDevEnd> | <SymDevName>>...]>]
    [-pace_range <[MinPace]:[MaxPace]>]

symqos -pst -sid <SymmID>

  enable

  disable

symqos -pst -sid <SymmID>
 -devs <<SymDevStart>:<SymDevEnd> | <SymDevName>
    [,<<SymDevStart>:<SymDevEnd> | <SymDevName>>...]>

  set hostio priority <Value>

symqos -pst -g <DgName> [-std] [-bcv]

  set hostio priority <Value>

symqos -pst

  list -sid <SymmID>
      [-all | -hostio_priority <<Value>|ALL>]
      [-devs <<SymDevStart>:<SymDevEnd> | <SymDevName>
        [,<<SymDevStart>:<SymDevEnd> |
          <SymDevName>>...]>]

  list -g <DgName> [-std] [-bcv]
      [-hostio_priority <<Value>|ALL>]

symqos -cp -sid <SymmID>

  enable

  disable

  analyze
```

```
  set empty <preserve | remove>

symqos -cp -name <Name> -sid <SymmID>

  create -target <TargetPercent>
      -min <MinPercent>
      -max <MaxPercent>
      -wp <WritePendingLimit>
      -time <DonationTime>

  modify [-target <TargetPercent>]
      [-min <MinPercent>]
      [-max <MaxPercent>]
      [-wp <WritePendingLimit>]
      [-time <DonationTime>]

  rename -new_name <NewCPName>

  delete

symqos -cp -name <CPName> -sid <SymmID>

  add dev <SymDevName>

  remove dev <SymDevName>

symqos -cp -name <CPName> -sid <SymmID>
  [-devs <<SymDevStart>:<SymDevEnd> | <SymDevName>
    [,<<SymDevStart>:<SymDevEnd> | <SymDevName>>...]> |
   -rdfg <GrpNum> |
   -pool <PoolName> <-snap | -rdfa_dse | -thin>]

  addall

  rmall
```

```
symqos -cp -name ‹CPName› -g ‹DgName›

  add ld ‹LdevName›

  remove ld ‹LdevName›

  addall [-std] [-bcv] [-vdev]

  rmall [-std] [-bcv] [-vdev]

symqos -cp [-name ‹CPName›] [-offline]

  list -sid ‹SymmID›
    [-devs ‹‹SymDevStart›:‹SymDevEnd› | ‹SymDevName›
      [,‹‹SymDevStart›:‹SymDevEnd› |
        ‹SymDevName››...]› |
    -rdfg ‹GrpNum›]

  list -g ‹DgName› [-std] [-bcv] [-vdev]

  list [-sid ‹SymmID›] -settings [-usage] [-v]

symqos -cp -sid ‹SymmID› [-offline]
  list [-all]
    [-devs ‹‹SymDevStart›:‹SymDevEnd› | ‹SymDevName›
      [,‹‹SymDevStart›:‹SymDevEnd› | ‹SymDevName››...]›]

symqos -RA -sid ‹SymmID›

  enable -io

  disable -io

symqos -RA -sid ‹SymmID›

  set IO -default
      -sync ‹SyncPercent›
```

```
        -async <AsyncPercent>
        -copy <CopyPercent>

    set IO -dir <# | ALL>
        -sync <SyncPercent>
        -async <AsyncPercent>
        -copy <CopyPercent>

    reset IO -dir <# | ALL>

  symqos -RA [-sid <SymmID>]

    list -io

  symqos -rcopy -sid <SymmID>
    -dir <# | ALL> [-p <# | ALL>]

    set ceiling <<CeilingPercent> | DISABLE | NONE>

    list ceiling
```

DESCRIPTION

The symqos command is used to view or change copy priorities for a range of devices, or selected members of a device group.

The symqos is also used to view or change the priority service time of devices with Enginuity 5772. The default device priority is 1 - the highest priority.

Cache partitions can be created or modified for different device groupings in addition to the default cache partition to which all devices belong initially with Enginuity 5772 and higher.

ARGUMENTS

add Adds a device to a particular cache partition.

addall Adds a range of devices to a particular cache partition.

analyze Enables analysis for cache partitioning. This mode allows the user to see if the target cache allocation of their partitions is reasonable. The min must be set to 0%, the max must be set to 100%, and the donation time must be 0 for all partitions.

create Creates a new cache partition if there is one available.

delete Deletes a cache partition that is no longer being used.

disable Disables the cache partition settings or disables the device priority QoS feature for a Symmetrix array.

When used with -io, disables the workload percentage settings for Synchronous, Asynchronous and Copy I/Os for all the RDF directors on the Symmetrix array.

enable Enables the cache partition settings or enables the device priority QoS feature for a Symmetrix array.

When used with -io, enables the workload percentage settings for Synchronous, Asynchronous and Copy I/Os for all the RDF directors on the Symmetrix array.

list Displays QoS copy priorities for a range of devices.

Displays device priority for a range of devices or a device group.

Displays cache partition settings for one or all partitions.

Displays cache partition devices for a range of devices, an RDF group, or a device group.

When used with -io, displays the defined workload percentages for Synchronous, Asynchronous and Copy I/Os on the Symmetrix array and all the RDF directors.

When used with -rcopy, displays the maximum bandwidth percentage allowed for Open Replicator usage for a given director, port, director and port, or all directors and ports.

modify Modifies one or more of the attributes for a given cache partition.

query Displays QoS copy priorities for specified members of a device group. Defaults to viewing STD and BCV devices.

remove Removes a device from a particular cache partition.

rename Changes the name of a cache partition.

reset Resets the RDF director I/O settings for

Synchronous, Asynchronous and Copy I/O workloads to the Symmetrix default.

rmall Removes a range of devices from a particular cache partition.

set Allows the setting of the specified keyword.

When used with IO, the percentages given for -sync, -async and -copy must each be greater than 1 and must add up to 100.

When used with -rcopy, sets the maximum allowed bandwidth percentage for Open Replicator usage for a given director, port, director and port or all directors and ports.

KEYWORDS

ceiling Used with -rcopy set and -rcopy list to set or display the percentage of director/port bandwidth allowed for Open Replicator usage.

dev Specifies the action to a device by Symmetrix device name.

empty Specifies the action to all empty partitions. By default, empty partitions, or those without device assignments, will be removed after 2 hours.

hostio priority
Assigns host I/O priority to a range of devices or devices in a device group. For device group, if no device type flag

is specified, the priority will be set for the STD devices only.

IO Sets or resets the percentage of RDF director CPU resources assigned to Synchronous, Asynchronous, and Copy I/Os on the Symmetrix array or the specified RDF Director(s).

ld Specifies the action to a device by logical device name.

pace Sets the QoS copy pace. Unless an LDevName is specified, it defaults to setting parameters on STD and BCV devices. Pace setting: integers between 0 (fastest pace) to 16 (slowest pace) are valid.

priority Sets the QoS copy priority. Unless an LDevName is specified, it defaults to setting parameters on STD and BCV devices. Host I/O priority: integers between 1 (highest priority) to 16 (lowest priority) are valid.

OPTIONS

-all Lists all Symmetrix devices, including internal devices (VAULT devices, etc.)

-async Specifies the percentage of RDF director CPU resources assigned to the Asynchronous workload on the Symmetrix array or RDF director(s).

-bcv Limits the devices from the device group to BCV devices.

-copy Specifies the percentage of RDF director CPU resources assigned to the Copy workload on the Symmetrix array or RDF director(s).

-cp Specifies a cache-partition operation.

-default Specifies the default setting of the specified keyword.

When used with IO, specifies the percentage of CPU resources assigned to Synchronous, Asynchronous, and Copy I/Os for all the RDF directors on the Symmetrix array.

-devs Specifies one or more ranges of Symmetrix devices to add, remove, move, or on which to set priority.

-dir Specifies the director ID.

-g Specifies a device group.

-h Provides brief, online help.

-hostio_priority
Specifies a host I/O priority value range from 1 to 16. 1 is the highest, 16 is the lowest.

-io Specifies an RDF Director I/O workload operation.

When used with list, lists the workload percentage settings for Synchronous, Asynchronous, and Copy I/Os on the Symmetrix array.

When used with enable or disable, enables or disables the workload percentage settings for Synchronous, Asynchronous, and Copy I/Os for all the RDF directors on the Symmetrix array.

-max Specifies the maximum cache percentage for a cache partition.

-min Specifies the minimum cache percentage for a cache partition.

-name Indicates a cache partition name.

-new_name Indicates a new cache partition name for a rename action.

-nobcv Specifies to work on group members that are not BCVs.

-offline Displays information from Symmetrix configuration database without refreshing the data from the Symmetrix array.

-p Sets the port number on which to list or set the ceiling. Defaults to ALL.

-pace_range Sets the minimum/maximum pace values for display.

-pst Specifies a priority service time operation.

-RA Specifies operation for an RDF Adaptor (RA), also referred to as an RDF director.

-rcopy Used with set or list ceiling to set or

display the percentage of director/port bandwidth allowed for Open Replicator usage.

-rdfg Specifies devices that belong to the specified RDF (RA) group.

-settings Lists the general cache partition configuration for the Symmetrix array.

-sg Specifies the name of the storage group.

-sid Specifies the unique Symmetrix ID.

-std Limits the devices from the device group to standard devices.

-sync Specifies the percentage of RDF director CPU resources assigned to the Synchronous workload on the Symmetrix array or RDF director(s).

-target Specifies the target cache percentage for a cache partition.

-time Specifies the donation time in seconds - the time for when idle cache is made available to other cache partitions.

-usage Specifies the cache partition usage.

-v Provides a more detailed, verbose listing of the cache partition configuration.

-vdev Limits the devices from the device group to VDEV devices.

-wp Specifies the write pending limit percentage for a cache partition [40-80].

PARAMETERS

AsyncPercent The percentage of RDF director CPU resources assigned to Asynchronous I/Os.

CeilingPercent The percentage of director/port bandwidth allowed for open replicator usage. Acceptable values are 0-100, DISABLE or NONE. If the value DISABLE is used, this will block Open Replicator I/O on the director/port specified. If the value NONE is used, this will turn off the ceiling function on this director/port, effectively enabling Open Replicator pace for sessions using this director/port.

CopyPercent The percentage of RDF director CPU resources assigned to Copy I/Os.

CPName A name assigned to a cache partition. The name must be unique and up to 31 characters.

DgName The device group name.

DonationTime The donation time in seconds.

GrpNum The RDF (RA) group number.

LdevName The device logical name of a specific member of the device group on which priorities should be set.

MinPace The minimum pace value in a range.

MinPercent The minimum cache percentage for a cache partition.

MaxPace The maximum pace value in a range.

MaxPercent The maximum cache percentage for a cache partition.

NewCPName A new name that can be assigned to an existing cache partition.

SgName The storage group name.

SymDevEnd The last Symmetrix device name in a range.

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

SymDevStart The first Symmetrix device name in a range.

SymmID The 12-digit ID of the Symmetrix array.

SyncPercent The percentage of RDF director CPU resources assigned to Synchronous I/Os.

TargetPercent The target cache percentage value for a cache partition. The target cache percentage should be more than or equal to the minimum cache percentage and less than or equal to the maximum cache percentage.

Value An integer value.

Pace setting: integers between 0 (fastest pace) to 16 (slowest pace) are valid.
If the value URGENT is used, the copy pace is classified as urgent, and may be faster than the default. If the value STOP is used, the background initiated copy will stop. Note that BCV is not supported with

URGENT or STOP.

Host I/O priority: integers between 1 (highest priority) to 16 (lowest priority) are valid.

WritePendingLimit

The write pending limit percentage for a cache partition [40-80].

RETURN CODES

Code #	Code Symbol
0	CLI_C_SUCCESS
1	CLI_C_FAIL

EXAMPLES

To view the copy priorities for devices 10 through 20 on Symmetrix 1234, enter:

```
symqos -sid 1234 -devs 10:20 list
```

To view the copy priorities for all STD and BCV devices in device group DeviceGroup, enter:

```
symqos -g DeviceGroup query
```

To enable host I/O device priority feature for Symmetrix 1234, enter:

```
symqos -pst -sid 1234 enable
```

To assign all STD devices of device group DeviceGroup

to host I/O priority 1, enter:

```
symqos -pst -g DeviceGroup set hostio priority 1 -std
```

To view device priorities for device 10 through 20 on Symmetrix 1234, enter:

```
symqos -pst -sid 1234 -devs 10:20 list
```

To enable the cache-partition feature for Symmetrix 1234, enter:

```
symqos -cp -sid 1234 enable
```

To create a cache partition on Symmetrix 1234, enter:

```
symqos -cp -name TestPartition -sid 1234 \\
-target 10 -min 5 -max 40 -wp 50 -time 10 create
```

To add device 00C to TestPartition on Symmetrix 1234, enter:

```
symqos -cp -name TestPartition -sid 1234 add dev 00C
```

To view the setting of cache partition TestPartition, enter:

```
symqos -cp -name TestPartition list -settings
```

To enable the workload percentage settings for Synchronous, Asynchronous and Copy I/Os on Symmetrix 1234, enter:

```
symqos -RA -sid 1234 enable -io
```

To set the default settings of the workload percentages on Symmetrix 1234 to 60% for Synchronous I/Os, 30% for Asynchronous I/Os and 10% for Copy I/Os, enter:

```
symqos -RA -sid 1234 set IO -default -sync 60
-async 30 -copy 10
```

To change the settings of the workload percentages on director 8G of Symmetrix 1234 to 50% for Synchronous I/Os, 30% for Asynchronous I/Os and 20% for Copy I/Os, enter:

```
symqos -RA -sid 1234 -dir 8G set IO -sync 50
-async 30 -copy 20
```

To reset the settings of the workload percentages on director 8G of Symmetrix 1234, enter:

```
symqos -RA -sid 1234 -dir 8G reset IO
```

symrcopy

Performs remote copy control operations between storage arrays on a collection of device pairs.

SYNOPSIS

```
symrcopy [-h]

symrcopy <-file <FileName> [-noprompt] |
    -noprompt 'redirect stdin'> [-star]
    [-i <Interval>] [-c <Count>]

  create <-push <-hot | -cold>
    [-differential | -nodifferential] |
    -pull <-hot [-donor_update] | -cold>
    [-frontend_zero] [-force]>
    [-name <SessionName>] [-copy | -precopy | -nocopy]
    [-force_copy] [-pace <Pace>]

  create -pull -migrate -host_type <OsType>
    [-hba_type <HbaType>] [-mp_type <MpType>]
    [-name <SessionName>] [-pace <Pace>] [-force]

  remove

symrcopy <-file <FileName> [-noprompt] |
    -session_name <SessionName> [-noprompt] |
    -noprompt 'redirect stdin'>
    [-v] [-force] [-star] [-i <Interval>] [-c <Count>]

  activate [-consistent | -migrate]

  failback -migrate

  recreate [-name <SessionName>] [-pace <Pace>] [-precopy]

  restore [-name <SessionName>] [-pace <Pace>]
    [-donor_update]
```

```
  rename -name <SessionName>

  set mode <copy | nocopy | precopy>

  set pace <Pace> [-migrate]

  set donor_update off [-consistent] [-force]

  set frontend_zero off [-migrate]

  terminate [-symforce] [-all_sessions | -migrate]

  terminate -symforce -rp

symrcopy [-sid SymmID] [-i <Interval>] [-c <Count>]

  list [-offline] [-detail | -wwn]
      [-type <migrate | standard | recoverpoint>]

symrcopy <-file <FileName> | -session_name <SessionName> |
    'redirect stdin'>
    [-offline] [-i <Interval>] [-c <Count>]

  query [-detail | -wwn]

  query -summary

  verify [-summary]
    [-createinprog | -created | -recreateinprog |
    -recreated | -copyinprog | -copyonaccess |
    -copyonwrite | -copied | -terminateinprog |
    -failed | -verifyinprog | -restored | -restinprog |
    -precopy [-cycled] | -syncinprog | -synchronized |
    -failedback]

symrcopy [-sid <SymmID>]
```

export -file ‹FileName› -session_name ‹SessionName›

DESCRIPTION

The symrcopy command controls Symmetrix Remote Copy sessions which can copy data from various types of arrays within the Storage Area Network (SAN). Copy operations are controlled from a host attached to a Symmetrix array (referred to as the control side). Data can be copied to (push operation) or from (pull operation) the remote side array. Copy operations are either online (hot) or offline (cold). Copying data from a Symmetrix to devices on remote storage arrays allows for data to be copied fully or incrementally.

ARGUMENTS

activate Starts the copying process on an existing session.

create Defines a new session.

export Creates the specified file with all of the session information for sessions matching session_name.

failback Stops a federated live migration session and returns the control device(s) to host active mode and the remote device(s) to host passive mode. The control device(s) will retain the WWN and geometry of the remote device(s).

list Lists all the sessions for a given Symmetrix array, or for all Symmetrix arrays.

query Queries for the status of sessions.

recreate Creates an incremental session on an existing session. Only valid for sessions created with the -differential flag.

remove Removes remote devices from a differential session in the Copied state.

restore Restores copied data from the remote device of an incremental push to the control device. Restore can only be run on an incremental push session in the Copied state.

rename Changes the name of a session. Can only be executed on a differential session in the Copied state.

set donor_update off
Allows the donor_update portion of a session to be cancelled.

set frontend_zero off
Turns off the feature that improves performance of pull sessions to thin devices by detecting incoming zero patterns.

set mode Allows the session mode to be changed to nocopy (while in the CopyInProg state), causing the session state to change to CopyOnAccess if the session was created with the pull flag, or to CopyOnWrite if the session was created with the push flag.

Allows the session mode to be changed

to copy (while in the CopyOnAccess or CopyOnWrite state), causing the session state to change to CopyInProg.

Allows the session mode to be changed to precopy (while in the Created or Recreated state), causing the session state to change to Precopy.

set pace Allows the session pace to be changed while in the CopyInProg state. Valid values are 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.

OPTIONS

-all_sessions Terminates all sessions associated with the control device. Remote devices in the control file are ignored.

-c Specifies a count to perform a specific action.

-cold Indicates that 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.

With a push operation, there may be up to 16 targets.

-consistent Causes the source and target pairs to be consistently copied.

-copy Causes the device copy to take place in the background. If -nocopy is specified, 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. Only used with create.

After the operation is executed, the state of the device pair is Copy in Progress. If all the tracks are eventually moved to the Target device, the state changes to Copied.

-cycled Used with verify command and precopy flag to verify first cycle of precopy is completed.

-detail Specifies a more detailed list or query. Note that output text may not fit in some displays.

-differential Allows a session to be recreated for incremental copy. A session created with -nodifferential cannot be recreated for incremental copy.

-donor_update Writes data to the control device and the remote device during a hot pull.

-file Specifies a file name to be used for the action, which contains device pairs. A device pair is a control device and a remote

device.

Note that data flows from the control to the remotes on a -push, but on a -pull, data flows from the remote to the control.

Control devices and remote devices may be specified as LUN World Wide Names (WWNs) or Symmetrix device names.

Valid tags are symdev and wwn.

Source devices and remote devices are space delimited.

Lines that start with a pound sign (#) are ignored. Control devices are always in the left hand column, and remote devices are always in the right.

The usual file format will be:

```
symdev=<SymmID>:<DevName> wwn=<LUN WWN>
...
...
```

To specify more than one target per source device, add subsequent records, using the same source device and new remote device. Valid only for -push -cold.

-force Forces the SYMAPI server to allow an action that would ordinarily fail.

-force_copy Forces a create operation even though one or more paired devices in the device file may not be large enough to contain the whole

extents of the control device on a push, or the whole extents of the remote device on a pull.

If the operation is a pull, and the control device is too small, the session will be created so that it will only copy the total number of blocks that will fit into the control device.

If the operation is a push, and the remote device is too small, the session will be created so that it will only copy the total number of blocks that will fit into the remote device, if it is visible to the API host.

-frontend_zero Feature that provides improved performance of pull sessions to thin devices through the detection of incoming zero patterns.

-h Provides brief, online help information.

-hba_type The application host's HBA driver type.

-host_type Specifies the application host operating system in a federated live migration operation.

-hot Indicates that all directors that are mapped to the local device must be able to reach the targets. The source devices may be Read Write.

With a push operation, there may be only one remote device.

-i Specifies the interval in seconds to repeat a specific action.
The default interval is 30 seconds if -c is used.
The minimum interval is 5 seconds.
For passive actions the minimum interval is 15 seconds. Passive actions are actions that do not acquire an exclusive lock.

-migrate Indicates a session performing a federated live migration operation.

-mp_type The application host's MP vendor and version.

-name Indicates a session name when creating, recreating, restoring, or renaming a session.

-nocopy Causes the copying of tracks only to happen for tracks accessed during a pull, or written during a push. The copying of tracks is not completed unless all tracks have been accessed or written. Normally, the device copy takes place in the background. Only used with create.

After the operation is executed, the state of the device pair is Copy on Access or Copy on Write. If all the tracks are eventually moved to the Target device, the state changes to Copied.

-nodifferential
Prevents a session from being recreated for incremental copy. A session must be created with -differential to be recreated for

incremental copy.

-offline Relies on information from the database for updated session information; does not query the Symmetrix array. Used with list or query.

-pace Sets the pace value used for the session Used for create and recreate.

-precopy Begins copying data immediately in the background at create or recreate time, but without taking a point in time image of the device. Only available for hot push sessions.

-pull Pulls data from the remote to the control device when the session is created with the -pull flag.

-push Pushes data from the control device to the remote device(s) when the session is created with the -push flag.

-rp Indicates a RecoverPoint session. Used with terminate and -symforce to clean up a RecoverPoint session.

-session_name Specifies the name of the session (or group of sessions) that you want to control.

-star Targets the action for devices that are in Star mode.

-summary Lists the number of sessions in each state.

-symforce Terminates a session that has not yet finished copying. Also used with -rp to terminate a RecoverPoint session. Used only with terminate.

-type Specifies which type of sessions to include in the list command output. If -type is not specified, all sessions will be included.

Type	Description
migrate	Indicates federated live migration sessions
recoverpoint	Indicates sessions used by the RecoverPoint appliance
standard	Indicates sessions that are neither recoverpoint nor federated live migration

-v Provides more detailed, verbose information.

-wwn Specifies a World Wide Name (WWN). Used for list or query to display remote devices as WWNs.

PARAMETERS

FileName The name of the file that contains the source and target pairs.

HbaType The Host Bus Adapter type. Possible values are:

- Emulex
- Qlogic

```
    MpType        The multi-path IO type.
                  Possible values are:

                   - DMP     (Dynamic multi-path)
                   - PPath    (PowerPath 4.6+)
                   - PPath_45 (PowerPath 4.5 only)
                   - NATIVE   (Native multi-path)

    OsType        The application host operating system.
                  Possible values are:

                   - AIX
                   - HPUX
                   - LINUX
                   - SunOS_Sparc
                   - VMWARE
                   - Windows

    Pace          The pace value assigned to the session
                  during create, recreate, or set pace
                  commands.

    SessionName   The optional assigned name used to control
                  a session or group of sessions.

    SymmID        The 12-digit Symmetrix ID number.
RETURN CODES

    Code #    Code Symbol
    ------    -----------

     0      CLI_C_SUCCESS

     1      CLI_C_FAIL

     2      CLI_C_DB_FILE_IS_LOCKED
```

18 CLI_C_ALREADY_IN_STATE
The device or session is
already in the desired state.

19 CLI_C_GK_IS_LOCKED
All GateKeepers to the Symmetrix
array are currently locked.

Return codes for symrcopy verify

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.

EXAMPLES

To create a hot push session from an input file, enter:

```
symrcopy create -f input.txt -hot -push
```

To activate a session from an input file, enter:

```
symrcopy activate -f input.txt
```

To query a session from an input file, enter:

```
symrcopy query -f input.txt
```

To terminate a session from an input file, enter:

```
symrcopy terminate -f input.txt
```

Input file examples:

The following file will control a single session with control device 10 and remote device 34:

```
symdev=000000001234:10 symdev=000000005678:34
```

The following file will control two separate sessions with different control and remote devices:

```
symdev=000000001234:01 symdev=000000005678:42
symdev=000000001234:02 symdev=000000005678:43
```

The following file shows a mix of symdev and wwn usage:

```
symdev=000000001234:01 symdev=000000005678:42
symdev=000000001234:02 symdev=000000005678:43
symdev=000000001234:03 wwn=60060480000000005678535 94D303434
```

The following file will control a session with one control device (01) and multiple remotes. (41 and 42) (Note: this can only be used with -cold and -push):

```
symdev=000000001234:01 symdev=000000005678:41
symdev=000000001234:01 symdev=000000005678:42
```

symrdb

Displays detailed mapping information about one or more schemas, tables, files, tablespaces, or segments that are defined in a specified database instance.

SYNOPSIS

```
symrdb [-h] -type ‹DbType› [-db ‹DbName›] [-kb|-blocks|-mb]
  list [TBS | FILE [-datalog] | SCHEMA | TABLE]
    [-v] [-unalloc]

  show [-no_extents | -expand | -collapse]
    [TBS ‹TbsName›|FILE ‹FileName›|SCHEMA ‹SchemaName› |
     TABLE ‹TableName›]

symrdb [-h] [-v] -type ‹DbType› [-db ‹DbName›]
    [-kb|-blocks|-mb]
  list [FILE | SEG | TABLE] -tbs ‹TbsName›

  list [FILE | SEG | TABLE] -schema ‹SchemaName›
symrdb [-h] -type ‹DbType› [-db ‹DbName›] [-kb|-blocks|-mb]
    [-no_extents | -expand | -collapse]
  show -tbs ‹TbsName›
    [FILE ‹FileName›|SEG ‹SegmentName›|TABLE ‹TableName›]

  show -schema ‹SchemaName›
    [FILE ‹FileName›|SEG ‹SegmentName›|TABLE ‹TableName›]

symrdb [-h] [-v] -type ‹DbType› [-db ‹DbName›]
    [-sid ‹SymmID›] [-rdfg ‹GrpNum›] [-R1|-R2]
    [-bcv | -nobcv | -vdev] [-data] [-log] [-control]
    [-force]

  rdb2dg ‹DgName› [-dgtype REGULAR | RDF1 | RDF2]

  rdb2cg ‹CgName› [-cgtype REGULAR | RDF1 | RDF2]
```

[-apidb | -rdf_consistency]

symrdb [-h] [-v] -type ‹DbType› [-db ‹DbName›]
-tbs ‹TbsName› [-sid ‹SymmID›] [-rdfg ‹GrpNum›]
[-R1|-R2] [-bcv | -nobcv | -vdev] [-force]

tbs2dg ‹DgName› [-dgtype REGULAR | RDF1 | RDF2]

tbs2cg ‹CgName› [-cgtype REGULAR | RDF1 | RDF2]
[-apidb | -rdf_consistency]

symrdb [-h] [-v] -type ‹DbType› [-db ‹DbName›]

show -config [-all]

symrdb [-h] [-v] [-i ‹Interval›] [-c ‹Count›]
stats stats_option

symrdb [-h] startup db_startup_options

symrdb [-h] shutdown db_shutdown_options

DESCRIPTION

The symrdb command displays mapping 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 of where the file, table, schema, or tablespace extents are mapped on Symmetrix devices.

The database user login information must be supplied with the SYMCLI_RDB_CONNECT environment variable. The user login information is specified in the following format, "username/password@service". The username and password must be non NULL.

Note: 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 or -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 a list of:

- files defined to make up the database
- schemas defined within the database
- tablespaces defined within the database
- tables defined within the database

Given a database name and tablespace or schema name, you can obtain a list of:

- files that make up the tablespace or schema
- segments defined within the tablespace or schema

```
 - tables defined within the tablespace or schema

To execute the symrdb utility, you must have the
proper application software installed and
environment variables set.

You can specify the database type, database, schema,
and tablespace name from environment variables.
The command line options take priority over the
environment variables as follows:

  Environment Variable   Use to Specify   Instead of
  --------------------   --------------   ----------
  SYMCLI_RDB_TYPE        database type    -type

  SYMCLI_RDB_NAME        database name    -db

  SYMCLI_SCHEMA_NAME     schema name      -schema

  SYMCLI_TBS_NAME        tablespace name  -tbs

In Oracle, the database name does not need to be
specified. The default will be taken from the instance
represented by the connection arguments.

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.

On DB2, for additional information about what some of
the configuration values mean, please refer to
"Administration Guide: Performance" or Configuration
```

parameters in the DB2 Information Center.

ARGUMENTS

list Lists the defined databases (or object type when a keyword is specificed) for the database instance. For Oracle, the name of the database instance is returned.

rdb2cg Translates the specified database into a composite group.

rdb2dg Translates the specified database into a device group.

show Shows database names, states pertaining to the connected server, status and usage of each of the databases. When a keyword is specified, detailed logical-to-physical mapping information about that object is returned.

stats Shows performance statistics about a specified database (type). The current supported databases are Oracle, SQL Server, Sybase, and IBMUDB.

tbs2cg Translates the specified database table space into a composite group. Only data database files are translated.

tbs2dg Translates the specified database tablespace into a device group. Only data database files are translated.

KEYWORDS

FILE Specifies the action on defined files for a specified database instance.

REGULAR Specifies a device or composite group type of regular.

RDF1 Specifies a device or composite group type of RDF1.

RDF2 Specifies a device or composite group type of RDF2.

SCHEMA Specifies the action on defined schemas for a specified database instance, tablespace, or schema.

SEG Specifies the action on defined segments for a specified tablespace or schema.

TABLE Specifies the action on defined tables for a specified database instance, tablespace, or schema.

TBS Specifies the action on defined tablespaces for a specified database instance.

OPTIONS

-all Displays all the possible database configuration values (use with -config).

-apidb Creates the CG in the SYMAPI DB only.

-bcv Associates only BCV devices to the target group.

-blocks Displays size information in 512-byte

blocks.

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

-cgtype Specifies a composite group type.

-collapse Collapses the extents of a database object, if possible. This is the default.

-config Displays the database configuration value.

-control Specifies to only operate on control database files. Default is all database files.

-data Specifies to only operate on 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. Used for Sybase only.

-db Specifies a relational database name.

-dgtype Specifies a device group type.

-expand Expands the extents of a database object, if possible.

-force Attempts to force the operation even though one or more devices in the database or tablespace may already be part of another DG or CG group.

-h Provides brief, online help information.

-i Repeats the interval in seconds.
The default interval is 30 seconds.
The minimum interval is 5 seconds.
For passive actions the minimum interval is 15 seconds. Passive actions are actions that do not acquire an exclusive lock.

-kb Displays size information in Kilobytes.

-log Operates only on log database files.

-mb Displays size information in Megabytes.
This is the default.

-nobcv Adds only standard devices to the target group. The default behavior is to add both standard and BCV devices.

-no_extents Excludes extents information from the display.

-R1 Adds R1 devices to the target device group.

-R2 Adds R2 devices to the target device group.

-rdf_consistency
Creates a CG, allowing it to be enabled for RDF consistency once devices have been added to the CG.

-rdfg Selects RDF devices that belong to the specified Symmetrix RA (RDF) group number.

-schema Specifies a database schema name.

-sid Specifies the unique Symmetrix ID.

-target Identifies the database statistics output options, refers to the stats_option on ora_options, sybase_options, sqlserver_options, and ibmudb_options.

-tbs Specifies a database tablespace name.

-type Specifies a database type (DbType).

-unalloc Displays unallocated space, for Sybase database file only.

-v Provides a more detailed, verbose listing.

-vdev Adds VDEVs to the target group.

PARAMETERS

CgName The composite group name.

DbName A specific database name.

db_startup_options
See below for specific database options.

db_shutdown_options
See below for specific database options.

DbTarget The metrics available for the specified database statistic.

DbType The database type. Supported values are:

- Oracle
- SQLServer
- Sybase
- MVSDB2
- IBMDB2
- IBMUDB
- Informix
- Exchange
- Exchange2007
- SharePoint

DgName The device group name.

FileName A specific database filename.

GrpNum The RDF (RA) group number.

SchemaName A specific database schema name.

SegmentName A specific database segment name.

stats_option See below for specific database options.

SymmID The 12-digit ID of the Symmetrix array.

TableName A specific database table name.

TbsName A specific database tablespace name.

Oracle Startup/Shutdown/Stats Options:

Startup...

```
symrdb [-h] 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]]
```

where:

```
Option or
Keyword    Description
---------  ----------------------------
dbname     Identifies the database name to mount
           or open. Refer to Oracle documentation
           for the definition.

filename   Specifies a filename to be used while
           starting up the instance.

FORCE      Shuts down the current Oracle
           instance (if it is running) with the
           shutdown option ABORT, before
           restarting it.

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.

MOUNT      Mounts the database; does not open it.

NOMOUNT    Causes the database not to be mounted
           upon instance startup.

OPEN       Mounts and opens the database.

OPEN_READ_ONLY
           Specifies READ ONLY to restrict users
           to read-only transactions, and prevent
```

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.

OPEN_RECOVER
Specifies to open the database, and that media recovery should be performed, if necessary, before starting the instance.

QUIET Suppresses the display of System Global Area information for the starting instance.

RESTRICT Allows only Oracle users with the RESTRICTED SESSION system privilege to connect to the database.

Shutdown...

symrdb [-h] shutdown -type Oracle
[ABORT | IMMEDIATE | NORMAL |TRANSACTIONAL [LOCAL]]

where:

```
Keyword    Description
---------  ----------------------
```

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.

LOCAL Specifies a transactional shutdown only on the local instance.

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 the next startup. NORMAL is the default option.

TRANSACTIONAL
Shuts down an instance while minimizing interruption to clients. No client can start a new transaction on the instance.

Stats...

symrdb stats -type Oracle -target
‹ INSTANCE | SESSION | FILE | ALL ›

where:

Keyword Description

```
---------  ----------------------
INSTANCE   Specifies instance stats.
SESSION    Specifies session stats.
FILE       Specifies file stats.

Sybase Startup/Shutdown/Stats Options:

Startup...

  symrdb startup -type Sybase
   -f runserver_file [-m] [-t delay_time]

    where:

    Keyword    Description
    ---------  ----------------------
    delay_time Estimated time to startup the
               Sybase server in seconds.

    -m         Starts database in a single user
               mode.

    runserver_file
               The absolute path name of a
               runserver file used as a reference
               each time you restart a Sybase
               server.

Shutdown...

  symrdb shutdown -type Sybase
   [-f srvname] [-w {wait | nowait}]

    where:

    Keyword    Description
    ---------  ----------------------
```

```
        nowait     Shuts down the server immediately.

        srvname    Specifies a logical name by which
                   the backup server is known in the
                   server's sysservers system table.

        wait       Brings the server down gracefully.

Stats...

    symrdb stats -type Sybase -target
     ‹ SERVER | OBJECT | DEVICE | ALL ›

        where:

        Keyword    Description
        ---------  ----------------------
        OBJECT     Specifies object stats.
        DEVICE     Specifies device stats.
        SERVER     Specifies server stats.


SqlServer Startup/Shutdown/Stats Options:

Startup...

    symrdb startup -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]

        where:

        Keyword    Description
        ---------  ----------------------
        -c         Shortens startup time.
```

-f Starts an instance with minimal configuration.

error_log_path
Names the error log file.

instance Specifies the instance name to start.

-m Starts an instance in single-user mode.

master_file_path
Names the master database file.

master_log_path
Names the master database log file.

-n Does not use the Windows application log to record an SQL Server event.

trace_number
Specifies a trace number.

virtual_addr_space
Displays the amount of virtual address space in megabytes.

-n Does not use the Windows application log to record an SQL Server event.

-x Disables the keeping of CPU time and cache-hit ratio statistics to allow maximum performance.

Shutdown...

symrdb shutdown -type SqlServer -s instance

where:

```
Keyword    Description
---------  ----------------------
instance   Instance name to be shut down.
```

Stats...

```
symrdb stats -type SqlServer -target
 ‹ INSTANCE | DATABASE | OBJECT | FILE | ALL ›
```

where:

```
Keyword    Description
---------  ----------------------
INSTANCE   Specifies instance stats.
DATABASE   Specifies database stats.
FILE       Specifies file stats.
OBJECT     Specifies object stats.
```

IBMUDB Startup/Shutdown/Stats Options:

Startup...

```
symrdb startup -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]] ]
```

where:

```
Keyword or
Option     Description
```

```
---------  ----------------------
ADDNODE    Issues the ADD NODE command.

computer   Specifies the computer name.

CATALOG    Indicates that the containers for
           the temporary tablespaces should be
           the same as those for the catalog
           node of each database.

hostname   Specifies the system name.

netname    Specifies the net name.

NODE       Indicates that the containers for the
           temporary tablespaces should be the
           same as those for the specified node.

node       Specifies the node number.

port       Specifies the port number.

profile    Specifies the name of the profile.

RESTART    Issues the RESTART DATABASE command.

STANDALONE Starts the node in STANDALONE mode.

tablespace_node
           Specifies the node number from which
           the temporary tablespace definitions
           should be obtained.

username/password
           Specifies how 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.

Shutdown...

    symrdb shutdown -type IBMUDB
     [ [FORCE | DROP] [DROP_ACT | CONTINUE | TERMINATE]
     [-f profile] [-n node] ]

       where:

       Keyword or
       Option     Description
       ---------  ----------------------
       CONTINUE   Subsequent call. Continue processing
                after a prompt.

       DROP       Drops the node from the db2nodes.cfg
                file.

       DROP_ACT   Initial call.

       FORCE      Issues the FORCE APPLICATION (ALL)
                command.

       node       Specifies the node number.

       profile    Specifies the name of the profile.

       TERMINATE  Subsequent call. Terminate processing
                after a prompt.

Stats...

    symrdb stats -type Ibmudb -target
     ‹ DATABASE | TABLE | TABLESPACE | ALL ›
```

where:

```
Keyword    Description
---------  ---------------------
DATABASE   Specifies database stats.
TABLE      Specifies table stats.
TABLESPACE Specifies tablespace stats.
```

RETURN CODES

```
Code #       Code Symbol
------       -----------

 0        CLI_C_SUCCESS

 1        CLI_C_FAIL
```

EXAMPLES

To define the database login parameters to be
user = scott, passwd = tiger, and service = acme, enter:

```
setenv SYMCLI_RDB_CONNECT scott/tiger@acme
```

To list all tables that reside in tablespace
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, and
to display the extent information in expanded mode

and size 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, passwd = sa_pass, and service = local, enter:

```
setenv SYMCLI_RDB_CONNECT "sa/sa_pass@local"
```

To list all tablespaces that define the database named master, enter:

```
symrdb -type SQLServer -db master list TBS
```

To list all files that define the database named master, enter:

```
symrdb -type SQLServer -db master list FILE
```

To list all tables that reside in the database named 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 tablespace named tbl_space1, enter:

```
symrdb -type ORACLE -tbs tbl_space1 tbs2cg newcg
 -cgtype RDF1 -R1
```

To start up an Oracle data manager with mode OPEN READ ONLY, enter:

```
symrdb startup -type ORACLE OPEN_READ_ONLY
```

To shut down an Oracle data manager with mode NORMAL, enter:

```
symrdb shutdown -type ORACLE NORMAL
```

To display statistics about a session of 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
```

A Time of day
B Session ID
C memory usage per second

NOTE: All the statistics values are per second.

symrdf

Performs a Symmetrix ping to all Symmetrix arrays or a specified Symmetrix array.

Lists all or selected SRDF devices on a Symmetrix array.

Performs Symmetrix SRDF control or set mode operations on a group of devices, or on one device pair.

A group of device pairs can be specified using device group, composite group, storage group or device file.

Performs Symmetrix SRDF query or verify on a group of devices.

Also performs dynamic SRDF operations:

Adding and modifying dynamic SRDF groups, and creating and deleting SRDF pairs.

