

Overview of SYMCLI Functionality

Date 1/8/2002

Copyright © 2001 EMC Corporation. All rights reserved.

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.

EMC, EMC², and Symmetrix are registered trademarks and DeltaMark, Fastrax, TimeFinder, SRDF, SymmAPI, Volume Logix, and where information lives are trademarks of EMC Corporation.

All other brand names are trademarks or registered trademarks of their respective owners.

Part Number C888

Printed 1/8/2002

Table of Contents

Introduction	4
Related Documentation	4
Symmetrix and SYMCLI Overview	5
Symmetrix Architecture	5
Symmetrix Device Architecture	6
Storage Devices	6
Meta Devices	7
Gatekeeper Devices	7
TimeFinder and BCV Devices	7
SRDF Devices	8
DRV Devices	8
VCM Devices	8
Device Groups	8
DeltaMark	8
Fastrax	8
SYMCLI Structure	9
Environment Variables and Naming Conventions	9
Directory Structure	10
Options File	11
Avoidance Files	11
Using SYMCLI Through a Remote Server	11
Server Access Security	11
Native Client/Server Environment	11
SYMCLI Base Commands	13
Configuration Data	13
Device Groups	13
Devices	14
Gatekeeper Devices	14
DRV Devices	15
Performance Statistics	15
BCV Devices	15
Data Object Changes	15
Remote SYMAPI Service	16
Labeling Devices for Windows NT	16
SYMCLI TimeFinder Commands	17
SYMCLI SRDF Commands	18
SYMCLI Control Commands	19
Symmetrix Optimizer	19
Quality of Service	19
SYMCLI Configuration Commands	20

SYMCLI Mapping Commands	21
Data Object Mapping	21
Database Mapping	21
File System Mapping	21
Logical Volume Mapping	22
SYMCLI Access Control Command	23
SYMCLI Checksum Command	24
 Conclusion	25
 Appendix A: SYMCLI Environment Variables	26
 Appendix B: Referencing Devices and Objects	29
 Appendix C: The Options File	30
 Appendix D: Avoidance Files	33

Introduction

This document provides an overview to the functionality and capabilities provided in Version 4.3 of the components of the EMC Solutions Enabler (known as SYMCLI — Symmetrix® Command Line Interface). Version 4.3 of SYMCLI was released in June 2001. While it is expected that such functionality will be continued and enhanced in later versions of SYMCLI, always consult the latest version of the *EMC Solutions Enabler*, *SYMCLI Release Notes* and relevant component Product Guides for up-to-date information and any restrictions on functionality and performance.

Related Documentation

The following SYMCLI reference manuals provide more detailed information on SYMCLI functionality and capabilities:

- *EMC Solutions Enabler, SYMCLI V4.3 Release Notes* (P/N 300-000-054)
- *EMC Solutions Enabler, Installation Guide* (P/N 300-000-047)
- *EMC Solutions Enabler, SYMCLI Base Component Product Guide* (P/N 300-000-048)
- *EMC Solutions Enabler SYMCLI Configuration Component Product Guide* (P/N 300-000-053)
- *EMC Solutions Enabler SYMCLI Control Component Product Guide* (P/N 300-999-142-01)
- *EMC Solutions Enabler SYMCLI Mapping Component Product Guide* (P/N 300-000-051)
- *EMC Solutions Enabler SYMCLI SRDF Component Product Guide* (P/N 300-000-049)
- *EMC Solutions Enabler SYMCLI TimeFinder Component Product Guide* (P/N 300-000-050)
- *EMC Solutions Enabler SYMCLI Access Control Component Product Guide* (P/N 300-000-069)
- *EMC Solutions Enabler SYMCLI V4.3 Checksum Release Notes* (P/N 300-000-046)

Symmetrix and SYMCLI Overview

The Solutions Enabler (known as SYMCLI) is a specialized set of formatted commands that can be invoked to manage the storage complex. SYMCLI commands are invoked from the host operating system command line (shell), and are used in single command line entries and scripts to map and perform control operations on devices and data objects. They may also be used to monitor device configuration and the status of devices that make up the storage environment, which is typically Symmetrix based.

SYMCLI commands are linked with the library functions in the Symmetrix Application Programming Interface (SYMAPI or SymmAPI™). These library functions use system calls that generate low-level SCSI, Fibre Channel, or ESCON commands to the Symmetrix unit(s). To reduce the number of inquiries from the host system to the Symmetrix, configuration and status information is maintained in a Symmetrix host database file (known as the SYMAPI database). The full software architecture from the Operating System (OS) level to Vendor Applications is illustrated diagrammatically in Figure 1. SYMCLI may be regarded as a host application written using the SYMAPI.

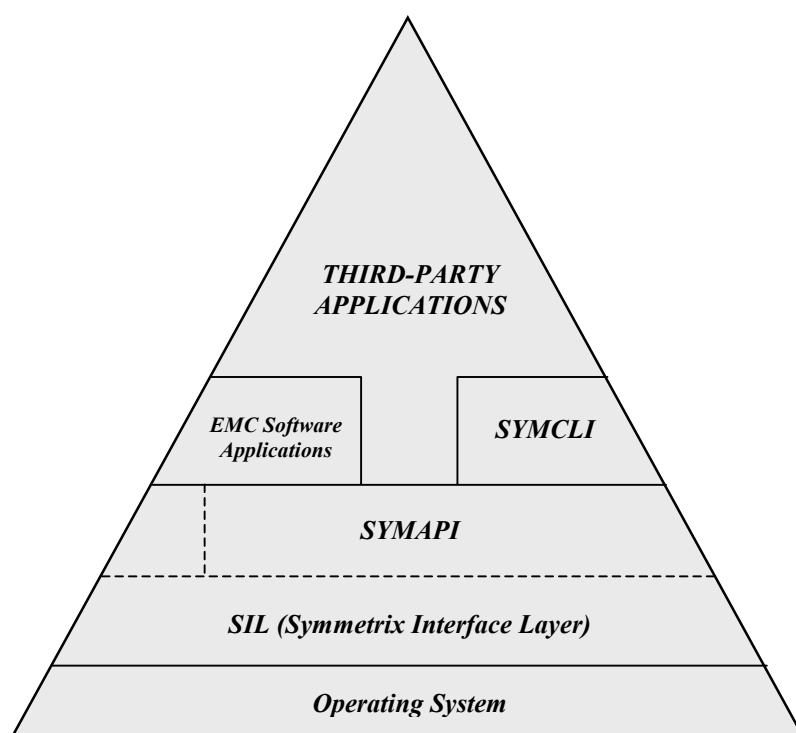


Figure 1. Software Architecture

Symmetrix Architecture

Symmetrix is an integrated cached disk array (ICDA) designed for online data storage. A host system and Symmetrix communicate via one or more SCSI or Fibre Channel interfaces (for MVS, bus and tag channel connected). Figure 2 illustrates the major functional components of a Symmetrix unit and its connection to host systems.

A *front-end director* (SA — SCSI, FA — Fibre Channel, or EA — ESCON) is a card that occupies one slot on the Symmetrix backplane (multiple directors are often on a single card). The front-end director provides the front-end connection and interface to Symmetrix cache array. A Symmetrix can have from 2 to 32 front-end directors, depending on the requirements and Symmetrix model.

