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IBM @server BladeCenter™

Fibre Channel Switch Interoperability Guide



**IBM server BladeCenter™
Fibre Channel Switch
Interoperability Guide**

Version 4.0

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Introduction

The *IBM eServer BladeCenter Switch Interoperability Guide* provides the details needed to configure and deploy multi-vendor switched fabrics. Detailed switch configuration data and step-by-step configuration procedures are provided to merge the IBM eServer BladeCenter with Brocade, Cisco, CNT, McDATA, and QLogic Fibre Channel switched fabrics that comply with the second revision of the Fibre Channel switch standard (FC-SW-2).

The FC-SW-2 Standard

FC-SW-2 is an open standard for switch-to-switch communication, allowing end users to choose best-in-class products with the assurance that these products can be deployed in multi-vendor storage area networks (SANs). Fibre Channel switches complying with this standard communicate connectivity and configuration information, path selection, and routing, as well as management and event services using the same language. FC-SW-2 also provides standardized mechanisms for SAN management. These applications can configure, manage, and monitor multi-vendor Fibre Channel SANs from any particular point in the fabric.

The IBM eServer BladeCenter 2-port Fibre Channel Switch Module and QLogic 6-port Enterprise Fibre Channel Switch Module (hereinafter referred to as the IBM eServer BladeCenter switch modules), along with switches from Brocade, Cisco, CNT, McDATA, and QLogic, can communicate across three specified FC-SW-2 levels, enabling end-users to deploy products that best suit their needs.

Level 1 addresses switch connectivity and configuration by allowing Fibre Channel switches to interoperate at the link level and by enabling switches to be configured as part of physical and logical configurations (such as Zoning). Fabric Zones allow customers to partition their storage network based on application requirements and to create virtual private SANs within a larger SAN.

Level 2 defines path selection and routing, which create interoperability at the operational level. The fabric shortest path first (FSPF) selection process, which is a key element of FC-SW-2, allows paths to be set up between end devices using multi-switch fabrics. This enables customers to design and implement Fibre Channel configurations based on their individual requirements.

Level 3 specifies management and event services. These services allow Fibre Channel services to be implemented using a distributed model, increasing availability and scalability throughout the entire fabric. The Name Server and Management Server allow the physical and logical SAN topology to be discovered through upper-level SAN management applications, thereby facilitating resource management and capacity planning. Event services create the means for SAN administrators to be notified in case of configuration changes, allowing them to take appropriate action.

IBM TotalStorage Support

This guide is limited to stating vendor switch interoperability with IBM eServer BladeCenter switch modules (IBM eServer BladeCenter 2-port Fibre Channel Switch Module and QLogic 6-port Enterprise Fibre Channel Switch Module for IBM eServer BladeCenter) using the FC-SW-2 open standard for switch-to-switch communication. This guide is not intended to provide interoperability support statements for IBM TotalStorage or other Fibre Channel storage vendor products of SAN configurations.

For interoperability and technical support information for IBM TotalStorage products, please use the support and interoperability URLs for IBM or other vendor products listed below.

Contacting IBM eServer BladeCenter Support

For more information about merging the IBM eServer BladeCenter with other switched fabrics, please contact IBM customer service. Resources can be found at the following IBM Web sites:

IBM eServer BladeCenter

<http://www.ibm.com/servers/eserver/bladecenter/>

IBM Technical Support

<http://www.ibm.com/support/us/>

NOTE: If you are contacting IBM technical support concerning implementing multi-vendor switches, specify *machine type* as **BladeCenter** so that your questions can be routed to the appropriate support representative.

