

EMC ControlCenter
5.2

FibreZone Command Line Interface
Reference Guide
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Audience

This guide is part of the ControlCenter 5.2 documentation set, and is intended for use by administrators using the FibreZone CLI to manage a switched fabric. Readers of this guide are expected to be familiar with the operating environments in which ControlCenter is installed on their networks.

Organization

This manual describes the EMC ControlCenter FibreZone software. FibreZone is a software application that allows you to create *zones* within a switched fabric to simplify management, increase performance, improve security, and isolate different environments. The FibreZone application lets you manage the configuration of a switched fabric from a centralized host-based location.

This manual contains the following information:

Chapter 1, *Introduction to Zoning*, provides an overview of switched Fibre Channel Storage Area Networks (SANs).

Chapter 2, *Introduction to FibreZone*, introduces the EMC FibreZone product.

Chapter 3, *Configuring the Fabric Using FibreZone*, describes how to set up and configure the switches in the FibreZone environment.

Chapter 4, *Using FibreZone*, provides examples of typical FibreZone operations.

Chapter 5, *FibreZone Commands*, lists the FibreZone commands and their definitions and provides examples of each command.

Appendix A, *FibreZone Connectivity Requirements*, details vendor-specific connectivity requirements.

Appendix B, *FibreZone Error Codes*, explains FibreZone error codes.

A *Glossary* and *Index* are located at the back of this document.

Related Documentation

ControlCenter documentation is available in the following locations:

- ◆ **Documentation /Help CD** provided with your EMC ControlCenter installation kit.
- ◆ **EMC Powerlink** (<http://powerlink.EMC.com>).
- ◆ **ControlCenter Documentation Library** available from the ControlCenter Console Help menu after installation.

Note and Caution Used in this Manual

EMC uses the following conventions for note and caution notices.

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



CAUTION

A caution contains information essential to avoid 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 guide:

AVANT GARDE	Keystrokes
Palatino, bold	◆ Dialog box, button, icon, and menu items in text ◆ Selections you can make from the user interface, including buttons, icons, options, and field names
<i>Palatino, italic</i>	◆ New terms or unique word usage in text ◆ Command line arguments when used in text ◆ Book titles
<i>Courier, italic</i>	Arguments used in examples of command line syntax.
Courier	System prompts and displays and specific filenames or complete paths. For example: <code>c:\ecc</code>
Courier, bold	◆ User entry. For example: <code>mkdir /cdrom</code> ◆ Options in command line syntax

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Introduction to Zoning

This chapter provides general information about zoning in switched Fibre Channel Networks and contains the following sections:

- ◆ Zoning Overview 1-2
- ◆ Zoning Concepts 1-3
- ◆ Zone Configurations..... 1-6
- ◆ FibreZone Configurations..... 1-8
- ◆ FibreZone and Solutions Enabler SYMCLI Device Masking..... 1-9

Zoning Overview

The complexity of switched Fibre Channel Storage Area Networks (SANs) has resulted in the need for new software tools to provide flexible management. Figure 1-1 shows a switched Fibre Channel network. A Fibre Channel network consisting of interconnected switches and hosts is also referred to as a *fabric*.

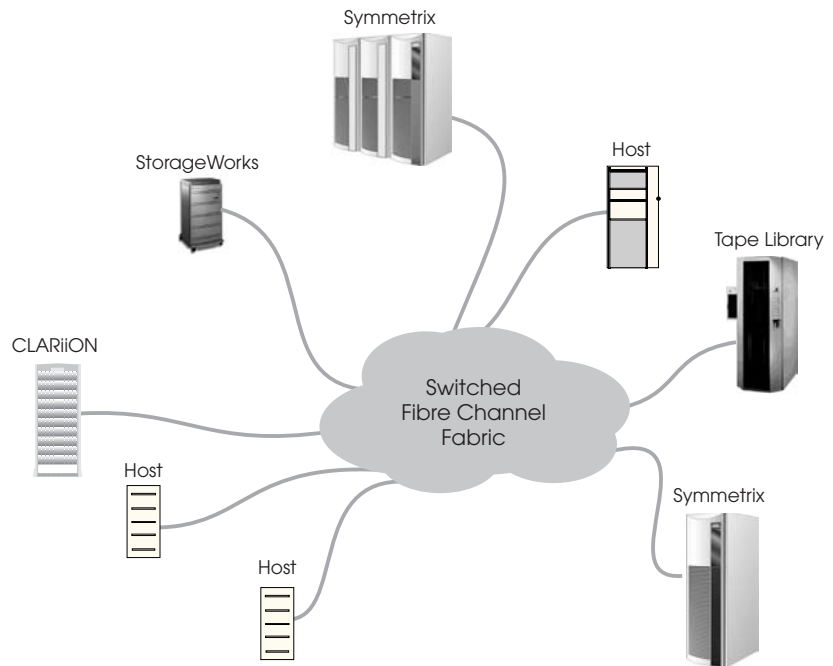


Figure 1-1 Switched Fabric

One of the aspects that makes switched fabrics so powerful is that all devices attached to a fabric can communicate with each other. However, often it becomes necessary to partition the network into subsets of devices through *zoning*.

Zoning is a technique used in switched fabric environments to create and manage subsets of logical devices. A zone consists of selected devices, such as host bus adapters (HBAs) and storage devices, in the fabric. Devices assigned to one zone can communicate with other devices in the same zone, but not with devices in zones of which they are not members.

Zoning Concepts

This section provides an overview of the following terms and concepts used in this guide:

- ◆ Fibre Channel Port Types
- ◆ World Wide Name
- ◆ Single-HBA Zoning

Fibre Channel Port Types

Fibre Channel standards use the term *node* to describe any device connected to one or more other devices over Fibre Channel. Each node has at least one port that connects to other ports on other nodes.

There are several types of Fibre Channel ports. The types used in examples in this manual are described below:

- ◆ N_Port — a port on a node outside the fabric.
- ◆ F_Port — a port located on a switching device that connects to an N_Port and brings that connection (internally within the switch) to the fabric.
- ◆ E_Port — a port located on a switching device that connects to another E_Port on the same or a different switching device.

The link joining a pair of E_Ports is called an Inter-Switch Link (ISL). E_Ports carry frames originating from the node ports as well as frames from within the fabric itself. The frames generated within the fabric provide control, management, and support of the fabric.

Examples of the N_Port, F_Port, and E_Port are shown in Figure 1-2.

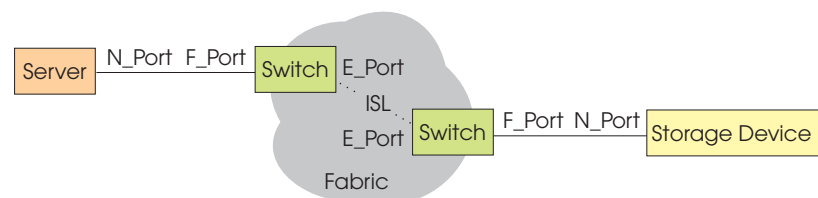


Figure 1-2 Fibre Channel Ports

World Wide Names

Each device attached to a fabric switch has a unique 64-bit identifier called a World Wide Name (WWN). These names are factory-set on HBAs in the hosts, and are generated on Fibre Channel Directors in an EMC Symmetrix® system. Each switch port also has a unique WWN.

For comparison with Ethernet terminology, an HBA is analogous to a NIC card, and a WWN to a MAC address.

World Wide Node Name

The ANSI standard also defines a World Wide Node Name (WWNN). The WWNN is neither universally nor consistently used by the industry. The WWNN can be used to identify a unit containing a group of ports. For example, a host may have one WWNN for the entire unit, but several WWNs (one for each port).

WWN Format

A WWN (or WWNN) consists of eight hex pairs separated by colons. For example:

10:00:08:00:88:44:50:ef

Single-HBA Zoning

Figure 1-3 shows a network with five zones set up to isolate different operating system environments and to create *single-HBA zoning*. In this example, the Windows NT users, SunOS users, a backup zone with an HP-UX host, and a zone containing a test environment are all isolated from each other.

Under single-HBA zoning, each HBA is configured with its own zone. The members of the zone consist of the HBA and one or more storage ports, such as a Symmetrix Fibre Adapter (FA) port, with the volumes that the HBA will use.

This zoning practice provides a fast, efficient, and reliable means of controlling the HBA discovery/login process. Without zoning, the HBA will attempt to log in to all ports on the fabric during discovery and during the HBA's response to a state change notification. With single-HBA zoning, the time and Fibre Channel bandwidth required to process discovery and the state change notification are minimized.

Single-HBA zoning is used in the FibreZone configuration examples in this guide.

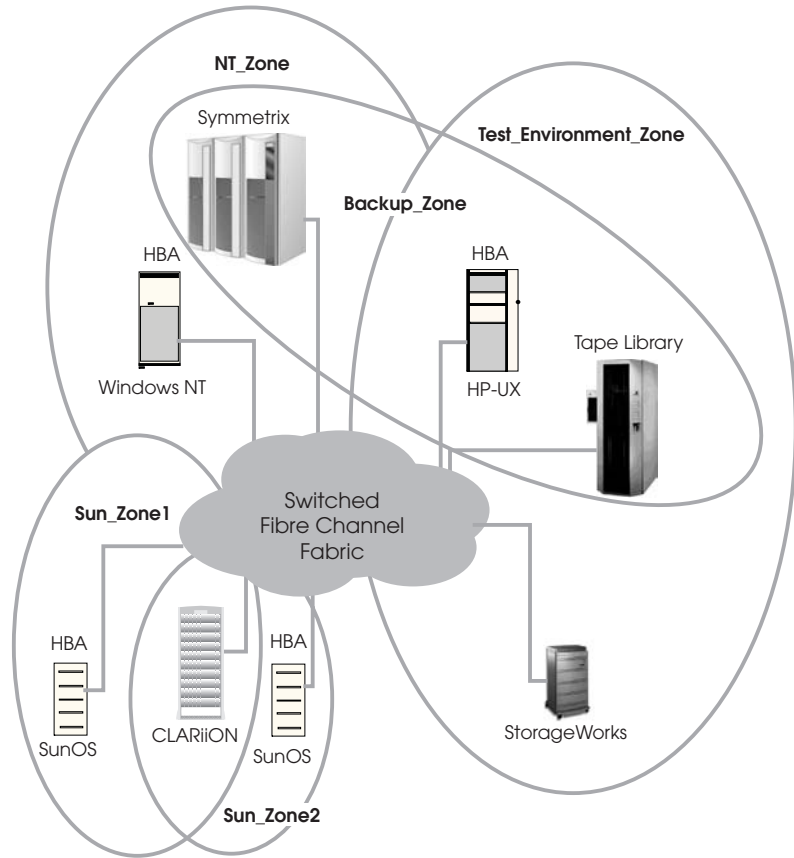


Figure 1-3 Switched Fabric With Five Single-HBA Zones

Zone Configurations

In general, zoning can be divided into two categories:

- ◆ *Port zoning*
- ◆ *WWN zoning*

Port Zoning

Port zoning, based on physical topology, uses the domain ID and port number of the switch (in the format *domainID:port number*), not the port WWN of the attached device to determine the zone set. This method allows you to change the HBA without changing any zoning information. However, it does not give you the flexibility to physically move attached nodes between switch ports without having to redefine the port number in the zone set.

WWN Zoning

WWN zoning creates zone sets using the WWNs of the attached nodes. This allows you to move nodes from one switch port to another without having to change the zone configuration. The zone set becomes independent of individual switch ports.

Mixed Port and WWN Zoning

Zoning may also utilize a mixture of Port and WWN zoning, using both the port numbers of the switch and the WWNs of the attached devices, depending on the switch and the fabric management tool. However, this method still restricts your flexibility to move attached nodes by requiring you to redefine the port numbers in the zone set. Figure 1-4 provides a mixed zoning example. Zone 1 contains a server identified by its WWN and a switch identified by its domain ID and port number.

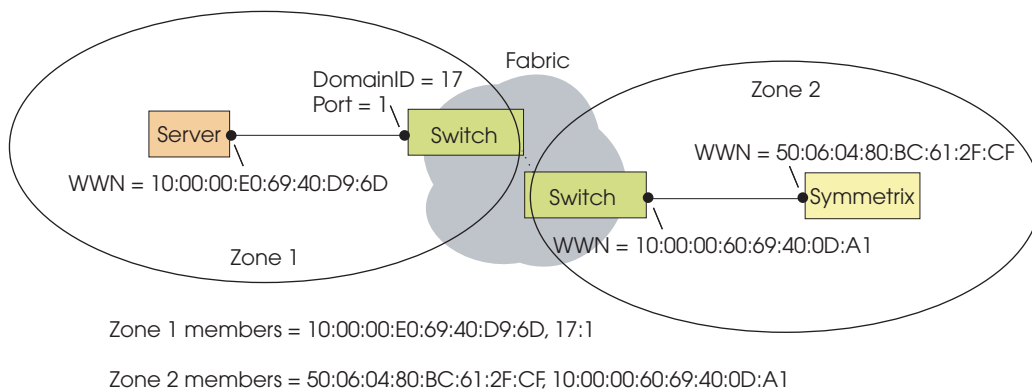


Figure 1-4 Mixed Port and WWN Zoning

Zoning Recommendations

EMC strongly recommends that you use only the attached port WWNs to define zones (WWN zoning). Zones defined by physical port numbers do not automatically adjust to link changes that may take place during switch maintenance and repair.

FibreZone is an access control method for Fibre Channel paths that utilizes the attached port WWNs and/or the domainID and port number (domainID:port number) of the switch. EMC Solutions Enabler SYMCLI Device Masking (see *FibreZone and Solutions Enabler SYMCLI Device Masking* on page 1-9) is an EMC access control method for Symmetrix devices that utilizes the WWNs of the HBAs for access control. Using the WWNs of the attached ports for both zone management and for volume access applies a common method to both levels of access control.

FibreZone Configurations

FibreZone is a software application that allows you to create, manage, and store Fibre Channel zone configurations in a common database on a management host. These configurations can then be *assigned* to a specific switch or switches. This allows the zoning for the entire switched fabric to be controlled from a centralized location on the management host.

The management host can be any supported host running FibreZone that has a network connection (such as Ethernet) to the fabric switch.

FibreZone allows the user to identify, create, and maintain zone configurations separate from the actual fabric environment that may or may not exist at the present time.

Advantages of FibreZone include:

- ◆ The configuration data is not lost if a switch is down or has to be replaced. When a switch is replaced or a new switch is added to a fabric, all configuration data can be copied to the new switch from the common database through a refresh command issued from FibreZone.
- ◆ FibreZone is *not* vendor-specific. It is a single, flexible, and easy to use zoning application that provides:
 - An interface for all supported switches. See the *Release Notes* included with this product for a list of supported switches.
 - A common database that can be backed up and restored in the event of failure of the management host.
 - Central management for your Fibre Channel network.

Chapter 2, *Introduction to FibreZone*, provides detailed information about FibreZone.

FibreZone and Solutions Enabler SYMCLI Device Masking

FibreZone and the EMC Solutions Enabler SYMCLI Device Masking component can be used together to give you a complete configuration and management package that provides both *primary* and *secondary* access control across the Fibre Channel Storage Area Network.

FibreZone provides the primary access control method by allowing you to manage a switched Fibre Channel Storage Area Network containing multiple hosts, switches, and storage devices. With FibreZone, you designate which HBAs can connect to which Fibre Channel adapters on a storage device.

Solutions Enabler SYMCLI Device Masking provides the secondary access control method by allowing you to control which Symmetrix devices a specific host HBA can access.

FibreZone, by restricting HBA access to specific storage Fibre Channel adapters, greatly reduces the time spent in the discovery process by each HBA. Solutions Enabler SYMCLI Device Masking further increases efficiency and security by controlling the HBA access to specific Symmetrix volumes.

Using FibreZone and SYMCLI Device Masking

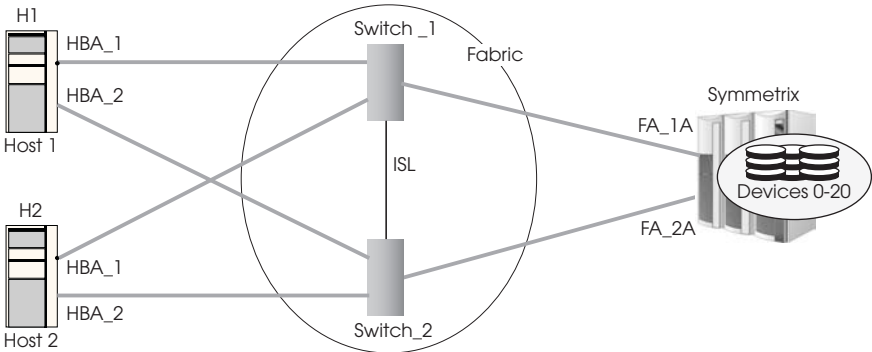
Figure 1-5 on page 1-10 provides a simplified example of a fabric that uses FibreZone with Solutions Enabler SYMCLI Device Masking.

In this example, each host has two HBA ports. There are two switches, each connected to a Symmetrix FA port. Each FA can access devices 0 through 20 on the Symmetrix system. In an unmanaged environment, each HBA could access all of the volumes on the Symmetrix system, but the administrator chooses to use FibreZone and Solutions Enabler SYMCLI Device Masking together to control each HBA's access to the Symmetrix devices.

The administrator used FibreZone to create four single-HBA zones each consisting of an HBA on a host and an FA on the Symmetrix. These zones dictate which HBA on the host side can talk to which FA on the Symmetrix side. For example, Zone_1 contains members H1_HBA_1 and FA_1A.

After configuring the fabric using FibreZone, the user configured the Symmetrix system using Solutions Enabler SYMCLI Device Masking to restrict HBA access to Symmetrix devices.

In this case, although both FA ports can access devices 0 through 20, the administrator used Solutions Enabler SYMCLI Device Masking to restrict the devices seen by the HBAs on H1 to devices 1 through F and the devices seen by the HBAs on H2 to 10 through 20.



Units	Zone Set	Zones	Members	Accessible Devices
Switch_1	ZoneSet_1	Zone_1	H1_HBA_1, FA_1A	1-F
		Zone_2	H2_HBA_1, FA_1A	10-20
Switch_2	ZoneSet_1	Zone_3	H1_HBA_2, FA_2A	1-F
		Zone_4	H2_HBA_2, FA_2A	10-20

Figure 1-5 FibreZone and Solutions Enabler SYMCLI Device Masking

Installing the FibreZone CLI

EMC ControlCenter™ zoning capabilities are available through the ControlCenter Console (with the SAN Manager license) or through the FibreZone CLI documented in this guide. In both cases installation instructions are provided in Volume 1 of the *EMC ControlCenter 5.2 Planning and Installation Guide*.

This Guide provides an overview of zoning using the FibreZone CLI. Details on zoning your SAN through the ControlCenter Console are provided in the Console online Help and in the *EMC ControlCenter 5.2 Administration/User Guide*.

Introduction to FibreZone

This chapter provides information about the FibreZone architecture and contains the following sections:

- ◆ FibreZone Software Architecture.....2-2
- ◆ FibreZone Internal Structure2-5
- ◆ FibreZone Object Relationship.....2-7

FibreZone Software Architecture

The FibreZone environment consists of objects representing physical entities such as HBAs (members) and switches (units), zoning entities such as zones and zone sets, and interfaces that allow FibreZone to communicate with the units (switches). Figure 2-1 shows the relationship of FibreZone objects.

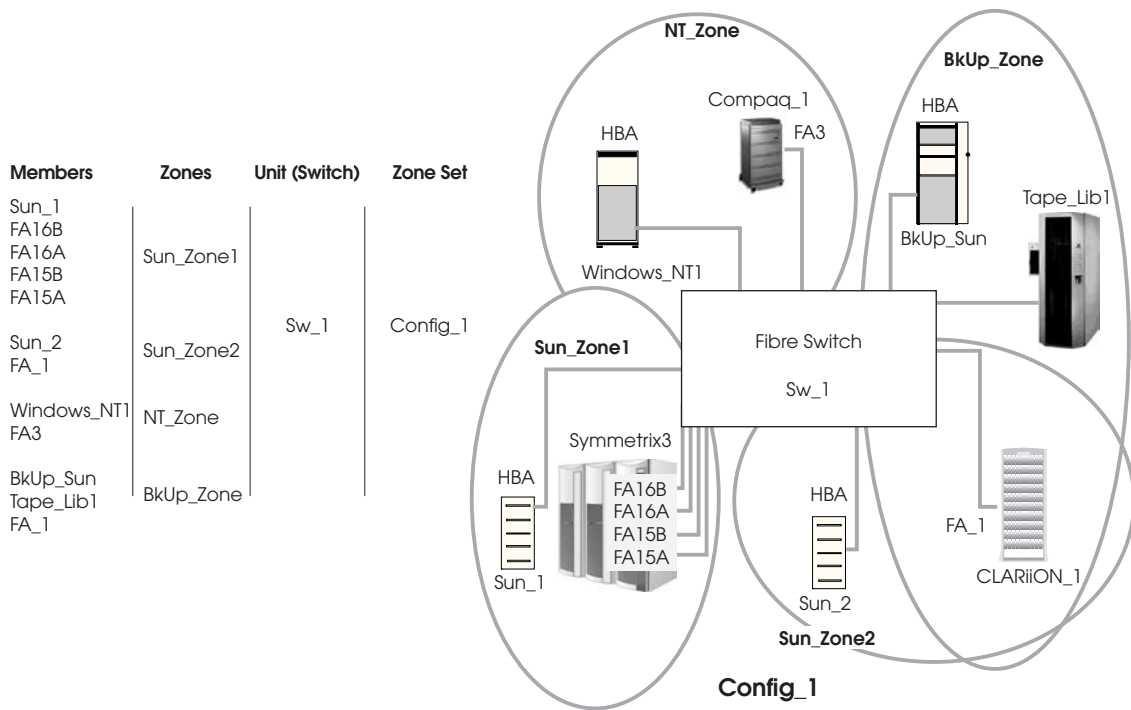


Figure 2-1 FibreZone Configuration Example

In the example shown in Figure 2-1, a zone set named Config_1 is assigned to a unit (switch) called Sw_1. The zone set consists of four zones (Sun_Zone1, Sun_Zone2, NT_Zone, and BkUp_Zone). Each zone has at least one member.

A member can belong to more than one zone. In the example in Figure 2-1, note that FA_1 on CLARiiON_1 is a member of both BkUp_Zone and Sun_Zone2.

Members

The *member* is the basic building block of the FibreZone software. Members are endpoint devices such as HBAs or Symmetrix Fibre Channel Adapters (FAs). Each member is identified by a unique WWN. A set of members make up a zone. Figure 2-2 shows the WWNs of the members of a zone named Test_Zone1.

In this example, the members of the zone include a Sun HBA (Sun_1) and four FA ports on a Symmetrix array. The Symmetrix array could be connected to multiple zones through these and other FA ports.