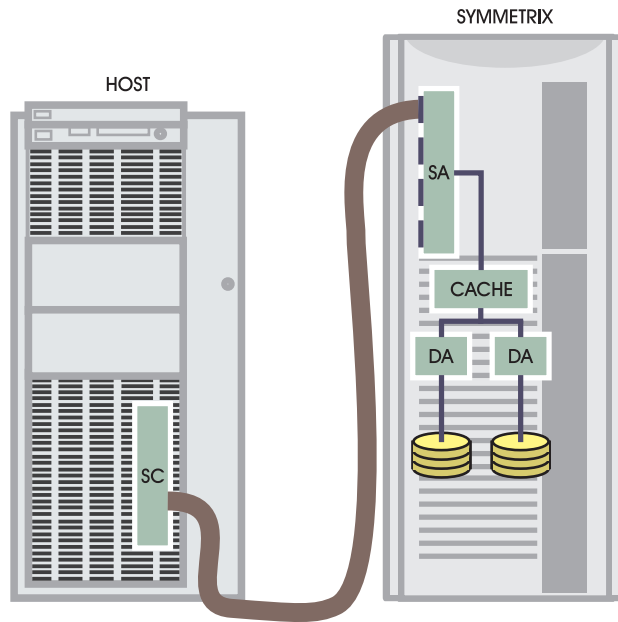


Figure 2. Symmetrix Components

Cache memory resides on boards that occupy as many as four slots on a Symmetrix backplane. Cache memory is a buffer interface between front-end directors and the back-end disk directors that store the current I/O data transfers.

A *disk director* (DA) is a card that occupies one slot on the Symmetrix backplane (multiple directors are often on a single card). Microcode on the card manages access to specific disk drives. The back-end director transfers data from disk to cache and destages write-bound data from cache to disk. A Symmetrix can have up to 32 disk directors, depending on the Symmetrix model.

Symmetrix Device Architecture

All host I/O transactions with the Symmetrix use Symmetrix cache on a front-end director. Because no physical disks are involved in the I/O protocol, Symmetrix devices are presented to the host with the following configuration attributes:

- Each device has **N** cylinders. This number is configurable ($\text{blocks} \div 960$).
- Each cylinder has **15** tracks (heads)
- For fixed block architecture (FBA) devices, each track has **64** blocks of **512** bytes. For non-FBA operating systems, the blocks are recognized without regard to the number of bytes.

Storage Devices

From the perspective of software executing on a host system, a Symmetrix appears to be a number of *physical devices* connected via I/O buses to one or more I/O controllers. A host application addresses each of these devices using a physical device name. Each physical device defined in the Symmetrix database has specific attributes, such as vendor ID, product ID, revision level, and serial ID.

As shown in Figure 3, a Symmetrix device can map to a part of a physical disk or to an entire disk. The part of a physical disk to which a Symmetrix device is mapped is called a *hypervolume* or a *hyper*. Each hypervolume in a Symmetrix system is assigned a hexadecimal number at the time that the Symmetrix is configured; this number serves as a unique identifier and is known as the Symmetrix *logical volume number*.

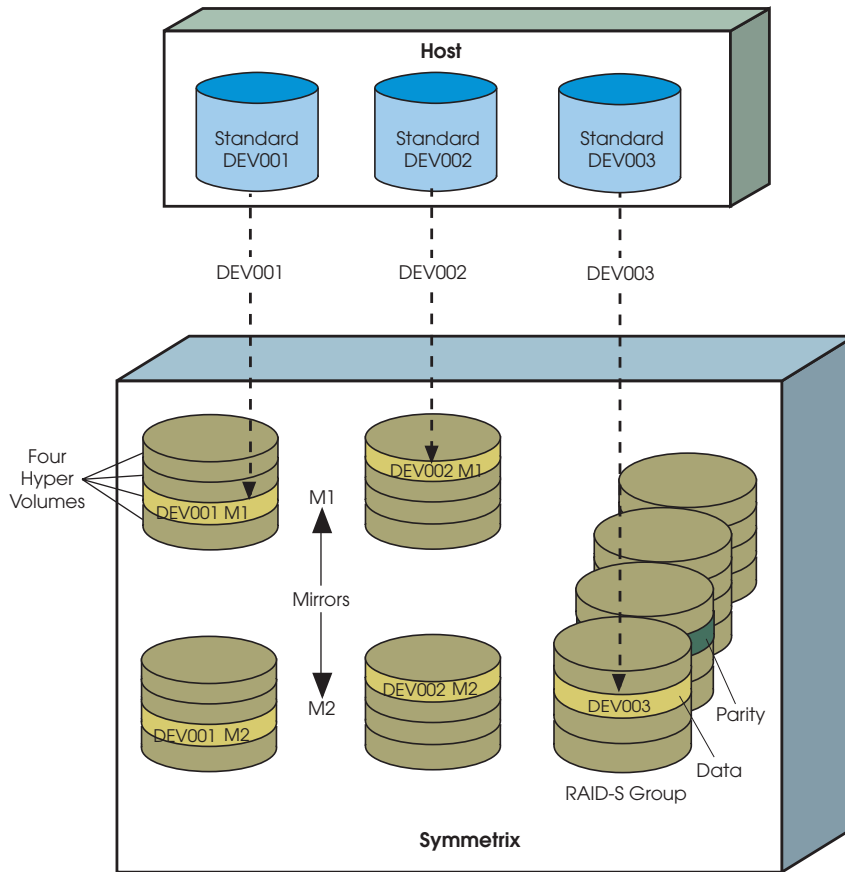


Figure 3. Mapping of Symmetrix Devices

Meta Devices

Meta devices allow individual devices to be grouped (concatenated or striped) to create larger devices. The *meta head* is the first device in the meta device sequence and is responsible for receiving incoming commands. When an incoming command for the meta head is processed, the Symmetrix determines which meta device member should execute the command.

Gatekeeper Devices

I/O commands executed by SYMAPI are transferred to the Symmetrix via a Symmetrix device that is designated as a *gatekeeper* device. The gatekeeper allows SYMAPI functions to retrieve configuration and status information from the Symmetrix without interfering with normal Symmetrix operations.

By default, one of the available Symmetrix devices is designated as a gatekeeper. Alternatively, specific devices may be designated as gatekeepers.

TimeFinder and BCV Devices

EMC TimeFinder™ is a business continuity solution that uses special Symmetrix devices called *Business Continuity Volumes (BCVs)*. While a BCV is attached (*established*) to a standard Symmetrix device, it operates as a mirror of the standard device and holds an up-to-date copy of the production data. In this mode, the BCV device is inaccessible via its original device address. When the BCV is detached (*split*) from the standard device, the user has a point-in-time copy of the production data, and the BCV can be assigned and mounted by another host through its original device address. Uses for these copies of

production data can include backup/restore, decision support, data warehouse loading, offloaded reporting, and applications testing.

Once host processing on the BCV device is complete, the BCV may again be mirrored to a standard Symmetrix device (either the same device to which it was previously paired, or to a different standard device).

SRDF Devices

The Symmetrix Remote Data Facility (SRDF™) is an online, host-independent, mirrored data storage solution that duplicates and maintains production site data on one or more physically separate target Symmetrix systems. These target systems can be across the room, around the globe, or anywhere in between. SRDF configurations have at least one source (R1) device mirrored to one target (R2) device.

SDRF provides a recovery solution for component or site failures using remotely mirrored devices. SRDF lowers backup and recovery costs, significantly reduces recovery time after a disaster, and is particularly beneficial in disaster recovery scenarios where quick recovery from site failure is essential.

