



Brocade® Zoning

User's Guide

Version 2.6

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Preface

About this Guide

This guide provides information and instructions for using the Brocade Zoning feature that is available with the SilkWorm 2000 series of switches. Brocade Zoning is supported by the Brocade Fabric Operating System, version 2.6. It is an optionally licensed product, and requires a valid license key to function.

The information in this guide is organized as follows:

Preface	Information about related publications and how to get help and software updates.
Chapter 1	An overview of Brocade Zoning.
Chapter 2	Instructions for installing the Brocade Zoning license key.
Chapter 3	Information about using and managing Brocade Zoning.
Chapter 4	Information about using Brocade Zoning with QuickLoop.
Appendix A	Brocade Zoning Sample Configurations.
Appendix B	Brocade Zoning Telnet commands.
Glossary	Glossary of commonly used terms.

Related Publications

Related product information can be found in the following Brocade publications:

- Brocade Fabric OS Reference
- Brocade Fabric Watch User's Guide
- Brocade Web Tools User's Guide
- Brocade Distributed Fabrics User's Guide
- Brocade QuickLoop User's Guide
- Brocade Zoning User's Guide
- Brocade Security User's Guide
- Brocade SES User's Guide
- SilkWorm 6400 Product Guide
- SilkWorm 2800 Hardware Reference
- SilkWorm 2400 Hardware Reference

For information about Fibre Channel standards, visit the Fibre Channel Industry Association web site, located at:

<http://www.fibrechannel.com>

Getting Help

Contact the supplier of your switch for technical support. This includes hardware and software support, all repairs, and spare components. Be prepared to provide the following information to the support personnel:

- Switch serial number
- Switch World Wide Name
- Output from the Telnet command `supportShow`
- Detailed problem description
- Topology configuration
- Troubleshooting steps already performed

Getting Software Updates

Contact your switch supplier for software updates and maintenance releases.

New switch firmware can be installed from the following host operating systems:

- UNIX
- Windows NT
- Windows 2000
- Windows 98
- Window 95

Utility programs to facilitate loading firmware from the listed operating systems and MIB files for switch management by SNMP are available at the following web site:

<http://www.brocade.com/index.html>

Introducing Brocade Zoning

Brocade Zoning allows you to partition your Storage Area Network (SAN) into logical groupings of devices that can access each other. Using Brocade Zoning, you can arrange fabric-connected devices into logical groups, or zones, over the physical configuration of the fabric.

Zones can be configured dynamically. They can vary in size depending on the number of fabric connected devices, and devices can belong to more than one zone. Because zone members can access only other members of the same zone, a device not included in a zone is not available to members of that zone. Therefore, you can use zones to:

- **Administer security**

Use zones to provide controlled access to fabric segments and to establish barriers between operating environments. For example, isolate systems with different uses or protect systems in a heterogeneous environment.

When Brocade Zoning is in secure mode, merge operations do not occur. Brocade Zoning is done on the primary Fabric Configuration Switch (FCS). The primary FCS switch makes zoning changes and other security related changes. The primary FCS switch also distributes zoning to all other switches in the secure fabric. All existing interfaces can be used to change zoning.

Zone management operations must be performed from the primary FCS switch using a zone management interface, such as telnet or Web Tools. A zoning database can be altered, provided you are connected to the primary FCS switch.

When two secure fabrics join, the traditional zoning merge does not occur. Instead, a zoning database is downloaded from the primary FCS switch of the merged secure fabric. When E_ports are active between two switches, the name of the FCS server and a zoning policy set version identifier are exchanged between the switches. If the views of the two secure fabrics are the same, the switches accept the result of the zone merge and then wait for the fabric's primary FCS server to download the remainder of the zoning policy sets to each switch in the fabric. If there is a view conflict, the E-ports are segmented as incompatible security data.

- **Customize environments**

Use zones to create logical subsets of the fabric to accommodate closed user groups or to create functional areas within the fabric. For example, include selected devices within a zone for the exclusive use of zone members, or create separate test or maintenance areas within the fabric.

- **Optimize IT resources**

Use zones to consolidate equipment, logically, for IT efficiency, or to facilitate time-sensitive functions. For example, create a temporary zone to back up non-member devices.

Figure 1-1 illustrates three zones with some overlap. It also contains devices that are not assigned to a zone, and are thus not active in the fabric if Brocade Zoning is enabled.

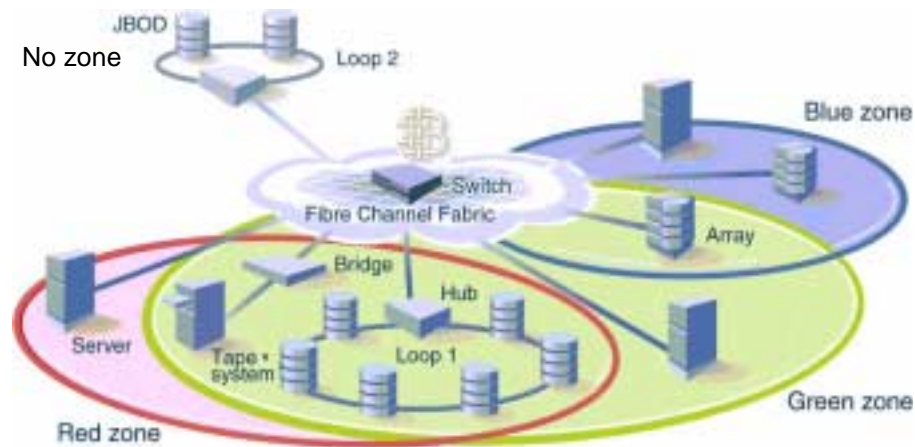


Figure 1-1 Fabric with Three Zones

Implementing Brocade Zoning

Implementing Brocade Zoning simplifies the zoning process in the following ways:

- Brocade Zoning can be administered from any switch in the fabric.
Changes configured to one switch automatically replicate to all switches in the fabric; if a new switch is added to an existing fabric, all zone characteristics are automatically applied to the new switch. Because each switch stores zoning information, Brocade Zoning ensures a high level of reliability and redundancy.
- Zones can be configured dynamically.
Configuring new zones does not interrupt traffic on unaffected ports or devices. And, they do not affect data traffic across interswitch links (ISLs) in cascaded switch configurations.
- Brocade Zoning uses policy-based administration.
Because Brocade Zoning uses policy-based administration - separating zone specification from zone enforcement - you can manage multiple zone configurations and easily enable a specific configuration when it is required. A fabric can store any number of zone configurations; however, only one configuration is active at a time. But, because the configurations are pre-determined and stored, a new configuration can be easily enabled.
- Brocade Zoning can be configured and administered through telnet commands or the optional Brocade Web Tools.
For information on telnet commands, refer to the *Brocade Fabric OS Reference*. For information on Web Tools, refer to the *Brocade Web Tools User's Guide*.

Installing Brocade Zoning

A Brocade Zoning license can be installed with either:

- *Installing Zoning with Telnet Commands* on page 2-1
- *Installing Zoning from Web Tools* on page 2-2

Installing Zoning with Telnet Commands

To install using telnet commands, perform the following steps:

1. Log onto the switch by telnet, see the user's guide provided with the hardware for details, using an account that has administrative privileges.
2. On the command line, enter
`licenseAdd "key"`
where "key" is the license key in double quotes.

Note: The license key must be entered exactly as given; it is case sensitive.

3. On the command line, enter
`licenseShow`
to be sure the license has been activated.

Example:

```
admin> licenseShow
9S9RzSebeATAS0k:
    Fabric Watch license
    Web license
    Zoning license
```

Installing Zoning from Web Tools

To install using Brocade Web Tools, perform the following steps:

1. Launch your browser.
2. Enter the switch name or IP address in the **Location/Address** field.
3. When the Fabric View appears, click on the appropriate switch icon.
4. When the Switch View appears, click the **admin** button.
5. When the Administration View appears, click the **License Admin** tab.
6. Enter the license key, and click **Add License**.

Using Brocade Zoning

This chapter explains both the concept of zoning and how to use Brocade Zoning to partition a fabric into logical groupings of devices.

Understanding Zoning

A zone is a group of fabric-connected devices arranged into a specified grouping. Any device connected to a fabric can be included in one or more zones. Devices within a zone possess an awareness of other devices within the same zone; they are not aware of devices outside of their zone. Therefore, if zoning is enabled, any device not in a zone is not able to communicate with any other device.

Zone members (ports, WWNs, or aliases) are grouped into a zone; in turn, zones are grouped in a zone configuration (a collection of zones). Zones can overlap; that is, a device can belong to more than one zone. And a fabric can consist of multiple zones. A zone configuration can include both hard and soft zones and there can be any number of zone configurations resident on a switch; however only one configuration can be active, that is enabled, at a time. Because the number of zones allowable is limited only by memory usage, the maximum number is virtually limitless.

Zone Types

Zones can be hard (hardware enforced) or soft (advisory). In a hard zone, sometimes referred to as a port zone, zone members are specified by physical port number. In a soft zone, at least one zone member is specified logically by World Wide Name (WWN).

Hard Zones

In a hard zone, all zone members are specified as switch ports; any number of ports in the fabric can be configured to the zone. When a zone member is specified by port number, only the individual device port specified is included in the zone.

Hard zones are position-dependent, that is, a device is identified by the physical port to which it is connected. Switch hardware ensures that there is no data transfer between unauthorized zone members. However, devices can transfer data between ports within the same zone. Consequently, hard zoning provides the greatest security possible. Use it where security must be rigidly enforced.

Soft Zones

In a soft zone, at least one zone member is specified by WWN. A device is included in a zone if either the node WWN or port WWN specified matches an entry in the name server table.

When a device logs in, it queries the name server for devices within the fabric. If zoning is in effect, only the devices in the same zone(s) are returned. Other devices are hidden from the name server query reply. When a WWN is specified, all ports on the specified device are included in the zone.

Soft zones are name server-dependent and therefore provide more flexibility - new devices can be attached without regard to physical location. However, the switch does not control data transfer so there is no guarantee against data transfer from unauthorized zone members. Use soft zoning where flexibility is important and security can be ensured by the cooperating hosts.

In addition to hard and soft zones, a third type of zone is also available:

- Broadcast Zone** Only one broadcast zone can exist within a fabric. It is named “broadcast” and it is used to specify those nodes that are to receive broadcast traffic.
- This type of zone is hardware enforced; the switch controls data transfer to a port.

Zone Enforcement

When zoning is *disabled*, the fabric is in non-zoning state and devices can access other devices in the fabric. When zoning is *enabled*, zoning is enforced throughout the fabric and devices can communicate only within their zones.