Member Name	WWN	Unit	Zone	Zone Set
Sun_1	10:00:00:e0:69:40:d9:6d			
FA16A	50:06:04:80:bc:61:2f:cf	Sw_1	Test_Zone1	TestConfig
FA16B	50:06:04:80:bc:61:2f:df			
FA15B	50:06:04:80:bc:61:2f:ce			
FA15A	50:06:04:80:bc:61:2f:de			

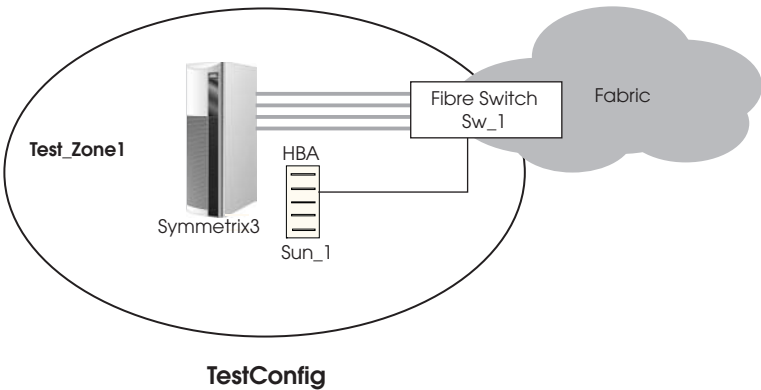


Figure 2-2 FibreZone Configuration Example

Zones

Figure 2-2 shows a zone named Test_Zone1. Zones consist of at least one member (there are five members in the example above) from a specified unit (switch).

A FibreZone zone definition remains in effect until it is changed or deleted. It is unaffected by reboots and power cycles. A group of zones is called a zone set.

Zone Sets

Figure 2-1 shows four zones that make up a zone set called Config_1. Figure 2-2 shows a zone set named TestConfig made up of one zone named Test_Zone1. A zone set consists of one or more zones and may be assigned to one or more units.

A zone set can be activated (enabled) or disabled at any time, but only one zone set can be active on a switch at one time. You select which zone set is active or you can disable zoning on the fabric (causing zoning to not be enforced).

Once you define the zone set configuration in the FibreZone database, you can assign the zone set to the units (switches) and then enable zoning at any time.

Interface

FibreZone maintains vendor-specific information in the FibreZone Interface database. The interface information is associated with each unit (switch) when the unit is created in the database.

Unit

FibreZone classifies a switch as a unit. The terms *switch*, *unit*, and *connectivity unit* (CU) are used interchangeably in this manual.

You assign a zone set to a switch based on its *unit name*.

Figure 2-1 on page 2-2 shows a unit named Sw_1. Sw_1 has four zones and eleven members associated with it.

Meta Units

FibreZone allows you to create and manage super-sets of units called *meta units*. A meta unit consists of two or more units sharing a common zone configuration. The meta unit allows you to apply a single command to several units at once, rather than applying the command multiple times to individual units. Figure 2-3 shows a meta unit named Meta_1 that consists of two units, Switch_1 and Switch_2.

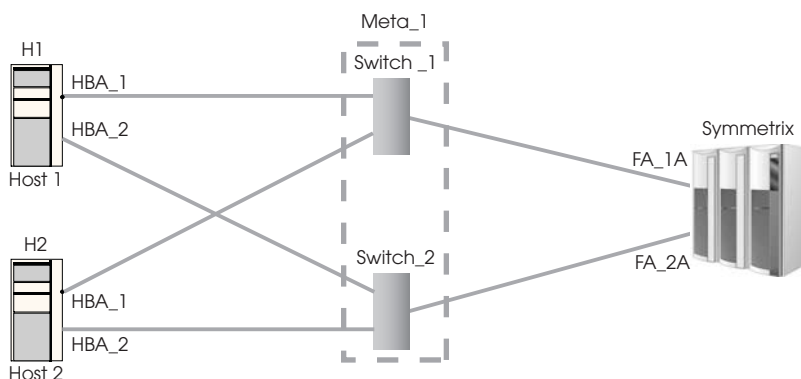


Figure 2-3 Meta Unit

FibreZone Internal Structure

The internal structure of FibreZone is shown in Figure 2-4. There are two main paths for commands in this structure:

- ◆ Database commands in which a command passes to the database through the database transactions layer.
- ◆ Active commands in which the command passes through the conn unit transactions layer and the vendor interface to a specific switch.

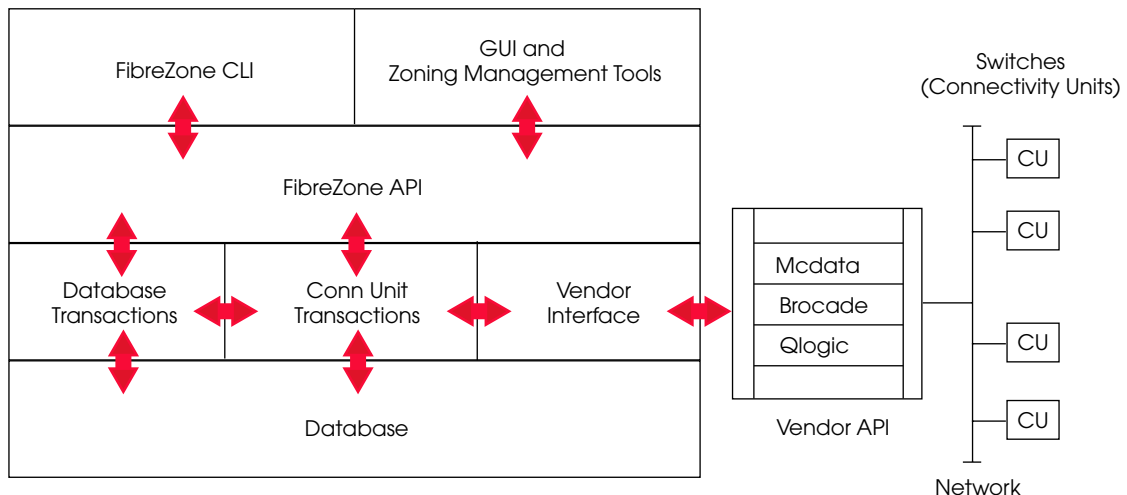


Figure 2-4 FibreZone Internal Structure

FibreZone Database Commands

FibreZone commands pass through the API layer to the database transactions layer to change or retrieve information from the FibreZone database. The database maintains the member, unit, zone, and configuration information. All **member**, **zone**, **interface**, and **zone set** commands act only on the database. Some **unit** commands such as **unit -info** (with no option), **unit -list**, **unit -delete**, and **unit -rename** also act only on the database.

Active FibreZone Commands

FibreZone uses a separate path to communicate with switches in the fabric. Active commands that change the configuration on the unit, such as **fabric -refresh** and **fabric -enable** (or **-disable**), are passed from the CLI through the FibreZone API and the database. The command then passes through the conn unit transactions layer and the vendor interface to the vendor API.

The vendor API contains vendor-specific connectivity and management information that allows FibreZone to connect to and manage any supported switch in the fabric.

Unit commands such as **unit -create**, **unit -import**, **unit -show**, and **unit -info** (with the **-online** option) use this same path to gather information from a unit (switch) and either display it or use it to update the database.

FibreZone Object Relationship

The relationship of objects in the FibreZone database is shown in Figure 2-5. A set of members make up a zone, and a set of zones make up a zone set or configuration. The zone set is assigned to the units, as is the specific vendor interface for that switch.

In this example, M1 is a member of two zones, Zone_1 and Zone_2. Zone_1 is a part of two zone sets, Config_1 and Config_2. Config_2 is the active zone set and is applied to a meta unit (Meta_1) consisting of three switches (unit_1, unit_2, and unit_3).

Unit_1 and Unit_2 use the Brocade vendor interface, Unit_3 uses the Mcddata vendor interface, and Unit_4 use the Qlogic vendor interface.

The Brocade, McDATA, and QLogic vendor interface names are entered with only the initial letter capitalized (for example, Brocade, Mcddata and Qlogic) in the FibreZone CLI.

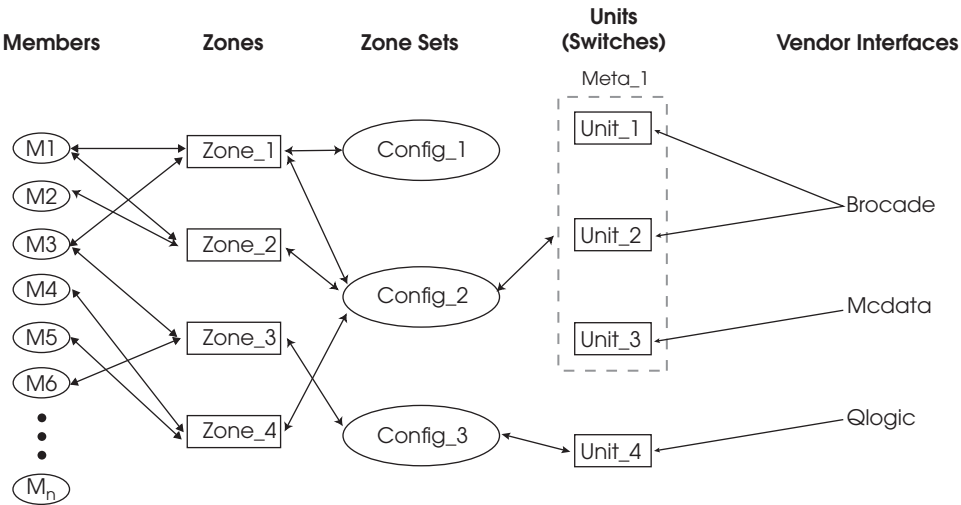
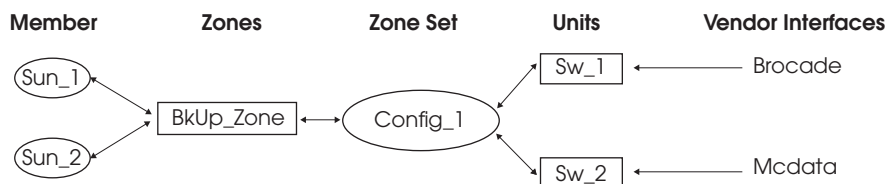


Figure 2-5 FibreZone Object Relationship

Figure 2-6 on page 2-8 provides an example of the FibreZone database structure. In this example, hosts Sun_1 and Sun_2 are members of BkUp_Zone. BkUp_Zone is part of the zone set Config_1 that is applied to two switches (Sw_1 and Sw_2). In this instance, Sw_1 uses the Brocade vendor interface and Sw_2 uses the Mcddata vendor interface.

This example also shows the attributes for each object. For example, the member `Sun_1` has the following attributes: Name = `Sun_1`, WWN = `10:00:00:e0:69:40:d9:6d`, zone = `BkUp_Zone`, WWNN = `10:00:00:e0:69:40:d9:6d`, and type = `HBA`.



Member Attributes

Name:	Sun_1	Sun_2
WWN:	10:00:00:e0:69:40:d9:6d	10:00:00:e0:69:81:05:b6
Zones:	BkUp_Zone	BkUp_Zone
WWNN:	10:00:00:e0:69:40:d9:6d	10:00:00:e0:69:81:05:b6
Type:	HBA	HBA

Zone Attributes

Name:	BkUp_Zone
Members:	Sun_1, Sun_2
Zone set:	Config_1

Zone Set Attributes

Name:	Config_1
Zones:	BkUp_Zone
Units:	Sw_1, Sw_2

Unit Attributes

Name:	Sw_1	Sw_2
Interface (library):	Brocade	Mcddata
Connection data:	IP, uname, password	Service Processor IP, Switch WWN
Assigned zone set:	Config_1	Config_1
Zoning:	enabled/disabled	enabled/disabled
Refreshed:	yes/no	yes/no
Default zoning:	N/A	yes/no
Vendor Interface		
Name:	Brocade	Mcddata
Units:	Sw_1	Sw_2

Figure 2-6 FibreZone Database Example

Configuring the Fabric Using FibreZone

This chapter describes how to configure the fabric using the FibreZone CLI. Chapter 4, *Using FibreZone*, provides FibreZone configuration examples. A complete list of CLI commands is provided in Chapter 5, *FibreZone Commands*.

- ◆ Fabric Configuration Using FibreZone.....3-2
- ◆ Configuring a New Switch3-3
- ◆ Configuring an Existing Switch.....3-21
- ◆ Configuring a New Multi-Switch Fabric3-26
- ◆ Configuring an Existing Multi-Switch Fabric.....3-36

Fabric Configuration Using FibreZone

The setup and configuration of the FibreZone-managed fabric varies based on the topology of the network, the type of switches, and so on. There are four basic scenarios you can encounter when using FibreZone for the first time:

- ◆ A new single switch installation. See *Configuring a New Switch* on page 3-3.
- ◆ Installing FibreZone into an existing fabric with a single switch. In this situation, zones and zone sets may be defined, but not through FibreZone. See *Configuring an Existing Switch* on page 3-21.
- ◆ A new switch installation with multiple switches in the fabric. See *Configuring a New Multi-Switch Fabric* on page 3-26.
- ◆ Installing FibreZone into an existing fabric with multiple switches. In this situation, a multi-switch fabric (that may or may not have zones and zone sets defined) already exists. See *Configuring an Existing Multi-Switch Fabric* on page 3-36.

Examples of the above scenarios are located at the end of each section. A complete description of FibreZone commands is contained in Chapter 5, *FibreZone Commands*.

Configuring a New Switch

This section provides an overview of switch configuration and examples for switch configuration using the *Mcdatal*, *Qlogic*, and *Brocade* interfaces:

- ◆ *Example 1: Configuring a New Switch (Brocade)* on page 3-5
- ◆ *Example 2: Configuring a New Switch (Qlogic)* on page 3-10
- ◆ *Example 3: Configuring a New Switch (Mcdatal)* on page 3-15

Switch Configuration Overview

This section outlines the steps used to configure a new switch.

A complete description of FibreZone commands is contained in Chapter 5, *FibreZone Commands*.

To configure a new switch from the FibreZone management host:

1. Ensure that the switch is accessible by the FibreZone management host.

A list of supported switches and network requirements is provided in the Release Notes included with this product.

2. Create a blocking zone set.

EMC recommends that you create a *blocking* zone set to prevent HBAs from attempting to log into all ports in the fabric as soon as they are connected to the switch. A blocking zone set contains a single zone with just one member that you assign to the switch. This blocks all of the HBAs from logging in because they are not members of the zone. The steps for creating a blocking zone set are outlined in *Create a Blocking Zone Set* on page 3-6.

3. Create the unit in the database and assign the blocking zone set to the switch by entering:

```
% fzone unit -create -name unit_name -interface interface_name -o
connection_data -assign blocking_zone_set
```

See *Connectivity Requirements* on page A-1 for the connection data and interface requirements for each switch.

4. You can now enable the blocking zone set on the switch with the **fabric -enable** command:

```
% fzone fabric -enable unit_name
```

5. Physically connect the ports (HBAs, FAs, etc.) to the switch.
6. Check that all ports are attached, and generate a list of available ports and their WWNs. To do so, enter:

```
% fzone unit -info unit_name -online
```

7. Create members by entering:

```
% fzone member -create [ -name member_name ] { -wwn wwn
| -port DomainID:Port } [ -node wwnn ] [ -type
type_name ]
```

8. Create zones and assign members to them by entering:

```
% fzone zone -create [ -name zone_name ]
member_1,...member_n
```

9. Create zone sets by entering:

```
% fzone Zone_set -create [ -name zone_set_name ]
zone_1,...zone_n
```

10. Assign the new zone set to the switch by entering:

```
% fzone unit -assign unit_name zone_set_name
```

11. Finish the switch configuration by refreshing zoning with the following command:

```
% fzone fabric -refresh unit_name
```

A fabric configuration example follows this section. Chapter 5, *FibreZone Commands*, provides an introduction to FibreZone commands used to manage the fabric.

Example 1: Configuring a New Switch (*Brocade*)

This section provides a basic example of how to set up and configure zoning on a switch using the *Brocade* interface. Figure 3-1 shows a new fabric with four hosts, a switch, and a Symmetrix system.

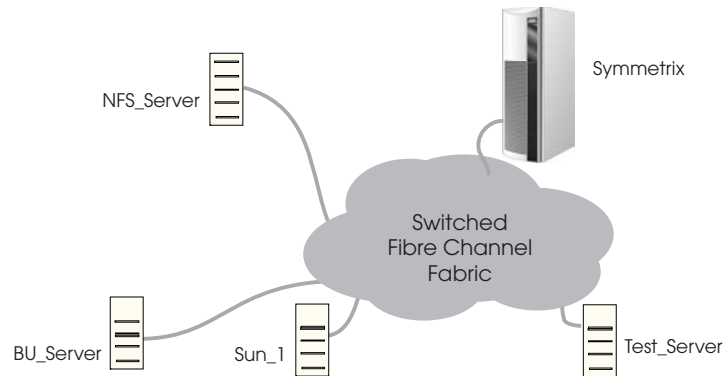


Figure 3-1 Simple Fabric With No Zoning

The user creates four single-HBA zones, each composed of a host and an FA port on the Symmetrix system. Sun_1 is designated as the management host and an Ethernet connection is established between it and the switch. The zone architecture is shown in Figure 3-2.

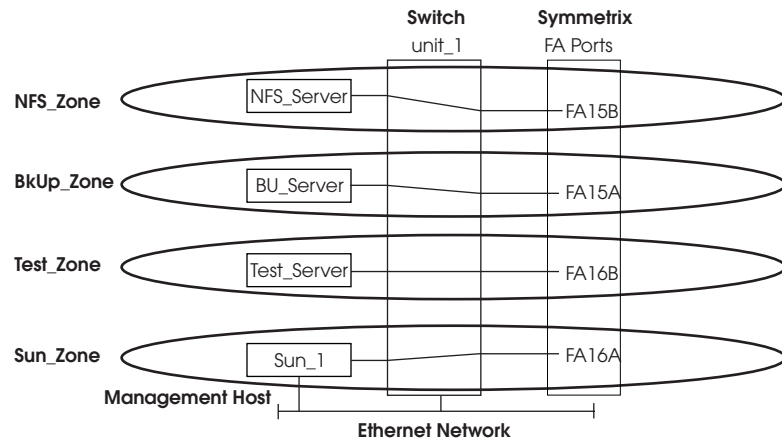


Figure 3-2 Zone Architecture

After determining the topology of the network, the user proceeds to install and configure the network as described in the next sections.

At this point, no nodes are attached to the switch.

Verifying the Network Connection Data

As shown in Figure 3-2 on page 3-5, the user establishes an Ethernet connection between the host chosen as the management host and the switch. The management host does not require a connection to the switch through the fabric (although in this case it has one).

Based on the switch model and the connectivity requirements the user determines the interface type (*Brocade* in this example) and connection data required for the switch (see Appendix A, *FibreZone Connectivity Requirements*):

Interface:	Brocade
IP Address:	172.23.203.251
User Name:	admin
Password:	password

Refer to the installation requirements section of the Release Notes included with this product and to the appropriate installation and configuration guides to set up your management host and fabric switches for network communication.

See Appendix A, *FibreZone Connectivity Requirements*, for the connection data required when creating a unit name. For example, the IP address, user name, and password are required for a switch using the *Brocade* interface.

Create a Blocking Zone Set

During this configuration, the HBAs will attempt to log into all ports in the fabric as soon as they are connected to the switches. To prevent this time-consuming process, the user creates a *blocking* zone set containing a single zone with just one member and then assigns the zone set to the switch. In this way, all of the HBAs are blocked from logging in because they are not members of an active zone.

Use the following steps to create the blocking zone set:

1. Create a member:

```
% fzone member -create -name block_member -wwn 01:01:01:01:01:01:01:01
```

2. Create a zone containing the block_member:

```
% fzone zone -create -name block_zone block_member
```

3. Create a zone set containing the block_zone:

```
% fzone Zone_set -create -name blocking_config block_zone
```

Creating the Unit

The user creates a unit by naming the switch (*unit_1*) and associating the name with the connection data and interface (see Appendix A, *FibreZone Connectivity Requirements*) and assigns the blocking zone set to the switch by entering:

```
% fzone unit -create -name unit_1 -interface Brocade -o
ip=172.23.203.251,uname=admin,password=password
-assign blocking_config
```

where:

-name is the unit name of the switch (*unit_1*).

-interface is the FibreZone software interface required for this type of switch (*Brocade* in this example).

Display a list of the available interfaces with the **fzone interface -list** command.

-o assigns the connection data. In this example, the switch requires the *Brocade* interface and the connection data consists of the IP address of the switch, user name, and a password.

Display a list of the required connection data for a particular interface with the **fzone interface -info interface_name** command.

-assign assigns a zone set to the unit. In this case the user assigned the blocking zone set named **blocking_config**.

Enable the Blocking Zone Set

The user now enables the blocking zone set on the switch with the **fabric -enable** command:

```
% fzone fabric -enable unit_1
```

Attaching the Nodes

The user physically attaches the nodes to the switch ports.

Discovering the Attached Nodes

The user now issues the following command to discover the WWNs of all of the attached nodes:

```
% fzone unit -info unit_1 -online
```

```
id           = 1
name         = unit_1
type         = unit
in use       = no
unit type    = std
zone set     = blocking_config
zoning       = enabled
refreshed    = yes
default zone = OFF
member of    =
interface    = Brocade
conn. data   = ip=172.23.203.251,uname=admin,password=*****
```

unit online info:

Model : SilkWorm 2800, Type 2.4, Firmware v2.3

Unit WWN : 10:00:00:60:69:00:08:fb

Fabric members:

DOMAIN	WWN	ROLE	IP	NAME
1	10:00:00:60:69:00:08:fb	PRINCIPAL	172.23.203.251	Test_2

Topology :

UNIT PORT		ATTACHED NODE(S)		
#	TYPE	FC-ID	WWN	WWNN
1	F	068213	50:06:04:82:BC:61:2F:1D	50:06:04:82:BC:61:2F:1D
2	F	068313	50:06:04:82:BC:61:2F:DE	50:06:04:82:BC:61:2F:DF
3	F	068413	50:06:04:82:BC:61:2F:CE	50:06:04:82:BC:61:2F:CF
4	F	068513	50:06:04:82:BC:61:2F:B0	50:06:04:82:BC:61:2F:B1
5	F	068613	10:00:00:E0:69:81:05:B6	20:00:00:E0:69:81:05:B6
6	F	068713	10:00:00:E0:69:C0:01:EE	20:00:00:E0:69:C0:01:EE
7	F	068813	10:00:00:E0:69:C1:03:8D	20:00:00:E0:69:C1:03:8D
8	F	068913	10:00:00:E0:69:80:03:B9	20:00:00:E0:69:80:03:B9

Misc. :

limitations :

Zone/ZoneSet Name First Character =
abcdefghijklmnopqrstuvwxyzABCDEFGHIJKLMNOPQRSTUVWXYZ

Zone/ZoneSet Name Other Characters =
0123456789abcdefghijklmnopqrstuvwxyzABCDEFGHIJKLMNOPQRSTUVWXYZ_

Max Length of ZoneSet Name = 64

Max Length of Zone Name = 64

Cfg name = different from its zone names

The unit online info output shows the *fabric members* (in this case there is only one switch in the fabric) and the *topology* that includes the unit port # and port type (all are F_Ports), and the Fibre Channel ID, WWN and WWNN of the attached nodes.