The combination of SRDF and TimeFinder provides the best of both worlds by combining disaster recovery and remote access to production data.

DRV Devices

A *DRV* (Dynamic Reallocation Volume) device is a non user-addressable Symmetrix device used internally by the Symmetrix Optimizer to temporarily hold user enterprise data while the devices are being re-organized. A DRV functions like a BCV device; it provides a temporary backup to a relocating hypervolume.

VCM Devices

A *VCM* (Volume Configuration Management) device is a small disk device (such as a 16 cylinder, 8 MB device) that is designated as a volume gatekeeper by the EMC Volume Logix™ utility.

Device Groups

Device groups are the primary means of control of Symmetrix devices. A device group represents several Symmetrix devices, and is established to provide configuration, status, and performance data on the collective devices within the device group. A Symmetrix device is assigned a logical name when the device is added to a device group.

DeltaMark

EMC DeltaMark™, also known as the Symmetrix Differential Data Facility (SDDF), answers the need for a more efficient way to process changes that occur in a database or files stored on Symmetrix systems. It differentiates between data that has changed since the last backup or data movement operation and that which has not. Backup, extraction, propagation, replication, or other data-movement applications can take advantage of the identified changes by moving only those changes. Data movement scales in proportion to the changes rather than the size of the database or file system.

DeltaMark functionality is used in TimeFinder so that only the tracks on the BCVs that have changed since the last backup are backed up, thereby reducing time and resource use.

Fastrax

The EMC Fastrax™ data movement platform is a high-performance backup and recovery data movement solution designed for direct, bi-directional movement of data between Symmetrix systems and high performance tape or other secondary storage, without any server, application, or network impact.

SYMCLI Structure

SYMCLI commands are grouped into the following licensed categories:

- **SYMCLI Base commands.** These commands obtain device configuration information, provide configuration control, and retrieve status data and performance statistics on Symmetrix units. The SYMCLI Base commands require an EMC Solutions Enabler Base Component license.
- **SYMCLI TimeFinder commands.** The SYMCLI TimeFinder commands extend the basic SYMCLI command set to manage and perform control operations on BCV devices within a TimeFinder environment. The SYMCLI TimeFinder commands require an EMC Solutions Enabler TimeFinder Component license.
- **SYMCLI SRDF commands.** The SYMCLI SRDF commands extend the basic SYMCLI command set to manage and perform control operations on SRDF devices in a Symmetrix Remote Data Facility configuration. The SYMCLI SRDF commands require an EMC Solutions Enabler SRDF Component license.
- **SYMCLI Control commands.** The SYMCLI Control commands provide special controls and performance features beyond those provided in the Base Component, and enable the storage environment to be tuned and optimized. The SYMCLI Control commands require an EMC Solutions Enabler Optimizer license.
- **SYMCLI Configuration Commands.** The SYMCLI Configuration commands extend the basic SYMCLI command set to manage and perform configuration changes. The SYMCLI Configuration commands require an EMC Solutions Enabler Configuration Manager license.
- **SYMCLI Mapping commands.** The SYMCLI Mapping commands extend the basic SYMCLI command set to allow the systematic discovery and examination of attributes of various objects on the host, within a specific relational database, in a file system, or in a Logical Volume Manager (LVM). These commands are typically non-Symmetrix specific, but support host system tasks when associated with Symmetrix management operations. The SYMCLI Mapping commands require an EMC Solutions Enabler Mapping Solution license.
- **SYMCLI Access Control command.** The SYMCLI Access Control command supports Symmetrix access control (SAC) requirements, allowing the set up and maintenance of an access-controlled environment over the Symmetrix resource (device pools). The SYMCLI Access Control command requires an EMC Solutions Enabler Base Component license.
- **SYMCLI Checksum command.** The SYMCLI Checksum command works in conjunction with the Oracle checksum facility to improve the detection and notification of errors during database write transfers between an Oracle application running on a host and a Symmetrix storage device. The SYMCLI Checksum command requires an EMC Solutions Enabler OraclePak license.

The `symcli help` command provides brief help or descriptions of all of the SYMCLI commands, details of the version of the SYMCLI installed on the host, and the settings of the environment variables (see below) for the current SYMCLI command line session.

Environment Variables and Naming Conventions

SYMCLI provides a group of environment variables that can be preset to streamline and expedite the SYMCLI command line session, eliminating the requirement for repeated key strokes. Appendix A contains brief descriptions of the environment variables and their function. Appendix B contains brief descriptions of the naming conventions used in the SYMCLI for referencing devices and objects.

Directory Structure

Tables 1, 2, and 3 list the various directories on the UNIX, Windows NT / Windows 2000, and Netware platforms that are installed and required in order to run the SYMCLI environment.

Table 1. SYMCLI Installed UNIX Directories

Contents	Directories	For Use By:
SYMCLI manpages for the commands	/usr/symcli/man /usr/symcli64/man /usr/symclimt/man /usr/symcli64mt/man	32-bit applications 64-bit applications Multithreaded 32-bit applications Multithreaded 64-bit applications
SYMCLI binaries for executables (the command line path)	/usr/symcli/bin /usr/symcli64/bin /usr/symclimt/bin /usr/symcli64mt/bin	32-bit applications 64-bit applications Multithreaded 32-bit applications Multithreaded 64-bit applications
Shared SYMAPI libraries	/usr/symcli/shlib /usr/symcli64/shlib /usr/symclimt/shlib /usr/symcli64mt/shlib	32-bit applications 64-bit applications Multithreaded 32-bit applications Multithreaded 64-bit applications
SYMCLI/SYMAPI Symmetrix configuration database file(s)	/var/symapi/db	Any application
SYMCLI environment and system files (licenses, avoidance, options, and server network files)	/var/symapi/config	Any application
SYMCLI log files for significant events	/var/symapi/log	Any application
SYMCLI libraries for XML	/usr/symcli/xml	Any application

Table 2. SYMCLI Installed Windows NT / Windows 2000 Directories

Directories	Contents
C:\Program Files\EMC\Symcli\man	SYMCLI manpages for the commands
C:\Program Files\EMC\Symcli\binaries	SYMCLI binaries for executables (the command line path)
C:\Program Files\EMC\Symapi\db	SYMCLI/SYMAPI Symmetrix configuration database file(s)
C:\Program Files\EMC\Symapi\config	SYMCLI environment and system files (licenses, avoidance, options, and server network files)
C:\Program Files\EMC\Symapi\log	SYMCLI/SYMAPI log files for significant events
C:\Program Files\EMC\Symcli\xml	SYMCLI XML examples

Table 3. SYMCLI Installed Netware Directories

Directories	Contents
sys:\system\EMC\Symcli\man	SYMCLI manpages for the commands
sys:\system\EMC\Symcli\binaries	SYMCLI binaries for executables (the command line path)
sys:\system\EMC\Symapi\db	SYMCLI/SYMAPI Symmetrix configuration database file(s)
sys:\system\EMC\Symapi\config	SYMCLI environment and system files (licenses, avoidance, options, and server network files)
sys:\system\EMC\Symapi\log	SYMCLI/SYMAPI log files for significant events
sys:\system\EMC\Symcli\xml	SYMCLI XML examples