A switch can maintain any number of zone configurations; however, only one zone configuration can be enabled, or enforced, at a time. Because multiple configurations reside in the switch, you can switch from one configuration to another as events dictate. For example, you can set up a pre-specified zone configuration to be enabled at certain times of the day; or, in the event of a disaster, you can quickly enable a defined configuration to implement your disaster policy.

Zone configurations can be:

- Defined** This is the complete set of all zone objects that have been defined in the fabric. When zone objects are defined, the information initially resides in RAM; it must be saved to ensure that it is saved to flash memory and is not lost during power down or when a new zone configuration is enabled.
- Changes replicate to all switches in the fabric whenever the zone information is changed. However, changes must be saved to flash memory to be committed to persistent store (that is, to remain across reboot).
- Enabled** This is the zone configuration that is enabled (active). It resides in RAM; it must be saved to ensure that it is not lost when a new configuration is enabled or during power down. Any changes replicate to all switches in the fabric when the configuration is enabled or saved. Use the `cfgEnable` command to: enable a zone configuration, initiate `cfgSave`, and propagate zoning throughout the fabric.
- Disabled** Use the `cfgDisable` command to: disable a zoning configuration, initiate `cfgSave` to save the zoning configuration to the flash, and to propagate the zoning configuration throughout the fabric.
- Saved** This is the zone configuration that was last saved. It resides in flash memory and it is persistent.

In Figure 1-1, Config5 is defined (created). When it is defined, it resides only in RAM. To transfer it to flash memory, to be permanently stored and accessible across reboots, it must be saved. This can be accomplished by either:

- Saving it directly to flash (the recommended method)
- Enabling it first, then it is saved to flash.

But, until it has been saved to flash, it is not permanently stored and available across reboots.

Note: Only the enabled configuration (in the shaded area) is enforced.

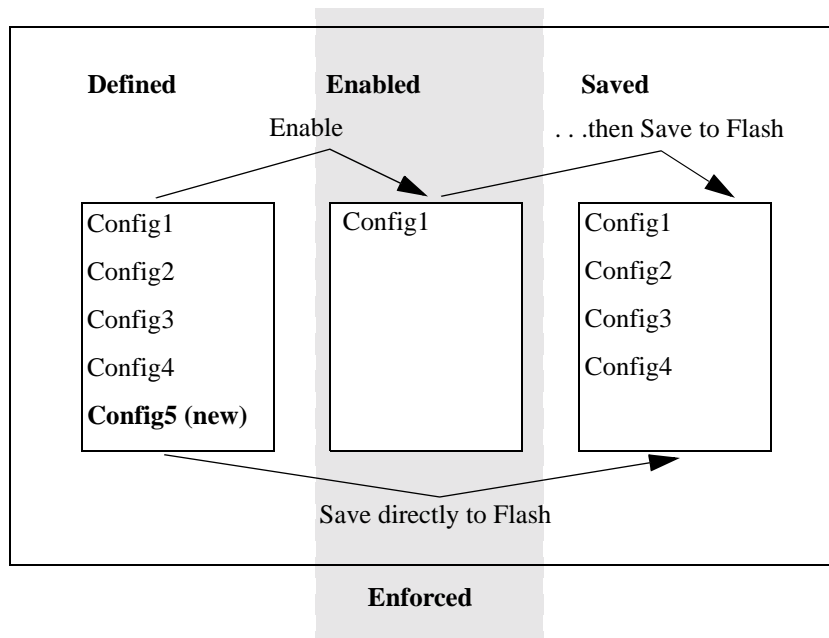


Figure 1-1 Saving a Zone Configuration

Enabling a Zone Configuration

When a zone configuration is enabled, all zones within the configuration are enabled. All devices within an enabled zone are visible to each other; however, they cannot communicate outside their zone. Zones can overlap within a zone configuration.

When a zone configuration is enabled the following happens:

1. All aliases are expanded.
2. Inconsistencies are checked.
 If any inconsistencies are discovered, an error occurs and the previous state of the fabric is preserved. (For example, if zoning was disabled, it remains disabled; if an existing configuration was enabled, it remains enabled.)
3. Switch hardware is loaded with the zoning information.
4. Zone members are loaded.
5. Registered State Change Notifications (RSCNs) are generated.

6. The configuration is saved to flash.

Implementing Zoning

Brocade Zoning can be implemented and administered from any switch in the fabric. Changes made to one switch are automatically distributed to all switches in the fabric. For that reason, Brocade Zoning requires that all switches in the fabric have an active Brocade Zoning license.

Brocade Zoning can be administered through either:

- Telnet command interface - see Appendix A, *Brocade Zoning Telnet Commands*.
- Brocade Web Tools web interface - See *Brocade Web Tools User's Guide*.

Configuring Zoning

Brocade Zoning is implemented by following the steps below:

1. Create alias (this step is optional)
2. Define zone
3. Define zone configuration
4. Enable zone configuration

Each zone object defined - alias, zone, zone configuration - must have a unique name; that is, an alias cannot have the same name as another alias, and it cannot have the same name as a zone or a zone configuration.

Note: During the configuration process below, changes should be saved periodically to ensure that they are stored in flash memory and protected against loss due to power outage and such.

1. Create Alias (optional)

An alias is a name assigned to a device or group of devices. By creating an alias you can assign a familiar name to a device, or you can group multiple devices into a single name. This can simplify cumbersome entries and it can allow an intuitive naming structure such as using `NT_Hosts` to define all NT hosts in the fabric.

An alias must be a unique alpha-numeric string beginning with an alpha character. The underscore character (`_`) is allowed and alias names are case sensitive. For example, `nt_hosts` is not the same name as `NT_Hosts`.

Aliases can greatly simplify the administrative process; however, they are not required to define zones.

2. Define Zone

A zone is a group of devices that can communicate with each other. Zone membership can include ports, WWNs, or aliases, or any combination of these. And, a device can be included in more than one zone.

To define a zone, specify the list of members to be included and assign a unique zone name; the zone name must be a unique alpha-numeric string beginning with an alpha character. The underscore character (`_`) is allowed and zone names are case sensitive. For example, `green_zone` is not the same name as `Green_Zone`.

Specify zone members by port number, WWN, alias, or a combination of any of the above.

To specify by **port number**, you must specify switch domain ID and port number, for example, 2,12 indicates switch domain ID 2, port number 12. When a member is specified by port number all devices connected to the port are included in the zone.

To specify by **WWN**, specify node name or port/device as an 8- hex number separated by colons, for example, 10:00:00:60:69:00:8a. These eight numbers are compared to the node and port name presented in a login frame (FLOGI or PLOGI). When a zone member is specified by node name, all ports on the device are included in the zone. When a zone member is specified by port name, only that port on the device (node) is included in the zone.

To specify by **alias**, specify the alias name.

Zone members can also be designated by a **combination of these methods**.

Example:

```
2,12; 2,14; 10:00:00:60:69:00:8a; nt_hosts
```

contains any devices connected to switch 2, ports 12 and 14, the device with a node name or port name of 10:00:00:60:69:00:8a as well as devices associated with the alias nt_hosts.

3. Define Zone Configuration

A zone configuration is a group of zones that are enforced whenever that zone configuration is enabled. And, a zone can be included in more than one zone configuration.

To define a zone configuration, specify the list of zones to be included and assign a zone configuration name; the zone configuration name must be a unique alpha-numeric string beginning with an alpha character. The underscore character (_) is allowed and zone names are case sensitive. For example, configuration1 is not the same name as Configuration1.

4. Enable Zone Configuration

To enable a zone configuration, select the zone configuration to be enabled. The configuration is downloaded to the switch hardware. RSCNs are sent to all fabric devices registered for state changes notifying these devices to re-query the name server to discover available devices that can be accessed.

Modifying Configurations

To make changes to an existing configuration, either add or remove individual elements to create the desired configuration. Once the changes have been made, save the configuration. This ensures the configuration is permanently saved in the switch and it also ensures that the configuration is replicated throughout the fabric.

The switch configuration file can also be uploaded to the host for archiving and it can be downloaded from the host to all switches in the fabric.

Adding a Switch

When a new switch is added to the fabric, it automatically takes on the zone configuration information from the fabric. To add the new switch, attach the E_ports and the new switch is incorporated into the fabric and the enabled zone configuration.

Merging Fabrics

When a new fabric (with no zone configuration information) is added to an existing zoned fabric, all switches in the new fabric take on the zoning characteristics present in the existing fabric.

If two fabrics that both contain zone configuration information are joined, the fabrics attempt to merge the two sets of zone configuration data.

In the simplest case, where both fabrics have identical zone configuration data and the same configuration enabled, the fabrics join to make one larger fabric with the same zone configuration enabled across the new fabric.

If the fabrics have different zone configuration data, the two sets of zone configuration data are merged if possible. If not possible, the inter-switch link (ISL) is segmented. A merge is not possible if any of the following exist:

Configuration mismatch	Zoning is enabled in both fabrics and the zone configurations that are enabled are different in each fabric.
Type mismatch	The name of a zone object in one fabric is used for a different type of zone object in the other fabric.
Content mismatch	The definition of a zone object in one fabric is different from the definition of zone object with the same name in the other fabric.

Transactional Model

Zoning commands are executed under the transactional model. A working copy of defined configurations is created by copying all information from zone or cfg lists at the start of a transaction.

The following commands are issued to open a transaction:

- aliAdd
- aliCreate
- aliDelete
- aliRemove
- cfgAdd
- cfgCreate
- cfgDelete
- cfgRemove
- qloopAdd
- qloopCreate
- qloopDelete
- qloopRemove
- zoneAdd
- zoneCreate

- `zoneDelete`
- `zoneRemove`

The following commands are issued to end a transaction:

- `cfgSave`
- `cfgEnable`
- `cfgDisable`

When a transaction is opened, all new zoning information is placed in a transactional buffer. Unless the transaction is closed, the new changes are not applied to the fabric. A transaction is aborted by the `cfgTransAbort`, or when another switch closes its transaction. When a transaction is closed, all new (from the transactional buffer) and existing zoning information is saved to memory and applied to the fabric.

Using QuickLoop Zones

In addition to zoning fabrics, covered in Chapter 3, Brocade Zoning also allows you to zone QuickLoops. By partitioning selected devices within a QuickLoop into a QuickLoop zone you can enhance management of a Fibre Channel Arbitrated Loop (FC-AL) in a legacy environment.

In QuickLoop zoning, devices within a QuickLoop can be partitioned off within that QuickLoop to form QuickLoop zones; in other words, a QuickLoop Zone is a subset of a QuickLoop and can include only QuickLoop devices.