Creating Members The user now begins to create zone members based on knowledge of the switch connections and the WWN information provided by the **fzone unit -info unit_name -online** command:

```
% fzone member -create -name FA_16A -wwn 50:06:04:82:bc:61:2f:cf
% fzone member -create -name FA_16B -wwn 50:06:04:82:bc:61:2f:df
% fzone member -create -name FA_15A -wwn 50:06:04:82:bc:61:2f:ce
% fzone member -create -name FA_15B -wwn 50:06:04:82:bc:61:2f:de
% fzone member -create -name Sun_1 -wwn 10:00:00:e0:69:81:05:b6
% fzone member -create -name Test_Server -wwn 10:00:00:e0:69:c0:01:ee
% fzone member -create -name BU_Server -wwn 10:00:00:e0:69:c1:03:8d
% fzone member -create -name NFS_Server -wwn 10:00:00:e0:69:80:03:b9
```

Creating Zones After the zone members are created, the user now creates zones. In this case, the user plans on having four single-HBA zones connected to individual FA ports:

```
% fzone zone -create -name Sun_Zone FA_16A,Sun_1
% fzone zone -create -name Test_Zone FA_16B,Test_Server
% fzone zone -create -name BkUp_Zone FA_15A,BU_Server
% fzone zone -create -name NFS_Zone FA_15B,NFS_Server
```

Creating a Zone Set After creating all required zones, the user now creates a zone set named *config_1* and adds the zones to it with the following command:

```
% fzone Zone_set -create -name config_1 Sun_Zone,Test_Zone,BkUp_Zone,NFS_Zone
```

In this example the user puts all of the zones into one zone set so that all zones will either be enabled or disabled at the same time. You could create other zone sets using some or just one of the zones.

Assigning a Zone Set The zone set (*config_1*) is assigned to the unit (*unit_1*) in the database:

```
% fzone unit -assign unit_1 config_1
```

Refreshing the Switch Now, the user refreshes the zoning configuration on the switch with the following command:

```
% fzone fabric -refresh unit_1
```

Managing the Fabric Configuration of the fabric is complete. Chapter 5, *FibreZone Commands*, provides an introduction to FibreZone commands used to manage the fabric.

Example 2: Configuring a New Switch (Qlogic)

This section provides a basic example of how to set up and configure zoning on a switch using the *Qlogic* interface. Figure 3-3 shows a new fabric with four hosts, a switch, and a Symmetrix system.

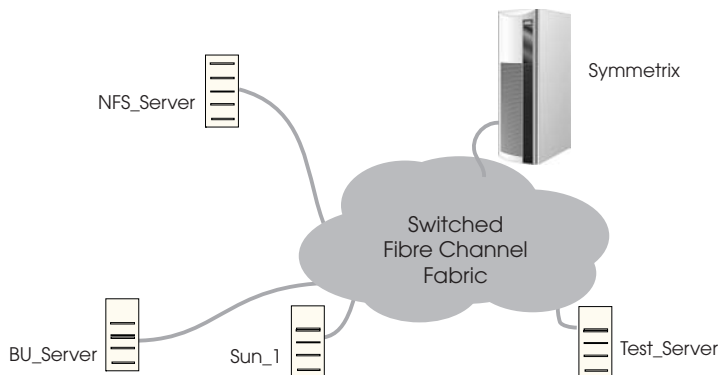


Figure 3-3 Simple Fabric With No Zoning

The user creates four single-HBA zones, each composed of a host and an FA port on the Symmetrix system. Sun_1 is designated as the management host and an Ethernet connection is established between it and the switch. The zone architecture is shown in Figure 3-4.

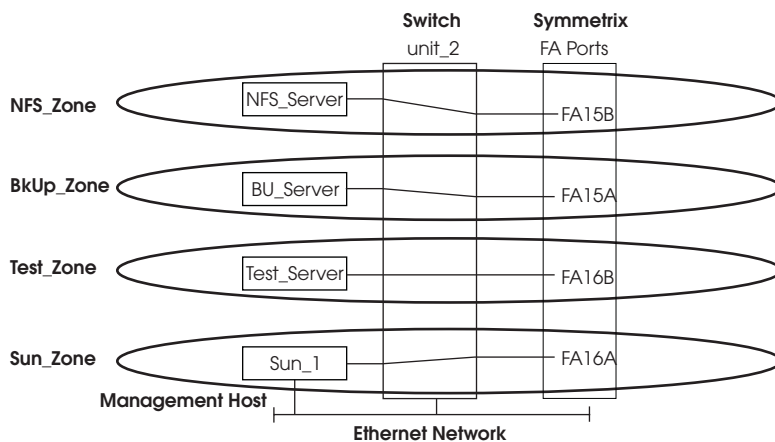


Figure 3-4 Zone Architecture

After determining the topology of the network, the user proceeds to install and configure the network as described in the next sections.

At this point, no nodes are attached to the switch.

Verifying the Network Connection Data

As shown in Figure 3-4, the user establishes an Ethernet connection between the host chosen as the management host and the switch. The management host does not require a connection to the switch through the fabric (although in this case it has one).

Based on the switch model and the connectivity requirements the user determines the interface type (*Qlogic* in this example) and connection data required for the switch (see Appendix A, *FibreZone Connectivity Requirements*):

Interface: **Qlogic**
IP Address: **172.23.203.251**

Refer to the installation requirements section of the release notes included with this product and to the appropriate installation and configuration guides to set up your management host and fabric switches for network communication.

See Appendix A, *FibreZone Connectivity Requirements*, for the connection data required when creating a unit name. For example, the IP address is required for a switch using the *Qlogic* interface.

Create a Blocking Zone Set

During this configuration, the HBAs will attempt to log into all ports in the fabric as soon as they are connected to the switches. To prevent this time-consuming process, the user creates a *blocking* zone set containing a single zone with just one member and then assigns the zone set to the switch. In this way, all of the HBAs are blocked from logging in because they are not members of an active zone.

Use the following steps to create the blocking zone set:

1. Create a member:

```
% fzone member -create -name block_member -wwn 01:01:01:01:01:01:01:01
```

2. Create a zone containing the block_member:

```
% fzone zone -create -name block_zone block_member
```

3. Create a zone set containing the block_zone:

```
% fzone Zone_set -create -name blocking_config block_zone
```

Creating the Unit

The user creates a unit by naming the switch (*unit_2*) and associating the name with the connection data and interface (see Appendix A, *FibreZone Connectivity Requirements*) and assigns the blocking zone set to the switch by entering:

```
% fzone unit -create -name unit_2 -interface Qlogic -o
    ip=172.23.203.251 -assign blocking_config
```

where:

-name is the unit name of the switch (*unit_2*).

-interface is the FibreZone software interface required for this type of switch (*Qlogic* in this example).

Display a list of the available interfaces with the **fzone interface -list** command.

-o assigns the connection data. In this example, the switch requires the *Qlogic* interface and the connection data consists of the IP address of the switch.

Display a list of the required connection data for a particular interface with the **fzone interface -info interface_name** command.

-assign assigns a zone set to the unit. In this case the user assigned the blocking zone set named **blocking_config**.

Enable the Blocking Zone Set

The user now enables the blocking zone set on the switch with the **fabric -enable** command:

```
% fzone fabric -enable unit_2
```

Attaching the Nodes

The user physically attaches the nodes to the switch ports.

Discovering the Attached Nodes

The user now issues the following command to discover the WWNs of all of the attached nodes:

```
% fzone unit -info unit_2 -online
```

```
id           = 1
name         = unit_2
type        = unit
in use       = no
```

```

unit type      = std
zone set       = blocking_config
zoning         = enabled
refreshed      = yes
default zone   = OFF
member of      =
interface      = Qlogic
conn. data     = ip=172.23.203.251

```

unit online info:

```

Model       : SANbox 16H, SwRev 01.06.01, FwRev E40123, HwRev 0E06 125040E
Unit WWN    : 10:00:00:c0:dd:00:88:bb

```

Fabric members:

DOMAIN	WWN	ROLE	IP	NAME
1	10:00:00:c0:dd:00:88:bb	PRINCIPAL	172.23.203.251	Test_2

Topology :

UNIT PORT		ATTACHED NODE(S)		
#	TYPE	FC-ID	WWN	WWNN
1	F	068213	50:06:04:82:BC:61:2F:1D	50:06:04:82:BC:61:2F:1D
2	F	068313	50:06:04:82:BC:61:2F:DE	50:06:04:82:BC:61:2F:DF
3	F	068413	50:06:04:82:BC:61:2F:CE	50:06:04:82:BC:61:2F:CF
4	F	068513	50:06:04:82:BC:61:2F:B0	50:06:04:82:BC:61:2F:B1
5	F	068613	10:00:00:E0:69:81:05:B6	20:00:00:E0:69:81:05:B6
6	F	068713	10:00:00:E0:69:C0:01:EE	20:00:00:E0:69:C0:01:EE
7	F	068813	10:00:00:E0:69:C1:03:8D	20:00:00:E0:69:C1:03:8D
8	F	068913	10:00:00:E0:69:80:03:B9	20:00:00:E0:69:80:03:B9

```

Misc.          :
limitations     :
MaxNumMembersInZone = 2000
MaxNumMembersInZoneset = 2000
MaxNumZones    = 256
MaxNumZonesets = 4
MaxNumZonesInZoneset = 256
MaxZoneNameLength = 64
MaxZonesetNameLength = 64
ValidNameFirstCharacter =
abcdefghijklmnopqrstuvwxyzABCDEFGHIJKLMNOPQRSTUVWXYZ0123456789^_~
ValidNameOtherCharacters =
abcdefghijklmnopqrstuvwxyzABCDEFGHIJKLMNOPQRSTUVWXYZ0123456789^_~

```

The unit online info output shows the *fabric members* (in this case there is only one switch in the fabric) and the *topology* that includes the unit port # and port type (all are F_Ports), and the Fibre Channel ID, WWN and WWNN of the attached nodes.

Creating Members

The user now begins to create zone members based on knowledge of the switch connections and the WWN information provided by the **fzone unit -info unit_name -online** command:

```
% fzone member -create -name FA_16A -wwn 50:06:04:82:bc:61:2f:cf
% fzone member -create -name FA_16B -wwn 50:06:04:82:bc:61:2f:df
% fzone member -create -name FA_15A -wwn 50:06:04:82:bc:61:2f:ce
% fzone member -create -name FA_15B -wwn 50:06:04:82:bc:61:2f:de
% fzone member -create -name Sun_1 -wwn 10:00:00:e0:69:81:05:b6
% fzone member -create -name Test_Server -wwn 10:00:00:e0:69:c0:01:ee
% fzone member -create -name BU_Server -wwn 10:00:00:e0:69:c1:03:8d
% fzone member -create -name NFS_Server -wwn 10:00:00:e0:69:80:03:b9
```

Creating Zones

After the zone members are created, the user now creates zones. In this case, the user plans on having four single-HBA zones connected to individual FA ports:

```
% fzone zone -create -name Sun_Zone FA_16A,Sun_1
% fzone zone -create -name Test_Zone FA_16B,Test_Server
% fzone zone -create -name BkUp_Zone FA_15A,BU_Server
% fzone zone -create -name NFS_Zone FA_15B,NFS_Server
```

Creating a Zone Set

After creating all required zones, the user now creates a zone set named *config_2* and adds the zones to it with the following command:

```
% fzone Zone_set -create -name config_2 Sun_Zone,Test_Zone,BkUp_Zone,NFS_Zone
```

In this example the user puts all of the zones into one zone set so that all zones will either be enabled or disabled at the same time. You could create other zone sets using some or just one of the zones.

Assigning a Zone Set

The zone set (*config_2*) is assigned to the unit (*unit_2*) in the database:

```
% fzone unit -assign unit_2 config_2
```

Refreshing the Switch

Now, the user refreshes the zoning configuration on the switch with the following command:

```
% fzone fabric -refresh unit_2
```

Managing the Fabric

Configuration of the fabric is complete. Chapter 5, *FibreZone Commands*, provides an introduction to FibreZone commands used to manage the fabric.

Example 3: Configuring a New Switch (*Mcddata*)

This section provides a basic example of how to set up and configure zoning on a switch using the *Mcddata* interface. Figure 3-5 shows a new fabric with four hosts, a switch, and a Symmetrix system.

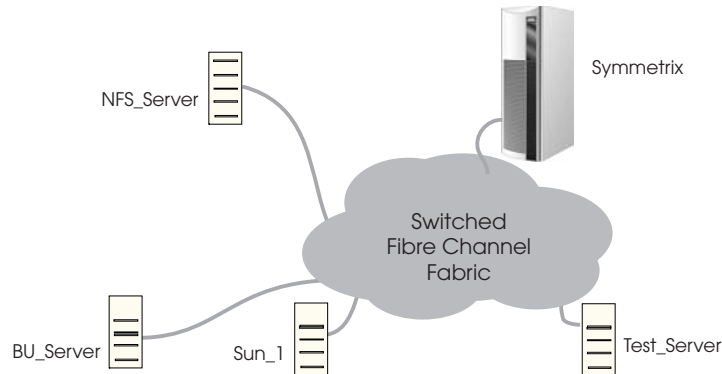


Figure 3-5 Simple Fabric With No Zoning

The user creates four single-HBA zones, each composed of a host and an FA port on the Symmetrix system. Sun_1 is designated as the management host and an Ethernet connection is established between it and the switch. The zone architecture is shown in Figure 3-6.

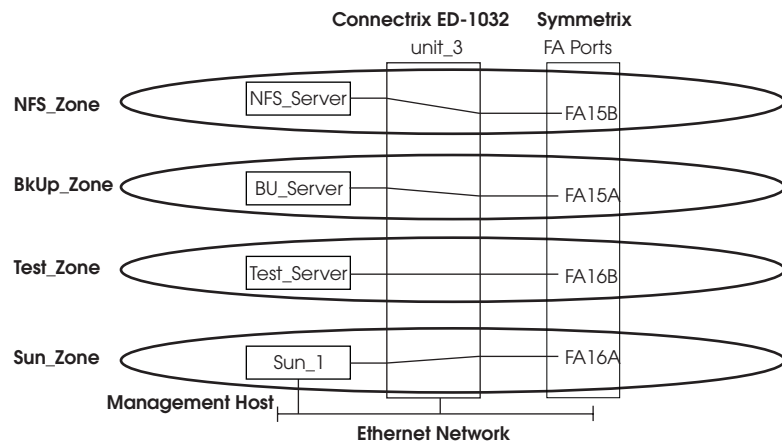


Figure 3-6 Zone Architecture

After determining the topology of the network, the user proceeds to install and configure the network as described in the next sections.

At this point, no nodes are attached to the switch.

Verifying the Network Connection Data

As Figure 3-6 on page 3-15 shows, the user establishes an Ethernet connection between the host chosen as the management host and the switch. The management host does not require a connection to the switch through the fabric (although in this case it has one).

Based on the switch model (see Appendix A, *FibreZone Connectivity Requirements*) the user determines the interface type (*Mcddata* in this example) and connection data required for each switch.

Determine the IP Address of the Service Processor on the switch by looking at the **TCP/IP properties** of the 10/100 Ethernet card under: **Start, Settings, Control Panel, Network, TCP/IP Protocol**.

Determine the WWN of the switch from the front panel display. Use the **Advance** button to advance the display to the WWN.

Interface:	Mcddata
IP Address:	172.23.203.240
WWN	10:00:08:00:88:40:30:FA

Refer to the installation requirements section of the release notes included with this product and to the appropriate installation and configuration guides to set up your management host and fabric switches for network communication.

See Appendix A, *FibreZone Connectivity Requirements*, for the connection data required when creating a unit name. For example, the IP address of the Service Processor and the WWN of the switch are required for a switch using the *Mcddata* interface.

Create a Blocking Zone Set

During this configuration, the HBAs will attempt to log into all ports in the fabric as soon as they are connected to the switches. To prevent this time-consuming process, the user creates a *blocking* zone set containing a single zone with just one member and then assigns the zone set to the switch. In this way, all of the HBAs are blocked from logging in because they are not members of an active zone.

Use the following steps to create the blocking zone set:

1. Create a member:

```
% fzone member -create -name block_member -wwn 01:01:01:01:01:01:01:01
```

2. Create a zone containing the block_member:

```
% fzone zone -create -name block_zone block_member
```

3. Create a zone set containing the block_zone:

```
% fzone Zone_set -create -name blocking_config block_zone
```

Creating the Unit

The user creates a unit by naming the switch (*unit_3*) and associating the name with the connection data and interface (see Appendix A, *FibreZone Connectivity Requirements*) and assigns the blocking zone set to the switch by entering:

```
% fzone unit -create -name unit_3 -interface Mcddata -o
ip=172.23.203.240,wwn=10:00:08:00:88:40:30:FA -assign
blocking_config
```

where:

-name is the unit name of the switch (*unit_3*).

-interface is the FibreZone software interface required for this type of switch (*Mcddata* in this example).

Display a list of the available interfaces by entering the **fzone interface -list** command.

-o assigns the connection data. In this example, the switch requires the *Mcddata* interface and the connection data consists of the IP address of the Service Processor and the WWN of the switch.

-assign assigns a zone set to the unit. In this case the user assigned the blocking zone set named **blocking_config**.

Display a list of the required connection data for a particular interface with the **fzone interface -info interface_name** command.

Enable the Blocking Zone Set

The user now enables the blocking zone set on the switch with the **fabric -enable** command:

```
% fzone fabric -enable unit_3
```

Attaching the Nodes

The user physically attaches the nodes to the switch ports.

Discovering the Attached Nodes

The user now discovers the WWNs of all of the attached nodes with:

```
% fzone unit -info unit_3 -online
```

```
id           = 4
name         = unit_3
type        = unit
in use      = no
unit type   = std
zone set    = blocking_config
zoning      = enabled
refreshed   = yes
default zone = OFF
member of   =
interface   = Mcddata
conn. data  = ip=172.23.203.240,wwn=10:00:08:00:88:40:30:FA
```

unit online info:

```
Model      : ED-1032, fw 03.02.00, sw ECM 5.xx bridge 2.00.01
```

```
Unit WWN   : 10:00:08:00:88:40:30:FA
```

Fabric members:

DOMAIN	WWN	ROLE	IP	NAME
1	10:00:08:00:88:40:30:FA	PRINCIPAL		

Topology :

UNIT PORT		ATTACHED NODE(S)		
#	TYPE	FC-ID	WWN	WWNN
1	F	2c0513	50:06:04:82:BC:61:2F:CF	50:06:04:82:BC:61:2F:C9
2	F	2c0613	50:06:04:82:BC:61:2F:DF	50:06:04:82:BC:61:2F:C9
3	F	2c0713	50:06:04:82:BC:61:2F:CE	50:06:04:82:BC:61:2F:C9
4	F	2c0813	50:06:04:82:BC:61:2F:DE	50:06:04:82:BC:61:2F:C9
5	F	2c0913	10:00:00:E0:69:81:05:B6	10:00:00:E0:69:81:05:BF
6	F	2c0A13	10:00:00:E0:69:C0:01:EE	10:00:00:E0:69:C0:01:B7
7	F	2c0B13	10:00:00:E0:69:C1:03:8D	10:00:00:E0:69:C1:05:8E
8	F	2c0c13	10:00:00:E0:69:80:03:B9	10:00:00:E0:69:80:03:B8

Misc. :

```
Number of units controlled by the Service Processor = 1:
```

```
UnitWWN = 10:00:08:00:88:40:30:FA
```

limitation. :

```
MaxNumMembersInZone = 4096
```

```
MaxNumMembersInZoneSet = 4096
```

```
MaxNumZones = 2000
```

```
MaxNumZonesets = 64
```

```
MaxNumZonesInZoneSet = 1023
```

```

MaxZoneNameLength = 64
MaxZonesetNameLength = 64
ValidNameFirstCharacter =
0123456789abcdefghijklmnopqrstuvwxyzABCDEFGHIJKLMNOPQRSTUVWXYZ^_-$
ValidNameOtherCharacters =
0123456789abcdefghijklmnopqrstuvwxyzABCDEFGHIJKLMNOPQRSTUVWXYZ^_-$
Zone Set Name = different from its zone names
Zone/Zone Set Name CaseSensitive = no

```

The unit -info -online output shows the *fabric members* (in this case there is only one switch in the fabric) and the *topology* including the switch port # and port type, and the Fibre Channel ID (FC-ID), WWN, and WWNN of the attached nodes.

Creating Members The user now begins to create zone members based on knowledge of the switch connections and the WWN (or domainID:Port) information provided by the **fzone unit -info unit_name -online** command:

```

% fzone member -create -name FA_16A -wwn 50:06:04:82:bc:61:2f:cf
% fzone member -create -name FA_16B -wwn 50:06:04:82:bc:61:2f:df
% fzone member -create -name FA_15A -wwn 50:06:04:82:bc:61:2f:ce
% fzone member -create -name FA_15B -wwn 50:06:04:82:bc:61:2f:de
% fzone member -create -name Sun_1 -wwn 10:00:00:e0:69:81:05:b6
% fzone member -create -name Test_Server -wwn 10:00:00:e0:69:c0:01:ee
% fzone member -create -name BU_Server -wwn 10:00:00:e0:69:c1:03:8d
% fzone member -create -name NFS_Server -wwn 10:00:00:e0:69:80:03:b9

```

Creating Zones After the zone members are created, the user now creates zones. In this case, the user plans on having four single-HBA zones connected to individual FA ports:

```

% fzone zone -create -name Sun_Zone FA_16A, Sun_1
% fzone zone -create -name Test_Zone FA_16B, Test_Server
% fzone zone -create -name BkUp_Zone FA_15A, BU_Server
% fzone zone -create -name NFS_Zone FA_15B, NFS_Server

```

Creating a Zone Set After creating all required zones, the user now creates a zone set named config_1 and adds the zones to it with the following command:

```

% fzone Zone_set -create -name config_1 Sun_Zone, Test_Zone, BkUp_Zone, NFS_Zone

```

In this example the user puts all of the zones into one zone set so that all zones will either be enabled or disabled at the same time. You could create other zone sets using some or just one of the zones.

Assigning a Zone Set

The zone set is now assigned to the unit in the database:

```
% fzone unit -assign unit_3 config_1
```

In this example, the user assigns the zone set named *config_1* to the switch named *unit_3*.

Refreshing the Switch

Now, the user refreshes the zoning configuration on the switch with the following command:

```
% fzone fabric -refresh unit_3
```

Managing the Fabric

Configuration of the fabric is complete. Chapter 5, *FibreZone Commands*, provides an introduction to FibreZone commands used to manage the fabric.

Configuring an Existing Switch

In this scenario, you are installing FibreZone on an existing switch that may or may not have zones and zone sets defined.

A configuration example follows this overview (see *Example 4: Configuring an Existing Switch* on page 3-22).

A complete description of FibreZone commands is contained in Chapter 5, *FibreZone Commands*.

To configure an existing switch from the FibreZone management host:

1. Ensure that the switch is accessible by the FibreZone management host. For a list of supported switches and network requirements, refer to the installation requirements section of the release notes included with this product.
2. Assign a unit name to the switch by entering:

```
% fzone unit -create -name unit_name -interface  
interface_name -o connection_data
```

See Table A-1, *Connectivity Requirements* on page A-1 for the connection data and interface requirements for each switch.