On the OpenVMS platform, EMC\$ROOT equates to the location picked for installation of the base software directory. In the following example, "SYS\$SYSDEVICE:[SYMAPI.]" is chosen:

```
[EXAMPLE]
"EMC$ROOT" = "SYS$SYSDEVICE:[SYMAPI.]"
"SYMAPI$ROOT" = "EMC$ROOT"
"SYMAPI$BIN" = "EMC$ROOT:[EXE.OVMS.SDK.REL]"
"SYMAPI$CONFIG" = "EMC$ROOT:[EMC.SYMAPI.CONFIG]"
"SYMAPI$DB" = "EMC$ROOT:[EMC.SYMAPI.DB]"
"SYMAPI$LOG" = "EMC$ROOT:[EMC.SYMAPI.LOG]"
"SYMAPI$SHLIB" = "EMC$ROOT:[SHLIB.OVMS.SDK.REL]"
"SYMCLI$BIN" = "EMC$ROOT:[EMC.SYMCLI.BINARIES]"
"SYMCLI$HELP" = "EMC$ROOT:[EMC.SYMCLI.HELP]"
"SYMCLI$SHLIB" = "EMC$ROOT:[EMC.SYMCLI.SHLIB]"
```

Options File

The `options` file in the SYMAPI configuration directory (e.g., `/var/symapi/config` on UNIX systems, etc.) contains default constants that can be set to change defaults on *this* host to certain options that are used in various SYMCLI commands and associated SYMAPI calls. This file can be used to customize and streamline command line coding to suit the specific storage environment. Appendix C contains brief descriptions of the options in the `options` file and their function.

Avoidance Files

The `symavoid`, `gkavoid`, and `inqfile` files are three *avoidance* files that can exist in the SYMAPI configuration directory to limit the scope or change the performance of SYMCLI online commands, particularly `symcfg discover` and `syminq`. These files can be used to customize and streamline command line coding to suit the specific storage environment. Appendix D contains brief descriptions of the avoidance files and their function.

Using SYMCLI Through a Remote Server

SYMCLI can be run as a client to a remote SYMAPI server in order to manage a remotely-controlled Symmetrix complex. The SYMAPI installation procedure installs the client server (`symapisrv`) in the binaries directory, and also installs two files (`netcnfg` and `symapinlck`) in the SYMAPI configuration directory. On both the client host or server host, the editable `netcnfg` file lists the network services available from that local host or from one or more remote hosts. To execute a remote SYMAPI session across a TCP/IP network connection, both the client and server `netcnfg` files must have service entries that map to the same node and port. The `symapinlck` file is used as a lock file on a server host to guarantee a single port listener for a network service.

Server Access Security

An optional file (`nethost`) for trusted-user host access can also be present in the server SYMAPI configuration directory. When this file exists (maintained by the System Administrator), only the nodes and users listed in this file are allowed to connect to the server to execute remote SYMCLI commands and SYMAPI functions. In addition, some settings in the `options` file can be used to limit the use of certain functions via the server.

Native Client/Server Environment

The host in a client/server environment can be configured to return physical device data in the host's native format into a `pdevfile` file instead of the SYMAPI database file. This option is especially useful in client/server configurations where the client is physically attached to the Symmetrix but the host

application is relying strictly on a server for communications with the Symmetrix. An example of this is clients that require a SYMAPI server running on the Symmetrix service processor.

The `pdevfile` option can be used for two kinds of configurations:

- Where a Symmetrix device is mapped to the physical devices both at the client and server
- Where a Symmetrix device is mapped to a physical device at the client but not at the server

An advantage of the first configuration is that the *PdevNames* will be shown in the client's format rather than the server's format.

The `syminq` and `sympd list` commands (see below in SYMCLI Base Commands) have an option (`-pdevfile`) to support output listing of physical devices in a device format native to the host.

SYMCLI Base Commands

The SYMCLI Base Commands are grouped into functional categories.

Configuration Data

The `symcfg` command displays Symmetrix configuration and status information, director information, and information about all the Symmetrix devices visible to the host. A description of the `symcfg` command is provided in Table 4.

Table 4. Configuration Data Command

Command	Description
<code>symcfg</code>	Performs operations on one or more Symmetrix units. Possible operations are: • Discover Symmetrix configuration information • Display configuration information for the following directors: Channel, Disk, ESCON, RDF, SCSI, and Fibre Channel • Refresh the Symmetrix database file or remove information from the Symmetrix database file • View or release Symmetrix exclusive locks • Display attributes of the Symmetrix and host environment • List application registrations and host connections • Take RA directors and SA ports offline (and online)

The `syminq` SCSI utility command is used to issue a SCSI INQUIRY and/or SCSI READ CAPACITY on one or all devices attached to a host, and is described in Table 5.

Table 5. SCSI Utility Command

Command	Description
<code>syminq</code>	Performs operations on a device given its physical device name. Possible operations are: • Issue a SCSI INQUIRY and/or SCSI READ CAPACITY on one or all devices attached to a host • List Symmetrix standard or BCV devices

Device Groups

The `symdg` and `syml` commands group Symmetrix devices for status, monitoring, and control purposes. For example, a device group can be set up to contain all devices used by a particular host or that are used in a particular database application. The `symdg` and `syml` commands are described in Table 6.

Table 6. Device Group Commands

Command	Description
<code>symdg</code>	Performs operations on a device group. Possible operations are: • Create a device group • Delete a device group • Rename a device group • List information about all device groups • Show detailed information about a device group • Show devices within a device group that have device external locks

Command	Description
<code>symld</code>	Performs operations on standard devices in a device group (using logical device names). Possible operations are: • Add devices to a device group • List all devices in a device group • Remove a device from a device group • Rename a device in the device group • Show detailed information about a device in a device group • Issue basic control operations such as write-disable and write-enable devices on front-end director ports • Apply a defined label to the device

Devices

Information about devices can be obtained using the `symdev` and `sympd` commands, which are described in Table 7. These commands vary in how the devices are referenced: by physical device name, logical device name, or Symmetrix device name.

Table 7. Device Commands

Command	Description
<code>symdev</code>	Performs operations on a device given its Symmetrix device name. Possible operations are: • List all Symmetrix devices that are configured in one or more Symmetrix units and which are reachable by this host (locally, or remotely via SRDF links) • Show detailed information about a Symmetrix device • List all Symmetrix devices that have SCSI reservations • List Symmetrix devices that have Symmetrix external locks • List devices that have device external locks • Release device external locks
<code>sympd</code>	Performs operations on a device given its physical device name. Possible operations are: • List all Symmetrix devices that are visible to the host • Show detailed information about a Symmetrix device that is visible to the host • List all Symmetrix devices that are visible to the host and which have SCSI reservations

Gatekeeper Devices

The `symgate` command is used to select a Symmetrix device to function as a gatekeeper device and associate that device with a specific device group. Table 8 describes the `symgate` command.

Table 8. Gatekeeper Command

Command	Description
<code>symgate</code>	Performs operations on a gatekeeper device. Possible operations are: • List the currently defined gatekeeper devices • Define a Symmetrix device as a gatekeeper device by adding it to the gatekeeper device list • Associate a gatekeeper device with a device group • Disassociate a gatekeeper device from a device group • Undefine a Symmetrix device as a gatekeeper device, which removes it from the gatekeeper list

DRV Devices

The `symdrv` command displays information for selected DRV devices, and is described in Table 9.

Table 9. DRV Command

Command	Description
<code>symdrv</code>	Lists information about DRV devices and their current standard device pairing(s).