SYNOPSIS

```
symrdf -h

symrdf [-sid ‹SymmID›] [-i ‹Interval›] [-c ‹Count›] [-rdf]

  ping

symrdf [-sid ‹SymmID›] [-i ‹Interval›] [-c ‹Count›]
    [-offline] [-v]
    [-all]
    [-rdfg ‹GrpNum›] [-bcv | -nobcv] [-rdfa] [-resv]
    [-consistency] [-concurrent]
    [-cascade] [-diskless_rdf]
    [[-R1 | -R2 | -R21] |
     [-dynamic [-R1 | -R2 | -BOTH]]]
    [-half_pair] [-dup_pair] [-star_mode]
    [-star_sync_target] [-star_async_target]
    [-cons_exempt] [-rdfa_wpace_exempt]
    [-rdfa_not_pace_capable]

  list [dev]

  list pd
```

```
symrdf -sid <SymmID> -rdfg <GrpNum> [-v]
   [-noprompt] [-i <Interval>] [-c <Count>]
   [-star]

  activate    <<-rdfa_dse [-both_sides]> |
            <-rdfa_pace | -rdfa_wpace | -rdfa_devpace
             [-force]>>

  deactivate  <<-rdfa_dse [-both_sides]> | -rdfa_wpace |
            <<-rdfa_pace | -rdfa_devpace> [-symforce]>>

  msc_cleanup

  set rdfg    <[-limbo <Secs>]
            [-domino <State>]
            [-autolink_recovery <State>]
            [-hwcomp <State>]
            [-swcomp <State>]>
            [-both_sides]

  set rdfa    <[-cycle_time <CycleTime>]
            [-priority <SessPriority>]
            [-transmit_idle <State>]>
            [-both_sides]

  set rdfa_pace
           <[-dp_autostart <State>]
            [-wp_autostart <State>]
            [-delay <WpaceDelay>]
            [-threshold <WpaceThreshold>]>
            [-both_sides]

  set rdfa_dse
           <[-autostart <State>]
            [-threshold <DseThreshold>]
            [-fba_pool <PoolName>]
            [-ckd3390_pool <PoolName>]
```

```
            [-ckd3380_pool <PoolName>]
            [-as400_pool <PoolName>]>
            [-both_sides]

    set label <GrpLabel>
```

Device Groups

```
  symrdf -g <DgName> [-v | -noecho] [-force] [-symforce]
     [-bypass] [-noprompt] [-i <Interval>] [-c <Count>]
     [-hop2 | -bcv [-hop2] | -all | -rbcv | -brbcv]
     [-rdfg <GrpNum>] [-star]
    deletepair

    establish [-full] [<LdevName> [<LdevName>...]]

    failback  [-remote] [-rp] [<LdevName> [<LdevName>...]]

    failover  [<LdevName> [<LdevName>...]]
          [-establish | -restore [-remote]]

    half_deletepair

    half_movepair -new_rdfg <GrpNum>

    half_swap

    merge     [-rp] [<LdevName> [<LdevName>...]]

    movepair -new_rdfg <GrpNum>

    restore   [-remote] [-rp] [-full]
          [<LdevName> [<LdevName>...]]

    resume    [-remote] [-rp] [<LdevName> [<LdevName>...]]

    split     [<LdevName> [<LdevName>...]]
```

```
    swap   [-refresh R1|R2]

    suspend   [<LdevName> [<LdevName>...]]

    update    [-remote] [-rp] [-until <InvalidTracks>]
            [<LdevName>...]

    invalidate <R1|R2> [<LdevName> [<LdevName>...]] [-nowd]

    not_ready  <R1|R2> [<LdevName> [<LdevName>...]]

    ready     <R1|R2> [<LdevName> [<LdevName>...]]

    refresh    <R1|R2> [-rp] [<LdevName> [<LdevName>...]]

    rw_disable R2 [<LdevName> [<LdevName>...]]

    rw_enable     <R1|R2> [<LdevName> [<LdevName>...]]

    write_disable <R1|R2> [<LdevName> [<LdevName>...]]
symrdf -g <DgName>
     [-hop2 | -bcv [-hop2] | -rbcv | -brbcv | -all]
     [-offline] [-i <Interval>] [-c <Count>]
     [-rdfg <GrpNum>]

    query [-rdfa | -summary] [<LdevName> [<LdevName>...]]

    verify [-summary]
     [-enabled | -synchronized | -suspended |
      -susp_offline | -split | -failedover | -updated |
      -syncinprog | -updateinprog | -partitioned |
      -valid | -consistent [-noinvalids] |
      -acp_disk | -acp_wp | -asynchronous |
      -semisynchronous | -synchronous]
      [<LdevName> [<LdevName>...]]
```

symrdf -g ‹DgName› [-v] [-bypass] [-force] [-star]
[-noprompt] [-i ‹Interval›] [-c ‹Count›]
[-hop2 | -bcv [-hop2] | -rbcv | -brbcv | -all]
[-rdfg ‹GrpNum›]

set acp_skew ‹SkewVal› [‹LdevName› [‹LdevName›...]]

set domino ‹State› [‹LdevName› [‹LdevName›...]]

set mode ‹ModeVal› [skew ‹SkewVal›]
[‹LdevName› [‹LdevName›...]] [-consistent]

set nr_if_invalid ‹State› [‹LdevName› [‹LdevName›...]]

Device group operations specific to SRDF/A

symrdf -g ‹DgName› [-v | -noecho] [-force] [-symforce]
[-bypass] [-noprompt] [-i ‹Interval›] [-c ‹Count›]
[-hop2 | -bcv [-hop2] | -all | -rbcv | -brbcv]
[-rdfg ‹GrpNum›] [-star]

disable

enable

failover [-immediate] [-establish | -restore [-remote]]

half_movepair -new_rdfg ‹GrpNum› [-cons_exempt]

movepair -new_rdfg ‹GrpNum› [-cons_exempt]

split [-immediate]

suspend [-immediate | -cons_exempt]

activate ‹-rdfa_dse |
-rdfa_pace | -rdfa_wpace | -rdfa_devpace |

```
                -rdfa_wpace_exempt [<LdevName> [LdevName>...]]>

        deactivate <-rdfa_dse |
                -rdfa_pace | -rdfa_wpace | -rdfa_devpace |
                -rdfa_wpace_exempt [<LdevName> [LdevName>...]]>

      symrdf -g <DgName>
        [-hop2 | -bcv [-hop2] | -rbcv | -brbcv | -all]
        [-i <Interval>] [-c <Count>] [-rdfg <GrpNum>]

        checkpoint
  Composite Groups

      symrdf -cg <CgName> [-v | -noecho] [-force] [-symforce]
        [-bypass] [-noprompt] [-i <Interval>] [-c <Count>]
        [-sid <SymmID> |
         -rdfg <SymmID:GrpNum <,GrpNum,...>> | all [,...] |
          name:<RdfGroupName>[,<RdfGroupName>,...]]
        [-hop2 | -bcv [-hop2] | -rbcv | -brbcv] [-star]

        deletepair

        establish  [-full] [<LdevName> [<LdevName>...]]

        failback   [-remote] [-rp] [<LdevName> [<LdevName>...]]

        failover   [<LdevName> [<LdevName>...]]
                [-establish | -restore [-remote]]

        half_deletepair

        half_swap

        merge     [-rp] [<LdevName> [<LdevName>...]]

        msc_cleanup
```

```
restore  [-remote] [-rp] [-full]
        [<LdevName> [<LdevName>...]]

resume   [-remote] [-rp] [<LdevName> [<LdevName>...]]

split   [<LdevName> [<LdevName>...]]

suspend [<LdevName> [<LdevName>...]]

swap    [-refresh <R1|R2>]

update    [-remote] [-rp] [-until <InvalidTracks>]
         <LdevName ...>

invalidate <R1|R2> [<LdevName> [<LdevName>...]] [-nowd]

not_ready  <R1|R2> [<LdevName> [<LdevName>...]]

ready     <R1|R2> [<LdevName> [<LdevName>...]]

refresh    <R1|R2> [-rp] [<LdevName> [<LdevName>...]]

rw_disable   R2    [<LdevName> [<LdevName>...]]

rw_enable  <R1|R2> [<LdevName> [<LdevName>...]]

write_disable <R1|R2> [<LdevName> [<LdevName>...]]

symrdf -cg <CgName> [-offline] [-i <Interval>] [-c <Count>]
    [-hop2 | -bcv [-hop2] | -rbcv | -brbcv]
    [-sid <SymmID> |
     -rdfg <SymmID:GrpNum <,GrpNum,...>> | all [,...] |
     name:<RdfGroupName>[,<RdfGroupName>,...]]

query  [-detail | -summary] [<LdevName> [<LdevName>...]]

verify [-summary]
```

```
[-enabled | -synchronized | -suspended |
 -susp_offline | -split | -failedover | -updated |
 -syncinprog | -updateinprog | -partitioned |
 -valid | -consistent [-noinvalids] |
 -cg_consistent |
 -acp_disk | -acp_wp | -asynchronous |
 -semisynchronous | -synchronous]
 [<LdevName> [<LdevName>...]]

symrdf -cg <CgName> [-v] [-force]
   [-bypass] [-noprompt] [-i <Interval>] [-c <Count>]
   [-hop2 | -bcv [-hop2] | -rbcv | -brbcv]
   [-sid <SymmID> | -rdfg <SymmID:GrpNum <,GrpNum,...>> |
    name:<RdfGroupName>[,<RdfGroupName>,...]] [-star]

  set acp_skew <SkewVal> [<LdevName> [<LdevName>...]]

  set domino <State> [<LdevName> [<LdevName>...]]

  set mode <ModeVal> [skew <SkewVal>]
     [<LdevName> [<LdevName>...]]

  set nr_if_invalid <State> [<LdevName> [<LdevName>...]]

Composite group operations specific to SRDF/A

symrdf -cg <CgName> [-v | -noecho] [-force] [-symforce]
   [-bypass] [-noprompt] [-i <Interval>] [-c <Count>]
   [-sid <SymmID> |
    -rdfg <SymmID:GrpNum <,GrpNum,...>> | all [,...] |
     name:<RdfGroupName>[,<RdfGroupName>,...]]
   [-hop2 | -bcv [-hop2] | -rbcv | -brbcv] [-star]

  failover [-immediate] [-establish | -restore [-remote]]

  split   [-immediate]
```

```
    suspend  [-immediate | -cons_exempt]

    activate <-rdfa_dse |
          -rdfa_pace | -rdfa_wpace | -rdfa_devpace |
          -rdfa_wpace_exempt [<LdevName> [LdevName>...]]>

    deactivate  <-rdfa_dse |
          -rdfa_pace | -rdfa_wpace | -rdfa_devpace |
          -rdfa_wpace_exempt [<LdevName> [LdevName>...]]>

  symrdf -cg <CgName> [-i <Interval>] [-c <Count>]
     [-hop2]
     [-rdfg name:RdfGroupName]

    checkpoint
```

Storage Groups

```
  symrdf -sg <SgName> -sid <SymmID> -rdfg <GrpNum>
     [-bypass] [-noprompt] [-i <Interval>] [-c <Count>]
     [-v | -noecho] [-force] [-symforce] [-star]
     [-hop2]

    createpair -type <R1|R2> -remote_sg <SgName>
     <-invalidate <R1|R2> | -establish | -restore [-rp] |
      -format [-establish]>
     [-hop2_rdfg <GrpNum>]
     [-rdf_mode <sync | acp_wp | acp_disk>]
     [-remote] [-nowd]

    deletepair

    establish [-full]

    failback  [-remote] [-rp]

    failover [-establish | -restore [-remote]]
```

half_deletepair

half_movepair -new_rdfg ‹GrpNum›

half_swap

merge [-rp]
movepair -new_rdfg ‹GrpNum›

restore [-remote] [-rp] [-full]

resume [-remote] [-rp]

split

suspend

swap [-refresh ‹R1|R2›]

update [-remote] [-rp] [-until ‹InvalidTracks›]

invalidate ‹R1|R2› [-nowd]

not_ready ‹R1|R2›

ready ‹R1|R2›

refresh ‹R1|R2› [-rp]

rw_disable R2

rw_enable ‹R1|R2›
write_disable ‹R1|R2›

symrdf -sg ‹SgName› -sid ‹SymmID› -rdfg ‹GrpNum›
[-offline] [-i ‹Interval›] [-c ‹Count›]

```
        [-hop2]

      query [-summary]

      verify [-summary]
        [-enabled | -synchronized | -suspended |
         -susp_offline | -split | -failedover | -updated |
         -syncinprog | -updateinprog | -partitioned |
         -valid |
         -acp_disk | -acp_wp |
         -synchronous]

    symrdf -sg <SgName> -sid <SymmID> -rdfg <GrpNum>
        [-force] [-v] [-bypass] [-noprompt]
        [-i <Interval>] [-c <Count>] [-star]
        [-hop2]

      set acp_skew <SkewVal>

      set domino <State>

      set mode <ModeVal> [skew <SkewVal>] [-consistent]

      set nr_if_invalid <State>

Storage group operations specific to SRDF/A

    symrdf -sg <SgName> -sid <SymmID> -rdfg <GrpNum>
        [-bypass] [-noprompt] [-i <Interval>] [-c <Count>]
        [-v | -noecho] [-force] [-symforce] [-star]
        [-hop2]

      createpair -type <R1|R2> -remote_sg <SgName>
        <-invalidate <R1|R2> | -establish | -restore [-rp] |
         -format [-establish]>
        [-hop2_rdfg <GrpNum>]
        [-rdf_mode <async>]
```

```
    [-remote] [-cons_exempt] [-nowd]

  disable

  enable

  failover [-immediate] [-establish | -restore [-remote]]

  half_movepair -new_rdfg <GrpNum> [-cons_exempt]

  movepair -new_rdfg <GrpNum> [-cons_exempt]

  split    [-immediate]

  suspend  [-immediate | -cons_exempt]

  activate   <-rdfa_dse |
           -rdfa_pace | -rdfa_wpace | -rdfa_devpace |
           -rdfa_wpace_exempt>

  deactivate <-rdfa_dse |
           -rdfa_pace | -rdfa_wpace | -rdfa_devpace |
           -rdfa_wpace_exempt>

symrdf -sg <SgName> -sid <SymmID> -rdfg <GrpNum>
    [-offline] [-i <Interval>] [-c <Count>]
    [-hop2]

  query [-rdfa | -summary]

  verify [-summary]
    [-enabled | -suspended |
     -susp_offline | -split | -failedover | -updated |
     -syncinprog | -updateinprog | -partitioned |
     -valid | -consistent [-noinvalids] |
     -asynchronous]
```

```
symrdf -sg <SgName> -sid <SymmID> -rdfg <GrpNum>
    [-i <Interval>] [-c <Count>]
    [-hop2]
  checkpoint
```

Device Files

```
symrdf -file <Filename> -sid <SymmID> -rdfg <GrpNum>
    [-bypass] [-noprompt] [-i <Interval>] [-c <Count>]
    [-v | -noecho] [-force] [-symforce] [-star]

  createpair -type <R1|R2>
    <-invalidate <R1|R2> | -establish | -restore [-rp] |
     -format [-establish]>
    [-rdf_mode <sync|semi|acp_wp|acp_disk|async>]
    [-g <NewDg>] [-remote] [-nowd]

  deletepair

  establish [-full]

  failback  [-remote] [-rp]

  failover [-establish | -restore [-remote]]

  half_deletepair

  half_movepair -new_rdfg <GrpNum>

  half_swap

  merge [-rp]
  movepair -new_rdfg <GrpNum>

  restore  [-remote] [-rp] [-full]

  resume  [-remote] [-rp]
```

```
    split

    suspend

    swap [-refresh <R1|R2>]

    update [-remote] [-rp] [-until <InvalidTracks>]

    invalidate   <R1|R2> [-nowd]

    not_ready    <R1|R2>

    ready        <R1|R2>

    refresh      <R1|R2> [-rp]

    rw_disable    R2

    rw_enable    <R1|R2>
    write_disable <R1|R2>

symrdf -file <Filename> -sid <SymmID> -rdfg <GrpNum>
    [-offline] [-i <Interval>] [-c <Count>]

    query [-rdfa | -summary]

    verify [-summary]
     [-enabled | -synchronized | -suspended |
      -susp_offline | -split | -failedover | -updated |
      -syncinprog | -updateinprog | -partitioned |
      -valid | -consistent [-noinvalids] |
      -acp_disk | -acp_wp | -asynchronous |
      -semisynchronous | -synchronous]

symrdf -file <Filename> -sid <SymmID> -rdfg <GrpNum>
     [-force] [-v] [-bypass] [-noprompt]
```

```
    [-i <Interval>] [-c <Count>] [-star]

  set acp_skew <SkewVal>

  set domino <State>

  set mode <ModeVal> [skew <SkewVal>] [-consistent]

  set nr_if_invalid <State>
```

Device File operations specific to SRDF/A

```
symrdf -file <Filename> -sid <SymmID> -rdfg <GrpNum>
    [-bypass] [-noprompt] [-i <Interval>] [-c <Count>]
    [-v | -noecho] [-force] [-symforce] [-star]

  createpair -type <R1|R2>
    <-invalidate <R1|R2> | -establish | -restore [-rp] |
     -format [-establish]>
    [-rdf_mode <async>]
    [-g <NewDg>] [-remote] [-cons_exempt] [-nowd]

  disable

  enable

  failover [-immediate] [-establish | -restore [-remote]]

  half_movepair -new_rdfg <GrpNum> [-cons_exempt]

  movepair -new_rdfg <GrpNum> [-cons_exempt]

  split    [-immediate]

  suspend  [-immediate | -cons_exempt]

  activate   <-rdfa_dse |
```

```
                -rdfa_pace | -rdfa_wpace | -rdfa_devpace |
                -rdfa_wpace_exempt›

        deactivate ‹-rdfa_dse |
                -rdfa_pace | -rdfa_wpace | -rdfa_devpace |
                -rdfa_wpace_exempt›

    symrdf -file ‹Filename› -sid ‹SymmID› -rdfg ‹GrpNum›
        [-i ‹Interval›] [-c ‹Count›]
        checkpoint

    symrdf -file ‹Filename› -sid ‹SymmID› -rdfg ‹GrpNum›
        [-noprompt] [-i ‹Interval›] [-c ‹Count›]
        [-v | -noecho] [-force]

        migrate ‹-setup |
            -replace ‹R1 -new_rdfg ‹GrpNum› | R2››
            ‹-config ‹PairConfigType››

Dynamic Groups

    symrdf addgrp -label ‹GrpLabel› -rdfg ‹GrpNum›
        -sid ‹SymmID›
        -dir ‹Dir[:‹Port›,...][,Dir[:‹Port›,...][,...]›
        -remote_rdfg ‹GrpNum› -remote_sid ‹SymmID›
        -remote_dir ‹Dir[:‹Port›,...][,Dir[:‹Port›,...][,...]›
        [-noprompt] [-i ‹Interval›] [-c ‹Count›]
        [[-fibre] | [-gige] | [-farpoint]]
        [-link_domino] [-remote_link_domino]
        [-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[:‹Port›,...][,Dir[:‹Port›,...][,...]›]
        [-remote_dir ‹Dir[:‹Port›,...][,Dir[:‹Port›,...]
```

[,...]›]
[-noprompt] [-i ‹Interval›] [-c ‹Count›] [-star]

symrdf removegrp -sid ‹SymmID›
‹-rdfg ‹GrpNum› | -label ‹GrpLabel››
[-noprompt] [-i ‹Interval›] [-c ‹Count›] [-star]
[-symforce]

DESCRIPTION

The symrdf command invokes an SRDF operation on a group of remotely-mirrored standard devices, or on one remotely-mirrored standard device. These operations can be performed on device groups, device files, composite groups, storage groups, and individual devices.

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), querying the state of the remotely mirrored pair, and setting the SRDF mode.

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 that you cannot perform an establish or restore if the remote pair state is not split or suspended.

Other operations include: creating, modifying and removing dynamic SRDF groups; creating, deleting and swapping SRDF device pairs; querying the state of SRDF pairs; verifying the state of SRDF pairs.

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 this 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 enabled for remote database consistency is called an SRDF consistency group.

Dynamic SRDF group operations consist of adding and modifying dynamic SRDF groups and creating and modiying SRDF device pairs.

ARGUMENTS

activate Activates the SRDF/A DSE or SRDF/A write pacing feature.

addgrp Creates a dynamic SRDF group.

checkpoint Returns checkpoint complete status when the data in the current cycle is committed to the R2 side.

Valid only for SRDF/A-capable devices that are participating in an active SRDF/A session. All the supplied devices must be in the same SRDF/A session.

createpair Creates dynamic SRDF pairs based on devices specified in a device file.
The Symmetrix ID specified is the R1 side by default, but can be the R2 side if the -R2 option is used.

deactivate Deactivates the SRDF/A DSE or SRDF/A write pacing feature.

deletepair Deletes dynamic SRDF pairing in the specified 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 the source (R1) side to the target (R2) side.

Depending on whether the 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 SRDF pair, invalidates all or the required tracks for the target (R2) side. Finally, a full data copy is started from the source (R1) side to target (R2) side.

For this action to execute, the standard SRDF devices in the group must be split.

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 SRDF links. Then it write enables the devices on the source (R1)

side to 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 SRDF links and write disables the devices on the source (R1) side to their local hosts. Then, it suspends traffic on the SRDF links, write enables the devices on the target side to their local hosts.

half_deletepair
Deletes one-half of the designated dynamic SRDF pair.

half_movepair Moves one side of the dynamic SRDF pair from one group to another group.

half_swap Swaps the SRDF personality of one-half of the designated dynamic SRDF pair. Source R1 devices become target R2 devices, and target R2 devices become source R1 devices.

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.

label Modifies the label of an existing dynamic SRDF group.

list Lists all SRDF devices.

merge Merges the device track tables of the

source (R1) side and the target (R2) side for one or all devices in a device group.

migrate Migrates an existing R1 or R2 device to a new device in a new Symmetrix array.

modifygrp Modifies an existing dynamic SRDF group.

movepair Moves both sides of a dynamic SRDF pair from one group to another group.

msc_cleanup Initiates an MSC cleanup operation.

not_ready Sets the source (R1) devices or the target (R2) devices to be SRDF Not Ready to their respective local hosts.

ping Pings one or more Symmetrix arrays. By default, only the remotely-connected Symmetrix arrays are pinged over SRDF links. If the -rdf option is specified, an RDF-configured Symmetrix array attached locally is pinged over SRDF links. The default is to ping it locally over the I/O channel.

The ping action returns a unique return code if all or some of the targeted Symmetrix arrays were successfully pinged.

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

ready Sets the source (R1) devices or the target (R2) devices to be SRDF Ready to their respective local hosts.

refresh Marks the source (R1) devices or the target (R2) devices to refresh from the remote mirror.

removegrp Removes a dynamic SRDF group.

restore Resumes remote mirroring and initiates a data copy from the target (R2) side to the source (R1) side. Depending on the operation, all (full) or only changed tracks (incremental) are copied to the source (R1) side.

Write disables the target devices to their local hosts. Subsequently, for each SRDF 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 SRDF devices in the group are in the Split pair state.

resume Resumes I/O traffic on the SRDF links for the remotely-mirrored pairs in the group.

rw_disable Read/write disables the source (R1) devices 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 their local hosts.

set Modifies the setting to the specified value.

split Stops remote mirroring for the SRDF pairs in the group. For each SRDF pair, suspends I/O traffic on the SRDF links and write enables the target devices to their local hosts.

This action can only be executed if the remotely-mirrored standard devices in the group are synchronized.

suspend Suspends I/O traffic on the SRDF links for the remotely mirrored pairs in the group.

swap Swaps the SRDF personality of the designated SRDF devices. Source R1 devices become target R2 devices, and target R2 devices become source R1 devices.

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 hosts.

verify Verifies whether one SRDF device pair or all SRDF device pairs in a device group or device file are in specific pair state, SRDF mode, or are enabled.

The verify action returns a unique return code if the verify criteria are not met.

write_disable Write disables the source (R1) devices or the target (R2) devices to their local hosts.

KEYWORDS

acp_skew Modifies the value of the skew factor for the set adaptive copy mode.

dev Lists all SRDF devices that are configured on the Symmetrix arrays attached to this host. This is the default with the list command.

domino Sets the domino mode for one or more SRDF pairs in a device group to enabled or disabled. Acceptable values are on (enabled) or off (disabled).

mode Sets the SRDF mode for one or more SRDF pairs in a device group to a ‹ModeVal› of synchronous (sync), semi-synchronous (semi), asynchronous (async), adaptive copy disk mode (acp_disk), or adaptive copy write pending mode (acp_wp), or it turns off the adaptive copy mode (acp_off).

nr_if_invalid Identifies whether the R2 devices in the devices pairs are marked as Not Ready due to invalid tracks. Acceptable values are on (enabled) or off (disabled).

pd Lists all SRDF devices visible to this host.

rdfa Sets the SRDF/A attributes.

rdfa_dse Sets the SRDF/A data set extension attributes.

rdfa_pace Sets the SRDF/A pace attributes.

rdfg Sets the SRDF/A group attributes.

OPTIONS

-acp_disk Verifies whether the SRDF device pairs are operating in adaptive copy disk mode.

-acp_wp Verifies whether the SRDF device pairs are operating in adaptive copy write pending mode.

-add Adds supporting SRDF directors to a dynamic SRDF group.

-all Lists all SRDF mirrors of the selected devices. Used with symrdf list.

When performing an SRDF control or set operation, it targets the SRDF action at all devices in the device group: Standard SRDF devices and locally-attached BCV SRDF devices.

This option is only supported for list and device group operations.

-asynchronous Verifies whether the SRDF device pairs are operating in asynchronous SRDF mode.

-as400_pool Specifies a DSE pool name containing SAVE devices with an AS400 emulation.If no argument is provided, the currently associated as400 pool is removed from the SRDF group.

-auto_link_recovery

Specifies whether the auto_link_recovery feature is locally enabled or disabled. Acceptable values are on (enabled) or off (disabled).

-autolink_recovery
Specifies whether the autolink_recovery feature is locally enabled or disabled, or if enabled on both sides if -both_sides is specified. Acceptable values are on (enabled) or off (disabled).

-autostart Specifies whether SRDF/A DSE is automatically activated when an SRDF/A session is on (Enabled) or off (Disabled) for the SRDF group. Acceptable values are on (Enabled) or off (Disabled).

-bcv Targets the SRDF action at the device group's locally-associated BCV devices that are configured as SRDF BCV devices.

-both Lists all SRDF devices that are RDF1 or RDF2 capable, when used with -dynamic.

-both_sides Targets the SRDF control at both sides of the SRDF link.

-brbcv Targets the SRDF action at the device group's remotely-associated SRDF BCV devices that can be BCV paired with the remote mirrors of the locally-associated SRDF BCV devices.

-bypass Bypasses any existing Symmetrix exclusive locks during an SRDF operation.
WARNING: Only use this flag if you are certain no other SRDF operation is in

progress at the local and/or remote Symmetrix arrays.

-c Specifies the number (count) of times to repeat the operation, displaying results appropriate to the operation at each iteration. Used with list, ping, query, and verify operations.

Specifies the number (count) of times to attempt to acquire an exclusive lock on the Symmetrix host database, or on the local and/or remote Symmetrix arrays. For SRDF control and set operations.

The time to wait between operation iterations or between attempts to acquire a needed lock is specified by -i (interval).

If neither -c nor -i is specified, these operations fail if unable to acquire a requested lock.

If -c is not specified and -i is specified, the program loops continuously, repeating the specified list, ping, query, or verify operation, or until the specified SRDF control or set operation has acquired the locks it needs and can start.

-cascade Lists cascaded SRDF devices (RDF21) and SRDF devices paired with RDF21 devices. When used with -R1, lists RDF1 devices paired with RDF21 devices. When used with -R2, lists RDF2 devices paired with RDF21 devices.

-cg Specifies a composite group name.

-cg_consistent Verifies that CG is RDF consistent.

-ckd3380_pool
Specifies a DSE pool name containing SAVE devices with a CKD3380 emulation. If no argument is provided the currently associated ckd3380 pool is removed from the SRDF group.

-ckd3390_pool
Specifies a DSE pool name containing SAVe devices with CKD3390 emulation. If no argument is provided, the currently associated ckd3390 pool is removed from the SRDF group.

-concurrent Lists concurrent SRDF devices (RDF11, RDF22) and SRDF devices paired with a concurrent SRDF device. When used with -R1, lists RDF11 devices and SRDF devices paired with a concurrent SRDF device. When used with -R2, lists RDF22 devices and RDF2 devices paired with a concurrent device.

-config Specifies the existing device pair configuration type. The only valid value is pair, which indicates the device pair is an R1-R2 pair that is not part of an SRDF concurrent or cascaded configuration.

-consistency Displays the SRDF consistency state when listing SRDF devices.

-consistent Verifies that the SRDF device pairs for a single SRDF group are in the R2 consistent

SRDF pair state, when used with the verify command. If the -noinvalids option is specified, it also verifies the SRDF device pairs do not have invalid tracks on the R1 and R2 sides.

When used with set mode sync, transitions from async to sync mode.

-cons_exempt Allows devices to be added, removed, or suspended without affecting the state of the SRDF/A session or requiring that other devices in the session be suspended. Used for an SRDF group supporting an active SRDF/A session.

When used with list operations, lists devices that are consistency exempt or that are paired with devices that are consistency exempt.

-cycle_time The minimum time to wait before attempting an SRDF/A cycle switch.

-delay The maximum host I/O delay that the SRDF/A write pacing feature will cause. Valid range of values for wpace_delay is between 1 and 1000000 micro-seconds.

-detail Displays detailed information for a CG, with information specific to the enable mode.

-dir Lists the local Symmetrix directors (separated by commas), such as, 1a, 1b, and so on.

-diskless_rdf Lists diskless SRDF devices as well as devices paired with diskless SRDF devices. When used with -R1, lists RDF1 devices that are either diskless or that are paired with a diskless device. When used with -R2, lists RDF2 devices that are either diskless or are paired with a diskless device. When used with -R21, lists RDF21 devices that are either diskless or that are paired with a diskless device.

-domino Specifies whether link domino is locally enabled or disabled, or enabled on both sides of an SRDF link when -both_sides is specified. Acceptable values are on (enabled) or off (disabled).

-dp_autostart Specifies whether the SRDF/A device-level pacing feature is automatically on (Enabled) or off (Disabled) when an SRDF/A session is activated for the RDF group. Acceptable values are on (enabled) or off (disabled).

-dup_pair Lists devices whose partner is of the same SRDF personality.

-dynamic Lists dynamic SRDF devices only. When used with -R1, lists RDF1 devices that are dynamic. When used with -R2, lists RDF2 devices that are also dynamic. When used with -both, lists SRDF devices that are RDF1 and RDF2 capable.

-enabled Verifies that the SRDF device pairs are in the SRDF consistency state.

-establish Begins a device copy. When used with

createpair, a full copy from the source to the target is started, synchronizing the dynamic SRDF pairs in the device file. When used with failover, the dynamic SRDF device pairs swap personality and an incremental establish is initiated. When used with -format option, the dynamic SRDF pair(s) will be made read/write on the RDF link without synchronization of the source and target after all tracks are cleared on what will become the R1 and R2 side.

-failedover Verifies the SRDF device pairs are in the Failedover pair state.

-farpoint Uses the FarPoint communication protocol.

-fba_pool Specifies a DSE pool name containing SAVE devices with an FBA emulation. If no argument is provided, the currently associated FBA pool is removed from the SRDF group.

-fibre Uses the Fibre Channel communication protocol.

-file Specifies a device file for SRDF operations. The device file contains device pairs (SymDevnames) listing a pair on each line. R1 devices are listed in the first column and R2 devices are listed in the second column. When using this option, specify an RDF group to which all devices in the first column belong.

For an R1 migration, you create a device

file to pair SRDF devices with the new non-SRDF devices. This pairing is used to temporarily transfer data from the existing R1 devices to the devices that will eventually replace them in an SRDF pair. The first column of the device file contains the existing R1 devices paired with the new non-SRDF devices in the second column.

For an R2 migration, you create a device file to pair SRDF devices with the new non-SRDF devices, which will eventually replace the existing R2 devices. The first column of the device file contains the R1 devices that are paired with the new devices in the second column when migration is complete.

-force Attempts to force the operation even though one or more devices in the device group may not be in the normal, expected SRDF state or SRDF mode for that operation.

-format When used with createpair, no data synchronization is done between source and target dynamic SRDF pairs in the device file after all tracks are cleared on what will become the R1 and R2 side.

-full Requests a full establish or restore operation. By default, if the -full option is not specified, an incremental establish or restore is attempted.

-g Specifies the device group name. For createpair, the device group is created with the devices in the device file.

-gige Uses the Gigabyte Ethernet protocol.

-h Provides brief online help information.

-half_pair Lists devices whose partner is not an SRDF device.

-hop2 Targets the SRDF action at the group's second-hop devices in a cascaded SRDF relationship. For example, in an RDF1 group, the action targets the R21->R2 pair of the R1->R21->R2 relationship.

-hop2_rdfg Specifies the SRDF group number for the second-hop. This can only be used when issuing a createpair -hop2 with an SG.

-hwcomp Specifies whether the hardware compression feature is on (enabled) or off (disabled). Compression minimizes the amount of data to be transmitted over an SRDF link. Acceptable values are on (enabled) or off (disabled).

-i Specifies the interval, in seconds, to wait, either between successive iterations of a list, ping, query, or verify operation, or between attempts to acquire an exclusive lock on the Symmetrix host database or on the local and/or remote Symmetrix arrays for SRDF control and set operations.

The default interval is 30 seconds.
The minimum interval is 5 seconds.
For passive actions the minimum interval is

15 seconds. Passive actions are actions that do not acquire an exclusive lock.

-immediate Applies only to SRDF/A-capable devices. Causes failover, split, and suspend commands to drop the SRDF/A session immediately.

-invalidate Marks the source (R1) devices or the target (R2) devices to invalidate for a full copy when an SRDF pair is created.

-label Specifies a label for a dynamic SRDF group.

-limbo Specifies the local link limbo value if used with the set argument and the remote link limbo value if used with the -both_sides option.

This option is for advanced users only. The link limbo range is 0-120 seconds. This value 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 are then marked Not Ready to the link. The default time is 10 seconds.

-link_domino Specifies whether the link domino feature is enabled or disabled. Acceptable values are on (enabled) or off (disabled).

-link_limbo Specifies a local link limbo value if used with the addgrp argument.

This option is for advanced users only. The link limbo range is 0-120 seconds. This value 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 are then marked Not Ready to the link. The default time is 10 seconds.

-new_rdfg Specifies a new group in which to move a dynamic SRDF pair.

When used with the migrate -replace R1 operation, specifies the SRDF group that connects the new R1 device to the existing R2 device.

-nobcv Lists standard SRDF devices only (excludes SRDF BCV devices).

-noecho Does not echo the progress status of the SRDF action to stdout.

-noinvalids Used with the -consistent option to verify the SRDF device pairs are in the R2 Consistent pair state, and the device pairs do not have invalid tracks on the R1 and R2 sides.

-noprompt Requests that prompts are not displayed after the command is entered. The default is to prompt the user for confirmation.

-nowd Bypasses the check to ensure the target of

the operation is not writable by the host. This applies to the source (R1) devices for the invalidate R1 action and to the target (R2) devices for the invalidate R2 action.

It applies to the R2 devices for all createpair actions, as well as to the R1 devices for the createpair -invalidate R1 action.

-offline Obtains data only from the configuration database on the host. No connections are made to any Symmetrix arrays. Available only for query and list actions.

-partitioned Verifies whether the SRDF device pairs are in the Partitioned pair state.

-priority The priority used to determine which SRDF/A sessions to drop if the cache becomes full. Valid range of values is 1-64.

-R1 Lists the RDF1 (R1) devices only. When used with -dynamic, lists the dynamic RDF1 devices.

-R2 Lists the RDF2 (R2) devices only. When used with -dynamic, lists the dynamic RDF2 devices.

-R21 Lists the RDF21 (R21) devices only.

-rbcv Targets the SRDF action at the device group's locally-associated SRDF BCV devices that can be BCV-paired with the remote mirrors of the standard RDF devices.

-rdf Pings the specified Symmetrix array using the SRDF links, even though it may be attached locally to the host.

-rdf_mode Sets the following SRDF modes for one or more SRDF pairs when issuing createpair: Synchronous (sync), Semi-synchronous (semi), Asynchronous (async), Adaptive Copy Disk mode (acp_disk), or Adaptive Copy Write Pending mode (acp_wp).

-rdfa Lists or queries devices that are SRDF/A-capable.

-rdfa_devpace Indicates that the operation affects the SRDF/A device-level write pacing feature.

-rdfa_dse Indicates that the operation affects the SRDF/A Delta Set Extension (DSE) feature.

-rdfa_not_pace_capable
When used with list operations, lists RDF pairs that cannot be write paced for any reason other than exemption from group-level SRDF/A Write Pacing.

-rdfa_pace Indicates that the operation affects both the group-level and the device-level components of the SRDF/A Write Pacing feature.

-rdfa_wpace Indicates that the operation affects the SRDF/A group-level Write Pacing feature.

-rdfa_wpace_exempt

When used with activate operations, excludes the specified devices from SRDF/A group-level Write Pacing.

When used with deactivate operations, clears a previously-set exempt state so that the specified devices can participate in SRDF/A group-level Write Pacing.

When used with list operations, lists devices that are exempt from SRDF/A group-level Write Pacing.

-rdfg Displays the SRDF devices belonging to the specified Symmetrix RA (SRDF) group number when used with list operations. When combined with other list options, displays devices that match those options within the specified group.

When used with controls, modify, and query, this option causes the operation to target a specific SRDF group.

When used with -sg createpair -hop2 this identifies the SRDF group associated with the SG. The -hop2_rdfg identifies the SRDF group to be used to create the new hop2 pair.

For the migrate operation, -rdfg represents the SRDF group used to pair the existing R1 device to the associated device in the second column of the file.

When migrating the R1 device, this SRDF group is temporary.

For composite groups, the format is a comma-separated combination of Symmetrix IDs and RA group numbers (SID:GRP,SID:GRP), or a comma-separated list of predefined names in the form of name:RdfGroupName, RdfGroupName, and so on.

-refresh Marks the source (R1) devices or the target (R2) devices to refresh from the remote mirror.

-remote Requests a remote data copy flag with failback, failover, restore, update, and resume. When the concurrent link is ready, data is copied to the concurrent SRDF mirror. These operations require the remote data copy option, or the concurrent link to be suspended.

-remote_auto_link_recovery
Enables auto-link recovery remotely.

-remote_dir Specifies a comma-separated list of remote Symmetrix directors, such as 1a,1b, and so on.

-remote_link_domino
Enables link domino remotely.

-remote_link_limbo
Specifies a remote link limbo value (range is 0-120 seconds).

This option is for advanced users only.

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 SRDF group number for the remote Symmetrix array.

-remote_sg Specifies the remote storage group name. When used with createpair -hop2 this is the remote storage group for the second-hop.

-remote_sid Specifies the remote Symmetrix array unique ID.

-remove Removes supporting RDF directors from a dynamic SRDF group.

-replace Replaces an original R1 or R2 device with a new device on another Symmetrix array. This is the second step of the SRDF migrate procedure.

-restore Begins a full copy from the target to the source, synchronizing the dynamic SRDF pairs in the device file. When used with failover, the dynamic SRDF device pairs swap personality and an incremental restore is initiated.

-resv Lists SRDF devices that have SCSI reservations.

-rp Allows the operation even though one or more devices are tagged for RecoverPoint. When used with refresh, only allowed for refresh R1.

-semisynchronous
Verifies whether the SRDF device pairs are operating in a semi-synchronous SRDF mode.

-setup Establishes a relationship and starts data synchronization between an existing R1 device on one Symmetrix array and a new device on another Symmetrix array. This is the first step of the SRDF migrate procedure.

-sg Specifies a storage group name.

-sid Specifies the unique Symmetrix ID.

For file operations, identifies the Symmetrix ID associated with the devices in the first column of the file.

-split Verifies the SRDF device pairs are in the Split pair state.

-star Specifies the action is targeted for devices in STAR mode.

-star_mode Lists devices currently in STAR mode.

-star_async_target
Allows the devices in async mode in an SRDF/Star environment to track changes between two target SRDF/Star sites.

-star_sync_target
Allows the devices in sync mode
in a SRDF/Star environment to track changes
between two target SRDF/Star sites.

-summary Displays a table showing the number of
device pairs in each SRDF pair state.

When used with query operations,
replaces the usual command output.

When used with the verify operation,
includes the table with the command output.

When used with the -interval and/or -count
options, also displays synchronization rate
and estimated ime to completion for both the
query and verify operations.

-suspended Verifies whether the SRDF device pairs
are in the Suspended pair state.

-susp_offline Verifies whether the SRDF device pairs
are in the Suspended pair state and
the SRDF link Suspend state is OFFLINE.

-swcomp Specifies whether the software compression
feature is enabled or disabled. Compression
minimizes the amount of data to be
transmitted over an SRDF link. Acceptable
values are on (enabled) or off (disabled).

-symforce Requests the Symmetrix array force operation
be executed when normally it is rejected.
Use extreme caution when using this option.

When used with removegrp action, removes one side of a dynamic SRDF group if the other side is not defined or is not accessible.
CAUTION: Use care when applying -symforce, as data could be lost or corrupted. Use of this option is not recommended, except in an emergency.
NOTE: To enable -symforce, a parameter called SYMAPI_ALLOW_RDF_SYMFORCE in the options file must be set to TRUE.

When used with -symforce, a split command executes on an SRDF pair, even when the pair is sync in progress or restore in progress. During the execution of an establish or restore command, -symforce prohibits the verification of valid tracks on the device at the source.

-synchronized Verifies whether the SRDF device pairs are in the Synchronized pair state.

-synchronous Verifies whether the SRDF device pairs are operating in synchronous SRDF mode.

-syncinprog Verifies whether the SRDF device pairs are in the SyncInProg pair state.

-threshold When used with rdfa_dse, it specifies the percentage of the Symmetrix array's write pending limit. Once the cache usage of all active SRDF/A groups in the array exceeds this limit, data tracks for this SRDF group start to spill over to disks. Acceptable values are between 20 and 100 integer values.

When used with rdfa_pace, it specifies the minimum percentage of the system write pending cache at which the Symmetrix array starts pacing host write I/Os for this SRDF group. Valid range of values is between 1 and *99*.

-transmit_idle
: If set to on (enabled), provides an extra level of protection so that the SRDF/A session does not drop when the SRDF link cannot transmit data. Acceptable values are on (enabled) or off (disabled).

-type
: Indicates the SRDF mirror type (R1 or R2) of the local devices when creating SRDF device pairs.

-until
: Specifies the number of invalid tracks to reach on the target side before the update action stops repeating every time the SRDF pair becomes updated.

-updated
: Verifies whether the SRDF device pairs are in the R1 Updated pair state.

-updateinprog
: Verifies whether the SRDF device pairs are in the R1 UpdInProg RDF pair state.

-v
: Provides a more detailed, verbose output.

-valid
: Verifies whether the SRDF device pairs are in a valid pair state.

-wp_autostart
: Specifies whether the SRDF/A write pacing feature is automatically on (enabled) when an SRDF/A session is activated for the SRDF

group. Acceptable values are on (enabled) or off (disabled).

PARAMETERS

acp_disk Sets the device pairs to adaptive copy disk mode.

acp_off Turns off the adaptive copy mode for the device pairs.

acp_wp Sets the device pairs to adaptive copy write pending mode.

all All SRDF (RA) groups.

async Sets the device pairs to asynchronous mode.

CgName The composite group name.

CycleTime The minimum time to wait before attempting an SRDF/A cycle switch.

DgName The device group name.

Dir Local or remote Symmetrix director.

DseThreshold Specifies the percentage of the Symmetrix array's write pending limit.

Filename The device file name.

GrpLabel The dynamic SRDF group label.

GrpNum The SRDF (RA) group number.

LdevName The logical device name of the standard

SRDF device.

ModeVal Sets the SRDF mode for one or more SRDF pairs in a device group. Possible values are:

sync
semi
acp_disk
acp_wp
acp_off
async

Note: The skew ‹SkewVal› and ‹LdevName› cannot be used with the async value. The -consistent option is only allowed with the sync value.