3. Finish the switch configuration by importing the existing zone configuration data from the switch to the FibreZone database with the following command:

```
% fzone unit -import unit_name -rename -apply
```

Use the **unit -import** command with the **-apply** option even if the switch was never configured for zoning. This step ensures that the information in the FibreZone database and the configuration information on the switch are the same.

Example 4: Configuring an Existing Switch

This section provides a basic example of how to set up and configure an existing switch for FibreZone. Figure 3-7 shows a portion of the fibre network with four hosts, a switch, and a Symmetrix system.

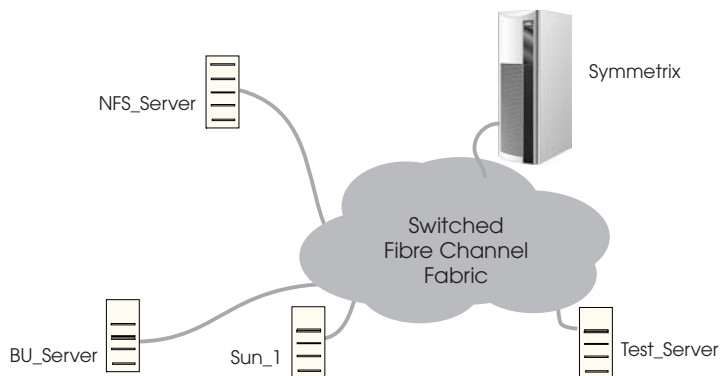


Figure 3-7 Fibre Network

The current zoning has four single-HBA zones between each host and an FA port on the Symmetrix system. The zone architecture is shown in Figure 3-8.

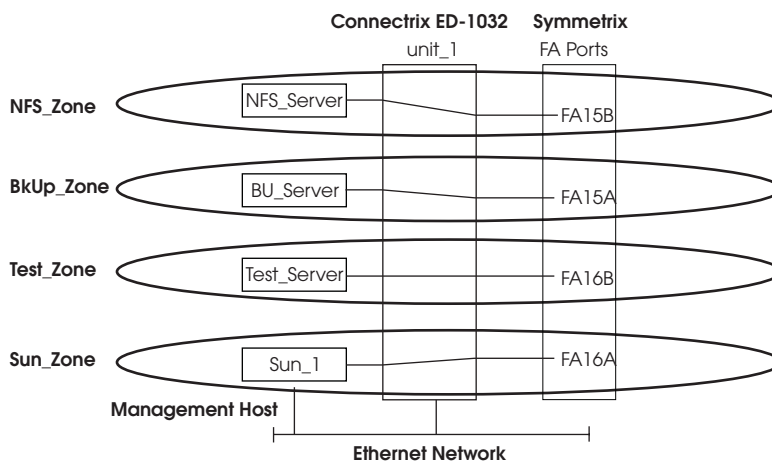


Figure 3-8 Zone Architecture

Verifying the Network Connection Data

Figure 3-8 shows that the user established an Ethernet IP network connection between the host chosen as the management host and the switch. The management host does not require a connection to the switch through the fabric (although in this case it has one).

Based on the switch model (see Appendix A, *FibreZone Connectivity Requirements*) the user determines the interface type (*Mcddata* in this example) and gets the following connection data based on Appendix A, *FibreZone Connectivity Requirements*:

Interface:	Mcddata
IP Address:	172.23.203.42
WWN (or DomainID:Port):	10:00:08:00:88:40:40:63

Refer to the installation requirements section of the release notes included with this product and the appropriate installation and configuration guides to set up your management host and fabric switches for network communication.

See Appendix A, *FibreZone Connectivity Requirements*, for the connection data required when creating a unit name. For example, the IP address and WWN are required for a switch using the *Mcddata* interface.

Creating the Unit

The user now creates a unit name for this switch, CTX1, and associates the name with the correct interface information in the FibreZone database:

```
% fzone unit -create -name CTX1 -interface Mcddata -o
ip=172.23.203.42,wwn=10:00:08:00:88:40:40:63
```

where:

-name is the unit name of the switch (*CTX1*)

-interface is the FibreZone software interface required for this type of switch (*Mcddata*).

-o assigns the connection data. This is a switch using the *Mcddata* interface, so the connection data consists of the IP address of the Service Processor and the WWN of the switch (if this switch used the *Brocade* or *Qlogic* interfaces instead, the connection data would be different).

Importing the Existing Zone Configuration

The user now imports the zone configuration(s) from the specified switch (in this example, *CTX1*), and uses the **-rename** and **-apply** options to replace any existing information in the FibreZone *CTX1* database with the imported information:

```
% fzone unit -import CTX1 -rename -apply
```

FibreZone imports the following zone configuration from *CTX1* and replaces the old information in the database for *CTX1*:

```
id          = 1
name        = Sun_Zone
type        = zone
in use      = yes
members     = Sun_1, FA16A
zone set    = config_1

id          = 2
name        = Test_Zone
type        = zone
in use      = yes
members     = Test_Server, FA16B
zone set    = config_1

id          = 3
name        = BkUp_Zone
type        = zone
in use      = yes
members     = BU_Server, FA15A
zone set    = config_1

id          = 4
name        = NFS_Zone
type        = zone
in use      = yes
members     = NFS_Server, FA15B
zone set    = config_1

id          = 1
name        = config_1
type        = zone set
in use      = yes
zones       = Sun_Zone, Test_Zone, BkUp_Zone, NFS_Zone
units       = CTX1
```

where:

id is the ID of this zone (generated by FibreZone), or as in the case of the last entry, the ID of the zone set.

name is the name of a specific zone (in this example *Sun_Zone*, *Test_Zone*, *BkUp_Zone*, and *NFS_Zone*), or the name of the zone set (*config_1*).

type is either zone or zone set.

in use is either yes or no and has different definitions depending on whether it pertains to a zone or to a zone set:

- for zones, *in use* is **yes** if a zone is in a zone set or **no** if it is not.
- for zone sets, *in use* is **yes** if the zone set is assigned to a unit or **no** if it is not.

members lists the members of that zone.

zone set provides the name of the zone set to which this zone belongs (*config_1* in this example).

zones lists the zones in the zone set.

units lists the units (switches) to which this zone set is applied.

Configuration of the fabric is complete. Chapter 5, *FibreZone Commands*, provides an introduction to FibreZone commands used to manage the fabric.

Configuring a New Multi-Switch Fabric

In this scenario, FibreZone is managing a new multi-switch fabric.

A configuration example follows this overview (see *Example 5: Configuring a New Multi-Switch Fabric* on page 3-28).

Chapter 5, *FibreZone Commands*, provides a complete description of FibreZone commands.

To configure a new multi-switch fabric from the FibreZone host:

1. Ensure that the switch is accessible by the FibreZone management host. For a list of supported switches and network requirements, refer to the installation requirements section of the release notes included with this product.

2. Create a blocking zone set.

EMC recommends that you create a *blocking* zone set to prevent HBAs from attempting to log into all ports in the fabric as soon as they are connected to the switch. A blocking zone set contains a single zone with just one member that you assign to the switch. This blocks all of the HBAs from logging in because they are not members of the zone. The steps for creating a blocking zone set are outlined in *Example 5: Configuring a New Multi-Switch Fabric* on page 3-28.

3. Assign a unit name, interface type, and connection data to each switch by entering:

```
% fzone unit -create -name unit_name -interface
interface_name -o connection_data
```

See *Connectivity Requirements* on page A-1 for the connection data and interface requirements for each switch.

4. Once you create the units, you can *optionally* group them into a meta unit to ensure that all switches in the fabric have the same zoning configuration and are managed together (not as individual units). You also assign the blocking zone set to the meta unit at this time.

```
% fzone unit -create -name meta_unit_name -meta
unit_1,...unit_n -assign blocking_config
```

5. You now enable the blocking zone set on the meta unit with the **fabric -enable** command:

```
% fzone fabric -enable meta_unit_name
```

6. Physically connect the ports (HBAs, storage ports, etc.) to the switch.
7. Check that all ports are attached, and generate a list of available ports and their WWNs (or DomainID:port). To do so, enter the following command for each switch:

```
% fzone unit -info unit_name -online
```

8. Create members based on the information you gathered in the previous step by entering:

```
% fzone member -create [ -name member_name ] { -wwn wwn  
| -port DomainID:Port } [ -node wwnn ] [ -type  
type_name ]
```

9. Create zones and assign members to them by entering:

```
% fzone zone -create [ -name zone_name ]  
member_1,...member_n
```

10. Create a zone set by entering:

```
% fzone Zone_set -create [ -name zone_set_name ]  
zone_1,...zone_n
```

11. Assign the new zone set to the meta unit by entering:

```
% fzone unit -assign meta_unit_name zone_set_name
```

12. Refresh zoning on the meta unit by entering:

```
% fzone fabric -refresh meta_unit_name
```

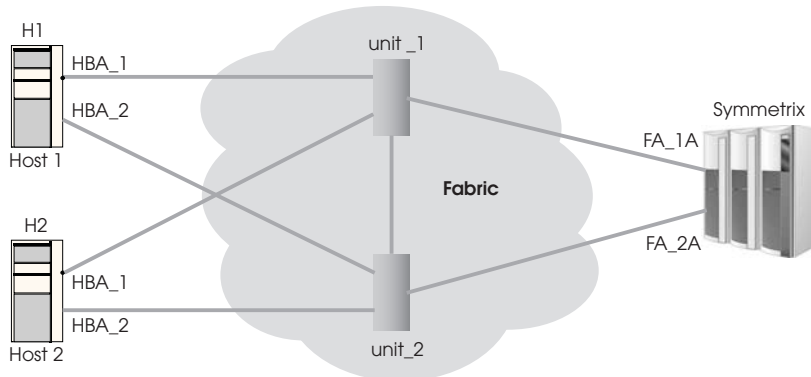
13. Now that the switches have the same zoning configuration, connect the E_Ports between the switches in the fabric.
14. Check to make sure that the switches form a fabric and are not segmented by doing a **unit -info -online** on an individual switch (not the meta unit):

```
% fzone unit -info unit_name -online
```

A fabric configuration example follows this section. Chapter 5, *FibreZone Commands*, provides an introduction to FibreZone commands used to manage the fabric.

Example 5: Configuring a New Multi-Switch Fabric

This section provides an example of how to set up and configure zoning in a new multi-switch fabric installation. Figure 3-9 shows a proposed new fabric with two hosts, two switches, and a Symmetrix system.



Zone Set	Zones	Units	Members
ZoneSet_1	Zone_1	unit_1	H1_HBA_1, FA_1A
	Zone_2		H2_HBA_1, FA_1A
	Zone_3	unit_2	H1_HBA_2, FA_2A
	Zone_4		H2_HBA_2, FA_2A

Figure 3-9 Proposed Fabric Design

The user creates four single-HBA zones, each composed of a host and an FA port on the Symmetrix system. Host 2 is designated as the management host and an Ethernet connection is established between it and the switches. The zone architecture is shown in Figure 3-10 on page 3-29.

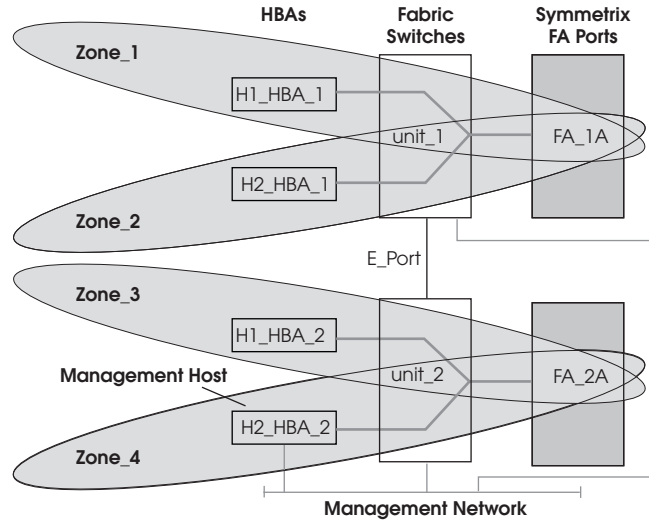


Figure 3-10 Zone Architecture

After determining the topology of the network, the user proceeds to install and configure the network as described in the next sections.

At this point, no nodes are attached to the switches.

Verifying the Network Connection Data

As Figure 3-10 shows, the user establishes an Ethernet connection between the host chosen as the management host and the switch. The management host does not require a connection to the switch through the fabric (although in this case it has one).

Based on the switch type and model (see Appendix A, *FibreZone Connectivity Requirements*) the user determines the interface type (*Brocade* in this example) and connection data for each switch:

Switch Name: **unit_1**
 Interface: **Brocade**
 IP Address: **172.23.203.251**
 User Name: **admin**
 Password: **password**

Switch Name: **unit_2**
 Interface: **Brocade**
 IP Address: **172.23.203.250**
 User Name: **admin**
 Password: **password**

Refer to the installation requirements section of the *Release Notes* included with this product and to the appropriate installation and configuration guides to set up your management host and fabric switches for network communication.

See Appendix A, *FibreZone Connectivity Requirements*, for the connection data required when creating a unit name. For example, the IP address, user name, and password are required for a switch using the *Brocade* interface.

Create a Blocking Zone Set

During this configuration, the HBAs will attempt to log into all ports in the fabric as soon as they are connected to the switches. To prevent this time-consuming process, you create a *blocking* zone set containing a single zone with just one member and then assign the zone set to the switches after they are assigned to a meta unit. In this way, all of the HBAs are blocked from logging in because they are not members of an active zone.

Use the following steps to create the blocking zone set:

1. Create a member:

```
% fzone member -create -name block_member -wwn 01:01:01:01:01:01:01:01
```

2. Create a zone containing one member:

```
% fzone zone -create -name block_zone block_member
```

3. Create a zone set containing one zone:

```
% fzone Zone_set -create -name blocking_config block_zone
```

Creating the Unit

The user creates a unit name for each switch (*unit_1* and *unit_2*) and associates the names with the correct connection data and interface type in the database:

```
% fzone unit -create -name unit_1 -interface Brocade -o  
ip=172.23.203.251,uname=admin,password=password
```

```
% fzone unit -create -name unit_2 -interface Brocade -o  
ip=172.23.203.250,uname=admin,password=password
```

where:

-**name** is the unit name of the switch (*unit_1* or *unit_2*).

-**interface** is the FibreZone software interface required for this type of switch (*Brocade* in this example).

Display a list of the available interfaces by entering the **fzone interface -list** command.

-o assigns the connection data. In this example, the switches require the *Brocade* interface and the connection data consists of the IP address of the switches, user names, and passwords.

Display a list of the required connection data for a particular interface with the **fzone interface -info interface_name** command.

Create a Meta Unit (Optional)

This is an optional step that allows you to manage multiple units in one operation. After creating *unit_1* and *unit_2*, the user groups them into a meta unit to ensure that they have the same zoning configuration and are managed together (not as individual units). The name of the new meta unit is *meta_1*. The user also assigns the blocking zone set to the meta unit:

```
% fzone unit -create -name meta_1 -meta unit_1,unit_2
    -assign blocking_config
```

Enable the Blocking Zone Set

The user now enables the blocking zone set on the meta unit with the **fabric -enable** command:

```
% fzone fabric -enable meta_1
```

Attaching the Nodes

The user physically attaches the nodes to the switch ports.

Discovering the Attached Nodes

The user now issues the **fzone unit -info -online** command for each unit to discover the WWNs of all of the attached nodes:

```
% fzone unit -info unit_1 -online
```

```
id           = 1
name         = unit_1
type        = unit
in use       = yes
unit type    = std
zone set     = blocking_config
zoning       = enabled
refreshed    = yes
default zone = OFF
member of    = meta_1
interface    = Brocade
conn. data   = ip=172.23.203.251,uname=admin,password=*****
```

```
unit online info:
```

```
Model       : SilkWorm 2800, Type 6.1, Fw a2.3a
Unit WWN    : 10:00:00:60:69:00:08:fb
```

Fabric members:

DOMAIN	WWN	ROLE	IP	NAME
1	10:00:00:60:69:00:08:fb	PRINCIPAL	172.23.203.251	TEST_2

Topology :

UNIT PORT		ATTACHED NODE(S)		
#	TYPE	FC-ID	WWN	WWNN
1	F	068213	50:06:04:82:BC:61:2F:DE	50:06:04:82:BC:61:2F:DF
5	F	068313	10:00:00:E0:69:81:05:B6	20:00:00:E0:69:81:05:B6
7	F	068413	10:00:00:E0:69:C1:03:8D	20:00:00:E0:69:C1:03:8D

```
Misc.          :
limitations     :
  MaxZoneNameLength = 65
  MaxZonesetNamelength = 65
  ValidNameFirstCharacter =
  abcdefghijklmnopqrstuvwxyzABCDEFGHIJKLMNPOQRSTUVWXYZ
  ValidNameOtherCharacters =
  0123456789abcdefghijklmnopqrstuvwxyzABCDEFGHIJKLMNPOQRSTUVWXYZ^_-$
  Zone Set Name = different from its zone names
```

FibreZone returns the following information about unit_2:

```
% fzone unit -info unit_2 -online
```

```
id           = 2
name         = unit_2
type         = unit
in use       = yes
unit type    = std
zone set     = blocking_config
zoning       = enabled
refreshed    = yes
default zone = OFF
member of    = meta_1
interface    = Brocade
conn. data   = ip=172.23.203.250,uname=admin,password=*****
```

unit online info:

```
Model       : SilkWorm 2800, Type 6.1, Fw a2.3a
Unit WWN    : 10:00:00:60:69:00:08:95
```

Fabric members:

DOMAIN	WWN	ROLE	IP	NAME
1	10:00:00:60:69:00:08:95	PRINCIPAL	172.23.203.250	LAB_1

Topology :

UNIT PORT		ATTACHED NODE(S)		
#	TYPE	FC-ID	WWN	WWNN
1	F	068213	50:06:04:82:bc:61:2f:ce	50:06:04:82:bc:61:2f:cf
7	F	068313	10:00:00:e0:69:80:03:b9	20:00:00:e0:69:80:03:b9
9	F	068413	10:00:00:e0:69:c0:01:ee	20:00:00:e0:69:c0:01:ee

```
Misc.          :
limitations     :
  MaxZoneNameLength = 65
  MaxZonesetNamelength = 65
  ValidNameFirstCharacter =
  abcdefghijklmnopqrstuvwxyzABCDEFGHIJKLMNOPQRSTUVWXYZ
  ValidNameOtherCharacters =
  0123456789abcdefghijklmnopqrstuvwxyzABCDEFGHIJKLMNOPQRSTUVWXYZ^_-$
  Zone Set Name = different from its zone names
```

The unit online info output includes the switch port # and port type and the WWN and WWNN of the attached node.

In this example, all of the port types are *F* (*F_Ports*), which means that these switch ports are connected to *N_Ports* on an HBA or storage port. The HBA and storage port WWNs and WWNNs appear under the ATTACHED NODE(S) column.

Creating Members

The user now begins to create zone members based on knowledge of the switch connections and the WWN information provided by the **fzone unit -info unit_name -online** command:

```
% fzone member -create -name FA_2A -wwn 50:06:04:82:bc:61:2f:cf
% fzone member -create -name FA_1A -wwn 50:06:04:82:bc:61:2f:ce
% fzone member -create -name H1_HBA_1 -wwn 10:00:00:e0:69:81:05:b6
% fzone member -create -name H1_HBA_2 -wwn 10:00:00:e0:69:c0:01:ee
% fzone member -create -name H2_HBA_1 -wwn 10:00:00:e0:69:c1:03:8d
% fzone member -create -name H2_HBA_2 -wwn 10:00:00:e0:69:80:03:b9
```

Creating Zones

After the zone members are created, the user now creates zones. In this case, the user plans on having four single-HBA zones connected to individual FA ports:

```
% fzone zone -create -name Zone_1 FA_1A,H1_HBA_1
% fzone zone -create -name Zone_2 FA_1A,H2_HBA_1
% fzone zone -create -name Zone_3 FA_2A,H1_HBA_2
% fzone zone -create -name Zone_4 FA_2A,H2_HBA_2
```

Creating Zone Set

After creating all required zones, the user now creates a zone set named *config_1* and adds the zones to it with the following command:

```
% fzone Zone_set -create -name config_1 Zone_1,Zone_2,Zone_3,Zone_4
```

In this example the user puts all of the zones into one zone set so that all zones in the fabric will either be enabled or disabled at the same time.

Assigning Zone Set

The zone set is now assigned to the meta unit in the database:

```
% fzone unit -assign meta_1 config_1
```

In this example, the user assigns the zone set named *config_1* to the meta unit containing the switches named *unit_1* and *unit_2*.

Refreshing the Switch

Now, the user refreshes the zoning configuration on the meta unit with the following command:

```
% fzone fabric -refresh meta_1
```

Connecting the E_Ports

Now that the switches have the same zoning configuration, the user connects the E_Ports between the switches in the fabric.

Verify the Fabric

The user now verifies that the fabric was created by doing a **unit -info -online** command on one of the units in the fabric (you cannot do a unit -info -online on a meta unit) to see if all of the switches in the fabric appear as fabric members:

```
% fzone unit -info unit_1 -online
```

The following output is returned. Note that now there are two Fabric members and that the topology shows an E_Port on port 8.

```
id           = 1
name         = unit_1
type         = unit
in use       = yes
unit type    = std
zone set     = config_1
zoning       = enabled
refreshed    = yes
default zone = OFF
member of    = meta_1
interface    = Brocade
conn. data   = ip=172.23.203.251,uname=admin,password=*****
```

```
unit online info:
```

```
Model       : SilkWorm 2800, Type 6.1, fw a2.3a
```

Unit WWN : 10:00:00:60:69:00:08:fb
Fabric members:

DOMAIN	WWN	ROLE	IP	NAME
1	10:00:00:60:69:00:08:fb	PRINCIPAL	172.23.203.251	TEST_2
2	10:00:00:60:69:00:08:95	SUBORDINATE	172.23.203.250	LAB_1

Topology :

UNIT PORT		ATTACHED NODE(S)		
#	TYPE	FC-ID	WWN	WWNN
1	F	068313	50:06:04:82:bc:61:2f:ce	50:06:04:82:bc:61:2f:cf
5	F	068413	10:00:00:e0:69:81:05:b6	20:00:00:e0:69:81:05:b6
7	F	068513	10:00:00:e0:69:c1:03:8d	20:00:00:e0:69:c1:03:8d
8	E		10:00:00:60:69:00:08:95	

Misc. :
 limitations :
 MaxZoneNameLength = 65
 MaxZonesetNamelength = 65
 ValidNameFirstCharacter =
 abcdefghijklmnopqrstuvwxyzABCDEFGHIJKLMNOPQRSTUVWXYZ
 ValidNameOtherCharacters =
 0123456789abcdefghijklmnopqrstuvwxyzABCDEFGHIJKLMNOPQRSTUVWXYZ^_-\$
 Zone Set Name = different from its zone names

Managing the Fabric

Configuration of the fabric is complete. Chapter 5, *FibreZone Commands*, provides an introduction to FibreZone commands used to manage the fabric.