IBM eServer BladeCenter Literature

<http://www.pc.ibm.com/us/eserver/bladecenter/literature.html>

Other IBM TotalStorage Contacts

For information on specific IBM products, refer to the following resources:

IBM DS4000 (formerly FAStT) Storage Interoperability Matrix

<http://www-1.ibm.com/servers/storage/disk/ds4000/interop-matrix.html>

IBM Enterprise Storage Server (ESS) Interoperability Matrix

<http://www.storage.ibm.com/disk/ess/supserver.htm>

IBM TotalStorage Technical Support

<http://www.ssddom02storage.ibm.com/techsup/webnav.nsf/support/sanfcswitch>

IBM TotalStorage SAN Fibre Channel Switch 3534 Model F08

<http://www.ssddom02storage.ibm.com/techsup/webnav.nsf/support/3534f08>
<ftp://service.boulder.ibm.com/storage/san/3534f08/SM3534F08.pdf>

IBM TotalStorage SAN Fibre Channel Switch 2109 Model F16

<http://www.ssddom02storage.ibm.com/techsup/webnav.nsf/support/2109f16>
<ftp://service.boulder.ibm.com/storage/san/2109f16/SM2109F16.pdf>

IBM TotalStorage SAN Fibre Channel Switch 2109 Model F32

<http://www.ssddom02storage.ibm.com/techsup/webnav.nsf/support/2109f32>
<ftp://service.boulder.ibm.com/storage/san/2109f32/SM2109F32.pdf>

IBM TotalStorage SAN Fibre Channel Switch 2109 Model M12

<http://www.ssddom02storage.ibm.com/techsup/webnav.nsf/support/2109m12>
<ftp://service.boulder.ibm.com/storage/san/2109m12/SM2109M12.pdf>

Contacting Other Storage Vendors

Brocade SilkWorm Switches

<http://www.brocade.com/products/switches.jsp>

Brocade SilkWorm Directors

<http://www.brocade.com/products/directors.jsp>

Cisco MDS 9000 Family Multilayer Fabric Switch

Cisco MDS 9000 Family Multilayer Director

<http://www.cisco.com/go/ibm/storage>

CNT FC/9000 Enterprise Director

<http://www.cnt.com/partners/technology/ibm>

McDATA ES-3016 & ES-3032 Fabric Switches (IBM Models 2031-16 & 2031-32)

<http://www.ssddom02storage.ibm.com/techsup/webnav.nsf/support/es3000>
<ftp://service.boulder.ibm.com/storage/san/es3032/SMES3032.pdf>

McDATA Sphereon 3216 & 3232 Fabric Switches (IBM Models 2031-216 & 2031-232)

<http://www.ssddom02storage.ibm.com/techsup/webnav.nsf/support/es3232>
<ftp://service.boulder.ibm.com/storage/san/es3232/SMES3232.pdf>

McDATA 4500 Fabric Switch (IBM Model 2031-224)

<http://www.ssddom02storage.ibm.com/techsup/webnav.nsf/support/es4500>
<ftp://service.boulder.ibm.com/storage/san/es4500/SMES4500.pdf>

McDATA Intrepid 6064 Enterprise Fibre Channel Director 1 & 2 Gbit/sec (IBM Model 2032-064)

<http://www.ssddom02storage.ibm.com/techsup/webnav.nsf/support/ed6064>
<ftp://service.boulder.ibm.com/storage/san/ed6064/SMED6064.pdf>

McDATA Intrepid 6140 Director 2 Gbit/sec (IBM Model 2032-140)

<http://www.ssddom02storage.ibm.com/techsup/webnav.nsf/support/ed6140>
<ftp://service.boulder.ibm.com/storage/san/ed6140/SMED6140.pdf>

QLogic SANbox2 Switches Product Information

http://www.qlogic.com/products/fc_san_switchs.asp

QLogic SANbox2 Switches Product Support

http://www.qlogic.com/support/home_resources.asp?id=37

QLogic SANbox 5200 Switches Product Information
http://www.qlogic.com/products/fc_san_switchs.asp

QLogic SANbox 5000 Switches Product Information and Product Support
http://www.qlogic.com/support/product_resources.asp?id=540

Supported Switches

The following IBM eServer BladeCenter switch modules have been tested in the IBM eServer BladeCenter environment and comply with the FC-SW-2 standard.

IBM eServer BladeCenter Supported Switches

Switch Model*
IBM eServer BladeCenter 2-port Fibre Channel Switch Module
QLogic 6-port Enterprise Fibre Channel Switch Module for IBM eServer BladeCenter

Note

*For the current firmware versions, please see the *IBM eServer BladeCenter Fibre Channel Switch Interoperability Quick Reference Guide* located at <http://www.ibm.com/support>.

