EMC® Solutions Enabler Symmetrix® CLI

Version 7.6

Command Reference

REV 01

EMC²

Copyright © 2005 - 2013 EMC Corporation. All rights reserved. Published in the USA.

Published May, 2013

EMC believes the information in this publication is accurate as of its publication date. The information is subject to change without notice.

The information in this publication is provided as is. EMC Corporation makes no representations or warranties of any kind with respect to the information in this publication, and specifically disclaims implied warranties of merchantability or fitness for a particular purpose. Use, copying, and distribution of any EMC software described in this publication requires an applicable software license.

EMC², EMC, and the EMC logo are registered trademarks or trademarks of EMC Corporation in the United States and other countries. All other trademarks used herein are the property of their respective owners.

For the most up-to-date regulatory document for your product line, go to the technical documentation and advisories section on the EMC online support website.

CONTENTS

Preface 7

Chapter 1: SYMCLI Commands 11

symaccess 12
symacl 24
symapierr 34
symaudit 35
symauth 44
symbcv 53
symcfg 60
symcg 77
symchg 92
symchksum 98
symcli 104
symclient 106
symclone 108
symconfigure 119
symconnect 161
symdev 165
symdg 180
symdisk 197
symdrv 201
symevent 203
symfast 219
symgate 228
symhost 231
symhostfs 234
syminq 237
symioctl 240
symipsec 245
symlabel 255
symld 258
symlmf 265
symlv 271

symmask 277
symmaskdb 285
symmigrate 289
symmir 295
symntctl 307
symoptmz 312
sympart 320
sympd 323
symrcopy 326
symrdb 335
symrdf 349
symrecover 377
symreplicate 387
symreturn 408
symrslv 409
symsan 413
symsg 415
symsnap 426
symqos 437
symstar 446
symstat 457
symtier 467
symtw 472
symvg 475
symvm 482

Chapter 2: Daemons 485

storapid 486
stordaemon 489
storevntd 496
storgnsd 498
storhorcmd 504
storifmxd 506
stororad 508
storrdfd 510
storsqld 512
storsrmd 514

storsrvd 516
storstpd 520
storsybs11d 525
storsybs12.5d 527
storsybs12d 530
storudbd 532
storwatchd 534

Chapter 3: Options Files 535
Daemon Options File 536
Options File 559

Chapter 4: Environment Variables 567

Chapter 4: SYMCLI Return Codes 575
Return code handling for Windows and UNIX 576
Return code handling for OpenVMS 588

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.

If a Solutions Enabler feature does not function properly or does not function as described in this guide, please contact the EMC Customer Support Center for assistance.

The EMC® Solutions Enabler Symmetrix® Command Line Interface (SYMCLI) is a comprehensive command set for managing your storage environment.

Software updates and documentation can be downloaded from:

- EMC Online Support

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.

Related documents

The following documents provide additional, relevant information.

- EMC Solutions Enabler documentation set
- EMC host connectivity guides

Conventions used in this manual

EMC uses the following conventions for special notices.

Every use of the word SYMCLI means Solutions Enabler.

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

CAUTION: A caution contains information essential to avoid data loss or damage to the system or equipment. The caution may apply to hardware or software.

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

Where to get help

EMC support, product, and licensing information can be obtained on EMC Online Support as described next.

To open a service request through EMC Online Support, you must have a valid support agreement. Contact your EMC sales representative for details about obtaining a valid support agreement or to answer any questions about your account.

Product information

For documentation, release notes, software updates, or for information about EMC products, licensing, and service, go to EMC Online Support (registration required) at:

https://support.EMC.com

Technical support

EMC offers a variety of support options.

Support by Product

EMC offers consolidated, product-specific information on the Web at:

https://support.EMC.com/products

The **Support by Product** web pages offer quick links to Documentation, White Papers, Advisories (such as frequently used Knowledgebase articles), and Downloads, as well as more dynamic content, such as presentations, discussion, relevant Customer Support Forum entries, and a link to EMC Live Chat.

EMC Live Chat

Open a Chat or instant message session with an EMC Support Engineer.

eLicensing support

To activate your entitlements and obtain your Symmetrix license files, visit the Service Center on https://support.EMC.com, as directed on your License Authorization Code (LAC) letter emailed to you.

For help with missing or incorrect entitlements after activation (that is, expected functionality remains unavailable because it is not licensed), contact your EMC Account Representative or Authorized Reseller.

For help with any errors applying license files through Solutions Enabler, contact the EMC Customer Support Center.

If you are missing a LAC letter, or require further instructions on activating your licenses through the Online Support site, contact EMC's worldwide Licensing team at licensing@emc.com or call:

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

EMEA: +353 (0) 21 4879862 and follow the voice prompts.

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.

Syntax

```
symaccess -h
symaccess -sid <SymmID>
   create -name <GroupName> -type initiator [ -wwn <wwn> |
      -iscsi <iscsi> | -file <InitiatorFileName> |
      -ig <InitiatorGroupName> ] [-consistent_lun]
   create -name <GroupName> -type port [-dirport <Dir>:<Port>
      [,<Dir>:<Port>...]]
   create -name <GroupName> -type storage
      [devs <SymDevStart:SymDevEnd> |
      <SymDevName[,SymDevName[,SymDevName...]]> |
      <-g <DgName> [-std] [-bcv] [-vdev] [-tgt]> |
      <-file <DeviceFileName> [src] [tgt]> |
      <sg <SgName>[,<SgName1>,<SgName2>,.,<SgNamen>]>
      [-reserve_id ResvID[,ResvID[,ResvID...]]]]
   create view -name <ViewName> -sg <StorageGroupName>
      -pg <PortGroupName> -ig <InitiatorGroupName>
      [-reserve_id ResvID[,ResvID[,ResvID...]]]
      [-lun <Addr>] [-ckd] [-celerra] [-rp]
   create view -name <GroupsAndViewName> -wwn <wwn> |
      -iscsi <iscsi> -dirport <Dir>:<Port>[,<Dir>:<Port>...]
      < devs <SymDevStart:SymDevEnd> [-lun <Addr>] >  |
      < <SymDevName> [-lun <Addr>] > |
      < <SymDevName,SymDevName,SymDevName...>
      [ -lun <Addr,Addr,Addr...>] >
      [-reserve_id ResvID[,ResvID[,ResvID...]]]
   [-ckd] [-celerra] [-rp]
   create view -name <GroupsAndViewName> -wwn <wwn> |
      -iscsi <iscsi> -dirport <Dir>:<Port>[,<Dir>:<Port>...]
      <-g <DgName> [-std] [-bcv] [-vdev] [-tgt]> |
      <-file <DeviceFileName> [src] [tgt]>
      [-reserve_id ResvID[,ResvID[,ResvID...]]]
      [-ckd] [-celerra] [-rp]
   delete <view -name <ViewName>
      [-unmap [-celerra] [-rp]]
      [-reserve_id ResvID[,ResvID[,ResvID...]]] > |
      < -name <GroupName> -type <storage
      [-reserve_id ResvID[,ResvID[,ResvID...]]] |
      port | initiator> [-force] > [-noprompt][-ckd]
```

```
    rename -name <GroupName> -type <storage | port | initiator>
       -new_name <NewGroupName>
    rename view -name <ViewName> -new_name <NewViewName>
    rename -wwn <wwn> | -iscsi <iscsi> -alias <alias>
    replace -wwn <wwn> -new_wwn <NewWWN> [-noprompt]
    replace -iscsi <iscsi> -new_iscsi <NewiSCSI> [-noprompt]
symaccess -sid <SymmID> -name <GroupName> -type storage
       [-reserve_id ResvID[,ResvID[,ResvID...]]]
       [-ckd] [-celerra] [-rp]
    add devs <SymDevStart:SymDevEnd> [-lun <Addr>] |
       <SymDevName> [-lun <Addr>] |
       <SymDevName,SymDevName,SymDevName...>
       [-lun <Addr> | -lun <Addr,Addr,Addr...>]
    add -g <DgName> [-std] [-bcv] [-vdev] [-tgt] [-lun <addr>]
    add -file <DeviceFileName> [src] [tgt] [-lun <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 devs <SymDevStart:SymDevEnd> | <SymDevName> |
       <SymDevName,SymDevName,SymDevName...>
    remove -g <DgName> [-std] [-bcv] [-vdev] [-tgt]
    remove -file <DeviceFileName> [src] [tgt]
    remove sg <SgName>[,<SgName1>,<SgName2>,.,<SgNamen>]
symaccess -sid <SymmID> -name <GroupName> -type port
       -dirport <Dir>:<Port>[,<Dir>:<Port>[,<Dir>:<Port>...]]
       [-ckd]
    add [-celerra] [-rp]
symaccess -sid <SymmID> -name <GroupName> -type port
       -dirport <Dir>:<Port>[,<Dir>:<Port>[,<Dir>:<Port>...]]
       [-ckd] [-force]
    remove [-unmap [-celerra] [-rp]]
symaccess -sid <SymmID> -name <GroupName> -type initiator
       -wwn <wwn> | -iscsi <iscsi> | -ig <InitiatorGroupName> |
       -file <InitiatorFileName>
    add
    remove
symaccess -sid <SymmID> -name <GroupName> -type initiator
    -wwn <wwn> | -iscsi <iscsi> | -file <InitiatorFileName>
    [-login]
    remove
symaccess -sid <SymmID> -wwn <wwn> | -iscsi <iscsi>
    [-dirport <Dir>:<Port>] -login
    remove
```

```
symaccess -sid <SymmID> -target_sid <SymmID>
    copy -name <GroupName> -type storage
    [-reserve_id ResvID[,ResvID[,ResvID...]]]
    copy -name <GroupName> -type initiator | port
    copy -name <ViewName> view [-ckd] [-celerra] [-rp]
    [-reserve_id ResvID[,ResvID[,ResvID...]]]
symaccess -sid <SymmID> -wwn <wwn> | -iscsi <iscsi>
    set hba_flags <on <flag,flag,flag...> <-enable |-disable> |
    off [flag,flag,flag...]>
    list logins [-dirport <Dir>:<Port>] [-v]
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> -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 <BackupFileName> [-noprompt] [-symforce]
    backup
    restore [-remove_ckd] [-disassociate] [-force]
symaccess discover hba [-rename] [-v]
symaccess list hba [-v]
symaccess -sid <SymmID> | -file <backup_filename>
    list [-name <GroupName>] [-v]
    list -type <storage [-devs <<SymDevStart>:<SymDevEnd> |
    <SymDevName> | <<SymDevName>,<SymDevName>...>>] | port
    [-dirport <Dir>:<Port>] | initiator [-wwn <wwn> |
    -iscsi <iscsi>]> [-name <GroupName>] [-detail | -v]
    list devinfo [-ig <InitiatorGroupName> [-detail]]
    list view [-name <ViewName>][-v][-detail]
    list chap [-dirport <Dir>:<Port>][-v]
    show <GroupName> -type <initiator [-detail] | port |
    storage>
    show view <ViewName> [-ig <ChildInitiatorGroupName>]
symaccess -sid <SymmID>
```

```
    list assignment [-v] -devs <<SymDevStart>:<SymDevEnd> |
    <SymDevName> | <<SymDevName>,<SymDevName>...>>
    list no_assignments [-dirport <Dir>:<Port>]
symaccess -sid <SymmID> | -file <backup_filename> [-log]
    verify
```

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

Name	Description
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 and writes the ASCII 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

Name	Description
assignments	Lists the currently assigned initiators for the specified devices.
chap	Specifies the iSCSI CHAP credential.

Name	Description
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

Name	Description
-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.

Name	Description
-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	Renames the group or view.
-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.

Name	Description
-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

Name	Description
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.

Name	Description
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]

Name	Description
	◆ 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.

Name	Description
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.

Syntax

```
symacl -h
symacl <-file <CommandFile>  |  <redirect_stdin>>[-v  |  -noecho]
   preview
symacl -sid <SymmID> [-v  |  -noecho]<-file <CommandFile>  |
<redirect_stdin>>
   prepare
   commit [-force] [-restore]
symacl
   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 sthe 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

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

Name	Description
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

Name	Description
accgroup	Returns the access IDs of a specified access group.
accpool	Returns the Symmetrix devices in a specified access-controlled device pool.

Options

Name	Description
-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

Name	Description
	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

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

Name	Description
	`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>] toaccpool <PoolName>;
```

To remove devices from a pool:

```
remove dev <StartDevName>[:<EndDevName>] fromaccpool <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> toaccgroup <GroupName>;
add restored accid <Id> name <IdName> toaccgroup <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,...> fromaccgroup <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

<table>
<tr><th>Name</th><th>Description</th></tr>
<tr><td>accessType</td><td>The type of access desired for the pool or group. Possible values are:
<table>
<tr><th colspan="2">Access Type</th></tr>
<tr><td>ADMIN</td><td>ECC</td></tr>
<tr><td>ADMINRD</td><td>ERASE</td></tr>
<tr><td>ALL</td><td>OPTMZR</td></tr>
<tr><td>BASE</td><td>POWRPATH</td></tr>
<tr><td>BASECTRL</td><td>QOS</td></tr>
<tr><td>BCV</td><td>RCOPY</td></tr>
<tr><td>CACHCTRL</td><td>RDF</td></tr>
<tr><td>CFGDEV</td><td>RPA</td></tr>
<tr><td>CFGSYM</td><td>SDDF</td></tr>
<tr><td>CHECKSUM</td><td>SDR</td></tr>
<tr><td>CREATEDV</td><td>SNAP</td></tr>
<tr><td>DIRCTRL</td><td>VLOGIX</td></tr>
</table>
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.</td></tr>
<tr><td>EndDevName</td><td>The last Symmetrix device name in a sequence (such as 02C).</td></tr>
<tr><td>GroupName</td><td>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.</td></tr>
<tr><td>Id</td><td>The unique ID. If creating a host-based access ID, the ID is obtained by</td></tr>
</table>

Name	Description
	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 (8 character maximum).
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

Value	Code Symbol	Description
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.

Syntax

```
symapierr [-h] <ErrorCode>
```

Description

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

Arguments

None.

Options

Name	Description
-h	Provides brief, online help information.

Parameters

Name	Description
ErrorCode	A numerical representation of an error.

Return Codes

Value	Code Symbol	Description
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.

Syntax

```
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
    <ApplId>[, <ApplId>, ...] ]
    [-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

Name	Description
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

Name	Description
-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.

Name	Description
-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

Name	Description
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	AuthCtrl
BegBckup	BeginBackup	BeginRestore
BeginSnapshot	BegRestr	BegSnap
Bind	BlksIO	Block
BlockDirectIO	Break	Cancel

Name	Description

Action Names		
CheckPoint	Chkpt	Cleanup
ClearStats	ClrStats	CodeLoad
Commit	CompressStart	CompStrt
CompressStop	CompStop	Configure
Configur	Connect	
Convert	CPAnalyze	CPAnalyz
Create	CreatePair	CrtPair
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	FullRestore
FullRstr	FullSnapRestore	
GenSwapList	GnSwpLst	
HalfDeletePair	HalfMove Pair	HMovPair
HalfSwap	Halt	HBAState
HDelPair	Hold	Host IO
HSwap		
IncEstablish	IncEsta	IncRestore

Name	Description

Action Names		
IncRstr	Initialize	Init
Invalidate	Invldate	ISnapRes
Isolate	IncSnapRestore	
Lock	Login	Logout
Map	Merge	Migrate
Modify	MovePair	MovPair
MscClnup	MSCCleanup	MSCSwitch
NotReady	NotRdy	Offline
Online	OptSwp	Other
OptmzrMove	OptMove	OptSchd
OptmzrSchedule	OptmzrSwap	OptSwap
ORMOff	ORMOn	ORMSys
PerstOn	PerstOff	Pin
PhoneHome	PhonHome	PortAccess
PortAccs	Prepare	Protect
R1Update	RDFSet	Ready
Reassociate	Reassoc	Rebind
Reboot	ReclaimStart	RclmStrt
ReclaimStop	RclmStop	Reconfig
Reconfigure	Recover	Recreate
Refresh	Relabel	Release
Relocated	Relocted	Remove
Rename	Repair	Replace
Reserve	Reset	Restart
Resume	Rollback	RWDisable
RWDisabl	RWEnable	
Scan	Set	SetORMOn

Name	Description
	Action Names SetORMOff, SetORMSystem, SetPersistentOff SetPersistentOn, SnapCreate, SnapCrea SnapTerm, Sparing, Split StarDis, STARDisable, StarEna STARenable, STARrefresh, STARref Start, Stop, Suspend Swap, Switch, Syscalls Sync Terminat, Terminate, Thaw TokenMgt Unbind, Unblock, UnblksIO Unhold, UnblockDirectIO, UncompressStart UncoStrt, UncompressStop, UncoStop Unlock, Unpin, Unprotect UnProtct Validate, VolAccess, VolAcces VTOC, WRDisable, WRDisab
ActivityId	The Activity ID associated with the performed action in the audit log.
AppliId	The name of an application whose activity generated audit log entries.

Name	Description
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

Value	Code Symbol	Description
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.

Syntax

```
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.
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
- 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

Name	Description
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

Name	Description
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

Name	Description
-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.

Name	Description
-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

Name	Description
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 group <GroupName> to role <RoleName>;
Re-assign a user or group to a different authorizationrole:
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 authorizationrole
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>;
Set the authorization enforcement policy:
set enforcement [advise  |  enforce];
```

Command File Parameters

Name	Description
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

Name	Description

	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 byquoting ("") 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 ◆ None Role names are not case sensitive.
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

Value	Code Symbol	Description
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;
```

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;
```

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;
```

symbcv

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

Syntax

```
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] [-rdfg <GrpNum>][-remote_
rdfg <RemoteGrpNum>] [-force][-sel_rdfg <SelRdfGrpNum>][-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

Name	Description
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

Name	Description
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

Name	Description
-bcv	Indicates that the remotely attached BCV will be paired with the

Name	Description
	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.

Name	Description
-offline	Makes the Symmetrix data connection offline from the host in-memory database for this action.
-P	Supplies the front-end (SCSI or Fibre) director port number 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

Name	Description
Count	Number of iterations to execute before exiting.
DestCgName	Destination composite group in which to move the BCV device(s).

Name	Description
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

Value	Code Symbol	Description
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 RDF (RA) directors.
- Set online or offline front-end (SA) director ports.
- Display available network services entered in the network service file.
- Display existing UNIX gatekeeper and database semaphores.
- Display application and host registration information.
- Display 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.

Syntax

```
symcfg -h
symcfg [-version | -kit | -db]
symcfg
    discover [-all | -symmetrix | -clariion |
    -pdev [-sid <SymmID>] | -sid <SymmID>]
    [-cache | -nocache]
    discover -clariion -file <assisted_discovery_file>
    scan
symcfg
    sync [-sid <SymmID>] [-rdf | -bcv | -local | -dirsts |
    -snap | -cfgmgr | -rcopy | -env_data | -sg |
    -fast | -tier | -vpdata]
    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>
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
    sync -clariion [-cid <ClarID>]
symcfg [-sid <SymmID>] [-offline]
    list [-CA  <#|ALL>] [-v]
    list [-DA  <#|ALL>] [-v]
    list [-DX  <#|ALL>] [-v]
    list [-dir <#|ALL>] [-address [-available] [-fibre]]
    [-p <#>]
    list [-dir <#|ALL>] [-v [-ALL]] [-p <#>]
    list [-EA  <#|ALL>] [-v]
    list [-EA  <#|ALL> [-p <#>]] [-address [-available]]
    list [-EF  <#|ALL>] [-v]
    list [-EF  <#|ALL> [-p <#>]] [-address [-available]]
    list [-FA  <#|ALL> [-p <#>]] [-address [-available]]
    list [-FA  <#|ALL> [-p <#>]] [-v [-ALL]]
    list [-RA  <#|ALL>] [-switched] [-v] [-rdfg <#|ALL>]
    list [-SA  <#|ALL>] [-p <#>]
    [-address [-available][-fibre]]
    list [-SA  <#|ALL>] [-p <#>] [-v [-ALL]]
    list [-SE  <#|ALL>] [-p <#>] [-v]

symcfg
    list -clariion [-cid <ClarID>]
symcfg [-sid <SymmID>]
```

```
    list -host_cache
    list -memory [-sid <SymmID>] [-offline]
    list -rdfg <#|ALL> [-dynamic|-static] [-rdfa | -detail]
    [-offline]
    list -status
    list -upatches
symcfg [-sid <SymmID>] [-v] [-offline]
    list [-SA  <#|ALL> [-port]]
    list [-FA  <#|ALL> [-port]]
    list [-RA  <#|ALL> [-port]]
symcfg [-sid <SymmID>] [-v]
    list [-LRU <#|ALL>] [-offline]
    list [-lock]
    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]]
    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]
    [-i <Interval>] [-c <Count>]
    list [-pool [-snap | -rdfa_dse [-rdfg <GrpNum>]]
    [-fba] [-ckd3390] [-ckd3380] [-as400] [-all] [-v]]
    list [-pool -thin [-fba] [-ckd3390] [-all] [-v]]
    list [-pool -thin -detail [-fba] [-ckd3390]]
    list [-savedev [-fba] [-ckd3390] [-ckd3380] [-as400]
    [-nonpooled]
    [-devs <<SymDevStart>:<SymDevEnd> | <SymDevName>
    [,<<SymDevStart>:<SymDevEnd> | <SymDevName>>...]>]
    list [-datadev [-fba] [-ckd3390] [-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 -RA <#|ALL> [-sid <SymmID>] [-noprompt] [-v]
    online
    offline
symcfg -SA <#> -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>]
    [-offline]
    [-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>
```

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

Arguments

Name	Description
authorization	Supplies and manages the connectivity information required to communicate witheither: ◆ certain storage arrays (e.g., CLARiiON) ◆ 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:

<table>
<tr><th>Name</th><th>Description</th></tr>
<tr><td></td><td>
<table>
<tr><th>Information</th><th>Option to Use</th></tr>
<tr><td>agent address</td><td>[-host]</td></tr>
<tr><td>user name</td><td>[-user]</td></tr>
<tr><td>password</td><td>[-password]</td></tr>
<tr><td>port</td><td>[-port]</td></tr>
<tr><td>alternate agent address</td><td>[-ahost]</td></tr>
<tr><td>namespace</td><td>[-namespace]</td></tr>
</table>
The agent address, user name, and password data information is required. 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.
</td></tr>
<tr><td>discover</td><td>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 options -symmetrix and -clariion provide flexibility to discover only Symmetrix arrays or only CLARiiON arrays. The -all option discovers all known storage arrays.
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.</td></tr>
<tr><td>list</td><td>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.</td></tr>
</table>

Name	Description
	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 or all RDF RA directors or a front-end (SA or FA) director port on a locally-attached Symmetrix array to the offline state. **Note:** Use caution when applying this action.
online	Sets one or all RDF RA directors or a front-end (SA or FA) director port on a locally-attached Symmetrix array to 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.
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 the system bay or drive bay LEDs.
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

Name	Description
-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 discover, discovers all known types of storage arrays. 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.
-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 the 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

Name	Description
	-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.
-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.
-CA	Confines the action to a channel director number. To select all channel director numbers, specify ALL.
-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.
-cid	Supplies the unique CLARiiON ID.
-clariion	Discovers or lists only CLARiiON arrays.
-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

Name	Description
	connectivity, sorted by Symmetrix ID. Only those hosts that have at least one registered application will be listed.
-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.
-detail	Displays detailed information for thin devices or RDF groups.
-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

Name	Description
	level 5771. 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.
-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.
-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.

Name	Description
	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.
-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 the system bay or drive bay LEDs.
-lock	Displays whether the Symmetrix array has an exclusive lock.
-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.
-mb	Lists capacity in megabytes.
-memory	Displays information about the memory boards.
-namespace	Specifies a namespace with authorization operations.
-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.
-offline	Sets the operation to work in offline mode, utilizing the host configuration database exclusively.

Name	Description
-p	Identifies a specific (SCSI or Fibre) port of a front-end director.
-password	The password associated with the user supplied by the -username option. If it is not specified on the command line, the system prompts for it. The characters entered do not display for additional security. This is an optional security feature.
-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	Lists the various front-end director port status (online/offline), and lists the associated director numbers when used with the list -SA option. Used with list -FA, list -RA, in addition to port status, the connection status of ports is also displayed. When used with the authorization command, this takes an argument to provide the port at which the agent is listening.
-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.
-reclaiming	Verifies devices that are currently being reclaimed from a thin pool.

Name	Description
-SA	Limits the action to a front-end (SCSI or Fibre) director number. To select all front-end 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.
-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.
-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.
-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.
-symmetrix	Discovers only Symmetrix arrays.
-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

Name	Description
	-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.
-vmware	Indicates that the supplied information is for a VMWare Virtual Infrastructure Service instead of a CLARiiON management processor. Used with the authorization action.
-vpdata	Refreshes (synchronizes) the configuration database file with virtual provisioning information gathered from the Symmetrix array.

Parameters

Name	Description
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.
HostName	The host name.

Name	Description
NameSpace	The namespace used with Authorization actions.
PassWord	The password associated with the UserName supplied during authorization actions.
PoolName	The device pool name.
ScriptFile	The full pathname of a script file to be executed.
SgName	The storage group 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

Value	Code Symbol	Description
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 that are in a failed state, enter:

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

symcg

Performs operations on a Symmetrix composite group (CG).

Syntax

```
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]
    exportall [-file <FileName>] [-rdf]
    import <CgName> [-file <FileName>]
    [-apidb | -rdf_consistency] [-rename]
    importall [-file <FileName>]
    [-apidb | -rdf_consistency]
    list [-offline] [-v]
    [-apidb | -rdf_consistency]
    list [-inactive]
    release <CgName> [-force] [-noprompt]
    [-sid <SymmID>] [-lock <#>]
    rename <OldCgName> <NewCgName>
    show <CgName> [-inactive] [-offline | -lock]
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> ...]] [-symforce]
    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> ...]]
    unhold [<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 [LdevName, [Ldevname...]]
    free [LdevName, [Ldevname...]] -stop
    reclaim [LdevName, [LdevName...]] [-persistent]
    reclaim [LdevName, [LdevName...]] [-stop]
    set -persistent [<LdevName> [<LdevName> ...]]
    unset -persistent [<LdevName> [<LdevName> ...]]
    set -orm <off |system>
    [<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, 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

Name	Description
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 devices to the thin pool.
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

Name	Description
	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. If the -apidb option is specified, the non-REGULAR group will not be stored in PowerPath.
importall	Imports all of the composite groups described by a text file that was created by the exportall action. If the -apidb option is specified, the non-REGULAR group will not be stored in PowerPath.
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

Name	Description
	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 devices 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 Optimzed Read Miss mode when combined with the -orm option.

Name	Description
show	Shows detailed information about the devices in a composite group.
unbind	Unbinds devices from the thin pool.
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.
write_disable	Disables writes for all devices in the composite group. By default, all devices in the STD device list are acted upon.

Keywords

Name	Description
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

Name	Description
-add	Specifies that the devices will be added to the RDF Consistency enabled CG from the staging area.
-all	Activates all inactive composite groups.
-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.

Name	Description
-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.
-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, and unhold.

Name	Description
-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.
-orm	Allows setting the Optimized Read Miss mode to off or system managed for the specified devices.
-persistent	Specifies the operation on the persistent indicator when used with set or unset. 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.

Name	Description
-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

Name	Description
	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.
-stop	Specifies that the compress, uncompress, allocate, free, or reclaim operation will be stopped.
-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.
-symforce	Forces the operation (when used with remove or delete) if the device is enabled for consistency and it cannot be disabled. Forces the host_active operation if a device is host visible.
-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

Name	Description
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.

Name	Description
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

Value	Code Symbol	Description
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_NAME>
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.

Code	Description
X	Identifies an RTGT device.
F	Identifies a Hop 2 TGT device.
N	Identifies an RA Group Name.
D	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›	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.

Syntax

```
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]
    [-devs <<SymDevStart>:<SymDevEnd> | <SymDevName>
    [,<<SymDevStart>:<SymDevEnd> | <SymDevName>>...]>]
       [-native][-v]
    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

Name	Description
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

Name	Description
	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

Name	Description
-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.

Name	Description
-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

Name	Description
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.

Name	Description
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, beginning the contiguous 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

Value	Code Symbol	Description
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

Name	Description
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

Name	Description
BlkSize	A default operation that checks I/O blocksize to block header.

Name	Description
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

Name	Description
-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

Name	Description
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

Value	Code Symbol	Description
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.

Syntax

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

Description

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

Arguments

None.

Options

Name	Description
-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

Value	Code Symbol	Description
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.