Fabric zones and QuickLoop zones are independent of each other; both types of zones can co-exist in the same zone configuration and QuickLoop devices can be included within a fabric zone configuration.

QuickLoop Zoning Advantages

In addition to all the advantages of fabric zoning - security, customization of environments, and optimization of IT resources - QuickLoop zoning can protect devices from disruption by unrelated devices during a critical process, for example, during a tape backup session.

In a QuickLoop with zoning enabled, transmission of the loop initialization primitive (LIP) signal and loop initialization are controlled by the switch; the LIP is transmitted only to looplets within the affected zone; other looplets on the QuickLoop are not affected. In this way, unwanted disruption to devices can be controlled.

QuickLoop Zones

QuickLoop zones are hardware enforced; switch hardware prevents unauthorized data transfer between ports within the zone allowing devices to be partitioned into zones to restrict system access to selected devices. Once devices are included in a zone, they are visible only to other devices within that zone.

QuickLoop zone members are designated by looplet (port number), or by Arbitrated Loop Physical Address (AL_PA). There are 126 unique AL_PAs per QuickLoop; therefore, a QuickLoop zone can contain no more than 126 devices.

Configuring QuickLoop Zones

To configure QuickLoop Zoning, follow the steps below:

1. Create a QuickLoop. A QuickLoop is comprised of FL_ports on one or two switches within the fabric. To create a QuickLoop, specify a QuickLoop name (referred to as a qloop name for zoning), followed by a list of AL_PAs to be included. QuickLoop names define the switch (or pair of switches) that make up the QuickLoop.

A QuickLoop name must be a unique alpha-numeric string beginning with an alpha character. The underscore character (`_`) is allowed and names are case sensitive. For example, `Qloop1` is not the same name as `qloop1`.

2. Define QuickLoop zone. A QuickLoop zone is a group of FL_ports or AL_PAs that can communicate with each other. These ports and AL_PAs must reside within the same QuickLoop. To be a QuickLoop zone, every member must be either a looplet (FL_port) or an AL_PA within a single QuickLoop. QuickLoop zones can overlap looplets, but they must be confined to a single QuickLoop. QuickLoop zones are hardware enforced, but zones within a single looplet are not enforceable; therefore it is recommended that you do not partition devices within a looplet into different zones.

To define a QuickLoop zone, specify the list of members to be included and assign a unique zone name. A QuickLoop zone name must be a unique alpha-numeric string beginning with an alpha character. The underscore character (`_`) is allowed and zone names are case sensitive. For example, `Zone1` is not the same name as `zone1`.

To create a QuickLoop zone, specify QuickLoop zone members by looplet, by AL_PA, or by combination of the two.

To specify by **looplet**, specify the QuickLoop zone name, in quotes, and the physical ports to be included, in quotes.

Example:

```
"QLZoneName", "0,0; 0,1; 2,6; 2,7; 2,8"
```

To specify by **AL_PA**, specify the QuickLoop zone name, in quotes, with the QuickLoop name, and desired AL_PAs in quotes. All AL_PAs must be associated with a QuickLoop name.

Example:

```
"QLZoneName", "qloop1[01,02,04,e0,e1,e2]"
```

To specify a **combination** of looplet and AL_PA.

Example:

```
"QLZoneName", "0,2; 0,3; qloop1[ca,cb,e1,e2]"
```

3. Define QuickLoop zone configuration. A QuickLoop zone configuration is a group of QuickLoop zones that are enforced whenever that zone configuration is enabled.

To define a QuickLoop zone configuration, assign a zone configuration name and specify the QuickLoop zones to be included, by zone name. The QuickLoop names of the QuickLoop zones must also be included in the zone configuration. A QuickLoop zone configuration name must be a unique alpha-numeric string beginning with an alpha character. The underscore character (`_`) is allowed and zone configuration names are case sensitive. For example, `QLConfig_1` is not the same name as `qlconfig_1`.

4. Enable QuickLoop zone configuration. To enable a QuickLoop zone configuration, select the configuration to be enabled.

Brocade Zoning Sample Configurations

The following sample configurations illustrate setting up a zone configuration. You will note that changes have been saved periodically. In addition to the periodic saves, the `cfgshow` command has been issued to display current status to verify that changes have been processed.

Set Up QuickLoop and Fabric Zones on Dual Switch Configuration (Mixed Mode Environment)

The following sample configuration illustrates setting up QuickLoop and Fabric Zones in a mixed mode environment. This configuration consists of ports that are set to QuickLoop and Fabric modes.

```
test180:admin> cfgShow
Define configuration:
  no configuration defined
Effective configuration:
no configuration in effect
test181:admin> cfgShow
Defined configuration
  no configuration in effect
Effective configuration:
  no configuration in effect
On switch 1...
<Set QuickLoop partner and enable QuickLoop ports on switch 1>
test180_Jr:admin> qlPartner "10:00:00:60:69:00:00:22"
Setting Quick Loop to dual-switch mode,
Committing configuration...done.
test180_Jr:admin>

test180_Jr:admin> qlPortEnable 1
Setting port to Quick Loop mode,
Committing configuration...done.
Activate looplet 1
```

```
test180_Jr:admin> qlPortEnable 2
Setting port to Quick Loop mode,
Committing configuration...done.
Activate looplet 2
test180_Jr:admin>
```

On switch2...

<Set QuickLoop partner and enable QuickLoop ports on switch 2>

```
test181_Jr:admin> qlPartner "10:00:00:60:69:00:00:11"
Setting Quick Loop to dual-switch mode,
Committing configuration...done.
test181_Jr:admin>
```

```
test181_Jr:admin>qlPortEnable 3
Setting port to QuickLoop mode,
Committing configuration...done.
Activate looplet 3
```

```
test181_Jr:admin> qlPortEnable 4
Setting port to Quick Loop mode,
Committing configuration...done.
Activate looplet 4
test181_Jr.admin>
```

<Create aliases for devices>

```
test180_Jr:admin> aliCreate "Private_ServerA", "1,3"
test180_Jr:admin> aliCreate "Private_ServerB", 1,4"
test180_Jr:admin> aliCreate "Private_StorageA", " 2,2"
test180_Jr:admin> aliCreate "Private_StorageB", "2,1"
test180_Jr:admin> aliCreate "Fabric_ServerA", "50:06:0b:00:00:06:9a:d6"
test180_Jr:admin> aliCreate "Fabric_ServerB", "50:06:0b:00:00:06:ad:10"
est180_Jr:admin> aliCreate "Fabric_StorageA", "50:06:04:82:bc:01:9a:1b"
test180_Jr:admin> aliCreate "Fabric_StorageB", "50:06:04:82:bc:01:9a:1c"
```

<Create a configuration including QuickLoop and Fabric Zones>

```

test180_Jr.admin> zoneCreate "ql_zone1", "Private_ServerA; Private_StorageA"
<Create QuickLoop zones, using ports>
test180_Jr:admin> zoneCreate "ql_zone1", "Private_ServerA; Private_StorageA"
test180_Jr:admin> zoneCreate "ql_zone2", "Private_ServerB; Private_StorageB"
<Create Fabric Zones, using switch ports or device WWN's>
test180_Jr:admin>zoneCreate "fabric_zone1", "Fabric_ServerA; Fabric_StorageA"
test180_Jr:admin>zoneCreate "fabric_zone2", "Fabric_ServerB; Fabric_StorageB"
<Save and enable the zone configuration>
test180_Jr:admin> cfgSave
Updating flash ...
test180_Jr:admin>cfgEnable "cfg1"
Setting switch to Fabric mode,
Committing configuration...done.
zone config "cfg1" is in effect
<This is an example of the zone configuration>
tesst180_Jr:admin>cfgShow
Defined configuration
cfg:          cfg1          ql_zone1;  al_zone2;  fabric_zone1;  fabric_zone2
zone:         fabric_zone1
                                   Fabric_ServerA; Fabric_StorageA
zone:         fabric_zone2
                                   Fabric_ServerB; Fabric_StorageB
zone:         ql_zone1
                                   Private_ServerA; Private_StorageA
zone:         ql_zone2
                                   Private ServerB; Private StorageB

alias: Fabric_ServerA
                                   50:06:0b:00:00:06:9a:d6
alias: Fabric_ServerB
                                   50:06:0b:00:00:06:ad:10
alias: Fabric_StorageA
                                   50:06:04:82:bc:01:0a:1b
alias: Fabric_StorageB
                                   50:06:04:82:bc:01:9a:1c
alias: Private_ServerA

```

```

                                1,3
alias: Private_ServerB
                                1,4
alias: Private_StorageA
                                2,2
alias: Private_StorageB
                                2,1
Effective configuration:
cfg:      cfg1
zone:     fabric_zone1
                                50:06:0b:00:00:06:9a:d6
                                50:06:04:82:bc:01:9a:1b
zone:     fabric_zone2
                                50:06:0b:00:00:06:ad:10
                                50:06:04:82:bc:01:9a:1c
zone:     ql_zone1
                                1,3
                                2,2
zone:     ql_zone2
                                1,4
                                2,1

test180_Jr:admin>
<END>

```

Set Up Zones in Dual-Switch QuickLoop

The following sample configuration illustrates setting up zones in a dual-switch QuickLoop. In this configuration, all ports on the switches, except for E_Ports, are enabled for QuickLoop and participate in a logical PLDA (Private Loop Direct Attach).

```

switch1:admin> cfgShow
Defined configuration:
  no configuration defined
Effective configuration:
  no configuration in effect
switch2:admin> cfgShow

```

```
Defined configuration
no configuration defined
Effective configuration:
no configuration in effect
```

<Create aliases for switch 1 and switch 2 using switches WWNs>

```
switch1:admin> aliCreate "switch1_WWN", "10:00:00:60:69:10:1c:19"
switch1:admin> aliCreate "switch2_WWN", "10:00:00:60:69:10:1b:a9"
```

<Create a dual-switch QuickLoop>

```
switch1:admin> qLoopCreate "qloop1", "switch1_WWN; switch2_WWN"
```

Note: The above steps are equivalent to the following:

On switch 1...

<Set QuickLoop partner and enable QuickLoop switch 1>

```
switch1:admin> qlPartner "10:00:00:60:69:10:1b:a9" Setting Quick Loop to dual-
switch mode,
```

Committing configuration..done.

```
switch1:admin> qlEnable
```

Setting switch to Quick Loop mode,

Committing configuration...done.

Initialize Quick Loop...

```
switch1:admin>
```

On switch 2...