NewDg Identifies the DG name in which to add the device pair after the pair is created.

off Turns domino mode, hwcomp, swcomp, auto_link_recovery, transmit_idle, wp_autostart, dp_autostart, autostart or nr_if_invalid off.

on Turns domino mode, hwcomp, swcomp, auto_link_recovery, transmit_idle, wp_autostart, dp_autostart, autostart or nr_if_invalid on.

PairConfigType Identifies the pair configuration type for the migrate action. Possible values are:

pair

PdevName Hostname for the physical device, such as /dev/rdsk/c2t0d2s3.

PoolName Specifies the name of a collection of SAVE devices with a particular emulation type to use for SRDF/A DSE.

Port Local or remote Symmetrix director port.

R1 Operation is targeted at the source (R1) side.

R2 Operation is targeted at the target (R2) side.

RdfGroupName Logical name associated with the RDF (RA) group(s).

Secs Number of seconds to set for link limbo.

semi Sets the device pairs into semi-synchronous mode.

SessPriority The priority used to determine which SRDF/A sessions to drop if the cache becomes full.

SgName The storage group name.

SkewVal Sets the skew factor for the adaptive copy mode. Possible values range from 0 to 65,534 tracks. For devices larger than 2 GB, a value of 65,535 can be specified to target all the tracks of any given drive.

State Specifies the state for various SRDF set operations. Possible values are:

on

off

SymmID 12-character ID that specifies the Symmetrix array.

sync Sets the device pairs into synchronous mode.

value Adaptive copy skew value or link limbo value.

WpaceDelay The maximum host I/O delay that the SRDF/A write pacing feature will cause.

WpaceThreshold
The minimum percentage of the system write pending cache at which the Symmetrix array will start pacing host write I/Os for this SRDF group.

RETURN CODES

Code #	Code Symbol
0	CLI_C_SUCCESS
1	CLI_C_FAIL
2	CLI_C_DB_FILE_IS_LOCKED
3	CLI_C_SYM_IS_LOCKED
18	CLI_C_ALREADY_IN_STATE The device or device group is already in the desired RDF state or mode. Applicable only for RDF control and RDF set mode actions.
19	CLI_C_GK_IS_LOCKED All GateKeepers to the Symmetrix array are currently locked.

21 CLI_C_NEED_MERGE_TO_RESUME
You must issue an RDF merge track table before you can resume the RDF links.

22 CLI_C_NEED_FORCE_TO_PROCEED
You can only proceed if you are certain, use the force flag.

23 CLI_C_NEED_SYMFORCE_TO_PROCEED
You can only proceed if necessary, use the symforce flag. NOTE: EMC DOES NOT RECOMMEND USING THIS FLAG EXCEPT IN AN EMERGENCY.

WARNING: Using symforce may result in DATA INTEGRITY PROBLEMS.

The following codes are returned by the ping action:

8 CLI_C_NOT_ALL_PINGED
Not all of the targeted Symmetrix arrays are successfully pinged.

9 CLI_C_NONE_PINGED
None of the targeted Symmetrix arrays are successfully pinged.

The following codes are returned by the verify action:

4 CLI_C_NOT_ALL_SYNCHRONIZED
Not all requested devices are in the Synchronized state.

5 CLI_C_NONE_SYNCHRONIZED
No requested devices are in

the Synchronized state.

6 CLI_C_NOT_ALL_UPDATED
Not all requested devices are in the Updated state.

7 CLI_C_NONE_UPDATED
No requested devices are in the Updated state.

14 CLI_C_NOT_ALL_VALID
Not all requested devices are in a valid RDF state (some devices are in the Invalid RDF state).

15 CLI_C_NONE_VALID
No requested devices are in a valid RDF state (all devices are in the Invalid RDF state).

25 CLI_C_NOT_ALL_SPLIT
Not all requested devices are in the Split RDF state (some devices are in the Split RDF state).

26 CLI_C_NONE_SPLIT
No requested devices are in the Split RDF state.

27 CLI_C_NOT_ALL_SYNCINPROG
Not all requested devices are in the SyncInProg RDF state (some devices are in the SyncInProg RDF state).

28 CLI_C_NONE_SYNCINPROG
No requested devices are in the SyncInProg RDF state.

31 CLI_C_NOT_ALL_SUSPENDED
Not all requested devices are in the Suspended RDF state (some devices are in the Suspended RDF state).

32 CLI_C_NONE_SUSPENDED
No requested devices are in the Suspended RDF state.

33 CLI_C_NOT_ALL_FAILED_OVER
Not all requested devices are in the Failed Over RDF state.

34 CLI_C_NONE_FAILED_OVER
No requested devices are in the Failed Over RDF state.

35 CLI_C_NOT_ALL_UPDATEINPROG
Not all requested devices are in the R1 UpdInProg RDF state.

36 CLI_C_NONE_UPDATEINPROG
No requested devices are in the R1 UpdInProg RDF state.

37 CLI_C_NOT_ALL_PARTITIONED
Not all requested devices are in the Partitioned RDF state.

38 CLI_C_NONE_PARTITIONED
No requested devices are in the Partitioned RDF state.

39 CLI_C_NOT_ALL_ENABLED
Not all devices in the request are in the Enabled consistency state.

40 CLI_C_NONE_ENABLED
No devices in the request are in the Enabled consistency state.

45 CLI_C_NOT_ALL_SUSP_AND_OFFLINE
Not all devices in the request are in the Suspended state and the Offline link suspend state.

46 CLI_C_NONE_SUSP_AND_OFFLINE
None of the devices in the request are in the Suspended state and the Offline link suspend state.

70 CLI_C_NOT_ALL_CONSISTENT
Not all of devices in the request are consistent.

71 CLI_C_NONE_CONSISTENT
None of the devices in the request are consistent.

146 CLI_C_NOT_ALL_CONSISTENT_NOINVALIDS
Not all of the devices in the request are consistent and have no invalid tracks.

147 CLI_C_NONE_CONSISTENT_NOINVALIDS

None of the devices in the
request are consistent and have no
invalid tracks.

148 CLI_C_NOT_ALL_SYNCHRONOUS
Not all of the devices in the
request are in synchronous RDF mode.

149 CLI_C_NONE_SYNCHRONOUS
None of the devices in the
request are in synchronous RDF mode.

150 CLI_C_NOT_ALL_SEMISYNCHRONOUS
Not all of the devices in the
request are in semisynchronous RDF mode.

151 CLI_C_NONE_SEMISYNCHRONOUS
None of the devices in the
request are in semisynchronous RDF mode.

152 CLI_C_NOT_ALL_ASYNCHRONOUS
Not all of the devices in the
request are in asynchronous RDF mode.

153 CLI_C_NONE_ASYNCHRONOUS
None of the devices in the
request are in asynchronous RDF mode.

154 CLI_C_NOT_ALL_ACP_WP
Not all of the devices in the
request are in adaptive copy write pending
RDF mode.

155 CLI_C_NONE_ACP_WP
None of the devices in the
request are in adaptive copy write pending
RDF mode.

156 CLI_C_NOT_ALL_ACP_DISK
Not all of the devices in the
request are in adaptive copy disk RDF mode.

157 CLI_C_NONE_ACP_DISK
None of the devices in the
request are in adaptive copy disk RDF mode.

EXAMPLES

To create an R1 device group called ProdDB, enter:

```
symdg create ProdDB -type RDF1
```

To add an R1 device as logical device acct1 to the device group prod, enter:

```
symdg -g ProdDB -sid 001 add dev 006 acct1
```

To split all standard SRDF devices in device group ProdDB, enter:

```
symrdf -g ProdDB split
```

To split a list of standard RDF devices in device group ProdDB, enter:

```
symrdf -g ProdDB split DEV001 DEV015 DEV020
```

To establish standard device acct1 in group ProdDB, and initiate a full data copy from the source side (R1) to the target side (R2) for the device acct1, enter:

```
symrdf -g ProdDB -full establish acct1
```

To perform an incremental restore from the target (R2) side to the source side (R1) for the SRDF pair acct1 in

group ProdDB, enter:

```
symrdf -g ProdDB restore acct1
```

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

```
symrdf -g ProdDB query
```

To query information about a list of SRDF standard devices in device group ProdDB, enter:

```
symrdf -g ProdDB query DEV001 DEV015 DEV020
```

To invoke a failover operation on multiple logical SRDF devices (DEV001, DEV002, and DEV011) in group prodDB, enter:

```
symrdf -g prodDB failover DEV001 DEV002 DEV011
```

For UNIX only, to invoke a failover operation on multiple logical SRDF devices in group ProdDB listed in a separate file (yourldevlist), enter:

```
symrdf -g ProdDB failover `cat yourldevlist`
```

In the above 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 a dynamic SRDF pair from a file called devices. The devices file contains Symmetrix device names that constitute the dynamic pairs. The local source Symmetrix is sid 810. Enter:

```
symrdf createpair -g ProdDB -file devices -sid 810
  -rdfg 2 -invalidate r2 -nop -type RDF1
```

Communication is through SRDF 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 two columns. R1 devices are listed in the first column and R2 devices are listed in the second column as follows:

```
010A   00B7
010F   00BF
0106   00C5
```

To delete the SRDF pair, enter:

```
symrdf deletepair -g ProdDB -rdfg 2
```

symrecover

Provides the user interface to the
EMC SRDF Automated Recovery tool.

SYNOPSIS

```
symrecover [-h]

symrecover [-env | -version]

symrecover start -g ‹DgName› | -cg ‹CgName›
            -mode SYNC | ASYNC [-out ‹LogPath›]
    [-options ‹OptionFile›]
```

DESCRIPTION

The symrecover command provides the user interface to the EMC SRDF Automated Recovery tool. The various compound actions perform the necessary commands, in the proper order, to allow you to monitor and restart a single EMC SRDF/S or SRDF/A session.

This command can be run from either the R1 or the R2 side as long as the group being monitored is fully viewable from the host. Either -g or -cg must be specified.

PATH is a REQUIRED environment variable setting. The fully qualified path to the PERL binary directory that is shipped with Solutions Enabler must be added to the head of default system path. Optionally the monitor can be invoked by fully qualifying the perl executable.

ARGUMENTS

start Starts the recovery session.

OPTIONS

-cg Specifies the name of the composite group to monitor.

-env Displays the default option settings. All other coded options are ignored. This option is ignored if coded in the options file.

-g Specifies the name of the device group to monitor.

-h Provides brief, online help information.

-mode Specifies the type of SRDF session to monitor. Valid values are SYNC and ASYNC. There is no default and this option must be specified.

-options The fully-qualified file containing these program options.

Double quote characters are allowed to frame the option's value but are not required. If quotes are used, leading and trailing blanks are preserved in all enclosed values.

Options with no CLI value can be assigned 0 for disable and 1 for enable. Comments are allowed using the "#" character anywhere on the line. Blank lines are permitted.

'g' and 'cg' can not be placed in the options file.

Option names are case sensitive.

Example:

```
#
# Option file for cg TestCG01
#

monitor_cycle_time = 180
    # Changing monitor
    # cycle time from 300
    # (default) to 180
    # seconds
# Currently installed symcli location
symcli_dir =
  C:\\program files\\tps\\emc\\symcli\\bin
#
monitor_only = 1
#
```

-out Specifies an alternate fully-qualified directory location to use for the log file. If the output directory cannot be created or written to, a warning message is issued and monitoring continues, and messages are displayed on the console but are not written to the log file.

The default is to the log in the current working directory.

-version Returns the installed symrecover version. This option is ignored if coded in the options file.

PARAMETERS

CgName Specifies the user-defined composite group name.

DgName Specifies the user-defined device group name.

LogPath Defines an alternate directory location for the log file directory. Overrides the default directory.

OptionFile Specifies the filename and path of the internal log file. If an alternate log file name is specified when starting a symreplicate session, the same log file name must be specified when issuing the stop, restart, query, show, and delete commands for the same symreplicate session.

RETURN CODES

Code #	Code Symbol
0	CLI_C_SUCCESS
1	CLI_C_FAIL

FILES

The option file is created by the user. It must conform to the following syntax:

```
#Comment
cascaded_monitor_both_hops=[0 | 1]

email_server= <e_srvr_addr> /
  [email_addr_target= <e_addr1, e_addr2, ..., ...>
```

```
  [email_subject= <err_subject_string>]
  [email_log_level= <severity_level>]
  [email_frequency= <email_frequency>]

goldcopy_location= <location>
goldcopy_type= <copytype>
goldcopy_state_startup= <copystate>
goldcopy_state_post_restart= <copystate>
goldcopy_resync_interval= <resynctime>
goldcopy_max_wait= <maxwaittime>
goldcopy_clone_list= <list>

log_level= <severity_level>

monitor_cycle_time= <cyc_time>
monitor_only=[0 | 1] | run_once=[0 | 1]
    | run_until_first_failure=[0 | 1]

rdfg <concur_def>

restart_adcopy_resynch_threshold= <tracks>
restart_attempt_pause= <time>
restart_delay= <time>
restart_group_on_startup
restart_max_attempts= <attempts>
restart_max_wait_adcopy_sync= <time>
restart_max_wait_state_change= <statetime>
restart_max_wait_warn_interval= <warntime>
restart_rdfa_min_cycle_warn_interval= <cyclewarntime>
restart_rdfa_min_cycle_warn_value= <warntime>
restart_state_syncinprog_wait_time= <time>
restart_state_transmit_warn_interval= <time>
restart_state_transmit_wait_time= <transwaittime>
restart_sync_type= <synctype>
restart_window= <time>

# End of Option File script
```

The following are the descriptions of the various option parameters available within an option file:

```
Option          Description
----------------  --------------------
cascaded_monitor_both_hops
            Values: 0 or 1

            Specifies to monitor both hops of
            a cascaded SRDF configuration. This
            option is not enabled by default.

            This option requires the R1->R21
            session to be in SYNC mode and R21->R2
            session to be in ASYNC mode.

            Note: If this option is enabled,
            the -mode option is ignored.

email_addr_source  Value: an email address, e_addr1

            Specifies the email address to use in
            the 'from' field of all emails sent by
            symrecover. No checks are done about the
            validity of this email address. If
            this value is not set, then a default
            value is generated based on the
            system's hostname and current user.

email_addr_target  Value: a list of valid email addresses,
            e_addr1,e_addr2, ..., ...

            Specifies the email notification
            address(es) to alert on errors. If
            any of the email_* options are
            specified, this option must also be
```

specified to activate email alerts.
Multiple comma-delimited addresses may be specified.

There is no default value.

email_server Value: e_srvr_addr

Specifies the host target email server.
If any of the email_* options are specified, then this option must also be specified to activate email alerts.

There is no default value.

email_subject Value: err_subject_string

Specifies the email notification subject on errors. The default value is:

SymRecover Alert: Host [HostName] Group [DgName]

email_log_level Value: severity_level

Specifies the severity level desired for the email alert-triggering message.
Possible values are:

Value	Meaning
0	Off
1	Only errors are reported
2	Errors and Warnings are reported
3	Errors, Warnings, and

Informational messages are reported

4 All messages are reported including all SYMCLI commands and responses.

Note: For each message that meets the particular logging level requirement, an email is shipped with that message. It is highly recommended that at most this be set to either a 1 or a 2.

If the required email options (email_server and email_addr_target) are not specified, then the default value is 0. If they are specified, then the default value is 1.

email_frequency Value: email_frequency

Specifies the email frequency desired. Possible values are:

```
Value          Meaning
------         ---------------------
per_log_msg     Email per log msg that
                meets logging level
                requirement.
per_monitor_loop Email per monitor loop
per_restart     Email when error is
                detected, when session
                is restarted and
                finished.
```

default: per_restart.

goldcopy_location Value: location

Specifies the location of the backup (gold copy). Possible values are:

```
Location  Meaning
--------  -------------------
NONE      No gold copy is desired.

          All other goldcopy_* options
          are ignored.

R2        A gold copy on the R2 side
          is desired.

ALL       A gold copy on the R21 side
          and R2 side is desired.
```

The default is R2 and this value is case insensitive.

goldcopy_type Value: copytype

Specifies the type of goldcopy to create on the R2 side. Possible values are:

```
copytype  Meaning
--------  ---------------
none      No gold copy is desired.

bcv       A BCV gold copy on the R2
          side is desired.

clone     A Clone gold copy on the R2
          will be created.
```

The default is bcv and this value is

not case sensitive.

Note: When bcv copytype is selected, BCVs must be paired with the R2 devices before starting symrecover.

Note: When clone copytype is selected, target devices must have a clone session with the R2 devices before starting symrecover.

goldcopy_state_startup

Value: copystate

Specifies the desired state of the R2 BCV gold copy upon routine startup. Possible values are:

```
copystate  Meaning
---------  -------------
establish  The devices should be
           established (BCV only).

split      The devices should be split
           (BCV only).

activated  The devices should be
           activated (Clone only).

created    The devices should be
           in created state
           (Clone only).

none       The devices should be
           unchanged.
```

The default is none and this value is

case insensitive.

Note: If the goldcopy type is BCV and the default state of the BCVs is establish, this may drop an SRDF/A session under certain conditions.

goldcopy_state_post_restart

Value: copystate

Following a successful SRDF/A session, restart or BCV resync, specifies the required state of the R2 gold copy. Possible values are:

```
copystate  Meaning
---------  -------------
establish  The devices should be
           left established
           (BCV only).

split      The devices should be split
           (BCV only).

activated  The devices should be
           activated (Clone only).

created    The devices should be
           in created state
           (Clone only).
```

The default is split and this value is case insensitive.

Note: If the goldcopy type is BCV and the default state of the BCVs is establish this drop an SRDF/A session

under certain conditions.

goldcopy_max_wait Value: maxwaittime

Specifies the maximum length of time in seconds for the program to wait for a group to finish synchronizing the standard devices with the goldcopies during a restart.

Possible values are 0 to maxint.

The default is 0 which is to wait forever.

goldcopy_clone_list
Value: list

If goldcopy_type is set to CLONE, this option tells symrecover which list within the DG or CG to use to find the CLONE devices.

Possible values are:

list	Meaning
tgt	Use the TGT list.
bcv	Use the BCV list.

goldcopy_resync_interval
Value: resynctime

Defines the amount of time in minutes when the gold copy BCV mirror or clone is automatically resynchronized. If the

goldcopy_state_post_restart is split or activated, the resynchronization causes the BCV mirror to be established and then the split or clone to be recreated and activated. If the goldcopy_state_post_restart is establish, or created then resynchronization, this ensures the BCVs or Clones are in the requested state.

This action only takesplace during non-error periods.

Valid values are 0, and 15 to maxint.

Zero (0) indicates that the mirrors are never to be automatically synchronized outside of error producing events. The default is 0.

Note: If the goldcopy type is BCV, then the act of frequently synchronizing the R2 BCVs may drop an SRDF/A session under certain conditions.

monitor_cycle_time Value: cycletime

Defines the number of seconds to pause between monitor status scans.

The minimum value is 60 seconds; the maximum is 3600 seconds.

The default value is 300 seconds.

monitor_only Values allowed: 0 or 1

Specifies whether to monitor only the state of the specified group. No recovery actions are performed.

This option is not enabled by default.

Note: monitor_only, run_once, and run_until_first_failure are mutually exclusive options.

run_once Values allowed: 0 or 1

Specifies whether to check the status of the group once. If the group required recovery actions, it performs them. Exits after one check.

This option is not enabled by default.

This option ignores the setting of restart_max_attempts.

Note: monitor_only, run_once, and run_until_first_failure are mutually exclusive options.

run_until_first_failure
Values allowed: 0 or 1

Specifies whether to monitor the group until the first failure occurs, and then exits without performing any recovery action.

This option is not enabled by default.

This option ignores the setting of

restart_max_attempts.

Note: monitor_only, run_once, and run_until_first_failure are mutually exclusive options.

rdfg
Specifies the concurrent RDF definition for the group. This value is taken directly as specified and no data validation is done on it.

Monitoring RDF1 type DG/CG containing concurrent R1 devices or monitoring RDF2 type DG/CG containing concurrent R2 devices requires that the -rdfg option is specified.

This option is not set by default and non-concurrent RDF groups are assumed.

Note: If the group is a composite group and consistency is enabled, then this must be of the "name:" format and this value is case sensitive.

restart_adcopy_resynch_threshold
Value: tracks

Specifies the number of tracks outstanding that, during recovery, will trigger a switch over to SRDF/A.

The default value is 30000.

restart_attempt_pause
Value: time (seconds)

Specifies the wait time before an attempt is made to restart a failed session to allow for things to settle down. Then after the restart_attempt_pause is complete, symrecover restarts the overall monitor loop.

If there is still a problem, the restart failure count is incremented and a restart is attempted.

Valid values are 30 to 3600 seconds.

The default is 60 seconds.

restart_delay Value: time (seconds)

Specifies the wait time after an attempt is made to restart a failed session and the attempt itself fails.

Valid values are 0 (no delay, immediately restart) to maxint.

The default is 30 seconds.

restart_group_on_startup

On symrecover startup, if the group being monitored is not initially in a CONSISTENT state, symrecover, by default, considers that an error occurred and exits.

If this option is specified, symrecover attempts to recover the group on startup.

This option is not enabled by default.

restart_max_attempts

Value: attempts

Specifies the maximum number of restart attempts to perform within the restart_window interval. After this limit is reached, the program terminates.

The valid range is from 0 to maxint.

The value of 0 means to infinitely attempt.

The default is 5 attempts.

restart_max_wait_adcopy_sync

Value: time (seconds)

Specifies the length of time in seconds that, during a restart, the program waits for a group to achieve the restart_adcopy_resync_threshold number of tracks pending.

Valid values are 0 to maxint.

The value of 0 means to infinitely wait.

The default is 0.

restart_max_wait_state_change

Value: statetime (seconds)

Specifies the length of time in seconds, during a restart, that the program waits for a group to change to a desired state once the change is requested.

Valid values are 0 to maxint.

The value of 0 means to infinitely wait.

The default is 0.

restart_max_wait_warn_interval

Value: warntime (seconds)

Specifies the length of time in seconds, while waiting for a state change to occur during a restart, for a progress warning message to be displayed.

Valid values are 0 and 30 to maxint.

The value of 0 means to wait forever.

The default is 600 seconds.

restart_rdfa_min_cycle_warn_interval

Value: cyclewarntime (seconds)

Specifies the length of time in seconds for a warning message to be repetitively displayed when the RDFA minimum cycle time exceeds the restart_rdfa_min_cycle_warn_value parameter.

Valid values are 30 to maxint.

The default is 600.

restart_rdfa_min_cycle_warn_value

Value: warntime (seconds)

Specifies the maximum value in seconds which a trigger can occur with a warning message, indicating that the RDFA minimum cycle time has exceeded this value.

Valid values are 0 and 30 to maxint.

The value of 0 means this feature is turned off.

The default is 0.

restart_state_syncinprog_wait_time

Value: time (seconds)

Specifies the maximum length of time in seconds, during a group syncinprog state, that a sleep is done before rechecking the group status.

Valid values are 30 to maxint.

The default is 120 seconds.

restart_state_transmit_warn_interval

Value: time (seconds)

Specifies the interval of time in seconds, while a group remains in a transmit idle state, that a warning message is generated.

Possible values are 0 to maxint.

The default is 300 seconds.

restart_state_transmit_wait_time
Value: transwaittime (seconds)

Specifies the maximum length of time in seconds during a group transmit idle state, that a sleep is done before rechecking the group status.

Valid values are 30 to maxint.

The default is 120 seconds.

restart_sync_type Value: synctype

Specifies the type of synchronization to use following the detection of a failed SRDF/A session. Possible values are:

```
synctype  Meaning
--------  ---------------
ADCOPY    Adaptive copy disk

SYNC      Synchronous mode

NONE      Intermediate track resynch
          stage is attempted. A
          direct re-establish using
          the existing SRDF session
          mode is attempted.
```

The default is ADCOPY.

restart_window Value: time (seconds)

Specifies the length of time in seconds, starting with the first failure, that begins the clock for counting all successive failures.

Any failures that occur within this timespan are considered grouped.

This window is used to determine the maximum number of restarts that are permitted per window of time.

The minimum value is 1800 seconds; the maximum is 86400 seconds.

The default is 3600 seconds.

log_level Value: The desired logging level.

Possible values are:

Value	Meaning
0	Off.
1	Only Errors are reported.
2	Errors and Warnings are reported.
3	Errors, Warnings, and Informational messages are reported.
4	All messages are reported.

The default is 3.

symreplicate

Performs a coherent, recurrent, background copy of data through an SRDF/TimeFinder configuration.

SYNOPSIS

```
symreplicate [-h]

  start -g ‹DgName› | -cg ‹CgName›
    -options ‹OptionFile› [-log ‹LogFile›]
    [-sid ‹SymmID›] [-preaction ‹ScriptFile›]
    [-postaction ‹ScriptFile›] [-postcycle ‹ScriptFile›]
    [-steperror ‹ScriptFile›] [-foreground] [-noprompt]
    |-consistent] [-recover]
    [-setup [-optimize|-optimize_rag|-exact]]

  setup -g ‹DgName› | -cg ‹CgName›
    -options ‹OptionFile›
    [-log ‹LogFile›] [-sid ‹SymmID›]
    [-optimize|-optimize_rag|-exact]
    [-foreground] [-noprompt] [-recover]

  stop -g ‹DgName› | -cg ‹CgName› | -log ‹LogFile›
    [-sid ‹SymmID›] [-step] [-noprompt]

  restart -g ‹DgName› | -cg ‹CgName› | -log ‹LogFile›
    [-sid ‹SymmID›] [-options ‹OptionFile›]
    [-foreground] [-noprompt] [-recover]

  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 [-g <DgName> | -cg <CgName> | -log <LogFile>]
  -sid <SymmID>

release -g <DgName> | -cg <CgName> | -log <LogFile>
  [-sid <SymmID>] [-force]

stats -g <DgName> | -cg <CgName> | -log <LogFile>
  [-sid <SymID>] [-i Interval] [-c Count]
  [-cycle] [-itrks] [-all]
```

DESCRIPTION

The symreplicate command performs automated, incremental, coherent copies of data. By default, the symreplicate session is performed as a background process on Unix and Windows platforms. Two Symmetrix array configurations are supported:

1. SINGLE_HOP configuration
2. MULTI_HOP configuration

The symreplicate SINGLE_HOP configuration:

```
|---------------|---------------|
| Symmetrix 1 | Symmetrix 2 |
| ----------- | ----------- |
|           |           |
| Standard  |           |
| Devices   |           |
|     |     |           |
|     |                 |
| R1-BCV ---------- R2      |
| Devices       Devices   |
|           |     |     |
|           |     |     |
|           |    BCV    |
```

```
|          |  Devices   |
|          |            |
|---------------|---------------|
```

The single-hop configuration copies data from the standard devices on Symmetrix array 1 to the BRBCV devices on Symmetrix array 2. Then symreplicate incrementally establishes SRDF and BCV pairs, and differentially splits BCV pairs to reduce required data transfers.

Device locks are held during the entire symreplicate session. This keeps other applications from altering device states while symreplicate is active. For example, if a symreplicate session terminates unexpectedly due to a system crash, you may need to manually release the locks. For more information on releasing the locks, refer to the symdev manpage.

To set up this configuration, take any number of standard devices of the same type (R1, R2, or non-RDF), and create a device or composite group of the same type. Add devices to the group, associate an equal number of R1-BCV devices of matching sizes, and then associate an equal number of BRBCV devices, also of matching sizes.

The required SYMCLI command sequence is similar to the following:

```
symdg create newdg
symdg add dev 000 -g newdg -sid 0001
symdg add dev 001 -g newdg
<...>
symbcv associate dev 1C0 -g newdg
symbcv associate dev 1C1 -g newdg
<...>
symbcv associate dev 210 -g newdg -bcv -rdf
```

```
symbcv associate dev 211 -g newdg -bcv -rdf
<...>
```

To start a symreplicate session, the following conditions must be met, or you must perform these actions using the setup command:

- Both sets of BCV pairs must have a pairing relationship.

- The local BCV pairs must be Established, the SRDF pairs must be Suspended, and the BRBCV pairs must be Split.

These conditions can be met through a manual process or symreplicate can put the devices into the initial state if you specify -setup on the command line.

To manually set up the devices, follow these steps, which are the same steps used by the symreplicate -setup option:

1) Split the BCV pairs.
   (Wait for any ongoing establish to complete...)
   symmir split -g newdg

2) Establish the SRDF pairs.
   symrdf establish -g newdg -bcv

3) Suspend the SRDF pairs.
   (Wait for the establish operation to complete...)
   symrdf suspend -g newdg -bcv

4) Establish the BCV pairs.
   symmir establish -g newdg

5) Establish the BRBCV pairs.

```
symmir establish -g newdg -bcv -rdf

6) Split the BRBCV pairs.
   (Wait for the establish operation to complete...)
   symmir split -g newdg -bcv -rdf
```

You may have to use additional flags for the SYMCLI commands shown above (such as -full) if the BCV pairs do not have an existing pairing relationship. For more information on BCV pairing, refer to the symmir manpage.

Use the -preaction and -postaction options to specify scripts to run before and after step 1.

The symreplicate multi-hop configuration:

```
|---------------|---------------|---------------|
| Symmetrix 1 | Symmetrix 2 | Symmetrix 3 |
| ----------- | ----------- | ----------- |
|                     |           |
|    R1 ------------ R2     |           |
|  Devices       Devices   |           |
|          |     |     |           |
|          |     |                 |
|          |   R1-BCV ---------- R2      |
|          |   Devices       Devices   |
|          |          |     |     |
|          |          |     |     |
|          |          | (  BCV  ) |
|          |          | ( Devices ) |
|          |          |           |
|---------------|---------------|---------------|
```

The multi-hop configuration copies data from the R1 devices on Symmetrix array 1 to the R2 devices on Symmetrix array 2 (and, by default, to BCV devices), which are then copied to devices on Symmetrix array 3.

The symreplicate command then incrementally establishes the SRDF and BCV pairs, and differentially splits the BCV pairs to reduce required data transfers.

The second-hop BCV devices are used by default, but may be omitted by disabling the USE_FINAL_BCV option in the options file. For more information, refer to the FILES section below.

Device locks are held during the entire symreplicate session. This prohibits other applications from altering device states while symreplicate is active. For example, if a symreplicate session terminates unexpectedly due to a system crash, you may need to manually release the locks. For more information on releasing the locks, refer to the symdev manpage.

To set up this configuration, create an R1 device or composite group, and add any number of R1 devices. Remotely associate an equal number of matching sized R1-BCV RBCV devices. If the second-hop BCVs are being used, these must also have a pairing relationship with the second-hop R2 devices.

The required SYMCLI command sequence is similar to the following:

```
symdg create newdg2 -type RDF1
symdg add dev 040 -g newdg2 -sid 0001
symdg add dev 041 -g newdg2
<...>
symbcv associate dev 1A0 -g newdg2 -rdf
symbcv associate dev 1A1 -g newdg2 -rdf
<...>
```

Note that the final BCVs, if used, are not a part of the group itself. It is useful during setup to use a

device file to control the second-hop pairs. For more information on device files, refer to the symmir man page.

To start a symreplicate session, the following conditions must be met, or use -setup to perform these tasks:

- All BCV pairs must have a pairing relationship.

- The local SRDF pairs must be Synchronized, the BCV pairs must be Established, and the remote SRDF pairs must be Suspended.

- If the final BCVs are used, the BCV pairs on the second-hop Symmetrix array must also be in the Split state.

These conditions can be met through a manual process or symreplicate can put the devices into the initial state if you specify -setup on the command line.

To manually setup the devices, follow these steps, which are the same steps used by the symreplicate -setup option:

1) Split the first-hop BCV pairs.
   (Wait for any ongoing establish to complete...)
   symmir split -g newdg2 -rdf -remote

2) Establish the remote SRDF pairs.
   (This step is completed via the previous command.)

3) Suspend the remote SRDF pairs.
   (This step will be completed by the next command.)

4) Establish the first-hop BCV pairs.
   (Wait for the RDF establish to complete...)

```
    symmir establish -g newdg2 -rdf

 5) Establish the second-hop BCV pairs.
    symmir establish -f second_hop_devs.txt

 6) Split the second-hop BCV pairs.
   (Wait for the establish operation to complete...)
    symmir split -f second_hop_devs.txt
```

Note that steps 5 and 6 are only performed if the second-hop BCV pairs are used. The second_hop_devs.txt file is the device file. For more information on device files, refer to the symmir man page.

You may need to use additional flags for the SYMCLI commands shown above (such as -full) if the BCV pairs do not have an existing pairing relationship. For more information on BCV pairing, refer to the symmir manpage.

Use the -preaction and -postaction flags to specify scripts to run before and after step 1.

ARGUMENTS

delete Deletes the symreplicate log files written to the SFS (Symmetrix File System).

list Lists the symreplicate log files written to the SFS.

query Displays the status of a symreplicate session.

release Releases device locks held from a terminated symreplicate session.

restart Restarts a terminated symreplicate session

at the step where it stopped.

setup Places all devices into the initial state, then stops.

show Shows information from the symreplicate log file.

start Begins a new symreplicate session.

stats Displays cycle time and/or invalid track statistics.

stop Terminates an existing symreplicate session.

OPTIONS

-all Displays all available information, including -args, -devs, and -opts for a show action or "-itrks -cycle" for a stats action. This is the default for both actions.

-args Shows information about command line arguments used to start the symreplicate session.

-c Specifies a count to perform a specific action.

-cg Specifies a composite group name.

-consistent Consistently splits all the BCV pairs on the local Symmetrix array for a single-hop configuration, or on the Hop 1 remote Symmetrix array for a multi-hop

configuration.

-cycle Displays cycle time statistics. Valid for a stats action only.

-devs Shows the devices that participate in the symreplicate session.

-exact Causes setup to pair all STDs and BCVs exactly as they appear in the group. Valid only for -setup.

-force Forces the SYMAPI server to allow an action that would ordinarily fail. Valid for a release action only.

-foreground Makes the symreplicate process run in the foreground (background is the default). Not available on Windows systems.

-g Specifies the device group name.

-h Provides brief, online help information.

-i Specifies the interval in seconds to repeat a specific action.
The default interval is 30 seconds if -c is used.
The minimum interval is 5 seconds.
For passive actions the minimum interval is 15 seconds. Passive actions are actions that do not acquire an exclusive lock.

-itrks Display invalid track statistics. Valid for a stats action only.

-log Specifies a log file name.

-noprompt Disables the system prompt for user confirmation.

-optimize Causes -setup to split all pairs and perform an optimized STD-BCV pairing within a Symmetrix array. Valid only for -setup.

-optimize_rag Causes -setup to split all pairs and perform an optimized STD-BCV pairing within RA Groups. Valid only for -setup.

-options Specifies an options file.

-opts Shows options from the symreplicate options file that were used to start the session.

-postaction Performs this action after the instant or consistent split. Information is provided through the following command line arguments:

Argument	Meaning
P1	Device group name

-postcycle Performs this action after each cycle. Information about the completed cycle is provided through the following command line arguments:

Argument	Meaning
P1	Device group name.
P2	Current cycle number.

P3 Number of cycles (‹NumCycles›
from the option file, see
below).
P4 Cycle duration in seconds.

The -postcycle option is not available
on all platforms.

-preaction Performs this action before the instant
or consistent split. Information is
provided through the following command
line arguments:

Argument	Meaning
P1	Device group name

-recover Tells symreplicate to recover the device
locks, if possible. Makes sure that no
other symreplicate session using the same
devices is running when using -recover.

-setup Performs the steps necessary to place the
devices in the initial state.

-sid Specifies the unique Symmetrix ID to where
the symreplicate log file is written. The
Symmetrix array must be running Enginuity
version 5669 or higher.

-sort Specifies how the symreplicate log file
names are sorted, either by name or by
type. The default is to sort the log
files by name.

-step Stops after the current symreplicate
step completes, rather than waiting until

the end of a cycle.

-steperror Performs this action when symreplicate encounters an error during normal cycling. This parameter takes effect after a symreplicate session was successfully launched. Diagnostic information about the error is provided through the following command line arguments:

Argument	Meaning
P1	Device or composite group name.
P2	Current cycle number.
P3	Number of cycles (‹NumCycles› from the option file, see below).
P4	Cycle duration in seconds.
P5	Step number where the error occurred.
P6	Text message describing when the error occurred. Details about the error are written to the SYMAPI log file.

This parameter does not replace the need to check for a non-zero exit status from symreplicate. Errors that occur before the symreplicate session is launched do not cause the script to execute. The -steperror option is not available on all platforms.

PARAMETERS

CgName Composite group name provided by user.

DgName Device group name.

Field Field to use when sorting the file names. Valid fields are name and type.

LogFile Filename and path of an internal log file. If an alternate logfile name is specified when starting a symreplicate session, the same logfile name must be specified when issuing stop, restart, query, show, and delete commands for the same symreplicate session.

OptionFile Name of the text file that contains the required parameters of the replicate actions.

ScriptFile Filename of the pre-action or post-action script.

SymmID 12-digit Symmetrix ID. See the -sid option above for restrictions. Also, if -sid is specified when starting a symreplicate session, the same Symmetrix ID must be specified when issuing stop, restart, query, show, and delete commands for the same symreplicate session.

RETURN CODES

Code #	Code Symbol
0	CLI_C_SUCCESS
1	CLI_C_FAIL

FILES

The option file is created by the user. It must conform to the following syntax:

```
#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›
SYMCLI_REPLICATE_TF_CLONE_EMULATION=‹TRUE|FALSE›
SYMCLI_REPLICATE_PERSISTENT_LOCKS=‹TRUE|FALSE›
SYMCLI_REPLICATE_CONS_SPLIT_RETRY=‹NumRetries›
SYMCLI_REPLICATE_R1_BCV_EST_TYPE=‹EstablishType›
SYMCLI_REPLICATE_R1_BCV_DELAY=‹EstablishDelay›
SYMCLI_REPLICATE_FINAL_BCV_EST_TYPE=‹EstablishType›
SYMCLI_REPLICATE_FINAL_BCV_DELAY=‹EstablishDelay›
SYMCLI_REPLICATE_ENABLE_STATS=‹TRUE|FALSE›
SYMCLI_REPLICATE_STATS_RESET_ON_RESTART=‹TRUE|FALSE›
```

The allowed options are as follows:

```
Option Name     Description
--------------  -----------------------
SYMCLI_REPLICATE_HOP_TYPE
```

‹RepType› is required, and is one of:

```
‹RepType›  Meaning
---------  ---------
SINGLE     Single-hop configuration.
MULTI      Multi-hop configuration.
```

SYMCLI_REPLICATE_CYCLE

‹CycleTime› is the period to wait between copy operations, in minutes, or in hh:mm format. Defaults to 0. Either SYMCLI_REPLICATE_CYCLE or SYMCLI_REPLICATE_CYCLE_DELAY is required, though both may be set to 0.

SYMCLI_REPLICATE_CYCLE_OVERFLOW

‹OvfMethod› is a description of what to do if the cycle overruns the specified CycleTime. It is one of the following:

```
‹OvfMethod›  Meaning
-----------  ---------
IMMEDIATE    Begin the next cycle
             immediately. This is the
             default.
NEXT         Skip this cycle and wait
             for the next to begin.
```

SYMCLI_REPLICATE_CYCLE_DELAY

‹Delay› is the minimum time to wait between adjacent cycles. Even if a cycle overruns the specified CycleTime and OvfMethod is set to IMMEDIATE, if a Delay is specified, symreplicate still waits this long before beginning another cycle. Defaults to 0. Either SYMCLI_REPLICATE_CYCLE or

SYMCLI_REPLICATE_CYCLE_DELAY is required, though both may be set to 0.

SYMCLI_REPLICATE_NUM_CYCLES

‹NumCycles› is the number of cycles to perform before exiting. A value of zero causes the action to cycle indefinitely.

SYMCLI_REPLICATE_USE_FINAL_BCV

May be used to omit the final BCV copy in the chain of data propagation for a multi hop configuration. By default, the final BCV is used. If this option is set to FALSE, the second-hop BCV devices will be omitted.

SYMCLI_REPLICATE_LOG_STEP

Causes symreplicate to write an entry to the SYMAPI log file after each step is completed. The entry shows the time the step ended and whether or not the step was successful.

SYMCLI_REPLICATE_GEN_TIME_LIMIT

Controls how long to retry recoverable errors that occur when a BCV or RDF control operation fails. An example of this type of error is failing to acquire a Symmetrix lock.

‹TimeLimit›

Controls how long symreplicate retries operations. The timer applies only when an error occurs continuously, or when no data has flowed for the duration of the timer.

Therefore, it is possible to set a TimeLimit that is smaller than the actual amount of time that the operation requires. For example, if on average it takes an hour to establish your RDF devices, it is possible to set a 15 minute RDF time limit that only expires when no data is transferred between the devices for a period of 15 minutes. As long as data flows between the devices, the timer does not expire.

Time limits are specified using either of the following formats:

1. HH:MM - Specifies the number of hours and minutes
2. SSS - Specifies the number of seconds

If not specified, the following default time limit, specified as HH:MM, applies:

SYMCLI_REPLICATE_GEN_TIME_LIMIT=00:30

A time limit of zero (0) indicates that no time limit applies. This causes the operation to be retried indefinitely.

SYMCLI_REPLICATE_BCV_TIME_LIMIT

Controls how long to retry errors, or to wait for data to flow, while querying BCV devices to determine whether or not they have entered a specific state.

‹TimeLimit›

See SYMCLI_REPLICATE_GEN_TIME_LIMIT.

If not specified, the following default time limit, specified as HH:MM, applies:

SYMCLI_REPLICATE_BCV_TIME_LIMIT=02:00

A time limit of zero (0) indicates that no time limit applies. This causes the operation to be retried indefinitely.

SYMCLI_REPLICATE_RDF_TIME_LIMIT

Controls how long to retry errors, or to wait for data to flow, while querying SRDF devices to determine whether or not they have entered a specific state.

‹TimeLimit›

See SYMCLI_REPLICATE_GEN_TIME_LIMIT.