Configuring an Existing Multi-Switch Fabric

In this situation, you are installing FibreZone into a multi-switch fabric that may or may not have zones and zone sets defined.

A configuration example follows this overview (see *Example 6: Configuring a Multi-Switch Fabric* on page 3-37). A complete description of FibreZone commands is contained in Chapter 5, *FibreZone Commands*.

To configure an existing multi-switch fabric from the FibreZone management host:

1. Ensure that the IP network connection between the management host and the switches is established. For a list of supported switches and network requirements, refer to the installation requirements section of the release notes included with this product.
2. Assign unit names by issuing the following command for each switch:

```
% fzone unit -create -name unit_name -interface
interface_name -o connection_data
```

See *Connectivity Requirements* on page A-1 for connection data and interface requirements.

3. Import the existing zone configuration data to the FibreZone database by issuing the following command for each switch:

```
% fzone unit -import unit_name -rename -apply
```

Use the **unit -import** command with the **-apply** option even if the switch was never configured for zoning. This ensures that the information in the database and the configuration information on the switch are the same.

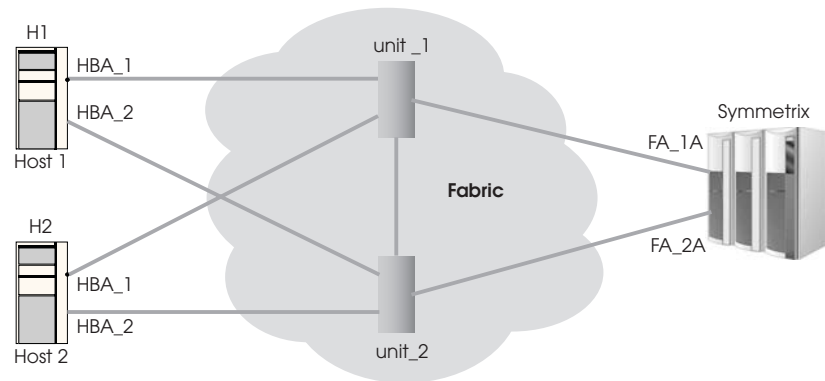
4. Group all of the units in the fabric into a meta unit with the following command:

```
% fzone unit -create -name meta_unit_name -meta
unit_1,...unit_n
```

A fabric configuration example follows this section. Chapter 5, *FibreZone Commands*, provides an introduction to FibreZone commands used to manage the fabric.

Example 6: Configuring a Multi-Switch Fabric

This section provides a basic example of how to configure an existing multi-switch fabric for FibreZone. Figure 3-11 shows the switched fabric with two hosts, two switches, and a Symmetrix system.



Zone Set	Zones	Units	Members
ZoneSet_1	Zone_1	unit_1	H1_HBA_1, FA_1A
	Zone_2		H2_HBA_1, FA_1A
	Zone_3	unit_2	H1_HBA_2, FA_2A
	Zone_4		H2_HBA_2, FA_2A

Figure 3-11 Multi-Switch Fabric

The current zoning has four single-HBA zones between the hosts and two FA ports on the Symmetrix system. The zone architecture is shown in Figure 3-12 on page 3-38.

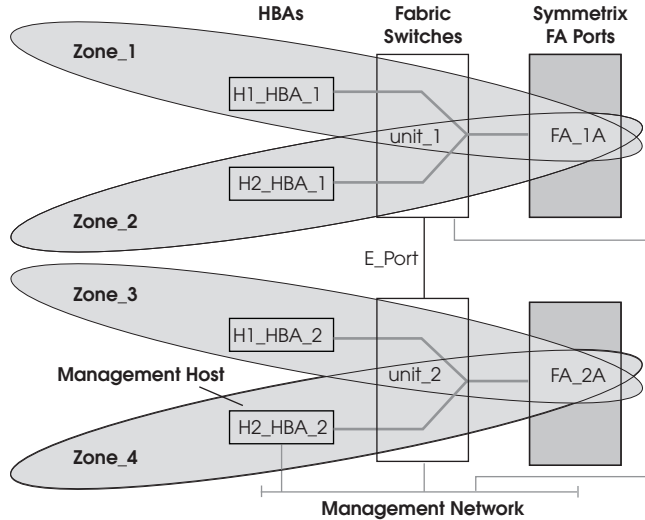


Figure 3-12 Zone Architecture

Verifying the Network Connection Data

Figure 3-12 shows that the user established an IP network connection between the host chosen as the management host and the switch. The management host does not require a connection to the switch through the fabric (although in this case it has one).

Based on the switch type and model (see Appendix A, *FibreZone Connectivity Requirements*) the user determines the interface type (*Brocade* in this example) and connection data required for each switch:

Switch Name: **unit_1**
 Interface: **Brocade**
 IP Address: **172.23.203.211**
 User Name: **admin**
 Password: **password**

Switch Name: **unit_2**
 Interface: **Brocade**
 IP Address: **172.23.203.250**
 User Name: **admin**
 Password: **password**

Refer to the installation requirements section of the release notes included with this product and the appropriate installation and configuration guides to set up your management host and fabric switches for network communication.

See Appendix A, *FibreZone Connectivity Requirements*, for the connection data required when creating a unit name. For example, the IP address, user name, and password are required for a switch using the *Brocade* interface.

Creating the Unit

The user now creates the units in the FibreZone database for the switches in the fabric, (*unit_1*, *unit_2*), and associates the names with the correct interface information in the FibreZone database:

```
% fzone unit -create -name unit_1 -interface Brocade -o
    ip=172.23.203.251,uname=admin,password=password

% fzone unit -create -name unit_2 -interface Brocade -o
    ip=172.23.203.250,uname=admin,password=password
```

where:

-name specifies the unit name of the switch (*unit_1*).

-interface specifies the FibreZone software interface required for this type of switch (*Brocade* in this example).

Display a list of the available interfaces by entering the **fzone interface -list** command.

-o assigns the connection data. In this example, the switches require the *Brocade* interface and the connection data consists of the IP address of the switch, user name, and a password.

Display a list of the required connection data for a particular interface with the **fzone interface -info interface_name** command.

Importing the Existing Zone Configuration

The user now imports the zone configuration(s) from each switch in the fabric, and uses the **-rename** and **-apply** options to replace any existing information in the FibreZone *unit_1* and *unit_2* database with the imported information:

```
% fzone unit -import unit_1 -rename -apply
```

FibreZone imports the zone configuration from *unit_1*, replaces the old database of that name (if it exists), and generates the following output:

```
id           = 1
name         = Zone_1
type         = zone
in use       = yes
members      = H1_HBA_1,FA_1A
zone set     = config_1

id           = 2
name         = Zone_2
type         = zone
in use       = yes
members      = H1_HBA_2,FA_2A
zone set     = config_1

id           = 3
name         = Zone_3
type         = zone
in use       = yes
members      = H2_HBA_1,FA_1A
zone set     = config_1

id           = 4
name         = Zone_4
type         = zone
in use       = yes
members      = H2_HBA_2,FA_2A
zone set     = config_1

id           = 1
name         = config_1
type         = zone set
in use       = yes
zones        = Zone_1,Zone_2,Zone_3,Zone_4
units        = unit_1,unit_2
```

where:

id is the ID of this zone (generated by FibreZone), or as in the case of the last entry, the ID of the zone set.

name is the name of a specific zone (in this example *Zone_1*, *Zone_2*, *Zone_3*, and *Zone_4*), or the name of the zone set (*config_1*).

type is either zone or zone set.

in use is either yes or no and has different definitions depending on whether it pertains to a zone or to a zone set:

- for zones, *in use* is **yes** if a zone is in a zone set or **no** if it is not.
- for zone sets, *in use* is **yes** if the zone set is assigned to a unit or **no** if it is not.

members lists the members of that zone.

zones lists the zones in the zone set.

units lists the units to which this zone set is applied.

Create a Meta Unit

The user now creates a meta unit that groups the two switches for ease of management and to ensure that their zone configurations are the same.

Creating a meta unit is an optional step that allows you to easily manage multiple units in the same fabric.

```
% fzone unit -create -name fabric_1 -meta unit_1,unit_2
```

where:

fabric_1 is the name of the meta unit in this example.

unit_1,unit_2 are the names of the switches in the FibreZone database separated by a comma.

Verify the Fabric

The user now verifies that the fabric was created by doing a **unit -info -online** command on one of the units in the fabric (you cannot do a unit -info -online on a meta unit) to see if all of the switches in the fabric appear as fabric members:

```
% fzone unit -info unit_1 -online
```

See *Verify the Fabric* on page 3-34 for an example of the output.

Configuration of the fabric is complete. Chapter 5, *FibreZone Commands*, provides an introduction to FibreZone commands used to manage the fabric.

This chapter provides a quick reference for using the FibreZone CLI after you configure the fabric as detailed in Chapter 3, *Configuring the Fabric Using FibreZone*. A complete list of commands is provided in Chapter 5, *FibreZone Commands*.

This chapter contains the following sections:

- ◆ FibreZone Command Quick Reference.....4-2
- ◆ Using FibreZone to Edit the Configuration4-8

FibreZone Command Quick Reference

This section provides a quick reference for the following FibreZone commands:

- ◆ *Member Commands* on page 4-2
- ◆ *Zone Commands* on page 4-3
- ◆ *Zone Set Commands* on page 4-3
- ◆ *Interface Commands* on page 4-4
- ◆ *Unit Commands* on page 4-4
- ◆ *Fabric Commands* on page 4-6
- ◆ *Admin Commands* on page 4-7
- ◆ *Version Command* on page 4-7

Member Commands

Table 4-1 provides a quick reference for **member** commands.

Table 4-1 Member Commands

If you want to	Use the following command
List all members in the database	fzone member -list
Delete a member from the database	fzone member -delete <i>member_name</i>
Create a member in the database	fzone member -create [-name <i>member_name</i>] { -wwn <i>wwn</i> -port <i>DomainID:Port</i> } [-node <i>wwnn</i>] [-type <i>type_name</i>]
Modify a member in the database	fzone member -modify <i>member_name</i> { -wwn <i>wwn</i> -port <i>DomainID:Port</i> -node <i>wwnn</i> -type <i>type_name</i> }
Rename a member in the database	fzone member -rename <i>old_name</i> <i>new_name</i>
Display detailed info about a member	fzone member -info { <i>member_name</i> <i>member_id</i> <i>wwn</i> <i>DomainID:Port</i> }
Display a list of member (device) types	fzone member -types-list

Zone Commands

Table 4-2 provides a quick reference for **zone** commands.

Table 4-2 Zone Commands

If you want to	Use the following command
List the zones in the database	<code>fzone zone -list</code>
Delete a zone from the database	<code>fzone zone -delete zone_name</code>
Create a zone in the database	<code>fzone zone -create [-name zone_name] member_1,...member_n</code>
Rename a zone in the database	<code>fzone zone -rename old_name new_name</code>
Display detailed info about a zone	<code>fzone zone -info { zone_name zone_id }</code>
Add a member to a zone	<code>fzone zone -add zone_name member_1,...member_n</code>
Remove a member from a zone	<code>fzone zone -remove zone_name member_1,...member_n</code>

Zone Set Commands

Table 4-3 provides a quick reference for **zone set** commands.

Table 4-3 Zone Set Commands

If you want to	Use the following command
List the zone sets in the database	<code>fzone Zone_set -list</code>
Delete a zone set from the database	<code>fzone Zone_set -delete zone_set_name</code>
Create a zone set name	<code>fzone Zone_set -create [-name zone_set_name] zone_1,...zone_n</code>
Rename a zone set in the database	<code>fzone Zone_set -rename old_name new_name</code>
Get info about a zone set in the database	<code>fzone Zone_set -info { zone_set_name zone_set_id }</code>
Add a zone to the zone set	<code>fzone Zone_set -add zone_set_name zone_1,...zone_n</code>
Remove a zone from the zone set	<code>fzone Zone_set -remove zone_set_name zone_1,...zone_n</code>

Interface Commands

Table 4-4 provides a quick reference for **interface** commands.

Table 4-4 Interface Commands

If you want to	Use the following command
List all available vendor interfaces	fzone interface -list
Get info about a specific vendor interface	fzone interface -info { <i>interface_name</i> <i>interface_id</i> }

Unit Commands

Table 4-5 provides a quick reference for FibreZone **unit** commands.

Table 4-5 Unit Commands

If you want to	Use the following command
List all units (switches) in the database	fzone unit -list
Delete a unit from the database	fzone unit -delete <i>unit_name</i>
Create a unit (name the unit, assign a vendor interface, assign the connection data, assign a zone set if specified) or Create a meta unit (name the meta unit, assign the type as meta, assign the units, assign a zone set, if specified)	fzone unit -create [-name <i>unit_name</i>] -interface <i>interface_name</i> -o <i>connection_data</i> [-assign <i>zone_set_name</i>] fzone unit -create [-name <i>meta_unit_name</i>] -meta <i>unit_1,..unit_n</i> [-assign <i>zone_set_name</i>]
Extend the meta unit by adding more units	fzone unit -extend <i>meta_unit_name</i> <i>unit_1,..unit_n</i>
Shrink the meta unit by removing units	fzone unit -shrink <i>meta_unit_name</i> <i>unit_1,..unit_n</i>
Rename a unit in the database	fzone unit -rename <i>old_name</i> <i>new_name</i>
Display detailed info for a unit from the database. Use the -online option to collect information from the unit itself.	fzone unit -info { <i>unit_name</i> <i>unit_id</i> } [-online]
Modify an entry. Note: You must specify at least one option.	fzone unit -modify <i>unit_name</i> { -interface <i>new_interface_name</i> -o <i>new_connection_data</i> }

Table 4-5 Unit Commands (continued)

If you want to	Use the following command
Show the active configuration on a unit. Use the -extend option to display a list of all zones and zone sets in the unit's database.	<code>fzone unit -show <i>unit_name</i> [-extend]</code>
Assign a new zone set to a unit.	<code>fzone unit -assign <i>unit_name</i> <i>zone_set_name</i></code>
Import the zones and zone sets defined on a unit into the FibreZone database. If the switch and database zones have the same members, the zone and zone set names are not changed in the database. Use the -rename option to rename zones or zone sets in the database that have identical contents in both the database and on the switch to match the names used by the switch. Use the -apply option to make the zoning configuration in the FibreZone database the same as the active zone set on the switch.	<code>fzone unit -import <i>unit_name</i> [-rename] [-apply]</code>
Turn on/off default zoning^a for a unit using the Mcddata interface in the FibreZone database. Use the <code>fzone unit -default_zone</code> command followed by the <code>fzone fabric -refresh</code> command to apply the change to the switch.	<code>fzone unit -default_zone { on off } <i>unit_name</i></code>

a. Default zoning is **OFF** during normal FibreZone operation.

Fabric Commands

Table 4-6 provides a quick reference for **fabric** commands.

Table 4-6 Fabric Commands

If you want to	Use the following command
Enable^a zoning on the fabric. Note: ALL enables zoning for all units that are disabled. The -purge option causes FibreZone to remove non-active zone and zone set information from the unit.	<code>fzone fabric -enable { ALL unit_1,...,unit_n } [-purge]</code>
Disable^a zoning on the fabric. Note: ALL disables zoning for all units that are enabled.	<code>fzone fabric -disable { ALL unit_1,...,unit_n }</code>
Refresh the zone set on specified units ^b . Note: ALL refreshes zoning for all units that are not refreshed. The -force option refreshes all units. The -purge option causes FibreZone to remove non-active zone and zone set information from the unit.	<code>fzone fabric -refresh { ALL [-force] unit_1,...,unit_n } [-purge]</code>

- a. The *fzone fabric -enable* and *-disable* commands do not change the default zone setting (on/off) on a unit using the Mcddata interface. Use the *fzone unit -default_zone* command followed by the *fzone fabric -refresh* command if you must change the default zoning on a unit using the Mcddata interface. The default zone setting on a unit using the Mcddata interface should always be **OFF** when used with FibreZone.
- b. FibreZone considers that a unit is refreshed if there have been no changes to the FibreZone database that affect this unit's zoning configuration since the last fabric instruction to this unit.

Admin Commands

Table 4-7 provides a quick reference for **admin** commands that allow you to back up, restore and clear the FibreZone database.

Table 4-7 Admin Commands

If you want to	Use the following command
Back up the FibreZone database	<code>fzone admin -backup <i>destination</i></code>
Restore the FibreZone database from a previously backed up version	<code>fzone admin -restore <i>source</i></code>
Clear the FibreZone database (except for the vendor interface data).	<code>fzone admin -clear_database <i>backup_file</i></code>

Version Command

Table 4-8 provides a quick reference for the **version** command that allows you to determine the version of FibreZone that you are currently using.

Table 4-8 FibreZone Version Command

If you want to	Use the following command
Determine the version of fibrezone that you are using	<code>fzone version</code>

Using FibreZone to Edit the Configuration

This section provides a quick reference for performing the following actions on FibreZone Objects:

- ◆ *Replacing an HBA in the Fabric* on page 4-8
- ◆ *Replacing a Unit* on page 4-9
- ◆ *Adding a Member to a Zone* on page 4-9
- ◆ *Removing a Member From a Zone* on page 4-10
- ◆ *Removing a Member From the Database* on page 4-10
- ◆ *Adding a Zone to a Zone Set* on page 4-10
- ◆ *Adding a New Unit* on page 4-11
- ◆ *Removing a Unit From the Database* on page 4-11
- ◆ *Creating a Meta Unit* on page 4-11
- ◆ *Adding a Unit to an Existing Fabric* on page 4-11
- ◆ *Obtaining the WWN of Attached Devices* on page 4-12
- ◆ *Getting Information About a Fabric* on page 4-12

Replacing an HBA in the Fabric

Replace an HBA in the fabric with the following steps:

1. Correct the member information in the FibreZone database by entering:

```
% fzone member -modify member_name { -wwn wwn | -port DomainID:Port |  
-node wwnn | -type type_name }
```

2. Refresh the configuration on the unit that the HBA is logged into by entering:

```
% fzone fabric -refresh unit_name
```

Replacing a Unit

Replace a unit in the fabric with the following steps:

It is possible for the zoning configuration on the current switch to be different from that in the FibreZone database. If you want to use the existing active configuration on the new switch, use the **fzone unit -import -apply** command to import the active zone set information from the switch into the FibreZone database before removing the old switch.

Complete these steps *before* making the physical connections between the switch and the HBAs.

1. Modify the unit information (if necessary) by entering:

```
% fzone unit -modify unit_name { -interface new_interface_name | -o
  new_connection_data }
```

2. Verify the unit information by entering:

```
% fzone unit -info unit_name -online
```

3. Refresh the configuration on the unit by entering:

```
% fzone fabric -refresh unit_name
```

4. Connect the HBAs to the switch.

Adding a Member to a Zone

Add a new member to a zone with the following steps:

1. Create the new member (if necessary) by entering:

```
% fzone member -create [ -name member_name ] { -wwn wwn | -port
  DomainID:Port } [ -node wwnn ] [ -type type_name ]
```

2. Add the member to a zone by entering:

```
% fzone zone -add zone_name member_name
```

3. Refresh the configuration on the unit (if necessary) by entering:

```
% fzone fabric -refresh unit_name
```

Removing a Member From a Zone

Remove a member from a zone or zones with the following steps:

1. Determine which zones contain this member by entering:

```
% fzone member -info { member_name | member_id | wwn | DomainID:Port }
```

2. Remove the member from each zone by entering:

```
% fzone zone -remove zone_name member_name
```

3. Refresh the unit configuration (if necessary) by entering:

```
% fzone fabric -refresh unit_name
```

Removing a Member From the Database

Remove a member from the database with the following steps:

1. Remove the member from the zone, if the member is in use, by entering:

```
% fzone zone -remove zone_name member_name
```

2. Remove the member from the database by entering:

```
% fzone member -delete member_name
```

3. Refresh the unit configuration (if the zone is active on a switch and you want this to be the new active configuration) by entering:

```
% fzone fabric -refresh unit_name
```

Adding a Zone to a Zone Set

Create a new zone and add it to a zone set with the following steps:

1. Create the zone by entering:

```
% fzone zone -create [ -name zone_name ] member_1,...member_n
```

2. Add the zone to a zone set in the database by entering:

```
% fzone Zone_set -add zone_set_name zone_name
```

3. Refresh the configuration on the unit (if the zone set is active) by:

```
% fzone fabric -refresh unit_name
```

Adding a New Unit

See *Configuring a New Switch* on page 3-3.

Removing a Unit From the Database

Remove the unit from the database by entering:

```
% fzone unit -delete unit_name
```

Creating a Meta Unit

Group a set of units together by entering:

```
% fzone unit -create -name meta_unit_name -meta unit_1,...unit_n  
[ -assign zone_set_name ]
```

FibreZone requires that units have the same zoning configuration before you group them into a meta unit.

Adding a Unit to an Existing Fabric

Add a unit to an existing fabric (meta unit) with the following steps:

This procedure assumes that the switches in the existing fabric are already grouped in a meta unit (see *Creating a Meta Unit*) and that the unit you are adding has the same zoning configuration as the meta unit.

1. Add the unit to the existing meta unit by entering:

```
% fzone unit -extend meta_unit_name unit_name
```

2. Refresh the configuration by entering:

```
% fzone fabric -refresh meta_unit_name
```

3. Connect the E_Ports between the switches to establish connectivity.
4. Confirm that the unit is a member of the fabric by entering:

```
% fzone unit -info unit_name -online
```

Obtaining the WWN of Attached Devices

Obtain the WWNs of all attached devices by entering:

```
% fzone unit -info { unit_name | unit_id } -online
```

Getting Information About a Fabric

Get information about a unit's fabric by entering:

```
% fzone unit -info { unit_name | unit_id } -online
```

This chapter provides descriptions and examples of the FibreZone command set.

This chapter consists of the following sections:

◆ FibreZone CLI Introduction	5-2
◆ fzone member	5-6
◆ fzone member Examples.....	5-9
◆ fzone zone	5-12
◆ fzone zone Examples	5-13
◆ fzone Zone_set.....	5-15
◆ fzone Zone_set Examples	5-16
◆ fzone interface	5-18
◆ fzone interface Examples	5-19
◆ fzone unit.....	5-21
◆ fzone unit Examples	5-25
◆ fzone fabric.....	5-34
◆ fzone fabric Examples	5-36
◆ fzone admin	5-38
◆ fzone admin Examples	5-39
◆ fzone version.....	5-40

FibreZone CLI Introduction

The FibreZone CLI allows you to manage zones, units, and zone sets with the following commands:

fzone member — Manipulate members. Options allow you to create, delete, or change the attributes of members, obtain a list of members, and display information about specific members.

fzone zone — Manipulate zones. Options allow you to create, delete, or change the name of zones, add a member to or remove a member from a zone, obtain a list of zones, and display information about specific zones.

fzone Zone_set — Manipulate zone sets. Options allow you to create, delete, or change the name of a zone set, add a zone to or remove a zone from a zone set, obtain a list of zone sets, and display information about a specific zone set.

fzone interface — Retrieve information about vendor interfaces. Options allow you to obtain a list of vendor interfaces and display specific information about them.

fzone unit — Perform operations on units and meta units. Options allow you to create, delete, change the attributes of units, obtain a list of units, and display specific information about units. You can also modify units and assign zone sets to them.

fzone fabric — Issue zone set configuration to fabric units. Options allow you to enable, disable, or refresh zoning for one or multiple units.

fzone admin — Back up, restore, and clear the FibreZone database.

fzone version — Display the version of FibreZone that you are using.