The IBM eServer BladeCenter switch modules have tested interoperable with the following switches from Brocade, Cisco, CNT, McDATA, and QLogic that comply with the FC-SW-2 standard. See the referenced page for detailed instructions on merging IBM eServer BladeCenter with these fabrics.

Brocade, Cisco, CNT, McDATA, and QLogic Supported Switches

Manufacturer	Switch Model ^a
Brocade (see page 11)	SilkWorm 3200/IBM 3534 F08 ^b
	SilkWorm 3250/IBM 2005 H08 ^b
	SilkWorm 3800/IBM 2109 F16 ^b
	SilkWorm 3850/IBM 2005 H16 ^b
	SilkWorm 3900/IBM 2109 F32 ^b
	SilkWorm 12000/IBM 2109 M12 ^b
Cisco (see page 117)	MDS 9120 Switch
	MDS 9140 Switch
	MDS 9216 Switch
	MDS 9509 Director
CNT (see page 153)	FC/9000 Switch

Brocade, Cisco, CNT, McDATA, and QLogic Supported Switches (Continued)

Manufacturer	Switch Model ^a
McDATA (see page 195)	ES-3016/IBM 2031-16 ES-3032/IBM 2031-32 Sphereon 3032/IBM 2031-216 Sphereon 3232/IBM 2031-232 Sphereon 4300/IBM 2034-212 Sphereon 4500/IBM 2031-224 Intrepid 6064 Director/IBM 2032-064 Intrepid 6140 Director/IBM 2032-140
QLogic (see page 291)	SANbox 5200 SANbox2-8 SANbox2-16 SANbox2-64

Notes

^aFor the current firmware versions, please see the *IBM eServer BladeCenter Fibre Channel Switch Interoperability Quick Reference Guide* located at <http://www.ibm.com/support>.

^bThe IBM 3534 F08, IBM 2005 H08, IBM 2109 F16, IBM 2005 H16, IBM 2109 F32, and IBM 2109 M12 are IBM TotalStorage SAN Switches.

How to Use this Guide

The *IBM eServer BladeCenter Switch Interoperability Guide* provides detailed switch configuration data and step-by-step configuration procedures for merging IBM eServer BladeCenter with Brocade, Cisco, CNT, McDATA, and QLogic Fibre Channel switched fabrics.

NOTE: Updated versions of this guide can be downloaded from the following IBM Web site:
<http://www.ibm.com/servers/eserver/bladecenter/>.

This section discusses:

- How the guide is organized ([see page 7](#))
- CLI documentation conventions ([see page 9](#))

How the Guide Is Organized

All chapters within the *IBM eServer BladeCenter Switch Interoperability Guide* are organized the same way. For a visual representation, [see page 8](#).

- **Configuration Considerations.** Details the configuration considerations, including features not supported by the vendor switches and IBM eServer BladeCenter switch modules.
- **Integration Checklist.** Lists the steps that must be completed to successfully merge the fabrics.
- **Supported Switches.** The supported switches for which this information applies.
- **Backing Up and Restoring the Current Configuration Settings.** The procedures for backing up and restoring the current switch configuration data.
- For the vendor switch and the IBM eServer BladeCenter switch module, this guide provides graphical user interface (GUI) and command line interface (CLI) information, as appropriate, for the following:
 - **Domain ID Configuration**
 - **Timeout Values**
 - **Principal Switch Configuration**
 - **Zone Configuration**
 - **Vendor and IBM eServer BladeCenter Specific Configuration**
 - **Operating Mode Configuration**
- **Successful Integration Checklist.** Lists the steps to be taken after the E_port connection has been established and the fabric has had time to update.

In addition, refer to the **Glossary** ([see page 335](#)) for terms used in this guide and to the **Index** ([see page 339](#)) for quick reference to key topics.

Visual Representation of How the Chapters Are Organized

Configuration Considerations

QLLogic SANBox 5000 Series and SANbox2 Series Switches

Configuration Considerations

There are no QLLogic configuration considerations. No limitations exist when merging QLLogic and IBM BladeCenter fabrics; all features are fully supported and comply with industry standards.