If not specified, the following default time limit, specified as HH:MM, applies:

SYMCLI_REPLICATE_RDF_TIME_LIMIT=04:00

A time limit of zero (0) indicates that no time limit applies. This causes the operation to be retried indefinitely.

SYMCLI_REPLICATE_GEN_SLEEP_TIME

During normal processing, symreplicate must wait for certain operations to complete before going on to the next step. The symreplicate action determines

that an operation is complete when devices have entered a specific state. If the operation is not complete, symreplicate sleeps for a period of time, then checks the device state again.

‹SleepTime›

Specifies the minimum time that symreplicate sleeps before checking to see if devices have entered a specific state, or retrying an operation when a recoverable error occurs.

When checking the device state, symreplicate calculates how long to sleep based on the number of invalid tracks and the rate at which data is moving. Therefore, the actual time that symreplicate sleeps may be greater than SleepTime. To set the maximum time that symreplicate sleeps, specify the corresponding factor.

SleepTimes are specified using the same format as for TimeLimits. However, unlike TimeLimits, a SleepTime must be greater than zero.

If not specified, the following default sleep time applies:

SYMCLI_REPLICATE_GEN_SLEEP_TIME=10

SYMCLI_REPLICATE_BCV_SLEEP_TIME

During normal processing, symreplicate must wait for certain BCV operations to

complete before going on to the next step. The symreplicate action determines that a BCV operation is complete when devices have entered a specific state. If the operation is not complete, symreplicate sleeps for period of time, then checks the device state again.

‹SleepTime›

See SYMCLI_REPLICATE_GEN_SLEEP_TIME

If not specified, the following default sleep time applies:

SYMCLI_REPLICATE_BCV_SLEEP_TIME=10

To set a maximum sleep time for BCV operations, use SYMCLI_REPLICATE_MAX_BCV_SLEEP_TIME_FACTOR

SYMCLI_REPLICATE_RDF_SLEEP_TIME

During normal processing, symreplicate must wait for certain SRDF operations to complete before going on to the next step. The symreplicate action determines that an SRDF operation is complete when devices have entered a specific state. If the operation is not complete, symreplicate sleeps for period of time, then checks the device state again.

‹SleepTime›

See SYMCLI_REPLICATE_GEN_SLEEP_TIME

If not specified, the following default

sleep time applies:

SYMCLI_REPLICATE_RDF_SLEEP_TIME=15

To set a maximum sleep time for SRDF operations, use SYMCLI_REPLICATE_MAX_RDF_SLEEP_TIME_FACTOR

SYMCLI_REPLICATE_MAX_BCV_SLEEP_TIME_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.

‹Factor›

The product of this value multiplied by the sleep time provides the maximum time that symreplicate sleeps.

Specifies a factor using a positive, non-zero integer.

If not specified, the following default factor applies:

SYMCLI_REPLICATE_MAX_BCV_SLEEP_TIME_FACTOR=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

Provides a way to specify the maximum time that symreplicate sleeps before rechecking if the SRDF devices have entered a specific

state.

‹Factor›

The product of this value multiplied by
the sleep time provides the maximum time
that symreplicate sleeps.

Specifies a factor using a positive,
non-zero integer.

If not specified, the following default
factor applies:

SYMCLI_REPLICATE_MAX_RDF_SLEEP_TIME_FACTOR=4

By default, symreplicate sleeps between 15
and 60 seconds, up to a maximum of 4 hours,
when checking on the state of SRDF devices.

SYMCLI_REPLICATE_PROTECT_BCVS

Specifies how symreplicate performs a
TimeFinder establish operation when using
two-way mirrored BCV devices. If specified,
all mirrors of the BCV devices join with the
mirrors of the standard devices.

‹Protection› can be one of the following
values:

```
‹Protection›  Meaning
------------  ---------------
NONE        Performs a normal TimeFinder
            establish operation, which is
            the 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 Perform 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 Perform a protected BCV establish for both the local and remote devices (single-hop) or the first and second-hop devices (multi-hop).

SYMCLI_REPLICATE_TF_CLONE_EMULATION
Indicates TimeFinder clone emulation is enabled. By default, clone emulation is disabled. A value of TRUE indicates clone emulation is enabled.

SYMCLI_REPLICATE_PERSISTENT_LOCKS
Causes symreplicate to acquire the device locks for the session with the SYMAPI_DLOCK_FLAG_PERSISTENT attribute. The default is FALSE, indicating the

persistent attribute is not used when acquiring the device locks for the session. A value of TRUE indicates to use the persistent attribute.

SYMCLI_REPLICATE_CONS_SPLIT_RETRY

Controls retry attempts when a consistent split operation fails because the timing window closed before the split operation completed.

‹NumRetries›

Specifies the number of error recovery attempts to be made.

A default retry value of 3 is used if the SYMCLI_REPLICATE_CONS_SPLIT_RETRY option parameter is not specified when a consistent split (-consistent) is requested.

A retry value of 0 indicates that no retry attempts be made.

SYMCLI_REPLICATE_R1_BCV_EST_TYPE

Specifies the establish type for the local first-hop BCV devices.

‹EstablishType›

Specifies the way the BCV establish operation is executed by TimeFinder. Specify one of the following values:

```
‹EstablishType›  Meaning
---------------  ---------
```

SINGULAR BCV devices are established one at a time; the next device is not established until the previous device is established.

SERIAL BCV devices are established as fast as the establish requests are accepted by the Symmetrix array.

PARALLEL BCV device establish requests are passed in parallel to each of the servicing DA directors.

For establish types of SINGULAR and PARALLEL, an ‹EstablishDelay› is specified through the SYMCLI_REPLICATE_R1_BCV_DELAY option.

SYMCLI_REPLICATE_FINAL_BCV_EST_TYPE

Specifies the establish type for the remote second-hop BCV devices.

‹EstablishType›

See SYMCLI_REPLICATE_R1_BCV_EST_TYPE

For establish types of SINGULAR and PARALLEL, an ‹EstablishDelay› can be specified through the SYMCLI_REPLICATE_FINAL_BCV_DELAY option

parameter.

SYMCLI_REPLICATE_R1_BCV_DELAY

Controls the rate of issuing establish requests for the local first-hop BCV devices.

‹EstablishDelay›

For an establish type of SINGULAR, this value denotes how long to wait between issuing establish requests.

For an establish type of PARALLEL, the delay value indicates how long to wait before passing the next establish request to an individual servicing DA director.

An establish delay of 0 to 30 seconds may be specified with a value of 0 being the default.

SYMCLI_REPLICATE_FINAL_BCV_DELAY

Controls the rate of issuing establish requests for the remote/second-hop BCV devices.

‹EstablishDelay›

See SYMCLI_REPLICATE_R1_BCV_DELAY

SYMCLI_REPLICATE_ENABLE_STATS

May be used to enable or disable the gathering of statistics. By default, statistics gathering is enabled.

A value of FALSE indicates that statistics

gathering is to be disabled.

SYMCLI_REPLICATE_STATS_RESET_ON_RESTART

May be used to reset statistics when a restart action is executed. By default the statistics are not reset upon restart of a symreplicate session.

A value of TRUE indicates that statistics are to be reset when restarting a symreplicate session.

EXAMPLES

To start a session for device group newdg, using an option file named opt.txt, enter:

```
symreplicate -g newdg -options opt.txt start
```

The file opt.txt could contain the following:

```
#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 is
#... not enough.
SYMCLI_REPLICATE_CYCLE_OVERFLOW=IMMEDIATE
```

To query the status of the above session, enter:

```
symreplicate -g newdg query
```

To terminate the above session, enter:

```
symreplicate -g newdg stop
```

To restart the terminated session, enter:

```
symreplicate -g newdg restart
```

SEE ALSO

symmir(1), symrdf(1), symdev(1), symreturn(1)

symreturn

Indicates a return value within pre-action and post-action scripts.

SYNOPSIS

symreturn [-h] [‹return_code›]

DESCRIPTION

The symreturn command 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

none

OPTIONS

-h Provides brief, online help information.

PARAMETERS

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.

RETURN CODES

```
Code #   Code Symbol
------   -----------

 0       CLI_C_SUCCESS

 #       CLI_C_FAIL
```

EXAMPLES

To exit the script with a successful return code, enter:

```
symreturn 0
```

symrslv

Displays detailed mapping information about a disk storage object.

SYNOPSIS

```
symrslv [-h] [-version] [-kb | -blocks | -mb]

  pd ‹PdevName›
    [-no_extents | -expand | -pdev_extents]

  lv ‹LVolName› -g ‹VgName›
    [-no_extents | -expand | -pdev_extents]
    [-stripe_column] [-type ‹VgType›]

  file ‹FileName›
    [-no_extents | -expand | -pdev_extents |
     -collapse | -phys_collapse]

  dir ‹Directory›
    [-no_extents | -expand | -pdev_extents]

  fs ‹MountPoint›
    [-no_extents | -expand | -pdev_extents]
    [-nfs]

  object ‹ObjectName›

  identify ‹ObjectName›
```

DESCRIPTION

The symrslv command displays detailed logical-to-physical mapping information specific to a disk storage object. By default, it provides data relating to the physical extents of these objects. Currently, the supported disk storage objects are:

- Physical devices
- Logical volumes
- Regular files
- Directories
- File systems
- Object

Object restriction:
Because not all options apply to all supported objects, no options can be passed if keyword object is specified.

Note that 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 RAID5 LVM mirror. This collapse is a logical collapse, meaning the data can be reconstructed with the meta data returned. The phys_collapse flag causes a physical collapse, which means that the data cannot be reconstructed with the meta data returned.

In the lists of mirror physical extents and mirror physical devices for the disk storage object, CLARiiON devices are distinguished from other device types by a (C) indicator.

Volume group name length restriction:
The volume group name field is limited to 63 characters. This length restriction is inclusive of the name and absolute path of the volume group even if the user only specified the volume group name itself. The behavior is undefined if the length is exceeded.

Logical volume name length restriction:
The logical volume name field is limited to 63 characters. The behavior is undefined if the length is exceeded.

Note that network based file systems based on the NFS protocol is supported on Linux, Solaris, HP_UX and AIX. Network based file systems based on CIFS protocol is supported on Linux and Windows. Resolving file system to a physical device and extent level is not applicable for network based file systems.

ARGUMENTS

dir Specifies a directory.

file Specifies a file name.

fs Specifies a file system mount point.

identify Specifies that the object be only identified but not resolved. Only objects with its corresponding object name can be specified as an argument to identify. Options cannot be specified because not all options apply to all supported object types, and the object type is not known when object is specified in the command line.

lv Specifies a logical volume name.

pd Specifies a device physical name.

object Specifies a generic object. In this case object could be either a directory, filename, file system mount point, logical volume name or a device physical name. Options cannot be specified because

not all options apply to all supported object types, and the object type is not known when the object is specified in the command line.

OPTIONS

-blocks Displays size information in 512-byte blocks.

-collapse Logically collapses the extents.

-expand Expands the extents, if possible. The default is to collapse the extents.

-g Specifies a volume group name for use with the lv argument.

-h Provides brief, online help information.

-kb Displays size information in Kilobytes.

-mb Displays size information in Megabytes. This is the default.

-nfs Displays information on mounted network based file systems.

-no_extents Excludes any extents information from displaying.

-pdev_extents Displays Pdev level extents only (does not expand extents to reflect an underlying meta device configuration).

-phys_collapse
Physically collapses the extents.

-stripe_column
For striped logical volumes, displays the extent's stripe column number.

-type Specifies the volume group type.

-version Displays SYMAPI build and runtime versions.

PARAMETERS

Directory The directory name. For a directory that is also a mount point, use a trailing slash at the end of the directory name to obtain the directory information.

FileName The file name.

LVolName The logical volume name.

MountPoint The file system mount point, (for example, d:). For a directory that is also a mount point, do not use a trailing slash at the end of the directory name to obtain the file system.

ObjectName The directory, file name, logical volume name, MountPoint, or PdevName.

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

VgName The logical volume group name.

VgType The volume group type. Supported values are:

Group Type

```
------------        -------------
DEFAULT             LINUX_LVM
AIX_LVM             LINUX_POOL
AIX_VXVM            LINUX_VXVM
AS400_LVM           ORACLE_ASM
DYNIX_SVM           SUN_SOLSTICE
EMC_PVM             SUN_VXVM
HP_LVM              WIN_LDM
HP_VXVM             WIN_VXVM
```

RETURN CODES

Code #	Code Symbol
0	CLI_C_SUCCESS
1	CLI_C_FAIL

EXAMPLES

To display physical extent information in kilobytes about the physical device /dev/rdsk/c2t0d2s2, enter:

```
symrslv -kb pd /dev/rdsk/c2t0d2s2
```

To display an expanded listing of physical extent information in blocks about the logical volume lvol1 in volume group ProdVG, enter:

```
symrslv -blocks -expand -g ProdVG lv lvol1
```

To display physical extent information in megabytes about the file accounts, enter:

```
symrslv -mb file accounts
```

To display physical extent information in blocks about the directory /usr, enter:

```
symrslv -blocks dir /usr
```

To display physical extent information in kilobytes about the file system whose mount point is /, enter:

```
symrslv -kb fs /
```

To display physical extent information about object /usr, enter:

```
symrslv object /usr
```

To identify object /usr, enter:

```
symrslv identify /usr
```

Notes:
- If object were to be passed as an argument to symrslv, user should not specify dir, file, fs, lv, or pd as an argument. The keyword object also does the type resolution.

- On the AS400 platform, only the lv and pd arguments are supported.

symsan

Lists the ports visible from a given director and the logical unit numbers (LUNs) visible behind a given remote port.

Lists the remote RDF directors and Symmetrix arrays visible from a given Symmetrix array and RDF director.

SYNOPSIS

```
symsan [-h]

  list <-sanports | -sanluns -wwn <SanPort> >
      -sid <SymmID>
      <-dir <# | ALL> | -DX <# | ALL> | -FA <# | ALL>>
      -port <# | ALL> [-detail]

  list -sanrdf
      -sid <SymmID>
      -dir <# | ALL> [-port <# | ALL>]
```

DESCRIPTION

The symsan command lists the ports visible from a given director and the LUNs visible behind a given remote port.

ARGUMENTS

list Lists all sessions for a specified Symmetrix array, or for all Symmetrix arrays.

OPTIONS

-detail Provides additional information if availiable. This includes the array ID for port scans and the extended LUN World Wide Name (WWN) field in LUN scans.

-dir Specifies a DX or FA director when scanning for ports and specifies an RDF director when scanning for remote RDF directors and Symmetrix arrays.

-DX Specifies the DX director.

-FA Specifies the FA director.

-h Provides brief, online help information.

-port Specifies the port on the local director.

-sanluns Lists the specific device LUNs visible to the supplied director/port, behind the specified remote port WWN.

-sanports Lists the ports visible to the supplied director/port.

-sanrdf Lists the remote RDF directors and Symmetrix arrays visible to the supplied RDF director.

-wwn Specifies the SAN WWN to use for listing device LUNs behind a given remote port.

PARAMETERS

A local director or port number.

SanPort The port WWN.

SymmID The 12-digit Symmetrix array ID.

RETURN CODES

Code #	Code Symbol
0	CLI_C_SUCCESS
1	CLI_C_FAIL

Examples

To list ports visible from a given local port, enter:

```
symsan list -sanports -sid 123 -dir 3B -port 0
```

To list LUNs visible from behind a port, enter:

```
symsan list -sanluns -sid 123 -dir 3B -port 0
    -wwn 0123456789ABCDEF
```

symsg

Performs operations on storage groups located in a specified Symmetrix array.

SYNOPSIS

```
symsg -h

symsg [-sid <SymmID>] [-i <Interval>] [-c <Count>] [-v]

  list [-offline]

  list -by_port -demand
    [-pg <PgName> | -dir <# [-p <#|ALL>] |ALL>]

  list -by_pg -demand [-pg <PgName>]

  list [-detail [-by_slo | -by_srp]]

symsg -sid <SymmID> [-i <Interval>] [-c <Count>] [-v]

  create <SgName>
    [-bw_max <MBperSec>]
    [-iops_max <IOperSec>]
    [-dynamic <NEVER | ALWAYS | ONFAILURE>]
    [-slo <SLOName> [-wl <WorkloadName>]]
    [-srp <SRPName>]

  convert -cascaded <SgName> <ChildSgName>
    [-host_IO <on_parent | on_child>]

  convert -standalone <SgName>
    [-host_IO <keep_parent | keep_child>]

  delete <SgName> [-force]

  export <SgName> [-file <FileName>] [-offline]
```

```
  exportall [-file <FileName>] [-offline]

  import <SgName> [-file <FileName>]

  importall [-file <FileName>]

  rename <OldSgName> <NewSgName>

  sg2cg <SgName> <CgName> [-bcv | -vdev | -tgt]
    [-R1 | -R2 | -R21 | -noRDF]
    [-apidb | -rdf_consistency]

  sg2dg <SgName> <DgName> [-bcv | -vdev | -tgt]
    [-R1 | -R2 | -R21 | -noRDF]

  show <SgName> [-offline]

symsg -sg <SgName> -sid <SymmID> [-i <Interval>]
    [-c <Count>] [-v] [-celerra] [-rp] [-ckd]

  add dev <SymDevName>

  add sg <SgName1>[,<SgName2>,<SgName3>,.,<SgNamen>]

  copy dev <SymDevName> <DestSgName>

  move dev <SymDevName> <DestSgName> [-force]

  remove dev <SymDevName> [-force]

  remove sg <SgName1>[,<SgName2>,<SgName3>,.,<SgNamen>]

symsg -sg <SgName> -sid <SymmID> [-i <Interval>]
    [-c <Count>] [-v] [-celerra] [-rp] [-ckd]
    [-SA <# | ALL>] [-p <#>] [-N <#>]
    [-cap <#> [-captype <mb> | <cyl>]]
```

```
[-devs <<SymDevStart>:<SymDevEnd> | <SymDevName>
  [,<<SymDevStart>:<SymDevEnd> | <SymDevName>>...]> |
  -file <DeviceFileName> [-tgt] ]

addall [pd | devs]

copyall <DestSgName>

moveall <DestSgName> [-force]

rmall [-force]

symsg -sg <SgName> -sid <SymmID> [-i <Interval>]
  [-c <Count>]

set <[-bw_max <MBperSec> | NOLIMIT ]
    [-iops_max <IOperSec> | NOLIMIT ]
    [-dynamic <NEVER | ALWAYS | ONFAILURE>]>
    [-slo <SLOName> [-wl <WorkloadName>] |-noslo]
    [-srp <SRPName> | -nosrp]

symsg -sg <SgName> -sid <SymmID> [-i <Interval>]
  [-c <Count>] [-v] [-noprompt] [-rp] [-star]
  [-celerra] [-skip -lockid <lockNum>]

ready

not_ready

rw_enable

write_disable

hold

unhold [-symforce]
```

compress [-stop]

uncompress [-stop]

bind -pool ‹PoolName›

unbind

rebind -pool ‹PoolName›

allocate [-persistent]

allocate -stop

free [-all]

free [-all] -stop

reclaim [-persistent]

reclaim -stop

set -persistent

unset -persistent

set -orm ‹ system | on | off ›

set -gcm [-symforce]

unset -gcm [-symforce]

symsg -sg ‹SgName› -sid ‹SymmID› [-i ‹Interval›]
[-c ‹Count›] [-v] [-noprompt] [-star]
[-skip -lockid ‹lockNum›]

pin

unpin

host_active [-force]

DESCRIPTION

The symsg command performs operations specific to storage groups: creating new storage groups, adding devices or other storage groups to a storage group, copying, moving and removing devices in a storage group, removing storage groups from a storage group, importing storage groups, exporting storage groups, deleting storage groups, renaming storage groups, converting storage groups between cascaded and standalone and listing and showing information about a storage group.

The symsg command also performs the following control actions on all of the devices in a storage group: write_disable, rw_enable, ready, not_ready, hold, unhold, pin, unpin, compress, uncompress, set, unset, bind, unbind, rebind, allocate, free and reclaim.

The export argument creates a group file (ASCII text) and the import argument reads a file to import a single storage group. The file contains as many device description lines or storage group description lines as there are devices or storage groups defined in the Storage Group detailed. There cannot be both device and storage group description lines in the same file. In addition, there may also be Host I/O limit maximum bandwidth, maximum IOPS or dynamic distribution description lines. Any lines that are blank or have a pound sign (#) in the first column are ignored.

‹SymDevName›

. . .

‹SymDevName›
B ‹MBperSec›
I ‹IOperSec›
D ‹DynDistribution›
L ‹SLOName›
R ‹SRPName›
W ‹WorkloadName›

or

S ‹StorageGroupName›
. . .
S ‹StorageGroupName›
B ‹MBperSec›
I ‹IOperSec›
D ‹DynDistribution›
L ‹SLOName›
R ‹SRPName›
W ‹WorkloadName›

The exportall argument creates a group file (ASCII text) and the importall argument reads a file to import all storage groups. The file contains as many storage group records as there are storage groups defined. Each record can contain as many device description lines or storage group description lines as there are devices or storage groups defined in the storage group being detailed. There cannot be both device and storage group description lines in the same record. In addition, there may also be Host I/O limit maximum bandwidth, maximum IOPS or dynamic distribution description lines. Any lines that are blank or have a pound sign (#) in the first column are ignored.

Group files contain device or storage group parameters in the following formats:

‹StorageGroupName›
‹SymmID›

‹SymDevName›
. . .
‹SymDevName›
B ‹MBperSec›
I ‹IOperSec›
D ‹DynDistribution›
L ‹SLOName›
R ‹SRPName›
W ‹WorkloadName›

‹StorageGroupName›
‹SymmID›
S ‹StorageGroupName›
. . .
S ‹StorageGroupName›
B ‹MBperSec›
I ‹IOperSec›
D ‹DynDistribution›
L ‹SLOName›
R ‹SRPName›
W ‹WorkloadName›

ARGUMENTS

add/addall Adds single or multiple devices or storage groups to a storage group.

allocate Allocates storage in the thin pool.

bind Binds the thin device(s) to the thin pool.

compress Starts data compression on thin device(s). When combined with the -stop option, data compression is stopped.

convert Converts a storage group between cascaded and standalone.

copy/copyall Copies devices from the ‹SgName› to the ‹DestSgName›.

create Creates a storage group.

delete Deletes a storage group. Deletion of a storage group is not allowed if the storage group is contained in a Masking View or associated with a FAST policy.

export Creates a text file that details the members of an existing storage group. The storage group can later be recreated from this file using the import command.

exportall Creates a text file that details the members of all existing storage groups. The storage groups can later be recreated from this file using the importall command.

free Frees storage in the thin pool.

hold Creates a hold on all available devices from an existing device group. When a hold is placed on a device, TimeFinder operations are blocked.

host_active Sets the host active mode on device(s). The device(s) must be in a host passive mode for this operation to succeed.

import Creates a storage group from data contained in a text file previously created using the export command.

importall Creates storage groups from data

contained in a text file previously created using the exportall command.

list Lists storage groups or with optional parameters produces Host IO Limit demand reports.

move/moveall Moves the device(s) and deletes them from the ‹SgName› before adding them to the ‹DestSgName›.

not_ready Sets the device(s) to Not Ready. The device must be in a User Ready status for this operation to succeed.

pin Sets the device(s) to a user-pinned state. User-pinned devices are not moved by the FAST controller, but can be moved with Optimizer or Symmigrate.

ready Sets the device(s) to Ready. The device must be in a User Not Ready status for this operation to succeed.

rebind Rebinds the device(s) to the thin pool.

reclaim Reclaims storage from the thin pool.

remove Removes a single device or a single or multiple storage groups from a storage group.

rename Renames the ASCII name of a storage group.

rmall Removes multiple devices from a storage group. If an optional range of devices is specified, only those devices included

in the range are removed. If no range of devices is provided, all of the devices are removed.

rw_enable Sets the device(s) to Read and Write Enabled to the local hosts.

set Sets the persistent indicator for allocations on thin device(s) when combined with the -persistent option. Or sets Host IO Limit on the specified storage group when combined with the -bw_max, -iops_max or -dynamic options. Sets the Optimized Read Miss mode when combined with the -orm option. Sets GCM mode when combined with -gcm.

sg2cg Adds selected members of a storage group to a target composite group. If the composite group does not exist, it is created. If none of the optional device types are specified, the default is to add standard devices.

sg2dg Adds selected members of a storage group to a target device group. If the device group does not exist, it is created. If none of the optional device types are specified, the default is to add standard devices.

show Shows detailed information about storage groups.

unbind Unbinds device(s) from the thin pool.

uncompress Starts data decompression on thin device(s).

When combined with the -stop option, data decompression is stopped.

unhold Releases devices that were previously set to the hold state.

unpin Removes the device(s) from the user-pinned state.

unset Clears the persistent indicator for allocations on thin device(s) when combined with the -persistent option. Clears GCM mode when combined with -gcm.

write_disable Sets the devices to Write Disabled to their local hosts.

KEYWORDS

dev Indicates a single Symmetrix device name.

devs Indicates multiple Symmetrix device names.

pd Indicates a physical (host) device name.

sg Indicates a list of storage group names.

OPTIONS

-all Used with the free operation in order to specify that all allocations associated with the indicated devices are to be freed, regardless of whether data has been written or not.

-apidb Overrides the options file setting and stores the RDF CG in the SYMAPI database

only.

-bcv Specifies that only local BCV devices are taken from the storage group and added to the device group, via usage of the sg2dg command, or to the composite group, via usage of the sg2cg command.

-bw_max Specifies the Host IO Limit maximum bandwidth in MB per second to be set on the storage group. The maximum bandwidth will be set to unlimited if NOLIMIT is specified.

-by_pg Specifies that the Host IO Limit demand report is being requested for port group information.

-by_port Specifies that the Host IO Limit demand report is being requested for port information.

-c Specifies the number (count) of times to attempt to acquire an exclusive lock on the Symmetrix host database.

The time to wait between attempts to acquire a needed lock is specified by -i (interval).

If neither -c nor -i is specified, operations will fail if they are unable to acquire a requested lock.

-cap Sets a minimum device size to the selection criteria of devices.

-captype ‹mb | cyl›

Specifies the units of capacity, either

megabytes or cylinders. The default if not specified is MB.

-cascaded Used with the convert operation to select that a standalone storage group be converted to a cascaded storage group.

-celerra Allows operations on Celerra FBA devices.

-ckd Allows operations on CKD devices.

-orm Allows setting the Optimized Read Miss mode to system default, on, or off for the specified devices.

-demand Specifies a Host IO Limit demand report.

-devs Specifies multiple range(s) of Symmetrix device names.

-dir Specifies the director number(s) for which the Host IO Limit demand report is being requested.

-dynamic Specifies the Host IO Limit dynamic distribution setting for the storage group.

-file Specifies a filename to use for the import/importall or export/exportall operations.

-file Specifies a filename to use as input.

-force Forces the operation on the storage group.

-gcm Allows setting or clearing the device GCM mode.

-h Provides online help.

-host_IO When converting a storage group to cascaded, it is used to select were an existing Host IO Limit is set.

When converting a storage group to standalone it is used to select which Host IO Limit to keep.

-i Specifies the interval time, in seconds, to wait between attempts to acquire an exclusive lock on the Symmetrix host database.
The default interval is 30 seconds.
The minimum interval is 5 seconds.
For passive actions the minimum interval is 15 seconds. Passive actions are actions that do not acquire an exclusive lock.

-iops_max Specifies the Host IO Limit maximum IOPs in I/Os per second. The maximum IOPs will be set to unlimited if NOLIMIT is specified.

-lockid Specifies the lock holder ID for preserving the target locks on the control operation.
The lock number ID must be a hexadecimal number.

-N Sets a number of devices to add, remove, or move.

-noprompt Disables the confirmation prompt.
The default is to prompt the user for confirmation before executing the operation.

-noRDF Copies non-SRDF devices only.

-noslo Specifies noslo or remove SLO set on SG.This will also remove any workload that was assigned for the SLO. If the SG has an SRP, then the SG will get an activity-based SLO. Otherwise, there will be no SLO or SRP for the SG and the SG will no longer be FAST Managed.

-nosrp Specifies nosrp or remove SRP set on SG.If the SG has an SLO set the system default SRP for the emulation type will be used with the SG. Otherwise, there will be no SRP or SLO for the SG and the SG will no longer be FAST Managed.

-offline Obtains information from the Symmetrix host configuration database.

-p Specifies the front-end (SCSI or Fibre) director port number to only select devices that are primarily visible through this director port. By default, all ports are selected.

-persistent Used with set or unset it specifies operation on the persistent indicator. Used with allocate or reclaim it specifies the use of persistent storage.

-pool Specifies a Thin Pool Name.

-pg Specifies that the Host IO Limit demand report is being requested for the port(s) in the specified port group.

-R1 Copies RDF1 (R1) devices only.

-R2 Copies RDF2 (R2) devices only.

-R21 Copies RDF21 (R21) devices only.

-rdf_consistency
Allowing created CG to be enabled for RDF consistency.

-rp Indicates the action is targeted for devices tagged for RecoverPoint.

-SA Specifies the front-end (SCSI or Fibre) director number to only select devices that are primarily visible through this director. Alternatively, if ALL (the default) is specified, all devices satisfying any other selection criterion will be selected.

-standalone Used with the convert operation to select that a cascaded storage group be converted to a standalone storage group.

-sid Specifies the unique Symmetrix ID.

-sg Specifies the name of the storage group.

-skip Skips the device locks action for control operations. Requires the -lockid option.

-slo Specifies a SLO name to be set on SG.

-srp Specifies a SRP name to be set on SG.

-star Indicates that the action is targeted for devices in STAR mode.

-stop Specifies that the compress, uncompress, allocate, free or reclaim operation will be stopped.

-symforce Requests the Symmetrix array force the operation to be executed when normally it is rejected. Use extreme caution when using this option.

-tgt Allows the user to specify that only local TGT devices are taken from the storage group and added to the device group, via usage of the sg2dg command, or to the composite group, via usage of the sg2cg command.

When used in conjunction with -file, specifies that devices are only taken from the second column of DeviceFileName.

-vdev Allows the user to specify that only local VDEV devices are taken from the storage group and added to the device group, via usage of the sg2dg command, or to the composite group, via usage of the sg2cg command.

-v Provides a more detailed, verbose listing.

-wl Specifies a workload name to be set on SG.

PARAMETERS

ALWAYS The Host IO Limits for the storage group are always dynamically redistributed.

ChildSgName The child storage group name.

DestSgName The name of the storage group to use as the destination of a copy/copyall or move/moveall operation.

DeviceFileName

The name of the file where devices are listed. The device file can contain devices (SymDevNames) separated by new lines or device pairs listing a pair each line (the source device, followed by a target device).

Examples of a device file format:

Example 1:

```
0026  0029
0015  0016
```

Example 2:

```
0001
0002
```

DynDistribution

The Host IO Dynamic Distribution setting

FileName The specified output or input of export, exportall, import, and importall commands, respectively.

IOperSec The number of I/Os per second. Valid values are between 100 and 2000000 IO/sec, in units of 100 IO/sec.

MBperSec The number of Mega Bytes per second. Valid values are between 1 and 100000 MB/sec.

NEVER The Host IO Limits for a storage group are never dynamically redistributed (static).

NewSgName The new storage group name.

OldSgName The original storage group name.

ONFAILURE The Host IO Limits for the storage group are dynamically redistributed only upon failure of a Front-End Port.

SgName The storage group name.

SLOName The name of the SLO.

SRPName The name of the SRP.

SymDevName The Symmetrix device name.

SymDevEnd The last Symmetrix device name in a sequence, such as 00B6.

SymDevStart The first Symmetrix device name in a sequence, such as 001C.

SymmID The 12-digit ID of the Symmetrix array.

WorkloadName The name of the Workload.

RETURN CODES

```
Code #   Code Symbol
------   -----------
```

0 CLI_C_SUCCESS

1 CLI_C_FAIL

EXAMPLES

To create a Symmetrix storage group named mysg_1 on Symmetrix array ID# 59866000123, enter:

```
symsg -sid 123 create mysg_1
```

To delete Symmetrix storage group storgrp_f and all contained devices on Symmetrix array ID# 59866000123, enter:

```
symsg -sid 123 delete storgrp_f -force
```

To rename Symmetrix storage group mysg_1 to storgrp_a on Symmetrix array ID# 59866000123, enter:

```
symsg -sid 123 rename mysg_1 storgrp_a
```

To add a single device to storage group storgrp_a, enter:

```
symsg -sid 123 -sg storgrp_a add dev 30
```

To add all devices that are primarily visible from this host to storage group storgrp_a, enter:

```
symsg -sid 123 -sg storgrp_a addall pd
```

To add a range of physical devices to storage group storgrp_a, enter:

```
symsg -sid 123 -sg storgrp_a addall pd -devs 30:3F
```

To add all devices listed in a file named my_storgrp_b.txt to a Symmetrix storage group named storgrp_b on Symmetrix array ID# 59866000123, enter:

```
symsg -sid 123 addall -file my_storgrp_b.txt
    -sg storgrp_b
```

To add storage groups storgrp_1 and storgrp_2 to storage group storgrp_a, enter:

```
symsg -sid 123 -sg storgrp_a add sg storgrp_1,storgrp_2
```

To copy a device from storage group storgrp_a to storgrp_b, enter:

```
symsg -sid 123 -sg storgrp_a copy dev 30 storgrp_b
```

To move a device from storage group storgrp_a to storgrp_b, enter:

```
symsg -sid 123 -sg storgrp_a move dev 30 storgrp_b
```

To copy multiple devices from storage group storgrp_a to storgrp_b, enter:

```
symsg -sid 123 -sg storgrp_a copyall
    -devs 30:3F,40 storgrp_b
```

To move multiple devices from storage group storgrp_a to storgrp_b, enter:

```
symsg -sid 123 -sg storgrp_a moveall
    -devs 30:3F,40 storgrp_b
```

To list all storage groups on Symmetrix array ID# 59866000123, enter:

```
symsg -sid 123 list
```

To list all Symmetrix storage groups in detailed format, enter:

```
symsg list -v
```

To show all devices in storage group storgrp_a, enter:

```
symsg -sid 123 show storgrp_a
```

To export a Symmetrix storage group named storgrp_c on Symmetrix array ID# 59866000123 to a file named my_storgrp_c, enter:

```
symsg -sid 123 export storgrp_c -file my_storgrp_c
```

To import a Symmetrix storage group named storgrp_c to Symmetrix array ID# 59866000123 from a file named my_storgrp_c, enter:

```
symsg -sid 123 import storgrp_c -file my_storgrp_c
```

To convert a Symmetrix storage group named storgrp_c to a device group named ProdDG, enter:

```
symsg -sid 123 sg2dg storgrp_c ProdDG
```

To remove a single device from storage group storgrp_a, enter:

```
symsg -sid 123 -sg storgrp_a remove dev 30
```

To remove all devices from storage group storgrp_a, enter:

```
symsg -sid 123 -sg storgrp_a rmall
```

To remove multiple devices from storage group storgrp_a, enter:

```
symsg -sid 123 -sg storgrp_a rmall -devs 31:35,37,40:43
```

To remove storage groups sgrp_1 and sgrp_2 from storage group storgrp_a, enter:

```
symsg -sid 123 -sg storgrp_a remove sg sgrp_1,sgrp_2
```

symsnap

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

SYNOPSIS

```
symsnap -h

symsnap -g <DgName> [-v] [-noprompt] [-i <Interval>]
    [-bcv | -rdf | -rbcv | -hop2] [-tgt]
    [-c <Count>] [-force] [-star]
    [-preserveTGTLocks -lockid <LockNum>]

  create [-exact] [-skip]
    [-svp <PoolName> | -duplicate] [-concurrent]
    [<LdevName> [VDEV pd <PdevName>]...|
     <LdevName> [VDEV dev <SymDevName>]...|
     <LdevName> [VDEV ld <LDevName>]...]

  activate [-consistent [-both_sides]]
    [-concurrent] [-duplicate]
    [-preaction <ScriptFile>]
    [-postaction <ScriptFile>]
    [-not_ready] [-skip]
    [<LdevName> [VDEV pd <PdevName>]...|
     <LdevName> [VDEV dev <SymDevName>]...|
     <LdevName> [VDEV ld <LDevName>]...]

  duplicate [-consistent] [-exact] [-concurrent]
    [-preaction <ScriptFile>]
    [-postaction <ScriptFile>]
    [-not_ready] [-skip]
    [<LdevName> [VDEV pd <PdevName>]...|
     <LdevName> [VDEV dev <SymDevName>]...|
     <LdevName> [VDEV ld <LDevName>]...]

  recreate [-skip] [-concurrent]
```

```
[<LdevName> [VDEV pd <PdevName>]...|
 <LdevName> [VDEV dev <SymDevName>]...|
 <LdevName> [VDEV ld <LDevName>]...]

terminate [-symforce] [-skip] [-restored]
 [-duplicate]
 [<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>]...]

establish [-full] [-exact] [-svp <poolname>]
 [-consistent [-both_sides]] [-concurrent]
 [-preaction <ScriptFile>]
 [-postaction <ScriptFile>]
 [-not_ready] [-skip]
 [<LdevName> [VDEV pd <PdevName>]...|
  <LdevName> [VDEV dev <SymDevName>]...|
  <LdevName> [VDEV ld <LDevName>]...]

restore [-full] [-not_ready]
  [<LdevName> [VDEV pd <PdevName>]...|
  <LdevName> [VDEV dev <SymDevName>]...|
  <LdevName> [VDEV ld <LDevName>]...]

symsnap -g <DgName> [-offline] [-i <Interval>] [-c <Count>]
 [-bcv | -rdf | -rbcv | -hop2]

query [<LdevName> [<LdevName>...]] [-multi]
 [-restore | -changed] [-attach] [-pools] [-summary]

verify [-created | -copied | -copyonwrite |
```

```
    -restinprog | -restored | -failed | -recreated]
    [-force] [-concurrent] [-summary]
     [‹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›]
    [-bcv | -rdf | -rbcv | -hop2]

  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›]
    [-bcv | -rdf | -rbcv | -hop2] [-tgt]
    [-c ‹Count›] [-force] [-star] [-sid ‹SymmID› |
     -rdfg ‹SymmID›:‹GrpNum›[,‹GrpNum›,...]|‹all›[,...] |
     name:‹RDFName›[,‹RDFName›,...]›]

  create [-exact] [-skip]
    [-svp ‹PoolName› | -duplicate] [-concurrent]
    [‹LdevName› [VDEV pd ‹PdevName›]...|
     ‹LdevName› [VDEV dev ‹SymDevName›]...|
     ‹LdevName› [VDEV ld ‹LDevName›]...]
```

```
activate [-consistent [-both_sides]]
  [-preaction <ScriptFile>]
  [-postaction <ScriptFile>]
  [-not_ready] [-skip] [-concurrent]
  [-duplicate]
  [<LdevName> [VDEV pd <PdevName>]...|
   <LdevName> [VDEV dev <SymDevName>]...|
   <LdevName> [VDEV ld <LDevName>]...]

duplicate [-consistent] [-exact]
  [-preaction <ScriptFile>]
  [-postaction <ScriptFile>]
  [-not_ready] [-skip] [-concurrent]
  [<LdevName> [VDEV pd <PdevName>]...|
   <LdevName> [VDEV dev <SymDevName>]...|
   <LdevName> [VDEV ld <LDevName>]...]

recreate [-skip] [-concurrent]
  [<LdevName> [VDEV pd <PdevName>]...|
   <LdevName> [VDEV dev <SymDevName>]...|
   <LdevName> [VDEV ld <LDevName>]...]

terminate [-symforce] [-skip] [-restored]
  [-duplicate]
  [<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>]...]

establish [-full] [-exact] [-svp <poolname>]
  [-consistent [-both_sides]]
```

```
    [-preaction <ScriptFile>]
    [-postaction <ScriptFile>]
    [-not_ready] [-skip] [-concurrent]
    [<LdevName> [VDEV pd <PdevName>]...|
     <LdevName> [VDEV dev <SymDevName>]...|
     <LdevName> [VDEV ld <LDevName>]...]

  restore [-full] [-not_ready]
    [<LdevName> [VDEV pd <PdevName>]...|
     <LdevName> [VDEV dev <SymDevName>]...|
     <LdevName> [VDEV ld <LDevName>]...]

symsnap -cg <CgName> [-offline] [-i <Interval>]
    [-c <Count>]
    [-bcv | -rdf | -rbcv | -hop2] [-sid <SymmID> |
    -rdfg <SymmID>:<GrpNum>[,<GrpNum>,...]|<all>[,...] |
     name:<RDFName>[,<RDFName>,...]>]

  query [-multi] [-restore] [-attach] [-sid <SymmID>]
    [-changed] [-pools] [-summary]
    [<LdevName> [<LdevName>...]]

  verify [-created | -copied | -copyonwrite |
     -restinprog | -restored | -failed | -recreated]
    [-force] [-concurrent] [-summary]
    [<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>]
```

```
[-bcv | -rdf | -rbcv | -hop2]
[-rdfg <SymmID>:<GrpNum>[,<GrpNum>,...]|<all>[,...] |
 name:<RDFName>[,<RDFName>,...]>]

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> [-noprompt] |
   -noprompt 'redirect stdin'> [-v] [-force]
   [-i <Interval>] [-c <Count>]
   [-preserveTGTLocks -lockid <LockNum>] [-star]

create [-skip] [-svp <PoolName> | -duplicate]

activate [-consistent] [-duplicate]
 [-preaction <ScriptFile>] [-postaction <ScriptFile>]
 [-not_ready] [-skip]

duplicate [-consistent]
 [-preaction <ScriptFile>] [-postaction <ScriptFile>]
 [-not_ready] [-skip]

recreate [-skip]

terminate [-symforce] [-skip] [-restored] [-duplicate]

establish [-full] [-svp <PoolName>] [-consistent]
 [-preaction <ScriptFile>] [-postaction <ScriptFile>]
 [-not_ready] [-skip]
```

```
    restore [-full] [-not_ready]