Performance Statistics

Counters on each Symmetrix unit accumulate event hits and the status of certain operations.

The `symstat` command can retrieve these counts and use them to compute performance statistics.

Table 10 describes the `symstat` command.

Table 10. Performance Statistics Command

Command	Description
<code>symstat</code>	Returns performance statistics for the entire Symmetrix unit, one or all directors of a specified type, a device, a device group, disks, or the mirrors of a Symmetrix device.

BCV Devices

The `symbcv` command performs support operations on BCV devices, including associating BCV devices to specific device groups. Table 11 describes the `symbcv` command.

Table 11. BCV Device Support Command

Command	Description
<code>symbcv</code>	Performs support operations on BCV devices. Possible operations are: • Associate one or all BCV devices with an existing device group • List all BCV devices • Disassociate one or all BCV devices from a device group • Associate remotely-attached BCV devices with an existing device group • Disassociate remotely-attached BCV devices from a device group

Data Object Changes

The `symchg` command (also known as the ChangeTracker command) monitors changes in the data objects in the storage environment, and is described in Table 12. This command requires the EMC DeltaMark license.

Table 12. Data Object Change Tracker Command

Command	Description
<code>symchg</code>	Marks areas of Symmetrix disk storage so that objects occupying those areas can be monitored for changes. Possible operations are: • Create a DeltaMark (or ChangeTracker) session for data objects • Delete a DeltaMark (ChangeTracker) session • Mark an object to be monitored • List the marked objects • View the marked objects for changes • Remove the marked object from the <code>symchg</code> database without session termination • Generate a report on the amount of change for the specified object in a specified log file

Remote SYMAPI Service

The `symapisrv` command controls the operation of the remote SYMAPI server, which provides a SYMCLI client/server connection to the Symmetrix subsystems. Table 13 describes the `symapisrv` command. This command requires the SYMAPI Server license.

Table 13. SYMAPI Service Command

Command	Description
<code>symapisrv</code>	Starts or stops an executable image, called the SYMAPI server, which provides a SYMAPI and SYMCLI client-server interface to Symmetrix systems.

Labeling Devices for Windows NT

In certain situations, relabeling devices is required when devices are under the control of Windows-type volume manager. If a BCV (TimeFinder) device holds an identical copy of its standard (paired) device, when the BCV becomes ready to the operating system, the volume manager will detect two (2) identical volumes with different mount points. This can cause the volume manager to exit and crash the system.

For Windows NT V4.0 only, the `symlabel` and `symld relabel` commands allow the creation of a separate serial number on either the primary (standard) volume or the TimeFinder copy. The devices are required to have a current valid Windows NT V4.0 label on them or the `symld relabel` command will fail. Running the Windows Disk Administrator once and writing a signature (`symlabel`) qualifies the device. Table 14 describes the `symlabel` command.

Table 14. Device Label Command

Command	Description
<code>symlabel</code>	Performs device label (signature) definitions on device(s) in a device group.

SYMCLI TimeFinder Commands

The `symioctl` and `symmir` commands perform control operations on BCV device pairs or a device group. Table 15 lists the BCV device control commands.

Table 15. BCV Device Control Commands

Command	Description
<code>symioctl</code>	Sends I/O control commands to a specified server application. Possible operations are: • Place objects into and take objects out of hot backup mode • Freeze or thaw I/O to a specified database application • Issue a checkpoint to the RDBMS • Archive the current log • Begin a snapshot backup on SQL Server 2000 and higher • Save snapshot meta-data and resume writes on SQL Server 2000 and higher • Restore previously saved snapshot meta-data on SQL Server 2000 and higher • Terminate the snapshot operation without saving meta-data and resume writes on SQL Server 2000 and higher The <code>symioctl</code> command is provided with the EMC Solutions Enabler TimeFinder Component, SRDF Component, and Mapping Solution licenses.
<code>symmir</code>	Performs control operations on BCV device pairs. Possible operations are: • Establish (mirror) one or all standard devices in a device group with one or more BCV devices that are associated locally or remotely with the group. The operation can be a full or incremental establish. • Restore one or all standard devices in a device group from one or more BCV devices that are associated locally or remotely with the group. The operation can be a full or incremental restore. • Split one or all BCV devices from the standard device(s) in a device group • Return information about the state of mirroring of one or all BCV device pairs in a device group

SYMCLI SRDF Commands

The SYMCLI SRDF commands perform SRDF control operations on devices and device groups in Symmetrix units in an SRDF configuration. Table 16 lists the SRDF control commands.

Table 16. SRDF Control Operations

Command	Description
<code>symcg</code>	Performs control operations on a Symmetrix SRDF consistency group. Possible operations are: • Create and delete consistency groups • Add and remove devices in a consistency group • Show detailed information about a consistency group • Enable or disable the consistency mode (state) of a consistency group
<code>symioctl</code>	Sends I/O control commands to a specified server application (see above under SYMCLI TimeFinder Commands).
<code>symrdf</code>	Performs control operations on SRDF devices. Possible operations are: • Establish (mirror) an SRDF pair by initiating a data copy from the source (R1) side to the target (R2) side. This operation can be a full or incremental establish. • Restore remote mirroring. Initiates a data copy from the target (R2) side to the source (R1) side. The operation can be a full or incremental restore. • Split an SRDF pair, which stops mirroring for the SRDF pair(s) in a device group • Failover from the source (R1) side to the target (R2) side, switching data processing to the target (R2) side • Failback from the target (R2) side to the source (R1) side, switching data processing to the source (R1) side • Update the source (R1) side after a failover, while the target (R2) side may still be operational to its local host(s) • Swap R1 and R2 designations between the target and source
<code>symreplicate</code>	Invokes a replicate session that generates automated, recurrent, background copies of the standard data following a patch across SRDF links and cascading BCVs. You can start a replicate session, stop it, and restart the replicate session. The <code>symreplicate</code> command requires the EMC Solutions Enabler TimeFinder Component and SRDF Component licenses.

SYMCLI Control Commands

The SYMCLI Control commands provide special controls and performance features.

Symmetrix Optimizer

The `symoptmz` command performs operations that set the tunable thresholds of the Symmetrix Optimizer algorithm. A description of the `symoptmz` command is provided in Table 17.

Table 17. Symmetrix Optimizer Command

Command	Description
<code>symoptmz</code>	Performs operations on the Symmetrix Optimizer. Possible operations are: • Display a list of information about the Optimizer-specific attributes of Symmetrix devices that are configured in one or more Symmetrix units connected to this host • Show specific information about the current Optimizer parameters • Enable the Optimizer algorithm processing • Disable the Optimizer algorithm processing • Set the values of the parameters that control the Optimizer algorithm

Quality of Service

The `symqos` command provides Quality of Service (QoS) controls on specified devices. A description of the `symqos` command is provided in Table 18.

Table 18. Quality of Service Command

Command	Description
<code>symqos</code>	Invokes Quality of Service (QoS) controls on certain devices. Possible operations are: • Display a list of QoS priorities assigned to devices and mirrors • Set the values and parameters for QoS priorities on the devices and mirrors • Query the QoS copy priorities for members of a specified group • List the least recently used (LRU) cache assignments • Set the LRU cache assignments for a device or device group

SYMCLI Configuration Commands

The SYMCLI Configuration commands perform powerful control operations that manage various types of configuration changes on devices in the Symmetrix environment. Table 19 lists the configuration commands.