FibreZone IDs

FibreZone generates IDs to help you identify members, zones, zone sets, interfaces, and units. These IDs appear at the beginning of output lines from **-list** commands. For example, a **member -list** command might appear as follows:

```
% fzone m -l
id      name                inuse    wwn                      zones' id
1       HARWOOD_D_emulx       y        10:00:00:00:c9:21:02:35  2
3       lol1047_jcore           y        20:00:00:e0:69:80:03:86  1
6       symm1_fa14a             y        50:06:04:80:bc:61:2f:cd  1,2
```

In the previous example, members have IDs of 1, 3, and 6. Note that the far right column of the **member -list** command output provides zone IDs. For example, 1011047_jcore is *in use* (a member of a zone) in a zone with an ID of 1.

Now you can use the **zone -list** command to identify the zones with IDs 1 and 2 as follows:

```
% fzone zone -l
id      name           inuse      zone-set's id      members' id
1       BackUp_Zone      y          1                   3, 6
2       TestZone         y          2                   1, 6
```

The zone with an ID of 1 is named BackUp_Zone and the zone with an ID of 2 is named TestZone. Note that this output also shows the IDs of the zone sets (in the zone-set's id column) that each zone belongs to, as well as the IDs of the members in each zone (in the members' id column). For example, TestZone is *in use* in a zone set with a zone set ID of 2 and contains members with IDs of 1 and 6.

FibreZone Syntax

The FibreZone CLI follows left-justified unique rules for command line syntax, meaning that with few exceptions, you need to type in only as many letters of the command as make it unique. This section details rules and exceptions and provides examples for FibreZone CLI syntax.

FibreZone CLI syntax is left-justified unique within object groups. Table 5-1 shows the object groups and the minimum syntax requirements for each command.

Table 5-1 FibreZone Syntax Rules

Complete Command Syntax	Minimum Command Syntax
fzone member	fzone m
-list	fzone m -l
-delete <i>member_name</i>	fzone m -d <i>member_name</i>
-create [-name <i>member_name</i>] { -wwn <i>wwn</i> -port <i>DomainID:Port</i> } [-node <i>wwnn</i>] [-type <i>type_name</i>]	fzone m -c [-na <i>member_name</i>] { -w <i>wwn</i> -p <i>DomainID:Port</i> } [-no <i>wwnn</i>] [-t <i>type_name</i>]
-rename <i>old_name new_name</i>	fzone m -r <i>old_name new_name</i>

Table 5-1 FibreZone Syntax Rules (continued)

Complete Command Syntax	Minimum Command Syntax
<code>-modify member_name</code> <code>{-wwn wwn -port DomainID:Port -node wwnn -type type_name }</code>	<code>fzone m -m member_name {-w wwn -p DomainID:Port -n wwnn -t type_name }</code>
<code>-info { member_name member_id wwn DomainID:Port }</code>	<code>fzone m -i { member_name member_id wwn DomainID:Port }</code>
<code>-types-list</code>	<code>fzone m -t</code>
fzone zone	<code>fzone z</code>
<code>-list</code>	<code>fzone z -l</code>
<code>-delete zone_name</code>	<code>fzone z -d zone_name</code>
<code>-create [-name zone_name] member_1,...member_n</code>	<code>fzone z -c [-n zone_name] member_1,...member_n</code>
<code>-rename old_name new_name</code>	<code>fzone z -ren old_name new_name</code>
<code>-info { zone_name zone_id }</code>	<code>fzone z -i { zone_name zone_id }</code>
<code>-add zone_name member_1,...member_n</code>	<code>fzone z -a zone_name member_1,...member_n</code>
<code>-remove zone_name member_1,...member_n</code>	<code>fzone z -rem zone_name member_1,...member_n</code>
fzone Zone_set	<code>fzone Z</code>
<code>-list</code>	<code>fzone Z -l</code>
<code>-delete zone_set_name</code>	<code>fzone Z -d zone_set_name</code>
<code>-create [-name zone_set_name] zone_1,...zone_n</code>	<code>fzone Z -c [-n zone_set_name] zone_1,...zone_n</code>
<code>-rename old_name new_name</code>	<code>fzone Z -ren old_name new_name</code>
<code>-info { zone_set_name zone_set_id }</code>	<code>fzone Z -i { zone_set_name zone_set_id }</code>
<code>-add zone_set_name zone_1,...zone_n</code>	<code>fzone Z -a zone_set_name zone_1,...zone_n</code>
<code>-remove zone_set_name zone_1,...zone_n</code>	<code>fzone Z -rem zone_set_name zone_1,...zone_n</code>
fzone interface	<code>fzone i</code>
<code>-list</code>	<code>fzone i -l</code>
<code>-info { interface_name interface_id }</code>	<code>fzone i -i { interface_name interface_id }</code>
fzone unit	<code>fzone u</code>
<code>-list</code>	<code>fzone u -l</code>

Table 5-1 FibreZone Syntax Rules (continued)

Complete Command Syntax	Minimum Command Syntax
-delete <i>unit_name</i>	fzone u -del <i>unit_name</i>
-create [-name <i>unit_name</i>] [-assign <i>zone_set_name</i>] -interface <i>interface_name</i> -o <i>connection_data</i>	fzone u -c [-n <i>unit_name</i>] [-a <i>zone_set_name</i>] -i <i>interface_name</i> -o <i>connection_data</i>
-create [-name <i>meta_unit_name</i>] [-assign <i>zone_set_name</i>] -meta <i>unit_1</i> ,... <i>unit_n</i>	fzone u -c [-n <i>meta_unit_name</i>] [-a <i>zone_set_name</i>] -m <i>unit_1</i> ,... <i>unit_n</i>
-extend <i>meta_unit_name</i> <i>unit_1</i> ,... <i>unit_n</i>	fzone u -e <i>meta_unit_name</i> <i>unit_1</i> ,... <i>unit_n</i>
-shrink <i>meta_unit_name</i> <i>unit_1</i> ,... <i>unit_n</i>	fzone u -shr <i>meta_unit_name</i> <i>unit_1</i> ,... <i>unit_n</i>
-rename <i>old_name</i> <i>new_name</i>	fzone u -r <i>old_name</i> <i>new_name</i>
-info { <i>unit_name</i> <i>unit_id</i> } [-online]	fzone u -in { <i>unit_name</i> <i>unit_id</i> } [-o]
-modify <i>unit_name</i> { -interface <i>new_interface_name</i> -o <i>new_connection_data</i> }	fzone u -m <i>unit_name</i> { -i <i>new_interface_name</i> -o <i>new_connection_data</i> }
-show <i>unit_name</i> [-extend]	fzone u -sho <i>unit_name</i> [-e]
-assign <i>unit_name</i> <i>new_zone_set_name</i>	fzone u -a <i>unit_name</i> <i>new_zone_set_name</i>
-import <i>unit_name</i> [-rename] [-apply]	fzone u -im <i>unit_name</i> [-r] [-a]
-default_zone { on off } <i>unit_name</i>	fzone u -def { on off } <i>unit_name</i>
fzone fabric	fzone f
-enable { ALL <i>unit_1</i> ,... <i>unit_n</i> } [-purge]	fzone f -e { ALL <i>unit_1</i> ,... <i>unit_n</i> } [-p]
-disable { ALL <i>unit_1</i> ,... <i>unit_n</i> }	fzone f -d { ALL <i>unit_1</i> ,... <i>unit_n</i> }
-refresh { ALL [-force] <i>unit_1</i> ,... <i>unit_n</i> } [-purge]	fzone f -r { ALL [-f] <i>unit_1</i> ,... <i>unit_n</i> } [-p]
fzone admin	fzone a
-backup <i>destination</i>	fzone a -b <i>destination</i>
-restore <i>source</i>	fzone a -r <i>source</i>
-clear_database <i>backup_file</i>	fzone a -c <i>backup_file</i>
fzone version	fzone v

fzone member

Synopsis

```
fzone m[ember] -list
fzone m[ember] -delete member_name
fzone m[ember] -create [ -name member_name ] { -wwn wwn |
    -port DomainID:Port } [ -node wwnn ] [-type type_name]
fzone m[ember] -rename old_name new_name
fzone m[ember] -modify member_name
    { -wwn wwn | -port DomainID:Port | -node wwnn | -type
    type_name }
fzone m[ember] -info { member_name | member_id | wwn |
    DomainID:Port }
fzone m[ember] -types-list
```

Description

This command allows you to manage members.

Options

-l[ist]

Lists all members.

-d[ele]te *member_name*

Deletes a member from the database. You cannot delete a member if it is use (in a zone). You must remove the member from the zones before deleting the member from the database.

-c[reate] [-name *member_name*] { -wwn *wwn* | -port *DomainID:Port* } [-node *wwnn*] [-type *type_name*]

Creates a member identity.

where:

-na[me] *name*

Assigns a name to a member. If you do not use this option, a default name is assigned to the member.

-w[wn] *wwn*

Uniquely identifies an HBA on the host based on the *World Wide Name* (WWN). You can enter the WWN with or without colons. For example, 50:06:04:82:bc:61:83:0e or 50060482bc61830e.

-p[ort] *DomainID:Port*

Used for port zoning. Uniquely identifies an HBA or storage port based on the Domain ID and port number of the switch it connects to. For example, an HBA connected to port 2 on a switch with a domain ID of 17 is identified as 17:2.

`-no[de] wwnn`

Specifies the optional World Wide Node Name (WWNN) associated with a member.

`-t[ype] type_name`

Specifies one of the member (device) types shown in Table 5-2 based on the *Fibre Channel Management Integration MIB*.

Table 5-2 Member (Device) Types

Member (Device) Type	Definition
UNKNOWN	Type unknown
OTHER	None of the following
HUB	Passive connectivity unit supporting loop protocol
SWITCH	Active connectivity unit supporting multiple protocols
GATEWAY	Unit that converts not only the interface but also encapsulates the frame into another protocol
CONVERTOR	Unit that converts from one interface to another
HBA	Host bus adapter
PROXY_AGENT	Software proxy-agent
STORAGE_DEVICE	Disk, cd, tape, and so on
HOST	Host computer
STORAGE_SUBSYSTEM	RAID, library, etc.
MODULE	Subcomponent of a system
SWDRIVER	Software driver
STORAGE_ACCESS_DEVICE	Storage management and access for heterogeneous hosts and heterogeneous devices

`-r[ename] old_name new_name`

Changes the name of an existing member.

`-m[odify] member_name { -w[wn] wwn | -p[ort] DomainID:Port | -n[ode] wwnn | -t[ype] type_name }`

Modifies the WWN, Port, WWNN, or device type of a specified member (refer to the **member -create** option).

```
-i[nfo] { member_name | member_id | wwn | DomainID:Port }
```

Displays detailed information about a member based on the member_name, the member_id (from the FibreZone database), the member WWN, or the domainID:port of the switch port.

```
-t[ypes-list]
```

Displays the member (device) types shown in Table 5-2 on page 5-7.

fzone member Examples

This section provides an example of each **fzone member** command.

Example: member -list

The FibreZone database displays a listing of all members. The listing provides the FibreZone ID of each member, the member name, whether or not it is in use (a member of a zone), its WWN, and of which zones it is a member, if any.

For example, in the following command output, member_21 has a member ID of 15, is already a member of at least one zone (in use), has a WWN of 20:00:00:e0:69:80:03:b9, and is a member of a zone with an ID of 4. You can then use the command **fzone zone -list** to identify which zone has an ID of 4.

```
% fzone m -l
```

id	name	inuse	wwn	zones' id
1	HARWOOD_D_emulx	n	10:00:00:00:C9:21:02:35	
2	lol1047_jcore	y	20:00:00:E0:69:80:03:86	2,3
3	symm1_fa14a	n	50:06:04:80:BC:61:2F:CD	
4	lol1048_jcore	y	20:00:00:E0:69:80:04:39	2,3
5	lol1042_jcore	y	10:00:00:E0:69:C0:01:EE	6
6	demo_m1	y	20:00:00:EF:DD:80:03:FF	1
7	HARWOOD_D_emulx1	n	10:00:00:00:C9:20:D7:3F	
8	Symm78_Fa14b	n	50:06:04:80:BC:61:2F:DD	
9	HARWOOD-D_emulex	n	10:00:00:00:C9:20:D6:0A	
10	symm_1_FA_14b	y	50:06:04:82:BC:61:2F:DD	2
11	symm_1_FA_15b	y	50:06:04:82:BC:61:2F:DE	3,5
12	symm_1_FA_15a	n	50:06:04:82:BC:61:2F:CE	
13	symm_1_FA_16b	n	50:06:04:82:BC:61:2F:DF	
14	symm_1_FA_16a	y	50:06:04:82:BC:61:2F:CF	4,5
15	member_21	y	20:00:00:E0:69:80:03:B9	4
16	Symm_384FA	y	50:06:04:82:BC:61:2F:1E	6
17	member_18	n	10:00:00:00:C9:21:02:34	

Example: member -delete

The member HARWOOD_D_emul is deleted from the FibreZone database.

```
% fzone m -d HARWOOD_D_emul
...done;
```

Example: member -create

In the FibreZone database, HARWOOD_D_emul is created as a member identified by the WWN 10:00:00:00:c9:21:02:35. The optional **-type** field is used to help identify the member device type. The output shows that the ID assigned by FibreZone is 1, that it has not yet been assigned to a zone (the zones field is blank) and therefore it is not in use.

Note that since no **-node** WWN was assigned during **member -create**, the node WWN field is blank in the output.

```
% fzone m -c -name HARWOOD_D_emul -w 10:00:00:00:C9:21:02:35 -type HBA
id                = 1
name              = HARWOOD_D_emul
type              = member
in use            = no
wwn/port-id       = 10:00:00:00:C9:21:02:35
node wwn          =
device type       = HBA
zones             =
```

Example: member -rename

In the FibreZone database, the name of HARWOOD_D_emul is changed to test_server. All other information remains unchanged.

```
% fzone m -ren HARWOOD_D_emul test_server
id                = 1
name              = test_server
type              = member
in use            = no
wwn/port-id       = 10:00:00:00:C9:21:02:35
node wwn          =
device type       = HBA
zones             =
```

Example: member -modify

In the FibreZone database, the WWN of member_21 is changed.

```
% fzone m -m member_21 -w 200000E0698003B9
id                = 15
name              = member_21
type              = member
in use            = no
wwn/port-id       = 20:00:00:E0:69:80:03:B9
node wwn          =
device type       = HBA
zones             =
```

Example: member -info

The FibreZone database displays information about member `symm_1_FA_15a`. Its ID is 12. It is in use in zones `QA_test_zone` and `eng_zone_1`. Its WWN is `50:06:04:82:BC:61:2F:CE`. The user did not enter any information about the WWNN or the type (by using the **-node** and **-type** options) when the member was created, so the node WWN field is blank and the device type is unknown.

```
% fzone m -i symm_1_FA_15a
id                = 12
name              = symm_1_FA_15a
type              = member
in use            = yes
wwn/port-id       = 50:06:04:82:BC:61:2F:CE
node wwn          =
device type       = UNKNOWN
zones             = QA_test_zone,eng_zone_1
```

fzone zone

Synopsis

```
fzone zone -list
fzone zone -delete zone_name
fzone zone -create [ -name zone_name ]
                    member_1,..member_n
fzone zone -rename old_name new_name
fzone zone -info { zone_name | zone_id }
fzone zone -add zone_name member_1,..member_n
fzone zone -remove zone_name member_1,..member_n
```

Description

This command allows you to manage zones.

Options

-l[ist]

Lists the zones.

-d[ele]te *zone_name*

Deletes a zone. You cannot delete a zone if it is use (in a zone set). Remove the zone from the zone sets (with the **fzone Zone_set -remove** command) before deleting the zone from the database.

-c[reate] [**-name** *zone_name*] *member_1,..member_n*

Creates a zone identity. FibreZone assigns a default zone name if you do not provide one with the **-name** option.

[**-n[ame]** *zone_name*]

Assigns a name to a zone.

-ren[ame] *old_name new_name*

Changes the zone name.

-i[nfo] { *zone_name* | *zone_id* }

Lists the names of the members of the zone and provides zone set information based on the zone name or the zone ID from the FibreZone database.

-a[dd] *zone_name member_1,..member_n*

Adds one or more members to a zone.

-rem[ove] *zone_name member_1,..member_n*

Removes one or more members from a zone.

A zone must contain at least one member (you cannot remove all of the members from a zone).

fzone zone Examples

This section provides an example of each **fzone zone** command.

Example: zone -list

A list of all zones is displayed. For example, BackUp_Zone has a zone ID of 1, is in use in a zone set with an ID of 1, and has two members with IDs of 6 and 4.

```
% fzone zone -l
```

id	name	inuse	zone-set's id	members' id
1	BackUp_Zone	y	1	6,4
2	Symm1_FA14b	y	2	2,4,11
3	Symm1_FA15b	y	2	2,12,4
4	jack	y	2	15,16
5	z	y	1	12,15
6	Johan	n		17,5

Example: zone -delete

Zone *Johan* is deleted from the FibreZone database. Note that Johan is not in use in the zone list in the previous example.

```
% fzone zone -d Johan
...done;
```

In the previous zone list, BackUp_Zone is in use (used in a zone set). To remove it from the database, we first find the name of the zone set that it belongs to with the **Zone_set-info** command (using the **zone_set_id**), and remove BackUp_Zone from the zone set with the **Zone_set-remove** command. After the zone is removed from the zone set, we can delete it from the database using the **zone -delete** command.

Example: zone -create

In the FibreZone database, zone QA_test_zone is created and is assigned two members (symm_1FA_15b and member_21). The output displays information about the new zone. Note that the zone is not in use, because it has not been assigned to a zone set.

```
% fzone zone -c -n QA_test_zone symm_1FA_15b,member_21
```

id	= 7
name	= QA_test_zone
type	= zone
in use	= no
members	= symm_1_FA_15b,member_21
zone set	=

Example: zone -rename

In the database, change the name of backup_zone to eng_zone_1.

```
% fzone zone -ren backup_zone eng_zone_1
```

```
id           = 1
name         = eng_zone_1
type        = zone
in use      = yes
members     = symm1_fa14a,demo_m1,alpha
zone set    = day_cfg
```

Example: zone -info

The database displays information about eng_zone_1, including the members of the zone, and the zone set (day_cfg).

```
% fzone zone -i eng_zone_1
```

```
id           = 1
name         = eng_zone_1
type        = zone
in use      = yes
members     = alpha,demo_m1
zone set    = day_cfg
```

Example: zone -add

In the FibreZone database, members symm1_fa_14a and symm_1_FA_3b are added to zone QA_test_zone. The displayed information shows that the new members have been added.

```
% fzone zone -a QA_test_zone symm1_fa14a,symm_1_FA_3b
```

```
id           = 4
name         = QA_test_zone
type        = zone
in use      = yes
members     = mem_16,symm1_fa14a,symm_1_FA_16a,symm_1_FA_3b
zone set    = AutoSymm
```

Example: zone -remove

In the database, symm1_fa14a and symm_1_FA_3b are removed from zone QA_test_zone (at least one member must remain in a zone).

```
% fzone zone -rem QA_test_zone symm1_fa14a,symm_1_FA_3b
```

```
id           = 4
name         = QA_test_zone
type        = zone
in use      = yes
members     = mem_16,symm_1_FA_16a
zone set    = AutoSymm
```

fzone Zone_set

Synopsis

```
fzone Zone_set -list
fzone Zone_set -delete zone_set_name
fzone Zone_set -create [ -name zone_set_name ]
    zone_1,..zone_n
fzone Zone_set -rename old_name new_name
fzone Zone_set -info { zone_set_name | zone_set_id }
fzone Zone_set -add zone_set_name zone_1,..zone_n
fzone Zone_set -remove zone_set_name zone_1,..zone_n
```

Description

This command allows you to manage configurations.

Options

-l[ist]

Displays a list of the zone sets in the database.

-d[ele]te *zone_set_name*

Deletes a zone set entry from the database. You cannot delete a zone set that is in use from the FibreZone database (a zone set is in use if it is assigned to a unit). If the zone set is in use, first assign another zone set to the unit(s) with the **fzone unit -assign** command and then use the **fzone Zone_set -delete** command.

-c[reate] [*-name zone_set_name*] *zone_1,..zone_n*

Creates a zone set entry, assigns a zone set name to that entry, and assigns one or more zones to the zone set membership in the database.

-ren[ame] *old_name new_name*

Changes the name of a zone set in the database.

-i[nfo] { *zone_set_name* | *zone_set_id* }

Displays detailed information about a zone set in the database based on the zone set name or ID.

-a[dd] *zone_set_name zone_1,..zone_n*

Adds one or more zones to a zone set in the database.

-rem[ove] *zone_set_name zone_1,..zone_n*

Removes one or more zones from a zone set in the database.

A zone set must contain at least one zone (you cannot remove all of the zones from a zone set).

fzone Zone_set Examples

This section provides an example of each **fzone Zone_set** command.

Example: Zone_set -list

The FibreZone database displays a listing of all zone sets (alpha_cfg, AutoSymm, and John).

In the following example, the zone set named alpha_cfg has an ID of 1, is not in use (not applied to any units), and thus has no unit IDs associated with it, and contains zones 5 and 1.

```
% fzone Z -l
```

id	name	inuse	units' id	zones' id
1	alpha_cfg	n		5,1
2	AutoSymm	y	3,4,5	2,3,4
3	John	y	1	6

Example: Zone_set -delete

The zone set named alpha_cfg is deleted from the FibreZone database.

```
% fzone Z -d alpha_cfg
```

```
...done;
```

Example: Zone_set -create

In the FibreZone database, a zone set entry named alpha_cfg is created, and zones BackUp_Zone and QA_test_zone are assigned to the zone set. This zone set has not been assigned to any units so it is not in use and the units field is blank.

```
% fzone Z -c -n alpha_cfg BackUp_Zone,QA_test_zone
```

```
id          = 1
name        = alpha_cfg
type        = zone set
in use      = no
zones       = BackUp_Zone,QA_test_zone
units       =
```

Example: Zone_set -rename

In the FibreZone database, the name of zone set *alpha_cfg* is changed to *archive*.

```
% fzone Z -ren alpha_cfg archive
id           = 1
name         = archive
type         = zone set
in use       = no
zones        = BackUp_Zone, QA_test_zone
units        =
```

Example: Zone_set -info

The FibreZone database displays information about zone set *alpha_cfg*.

```
% fzone Z -i alpha_cfg
id           = 1
name         = alpha_cfg
type         = zone set
in use       = no
zones        = BackUp_Zone, QA_test_zone
units        =
```

Example: Zone_set -add

In the FibreZone database, zone *QA_test_zone* is added to zone set *AutoSymm*.

```
% fzone Z -a AutoSymm QA_test_zone
id           = 1
name         = AutoSymm
type         = zone set
in use       = no
zones        = BackUp_Zone, QA_test_zone
units        =
```

Example: Zone_set -remove

In the FibreZone database, zone *QA_test_zone* is removed from zone set *AutoSymm* (at least one zone must remain in a zone set).

```
% fzone Z -rem AutoSymm QA_test_zone
id           = 1
name         = AutoSymm
type         = zone set
in use       = no
zones        = BackUp_Zone
units        =
```

fzone interface

Synopsis

```
fzone i[nterface] -list  
fzone i[nterface] -info { interface_name | interface_id }
```

Description

This command allows you to list the available vendor interfaces and display detailed information about a specific interface.