Syntax

```
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 <[-vxfs <MountPoint...>]  | [-rdb -dbtype <DbType> [-db
    <DbName>]]  | [-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 [-vxfs <MountPoint...>]  | [-rdb -dbtype <DbType> [-db
    <DbName>] ]  | [-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
<redirect_stdin>> [-force] [-noprompt][-i <Interval>] [-c <Count>]
[-star][-preserveTGTLocks -lockid <LockNum>] [-v]

    create [-skip][[-nocopy  |  -vse] [-nodifferential]]  | [[-copy
    |  -precopy] [-differential  |  -nodifferential]]

    split [-skip]

    activate <[-vxfs <MountPoint...>]  | [-rdb -dbtype <DbType> [-db
    <DbName>]]  | [-consistent]>[-preaction <ScriptFile>]
    [-postaction <ScriptFile>][-not_ready] [-skip]

    terminate [-symforce] [-skip] [-restored] [-not_ready]

    recreate [-skip] [-precopy]

    establish [-vxfs <MountPoint...>]  | [-rdb -dbtype <DbType> [-db
    <DbName>] ]  | [-consistent][-preaction <ScriptFile>]
    [-postaction <ScriptFile>][-not_ready] [-skip][-full [-opt  |
    -exact] [-vse]]

    restore [-preaction <ScriptFile>][-postaction<ScriptFile>]
    [-full]

symclone -sid <SymmID> <-file <DeviceFileName>  | -noprompt
<redirect_stdin>> [-force][-i <Interval>] [-c <Count>]

    query [-multi] [-summary]

    verify [-created  |  -copied  |  -copyinprog  | -copyonaccess  |
     -copyonwrite  |  -precopy [-cycled]  | -recreated  |  -restored
     |  -restinprog  |  -split][-force] [-concurrent] [-summary]

    set mode <copy  |  nocopy  |  precopy>

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 <[-vxfs <MountPoint...>]  | [-rdb -dbtype <DbType> [-db
    <DbName>] ]  | [-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 [-vxfs <MountPoint...>]  | [-rdb -dbtype <DbType> [-db
    <DbName>] ]  | [-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

Name	Description
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.

Name	Description
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

Name	Description
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	Description
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

Name	Description
-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.
-db	Specifies the name of the relational database. This option is not

Name	Description
	required for Oracle.
-dbtype	Specifies the relational database type.
-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.

Name	Description
-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.
-rdb	Freezes the log files and the specified database just before the activate is performed and then thaws them as soon as the activate completes.
-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

Name	Description
	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.
-vxfs	Lists one or more Veritas VxFS filesystem mount points. Freezes the filesystem(s) mounted on this host just before performing the activate, and thaws them as soon as the activate completes.

Parameters

Name	Description
CgName	The composite group name.
DbName	The relational database name.
DbType	The relational database type.Possible values are: ◆ Oracle ◆ SQLServer ◆ Sybase ◆ Informix ◆ IBMUDB ◆ Exchange ◆ Exchange2007 ◆ SharePoint
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

Name	Description
	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.
MountPoint	The file system mount point.
RdfGroupName	The logical name associated with the RDF (RA) group(s).
PdevName	The target or Symmetrix device physical (host) name.
PowerPathPdevName	A PowerPath device name (you can enter one or more physical device names).
ScriptFile	The full pathname of a script file to execute.
SymDevName	The target or Symmetrix device name.

Return Codes

Value	Code Symbol	Description
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.

Value	Code Symbol	Description
Return codes for symclone verify:		
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.

Syntax

```
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:

```
create dev count=<n>,
size = <n> [MB  |  GB  |  CYL],
emulation=<EmulationType>,
config=<DevConfig>
[, data_member_count=<n>]
[, remote_config=<DevConfig>,
  remote_data_member_count=<n>,
  ra_group=<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  |  n [ MB  |  GB  |  CYL]>]
[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]]...]
[,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>"]";
```

Disabling RDF/A on an RA group:

```
disable rdfa on ra_group=<n>,
delete_support_devices=[TRUE  |  FALSE];
```

Dissolving a metadevice:

```
dissolve meta dev <SymDevName>[:<SymDevName>]
[[,<SymDevName>[:<SymDevName>]]...];
```

Enabling RDF/A on an RA group:

```
enable rdfa on ra_group=<n>,
make_group_swappable=[TRUE  |  FALSE];
```

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 aliasfrom 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 geometry:

```
set dev <SymDevName>[:<SymDevName>]
geometry [= SYMM-6  |  = SYMM-7  |  = CLARIION]cyls = <n>;
set dev <SymDevName>[:<SymDevName>]
geometry = <NO GEOMETRY>;
```

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 an RA (RDF) group parameter:

```
set [ra  |  rdf] group <GroupNum>
[minimum_cycle_time = <CycleTime>]   |
[rdf_hw_compression = <ENABLE  |  DISABLE>]  |
[rdf_sw_compression = <ENABLE  |  DISABLE>]  |
[rdfa_devpace_autostart = <ENABLE>  |  <DISABLE>]  |
 [rdfa_dse_autostart = <ENABLE  |  DISABLE>]  |
 [rdfa_dse_pool = <PoolName>  |  <NO POOL>
emulation = [fba | ckd-3390 | ckd-3380 | as400] ]  |
[rdfa_dse_threshold = <% of system WP>]  |
[rdfa_transmit_idle = <ENABLE  |  DISABLE>]  |
 [rdfa_wpace_delay =  <delay in usecs>]  |
[rdfa_wpace_threshold = <min % of WP cache>]  |
 [rdfa_wpace_autostart = <ENABLE>  |  <DISABLE>]  |
[session_priority = <SessPriority>];
```

Setting a Symmetrix configuration metric:

```
set symmetrix<metric_name> = <metric_value>[,
<metric_name> = <metric_value>];
```

Swapping an RA group:

```
swap ra group <n>,refresh=<refresh_opt>,
start_copy=<YES  |  NO>;
```

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 |NONE>]
[, vp_compression = <ENABLER | DISABLE>];
```

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>;
```

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>;
```

Deactivating a DATADEV for use:

```
deactivate dev <SymDevName>:[<SymDevName>]
in pool<PoolName>,
type = <thin>;
```

Binding thin devices to a pool:

```
bind tdev <<SymDevName>[:<SymDevName>] |
in DG <DgName | in SG <SgName>
to pool<PoolName>,
<[preallocate size = <ALL | n [MB | GB | CYL]>]
[allocate type = persistent]>;
```

Unbinding thin devices to a pool:

```
unbind tdev <<SymDevName>[:<SymDevName>] |
in DG <DgName | in SG <SgName>
from pool<PoolName>;
```

Rebinding thin devices to a pool:

```
rebind tdev <<SymDevName>[:<SymDevName>] |
in DG <DgName | in SG <SgName>
to pool<PoolName>;
```

Starting allocation on thin devices:

```
start allocate on tdev <<SymDevName>[:<SymDevName>]  |
in DG <DgName>  |  in SG <SgName>>
start_cyl = <n>
<end_cyl = <n  |  last_cyl>  |
size = <mmm> MB | GB | CYL>,
[allocate_type = persistent];
```

Stopping allocation on thin devices:

```
stop allocate on tdev <<SymDevName>[:<SymDevName>]  |
in DG <DgName>  |  in SG <SgName>>;
```

Starting free on thin devices:

```
start free on tdev <<SymDevName>[:<SymDevName>]  |
in DG <DgName>  |  in SG <SgName>>
```

```
start_cyl = <n> <end_cyl = <n  |  last_cyl>  |
size = <n> MB  |  GB  |  CYL>;
```

Stopping free on thin devices:

```
stop free on tdev <<SymDevName>[:<SymDevName>]  |
in DG <DgName>  |  in SG <SgName>>;
```

Starting reclaim on thin devices:

```
start reclaim on tdev <<SymDevName>[:<SymDevName>]  |
in DG <DgName>  |  in SG <SgName>>
[allocate_type = persistent];
```

Stopping reclaim on thin devices:

```
stop reclaim on tdev <<SymDevName>[:<SymDevName>]  |
in DG <DgName>  |  in SG <SgName>>;
```

Starting a drain operation on a DATADEV:

```
start drain on dev <SymDevName>[:<SymDevName>]
in pool <PoolName> type = <thin>;
```

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:

```
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>];
```

Removing an external device from a disk group:

```
remove external_disk <wwn=<wwn>  |  spid=<SpindleID>>
[force_remove=<YES | NO>];
```

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

RDF configuring:

- Adding/removing RDF attributes
- Swapping RDF src/target attributes for an RA group
- Enabling/disabling RDF/A on an RA group
- Setting RA group attributes

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, worm, 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
- concurrent_rdf (Obsolete in Enginuity 5874+)
- dynamic_rdf (Obsolete in Enginuity 5874+)
- dynamic_concurrent_rdf (Obsolete in Enginuity 5874+)
- FBA_multi_access_cache (Obsolete in Enginuity 5874+)
- hot_swap_policy (Obsolete in Enginuity 5874+)
- max_hypers_per_disk (Obsolete in Enginuity 5874+)
- min_auto_meta_size
- pav_alias_limit
- pav_mode
- rdfa_cache_percent
- rdfa_host_throttle_time
- RAID_5_support (Obsolete in Enginuity 5772+)
- RAID_S_members (Obsolete in Enginuity 5772+)
- RAID_S_support (Obsolete in Enginuity 5771+)
- VCMDB_restricted_access (Obsolete in Enginuity 5771+)

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.

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

Name	Description
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

Name	Description
	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

Name	Description
-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

Name	Description
	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

Name	Description
	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

Name	Description
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 noexpiration. 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

Name	Description
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

Name	Description
	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 FBAemulation 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:

Name	Description

Device Type		Meta Size	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	5568
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_	71568*	8946	5x68
If SYMAPI_TRACK_SIZE_32K_COMPATIBLE is set to ENABLE in the options file:			
If SYMAPI_TRACK_SIZE_32K_COMPATIBLE is set to DISABLE in the options file (default value):			

Name	Description

Device Type		Meta Size	Minimum Enginuity
M4326_50			
AS/400_ M4327_50	143584*	8974	5x68
AS/400_ M2105_A05	71568*	8946	5x68
AS/400_ M2105_A85	71568*	8946	5x68
If SYMAPI_TRACK_SIZE_32K_COMPATIBLE is set to ENABLE in the options file:			
M4326_50			
AS/400_ M2107_A06	287152*	35894	5771
AS/400_ M2107_A07	574304*	35894	5771
AS/400_ M2107_A86	287152*	35894	5771
AS/400_ M2107_A87	574304*	35894	5771
AS/400_ M2107_A02	35720*	8930	5773
AS/400_ M2107_A04	143584*	35896	5773
AS/400_ M2107_A05	71568*	17892	5773
AS/400_ M2107_A82	35720*	8930	5773
AS/400_ M2107_A84	143584*	35896	5773
AS/400_ M2107_A85	71568*	17892	5773
If SYMAPI_TRACK_SIZE_32K_COMPATIBLE is set to DISABLE in the options file (default value):			

Name	Description
	<table><tr><th>Device Type</th><th></th><th>Meta Size</th><th>Minimum Enginuity</th></tr><tr><td colspan="4">If SYMAPI_TRACK_SIZE_32K_COMPATIBLE is set to ENABLE in the options file:</td></tr><tr><td colspan="4">If SYMAPI_TRACK_SIZE_32K_COMPATIBLE is set to DISABLE in the options file (default value):</td></tr><tr><td>AS/400_ M4328_50</td><td>143576*</td><td>17947</td><td>5771</td></tr><tr><td>AS/400_ M2107_A06</td><td>143576*</td><td>17947</td><td>5771</td></tr><tr><td>AS/400_ M2107_A07</td><td>287152*</td><td>17947</td><td>5771</td></tr><tr><td>AS/400_ M2107_A86</td><td>143576*</td><td>17947</td><td>5771</td></tr><tr><td>AS/400_ M2107_A87</td><td>287152*</td><td>17947</td><td>5771</td></tr><tr><td>AS/400_ M2107_A02</td><td>17860*</td><td>4465</td><td>5773</td></tr><tr><td>AS/400_ M2107_A04</td><td>71792*</td><td>17948</td><td>5773</td></tr><tr><td>AS/400_ M2107_A05</td><td>35784*</td><td>8946</td><td>5773</td></tr><tr><td>AS/400_ M2107_A82</td><td>17860*</td><td>4465</td><td>5773</td></tr><tr><td>AS/400_ M2107_A84</td><td>71792*</td><td>17948</td><td>5773</td></tr><tr><td>AS/400_ M2107_A85</td><td>35784*</td><td>8946</td><td>5773</td></tr></table> * 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).

Name	Description
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 adevice can be accessed. These include: ◆ RDB_Cksum ◆ Worm (can be enabled only) (Obsolete in Enginuity 5771+) ◆ 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

Name	Description
	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. This must be done using the swap ra group command. 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

Name	Description
	◆ 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.
Device Name	A user-specified device name of up to 64 characters in length 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

Name	Description
	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

Name	Description
	◆ 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

Name	Description
	(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 5x68 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] ◆ Unique_WWN+ [UWN]

Name	Description
	◆ 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 **For Enginuity levels 5x67 and earlier:** SCSI port flags: ◆ Tagged_Commands* [T] ◆ Linked_Commands* [L] ◆ Sync_Transfer* [Y] ◆ Wide_Transfer* [W] ◆ Negotiate_Reset [N] ◆ Soft_Reset [S] ◆ Environ_Set [E] ◆ Cyl_Count_In_Name* [P] ◆ PBAY_Monitor [Q] ◆ HP3000_Mode [B] (Return Busy on Abort) ◆ Command_Reordering [R] ◆ Common_Serial_Number [C] ◆ Set_Qerr [Z] ◆ Disable_Q_Reset_on_UA [D] ◆ Disable_Ultra* [U] ◆ Sunapee [A or SCL] ◆ Siemens [S] ◆ Disable_False_Disconnect*[DFD]

Name	Description
	◆ Disable_Mini_Q* [DMQ] ◆ Avoid_Force_Negotiate [AFN] ◆ Auto_Busy [AB] ◆ Sequent [SEQ] ◆ Avoid_Reset_Broadcast [ARB] ◆ Server_On_AS400 [A4S] ◆ SCSI_3 [SC3] ◆ Disable_Interleaved_Cmds Fibre port flags: ◆ Disk_Array [DAR or A] ◆ Volume_Set_Addressing [V] ◆ Hard_Addressing [H] ◆ Non_Participating [NP] ◆ Global_3rdParty_Logout [TP] ◆ Init_Point_to_Point [PP] ◆ Unique_WWN [UWN] ◆ Generic_VSA* [GVSA] ◆ VCM_State [VCM] ◆ Class_2_Service* ◆ OpenVMS [OVMS] * Not available for host-based configuration changes.
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

Name	Description
	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,

<table>
<tr><th>Name</th><th>Description</th></tr>
<tr><td></td><td>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.</td></tr>
<tr><td>member_size_equal</td><td>Indicates that the meta members created on an eDisk will have the same size. Available when adding an eDisk with encapsulation.</td></tr>
<tr><td>meta_option</td><td>The meta type configuration. Possible values are: CONCATENATED or STRIPED.</td></tr>
<tr><td>meta_stripe_size</td><td>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:
<table>
<tr><th>‹meta_stripe_size›</th><th>(=) Cylinders</th></tr>
<tr><td>1920</td><td>2</td></tr>
<tr><td>3840</td><td>4*</td></tr>
<tr><td>7680</td><td>8*</td></tr>
<tr><td>15360</td><td>16*</td></tr>
<tr><td>30720</td><td>32*</td></tr>
<tr><td>61440</td><td>64*</td></tr>
</table>
* Available with Enginuity 5x68 or earlier.</td></tr>
<tr><td>metric_name</td><td>The Symmetrix metric to be set. Possible values are:
<table>
<tr><th>Metric Name</th><th>Description</th></tr>
<tr><td>auto_meta</td><td>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</td></tr>
</table></td></tr>
</table>

Name	Description
	<table><tr><th>Metric Name</th><th>Description</th></tr><tr><td></td><td>meta devices.</td></tr><tr><td>auto_meta_config</td><td>Specifies the default meta config when auto meta feature is enabled. Possible values are CONCATENATED, STRIPED, or NONE.</td></tr><tr><td>auto_meta_member_size</td><td>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:<table><tr><th>Enginuity</th><th>32K_compatibility</th><th>Max Cylinders</th></tr><tr><td>5773</td><td>Disabled</td><td>65520</td></tr><tr><td>5773</td><td>Enabled</td><td>131040</td></tr><tr><td>5874+</td><td>Disabled</td><td>262668</td></tr><tr><td>5874+</td><td>Enabled</td><td>525336</td></tr></table></td></tr><tr><td>concurrent_rdf</td><td>Enables access to the concurrent RDF feature (multiple R2 devices for a single R1). Possible values are ENABLE or DISABLE.</td></tr><tr><td>dynamic_rdf</td><td>Enables the ability to create a pool of devices that are RDF capable (can be dynamically assigned as RDF1 or RDF2 devices). Possible values are ENABLE or DISABLE.</td></tr><tr><td>dynamic_concurrent_rdf</td><td>Enables access to the concurrent RDF feature (multiple R2 devices for a single R1), for dynamic RDF devices. Possible values are ENABLE or DISABLE.</td></tr><tr><td>fba_multi_access_cache</td><td>Specifies that read requests can share cache slots in some conditions. Possible values are ENABLE or DISABLE. (Obsolete in Enginuity 5874+)</td></tr><tr><td>hot_swap_policy</td><td>Indicates whether data from a failed disk should be relocated temporarily or permanently moved to a spare disk. Possible values are TEMPORARY or PERMANENT.</td></tr></table>

<table>
<tr><th>Name</th><th>Description</th></tr>
<tr><td></td><td>
<table>
<tr><th>Metric Name</th><th>Description</th></tr>
<tr><td>pav_alias_limit</td><td>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.</td></tr>
<tr><td>min_auto_meta_size</td><td>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):
<table>
<tr><th>Enginuity</th><th>32K_compatibility</th><th>Max/Default cyl</th></tr>
<tr><td>5773</td><td>Disabled</td><td>65521</td></tr>
<tr><td>5773</td><td>Enabled</td><td>131042</td></tr>
<tr><td>5874+</td><td>Disabled</td><td>262669</td></tr>
<tr><td>5874+</td><td>Enabled</td><td>525338</td></tr>
</table></td></tr>
<tr><td>max_hypers_per_disk</td><td>Specifies the maximum number of hypers that can be created on a physical disk. This value can only be increased. Legal values vary with the Enginuity level in use.</td></tr>
</table>
</td></tr>
</table>

Name	Description
	<table><tr><th>Metric Name</th><th>Description</th></tr><tr><td>PAV_mode</td><td>Enables the use of PAV (Parallel Access Volumes). Possible values are:<table><tr><th>PAV_mode</th><th>Description</th></tr><tr><td>NONE</td><td>No PAV volumes can be configured in the Symmetrix array. (Not available for customer use.)</td></tr><tr><td>STANDARD</td><td>Standard PAV volumes with static aliasing can be configured.</td></tr><tr><td>DYNAMIC_STANDARD</td><td>Standard PAV volumes with dynamic aliasing can be configured.</td></tr><tr><td>SIEMENS</td><td>Standard PAV volumes with static aliasing modified for Fujitsu Siemens hosts. (Not available for customer use.)</td></tr><tr><td>DYNAMIC_SIEMENS</td><td>Standard PAV volumes with dynamic aliasing modified for Fujitsu Siemens hosts. (Not available for customer use.)</td></tr></table></td></tr><tr><td>rdfa_cache_percent</td><td>The percentage of write pending cache that can be used by RDF/A. Possible values are from 0 to 100 percent.</td></tr><tr><td>rdfa_host_throttle_time</td><td>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.</td></tr><tr><td>RAID_5_support</td><td>Enables the ability to create RAID-5 devices in the Symmetrix array. Possible values are ENABLE or DISABLE. (Obsolete in Enginuity 5772+)</td></tr></table>

Name	Description
	<table><tr><th>Metric Name</th><th>Description</th></tr><tr><td>RAID_S_ members</td><td>If RAID_S_support is enabled, allows the user to specify whether a RAID_S device set should include either 3 members plus a parity drive, or 7 members plus a parity drive. Legal values are 3 and 7. This also controls the RAID-5 member count. (Obsolete in Enginuity 5772+)</td></tr><tr><td>RAID_S_ support</td><td>Enables the ability to create RAID-S devices in the Symmetrix array. Possible values are ENABLE or DISABLE. Not available for Enginuity 5771 or higher.</td></tr><tr><td>VCMDB_ restricted_ access</td><td>When enabled, restricts access to the VCM database to those hosts indicated by the user. Possible values are ENABLE or DISABLE. Not available for Enginuity 5771 or higher.</td></tr></table>
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.
mvs_ssid	See remote_mvs_ssid below.
NewPoolName	The new pool name. See PoolName.
pav alias	See alias.

Name	Description
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_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

Name	Description
	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

Name	Description
	SSID mapped and some unmapped.
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.)
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).
spid	Indicates the specific spindle ID of the target eDisk.
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

Value	Code Symbol	Description
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.

Value	Code Symbol	Description
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 swap ra_group 1 on Symmetrix array 12345 from an R1 (source) to an R2 (target) group, enter:

```
symconfigure commit -sid 12345 -file swap_ra_group.cmd
```

Where swap_ra_group.cmd contains:

```
swap ra group 1, refresh=r2, start_copy=no;
```

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 set spoofed geometry on device 01A, enter:

```
set dev 01A geometry = Symm-6 cyls = 200;
```

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 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.

Syntax

```
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

Name	Description
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

Name	Description
chap	Specifies the iSCSI CHAP credential.
radius	Specifies the iSCSI Radius server.

Options

Name	Description
-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

Name	Description
#	A specific director or port number.
All	All directors or ports.
Backup1	The first backup for the Radius server.

Name	Description
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.

Syntax

```
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]
        [-ficon] [-escon][-dldev]
        [-noport | -firstport | -multiport] [-bcv | -nobcv | -drv]
        [-meta] [-nomember]
        [-spare] [-dynamic] [-worm] [-vdev]
        [-savedev [-nonpooled]] [-raids]
        [-disk_group <DskGrpNum>  |  name:<DskGrpName>]
        [-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]
        [-reserved  |  -noreserved] [-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 Off]
        [-technology <EFD  |  FC  |  SATA>]
        [-internal  |  -external  |  -encapsulated [-limited]]
        [-R1] [-R2] [-R21] [-notrdf] [-rdfg <RdfGrpNum>]
        [-rdfa]] [-half_pair] [-dup_pair]
    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]
        [-ficon] [-escon]
        [-noport | -firstport | -multiport] [-bcv | -nobcv | -drv]
        [-meta] [-nomember]
        [-spare] [-dynamic] [-worm] [-vdev]
        [-savedev [-nonpooled]][-raids]
        [-disk_group <DskGrpNum>  |  name:<DskGrpName>]
        [-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]
        [-reserved  |  -noreserved] [-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 off]
        [-internal  |  -external  |  -encapsulated [-limited]]
        [-R1] [-R2] [-R21] [-notrdf] [-rdfg <RdfGrpNum>]
        [-rdfa] [-half_pair] [-dup_pair]
symdev [-sid <SymmID>] [-offline]
    list -space <-DA <# | ALL>  |  -DX <# | ALL>> [-cyl] [-spindle]
    list -inventory
symdev [-sid <SymmID>] [-hyper <# | ALL>] [-spindle]
       [-firstport] [-host_cache]
       [-orm 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 [-cid <ClarID>] [-offline]
    list -clariion [-cap <#>] [-N <#>]
       [-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  |
        -clariion  | -vnx |  -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> [-symforce]
    set -persistent   <SymDevName>
    unset -persistent <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  |  -clariion  |
       -vnx |  -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   [-symforce]
    compress [-stop]
    uncompress [-stop]
    bind -pool <PoolName>
    unbind
    rebind -pool <PoolName>
    allocate [-persistent]
    allocate -stop
    free
    free -stop
    reclaim [-persistent]
    reclaim [-stop]
    set -persistent
    unset -persistent
    set -orm <off | system>
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  |  -clariion  |
    -vnx | -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   [-symforce]
    compress [-stop]
    uncompress [-stop]
    bind -pool <PoolName>
    unbind
    rebind -pool <PoolName>
    allocate [-persistent]
    allocate -stop
    free
    free -stop
    reclaim [-persistent]
```

```
    reclaim [-stop]
    set -persistent
    unset -persistent
    set -orm <off | system>
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, rebind, allocate, free, and reclaim.

Arguments

Name	Description
allocate	Allocates storage in the thin pool.
bind	Binds the thin devices to the pool.
compress	Starts data compression on thin devices. 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.

Name	Description
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 devices 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.
show	Shows detailed information about a specific Symmetrix device, such as 000C.
unbind	Unbinds devices from the thin pool.
uncompress	Starts data decompression on thin devices. 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

Name	Description
	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.
write_disable	Sets the device(s) to be Write Disabled to the local hosts on the specified front-end director port(s).

Options

Name	Description
-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.
-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.
-cid	Specifies a unique CLARiiON ID.
-clariion	Lists CLARiiON devices, or specifies the ClARiiON device geometry when setting the device geometry. It indicates 10 sectors per track and 16 tracks per cylinder.
-cyl	Lists the device capacity in cylinders, or specifies the device capacity when setting the device geometry. The default is megabytes (MB).
-DA	Lists the Symmetrix devices that are mapped to a certain DA director number. The interface, disk, and hyper IDs can also be used to limit the list further, but the default is ALL

Name	Description
	unless otherwise specified.
-datadev	Lists the data device(s).
-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 SCSI 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_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 defaults 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.
-FA	Lists devices mapped to a specific fibre front-end director number.

Name	Description
-fast	Lists the Symmetrix devices that are FAST controlled.
-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.
-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.
-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.

Name	Description
-identity_set	Lists devices whose external identity has been changed as part of a federated live migration operation.
-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.
-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.
-offline	Sets the Optimized Read Miss mode to off or system managed for the specified devices. When used with the list

Name	Description
	action, lists devices with Optimized Read Miss mode set to off.
-orm	Sets the device(s) to be Ready. The device must be in a User Not Ready state for this operation to succeed.
-persistent	Specifies that the set or unset will operate on the persistent indicator. When 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 RDF group.
-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

Name	Description
	RecoverPoint use. Lists the Symmetrix devices that have been tagged for RecoverPoint use.
-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.

Name	Description
-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.
-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.
-worm	Lists all WORM-enabled devices.
-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

Name	Description
ClarID	The ID of the CLARiiON array.
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

Value	Code Symbol	Description
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.

Syntax

```
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>]]
    exportall [-delete] [-file <FileName>][[-rdf [-rdfg <GrpNum>]]
    | [-sid <SymmID>]]
    import <DgName> [-file <FileName>]
    importall [-file <FileName>]
    list [-sid <SymmID>] [-offline] [-v]
    list [-inactive]
    show <DgName> [-inactive] [-offline | -lock ]
    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...]] [-symforce]
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>  [LdevName [LdevName...]]
```

```
    allocate  [LdevName [LdevName...]][-persistent]
    allocate  [LdevName [LdevName...]] -stop
    free [LdevName [LdevName...]]
    free  [LdevName [LdevName...]]-stop
    reclaim  [LdevName [LdevName...]][-persistent]
    reclaim  [LdevName [LdevName...]][-stop]
    set -persistent [LdevName [LdevName...]]
    unset -persistent [LdevName [LdevName...]]
    set -orm <off | system>  [LdevName [LdevName...]]
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, rebind, allocate, free, and reclaim. By default the actions will only be applied to the standard devices in the group. The -bcv and -tgt options must be specified to operate on those types of devices.

Arguments

Name	Description
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

Name	Description
	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	Bind the thin devices 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 stops.
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.

Name	Description
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 a 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.

Name	Description
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 devices 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.
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.
uncompress	Starts data decompression on thin device(s). When combined with the -stop option, data decompression stops.

Name	Description
Unbind	Unbinds devices from the thin pool.
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.
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

Name	Description
-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

Name	Description
	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.
-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).

Name	Description
	<table><tr><th>-ftype</th><th>Description</th></tr><tr><td>STD_ R1BCV</td><td>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.</td></tr><tr><td>STD_ VDEV</td><td>Creates a file containing a list of all of the standard/virtual device pairs that are in the group.</td></tr><tr><td>BCV_ VDEV</td><td>Creates a file containing a list of all of the BCV/virtual device pairs that are in the group.</td></tr></table>
-g	Specifies a device group name.
-geometry	Shows device geometry.
-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

Name	Description
	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	The data is obtained strictly from the configuration database on the host. For the list and show operations, no connections are made to any Symmetrix arrays.
-orm	Sets the Optimized Read Miss mode to off or system managed for the specified devices.
-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	Specifies that the set or unset will operate 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.

Name	Description
-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

Name	Description
	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 stop.
-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

Name	Description
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.
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:

<table>
<tr><th>Parameter</th><th>Description</th></tr>
<tr><td></td><td>
<table>
<tr><th>Symbolic Name</th><th>Value</th></tr>
<tr><td>SYMAPI_C_DGTYPE_REGULAR</td><td>0</td></tr>
<tr><td>SYMAPI_C_DGTYPE_RDF1</td><td>1</td></tr>
<tr><td>SYMAPI_C_DGTYPE_RDF2</td><td>2</td></tr>
<tr><td>SYMAPI_C_DGTYPE_RDF21</td><td>3</td></tr>
<tr><td>SYMAPI_C_DGTYPE_ANY</td><td>4</td></tr>
</table>
</td></tr>
<tr><td>‹SymmID›</td><td>Specifies the 12-digit ID of the Symmetrix array associated with the group.</td></tr>
<tr><td>‹DeviceType›</td><td>Defines the device type for the group member being exported or imported:
<table>
<tr><th>Type</th><th>Meaning</th></tr>
<tr><td>S</td><td>Standard Device (STD)</td></tr>
<tr><td>B</td><td>Local BCV Device (BCV)</td></tr>
<tr><td>R</td><td>Remote BCV Device (RBCV)</td></tr>
<tr><td>Z</td><td>BCV Remote BCV Device (BRBCV)</td></tr>
<tr><td>Y</td><td>Remote Remote BCV Device (RRBCV)</td></tr>
<tr><td>D</td><td>Hop 2 BCV Device (2BCV)</td></tr>
<tr><td>G</td><td>Gatekeeper Device</td></tr>
<tr><td>V</td><td>VDEV Device</td></tr>
<tr><td>W</td><td>Remote VDEV Device (RVDEV)</td></tr>
<tr><td>E</td><td>Hop 2 VDEV Device (2VDEV)</td></tr>
<tr><td>T</td><td>Target Device</td></tr>
<tr><td>X</td><td>Remote Target Device (RTGT)</td></tr>
<tr><td>F</td><td>Hop 2 Target Device (2TGT)</td></tr>
</table>
</td></tr>
<tr><td>‹DeviceParameters›</td><td>Defines the device parameters:
<table>
<tr><th>Type</th><th>Parameters</th></tr>
<tr><td>S</td><td>‹SymmID› ‹LdevName›</td></tr>
<tr><td>B</td><td>‹SymmID› ‹LdevName›</td></tr>
</table>
</td></tr>
</table>

Parameter	Description

Type	Parameters
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

Value	Code Symbol	Description
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 and their hypers within Symmetrix arrays.

Syntax

```
symdisk [-h]
symdisk [-sid <SymmID>] [-offline] [-cyl][-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 -paths [-spid <SpindleID>
 | -DX <#  |  ALL> [-port <#  |  ALL>]]
    list -detail
    list [-offline]
symdisk [-sid <SymmID>] [-offline] [-cyl]
    list -dskgrp_summary [-v][[-disk_group <DskGrpNum  |
    name:<DskGrpName>  |  ALL>] |  -internal  |  -external]
    show <DiskAddress> [-gaps_only]
symdisk -sid <SymmID> [-offline] [-cyl]
    show -spid <SpindleID> [-gaps_only]
    show -wwn <ExternalWWN> [-gaps_only]
```

Description

The symdisk command allows access to the configuration information of the physical disks (spindles) that make up a Symmetrix array. It can be used to list all of the disks in a Symmetrix array or only those that match certain criteria.

The selection criteria allows the user to return only data about the disks on a certain disk director (DA), disk interface (INT), or disk SCSI target ID (TID). 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

Name	Description
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.

Options

Name	Description
-all	Includes spare disks in the -disk_group disk listing. This option is specific to -disk_group and is not compatible with -dskgrp_summary.
-cyl	Displays the disk capacities in terms of cylinders instead of 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.
-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.
-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.
-h	Provides brief, online help information.
-hypers	Shows hyper information when used with -v.
-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.

Name	Description
-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.
-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.
-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

Name	Description
#	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

Value	Code Symbol	Description
0	**CLI_C_SUCCESS**	
1	**CLI_C_FAIL**	

Examples

To list all of the disks in 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 in 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.