<Set QuickLoop partner and enable QuickLoop ports on switch 2>

```
switch2:admin> qlPartner "10:00:00:60:69:10:1c:19"
```

Setting Quick Loop to dual-switch mode,

COMmitting configuration...done.

```
switch2:admin> qlEnable
```

Setting switch to Quick Loop mode,

Committing configuration...done.

Initialize Quick Loop...

```
switch2:admin>
```

<Create aliases for QuickLoop devices>

```
switch1:admin> aliCreate "Private_ServerA", "1,3"
```

```
switch1:admin> aliCreate "Private_ServerB", "1,4"
```

```
switch1:admin> aliCreate "Private_ServerC", "1,5"
switch1:admin> aliCreate "Private_StorageA", "2,2"
switch1:admin> aliCreate "Private_StorageB", "2,3"
switch1:admin> aliCreate "Private_StorageC", "2,4"
```

<Create QuickLoop zones using ports>

```
switch1:admin> zoneCreate "ql_zone1", "Private_ServerA; Private_StorageA"
switch1:admin> zoneCreate "ql_zone2", "Private_ServerB; Private_StorageB"
switch1:admin> zoneCreate "ql_zone3", "Private_ServerC; Private_StorageC"
```

<Create a configuration for QuickLoop zones>

```
switch1:admin> cfgCreate "cfg1", "qloop1;ql_zone1;ql_zone2;ql_zone3"
```

<Save and enable the zone configuration>

```
switch1:admin> cfgSave
```

Update flash ...

```
switch1:admin> cfgEnable "cfg1"
```

Setting switch to Quick Loop mode,

Committing configuration...done.

Initialize Quick Loop...

zone config "cfg1" is in effect

Updating flash ...

```
switch1:admin>
```

<This is what the zone configuration should look like>

```
switch1:admin> cfgShow
```

Define configuration:

```
cfg:    cfg1    qloop1; ql_zone1;  ql_zone2; ql_zone3
zone:   ql_zone1
                Private_ServerA; Private_StorageA
zone:   ql_zone2
                Private_ServerB; Private_StorageB
zone:   ql_zone3
                Private_ServerC; Private_StorageC
alias:  Private_ServerA
                1,3
alias:  Private_ServerB
                1,4
```

```
alias:Private_ServerC
                1,5
alias:Private_StorageA
                2,2
alias:Private_StorageB
                2,3
alias:Private_StorageC
                2,4
alias: switch1_WWN 10:00:00:60:10:1c:19
alias: switch2_WWN 10:00:00:60:10:1b:a9
qloop: qloop1 switch1; switch2
Effective configuration:
cfg:    cfg1
zone:   ql_zone1
        1,3
        2,2
zone:   ql_zone2
        1,4
        2,3
zone:   ql_zone3
        1,5
        2,4
qloop: qloop1 10:00:00:60:69:10:1c:19
        10:00:00:60:69:10:1b:a9
switch1:admin>
<END>
```


Brocade Zoning Telnet Commands

Overview

To use a telnet command, log in with administrative privileges to any switch in the fabric, enter the command with required operands, if any, and press the Enter key. Changes made to the zoning configuration on one switch are replicated through all switches within the fabric.

Note: When accessing the switch using simultaneous multiple connections (telnet, Web Tools) it is possible that a change resulting from one connection may not transfer to another connection. Also, it is possible that a change from one connection could overwrite a change from another connection. Therefore, use care when making changes using simultaneous sessions.

Grouped by function, below are the telnet commands used to administer Brocade Zoning.

Command	Description	See Page
Zone Alias		
aliAdd	Add a member to a zone alias.	A-3
aliCreate	Create a zone alias.	A-4
aliDelete	Delete a zone alias.	A-5
aliRemove	Remove a member from a zone alias.	A-6
aliShow	Show zone alias definition.	A-7
Zoning		
zoneAdd	Add a member to a zone.	A-24
zoneCreate	Create a zone.	A-25
zoneDelete	Delete a zone.	A-27
zoneRemove	Remove a member from a zone.	A-28
zoneShow	Show zone information.	A-29
QuickLoop Zoning		
qloopAdd	Add a member to a QuickLoop.	A-19
qloopCreate	Create a QuickLoop.	A-20
qloopDelete	Delete a QuickLoop.	A-21
qloopRemove	Remove a member from a QuickLoop.	A-22

Command	Description	See Page
qloopShow	Show QuickLoop information.	A-23
Zone Configuration		
cfgAdd	Add a zone to a zone configuration.	A-8
cfgCreate	Create a zone configuration.	A-10
cfgDelete	Delete a zone configuration.	A-11
cfgRemove	Remove a zone from a zone configuration.	A-14
cfgShow	Show zone configuration definition.	A-16
Configuration Management		
cfgClear	Clear all zone configurations.	A-9
cfgDisable	Disable a zone configuration.	A-12
cfgEnable	Enable a zone configuration.	A-13
cfgSave	Save zone configurations in flash memory.	A-15
cfgShow	Show zone configuration definition.	A-16
cfgTransAbort	Abort the current zoning transaction.	

aliAdd Add a member to a zone alias.

Synopsis `aliAdd aliName, aliMemberList`

Availability Administrator

Description Use this command to add one or more members to an existing zone alias.
The alias member list cannot contain another zone alias.

Operands The following operands are required:

`aliName` Name for the zone alias, in quotes.

`aliMemberList` List of members to be added to alias, in quotes, separated by semi-colons. Can be one or more of the following:

Physical fabric port numbers

Worldwide names

QuickLoop AL_PAs

Example To add worldwide names to the following aliases:

```
sw5:admin> aliAdd "array1", "21:00:00:20:37:0c:72:51"  
sw5:admin> aliAdd "array2", "21:00:00:20:37:0c:9c:6b"  
sw5:admin> aliAdd "loop1", "21:00:00:20:37:0c:6a:40"
```

See Also `aliCreate`
`aliDelete`
`aliRemove`
`aliShow`

aliCreate

Create a zone alias.

Synopsis `aliCreate aliName, aliMemberList`**Availability** Administrator**Description** Use this command to create a new zone alias.

A zone alias name is a C-style name beginning with a letter and followed by any number of letters, digits and underscore characters. Names are case sensitive, for example “Ali_1” and “ali_1” are different zone aliases. Blank spaces are ignored.

The zone alias member list must have at least one member (empty lists are not allowed). The alias member list cannot contain another zone alias.

Operands The following operands are required:

<code>aliName</code>	Name for new zone alias, in quotes. This name cannot be used for another zone object.
<code>aliMemberList</code>	List of members to be included in alias, in quotes, separated by semi-colons. Can be one or more of the following: <ul style="list-style-type: none"> Physical fabric port numbers Worldwide names QuickLoop AL_PAs

Example To create three zone aliases using worldwide names:

```
sw5:admin> aliCreate "array1", "21:00:00:20:37:0c:72:8c"
sw5:admin> aliCreate "array2", "21:00:00:20:37:0c:66:23"
sw5:admin> aliCreate "loop1", "21:00:00:20:37:0c:67:e3"
```

See Also

- `aliAdd`
- `aliDelete`
- `aliRemove`
- `aliShow`

aliDelete Delete a zone alias.

Synopsis `aliDelete aliName`

Availability Administrator

Description Use this command to delete a zone alias.

Operands The following operand is required:

`aliName` Name of zone alias to be deleted, in quotes.

Example To delete the zone alias “array2”:

```
sw5:admin> aliDelete "array2"
```

See Also `aliAdd`
`aliCreate`
`aliRemove`
`aliShow`

aliRemove Remove a member from a zone alias.

Synopsis `aliRemove aliName, aliMemberList`

Availability Administrator

Description Use this command to remove one or more members from an existing zone alias.

The member list is located by an exact string match, therefore, it is important to maintain the order when removing multiple members. For example, if a zone alias contains “1,2; 1,3; 1,4” then removing “1,3; 1,4” succeeds, but removing “1,4; 1,3” fails.

If all members are removed, the zone alias is deleted.

Operands The following operands are required:

`aliName` Name of zone alias, in quotes.

`aliMemberList` List of members to be removed from alias, in quotes, separated by semi-colons. Can be one or more of the following:

Physical fabric port numbers

Worldwide names

QuickLoop AL_PAs

Example To remove a worldwide name from “array1”:

```
sw5:admin> aliRemove "array1", "21:00:00:20:37:0c:71:d2"
```

See Also `aliAdd`
`aliCreate`
`aliDelete`
`aliShow`

aliShow Display zone alias information.

Synopsis aliShow [pattern]

Availability All users

Description Use this command to display zone configuration information.

If no parameters are specified, all zone configuration information (both defined and enabled) is displayed. See `cfgShow` for a description of this display.

If a parameter is specified, it is used as a pattern to match zone alias names; those that match in the defined configuration are displayed.

Operands The following operand is optional:

`pattern` A POSIX style regular expression used to match zone alias names.

Patterns may contain:

Question mark “?” that matches any single character

Asterisk “*” that matches any string of characters

Ranges “[0-9a-f]” that match any character within the range

Example To show all zone aliases beginning with “arr”:

```
sw5:admin> aliShow "arr*"
alias: array1 21:00:00:20:37:0c:76:8c
alias: array2 21:00:00:20:37:0c:66:23
```

See Also aliAdd
aliCreate
aliDelete
aliRemove

cfgAdd Add a member to a zone configuration.

Synopsis `cfgAdd cfgName, cfgMemberList`

Availability Administrator

Description Use this command to add one or more members to an existing zone configuration.

Operands The following operands are required:

<code>cfgName</code>	Name for the zone configuration, in quotes.
<code>cfgMemberList</code>	List of members to be added to zone configuration, in quotes, separated by semi-colons. Can be one or more of the following: Zone names QuickLoop names

Example To add a new zone to the configuration "USA_cfg":

```
sw5:admin> cfgAdd "USA_cfg", "Green_zone"
```

See Also

- `cfgClear`
- `cfgCreate`
- `cfgDelete`
- `cfgDisable`
- `cfgEnable`
- `cfgRemove`
- `cfgSave`
- `cfgShow`

cfgClear Clear all zone configurations.

Synopsis `cfgClear`

Availability Administrator

Description Use this command to clear all zone configuration information from the fabric. If a zone configuration is enabled, it is first disabled. All defined zone objects are then deleted.

Note: `cfgClear` does not affect the zone configuration information in non-volatile memory.

Operands None

Example To clear all zones, then clear non-volatile memory:

```
sw5:admin> cfgClear
sw5:admin> cfgSave
```

See Also `cfgDisable`
`cfgEnable`
`cfgSave`

cfgCreate Create a zone configuration.

Synopsis `cfgCreate cfgName, cfgMemberList`

Availability Administrator

Description Use this command to create a new zone configuration.