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

    query [-multi] [-restore] [-attach] [-pools] [-changed]
     [-summary]

    verify [-created | -copied | -copyonwrite |
     -restinprog | -restored | -failed | -recreated]
     [-force] [-summary]

  symsnap -sid <SymmID> <-file <DeviceFileName> [-noprompt] |
     -noprompt 'redirect stdin'> [-v]
     [-i <Interval>] [-c <Count>]

    attach

    detach

  symsnap [-sid <SymmID>] [-i <Interval>] [-c <Count>]
        [-offline]

    list
```

DESCRIPTION

The symsnap command performs snap operations on a device group, composite group, devices within the group, or on devices in a device file.

These operations include creating and activating a source device with a target device, terminating the snap session, and querying the state of the device pair.

You can perform all of these operations on a group or

individual device basis.

Before you can create a copy session between a target device and a source device, the target device must be associated with the device group and the target device must be the same size as the source device.

ARGUMENTS

activate Activate an internal copy session with the devices in the device or composite group and one or more target devices associated with the group.

While the operation is in progress, the state of the device pair is Copy on Write. If the source device is completely written to, the state changes to Copied.

attach When a device create is issued, attaches a virtual device (VDEV) target to a source device as the preferred target device for pairing.

create Creates an internal snap session with the devices that are 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 CreateInProg. 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 of the source device.

duplicate Creates and activates a duplicate snap session in a single operation. This is equivalent to performing create -duplicate followed by activate -duplicate.

establish Creates and activates an internal snap session with the devices in the group and one or more target devices associated with the group. Specifying this argument without the -full option performs a recreate followed by an activate operation.

list Lists snap sessions.

query Returns snap state information about one or all device pairs in a group or device file.

recreate Recreates the snap session on an existing VDEV. This only applies to sessions that have been activated.

restore Restores a 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.

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

verify Verifies, by default, whether one device pair is in the CopyOnWrite state or all device pairs in a group are in the CopyOnWrite state.

KEYWORDS

BCV Specifies a BCV target device.

dev Indicates a Symmetrix device name.

ld Indicates a logical device name.

pd Indicates a physical device name.

SRCDEVS Specifies to use the path names from the standard devices being controlled.

SYM Specifies a Symmetrix target device (STD or BCV).

VDEV Specifies a Symmetrix virtual device.

OPTIONS

-attach Displays target attachment information for the standard device(s) in the device group.

-bcv Uses BCV devices as the source devices and VDEV devices as the target devices. You can only use this option with device or composite groups.

-both_sides Activates all locally and remotely associated VDEV pairs in an SRDF group.

-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 and an interval (-i) is specified, the command will loop continuously to display or to start the mirroring operation.

-cg Applies a composite group name to the command.

-changed When specified with the query argument, this option shows the number of tracks that were written to either the source device or to the virtual device.

-concurrent When specified with the verify argument, this option verifies the standard device and multiple target devices. When specified with active commands, this option performs the operation on a pair with an additional target device.

-consistent Causes the source and target pairs to be consistently activated.

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

-copyonwrite Verifies that the snap device pair(s) are in the CopyOnWrite state.

-created Verifies that the snap device pair(s) are in the Created state.

-duplicate For create, activate, and terminate actions indicates that the action is to be performed on a VDEV to VDEV pair.

-exact Pairs devices in the exact order in which the source and target devices were added to the device group.

-failed Verifies that the snap device pair(s) are in the Failed state.

-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). A Symmetrix ID is required for this option. -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) for the specified operation.

-full Performs a full restore. This option is used with the restore command.

-g Applies a device group name to the command.

-h Provides brief online help information.

-hop2 Performs the specified action on the Symmetrix array two hops away.

-i Specifies the repeat interval in seconds to display or to acquire an exclusive lock on the Symmetrix host database.
The default interval is 30 seconds.
The minimum interval is 5 seconds.
For passive actions the minimum interval is 15 seconds. Passive actions are actions that do not acquire an exclusive lock.

-lockid Specifies the lock holder ID for preserving the target locks on the control operation.

-multi Applies to a query operation in a

multi-target environment to show all targets that are paired with source devices. Devices are listed in chronological order.

-noprompt Requests to not return a prompt after you enter a command. The default is to prompt for confirmation.

-not_ready Performs the snap control operation but leaves the target device(s) Not Ready. That is, each target device will be set Not Ready prior to the operation completing.

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

-pools Used with query to display pool names for each session.

-postaction Executes the script argument after a snap session has been activated.

-preaction Executes the script argument before a copy session has been activated.

-preserveTGTLocks
Prevents the action from taking out device locks on the target devices. The target devices must already be locked by the same lock holder ID.

-rbcv Uses the RBCV devices as the source devices and the RVDEV devices as the target devices. This is used only with device or composite groups.

-rdf Performs the action on the remote Symmetrix array.

-rdfg This option causes the command to perform the requested action on a subset of the composite group defined by one or more Symmetrix/RA group combinations supplied as the argument to -rdfg.
This argument is a comma separated list in the form:
SID:GrpNum,SID:GrpNum,...
or a comma-separated list of predefined names in the form:
name:Name,Name,...
GrpNum may be specified as "all" to use all of the RA Groups on a Symmetrix.

-recreated Verifies that the snap device pair(s) are in the Recreated state.

-restinprog Verifies that the snap device pair(s) are in the RestInProg (restore) state.

-restore Shows the VDEV where the snap pair was restored.

-restored Verifies that the snap device pair(s) are in the Restored state.

-sid Supplies the unique Symmetrix ID.

-skip Skips the source locks action. This option will not lock the source devices if all of the specified source devices are either locked or are unlocked.

-star Targets the action at devices in STAR mode.

-summary Shows device state summary.

-svp Filters the list based on the supplied PoolName.

-symforce Forces the operation to execute when normally it would be rejected. On terminate, it causes the Symmetrix array to stop a snap session. IMPORTANT: Use extreme caution with this option.

-tgt Specifies to use VDEVs associated as TGT devices for snap targets. This uses local TGT devices, remote RTGT devices, and two hop2TGT devices.

-v Provides a more detailed, verbose listing.

PARAMETERS

CgName Composite group name.

Count Number of iterations to execute before exiting.

DgName Device group name.

DeviceFileName Device Filename.
The device file contains device pairs (SymDevNames) listing a pair of devices on each line (the source device first, a space, followed by the target device name on each line. Comments are prefixed with #.

GrpNum RDF (RA) group number.

Interval Interval between polls, in seconds.

LdevName Device logical name of either the standard or the BCV device.

LockNum Hexadecimal value of the lock holder ID.

Name Logical name associated with the RDF (RA) group(s).

PdevName The device physical (host) name for the BCV device, such as /dev/rdsk/c2t0d2s2.

PoolName Name of the SAVE device pool.

ScriptFile Full pathname of a script file to be executed.

SymDevName Symmetrix device name, unique per Symmetrix array, for the BCV device. For example 01C.

RETURN CODES

Code #	Code Symbol
0	CLI_C_SUCCESS
1	CLI_C_FAIL
2	CLI_C_DB_FILE_IS_LOCKED
18	CLI_C_ALREADY_IN_STATE The device or device group is already in the desired snap state.
19	CLI_C_GK_IS_LOCKED All gatekeepers to the Symmetrix array are

currently locked.

22 CLI_C_NEED_FORCE_TO_PROCEED
Requires the force flag to proceed.

23 CLI_C_NEED_SYMFORCE_TO_PROCEED
Requires the symforce flag to proceed.
CAUTION: Extreme caution should be exercised when using this option.

Return codes for symsnap verify

12 CLI_C_NOT_ALL_RESTORED
Not all source devices are in the Restored state.

13 CLI_C_NONE_RESTORED
No source devices are in the Restored state.

29 CLI_C_NOT_ALL_RESTINPROG
Not all source devices are in the RestInProg state.

30 CLI_C_NONE_RESTINPROG
No source devices are in the RestInProg state.

55 CLI_C_NOT_ALL_COPIED
Not all source devices are in the Copied state.

56 CLI_C_NONE_COPIED
No source devices are in the Copied state.

60 CLI_C_NOT_ALL_CREATED

Not all source devices are in
the Created state.

61 CLI_C_NONE_CREATED
No source devices are in the
Created state.

66 CLI_C_NOT_ALL_COPYONWRITE
Not all source devices are in
the CopyOnWrite state.

67 CLI_C_NONE_COPYONWRITE
No source devices are in the
CopyOnWrite state.

EXAMPLES

To create the device group ProdDB as a REGULAR device group, enter:

```
symdg create ProdDB
```

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

```
setenv SYMCLI_DG ProdDB
```

To add the standard device /dev/rdsk/c1t1d1s2 to device group ProdDB and name it act1, enter:

```
symdg add pd c1t1d1s2 act1
```

To add the VDEV device /dev/rdsk/c2t0d2s2 to device group ProdDB and name it myvdev1, enter:

```
symdg add pd c2t0d2s2 myvdev1
```

To create a snap 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
```

symsnapvx

Performs TimeFinder/SnapVX control, list, and verify operations on a device list, a list of ranges, a device group (DG), composite group (CG), or storage group (SG). Also performs array-wide list operations.

SYNOPSIS

```
symsnapvx -h

symsnapvx -g ‹DgName› -name ‹SnapshotName›
    [-rdf | -hop2]
    [-v] [-noprompt] [-force] [-star]
    [-i ‹Interval›] [-c ‹Count›]

  establish [-ttl ‹-delta ‹Days› | -absolute ‹Date››]
    [-both_sides]
    [-preaction ‹ScriptFile›] [-postaction ‹ScriptFile›]

symsnapvx -g ‹DgName›
    -snapshot_name ‹SnapshotName›
      [-generation ‹GenerationNumber›]
    [-rdf | -hop2]
    [-v] [-noprompt] [-force] [-star]
    [-i ‹Interval›] [-c ‹Count›]

  restore
    [-preaction ‹ScriptFile›][-postaction ‹ScriptFile›]
    [-remote]

  terminate [-restored [-symforce]]

  rename -name ‹NewSnapshotName›

  set ttl
    ‹-delta ‹Days› | -absolute ‹Date››
```

```
symsnapvx -g <DgName>
    -snapshot_name <SnapshotName>
      [-generation <GenerationNumber>]
    [-rdf | -hop2]
    [-v] [-noprompt] [-force] [-star]
    [-i <Interval>] [-c <Count>]

  link [-copy [-remote] ] [-exact]

  relink [-copy [-remote]] [-exact]

  unlink [-symforce]

  set mode <copy | nocopy>

symsnapvx -g <DgName>
    -snapshot_name <SnapshotName>
      [-generation <GenerationNumber>]
    [-rdf | -hop2]
    [-force] [-summary [-mb | -gb | -tb]]
    [-i <Interval>] [-c <Count>]

  verify [-established | -estinprog]

  verify [-restored | -restinprog]

  verify [-linked  [-defined][-by_tgt]]

  verify [[-copyinprog | -copied [-destaged]] [-by_tgt]]

symsnapvx -g <DgName>
    [-snapshot_name <SnapshotName>
       [-generation <GenerationNumber>]]
    [-failed] [-detail [-last_n <count>]]
    [-rdf | -hop2]
    [-mb | -gb | -tb]
    [-i <Interval>] [-c <Count>] [-offline]
```

```
  list [-linked [-by_tgt] | -restored]

symsnapvx -g ‹DgName›
    [-snapshot_name ‹SnapshotName›
      [-generation ‹GenerationNumber›]]
    [-rdf | -hop2]
    [-mb | -gb | -tb]
    [-i ‹Interval›] [-c ‹Count›] [-offline]

  list -summary

symsnapvx -sid ‹SymmID› -name ‹SnapshotName›
    ‹-file ‹DeviceFileName› [-noprompt] |
     -noprompt 'redirect stdin' |
     -devs ‹‹SymDevStart›:‹SymDevEnd› | ‹SymDevName››
          [,‹‹SymDevStart›:‹SymDevEnd› | ‹SymDevName››...]
          [-noprompt]›
    [-v] [-force] [-star]
    [-i ‹Interval›] [-c ‹Count›]

  establish [-ttl ‹-delta ‹Days› | -absolute ‹Date››]
    [-preaction ‹ScriptFile›] [-postaction ‹ScriptFile›]

symsnapvx -sid ‹SymmID›
    ‹-file ‹DeviceFileName› [-noprompt] |
     -noprompt 'redirect stdin' |
     -devs ‹‹SymDevStart›:‹SymDevEnd› | ‹SymDevName››
          [,‹‹SymDevStart›:‹SymDevEnd› | ‹SymDevName››...]
          [-noprompt]›
    -snapshot_name ‹SnapshotName›
      [-generation ‹GenerationNumber›]
    [-v] [-force] [-star]
    [-i ‹Interval›] [-c ‹Count›]

  restore
    [-preaction ‹ScriptFile›] [-postaction ‹ScriptFile›]
```

```
    [-remote]

  terminate [-restored [-symforce]]

  rename -name ‹NewSnapshotName›

  set ttl
    ‹-delta ‹Days› | -absolute ‹Date››

symsnapvx -sid ‹SymmID›
    ‹-file ‹DeviceFileName› [-noprompt] |
     -noprompt 'redirect stdin' |
     ‹-devs ‹‹SymDevStart›:‹SymDevEnd› | ‹SymDevName››
        [,‹‹SymDevStart›:‹SymDevEnd› | ‹SymDevName››...]›
      -lndevs ‹‹SymDevStart›:‹SymDevEnd› | ‹SymDevName››
        [,‹‹SymDevStart›:‹SymDevEnd› | ‹SymDevName››...]›
      [-noprompt]››
    -snapshot_name ‹SnapshotName›
      [-generation ‹GenerationNumber›]
    [-v] [-force] [-star]
    [-i ‹Interval›] [-c ‹Count›]

  link [-copy [-remote]] [-exact]

  relink [-copy [-remote]] [-exact]

  unlink [-symforce]

  set mode ‹copy | nocopy›

symsnapvx -sid ‹SymmID›
    ‹-file ‹DeviceFileName› |
     'redirect stdin' |
     -devs ‹‹SymDevStart›:‹SymDevEnd› | ‹SymDevName››
        [,‹‹SymDevStart›:‹SymDevEnd› | ‹SymDevName››...]› |
     -lndevs ‹‹SymDevStart›:‹SymDevEnd› | ‹SymDevName››
        [,‹‹SymDevStart›:‹SymDevEnd› | ‹SymDevName››...]›
```

```
        -snapshot_name <SnapshotName>
          [-generation <GenerationNumber>]
        [-force] [-summary [-mb | -gb | -tb]]
        [-i <Interval>] [-c <Count>]

      verify [-established | -estinprog]

      verify [-restored | -restinprog]

      verify [-linked  [-defined][-by_tgt]]

      verify [[-copyinprog | -copied [-destaged]] [-by_tgt]]

    symsnapvx -sid <SymmID>
        -file <DeviceFileName> |
        'redirect stdin' |
        -devs <<SymDevStart>:<SymDevEnd> | <SymDevName>
            [,<<SymDevStart>:<SymDevEnd> | <SymDevName>>...]> |
        -lndevs <<SymDevStart>:<SymDevEnd> | <SymDevName>
            [,<<SymDevStart>:<SymDevEnd> | <SymDevName>>...]>
        [-snapshot_name <SnapshotName>
          [-generation <GenerationNumber>]]
        [-failed] [-detail [-last_n <count>]]
        [-mb | -gb | -tb]
        [-i <Interval>] [-c <Count>] [-offline]

      list [-linked [-by_tgt] | -restored]

    symsnapvx -sid <SymmID>
        -file <DeviceFileName> |
        'redirect stdin' |
        -devs <<SymDevStart>:<SymDevEnd> | <SymDevName>
            [,<<SymDevStart>:<SymDevEnd> | <SymDevName>>...]> |
        -lndevs <<SymDevStart>:<SymDevEnd> | <SymDevName>
            [,<<SymDevStart>:<SymDevEnd> | <SymDevName>>...]>
        [-snapshot_name <SnapshotName>
          [-generation <GenerationNumber>]]
```

```
    [-mb | -gb | -tb]
    [-i <Interval>] [-c <Count>] [-offline]

  list -summary

symsnapvx -sid <SymmID>
    [-failed]
    [-mb | -gb | -tb]
    [-i <Interval>] [-c <Count>] [-offline]

  list

symsnapvx -sid <SymmID> -sg <SgName> -name <SnapshotName>
    [-v] [-noprompt] [-force] [-star]
    [-i <Interval>] [-c <Count>]

  establish [-ttl <-delta <Days> | -absolute <Date>>]
    [-preaction <ScriptFile>] [-postaction <ScriptFile>]

symsnapvx -sid <SymmID> -sg <SgName>
    -snapshot_name <SnapshotName>
      [-generation <GenerationNumber>]
    [-v] [-noprompt] [-force] [-star]
    [-i <Interval>] [-c <Count>]

  restore
    [-preaction <ScriptFile>] [-postaction <ScriptFile>]
    [-remote]

  terminate [-restored [-symforce]]

  rename -name <NewSnapshotName>

  set ttl
    <-delta <Days> | -absolute <Date>>

symsnapvx -sid <SymmID> -sg <SgName> -lnsg <SgName>
```

```
    -snapshot_name <SnapshotName>
      [-generation <GenerationNumber>]
    [-v] [-noprompt] [-force] [-star]
    [-i <Interval>] [-c <Count>]

  link [-copy [-remote]] [-exact]

  relink [-copy [-remote]] [-exact]

  unlink [-symforce]

  set mode <copy | nocopy>

symsnapvx -sid <SymmID> [-sg <SgName> | -lnsg <SgName>]
    -snapshot_name <SnapshotName>
      [-generation <GenerationNumber>]
    [-force] [-summary [-mb | -gb | -tb]]
    [-i <Interval>] [-c <Count>]

  verify [-established | -estinprog]

  verify [-restored | -restinprog]

  verify [-linked  [-defined][-by_tgt]]

  verify [[-copyinprog | -copied [-destaged]] [-by_tgt]]

symsnapvx -sid <SymmID> -sg <SgName>
    [-snapshot_name <SnapshotName>[
      [-generation <GenerationNumber>]
    [-failed] [-detail [-last_n <count>]]
    [-mb | -gb | -tb]
    [-i <Interval>] [-c <Count>] [-offline]

  list [-linked | -restored]

symsnapvx -sid <SymmID> -lnsg <SgName>
```

```
    [-snapshot_name <SnapshotName>]
      [-generation <GenerationNumber>]
    [-failed] [-detail [-last_n <count>]]
    [-mb | -gb | -tb]
    [-i <Interval>] [-c <Count>] [-offline]

  list -linked -by_tgt

symsnapvx -sid <SymmID> -sg <SgName>
    [-snapshot_name <SnapshotName>]
      [-generation <GenerationNumber>]
    [-mb | -gb | -tb]
    [-i <Interval>] [-c <Count>] [-offline]

  list -summary

symsnapvx -cg <CgName> -name <SnapshotName>
    [-sid <SymmID> |
     -rdfg <SymmID>:<GrpNum>[,<GrpNum>,...]|<all>[,...] |
    name:<RdfGroupName>[,<RdfGroupName>,...]>]
    [-rdf | -hop2] [-v] [-noprompt] [-force] [-star]
    [-i <Interval>] [-c <Count>]

  establish [-ttl <-delta <Days> | -absolute <Date>>]
    [-both_sides]
    [-preaction <ScriptFile>] [-postaction <ScriptFile>]

symsnapvx -cg <CgName>
    -snapshot_name <SnapshotName>
      [-generation <GenerationNumber>]
    [-rdf | -hop2] [-v] [-noprompt] [-force] [-star]
    [-i <Interval>] [-c <Count>]
    [-sid <SymmID> |
     -rdfg <SymmID>:<GrpNum>[,<GrpNum>,...]|<all>[,...] |
     name:<RdfGroupName>[,<RdfGroupName>,...]>]

  restore
```

```
    [-preaction ‹ScriptFile›][-postaction ‹ScriptFile›]
    [-remote]

  terminate [-restored [-symforce]]

  rename -name ‹NewSnapshotName›

  set ttl
    ‹-delta ‹Days› | -absolute ‹Date››

symsnapvx -cg ‹CgName›
    -snapshot_name ‹SnapshotName›
      [-generation ‹GenerationNumber›]
    [-rdf | -hop2] [-v] [-noprompt] [-force] [-star]
    [-i ‹Interval›] [-c ‹Count›]
    [-sid ‹SymmID› |
     -rdfg ‹SymmID›:‹GrpNum›[,‹GrpNum›,...]|‹all›[,...] |
     name:‹RdfGroupName›[,‹RdfGroupName›,...]›]

  link [-copy [-remote]] [-exact]

  relink [-copy [-remote]] [-exact]

  unlink [-symforce]

  set mode ‹copy | nocopy›

symsnapvx -cg ‹CgName›
    -snapshot_name ‹SnapshotName›
      [-generation ‹GenerationNumber›]
    [-rdf | -hop2]
    [-force] [-summary [-mb | -gb | -tb]]
    [-i ‹Interval›][-c ‹Count›]
    [-sid ‹SymmID› |
    -rdfg ‹SymmID›:‹GrpNum›[,‹GrpNum›,...]|‹all›[,...] |
     name:‹RdfGroupName›[,‹RdfGroupName›,...]›]
```

```
    verify [-established | -estinprog]

    verify [-restored | -restinprog]

    verify [-linked  [-defined][-by_tgt]]

    verify [[-copyinprog | -copied [-destaged]] [-by_tgt]]

  symsnapvx -cg CgName
      [-snapshot_name <SnapshotName>
        [-generation <GenerationNumber>]]
      [-failed] [-detail [-last_n <count>]]
      [-rdf | -hop2]
      [-sid <SymmID> |
      -rdfg <SymmID>:<GrpNum>[,<GrpNum>,...]|<all>[,...] |
       name:<RdfGroupName>[,<RdfGroupName>,...]>]
      [-mb | -gb | -tb]
      [-i <Interval>] [-c <count>] [-offline]

    list [-linked [-by_tgt] | -restored]

  symsnapvx -cg CgName
      [-snapshot_name <SnapshotName>
        [-generation <GenerationNumber>]]
      [-rdf | -hop2]
      [-sid <SymmID> |
      -rdfg <SymmID>:<GrpNum>[,<GrpNum>,...]|<all>[,...] |
       name:<RdfGroupName>[,<RdfGroupName>,...]>]
      [-mb | -gb | -tb]
      [-i <Interval>] [-c <count>] [-offline]

    list -summary
```

DESCRIPTION

The symsnapvx command performs TimeFinder/Snapvx operations on a device list, a list of device ranges, a device group

(DG), composite group (CG), or storage group (SG).

These operations are establishing, restoring, linking, and terminating snapshots. In addition, they allow listing the state of snapshots on devices or on the entire Symmetrix.

All SnapVX operations may be performed on a group or individual device basis. For group operations all devices must have been previously associated with the group.

ARGUMENTS

establish Creates and activates a Snapvx snapshot.

link Presents the snapshot data on the target device. With the -copy option the data is copied to the target.

list Lists all snapshots in a device file, device ranges, DG, CG, or SG filtered by snapshot_name, generation, restored, link, or failed. Output options are detail, summary, last_n, mb, gb and tb.

relink Removes the current link to target device and presents a different snapshot. The relink command may also be used to relink to the same snapshot. This has the effect of refreshing the point-in-time copy on the link target when it's been modified by host writes. With the -copy option performs a differential copy to the target.

rename Changes the name assigned to a snapshot.

restore Copies the point-in-time data from a

snapshot back to the original source device. When possible the restore operation will automatically determine whether this is done incrementally (copying changed tracks only) or if a complete copy is required. The snapshot must be fully Established to perform a restore.

set mode Changes the copy mode of a link to Copy or NoCopy.

set ttl Sets a time to live for a snapshot as either number of days from now (-delta) or a date (-absolute). The delta is specified from 1 to 400 days. The absolute time is a specified date up to 400 days in the future from which a delta is created based on the difference between the absolute time specified in the command and the host time when the command is issued.

terminate Removes an existing Snapvx snapshot. A linked snapshot cannot be terminated.

unlink Removes the current link to target device(s).

verify Verifies whether one or more devices are in the requested state.

KEYWORDS

copy Sets the link copy mode to perform background copy to the target device(s).

name Indicates an RDF group's logical name within a CG.

nocopy Sets the link copy mode to not perform background copy to the target device(s).

OPTIONS

-absolute Specifies a date and time for the snapshot time to live in the form MM/DD/YYYY (month/date/year) with reference to the host time. The specified date may be up to 400 days in the future.

-both_sides Performs the operation on both locally and remotely associated snapshots. Only valid with DG or CG.

-by_tgt Used with list -linked to display by link target or verify -linked, -copyinprog, or -copied to verify by link target.

-c Specifies the number (count) of times to Display or verify.

Specifies the number (count) of times to attempt to acquire an exclusive lock on the Symmetrix host database during control operations.

If you do not specify this option and specify an interval (-i), the program will loop continuously to list or verify or start the control operation.

-cg Applies a composite group name to the command.

-copied Verifies that the link(s) are in the Copied state. The -destaged switch may be used to verify that all tracks have been physically written to the link

target.

-copy Used with link and relink to specify copy mode.

-copyinprog Verifies that the link(s) are in the CopyInProg state.

-delta Specifies the time to live in days. This may be set to any value between 1 and 400.

-defined Used with verify -linked to wait until all tracks have been defined.

-destaged Used with verify -copied to wait until all tracks have been fully destaged and copied to the target before indicating in-state.

-detail Used with list to get an expanded display that provides all information.

-devs Specifies the ranges of Symmetrix source devices.

-established Verifies that the snapshot is in the Established state.

-estinprog Verifies that the snapshot is in the EstInProg state.

-exact When specified, pairs source and link devices in their ordinal positions within the selection. When not set uses the source and link device selections as a pool that pairs by best match.

-failed Used with list to display only failed snapshots or links.

-file Applies a device file to the command. The device file contains a list of devices or device pairs (SymDevnames) listing a device or pair per each line. For single devices, one device is entered per line. For device pairs, one pair is entered per line (the source device first, a space, and the target device). Device files may include comment lines that begin with the pound sign (#). A Symmetrix ID is required for this option. -f is synonymous with -file.

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

-g Applies a device group name to the command.

-gb Displays counts in gigabytes.

-generation Uniquely identifies snapshots of the same name and device. The generation number is incremented by one for each snapshot on a device and they are ordered by timestamp. If omitted the operation will default to generation zero (the most recent) for control operations.

-h Provides brief online help information.

-hop2 Performs the specified action on the

Symmetrix array two hops away. Only valid with DG or CG.

-i Specifies the repeat interval, in seconds, to wait, either between successive iterations of a list or verify operation or between control operation attempts to acquire an exclusive lock on the Symmetrix host database.

The default interval is 30 seconds.
The minimum interval is 5 seconds.
For passive actions the minimum interval is 15 seconds. Passive actions are actions that do not acquire an exclusive lock.

When used with the list or verify action, the number of seconds specified indicates the interval of time (in seconds) to repeat the verify command before the verify action finds and reports the pairs in state

-last_n Limits list output items to the number of last_n per device. Used with list to limit the number of generations to display for each device. Only applies to the detailed displays.

-linked When used with the list action displays the links associated with the selected devices. When used with the verify action verifies that nocopy links are in the linked state.

-lndevs Specifies the ranges of Symmetrix target devices.

-lnsg Applies an SG name to the command for

target devices.

-mb Displays counts in megabytes.

-name For establish this is the user supplied name for a new Snapvx snapshot.

-noprompt Requests to not return a prompt after a command is entered. The default is to prompt for confirmation.

-offline Specifies that the Symmetrix data connection is offline and the operation will use the host in-memory database.

-postaction Executes the script argument after a snapshot has been established or restored.

-preaction Executes the script argument before a snapshot has been established or restored.

-rdf Performs the action on the remote Symmetrix array. Only valid with DG or CG.

-rdfg Performs the requested action on a subset of the CG defined by one or more Symmetrix/RA Group combinations supplied as the argument to -rdfg.

-remote Acknowledges that the data will be propagated to the remote mirror of the RDF device. This is not allowed on a nocopy linked target.

-restinprog With the verify command, verifies that the snapshot(s) are in the RestoreInProgress state.

-restored With the verify command, verifies that the snapshot(s) are in the Restored state. With the terminate command, terminates restore(s). With list command displays restored snapshots only.

-snapshot_name The name of an existing snapshot used to identify the snapshot to be operated on.

-sid Applies the command to the specified Symmetrix ID. Use this option with the -file or -sg option to select the Symmetrix array on which to perform the operation, or specify this option with -cg option to restrict the operation to a single Symmetrix array.

-sg Applies an SG name to the command for source devices.

-star Targets the action at devices in STAR mode.

-summary Shows a summary of snapshot and link states for list or verify.

-symforce Forces the operation to execute when normally it is rejected. Use extreme caution with this option. If used when a link is copy in progress or when a restore is restore in progress, this will cause an incomplete copy and data on the copy target would not be usable.

-tb Displays counts in terabytes.

-ttl Applies a time to live when establishing

a new snapshot.

-v Provides a more detailed, verbose listing.

PARAMETERS

CgName The composite group name.

Count The number of times (count) to repeat.

Date The date in the format of MM/DD/YYYY.
This is with reference to the host time.

Day The day in the form ddd with
reference to the host time.

DeviceFileName The device file name. The device file
contains a list of devices or device
pairs (SymDevNames).

DgName The device group name.

GenerationNumber
The generation number of the snapshot.

GrpNum The RDF group number.

Interval The interval between polls, in seconds.

NewSnapshotName
The new snapshot name.

RdfGroupName The logical name associated with the RDF
group(s) in a CG.

SnapshotName The snapshot name.

ScriptFile The full pathname of a script file to

execute.

SymDevEnd The last Symmetrix device name in a range.

SymDevStart The first Symmetrix device name in a range.

SymmID The 12-digit ID of the Symmetrix array.

SgName The storage group name.

RETURN CODES

Code #	Code Symbol
0	CLI_C_SUCCESS
1	CLI_C_FAIL
2	CLI_C_DB_FILE_IS_LOCKED
18	CLI_C_ALREADY_IN_STATE The device or device group is already in the desired Copy state.
19	CLI_C_GK_IS_LOCKED All gatekeepers to the Symmetrix array are currently locked.
22	CLI_C_NEED_FORCE_TO_PROCEED Requires the force flag to proceed.
23	CLI_C_NEED_SYMFORCE_TO_PROCEED Requires the symforce flag to proceed. CAUTION: Extreme caution should be exercised when using this option.

Return codes for symsnapvx verify

12 CLI_C_NOT_ALL_RESTORED
Not all devices are in the 'Restored' state.

13 CLI_C_NONE_RESTORED
None of the devices are in the 'Restored' state.

18 CLI_C_ALREADY_IN_STATE
The Device(s) is (are) already in the desired state or mode.

29 CLI_C_NOT_ALL_RESTINPROG
NOT all of the pairs are in the 'RestInProg' state.

30 CLI_C_NONE_RESTINPROG
NONE of the pairs are in the 'RestInProg' state.

162 CLI_C_NOT_ALL_ESTABLISHED
Not all devices are in the 'Established' state.

163 CLI_C_NONE_ESTABLISHED
None of the devices are in the 'Established' state.

164 CLI_C_NOT_ALL_ESTINPROG
Not all devices are in the 'Estinprog' state.

165 CLI_C_NONE_ESTINPROG
None of the devices are in the 'Estinprog' state.

166 CLI_C_NOT_ALL_LINKED
Not all devices are in
the 'Linked' state.

167 CLI_C_NONE_LINKED
None of the devices are in
the 'Linked' state.

168 CLI_C_NOT_ALL_DEFINED
Not all devices are in
the 'Defined' state.

169 CLI_C_NONE_DEFINED
None of the devices are in
the 'Defined' state.

170 CLI_C_NOT_ALL_CIPLINKED
Not all linked devices
are in the 'Copyinprog'
state.

171 CLI_C_NONE_CIPLINKED
None of the linked devices
are in the 'Copyinprog'
state.

172 CLI_C_NOT_ALL_COPIEDLINKED
Not all linked devices
are in the 'Copied' state.

173 CLI_C_NONE_COPIEDLINKED
None of the linked devices
are in the 'Copied' state.

174 CLI_C_NOT_ALL_DESTAGED
Not all devices are in the
'Destaged' state.

175 CLI_C_NONE_DESTAGED
None of the devices are in the 'Destaged' state.

symstar

Performs SRDF/Star control operations
on a composite group.

SYNOPSIS

```
symstar -h

symstar show <CgName> [-detail]

symstar list [-c <Count>] [-i <Interval>]
    [-full] [-offline] [-local]

symstar -cg <CgName> [-noprompt] [-i <Interval>]
    [-c <Count>] [-wkload <SiteName>]
    [-opmode <concurrent | cascaded>]

  cleanup -site <SiteName> [-force] [-v]

  configure -add recovery_rdf_pairs

  configure -reset rdf_mode

  connect -site <SiteName> [-force] [-v] [-full]
    [-keep_data <SiteName> [-remote]]

  disable [-force] [-v]

  disconnect -site <SiteName> [-force] [-trip] [-v]

  enable [-force] [-v]

  halt [-reset] [-force] [-v]

  isolate -site <SiteName> [-force] [-v]

  protect -site <SiteName> [-force] [-v]
```

```
  query [-detail] [-offline]

  reconfigure -path <SrcSiteName>:<TgtSiteName>
    -site <TgtSiteName>
    [-remove <SrcSiteName>:<TgtSiteName>]
    [-full] [-reset] [-force] [-v]

  recover [-force]

  reset -site <SiteName> [-force] [-v]

  switch -site <SiteName> [-keep_data <SiteName>] [-force]
    [-full] [-v]

  unprotect -site <SiteName> [-force] [-v]

symstar -cg <CgName> [-i <Interval>] [-c <Count>]
    [-noprompt]

  verify -site <SiteName> -connected | -disconnected |
    -halted | -haltfail | -haltstarted | -isolated |
    -pathfail [-cleanreq] | -pathfailinprog | -protected

  verify -protected | -tripped | -trip_inprogress |
    -unprotected

symstar -cg <CgName> [-noprompt]

  buildcg -site <SiteName> [-update]

  setup -options <OptionsFile> [-distribute]
    [-site <SiteName>]
    [-opmode <concurrent | cascaded>]

  setup -options <OptionsFile> -reload_options
```

```
  setup -remove [-force]

symstar -cg <CgName> [-i <Interval>] [-c <Count>]
    [-noprompt] [-v]
    -sid <SymmID>
    -devs <<SymDevStart>:<SymDevEnd> | <SymDevName>
      [,<<SymDevStart>:<SymDevEnd> | <SymDevName>>...]> |
      -file <FileName>
    -stg_rdfg <GrpNum>[,<GrpNum>]
    -cg_rdfg <CgGrpNum>[,<CgGrpNum>]
    [-stg_r21_rdfg <R21GrpNum> -cg_r21_rdfg <CgR21GrpNum>]

  modifycg -add [-force]

  modifycg -remove
```

DESCRIPTION

The symstar command provides query and composite control operations to manage an SRDF/Star environment.

ARGUMENTS

buildcg Reads the internal definition for the SRDF/Star configuration and creates the matching host composite group (CG).

cleanup Cleans up stale information after a disaster failure (loss of WorkloadSite).

configure Changes the SRDF configuration.

connect Makes an SRDF connection and starts the data flow.

disable Disables SRDF/Star consistency protection.

disconnect Suspends the SRDF data flow.

enable Enables SRDF/Star consistency protection.

halt Write disables devices and synchronizes SRDF data to remote sites.

isolate Isolates the SyncTargetSite or AsyncTargetSite from the SRDF/Star replication. The RDF2 devices of the isolated site are made read/write enabled to their hosts.

list Displays information about all SRDF/Star configurations with an SRDF/Star definition file that is present either locally or on a locally-attached Symmetrix array.

modifycg Moves devices between the staging area and the SRDF/Star CG, and updates the CG definition to reflect the changes.

protect Waits for SRDF data to be synchronized to the remote SyncTargetSite or AsyncTargetSite and turns on SRDF consistency protection.

query Displays the status of the SRDF/Star configuration.

reconfigure
Changes the SRDF/Star replication data path.

rdf_mode Specifies that the SRDF mode for the connected sites in the CG be reset to adaptive copy. If the CG is configured with an R22 device, the recovery SRDF pairs are also reset to adaptive copy mode.

recover Recovers the failed modify add or modify remove operation and places the SRDF/Star CG into a known state.

reset Cleans up stale information after a transient failure (loss of connectivity) to the SyncTargetSite or AsyncTargetSite.

setup Reads and validates the host composite group that manages the SRDF/Star replication.

Builds an internal representation of the composite group and saves it in the following directories:

- /var/symapi/config/STAR/def (for UNIX) or
- %Program Files%\\EMC\\SYMAPI\\config\\Star\\ def (for Windows)

show Displays the contents of the internal definition for the SRDF/Star configuration.

switch Performs the necessary operations to start the workload at the SyncTargetSite or AsyncTargetSite.

unprotect Disables SRDF consistency protection for the devices on the SRDF links to the remote SyncTargetSite or AsyncTargetSite.

verify Verifies a given site or checks if SRDF/Star is in a desired state.

KEYWORDS

cascaded Sets the mode of operation for the SRDF/Star configuration to cascaded.

concurrent Sets the mode of operation for the SRDF/Star configuration to concurrent.

recovery_rdf_pairs
Configures the existing SRDF/Star configuration to incorporate R22 devices for the recovery SRDF pairs.

OPTIONS

-add Specifies the element of configuration to add.

-c Specifies the number (count) of times to display or to acquire an exclusive lock 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 display shows continuously, or until the SRDF/Star operation starts.

-cg Identifies the name of the host composite group.

-cg_rdfg The SRDF group(s) within the SRDF/Star CG in which to add or remove devices. For a concurrent SRDF/Star CG, two SRDF groups must be specified, separated by a comma. These SRDF groups are associated with the SRDF groups in the -stg_rdfg option. This association is based on their order in this option and -stg_rdfg.

-cg_r21_rdfg
The SRDF group connecting the R21 and R2 Symmetrix arrays of a cascaded SRDF/Star CG. It is only valid for operations involving cascaded R1 devices. This SRDF group is

associated with the SRDF group specified in the -stg_r21_rdfg option.

-cleanreq Verifies the site is in the pathfail state and needs cleaning.

-connected Verifies the site is in the connected state.

-detail Includes extended information in the output when used with the query and show commands.

-devs Specifies the ranges of Symmetrix devices to add or remove.

-disconnected
Verifies the site is in the disconnected state.

-distribute
Performs an automatic SRDF/Star definition file distribution. This form of setup does not disrupt an active protected SRDF/Star setup.

-file Specifies the filename containing the list of devices to act upon. Only the SymDevName specified in the first column of each line is used.

-force Allows the action to proceed even if the SRDF/Star environment is not currently in the proper state for that action. When used with the switch action, this lets you specify the -keep_data SiteName option if the current state of that site's data is not consistent. When used with the setup -remove action, this removes all SRDF/Star metadata

associated with the SRDF/Star CG, even when the CG is not defined in the symapi database.

-full Used by reconfigure, switch, and connect. Performs a full SRDF resynchronization if SRDF incremental resync is not available. Used by the list action to display full names instead of abbreviations.

-h Provides brief, online help information.

-halted Verifies the site is in the halted state.

-haltfail Verifies the site is in the haltfail state.

-haltstarted
Verifies the site is in the haltstarted state.

-i Specifies the repeat interval in seconds to display or to acquire an exclusive lock on the Symmetrix host database, the local Symmetrix array, and the remote Symmetrix arrays.
The default interval is 30 seconds.
The minimum interval is 5 seconds.
For passive actions the minimum interval is 15 seconds. Passive actions are actions that do not acquire an exclusive lock.

-isolated Verifies the site is in the isolated state.

-keep_data Identifies which site's data is retained when used with the switch and connect action.

If you switch to the SyncTargetSite and choose to keep the data of the AsyncTargetSite, the SRDF devices are reconfigured to make a new R1->R2 pairing. For the connect action, an SRDF establish or restore operation is performed, depending on which site's data is retained. By default, the workload site data is retained.

-local Lists only the locally-defined CGs. Available only for the list action.

-noprompt Requests no prompt before performing action.

-offline Obtains data from the configuration database on the host. No connections are made to any Symmetrix arrays. Available only for query and list actions.

-opmode Specifies the mode of operation (concurrent or cascaded).

-options Identifies the name of the file containing the options to use for this SRDF/Star configuration.

-path Specifies the sites on which the new SRDF pairs are created when the reconfigure action is issued.

-pathfail Verifies the site is in the pathfail state.

-pathfailinprog
Verifies the site in in the pathfailinprog state.

-protected Verifies the site is in the protected

state. If -site is not specified, verifies that SRDF/Star is in the protected state.

-reload_options
Reads the specified options file to update the SRDF/Star definition file when using the setup action. Do not change any SITE_NAME values with this option.

-remote Indicates the remote data copy flag. Used with the connect action when keeping remote data and the concurrent link is ready. Data is also copied to the concurrent SRDF mirror. Not required if the concurrent link is suspended.

-remove For the reconfigure action, specifies the sites on which the SRDF pairs are removed.

For the setup action, specifies that all SRDF/Star mode settings for all SRDF groups be set to off if the CG is defined in the symapi database, and to remove all SRDF/Star metadata associated with the group.

For the modifycg action, indicated to remove the specified devices from the SRDF/Star CG to the staging area.

-reset Performs a reset action on the path when the reconfigure action is issued. When used with the halt action, allows the application to be restarted at the same site after the halt command has completed or failed. When used with the configure action, specifies the element of the reset operation.

-sid Specifies the unique Symmetrix ID.

-site Specifies the SiteName to apply the given action.

-stg_r21_rdfg
For modifycg operations, indicates the SRDF group comprising the staging area at the R21 Symmetrix array when the configuration is cascaded. It is required for an add or remove operation when the setup is cascaded. This SRDF group is associated with the SRDF group in the -cg_r21_rdfg option.