Syntax

```
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

Name	Description
list	Lists all the DRV devices (SymDevNames) that are configured on Symmetrix arrays attached to this host.

Options

Name	Description
-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

Name	Description
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

Value	Code Symbol	Description
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.

Syntax

```
symevent -h
symevent [-sid <SymmID>] [-v] [-warn  |  -error  |  -fatal]
    monitor [-i <Interval>] [-c <Count>]
    list [-start <Date:Time>] [-end <Date:Time>] [-dir]
```

Description

The symevent command allows an administrator to monitor events within a Symmetrix array that may affect its operation. In most cases, a reported event represents a condition that has already been repaired. This tool allows an administrator to track those events 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

Name	Description
list	Lists events which have occurred over time on the Symmetrix array.
monitor	Monitors the Symmetrix array in real time for new events.

Options

Name	Description
-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

Name	Description
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

Value	Code Symbol	Description
0	**CLI_C_SUCCESS**	
1	**CLI_C_FAIL**	

Reported Events

Event Code Symbol	Severity	Description
DIAG_TRACE_TRIG	Informational	A Symmetrix diagnostic event-trace was triggered
DIAG_TRACE_TRIG_REMOTE	Informational	A diagnostic event-trace was triggered for a Symmetrix remotely attached via RDF links
TOO_MANY_SUSPHALT_CHAINS	Informational	Too many suspend/halt chains switching to Adaptive Copy Write Pending Mode
MEM_DISABLE_INVOKED	Informational	One or more memory banks were disabled due to cache errors
SPARE_INVOKED	Informational	A Spare Disk was invoked against a Symmetrix Disk
M2_RESYNC_WITH_M1	Informational	An M2 mirror of a Symmetrix Device is resynchronizing with the M1 mirror
M1_RESYNC_WITH_M2	Informational	An M1 mirror of a Symmetrix Device is resynchronizing with the M2 mirror
DISK_ADAPTER_DEAD	Fatal	A Symmetrix Disk Director is

Event Code Symbol	Severity	Description
		not responding
ALL_DEVICES_MIGRATED	Infor-mational	All Symmetrix migration devices have completed the data migration
DEVICE_RESYNC_STARTED	Infor-mational	A Symmetrix device resyn-chronization process has started
SPARE_INVOKED_REMOTE	Infor-mational	A Spare Disk was invoked against the Disk of the R2 mirror in Symmetrix remotely attached via RDF links
RDF_SIM_MESSAGE	Infor-mational	The RDF subsystem initiated a SIM message to a Symmetrix remotely attached via RDF links
RDF_ERROR	Error	The RDF subsystem has experienced an error
FC_OPTICAL_MOD_ERROR	Warning	A Fibre Channel optical module has experienced a problem
ALL_RDF_LINKS_DOWN	Warning	No RDF links in an RDF group are operational
ALL_RDF_LINKS_NOW_UP	Infor-mational	All RDF links in an RDF group are now operational

Event Code Symbol	Severity	Description
BUS_PROBLEM	Infor-mational	Bus Arbiter problem: primary arbiter has experienced a problem
TEMPERATURE_PROBLEMS	Warning	The Symmetrix is experiencing temperature problems
ALARM_SIGNAL	Warning	An alarm signal was set but no alarm was found
ALARM_SIGNAL_POWER	Warning	An alarm signal was set indicating a power subsystem error
MIRROR_NR	Warning	A device has a mirror that is Not Ready
MIRROR_WD	Warning	A Symmetrix device has a member or a mirror that is Write Disabled
RDF2_DEVICE_NR	Infor-mational	One of the RDF2 devices was found to be Not Ready
SP_NOT_RESPONDING	Warning	The Symmetrix Service Processor is not communicating with the Symmetrix
SP_PHONEHOME_FAIL	Warning	The Symmetrix Service Processor could not complete a Call Home for service

Event Code Symbol	Severity	Description
12_VOLTS_ON	Warning	One of the Symmetrix subsystems is running in the abnormal 12-Volts mode
SENSE_CABLE_MISSING	Warning	A Symmetrix power subsystem Environment sense cable is missing
AC_LINE_INTERRUPTED	Warning	A Symmetrix power subsystem AC line interruption was detected
HIGH_CHARGE_MISSING	Warning	The Symmetrix battery system is not fully charged
LATCHED_ALARMS	Warning	A Symmetrix power subsystem discovered latched alarms
ONE_RDF_LINK_DOWN	Warning	A single RDF link in an RDF group is not operational
ONE_RDF_LINK_NOW_UP	Warning	A single RDF link in an RDF group is now operational after a 'Single Link Down' event
SP_PHONEHOME_SUCCESS	Infor-mational	The Symmetrix Service Processor completed a Call Home for service
UNABLE_TO_SET_REGISTER	Warning	A Symmetrix communication

Event Code Symbol	Severity	Description
		subsystem was unable to set a shared register
DISABLED_MEMORY_BANK	Warning	A Symmetrix Director reported Disabled Memory Bank to a host
INVALID_ENVIR_BITS	Warning	A validity problem was detected during an environmental test
ENABLED_ENVIR_TESTING	Infor-mational	An event was detected to enable environmental testing in diagnosis mode
COMM_BOARD_MISMATCH	Error	The Symmetrix communication board software data has a mismatch
OLD_BOARD_MISMATCH	Error	The Symmetrix communication board old information does not match current information
THERMAL_DET_FAILED_TEST	Error	The Symmetrix thermal tests detected a failure
THERMAL_EVENT	Error	A thermal event was detected in the Symmetrix
POWER_ON_TIME_FAILED_TEST	Error	The Symmetrix environment tests found

Event Code Symbol	Severity	Description
		inconsistencies in Power-on-Time
SP_CONNECT_TIME_NOT_FOUND	Error	The Symmetrix has no records of the last Service Processor connection time
SP_CONNECT_VIA_SERIAL_LINE	Infor-mational	The Service Processor is currently communicating via a serial line
SYMREMOTE_CONNECTED	Infor-mational	A SymmRemote session is currently connected to the Service Processor
SYMREMOTE_REJECTED	Infor-mational	A SymmRemote session to the Service Processor was denied access
SYMREMOTE_DISCONNECTED	Infor-mational	A SymmRemote session to the Service Processor was disconnected
SP_EXCESS_MEMORY_USAGE	Warning	The Service Processor software detected excessive memory usage
BATTERY_FAILED_TEST	Warning	Automatic battery tests detected failures
NO_COMM_TO_MII_DIR	Warning	The Service Processor could not communicate to

Event Code Symbol	Severity	Description
		a director
CANT_QUERY_MII_DIR	Warning	The Service Processor could not query a director
SP_COMM_TO_MII_DIR	Infor-mational	The Service Processor is communicating via a local director
CANT_READ_ENVIR_SENSOR	Warning	The Service Processor failed to read an environmental sensor
UNRECOGNIZED_EPO_CARD	Warning	The Service Processor has detected a failed or unrecognized communication card
ENVIR_READING_OUT_OF_LIMIT	Warning	The Service Processor found environmental readings to be out of limits
HIGH_TEMP_DETECTED	Warning	The Service Processor detected high temperature
EXCESS_TEMP_DETECTED	Warning	The Service Processor detected excessive temperature
SP_DISK_FULL	Warning	The Service Processor disk is full
SMOKE_DETECT_MALFUNCTION	Warning	The Service Processor detected a

Event Code Symbol	Severity	Description
		malfunction in the smoke detector
SMOKE_DETECT_ALERT	Warning	The Service Processor detected a smoke detector alert
PHONEHOME_TRIGGER	Infor-mational	A certain event triggered a Call Home for service
DB_CHECKSUM_TRIGGER	Infor-mational	A Database Double Checksum detection event was triggered
RDF_CG_TRIGGER	Infor-mational	An RDF CG trip event was triggered
SP_REBOOT_SUCCESS	Infor-mational	The Service Processor has successfully rebooted
SAVEDEVS_FULL	Error	The save or data device pool is full
SRDFA_INACTIVE	Warning	SRDF/A is now inactive
SRDFA_ACTIVE	Infor-mational	SRDF/A is now active
ACCESS_TO_NR_DEVICE	Warning	Access was attempted to a Not Ready device
SAVEDEVS_NEAR_FULL	Warning	The save or data device pool is almost full
SAVEDEV_NOT_RDY	Error	An active device in the Timefinder/Snap save device pool has gone Not

Event Code Symbol	Severity	Description
		Ready
DIRECTOR_DEAD	Fatal	A Symmetrix Director is not responding
TIMEOUT_R2_WP_LIMIT	Error	Timeout writing to an R2 device. Maximum writes pending is reached
RDFA_SESS_DROP_WPL_DSBL	Error	SRDF/A Session dropped, write pending limit reached. Host throttling disabled
RDFA_SESS_DROP_WPL_ENBL	Error	SRDF/A Session dropped, write pending limit reached. Host throttling enabled
RDFA_SESS_DROP_DEV_NR_OFF	Error	SRDF/A Session dropped, device not ready. Tolerance mode is off
RDFA_SESS_DROP_DEV_NR_CG	Error	SRDF/A Session dropped, device not ready through consistency group
RDFA_SESS_DROP_NO_RDF_LNK	Error	SRDF/A Session dropped, no RDF links operational
RDFA_SESS_DROP_TIMEOUT_MSC	Error	SRDF/A Session dropped, time out in MSC mode
RDFA_SESS_DROP_TIMEOUT_HA	Error	SRDF/A Session dropped, time

Event Code Symbol	Severity	Description
		out on an HA
RDFA_SESS_DROP_TIMEOUT_RA	Error	SRDF/A Session dropped, time out on an RA
GEN_CHECKSUM_TRIGGER	Infor-mational	A Generic Double Checksum detection event was triggered
POWER_ZONE_COUNTDOWN_STARTED	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	Error	Power zone 5 hours before shutdown, one of the power zones is down. 5 hours before Vault shutdown
POWER_ZONE_ILLEGAL_STATUS	Error	Power zone down, illegal status, found file with old information
POWER_ZONE_DOWN_FAILED	Error	Power zone down failed
POWER_ZONE_WAIT_TIME_CHANGED_ON_GUI	Error	Power zone down - wait time changed on the GUI
RDFA_DROP_ISSUED_FROM_HOST	Warning	SRDF/A session drop requested [host software initiated]
RDFA_DEACTIVATE_ISSUED_FROM_HOST	Warning	SRDF/A session transition out of

Event Code Symbol	Severity	Description
		Asynchronous mode requested [host software initiated]
RDFA_PENDING_DROP_ISSUED_FROM_HOST	Warning	SRDF/A session drop at cycle boundary requested [host software initiated]
RDFA_CONSISTENT_DEACTIVATE_ISSUED_FROM_HOST	Warning	SRDF/A session transition from Asynchronous to Synchronous mode requested [host software initiated]
RDFA_DROP_ISSUED	Warning	SRDF/A session drop requested
RDFA_DEACTIVATE_ISSUED	Warning	SRDF/A session transition out of Asynchronous mode requested
RDFA_PENDING_DROP_ISSUED	Warning	SRDF/A session drop at cycle boundary requested
RDFA_CONSISTENT_DEACTIVATE_ISSUED	Warning	SRDF/A session transition from Asynchronous to Synchronous mode requested
DAE_PSA_M_FAN_FAULT	Error	Environmental Error: Power Supply A multiple Fan fault
DAE_PSA_S_FAN_FAULT	Error	Environmental Error: Power Supply A single Fan fault

Event Code Symbol	Severity	Description
DAE_PSA_FAULTED	Error	Environmental Error: Power Supply A faulted
DAE_PSA_SHUTDOWN	Error	Environmental Error: Power Supply A shutdown
DAE_PSB_M_FAN_FAULT	Error	Environmental Error: Power Supply B multiple fan fault
DAE_PSB_S_FAN_FAULT	Error	Environmental Error: Power Supply B single fan fault
DAE_PSB_FAULTED	Error	Environmental Error: Power Supply B faulted
DAE_PSB_SHUTDOWN	Error	Environmental Error: Power Supply B shutdown
DAE_LCC_A_TEMP_HIGH	Error	Environmental Error: Link Card Controller A temperature high
DAE_LCC_B_TEMP_HIGH	Error	Environmental Error: Link Card Controller B temperature high
DAE_SPS_INTRN_FAULT	Error	Environmental Error: Supplemental Power Supply internal fault
DAE_SPS_BAT_ENDLINE	Error	Environmental Error: Supplemental Power Supply

Event Code Symbol	Severity	Description
		battery end of line
DAE_SPS_LOW_VOLTAGE	Error	Environmental Error: Supplemental Power Supply low input AC Voltage
RDFA_SE_TRANS_IDLE	Error	SRDF/A Session entering transmit idle state
RDFA_SR_TRANS_IDLE	Warning	SRDF/A Session recovered from a transmit idle state
RDFA_TO_TRANS_IDLE	Error	SRDF/A Session dropped, transmit idle state timeout
RDFA_SD_NO_ONL_RA	Error	SRDF/A Session dropped, no online RAs
AUDIT_HIGH_ACTIVITY:	Warning	Entries are being written to the audit log at an unusually high rate
AUDIT_SFS_MIRR_OFF:	Error	Audit log has lost its redundancy due to an SFS mirror being offline
AUDIT_LOG_WRAPPED:	Warning	Audit log entries have been overwritten in an unusually short time period
RDFA_SE_DROP_WPL_CP:	Error	SRDF/A Session dropped, write pending limit reached on a

Event Code Symbol	Severity	Description
		cache partition
RDFA_NO_CYCLE_SWITCH:	Warning	There has been no SRDF/A cycle switching within the past hour.

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

Syntax

```
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

Name	Description
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

Name	Description
-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

Name	Description
	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 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 are provisioned on internal disk

Name	Description
	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.

Name	Description
-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 it starts 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

Name	Description
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.

Name	Description
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

Value	Code Symbol	Description
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 -technology ALL -demand -vp
```

symgate

Performs operations on a gatekeeper device.

Syntax

```
symgate [-h]
symgate [-offline]
    associate pd <PdevName> -g <DgName>
    disassociate pd <PdevName> -g <DgName>
    define pd <PdevName>
    undefine pd <PdevName>
symgate [-offline] [-sid <SymmID>]
    associate dev <SymDevName> -g <DgName>
    disassociate dev <SymDevName> -g <DgName>
    define dev <SymDevName>
    undefine dev <SymDevName>
symgate
    list [-offline] [-sid <SymmID>] [-v]
```

Description

The symgate command performs operations on a gatekeeper device, including: associating a gatekeeper with a device group, defining a host device as a gatekeeper device (adding it to the gatekeeper device list), listing the gatekeeper devices, disassociating a gatekeeper device from a device group, and removing a host device from the gatekeeper device list.

Note: The device MUST be visible to the local host.

Arguments

Name	Description
associate	Associates a Symmetrix host device with an existing device group. **Note:** You can substitute the argument add for associate.
define	Defines a host device, by either physical device name (pd) or Symmetrix device name (dev) as a gatekeeper device.
disassociate	Disassociates a gatekeeper device from a device group. The group must exist, and the gatekeeper device must have been previously associated with the group. **Note:** You can substitute the argument remove for disassociate.
list	Lists the host physical device names that are currently in the gatekeeper device list.
undefine	Removes a host device from the gatekeeper device list.

Options

Name	Description
-g	Applies the command to device group name.
-h	Provides brief, online help information.
-offline	Makes the Symmetrix data connection offline from the host in-memory database for this action.
-sid	Specifies a unique Symmetrix ID.
-v	Provides a more detailed, verbose listing.

Parameters

Name	Description
DgName	Name of the device group.
PdevName	Physical device (host) name for the device, such as /dev/rdsk/c2t0d2s2.
SymDevName	Device Symmetrix (numbered) name such as 000C.
SymmID	12-character ID that specifies the Symmetrix array

Return Codes

Value	Code Symbol	Description
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 Symmetrix host device to be a gatekeeper device, enter:

```
symgate define pd /dev/rdsk/c2t0d2s2
```

To associate a gatekeeper device with Symmetrix array 56, in device group prod, enter:

```
symgate -g prod associate dev 000C -sid 56
```

To list all defined gatekeeper devices, enter:

```
symgate list
```

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

```
symgate -g ProdDB disassociate pd /dev/rdsk/c2t0d2s2
```

To undefine a gatekeeper device, enter:

```
symgate undefine dev 000C
```

symhost

Displays host configuration information and performance statistics.

Syntax

```
symhost show -config [-h]
symhost stats [-h] [-i <Interval>] [-c <Count>][-type CPU | MEMORY
 | DISK | ALL]
```

Description

The symhost command displays host configuration information and performance statistics. The performance statistics are displayed for CPU, memory, and host devices. Note that not all statistics are available for all hosts.

Arguments

Name	Description
show	Shows detailed configuration information.
stats	Shows performance statistics.

Options

Name	Description
-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.

Name	Description
-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

Value	Code Symbol	Description
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)
```

symhostfs

Displays information about file systems, directories, and regular files that are defined on the host system.

Syntax

```
symhostfs [-h] [-meta | -data] [-kb | -blocks | -mb]
    list [ObjName] [-v] [-R]
    list [-file <ObjName> | -dir <ObjName> | -nfs] [-v] [-R]
    show <ObjName>[-no_extents | -expand | -collapse | -phys_
    collapse]
```

Description

The symhostfs command displays mapping information specific to the file systems that are defined on the host system.

A list of file systems, files, or directories can be obtained with symhostfs. The default is to list the mounted local file systems. The list of files or subdirectories of a given parent directory can be obtained by specifying the -dir or -file option.

Detailed information can be retrieved for file systems, files, or directories. The attributes will be shown for each object type. For file systems that are mounted on Symmetrix devices, you can obtain logical to physical information of where the file extents are mapped on these Symmetrix devices.

Note that with network based file systems, the file system device is represented with the remote host and remote path. For Unix and Linux, the format is "remote host name (or IP address) : directory exported from the remote host". For Windows, it is represented as a UNC path. The remote host field is either host name or IP address depending upon what is used while mounting NFS. Network based file systems are represented as NFS independent of the protocol (NFS or CIFS) the file system is based on. NFS based on NFS protocol is supported on Linux, Solaris, HP_UX and AIX. NFS based on CIFS protocol is supported on Linux and Windows.

Arguments

Name	Description
list	Lists file systems, files or directories on the current host system. Note that the default is to show only local file systems. Network based file systems are not shown by default.
show	Shows detailed mapping information about a file system, file or directory on the current host system.

Options

Name	Description
-blocks	Displays size information in 512-byte blocks.
-collapse	Collapses the extents of a file or file system, if possible. This is the default.
-data	Displays a file's data extents only.
-dir	Displays directory information.
-expand	Expands the extents of a file or file system, if possible.
-file	Displays regular file information. This is the default for list when an object name is specified.
-h	Provides brief, online help information.
-kb	Displays size information in Kilobytes.
-mb	Displays size information in Megabytes. This is the default.
-meta	Displays a file's meta data extents only. Default is to show both meta data and data extents.
-nfs	Displays information on mounted network based file systems.
-no_extents	Excludes extent information from the display.
-phys_collapse	Physical collapse of the extents of a file or file system.
-R	Displays directory or file information recursively.
-v	Provides a more detailed, verbose listing.

Parameters

Name	Description
ObjName	A directory or file name.

Return Codes

Value	Code Symbol	Description
0	**CLI_C_SUCCESS**	
1	**CLI_C_FAIL**	

Examples

To list all the mounted file systems, enter:

```
symhostfs list
```

To recursively list all the subdirectories of directory "/usr", enter:

```
symhostfs list "/usr" -dir -R
```

To display detailed information about directory /usr/guest, enter:

```
symhostfs show "/usr/guest"
```

To display detailed information about the file system /mountp1, with the extent information collapsed, and all sizes reported in megabytes, enter:

```
symhostfs -collapse -mb show "/mountp1"
```

syminq

Issues a SCSI INQUIRY command, and optionally a SCSI READ CAPACITY, on one or all devices. In addition, it can be used to obtain a list of the local host's HBAs.

Syntax

```
syminq [-h]
syminq [-sym] [-bcv] [-powerpath] [PdevName][-symmids] [-la  |
-nocapacity][-pdevfile] [-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

Name	Description
-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.

Name	Description
-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.

Name	Description
-winvol	Displays Windows volumes only.
-wwn	Displays the device WWN.

Parameters

Name	Description
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.

Syntax

```
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 Variable	Can be Used Instead of	To Specify
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

Name	Description
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

Name	Description
-checkpoint	Requests a checkpoint prior to the specified action.
-h	Provides brief, online help information.

Name	Description
-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

Name	Description
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

Value	Code Symbol	Description
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.

Syntax

```
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

Name	Description
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

Name	Description
-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

Name	Description
#	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.

Name	Description
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

Name	Description
-priority	Specifies the index number of the policy to be retrieved or

Name	Description
	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.

Name	Description
-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 applyto 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 hashfunctions. Possible values are:

Name	Description
	◆ null ◆ sha1 ◆ md5 ◆ xcbc
-enc_alg	Specifies the encryption algorithm for IKE or ESP policy transforms. Possiblevalues 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 SecurityPayload (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 forIKE transforms. Possible values are: ◆ preshared_key ◆ dsa ◆ rsa

Command File Parameters

Name	Description
Level#	An unsigned 32-bit integer that specifies the priority level (policy index number 0-110).

Name	Description

IPaddr	The local, remote, or remote-tunnel endpoint IP address. In addition to the IP address, the mask andIP 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 beadhered 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

Name	Description
	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 correspondingobject 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, canbe 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

Value	Code Symbol	Description
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.

Syntax

```
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

Name	Description
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

Name	Description
label	Applies an 8-digit hexadecimal label for Windows or a device label for Solaris.

Name	Description
solaris	Writes a Solaris type label on the device.
WNT	Writes Windows type label on the device.

Options

Name	Description
-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

Name	Description
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

Value	Code Symbol	Description
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
```

symld

Performs operations on one or more STD devices, BCVs, TGTs, or VDEVs in a device group (dg).

Syntax

```
symld [-h]
symld -g <DgName> [-offline] [-i <Interval>] [-c <Count>]
    add pd <PdevName> [LdevName]
    add dev <SymDevName> [LdevName][-sid <SymmID>][<-vdev  |  -tgt>
    <-rdf  |  -hop2>[-rdfg <GrpNum> [-remote_rdfg <RemoteGrpNum>]]]
    addall [-sid <SymmID>][-SA <# | ALL>][-P <#>][<-vdev  |  -tgt>
    <-rdf  |  -hop2>[-rdfg <GrpNum> [-remote_rdfg <RemoteGrpNum>]]]
    [-cap <#>] [-N <#>][-RANGE <SymDevStart>:<SymDevEnd>,
    <SymDevStart>:<SymDevEnd>,...][-sel_rdfg <SelRdfgNum>][pd  |
    dev  | -host <HostName>] [-v]
    break [LdevName] [-noprompt] [-vdev]
    list  [-v] [-resv] [-cyl] [-held]
    show <LdevName> [-geometry]
    remove <LdevName> [-force]
    rmall [-force] [-SA <# | ALL>] [-P <#>] [-cap <#>][-N <#>]
    [-RANGE <SymDevStart>:<SymDevEnd>][<-vdev  |  -tgt> -rdf [-rdfg
    <GrpNum>]  |  -hop2]
    move <LdevName> <DestDgName> [-force] [-rename]
    moveall <DestDgName> [-force] [-rename][-SA <# | ALL>] [-P <#>]
    [-cap <#>] [-N <#>][<-vdev  |  -tgt> [-hop2]  |  -rvdev  |
    -rtgt][-RANGE <SymDevStart>:<SymDevEnd>]
    copy <LdevName> <DestDgName> [-force] [-rename]
    copyall <DestDgName> [-force] [-rename][-SA <# | ALL>] [-P <#>]
    [-cap <#>] [-N <#>][<-vdev  |  -tgt> [-hop2]  |  -rvdev  |
    -rtgt][-RANGE <SymDevStart>:<SymDevEnd>]
    rename <LdevName> <NewLdevName>
symld -g <DgName> [-noprompt] [-i <Interval>] [-c <Count>][-SA <# |
ALL>] [-P <#>] [-bcv  |  -vdev  |  -tgt]
    rw_enable [LdevName [LdevName...]]
    write_disable [LdevName [LdevName...]]
symld -g <DgName> [-noprompt] [-i <Interval>] [-c <Count>][-bcv  |
-vdev  |  -tgt]
    relabel [LdevName [LdevName...]][-force]
symld -g <DgName> [-noprompt] [-i <Interval>] [-c <Count>][-bcv
[-hop2]  |  -rbcv  |  -brbcv  |  -rrbcv  | -vdev [-hop2]  |  -rvdev
|  -tgt [-hop2]  |  -rtgt]
    ready [LdevName [LdevName...]]
    not_ready [LdevName [LdevName...]]
    hold   [LdevName [LdevName...]]
    unhold [LdevName [LdevName...]] [-symforce]
```

Description

The symld command performs operations specific to a device in a device group, such as, adding a device to a device group, adding all available devices to a device group, list all devices in a device group, remove a device from a device group, removes/moves 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.

Arguments

Name	Description
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, specifying its physical (host) device name.
addall dev	Adds all ungrouped Symmetrix devices from a specified Symmetrix array to an existing device group.
addall pd	Adds all ungrouped physical devices from a specified Symmetrix array to an existing device group.
break	Breaks SCSI device reservations on one or all devices in the device group that are currently reserved.
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.
list	Lists all available devices from an existing device group.
move	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.
copy	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.
not_ready	Sets the device(s) to be Not Ready. The device must be in a User Ready status for this operation to succeed.
ready	Sets the device(s) to be Ready. The device must be in a User Not Ready

Name	Description
	status for this operation to succeed.
relabel	Applies the defined label to the device. The device must be in a User Not Ready status for this operation to be accepted. Refer to the symlabel command for details about how to define a device label.
rmall	Removes all standard devices from an existing device group.
remove	Removes a standard device from an existing device group.
rename	Renames a device within a device group.
rw_enable	Sets the device(s) to be Read and Write Enabled to its (their) 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 on which the devices is (are) visible.
show	Shows status information about a device in the device group.
unhold	Releases devices that were previously set to the hold state.
write_disable	Sets the device(s) to be Write Disabled to its (their) local hosts, on the specified front director port(s). If no ports are specified, then the device (s) will be Write Disabled on all ports on which the devices is (are) visible.

Options

Name	Description
-bcv	Targets the operation to the specified BCV device(s) that are locally associated with the device group.
-brbcv	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 (in megabytes) to the selection criteria of devices to add, move, remove to/from a device group.
-cyl	Displays the device capacity in cylinders. The default is megabytes (MB).
-force	Applies force with the specified action on a device group that would otherwise be rejected. Forces standard devices to be removed or moved

Name	Description
	from a device group, without querying the Symmetrix array for the device's BCV pair states, if any.
-g	Specifies a device group name.
-geometry	Shows device geometry.
-h	Provides brief online help information.
-held	Lists devices in the device group that have device holds.
-hop2	Indicates the device is two hops away. 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.
-N	Sets a number of devices to add, remove, or move.
-noprompt	Disables the prompt for confirmation feature. The default is to prompt the user for confirmation before executing the operation.
-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.
-RANGE	Specifies the ranges of Symmetrix devices to add, remove, and move.
-rbcv	Targets the action at the device group's locally associated RDF BCV device(s) that can be BCV paired with the remote mirror(s) of the standard RDF device(s).
-rdf	Indicates that remote VDEVs or TGTs are being added to the group.
-rdfg	Supplies the RA (RDF) group number to only add devices that belong to this RA group number.
-remote_rdfg	Specifies the RDF (RA) group to access a two-hop device from the first hop.
-rename	Renames the standard device(s) to the default names as they are moved from their current device group to the destination device group.

Name	Description
-resv	Lists devices in the device group that have SCSI reservations.
-rrbcv	Targets the action at the specified remotely associated remote BCV device(s) in the device group.
-rtgt	Targets the indicated action at the devices in RTGT list of the device group.
-rvdev	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	Supplies the Symmetrix ID to add only devices belonging to the specified Symmetrix array.
-symforce	Requests that the Symmetrix force the operation to be executed when normally it is rejected. **Caution:** Extreme caution should be exercised when using this option.
-tgt	Targets the indicated action at the devices in TGT list of the device group.
-v	Provides a more detailed, verbose listing.
-vdev	Targets the indicated action at the specified VDEV device(s) that are associated with the device group.

Parameters

Name	Description
DestDgName	The destination device group to which the standard device(s) is (are) moved.
DgName	The device group name.
HostName	The name of the host system.
GrpNum	The RDF (RA) group number.
LdevName	The logical device name, either named by the user, or automatically assigned when a device is added to a device group.
NewLdevName	The renamed device logical name.
PdevName	The host name for the device, such as /dev/rdsk/c2t0d2s2.

Name	Description
SelRdfGrpNum	The Symmetrix RA (RDF) group number of the devices to be added via an addall operation.
SymDevEnd	The Symmetrix device name, ending the range of selected devices, unique per Symmetrix array, such as 001C.
SymDevName	The Symmetrix device name, unique per array, such as 01C.
SymDevStart	The Symmetrix device name, starting the range of selected devices, such as 0000.
SymmID	The 12-digit ID of the Symmetrix array.

Return Codes

Value	Code Symbol	Description
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 add a Symmetrix host device to group ProdDB, and assign a device logical name temp1, enter:

```
symld -g ProdDB add pd /dev/rdsk/c2t0d2s2 temp1
```

To add a Symmetrix device to group ProdDB and assign a device logical name temp2, enter:

```
symld -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:

```
symld -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:

```
symld -g ProdDB -RANGE 000:00F addall pd
```

To list all devices in device group ProdDB, enter:

```
symld -g ProdDB list
```

To rename device DEV001 to log1 in group ProdDB, enter:

```
symld -g ProdDB rename DEV001 log1
```

To remove device log1 from device group ProdDB, enter:

```
symld -g ProdDB remove log1
```

To show detailed information about device log1, enter:

```
symld -g ProdDB show log1
```

To write disable device DEV001 on Symmetrix director 16A and Port 0, enter:

```
symld -g ProdDB -SA 16A -P 0 write_disable DEV001
```

To relabel all BCV devices that are locally-associated with device group ProdDB, enter:

```
symld -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:

```
symld -g ProdDB -RANGE 000:00F addall pd -vdev
```

symlmf

This command is used to manage licenses with Solutions Enabler.

Syntax

```
symlmf  <LicenseKey>
symlmf  add    -type se -lic <LicenseKey>
   delete -type se -license <LicenseKey>
   list   -type se [-v] [-summary]
   add    -type emclm -file <FileName>
   add    -type emclm -directory <DirName>
   add    -type emclm -sid <SymmID> -file <FileName>
   delete -type emclm -feature <FeatureName>-sid <SymmID>
      [-hostid <HostID>]
   delete -type emclm -file <FileName>
   delete -type emclm -directory <DirName>
   list   -type emclm [-v] [-host] [-macaddr]
   list   -type emclm -sid <SymmID>
   query  -type emclm -sid <SymmID>
   show   -type emclm -sid <SymmID>
   list   -type host
   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".

Also licenses can be listed by the categories of where they apply. There are two types of categories that are supported:

- Licenses that apply only to host features - indicated by a type of 'host'.
- Licenses that apply only to Symmetrix features indicted by a type of 'sym'.

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 one or more licenses - from file(s) on disk. When '-sid ‹SymmID›' is not specified the 'add -type emclm' action is assumed for host based license(s).

  ```
  add  -type emclm -file <FileName>
  add  -type emclm -directory <DirName>
  add  -type emclm -sid <SymmID> -file <FileName>
  ```

- The 'delete' action can be used to delete one or more licenses - using file(s) on disk or specifying the feature name and Symmetrix serial number of the license. This action can only be applied to the host based licenses.

  ```
  delete -type emclm -file <FileName>
  delete -type emclm -directory <DirName>
  delete -type emclm -feature <FeatureName> -sid <SymmID>
     [-hostid <HostID>]
  ```

- The 'list' action can be used to display installed licenses.

  ```
  list -type emclm [-v] [-host] [-macaddr]
  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 host features:

- The 'list' action can be used to display only licenses that apply to the current host.

  ```
  list -type host
  ```

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

Name	Description
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 either a license file on disk ('-file ‹FileName›') or a directory of license files on disk ('-directory ‹DirName›'). With the -sid option a file of Symmetrix based licenses can be added. Without the -sid option host based licenses can be added. The -directory option can not be used with -sid option.
delete	Delete one or more licenses. SE licenses are supplied on the command line via the '-license ‹LicenseKey›' option. EMCLM licenses are supplied by supplying the pathname to either a license file on disk ('-file ‹FileName›') or a directory of license files on disk ('-directory ‹DirName›'). Also, a license can be supplied on the command line via the '-feature ‹FeatureName› -sid ‹SymmID›' option. The Symmetrix EMCLM licenses can 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

Name	Description
-directory	Specifies the path to a directory where license files are located. These license files must all have an extension of '.lic'.
-feature	Specifies the feature name of the license.