Table 19. Configuration Commands

Command	Description
<code>symconfigure</code>	Performs control operations that manage major configuration changes. Possible operations are: • Create new Symmetrix devices • Convert devices to other configuration types by adding/removing RDF, BCV, or DRV attributes • Form/dissolve meta devices • Add/remove meta device members • Map/unmap a Symmetrix device to front-end ports • Swap SRDF source/target attributes for an RA group • Set/reset SCSI or Fibre Channel port flags • Increase device protection by adding additional mirrors • Set device attributes • Set selective Symmetrix metrics (e.g., maximum number of hypers that can be created on a physical disk)
<code>symrdf swap</code>	Performs a control operation to swap SRDF personality (R1 designated devices become R2, and R2 designated devices become R1).

SYMCLI Mapping Commands

The SYMCLI Mapping commands focus on the open system tasks of mapping and examining the various objects on the host system, their relational databases, and the attached Symmetrix storage units.

Data Object Mapping

SYMCLI Data Object Mapping allows examination of the mapping of Symmetrix storage devices and the characteristics of data files and objects. The `symrslv` command displays the extent of data files and objects, and how they are mapped on Symmetrix and non-Symmetrix devices. A description of the `symrslv` command is provided in Table 20.

Table 20. Data Object Mapping Command

Command	Description
<code>symrslv</code>	Displays logical to physical mapping information about a logical object. Possible operations are: • Display logical to physical mapping information about any physical device • Display logical to physical mapping information about a logical volume • Display logical to physical mapping information about a regular host file or a Symmetrix file • Display logical to physical mapping information about a directory • Display logical to physical mapping information about a host file system

Database Mapping

SYMCLI Database Mapping commands allow examination of host database mapping and characteristics of a database. These command provide listings and attributes that describe various databases, their structures, files, tablespaces, and user schemas. Typically, the SYMCLI Database Mapping commands work with Oracle, Informix, SQL Server, Sybase, MVS DB2, and DB2/UDB database applications. A description of the SYMCLI Database Mapping commands is provided in Table 21.

Table 21. Database Object Mapping Commands

Command	Description
<code>symrddb</code>	List various physical and logical database objects. Possible operations are: • Current relational database instances available • Tablespaces, files, tables, or schemas of a database • Files, segments, or tables of a database tablespace or schema Show information about a database object. Possible operations are: • Tablespace, file, table, or schema of a database • File, segment, or a table of a specified tablespace or schema Other possible operations are: • Translate the devices of a specified database into a device group or a consistency group • Translate the devices of a specified tablespace into a device group or a consistency group
<code>symioctl</code>	Sends I/O control commands to a specified server application (see above under SYMCLI TimeFinder Commands).

File System Mapping

SYMCLI File System Mapping allows investigation of the file systems that are in use on the operating system. The following operating systems and file types are supported: HP-UX [hfs, VxFS (jfs)], IBM AIX (jfs), Sun Solaris (ufs, VxFS), Digital UNIX and Compaq Tru64 UNIX (ufs, AdvFS), and MS Windows

NT and Windows 2000 (NTFS). The `symhostfs` command provides listings and attributes that describe file systems, directories, and files, and their mapping to physical devices and extents. A description of the `symhostfs` command is provided in Table 22.

Table 22. File System Mapping Command

Command	Description
<code>symhostfs</code>	Displays mapping information about file systems, directories, and regular files that are defined on the host system. Possible operations are: • Display a list of file systems, files, or directories • Display more detail information about a file system or file system object

Logical Volume Mapping

SYMCLI Logical Volume Mapping commands allow mapping of logical volumes to a detailed view of host and Symmetrix disk usage. Logical volume architecture defined by a Logical Volume Manager (LVM) is a means for organizing physical disk storage for optimal use by host applications. The following LVMs are currently supported: HP LVM for the HP-UX operating system, AIX LVM for the IBM AIX operating system, VERITAS VxVM for the Sun Solaris and HP-UX operating systems, Sequent Volume Manager (ptx/SVM) for the DYNIX/ptx operating system, Logical Storage Manager (LSM) for Digital UNIX and Compaq Tru64 UNIX (DEC OSF/1), Disk Administrator (DiskADM) for Windows NT/2000, and Logical Disk Manager (LDM) for Windows 2000. A description of the SYMCLI Logical Volume Mapping commands is provided in Table 23.

Table 23. Logical Volume Mapping Commands

Command	Description
<code>symvg</code>	Displays mapping information about one or more logical volume groups that are defined by the specific platform's LVM. Possible operations are: • Display a list of volume groups defined on the host system by the LVM • Display more detailed information about a volume group, listing its logical volumes • Translate a logical volume group to a Symmetrix device group • Translate a logical volume group to a consistency group
<code>symlv</code>	Displays mapping information about one or more logical volumes that are defined in a specified LVM's volume group. Possible operations are: • Display a list of logical volumes on a specified volume group • Display detail information (including extent data) about a logical volume

SYMCLI Access Control Command

The `symacl` command sets up access control mechanisms and changes access control entries in an access control database, allowing an administrator of the Symmetrix storage site to set up and restrict host and user access control operations to defined sets of devices (device pools) across the various Symmetrix units. A description of the `symacl` command is provided in Table 24.

Table 24. Access Control Command

Command	Description
<code>symacl</code>	Performs management operations on the Symmetrix access control environment. Possible operations are: • List all access control entries (ACEs), access pools, or access groups • Show the state of the access control environment on a Symmetrix • Show detail information about the access group or pool • Release or abort any pending access control session lock • Preview or verify the contents of an access control command file for proper syntax and correctness • Prepare or check an access control command file for appropriateness of the requested access control entries against the current state of the Symmetrix • Commits all access control commands as entries to the access control database

SYMCLI Checksum Command

The `symchksum` command performs checksum error checks on data pages written by an Oracle database *as they are written to the disk*. The check takes place before the write command is acknowledged. Errors are immediately detected within the blocks of the extent and logged in the Symmetrix error log facilities, and can be rejected and/or reported in a phone-home connection. A description of the `symchksum` command is provided in Table 25.

Table 25. Checksum Command

Command	Description
<code>symchksum</code>	Performs Symmetrix checksum operations on one or all of the RDBMS tablespaces residing on Symmetrix devices. Possible operations are: • Enable or disable Symmetrix checksum operations on the extents of a specified database instance or tablespace • List all devices that have checksum checking enabled • Show the extents of a specified device that are having checksum checking performed • Validate that a specified database or tablespace is able to have checksum checking enabled • Verify devices of a database or tablespace that have checksum enabled

Conclusion

The EMC Solutions Enabler kit is the software that provides an application programming interface (the SYMAPI shared library) and the Symmetrix Command Line Interface (SYMCLI). The SYMCLI is a special command set that works on Windows and various open systems UNIX platforms, and which performs a variety of control and management operations. The SYMCLI commands are grouped into categories as follows:

Base	TimeFinder	SRDF	Control	Access Control	Mapping
symapisrv	symioctl	symcg	symoptmz	symacl	symhostfs
symbcv	symmir	symioctl	symqos		symioctl
symcfg		symrdf			symlv
symchg		symreplicate			symrdb
symcli					symrslv
symdev					symvg
symdg					
symdrv					
symgate					
syminq					
symlabel					
symld					
sympd					
symstat					
			Configuration		Checksum
			symconfigure		symchksum

The SYMCLI provides command-line users and script programmers with an interface for managing the Symmetrix units and their devices in an enterprise storage environment.