-stg_rdfg For the modifycg operations, indicates the SRDF group(s) comprising the staging area. For a concurrent CG, two groups must be specified, separated by a comma. These SRDF groups are associated with the SRDF groups in the -cg_rdfg option. This association is based on their order in this option and -cg_rdfg.

-trip Transitions the site to pathfail state when used with disconnect action.

-tripped Verifies SRDF/Star is in the tripped state.

-trip_inprogress
Verifies SRDF/Star is in the trip_inprogress state.

-unprotected
Verifies the site is in the unprotected state. If -site is not specified, verifies SRDF/Star is in the unprotected state.

-update Allows the updating of the existing host composite group from the STAR definition file.

-v Provides a more detailed, verbose listing.

-wkload Specifies the current workload site name if symstar fails to determine the current workload site name.

PARAMETERS

CgGrpNum The SRDF (RA) group number in the CG.

CgName The name of the host composite group.

Count The number of times (count) to repeat.

FileName The name of the file that contains a list. Only the SymDevName specified on the first column of each line is used.

GrpNum The SRDF (RA) group number.

Interval The repeat interval in seconds.

OptionsFile The name of a file containing the symstar options.

R21GrpNum The SRDF (RA) group number of the R1 mirror of the R21 device.

SiteName The user-specified name for the SyncTargetSite or AsyncTargetSite.

SrcSiteName The name of the source (R1) site in a path.

SymDevEnd The last Symmetrix device name in a sequence, such as 00B6.

SymDevName The Symmetrix device name , unique per

Symmetrix array, such as 001C.

SymDevStart The first Symmetrix device name in a sequence, such as 001C.

SymmID The 12-digit ID of the Symmetrix array.

TgtSiteName The name of the target (R2) site in a path.

RETURN CODES

Code #	Code Symbol
0	CLI_C_SUCCESS The action was successful.
1	CLI_C_FAIL The action was unsuccessful.
18	CLI_C_ALREADY_IN_STATE The system is already in the desired state.
22	CLI_C_NEED_FORCE_TO_PROCEED The system is not in the proper state to execute this procedure. Use -force to execute this procedure anyway.
90	CLI_C_NONE_VERIFIED The system is not in desired state.
191	CLI_C_FEATURE_NOT_AVAILABLE The feature is not available in this version.

FILES

The options file is created by the user. It must conform to the following syntax:

```
SYMCLI_STAR_WORKLOAD_SITE_NAME          = ‹Wname›
SYMCLI_STAR_SYNCTARGET_SITE_NAME        = ‹Sname›
SYMCLI_STAR_ASYNCTARGET_SITE_NAME       = ‹Aname›
SYMCLI_STAR_ADAPTIVE_COPY_TRACKS        = ‹Numtracks›
SYMCLI_STAR_ACTION_TIMEOUT              = ‹Numseconds›
SYMCLI_STAR_TERM_SDDF                   = ‹YES/NO›
SYMCLI_STAR_ALLOW_CASCADED_CONFIGURATION = ‹YES/NO›
SYMCLI_STAR_SYNCTARGET_RDF_MODE         = ‹ACP/SYNC›
SYMCLI_STAR_ASYNCTARGET_RDF_MODE        = ‹ACP/ASYNC›
```

The supported options include:

```
Option          Description
---------------  --------------------
SYMCLI_STAR_WORKLOAD_SITE_NAME
            Value: ‹Wname›

            ‹Wname› is the name for the site where
            the concurrent RDF1 devices are local.

            The default value is SITE_A.

SYMCLI_STAR_SYNCTARGET_SITE_NAME
            Value: ‹Sname›

            ‹Sname› is the name for the
            synchronous target site. It must match
            the name assigned to the SRDF/S RDF
            groups in the composite group.

            The default value is SITE_B.

SYMCLI_STAR_ASYNCTARGET_SITE_NAME
            Value: ‹Aname›

            ‹Aname› is the name for the
            asynchronous target site. It must
```

match the name assigned to the SRDF/A RDF groups in the composite group.

The default value is SITE_C.

SYMCLI_STAR_ADAPTIVE_COPY_TRACKS

Value: ‹Numtracks›

‹Numtracks› is the number of invalid tracks to reach before transitioning out of adaptive copy mode and setting the mode to SRDF/S or SRDF/A.

The default value is 30000.

SYMCLI_STAR_ACTION_TIMEOUT

Value: ‹Numseconds›

‹Numseconds› is the maximum number of seconds to wait to achieve consistency protection or R2_Recoverable STAR protection, or for devices to reach ‹Numtracks› invalid tracks while syncing RDF devices.

The default value is 18000.

SYMCLI_STAR_TERM_SDDF

Allowed values: YES or NO

If set to YES, SDDF sessions are terminated on both the SYNC and ASYNC target sites at the time of symstar disable.

If set to NO, SDDF sessions on both SYNC and ASYNC target sites are not

terminated (deactivated instead) at
the time of symstar disable.

SYMCLI_STAR_ALLOW_CASCADED_CONFIGURATION
Allowed values: YES or NO

If set to YES, cascaded configurations
are allowed.

In cascaded configurations, the
data flows from the workload site to
the synchronous target site and then
to the asynchronous target site.

SYMCLI_STAR_SYNCTARGET_RDF_MODE
Valid values: ACP or SYNC

If set to ACP, the SRDF mode between
the workload site and the synchronous
target site is transitioned to
adaptive copy mode at the end of
'symstar unprotect'. If set
to SYNC, the SRDF mode between the
workload site and synchronous target
site remains in synchronous mode at
the end of 'symstar unprotect'.

The default value is ACP.

SYMCLI_STAR_ASYNCTARGET_RDF_MODE
Valid values: ACP or ASYNC

If set to ACP, the SRDF mode between
the workload site and the asynchronous
target site is transitioned to
adaptive copy mode at the end of
'symstar unprotect'. If set to ASYNC,

the SRDF mode between the workload site and asynchronous target site remains in asynchronous mode at the end of 'symstar unprotect'.

The default value is ACP.

EXAMPLES

To create the composite group for SRDF/Star protection, enter:

```
symcg create MyStar -type RDF1 -rdf_consistency
```

To add the concurrent SRDF devices to the MyStar composite group where the SRDF/A group is 30 and the SRDF/A group is 31, enter:

```
symcg -cg MyStar addall dev -sid 63 -rdfg 31
```

To assign the SRDF group names in the MyStar composite group, enter:

```
symcg -cg MyStar -rdfg 63:30 set -name synctgt
symcg -cg MyStar -rdfg 63:31 set -name asynctgt
```

To assign the recovery SRDF groups in the MyStar composite group, enter:

```
symcg -cg MyStar -rdfg 63:30 set -recovery_rdfg 20
symcg -cg MyStar -rdfg 63:31 set -recovery_rdfg 21
```

To create the SRDF/Star definition file, enter:

```
symstar -cg MyStar setup -option options.file
```

To connect the synchronous target site, enter:

```
symstar -cg MyStar connect -site synctgt
```

To protect the synchronous target site, enter:

```
symstar -cg MyStar protect -site synctgt
```

To connect the asynchronous target site, enter:

```
symstar -cg MyStar connect -site asynctgt
```

To protect the asynchronous target site, enter:

```
symstar -cg MyStar protect -site asynctgt
```

To enable the SRDF/Star protection for the composite group, enter:

```
symstar -cg MyStar enable
```

To verify synctgt is in a protected state, enter:

```
symstar -cg MyStar verify -site synctgt -protected
```

To change the flow of data from:

workload site to synctgt and workload site to asynctgt

to:

workload site to synctgt to asynctgt,

Enter:

```
symstar -cg MyStar reconfigure -path synctgt:asynctgt
      -site asynctgt
```

To change the flow of data from:

workload site to synctgt to asynctgt.

to:

workload site to synctgt and workload site to asynctgt,

Enter:

```
symstar -cg MyStar reconfigure -path workload:asynctgt
        -site asynctgt
```

symstat

Displays statistics about Symmetrix arrays, directors, disks, device groups, or devices.

SYNOPSIS

```
symstat -raw [-i <Interval>]

symstat -i <Interval> [-c <Count>]
  [-type REQUESTS [-g <DgName> [-bcv | -all]]]

symstat -i <Interval> [-c <Count>]
    -sid <SymmID> -RepType rdfa [-v]
    [-type REQUESTS]
    [-g ALL|-rdfg <#|ALL>|-cg <CgName|ALL>]

symstat -i <Interval> [-c <Count>]
    -g <DgName> -RepType rdfa [-v]
    [-type REQUESTS] [-hop2]

symstat -i <Interval> [-c <Count>]
    -sid <SymmID> -RepType rdf
    [-type REQUESTS] [-g ALL | -rdfg <#|ALL>]

symstat -i <Interval> [-c <Count>]
   -g <DgName> -RepType rdf
    [-type REQUESTS] [-hop2]

symstat -i <Interval> [-c <Count>]
    -sid <SymmID> -RepType rcopy
    [-type REQUESTS] [-name <sessionName>]

symstat -i <Interval> [-c <Count>]
    -type REQUESTS -CA <#|ALL> [-sid <SymmID>]

symstat -i <Interval> [-c <Count>]
    -type REQUESTS -EA <#|ALL> [-sid <SymmID>]
```

```
symstat -i <Interval> [-c <Count>]
    -type REQUESTS -EF <#|ALL> [-sid <SymmID>]

symstat -i <Interval> [-c <Count>]
    -type REQUESTS -RA <#|ALL> [-sid <SymmID>]

symstat -i <Interval> [-c <Count>]
    -type REQUESTS -SA <#|ALL> [-sid <SymmID>]

symstat -i <Interval> [-c <Count>]
    -dir <#|ALL> [-sid <SymmID> -RepType rcopy]

symstat -i <Interval> [-c <Count>]
    -type PREFETCH -DA <#|ALL> [-sid <SymmID>]

symstat -i <Interval> [-c <Count>]
    -type PREFETCH -DX <#|ALL> [-sid <SymmID>]

symstat -i <Interval> [-c <Count>]
    -type CACHE [-sid <SymmID>] [-CA <#|ALL>]

symstat -i <Interval> [-c <Count>]
    -type CACHE [-sid <SymmID>] [-EA <#|ALL>]

symstat -i <Interval> [-c <Count>]
    -type CACHE [-sid <SymmID>] [-RA <#|ALL>]

symstat -i <Interval> [-c <Count>]
    -type CACHE [-sid <SymmID>] [-SA <#|ALL>]

symstat -i <Interval> [-c <Count>]
    -type CACHE [-sid <SymmID>] [-dir <#|ALL>]

symstat -i <Interval> [-c <Count>]
    -type CACHE -sid <SymmID> -RepType rdfa
    [-g ALL | -rdfg <#|ALL> | -cg <CgName|ALL>]
```

```
symstat -i <Interval> [-c <Count>]
    -type CACHE -g <DgName> -RepType rdfa [-hop2]

symstat -i <Interval> [-c <Count>]
    -type CYCLE -sid <SymmID> -RepType rdfa
    [-g ALL | -rdfg <#|ALL> | -cg <CgName|ALL>]

symstat -i <Interval> [-c <Count>]
    -type CYCLE -g <DgName> -RepType rdfa [-hop2]

symstat -i <Interval> [-c <Count>]
    -type PORT -dir <#|ALL> [-sid <SymmID>]
    [-port <#|ALL>]

symstat -i <Interval> [-c <Count>]
    -type PORT -sid <SymmID> -dir <#|ALL>
    -RepType rcopy [-port <#|ALL>]

symstat -i <Interval> [-c <Count>]
    -type PATH -sid <SymmID> -RepType rcopy
    [-by_session | -by_port]

symstat -i <Interval> [-c <Count>]
    -type DISK -sid <SymmID>
    [-spindle [-internal | -external]]
    [[-disk <DA|ALL>[,<int|ALL>[,<id|ALL>]]] |
     [-spid <SpindleID|ALL>]]

symstat -i <Interval> [-c <Count>]
    -type DISK -sid <SymmID> -DX <#|ALL> [-spindle]

symstat -i <Interval> [-c <Count>]
    -type BACKEND -g <DgName> -ld <LdevName> [-mirror <#>]

symstat -i <Interval> [-c <Count>]
    -type BACKEND -pd <PdevName> [-mirror #]
```

```
symstat -i <Interval> [-c <Count>]
    -type BACKEND -dev <SymDevname>
    [-sid <SymmID>] [-mirror <#>]

symstat -i <Interval> [-c <Count>]
    -type MEMIO -g <DgName>
    [-ld <LdevName> | -bcv | -all]

symstat -i <Interval> [-c <Count>]
    -type MEMIO -pd <Pdevname>

symstat -i <Interval> [-c <Count>]
    -type MEMIO -dev <SymDevname> [-sid <SymmID>]

symstat -i <Interval> [-c <Count>]
    -type DMSP -g <DgName> -ld <LdevName>

symstat -i <Interval> [-c <Count>]
    -type DMSP -pd <PdevName>

symstat -i <Interval> [-c <Count>]
    -type DMSP -dev <SymDevname> [-sid <SymmID>]

symstat -i <Interval> [-c <Count>]
    -type RDF
    <-dev SymDevname            |
     -g <DgName> <-ld LdevName>  |
     -rdfg <#|ALL>              |
     -dir <#|ALL>               |
     -dir <#> -rdflink >

symstat -i <Interval> [-c <Count>]
    -type ISCSI [-sid <SymmID>] -RE <#>
    -ip <remote_ip_addr>
    <-rdf_spdlmt | -rdf_nw_comp | -spdlmt_grp>

symstat -i <Interval> [-c <Count>]
```

-type ISCSI [-sid ‹SymmID›] -DIR ‹#›
‹-tcp_conn | -gige_dir›

DESCRIPTION

The symstat command provides statistics about a Symmetrix array, a director, a device group, a disk, or a device. This command also displays DMSP (dynamic mirroring service policy) information about 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.

-by_port Organizes the path output by active R-Copy port.

-by_session Organizes the path output by remote copy session name.

-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 Limits the action to a channel director

number. To select all channel directors, specify ALL.

-cg Specifies the composite group name.

-DA Limits the action to a disk director number. To select all disk directors, specify ALL.

-DX Limits the action to an external disk director number. To select all disk directors, specify ALL.

-dev Applies Symmetrix device names to the action.

-dir Limits the action to a director number. To select all directors, specify ALL.

-disk Applies the action to a physical disk (DA, int, id). For example, SCSI ID 4 on interface C of DA 2A would be:

```
-disk 2A,C,4
```

The syntax -disk 02A:C4 is also valid.

-EA Limits the action to an ESCON director number. To select all ESCON directors, specify ALL.

-EF Limits the action to a FICON director number. To select all ESCON directors, specify ALL.

-g Limits the action to a device group name. The -dg option is also valid.

-gige_dir Collects network statistics for an entire director (iSCSI stats).

-h Provides brief online help information.

-hop2 Displays SRDF statistics for the second hop of a cascaded SRDF configuration.

-i Specifies the repeat interval in seconds. The default interval is 90 seconds. The minimum interval is 60 seconds.

-ip Specifies the remote IP address (to gather SRDF network compr stats-iSCSI).

-ld Applies logical device names to the action.

-mirror Requests stats from a specified mirror (1-4).

-name Specifies an optional, user-defined remote copy session name. The name is defined when the session is created.

-pd Applies physical device names to the action.

-port Specifies the director port number. ALL selects all ports for the specified director.

-RA Limits the action to an SRDF director (adapter) number. To select all SRDF directors, specify ALL.

-raw Returns raw statistics.

-RE GigE director configured as the SRDF (adapter) number. To select all SRDF directors, specify ALL.

-rdfg Collects statistics for the SRDF/A sessions by RA group number. To select all RA group numbers, specify ALL.

-rdflink Collects SRDF link-level statistics.

-rdf_nw_comp Collects SRDF network compression statistics (iSCSI stats).

-rdf_spdlmt Collects RDF speed limit information (iSCSI stats).

-RepType Specifies the replication type. Currently, rdfa, rdf and rcopy are supported.

-SA Limits the action to a front-end (SCSI or Fibre) director number. To select all front-end directors, specify ALL.

-sid Supplies the unique Symmetrix ID.

-spdlmt_grp Collects speed limit group statistics (iSCSI stats).

-tcp_conn Collects TCP connection-based statistics (iSCSI stats).

-spid Indicates the specific spindle ID of the target disk. To select all spindles, specify ALL.

-spindle Displays spindle information instead of

the standard disk address information.

-internal Displays internal spindles of spindle IDs specified.

-external Displays external spindles of spindle IDs specified.

-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:

```
Type     Performance Information
--------  ------------------------

BACKEND   Back-end I/O requests and
          throughput for selected device.

CACHE     Cache activity for
          selected front-end or remote
          link director(s) only.

CYCLE     Cycle summary information
          for active SRDF/A sessions or
          sessions that have non-zero cache
          usage.

DISK      Back-end I/O requests
          and throughput for the selected
          disk.

DMSP      DMSP stats for the
          selected device.
ISCSI     GigE network stats.
```

MEMIO Cache memory to disk activity for selected device(s).

PATH rcopy path information for non-incremental sessions. Symmetrix arrays that have all or some incremental sessions report an error.

PORT Performance statistics for a director port.

PREFETCH Tracks prefetch disk activity for selected back-end director(s) only.

RDF I/O requests and throughput for selected RDF device(s) or RA group(s) or RDF director(s).

REQUESTS 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

CgName Composite group name.

DA Disk director (DA) number.

DgName Device group name given by user. The name must be unique to this host.

id Director SCSI number of the specified physical disk to the statistics action.

int Director interface number to the
specified physical disk.

LdevName Logical device name either supplied by
the user or automatically assigned when a
device is added to a device group.

PdevName Physical (host) name for the device,
such as /dev/rdsk/c2t0d2s3.

remote_ip_addr Remote IP address.
sessionName Optional name that can be ascribed
to a remote copy session.

SymDevname Symmetrix device name, such as 000C.

SymmID 12-digit ID of the Symmetrix array.

SpindleID The spindle ID of the disk in hex format.

RETURN CODES

Code #	Code Symbol
0	CLI_C_SUCCESS
1	CLI_C_FAIL
19	CLI_C_GK_IS_LOCKED All GateKeepers to the Symmetrix unit are currently locked.

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 SRDF directors in the specified Symmetrix array every 60 seconds for a count of 10, 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 specified group every 60 seconds 100 times, enter:

```
symstat -g queryDB -i 60 -c 100 -type MEMIO
```

The following output is returned:

```
      DEVICE            Tracks/sec     % Dev
  H:M:S        WP Tracks  Prefchd Destgd   WPmax
   A            B       C     D       E
```

A Time of day.
B Total number of write pending tracks not yet destaged to disk.
C Number of tracks prefetched per second.
D Number of tracks destaged per second.
E Percentage write pending tracks are of device write pending limit.

To display REQUEST statistics about all devices in the specified group every 60 seconds 100 times, enter:

```
symstat -g rdwrDB -i 60 -c 100 -type REQUEST
```

The following output is returned:

```
    DEVICE    IO/sec       KB/sec    % Hits %Seq Num WP
 H:M:S       READ  WRITE   READ  WRITE  RD WRT READ Tracks
  A         B     C      D     E     F G    H    I
```

A Time of day.
B Number of read requests per second.
C Number of write requests per second.
D Number of kilobytes read per second.
E Number of kilobytes written per second.
F Read cache hit ratio. This field is blank for 5063 SYMMETRIX data.
G Write cache hit ratio. For 5063 data, read+write cache hit ratio.
H Percentage of read requests that are sequential.
I Total number of write pending tracks.

To display REQUEST statistics about all front-end SA directors in the specified Symmetrix every 60 seconds 100 times, enter:

```
symstat -SA ALL -i 60 -c 100 -type REQ -sid 8910
```

The following output is returned:

```
      DIRECTOR  IO/sec    Cache Requests/sec    % RW
  H:M:S          Host     READ   WRITE     RW  Hits
   A            B        C      D      E    F
```

A Time of day.

B For front-end directors, number of CDB requests, including read and write requests per second.
For back-end directors, number of disk reads and/or writes per second.
For remote link directors, number of remote reads and/or writes per second.

C Number of cache read requests per second.

D Number of cache write requests per second.

E Number of cache read and write requests per second.

F Read and write cache hit ratio.

To display CACHE statistics about all front-end SA directors in the specified Symmetrix array every 60 seconds 100 times, enter:

```
symstat -SA ALL -i 60 -c 100 -type cache -sid 8910
```

The following output is returned:

```
    DIRECTOR  Misses/sec      Disconnects/sec
H:M:S         Cache Read      System   Device
 A            B           C       D
```

A Time of day.

B Number of cache read misses per second.

C Number of disconnects per second due to system write pending limit.

D Number of disconnects per second due to device write pending limit.

To display PREFETCH statistics about all back-end DA directors in the specified Symmetrix array every 60 seconds 100 times, enter:

```
symstat -DA ALL -i 60 -c 100 -type prefetch -sid 8910
```

The following output is returned:

```
      DIR  Preftch   Preftch Trk/sec
  H:M:S     Trk/sec   Used    Unused
    A        B       C       D
```

A Time of day.
B Number of prefetched tracks per second.
C Number of prefetched tracks used per second.
D Number of prefetched tracks superseded per second.

To display BACKEND statistics for device 068 on the specified Symmetrix every 60 seconds, enter:

```
symstat -i 60 -type backend -dev 68 -sid 8910
```

The following output is returned:

```
     DEVICE    IO/sec       KB/sec    Prefetched Tracks
 H:M:S       READ  WRITE   READ  WRITE    Tracks   Used
  A          B    C      D    E      F      G
```

A Time of day.
B Number of read requests per second.
C Number of write requests per second.
D Number of kilobytes read per second.
E Number of kilobytes written per second.
F Number of prefetched tracks per second.
G Number of prefetched tracks used per second.

To display DMSP statistics for device 000 on the specified Symmetrix array every 60 seconds, enter:

```
symstat -i 60 -type dmsp -dev 0 -sid 8910
```

The following output is returned:

```
      DEVICE  Mirror # Pref  New   Old    % I/O   Act
```

```
H:M:S        1 2   Mirr  MSP   MSP   Seq Wrt  Lev
 A         B C    D    E    F    G  H   I
```

A Time of day.
B DMSP mirror 1 info (mset element number, DA number, DA interface, and disk SCSI ID).
C DMSP mirror 2 info.
D Preferred DMSP mirror.
E New mirror service policy.
F Old mirror service policy.
G Percent of I/O which is sequential.
H Percent of I/O which is writes.
I Activity level.

To display DISK statistics for the physical drive located at 02A:C5 in the specified Symmetrix array every 60 seconds, enter:

```
symstat -i 60 -disk 2a,c,5 -type disk -sid 8910
```

The following output is returned:

```
      DISK   IO/sec       KB/sec
 H:M:S     READ  WRITE   READ  WRITE
  A   B    C    D      E    F
```

A Time of day.
B Specified physical disk output in the format (for example, 02A:C5).
C Number of read requests per second.
D Number of write requests per second.
E Number of kilobytes read per second.
F Number of kilobytes written per second.

symstp

Collects raw performance counters for a Symmetrix array, directors, devices, disks, ports, LRU, and RDFA.

SYNOPSIS

symstp [-i ‹Interval›] [-c ‹Count›]

[-all]

[-sys]

[-dev]

[-dir]

[-disk]

[-port]

[-lru]

[-rdfa]

DESCRIPTION

The symstp command collects statistics information for all available Symmetrix arrays, its directors, devices, disks, director ports, LRUs, or SRDF/A. The output is ASCII ttp format which are created in the current directory.

ARGUMENTS

None.

OPTIONS

-all Specifies to collect counters for all (DEFAULT) performance categories.

-c Specifies the number (count) of times (cycles) to collect statistics. If this option is not specified and an interval (-i) is specified, statistics will be collected continuously.

-dev Specifies to collect counters for the device performance category.

-dir Specifies to collect counters for the director performance category.

-disk Specifies to collect counters for the disk performance category.

-dlf Disables the collection information log file.

-h Provides brief, online help information.

-i Specifes the repeat interval in seconds. The default interval is 300 seconds. The minimum interval is 60 seconds.

-ldb Specifies to use a local SYMAPI database rather than an in-memory database.

-lru Specifies to collect counters for the LRU performance category.

-port Specifies to collect counters for the port performance category.

-rdfa Specifies to collect counters for the RDF/A performance category.

-sid Supplies the Symmetrix ID to limit the scope of the operation to the specified Symmetrix array. The default is all visible Symmetrix arrays.

-sys Specifies to collect counters for the system performance category.

-u Specifies to run in uncompressed mode (no zip file).

-v Provides a more detailed, verbose listing.

WINDOWS ONLY OPTIONS

-dfs Disables the Windows free-space check.

PARAMETERS

SymmID The 12-digit ID of the Symmetrix array.

RETURN CODES

Code #	Code Symbol
0	CLI_C_SUCCESS
1	CLI_C_FAIL
19	CLI_C_GK_IS_LOCKED All GateKeepers to the Symmetrix array are currently locked.

EXAMPLES

To collect all statistics for all Symmetrix arrays every

600 seconds continuously, enter:

```
symstp -i 600
```

To collect all statistics for the specified Symmetrix array every 2 minutes (120 seconds) for 12 cycles (about 24 minutes), enter:

```
symstp -sid 1357 -i 120 -c 12
```

To collect system and RDF/A statistics for the specified Symmetrix array every 5 minutes (300 seconds) for 10 cycles, enter:

```
symstp -i 300 -c 10 -sys -rdfa -sid 098712341357
```

To collect all statistics for the specified Symmetrix array every 5 minutes (300 seconds) for 10 cycles without compression, enter:

```
symstp -i 300 -c 10 -all -sid 098712341357 -u
```

symtier

Allows you to create and manage storage tiers that can be used for FAST policies.

SYNOPSIS

```
symtier -sid ‹SymmID› [-i ‹Interval›] [-c ‹Count›]

  create -name ‹TierName›
    ‹-tgt_raid1 |
     -tgt_raid5 -tgt_prot ‹3+1 | 7+1› |
     -tgt_raid6 -tgt_prot ‹6+2 | 14+2››
    -technology ‹EFD | FC | SATA›
    -inc_type dynamic

  create -name ‹TierName›
    ‹-tgt_raid1 |
     -tgt_raid5 -tgt_prot ‹3+1 | 7+1› |
     -tgt_raid6 -tgt_prot ‹6+2 | 14+2››
    -technology ‹EFD | FC | SATA›
    -inc_type static
    [-dsk_grp ‹‹DiskGroupID›[,‹DiskGroupID›...] |
            name:‹DiskGroupName›[,‹DiskGroupName›...]›]

  create -name ‹TierName›
    ‹-tgt_unprotected | -tgt_raid1 |
     -tgt_raid5 -tgt_prot ‹3+1 | 7+1› |
     -tgt_raid6 -tgt_prot ‹6+2 | 14+2››
    ‹-technology ‹EFD | FC | SATA››
    [-external]
    -vp
    [-pool ‹‹PoolName›[,‹PoolName›...]›]

  modify -tier_name ‹TierName›
    -technology ‹EFD | FC | SATA›

  delete -tier_name ‹TierName› [-force]
```

```
rename -tier_name <TierName> -name <NewTierName>

add -tier_name <TierName> [-propagate]
  -dsk_grp <<DiskGroupID>[,<DiskGroupID>...]> |
        <name:<DiskGroupName>[,<DiskGroupName>...]>

add -tier_name <TierName>
  -pool <<PoolName>[,<PoolName>...]>

remove -tier_name <TierName> [-propagate]
  -dsk_grp <<DiskGroupID>[,<DiskGroupID>...]> |
        <name:<DiskGroupName>[,<DiskGroupName>...]>

remove -tier_name <TierName>
  -pool <<PoolName>[,<PoolName>...]>

symtier [-sid <SymmID>] [-v] [-offline]

list [-dp | -vp [-ckd | -fba]]
    [-technology <EFD | FC | SATA> | -external]

symtier -sid <SymmID> [-offline]

show -tier_name <TierName>
```

DESCRIPTION

The symtier command provides the ability to create, delete and modify the storage tiers. The tiers can be added to FAST policies.

ARGUMENTS

add Adds disk groups or thin pools to the storage tier.

create Creates a storage tier with the specified attributes.

delete Deletes the storage tiers.

list Lists storage tier names and details.

modify Modify tier attributes.

remove Removes disk groups or thin pools from the storage tier.

rename Renames the storage tier.

show Shows detailed information about the storage tier.

OPTIONS

-c Specifies the number (count) of times to try the requested action. If this option is not specified, and an interval (-i) is specified, the process will attempt -c number of times waiting for the database lock.

-ckd Specifies the operation to be on CKD emulation tiers.

-dp Specifies the operation to be on disk group-provisioned tiers.

-dsk_grp Specifies the disk groups be added to the tier. The list can contain either the disk group IDs or the disk group names.

-external Indicates that the tier will contain externally provisioned VP pools.

-fba Specifies the operation to be on FBA emulation tiers.

-force Allows a non-empty tier to be deleted.

-h Provides brief, online help information.

-i Specifies the repeat interval for retrying the requested action. This option indicates how often to attempt to get the needed resources to start a new session. The default interval is 30 seconds. The minimum interval is 15 seconds.

-inc_type Specifies if the storage tier is static or dynamic. A static tier only includes the specified disk groups. A dynamic tier includes all disk groups that match the tier specifications, including any new disk groups which were created after the tier was created.

-name Specifies the name of the tier being created or the new name if the tier is being renamed.

-offline Displays the Symmetrix devices from the Symmetrix configuration database without refreshing the data from the Symmetrix array.

-pool Specifies the names of the thin pools to be included, added, or removed from the VP tier.

-propagate Allows the changes to be propagated to all necessary tiers to prevent partial overlap of disk groups.

-sid Restricts the selection criterion to the specified Symmetrix array ID.

-technology Specifies the drive type. The supported types are EFD, FC, or SATA.

-tier_name Specifies the storage tier name.

-tgt_prot Applies to devices with -raid5 or -raid6 only. Further filters raid devices based on protection types, 3+1, 7+1, 6+2 or 14+2.

-tgt_raid1 Indicates that the target protection type is RAID-1.

-tgt_raid5 Indicates that the target protection type is RAID-5.

-tgt_raid6 Indicates that the target protection type is RAID-6.

-tgt_unprotected
Indicates that the target protection type is unprotected.

-v Provides a more detailed, verbose listing.

-vp Specifies the operation to be on virtual provisioned tiers.

PARAMETERS

Count The number of iterations to execute before exiting.

DiskGroupID The disk group ID.

DiskGroupName
The disk group name.

Interval The interval between polls, in seconds.

NewName The new storage tier name.

PoolName The thin pool name.

SymmID The 12-digit ID of the Symmetrix array.

TierName The storage tier name.

RETURN CODES

Code #	Code Symbol
0	CLI_C_SUCCESS
1	CLI_C_FAIL
2	CLI_C_DB_FILE_IS_LOCKED
19	CLI_C_GK_IS_LOCKED All Gatekeepers to the Symmetrix array are currently locked.

EXAMPLES

To create a static disk group-provisioned storage tier, enter:

```
symtier -sid 207 create -name PrimeTier -tgt_raid1
  -inc_type static -technology EFD -dsk_grp 1
```

To create a dynamic disk group-provisioned storage tier, enter:

```
symtier -sid 207 create -name PrimeDBTier -tgt_raid5
  -tgt_prot 3+1 -inc_type dynamic -technology EFD
```

To create a virtually-provisioned storage tier, enter:

```
symtier -sid 207 create -name VPTier -tgt_raid1
  -technology EFD -vp
```

To delete a storage tier, enter:

```
symtier -sid 207 delete -tier_name PrimeTier
```

To add a disk group to a disk group-provisioned storage tier, enter:

```
symtier -sid 207 add -dsk_grp 2 -tier_name PrimeTier
```

To add a thin pool to a virtually-provisioned storage tier, enter:

```
symtier -sid 207 add -tier_name VPTier -pool
  AddPool
```

To remove a disk group from a disk group-provisioned storage tier, enter:

```
symtier -sid 207 remove -dsk_grp 1
  -tier_name PrimeTier
```

To remove a thin pool from a virtually-provisioned storage tier, enter:

```
symtier -sid 207 remove -pool RemPool
  -tier_name VPTier
```

To rename a storage tier, enter:

```
symtier -sid 207 rename -tier_name PrimeDBTier
  -name PrimeTierR1
```

symtw

Defines time windows for FAST, FAST VP, and Optimizer.

SYNOPSIS

```
symtw -h

symtw -sid <SymmID> -inclusive [-noprompt]
    -type <move_dp | move_vp | perf | all>

  add    -days <DayList>
        -start_time <Time> -end_time <Time>

  remove <-days <DayList>
         -start_time <Time> -end_time <Time>

symtw -sid <SymmID> -exclusive [-noprompt]
    -type <move_dp | move_vp | perf | all>

  add    -start_day <DateTime> -end_day <DateTime>

  remove -start_day <DateTime> -end_day <DateTime>

symtw -sid <SymmID> <<-inclusive> <-exclusive>> [-noprompt]
    -type <move_dp | move_vp | perf | all>

  rmall

symtw [-sid <SymmID>] [-offline]

  list [-type <move_dp | move_vp | perf>]

  list -summary [-date <Date>]

symtw -sid <SymmID> [-noprompt]
```

convert [-date ‹Date›] [-force]

DESCRIPTION

The symtw command defines time windows to control FAST, FAST VP, and Optimzier.

Three types of time windows can be added and removed. The list command displays all the defined time windows.

ARGUMENTS

add Adds a new time window.

convert Converts the legacy symoptmz time window definitions to the symtw enhanced time window definitions.

list Lists the time window information for a given Symmetrix array, or for all Symmetrix arrays.

remove Removes a time window from the Symmetrix array.

rmall Removes all time windows that match the specified type.

KEYWORDS

all Indicates all time window types for both inclusive and exclusive time windows. When combined with the add operation, the specified time window will be added for all three window types. When combined with the remove operation, any time window of any type that matches will be removed.

move_dp Indicates the disk group provisioning time window type.

move_vp Indicates the virtual provisioning time window type.

perf Indicates the performance time window type.

OPTIONS

-date Indicates the week which includes the start date when generating or displaying the composite time windows. The week always runs from Sunday to the following Saturday.

-days Indicates the days in a week that the time window applies.

-end_day Indicates the end date and time of the exclusive time window.

-end_time Specifies the ending time of day for the time window. Valid values are from 00:00 to 24:00 in 30 minute increments. The ending time has to be within the day boundary. The time 00:00 represents midnight AM and 24:00 represents midnight PM. For the inclusive time window only.

-exclusive Indicates the time windows that will not allow the operation to be executed. The exclusive time window will supersede all inclusive time windows.

-force Attempts to force the convert operation to happen even though the symoptmz time windows cannot be translated to the symtw

time windows.

-inclusive Indicates the time windows that will execute operations.

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

-offline Displays information from the Symmetrix configuration database without refreshing the data from the Symmtrix array.

-sid Specifies the unique Symmetrix ID.

-start_day Indicates the start date and time of the exclusive time window.

-start_time Specifies the starting time of day for the time window. Vaild values are from 00:00 to 24:00 in 30 minute increments. The starting time must be within the day boundary. The time 00:00 represents midnight AM and 24:00 represents midnight PM. For the inclusive time window only.

-summary Displays a calendar view of all defined time windows.

-type Indicates the type of the time window. Valid values are move_dp, move_vp, and perf.

PARAMETERS

Date The date in the format of MMDDYYYY.

DateTime The date and time in the format of MMDDYYYY:HHMM. The time of day values are in

30 minute increments. The valid values for minutes are 0 and 30.

DayList Any comma-separated combination of Mon, Tue, Wed, Thu, Fri, Sat, and Sun.

SymmID The 12-digit ID of the Symmetrix array.

Time The time of day in the format of HH:MM. The valid values are 00:00 to 24:00 for each day in 30 minute increments. The time 00:00 represents midnight AM and 24:00 represents midnight PM.

RETURN CODES

Code #	Code Symbol
0	CLI_C_SUCCESS
1	CLI_C_FAIL
2	CLI_C_DB_FILE_IS_LOCKED
19	CLI_C_GK_IS_LOCKED All GateKeepers to the Symmetrix array are currently locked.

EXAMPLES

To add a new disk group provisioning time window, enter:

```
symtw add -sid 123 -type move_dp -inclusive
    -days Mon,Tue,Fri
    -start_time 18:00 -end_time 24:00
```

To remove a disk group provisioning time window, enter:

```
symtw remove -sid 123 -type move_dp
    -days Mon,Tue,Fri
    -start_time 08:00 -end_time 12:00
```

symvg

Displays information for logical volume groups (vg) that are defined by the platform's logical volume manager.

SYNOPSIS

```
symvg [-h] [-type ‹VgType›]

  list [-v]

  show ‹VgName›

  deport ‹VgName› [-newvg ‹NewVgName›] [-host ‹hostid›]
    [-mapfile ‹Filename›] [-overwrite]

  import ‹VgName› [-newvg ‹NewVgName›]
    [-mapfile ‹Filename›] [-cluster] [-clear] [-persistent]

  rescan

  create  ‹VgName› [-p PartitionSize] ‹PdevName...›

  destroy ‹VgName›

  adddev  ‹VgName› ‹PdevName...›

  rmdev   ‹VgName› ‹PdevName...›

  recover ‹VgName›

symvg [-h] [-v] [-type ‹VgType›] [-force] [-sid ‹SymmID›]
    [-rdfg ‹GrpNum›] [-R1 | -R2] [-bcv | -nobcv | -vdev]

  vg2dg ‹VgName› ‹DgName›
    [-dgtype [REGULAR | RDF1 | RDF2 | ANY]]
```

```
vg2cg ‹VgName› ‹CgName›
  [-cgtype [REGULAR | RDF1 | RDF2 | ANY]]
  [-apidb | -rdf_consistency]
```

DESCRIPTION

The symvg command displays information and provides for the provisioning of logical volume groups that are defined on the host system.

Additionally, the user can convert the devices of a specified volume group to a device group 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.

Import, deport, rescan and the provisioning operations such as create, destroy, adddev, rmdev, and recover are supported only on specific logical volume managers.

Volume group name length restriction:
The volume group name field is limited to 63 characters. This length restriction is inclusive of the name and absolute path of the volume group even if the user only specified the volume group name itself. The behavior is undefined if the length is exceeded.

When mapping objects in the ASM volume manager, three environment variables are required in order to contact the ASM instance:

```
Environment Variable   Description
--------------------   ------------------
SYMAPI_ASM_HOME        Oracle Home of ASM instance
```

SYMAPI_ASM_SID Oracle Sid of ASM instance
SYMCLI_ASM_CONNECT username/password of ASM instance

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 of the volume groups that were defined for this host. The behavior is undefined if the volume group name is more than 63 characters.

recover Recovers a failed volume group. This operation is currently supported for SUN_VXVM, HP_VXVM, AIX_VXVM, WIN_LDM, WIN_VXVM, LINUX_VXVM, EMC_PVM and OSF1_LSM.

rescan Rescans all of the volume groups. This operation is currently supported only for the Logical Disk Manager (LDM) volume groups and Veritas VXVM volume groups on Windows platforms, Linux LVM volume groups on Linux platforms, and HP LVM volume groups on HP-UX platforms.

rmdev Removes the specified devices from the volume group.

show Shows information about a volume group.

vg2cg Converts the specified volume group into a composite group.

vg2dg Converts the specified volume group into a device group.

OPTIONS

-apidb Creates the composite groups in the SYMAPI database only.

-bcv Associates only BCV devices to the target group.

-cgtype Specifies a composite group type.

-clear Imports a volume group and clears the host ID on the volume group. This flag is only for Veritas volume managers.

-cluster Imports a Windows VxVM volume group as a cluster.

-dgtype Specifies a device group type.

-force Attempts to force the operation even though one or more devices in the volume group may already be part of another device group or composite group.

-h Provides brief, online help information.

-host Specifies the host ID of the host on which the deported volume group can be imported.

-mapfile Specifies the filename where volume group information is stored when an import or deport is performed.

-newvg Specifies a new volume group name for the volume group.

-nobcv Adds standard devices only to the target group. The default behavior is to add both standard and BCV devices.

-overwrite Used in conjunction with the -mapfile option to overwrite an existing mapfile if set.

-p Specifies the partition size in megabytes. This option is only valid for AIX_LVM type LVM.

-persistent Imports the volume group by configuring physical devices in persistent DSF format. This option is only valid for HP LVM on HPUX 11.31.

-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 enables it for SRDF consistency protection after devices are added to it.

-rdfg Selects SRDF devices that belong to a

specified Symmetrix SRDF (RA) group number.

-sid Specifies a unique Symmetrix ID.

-type Specifies the volume group type.

-v Provides a more detailed, verbose listing.

-vdev Adds VDEVs to the target group.

PARAMETERS

CgName The composite group name.

DgName The device group name.

Filename The file name where the volume group information is stored when an import or deport operation is performed.

GrpNum The SRDF (RA) group number.

hostid The host identification number.

NewVgName The new logical volume group name.

PartitionSize The partition size for a device in MBs.

PdevName A fully-qualified device path of a character device.

SymmID The 12-digit ID of the Symmetrix array.

VgName The logical volume group name.

VgType The volume group type. Values are:

```
Group Type
------------        -------------
DEFAULT             LINUX_LVM
AIX_LVM             LINUX_POOL
AIX_VXVM            LINUX_VXVM
AS400_LVM           ORACLE_ASM
DYNIX_SVM           SUN_SOLSTICE
EMC_PVM             SUN_VXVM
HP_LVM              WIN_LDM
HP_VXVM             WIN_VXVM
```

RETURN CODES

Code #	Code Symbol
0	CLI_C_SUCCESS
1	CLI_C_FAIL

EXAMPLES

To list all the default logical volume groups in a list format, enter:

```
symvg list
```

To list all the SunOS 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 create an ANY device group named newdg from the volume group named thisvg enter:

```
symvg vg2dg thisvg newdg -dgtype ANY
```

To deport a volume group named testvg out of the system, enter:

```
symvg deport testvg
```

To deport a volume group named testvg so that it can be imported on a host named foo, enter:

```
symvg deport testvg -host foo
```

Note: The previous option is available only with VxVM on HP and SUNOS platforms.