IBM BladeCenter configuration considerations are as follows:

- If you will be implementing the I/O stream guard feature, please contact your IBM technical support representative prior to configuring. Additional configuration procedures may be required.
- Contact IBM Technical Support to obtain the document, *IBM eServer BladeCenter Remote Boot*. If you are planning to use the boot form SAN functionality.

Integration Checklist

The following steps must be completed to successfully merge QLLogic and IBM BladeCenter fabrics. The remainder of this section provides detailed instructions and examples.

ATTENTION:

- Back up the current switch configuration data prior to performing the following steps so that the configuration is available if something goes wrong (see the first step for details).
- Disruptions in the fabric can occur as a result of performing the following steps. Therefore, it is recommended that these changes be done during down time or off-peak hours.

✓ Back up the current switch configuration data (see *Backing Up and Restoring the Current Configuration Settings* on page 308).

✓ Verify that the correct version of switch firmware is installed on each switch (see *Supported Switches* on page 308).

✓ Ensure that each switch has a unique Domain ID (see *Domain ID Configuration* on page 310).

✓ Set all switches to the appropriate Timeout values (see *Timeout Values* on page 322).

✓ Ensure that all Zone sets and Zone names are unique and conform to ANSI T11 standards (see *Zone Set Names* on page 328).

✓ Verify that the fabrics have successfully merged (see *Successful Integration Checklist* on page 347).

✓ Contact IBM Technical Support to obtain the document, *IBM eServer BladeCenter Remote Boot*. If you are planning to use the boot form SAN functionality.

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Integration Checklist

Supported Switches

QLLogic SANBox 5000 Series and SANbox2 Series Switches
Supported Switches

The following IBM BladeCenter switch modules have been tested in the IBM BladeCenter environment and comply with the FC-SW-2 standard. They have tested interoperability with the following switches from QLLogic that comply with the FC-SW-2 standard.

IBM BladeCenter and QLLogic Supported Switches

Manufacturer	Switch Model
IBM BladeCenter	IBM eServer BladeCenter 2-port Fibre Channel Switch Module
QLLogic	QLLogic Export Enterprise Fibre Channel Switch Module for IBM eServer BladeCenter
	SANbox 5000
	SANbox2
	SANbox2-8
	SANbox2-16
	SANbox2-64

Note:
For the current firmware versions, please see the *IBM BladeCenter Fibre Channel Switch Interoperability Quick Reference Guide* located at <http://www.ibm.com/ibm/qllogic>.

The following figures illustrate a QLLogic Fibre Channel fabric prior to and after merging with an IBM BladeCenter.

QLLogic Fibre Channel Fabric Prior to Merging with the IBM BladeCenter

QLLogic Fibre Channel Fabric with the IBM BladeCenter

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Backing Up and Restoring the Current Configuration Settings

QLLogic SANBox 5000 Series and SANbox2 Series Switches
Backing Up and Restoring the Current Configuration Settings

Backing Up and Restoring the Current Configuration Settings

Back up the current QLLogic switch configuration data prior to following the steps to merge QLLogic and IBM BladeCenter fabrics so that the configuration can be restored if something goes wrong.

NOTE: For additional information, refer to the documentation provided with the switch.

This backup and restore process uses the SANbox Manager function. Note the following:

- The archive file can be used for restoring the configuration on the same switch or a replacement switch, and as a template for configuring new switches to add to a fabric.
- The switch archive must be compatible with the switch to be restored. For example, you cannot restore a SANbox2-8 switch with a SANbox2-16 archive.

Backup Procedure

Do the following to create an XML archive file containing the QLLogic configuration settings:

- Open the Switch menu and select **Archive**.
- In the Save window, enter a file name.
- Click the **Save** button.

Restore Procedure

If you need to restore the QLLogic switch settings, do the following using the XML archive file:

- Log into the fabric through the switch you want to restore. You cannot restore a switch over an inter-switch link (ISL).
- Open the Switch menu and select **Restore**.
- In the Restore window, enter the archive file name or browse for the file.
- Click the **Restore** button.