A zone configuration name is a C-style name beginning with a letter and followed by any number of letters, digits and underscore characters. Names are case sensitive, for example “Cfg_1” and “cfg_1” are different zone configurations. Blank spaces are ignored.

The zone configuration member list must have at least one member (empty lists are not allowed).

Operands The following operands are required:

`cfgName` Name for the zone configuration to be created, in quotes. This name cannot be used for another zone object.

`cfgMemberList` List of members to be included, in quotes, separated by semi-colons. Can be one or more of the following:

Zone names

QuickLoop names

Example To create a configuration containing three zones:

```
sw5:admin> cfgCreate "USA_cfg", "Red_zone;  
Blue_zone; Green_zone"
```

See Also `cfgAdd`
`cfgClear`
`cfgDelete`
`cfgDisable`
`cfgEnable`
`cfgRemove`
`cfgSave`
`cfgShow`

cfgDelete Delete a zone configuration.

Synopsis `cfgDelete cfgName`

Availability Administrator

Description Use this command to delete a zone configuration.
`cfgName` is the name of an existing zone configuration.

Operands The following operand is required:
`cfgName` Name of zone configuration to be deleted, in quotes.

Example To delete the zone configuration "USA_cfg":

```
sw5:admin> cfgDelete "USA_cfg"
```

See Also `cfgAdd`
`cfgClear`
`cfgCreate`
`cfgDisable`
`cfgEnable`
`cfgRemove`
`cfgSave`
`cfgShow`

cfgDisable Disable a zone configuration.

Synopsis `cfgDisable`

Availability Administrator

Description Use this command to disable the enabled zone configuration. The fabric returns to non-zoning mode.

Operands None

Example To disable the current zone configuration:

```
sw5:admin> cfgDisable
```

See Also `cfgClear`
 `cfgEnable`
 `cfgSave`

cfgEnable Enable a zone configuration.

Synopsis `cfgEnable cfgName`

Availability Administrator

Description Use this command to enable a zone configuration.

The configuration to be enabled is built when a specified zone configuration is enabled. It is built by checking for undefined zone names, zone alias names, or other inconsistencies and then expanding zone aliases, removing duplicate entries, and installing the enabled configuration.

If the build fails, the previous state is preserved (zoning remains disabled, or the previous enabled configuration remains in effect). If the build succeeds, the new configuration replaces the previous configuration.

See `cfgShow` for a description of defined and enabled configurations.

Operands The following operand is required:

`cfgName` Name of zone configuration to be enabled, in quotes.

Example To enable the zone configuration "USA_cfg":

```
sw5:admin> cfgEnable "USA_cfg"  
zone config "USA_cfg" is in effect
```

See Also `cfgClear`
`cfgDisable`
`cfgSave`
`cfgShow`

cfgRemove Remove a member from a zone configuration.

Synopsis `cfgRemove cfgName, cfgMemberList`

Availability Administrator

Description Use this command to remove a member from an existing zone configuration.

The member list is located by an exact string match, therefore, it is important to maintain the order when removing multiple members. For example, if a zone configuration contains “cfg2; cfg3; cfg4” then removing “cfg3; cfg4” succeeds, but removing “cfg4; cfg3” fails .

If all members are removed, the zone configuration is deleted.

Operands The following operands are required:

`cfgName` Name of zone configuration, in quotes.

`cfgMemberList` List of zone configuration members to be removed, in quotes, separated by semi-colons. Can be one or more of the following:

Zone Names

QuickLoop names

Example To remove “Green_zone” from “USA_cfg”:

```
sw5:admin> cfgRemove "USA_cfg", "Green_zone"
```

See Also

`cfgAdd`
`cfgClear`
`cfgCreate`
`cfgDelete`
`cfgDisable`
`cfgEnable`
`cfgSave`
`cfgShow`

cfgSave Save zone configuration to non-volatile memory.

Synopsis `cfgSave`

Availability Administrator

Description Use this command to save the current zone configuration. The defined configuration and the name of the enabled configuration are written to non-volatile memory in all switches in the fabric.

The saved configuration is automatically reloaded by the switch on power up and, if a configuration was enabled at the time it was saved, the same configuration is reinstalled with an automatic `cfgEnable` command.

Because the saved configuration is reloaded at power on, only valid configurations are saved. `cfgSave` verifies that the enabled configuration is valid by performing the same tests as `cfgEnable`. If the tests fail, an error is displayed and the configuration is not saved. Tests may fail if a configuration has been modified since the last `cfgEnable`.

Operands None

Example To enable a zone configuration, then save it:

```
sw5:admin> cfgEnable "USA_cfg"  
zone config "USA_cfg" is in effect  
  
sw5:admin> cfgSave  
Updating flash...
```

See Also `cfgClear`
`cfgDisable`
`cfgEnable`
`cfgShow`

cfgShow Display zone configuration information.

Synopsis `cfgShow [pattern]`

Availability All users

Description Use this command to display zone configuration information.

If no parameters are specified, all zone configuration information (both defined and enabled) is displayed.

If a parameter is specified, it is used as a pattern to match zone configuration names with the zone configurations that are in the defined configuration; those that match the pattern are displayed.

The defined configuration is the complete set of all zone objects that have been defined in the fabric. There may be multiple zone configurations defined, but only one can be enabled at a time. There may be inconsistencies in the definitions, zones or aliases that are referenced but not defined, or there may be duplicate members.

The enabled configuration is the zone configuration that is currently enabled. The devices that an initiator sees are based on this configuration. The enabled configuration is built when a specified zone configuration is enabled.

Operands The following operand is optional:

`pattern` A POSIX style regular expression used to match zone configuration names.

Patterns may contain:

Question mark “?” that matches any single character

Asterisk “*” that matches any string of characters

Ranges “[0-9a-f]” that match any character within the range

Example To show all defined configurations:

```
sw5:admin> cfgShow "*"
      cfg:  USA1Blue_zone
      cfg:  USA_cfgRed_zone; Blue_zone
```

To show all configuration information:

```
sw5:admin> cfgShow
Defined configuration:
  cfg:   USA1      Blue_zone
  cfg:   USA_cfg   Red_zone; Blue_zone
  zone:  Blue_zone
           1,1; array1; 1,2; array2
  zone:  Red_zone
           1,0; loop1
  alias: array1   21:00:00:20:37:0c:76:8c;
                 21:00:00:20:37:0c:71:02
  alias: array2   21:00:00:20:37:0c:76:22;
                 21:00:00:20:37:0c:76:28
  alias: loop1    21:00:00:20:37:0c:76:85;
                 21:00:00:20:37:0c:71:df

Enabled configuration:
  cfg:   USA_cfg
  zone:  Blue_zone
           1,1
           21:00:00:20:37:0c:76:8c
           21:00:00:20:37:0c:71:02
           1,2
           21:00:00:20:37:0c:76:22
           21:00:00:20:37:0c:76:28
  zone:  Red_zone
           1,0
           21:00:00:20:37:0c:76:85
           21:00:00:20:37:0c:71:df
```

See Also

- cfgAdd
- cfgClear
- cfgCreate
- cfgDelete
- cfgDisable
- cfgEnable
- cfgRemove
- cfgSave

cfgTransAbort Abort the current zoning transaction.

Synopsis `cfgTransAbort`

Availability Administrator

Description Use this command to abort the current zoning transaction.
Changes made since the transaction began are removed, and the zone configuration database is restored to the state before the transaction started.

Operands None.

Example To abort the current transaction:

```
sw5:admin> cfgTransAbort
```

qloopAdd Add a member to a QuickLoop.

Synopsis `qloopAdd qloopName, qloopMemberList`

Availability Administrator

Description Use this command to add one or more members to an existing QuickLoop.

When a configuration is enabled, all QuickLoops defined in the configuration must resolve to one or two switch worldwide names.

Operands The following operands are required:

`qloopName` Name of QuickLoop, in quotes.

`qloopMemberList` List of QuickLoop members, in quotes, separated by semi-colons.
Can include one or more of the following:

Worldwide names

Zone alias names

Example To add an alias for a second worldwide name to “qlp1”:

```
sw5:admin> qloopAdd "qlp1", "wnw2"
```

See Also `qloopCreate`
`qloopDelete`
`qloopRemove`
`qloopShow`

qloopCreate Create a QuickLoop.

Synopsis `qloopCreate qloopName, qloopMemberList`

Availability Administrator

Description Use this command to create a QuickLoop.

A QuickLoop name is a C-style name beginning with a letter and followed by any number of letters, digits, and underscore characters. Names are case sensitive, for example “Qloop_1” indicates a different QuickLoop than “qloop_1”. Blank spaces are ignored.

The QuickLoop member list must have one or two members; an empty list is not allowed.

When a configuration is enabled, all QuickLoops defined in the configuration must resolve to a maximum of two switch worldwide names.

Operands The following operands are required:

`qloopName` Name of QuickLoop to be created, in quotes. Name cannot be used for another zone object.

`qloopMemberList` List of members to be added to QuickLoop, in quotes, separated by semi-colons. Can be one or more of the following:

Worldwide names

Zone alias names

Example To create two QuickLoops, a single switch and one dual switch:

```
sw5:admin> qloopCreate "qlp1", "10:00:00:60:69:00:60:11"  
sw5:admin> qloopCreate "qlp2", "wwn2; wwn3"
```

See Also `qloopAdd`
`qloopDelete`
`qloopRemove`
`qloopShow`

qloopDelete Delete a QuickLoop.

Synopsis `qloopDelete qloopName`

Availability Administrator

Description Use this command to delete a QuickLoop.

When a configuration is enabled, all QuickLoops defined in the configuration must resolve to a maximum of two switch worldwide names.

Operands The following operand is required:

`qloopName` Name of QuickLoop, in quotes.

Example To delete QuickLoop “qlp2”:

```
sw5:admin> qloopDelete "qlp2"
```

See Also `qloopAdd`
`qloopCreate`
`qloopRemove`
`qloopShow`

qloopRemove Remove a member from a QuickLoop.

Synopsis `qloopRemove qloopName, qloopMemberList`

Availability Administrator

Description Use this command to remove one or more members from a QuickLoop.

The member list is identified through an exact string match; therefore, when removing multiple members, order is important. For example, if a QuickLoop contains “wwn2; wwn3; wwn4”, removing “wwn3; wwn4” succeeds, but removing “wwn4; wwn3” fails .

If all members are removed, the QuickLoop is deleted.

When a configuration is enabled, all QuickLoops defined in the configuration must resolve to one or two switch worldwide names.