Appendix A: SYMCLI Environment Variables

This appendix provides a brief description of the environment variables that can be preset to streamline and expedite the SYMCLI command line session. The `symcli -env` command displays what environment variables can be set, while the `symcli -def` command displays the environment variables that have been set for the SYMCLI command line session. The environment variables are described in Table 26.

Table 26. Environment Variables

Variable Name	Description	Default
<code>SYMCLI_ACCESS_PIN</code>	For <code>symacl</code> with ADMIN privileges, this variable must be set to the ADMIN PIN (4 to 12 characters) to enable the <code>commit</code> , <code>prepare</code> , and <code>release</code> actions. If this is not set, you will always be prompted for a PIN.	NULL
<code>SYMCLI_BCV_PAIR_POLICY</code>	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: <code>CANCEL_OLDEST</code> (the default) <code>CANCEL_NEWEST</code> <code>DONT_CANCEL</code>	<code>CANCEL_OLDEST</code>
<code>SYMCLI_CG</code>	Specifies a default consistency group name.	None
<code>SYMCLI_CONNECT</code>	Specifies the service name when running the client server <code>symapisrv</code> .	NULL
<code>SYMCLI_CONNECT_TYPE</code>	Defines the local or remote mode of the host or client connection to the Symmetrix. Possible values for the client are: <code>REMOTE</code> Defines a client operation in which all the remote commands are strictly executed on the server, and the Symmetrix database is strictly read and updated remotely. <code>REMOTE_CACHED</code> Defines a client operation in which the remote Symmetrix database is modified remotely but cached in memory locally. Those functions that are control operations or which modify the database are executed remotely. These modifications to the remote database are then cached locally. <code>LOCAL</code> Defines a local connection to the Symmetrix. (Not used for a client-server connection.)	NULL
<code>SYMCLI_CTL_ACCESS</code>	Specifies how to obtain a lock on the Symmetrix database file before starting a Symmetrix control operation. Possible values are: <code>EXCLUSIVE</code> <code>PARALLEL</code>	<code>EXCLUSIVE</code>
<code>SYMCLI_DB_FILE</code>	Specifies the default database file for Symmetrix configuration data.	<code>symapi_db.bin</code>
<code>SYMCLI_DG</code>	Specifies a default device group name.	None

Variable Name	Description	Default
<code>SYMCLI_LDEV_NAMING</code>	Specifies a default device naming convention other than logical device names. Possible values are: <code>DEFAULT</code> (= <i>LdevNaming</i>) <code>SYMDEV</code> <code>PDEV</code> <code>SYMDEV</code> or <code>PDEV</code> are for Symmetrix device names or physical device names respectively.	<code>DEFAULT</code> (<i>LdevNaming</i>)
<code>SYMCLI_LOG</code>	Specifies a single file to be used as the log file where all new entries are appended to the file.	0
<code>SYMCLI_MAX_BCV_PAIRS</code>	Normally, SYMCLI allows up to 8 BCV device pairs that 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
<code>SYMCLI_MODE</code>	Specifies the command output reporting style to be compatible with prior SYMCLI versions. Possible values are: <code>V32</code> <code>V40</code> <code>V41</code> <code>V42</code>	None
<code>SYMCLI_NOLOGGING</code>	When set to 1, disables logging.	0
<code>SYMCLI_NOPROMPT</code>	When set to 1, disables verification prompts.	0
<code>SYMCLI_OFFLINE</code>	When set to 1, disables online access to Symmetrix device status (Symmetrix database access only).	0
<code>SYMCLI_OSM_VERSION</code>	Specifies the version reported by the SYMCLI OSM SRDF Compatibility mode.	4.0.0
<code>SYMCLI_PDEV_FILE</code>	The physical device filename to be used in lieu of the Symmetrix database.	NULL
<code>SYMCLI_RDB_CONNECT</code>	Specifies a user name, password, and remote service name for a user's relational database account (<i>user/password@service</i>).	NULL
<code>SYMCLI_RDB_NAME</code>	Specifies the default relational database name (<i>DbName</i>).	NULL
<code>SYMCLI_RDB_TYPE</code>	Specifies a specific type (<i>DbType</i>) of database. Possible values are: <code>Oracle</code> <code>Informix</code> <code>SQLServer</code> <code>Sybase</code> <code>MVSDB2</code>	NULL
<code>SYMCLI_RETURN_MODE</code>	When set to <code>FORMATTED</code> for Unisys platforms only, prints return code mnemonics and error strings following the execution of each SYMCLI command. <code>DEFAULT</code> disables this feature.	<code>DEFAULT</code>
<code>SYMCLI_SCHEMA_NAME</code>	Specifies a relational database schema name (<i>SchemaName</i>).	NULL
<code>SYMCLI_SID</code>	Specifies a default Symmetrix ID.	None

Variable Name	Description	Default
<code>SYMCLI_SKIP_ON_FAILURE</code>	When set to 1, causes the <code>symcfg discover</code> command (which scans all bus-connected devices) to skip over any Symmetrix unit encountered in an error state. This allows the command to complete the scan of the remaining units. (Otherwise, the command faults and will fail to complete the interrogation of all the Symmetrix units.)	0
<code>SYMCLI_TBS_NAME</code>	Specifies a relational database tablespace name (<i>TblSpName</i>).	NULL
<code>SYMCLI_UPPERCASE</code>	When set to 1, specifies that any user input in lowercase is entered as uppercase.	0
<code>SYMCLI_VERBOSE</code>	When set to 1, enables the verbose response mode.	0
<code>SYMCLI_VG</code>	Specifies a default logical volume group name.	None
<code>SYMCLI_WAIT_ON_DB</code>	When set to 1, causes the SYMCLI to wait for Symmetrix database access when locked by another user. Otherwise, a busy database will cause an error.	0
<code>SYMCLI_WAIT_ON_GK</code>	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

Appendix B: Referencing Devices and Objects

The SYMCLI commands use a number of different types of names to specify a Symmetrix device:

<i>PdevName</i> or <i>pd</i>	— Indicates a Physical (host) device name
<i>SymDevName</i> or <i>dev</i>	— Indicates a Symmetrix device name
<i>LdevName</i> or <i>ld</i>	— Indicates a Logical device name

Other Symmetrix objects require certain notation to identify them in the command line, and these notations and conventions are listed in Table 27.

Table 27. Naming Conventions

Parameter/Reference	Description	Examples
<i>CgName</i> (cg)	Consistency group name.	mycg1
<i>DbName</i> (db)	Relational database name.	HR
<i>DgName</i> (dg)	Device group name.	prod_1
<i>FileName</i>	Relational database file name.	EMP_HIST.dbf
<i>LdevName</i> (ld)	Logical device name, either given at the command line or assigned automatically when a device is added to a device group.	DEV001 BCV001
<i>LvolName</i> (lv)	Logical Volume Manager's (LVM's) logical volume name.	logvol1
<i>PdevName</i> (pd)	Host's physical device name.	/dev/rdisk/c2t0d0s2 (See note below)
<i>SchemaName</i>	Relational database schema name.	SCOTT
<i>SegmentName</i>	Relational database segment name.	EMP_SEG
<i>SymDevName</i> (dev)	Symmetrix device name, unique for each Symmetrix unit.	00C
<i>SymmID</i> (sid)	Symmetrix unit identifier number.	010012392173
<i>TableName</i>	Relational database table name.	EMP
<i>TblSpName</i>	Relational database tablespace name.	tbl_space1
<i>VgName</i>	LVM's volume group name.	vol1

Note: For Windows NT, the physical device name is of the form: \\.\physicaldevice2

Appendix C: The Options File

The `options` file is an editable text file that can be used to change the default behavior of certain SYMCLI or SYMAPI command options *on this host*. The file contains editable default constants set to certain optional defaults in the line entries. If the `options` file does not exist, it may be created using an editor in order to add options to it.