Name	Description
-file	Specifies the path to a license file.
-host	Causes licenses for only the current host to be displayed.
-hostid	Specifies the host ID of the license.
-license	Specifies a traditional SE license key.
-macaddr	Causes MAC addresses to be displayed instead of host names.
-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

Name	Description
DirName	The path to a directory.
FeatureName	Feature Name of the license.
FileName	The path to a file.
HostID	Host ID of the license.
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 host base licenses from a license file, enter:

```
symlmf add -type emclm -file /tmp/api300_072809.lic
```

To add EMCLM host base licenses from multiple license files in a directory, enter:

```
symlmf add -type emclm -directory /tmp/licenses
```

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 EMCLM host base licenses using a license file, enter:

```
symlmf delete -type emclm -file /tmp/api300_072809.lic
```

To delete EMCLM host base licenses using multiple license files in a directory, enter:

```
symlmf delete -type emclm -directory /tmp/licenses
```

To delete an EMCLM host base license from the command line, enter:

```
symlmf delete -type emclm -feature SPA_BASE
                  -sid 000111222333
```

To delete an SE license from the command line, enter:

```
symlmf delete -type se -license 1234-5678-9ABC-EDF0
```

To display the currently installed EMCLM host base licenses, enter:

```
symlmf list -type emclm
```

To display the currently installed EMCLM host base licenses for just this host, enter:

```
symlmf list -type emclm -host
```

To display the currently installed EMCLM host base licenses with more information, enter:

```
symlmf list -type emclm -v
```

To display the MAC addresses instead of the host names of the currently installed EMCLM host base licenses, enter:

```
symlmf list -type emclm -macaddr
```

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 host based licenses of the current host, enter:

```
symlmf list -type host
```

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.

Syntax

```
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

Name	Description
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, SunOS, Linux is Veritas volume manager 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

Name	Description
-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.

Name	Description
-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 suffixessupported 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 suffixessupported are:

Name	Description
	◆ 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

Name	Description
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.

Name	Description
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, LINUX_LVM and ORACLE_ASM.

Return Codes

Value	Code Symbol	Description
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.

Syntax

```
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> -wwn <wwn>  |  -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> <-wwn <wwn>  |  -awwn <awwn>>  | <-iscsi
<iscsi>  |  -aiscsi <aiscsi> [-name <name>]>

   delete [-dir all -p all  |  -dir # -p #] [-login][-reserve_id
   <ResvID>[,<ResvID>[,<ResvID>]]]

symmask -sid <SymmID> -wwn <wwn>  |  -awwn <awwn>

   set lockdown <on <fcid>  |  off> -dir <#> -p <#>

symmask -sid <SymmID> -wwn <wwn>  |  -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

Name	Description
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.

Name	Description
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

Name	Description
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.

Name	Description
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

Name	Description
-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

Name	Description
	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

Name	Description
	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

Name	Description
#	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.

Name	Description
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

Name	Description
	Valid Host Types 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.

Syntax

```
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

Name	Description
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

Name	Description
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

Name	Description
-aiscsi	Specifies a user-given name, or alias iSCSI name.
-awwn	Specifies a user-given name, or alias WWN.

Name	Description
-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

Name	Description
#	A specific director or port number.
aiscsi	A user-given name in two parts, separated by a slash (/).
all	All fibre directors or ports.

Name	Description
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.

Syntax

```
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

Name	Description
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

Name	Description
-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

Name	Description
	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.

Name	Description
-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

Name	Description
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`

Name	Description

	`14 27`
	
	Or for a meta SRC device with non metaTGT 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

Value	Code Symbol	Description
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.

Syntax

```
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][<-instant  |  -consistent> -both_sides]  |
    [-instant [-vxfs <MountPoint...>  | -rdb -dbtype <DbType> [-db
    <DbName>]]  |  -consistent][<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 [-synched  |  -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][-instant [-vxfs <MountPoint...>  | -rdb -dbtype
    <DbType> [-db <DbName>]]  | -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 [-synched  |  -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 <redirect_
stdin>>[-v] [-force] [-symforce] [-reverse] [-noprompt][-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][-instant [-vxfs <MountPoint...>  | -rdb -dbtype
    <DbType> [-db <DbName>]]  | -consistent]

symmir -sid <SymmID><-file <DeviceFileName>  | -noprompt <redirect_
stdin>> [-force][-i <Interval>] [-c <Count>]

    query [[-attach] [-multi] [-protect] [-protbcvest][-bg
    [-percent]]]  |  [-summary]

    verify [-synched  |  -restored [-protect]  |  -split [-bg] |
    -syncinprog  |  -restinprog [-protect] ][-concurrent] [-summary]

    verify -bcv_mirrors [-ready  |  -syncinprog  | -restinprog]
    [-concurrent]

symmir [-sid <SymmID>] [-i <Interval>] [-c <Count>][-offline]
```

```
    list
symmir -sid <SymmID><-file <DeviceFileName>  | -noprompt <redirect_
stdin>> [-v] [-noprompt][-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

Name	Description
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

Name	Description
	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

Name	Description
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

Name	Description
-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.
-db	Specifies the relational database name. This is not required for Oracle.
-dbtype	Specifies the relational database type.
-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

Name	Description
	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.
-instant	Indicates that the split operation should be performed as a quick, foreground split. This feature is available with Enginuity 5x66 or later.
-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.

Name	Description
-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 instant split operation. You must specify the full pathname of the script.
-preaction	Specifies to execute the script argument before an establish, restore, or instant 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.
-rdb	Freezes the log files and the specified database just before performing the instant split and then thaws them as soon as the foreground split completes.
-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.

Name	Description
-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.
-synched	Verifies that the BCV pair(s) are in the Synchronized state.
-syncinprog	Verifies that the BCV pair(s) are in the SyncInProg state.

Name	Description
-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.
-vxfs	Lists one or more Veritas VxFS filesystem mount points. Specifies to freeze the filesystem(s) mounted on this host just before performing the instant split and to thaw them as soon as the foreground split completes.
-v	Provides a more detailed, verbose listing.

Parameters

Name	Description
CgName	The composite group name.
DbName	The relational database name.
DbType	The relational database type.Supported values are: ◆ Oracle ◆ SQLServer ◆ Sybase ◆ MVSDB2 ◆ Informix ◆ IBMUDB ◆ Exchange ◆ Exchange2007 ◆ SharePoint
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	Description
MountPoint	The file system mount point.
Name	The logical name associated with the RDF (RA) group(s).
PdevName	The BCV or Symmetrix device physical (host) name.
PowerPathPdevName	A PowerPath device name (you can enter one or more physical device names).
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

Value	Code Symbol	Description
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
Return codes for symmir restore:		
Return codes for symmir verify:		

Value	Code Symbol	Description
Return codes for symmir establish:		
		repeat the action using the -i and/or -c flags.
Return codes for symmir restore:		
		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:		
		repeat the action using the -i and/or -c flags.
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.

Syntax

```
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

Name	Description
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

Name	Description
	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

Name	Description
-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.

Name	Description
-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

Name	Description
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.

Syntax

```
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

Name	Description
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

Name	Description
-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

Name	Description
	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

Name	Description
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

Value	Code Symbol	Description
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.

Syntax

```
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

Name	Description
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

Name	Description
-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

Name	Description
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

Value	Code Symbol	Description
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.

Syntax

```
sympd  -h
sympd [-offline] [-sid <SymmID>] [-v]
    list [-resv]
    list [-SA <# | ALL>] [-p <#>] [-scsi] [-fibre]
    [-escon] [-ficon] [-gige]
    [-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

Name	Description
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

Name	Description
-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.
-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.

Name	Description
-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

Name	Description
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

Value	Code Symbol	Description
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
```

symrcopy

Performs remote copy control operations between storage arrays on a collection of device pairs.

Syntax

```
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 [-vxfs <MountPoint...>] | [-rdb -dbtype <DbType> [-db
    <DbName>]]  | [-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 [-v  |  -noprompt] [-i <Interval>] [-c <Count>]
    set ceiling <Ceiling> -sid <SymmID>-dir < | ALL> [-port <# |
    ALL>]
symrcopy [-sid SymmID] [-i <Interval>] [-c <Count>]
    list [-offline] [-detail  |  -wwn][-type <migrate  |  standard
    |  recoverpoint>]
    list ceiling [-dir <#  |  ALL>] [-port <#  |  ALL>]
symrcopy <-file <FileName>  |  -session_name <SessionName>-noprompt
'redirect stdin'>[-offline] [-i <Interval>] [-c <Count>]
    query [-detail  |  -wwn  |  -star]
    query -summary
    verify [-star]  |  [-summary][-createinprog  |  -created  |
    -recreateinprog  | -recreated  |  -copyinprog  |  -copyonaccess
    | -copyonwrite  |  -copied  |  -terminateinprog  | -failed  |
    -verifyinprog  |  -restored  |  -restinprog  | -precopy
    [-cycled]  |  -syncinprog  |  -synchronized  | -failedback]
symrcopy [-noprompt] [-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

Name	Description
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.
list ceiling	Lists the maximum bandwidth percentage for a given director, port, director and port, or all directors and ports.
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 ceiling	Sets the maximum allowed bandwidth percentage for a given director, port, director and port or all directors and ports. Acceptable values are 0-100 or NONE (shuts the ceiling function off). The pace value is ignored for all participating director/port combinations when the ceiling value is not set to NONE.

Name	Description
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

Name	Description
-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.

Name	Description
-db	Specifies the relational database name. This option is not required for Oracle.
-dbtype	Specifies the relational database type.
-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.
-dir	Sets the director number on which to list or set the ceiling.
-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 or CLARiiON device names. Valid tags are symdev, clardev, 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

Name	Description
	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. 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.
-port	Sets the port number on which to list or set the ceiling. Used for list and set ceiling.
-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.

Name	Description
-push	Pushes data from the control device to the remote device(s) when the session is created with the -push flag.
-rdb	Freezes the log files and the specified database just before the activate is performed and thaws them as soon as the activate completes. The host physical devices that the database log files reside must be PowerPath devices.
-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.
-vxfs	Lists one or more Veritas VxFS filesystem mount points. The filesystem (s), mounted on this host, will be frozen just before the activate is performed and thawed as soon as the activate completes.
-wwn	Specifies a World Wide Name (WWN). Used for list or query to display remote devices as WWNs.

Parameters

Name	Description
#	The director or port number for the set or list ceiling commands.
ALL	All directors or ports for the set or list ceiling commands.
Ceiling	The percentage of director/port bandwidth allowed for open replicator usage.

Name	Description
DbName	The relational database name.
DbType	The relational database type.Possible values are: ◆ Oracle ◆ SQLServer ◆ Sybase ◆ Informix ◆ IBMUDB ◆ Exchange ◆ Exchange2007 ◆ SharePoint
FileName	The name of the file that contains the source and target pairs.
HbaType	The Host Bus Adapter type.Possible values are: ◆ Emulex ◆ Qlogic
MountPoint	The file system mount point.
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.

Name	Description
SessionName	The optional assigned name used to control a session or group of sessions.
SymmID	The 12-digit Symmetrix ID number.

Return Codes

Value	Code Symbol	Description
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.

Syntax

```
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

Name	Description
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

Name	Description
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.

Name	Description
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

Name	Description
-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

Name	Description
	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

Name	Description
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.

Name	Description
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

Value	Code Symbol	Description
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 device pairs (device group, composite group, or device file) or on a single device pair. Performs Symmetrix SRDF query or verify on a group of device pairs.

Also performs dynamic SRDF operations: Adding and modifying dynamic SRDF groups, and creating and deleting SRDF pairs.

Syntax

```
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] [-symforce]
[-noprompt] [-i <Interval>] [-c <Count>]
   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
<SymmID:GrpNum  |  name:RdfGroupName>]
    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 [-rp] <R1 | R2>
    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]
    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> -remote_rdfg <GrpNum>-remote_sid <SymmID> -remote_dir <Dir>
[-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>] [-remote_dir <Dir>][-noprompt]
[-i <Interval>] [-c <Count>] [-star]
symrdf removegrp -sid <SymmID><-rdfg <GrpNum>  |  -label <GrpLabel>>
[-noprompt] [-i <Interval>] [-c <Count>] [-star][-symforce]
symrdf [-sid <SymmID>] [-i <Interval>] [-c <Count>][-percent <1-100>
-action <ScriptFile> [-norepeat]][-svp <PoolName>]
   monitor
```

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, 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; monitoring SRDF/A DSE pool usage by Symmetrix ID or pool name.

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

Name	Description
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

Name	Description
	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.
monitor	Checks the total percent full of the SAVE devices currently configured in a SRDF/A DSE pool, and can optionally execute a script file if a specified percentage is encountered.
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.

Name	Description
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

Name	Description
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	Indicates that the operation affects both the group-level and the device-level components of the SRDF/A Write Pacing feature.
rdfg	Sets the SRDF/A group attributes.

Options

Name	Description
-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.
-action	Indicates to run a script when the specified percent value is encountered. The full pathname to the action script must be specified. The first argument passed to the script is automatically set to the percent value. This option requires the -percent option.
-add	Adds supporting SRDF directors to a dynamic SRDF group.
-all	Lists all SRDF mirrors of the selected devices. Used with symrdf list.

Name	Description
	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

Name	Description
	operation, displaying results appropriate to the operation at each iteration. Used with list, monitor, 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, monitor, 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

Name	Description
	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 (eisabled).
-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

Name	Description
	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

Name	Description
	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.
-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, monitor, 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.

Name	Description
-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.
-norepeat	Specifies that the action script be run only once when the threshold is met. Used with the action script option on the monitor command.

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

Name	Description
-rdfa_not_pace_capable	When used with list operations, lists SRDF 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. 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.

Name	Description
-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_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 when 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.
-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.

Name	Description
-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.
-svp	Specifies the SRDF/A DSE SAVE pool name.
-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.

Name	Description
-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

Name	Description
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	The comma-separated list of Symmetrix directors.
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,

Name	Description
	autostart or nr_if_invalid on.
PairConfigType	**Identifies the pair configuration type for the migrate action. Possible value: 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.
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).
ScriptFile	Full pathname of a script file to be executed.
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.
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 setoperations. 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

Value	Code Symbol	Description
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

Value	Code Symbol	Description
The following codes are returned by the ping action:		
The following codes are returned by the verify action:		
		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

Value	Code Symbol	Description
The following codes are returned by the ping action:		
The following codes are returned by the verify action:		
		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

Value	Code Symbol	Description
The following codes are returned by the ping action:		
The following codes are returned by the verify action:		
		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.

Syntax

```
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

Name	Description
start	Starts the recovery session.

Options

Name	Description
-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.

Name	Description

	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

Name	Description
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

Value	Code Symbol	Description
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.

<table>
<tr><th>Option</th><th>Description</th></tr>
<tr><td>email_
frequency</td><td>Value: email_frequency
Specifies the email frequency desired. Possible values are:
<table>
<tr><th>Value</th><th>Meaning</th></tr>
<tr><td>per_log_msg</td><td>Email per log msg that meets logging level requirement.</td></tr>
<tr><td>per_monitor_
loop</td><td>Email per monitor loop</td></tr>
<tr><td>per_restart</td><td>Email when error is detected, when session is restarted and finished.</td></tr>
</table>
default: per_restart.</td></tr>
<tr><td>goldcopy_
location</td><td>Value: location
Specifies the location of the backup (gold copy). Possible values are:
<table>
<tr><th>Location</th><th>Meaning</th></tr>
<tr><td>NONE</td><td>No gold copy is desired.
All other goldcopy_* options are ignored.</td></tr>
<tr><td>R2</td><td>A gold copy on the R2 side is desired.</td></tr>
<tr><td>ALL</td><td>A gold copy on the R21 side and R2 side is desired.</td></tr>
</table>
The default is R2 and this value is case insensitive.</td></tr>
<tr><td>goldcopy_
type</td><td>Value: copytype
Specifies the type of goldcopy to create on the R2 side. Possible values are:
<table>
<tr><th>copytype</th><th>Meaning</th></tr>
<tr><td>none</td><td>No gold copy is desired.</td></tr>
<tr><td>bcv</td><td>A BCV gold copy on the R2 side is desired.</td></tr>
<tr><td>clone</td><td>A Clone gold copy on the R2 will be created.</td></tr>
</table>
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.</td></tr>
</table>

<table>
<tr><th>Option</th><th>Description</th></tr>
<tr><td>goldcopy_
state_
startup</td><td>Value: copystate
Specifies the desired state of the R2 BCV gold copy upon routine startup. Possible values are:
<table>
<tr><th>copystate</th><th>Meaning</th></tr>
<tr><td>establish</td><td>The devices should be established (BCV only).</td></tr>
<tr><td>split</td><td>The devices should be split (BCV only).</td></tr>
<tr><td>activated</td><td>The devices should be activated (Clone only).</td></tr>
<tr><td>created</td><td>The devices should be in created state (Clone only).</td></tr>
<tr><td>none</td><td>The devices should be unchanged.</td></tr>
</table>
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.</td></tr>
<tr><td>goldcopy_
state_post_
restart</td><td>Value: copystate
Following a successful SRDF/A session, restart or BCV resync, specifies the required state of the R2 gold copy. Possible values are:
<table>
<tr><th>copystate</th><th>Meaning</th></tr>
<tr><td>establish</td><td>The devices should be left established (BCV only).</td></tr>
<tr><td>split</td><td>The devices should be split (BCV only).</td></tr>
<tr><td>activated</td><td>The devices should be activated (Clone only).</td></tr>
<tr><td>created</td><td>The devices should be in created state (Clone only).</td></tr>
</table>
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.</td></tr>
<tr><td>goldcopy_
max_wait</td><td>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.</td></tr>
<tr><td>goldcopy_
clone_list</td><td>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.
<table>
<tr><th>list</th><th>Meaning</th></tr>
<tr><td>tgt</td><td>Use the TGT list.</td></tr>
<tr><td>bcv</td><td>Use the BCV list.</td></tr>
</table></td></tr>
</table>

<table>
<tr><th>Option</th><th>Description</th></tr>
<tr><td></td><td>
<table>
<tr><th>list</th><th>Meaning</th></tr>
<tr><td>tgt</td><td>Use the TGT list.</td></tr>
<tr><td>bcv</td><td>Use the BCV list.</td></tr>
</table>
</td></tr>
<tr><td>goldcopy_
resync_
interval</td><td>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.</td></tr>
<tr><td>monitor_
cycle_time</td><td>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.</td></tr>
<tr><td>monitor_
only</td><td>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.</td></tr>
<tr><td>run_once</td><td>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.</td></tr>
<tr><td>run_until_
first_failure</td><td>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.</td></tr>
</table>

Option	Description
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.

Option	Description
	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.

<table>
<tr><th>Option</th><th>Description</th></tr>
<tr><td></td><td>The default is 120 seconds.</td></tr>
<tr><td>restart_
sync_type</td><td>Value: synctype
Specifies the type of synchronization to use following the detection of a failed SRDF/A session. Possible values are:
<table>
<tr><th>synctype</th><th>Meaning</th></tr>
<tr><td>ADCOPY</td><td>Adaptive copy disk</td></tr>
<tr><td>SYNC</td><td>Synchronous mode</td></tr>
<tr><td>NONE</td><td>Intermediate track resynch stage is attempted. A direct re-establish using the existing SRDF session mode is attempted.</td></tr>
</table>
The default is ADCOPY.</td></tr>
<tr><td>restart_
window</td><td>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.</td></tr>
<tr><td>log_level</td><td>Value: The desired logging level.
Possible values are:
<table>
<tr><th>Value</th><th>Meaning</th></tr>
<tr><td>0</td><td>Off.</td></tr>
<tr><td>1</td><td>Only Errors are reported.</td></tr>
<tr><td>2</td><td>Errors and Warnings are reported.</td></tr>
<tr><td>3</td><td>Errors, Warnings, and Informational messages are reported.</td></tr>
<tr><td>4</td><td>All messages are reported.</td></tr>
</table>
The default is 3.</td></tr>
</table>

symreplicate

Performs a coherent, recurrent, background copy of data through an SRDF/TimeFinder configuration.

Syntax

```
symreplicate [-h]
    start [-g <DgName> | -cg <CgName>]-options <OptionFile> [-log
    <LogFile>][-sid <SymmID>] [-preaction <ScriptFile>][-postaction
    <ScriptFile>] [-postcycle <ScriptFile>][-steperror <ScriptFile>]
    [-foreground] [-noprompt][-vxfs <MountPoint...> | -rdb -dbtype
    DbType [-db DbName] | -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

Name	Description
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

Name	Description
-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

Name	Description
	multi-hop configuration.
-cycle	Displays cycle time statistics. Valid for a stats action only.
-db	Specifies the relational database name. This is not required for Oracle.
-dbtype	Specifies the relational database type.
-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. 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

<table>
<tr><th>Name</th><th>Description</th></tr>
<tr><td>-postcycle</td><td>Performs this action after each cycle. Information about the completed cycle is provided through the following command line arguments:
<table>
<tr><th>Argument</th><th>Meaning</th></tr>
<tr><td>P1</td><td>Device group name.</td></tr>
<tr><td>P2</td><td>Current cycle number.</td></tr>
<tr><td>P3</td><td>Number of cycles (‹NumCycles› from the option file, see below).</td></tr>
<tr><td>P4</td><td>Cycle duration in seconds.</td></tr>
</table>
The -postcycle option is not available on all platforms.</td></tr>
<tr><td>-preaction</td><td>Performs this action before the instant or consistent split. Information is provided through the following command line arguments:
<table>
<tr><th>Argument</th><th>Meaning</th></tr>
<tr><td>P1</td><td>Device group name</td></tr>
</table></td></tr>
<tr><td>-rdb</td><td>Indicates that the files of the specified database be frozen just before the instant split is performed, and thawed as soon as the foreground portion of the split completes.
The host physical devices where the database files reside must be PowerPath devices.</td></tr>
<tr><td>-recover</td><td>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.</td></tr>
<tr><td>-setup</td><td>Performs the steps necessary to place the devices in the initial state.</td></tr>
<tr><td>-sid</td><td>Specifies the unique Symmetrix ID to where the symreplicate log file is written. The Symmetrix array must be running Enginuity version 5669 or higher.</td></tr>
<tr><td>-sort</td><td>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.</td></tr>
<tr><td>-step</td><td>Stops after the current symreplicate step completes, rather than waiting until the end of a cycle.</td></tr>
<tr><td>-steperror</td><td>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:</td></tr>
</table>

Name	Description
	<table><tr><th>Argument</th><th>Meaning</th></tr><tr><td>P1</td><td>Device or composite group name.</td></tr><tr><td>P2</td><td>Current cycle number.</td></tr><tr><td>P3</td><td>Number of cycles (‹NumCycles› from the option file, see below).</td></tr><tr><td>P4</td><td>Cycle duration in seconds.</td></tr><tr><td>P5</td><td>Step number where the error occurred.</td></tr><tr><td>P6</td><td>Text message describing when the error occurred. Details about the error are written to the SYMAPI log file.</td></tr></table> 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.
-vxfs	Specifies a list of one or more Veritas VxFS filesystem mount points. The filesystems, mounted on this host, are frozen just before the instant split is performed, and thawed as soon as the foreground portion of the split completes. This feature is currently available on the Solaris and HP-UX operating systems.

Parameters

Name	Description
CgName	Composite group name provided by user.
DbName	Relational database name.
DbType	Relational database type. Choices are one of the following: ◆ Oracle ◆ SQLServer ◆ IBMUDB ◆ Exchange ◆ Exchange2007 ◆ SharePoint
DgName	Device group name.

Name	Description
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.
MountPoint	File system mount point.
OptionFile	Name of the text file that contains the required parameters of the replicate actions.
PowerPathPdevName	PowerPath device name.
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

Value	Code Symbol	Description
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:

<table>
<tr><th>Option Name</th><th>Description</th></tr>
<tr><td>SYMCLI_REPLICATE_HOP_TYPE</td><td>‹RepType› is required, and is one of:
<table>
<tr><th>‹RepType›</th><th>Meaning</th></tr>
<tr><td>SINGLE</td><td>Single-hop configuration.</td></tr>
<tr><td>MULTI</td><td>Multi-hop configuration.</td></tr>
</table></td></tr>
<tr><td>SYMCLI_REPLICATE_CYCLE</td><td>‹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.</td></tr>
<tr><td>SYMCLI_REPLICATE_CYCLE_OVERFLOW</td><td>‹OvfMethod› is a description of what to do if the cycle overruns the specified CycleTime. It is one of the following:
<table>
<tr><th>‹OvfMethod›</th><th>Meaning</th></tr>
<tr><td>IMMEDIATE</td><td>Begin the next cycle immediately. This is the default.</td></tr>
<tr><td>NEXT</td><td>Skip this cycle and wait for the next to begin.</td></tr>
</table></td></tr>
<tr><td>SYMCLI_REPLICATE_CYCLE_DELAY</td><td>‹Delay› is the minimum time to wait between adjacent cycles.</td></tr>
</table>

Option Name	Description
	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

Option Name	Description
	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: 3. HH:MM - Specifies the number of hours and minutes 4. 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.

Option Name	Description
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

Option Name	Description
	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

Option Name	Description
	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

<table>
<tr><th>Option Name</th><th>Description</th></tr>
<tr><td></td><td>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.</td></tr>
<tr><td>SYMCLI_REPLICATE_PROTECT_BCVS</td><td>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:
<table>
<tr><th>‹Protection›</th><th>Meaning</th></tr>
<tr><td>NONE</td><td>Performs a normal TimeFinder establish operation, which is the default.</td></tr>
<tr><td>LOCAL</td><td>Performs a protected BCV establish for the local devices only in a single-hop configuration.</td></tr>
<tr><td>FIRST_HOP</td><td>Performs a protected BCV establish for the first-hop devices only in a multi-hop configuration.</td></tr>
</table></td></tr>
</table>

<table>
<tr><th>Option Name</th><th>Description</th></tr>
<tr><td></td><td>
<table>
<tr><th>‹Protection›</th><th>Meaning</th></tr>
<tr><td>REMOTE</td><td>Perform a protected BCV establish for the remote devices only in a single-hop configuration.</td></tr>
<tr><td>SECOND_ HOP</td><td>Performs a protected BCV establish for the second-hop devices only in a multi-hop configuration.</td></tr>
<tr><td>BOTH</td><td>Perform a protected BCV establish for both the local and remote devices (single-hop) or the first and second-hop devices (multi-hop).</td></tr>
</table>
</td></tr>
<tr><td>SYMCLI_REPLICATE_TF_CLONE_EMULATION</td><td>Indicates TimeFinder clone emulation is enabled. By default, clone emulation is disabled. A value of TRUE indicates clone emulation is enabled.</td></tr>
<tr><td>SYMCLI_REPLICATE_PERSISTENT_LOCKS</td><td>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.</td></tr>
</table>

<table>
<tr><th>Option Name</th><th>Description</th></tr>
<tr><td>SYMCLI_REPLICATE_CONS_SPLIT_RETRY</td><td>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.</td></tr>
<tr><td>SYMCLI_REPLICATE_R1_BCV_EST_TYPE</td><td>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:
<table>
<tr><th>‹Estab-lishType›</th><th>Meaning</th></tr>
<tr><td>SINGULAR</td><td>BCV devices are established one at a time; the next device is not established until the previous device is established.</td></tr>
<tr><td>SERIAL</td><td>BCV devices are established as fast as the</td></tr>
</table></td></tr>
</table>

<table>
<tr><th>Option Name</th><th>Description</th></tr>
<tr><td></td><td>
<table>
<tr><th>‹EstablishType›</th><th>Meaning</th></tr>
<tr><td></td><td>establish requests are accepted by the Symmetrix array.</td></tr>
<tr><td>PARALLEL</td><td>BCV device establish requests are passed in parallel to each of the servicing DA directors.</td></tr>
</table>
For establish types of SINGULAR and PARALLEL, an ‹EstablishDelay› is specified through the SYMCLI_REPLICATE_R1_BCV_DELAY option.
</td></tr>
<tr><td>SYMCLI_REPLICATE_FINAL_BCV_EST_TYPE</td><td>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.</td></tr>
<tr><td>SYMCLI_REPLICATE_R1_BCV_DELAY</td><td>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</td></tr>
</table>

Option Name	Description
	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
- symrdf
- symdev
- symreturn

symreturn

Indicates a return value within pre-action and post-action scripts.

Syntax

```
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

Name	Description
-h	Provides brief, online help information.

Parameters

Name	Description
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

Value	Code Symbol	Description
0	**CLI_C_SUCCESS**	

Examples

To exit the script with a successful return code, enter:

```
symreturn 0
```

symrslv

Displays detailed mapping information about a disk storage object.

Syntax

```
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

Name	Description
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

Name	Description
-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.

Name	Description
-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

Name	Description
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

Value	Code Symbol	Description
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.

Syntax

```
symsan [-h]
    list <-sanports  |  -sanluns -wwn <SanPort> >
       -sid <SymmID>
       <-dir <#  |  ALL>  |  -DX <#  |  ALL>  |  -FA <#  |  ALL>>
       -port <#  |  ALL> [-detail]
    list -sanrdf
       -sid <SymmID>
       -dir <# | ALL>
```

Description

The symsan command lists the ports visible from a given director and the LUNs visible behind a given remote port.

Arguments

Name	Description
list	Lists all sessions for a specified Symmetrix array, or for all Symmetrix arrays.

Options

Name	Description
-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.

Name	Description
-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

Name	Description
#	A local director or port number.
SanPort	The port WWN.
SymmID	The 12-digit Symmetrix array ID.

Return Codes

Value	Code Symbol	Description
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
```

symsg

Performs operations on storage groups located in a specified Symmetrix array.

Syntax

```
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>]
symsg -sid <SymmID> [-i <Interval>] [-c <Count>] [-v]
    create <SgName>
       [-bw_max <MBperSec>] [-iops_max <IOperSec>]
       [-dynamic <NEVER | ALWAYS | ONFAILURE>]
    delete <SgName> [-force]
    export <SgName> [-file <FileName>]
    exportall [-file <FileName>]
    import <SgName> [-file <FileName>]
    importall [-file <FileName>]
    rename <OldSgName> <NewSgName>
    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>]
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>  [LdevName [LdevName...]]
    allocate  [LdevName [LdevName...]][-persistent]
    allocate  [LdevName [LdevName...]] -stop
    free [LdevName [LdevName...]]
    free  [LdevName [LdevName...]]-stop
    reclaim  [LdevName [LdevName...]][-persistent]
    reclaim  [LdevName [LdevName...]][-stop]
    set -persistent
    unset -persistent
    set -orm < off | system>
symsg -sg <SgName> -sid <SymmID> [-i <Interval>][-c <Count>] [-v]
[-noprompt] [-star][-skip -lockid <lockNum>]
    pin
    unpin
    host_active [-symforce]
```

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, and listing and showing information about a storage group.

The export argument creates a group file (ASCII text) and the import argument reads a file to import a 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 list. 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:

```
<SymmID>
<SymDevName>
<SymDevName>
. . .