Operands The following operands are required:

<code>qloopName</code>	Name of QuickLoop, in quotes.
<code>qloopMemberList</code>	List of QuickLoop members to be removed, in quotes, separated by semi-colons. Can be one or more of the following: Worldwide Names Zone alias names

Example To remove member “wwn2” from “qlp1”:

```
sw5:admin> qloopRemove "qlp1", "wwn2"
```

See Also `qloopAdd`
`qloopCreate`
`qloopDelete`
`qloopShow`

qloopShow Display QuickLoop information.

Synopsis qloopShow [pattern]

Availability All users

Description Use this command to display QuickLoop configuration information.

If no parameters are specified, all zone configuration information (defined and enabled) is displayed. See `cfgShow` for a description of this display.

If a parameter is specified, it is used as a pattern to match QuickLoop names; those that match in the defined configuration are displayed.

Operands The following operand is optional:

`pattern` A POSIX style regular expression used to match QuickLooe names.

Patterns may contain:

Question mark “?” that matches any single character

Asterisk “*” that matches any string of characters

Ranges “[0-9a-f]” that match any character within the range

Example To display all QuickLoops beginning with the letter “q”:

```
sw5:admin> qloopShow "q*"
qloop: qlp1      10:00:00:60:69:00:60:11
                10:00:00:60:69:00:30:02
qloop: qlp2      10:00:00:60:69:00:60:13
```

See Also qloopAdd
qloopCreate
qloopDelete
qloopRemove

zoneAdd Add a member to the zone.

Synopsis zoneAdd zoneName, zoneMemberList

Availability Administrator

Description Use this command to add one or more members to an existing zone.

Operands The following operands are required:

zoneName	Name for the existing zone, in quotes.
zoneMemberList	List of members to be added, in quotes, separated by semi-colons. Can be one or more, of the following: <ul style="list-style-type: none">Physical fabric port numberWorldwide nameQuickLoop AL_PAZone alias name

Example To add aliases for three disk arrays to “Blue_zone”:

```
sw5:admin> zoneAdd "Blue_Zone", "array3; array4; array5"
```

See Also zoneCreate
zoneDelete
zoneRemove
zoneShow

zoneCreate Create a zone.

Synopsis `zoneCreate zoneName, zoneMemberList`

Availability Administrator

Description Use this command to create a new zone.

A zone name is a C-style name beginning with a letter and followed by any number of letters, digits, and underscore characters. Names are case sensitive, for example “Zone_1” indicates a different zone than “zone_1”. Blank spaces are ignored.

The zone member list must have at least one member (empty lists are not allowed). The members are described by a list of member definitions separated by semi-colons.

Specify a *physical fabric port number* as a pair of decimal numbers “s,p” where “s” is the switch number (domain ID) and “p” is the port number on that switch. For example, “2,12” specifies port 12 on switch number 2. When a zone member is specified by physical fabric port number, then all devices connected to that port are in the zone. If this port is an arbitrated loop, then all devices on the loop are in the zone.

Specify a *Worldwide name* as eight hex numbers separated by colons, for example “10:00:00:60:69:00:00:8a”. Brocade Zoning has no knowledge of the fields within a Worldwide Name; the eight bytes are simply compared with the Node and Port Names presented by a device in a login frame (FLOGI or PLOGI). When a zone member is specified by Node Name, then all ports on that device are in the zone. When a zone member is specified by Port Name, then only that single device port is in the zone.

Specify a *QuickLoop AL_PA* as a QuickLoop name followed by a list of AL_PAs, for example “qloop1[01,02]”. QuickLoop names have the same format as zone names, and are created with the `qloopCreate` command to define a switch or pair of switches that form the QuickLoop.

Specify a *zone alias name* using the same format as a zone name; it is created with the `aliCreate` command. The alias must resolve to a list of one or more of the following:

- Physical fabric port numbers
- Worldwide Names
- QuickLoop AL_PAs

The types of zone members used to define a zone may be mixed. For example, a zone defined with the following members: “2,12; 2,14; 10:00:00:60:69:00:00:8a” would contain all devices connected to switch 2, ports 12 and 14, and to the device with the worldwide name “10:00:00:60:69:00:00:8a” (either node name or port name), at the port in the fabric to which it is connected.

Operands The following operands are required:

zoneName	Name for a zone to be created, in quotes. This name cannot be used for any other zone object.
zoneMemberList	List of members to be included in zone, in quotes, separated by semi-colons. Can be one or more of the following: <ul style="list-style-type: none">Physical fabric port numbersWorldwide namesQuickLoop AL_PAsZone alias names

Example To create three zones using a combination of port numbers and zone aliases:

```
sw5:admin> zoneCreate "Red_zone", "1,0; loop1"  
sw5:admin> zoneCreate "Blue_zone", "1,1; array1; 1,2; array2"  
sw5:admin> zoneCreate "Green_zone", "1,0; loop1; 1,2; array2"
```

See Also

- zoneAdd
- zoneDelete
- zoneRemove
- zoneShow

zoneDelete

Delete a zone.

Synopsis zoneDelete zoneName

Availability Administrator

Description Use this command to delete a zone.

Operands The following operand is required:

zoneName Name of the zone to be deleted, in quotes.

Example To delete the zone "Blue_zone":

```
sw5:admin> zoneDelete "Blue_zone"
```

See Also zoneAdd
zoneCreate
zoneRemove
zoneShow

zoneRemove

Remove a member from a zone.

Synopsis `zoneRemove zoneName, zoneMemberList`

Availability Administrator

Description Use this command to remove one or more members from an existing zone.

The member list is located by an exact string match, therefore, it is important to maintain the order when removing multiple members. For example, if a zone contains “array2; array3; array4”, removing “array3; array4” succeeds. but removing “array4; array3” fails.

If all members are removed, the zone is deleted.

Operands The following operands are required:

`zoneName` Name of the zone, in quotes.

`zoneMemberList` List of members to be removed from zone, in quotes, separated by semi-colons. Can be one or more of the following:

Physical fabric port numbers

Worldwide names

QuickLoop AL_PAs

Zone alias names

Example To remove “array2” from “Blue_zone”:

```
sw5:admin> zoneRemove "Blue_zone", "array2"
```

See Also `zoneAdd`
 `zoneCreate`
 `zoneDelete`
 `zoneShow`

zoneShow Display zone information.
W

Synopsis zoneShow [pattern]

Availability All users

Description Use this command to display zone configuration information.

If no parameters are specified, all zone configuration information (both defined and enabled) is displayed. See `cfgShow` for a description of this display.

If a parameter is specified, it is used as a pattern to match zone configuration names, and those that match in the defined configuration are displayed.

Operands The following operand is optional:

`pattern` A POSIX style regular expression used to match zone configuration names.

Patterns may contain:

Question mark “?” that matches any single character

Asterisk “*” that matches any string of characters

Ranges “[0-9a-f]” that match any character within the range

Example To show all zones beginning with the letters “A” through “C”:

```
sw5:admin> zoneShow "[A-C]*"  
zone: Blue_zone 1,1; array1; 1,2; array2
```

See Also zoneAdd
 zoneCreate
 zoneDelete
 zoneRemove

B

Brocade Zoning Telnet Commands

Glossary

8b/10b Encoding	An encoding scheme that converts each 8-bit byte into 10 bits. Used to balance ones and zeros in high-speed transports.
Address Identifier	A 24-bit or 8-bit value used to identify the source or destination of a frame.
AL_PA	Arbitrated Loop Physical Address; a unique 8-bit value assigned during loop initialization to a port in an arbitrated loop.
Alias Address Identifier	An address identifier recognized by a port in addition to its standard identifier. An alias address identifier may be shared by multiple ports.
Alias AL_PA	An AL_PA value recognized by an L_Port in addition to the AL_PA assigned to the port. See also <i>AL_PA</i> .
Alias Server	A fabric software facility that supports multicast group management.
ANSI	American National Standards Institute; the governing body for fibre channel standards in the U.S.A.
API	Application Programming Interface; defined protocol that allows applications to interface with a set of services.
Arbitrated Loop	A shared 100 MBps fibre channel transport structured as a loop. Can support up to 126 devices and one fabric attachment. See also <i>Topology</i> .
ASIC	Application Specific Integrated Circuit.
ATM	Asynchronous Transfer Mode; a transport used for transmitting data over LANs or WANs that transmit fixed-length units of data. Provides any-to-any connectivity, and allows nodes to transmit simultaneously.
AW_TOV	Arbitration Wait Time-out Value; the minimum time an arbitrating L_Port waits for a response before beginning loop initialization.
Bandwidth	The total transmission capacity of a cable, link, or system. Usually measured in bps (bits per second). May also refer to the range of transmission frequencies available to a network. See also <i>Throughput</i> .
BB_Credit	Buffer-to-buffer credit; the number of frames that can be transmitted to a directly connected recipient or within an arbitrated loop. Determined by the number of receive buffers available. See also <i>Buffer-to-buffer Flow Control</i> , <i>EE_Credit</i> .
Beginning Running Disparity	The disparity at the transmitter or receiver when the special character associated with an ordered set is encoded or decoded. See also <i>Disparity</i> .
BER	Bit Error Rate; the rate at which bits are expected to be received in error. Expressed as the ratio of error bits to total bits transmitted. See also <i>Error</i> .
Block	As applies to fibre channel, upper-level application data that is transferred in a single sequence.

Broadcast	The transmission of data from a single source to all devices in the fabric, regardless of zoning. See also <i>Multicast</i> , <i>Unicast</i> .
Brocade® Distributed Fabrics	The combined manual for the software products Brocade Extended Fabrics and Brocade Remote Switch (“Distributed Fabrics” is not a software product). See also <i>Brocade Extended Fabrics</i> , <i>Brocade Remote Switch</i> .
Brocade Extended Fabrics™	A Brocade product that runs on Fabric OS and allows creation of a fibre channel fabric interconnected over distances of up to 100 kilometers. See also <i>Brocade Distributed Fabrics</i> .
Brocade Fabric Assist™	A Brocade feature that enables private and public hosts to access public targets anywhere on the fabric, provided they are in the same Fabric Assist zone. This feature is available only when both Brocade QuickLoop and Brocade Zoning are installed on the switch.
Brocade Fabric Manager™	A Brocade product that works in conjunction with Web Tools to provide a graphical user interface for managing switch groups (such as the SilkWorm 6400) as a single unit, instead of as separate switches. Fabric Manager is installed on and run from a computer workstation.
Brocade Fabric Watch™	A Brocade product that runs on Fabric OS and allows monitoring and configuration of fabric and switch elements.
Brocade ISL Trunking™	A Brocade feature that enables distribution of traffic over the combined bandwidth of up to four ISLs (between adjacent switches), while preserving in-order delivery. A set of trunked ISLs is called a trunking group; each port employed in a trunking group is called a trunking port. See also <i>Master Port</i> .
Brocade MIB Reference Manual	A reference manual that provides descriptions and information about the different Brocade MIB types.
Brocade Performance Monitoring™	A Brocade product that provides error and performance information to the administrator and end user for use in storage management.
Brocade QuickLoop™	A Brocade product that makes it possible to allow private devices within loops to communicate with public and private devices across the fabric through the creation of a larger loop. May also refer to the arbitrated loop created using this software. A QuickLoop can contain a number of devices or looplets; all devices in the same QuickLoop share a single AL_PA space.
Brocade Remote Switch™	A Brocade product that runs on Fabric OS and enables two SilkWorm 2000 fabric switches to be connected over an ATM (asynchronous transfer mode) connection. This requires a compatible fibre channel to ATM gateway, and can have a distance of up to 10 kilometers between each switch and the respective ATM gateway. See also <i>Brocade Distributed Fabrics</i> .
Brocade SES™	A Brocade product that runs on Fabric OS and allows monitoring, configuring, and maintenance of the Brocade SilkWorm Switch family using SCSI-3 Enclosure Services.
Brocade Web Tools™	A Brocade product that runs on Fabric OS and provides a graphical interface to allow monitoring and management of individual switches or entire fabrics from a standard workstation.