To import a volume group named testvg into the system, enter:

```
symvg import testvg
```

To import on an AIX LVM volume group named aixtestvg, enter:

```
symvg import aixtestvg  -mapfile hdisk22
```

Note: In the previous example, the -mapfile option specified the device name 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/rdsk/c0t0d0s2
```

To create a volume group named aixtestvg of type AIX LVM with a partition size of 16MB, enter:

```
symvg create aixtestvg -p 16 /dev/rhdisk40
```

To add a device to the volume group named testvg, enter:

```
symvg adddev testvg /dev/rdsk/c0t0d1s2
```

To remove two devices from the volume group named testvg, enter:

```
symvg rmdev testvg /dev/rdsk/c0t0d1s2 /dev/rdsk/c0t5d5s2
```

To remove the volume group named testvg from the system, enter:

```
symvg destroy testvg
```

Volume group options for import/deport operations:

Type	action	VgName	-newvg	-mapfile	-cluster	-persistent
AIX_LVM	I	M	O	M	NA	NA
AIX_LVM	D	M	NA	NA	NA	NA
EMC_PVM	I	O	O	M	NA	NA
EMC_PVM	I	M	O	O	NA	NA
EMC_PVM	D	M	NA	O	NA	NA
HP_LVM	D	M	NA	M	NA	NA
HP_LVM	I	M	NA	M	NA	O
HP_VXVM	I/D	M	O	NA	NA	NA

NT_LDM	I	M	O	NA	O	NA
NT_LDM	D	M	NA	NA	NA	NA
OSF1_LSM	I/D	M	O	NA	NA	NA
SUN_VXVM	I/D	M	O	NA	NA	NA
AIX_VXVM	I/D	M	O	NA	NA	NA
LINUX_VXVM	I/D	M	O	NA	NA	NA
LINUX_LVM	I/D	M	NA	M	NA	NA
SUN_SOLSTICE	I/D	M	NA	NA	NA	NA

Legend for the abbreviations used in the table:

D - Deport
I - Import
M - Mandatory
NA - Not Applicable
O - Optional

Notes:

1. For an import operation for AIX LVM, the -mapfile option is used to specify a device name that existed as part of the volume group.

2. The output of the symvg show command can report incorrect device status. Whenever the device status is reported incorrectly, it is recommended that the user run symcfg sync and then run symvg show to report the correct device status.

3. On Windows platforms, import and deport operations are supported for Veritas VxVM 2.7 and higher. Provisioning operations such as create, destroy, adddev, rmdev are supported for Veritas VxVM 3.0 and higher.

4. With Veritas volume managers on all host

operating systems, the deport operation on volume groups named rootdg is not allowed.

5. The recover action is not supported for the following volume managers:
   - AIX LVM on the AIX platform.
   - HP LVM on the HP-UX platform.
   - Native LVM on the Linux platform.
   These are the default LVMs for their respective platforms.

6. On the HP-UX platform with HP-UX LVM, with a volume group containing an EMC Symmetrix disk, you can only add Symmetrix disks with the same attributes to the volume group. For example, if a volume group contains an EMC Symmetrix disk of a 2-way-mir type, only Symmetrix disks of a 2-way-mir type can be added to this volume group.

7. On the Solaris platform with SUN_SOLSTICE volume manager, a volume group named solstice cannot be created.

CHAPTER 2
Options Files

This chapter contains details on the Daemon Options file and the Options file.

Daemon Options File

The daemon_options file contains parameters that can be set to control the behavior of the various EMC Solutions Enabler daemons. Each daemon reads this file as it starts and applies any settings within it that apply.

CAUTION: These parameters are intended for experienced users. In most scenarios, the default values used by the daemons will be sufficient.

CAUTION: This file should be protected so that only authorized users can make changes to it.

Lines in this file are allowed to have one of the following formats:

NAME = VALUE	Set the parameter NAME for all daemons that understand this parameter.
stororad:NAME = VALUE	Set the parameter NAME for only the stororad daemon.
storora*NAME = VALUE	Set the parameter NAME for all daemons whose name begins with storora. The asterisk (*) character is a wildcard - matching the remainder of a daemons name.

Option values that are very long can extend to the next line by placing a backslash at the very end of the line. For example:
stororad:NAME = VALUE1 : VALUE2 : VALUE3 : \
VALUE4 : VALUE5

The daemon_options file is located in the SYMAPI configuration directory.

Directory	System
`/var/symapi/config`	UNIX
`C:\Program files\EMC\Symapi\config`	Windows
`your_specific_installation_directory`	OpenVMS, AS/400, MVS

These common daemon parameters apply to the core Solutions Enabler daemons:

storsrvd [Base Daemon]
storevntd [Event Daemon]
storgnsd [GNS Daemon]
storrdfd [RDF Daemon]
storapid [SYMAPI Server Daemon]
storstpd [STP Daemon]
storwatchd [Watchdog Daemon, UNIX only]

Common Parameters

The following table provides the description and default values for each parameter.

Parameter	Allowed Values	Default Value	Description
AUTORESTART	enable | disable	Default value: enable	Specifies whether a watchdog mechanism (UNIX: storwatchd daemon) should be used to automatically restart a daemon if it crashes.
LOG_LEVEL	error | info | debug | verbose | warning	Default value: warning	Specifies a severity-based control over logging volume. Messages that are issued with a severity equal to or exceeding the level specified will be recorded in the log file. Do not use debug or verbose without direction from EMC Customer Support.
LOGFILE_TYPE	dated | wrap	Default value: wrap	Specifies which style of log file the daemon will use. Two styles are supported: wrap: Two log files are maintained: storxxxx.log0 and and storxxxx.log1. Logging alternates between these--switching to the other file each time the maximum size specified by the LOGFILE_SIZE parameter is reached. The modified time on the files can be used to determine the current one. dated: A separate log file is used for each day: storxxxx-YYYYMMDD.log. (e.g.: storapid-20041130.log). There are no size limits on these files. Log files are written to the following directory: UNIX: /var/symapi/log Windows: c:\\Program Files\\EMC\\SYMAPI\\log The dated LOGFILE_TYPE is recommended for storstpd.
LOGFILE_SIZE	A number, in KB units	Default value: 1000 (1000-KB)	For LOGFILE_TYPE=wrap style log files, how large each log file is allowed to grow before wrapping to the alternate file.
LOGFILE_ RETENTION	A number of days, greater than zero.	Default value: 3 (days)	For LOGFILE_TYPE=dated style log files, log files more than this many days old will be automatically deleted.
LOGFILE_ PERMS	r | n | rw	Default value: rw	By default, daemon log files allow anyone to read or write them (UNIX mode of rwxrwxrwx). This option can be set to override that behavior, as follows: rw: Anyone can read or write (default). r: The owner (root) can read/write, others can read. n: The owner can read/write, no one else can access.
SECURE_ DIRECTORY_ PATH	One or more semicolon	Default value: None	Controls which directories the daemon is permitted to read from, write arbitary files to, or execute a script from as directed to by SE applications. For example, this

Parameter	Allowed Values	Default Value	Description
	(On non-Window platforms)		applies to backup/restore and script files that storsrvd can be asked to read, write or execute. On Windows, this is a list of directories separated by a semicolon, ';'. Also, either forward or back slashes ('/','\') can be used when specifying the directory name. For example: storsrvd:secure_directory_path = c:\Temp\dir1;c:/Users/SE On non-Windows platforms, this is a list of directories separated by a semicolon, ';', or colon, ':'. Also, only a forward slash ('/') can be used when specifying the directory name. For example: storsrvd:secure_directory_path = /tmp/dir1;/opt/dir2;/users/se If this parameter is not set any directory can be used.
IBMI_JOBQ_NAME	Any name of 10 characters long.	*JOBD	Specifies the job queue in which this job is placed. *JOBD: The submitted job is placed on the job queue named in the specified job description. name: Specify the name of the job queue.
IBMI_JOBQ_LIB_NAME	Any name of 10 characters long.	*LIBL	Specifies the library in which the job queue is located. *LIBL: All libraries in the library list for the current thread are searched until the first match is found. *CURLIB: The current library for the thread is used to locate the job, queue. If no library is specified as the current library for the thread, the QGPL library is used. name: Specify the name of the library where the job queue is located.

storsrvd [SYMAPI server daemon] parameters

This daemon handles remote SYMAPI client connections over TCP/IP to storage arrays. Storsrvd provides the same services as the former symapisrv command. Refer to the storsrvd(3) man page for additional details.

Parameter	Allowed Values	Default Value	Description
LOG_FILTER	SERVER | CONTROLS | SESSION | APIREQ	Default value: None	Specifies category-based control over logging volume, by selecting which types of storsrvd numbered log messages are recorded in the storsrvd log files. Each log message issued by storsrvd is associated with a category, expressed by the filter names shown below. The numbered messages will appear in the storsrvd log files and on a terminal if one is available. Numbered messages issued by storsrvd use a message identifier that precedes the message text: ANR0001I SYMAPI server ready to accept SECURE connections. The value to be specified for LOG_FILTER consists of a series of keywords separated by a commas (,) or plus signs {+). SERVER: Records high level events of the server: initialization, termination, and other events not directly related to a SYMAPI session. SESSION: Records arrival and termination of SYMAPI sessions. APIREQ: Records arrival and completion of SYMAPI function requests. CONTROLS: Records activity during execution of management requests from stordaemon or the system console in the z/OS environment. If LOG_FILTER specifies either SESSION or APIREQ it is most useful to set LOG_LEVEL to info.
LOG_ SHOW_ MSGID	disable | enable	Default value: enable	Displays message identifiers in the log messages issued by storsrvd.
LOG_ SHOW_ CATEGORY	enable | disable	Default value: disable	Displays the category (see LOG_FILTER above) in the output log messages, preceding the message identifier.
PORT	1 - 65534 | 2707	Default value: 2707	Specifies the TCP/IP port on which storsrvd will listen for connections from remote SYMAPI clients. Generally, numbers less than 1000 are reserved for well known daemon servers such as telnet, ftp, and http.
SECURITY_ LEVEL	NONSECURE | ANY | SECURE	Default value: SECURE	Specifies the security level for SYMAPI sessions. The security level indicates the server's capability and its expectation for remote clients to negotiate negotiate secure sessions using SSL (Secure Sockets Layer). NONSECURE indicates that the server will only accept clients that agree to negotiate a session without

Parameter	Allowed Values	Default Value	Description
			authentication and encryption provided by SSL. ANY indicates that the server will accept connections from clients who can negotiate secure sessions, and from clients who cannot negotiate secure sessions. A client that cannot negotiate a secure session may be using a version of SYMAPI that is less that 6.0, or may be running on a platform which does not support SSL, or may have been configured to bypass secure sessions. SECURE indicates that the server will only accept clients who agree to negotiate a secure session. Clients who cannot negotiate secure sessions will be refused access to remote SYMAPI services.
SECURITY_ ALT_CERT_ FILE	Any valid simple file name.	Default value: symapisrv_ cert.pem	Specifies the name of an alternate certificate file to be used by the server instead of the certificate generated at installation, and will be paired with the file specified in the SECURITY_ALT_KEY_FILE option. If this option is used, the SECURITY_ALT_KEY_FILE option must also be used to specify an alternate key file. The certificate file must be located in the /var/symapi/config/cert directory. Do not specify the directory in the value.
SECURITY_ ALT_KEY_ FILE	Any valid simple file name.	Default value: symapisrv_ key.pem	Alternate key file. Specifies the name of an alternate private key file to be used by the server instead of the key generated at installation, and will be paired with the file specified in the SECURITY_ALT_CERT_FILE option. If this option is used, the SECURITY_ALT_CERT_ FILE option must also be used to specify an alternate certificate file. The key file must be located in the /var/symapi/config/cert directory. Do not specify the directory in the value.
SECURITY_ CLT_ SECURE_ LVL	MUSTVERIFY | NOVERIFY | VERIFY	Default value: VERIFY	Client certificate verification level. (This feature is not available on z/OS). This option controls the verification of the client certificate by the server. The following values may be specified: MUSTVERIFY: Indicates that the server will only accept communications from a version of the client that can send a certificate to be verified. NOVERIFY: Indicates that the server will not verify the client certificate. VERIFY: Indicates that the server will verify a client certificate if the version of the client can send a certificate. THIS OPTION IS IGNORED IF SECURE COMMUNICATIONS ARE NOT ESTABLISHED.
MAX_ SESSIONS	0 - 100	Default value: 100	This option takes precedence over the options file option SYMAPI_MAX_CLIENTS. This specifies the global high-water mark of all sessions allowed by the

Parameter	Allowed Values	Default Value	Description
			server, without respect to source host or user. When the next new session will cause the current number of sessions to exceed this number, it will be refused. This parameter can be changed and reloaded while the server is running with the CLI stordaemon action storsrvd -cmd reload.
MAX_ SESSIONS_ PER_HOST	A positive number - NOLIMIT	NOLIMIT	Specifies the high-water mark for concurrent sessions from any specific host. When the next new session from the source host will cause the current number of sessions from that host to exceed this number, the session will be refused. When setting a numeric value, it should be <= the MAX_SESSIONS value. If it is set greater than MAX_ SESSIONS, then the maximum number of sessions for any specific host will be restricted to MAX_SESSIONS. If the value is set to NOLIMIT, then host sessions are only restricted by the MAX_SESSIONS value. This parameter can be changed and reloaded while the server is running with the CLI stordaemon action storsrvd -cmd reload.
MAX_ SESSIONS_ PER_USER	A positive number - NOLIMIT	NOLIMIT	This option specifies the high-water mark for concurrent sessions from any specific user. When the next new session from the source user will cause the current number of sessions from that user to exceed this number, the session will be refused. When setting a numeric value, it should be <= the MAX_SESSIONS value. If it is set greater than MAX_ SESSIONS, then the maximum number of sessions for any specific user will be restricted to MAX_SESSIONS. If the value is set to NOLIMIT, then user sessions are only restricted by the MAX_SESSIONS value. This parameter can be changed and reloaded while the server is running with the CLI stordaemon action storsrvd -cmd reload.
PERMIT_ SYMAPI_ DEBUG	none | client | server	server	Controls whether SYMAPI debug logs can be created by clients, server, or not at all. When the value is 'none', debug logging is suspended, regardless of the settings of commonly used debug flags configuration. When the value is 'server', the server's debugging configuration will be in effect, but settings from clients are ignored.

Parameter	Allowed Values	Default Value	Description
			When the value is 'client', settings sent to the server from the client are respected.
SECURITY_ CERT_ ALLOW_ WILDCARDS	ENABLE | DISABLE	DISABLE	Specifies if wildcards are allowed in the Common Name of a client certificate. The following values may be specified: ENABLE: Indicates that the server will accept wildcards in the Common Name of a client certificate. DISABLE: Indicates that the server will reject any host with wildcards in the Common Name of a client certificate.

storapid [Base Daemon] parameters

This daemon facilitates I/O accesses to Symmetrix storage arrays. Refer to the storapid(3) man page for additional details.

Parameter	Allowed Values	Default Value	Description
USE_ALL_GKS	disable | enable	Default value: enable	Specifies whether or not the storapid is free to use all available gatekeepers, if the syscall volume is high enough. When disabled, the storapid restricts itself to using no more than 75% of the available gatekeepers. If this parameter is changed, the storapid must be restarted for the new value to take effect.
GK_USE	dedicated_only | legacy	Default value: legacy	If set to 'dedicated_only', then the base daemon restricts itself to using only dedicated gatekeepers. This ensures that data devices will never be used as gatekeepers without the need to maintain the gkselect or gkavoid file. Note, even though VCM/ACLX devices can be used as gatekeepers, they are not classified as dedicated gatekeepers. If set to 'legacy', then the base daemon may temporarily use a data device as a gatekeeper if the syscall load is high enough. This parameter can be changed and reloaded while the base daemon is running with the CLI stordaemon action storapid -cmd reload.
INQUIRY_TIMEOUT	A number of seconds.	Default value: 900	Specifies how long priority inquiry results are to remain in memory before expiring, and new data is retrieved from the host and arrays. A value of -1 indicates the data never expires. A value of zero indicates the data always expires.
BACKGROUND_AUDIT_LOG	disable | enable	Default value: disable	Writes audit log entries on behalf of the requesting client, and returns control back to the client while the entry is being written. An audit log entry is preserved on disk until the entry is written to the Symmetrix array. This ensures no entries are lost if the base daemon is stopped and restarted before all entries are written. This parameter can be changed and reloaded while the base daemon is running with the CLI stordaemon action storapid -cmd reload.
SINGLE_GK_POLICY	pool | close	Default value: close	If the base daemon only has one gatekeeper device, this parameter tells the base daemon what to do with the device after each use. A value of pool tells the daemon to put it back into the gatekeeper pool. A value of close tells the daemon to close the device after each use. This parameter is useful for device masking on hosts that only see a single device. Setting the value to close will slow down all commands, so it is recommended that this

Parameter	Allowed Values	Default Value	Description
			setting only be used for as short a time as possible. An example of how to use this setting follows: 1. Edit the daemon_options file and add: storapid:SINGLE_GK_POLICY = close 2. Reload storapid settings with this command: stordaemon action storapid -cmd reload 3. Perform all the device masking commands. 4. Edit the daemon_options file and set: storapid:SINGLE_GK_POLICY = pool 5. Reload the storapid settings. 6. Verify that the setting is back to pool: stordaemon action storapid -cmd show_gk_stats
INTERNODE_LOCK_INFORMATION_EXPORT	disable | enable	Default value: enable	Makes SEL and DEL lock information available for all base daemon hosts attached to the Symmetrix array for use with available LockShow API functions. This parameter can be changed and reloaded while the base daemon is running with the CLI stordaemon action storapid -cmd reload.
PARALLEL_INQUIRY_SIZE	0 - 65535 seconds	Default value: 0	Indicates the number of threads to use when the base daemon is performing an inquiry. The device list is scattered across those threads to potentially improve performance. Devices that fail to respond within the DEVICE_INQUIRY_TIMEOUT period get abandoned, with inquiry data not provided to the requesting API client for those devices. A value of zero keeps the inquiry process as a single list, executed on the calling client's thread. To help determine the optimal setting for the host use the CLI stordaemon action storapid -cmd scan -inquiry This parameter can be changed and reloaded while the base daemon is running, with the CLI stordaemon action storapid -cmd reload. This value can be viewed and set with the CLI stordaemon getvar and setvar commands.
DEVICE_INQUIRY_TIMEOUT	A number of seconds, >= 1	Default value 60	Specifies how long a thread in the parallel inquiry feature waits for a device to respond before abandoning it during the inquiry process. The thread may or may not complete, depending on why the device is not responding. If a device is eventually made to respond by other means and the nature of the OS does not provide any indication to the waiting request in the base daemon, the base daemon will need to be restarted. This parameter can be changed and reloaded while the base daemon is running, with the CLI stordaemon action storapid -cmd reload. This value can be viewed and set with the CLI stordaemon getvar and setvar commands.
BACKGROUND_	disable |	Default	Performs a discovery of select syscall data on behalf of

Parameter	Allowed Values	Default Value	Description
DISCOVERY	enable	value: enable	the requesting API client that initiated a discovery. These syscalls are issued in parallel with other syscalls being issued by the client. Syscall data is kept in cache until the client requests the data, and then is discarded. This parameter can be changed and reloaded while the base daemon is running, with the CLI stordaemon action storapid -cmd reload.

storgnsd [Group Name Service (GNS) Daemon] parameters

This daemon supports GNS (Group Name Services) on a host. Refer to the storgnsd(3) man page for additional details.

Parameter	Allowed Values	Default Value	Description
AUTORESTART	disable | enable	Default value: enable	Specifies whether to use a watchdog mechanism to monitor and automatically restart storgnsd if it crashes.
GNS_DEVICE_POLL_INTERVAL	A number, in seconds.	Default value: 15	Specifies how frequently storgnsd polls for changes made to groups from other hosts. The smaller this value is, the more quickly a host will recognize group changes made from other hosts.
GNS_PPATH_POLL_INTERVAL	A number, in seconds.	Default value: 60	Specifies how frequently storgnsd checks to see whether PowerPath or RDF consistency group updates are necessary.
GNS_REMOTE_MIRROR	enable | disable	Default value: disable	Specifies whether storgnsd should automatically mirror RDF1 and RDF2 type DG and CG group definitions for use on remote (SRDF) Symmetrix arrays. Limitations include: - REGULAR type and type ANY groups are not mirrored. - Mirrors will not be created if the remote Symmetrix array is also directly attached to the local host. (Refer to the GNS_SYMAVOID_LOCAL option below.) - For CG groups, BCV type devices are not mirrored.
GNS_RMTARR_UPDATE_INTERVAL	A number, in seconds.	Default value: 60	Specifies how frequently storgnsd should attempt to propagate device groups over to remote (SRDF) Symmetrix arrays. This is only relevant if the GNS_REMOTE_MIRROR option is set to enable.
GNS_INIT_REMOTE_SYMMS	disable | enable	Default value: enable	Initializes the GNS group repository on remote Symmetrix arrays while remotely mirroring groups (i.e., the GNS_REMOTE_MIRROR option is enabled). If disabled, a GNS daemon directly connected to such remote arrays has to perform the initialization-when it encounters the array. This option should be disabled if (a) remote mirroring is enabled (GNS_REMOTE_MIRROR), (b) GNS daemons will be actively running on both sides of the SRDF link, (c) groups are being modified on both the local and remote Symmetrix arrays and (d) GNS backup/restore is enabled (GNS_SHADOW_FILE). Failing to disable this option in this scenario may result in data loss, due to interaction between the backup/restore and remote mirroring mechanisms.
GNS_SHADOW_FILE	enable | needed | disable	Default value: disable	Specifies whether storgnsd should maintain backup copies of GNS data for attached Symmetrix arrays. These

Parameter	Allowed Values	Default Value	Description
			backups, maintained on the local disk, are automatically restored to the GNS repository on a Symmetrix array if storgnsd detects that the repository there has been erased. This could occur, for example, if the Symmetrix array is VTOC'd or suffers a power loss under ucode versions 5x67/5x68 or has a destructive upgrade performed to it. Note that these backups will only be maintained for local arrays--not ones that are remote (SRDF). It is recommended that this option be enabled on a subset of hosts running GNS daemons. Because of its effect on performance, it usually does not make sense to have more than 2-4 GNS daemons managing these backup copies--assuming that they can see all the relevant Symmetrix arrays. If enable: Backup copies will be maintained for all arrays. If needed: Backup copies will only be maintained for arrays with ucode versions below 5x71. If disable: Backup copies will not be maintained.
GNS_ SYMAVOID	A comma separated list of Symmetrix IDs. Note that	Default value: None	Specifies a set of Symmetrix arrays, both local and (SRDF) remote, that GNS should NOT manage. Specifically, GNS will not examine these arrays for group definitions and will fail if an attempt is made to define a group containing devices on one of these. Also, mirroring of groups will not occur to remote Symmetrix arrays if they are in this list.
GNS_ SYMINCLUDE	A comma separated list of Symmetrix IDs. Note that	Default value: None	Specifies the only Symmetrix arrays, both local and (SRDF) remote, that GNS will manage. Specifically, GNS will only examine these arrays (and no others) for group definitions and will only allow groups to be defined that contain devices on one of these. Also, mirroring of groups will not occur to remote Symmetrix arrays if they are NOT in this list. If both GNS_SYMAVOID and GNS_SYMINCLUDE are supplied, the effect is cumulative. Only arrays specified by GNS_SYMINCLUDE but not in GNS_SYMAVOID will be managed.
GNS_ SYMAVOID_ LOCAL	A comma separated list of Symmetrix IDs. Note that	Default value: None	Specifies a set of local Symmetrix arrays that GNS should NOT manage. Specifically, if an array listed here can be accessed both locally and remotely (by RDF) from this host, the local connection will be ignored. This can be used to enable automatic group mirroring where the remote array is also local to the host (refer to the gns_remote_mirror option above).

storevntd [Event Daemon] parameters

This daemon acts as the clearing house for Solutions Enabler events on a host. Refer to the storevntd(3) man page for additional details.

Parameter	Allowed Values	Default Value	Description
SYMM_POLL_INTERVAL	A number of seconds.	Default value: 60	Specifies how often, in seconds, to poll Symmetrix arrays for events that need to be delivered.
EVENT_LISTEN_PORT	An IP port number.	Default value: 0 - means to let the OS pick an unused port	Which IP port to use when listening for events being forwarded from remote hosts. By default, an unused port picked by the OS is used. This option might be needed if the presence of a firewall requires the use of a particular port.
LOG_EVENT_TARGETS	One or more (space separated) of: snmp, file, system,	Default value: none	Controls whether events should be automatically logged. One or more of the following may be supplied: file: Events are written to a file on disk. snmp: Events are mapped into SNMP traps. system: Events are written to the Event Log (Windows) or the local syslog service (otherwise). syslog: Events are sent directly to a remote syslog server, bypassing any local syslog service. Some of these possible targets can be configured by options that are described below.
LOG_SYMMETRIX_EVENTS	see above	Default value: No events are logged.	Specifies events that are to be automatically logged. Refer to the LOG_EVENT_TARGETS option above. This option consists of a records separated by a semicolon. Typically, each record will be placed on a line by itself. Each of these records in turn consists of a number of comma-separated fields. [sid=nnnnn,] CAT[, ...] [,ignore] [,tgt=xxx] sid=nnnnnnnnnnnn Specifies a Symmetrix ID. By default, all known Symmetrix arrays will be monitored. CAT Specifies the event(s) to be monitored. This can be either the name of an event category or a numerical event ID. This is the only field that is required. One or more values (comma separated) may be present.

Parameter	Allowed Values	Default Value	Description
			Supported categories are: status, events, array subsystem, checksum, diagnostic, environmental, device pool, service processor, srdf system, srdf link, srdfa session, srdf consistency group, director, device, and disk. comp=xxxx "comp=aaa,bbb,ccc" Certain events apply to specific sub-components within the array: a device (5 digit hexadecimal), disk, pool. This field specifies that only events for the specified component (or components) should be delivered. If more than one component is being present, the entire field must be enclosed in double quotes. e.g., "comp=00004,00010,00100" thresh_critical=nn thresh_major=nn (equivalent to: thresh=nn) thresh_warn=nn thresh_info=nn Certain events correspond to numerical quantities of some sort. A threshold is associated with each severity level, and an event is generated at that severity when the event's value exceeds the associated threshold. These fields can be used to override the default threshold values controlling when an event is delivered. One example of this is the event that indicates the percentage of space used for a pool. These fields can be set to control when events are to be generated. e.g.: thresh_critical=96, thresh_major=80, thresh_warn=60 ignore If present, these event(s) are not to be logged, even if they are matched by a different record. tgt=xxx If present, these event(s) are sent to only the specified target, which must be one of: snmp, file, system, syslog. The specified target must also be present in the default target list given by the LOG_EVENT_TARGETS option.
LOG_EVENT_FILE_NAME	file name, without any suffix	Default value:	For event logging to a file (LOG_EVENT_TARGETS contains 'file'): the base name of the file that is

Parameter	Allowed Values	Default Value	Description
		events	used. This file is created within the standard log file directory. UNIX: /var/symapi/log Windows: c:\\Program Files\\EMC\\SYMAPI\\log Depending on the setting of the LOG_EVENT_FILE_TYPE option, a suffix will added to this name.
LOG_EVENT_FILE_TYPE	dated | wrap	Default value: wrap	For event logging to a file (LOG_EVENT_TARGETS contains 'file'): the type of log file that is used. Two styles are supported: wrap: Two log files are maintained: xxxx.log0 and and xxxx.log1. Logging alternates between these--switching to the other file each time the maximum size specified by the LOG_EVENT_FILE_SIZE parameter is reached. The modified time on the files can be used to determine the "current" one. dated: A separate log file is used for each day: xxxx-YYYYMMDD.log. (e.g., events-200411) There are no limits on how large these files can become.
LOG_EVENT_FILE_SIZE	A number, in KB	Default value: 1000 (1000-KB)	Specifies how large each log file is allowed to grow before wrapping to the alternate file. This option is for event logging to a file (LOG_EVENT_TARGETS contains 'file'): if LOG_EVENT_FILE_TYPE == wrap.
LOG_EVENT_FILE_RETENTION	A number of days, greater than zero.	Default value: 3 (days)	Indicates that log files more than this many days old will be automatically deleted. This option is for event logging to a file (LOG_EVENT_TARGETS contains 'file'): if LOG_EVENT_FILE_TYPE == dated.
LOG_EVENT_FILE_PERMS	n | rw | r	Default value: r	Specifies the permissions to be applied to new log files that are created. This option is for event logging to a file (LOG_EVENT_TARGETS contains 'file'). Possible values: rw: Anyone can read or write. r: The owner (root) can read/write, others can read. n: The owner can read/write, no one else can access.
LOG_EVENT_SYSLOG_HOST	A host name or IP address.	Default value: None - a value is required.	Specifies the host on which the remote syslog server is running. This option is for event logging to syslog (LOG_EVENT_TARGETS contains 'syslog').
LOG_EVENT_	A decimal port	Default	Specifies the port to which the remote syslog

Parameter	Allowed Values	Default Value	Description
SYSLOG_PORT	number.	value: 514	server is listening. This option is for event logging to syslog (LOG_EVENT_TARGETS contains 'syslog').
SNMP_TRAP_ CLIENT_ REGISTRATION	IP,port,filter,state - with no spaces	Default value: none	Provides a list of target IPs and ports to send SNMP traps to, when the LOG_EVENT_TARGETS option specifies snmp. Format is: IP,port,filter,state, where filter represents the trap sending filtering levels as defined in the fcmgmt MIB, and state represents the start up row state in the trap_client_registration table in the fcmgmt MIB. Multiple entries should be on their own line, delineated with a backslash (\) character on the preceding line. This parameter can be changed and reloaded while the event daemon is running, with the CLI stordaemon action storevntd -cmd reload.
SNMP_ MANAGEMENT_ URL	‹ip|DNS host name›‹:port›	Default value: none	Provides launch capability of a management application, such as SMC or ECC, from within a third party management framework. This parameter can be changed and reloaded while the event daemon is running, with the CLI stordaemon action storevntd -cmd reload.

storstpd [Statistics Collection (STP) Daemon] parameters

This daemon supports STP Statistics collection. Refer to the storstpd(3) man page for additional details.

Parameter	Allowed Values	Default Value	Description
DMN_ SERVICE_ PROCESSOR_ DELAY	0 - 30	Default value: 9 (minutes)	Tells storstpd, when running on the service processor, to delay this many minutes before starting anything, giving time for other applications or tasks that execute at system boot to execute before collections begin. This option is ignored when running on a host.
DMN_RUN_ SPA	disable | enable	Default value: enable	Determines if storstpd starts the necessary components for supporting the SPA application. Note: SPA support is not available on the service processor and the setting of this option is ignored.
DMN_RUN_ RTC	disable | enable	Default value: enable	Determines if storstpd starts the necessary components for real-time metrics collection.
DMN_ROOT_ LOCATION	Full file path specification.	Default value: UNIX: /var/symapi/stp	Specifies a full file/path location that storstpd will use as its root directory for file creation. Note: This location MUST exist or will revert to default location. Note: If storstpd runs as a privileged user, the directory named here must also be specified in the storstpd:secure_directory_path option. If storstpd is not run as a privileged user, there is no harm in specifying it in the secure_directory_ path, but it is not validated when running as a non-privileged user. Note: If storstpd runs as non-root in Unix (stordaemon setuser is used to change ownership) and this option is changed, the stordaemon setuser command must be reissued to set permissions properly after this change.
DMN_ SYMMIDS	A comma-separated list of Symmetrix IDs; shortcuts	Default value: None (all SymmIDs)	Specifies a set of Symmetrix arrays for which the storstpd should collect statistics. If not present, storstpd will collect statistics for all local SymmIDs found.
DMN_MAX_ ARRAYS	1 - 50	Default value: 6	Specifies the maximum number of arrays on which storstpd can collect. If the number of

Parameter	Allowed Values	Default Value	Description
			local arrays listed in DMN_SYMMIDS exceeds, or if DMN_SYMMIDS is null and the number of local arrays exceeds DMN_MAX_ARRAYS, no collections will run.
DMN_ REMOTE_ MODE	enable | disable	Default value: disable	Indicates that storstpd will establish a remote connection, instead of operating locally. A valid DMN_REMOTE_ADDRESS and DMN_REMOTE_ PORT must be provided. This setting is ignored when running on a service processor.
DMN_ REMOTE_ ADDRESS	A valid IP address.	Default value: None	Specifies a valid IP address used to establish a remote SYMAPI connection. This setting is ignored if DMN_REMOTE_MODE is disabled.
DMN_ REMOTE_ PORT	A valid IP port.	Default value: 2707	Specifies a valid IP port used to establish a remote SYMAPI connection. This setting is ignored if DMN_REMOTE_MODE is disabled.
RTC_ COLLECT_ INTERVAL	A number, in seconds (2-4, 5, 10, 15).	Default value: 2	Specifies how frequently storstpd collects real-time statistics.
TTP_ RETENTION_ DAYS	0-365	Default value: 30	Sets the current retention policy, in days.
TTP_DISK_ SPACE_ THRESHOLD	1 - 99	Default value: 80	Tells storstpd not to allow ttp/btp disk space consumption to rise about the threshold. Must be an integer from 1 (percent) to 99 (percent).
TTP_ ARCHIVE_ TIME	A time. HH:MM	Default value: 00:00	The time of day to archive TTP collection file.
TTP_ ARCHIVE_ INTERVAL	Number of hours, HH, from 0-24.	Default value: 1	Tells storstpd to archive every HH hours. A setting of 1 will tell storstpd to archive every 1 hour.
TTP_SYS_ METRICS	disable | enable	Default value: enable	Tells storstpd whether to collect TTP counters for the system performance category.
TTP_DEV_ METRICS	disable | enable	Default value: enable	Tells storstpd whether to collect TTP counters for the device performance category.
TTP_DIR_ METRICS	disable | enable	Default value: enable	Tells storstpd whether to collect TTP counters for the director performance category.
TTP_DISK_ METRICS	disable | enable	Default value: enable	Tells storstpd whether to collect TTP counters for the disk performance category.

Parameter	Allowed Values	Default Value	Description
TTP_EXT_ DISK_ METRICS	disable | enable	Default value: enable	Tells storstpd whether to collect TTP counters for external disks.
TTP_PORT_ METRICS	disable | enable	Default value: enable	Tells storstpd whether to collect TTP counters for the director port performance category.
TTP_RDFA_ METRICS	disable | enable	Default value: enable	Tells storstpd whether to collect TTP counters for the rdfa performance category.
TTP_ORS_ METRICS	disable | enable	Default value: enable	Tells storstpd whether to collect TTP counters for the Open Replicator performance category.
TTP_CPT_ METRICS	enable | disable	Default value: enable	Tells storstpd whether to collect TTP counters for the cache partition performance category.
TTP_RDFSYS_ METRICS	enable | disable	Default value: enable	Tells storstpd whether to collect TTP counters for the RDF system performance category.
TTP_RDFDIR_ METRICS	enable | disable	Default value: enable	Tells storstpd whether to collect TTP counters for the RDF director performance category.
TTP_RDFDEV_ METRICS	enable | disable	Default value: enable	Tells storstpd whether to collect TTP counters for the RDF device performance category.
TTP_RDFGRP_ METRICS	enable | disable	Default value: enable	Tells storstpd whether to collect TTP counters for the RDF group performance category.
TTP_SE_TCP_ METRICS	enable | disable	Default value: disable	Tells storstpd whether to collect TTP counters for the Dir-SE TCP connection statistics category.
TTP_SE_NW_ METRICS	enable | disable	Default value: disable	Tells storstpd whether to collect TTP counters for the Dir-SE network statistics category.
TTP_SE_NWI_ METRICS	enable | disable	Default value: disable	Tells storstpd whether to collect TTP counters for the Dir-SE N/W interface statistics category.
TTP_RE_SG_ METRICS	enable | disable	Default value: disable	Tells storstpd whether to collect TTP counters for the Dir-RE speedlimit group statistics category.
TTP_RE_ NWC_ METRICS	enable | disable	Default value: disable	Tells storstpd whether to collect TTP counters for the Dir-RE N/W compression statistics category.
TTP_TP_DEV_ METRICS	enable | disable	Default value: enable	Tells storstpd whether to collect TTP counters for the TP pool device statistics category.
TTP_TP_ METRICS	enable | disable	Default value: enable	Tells storstpd whether to collect TTP counters for the TP pool statistics category.

Parameter	Allowed Values	Default Value	Description
TTP_DEV_ LOCAL_ METRICS	disable | enable	Default value: disable	Tells storstpd whether to collect TTP counters for the device locality category.
TTP_DEV_ SKEW_ METRICS	disable | enable	Default value: disable	Tells storstpd whether to collect TTP counters for the device skew category.

Options File

This options file 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: These parameters are intended 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.

Options File

The options file is located in the SYMAPI configuration directory.

Directory	System
`/var/symapi/config`	UNIX
`C:\Program files\EMC\Symapi\config`	Windows
`your_specific_installation_directory`	OpenVMS, AS/400, MVS

The following table provides the description and default values for each option.

Option Name	Description	=‹optionalvalue | defaultvalue›
SYMAPI_ACC_ ADMIN_VIA_SERVER	Enables/disables the client SYMAPI/SYMCLI access control commands for prepare, release, and commit actions to execute at the SYMAPI server.	= DISABLE | ENABLE
SYMAPI_ACC_ DISPLAY_VIA_ SERVER	Enables/disables the client SYMAPI/SYMCLI access control display commands for list and show actions to execute at the SYMAPI server.	= DISABLE | ENABLE
SYMAPI_ALLOW_ CELERRA_DEV_CTRL	Allows controls on Celerra devices.	= ENABLE | DISABLE
SYMAPI_ALLOW_ RDF_SYMFORCE	Indicates whether users can specify -symforce when performing RDF control operations.	= TRUE | FALSE
SYMAPI_ALLOW_ SCRIPTS_VIA_ SERVER	Specifies whether to allow pre-action and post-action scripts for TimeFinder commands to be run by the SYMAPI server.	= ENABLE | DISABLE
SYMAPI_APPREG_ AUTO_EXPIRATION	Specifies whether to expire entries in the application registration table, based on their age.	= DISABLE | ENABLE
SYMAPI_APPREG_ EXPIRATION_PERIOD	Sets the number of days after which an entry can be expired.	= 15 - 365 | 90

Option Name	Description	=<optionalvalue | defaultvalue>
SYMAPI_BCV_ ESTAB_INC_TO_ FULL	Controls whether an incremental BCV establish will automatically be converted to a full establish if needed.	= ENABLE | DISABLE
SYMAPI_BCV_ SINGULAR_INTERVAL	When SYMAPI_DEFAULT_BCV_ESTABLISH_TYPE is set to SINGULAR, the SYMAPI inserts a pause between the control of each pair. The pause can be set to any value between 0 and 30 seconds.	= 0 to 30 | 0
SYMAPI_CG_ TIMEOUT	Sets the time-out period during which the host will attempt to trip a failed consistency group.	= 10 - 120 | 30
SYMAPI_CG_ TIMEOUT_ACTION	Specifies which action to take for an SRDF consistency group time out.	= FAIL | RETRY
SYMAPI_CLONE_ COPY_ON_WRITE	Sets clone nocopy mode to copy-on-write (ENABLE) or copy-on-access (DISABLE).	= ENABLE | DISABLE
SYMAPI_COLLAPSE_ STRIPED_META_ EXTENTS	Specifies whether mapping commands can be entered without having to type the -collapse option in every command.	= DISABLE | ENABLE
SYMAPI_ COMMAND_SCOPE	Specifies whether the command scope is enabled.	= ENABLE | DISABLE
SYMAPI_CTRL_VIA_ SERVER	Blocks the client SYMAPI/SYMCLI control commands from executing at the SYMAPI server.	= DISABLE | ENABLE
SYMAPI_DATED_ LOGFILE_NAME	Enables/disables the creation of dated SYMAPI log files.	= DISABLE | ENABLE
SYMAPI_DB_FILE_ COMPRESSION	Minimizes the overall database file size by compressing the file.	= DISABLE | ENABLE
SYMAPI_DB_ FSYNC_MODE	When writing the database, force its contents out to disk. Setting this option to false may provide a slight performance improvement, at the cost of a small possibility of the database file becoming corrupt following a host crash.	= DISABLE | ENABLE
SYMAPI_DEFAULT_ BCV_ESTABLISH_ TYPE	Specifies how the DA director processes the establish action on BCV and standard devices.	= SINGULAR | SERIAL | PARALLEL
SYMAPI_DEFAULT_ BCV_RESTORE_TYPE	Sets the default behavior for a BCV restore operation.	= SINGULAR | SERIAL | PARALLEL
SYMAPI_DEFAULT_ BCV_SPLIT_TYPE	Sets the default behavior for a BCV split operation.	= INSTANT | REGULAR

Option Name	Description	=<optionalvalue | defaultvalue>
SYMAPI_DEFAULT_ SNAP_TERM_TYPE	Sets the way a DA director processes the terminate action on Snap devices.	= PARALLEL | SERIAL
SYMAPI_ENABLE_ DEVICE_ RESERVATIONS	Specifies whether to enable device reservations.	= FALSE | TRUE
SYMAPI_ENFORCE_ DEVICE_ RESERVATIONS	Specifies whether to enforce a device reservation.	= FALSE | TRUE
SYMAPI_ ENHANCED_USER_ AUTHENTICATE	Enables enhanced (KERBEROS) user authentication.	= ENABLE | DISABLE
SYMAPI_GNS_CS_ STALE_DATA_ TIMEOUT	Sets the timeout period, in seconds, for the client's in-memory GNS group information before the server is polled for updates.	= 1 - 15 | 1
SYMAPI_GNS_ MIRRORED_GROUP_ CONTROL	Allows group modifications to device groups that were created by a remote GNS daemon via remote SRDF mirroring.	= ENABLE | DISABLE
SYMAPI_IO_DRAIN_ TIMEOUT	Controls the amount of time, in seconds, that PowerPath will wait for incoming I/Os to finish before responding that the I/Os are suspended.	= 5 - 120 | 60
SYMAPI_IO_THAW_ INTERVAL	Controls the amount of time, in seconds, that PowerPath will suspend I/Os before automatically restarting them.	= 5 - 120
SYMAPI_LOGFILE_ DATE_FORMAT	Changes the date format in the log entries.	= FORMAT2 | FORMAT1
SYMAPI_LOGFILE_ FORMAT	Controls the presence of optional fields within log file records: pid include Process tid include Thread userid include User ID activityid include Activity ID	= userid | activityid | pid | tid
SYMAPI_LOGFILE_ RETENTION	Sets the maximum number of days to retain a log file, after which the log file is deleted.	= 0, 6 - 1825 On Service Processor 30 Other hosts 0 (infinite retention)
SYMAPI_PARALLEL_ RA_GROUPS	Locks RA groups during RDF control actions, instead of applying Symmetrix array locks.	= ENABLE | DISABLE
SYMAPI_POOL_ ALLOW_MIX_TYPE	Allows devices with different disk characteristics in a device pool (Snap/Thin).	= ENABLE | DISABLE

Option Name	Description	=<optionalvalue | defaultvalue>
SYMAPI_RCOPY_ GET_MODIFIED_ TRACKS	Enables/disables the calculation of modified tracks.	= TRUE | FALSE
SYMAPI_RCOPY_ SESSION_LIMIT (Requires 5671+)	This option requires Enginuity 5771 or higher. Specifies how many sessions are allowed at any one time on this array.	= 0 - 1024 | 512
SYMAPI_RDF_RW_ DISABLE_R2	Causes the R2 device to be set to read/write disabled, or not-ready, on the RA during establish, restore, failback, or createpair-establish operations.	= ENABLE | DISABLE
Parameter SYMAPI_ SECURITY_ALT_ CERT_FILE	Any valid simple file name.	= Any valid simple file name.
Parameter SYMAPI_ SECURITY_ALT_KEY_ FILE	Any valid simple file name.	= Any valid simple file name.
SYMAPI_SERVER_ SECURITY_LEVEL	Specifies the session security level. Should be SECURE on all platforms where Solutions Enabler supports SSL; NONSECURE otherwise. Possible values are: ◆ SECURE: Accept secure sessions only. ◆ NONSECURE: Accept non-secure sessions only (client and server do not initialize secure socket library). ◆ ANY: Accept both types. Refer to the Solutions Enabler release notes.	= SECURE | NONSECURE | ANY
SYMAPI_SNAP_ CONTROL_INTERVAL	When operating in SERIAL mode, spaces the snap or clone create and terminate operations by inserting a pause between the control of each pair. The pause can be set to any value between 0 and 30 seconds.	= 0 - 30 | 0
SYMAPI_SNAP_ COUNT_MODIFIED_ TRACKS	Sets snap to return a count of the changed tracks. This option is ignored when the request is made remotely.	= TRUE | FALSE
SYMAPI_SNAP_ PERSISTENT_ RESTORE	Specifies whether snap restores are performed as persistent restores.	= DISABLE | ENABLE
SYMAPI_TF_COUNT_ MODIFIED_TRACKS	Sets TimeFinder to return a count of the changed tracks. This option is ignored when the request is made remotely.	= TRUE | FALSE

Option Name	Description	=<optionalvalue | defaultvalue>
SYMAPI_TF_MULTI_ESTAB_REST (Requires 5671+)	Controls whether TimeFinder uses the multi-instant establish and restore feature.	= DISABLE | ENABLE
SYMAPI_TF_NOT_READY_BCVS	Controls whether a user Not-Ready occurs on the BCV devices before a restore or an establish command.	= ENABLE | DISABLE
SYMAPI_TF_RDF_SUSPEND	Causes TimeFinder to suspend the RDF link of an R1-BCV prior to an establish or restore command. Normally, this is done by Enginuity.	= DISABLE | ENABLE
SYMAPI_TRACK_SIZE_32K_COMPATIBLE	Specifies how to report device sizes. ENABLE reports device size in terms of 32 KB tracks. DISABLE reports device sizes in their native mode, depending on the Symmetrix array model.	= ENABLE | DISABLE
SYMAPI_UNIQUE_ACL_PARTITION_IDS	For AIX and HP-UX hosts. Determines how partition IDs are generated. ENABLE generates unique IDs for each partition running on the machine. DISABLE uses a single unique ID for all partitions running on the machine.	= DISABLE | ENABLE
SYMAPI_USE_GNS	Stores and maintains, in a common repository, SYMAPI device group (DG) and composite group (CG) definitions across Symmetrix arrays that are visible to all locally-attached hosts.	= ENABLE | DISABLE
SYMAPI_USE_RDFD	Allows the creation of RDF_CONSISTENCY composite groups, to be managed by the RDF daemon.	= ENABLE | DISABLE
SYMAPI_WAIT_FOR_BCV_BG_SPLIT	Sets the default behavior for the BCV split operation to wait for the background split to be complete before returning your call.	= TRUE | FALSE
SYMAPI_WAIT_FOR_BCV_SYNCH	Sets the default behavior for the BCV establish operation to wait for the establish operation to complete before returning your call.	= TRUE | FALSE
SYMAPI_WAIT_ON_LOCKED_GK	Specifies whether to wait when a locked gatekeeper device is encountered.	= ENABLE | DISABLE

Option Name	Description	=<optionalvalue | defaultvalue>
SYMAPI_GKMGMT	When enabled, gatekeeper devices are selected by the base daemon (storapid) for SYMAPI client processes which want to send commands to a Symmetrix array. Once a device has been selected and used, future requests are more efficient, and can be multiplexed for multiple client processes. When disabled, each client process must go through the selection, opening, locking, and unlocking, of the gatekeeper(s) for the duration of the SYMAPI function.	= DISABLE | ENABLE
SYMAPI_RDF_ CREATEPAIR_ LARGER_R2		= DISABLE | ENABLE
SYMAPI_ALLOW_ CG_ENABLE_FROM_ R2	When set to DISABLE this option will not allow enabling a CG from R2 side.	= ENABLE | DISABLE
SYMAPI_TF_CHECK_ ONLINE_CKD	Enables CKD device online check.	= ENABLE | DISABLE
SYMAPI_POOL_ DRAIN_THRESHOLD	This option can be set to change the Pool used space threshold that is validated when disabling or draining a save or data device. If the used space of a pool will exceed this threshold after the drain or disable request is satisfied, then the request will be blocked. The allowable values for this setting are from 0 to 100 percent. The default setting is 90.	= 0 - 100
SYMAPI_RDF_ CHECK_R2_NOT_ WRITABLE	When enabled, verify that the R2 devices are not writable by the host for createpair operations other than createpair -invalidate [R1|R2].	= 0 - 100
SYMAPI_DEFAULT_ RDF_MODE	Specifies the default rdf_mode for createpair operations.	= 0 - 100

Option Name	Description	=<optionalvalue | defaultvalue>
SYMAPI_ ALTERNATE_ ACCESS_ID	This option applies to Symmetrix Access Control. It controls whether a host's Access ID is generated based on the hardware and operating environment of the host or # based on a random number or a user-chosen passphrase. DISABLE: The host access ID is generated based on the hardware and operating environment of the host. This mode cannot be used on Intel-based processors or hosts whose networking signatures may be non-unique. ENABLE: The host access ID is generated based on a random number or on a user-chosen passphrase. This mode must be used especially on Intel based platforms, but may be used on all platforms.	= ENABLE (on Intel platforms) DISABLE (on non-Intel platforms)
SYMAPI_USE_ ACCESS_ID	This option applies to Symmetrix Access Control. Specifies whether to use the access ID generated on client or server. Used only on the server side during client/server operations. Possible values are: CLIENT: The client access ID is used for every command performed. If a client access ID is not available the command will fail. See also SYMAPI_CLIENT_SIDE_ ACCESS_ID. SERVER: The server access ID is used for every command performed. ANY: If the client access ID is available it is used for every command performed. If it is not available then the server access ID is used.	= ANY | CLIENT | SERVER
SYMAPI_CLIENT_ SIDE_ACCESS_ID	This option applies to Symmetrix Access Control. Specifies whether the client access ID is sent to the server during client/server operations. ENABLE: If set to ENABLE, the client sends its access ID to the server. If the server is using SYMAPI_USE_ ACCESS_ID=CLIENT or ANY, the server applies the client's access ID to all management operations. DISABLE: If set to DISABLE, the client does not send its access ID to the server. If the server expects an access ID from the client, operations will fail. See also SYMAPI_USE_ACCESS_ID.	= ENABLE | DISABLE

Option Name	Description	=<optionalvalue | defaultvalue>
SYMAPI_SERVER_ DEBUG_SCOPE	This option applies to Solutions Enabler debugging. It expresses the client's desire regarding where debug data will be collected. Even though the client may indicate server side debugging, the server configuration may prevent such collection. CLIENT: Debug settings only apply on the client side. SERVER: Debug settings only apply on the server side. BOTH: Debug settings apply on both client and server.	= CLIENT | SERVER | BOTH CLIENT
SYMAPI_FIPS	This option specifies the status of FIPS. If enabled Solutions Enabler will use cryptographic algorithms that meet the FIPS requirements. If disabled the standard Solutions Enabler cryptographic algorithms will be used. If the SYMAPI_SECURITY_LEVEL option is set but not set to SECURE this option is ignored.	= ENABLE | DISABLE
SYMAPI_ SYMDEVNAME_ WIDTH	This option can be set to specify the default string width for Symmetrix device numbers returned in API structures and displayed in CLI screens. Device numbers will be left-padded with zeros (0) as needed to fill the specified width. Device numbers in CLI displays will also be left-padded with zeros (0) as needed, and also left-justified and right-padded with spaces () as needed to maintain consistent column alignment, regardless of the specified width. Note: Valid option settings are 3, 4 or 5 (default). Values less than 3 will be normalized to 3 and values greater than 5 will be normalized to 5.	= 3 - 5 | 5
SYMAPI_SNAPVX_ LARGER_TARGET	When set to DISABLE this option will not allow snapshots to a target device that is larger # than the source device.	= DISABLE | ENABLE

CHAPTER 3
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
```