<SymmID>
S <StorageGroupName>
S <StorageGroupName>
B <MBperSec>
I <IOperSec>
D <DynDistribution>
. . .
```

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›

‹StorageGroupName›

‹SymmID›

S ‹StorageGroupName›

S ‹StorageGroupName›

B ‹MBperSec›

I ‹IOperSec›

D ‹DynDistribution›

Arguments

Name	Description
add/addall	Adds single or multiple devices or storage groups to a

Name	Description
	storage group.
allocate	Allocates storage in the thin pool.
compress	Starts data compression on thin device(s). When combined with the -stop option, data compression stops.
copy/copyall	Copies devices to both the ‹SgName› and 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 existing storage groups. The storage groups can later be recreated from this file using the import 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 single 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 I/O Limits 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.

Name	Description
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 devices 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 I/O Limits 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.
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 devices from the thin pool.
uncompress	Starts data decompression on thin device(s). When combined with the -stop option, data decompression stops.
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.
write_disable	Sets the devices to Write Disabled to their local hosts.

Keywords

Name	Description
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

Name	Description
-bcv	Specifies that only local BCV devices are taken from the storage group and added to the device group. This option is used with the sg2dg command.
-bw_max	Specifies the Host I/O Limits 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 I/O Limits demand report is being requested for port group information.
-by_port	Specifies that the Host I/O Limits 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.
-celerra	Allows operations on Celerra FBA devices.
-ckd	Allows operations on CKD devices.
-demand	Specifies a Host I/O Limits demand report.
-devs	Specifies multiple range(s) of Symmetrix device names.
-dir	Specifies the director number(s) for which the Host I/O Limits demand report is being requested.

Name	Description
-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.
-h	Provides online help.
-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 I/O Limits 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.
-offline	Obtains information from the Symmetrix host configuration database.
-orm	Sets the Optimized Read Miss mode to off or system managed for the specified devices.
-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	Specifies that set or unset operates on the persistent indicator. When used with allocate or reclaim, it specifies the use of persistent storage.
-pool	Specifies a thin pool name.
-pg	Specifies that the Host I/O Limits demand report is being requested for the port(s) in the specified port group.

Name	Description
-R1	Copies RDF1 (R1) devices only.
-R2	Copies RDF2 (R2) devices only.
-R21	Copies RDF21 (R21) devices only.
-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.
-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.
-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. This option is used with the sg2dg 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. This option is used with the sg2dg command
-v	Provides a more detailed, verbose listing.

Parameters

Name	Description
ALWAYS	The Host IO Limits for the storage group are always dynamically redistributed.
DestSgName	The name of the storage group to use as the destination of

Name	Description
	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 100000 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.
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.

Return Codes

Value	Code Symbol	Description
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.

Syntax

```
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 <[-vxfs <MountPoint...>]  | [-rdb -dbtype <DbType> [-db
    <DbName>] ]  | [-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 <[-vxfs <MountPoint...>]  | [-rdb -dbtype <DbType>
    [-db <DbName>] ]  | [-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>]<[-vxfs
    <MountPoint...>]  | [-rdb -dbtype <DbType> [-db <DbName>] ]  |
    [-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 <[-vxfs <MountPoint...>]  | [-rdb -dbtype <DbType> [-db
    <DbName>] ] | [-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 <[-vxfs <MountPoint...>]  | [-rdb -dbtype <DbType>
    [-db <DbName>] ] | [-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>]<[-vxfs
    <MountPoint...>]  | [-rdb -dbtype <DbType> [-db <DbName>] ] |
    [-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
<redirect_stdin>> [-v] [-force] [-noprompt][-i <Interval>] [-c
<Count>][-preserveTGTLocks -lockid <LockNum>] [-star]

    create [-skip] [-svp <PoolName>  |  -duplicate]

    activate <[-vxfs <MountPoint...>]  | [-rdb -dbtype <DbType> [-db
    <DbName>]]  | [-consistent]> [-duplicate][-preaction
    <ScriptFile>] [-postaction <ScriptFile>][-not_ready] [-skip]

    duplicate <[-vxfs <MountPoint...>]  | [-rdb -dbtype <DbType>
    [-db <DbName>]]  | [-consistent]>[-preaction <ScriptFile>]
    [-postaction <ScriptFile>][-not_ready] [-skip]

    recreate [-skip]

    terminate [-symforce] [-skip] [-restored] [-duplicate]

    establish [-full] [-svp <PoolName>]<[-vxfs <MountPoint...>]  |
    [-rdb -dbtype <DbType> [-db <DbName>]]  | [-consistent]>
    [-preaction <ScriptFile>] [-postaction <ScriptFile>][-not_ready]
    [-skip]

    restore [-full] [-not_ready]

symsnap -sid <SymmID> <-file <DeviceFileName>  | -noprompt
<redirect_stdin>> [-force] [-i <Interval>][-c <Count>]

    query [-multi] [-restore] [-attach] [-pools] [-changed]
    [-summary]

    verify [-created  |  -copied  |  -copyonwrite  | -restinprog  |
    -restored  |  -failed  |  -recreated][-summary]

symsnap -sid <SymmID> <-file <DeviceFileName>  | -noprompt
<redirect_stdin>> [-v] [-noprompt][-i <Interval>] [-c <Count>]

    attach

    detach

symsnap [-sid <SymmID>] [-i <Interval>] [-c <Count>][-offline]

    list [-pools [-all]]  |  [-svp <PoolName>]  | [-savedevs [-fba
    |  -ckd  |  -ckd3390  |  -ckd3380 | -as400][-all] [-svp
    <PoolName>]]

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

    show pool <PoolName> [-all][-fba  |  -ckd  |  -ckd3390  |
    -ckd3380 |  -as400]

symsnap [-sid <SymmID>] [-i <Interval>] [-c <Count>][-offline]
[-percent <1-100> -action <ScriptFile> [-norepeat]][-svp <PoolName>]
[-fba  |  -ckd  |  -ckd3390  |  -ckd3380  | -as400]
```

```
monitor
```

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

Name	Description
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, SAVE devices, or SAVE device pools.
monitor	Checks the total percent full of the SAVE devices currently configured and can optionally execute a script file if a specified percentage is encountered.
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.

Name	Description
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.
show pool	Shows detailed information about the SAVE device pool.
terminate	Terminates (stops) the existing internal copy session between the specified source and target devices in a device group.
verify	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

Name	Description
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

Name	Description
-action	Selects a script to run when the specified percent value is encountered. You must specify the full pathname to the script. The first argument passed to the script is automatically set to the percent value. This option requires the -percent option.
-all	Includes active and inactive information in the display and calculations for the group(s).
-as400	List or monitor only AS400 devices.
-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.

Name	Description
-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.
-ckd	Limits the list argument to display only the CKD devices.
-ckd3380	Limits the list argument to display only the CKD3380 devices.
-ckd3390	Limits the list argument to display only the CKD3390 devices.
-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.
-db	Specifies the name of the relational database. This option is not required for Oracle.
-dbtype	Specifies the relational database type.
-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.
-fba	Specifies to list or monitor FBA devices only.
-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.

Name	Description
-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.
-norepeat	Specifies that the action script should only be run once if the threshold has been met. This option is used with the action script option on the monitor command.
-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.
-percent	Causes the action script to be executed when the percent full argument is encountered.
-pools	Displays a list of Snap pools.
-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

Name	Description
	devices as the target devices. This is used only with device or composite groups.
-rdb	Freezes the log files and the specified database just before the activate is performed, and thaws them as soon as the activate completes. The host physical devices in which the database log files reside must be PowerPath devices.
-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 inthe form:
	`SID:GrpNum,SID:GrpNum,...`
	or a comma-separated list of predefinednames 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.
-savedevs	Displays the current space used on SAVE devices.
-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.

Name	Description
-v	Provides a more detailed, verbose listing.
-vxfs	Lists one or more Veritas VxFS filesystem mount points. Specifies to freeze the filesystem(s) mounted on this host just before performing the activate, and to thaw them as soon as the activate completes. This feature is currently available on Solaris and HP-UX operating systems.

Parameters

Name	Description
CgName	Composite group name.
Count	Number of iterations to execute before exiting.
DbName	Relational database name.
DbType	Relational database type. Possible valuesare: ◆ Oracle ◆ SQLServer ◆ Sybase ◆ Informix ◆ IBMUDB ◆ Exchange ◆ Exchange2007 ◆ SharePoint
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.
MountPoint	File system mount point.

Name	Description
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.
PowerPathPdevName	PowerPath device name (one or more physical device names can be entered).
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

Value	Code Symbol	Description
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.

Value	Code Symbol	Description
Return codes for symsnap verify:		
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
```

symqos

Provides Quality of Service controls on specified devices.

Syntax

```
symqos -h
symqos -g <DgName> [-bcv  |  -nobcv]
    set <BCV | RDF | MIR | CLONE | VLUN><pace | priority <URGENT |
    <Value> | STOP>>[LdevName]
    set LRU <<#>,<#>,<#>  |  ALL> [LdevName]set LRUNAME <LRUName>
    [LdevName]
    reset LRU [LdevName]
    query [-lru]
    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>>. . .]>]
       [-lru <# | ALL>][-pace_range <[MinPace]:[MaxPace]>]
    list  -devs <<SymDevStart>:<SymDevEnd>  |  <SymDevName>
      [,<<SymDevStart>:<SymDevEnd>  |  <SymDevName>>. . .]>]
       [-lruname <<LRUName> | ALL>]
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>]
    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>
    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
```

Description

The symqos command is used to view or change copy priorities and LRU assignments 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

Name	Description
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

Name	Description
	Synchronous, Asynchronous and Copy I/Os on the Symmetrix array and all the RDF directors.
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 settings of the specified keyword. When used with LRU, resets the QoS LRU assignment back to the default LRU. When used with IO, 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.

Keywords

Name	Description
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.
LRU	Specifies the action to the Least recently used cache management group for the specifed object.
LRUNAME	Specifies the action to the specifed least recently used cache management group.
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.

Name	Description
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

Name	Description
-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 the 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.
-lru	Lists device assignments to LRU cache management groups by LRU number.
-lruname	Lists device assignments to LRU cache management groups by LRU name.

Name	Description
-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.
-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.
-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

Name	Description
AsyncPercent	The percentage of RDF director CPU resources assigned to Asynchronous I/Os.
CopyPercent	The percentage of RDF director CPU resources assigned to Copy I/Os.

Name	Description
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.
LRUName	Least recently used cache management group name.
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

Value	Code Symbol	Description
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 assign all devices of device group DeviceGroup to LRU group 2, enter:

```
symqos -g DeviceGroup set LRU 2
```

To assign all devices of device group DeviceGroup to LRU group GROUP_2, enter:

```
symqos -g DeviceGroup set LRUname GROUP_2
```

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
```

symstar

Performs SRDF/Star control operations on a composite group.

Syntax

```
symstar -h
symstar show <CgName> [-detail]
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]
    list [-full] [-offline] [-local]
    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

Name	Description
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.

Name	Description
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

Name	Description
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 f-or`
	`the recovery SRDF pairs.`

Options

Name	Description
-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

Name	Description
	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.

Name	Description
-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

Name	Description
	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

Name	Description
CgGrpNum	The SRDF (RA) group number in the CG.
CgName	The name of the host composite group.

Name	Description
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

Value	Code Symbol	Description
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_COMPATIBILITY_MODE            = <V65/V70>
SYMCLI_STAR_AUTO_DISTRIBUTE_INTERNAL_FILE = <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

Option	Description
	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.

Syntax

```
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>] [-lru <# | ALL | name>]

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

Name	Description
-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 oninterface C of DA 2A would be: `-disk 2A,C,4`

Name	Description
	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 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.
-ip	Specifies the remote IP address (to gather SRDF network compr stats-iSCSI).
-ld	Applies logical device names to the action.
-lru	Specifies the Least-Recently Used cache management group.
-mirror	Requests stats from a specified mirror (1-4).
-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).

Name	Description
-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.

Name	Description
	<table><tr><th>Type</th><th>Performance Information</th></tr><tr><td>PREFETCH</td><td>Tracks prefetch disk activity for selected back-end director(s) only.</td></tr><tr><td>REQUESTS</td><td>I/O requests and throughput for selected device(s) or any type of director(s). This is the default.</td></tr></table>
-v	Provides a more detailed, verbose listing.

Parameters

Name	Description
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

Value	Code Symbol	Description
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 10 seconds 100 times, enter:

```
symstat -g queryDB -i 10 -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 10 seconds 100 times, enter:

```
symstat -g rdwrDB -i 10 -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 10 seconds 100 times, enter:

```
symstat -SA ALL -i 10 -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 10 seconds 100 times, enter:

```
symstat -SA ALL -i 10 -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 10 seconds 100 times, enter:

```
symstat -DA ALL -i 10 -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 10 seconds, enter:

```
symstat -i 10 -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 15 seconds, enter:

```
symstat -i 15 -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 5 seconds, enter:

```
symstat -i 5 -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.
```

symtier

Allows you to create and manage storage tiers that can be used for FAST policies.

Syntax

```
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

Name	Description
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	Modifies the 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

Name	Description
-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 5 seconds. For passive actions, the minimum interval is 15 seconds. Passive actions are actions that do not acquire an exclusive lock.
-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

Name	Description
	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

Name	Description
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

Value	Code Symbol	Description
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.

Syntax

```
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

Name	Description
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

Name	Description
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

Name	Description
-date	Indicates the week which includes the start date when generating or display the composite time windows. The week is 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 a day for the time window. Valid values are from 00:00 to 24:00 in 30 minutes 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 a day for the time window. Vaild values are from 00:00 to 24:00 in 30 minutes 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.

Name	Description
-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

Name	Description
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 minutes increments. The time 00:00 represents midnight AM and 24:00 represents midnight PM.

Return Codes

Value	Code Symbol	Description
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.

Syntax

```
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

Name	Description
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

Name	Description
-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.

Name	Description
-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

Name	Description
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

Value	Code Symbol	Description
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	VgName -newvg -mapfile -cluster -persistent	-newvg -mapfile -cluster -persistent	-mapfile -cluster -persistent	-cluster -persistent	-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.

symvm

Displays the virtual configuration information. Lists and shows the running VMs. Lists and shows the datastores. Lists and shows the physical devices attached to the server and the VMs.

Syntax

```
symvm -h
symvm
    list [-server  <ServerName | ALL>] [-v]
    list [-server <ServerName | ALL> ] [-vm <VMname | ALL>]
    list [-server <ServerName | ALL>][-storage <StorageName | ALL>]
    [-v]
    list pd [-v]
    list [-server <ServerName | ALL>] -disks[-available  |  -mapped]
    [-sid <SymmID>] [-N <#>]
    list [-server <ServerName | ALL>] -gk [-sid <SymmID>][-mapped]
    [-vm <VMname>] [-N <#>]
symvm
    show [-server <ServerName>]
    show [-server <ServerName>] [-vm <VMname>]
    show [-server <ServerName>] [-storage <StorageName>]
    show [-pd <PDevName>]
symvm
    map [-server <ServerName>] [-VM <VMname>]
         -array_id <ArrayID>[-dev <DevID>   |
        [-devs <<SymDevStart>:<SymDevEnd> | <SymDevName>
        [,<<SymDevStart>:<SymDevEnd>
            <SymDevName>>...]>]
         -file <FileName> ]
    unmap [-server <ServerName>] [-VM <VMname>]
        -array_id <ArrayID>
       [-dev <DevID>   |
       [-devs <<SymDevStart>:<SymDevEnd> | <SymDevName>
       [,<<SymDevStart>:<SymDevEnd> |
          <SymDevName>>...]>]
         -file <FileName> ]
```

Description

The symvm command displays information about the virtualization environment. It can be configured to display VMware ESX or Microsoft HyperV information. You can map raw devices to VMs within the ESX server.

Arguments

Name	Description
list	Lists all servers defined on the authorization file.
map	Maps a physical device or a range of devices to a VM.
show	Shows detailed information about a specific server or a VM or a storage or a virtual disk.
unmap	Unmaps a physical device or a range of devices from a VM.

Keywords

Name	Description
pd	Lists all virtual devices that are visible to the current VM.

Options

Name	Description
-available	Lists all devices that are not mapped to any VM or used in any storage.
-array_id	Specifies the array ID.
-dev	Specifies the device number to map.
-devs	Specifies a set of Symmetrix device ranges and/or individual Symmetrix devices.
-disks	Lists all devices that are visible to the server.
-gk	Lists all Symmetrix gatekeeper devices that are visible to the server.
-mapped	Lists all devices that are either mapped to a VM or used in a named storage object.
-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.
-pd	Specifies a virtual disk.
-sid	Specifies a unique Symmetrix ID.
-storage	Specifies a storage name.
-v	Provides a more detailed, verbose listing.
-vm	Specifies a VM name.

Parameters

Name	Description
ArrayID	The Symmetrix or CLARiiON array ID.
DevEnd	The last device ID in a sequence.
DevID	The device ID.
DevStart	The first device ID in a sequence.
ServerName	The ESX or HyperV server name.
StorageName	The storage name. Datastore in VMware. Volume in HyperV.
SymmID	The 12-digit ID of the Symmetrix array.
VMname	The VM or guest name.

Return Codes

Value	Code Symbol	Description
0	**CLI_C_SUCCESS**	
1	**CLI_C_FAIL**	

Examples

To list all available servers, enter:

```
symvm list -server ALL
```

To show details for a specific server, enter:

```
symvm list -server server_name -v
```

To list all disks that are visible to the server, enter:

```
symvm list -server server_name -disks
```

CHAPTER 2
Daemons

This section contains the daemon man pages. For details on how to set up and use the daemons, refer to the *EMC Solutions Enabler Installation Guide*.

storapid

The Base daemon.

Description

The storapid daemon is optional - and is run at the user's discretion.

The storapid daemon can be started in a number of ways:

- By default, all Symmetrix I/O operations are forwarded to the storapid. Therefore, the Solution Enabler libraries will automatically start the storapid the first time its services are needed.
- An administrator can explicitly start storapid as follows:

  ```
  stordaemon start storapid
  ```

- An administrator can arrange for the OS to automatically start storapid at system boot time as follows:

  ```
  stordaemon install storapid -autostart
  ```

The section below describes an options setting which causes a watchdog mechanism to monitor storapid - and automatically restart it when it crashes.

If storapid is running, the Solutions Enabler runtime libraries (SYMAPI, STORAPI) forward all I/O operations on Symmetrix storage arrays to it for processing.

Running the daemon provides the following benefits:

- Proxy. Applications need not run as root (UNIX), since I/O operations are performed by storapid which itself runs as root. See the security discussion below.
- Reliability. If an application crashes (or exits) while holding a Symmetrix External Lock (SEL) or a Device External Lock (DEL), storapid will automatically release the lock.
- Performance. Data returned from a Symmetrix array is maintained in internal cache tables, and subsequent requests for that data, if still current, returns from cache, rather than making an I/O request to the Symmetrix array for the data.
- Gatekeeper selection. Gatekeeper device management is provided for all SYMAPI/CLI clients requiring access to Symmetrix arrays, and for the GNS and RDF daemons. This alleviates contention when there are limited gatekeeper resources available and also eliminates the need for every client to constantly select, open, lock, and ping for an available gatekeeper device for every online function.

The storapid daemon only performs these I/O operations on behalf of local users who are authorized to use it:

- Privileged users (root on Unix, in the Administrator's group on Windows) are implicitly authorized to make use of storapid.

- Otherwise, users listed in the daemon_users authorization file are permitted to make use of storapid. This file is located in the following directory:

```
UNIX:     /var/symapi/config
Windows:  c:\Program Files\EMC\SYMAPI\config
```

  Within this file, user 'smith' is authorized by the following line:

```
smith     storapid
```

- For compatibility with prior releases, users can also be authorized to make use of storapid with an entry in the older bdmnusers file located in the same directory. Within this file, user 'smith' is authorized by the following line:

```
smith
```

It is important that both of these authorization files (daemon_users and bdmnusers) be adequately protected - so that they can only be modified by privileged users.

If a user is not authorized to make use of storapid, the Solutions Enabler libraries perform these I/O operations directly - in the context of the user/application.

The storapid daemon is supported on all Solutions Enabler platforms.

Options

The stordaemon command can be used to start, stop, and monitor the storapid daemon. See the stordaemon(3) man page for details.

A number of configuration options can be set in the daemon_options file located in the following directory:

```
UNIX:     /var/symapi/config
Windows:  c:\Program Files\EMC\SYMAPI\config
```

Some of the more commonly used options are the following:

Parameter	Allowed Values	Default	Description
storapid:data_ caching	`enable|disable`	The default setting is disable.	Enables or disables data caching ofSymmetrix configuration and statistical data,as defined by internal caching policies.
storapid:data_ compression	`enable|disable`	The default setting is disable.	Enables or disables the use of data compressionfor cached data.
storapid:inquiry_ timeout	`nn`	The default setting is 900 seconds (15 minutes.)	Indicates how long inquiry results remain in cachebefore expiring, and new data is retrieved fromthe host and array. A value of -1 indicates thedata never expires. A value of zero indicates thedata always expires.

Parameter	Allowed Values	Default	Description
storapid:base_timeout	nn	The default setting is 86400 (1 day.)	Indicates how long Symmetrix data categorized as'Base' remains in cache before expiring, andnew data is retrieved from the array. 'Base'results are considered those containingconfiguration type data that rarely changes.A value of -1 indicates the data never expires.A value of zero indicates the data always expires.
storapid:dynamic_timeout	nn	The default setting is 15 seconds.	Indicates how long Symmetrix data categorized as'dynamic' remains in cache before expiring, and new data is retrieved from the array.A value of -1 indicates the data never expires.A value of zero indicates the data always expires.'Dynamic' results are considered those containingconfiguration type data subject to frequent orconstant change.
storapid:statistics_timeout	nn	The default setting is 15 seconds.	Indicates how long Symmetrix data categorized as'statistics' remains in cache before expiring, andnew data is retrieved from the array. A valueof -1 indicates the data never expires. A value ofzero indicates the data always expires. This valueshould be adjusted, as necessary, to match thelowest interval (-i) used with CLI commands.

Diagnostics

Diagnostic messages are written to the log file storapid-yyyymmdd.log if the logfile_type option is set to 'dated', or to the log files storapid.log0 and storapid.log1. Log files are located in the following directory:

```
UNIX:     /var/symapi/log
Windows:  c:\Program Files\EMC\SYMAPI\log
```

See Also

stordaemon(3)

stordaemon

This command is used to control the EMC Solutions Enabler daemon processes. This can be used to start, stop, or query their status.

Syntax

```
stordaemon [-h]  [-scripting]
    list      [-v] [-running] [-all] [-brief][-exit_num_running]
    start     Daemon [-inst Inst] [-wait NumSecs] [-args ...]
    shutdown  Daemon | all [-immediate] [-abort] [-wait NumSecs]
    install   Daemon  [-autostart] [-inst Inst]
    uninstall Daemon
    show      Daemon
    showlog   Daemon [-lines NumLines]
    getvar    Daemon -name Var
    setvar    Daemon -name Var=Value
    action    Daemon -cmd ...
    setoption Daemon -name Option=Value [-force]
    setuser   Daemon | all -user User [-v]
    disable   all  [-duration NumMinutes]
    enable    all
```

Description

stordaemon is used to start, stop, query status from, or otherwise control, the Solutions Enabler daemons.

The available daemons are listed below. Additional information is contained in the specific documentation for each. Note that on certain platforms, only some of these daemons are supported.

Name	Description
storapid	Base API daemon
storgnsd	Group Name Services daemon
storrdfd	RDF daemon
storevntd	Event daemon
storsrvd	SYMAPI Server daemon
storwatchd	UNIX only: Watchdog daemon
storsrmd	SRM daemon
stororad	SRM daemon for Oracle DB

Name	Description
storora64d	SRM daemon for Oracle DB (64-bit)
storudbd	SRM daemon for UDB DB
storifmxd	SRM daemon for Informix DB
storsqld	SRM daemon for SQL DB
storsybs12d	SRM daemon for Sybase DB - version 12
storsybs12.5d	SRM daemon for Sybase DB - version 12.5
storsybs12.5_64d	SRM daemon for Sybase DB - version 12.5 (64-bit)

Note that stordaemon can only manage daemons installed on the local machine.

For the start and shutdown operations, stordaemon will wait for as many as 30 seconds for the specified daemon(s) to actually start or exit. The '-wait N' option can be used to specify a different value or to indicate that stordaemon should not wait at all.

Arguments

Name	Description
list	Lists daemons installed on the host - along with an indication ('*') of which are currently running.
start	Starts the daemon whose name is Daemon. Only privileged users (root or Administrator) can perform this operation.
shutdown	Shuts down the daemon whose name is Daemon. If 'all' is specified, all running daemons are stopped. Unless the '-immediate' option is specified as well, daemons will not actually terminate until any clients currently connected to them have first disconnected (e.g., exited). While in this 'shutdown pending' state, connections from new clients will not be accepted.
install	Installs the daemon whose name is Daemon. On Windows, this records the daemon within the Service Control Manager database. On UNIX, this has no effect unless the -autostart is supplied as well. If the -autostart flag is provided, the operating system is told to automatically start the daemon at system boot time. On Windows, the Service Control Manager handles this startup. On UNIX, this is done by creating an appropriate OS initialization script (e.g.: with Solaris, under /etc/init.d and /etc/rc3.d).
uninstall	Un-installs the daemon whose name is Daemon. On Windows, this removes the definition from the Service Control Manager database. On UNIX, the only effect is to undo any startup file changes that were made by a prior 'install -autostart' operation for the daemon.

Name	Description
show	Displays a status message for the daemon whose name is Daemon.
showlog	Displays the location of the log files used by the daemon whose name is Daemon. If the '-lines' option is specified, the contents of the log file display as well.
getvar	Retrieves a configuration setting for the running daemon whose name is Daemon. The name of the setting is given by the Var=Value parameter. The settings, if any, that can be changed for a daemon are detailed in the documentation for that daemon.
setvar	Changes a configuration setting for the running daemon whose name is Daemon. The name of the setting and its value are given by the Var=Value parameter. The settings, if any, that can be changed for a daemon are detailed in the documentation for that daemon.
action	Asks the daemon to perform some action. The action to be performed follows the '-cmd' option. The documentation for a daemon lists any operational actions supported by that daemon. Also, an action of 'help' for an individual daemon lists all supported actions.

setoption	Updates the daemon_options file with an options setting for the daemon. The name of the option and its value are given by the Option=Value parameter. By default, a line for this option (including the daemon name) must already be present in the daemon_options file -- perhaps commented out. For example, for the storapiddaemon and the XXX option:
	`# storapid:XXX = ...`
	`storapid:XXX = ...`
	
	The '-force' option can be supplied to override this behavior - adding the setting regardless of whether it is already present in the file.

setuser	This operation is only supported on UNIX platforms. By default, daemons on UNIX run as root - since they are installed with root as their owner and their setuid flags turned on. This operation can be used to re-configure a daemon to run under a different user identity. It does this by changing the owner of the daemon executable and re-protecting data files used by that daemon so that it will continue to have access to them. This is only supported for a subset of the daemons: storsrvd, storgnsd, storevntd and storwatchd. Specifying a daemon name of 'all' will cause all of these daemons to be processed. A restriction is that all daemons configured to run as something other than root must run as the same user identity. You cannot, for example, have one daemon run as 'sys' and another as 'bin'. The '-v' argument can be used to display details on the changes that are made.
disable	Disables subsequent daemon starts (e.g., via 'stordaemon start'). This operation is only supported with a daemon name of 'all' - applying to all

Name	Description
	daemons. Note that there is no effect on daemons that are already running. This operation is provided for use by the Solutions Enabler install scripts. Its use in other scenarios is strongly discouraged. The '-duration' option, if supplied, gives the number of minutes the disabled state will continue. This defaults to 60.
enable	Enables subsequent daemon starts - reversing the effect of an earlier 'disable' operation. This operation is only supported with a daemon name of 'all' -- applying to all daemons.

Options

Name	Description
-h	Displays help information.
-scripting	Omits any descriptive header messages. This may be useful in scripts when parsing output from stordaemon.
-v	Displays a status message for each running daemon when used with the list argument. Displays a detailed message for each file whose protections or owner has changed. Used with the setuser argument.
-brief	Displays only daemon names, 1 per line. Used with the list argument.
-running	Displays only currently running daemons. Used with the list argument.
-all	Displays all daemons - including those not installed on the local host. Used with the list argument.
-exit_num_running	Sets the stordaemon's exit status to the number of daemons that are currently running. Used with the list argument.
-wait	Waits up to this many seconds for the specified daemon to actually start or terminate. Used with the shutdown or start arguments. By default, this value is 30 (seconds). If a value if 0 is supplied, stordaemon will return immediately, instead of waiting for the daemon to start or terminate.
-inst	Starts one or more specific instances of a daemon when used with the start argument. Installs the specific instance of the daemon when used with the install argument. This option should rarely be needed. Refer to the documentation on each of the database daemons for information on when its use would be appropriate. This option can be used to start multiple instances of certain of the

Name	Description
	database daemons. Either one or more instance names can be specified - as shown below under the Inst parameter.
-args ...	Passes the remaining arguments to the daemon being started for its use. Refer to the documentation for each of the daemons to see which, if any, additional arguments they accept. This option must be the last stordaemon option. The first argument following this must begin with a '-'.
-cmd	Passes the remaining arguments to the daemon as a command to execute. Refer to the documentation for each of the daemons to see which, if any, commands they accept.
-immediate	Asks the specified daemon(s) to shutdown immediately. By default, it will wait for existing client connections to terminate before exiting. Used with the shutdown argument.
-abort	Sends the specified daemon(s) the KILL signal instead of asking them to shut themselves down. Only privileged users (root) can use this option. [Supported on UNIX only.]
-lines	Displays the end (tail) of the daemon's log file as well. If omitted, this defaults to 20. Used with the showlog argument.
-name	Specifies the name of the setting to change and its value. The Var=Value parameter is required. Used with the setvar argument.
-user	Sets the daemon to run as the specified user. Used with the setuser argument.
-autostart	Starts the daemon automatically at system boot time. Used with the install argument.
-force	Performs the operation even if the specified option is not already present within the daemon_options file - or if the daemon_options file does not exist. Used with the setoption argument.
-duration	Specifies the number of minutes to disable daemons. If omitted, this defaults to 60. Used with the disable argument.

Parameters

Name	Description
Inst	For the start argument: one or more daemon instance names, in a comma separated list. For example: '-inst 80' or 'inst 80,90,100'. As noted above, this parameter should rarely be needed. For the install argument: only a single name may be supplied.
NumSecs	For the shutdown argument: the maximum number of seconds to wait for the specified daemons to terminate.

Name	Description
Daemon	The daemon name, when used with the list argument. For the 'show', 'shutdown' and 'showlog' arguments, this daemon name must include any instance qualifier used to start the daemon. Refer to the examples below. For the 'shutdown' argument, the value "all" causes the operation to be performed on all running daemons.
NumLines	The number of lines to display from the end of the daemon's log file.
NumMinutes	The number of minutes to disable daemons. If omitted, this defaults to 60.
Var=Value	The name of the configuration setting to be changed and its value.
Option=Value	The name of the daemon option to be set along with its value.
User	The name of the user that the daemon is set to run as.

Return Codes

Code	Description
0	The operation succeeded.
1	There was a problem with the arguments supplied on the command line.
2	The operation failed.
5	The operation failed - due to an internal error.

Examples

To list all daemons that have been installed - along with an indication of which are currently running, enter:

```
stordaemon list
```

To list all daemons that are currently running - along with status information on each, enter:

```
stordaemon -running -verbose list
```

To start the stororad daemon and wait up to 5 seconds for it to come up, enter:

```
stordaemon -wait 5 start stororad
```

To start the stororad daemon with a specific instance qualifier, enter:

```
stordaemon -inst 80 start stororad
```

The daemon will have an actual name of stororad80.

To start two instances of the stororad daemon, enter:

```
stordaemon -inst 90,100 start stororad
```

These will be named stororad90 and stororad100.

To shut down the stororad daemon started previously, enter:

```
stordaemon shutdown stororad
```

To shuts down the '80' instance of the stororad daemon started previously, enter:

```
stordaemon shutdown stororad80
```

To shut down all running daemons - waiting up to 5 seconds for them to actually terminate, enter:

```
stordaemon -wait 5 shutdown all
```

To display a status message for the stororad daemon, enter:

```
stordaemon show stororad
```

To display the last 100 lines from the stororad daemon's log file, enter:

```
stordaemon showlog stororad -lines 100
```

To set the gns_remote_mirror option for the GNS daemon, enter:

```
stordaemon setoption storgnsd -name gns_remote_mirror=enable
```

To reconfigure the GNS daemon to run under the 'daemon' user identity, enter:

```
storgnsd setuser storgnsd -user daemon
```

storevntd

The Asynchronous Event daemon.

Description

The storevntd daemon acts as the clearing house for Solutions Enabler events on a host.

In most cases, events are first delivered by a producer the event daemon, and from there are forwarded to any client applications that have registered an interest in them.

In client/server mode, events are forwarded from the event daemon on the remote (server) host to the one on the local (client) host, and from there to client applications.

The event daemon itself generates (by polling in some cases) events related to Symmetrix and CLARiiON storage arrays.

The event daemon can also be optionally configured to monitor certain events and automatically log them sing one or more of the following mechanisms:

- SNMP traps to an SNMP management application
- A local log file
- Syslog (UNIX) or the Windows event log

An options file setting can initiate a watchdog mechanism to monitor storevntd - and automatically restart it if it crashes.

Only authorized users are permitted control the storevntd daemon:

- Privileged users (root on UNIX) are implicitly authorized.
- Otherwise, users must be listed in the daemon_users authorization file to be authorized. This file is located in the following directory:

  ```
  UNIX:     /var/symapi/config
  Windows:  c:\Program Files\EMC\SYMAPI\config
  ```

  Within this file, user 'smith' is authorized by the following line:

  ```
  smith     storevntd
  ```

The storevntd daemon is supported on Windows, UNIX, and z/OS platforms.

Options

The stordaemon command can be used to start, stop, and monitor the storevntd daemon. See the stordaemon(3) man page for details.

A number of configuration options can be set in the daemon_options file located in the following directory:

```
UNIX:     /var/symapi/config
Windows:  c:\Program Files\EMC\SYMAPI\config
```

Some of the more commonly used options are the following.

Parameter	Allowed Values	Default	Description
storevntd:symm_poll_interval	`nn`	The default setting is 60 seconds.	How often to poll Symmetrix arrays for events thatneed to be delivered.
storevntd:autorestart	`enable|disable`	The default setting is enable.	Whether to use a watchdog mechanism to automatically restart storevntd if it crashes.
storevntd:log_event_targets storevntd:log_symmetrix_events	`nn`	none	Whether to automatically log events and, if so,where.

Refer to the README.daemon_options file that is installed.

Diagnostics

By default, diagnostic messages are written to the log files storevntd.log0 and storevntd.log1, located in the following directory:

```
UNIX:     /var/symapi/log
Windows:  c:\Program Files\EMC\SYMAPI\log
```

See Also

stordaemon(3), storwatchd(3)

storgnsd

The Group Name Services (GNS) daemon.

Description

GNS is an optional feature. When enabled, it provides a global, distributed repository for DG and CG group definitions. Changes made to a group from one host are automatically visible to other hosts on which GNS is enabled.

GNS stores group definitions on Symmetrix arrays. Specifically, a group's definition is distributed across the arrays for which it contains devices.

The storgnsd daemon runs on each host for which GNS is enabled - and is responsible for providing GNS group semantics to other Solutions Enabler components on that host.

Typically, GNS use is enabled with the SYMAPI_USE_GNS option in the options file:

```
SYMAPI_USE_GNS     = ENABLE | DISABLE
```

The ENABLE setting enables GNS for all applications running on the host that are using the default SYMAPI database file.

By default, GNS use is disabled on a host.

The storgnsd daemon can be started in a number of ways:

- If GNS use is enabled, the Solution Enabler libraries will automatically start storgnsd the first time its services are needed.
- An administrator can explicitly start storgnsd as follows:

  ```
  stordaemon start storgnsd
  ```

- An administrator can set the OS to automatically start storgnsd at system boot time, as follows:

  ```
  stordaemon install storgnsd -autostart
  ```

An options setting can be set for a watchdog mechanism to monitor storgnsd and automatically restart it if it crashes.

If GNS is being used to maintain consistency groups within the RDF daemon, the SYMAPI_USE_GNS must be set to ENABLE at storgnsd start time. The use of storgnsd autorestart watchdog, along with the automatic start of storgnsd at system boot time, is important to ensure that storgnsd is always running.

Only authorized users are permitted to use GNS or control the storgnsd daemon:

- Privileged users (root on UNIX) are implicitly authorized.
- Otherwise, users must be listed in the daemon_users authorization file to be authorized. This file is located in the following directory:

  ```
  UNIX:     /var/symapi/config
  Windows:  c:\Program Files\EMC\SYMAPI\config
  ```

  Within this file, user 'smith' is authorized by the following line:

  ```
  smith     storgnsd
  ```

The storgnsd daemon is supported on Windows and UNIX platforms.

Options

The stordaemon command can be used to start, stop, and monitor the storgnsd daemon. See the stordaemon(3) man page for details.

A number of configuration options can be set in the daemon_options file located in the following directory:

```
UNIX:     /var/symapi/config
Windows:  c:\Program Files\EMC\SYMAPI\config
```

Some of the more commonly used options follow:

Parameter	Allowed Values	Default	Description
storgnsd:autorestart	`enable|disable`	enable.	Whether to use a watchdog mechanism to automatically restart storgnsd if it crashes.
storgnsd:gns_device_poll_interval	`nn`	none	How often storgnsd polls for group changes made from other hosts. The smaller this value is, the more quickly a host will recognize group changes made from a other hosts.
storgnsd:gns_ppath_poll_interval	`nn`	none	How often storgnsd checks whether the RDF daemon needs to be updated to reflect changes made to CGs stored within GNS.
storgnsd:gns_remote_mirror	`enable|disable`	disable.	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 groups are not mirrored.

Parameter	Allowed Values	Default	Description
			◆ Mirrors will not be created if the remote Symmetrix array is also directly attached to the local host. ◆ For CG groups, BCV type devices are not mirrored.
storgnsd:gns_rmtarr_update_interval	`nn`	none	If gns_enb_remote_mirror is set to enable, how often storgnsd attempts to propagate DG group changes over to remote (SRDF) Symmetrix arrays.
storgnsd:gns_shadow_file	`enable|disable|needed`	disable.	Whether storgnsd should maintain backup copies of GNS data for attached Symmetrix arrays. Refer to the section BACKUP SHADOW FILES below. If set to enable, backups are maintained for all local Symmetrix arrays. If set to needed, backups are only maintained for Symmetrix arrays with Enginuity versions lower than 5x71.
storgnsd:gns_init_remote_symms	`enable|disable`	enable.	If enabled (the default), GNS will initialize the GNS group repository on remote Symmetrix arrays while remotely mirroring groups (the above gns_remote_mirror option is

Parameter	Allowed Values	Default	Description
			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.

Refer to the README.daemon_options file for additional options, along with default values for storgnsd.

Backup Shadow Files

The gns_shadow_file option can be set to cause a GNS daemon to automatically maintain backups of GNS data from Symmetrix arrays. These files are written to the local disk as follows, where ‹SID› corresponds to a Symmetrix ID:

```
UNIX:    /var/symapi/gns/<SID>.shadow
Windows: c:\Program Files\EMC\SYMAPI\gns\<SID>.shadow
```

These files are overwritten each time a GNS daemon notices a change to group data on the Symmetrix array in question. GNS will automatically restore from them if it notices that the GNS repository on a Symmetrix array has been erased. **Note** that these backups will only be maintained for local arrays - not remote arrays.

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 they can see all the relevant Symmetrix arrays.

As an alternative to the automatic mechanism, backups to and restores from the shadow files can be manually triggered by invoking the storgnsd program as follows:

```
storgnsd backup -sid SID
          Generate a GNS backup file for the specified
          Symmetrix array.

storgnsd backup
          Generate a GNS backup file for all locally
          attached Symmetrix arrays.

storgnsd restore -sid SID [-noprompt]
          Restore GNS data to the specified Symmetrix
          array from a backup file previously created.
          Since this operation is destructive in nature,
          a positive confirmation is required before it
          will proceed. The -noprompt argument will,
          if present, cause this confirmation step to
          be skipped.
```

Notes:

- The storgnsd executable is located in the 'daemons' directory in the Solutions Enabler installation area.
- This manual mechanism will typically be most useful if the automatic mechanism is disabled, which it is by default.

  If the automatic mechanism is enabled, it makes sense to regularly backup the files that it generates to ensure that they will be available if needed for a future manual restore. This is because the automatic mechanism regularly overwrites these backup files.
- These commands can be issued while the GNS daemon is already running normally. If so, a restore operation will be noticed by the daemon the next time it polls that Symmetrix array. In some environments, it might make sense to invoke the backup operation from within a regularly scheduled 'cron' job.

Diagnostics

By default, diagnostic messages are written to the log files storgnsd.log0 and storgnsd.log1, located in the following directory:

```
UNIX:     /var/symapi/log
Windows:  c:\Program Files\EMC\SYMAPI\log
```

The style and maximum size of GNS log files can be controlled using options in the daemon_options file. Refer to daemon_options.README for additional information.

GNS space utilization on each Symmetrix array can be displayed with the following command:

```
stordaemon action storgnsd -cmd list -freespace
```

Although very unlikely, it is possible for the GNS data on a Symmetrix array to become corrupt if I/O errors occur in the middle of certain critical updates to it. While in such a state, GNS operations to that Symmetrix array will fail. This can be recognized by the presence of CORRUPT errors in the log file and will also be indicated by the output produced by the freespace command. In such cases, a 'fsck' like repair operation can be initiated using the following command. This can be performed while the GNS daemon is already running normally:

```
storgnsd repair -sid SID
```

Alternatively, a restore operation can be initiated as previously described to recover from the damage.

In extreme circumstances, the following command can be used to fully reinitialize the GNS data area on a given Symmetrix array. Use this command with extreme care:

```
storgnsd reset -sid SID
```

Security Notes

Only privileged users are allowed to perform the administrative operations previously discussed:

```
storgnsd backup
storgnsd restore
storgnsd reset
storgnsd repair
```

If User Authorization is enabled for a Symmetrix array, the user performing the command must be assigned a role of Admin or StorageAdmin. Refer to the documentation for the symauth command.

If User Authorization is not enabled for a Symmetrix array, the user must be the super-user (UNIX) or have Administrative privileges (Windows).

See Also

stordaemon(3), storwatchd(3), symauth(1)

storhorcmd

A daemon/service for starting the HORCM manager on Windows.

Description

To manage HDS storage arrays, the HORCM manager, provided by the hardware vendor (HP) must be running.

By default, SYMAPI communicates with this HORCM manager as needed to discover and operate on these arrays. If you are running the SYMAPI storapid base daemon, however, Windows security mechanisms prevent this daemon from communicating with the HORCM manager as it is normally started.

In this scenario, the storhorcmd daemon can be used to start the HORCM manager as a Windows Service, enabling storapid to communicate with it.

Arguments

The stordaemon command should be used to start, stop, and monitor the storhorcmd daemon. See the stordaemon(3) man page for details. The service control manager can also be used to start the storhorcmd service.

Specific startup arguments are supplied to storhorcmd by placing them after the -args parameter to stordaemon.

Multiple instances of the HORCM manager can run at the same time; each with a different instance number. During STORAPI discovery, a discovery profile is supplied that indicates the instance to be used. The storhorcmd daemon can be told to start a specific instance of the HORCM manager in either of the following two ways:

- Option setting in the c:\Program Files\EMC\SYMAPI\config\daemon_options file:

```
storhorcmd:horcm_inst   =  INST#
```

- Command line argument - supplied with stordaemon:

```
stordaemon start storhorcmd ... -args INST#
```

The storhorcmd daemon needs the location of the binaries used to start and stop the HORCM manager (horcmstart.exe and horcmshutdown.exe). By default, it consults the Windows Registry for a HORCM installation location and, if that fails, tries a default location of c:\HORCM. The storhorcmd daemon can be given a nonstandard installation location in either of the following two ways:

- Option setting in the c:\Program Files\EMC\SYMAPI\config\daemon_options file:

```
storhorcmd:horcm_path   =  PATHNAME
```

- Command line argument - supplied via stordaemon:

```
stordaemon start storhorcmd ... -args -path PATH
```

Note that the PATH is the installation location. The needed binaries (horcmstart.exe) are located in the etc' sub-directory below this.

Diagnostics

Diagnostic messages are written to the log files storhorcmd.log0 and storhorcmd.log1, located by default in the following folder:

```
c:\Program Files\EMC\SYMAPI\log
```

Notes

The storhorcmd daemon runs as a Windows service. After it is installed and started the first time, it appears in the service list dialog box as `EMC storhorcmd` and can be accessed by clicking on the services icon in the control panel (Windows NT) or the administrative tools icon (Windows 2000). The system administrator can modify the startup options in the service list dialog box to start the daemon automatically at boot time.

See Also

stordaemon(3), StorInstanceDiscover(3)

storifmxd

The daemon for IBM Informix Dynamic Server database mapping and control.

Description

The storifmxd SRM API facility significantly improves communication between applications and Informix Dynamic database servers. It runs as a UNIX daemon that forwards requests from the application's API function calls to the IBM Informix database server, and returns the results back to the application. Applications will use the daemon if it is running. The daemon starts automatically when an application issues the SymDbConnect() call to connect to a database instance. Some of the primary benefits of the daemon include:

- Performance: Most database mapping functions are significantly faster because of the persistent database connection, faster communication mechanism, and multi-threaded design.
- Ease of Use: Applications no longer have to execute as a privileged user. The storifmxd daemon must be started by a privileged user.

The daemon only supports local client connections; the application must either run on the same host or run on a different host and connect to a SYMAPI server that is local to the daemon. The application can not communicate directly with a daemon on another host.

Arguments

The stordaemon command can be used to start, stop, and monitor the storifmxd daemon. See the stordaemon(3) man page for details. The default behavior is to start the daemon automatically from the SymDbConnect() API, however, you can also start the daemon using the stordaemon command.

Files

If the -log option is used with the stordaemon start command, a log file will be created with the specified name and path. The daemon, when started without the -log option, logs messages in a file that resides in the directory /var/symapi/log. The filename is constructed using the daemon name and the INFORMIXSERVER environment variable that is used to start the daemon. For example, if an informix daemon is associated with the INFORMIXSERVER ifmx73, then the daemon named storifmxdifmx73 will log to files named storifmxdifmx73.log0 and storifmxdifmx73.log1.

Diagnostics

The daemon log file may contain information that may be helpful in diagnosing problems. To enable additional logging, the daemon configuration file can be used, and the variables debug and pdsdebug may be set to appropriate values depending on the extent of logging required. Additionally, the SYMAPI log file may also contain useful information for resolving problems.

Notes

If the daemon cannot be started, applications will use the old mechanism to communicate with IBM Informix Dynamic Server. If an application has already connected using the daemon and the daemon is stopped, the application will continue to run using the old mechanism. If an application has already connected with the old mechanism and the daemon is started, the application will automatically switch to using the daemon. This behavior is true only when the applications have calls that work with the old mechanism and the daemon and does not apply to calls like SymDbSqlExecute() which work only with the daemon.

It is necessary to set the LD_LIBRARY_PATH, SHLIB_PATH or LIBPATH environment variable to two IBM Informix Dynamic Server library directories ($INFORMIXDIR/lib and $INFORMIXDIR/lib/esql) when starting the daemon.

It is not necessary to set the INFORMIXDIR, ONCONFIG or INFORMIXSERVER environment variables when starting the daemon. When the application calls SymDbConnect() or StorDbConnect(), these values will be:

1. Retrieved from the application's environment.
2. Forwarded with the connection request to the daemon.
3. Set by the daemon in its own environment.
4. Retrieved by IBM Informix Dynamic Server's client connection code from the daemon's environment.

The database connection is maintained by a thread in the daemon until the application calls SymDbDisconnect or StorDbDisconnect.

The $INFORMIXDIR/etc/sqlhosts file should contain an entry for the Informix server that specifies TCP/IP (onsoctcp) as the communication protocol. Informix does not allow a single process to have multiple connections to a server using the shared memory (onipcshm) protocol. Since the database daemon uses threads to support multiple connections, a second or subsequent connection request will fail. Currently, any daemon connection request that fails will be retried with the old mechanism so the application should continue running. However, the old mechanism may be retired in the future, in which case the connection request would fail.

The daemon started automatically by the API SymDbConnect() is associated with the database instance specified by INFORMIXDIR, INFORMIXSERVER, and ONCONFIG variables. Applications that have the same setting for INFORMIXDIR, INFORMIXSERVER, and ONCONFIG are serviced by the daemon so started. For example: If the user has INFORMIXDIR set to /db/informix/7.3, INFORMIXSERVER set to ifmx73, and ONCONFIG set to onconfig.ifmx73, then a daemon named storifmxdifmx73 is started. Applications that have the same settings for INFORMIXDIR, INFORMIXSERVER, and ONCONFIG will use the daemon storifmxdifmx73. Applications that have different settings for the environment variables will start a different daemon. The INFORMIXDIR, INFORMIXSERVER, and ONCONFIG together determine the daemon that services the application.

See Also

stordaemon(3)

stororad

daemon/service for Oracle database mapping and control.

Description

The stororad SRM API facility significantly improves communication between applications and Oracle database servers. It runs as a UNIX daemon or Windows service that forwards requests from the application's API function calls to the Oracle database server and returns the results back to the application. Applications will use the daemon if it is running. The daemon starts automatically when an application issues the SymDbConnect() call to connect to a database instance. Some of the primary benefits of the daemon include:

- Performance: Most database mapping functions are significantly faster because of the persistent database connection, faster communication mechanism, and multi-threaded design.
- Ease of Use: Applications no longer have to execute as a privileged user.

The daemon only supports local client connections; the application must either run on the same host, or run on a different host and connect to a SYMAPI server that is local to the daemon. The application can not communicate directly with a daemon on another host.

Arguments

The stordaemon command can be used to start, stop, and monitor the stororad daemon. See the stordaemon(3) man page for details. On Windows, the service control manager can also be used to start the stororad service. The default behavior is to start the daemon automatically from the SymDbConnect() API, however if the user can start the daemon using the stordaemon command.

Files

If the -log option is used with the stordaemon start command, a log file will be created with the specified name and path. The daemon, when started without the -log option, logs messages in a file that resides in the directory /var/symapi/log. The filename is constructed using the daemon name and the ORACLE_SID environment variable that is used to start the daemon. For example, if an Oracle daemon is associated with the ORACLE_SID orcl8, then the daemon named stororadorcl8 will log to files named stororadorcl8.log0 and stororadorcl8.log1.

Diagnostics

The daemon log file may contain helpful information for diagnosing problems. To enable additional logging, the daemon configuration file can be used and the variables debug and pdsdebug may be set to appropriate values, depending on the extent of logging required. Additionally, the SYMAPI log file may also contain useful information for resolving problems.

Notes

If the daemon cannot be started, applications will use the old mechanism to communicate with Oracle. If an application has already connected with the daemon and the daemon is stopped, the application will continue to run using the old mechanism. If an application has already connected with the old mechanism, and the daemon is started, the application will automatically switch to using the daemon. This behavior is true only when the applications have calls that work with the old mechanism and the daemon, and does not apply to calls like SymDbSqlExecute(), which work only with the daemon.

For applications that need to connect to 64 bit Oracle instances, the stororа64d daemon will be used.

On the Windows platform, stororad will run as a service. After the service is installed, it appears in the service list dialog box as stororad, and can be accessed by clicking on the services icon in the control panel (Windows NT) or the administrative tools icon (Windows 2000). The system administrator can modify the startup options in the service list dialog box to start the daemon automatically at boot time.

It is not necessary to set the ORACLE_HOME and ORACLE_SID environment variables when starting the daemon. When the application calls SymDbConnect() or StorDbConnect(), the values will be:

1. Retrieved from the application's environment.
2. Forwarded with the connection request to the daemon.
3. Set by the daemon in its own environment.
4. Retrieved by Oracle's client connection code from the daemon's environment.

The database connection is maintained by a thread in the daemon until the application calls SymDbDisconnect or StorDbDisconnect. The autostart mechanism requires all the applications to set the appropriate environment variables required to communicate to the database.

The daemon started automatically by the API SymDbConnect() is associated with the database instance specified by ORACLE_HOME and ORACLE_SID. Applications that have the same setting for ORACLE_HOME and ORACLE_SID are serviced by the daemon as started. For example: If the user has ORACLE_HOME set to /db/oracle/8.0.6 and ORACLE_SID set to orcl8, a daemon named stororadorcl8 is started. Applications that have the same settings for ORACLE_HOME and ORACLE_SID will use the daemon stororadorcl8. Applications that have different settings for the environment variables will start a different daemon. The ORACLE_HOME and ORACLE_SID together determine the daemon that services the application.

See Also

stordaemon(3)

storrdfd

An RDF consistency daemon.

Description

The RDF daemon is an optional feature that provides consistency for SRDF/A MSC and RDF-ECA composite groups in multi-Symmetrix array environments.

RDF consistency protection is enabled when an application enables a composite group for MSC or RDF-ECA protection. When providing MSC consistency protection, the RDF daemon performs MSC cycle switching and cache recovery for all Symmetrix arrays participating in the RDF consistency- enabled composite groups. When providing RDF-ECA protection, the RDF daemon monitors ECA trip events and propagates any ECA trips to all devices on all Symmetrix arrays participating in the RDF consistency-enabled composite group.

The storrdfd daemon runs on each host for which RDF consistency is required. If GNS is enabled, the RDF daemon relies on GNS to propagate composite group definitions to all pertinent hosts. If GNS is not enabled, the user must explicitly create the exact same composite group definitions on each participating host. See the storgnsd(3) man page for details on GNS usage.

The storrdfd daemon can be started in a number of ways:

- If not already started, the Solutions Enabler libraries will automatically start storrdfd the first time its services are needed. In other words, the first time a compostie group is enabled for RDF consistency.
- An administrator can explicitly start storrdfd as follows:

  ```
  stordaemon start storrdfd
  ```

- An administrator can arrange for the OS to start storrdfd automatically at system boot time, as follows:

  ```
  stordaemon install storrdfd -autostart
  ```

The watchdog daemon is required by the RDF daemon to automatically restart it if it crashes.

Only authorized users are permitted to use the RDF daemon or control the storrdfd daemon:

- Privileged users (root on UNIX) are implicitly authorized.
- Otherwise, users must be listed in the daemon_users authorization file to be authorized. This file is located in the following directory:

  ```
  UNIX:     /var/symapi/config
  Windows:  c:\Program Files\EMC\SYMAPI\config
  ```

  Within this file, user smith is authorized in the following line:

  ```
  smith     storrdfd
  ```

The storrdfd daemon is supported on Windows and UNIX platforms.

Arguments

The stordaemon command can be used to start, stop, and monitor the storrdfd daemon. See the stordaemon(3) man page for details.

A number of configuration options can be set in the daemon_options file located in the following directory:

```
UNIX:     /var/symapi/config
Windows:  c:\Program Files\EMC\SYMAPI\config
```

Some of the more commonly used options are the following:

```
storrdfd:logfile_size = nn
```

Where nn is the maximum size (in KB) that the RDF daemon's log file is permitted to grow to before wrapping.

Refer to the README.daemon_options file for additional options, along with default values that storrdfd uses.

Diagnostics

Diagnostic messages are written to the log files storrdfd.log0 and storrdfd.log1, located in the following directory:

```
UNIX:     /var/symapi/log
Windows:  c:\Program Files\EMC\SYMAPI\log
```

See Also

stordaemon(3), storwatchd(3), storgnsd(3)

storsqld

A service for Microsoft SQL Server database mapping and control.

Description

The storsqld SRM API facility significantly improves communication between applications and Microsoft SQL Server database servers. It runs as a Windows service that forwards requests from the application's API function calls to the Microsoft SQL Server database server, and returns the results back to the application. Applications will use the service if it is running. The service starts automatically when an application issues the SymDbConnect () call to connect to a database instance. Some of the primary benefits of this daemon include:

- Performance: Most database mapping functions are significantly faster because of the persistent database connection, faster communication mechanism, and multi-threaded design.
- Ease of use: Applications no longer have to execute as a privileged user. The storsqld service must be started by a privileged user.
- Reliability: Database control functions are more reliable because the service creates a separate connection thread that maintains a persistent database connection across database freeze/thaw operations. This avoids problems when a database is frozen and the application is unable to reconnect to thaw the database.

The service only supports local client connections, so the application must either run on the same host, or run on a different host and connect to a SYMAPI server that is local to the service. The application can not communicate directly with a service on another host.

Arguments

The stordaemon command can be used to start, stop, and monitor the storsqld service. See the stordaemon(3) man page for details. In addition, the service control manager can also be used to start the storsqld service. The default behavior is to start the service automatically from the SymDbConnect() API, however, you can start the service using the stordaemon command.

Files

If the -log option is used with the stordaemon start command, a log file will be created with the specified name and path. The daemon, when started without the -log option, logs messages in a file that resides in the directory C:\Program Files\Emc\symapi\log. The log filename is constructed using the service name. The storsqld service will log to files named storsqld.log0 and storsqld.log1

Diagnostics

The service log file may contain helpful information for diagnosing problems. To enable additional logging, the daemon configuration file can be used and the variables debug and pdsdebug may be set to appropriate values, depending on the extent of logging required. Additionally, the SYMAPI log file may also contain useful information for resolving problems.

Notes

If the service cannot be started, applications will use the old mechanism to communicate with Microsoft SQL Server. If an application has already connected with the service and the service is stopped, the application will continue to run using the old mechanism. If an application has already connected with the old mechanism and the service is started, the application will automatically switch to using the service.

The storsqld daemon runs as a service. After the service is installed, it appears in the service list dialog box as EMC storsqld and can be accessed by clicking the the services icon in the control panel (Windows NT), or the administrative tools icon (Windows 2000). The system administrator should modify the startup options in the service list dialog box to start the service automatically at boot time.

The database connection is maintained by a thread in the service until the application calls SymDbDisconnect() or StorDbDisconnect().

See Also

stordaemon(3)

storsrmd

The daemon service for SRM operations. The storsrmd64 daemon is for 64-bit operating systems.

Description

The storsrmd SRM API facility allows non-root or non-administrator users to perform SRM operations. The storsrmd daemon service can be started in different ways:

- A root or administrator can explicitly start storsrmd as follows:

```
stordaemon start storsrmd (or storsrmd64)
```

- On Unix systems storsrmd daemon automatically starts when the user is non-root or non-administrator, and SRM API functions requiring root or administrator privilege for the operation are called. On the other hand, on Windows storsrmd runs as a service. It needs to be up and running for SRM API calls that requires administrator privileges for the operation.

One of the primary benefits of the SRM daemon is that SRM applications no longer have to execute as a root or administrator user.

The SRM daemon only performs the operations on behalf of local users who are authorized to use it:

- Privileged users (root on UNIX, in the Administrator's group on Windows) are implicitly authorized without using storsrmd (or storsrmd64 in 64-bit).
- Otherwise, users listed in the daemon_users authorization file are permitted to make use of storsrmd. This file is located in the following directory:

```
UNIX:     /var/symapi/config
Windows:  c:\Program Files\EMC\SYMAPI\config
```

  Within this file, user smith is authorized with the following line:

```
 smith     storsrmd
```

If users are permitted to do certain SRM control operations, the following line needs to be added to daemon_users:

```
smith     storsrmd    <control operation>
```

There are a list of SRM control operations listed in the daemon_users file. There are currently 16 control operations for SRM daemons.

To use certain operations, a non-root user also must have operating system-level permissions, for example:

- Only permits root user access: -rwx------ root other /usr/vxfs/root.bin
- Permits user smith and root access: -rwx------ smith symapi /usr/vxfs/smithroot.bin
- Permits all users access: -rwxrwxrwx root other /usr/vxfs/allusers.bin

(Assume -rwxrwxrwx for /usr and /usr/vxfs)

It is important that the authorization files (daemon_users) be adequately protected, therefore they can only be modified by privileged users.

The SRM daemon is supported on AIX, Solaris, HP-UX, Windows, OSF1, and Linux platforms.

The daemon only supports local client connections, therefore the application must either run on the same host, or run on a different host and connect to a SYMAPI server that is local to the daemon. The application cannot communicate directly with a daemon on another host.

Options

The stordaemon command can be used to start, stop, and monitor the storsrmd daemon. See the stordaemon(3) man page for details.

A number of configuration options can be set in the daemon_options file located in the following directory:

```
UNIX:     /var/symapi/config
Windows:  c:\Program Files\EMC\SYMAPI\config
```

Diagnostics

The daemon log file may contain information that may be helpful in diagnosing problems. To enable additional logging, the daemon configuration file can be used and the variables debug and pdsdebug may be set to appropriate values depending on the extent of logging required. Additionally, the SYMAPI log file may also contain useful information for resolving problems.

Diagnostic messages are written to the log file storsrmd-yyyymmdd.log if the logfile_type option is set to dated, or to the log files storsrmd.log0 and storsrmd.log1. Log files are located in the following directory:

```
UNIX:     /var/symapi/log
Windows:  c:\Program Files\EMC\SYMAPI\log
```

Notes

For a 64-bit application, it will automatically use the 64-bit SRM daemon (storsrmd64). User may also use stordaemon to start the 64-bit SRM daemon.

See Also

stordaemon(3)

storsrvd

The SYMAPI server daemon.

Description

The storsrvd daemon replaces symapisrv as the provider of SYMAPI services to remote clients. Storsrvd listens for SYMAPI sessions from remote clients and also responds to management requests from authorized users of the stordaemon command on the same host.

The storsrvd daemon can be started in a number of ways. An administrator can explicitly start storsrvd, as follows:

```
stordaemon start storsrvd
```

An administrator can arrange for the OS to automatically start storsrvd at system boot time as follows:

```
stordaemon install storsrvd -autostart
```

To enable the storwatchd daemon monitor feature that restarts storsrvd when it crashes, the autorestart option in the daemon_options file is used. Refer to the daemon_options file in the Solutions Enabler configuration directory for more information.

The storsrvd daemon is supported on all Solutions Enabler platforms.

Logging

The storsrvd daemon uses the common logging infrastructure of all Solutions Enabler daemons. You can find log files under:

```
UNIX:     /var/symapi/log
Windows:  c:\Program Files\EMC\SYMAPI\log
```

The storsrvd log files by default operate as a pair of files which alternate, switching from one to the other as the size reaches an installation chosen limit. By default, you will see:

```
storsrvd.log0 and storsrvd.log1
```

If you choose to use dated logs. storsrvd will write to a single file per day, switching on first write to the log after midnight. In this case you will see one or more files of this form:

```
storsrvd-yyyymmdd.log
```

Refer to the daemon_options file log_filetype option for more information on using dated logs. Logging volume is controlled using the following options:

```
log_level controls inclusion of log messages based on
severity:

    debug, info, warning, error, critical

log_filter controls the inclusion of log messages based
on category. The categories used by storsrvd are:
```

Category	Description
SERVER:	High level events related to general server operation.
SESSION:	Show events that track SYMAPI session arrival and termination.
APIREQ:	Show events that track SYMAPI API request arrival and termination. This setting can cause a high volume of log output.
CONTROLS:	Show events that relate to execution of management commands.
TCPIP:	Show network events.

For more information on logging volume controls, refer to the daemon_options file. Refer also to the description of the log_show_category option shown below.

All log messages issued by the core storsrvd logic use a message identifier prepended to the message text. You will see 'ANRnnnnX' which clearly identifies messages issued by storsrvd and distinguishes them from common daemon log messages. In the message identifier, 'nnnn' is a decimal number, and 'X' corresponds to the severities listed above in the log_level item. The storsrvd log messages are documented in the Solutions Enabler Installation Guide. In the guide, each message contains a description of the circumstances under which the message is issued, and what action must be taken, if any is necessary.

Authorization

SYMAPI Sessions - NETHOST FILE

An optional file, listing trusted hosts and users can be placed in the Solutions Enabler configuration directory on the host where storsrvd runs. Create the file 'nethost' in:

```
UNIX:     /var/symapi/config
Windows:  c:\Program Files\EMC\SYMAPI\config
```

The server uses the nethost file to authorize incoming client connections from applications that are executing remote SYMAPI functions. If this file exists, then only the nodes and users entered in the file will be allowed to connect to the server to execute remote API functions. If this file does not exist, then all SYMAPI clients are allowed to connect to the SYMAPI server.

The valid formats of an entry are as follows:

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

(where * means wildcard for any host or any user)

Note:  For readability and maintainability when
       specifying a long list of users, the node or
       address can be repeated with additional user
       names listed.
```

CONTROL sessions - daemon_users

Designated users can interact with the storsrvd daemon using the stordaemon command. All control commands are authorized in one of the following ways.