Brocade Zoning™	A Brocade product that runs on Fabric OS and allows partitioning of the fabric into logical groupings of devices. Devices in a zone can only access and be accessed by devices in the same zone. See also <i>Zone</i> .
Buffer-to-buffer Flow Control	Management of the frame transmission rate in either a point-to-point topology or in an arbitrated loop. See also <i>BB_Credit</i> .
Cascade	Two or more interconnected fibre channel switches. SilkWorm 2000 switches can be cascaded up to 239 switches, with a recommended maximum of seven interswitch links (no path longer than eight switches). See also <i>Fabric, ISL</i> .
Chassis	The metal frame in which the switch and switch components are mounted.
Circuit	An established communication path between two ports. Consists of two virtual circuits capable of transmitting in opposite directions. See also <i>Link</i> .
Class 1	Service that provides a dedicated connection between two ports (also called connection-oriented service), with notification of delivery or nondelivery.
Class 2	Service that provides multiplex and connectionless frame switching service between two ports, with notification of delivery or nondelivery.
Class 3	Service that provides a connectionless frame switching service between two ports, without notification of delivery or nondelivery of data. Can also be used to provide a multicast connection between the originator and recipients, with notification of delivery or nondelivery.
Class F	Connectionless service for control traffic between switches, with notification of delivery or nondelivery of data between the E_Ports.
Class of Service	A specified set of delivery characteristics and attributes for frame delivery.
Comma	A unique pattern (either 1100000 or 0011111) used in 8B/10B encoding to specify character alignment within a data stream. See also <i>K28.5</i> .
Community (SNMP)	A relationship between a group of SNMP managers and an SNMP agent, in which authentication, access control, and proxy characteristics are defined. See also <i>SNMP</i> .
CRC	Cyclic Redundancy Check; a check for transmission errors included in every data frame.
Credit	As applies to fibre channel, the number of receive buffers available for transmission of frames between ports. See also <i>BB_Credit, EE_Credit</i> .
Cut-through	A switching technique that allows the route for a frame to be selected as soon as the destination address is received. See also <i>Route</i> .
Data Word	Type of transmission word that occurs within frames. The frame header, data field, and CRC all consist of data words. See also <i>Frame, Ordered set, Transmission Word</i> .
Defined Zone Configuration	The set of all zone objects defined in the fabric. May include multiple zone configurations. See also <i>Enabled Configuration, Zone Configuration</i> .
Disparity	The relationship of ones and zeros in an encoded character. “Neutral disparity” means an equal number of each, “positive disparity” means a majority of ones, and “negative disparity” means a majority of zeros.
DLS	Dynamic Load Sharing; dynamic distribution of traffic over available paths. Allows for recomputing of routes when an Fx_Port or E_Port changes status.

Domain ID	As applies to SilkWorm switches, a unique number between 1 and 239 that identifies the switch to the fabric and is used in routing frames. Usually automatically assigned by the switch, but can be manually assigned.
E_D_TOV	Error Detect Time-out Value; the minimum amount of time a target waits for a sequence to complete before initiating recovery. Can also be defined as the maximum time allowed for a round-trip transmission before an error condition is declared. See also <i>R_A_TOV</i> , <i>RR_TOV</i> .
E_Port	Expansion Port; a type of switch port that can be connected to an E_Port on another switch to create an ISL. See also <i>ISL</i> .
EE_Credit	End-to-end Credit; the number of receive buffers allocated by a recipient port to an originating port. Used by Class 1 and 2 services to manage the exchange of frames across the fabric between source and destination. See also <i>End-to-end Flow Control</i> , <i>BB_Credit</i> .
EIA Rack	A storage rack that meets the standards set by the Electronics Industry Association.
Enabled Zone Configuration	The currently enabled configuration of zones. Only one configuration can be enabled at a time. See also <i>Defined Configuration</i> , <i>Zone Configuration</i> .
End-to-end Flow Control	Governs flow of class 1 and 2 frames between N_Ports. See also <i>EE_Credit</i> .
Error	As applies to fibre channel, a missing or corrupted frame, time-out, loss of synchronization, or loss of signal (link errors). See also <i>Loop Failure</i> .
Exchange	The highest level fibre channel mechanism used for communication between N_Ports. Composed of one or more related sequences, and can work in either one or both directions.
F_Port	Fabric Port; a port that is able to transmit under fabric protocol and interface over links. Can be used to connect an N_Port to a switch. See also <i>FL_Port</i> , <i>Fx_Port</i> .
Fabric	A fibre channel network containing two or more switches in addition to hosts and devices. May also be referred to as a switched fabric. See also <i>Topology</i> , <i>SAN</i> , <i>Cascade</i> .
Fabric Name	The unique identifier assigned to a fabric and communicated during login and port discovery.
Fabric OS™	The proprietary operating system on Brocade switches.
FC-AL-3	The Fibre Channel Arbitrated Loop standard defined by ANSI. Defined on top of the FC-PH standards.
FC-FLA	The Fibre Channel Fabric Loop Attach standard defined by ANSI.
FCP	Fibre Channel Protocol; mapping of protocols onto the fibre channel standard protocols. For example, SCSI FCP maps SCSI-3 onto fibre channel.
FC-PH-1, 2, 3	The Fibre Channel Physical and Signalling Interface standards defined by ANSI.
FC-PI	The Fibre Channel Physical Interface standard defined by ANSI.
FC-PLDA	The Fibre Channel Private Loop Direct Attach standard defined by ANSI. Applies to the operation of peripheral devices on a private loop.

FC-SW-2	The second generation of the Fibre Channel Switch Fabric standard defined by ANSI. Specifies tools and algorithms for the interconnection and initialization of fibre channel switches in order to create a multi-switch fibre channel fabric.
Fibre Channel Transport	A protocol service that supports communication between fibre channel service providers. See also <i>FSP</i> .
Fill Word	An IDLE or ARB ordered set that is transmitted during breaks between data frames to keep the fibre channel link active.
Firmware	The basic operating system provided with the hardware.
FL_Port	Fabric Loop Port; a port that is able to transmit under fabric protocol and also has arbitrated loop capabilities. Can be used to connect an NL_Port to a switch. See also <i>F_Port</i> , <i>Fx_Port</i> .
FLOGI	Fabric Login; the process by which an N_Port determines whether a fabric is present, and if so, exchanges service parameters with it. See also <i>PLOGI</i> .
Frame	The fibre channel structure used to transmit data between ports. Consists of a start-of-frame delimiter, header, any optional headers, the data payload, a cyclic redundancy check (CRC), and an end-of-frame delimiter. There are two types of frames: Link control frames (transmission acknowledgements, etc.) and data frames.
FRU	Field-replaceable Unit; a component that can be replaced on site.
FS	Fibre Channel Service; a service that is defined by fibre channel standards and exists at a well-known address. For example, the Simple Name Server is a fibre channel service. See also <i>FSP</i> .
FSP	Fibre Channel Service Protocol; the common protocol for all fabric services, transparent to the fabric type or topology. See also <i>FS</i> .
FSPF	Fabric Shortest Path First; Brocade's routing protocol for fibre channel switches.
Full-duplex	A mode of communication that allows the same port to simultaneously transmit and receive frames. See also <i>Half-duplex</i> .
Fx_Port	A fabric port that can operate as either an F_Port or FL_Port. See also <i>F_Port</i> , <i>FL_Port</i> .
G_Port	Generic Port; a port that can operate as either an E_Port or F_Port. A port is defined as a G_Port when it is not yet connected or has not yet assumed a specific function in the fabric.
GBIC	Gigabit Interface Converter; a removable serial transceiver module that allows gigabaud physical-level transport for fibre channel and gigabit ethernet.
Gbps	Gigabits per second (1,062,500,000 bits/second).
GBps	GigaBytes per second (1,062,500,000 bytes/second).
Half-duplex	A mode of communication that allows a port to either transmit or receive frames at any time, but not simultaneously (with the exception of link control frames, which can be transmitted at any time). See also <i>Full-duplex</i> .
Hard Address	The AL_PA that an NL_Port attempts to acquire during loop initialization.
HBA	Host Bus Adapter; the interface card between a server or workstation bus and the fibre channel network.