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Configuration Sections

Vendor GUI

Vendor CLI

IBM eServer BladeCenter GUI

IBM eServer BladeCenter CLI

Successful Integration Checklist

QLLogic Specific Configuration
Not applicable.

IBM BladeCenter Specific Configuration
Not applicable.

Operating Mode Configuration
Not applicable.

Successful Integration Checklist

Perform the following steps after the E-port connection has been established and the fabric has had time to update. If everything verifies, the QLLogic and IBM BladeCenter fabrics have successfully merged.

- Compare and verify that all Zoning information has been propagated on all switches.
- Verify that the correct Zone Set is activated.
- Compare and verify that all devices are in the Name Server of each switch.
- Verify that all initiators continue to detect and have access to all targets that existed prior to the fabric merger.

After everything is verified, your fabric has merged successfully and no additional steps need to be taken. If any of the above tasks did not complete successfully, contact IBM support.

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CLI Documentation Conventions

The following is a sample CLI. Note the following:

- Items in brackets (such as [Online]) indicate the default value.
- Items in **bold** (such as **set config switch**) indicate the value to be entered or range of values that can be entered.
- Login. As each line displays, enter the value or accept the default value. Then press **ENTER**.

```
Login: USERID
Password: xxxxxxxx
Switchblade2: admin> admin start
Switchblade2 (admin): admin> config edit
    The config named default is being edited.
Switchblade2 (admin-config): admin> set config switch
    A list of attributes with formatting and current values will follow.
    Enter a new value or simply press the ENTER key to accept the current
    value. If you wish to terminate this process before reaching the end of
    the list press 'q' or 'Q' and the ENTER key to do so.
    AdminState (1=Online, 2=Offline, 3=Diagnostics) [Online]
    BroadcastEnabled (True / False) [True]
    InbandEnabled (True / False) [True]
    FdmiEnabled (True / False) [True]
    FdmiEntries (decimal value, 0-1000) [1000]
    DefaultDomainID (decimal value, 1-239) [1] 124
    DomainIDLock (True / False) [False] true
    SymbolicName (string, max=32 chars) [Switchblade2]
    R_A_TOV (decimal value, 100-100000 msec) [10000]
    E_D_TOV (decimal value, 10-20000 msec) [2000]
    PrincipalPriority (decimal value, 1-255) [254]
    ConfigDescription (string, max=64 chars) [Qlogic 6-port Enterprise
    Switch Module for IBM eServer BladeCenter]
    FC-SW-2 Compliant (True / False) [True]
    Finished configuring attributes.
    This configuration must be saved (see config save command) and activated
    (see config activate command) before it can take effect.
    To discard this configuration use the config cancel command.
```

```
Switchblade2 (admin-config): admin> config save  
    The config named default has been saved.  
Switchblade2 (admin): admin> config activate  
    The currently active configuration will be activated.  
    Please confirm (y/n): [n] y  
Switchblade2 (admin): admin> admin end
```

Merging IBM eServer BladeCenter and Brocade Fabrics

The following IBM eServer BladeCenter switch modules have been tested in the IBM eServer BladeCenter environment and comply with the FC-SW-2 standard. They have tested interoperable with the following switches from Brocade that comply with the FC-SW-2 standard.

IBM eServer BladeCenter and Brocade Supported Switches

Manufacturer	Switch Model^a
IBM eServer BladeCenter	IBM eServer BladeCenter 2-port Fibre Channel Switch Module QLogic 6-port Enterprise Fibre Channel Switch Module for IBM eServer BladeCenter
Brocade	SilkWorm 3200/IBM 3534 F08 ^b SilkWorm 3250/IBM 2005 H08 ^b SilkWorm 3800/IBM 2109 F16 ^b SilkWorm 3850/IBM 2005 H16 ^b SilkWorm 3900/IBM 2109 F32 ^b SilkWorm 12000/IBM 2109 M12 ^b

Notes

^aFor the current firmware versions, please see the *IBM eServer BladeCenter Fibre Channel Switch Interoperability Quick Reference Guide* located at <http://www.ibm.com/support>.

^bThe IBM 3534 F08, IBM 2005 H08, IBM 2109 F16, IBM 2005 H16, IBM 2109 F32, and IBM 2109 M12 are IBM TotalStorage SAN Switches.