The possible options in the `options` file are listed in Table 28.

Table 28. Options In The `options` File

Option	Description	Default	Used By
<code>SYMAPI_CTRL_OF_NONVISIBLE_DEVS</code>	Set to <code>DISABLE</code> to block the SYMAPI/SYMCLI control commands from targeting devices that are not visible to this host.	<code>ENABLE</code>	Base, (All)
<code>SYMAPI_CTRL_VIA_SERVER</code>	Set to <code>DISABLE</code> to block the client SYMAPI/SYMCLI control commands from executing at the SYMAPI server.	<code>ENABLE</code>	Base, (All)
<code>SYMAPI_DATED_LOGFILE_NAME</code>	Set to <code>DISABLE</code> to allow the creation of undated SYMAPI log files.	<code>ENABLE</code>	Base, (All)
<code>SYMAPI_LOGFILE_DATE_FORMAT</code>	Set to <code>FORMAT2</code> to change the date format in the log entries to <code>yyyy-mm-dd</code> .	<code>FORMAT1</code> (<code>mm/dd/yyyy</code>)	Base, (All Control)
<code>SYMAPI_MAX_CLIENTS</code>	Adjusts the limit of the number of clients to allow in a client/server environment.	100 clients on a regular host, 10 on a Symmetrix service processor	Client/Server
<code>SYMAPI_ALLOW_SCRIPTS_VIA_SERVER</code>	Set to <code>ENABLE</code> to allow pre-action and post-action scripts for TimeFinder commands to be run via the SYMAPI server.	<code>DISABLE</code>	TimeFinder
<code>SYMAPI_DEFAULT_BCV_ESTABLISH_TYPE</code>	Controls how a BCV establish is executed. Possible values are: <code>SINGULAR</code> Devices (including meta device members) are established one at a time. The next device establish action will not be initiated until a servicing DA has accepted the previous device establish action. <code>SERIAL</code> Devices are passed to the Symmetrix as fast as they can be accepted. They will be placed in the Symmetrix queue and serviced by the DAs from this queue. <code>PARALLEL</code> Devices are passed in parallel to the servicing DAs. SYMAPI will ensure that no more than one establish per the servicing DA will be outstanding at any one time.	<code>PARALLEL</code>	TimeFinder

Option	Description	Default	Used By
SYMAPI_DEFAULT_BCV_RESTORE_TYPE	Controls how a BCV restore is executed. Possible values are: SINGULAR Devices (including meta device members) are restored one at a time. The next device restore action will not be initiated until a servicing DA has accepted the previous device restore action. SERIAL Devices are passed to the Symmetrix as fast as they can be accepted. They will be placed in the Symmetrix queue and serviced by the DAs from this queue. PARALLEL Devices are passed in parallel to the servicing DAs. SYMAPI will ensure that no more than one restore per the servicing DA will be outstanding at any one time.	PARALLEL	TimeFinder
SYMAPI_BCV_SINGULAR_INTERVAL	Causes the SINGULAR restore process (see above) to pause (sleep) for an interval of time (0 – 30 secs) between each device operation in the restore sequence. DEFAULT equals 0 secs, effectively turning off the interval parameter.	DEFAULT	TimeFinder
SYMAPI_DEFAULT_BCV_SPLIT_TYPE	The instant (-instant) option for the symmir command improves the performance of a typical split operation by performing a quick foreground BCV split. Set to INSTANT to make this option the default split mode.	REGULAR	TimeFinder
SYMAPI_TF_COUNT_MODIFIED_TRACKS	This option can be used to count the standard track changes when a query action is performed and the BCV pair is in a split state. Set to TRUE to turn the track count behavior on. However, note that performance might be degraded if you have a sizeable group of devices.	FALSE	TimeFinder
SYMAPI_WAIT_FOR_BCV_BG_SPLIT	This option can be used when you want the SYMAPI/SYMCLI instant split command to wait for the background split operation to complete before returning to the command prompt. Set to TRUE to make this option the default behavior of the instant split operation.	FALSE	TimeFinder

Option	Description	Default	Used By
SYMAPI_WAIT_FOR_BCV_SYNC	Controls how a BCV establish or restore is executed. Possible values are: TRUE The command will not return to the command prompt until the establish or restore action has been completed and the devices are synchronized. FALSE The command will issue the establish or restore action and return to the command prompt without waiting for the devices to complete synchronization.	FALSE	TimeFinder
SYMAPI_SYNC_DIRECTION	Confines TimeFinder and SRDF operations to establish or restore actions.	BOTH	TimeFinder SRDF
SYMAPI_ALLOW_RDF_SYMFORCE	Set to TRUE to allow users to specify the -symforce option when performing SRDF control operations.	FALSE	SRDF
SYMAPI_PARALLEL_RA_GROUPS	Set to ENABLE to allow the locking of RA groups during SRDF control actions, instead of applying Symmetrix locks. This enables SRDF control actions to be done at the same time (i.e., parallel) across different RA groups.	DISABLE	SRDF
SYMAPI_ACC_ADMIN_VIA_SERVER	Set to DISABLE to disable the client SYMAPI/SYMCLI access control commands for prepare, release, and commit actions from executing at the SYMAPI server.	ENABLE	Access Control
SYMAPI_ACC_DISPLAY_VIA_SERVER	Set to DISABLE to disable the client SYMAPI/SYMCLI access control displays commands for list and show actions from executing at the SYMAPI server.	ENABLE	Access Control

As shown in Table 28, a parameter may affect all components or just certain SYMCLI component areas.

Appendix D: Avoidance Files

The avoidance files are editable text files containing physical (host) device names (*PdevNames*) or Symmetrix IDs (*SymmIDs*) that can be used to limit SYMCLI from seeing certain Symmetrix units, devices, or gatekeepers that would otherwise be affected by various commands.

- `symavoid` — The `symavoid` file affects the operation of `symcfg discover` so that it skips over looking for devices that belong to the Symmetrix units identified in this file. This may be useful if you wish SYMCLI to avoid multiple Symmetrix units connected to the host. The `symavoid` file is formatted with 10- to 12-character *SymmIDs*, with one *SymmID* per line.
- `inqfile` — The `inqfile` file affects the operation of `syminq` and `symcfg discover`, which will find only the physical devices specified in this file. This may be useful to limit these commands to affect only certain Symmetrix devices connected to the host. The `inqfile` file is formatted with *PdevNames*, with one *PdevName* per line.
- `gkavoid` — The `gkavoid` file affects various online-type SYMCLI commands that use a gatekeeper to communicate to a Symmetrix unit. A gatekeeper whose *PdevName* matches any of the entries specified in the `gkavoid` file, will not be chosen as a gatekeeper to communicate with the Symmetrix. This may be useful to designate certain Symmetrix devices that should not be used as gatekeepers. The `gkavoid` file is formatted with *PdevNames*, with one *PdevName* per line.