Hub	A fibre channel wiring concentrator that collapses a loop topology into a physical star topology. Nodes are automatically added to the loop when active and removed when inactive.
Idle	Continuous transmission of an ordered set over a fibre channel link when no data is being transmitted, to keep the link active and maintain bit, byte, and word synchronization.
Initiator	A server or workstation on a fibre channel network that initiates communications with storage devices. See also <i>Target</i> .
Integrated Fabric	The fabric created by a SilkWorm 6400, consisting of six SilkWorm 2250 switches cabled together and configured to handle traffic as a seamless group.
IOD	In-order Delivery; a parameter that, when set, guarantees that frames are either delivered in order or dropped.
ISL	Interswitch Link; a fibre channel link from the E_Port of one switch to the E_Port of another. See also <i>E_Port</i> , <i>Cascade</i> , <i>Brocade ISL Trunking</i> .
Isolated E_Port	An E_Port that is online but not operational due to overlapping domain IDs or nonidentical parameters (such as E_D_TOVs). See also <i>E_Port</i> .
IU	Information Unit; a set of information as defined by either upper-level process protocol definition or upper-level protocol mapping.
JBOD	Just a Bunch Of Disks; indicates a number of disks connected in a single chassis to one or more controllers. See also <i>RAID</i> .
K28.5	A special 10-bit character used to indicate the beginning of a transmission word that performs fibre channel control and signaling functions. The first seven bits of the character are the comma pattern. See also <i>Comma</i> .
L_Port	Loop Port; a node port (NL_Port) or fabric port (FL_Port) that has arbitrated loop capabilities. An L_Port can be in one of two modes: <ul style="list-style-type: none"> • <i>Fabric mode</i> Connected to a port that is not loop capable, and using fabric protocol. • <i>Loop mode</i> In an arbitrated loop and using loop protocol. An L_Port in loop mode can also be in participating mode or non-participating mode. See also <i>Non-participating Mode</i> , <i>Participating Mode</i> .
Latency	The period of time required to transmit a frame, from the time it is sent until it arrives.
Link	As applies to fibre channel, a physical connection between two ports, consisting of both transmit and receive fibres. See also <i>Circuit</i> .
Link Services	A protocol for link-related actions.
LIP	Loop Initialization Primitive; the signal used to begin initialization in a loop. Indicates either loop failure or resetting of a node.
LM_TOV	Loop Master Time-out Value; the minimum time that the loop master waits for a loop initialization sequence to return.
Loop Failure	Loss of signal within a loop for any period of time, or loss of synchronization for longer than the time-out value.
Loop Initialization	The logical procedure used by an L_Port to discover its environment. Can be used to assign AL_PA addresses, detect loop failure, or reset a node.

Loop_ID	A hex value representing one of the 127 possible AL_PA values in an arbitrated loop.
Looplet	A set of devices connected in a loop to a port that is a member of another loop.
LPSM	Loop Port State Machine; the logical entity that performs arbitrated loop protocols and defines the behavior of L_Ports when they require access to an arbitrated loop.
LWL	Long Wavelength; a type of fiber optic cabling that is based on 1300nm lasers and supports link speeds of 1.0625 Gbps. May also refer to the type of GBIC or SFP. See also <i>SWL</i> .
Master Port	As relates to trunking, the port that determines the routing paths for all traffic flowing through the trunking group. One of the ports in the first ISL in the trunking group is designated as the master port for that group. See also <i>Brocade ISL Trunking</i> .
MIB	Management Information Base; an SNMP structure to help with device management, providing configuration and device information.
Multicast	The transmission of data from a single source to multiple specified N_Ports (as opposed to all the ports on the network). See also <i>Broadcast, Unicast</i> .
Multimode	A fiber optic cabling specification that allows up to 500 meters between devices.
N_Port	Node Port; a port on a node that can connect to a fibre channel port or to another N_Port in a point-to-point connection. See also <i>NL_Port, Nx_Port</i> .
Name Server	Frequently used to indicate Simple Name Server. See also <i>SNS</i> .
NL_Port	Node Loop Port; a node port that has arbitrated loop capabilities. Used to connect an equipment port to the fabric in a loop configuration through an FL_Port. See also <i>N_Port, Nx_Port</i> .
Node	A fibre channel device that contains an N_Port or NL_Port.
Node Name	The unique identifier for a node, communicated during login and port discovery.
Non-participating Mode	A mode in which an L_Port in a loop is inactive and cannot arbitrate or send frames, but can retransmit any received transmissions. This mode is entered if there are more than 127 devices in a loop and an AL_PA cannot be acquired. See also <i>L_Port, Participating Mode</i> .
Nx_Port	A node port that can operate as either an N_Port or NL_Port.
Ordered Set	A transmission word that uses 8B/10B mapping and begins with the K28.5 character. Ordered sets occur outside of frames, and include the following items: <ul style="list-style-type: none"> • <i>Frame delimiters</i> Mark frame boundaries and describe frame contents. • <i>Primitive signals</i> Indicate events. • <i>Primitive sequences</i> Indicate or initiate port states. Ordered sets are used to differentiate fibre channel control information from data frames and to manage the transport of frames.
Packet	A set of information transmitted across a network. See also <i>Frame</i> .
Participating Mode	A mode in which an L_Port in a loop has a valid AL_PA and can arbitrate, send frames, and retransmit received transmissions. See also <i>L_Port, Non-participating Mode</i> .

Path Selection	The selection of a transmission path through the fabric. Brocade switches use the FSPF protocol.
Phantom Address	An AL_PA value that is assigned to an device that is not physically in the loop. Also known as phantom AL_PA.
Phantom Device	A device that is not physically in an arbitrated loop but is logically included through the use of a phantom address.
PLOGI	Port Login; the port-to-port login process by which initiators establish sessions with targets. See also <i>FLOGI</i> .
Point-to-point	A fibre channel topology that employs direct links between each pair of communicating entities. See also <i>Topology</i> .
Port_Name	The unique identifier assigned to a fibre channel port. Communicated during login and port discovery.
POST	Power On Self-Test; a series of tests run by a switch after it is turned on.
Private NL_Port	An NL_Port that communicates only with other private NL_Ports in the same loop and does not log into the fabric.
Private Device	A device that supports arbitrated loop protocol and can interpret 8-bit addresses, but cannot log into the fabric.
Private Loop	An arbitrated loop that does not include a participating FL_Port.
Protocol	A defined method and a set of standards for communication.
Public NL_Port	An NL_Port that logs into the fabric, can function within either a public or a private loop, and can communicate with either private or public NL_Ports.
Public Device	A device that supports arbitrated loop protocol, can interpret 8-bit addresses, and can log into the fabric.
Public Loop	An arbitrated loop that includes a participating FL_Port, and may contain both public and private NL_Ports.
R_A_TOV	Resource Allocation Time-out Value; the maximum time a frame can be delayed in the fabric and still be delivered. See also <i>E_D_TOV</i> , <i>RR_TOV</i> .
RAID	Redundant Array of Independent Disks; a collection of disk drives that appear as a single volume to the server and are fault tolerant through mirroring or parity checking. See also <i>JBOD</i> .
Request Rate	The rate at which requests arrive at a servicing entity. See also <i>Service Rate</i> .
Route	As applies to a fabric, the communication path between two switches. May also apply to the specific path taken by an individual frame, from source to destination. See also <i>FSPF</i> .
Routing	The assignment of frames to specific switch ports, according to frame destination.
RR_TOV	Resource Recovery Time-out Value; the minimum time a target device in a loop waits after a LIP before logging out a SCSI initiator. See also <i>E_D_TOV</i> , <i>R_A_TOV</i> .
RSCN	Registered State Change Notification; a switch function that allows notification of fabric changes to be sent from the switch to specified nodes.
SAN	Storage Area Network; a network of systems and storage devices that communicate using fibre channel protocols. See also <i>Fabric</i> .

Sequence	A group of related frames transmitted in the same direction between two N_Ports.
Service Rate	The rate at which an entity can service requests. See also <i>Request Rate</i> .
SFP	Small Form Factor Pluggable; optical transceiver used to convert signals between optical fiber cables and switches.
SI	Sequence Initiative.
SilkWorm	The brand name for Brocade's family of switches
Single Mode	The fiber optic cabling standard that corresponds to distances of up to 10 km between devices.
SNMP	Simple Network Management Protocol. An internet management protocol that uses either IP for network-level functions and UDP for transport-level functions, or TCP/IP for both. Can be made available over other protocols, such as UDP/IP, because it does not rely on the underlying communication protocols. See also <i>Community (SNMP)</i> .
SNS	Simple Name Server; a switch service that stores names, addresses, and attributes for up to 15 minutes, and provides them as required to other devices in the fabric. SNS is defined by fibre channel standards and exists at a well-known address. May also be referred to as directory service. See also <i>FS</i> .
Switch	Hardware that routes frames according to fibre channel protocol and is controlled by software.
Switch Name	The arbitrary name assigned to a switch.
Switch Port	A port on a switch. Switch ports can be E_Ports, F_Ports, or FL_Ports.
SWL	Short Wavelength; a type of fiber optic cabling that is based on 850nm lasers and supports 1.0625 Gbps link speeds. May also refer to the type of GBIC or SFP. See also <i>LWL</i> .
Target	A storage device on a fibre channel network. See also <i>Initiator</i> .
Tenancy	The time from when a port wins arbitration in a loop until the same port returns to the monitoring state. Also referred to as loop tenancy.
Throughput	The rate of data flow achieved within a cable, link, or system. Usually measured in bps (bits per second). See also <i>Bandwidth</i> .
Topology	As applies to fibre channel, the configuration of the fibre channel network and the resulting communication paths allowed. There are three possible topologies: <ul style="list-style-type: none"> • Point to point - A direct link between two communication ports. • Switched fabric - Multiple N_Ports linked to a switch by F_Ports. • Arbitrated loop - Multiple NL_Ports connected in a loop.
Translative Mode	A mode in which private devices can communicate with public devices across the fabric.
Transmission Character	A 10-bit character encoded according to the rules of the 8B/10B algorithm.
Transmission Word	A group of four transmission characters.
Trap (SNMP)	The message sent by an SNMP agent to inform the SNMP management station of a critical error. See also <i>SNMP</i> .

Trunking	See <i>Brocade ISL Trunking</i> .
Tunneling	A technique for enabling two networks to communicate when the source and destination hosts are both on the same type of network, but are connected by a different type of network.
U_Port	Universal Port; a switch port that can operate as a G_Port, E_Port, F_Port, or FL_Port. A port is defined as a U_Port when it is not connected or has not yet assumed a specific function in the fabric.
UDP	User Datagram Protocol; a protocol that runs on top of IP and provides port multiplexing for upper-level protocols.
ULP	Upper-level Protocol; the protocol that runs on top of fibre channel. Typical upper-level protocols are SCSI, IP, HIPPI, and IPI.
ULP_TOV	Upper-level Time-out Value; the minimum time that a SCSI ULP process waits for SCSI status before initiating ULP recovery.
Unicast	The transmission of data from a single source to a single destination. See also <i>Broadcast, Multicast</i> .
Well-known Address	As pertaining to fibre channel, a logical address defined by the fibre channel standards as assigned to a specific function, and stored on the switch.
Workstation	A computer used to access and manage the fabric. May also be referred to as a management station or host.
WWN	Worldwide Name; an identifier that is unique worldwide. Each entity in a fabric has a separate WWN.
Zone	A set of devices and hosts attached to the same fabric and configured as being in the same zone. See also <i>Brocade Zoning</i> . Devices and hosts within the same zone have access permission to others in the zone, but are not visible to any outside the zone.
Zone Configuration	A specified set of zones. Enabling a configuration enables all zones in that configuration. See also <i>Defined Configuration, Enabled Configuration</i> .

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