Privileged users (root on UNIX, in the Administrator's group on Windows) are implicitly authorized to use stordaemon to manage storsrvd.

Otherwise, users listed in the daemon_users authorization file are permitted to manage storsrvd. This file is located in the Solutions Enabler configuration directory:

```
UNIX:     /var/symapi/config
Windows:  c:\Program Files\EMC\SYMAPI\config
```

Each user listed in daemon_users may be authorized for one or more daemons. For complete instructions on the use of daemon_users authorization, visit the file as described in the previous paragraph.

It is important that the daemon_users authorization file be adequately protected, therefore it can only be changed by privileged users.

Actions

The stordaemon command can be used to start, stop, and monitor the storsrvd daemon. Refer to the stordaemon(3) man page for details. Through stordaemon, storsrvd will respond to the base commands supported by all daemons and will support a set of extended commands using the stordaemon action command.

stordaemon action storsrvd -cmd reload Re-reads the storsrvd section for changed options (see also stordaemon setvar).

stordaemon action storsrvd -cmd list -sessions Displays a list of currently active SYMAPI sessions.

stordaemon action storsrvd -cmd show -sessions [-num nnn] Displays the details for a specific session (if -num nnn' is specified) or for all active SYMAPI sessions.

Options

A number of configuration options can be set in the daemon_options file located in the following directory:

```
UNIX:     /var/symapi/config
Windows:  c:\Program Files\EMC\SYMAPI\config
```

Storsrvd supports all the common daemon options for logging, auto-restart, and debugging data. In addition, the options specific to storsrvd are shown below:

Parameter	Allowed Values	Default Value	Descrip-tion
storsrvd:port	nnnn	The default is 2707.	Specifies a positive decimal number less than 65536,

Parameter	Allowed Values	Default Value	Description
			indicating on what TCP/IP port storsrvd will listen for remote client connections.
`storsrvd:security_level`	NON-SECURE | ANY | SECURE	The default depends on the platform and is documented at http://e-labnavigator.EMC.com	Specifies the desired security level to apply to remote connections.
`storsrvd:log_show_category`	enable | disable	The default value is disable.	Enables or disables the display of the category used for each storsrvd numbered log message.

See Also

stordaemon(3), storapid(3)

storstpd

The STP statistics collection daemon.

Notice

When upgrading to newer versions of Solutions Enabler the daemon_options is not overwritten and should be compared to the README.daemon_options file, which will contain all new options.

Description

The storstpd daemon is an optional feature and is used to collect raw performance counters for a Symmetrix, directors, devices, disks, ports, LRU, RDFA, ORS, device groups, and cache partitions. These counters are collected according to criteria defined in the daemon_options file, and stored in a TTP formated ASCII file stored in the following location:

```
UNIX:     /var/symapi/stp
Windows:  c:\Program Files\EMC\SYMAPI\stp
```

The storstpd daemon can be started in a number of ways. An administrator can explicitly start storstpd as follows:

```
stordaemon start storstpd
```

An administrator can arrange for the OS to automatically start storstpd at system boot time as follows:

```
stordaemon install storstpd -autostart
```

As described below, an options setting can be set which causes a watchdog mechanism to monitor storstpd - and automatically restart it if it crashes.

Once running, the user (an administrator) can communicate with the storstpd daemon using the stordaemon CLI.

With Solutions Enabler V6.5 and higher, storsptd also provides collection services to SMC and SPA clients.

Overview

The storstpd daemon is the Solutions Enabler performance statistics collector that provides collection service to multiple applications, including TTP, SMC, and SPA. Like all Solutions Enabler daemons, the storstpd daemon is manipulated using the stordaemon command line utility.

Common Collector:

A common collector is used for efficiency and to reduce host and Symmetrix resource consumption. The common collector gathers performance metric data at regular intervals and application packagers provide the collected data to the different applications supported (TTP, SMC, SPA).

Options

The stordaemon command can be used to start, stop, install, and show the storstpd daemon. See the stordaemon(3) man page for more details.

There are a number of configuration options which can be set using stordaemon setoption command or editing the daemon_options file located in the following directory:

```
UNIX:     /var/symapi/config
Windows:  c:\Program Files\EMC\SYMAPI\config
```

Storstpd Daemon

The storstpd daemon has many options, which can be modified using the stordaemon setoption command:

```
stordaemon setoption storstpd -name option_name=option_value
```

Options that are specific to the operation of the daemon itself include:

Option	Default Value
dmn_service_processor_delay	9 minutes (SP only)
dmn_run_spa	Enabled (not on service processor)
dmn_run_smc	Enabled (allowed on service processor)
dmn_run_rtc	Enabled (not on service processor)
dmn_run_ttp	Disabled
dmn_run_ttp_on_sp	Enabled
dmn_root_location	Unix: `/var/symapi/stp` Windows: `c:\Program Files\EMC\SYMAPI\stp`
dmn_symmids	Specifies which arrays to collect for. Default is null (collect for all arrays).
dmn_remote_mode	Disabled (not on service processor) Runs storstpd in remote mode.
dmn_remote_address	The IP address of remote host.
dmn_remote_port	The IP port of remote host.

Symmetrix Performance Analyzer (SPA)

Symmetrix Performance Analyzer is an offering from EMC for analyzing array performance. SPA communicates directly to storstpd, which sends metric data to the SPA Data Management Facility. For information regarding SPA, contact your local EMC Sales representative.

Starting with Solutions Enabler V7.1, storstpd also sends a small set of Symmetrix director performance statistics to SPA in real-time.

Options that are specific to the operation of the real-time collector include:

Option	Default Value
rtc_collect_interval	2 seconds

Symmetrix Management Console (SMC)

The storstpd daemon supports SMC's QOS monitor by sending specific performance statics for system-level metrics, cache partition metrics, and device group metrics, through event postings to the event daemon, then to all clients which are registered for those types of events. Currently, only the QOS monitor has this capability.

Options that are specific to the operation of the SMC collector include:

Option	Default Value
smc_collect_interval	5 Minutes

The smc_collect_interval can be 2, 3, 4, 5, 10, or 15 minutes.

TTP Options:

TTP provides performance collection data to external tools such as STP Navigator and SymmMerge.

Options that are specific to the operation of the ttp collection include:

Option	Default Value
ttp_symmids	N/A
ttp_dev_groups	N/A
ttp_audit_log	Enabled
ttp_config_db	Enabled
ttp_retention_policy	Enabled
ttp_retention_days	30
ttp_disk_space_threshold	80
ttp_collection_interval	15
ttp_collect_iterations	0
ttp_archive_time	00:00
ttp_archive_interval	4
ttp_sys_metrics	Enabled
ttp_dev_metrics	Enabled
ttp_dir_metrics	Enabled
ttp_disk_metrics	Enabled
ttp_port_metrics	Enabled

Option	Default Value
ttp_lru_metrics	Disabled
ttp_rdfa_metrics	Enabled
ttp_ors_metrics	Enabled
ttp_cpt_metrics	Disabled
ttp_rdfsys_metrics	Enabled
ttp_rdfdir_metrics	Enabled
ttp_rdfdev_metrics	Enabled
ttp_rdfgrp_metrics	Enabled
ttp_se_tcp_metrics	Disabled
ttp_se_nw_metrics	Disabled
ttp_se_nwi_metrics	Disabled
ttp_re_sg_metrics	Disabled
ttp_re_nwc_metrics	Disabled

The ttp_collection_interval can be 1, 2, 3, 4, 5, 10, or 15 minutes.

NOTE:

A ttp_collection_interval of less than 5 minutes on the service processor is intended for Speed Guru purposes and is used at one's own peril.

ACTIONS (TTP only):

The storstpd daemon supports the following action commands for controlling TTP collection. Action commmands, invoked using the stordaemon action command, are used as follows:

```
stordaemon action storstpd -cmd start
   Starts a TTP collection based on the current defined options
   if a collection is not currently running.

stordaemon action storstpd -cmd stop
   Stops all TTP collections currently running.

stordaemon action storstpd -cmd archive
   Closes all open (running) TTP collection files, opens new
   TTP collection files, and continues with TTP collection.

stordaemon action storstpd -cmd restart
   Stops the current TTP collections, closes all TTP data
   files, refreshes options to current daemon_options, and
   starts a new TTP collection.
```

The storstpd daemon is supported on Windows and UNIX platforms.

Diagnostics

By default, diagnostic messages are written to the log files storstpd.log0 and storstpd.log1, located in the following directory:

```
UNIX:     /var/symapi/log
Windows:  c:\Program Files\EMC\SYMAPI\log
```

The style and maximum size of storstpd log files can be controlled with options in the daemon_options file. Refer to daemon_options.README for additional information.

See Also

stordaemon(3)

storsybs11d

The daemon for Sybase Adaptive Server database mapping and control.

Description

The storsybs11d SRM API facility significantly improves communication between applications and Sybase Adaptive Server database servers. It runs as a UNIX daemon that forwards requests from the application's API function calls to the Sybase Adaptive Server database server and returns the results back to the application. Applications will use the daemon if it is running. The daemon starts automatically when an application issues the SymDbConnect() call to connect to a database instance. Some of the primary benefits of the daemon include:

- Performance: Most database mapping functions are significantly faster because of the persistent database connection, faster communication mechanism, and multi-threaded design.
- Ease of Use: Applications no longer have to execute as a privileged user. The storsybs11d daemon must be started by a privileged user.
- Reliability: Database control functions are more reliable because the daemon creates a separate connection thread that maintains a persistent database connection across database freeze/thaw operations. This avoids problems when a database is frozen and the application is unable to reconnect to thaw the database.

The daemon only supports local client connections; the application must either run on the same host or run on a different host and connect to a SYMAPI server that is local to the daemon. The application cannot communicate directly with a daemon on another host.

Arguments

The stordaemon command can be used to start, stop, and monitor the storsybs11d daemon. See the stordaemon(3) man page for details. The default behavior is to start the daemon automatically from the SymDbConnect() API, however the user can also start the daemon using the stordaemon command.

Files

If the -log option is used on the stordaemon start command, a log file will be created with the specified name and path. The daemon, when started without the -log option, logs messages in a file which resides in the directory /var/symapi/log. The filename is constructed using the daemon name and the DSQUERY environment variable that is used to start the daemon. For example, if a Sybase daemon is associated with the DSQUERY syb119, then the daemon named storsybs11dsyb119 will log to files named storsybs11dsyb119.log0 and storsybs11dsyb119.log1.

Diagnostics

The service log file may contain helpful information for diagnosing problems. To enable additional logging, the daemon configuration file can be used and the variables debug and pdsdebug may be set to appropriate values, depending on the extent of logging required. Additionally, the SYMAPI log file may also contain useful information for resolving problems.

Notes

If the daemon cannot be started, applications will use the old mechanism to communicate with Sybase. If an application has already connected using the daemon and the daemon is stopped, the application will continue to run using the old mechanism. If an application has already connected with the old mechanism and the daemon is started, the application will automatically switch to using the daemon. This behavior is true only when the applications have calls that work with the old mechanism and the daemon and does not apply to calls like SymDbSqlExecute() which work only with the daemon.

The storsybs11d daemon can only connect to Sybase ASE 11.9 servers. It can not connect to Sybase ASE 12.0 or 12.5 servers.

It is necessary to set the LD_LIBRARY_PATH environment variable to the Sybase Adaptive Server library directory when starting the daemon. It is not necessary to set the SYBASE or DSQUERY environment variables when starting the daemon. When the application calls SymDbConnect or StorDbConnect, these values will be:

1. Retrieved from the application's environment.
2. Forwarded with the connection request to the daemon.
3. Set by the daemon in its own environment.
4. Retrieved by Sybase Adaptive Server's client connection code from the daemon's environment.

The database connection is maintained by a thread in the daemon until the application calls SymDbDisconnect or StorDbDisconnect. The autostart mechanism requires all the applications to set the appropriate environment variables required to communicate to the database.

The daemon started automatically by the API SymDbConnect() is associated with the database instance specified by SYBASE, DSQUERY, SYBASE_ASE, and SYBASE_OCS. Applications which have the same setting for the environment variables mentioned above are serviced by the daemon so started. For example, if the user has SYBASE set to /db/sybase/11.9 and DSQUERY set to syb119, then a daemon named storsybs11dsyb119 is started. Applications that have the same settings for SYBASE, DSQUERY, SYBASE_ASE, and SYBASE_OCS will use the daemon storsybs11dsyb119. Applications that have different settings for the environment variables will start a different daemon. The variables SYBASE, DSQUERY, SYBASE_ASE, and SYBASE_OCS together determine the daemon that will service the application.

See Also

stordaemon(3)

storsybs12.5d

storsybs12.5.5d - The daemon for Sybase Adaptive Server database mapping and control.

Description

The storsybs12.5d SRM API facility significantly improves communication between applications and Sybase Adaptive Server database servers. It runs as a UNIX daemon that forwards requests from the application's API function calls to the Sybase Adaptive Server database server and returns the results back to the application. Applications will use the daemon if it is running. The daemon starts automatically when an application issues the SymDbConnect() call to connect to a database instance. Some of the primary benefits of the daemon include:

- Performance: Most database mapping functions are significantly faster because of the persistent database connection, faster communication mechanism, and multi-threaded design.
- Ease of Use: Applications no longer have to execute as a privileged user. The storsybs12.5d daemon must be started by a privileged user.
- Reliability: Database control functions are more reliable because the daemon creates a separate connection thread that maintains a persistent database connection across database freeze/thaw operations. This avoids problems when a database is frozen and the application is unable to reconnect to thaw the database.

The daemon only supports local client connections so the application must either run on the same host or run on a different host and connect to a SYMAPI server that is local to the daemon. The application can not communicate directly with a daemon on another host.

Arguments

The stordaemon command can be used to start, stop, and monitor the storsybs12.5d daemon. See the stordaemon(3) man page for details. The default behavior is to start the daemon automatically from the SymDbConnect() API, however you can also start the daemon using the stordaemon command.

Files

If the -log option is used on the stordaemon start command, a log file will be created with the specified name and path. The daemon, when started without the -log option, logs messages in a file which resides in the directory /var/symapi/log. The filename is constructed using the daemon name and the DSQUERY environment variable that is used to start the daemon. For example, if a Sybase daemon is associated with the DSQUERY syb125, then the daemon named storsybs12.5dsyb125 will log to files named storsybs12.5dsyb125.log0 and storsybs12.5dsyb125.log1

Diagnostics

The daemon log file may contain information that may be helpful in diagnosing problems. To enable additional logging the daemon configuration file can be used and the variables debug and pdsdebug may be set to appropriate values depending on the extent of logging required. Additionally, the SYMAPI log file may also contain useful information for resolving problems.

Notes

If the daemon cannot be started, applications will use the old mechanism to communicate with Sybase. If an application has already connected using the daemon and the daemon is stopped, the application will continue to run using the old mechanism. If an application has already connected with the old mechanism and the daemon is started, the application will automatically switch to using the daemon. This behavior is true only when the applications have calls that work with the old mechanism and the daemon and does not apply to calls like SymDbSqlExecute(), which work only with the daemon.

The storsybs12.5d daemon can only connect to Sybase ASE 12.5 servers. It can not connect to Sybase ASE 11.9 or 12.0 servers.

For applications that need to connect to 64-bit Sybase instances, the storsybs12.5_64d daemon will be used.

It is necessary to set the LD_LIBRARY_PATH environment variable to the Sybase Adaptive Server library directory when starting the daemon. It is not necessary to set the SYBASE or DSQUERY environment variables when starting the daemon. When the application calls SymDbConnect or StorDbConnect, these values will be:

1. Retrieved from the application's environment.
2. Forwarded with the connection request to the daemon.
3. Set by the daemon in its own environment.
4. Retrieved by Sybase Adaptive Server's client connection code from the daemon's environment.

The database connection is maintained by a thread in the daemon until the application calls SymDbDisconnect or StorDbDisconnect. The autostart mechanism requires all the applications to set the appropriate environment variables required to communicate to the database.

The daemon started automatically by the API SymDbConnect() is associated with the database instance specified by SYBASE, DSQUERY, SYBASE_ASE, and SYBASE_OCS. Applications which have the same setting for the environment variables mentioned above are serviced by the daemon so started. For example, if the user has SYBASE set to /db/sybase/12.5 and DSQUERY set to syb125, then a daemon named storsybs12.5dsyb125 is started. Applications that have the same settings for SYBASE, DSQUERY, SYBASE_ASE, and SYBASE_OCS will use the daemon storsybs12.5dsyb125. Applications that have different settings for the environment variables will start a different daemon. The variables SYBASE, DSQUERY, SYBASE_ASE, and SYBASE_OCS together determine the daemon that would service the application.

See Also

stordaemon(3)

storsybs12d

The daemon for Sybase Adaptive Server database mapping and control.

Description

The storsybs12d SRM API facility significantly improves communication between applications and Sybase Adaptive Server database servers. It runs as a UNIX daemon that forwards requests from the application's API function calls to the Sybase Adaptive Server database server and returns the results back to the application. Applications will use the daemon if it is running. The daemon starts automatically when an application issues the SymDbConnect() call to connect to a database instance. Some of the primary benefits of the daemon include:

- Performance: Most database mapping functions are significantly faster because of the persistent database connection, faster communication mechanism, and multi-threaded design.
- Ease of Use: Applications no longer have to execute as a privileged user. The storsybs12d daemon must be started by a privileged user.
- Reliability: Database control functions are more reliable because the daemon creates a separate connection thread that maintains a persistent database connection across database freeze/thaw operations. This avoids problems when a database is frozen and the application is unable to reconnect to thaw the database.

The daemon only supports local client connections so the application must either run on the same host or run on a different host and connect to a SYMAPI server that is local to the daemon. The application can not communicate directly with a daemon on another host.

Arguments

The stordaemon command can be used to start, stop, and monitor the storsybs12d daemon. See the stordaemon(3) man page for details. The default behavior is to start the daemon automatically from the SymDbConnect() API, however you can also start the daemon using the stordaemon command.

Files

If the -log option is used on the stordaemon start command, a log file will be created with the specified name and path. The daemon, when started without the -log option, logs messages in a file which resides in the directory /var/symapi/log. The filename is constructed using the daemon name and the DSQUERY environment variable that is used to start the daemon. For example, if a Sybase daemon is associated with the DSQUERY syb120, then the daemon named storsybs12dsyb120 will log to files named storsybs12dsyb120.log0 and storsybs12dsyb120.log1.

Diagnostics

The daemon log file may contain helpful information for diagnosing problems. To enable additional logging, the daemon configuration file can be used and the variables debug and pdsdebug may be set to appropriate values depending on the extent of logging required. Additionally, the SYMAPI log file may also contain useful information for resolving problems.

Notes

If the daemon cannot be started, applications will use the old mechanism to communicate with Sybase. If an application has already connected using the daemon and the daemon is stopped, the application will continue to run using the old mechanism. If an application has already connected with the old mechanism and the daemon is started, the application will automatically switch to using the daemon. This behavior is true only when the applications have calls that work with the old mechanism and the daemon and does not apply to calls like SymDbSqlExecute() which work only with the daemon.

The storsybs12d daemon can only connect to Sybase ASE 12.0 servers. It can not connect to Sybase ASE 11.9 or 12.5 servers.

It is necessary to set the LD_LIBRARY_PATH environment variable to the Sybase Adaptive Server library directory when starting the daemon. It is not necessary to set the SYBASE or DSQUERY environment variables when starting the daemon. When the application calls SymDbConnect or StorDbConnect, these values will be:

1. Retrieved from the application's environment.
2. Forwarded with the connection request to the daemon.
3. Set by the daemon in its own environment.
4. Retrieved by Sybase Adaptive Server's client connection code from the daemon's environment.

The database connection is maintained by a thread in the daemon until the application calls SymDbDisconnect or StorDbDisconnect. The autostart mechanism requires all the applications to set the appropriate environment variables required to communicate to the database.

The daemon started automatically by the API SymDbConnect() is associated with the database instance specified by SYBASE, DSQUERY, SYBASE_ASE, and SYBASE_OCS. Applications which have the same setting for the environment variables mentioned above are serviced by the daemon so started. For example, if the user has SYBASE set to /db/sybase/12.0 and DSQUERY set to syb120, then a daemon named storsybs12dsyb120 is started. Applications that have the same settings for SYBASE, DSQUERY, SYBASE_ASE, and SYBASE_OCS will use the daemon storsybs12dsyb120. Applications that have different settings for the environment variables will start a different daemon. The variables SYBASE, DSQUERY, SYBASE_ASE, and SYBASE_OCS together determine the daemon that will service the application.

See Also

stordaemon(3)

storudbd

The daemon service for IBM DB2/UDB database mapping and control.

Description

The storudbd SRM API facility significantly improves communication between applications and IBM DB2/UDB database servers. It runs as a UNIX daemon or Windows service that forwards requests from the application's API function calls to the IBM DB2/UDB database server and returns the results back to the application. Applications will use the daemon if it is running. The daemon starts automatically when an application issues the SymDbConnect () call to connect to a database instance. Some of the primary benefits of the daemon include:

- Performance: Most database mapping functions are significantly faster because of the persistent database connection, faster communication mechanism, and multi-threaded design.
- Ease of Use: Applications no longer have to execute as a privileged user. The storudbd daemon must be started by a privileged user.
- Reliability: Database control functions are more reliable because the daemon creates a separate connection thread that maintains a persistent database connection across database freeze/thaw operations. This avoids problems when a database is frozen and the application is unable to reconnect to thaw the database.

The daemon only supports local client connections, therefore the application must either run on the same host or run on a different host and connect to a SYMAPI server that is local to the daemon. The application can not communicate directly with a daemon on another host.

Arguments

The stordaemon command can be used to start, stop, and monitor the storudbd daemon. See the stordaemon(3) man page for details. On Windows, the service control manager can also be used to start the storudbd service. The default behavior is to start the daemon automatically from the SymDbConnect() API, however you can also start the daemon using the stordaemon command.

Files

If the -log option is used on the stordaemon start command, a log file will be created with the specified name and path. The daemon, when started without the -log option, logs messages in a file that resides in the directory /var/symapi/log. The filename is constructed using the daemon name and the DB2INSTANCE environment variable that is used to start the daemon. For example, if a DB2/UDB daemon is associated with the DB2INSTANCE db2v7in1, then the daemon named storudbddb2v7in1 will log to files named storudbddb2v7in1.log0 and storudbddb2v7in1.log1.

Diagnostics

The daemon log file may contain information that may be helpful in diagnosing problems. To enable additional logging the daemon configuration file can be used and the variables debug and pdsdebug may be set to appropriate values depending on the extent of logging required. Additionally, the SYMAPI log file may also contain useful information for resolving problems.

Notes

If the daemon cannot be started, applications will use the old mechanism to communicate with IBM DB2/UDB. If an application has already connected through the daemon and the daemon is stopped, the application will continue to run using the old mechanism. If an application has already connected with the old mechanism and the daemon is started, the application will automatically switch to using the daemon. This behavior is true only when the applications have calls that work with the old mechanism and the daemon and does not apply to calls like SymDbSqlExecute() which work only with the daemon.

On the Windows platform, stoudbd will be run as a service. After the service is installed, it will appear in the service list dialog box as storudb and can be accessed by clicking on the services icon in the control panel (Windows NT) or the administrative tools icon (Windows 2000). The system administrator can modify the startup options in the service list dialog box to start the daemon automatically at boot time.

It is necessary to set the LD_LIBRARY_PATH environment variable to the IBM DB2/UDB library directory when starting the daemon. It is not necessary to set the DB2INSTANCE environment variable when starting the daemon. When the application calls SymDbConnect or StorDbConnect, this value will be:

1. Retrieved from the application's environment.
2. Forwarded with the connection request to the daemon.
3. Set by the daemon in its own environment.
4. Retrieved by IBM DB2/ UDB's client connection code from the daemon's environment.

The database connection is maintained by a thread in the daemon until the application calls SymDbDisconnect or StorDbDisconnect. The autostart mechanism requires all the applications to set the appropriate environment variables required to communicate to the database.

The daemon started automatically by the API SymDbConnect() is associated with the database instance specified by DB2INSTANCE. Applications which have the same setting for DB2INSTANCE are serviced by the daemon so started. For example, if the user has DB2INSTANCE set to db2v7in1, then a daemon named storudbddb2v7in1 is started. Applications that have the same settings for DB2INSTANCE will use the daemon storudbddb2v7in1. Applications that have different settings for the environment variables will start a different daemon. The DB2INSTANCE variable determines the daemon that would service the application.

See Also

stordaemon(3)

storwatchd

A watchdog daemon used on UNIX platforms.

Description

The storwatchd daemon is used to monitor the core Solutions Enabler daemons (storapid, storrdfd, storgnsd, storevntd) and automatically restart them if they crash.

This watchdog mechanism is enabled by default. Detailed instructions on how to disable it can be found in the installed README.daemon_options file.

The storwatchd daemon is only used on UNIX. On Windows, this functionality is provided by the Service Control Manager.

Normally, users should have no reason to interact directly with storwatchd. It automatically starts when its services are first required. For example, when a daemon starts that has been configured to make use of it.

Only authorized users are permitted to control (explicitly shutdown) the storwatchd daemon:

- Privileged users (root on UNIX) are implicitly authorized.
- Otherwise, users must be listed in the daemon_users authorization file to be authorized. This file is located in the following directory:

  ```
  UNIX: /var/symapi/config
  ```

  Within this file, user smith is authorized with the following line:

  ```
  smith storwatchd
  ```

The storwatchd daemon is supported on UNIX platforms.

Arguments

Users should normally never need to interact directly with storwatchd.

The stordaemon command can be used to start, stop, and monitor the storwatchd daemon. See the stordaemon(3) man page for details.

Diagnostics

Diagnostic messages are written to the log files storwatchd.log0 and storwatchd.log1, located in the following directory:

```
/var/symapi/log/
```

See Also

stordaemon(3), storgnsd(3), storapid(3), storrdfd(3)

CHAPTER 3
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,

Parameter	Allowed Values	Default Value	Description
			others can read. n: The owner can read/write, no one else can access.
SECURE_ DIRECTORY_ PATH	One or more semicolon (On non-Window platforms)	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 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.

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.

Parameter	Allowed Values	Default Value	Description
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 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

Parameter	Allowed Values	Default Value	Description
			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.

Parameter	Allowed Values	Default Value	Description
			When the value is 'server', the server's debugging configuration will be in effect, but settings from clients are ignored. When the value is 'client', settings sent to the server from the client are respected.
SECURITY_ CERT_ ALLOW_ WILDCARDS	ENABLE | DISABLE	Default value: DISABLE	Specifies if wildcards are allowed in the Common Name of a 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

Parameter	Allowed Values	Default Value	Description
			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 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.
INTERNODE_LOCK_RECOVERY	enable | disable	Default value: disable	Enables internode lock recovery capabilities that allows the daemon to recover SEL and DEL locks previously acquired by another daemon if it's determined that daemon is no longer active. This parameter can be changed and reloaded while the base daemon is running with the CLI stordaemon action storapid -cmd reload.
INTERNODE_LOCK_RECOVERY_HEARTBEAT_INTERVAL	0 - 65535 seconds	Default value: 0	Specifies the frequency to issue host heartbeats to any Symmetrix array that the daemon has acquired a SEL or DEL lock, and the lock is still held. The heartbeat is the indication to any other base daemon running on a host attached to the array that the lock is recoverable. A base daemon must be configured to recover locks by enabling the INTERNODE_LOCK_RECOVERY option. A value greater than zero will enable the INTERNODE_LOCK_INFORMATION_EXPORT option. This parameter can be changed and

Parameter	Allowed Values	Default Value	Description
			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_ DISCOVERY	disable | enable	Default value: enable	Performs a discovery of select syscall data on behalf of 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.
FILE_	A number	Default	Specifies how long a thread in the Enginuity

Parameter	Allowed Values	Default Value	Description
TRANSFER_ TIMEOUT	of seconds, >= 1	value: 3600	code load feature is to wait for the targeted SP to complete the transfer of a file to its local disk. The transfer will be aborted by the initiating base daemon upon expiration. This parameter can be changed and reloaded while the base daemon is running, with the CLI stordaemon action storapid -cmd reload. The new value will be effective on subsequent transfers.

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

Parameter	Allowed Values	Default Value	Description
			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 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.

Parameter	Allowed Values	Default Value	Description
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

Parameter	Allowed Values	Default Value	Description
			or a numerical event ID. This is the only field that is required. One or more values (comma separated) may be present. 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 (4 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=0004,0010,0100" 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

Parameter	Allowed Values	Default Value	Description
			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: events	For event logging to a file (LOG_EVENT_ TARGETS contains 'file'): the base name of the file that is 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)

Parameter	Allowed Values	Default Value	Description
			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_ SYSLOG_PORT	A decimal port number.	Default value: 514	Specifies the port to which the remote syslog 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.
TEST_MODE	disable | enable	Default value: disable	Provides the ability to run storevntd in test mode. In this mode, faults can be artificially injected to generate events without stressing the Symmetrix array.

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_ SMC	disable | enable	Default value: disable	Determines if storstpd starts the necessary components for supporting the SMC application. Note: SMC is supported on the service processor.
DMN_RUN_ TTP	disable | enable	Default value: disable	Determines if storstpd starts the necessary components for supporting TTP collection on a host.
DMN_RUN_ TTP_ON_SP	disable | enable	Default value: enable	Determines if storstpd starts the necessary components for supporting TTP collection on the service processor. Note: When enabled on the service processor, two collection files will be created. One containing the normal full collection and another containing an SRDF/A only collection.
DMN_RUN_ RTC	disable | enable	Default value: enable	Determines if storstpd starts the necessary components for real-time metrics collection.
DMN_RTC_ DATA_ ENCODE	enable | disable	Default value: disable	Indicates that the real time data posted will be compressed/encoded.
DMN_ROOT_ LOCATION	Full file path specification.	Default value: UNIX:	Specifies a full file/path location that storstpd will use as its root directory for

Parameter	Allowed Values	Default Value	Description
		/var/symapi/stp	file creation. Note: This location MUST exist or will revert to default location.
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 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.
SYNC_VP_ DATA	disable | enable	Default value: enable	Determines if storstpd syncs Virtual Provisioning information. The daemon_options parameter SYNC_ VP_DATA_INTERVAL determines the interval at which this sync is done.
SYNC_VP_ DATA_ INTERVAL	A number, in minutes.	Default value: 5	Determines the interval at which storstpd syncs Virtual Provisioning information if SYNC_VP_DATA is enabled.
SMC_ COLLECT_	A number, in minutes (2-4,	Default value: 5	Specifies how frequently storstpd collects statistics for the SMC

Parameter	Allowed Values	Default Value	Description
INTERVAL	5, 10, 15).		application.
RTC_ COLLECT_ INTERVAL	A number, in seconds (2-4, 5, 10, 15).	Default value: 5	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_ COLLECTION_ INTERVAL	A number, in minutes [1-5, 10, 15].	Default value: 15	How frequently storstpd collects TTP statistics. IMPORTANT: TTP collection is only allowed on the Service Processor. Using collection intervals of less than 5 minutes is not recommended and usage of such intervals is for the discretion of a qualified EMC Performance Guru.
TTP_ COLLECT_ ITERATIONS	A number. If zero, ignored.	Default value: 0	Tells storstpd to collect n iterations of TTP and then end the collection.
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: 4	Tells storstpd to archive every HH hours. A setting of 4 will tell storstpd to archive every 4 hours.
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_	disable |	Default value:	Tells storstpd whether to collect TTP

Parameter	Allowed Values	Default Value	Description
METRICS	enable	enable	counters for the disk performance category.
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.