Options

`-l[ist]`

Displays a listing of all interfaces.

`-i[nfo] { interface_name | interface_id }`

Displays detailed information about a specific interface.

fzone interface Examples

This section provides examples for each **fzone interface** command.

Example: interface -list

The FibreZone database displays a list of all interfaces.

In the following example, the *Brocade* interface has an ID of 1 and is in use on the unit with an ID of 1.

```
% fzone i -l
id      name          inuse    model          units' id
1       Brocade        y        DS-8B,DS-16B,DS-16B2,DP3-SCB,ED12000B,SilkWorm1
2       Mcdata          n        ED-1032,ED-64M,DS-16M,DS-32M,DS-16M2,DS-32M2
3       Qlogic          n        DP3-SCQ,DS-16A,SANbox
```

Example: interface -info

This release of FibreZone has three interface options: *Qlogic*, *Brocade* and *Mcdata* (Appendix A, *FibreZone Connectivity Requirements*, lists supported switches with their required interface). An example of each option is provided in this section.

The following example displays information about the *Qlogic* interface. The interface has an ID of 3 and is use on switches An2 and An3. The output also details the required connectivity format when creating a unit. The *Qlogic* interface requires the native or gateway IP address and the switch WWN.

```
% fzone i -i Qlogic
id          = 3
name        = Qlogic
type        = interface
in use      = yes
version     = 2.00.04
device type = switch
model       = DP3-SCQ,DS-16A,SANbox
conn.data   = ip=<native/gateway switch IP>[wwn=<switch wwn>]
conn.units  = An2, An3
```

The following example displays information about the *Brocade* interface. The interface has an ID of 1 and is in use on units Bro1 and Bro2. The output also details the required connectivity format when creating a unit. The *Brocade* interface requires the unit IP address, user name, and password.

```
% fzone i -i Brocade
id           = 1
name         = Brocade
type         = interface
in use       = yes
version      = 2.00.04
device type  = switch
model        = DS-8B,DS-16B,DS-16B2,DP3-SCB,ED12000B,SilkWorm
conn.data    = ip=<Switch IP Address>,uname=<User Name>,password=<Password>
conn.units   = Bro1,Bro2
```

The following example displays information about the *Mcddata* interface. The interface has an ID of 2, and is in use on unit CTX1. The output also details the required connectivity format when creating a unit. The *Mcddata* interface requires the IP address of the Service Processor and the WWN of the switch.

```
% fzone i -i Mcddata
id           = 2
name         = Mcddata
type         = interface
in use       = yes
version      = 2.00.04
device type  = switch
model        = ED-1032,ED-64M,DS-16M,DS-32M,DS-16M2,DS-32M2
conn.data    = ip=<Service Processor IP Address>,wwn=<Switch WWN>
conn.units   = CTX1
```

fzone unit

Synopsis

```
fzone u[nit] -list
fzone u[nit] -delete unit_name
fzone u[nit] -create [ -name unit_name ] -interface interface_name -o
    connection_data [ -assign zone_set_name ]
fzone u[nit] -create [ -name meta_unit_name ] -meta unit_1,...unit_n
    [ -assign zone_set_name ]
fzone u[nit] -extend meta_unit_name unit_1,...unit_n
fzone u[nit] -shrink meta_unit_name unit_1,...unit_n
fzone u[nit] -rename old_name new_name
fzone u[nit] -info { unit_name | unit_id } [ -online ]
fzone u[nit] -modify unit_name { -interface new_interface_name | -o new_conn.data }
fzone u[nit] -show unit_name [ -extend ]
fzone u[nit] -assign unit_name new_zone_set_name
fzone u[nit] -import unit_name [ -rename ] [ -apply ]
fzone u[nit] -default_zone { on | off } unit_name
```

Description This command allows you to manage the Connectivity Unit table.

Options -l[ist]

Displays a listing of the units in the database.

-del[ete] *unit_name*

Deletes a unit from the database. A unit cannot be deleted if it is in use (part of a meta unit). The unit must first be removed from the meta unit with the **-shrink** option.

-c[reate] [-name *unit_name*] -interface *interface_name*
-o *connection_data* [-assign *zone_set_name*]

Creates a unit (assigns a name, associates an interface, assigns connection data, and assigns a zone set name, if specified).

[-n[ame] *unit_name*]

Assigns a name to a unit. If this option is not used, a default name is assigned to the unit.

-i[nterface] *interface_name*

Assigns an interface (either *Brocade*, *Qlogic*, or *Mcddata*) to a unit.

-o *connection_data*

Assigns connection data to a unit. Use the **interface -info** command to determine the required connection data.

```
[ -assign zone_set_name ]
```

Assigns a zone set to a unit.

```
-c[reate] [ -name meta_unit_name ] -m[eta]  
unit_1,...unit_n [ -assign zone_set_name ]
```

Creates a meta unit (assigns a name to the meta unit, associates an interface with the unit, assigns units, and assigns a zone set name to the entry, if specified).

Units in a meta unit must have the same zoning configuration. If you try to create a meta unit out of units that have different zoning configurations, an error occurs.

```
-m[eta]
```

Used with the **-create** command to create a meta unit (group of units treated as one).

```
-e[xtend] meta_unit_name unit_1,...unit_n
```

Adds units to an existing meta unit.

```
-shr[ink] meta_unit_name unit_1,...unit_n
```

Removes units from an existing meta unit.

A meta unit must contain at least two units.

```
-ren[ame] old_name new_name
```

Renames a unit in the database.

```
-in[fo] { unit_name | unit_id } [ -online ]
```

Displays detailed database information about a unit. Use the **-online** option to display detailed information from the unit (not for meta units, applies to individual units only).

```
-m[odify] unit_name { -interface new_interface_name |  
-o new_conn.data }
```

Modifies a unit entry in the database (not for meta units, applies to individual units only).

You should specify at least one option with this command.

```
-sho[w] unit_name [ -extend ]
```

Displays the current active zoning configuration on the unit. Use the **-extend** option to display a list of all zone sets and zones in the unit's database (not for meta units, applies to individual units only).

The output from this command may display the following message:

```
The zoning configuration for unit <unit_name> is out of sync!!!
```

This means that the zoning configuration on the switch is different from that in the FibreZone database.

Use **fzone unit -import -apply** if you want to change the FibreZone database zoning configuration to be the same as on the switch.

Use **fzone fabric -refresh** if you want to change the switch zoning configuration to be the same as in the FibreZone database.

```
-a[ssign] unit_name new_zone_set_name
```

Assigns a zone set to a unit or meta unit in the database. Zone sets cannot be individually assigned to units that belong to a meta unit.

```
-im[port] unit_name [ -rename ] [ -apply ]
```

Imports the zones and zone sets defined on a unit into the FibreZone database. If the switch and database zones have the same members, the zone and zone set names are not changed in the database.

Use the **-import** command to initially populate the database after creating a unit (not for meta units, applies to individual units only), or to import changes that you made to the switch into the FibreZone database.

Do not use **fzone unit -import** to try to make duplicate copies of the zone set on a switch. Use **fzone Zone_set -create** to create a new zone set with the same zones as the existing zone set in the FibreZone database.

Duplicate objects (objects with different names but identical properties) are not imported more than once into the FibreZone database. If you have duplicate zones (zones with different names

but the same members), or zone sets (zone sets with different names but identical zones) in a switch database, FibreZone will import only one occurrence of the duplicated object.

For example, if zone_1 and zone_2 have the same members, FibreZone imports only one of the zones. If FibreZone imports zone_1, and you want to rename the zone to zone_2 in the FibreZone database, use the **fzone zone -rename zone_1 zone_2** command.

Duplicate zones and zone sets take up space in the FibreZone database and their use is not recommended. However, if you must create a duplicate zone, use the **fzone zone -create -name zone_name member_1...member_n** command or the **fzone Zone_set -create -name zone_set_name zone_1....zone_n** command to duplicate the zone or zone set that was not imported.

Use the **-rename** option to rename zones or zone sets in the database that have identical contents in both the database and on the switch to match the names used by the switch.

Use the **-apply** option to make the zoning configuration in the database the same as the active zone set on the switch. The **-apply** option affects the zoning state (enabled/disabled), the refresh state, the active zone set, and (on a switch using the Mcddata interface) default zoning (on/off).

```
-def[ault_zone] { on | off } unit_name
```

Turns on and off default zoning in the database for a switch (if applicable). Meta units and the units that belong to meta units cannot have default zoning turned on/off. This option applies to individual units only.

Use the **unit -default_zone** command followed by the **fabric -refresh** command to apply the default zoning change to the switch itself.

Default zoning is **Off** in normal FibreZone operation.

fzone unit Examples

This section provides an example of each **fzone unit** command.

Example: unit -list

Display a list of all units in the database. The output displays the FibreZone ID of the unit, the unit's name, whether or not it is part of a meta unit (in use), its type (either standard or meta), the interface, whether zoning is enabled or disabled, and the zone set that is applied to the unit. The list also displays, under the *grouping* heading, the ID of the meta unit that the unit belongs to or a list of the IDs of the units in the meta unit (if applicable). In this example, *meta_test* is a meta unit composed of units *Swh_1* and *Swh_2*.

```
% fzone u -l
```

id	name	inuse	type	interface	zoning	zone-set	grouping
1	unit_1	n	std	Brocade	enabled	AutoSymm	
2	CTX1	n	std	Mcddata	disabled		
3	br	n	std	Brocade	enabled	Cfg_b211_H192	
4	Swh_1	y	std	Mcddata	enabled	test_config	6
5	Swh_2	y	std	Mcddata	enabled	test_config	6
6	meta_test	n	meta		enabled	test_config	4,5

Example: unit -delete

Unit *CTX1* is deleted from the FibreZone database.

```
% fzone u -d CTX1
...done
```

Example: unit -create (for a unit using the *Brocade* interface)

In the FibreZone database, a unit named *unit_1* is created. Note that in this example, the unit is assigned to the *AutoSymm* zone set.

```
% fzone u -c -n unit_1 -i Brocade -o
  ip=172.23.203.251,uname=admin,password=password -a AutoSymm
```

id	= 1
name	= unit_1
type	= unit
in use	= no
unit type	= std
zone set	= AutoSymm
zoning	= disabled
refreshed	= no
member of	=
interface	= Brocade
conn. data	= ip=172.23.203.251,uname=admin,password=*****

Example: unit -create (for a unit using the Qlogic interface)

In the FibreZone database, a unit named Ancor1 is created. Note that in this example, the unit is assigned to the AutoSymm zone set.

```
% fzone u -c -n Ancor -i Qlogic -o ip=172.23.203.249 -a AutoSymm
id                = 3
name              = Ancor1
type              = unit
in use            = no
unit type         = std
zone set          = AutoSymm
zoning            = disabled
refreshed         = no
member of         =
interface         = Qlogic
conn. data        = ip=172.23.203.249
```

Example: unit -create (for a unit using the Mcddata interface)

In the FibreZone database, a unit named CTX1 is created. Note that in this example, the unit is assigned to the AutoSymm zone set.

```
% fzone u -c -n CTX1 -i Mcddata -o ip=172.23.203.42,wwn=10:00:08:00:88:40:00:43
-a AutoSymm
id                = 2
name              = CTX1
type              = unit
in use            = no
unit type         = std
zone set          = AutoSymm
zoning            = disabled
refreshed         = no
default zone      = OFF
member of         =
interface         = Mcddata
conn. data        = ip=172.23.203.42,wwn=10:00:08:00:88:40:00:43
```

Example: unit -create (for a meta unit)

In the FibreZone database, a meta unit named BkUp_Meta is created. The meta unit consists of the switches unit_1 and CTX1. The units are assigned to the AutoSymm zone set.

```
% fzone u -c -n BkUp_Meta -meta unit_1,CTX1 -assign AutoSymm
id                = 3
name              = BkUp_Meta
type              = unit
in use            = no
unit type         = meta
zone set          = AutoSymm
zoning            = disabled
refreshed         = no
group list        = unit_1,CTX1
```

Example: unit -rename

Unit (CTX1) is renamed to BkUp1 in the FibreZone database.

```
% fzone u -r CTX1 BkUp1
id           = 2
name         = BkUp1
type         = unit
in use       = yes
unit type    = std
zone set     = AutoSymm
zoning       = disabled
refreshed    = no
default zone = OFF
member of    = BkUp_Meta
interface    = Mcddata
conn. data   = ip=172.23.203.42,wwn=10:00:08:00:88:40:00:43
```

Example: unit -info (for a unit using the Qlogic interface)

This example displays information from the switch itself (using the **-online** option) about a unit named An120. Note that the switch limitations displayed at the end of the output are different for units using the *Qlogic*, *Mcddata* or *Brocade* interfaces.

In this example, the ID of the switch named An120 is 5. The fabric consists of three switches as shown in the *fabric members* and *topology* tables.

```
% fzone unit -info ancor120 -online
id           = 5
name         = An120
type         = unit
in use       = no
unit type    = std
zone set     = new_zone
zoning       = enabled
refreshed    = yes (Tue Oct 30 15:55:39 2001)
default zone = OFF
member of    =
interface    = Qlogic
conn. data   = ip=172.23.154.120
```

unit online info:

```
Model       : SANbox 16H, SwRev 01.06.01, FwRev E40123, HwRev 0E06 125040E
Unit WWN    : 10:00:00:c0:dd:00:88:bb
```

Fabric members:

DOMAIN	WWN	ROLE	IP	NAME
17	10:00:00:c0:dd:00:88:43	SUBORDINATE	172.23.154.122	

```

18      | 10:00:00:c0:dd:00:88:bb | SUBORDINATE | 172.23.154.120 |
19      | 10:00:00:c0:dd:00:86:7d | PRINCIPAL   | 172.23.154.121 |
-----

```

```
Topology      :
```

```

-----
UNIT PORT | ATTACHED NODE(S)
-----
# TYPE   | FC-ID   | WWN           | WWNN
-----
4  E     | 130b00  | 20:0b:00:c0:dd:00:86:7d | 10:00:00:c0:dd:00:86:7d
-----

```

```
Misc.        :
```

```
limitation.   :
```

```

    MaxNumMembersInZone = 2000
    MaxNumMembersInZoneset = 2000
    MaxNumZones = 256
    MaxNumZonesets = 4
    MaxNumZonesInZoneset = 256
    MaxZoneNameLength = 64
    MaxZonesetNameLength = 64
    ValidNameFirstCharacter =
    abcdefghijklmnopqrstuvwxyzABCDEFGHIJKLMNOPQRSTUVWXYZ0123456789^_~
    ValidNameOtherCharacters =
    abcdefghijklmnopqrstuvwxyzABCDEFGHIJKLMNOPQRSTUVWXYZ0123456789^_~

```

Example: unit -info (for a unit using the *Brocade* interface)

This example displays information from the switch itself (using the **-online** option) about a unit named `unit_1`. Note that the switch limitations displayed at the end of the output are different for units using the *Mcddata* or *Qlogic* interfaces.

In this example, the ID of the switch named `unit_1` is 1, and it is in use in a meta unit named `BkUp_Meta`. The fabric consists of two switches `E_Ported` together as shown in the *fabric members* and *topology* tables.

```

% fzone unit -info unit_1 -online
id           = 1
name         = unit_1
type         = unit
in use       = yes
unit type    = std
zone set     = AutoSymm
zoning       = enabled
refreshed    = yes
default zone = OFF
member of    = BkUp_Meta
interface    = Brocade
conn. data   = ip=172.23.203.251,uname=admin,password=*****

unit online info:
  Model      : SilkWorm 2800, Type 6.1, Fw a2.3a

```

Unit WWN : 10:00:00:60:69:00:08:fb
Fabric members:

DOMAIN	WWN	ROLE	IP	NAME
1	10:00:00:60:69:00:08:fb	PRINCIPAL	172.23.203.251	Lab_1
2	10:00:00:60:69:00:08:95	SUBORDINATE	172.23.203.250	Test_2

Topology :

UNIT PORT		ATTACHED NODE(S)		
#	TYPE	FC-ID	WWN	WWNN
1	F	068213	50:06:04:82:BC:61:2F:CE	50:06:04:82:BC:61:2F:CF
2	F	068313	50:06:04:82:BC:61:2F:DE	50:06:04:82:BC:61:2F:DF
5	F	068413	10:00:00:E0:69:81:05:B6	20:00:00:E0:69:81:05:B6
6	F	068513	10:00:00:E0:69:C0:01:EE	20:00:00:E0:69:C0:01:EE
0	E			10:00:00:60:69:00:08:95

Misc.limitations :

```
MaxZoneNameLength = 65
MaxZonesetNamelength = 65
ValidNameFirstCharacter =
abcdefghijklmnopqrstuvwxyzABCDEFGHIJKLMNOPQRSTUVWXYZ
ValidNameOtherCharacters =
0123456789abcdefghijklmnopqrstuvwxyzABCDEFGHIJKLMNOPQRSTUVWXYZ^_-$
Zone Set Name = different from its zone names
```

Example: unit -info (for a unit using the *Mcddata* interface)

This example displays information from the switch itself (using the **-online** option) about connectivity unit CTX1. Note that the switch limitations displayed at the end of the output are different for units using the *Brocade* or *Qlogic* interfaces and that Connectrix™ versions have different limitations as well.

```
% fzone unit -info CTX1 -online
```

```
id           = 2
name         = CTX1
type         = unit
in use       = yes
unit type    = std
zone set     = AutoSymm
zoning       = enabled
refreshed    = no
default zone = OFF
member of    = BkUp_Meta
interface    = Mcddata
conn.data    = ip=172.23.203.42,wwn=10:00:08:00:88:40:00:43
```

```
unit online info:
```

```
Model       : ED-1032, fw 03.02.00, sw ECM 5.xx bridge 2.00.01
Unit WWN    : 10:00:08:00:88:40:00:43
```

```
Fabric members:
```

DOMAIN	WWN	ROLE	IP	NAME
1	10:00:08:00:88:40:00:43	PRINCIPAL		
2	10:00:08:00:88:40:30:FA	SUBORDINATE		

```
Topology :
```

UNIT PORT		ATTACHED NODE(S)		
#	TYPE	FC-ID	WWN	WWNN
1	F	210113	50:06:04:82:C0:31:7A:12	50:06:04:82:C0:31:7A:13
4	F	210213	50:06:04:80:00:04:F1:DC	50:06:04:80:00:04:F1:DE
5	F	210313	10:00:00:00:C9:21:83:A4	20:00:00:00:C9:21:83:A4
11	F	210413	10:00:00:00:C9:20:D8:62	20:00:00:00:C9:20:D8:62
15	F	210513	50:06:04:82:BC:61:2E:9D	50:06:04:82:BC:61:2E:9E
20	F	210613	50:06:04:82:BC:61:2E:8D	50:06:04:82:BC:61:2E:8E
24	F	210713	20:00:00:E0:69:40:04:41	20:00:00:E0:69:40:04:41
23	E			10:00:08:00:88:40:30:FA

```
Misc. :
```

```
Number of units controlled by the Service Processor = 2:
UnitWWN = 10:00:08:00:88:40:00:43
UnitWWN = 10:00:08:00:88:40:30:FA
```

```
limitation. :
```

```
MaxNumMembersInZone = 4096
MaxNumMembersInZoneSet = 4096
MaxNumZones = 2000
MaxNumZonesets = 64
MaxNumZonesInZoneSet = 1023
MaxZoneNameLength = 64
MaxZonesetNameLength = 64
```

```

ValidNameFirstCharacter =
0123456789abcdefghijklmnopqrstuvwxyzABCDEFGHIJKLMNOPQRSTUVWXYZ^_-$
ValidNameOtherCharacters =
0123456789abcdefghijklmnopqrstuvwxyzABCDEFGHIJKLMNOPQRSTUVWXYZ^_-$
Zone Set Name = different from its zone names
Zone/Zone Set Name CaseSensitive = no

```

Example: unit -modify

This example modifies a unit named *unit_1* to change the connection data information stored in the database. In this example, the IP address of the switch was changed during a network reconfiguration. Now the connection data must be modified so that FibreZone has the correct IP address in its database.

```

% fzone u -m unit_1 -o ip=172.23.203.49,uname=admin,password=password
id                = 1
name              = unit_1
type              = unit
in use            = yes
unit type         = std
zone set          = AutoSymm
zoning            = enabled
refreshed         = no
member of         = BkUp_Meta
interface         = Brocade
conn. data        = ip=172.23.203.49,uname=admin,password=*****

```

Example: unit -show

This example shows the current zoning configuration and active zone set for unit lol11052. This command shows information from the unit, not from the database. Use the **-extend** option to display a list of all active and non-active zone sets and zones in the unit's database.

In this example, the zoning configuration is *out of sync* meaning that the zoning configuration on the switch is different from that on the FibreZone database.

Use **fzone unit -import -apply** if you want to change the FibreZone database zoning configuration to be the same as on the switch.

Use **fzone fabric -refresh** if you want to change the switch zoning configuration to be the same as in the FibreZone database.

```
% fzone u -sho lol1052
```

The zoning configuration for unit lol1052 is out of sync!!!

Active Zoning configuration for unit lol1052

```
Default zone      : off
Zoning           : enabled
Active zone set   : AutoConfig
Active zones      : Symm1_FA14b, jack, Symm1_FA15b
```

```
    zone: Symm1_FA14b
        member: 50:06:04:82:bc:61:2f:dd
        member: 20:00:00:e0:69:80:03:86
```

```
    zone: jack
        member: 20:00:00:e0:69:80:03:b9
        member: 50:06:04:82:bc:61:2f:cf
```

```
    zone: Symm1_FA15b
        member: 50:06:04:82:bc:61:2f:de
        member: 20:00:00:e0:69:80:03:86
```

Example: unit -assign

This example assigns the zone set named AutoSymm to the meta unit BkUp_Meta (which consists of units CTX1 and Unit_1) in the database.

You cannot assign a zone set to the individual units of a meta unit. You assign the zone set to the meta unit to which the units belong.

```
% fzone u -a BkUp_Meta AutoSymm
```

```
id           = 2
name         = BkUp_Meta
type         = unit
in use       = no
unit type    = meta
zone set     = AutoSymm
zoning       = enabled
refreshed    = no
default zone = OFF
group list   = CTX1,Unit_1
```

Example: unit -import

This example imports the zoning database from unit_1 to the FibreZone database. Use the **-import** option to populate a database after creating a unit.