Variable Name	Description	Default
SYMCLI_ACCESS_PIN	For symacl 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_ASM_CONNECT	When mapping Oracle ASM, this variable must be set with connection information for the ASM instance. Format: user/passwd@service	NULL
SYMCLI_BCV_EST_TYPE	Specifies the default method for establishing BCV pairs. Possible values are: ◆ SINGULAR: Specifies to issue an establish to a single device, including a meta member, at a time. This method allows other tasks access to the Symmetrix array when doing a large number of establishes. ◆ PARALLEL: Specifies to issue an establish to each servicing disk adapter (DA) in parallel, and then wait for a DA to finish before issuing another establish to that DA. This method will keep the Symmetrix DAs the busiest. ◆ SERIAL: Specifies to issue establishes as fast as the Global Special Task (GST) queue can handle them. However, all members of a meta must be established before continuing to the	PARALLEL

Variable Name	Description	Default
	next meta or device. This is the default method when using meta devices.	
SYMCLI_BCV_DELAY	When the SYMCLI_BCV_EST_TYPE parameter (described earlier in this table) is set to SINGULAR or PARALLEL, this parameter specifies how long (in seconds) to wait between sending commands to the Symmetrix array. Possible values range from 0 to 30.	0
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 are: CANCEL_ OLDEST, CANCEL_NEWEST, and DONT_ CANCEL.	CANCEL_ OLDEST
SYMCLI_BLOCK_SYMMASK	Can be set to 1 to block the use of symmask and symmaskdb (compatibility mode) for a Symmetrix with Enginuity 5874.	None
SYMCLI_COMMAND_SCOPE	Sets the scope of the device selection process. ENABLED limits the operation to the devices within the scope of the command. DISABLED performs the operation on the devices within the scope of the command plus any additional devices associated by session and/or state.	DISABLED
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_LARGER_TGT	Can be set to ENABLED to allow the creation of Clone sessions where the target device is larger than the source device. The default is to block this type of operation.	DISABLED
SYMCLI_CLONE_PAIR_POLICY	Specifies the CLONE terminate policy, that	DONT_TERM

Variable Name	Description	Default
	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.	
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 and 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_FILE	Can be set to the default file for various operations.	None
SYMCLI_FULL_PDEVNAME	Can be set to 1 to preserve the complete	0

Variable Name	Description	Default
	pdevname.	
SYMCLI_GENERATOR_FILE	Specifies a file to write a log of all active commands (BCV, SRDF, and Snap).	None
SYMCLI_INQ_DATA_CACHED	Can be set to 1 to use the cached inquiry data.	0
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 = *LdevNaming*)	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
SYMCLI_MANPATH	Can be set to specify a non-default location for the SYMCLI online help files. If set, it should be a complete specification of the path to the directory/folder containing those files.	None
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_MAX_BCV_PAIRS	Normally, SYMCLI allows up to 8 BCV device pairs, which can be incrementally established with standard devices. The maximum number of pairs can be custom adjusted from 1 to 16 pairs with this variable.	8
SYMCLI_MODE	Specifies the command output reporting style to be compatible with prior SYMCLI versions. Possible values are V60, V61, V62, V63, V64, V65, V70.	None
SYMCLI_MULTI_VIRTUAL_SNAP	Specifies if more than 16 Snap sessions can be created on the same SRC device. Can be set to ENABLED or DISABLED.	DISABLED
SYMCLI_NOLOGGING	When set to 1, logging is disabled.	0
SYMCLI_NOPROMPT	When set to 1, disables verification	0

Variable Name	Description	Default
	prompts.	
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	Sets a specific mode to output SYMCLI commands. Valid modes are Standard, XML_ELEMENT, and XML_ATTRIBUTE. If the XML mode is specified, the output will be element-based.	Standard
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.	None
SYMCLI_RDB_CONNECT	Can be set to specify the default relational database connection information in the format user/password@service.	NULL
SYMCLI_RDB_NAME	Specifies the default relational database name (*DbName*).	NULL
SYMCLI_RDB_TYPE	Specifies a specific type (*DbType*) of database. Possible values: Oracle,,Informix, SQLServer, Sybase, IBMUDB, Exchange, and SharePoint.	NULL
SYMCLI_RDFG_CONSISTENCY	Can be set to enable consistency verification on an RDF Group level for consistent operations.	DISABLE
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	Prints return code mnemonics and error strings concluding the execution of SYMCLI commands. Possible values are DEFAULT	DEFAULT

Variable Name	Description	Default
	and FORMATTED. DEFAULT is equivalent to an unset. FORMATTED enables the printing of return code mnemonics and error strings.	
SYMCLI_SCHEMA_NAME	Specifies a relational database schema name (*SchemaName*).	NULL
SYMCLI_SID	Specifies a default Symmetrix ID.	None
SYMCLI_SKIP_ON_FAILURE	When set to 1, causes the symcfg discover 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_SNAPVX_LARGER_TGT	Can be set to DISABLE to block linking snapshots to the target device that is larger than the source device. The default is to allow this type of operation.	ENABLE
SYMCLI_SVP	Can be set as the default SAVE device pool name.	DEFAULT_ POOL
SYMCLI_TBS_NAME	Specifies a relational database tablespace name (*TblSpName*).	
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
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	0

Variable Name	Description	Default
	error.	
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

CHAPTER 4
SYMCLI Return Codes

The following sections list the status or error codes that can be returned by the various SYMCLI commands on a Windows and UNIX (for example, in a UNIX C shell, returned using echo $status), or OpenVMS platforms.

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Return code handling for Windows and UNIX

Return code handling for Windows and UNIX The following lists the 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).

Code	Code symbol	Description
0	SUCCESS	CLI call completed successfully.
1	FAIL	CLI call failed.
2	DB_FILE_IS_LOCKED	Another process has an exclusive lock on the Host database file.
3	SYM_IS_LOCKED	Another process has an exclusive lock on the Symmetrix.
4	NOT_ALL_SYNCHRONIZED	NOT all of the mirrored pairs are in the 'Synchronized' state.
5	NONE_SYNCHRONIZED	NONE of the mirrored pairs are in the 'Synchronized' state.
6	NOT_ALL_UPDATED	NOT all of the mirrored pairs are in the 'Updated' state.
7	NONE_UPDATED	NONE of the mirrored pairs are in the 'Updated' state.
8	NOT_ALL_PINGED	NOT all of the remote Symmetrix units can be pinged.
9	NONE_PINGED	NONE of the remote Symmetrix units can be pinged.
10	NOT_ALL_SYNCHED	NOT all of the mirrored pairs are in the 'Synchronized' state.
11	NONE_SYNCHED	NONE of the mirrored pairs are in the 'Synchronized' state.
12	NOT_ALL_RESTORED	NOT all of the pairs are in the 'Restored' state.
13	NONE_RESTORED	NONE of the pairs are in the 'Restored' state.
14	NOT_ALL_VALID	NOT all of the mirrored pairs are in a valid state.
15	NONE_VALID	NONE of the mirrored pairs are in a valid state.

16	SYM_NOT_ALL_LOCKED	NOT all of the specified Symmetrix units have an exclusive Symmetrix lock.
17	SYM_NONE_LOCKED	NONE of the specified Symmetrix units have an exclusive Symmetrix lock.
18	ALREADY_IN_STATE	The Device(s) is (are) already in the desired state or mode.
19	GK_IS_LOCKED	All GateKeeper devices to the Symmetrix unit are currently locked.
20	WP_TRACKS_IN_CACHE	Operation cannot proceed because the target device has Write Pending I/O in the cache.
21	NEED_MERGE_TO_RESUME	Operation cannot proceed without first performing a merge of the RDF Track Tables.
22	NEED_FORCE_TO_PROCEED	Operation cannot proceed in the current state except if you specify a force flag.
23	NEED_SYMFORCE_TO_PROCEED	Operation cannot proceed in the current state except if you specify a symforce flag.
24	NOT_IN_SYNC	The Symmetrix configuration and the database file are NOT in sync.
25	NOT_ALL_SPLIT	NOT all of the mirrored pairs are in the 'Split' state.
26	NONE_SPLIT	NONE of the mirrored pairs are in the 'Split' state.
27	NOT_ALL_SYNCINPROG	NOT all of the mirrored pairs are in the 'SyncInProg' state.
28	NONE_SYNCINPROG	NONE of the mirrored pairs are in the 'SyncInProg' state.
29	NOT_ALL_RESTINPROG	NOT all of the pairs are in the 'RestInProg' state.
30	NONE_RESTINPROG	NONE of the pairs are in the 'RestInProg' state.
31	NOT_ALL_SUSPENDED	NOT all of the mirrored pairs are in the 'Suspended' state.

32	NONE_SUSPENDED	NONE of the mirrored pairs are in the 'Suspended' state.
33	NOT_ALL_FAILED_OVER	NOT all of the mirrored pairs are in the 'Failed Over' state.
34	NONE_FAILED_OVER	NONE of the mirrored pairs are in the 'Failed Over' state.
35	NOT_ALL_UPDATEINPROG	NOT all of the mirrored pairs are in the 'R1 UpdInProg' state.
36	NONE_UPDATEINPROG	NONE of the mirrored pairs are in the 'R1 UpdInProg' state.
37	NOT_ALL_PARTITIONED	NOT all of the mirrored pairs are in the 'Partitioned' state.
38	NONE_PARTITIONED	NONE of the mirrored pairs are in the 'Partitioned' state.
39	NOT_ALL_ENABLED	NOT all of the mirrored pairs are in the 'Enabled' consistency state.
40	NONE_ENABLED	NONE of the mirrored pairs are in the 'Enabled' consistency state.
41	NOT_ALL_SYNCHRONIZED_AND_ENABLED	NOT all of the mirrored pairs are in the 'Synchronized' rdf state and the 'Enabled' consistency state.
42	NONE_SYNCHRONIZED_AND_ENABLED	NONE of the mirrored pairs are in the 'Synchronized' rdf state and in the 'Enabled' consistency state.
43	NOT_ALL_SUSP_AND_ENABLED	NOT all of the mirrored pairs are in the 'Suspended' rdf state and 'Enabled' consistency state.
44	NONE_SUSP_AND_ENABLED	NONE of the mirrored pairs are in the 'Suspended' rdf state and the 'Enabled' consistency state.
45	NOT_ALL_SUSP_AND_OFFLINE	NOT all of the mirrored pairs are in the 'Suspended' rdf state and 'Offline' link suspend state.
46	NONE_SUSP_AND_OFFLINE	NONE of the mirrored pairs are in the 'Suspended' rdf state and the 'Offline' link suspend state.

47	WONT_REVERSE_SPLIT	Performing this operation at this time will not allow you to perform the next BCV split as a reverse split.
48	CONFIG_LOCKED	Access to the configuration server is locked.
49	DEVS_ARE_LOCKED	One or more devices are locked.
50	MUST_SPLIT_PROTECT	If a device was restored with the protect option, it must be split with the protect option.
51	PAIRED_WITH_A_DRV	The function can not be performed since the STD device is already paired with a DRV device.
52	PAIRED_WITH_A_SPARE	NOT all of the Snap pairs are in the 'Copy in progress' state.
53	NOT_ALL_COPYINPROG	NOT all of the pairs are in the 'CopyInProgress' state.
54	NONE_COPYINPROG	NONE of the pairs are in the 'CopyInProgress' state.
55	NOT_ALL_COPIED	NOT all of the pairs are in the 'Copied' state.
56	NONE_COPIED	NONE of the pairs are in the 'Copied' state.
57	NOT_ALL_COPYONACCESS	NOT all of the pairs are in the 'CopyonAccess' state.
58	NONE_COPYONACCESS	NONE of the pairs are in the 'CopyonAccess' state.
59	CANT_RESTORE_PROTECT	The protected restore operation can not be completed because there are write pendings or the BCV mirrors are not synchronized.
60	NOT_ALL_CREATED	NOT all of the pairs are in the 'Created' state.
61	NONE_CREATED	NONE of the pairs are in the 'Created' state.
62	NOT_ALL_READY	NOT all of the BCVs local mirrors are in the 'Ready' state.

63	NONE_READY	NONE of the BCVs local mirrors are in the 'Ready' state.
64	STD_BKGRND_SPLIT_IN_PROG	The operation cannot proceed because the STD Device is splitting in the Background.
65	SPLIT_IN_PROG	The operation cannot proceed because the pair is splitting.
66	NOT_ALL_COPYONWRITE	NOT all of the pairs are in the 'CopyOnWrite' state.
67	NONE_COPYONWRITE	NONE of the pairs are in the 'CopyOnWrite' state.
68	NOT_ALL_RECREATED	Not all devices are in the 'Recreated' state.
69	NONE_RECREATED	No devices are in the 'Recreated' state.
70	NOT_ALL_CONSISTENT	NOT all of the mirrored pairs are in the 'Consistent' state.
71	NONE_CONSISTENT	NONE of the mirrored pairs are in the 'Consistent' state.
72	MAX_SESSIONS_EXCEEDED	The maximum number of sessions has been exceeded for the specified device.
73	NOT_ALL_PRECOPY	Not all source devices are in the 'Precopy' state.
74	NONE_PRECOPY	No source devices are in the 'Precopy' state.
75	NOT_ALL_PRECOPY_CYCLED	Not all source devices have completed one precopy cycle.
76	NONE_PRECOPY_CYCLED	No source devices have completed one precopy cycle.
77	CONSISTENCY_TIMEOUT	The operation failed because of a Consistency window timeout.
78	NOT_ALL_FAILED	NOT all of the pairs are in the 'Failed' state.
79	NONE_FAILED	NONE of the pairs are in the 'Failed' state.
80	CG_NOT_CONSISTENT	CG is NOT RDF-consistent.
81	NOT_ALL_CREATEINPROG	NOT all of the pairs are in the

		'CreateInProg' state.
82	NONE_CREATEINPROG	None of the pairs are in the 'CreateInProg' state.
83	NOT_ALL_RECREATEINPROG	NOT all of the pairs are in the 'RecreateInProg' state.
84	NONE_RECREATEINPROG	None of the pairs are in the 'RecreateInProg' state.
85	NOT_ALL_TERMINPROG	NOT all of the pairs are in the 'TerminateInProg' state.
86	NONE_TERMINPROG	None of the pairs are in the 'TerminateInProg' state.
87	NOT_ALL_VERIFYINPROG	NOT all of the pairs are in the 'VerifyInProg' state.
88	NONE_VERIFYINPROG	None of the pairs are in the 'VerifyInProg' state.
89	NOT_ALL_VERIFIED	NOT all of the pairs are in the requested states.
90	NONE_VERIFIED	NONE of the pairs are in the requested states Note: This message is returned when multiple states are verified at once.
91	RDFG_TRANSMIT_IDLE	RDF group is operating in SRDF/A Transmit Idle.
92	NOT_ALL_MIGRATED	Not all devices are in the ' Migrated' state.
93	NONE_MIGRATED	None of devices are in the 'Migrated' state.
94	NOT_ALL_MIGRATEINPROG	Not all devices are in the 'MigrateInProg' state.
95	NONE_MIGRATEINPROG	None of devices are in the 'MigrateInProg' state.
96	NOT_ALL_INVALID	Not all devices are in the 'Invalid' state.
97	NONE_INVALID	None of devices are in the 'Invalid' state.
98	EMPTY_BACKUP	Cannot create an empty backup file.

99	NOT_ALL_BOUND	Not all devices are in the 'Bound' state.
100	NONE_BOUND	None of the devices are in the 'Bound' state
101	NOT_ALL_BINDING	Not all devices are in the 'Binding' state.
102	NONE_BINDING	None of the devices are in the 'Binding' state.
103	NOT_ALL_ALLOCATING	Not all devices are in the 'Allocating' state.
104	NONE_ALLOCATING	None of the devices are in the 'Allocating' state
105	NOT_ALL_DEALLOCATING	Not all devices are in the 'Deallocating' state.
106	NONE_DEALLOCATING	None of the devices are in the 'Deallocating' state.
107	NOT_ALL_DRAINING	Not all devices are in the 'Draining' state.
108	NONE_DRAINING	None of the devices are in the 'Draining' state.
109	NOT_ALL_UNBOUND	Not all devices are in the 'Unbound' state.
110	NONE_UNBOUND	None of the devices are in the 'Unbound' state.
111	NOT_ALL_NONPOOLED	Not all devices are in the 'Nonpooled' state.
112	NONE_NONPOOLED	None of the devices are in the 'Nonpooled' state.
113	NOT_ALL_DRAINWAIT	Not all devices are in the 'Drainwait' state.
114	NONE_DRAINWAIT	None of the devices are in the 'Drainwait' state.
115	NOT_ALL_DISABLED	Not all devices are in the 'Disabled' state.
116	NONE_DISABLED	None of the devices are in the 'Disabled' state.
117	NOT_ALL_DEACTIVATED	Not all devices are in the 'Deactivated' state.

118	NONE_DEACTIVATED	None of the devices are in the 'Deactivated' state.
119	NOT_ALL_UNBINDING	Not all devices are in the 'Unbinding' state.
120	NONE_UNBINDING	None of the devices are in the 'Unbinding' state.
121	NOT_ALL_RECLAIMING	Not all devices are in the 'Reclaiming' state.
122	NONE_RECLAIMING	None of the devices are in the 'Reclaiming' state.
123	NOT_ALL_BALANCING	Not all devices are in the 'Balancing' state.
124	NONE_BALANCING	None of the devices are in the 'Balancing' state.
125	DEVMASK_VALDTE_FAILED	The device masking data contains inconsistencies.
126	DEVMASK_FREQNT_CHANGES	The device masking data is continuously changing. Please try again.
127	STAR_INV_STATE	The operation is not allowed in the current Star state.
128	STAR_ALLOWED_FROM_WKLD	The operation is allowed from workload site only.
129	STAR_INV_DEF_FILE_FMT	The Star definition file format is not valid.
130	STAR_ACTN_FILE_ERROR	An error occured while accessing the Star action file.
131	STAR_DEF_FILE_ERROR	An error occured while accessing the Star definition file.
132	STAR_SETUP_REQD	The Star Setup action is required.
133	STAR_SETUP_INV_OPMODE	The specified Star mode of operation is not valid.
134	STAR_OPMODE_REQD	The Star mode of operation is required for this operation.
135	STAR_CTL_SITE_REQD	The Star control site name is required for this operation.

136	STAR_WKLD_SITE_REQD	The Star workload site name is required for this operation.
137	STAR_WKLD_OP_REQD	The Star workload site name and Star mode of operation is required for this operation.
138	STAR_CREATE_GROUP_FAIL	An error occured while creating Star group.
139	STAR_FULL_COPY_REQD	Star differential resync is not available. The FULL_COPY flag is required.
140	STAR_INV_ACTION_WOF	Operation can not be performed except if force flag is used.
141	STAR_BUILDCG_REQD	The Star Buildcg action is required.
142	NOT_ALL_FAILEDBACK	Not all devices are in the 'Failedback' state.
143	NONE_FAILEDBACK	None of the devices are in the 'Failedback' state.
144	NOT_ALL_STOPPED	Not all devices are in the 'Stopped' state.
145	NONE_STOPPED	None of the devices are in the 'Stopped' state.
146	NOT_ALL_CONSISTENT_NOINVALIDS	Not all devices are in the 'Consistent with no invalid tracks' state.
147	NONE_CONSISTENT_NOINVALIDS	None of the devices are in the 'Consistent with no invalid tracks' state
148	NOT_ALL_SYNCHRONOUS	Not all devices are in the 'Synchronous RDF' mode.
149	NONE_SYNCHRONOUS	None of the devices are in the 'Synchronous RDF' mode.
150	NOT_ALL_SEMISYNCHRONOUS	Not all devices are in the 'Semi-Synchronous RDF' mode.
151	NONE_SEMISYNCHRONOUS	None of the devices are in the 'Semi-Synchronous RDF' mode.
152	NOT_ALL_ASYNCHRONOUS	Not all devices are in the 'Asynchronous RDF' mode.

153	NONE_ASYNCHRONOUS	None of the devices are in the 'Asynchronous RDF' mode.
154	NOT_ALL_ACP_WP	Not all devices are in the 'Adaptive Copy Write Pending RDF' mode.
155	NONE_ACP_WP	None of the devices are in the 'Adaptive Copy Write Pending RDF' mode.
156	NOT_ALL_ACP_DISK	Not all devices are in the 'Adaptive Copy Disk RDF' mode.
157	NONE_ACP_DISK	None of the devices are in the 'Adaptive Copy Disk RDF' mode.
158	NOT_ALL_COMPRESSING	Not all devices are in the 'Compressing' state.
159	NONE_COMPRESSING	None of the devices are in the 'Compressing' state.
160	NOT_ALL_UNCOMPRESSING	Not all devices are in the 'Uncompressing' state.
161	NONE_UNCOMPRESSING	Not all devices are in the 'Established' state.
162	NOT_ALL_ESTABLISHED	Not all devices are in the 'Established' state.
163	NONE_ESTABLISHED	None of the devices are in the 'Established' state.
164	NOT_ALL_ESTINPROG	Not all devices are in the 'Estinprog' state.
165	NONE_ESTINPROG	None of the devices are in the 'Estinprog' state.
166	NOT_ALL_LINKED	Not all devices are in the 'Linked' state.
167	NONE_LINKED	None of the devices are in the 'Linked' state.
168	NOT_ALL_DEFINED	Not all devices are in the 'Defined' state.
169	NONE_DEFINED	None of the devices are in the 'Defined' state.
170	NOT_ALL_CIPLINKED	Not all linked devices are in the 'Copyinprog' state.

171	NONE_CIPLINKED	None of the linked devices are in the 'Copyinprog' state.
172	NOT_ALL_COPIEDLINKED	Not all linked devices are in the 'Copied' state.
173	NONE_COPIEDLINKED	None of the linked devices are in the 'Copied' state.
174	NOT_ALL_DESTAGED	Not all devices are in the 'Destaged' state.
175	NONE_DESTAGED	None of the devices are in the 'Destaged' state.

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). The table belows describes the set of possible return hex values and their associated meaning with SYMCLI on OpenVMS.

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.

Returned hex value	SYMCLI 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
%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
%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)	MUST_SPLIT_PROTECT
%X1FFF019A	51	2 (E)	PAIRED_WITH_A_DRV
%X1FFF01A2	52	2 (E)	PAIRED_WITH_A_SPARE
%X1FFF01AB	53	3 (I)	NOT_ALL_COPYINPROG
%X1FFF01B3	54	3 (I)	NONE_COPYINPROG
%X1FFF01BB	55	3 (I)	NOT_ALL_COPIED
%X1FFF01C3	56	3 (I)	NONE_COPIED
%X1FFF01CB	57	3 (I)	NOT_ALL_COPYONACCESS
%X1FFF01D3	58	3 (I)	NONE_COPYONACCESS
%X1FFF01DA	59	2 (E)	CANT_RESTORE_PROTECT
%X1FFF01E3	60	3 (I)	NOT_ALL_CREATED
%X1FFF01EB	61	3 (I)	NONE_CREATED
%X1FFF01F3	62	3 (I)	NOT_ALL_READY
%X1FFF01FB	63	3 (I)	NONE_READY
%X1FFF0202	64	2 (E)	SYM_IS_LOCKED
%X1FFF020A	65	2 (E)	SPLIT_IN_PROG
%X1FFF0213	66	3 (I)	NOT_ALL_COPYONWRITE
%X1FFF021B	67	3 (I)	NONE_COPYONWRITE
%X1FFF0223	68	3 (I)	Reserved for future use.
%X1FFF022B	69	3 (I)	Reserved for future use.
%X1FFF0233	70	3 (I)	NOT_ALL_CONSISTENT
%X1FFF023B	71	3 (I)	NONE_CONSISTENT
%X1FFF0242	72	2 (E)	MAX_SESSIONS_EXCEEDED

%X1FFF024B	73	3(I)	NOT_ALL_PRECOPY
%X1FFF0253	74	3(I)	NONE_PRECOPY
%X1FFF025B	75	3(I)	NOT_ALL_PRECOPY_CYCLED
%X1FFF0263	76	3(I)	NONE_PRECOPY_CYCLED
%X1FFF026A	77	2(E)	CONSISTENCY_TIMEOUT
%X1FFF0273	78	3(I)	NOT_ALL_FAILED
%X1FFF027B	79	3(I)	NONE_FAILED
%X1FFF0283	80	3(I)	CG_NOT_CONSISTENT
%X1FFF028B	81	3(I)	NOT_ALL_CREATEINPROG
%X1FFF0293	82	3(I)	NONE_CREATEINPROG
%X1FFF029B	83	3(I)	NOT_ALL_RECREATEINPROG
%X1FFF02A3	84	3(I)	NONE_RECREATEINPROG
%X1FFF02AB	85	3(I)	NOT_ALL_TERMINPROG
%X1FFF02B3	86	3(I)	NONE_TERMINPROG
%X1FFF02BB	87	3(I)	NOT_ALL_VERIFYINPROG
%X1FFF02C3	88	3(I)	NONE_VERIFYINPROG
%X1FFF02CB	89	3(I)	NOT_ALL_VERIFIED
%X1FFF02D3	90	3(I)	NONE_VERIFIED
%X1FFF02DA	91	2(E)	RDFG_TRANSMIT_IDLE
%X1FFF02E2	92	2(E)	NOT_ALL_MIGRATED
%X1FFF02EA	93	2(E)	NONE_MIGRATED
%X1FFF02F2	94	2(E)	NOT_ALL_MIGRATEINPROG
%X1FFF02FA	95	2(E)	NONE_MIGRATEINPROG
%X1FFF0302	96	2(E)	NOT_ALL_INVALID
%X1FFF030A	97	2(E)	NONE_INVALID
%X1FFF04C2	98	2(E)	EMPTY_BACKUP
%X1FFF04CA	99	2(E)	NOT_ALL_BOUND
%X1FFF0802	100	2(E)	NONE_BOUND
%X1FFF080A	101	2(E)	NOT_ALL_BINDING
%X1FFF0812	102	2(E)	NONE_BINDING

%X1FFF081A	103	2(E)	NOT_ALL_ALLOCATING
%X1FFF0822	104	2(E)	NONE_ALLOCATING
%X1FFF082A	105	2(E)	NOT_ALL_DEALLOCATING
%X1FFF0832	106	2(E)	NONE_DEALLOCATING
%X1FFF083A	107	2(E)	NOT_ALL_DRAINING
%X1FFF0842	108	2(E)	NONE_DRAINING
%X1FFF084A	109	2(E)	NOT_ALL_UNBOUND
%X1FFF0882	110	2(E)	NONE_UNBOUND
%X1FFF088A	111	2(E)	NOT_ALL_NONPOOLED
%X1FFF0892	112	2(E)	NONE_NONPOOLED
%X1FFF0892	113	2(E)	NOT_ALL_DRAINWAIT
%X1FFF089A	114	2(E)	NONE_DRAINWAIT
%X1FFF08AA	115	2(E)	NOT_ALL_DISABLED
%X1FFF08B2	116	2(E)	NONE_DISABLED
%X1FFF08BA	117	2(E)	NOT_ALL_DEACTIVATED
%X1FFF08C2	118	2(E)	NONE_DEACTIVATED
%X1FFF08CA	119	2(E)	NOT_ALL_UNBINDING
%X1FFF902	120	2(E)	NONE_UNBINDING
%X1FFF090A	121	2(E)	NOT_ALL_RECLAIMING
%X1FFF0912	122	2(E)	NONE_RECLAIMING
%X1FFF091A	123	2(E)	NOT_ALL_BALANCING
%X1FFF0922	124	2(E)	NONE_BALANCING
%X1FFF092A	125	2(E)	DEVMASK_VALDTE_FAILED
%X1FFF0932	126	2(E)	DEVMASK_FREQNT_CHANGES
%X11FF093A	127	2(E)	STAR_INV_STATE
%X11FFF0942	128	2(E)	STAR_ALLOWED_FROM_WKLD
%X1FFF094A	129	2(E)	STAR_INV_DEF_FILE_FMT
%X1FFF0982	130	2(E)	STAR_ACTN_FILE_ERROR
%X1FFF098A	131	2(E)	STAR_DEF_FILE_ERROR
%X1FFF0992	132	2(E)	STAR_SETUP_REQD

%X1FFF0992	133	2(E)	STAR_SETUP_INV_OPMODE
%X1FFF09A2	134	2(E)	STAR_OPMODE_REQD
%X1FFF09AA	135	2(E)	STAR_CTL_SITE_REQD
%X1FFF09B2	136	2(E)	STAR_WKLD_SITE_REQD
%X1FFF09BA	137	2(E)	STAR_WKLD_OP_REQD
%X1FFF09C2	138	2(E)	STAR_CREATE_GROUP_FAIL
%X1FFF09CA	139	2(E)	STAR_FULL_COPY_REQD
%X1FFF0A02	140	2(E)	STAR_INV_ACTION_WOF
%X1FFF0A0A	141	2(E)	STAR_BUILDCG_REQD
%X1FFF0A13	142	3(I)	NOT_ALL_FAILEDBACK
%X1FFF0A1B	143	3(I)	NONE_FAILEDBACK
%X1FFF0A23	144	3(I)	NOT_ALL_STOPPED
%X1FFF0A2B	145	3(I)	NONE_STOPPED
%X1FFF0A33	146	3(I)	NOT_ALL_CONSISTENT_NOINVALIDS
%X1FFF0A3B	147	3(I)	NONE_CONSISTENT_NOINVALIDS
%X1FFF0A43	148	3(I)	NOT_ALL_SYNCHRONOUS
%X1FFF0A4B	149	3(I)	NONE_SYNCHRONOUS
%X1FFF0A83	150	3(I)	NOT_ALL_SEMISYNCHRONOUS
%X1FFF0A8B	151	3(I)	NONE_SEMISYNCHRONOUS
%X1FFF0A93	152	3(I)	NOT_ALL_ASYNCHRONOUS
%X1FFF0A9B	153	3(I)	NONE_ASYNCHRONOUS
%X1FFF0AA3	154	3(I)	NOT_ALL_ACP_WP
%X1FFF0AAB	155	3(I)	NONE_ACP_WP
%X1FFF0AB4	156	3(I)	NOT_ALL_ACP_DISK
%X1FFF0ABB	157	3(I)	NONE_ACP_DISK
%X1FFF0AC3	158	3(I)	NOT_ALL_COMPRESSING
%X1FFF0ACB	159	3(I)	NONE_COMPRESSING
%X1FFF0AC3	160	3(I)	NOT_ALL_UNCOMPRESSING
%X1FFF0B0B	161	3(I)	NONE_UNCOMPRESSING
%X1FFF0B13	162	3(I)	NOT_ALL_ESTABLISHED

%X1FFF0B1B	163	3(I)	NONE_ESTABLISHED
%X1FFF0B23	164	3(I)	NOT_ALL_ESTINPROG
%X1FFF0B2B	165	3(I)	NONE_ESTINPROG
%X1FFF0B33	166	3(I)	NOT_ALL_LINKED
%X1FFF0B3B	167	3(I)	NONE_LINKED
%X1FFF0B43	168	3(I)	NOT_ALL_DEFINED
%X1FFF0B4B	169	3(I)	NONE_DEFINED
%X1FFF0B83	170	3(I)	NOT_ALL_CIPLINKED
%X1FFF0B8B	171	3(I)	NONE_CIPLINKED
%X1FFF0B93	172	3(I)	NOT_ALL_COPIEDLINKED
%X1FFF0B9B	173	3(I)	NONE_COPIEDLINKED
%X1FFF0BA3	174	3(I)	NOT_ALL_DESTAGED
%X1FFF0BAB	175	3(I)	NONE_DESTAGED