Parameter	Allowed Values	Default Value	Description
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.
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_DEV_ IN_MULT_GRPS	Enables devices to belong to multiple groups.	= ENABLE | DISABLE
SYMAPI_ ALLOW_RDF_ SYMFORCE	Indicates whether users can specify -symforce when performing RDF control operations.	= TRUE | FALSE

Option Name	Description	=‹optionalvalue | defaultvalue›
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
SYMAPI_BCV_ ESTAB_INC_ TO_FULL	Contols 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_ OF_ NONVISIBLE_ DEVS	Blocks the SYMAPI/SYMCLI control commands from targeting devices that are not visible to this host.	= DISABLE | ENABLE
SYMAPI_CTRL_ VIA_SERVER	Blocks the client SYMAPI/SYMCLI control commands from executing at the SYMAPI server.	= DISABLE | ENABLE

Option Name	Description	=<optionalvalue | defaultvalue>
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
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

Option Name	Description	=<optionalvalue | defaultvalue>
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 entry in the file, after which the entry 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 to have devices with different disk characteristics in a device pool (Snap/Thin).	= ENABLE | DISABLE
SYMAPI_RCOPY_GET_MODIFIED_TRACKS	Enables/disables the calculation of modified tracks.	= TRUE | FALSE

Option Name	Description	=‹optionalvalue | defaultvalue›
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_ 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. ◆ ANY: Accept both types. ◆ NONSECURE: Accept non-secure sessions only (client and server do not initialize secure socket library). Refer to the Solutions Enabler release notes.	= SECURE | ANY | NONSECURE
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_ DEFAULT_ POOL_COMPAT	Sets the snap default pool compatibility to display disabled devices.	= ENABLE | DISABLE

Option Name	Description	=<optionalvalue | defaultvalue>
SYMAPI_SNAP_PERSISTENT_RESTORE	Specifies whether snap restores are performed as persistent restores.	= DISABLE | ENABLE
SYMAPI_SYNC_DIRECTION	Confines TimeFinder operations to either establish, restore, or both actions.	= ESTABLISH | RESTORE | BOTH
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
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_THREE_CHAR_SYMDEVNAME	Allows the use of the three-character naming convention for the Symmetrix device name (SymDevName) supported in previous releases, rather than the new four-character convention.	= DISABLE | ENABLE
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

Option Name	Description	=<optionalvalue | defaultvalue>
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
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_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. 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.	= 0 - 100
SYMAPI_ CLIENT_SIDE_ ACCESS_ID	This option applies to Symmetrix Access Control. Specifies whether the access ID is generated and stored on the client or server side. Used only on the client side during client/server operations.	= 0 - 100
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, SE will use cryptographic algorithms that meet the FIPS requirements. If disabled, the standard SE cryptographic algorithms will be used. If the SYMAPI_SECURITY_LEVEL option is set but not set to SECURE, this option is ignored.	= ENABLE | DISABLE

CHAPTER 4
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	PARALLEL

Variable Name	Description	Default
	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 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_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,	NOCOPY

Variable Name	Description	Default
	COPY_DIFF, or PRECOPY_DIFF.	
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 SYMCLI uses when establishing a new clone and the maximum number of clones has been reached. Can be set to TERM_OLDEST or DONT_TERM.	DONT_TERM
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	LOCAL: (when SYMCLI_ CONNECT is NOT set) REMOTE: (when the SYMAPI thin client is installed) REMOTE_ CACHED (when SYMCLI_ CONNECT is set)

Variable Name	Description	Default
	operations or that modify the configuration database are executed remotely. These modifications to the remote configuration database are then cached locally.	
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 pdevname.	0
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	None

Variable Name	Description	Default
	entries are appended to the file.	
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 prompts.	0
SYMCLI_OFFLINE	When set to 1, online access to Symmetrix device status is disabled (Symmetrix configuration database access only).	0
SYMCLI_OSM_VERSION	Specifies the version reported by the SYMCLI OSM SRDF Compatibility mode.	4.0.0
SYMCLI_OUTPUT_MODE	Sets a specific mode to output SYMCLI commands. Valid modes are Standard, XML_ELEMENT, and XML_ATTRIBUTE. If the XML mode	Standard

Variable Name	Description	Default
	is specified, the output will be element-based.	
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 and FORMATTED. DEFAULT is equivalent to an unset. FORMATTED enables the printing of return code mnemonics and	DEFAULT

Variable Name	Description	Default
	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_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 error.	0

Variable Name	Description	Default
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
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 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.

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.

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	CLI_C_SUCCESS	CLI call completed successfully.
1	CLI_C_FAIL	CLI call failed.
2	CLI_C_DB_FILE_IS_LOCKED	Another process has an exclusive lock on the Host database file.
3	CLI_C_SYM_IS_LOCKED	Another process has an exclusive lock on the Symmetrix.
4	CLI_C_NOT_ALL_SYNCHRONIZED	NOT all of the mirrored pairs are in the 'Synchronized' state.
5	CLI_C_NONE_SYNCHRONIZED	NONE of the mirrored pairs are in the 'Synchronized' state.
6	CLI_C_NOT_ALL_UPDATED	NOT all of the mirrored pairs are in the 'Updated' state.
7	CLI_C_NONE_UPDATED	NONE of the mirrored pairs are in the 'Updated' state.
8	CLI_C_NOT_ALL_PINGED	NOT all of the remote Symmetrix units can be pinged.
9	CLI_C_NONE_PINGED	NONE of the remote Symmetrix units can be pinged.
10	CLI_C_NOT_ALL_SYNCHED	NOT all of the mirrored pairs are in the 'Synchronized' state.
11	CLI_C_NONE_SYNCHED	NONE of the mirrored pairs are in the 'Synchronized' state.

12	CLI_C_NOT_ALL_RESTORED	NOT all of the pairs are in the 'Restored' state.
13	CLI_C_NONE_RESTORED	NONE of the pairs are in the 'Restored' state.
14	CLI_C_NOT_ALL_VALID	NOT all of the mirrored pairs are in a valid state.
15	CLI_C_NONE_VALID	NONE of the mirrored pairs are in a valid state.
16	CLI_C_SYM_NOT_ALL_LOCKED	NOT all of the specified Symmetrix units have an exclusive Symmetrix lock.
17	CLI_C_SYM_NONE_LOCKED	NONE of the specified Symmetrix units have an exclusive Symmetrix lock.
18	CLI_C_ALREADY_IN_STATE	The Device(s) is (are) already in the desired state or mode.
19	CLI_C_GK_IS_LOCKED	All GateKeeper devices to the Symmetrix unit are currently locked.
20	CLI_C_WP_TRACKS_IN_CACHE	Operation cannot proceed because the target device has Write Pending I/O in the cache.
21	CLI_C_NEED_MERGE_TO_RESUME	Operation cannot proceed without first performing a merge of the RDF Track Tables.
22	CLI_C_NEED_FORCE_TO_PROCEED	Operation cannot proceed in the current state except if you specify a force flag.
23	CLI_C_NEED_SYMFORCE_TO_PROCEED	Operation cannot proceed in the current state except if you specify a symforce flag.

24	CLI_C_NOT_IN_SYNC	The Symmetrix configuration and the database file are NOT in sync.
25	CLI_C_NOT_ALL_SPLIT	NOT all of the mirrored pairs are in the 'Split' state.
26	CLI_C_NONE_SPLIT	NONE of the mirrored pairs are in the 'Split' state.
27	CLI_C_NOT_ALL_SYNCINPROG	NOT all of the mirrored pairs are in the 'SyncInProg' state.
28	CLI_C_NONE_SYNCINPROG	NONE of the mirrored pairs are in the 'SyncInProg' state.
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.
31	CLI_C_NOT_ALL_SUSPENDED	NOT all of the mirrored pairs are in the 'Suspended' state.
32	CLI_C_NONE_SUSPENDED	NONE of the mirrored pairs are in the 'Suspended' state.
33	CLI_C_NOT_ALL_FAILED_OVER	NOT all of the mirrored pairs are in the 'Failed Over' state.
34	CLI_C_NONE_FAILED_OVER	NONE of the mirrored pairs are in the 'Failed Over' state.
35	CLI_C_NOT_ALL_UPDATEINPROG	NOT all of the mirrored pairs are in the 'R1 UpdInProg' state.
36	CLI_C_NONE_UPDATEINPROG	NONE of the mirrored pairs are in the 'R1 UpdInProg' state.
37	CLI_C_NOT_ALL_PARTITIONED	NOT all of the mirrored pairs are in the 'Partitioned' state.

38	CLI_C_NONE_PARTITIONED	NONE of the mirrored pairs are in the 'Partitioned' state.
39	CLI_C_NOT_ALL_ENABLED	NOT all of the mirrored pairs are in the 'Enabled' consistency state.
40	CLI_C_NONE_ENABLED	NONE of the mirrored pairs are in the 'Enabled' consistency state.
41	CLI_C_NOT_ALL_SYNCHRONIZED_AND_ENABLED	NOT all of the mirrored pairs are in the 'Synchronized' rdf state and the 'Enabled' consistency state.
42	CLI_C_NONE_SYNCHRONIZED_AND_ENABLED	NONE of the mirrored pairs are in the 'Synchronized' rdf state and in the 'Enabled' consistency state.
43	CLI_C_NOT_ALL_SUSP_AND_ENABLED	NOT all of the mirrored pairs are in the 'Suspended' rdf state and 'Enabled' consistency state.
44	CLI_C_NONE_SUSP_AND_ENABLED	NONE of the mirrored pairs are in the 'Suspended' rdf state and the 'Enabled' consistency state.
45	CLI_C_NOT_ALL_SUSP_AND_OFFLINE	NOT all of the mirrored pairs are in the 'Suspended' rdf state and 'Offline' link suspend state.
46	CLI_C_NONE_SUSP_AND_OFFLINE	NONE of the mirrored pairs are in the 'Suspended' rdf state and the 'Offline' link suspend state.
47	CLI_C_WONT_REVERSE_SPLIT	Performing this operation at this time

		will not allow you to perform the next BCV split as a reverse split.
48	CLI_C_CONFIG_LOCKED	Access to the configuration server is locked.
49	CLI_C_DEVS_ARE_LOCKED	One or more devices are locked.
50	CLI_C_MUST_SPLIT_PROTECT	If a device was restored with the protect option, it must be split with the protect option.
51	CLI_C_PAIRED_WITH_A_DRV	The function can not be performed since the STD device is already paired with a DRV device.
52	CLI_C_PAIRED_WITH_A_SPARE	NOT all of the Snap pairs are in the 'Copy in progress' state.
53	CLI_C_NOT_ALL_COPYINPROG	NOT all of the pairs are in the 'CopyInProgress' state.
54	CLI_C_NONE_COPYINPROG	NONE of the pairs are in the 'CopyInProgress' state.
55	CLI_C_NOT_ALL_COPIED	NOT all of the pairs are in the 'Copied' state.
56	CLI_C_NONE_COPIED	NONE of the pairs are in the 'Copied' state.
57	CLI_C_NOT_ALL_COPYONACCESS	NOT all of the pairs are in the 'CopyonAccess' state.
58	CLI_C_NONE_COPYONACCESS	NONE of the pairs are in the 'CopyonAccess' state.
59	CLI_C_CANT_RESTORE_PROTECT	The protected restore operation can not be completed because there are write pendings or the BCV mirrors are

		not synchronized.
60	CLI_C_NOT_ALL_CREATED	NOT all of the pairs are in the 'Created' state.
61	CLI_C_NONE_CREATED	NONE of the pairs are in the 'Created' state.
62	CLI_C_NOT_ALL_READY	NOT all of the BCVs local mirrors are in the 'Ready' state.
63	CLI_C_NONE_READY	NONE of the BCVs local mirrors are in the 'Ready' state.
64	CLI_C_STD_BKGRND_SPLIT_IN_PROG	The operation cannot proceed because the STD Device is splitting in the Background.
65	CLI_C_SPLIT_IN_PROG	The operation cannot proceed because the pair is splitting.
66	CLI_C_NOT_ALL_COPYONWRITE	NOT all of the pairs are in the 'CopyOnWrite' state.
67	CLI_C_NONE_COPYONWRITE	NONE of the pairs are in the 'CopyOnWrite' state.
68	CLI_C_NOT_ALL_RECREATED	Not all devices are in the 'Recreated' state.
69	CLI_C_NONE_RECREATED	No devices are in the 'Recreated' state.
70	CLI_C_NOT_ALL_CONSISTENT	NOT all of the mirrored pairs are in the 'Consistent' state.
71	CLI_C_NONE_CONSISTENT	NONE of the mirrored pairs are in the 'Consistent' state.
72	CLI_C_MAX_SESSIONS_EXCEEDED	The maximum number of sessions has been exceeded for the specified device.
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 one precopy cycle.
77	CLI_C_CONSISTENCY_TIMEOUT	The operation failed because of a Consistency window timeout.
78	CLI_C_NOT_ALL_FAILED	NOT all of the pairs are in the 'Failed' state.
79	CLI_C_NONE_FAILED	NONE of the pairs are in the 'Failed' state.
80	CLI_C_CG_NOT_CONSISTENT	CG is NOT RDF-consistent.
81	CLI_C_NOT_ALL_CREATEINPROG	NOT all of the pairs are in the 'CreateInProg' state.
82	CLI_C_NONE_CREATEINPROG	None of the pairs are in the 'CreateInProg' state.
83	CLI_C_NOT_ALL_RECREATEINPROG	NOT all of the pairs are in the 'RecreateInProg' state.
84	CLI_C_NONE_RECREATEINPROG	None of the pairs are in the 'RecreateInProg' state.
85	CLI_C_NOT_ALL_TERMINPROG	NOT all of the pairs are in the 'TerminateInProg' state.
86	CLI_C_NONE_TERMINPROG	None of the pairs are in the 'TerminateInProg' state.
87	CLI_C_NOT_ALL_VERIFYINPROG	NOT all of the pairs are in the 'VerifyInProg' state.
88	CLI_C_NONE_VERIFYINPROG	None of the pairs are in

		the 'VerifyInProg' state.
89	CLI_C_NOT_ALL_VERIFIED	NOT all of the pairs are in the requested states.
90	CLI_C_NONE_VERIFIED	NONE of the pairs are in the requested states Note: This message is returned when multiple states are verified at once.
91	CLI_C_RDFG_TRANSMIT_IDLE	RDF group is operating in SRDF/A Transmit Idle.
92	CLI_C_NOT_ALL_MIGRATED	Not all devices are in the ' Migrated' state.
93	CLI_C_NONE_MIGRATED	None of devices are in the 'Migrated' state.
94	CLI_C_NOT_ALL_MIGRATEINPROG	Not all devices are in the 'MigrateInProg' state.
95	CLI_C_NONE_MIGRATEINPROG	None of devices are in the 'MigrateInProg' state.
96	CLI_C_NOT_ALL_INVALID	Not all devices are in the 'Invalid' state.
97	CLI_C_NONE_INVALID	None of devices are in the 'Invalid' state.
98	CLI_C_EMPTY_BACKUP	Cannot create an empty backup file.
99	CLI_C_NOT_ALL_BOUND	Not all devices are in the 'Bound' state.
100	CLI_C_NONE_BOUND	None of the devices are in the 'Bound' state
101	CLI_C_NOT_ALL_BINDING	Not all devices are in the 'Binding' state.
102	CLI_C_NONE_BINDING	None of the devices are in the 'Binding' state.
103	CLI_C_NOT_ALL_ALLOCATING	Not all devices are in the 'Allocating' state.
104	CLI_C_NONE_ALLOCATING	None of the devices are in the 'Allocating' state

105	CLI_C_NOT_ALL_DEALLOCATING	Not all devices are in the 'Deallocating' state.
106	CLI_C_NONE_DEALLOCATING	None of the devices are in the 'Deallocating' state.
107	CLI_C_NOT_ALL_DRAINING	Not all devices are in the 'Draining' state.
108	CLI_C_NONE_DRAINING	None of the devices are in the 'Draining' state.
109	CLI_C_NOT_ALL_UNBOUND	Not all devices are in the 'Unbound' state.
110	CLI_C_NONE_UNBOUND	None of the devices are in the 'Unbound' state.
111	CLI_C_NOT_ALL_NONPOOLED	Not all devices are in the 'Nonpooled' state.
112	CLI_C_NONE_NONPOOLED	None of the devices are in the 'Nonpooled' state.
113	CLI_C_NOT_ALL_DRAINWAIT	Not all devices are in the 'Drainwait' state.
114	CLI_C_NONE_DRAINWAIT	None of the devices are in the 'Drainwait' state.
115	CLI_C_NOT_ALL_DISABLED	Not all devices are in the 'Disabled' state.
116	CLI_C_NONE_DISABLED	None of the devices are in the 'Disabled' state.
117	CLI_C_NOT_ALL_DEACTIVATED	Not all devices are in the 'Deactivated' state.
118	CLI_C_NONE_DEACTIVATED	None of the devices are in the 'Deactivated' state.
119	CLI_C_NOT_ALL_UNBINDING	Not all devices are in the 'Unbinding' state.
120	CLI_C_NONE_UNBINDING	None of the devices are in the 'Unbinding' state.
121	CLI_C_NOT_ALL_RECLAIMING	Not all devices are in the 'Reclaiming' state.
122	CLI_C_NONE_RECLAIMING	None of the devices are

		in the 'Reclaiming' state.
123	CLI_C_NOT_ALL_BALANCING	Not all devices are in the 'Balancing' state.
124	CLI_C_NONE_BALANCING	None of the devices are in the 'Balancing' state.
125	CLI_C_DEVMASK_VALDTE_FAILED	The device masking data contains inconsistencies.
126	CLI_C_DEVMASK_FREQNT_CHANGES	The device masking data is continuously changing. Please try again.
127	CLI_C_STAR_INV_STATE	The operation is not allowed in the current Star state.
128	CLI_C_STAR_ALLOWED_FROM_WKLD	The operation is allowed from workload site only.
129	CLI_C_STAR_INV_DEF_FILE_FMT	The Star definition file format is not valid.
130	CLI_C_STAR_ACTN_FILE_ERROR	An error occured while accessing the Star action file.
131	CLI_C_STAR_DEF_FILE_ERROR	An error occured while accessing the Star definition file.
132	CLI_C_STAR_SETUP_REQD	The Star Setup action is required.
133	CLI_C_STAR_SETUP_INV_OPMODE	The specified Star mode of operation is not valid.
134	CLI_C_STAR_OPMODE_REQD	The Star mode of operation is required for this operation.
135	CLI_C_STAR_CTL_SITE_REQD	The Star control site name is required for this operation.
136	CLI_C_STAR_WKLD_SITE_REQD	The Star workload site name is required for this operation.

137	CLI_C_STAR_WKLD_OP_REQD	The Star workload site name and Star mode of operation is required for this operation.
138	CLI_C_STAR_CREATE_GROUP_FAIL	An error occured while creating Star group.
139	CLI_C_STAR_FULL_COPY_REQD	Star differential resync is not available. The FULL_COPY flag is required.
140	CLI_C_STAR_INV_ACTION_WOF	Operation can not be performed except if force flag is used.
141	CLI_C_STAR_BUILDCG_REQD	The Star Buildcg action is required.
142	CLI_C_NOT_ALL_FAILEDBACK	Not all devices are in the 'Failedback' state.
143	CLI_C_NONE_FAILEDBACK	None of the devices are in the 'Failedback' state.
144	CLI_C_NOT_ALL_STOPPED	Not all devices are in the 'Stopped' state.
145	CLI_C_NONE_STOPPED	None of the devices are in the 'Stopped' state.
146	CLI_C_NOT_ALL_CONSISTENT_NOINVALIDS	Not all devices are in the 'Consistent with no invalid tracks' state.
147	CLI_C_NONE_CONSISTENT_NOINVALIDS	None of the devices are in the 'Consistent with no invalid tracks' state
148	CLI_C_NOT_ALL_SYNCHRONOUS	Not all devices are in the 'Synchronous RDF' mode.
149	CLI_C_NONE_SYNCHRONOUS	None of the devices are in the 'Synchronous RDF' mode.
150	CLI_C_NOT_ALL_SEMISYNCHRONOUS	Not all devices are in the 'Semi-Synchronous RDF' mode.
151	CLI_C_NONE_SEMISYNCHRONOUS	None of the devices are

		in the 'Semi-Synchronous RDF' mode.
152	CLI_C_NOT_ALL_ASYNCHRONOUS	Not all devices are in the 'Asynchronous RDF' mode.
153	CLI_C_NONE_ASYNCHRONOUS	None of the devices are in the 'Asynchronous RDF' mode.
154	CLI_C_NOT_ALL_ACP_WP	Not all devices are in the 'Adaptive Copy Write Pending RDF' mode.
155	CLI_C_NONE_ACP_WP	None of the devices are in the 'Adaptive Copy Write Pending RDF' mode.
156	CLI_C_NOT_ALL_ACP_DISK	Not all devices are in the 'Adaptive Copy Disk RDF' mode.
157	CLI_C_NONE_ACP_DISK	None of the devices are in the 'Adaptive Copy Disk RDF' mode.
158	CLI_C_NOT_ALL_COMPRESSING	Not all devices are in the 'Compressing' state.
159	CLI_C_NONE_COMPRESSING	None of the devices are in the 'Compressing' state.
160	CLI_C_NOT_ALL_UNCOMPRESSING	Not all devices are in the 'Uncompressing' state.
161	CLI_C_NONE_UNCOMPRESSING	None of the devices are in the 'Uncompressing' 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)	CLI_C_MUST_SPLIT_PROTECT
%X1FFF019A	51	2 (E)	CLI_C_PAIRED_WITH_A_DRV
%X1FFF01A2	52	2 (E)	CLI_C_PAIRED_WITH_A_SPARE
%X1FFF01AB	53	3 (I)	CLI_C_NOT_ALL_COPYINPROG
%X1FFF01B3	54	3 (I)	CLI_C_NONE_COPYINPROG
%X1FFF01BB	55	3 (I)	CLI_C_NOT_ALL_COPIED
%X1FFF01C3	56	3 (I)	CLI_C_NONE_COPIED
%X1FFF01CB	57	3 (I)	CLI_C_NOT_ALL_COPYONACCESS
%X1FFF01D3	58	3 (I)	CLI_C_NONE_COPYONACCESS
%X1FFF01DA	59	2 (E)	CLI_C_CANT_RESTORE_PROTECT
%X1FFF01E3	60	3 (I)	CLI_C_NOT_ALL_CREATED
%X1FFF01EB	61	3 (I)	CLI_C_NONE_CREATED
%X1FFF01F3	62	3 (I)	CLI_C_NOT_ALL_READY
%X1FFF01FB	63	3 (I)	CLI_C_NONE_READY
%X1FFF0202	64	2 (E)	CLI_C_SYM_IS_LOCKED
%X1FFF020A	65	2 (E)	CLI_C_SPLIT_IN_PROG
%X1FFF0213	66	3 (I)	CLI_C_NOT_ALL_COPYONWRITE
%X1FFF021B	67	3 (I)	CLI_C_NONE_COPYONWRITE
%X1FFF0223	68	3 (I)	Reserved for future use.
%X1FFF022B	69	3 (I)	Reserved for future use.
%X1FFF0233	70	3 (I)	CLI_C_NOT_ALL_CONSISTENT
%X1FFF023B	71	3 (I)	CLI_C_NONE_CONSISTENT

%X1FFF0242	72	2 (E)	CLI_C_MAX_SESSIONS_EXCEEDED
%X1FFF024B	73	3(I)	CLI_C_NOT_ALL_PRECOPY
%X1FFF0253	74	3(I)	CLI_C_NONE_PRECOPY
%X1FFF025B	75	3(I)	CLI_C_NOT_ALL_PRECOPY_ CYCLED
%X1FFF0263	76	3(I)	CLI_C_NONE_PRECOPY_CYCLED
%X1FFF026A	77	2(E)	CLI_C_CONSISTENCY_TIMEOUT
%X1FFF0273	78	3(I)	CLI_C_NOT_ALL_FAILED
%X1FFF027B	79	3(I)	CLI_C_NONE_FAILED
%X1FFF0283	80	3(I)	CLI_C_CG_NOT_CONSISTENT
%X1FFF028B	81	3(I)	CLI_C_NOT_ALL_CREATEINPROG
%X1FFF0293	82	3(I)	CLI_C_NONE_CREATEINPROG
%X1FFF029B	83	3(I)	CLI_C_NOT_ALL_RECREATEINPROG
%X1FFF02A3	84	3(I)	CLI_C_NONE_RECREATEINPROG
%X1FFF02AB	85	3(I)	CLI_C_NOT_ALL_TERMINPROG
%X1FFF02B3	86	3(I)	CLI_C_NONE_TERMINPROG
%X1FFF02BB	87	3(I)	CLI_C_NOT_ALL_VERIFYINPROG
%X1FFF02C3	88	3(I)	CLI_C_NONE_VERIFYINPROG
%X1FFF02CB	89	3(I)	CLI_C_NOT_ALL_VERIFIED
%X1FFF02D3	90	3(I)	CLI_C_NONE_VERIFIED
%X1FFF02DA	91	2(E)	CLI_C_RDFG_TRANSMIT_IDLE
%X1FFF02E2	92	2(E)	CLI_C_NOT_ALL_MIGRATED
%X1FFF02EA	93	2(E)	CLI_C_NONE_MIGRATED
%X1FFF02F2	94	2(E)	CLI_C_NOT_ALL_MIGRATEINPROG
%X1FFF02FA	95	2(E)	CLI_C_NONE_MIGRATEINPROG
%X1FFF0302	96	2(E)	CLI_C_NOT_ALL_INVALID
%X1FFF030A	97	2(E)	CLI_C_NONE_INVALID
%X1FFF04C2	98	2(E)	CLI_C_EMPTY_BACKUP
%X1FFF04CA	99	2(E)	CLI_C_NOT_ALL_BOUND
%X1FFF0802	100	2(E)	CLI_C_NONE_BOUND
%X1FFF080A	101	2(E)	CLI_C_NOT_ALL_BINDING

%X1FFF0812	102	2(E)	CLI_C_NONE_BINDING
%X1FFF081A	103	2(E)	CLI_C_NOT_ALL_ALLOCATING
%X1FFF0822	104	2(E)	CLI_C_NONE_ALLOCATING
%X1FFF082A	105	2(E)	CLI_C_NOT_ALL_DEALLOCATING
%X1FFF0832	106	2(E)	CLI_C_NONE_DEALLOCATING
%X1FFF083A	107	2(E)	CLI_C_NOT_ALL_DRAINING
%X1FFF0842	108	2(E)	CLI_C_NONE_DRAINING
%X1FFF084A	109	2(E)	CLI_C_NOT_ALL_UNBOUND
%X1FFF0882	110	2(E)	CLI_C_NONE_UNBOUND
%X1FFF088A	111	2(E)	CLI_C_NOT_ALL_NONPOOLED
%X1FFF0892	112	2(E)	CLI_C_NONE_NONPOOLED
%X1FFF0892	113	2(E)	CLI_C_NOT_ALL_DRAINWAIT
%X1FFF089A	114	2(E)	CLI_C_NONE_DRAINWAIT
%X1FFF08AA	115	2(E)	CLI_C_NOT_ALL_DISABLED
%X1FFF08B2	116	2(E)	CLI_C_NONE_DISABLED
%X1FFF08BA	117	2(E)	CLI_C_NOT_ALL_DEACTIVATED
%X1FFF08C2	118	2(E)	CLI_C_NONE_DEACTIVATED
%X1FFF08CA	119	2(E)	CLI_C_NOT_ALL_UNBINDING
%X1FFF902	120	2(E)	CLI_C_NONE_UNBINDING
%X1FFF090A	121	2(E)	CLI_C_NOT_ALL_RECLAIMING
%X1FFF0912	122	2(E)	CLI_C_NONE_RECLAIMING
%X1FFF091A	123	2(E)	CLI_C_NOT_ALL_BALANCING
%X1FFF0922	124	2(E)	CLI_C_NONE_BALANCING
%X1FFF092A	125	2(E)	CLI_C_DEVMASK_VALDTE_FAILED
%X1FFF0932	126	2(E)	CLI_C_DEVMASK_FREQNT_ CHANGES
%X11FF093A	127	2(E)	CLI_C_STAR_INV_STATE
%X11FFF0942	128	2(E)	CLI_C_STAR_ALLOWED_FROM_ WKLD
%X1FFF094A	129	2(E)	CLI_C_STAR_INV_DEF_FILE_FMT
%X1FFF0982	130	2(E)	CLI_C_STAR_ACTN_FILE_ERROR

%X1FFF098A	131	2(E)	CLI_C_STAR_DEF_FILE_ERROR
%X1FFF0992	132	2(E)	CLI_C_STAR_SETUP_REQD
%X1FFF0992	133	2(E)	CLI_C_STAR_SETUP_INV_OPMODE
%X1FFF09A2	134	2(E)	CLI_C_STAR_OPMODE_REQD
%X1FFF09AA	135	2(E)	CLI_C_STAR_CTL_SITE_REQD
%X1FFF09B2	136	2(E)	CLI_C_STAR_WKLD_SITE_REQD
%X1FFF09BA	137	2(E)	CLI_C_STAR_WKLD_OP_REQD
%X1FFF09C2	138	2(E)	CLI_C_STAR_CREATE_GROUP_FAIL
%X1FFF09CA	139	2(E)	CLI_C_STAR_FULL_COPY_REQD
%X1FFF0A02	140	2(E)	CLI_C_STAR_INV_ACTION_WOF
%X1FFF0A0A	141	2(E)	CLI_C_STAR_BUILDCG_REQD
%X1FFF0A13	142	3(I)	CLI_C_NOT_ALL_FAILEDBACK
%X1FFF0A1B	143	3(I)	CLI_C_NONE_FAILEDBACK
%X1FFF0A23	144	3(I)	CLI_C_NOT_ALL_STOPPED
%X1FFF0A2B	145	3(I)	CLI_C_NONE_STOPPED
%X1FFF0A33	146	3(I)	CLI_C_NOT_ALL_CONSISTENT_ NOINVALIDS
%X1FFF0A3B	147	3(I)	CLI_C_NONE_CONSISTENT_ NOINVALIDS
%X1FFF0A43	148	3(I)	CLI_C_NOT_ALL_SYNCHRONOUS
%X1FFF0A4B	149	3(I)	CLI_C_NONE_SYNCHRONOUS
%X1FFF0A83	150	3(I)	CLI_C_NOT_ALL_ SEMISYNCHRONOUS
%X1FFF0A8B	151	3(I)	CLI_C_NONE_SEMISYNCHRONOUS
%X1FFF0A93	152	3(I)	CLI_C_NOT_ALL_ASYNCHRONOUS
%X1FFF0A9B	153	3(I)	CLI_C_NONE_ASYNCHRONOUS
%X1FFF0AA3	154	3(I)	CLI_C_NOT_ALL_ACP_WP
%X1FFF0AAB	155	3(I)	CLI_C_NONE_ACP_WP
%X1FFF0AB4	156	3(I)	CLI_C_NOT_ALL_ACP_DISK
%X 1FFF0ABB	157	3(I)	CLI_C_NONE_ACP_DISK
%X 1FFF0AC3	158	3(I)	CLI_C_NOT_ALL_COMPRESSING

%X 1FFF0ACB	159	3(I)	CLI_C_NONE_COMPRESSING
%X 1FFF0B03	160	3(I)	CLI_C_NOT_ALL_UNCOMPRESSING
%X 1FFF0B0B	161	3(I)	CLI_C_NONE_UNCOMPRESSING