Do not use **fzone unit -import** to try to make duplicate copies of the zone set on a switch. Use **fzone Zone_set -create** to create a new zone set with the same zones as the existing zone set in the FibreZone database.

```
% fzone u -im unit_1
id           = 1
name         = Sun_Zone
type         = zone
in use       = yes
members      = Sun_1, FA16A
zone set     = config_1

id           = 2
name         = Test_Zone
type         = zone
in use       = yes
members      = Test_Server, FA16B
zone set     = config_1

id           = 3
name         = BkUp_Zone
type         = zone
in use       = yes
members      = BU_Server, FA15A
zone set     = config_1

id           = 4
name         = NFS_Zone
type         = zone
in use       = yes
members      = NFS_Server, FA15B
zone set     = config_1

id           = 1
name         = AutoSymm
type         = zone set
in use       = yes
zones        = Sun_Zone, Test_Zone, BkUp_Zone, NFS_Zone
units        = unit_1

id           = 2
name         = Test_Config
type         = zone set
in use       = no
zones        = Test_Zone, BkUp_Zone, NFS_Zone
units        = unit_1, CTX1
```

fzone fabric

Synopsis

```
fzone f[abric] -enable { ALL | unit_1,..unit_n } [ -purge ]
fzone f[abric] -disable { ALL | unit_1,..unit_n }
fzone f[abric] -refresh { ALL [ -force ] | unit_1,..unit_n } [ -purge ]
```

Description

This command allows you to enable or disable zoning on units or to refresh the configuration on a unit from the FibreZone database.

In a fabric with multiple units, it is possible to have zoning inconsistencies (some units may be enabled and others may be disabled for example). FibreZone allows you to apply a fabric command to an inconsistent fabric. The fabric commands are sent to one unit in the fabric and propagated through the fabric to the other switches in the fabric automatically.

For example if you apply a **fabric -enable** command to a fabric with some units disabled, the command is applied to one switch and then automatically propagated through the fabric to the other switches, ensuring that all switches in the fabric are enabled.

Under some conditions, you may need to purge non-active zone and zone set information from the unit during **fabric -enable** and **fabric -refresh** commands. For example, if a switch reaches the limit of allowable zones in its database, or if the switch is out of memory, and you attempt a fabric command, the command fails and an error is generated (see Appendix B, *FibreZone Error Codes*). You can then retry the command using the **-purge** option to remove the non-active zones and zone set information.

Options

```
-e[nable] { ALL | unit_1,..unit_n } [ -purge ]
```

Enables zoning on individual units or meta units. Units that belong to a meta unit are enabled through the meta unit.

The **ALL** option enables zoning for all units that are disabled.

```
-d[isable] { ALL | unit_1,..unit_n }
```

Disables zoning on individual units or meta units. Units that belong to a meta unit are disabled through the meta unit.

The **ALL** option disables zoning for all units that are enabled.

```
-r[efresh] { ALL [ -force ] | unit_1,..unit_n } [-purge]
```

Applies the zoning configuration from the FibreZone database to individual units or meta units. Units that belong to a meta unit are refreshed through the meta unit.

The **ALL** option refreshes zoning for all units that are not currently refreshed.

The **-force** option refreshes all units.

fzone fabric Examples

This section provides an example of each **fzone fabric** command.

Example: fabric -enable

This example enables zoning on all units (in this example there are only two, lol1051 and lol1052).

```
% fzone f -e ALL
id           = 1
name         = lol1052
type         = conn.unit
in use       = yes
class        = switch
conn.data    = ip=172.23.203.45,uname=admin,password=*****
interface    = Brocade
refreshed    = yes
zoning       = enabled
zone set     = AutoSymm

id           = 2
name         = lol1051
type         = conn.unit
in use       = yes
class        = switch
conn.data    = ip=172.23.203.46,uname=admin,password=*****
interface    = Brocade
refreshed    = yes
zoning       = enabled
zone set     = AutoSymm
```

Example: fabric -disable

This example disables zoning for all units (in this example there are only two units, lol1051 and lol1052).

```
% fzone f -d ALL
id           = 1
name         = lol1052
type         = conn.unit
in use       = no
class        = switch
conn.data    = ip=172.23.203.45,uname=admin,password=*****
interface    = Brocade
refreshed    = yes
zoning       = disabled
zone set     = AutoSymm

id           = 2
name         = lol1051
```

```
type           = conn.unit
in use         = no
class          = switch
conn.data      = ip=172.23.203.46,uname=admin,password=*****
interface      = Brocade
refreshed      = yes
zoning         = disabled
zone set       = AutoSymm
```

Example: fabric -refresh

This example refreshes zoning for unit lol1052.

```
% fzone f -r lol1052
id           = 1
name         = lol1052
type         = conn.unit
in use       = yes
class        = switch
conn.data    = ip=172.23.203.45,uname=admin,password=*****
interface    = Brocade
refreshed    = yes
zoning       = enabled
zone set     = AutoSymm
```

fzone admin

Synopsis

```
fzone a[dmin] -backup destination
fzone a[dmin] -restore source
fzone a[dmin] -clear_database backup_file
```

Description This command allows you to back up the FibreZone database, to restore the database from a previously backed up version, or to clear the database (except for the vendor interface data).

Options

```
-b[ackup] destination
    Allows you to back up the entire database.

-r[estore] source
    Restore a database from a previously backed up version.

-c[lear_database] backup_file
    Backup the FibreZone database to the backup_file location and
    then clear the database (except for the vendor interface data).
```

FibreZone backs up the database to the specified location before it is cleared.



CAUTION

The *fzone admin -restore* command is not cross-platform compatible. The database backup should only be restored to the same type of platform that it was backed up on.

fzone admin Examples

Example: admin -backup

This example backs up the FibreZone database to the file /emc/slamont/my_backup.

```
% fzone a -b /emc/slamont/my_backup  
...done;
```

Example: admin -restore

This example restores the FibreZone database from the previously backed up version.

```
% fzone a -r /emc/slamont/my_backup  
...done;
```

Example: admin -clear_database

This example backs up the FibreZone database to /emc/slamont/my_backup and then clears the FibreZone database (except for the vendor interface data).

```
% fzone a -c /emc/slamont/my_backup  
...done;
```

fzone version

Synopsis `fzone v[ersion]`

Description This command allows you to determine the version of FibreZone you are currently using.

Example: *version*

This example determines the FibreZone software version.

```
% fzone v  
EMC FibreZone version 2.00.04
```

FibreZone Connectivity Requirements

This appendix lists the connectivity requirements for FibreZone.

The release notes included with this product provide the most up-to-date interface and connectivity requirements for switches.

FibreZone assigns connection data to each unit in the fabric so the Control Station host can communicate with each unit through the customer's network. Connection data is vendor- and unit-specific.

This table details the connection requirements for each vendor interface.

The Brocade, McDATA, and QLogic vendor interface names are entered with only the initial letter capitalized (for example, **B**rocade, **M**cdata and **Q**logic) in the FibreZone CLI.

Table A-1 Connectivity Requirements

Vendor Interface	Connection Data Requirements
Mcdata	IP address and WWN
Qlogic	- Native IP address or - Gateway IP address and WWN
Brocade	IP address, user name, and password

FibreZone Error Codes

Table B-1 describes the FibreZone error codes.

Table B-1 FibreZone Error Codes

Return Value	Error Message	Possible Solutions
-2	Unable to acquire lock(s), try again later.	1. Run FibreZone from the same account that you installed it in. You should install and run FibreZone from root (UNIX) or administrator (Windows NT). 2. Allow other FibreZone processes to finish, then try again. 3. Manually remove all files in the %FZ_ROOT%\db\lock directory.
-3	Invalid Name: The name entered does not meet FibreZone's naming rules.	The name must meet the following conditions: - not more than 255 characters - no spaces, semicolons (;), or colons (:) - name cannot contain only decimal digits
-4	An invalid WWN format was specified.	Make sure that the WWN format is either 8 hex digits separated by colons (:) or 8 hex digits with no colons. For example: 10:00:08:00:88:40:D0:43 or 100008008840D043.
-5	No such object.	Check that you entered the correct object ID, name, or WWN.
-6	Name already exists in the Fibre Zone database. Try entering a new name.	You tried to name a zone, zone set, or unit to a name that already exists for the object type. Try a new name.
-7	Item is currently in use.	If you want to delete the object, remove member from zone, zone from zoneset, or unit from meta unit before deleting it.

Table B-1 FibreZone Error Codes (continued)

Return Value	Error Message	Possible Solutions
-8	Member(s) already in use.	The name is already used, use a unique member name to add or create a member.
-9	Object(s) not found.	Create this member or check the database for the correct name.
-10	Object(s) not in use.	This member is not in use, you don't need to try to remove it from the zone.
-11	Attempting to remove too many objects.	Leave at least one member in a zone, at least one zone in a zone set, or at least two units in a meta unit.
-12	Unable to load interface.	Repeat the command, and if you still receive the same error message, you need to re-install FibreZone.
-13	Unable to establish connection.	Check that the IP address is correct. For Brocade Switch: (1) Check that you entered correct user name and/or password. (2) For firmware 2.6 and 4.x, the default passwords must be changed before using FibreZone. For McDATA Switch: (1) Check that FibreZoneBridge is running on the Connectrix Service Processor. (2) Check that you entered correct WWN.
-14	Format error.	API error code. Contact Customer Service.
-15	Unit is unreachable.	FibreZone cannot "ping" the unit. Check your network connections.
-16	Interface does not exist.	You tried to assign an interface that does not exist to a unit. Enter the correct interface name (Mcddata, Brocade, or Qlogic).
-17	Zone set does not exist.	You tried to assign a zone set that does not exist to a unit. Enter the correct zone set name. Use fzone Zone_set -list to list your zone sets.
-18	Invalid unit type.	You assigned an invalid optional member type. Use fzone member -types-list for a list of the member types.
-19	Unit error.	Unit was unable to carry out a command and returned an error message (if applicable). Contact Customer Service.
-20	Unexpected unit result.	The results are inconsistent from the unit. For example, <i>enable zoneset</i> returns success while immediately a <i>get active zoneset</i> command returns "no active zoneset." Repeat the operation.
-21	Resource temporarily unavailable.	Repeat the operation.
-22	Unable to load database.	Repeat the operation.

Table B-1 FibreZone Error Codes (continued)

Return Value	Error Message	Possible Solutions
-23	Unit is already enabled.	Zoning is already enabled in the FibreZone database for this unit. If the unit is out of synchronization with the FibreZone database or if you want to enable zoning on the switch itself, use fabric -refresh .
-24	Unit is already disabled.	Zoning is already disabled in the FibreZone database for this unit. If the unit is out of synchronization with the FibreZone database or if you want to disable zoning on the switch itself, use fabric -refresh .
-25	Unit execute error.	Contact Customer Service.
-26	No available unit for the operation.	No action is necessary, all of the units associated with this command have already been enabled, disabled, or refreshed.
-27	Wrong conn. data usage.	Use the fzone interface -info command to get the correct conn. data usage.
-29	FZ_ROOT is not defined.	The FZ_ROOT environment variable may be incorrectly set. For UNIX run . /setup.profile for shell or kshell or source /setup.cshrc for cshell or tcshell from the FibreZone directory. For Windows NT open a DOS shell and run install_dir\SetEnv.bat . For example if FibreZone was installed into the default directory, the command is "C:\Program Files\EMC\FibreZone\SetEnv.bat".
-30	Result buffer overrun.	The zoning information is too large so that the buffer is overflow. Try to import active zoning only.
-31	Illegal Zone.	You are trying to activate/refresh a zone onto a unit which contains invalid characters in its name.
-32	Illegal Zone Set.	You are trying to activate/refresh a zone set onto a unit which contains invalid characters in its name.
-33	Duplicate connection data.	Duplicate data exists in the FibreZone database (WWN, IP Address).
-34	Invalid default zone value.	API error code. Contact Customer Service.
-35	Default zone not supported.	The default zone On/Off command is only supported on Connectrix switches. Do not apply this command to other vendor's switches.
-36	Value is already set.	No action is necessary. You are trying to set a value to the same value ("on" to "on" for example).
-37	Not enough group members.	Make sure that you have at least the following minimum group members: 1 member in a zone 2 units in a meta unit 1 zone in a zone set

Table B-1 FibreZone Error Codes (continued)

Return Value	Error Message	Possible Solutions
-38	Unit does not have an assigned zone set.	You tried to activate zoning on fabric which does not have an assigned zone set.
-39	Unable to import active config.	Unable to import active config from the unit.
-40	Cannot do Import/Show on an empty zone set.	No action is necessary. There were no zones in the zone set on the unit so it was not imported.
-41	Cannot do Import/Show on an empty zone.	No action is necessary. Zones with no members were not imported.
-42	Unit test failure on unit.	When this error occurs, all zoning commands fail. The possible reason is that the switch firmware does not support zoning.
-43	Inconsistent (assigned) zoning configuration for units in fabric.	You tried to do a Refresh/Enable zoning with one of the following: (1)Assigned zone set is different for units in the fabric, (2)default zone status is different for units in the fabric or (3)zoning enable/disable is inconsistent. Assign zone set again to the fabric, import active zone set, or enable fabric command.
-44	Unit doesn't exist in the database.	You attempted to extend or shrink a meta unit with a unit that doesn't exist in the database. Create the unit or check the database for the correct unit.
-45	Illegal operation for unit.	Some unit commands, such as fzone unit -info -online and fzone unit -show , are not allowed on meta units; you must apply them directly to the unit. Apply fabric commands to the meta unit and not to the individual units.
-46	Invalid result buffer.	Repeat the operation.
-47	Database Commit failed.	Exit the application and repeat the operation.
-48	Unable to save Transaction.	Manually remove all files under %FZ_ROOT%\db\tmp directory.
-49	Fibre Zone database has become stale.	You may have attempted to use the CLI and ControlCenter GUI at the same time. Redoing the operation may solve this problem
-50	Not encode-able.	Contact Customer Service.
-51	Backup file is bad. Can not restore.	The specified backup file is not a valid file. Either the backup file is corrupted or the database backup version is not compatible.
-53	Can not backup an empty database.	FibreZone is unable to backup an empty database. If database is not empty, Contact Customer Service.
-54	DB files or DB backup files are corrupted	Repeat the operation may solved the problem, otherwise call Customer Service.
-55	Version mismatch.	Contact Customer Service.

Table B-1 FibreZone Error Codes (continued)

Return Value	Error Message	Possible Solutions
-56	Invalid port member format.	Make sure the port member format is DomainID:Port member, for example, 2:12.
-57	Too many zones/zonesets on switch, need purge.	Repeat the operation using the -purge option.
-58	Too many zones in zoneset.	Remove some zones from zoneset.
-59	Too many members in zone.	Remove some members from zone.
-60	Illegal zone/zoneset name.	The zone/zoneset name is illegal for the switch. Please refer to the switch limitations to find out the legal name for the switch. A common error is a name starting with a <i>digit</i> such as 7_config. Some switch firmware versions do not support hyphens; a name such as zone-7 may be illegal on these switches.
-61	Duplicate zone/zoneset name.	Error occurs on enable/refresh fabric command. There are two cases: Case one — a zoneset has the same name as one of its zones. For example, a zoneset named “my_zoning” contains a zone named “my_zoning”. This kind of name is illegal for McDATA and Brocade switches. Case two — the zoneset (zone) name is the same as one of the zone (zoneset) names on the switch. For example, the user tries to enable a zoneset named “my_zoning”, but there is an inactive zone named “my_zoning” on the switch. In both of the cases listed above, the user needs to change the zoneset/zone name.
-62	Switches may contain non-standard zoning, cannot retrieve zoning information.	FibreZone only supports WWN zoning and port zoning. If this error is shown, there may be other zoning on the switch. For example, a Brocade switch may have quick-loop zoning or a QLogic switch may have FC-ID zoning. Remove these kinds of zoning on the switch.
-63	Zoning is not manageable through this switch.	Cannot change zoning information of a inter-operability fabric through a Brocade switch. Try the McDATA switch.
-64	No zoning license on the switch.	Purchase the zoning license from switch vendor.
-65	Zoning is not supported.	The common cause for this error is when a user tries to enable/refresh port zoning on an inter-operability fabric. Only WWN zoning can apply on this kind of fabric. A rare case is that the switch firmware does not support zoning.
-66	Incompatible bridge version.	Upgrade the FibreZoneBridge on the Connectrix Service Processor.
-67	Switch is engaged.	This error only occurs on Brocade switch. Another user is logged into the switch.

This glossary contains terms related to Fibre Channel fabric technology and EMC software and hardware. Many of these terms are used in this manual.

A

Active Domain ID The domain ID actively being used by a switch. It is assigned to a switch by the principal switch.

Adapter A card that provides the physical interface between the director and disk devices (SCSI adapter), director and serial channels (Serial adapter), or director and Fibre Channels (Fibre Channel adapter).

Alias A name representing one or more port numbers or World-Wide Names.

C

CLI Command line interface.

D

Device A uniquely addressable part of the Symmetrix subsystem that consists of a set of access arms, the associated disk surfaces, and the electronic circuitry required to locate, read, and write data. See also *Volume*.

Device Address The hexadecimal value that uniquely defines a physical I/O device on a channel path. A SCSI address consists of a target ID and a logical unit number (LUN).

Device Number The value that logically identifies a disk device in a string.

DNS *See* Domain Name Service Name.

Domain ID A number (1 to 255) that uniquely identifies a switch in a fabric. A distinct domain ID is allocated to each switch in the fabric by the principal switch.

Domain Name Service Name Host or node name for a system that is translated to an IP address through a name server. All DNS names have a hostname component and, if fully qualified, a domain component, such as *host1.abcd.com*. In this example, *host1* is the hostname.

E

E_Port Expansion Port, a physical interface within the Fibre Channel switch that attaches to another E_Port on a Fibre Channel switch through an interswitch link.

Expansion Port A physical interface that attaches to another E_Port on a Fibre Channel switch through an interswitch link to form a multi-switch fabric.

F

FA The Fibre Channel Director/Interface Adapter combination in the Symmetrix subsystem.

Fabric Any interconnect between two or more N_Ports, including point-to-point, loop, and Switched Fabric. Specific to Fibre Channel, a Fabric is one or more switching devices that interconnect Fibre Channel N_Ports and route Fibre Channel frames based on destination IDs in the frame headers. *See also Fibre Channel Switch.*

Fabric Port Physical interface within the fabric which attaches to an N_Port through a point-to-point full duplex link connection.

Failover The process of detecting a failure on an active ED-1032 field replaceable unit (FRU) and the automatic transition of functions to a backup FRU.

FC-SW	The Fibre Channel Fabric standard.
Fibre	A general term used to cover all physical media types supported by the Fibre Channel specification, such as optical fiber, twisted pair, and coaxial cable.
Fibre Channel	The general name of an integrated set of ANSI standards that define new protocols for flexible information transfer. Logically, Fibre Channel is a high-performance serial data channel.
Fibre Channel Director	The component in the Symmetrix subsystem that interfaces between the host Fibre Channel interface and data storage. This component transfers data between the channel and cache.
Fibre Channel Switch	Fibre Channel Switch topology, or Fabric, allows dynamic interconnections between nodes through ports connected to the fabric. A Fibre Channel switch creates a Fibre Channel Fabric (FC-SW), while a hub provides an interconnect mechanism in an arbitrated loop (FC-AL).
Fiber Optics	The branch of optical technology concerned with the transmission of radiant power through fibers made of transparent materials such as glass, fused silica, and plastic. Either a single discrete fiber or a non spatially aligned fiber bundle can be used for each information channel. Such fibers are often called optical fibers to differentiate them from fibers used in non-communication applications.
Firmware	The program code (embedded software) that resides and executes on a connectivity device, such as the ED-1032 Director, a Symmetrix Fibre Channel Director, or a host bus adapter (HBA).
F_Port	Fabric Port, a physical interface within the fabric. An F_Port attaches to an N_Port through a point-to-point full-duplex link connection.
Frame	The smallest indivisible packet of data that is sent on a link.
Frame Header	Control information placed before data when encapsulating data for network transmission.
G	
Gigabyte (GB)	10^9 (1,073,741,824) bytes.

H

HBA *See Host Bus Adapter.*

Host Bus Adapter A card in the host device that provides a connection to a Fibre Channel fabric.

I

Identifier (ID) A sequence of bits or characters that identifies a program, device, controller, or system.

Internet Protocol *See IP.*

Interswitch Link *See ISL.*

IP Internet Protocol, the TCP/IP standard protocol that defines the datagram as the unit of information passed across an internet and provides the basis for connectionless, best-effort packet delivery service.

IP Address A unique string of numbers that identifies a device on a network. The address consists of four groups (quadrants) of numbers delimited by periods. (This is called *dotted-decimal* notation.) All resources on the network must have an IP address. A valid IP address is in the form *nnn.nnn.nnn.nnn*, where each *nnn* is a decimal in the range 0 to 255.

I/O Device An addressable input/output unit, such as a disk device.

ISL A physical E_Port connection between two switches in a fabric.

K

Kilobyte (KB) 1,024 bytes.

L

Logical Volume A user-addressable unit of storage. In the Symmetrix subsystem, you can define multiple logical volumes on a single physical disk device.

LUN Logical unit number.

M

Megabyte (MB) 10^6 (1,048,576) bytes.

Member See *Zone Member*.

Multiswitch Fabric Fibre Channel fabric created by linking more than one switch or director together to allow communication. *Also see* ISL.

Multiswitch Linking Port-to-port connections between two switches.

N

Name Server The program facility that allows the N_Ports to register and discover Fibre Channel attributes.

Network Address A name or address that identifies a managed product, such as the switch, on a TCP/IP network. The network address can be either an IP address in dotted decimal notation, or a domain name service (DNS) name as administered on a customer network. All DNS names have a host name component and (if fully qualified) a domain component, such as *host1.emc.com*. In this example, *host1* is the host name and *mcddata.com* is the domain component.

Nickname See *Alias*.

Node The point at which one or more functional units connect to the network.

N_Port Node Port, a physical interface within an end device (node) which can attach to an F_Port or directly to another N_Port through a point-to-point link connection.

S

Solutions Enabler (SYMCLI) A specialized set of commands used in command line entries or scripts to monitor and perform control operations on devices and data objects.

SYMCLI Device Masking A subset of Solutions Enabler commands that enable you to control host HBA access to specified Symmetrix devices.

U

Unit Address The hexadecimal value that uniquely defines a physical I/O device on a channel path in an MVS™ environment. See also *Device Address*.

V

VCMDB See *Volume Logix database*.

Volume A general term referring to a storage device. In the Symmetrix subsystem, a volume corresponds to single disk device visible to the host.

Volume Logix Database A Symmetrix device used as a database that stores access control information.

W

WWN World Wide Name uniquely identifying a connection to the Fibre Channel environment. A 64-bit value expressed as a sequence of eight hexadecimal values separated by periods.

Z

Zone A collection of zone members. Zone members in a zone are made aware of each other, but not made aware of devices outside the zone.

Zone Member A device to be included in a zone. A member may be specified by: a port on a switch (by Domain_ID and port number), or the device's address identifier (WWN).

Zone Name The name assigned to a zone.

Zone Set One or more zones that are activated or deactivated as a group.

Zoning A feature that allows grouping of devices in switched fabric environments by such characteristics as function and location. Devices in the same zone can communicate with each other, but devices in different zones cannot.

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