The following chapters provide detailed information about merging Brocade and IBM eServer BladeCenter fabrics:

- **Brocade SilkWorm Switches / IBM TotalStorage SAN Switches (8-Port and 16-Port)** ([see page 13](#))
- **Brocade SilkWorm Switches / IBM TotalStorage SAN Switches (32-Port and 64-Port)** ([see page 59](#))

Brocade SilkWorm Switches / IBM TotalStorage SAN Switches (8-Port and 16-Port)

Configuration Considerations

Brocade configuration considerations are as follows:

- When merging Brocade and IBM eServer BladeCenter fabrics, be sure to enable Interoperability mode on all Brocade switches in the fabric. Brocade switches that are not in Interoperability mode are unable to communicate with IBM eServer BladeCenter FC-SW-2 fabrics and Brocade fabrics in proprietary mode.
- Existing Brocade switches retain the following features that are available once the IBM eServer BladeCenter switch module is merged into a heterogeneous fabric. The features will function on Brocade switches that are in Interoperability mode:
 - **Trunking.** Operates on all Brocade switches configured with this feature. Additionally, traffic submitted to and from a IBM eServer BladeCenter switch module-attached device (initiator/target) can pass through Brocade Trunked ISL ports.
 - **Aliasing.** Operates on all Brocade switches configured with this feature. Can only be managed by the originating switch vendor's management utility or CLI. Aliased names do not propagate between vendors' management utilities, but when an Alias is created and entered into a zone, the WWPNs that were in the Alias propagate correctly.
- To support zoning with an IBM eServer BladeCenter switch module and the Brocade SilkWorm 3200/IBM TotalStorage SAN Switch H08, you must purchase and enable a fabric zoning license from Brocade.
- Brocade proprietary features that may not function in multi-vendor fabrics include:
 - Brocade QuickLoop
 - Brocade Fabric Assist
 - Brocade Remote Switch
 - Brocade Extended Fabric
 - Brocade Advanced Performance Monitor
 - Brocade Secure Fabric OS
 - Brocade Fabric Services
 - Management Server
 - Platform Support
 - Virtual Channels
 - Broadcast Zones
- When merging Brocade and IBM eServer BladeCenter fabrics, a maximum of 31 switches can be configured.

- When forming an ISL between these larger port Brocade switches and another vendor in the Interoperability mode, Brocade switches no longer have default zones. Therefore, the attached switches—without extended addressing—cannot adequately address the higher Brocade switch ports without Name Server propagation. To enable upper port connectivity, follow these steps:
 1. Establish the ISL between switches with a port lower than 16.
 2. Apply any required zones in ports lower than 16.
 3. After applying zones in the lower numbered ports, the devices in port greater than 16 should be visible for zoning or establishing an ISL.
- When zones are merged upon connecting an IBM eServer BladeCenter to any Brocade fabric operating in interopmode or when zones are modified using the IBM eServer BladeCenter GUI after the connection is made, Brocade's Web Tools do not display the zones. To verify that a successful zone merge has occurred, use the Brocade CLI `zonestow` command.
- It is recommended that you use Brocade's Web Tools or the Brocade CLI to create and manage zones with an active zoneset that contains 450 or more zone members. If you are using the IBM eServer BladeCenter GUI or IBM eServer BladeCenter CLI, note the following:
 - If there is an active zoneset on the IBM eServer BladeCenter switch module that contains 450 or more zone members, the Brocade switches and IBM eServer BladeCenter switch modules will not connect.
 - If the Brocade and IBM eServer BladeCenter fabrics are connected and you create a zoneset on the IBM eServer BladeCenter switch module that contains 450 or more zone members, the zoneset will not activate when connected to the Brocade switch.

IBM eServer BladeCenter configuration considerations are as follows:

- If you will be implementing the I/O stream guard feature, please contact your IBM technical support representative prior to configuring. Additional configuration procedures may be required.
- Contact IBM Technical Support to obtain the document, *IBM eServer BladeCenter Remote Boot*, if you are planning to use the boot form SAN functionality.

Integration Checklist

The following steps must be completed to successfully merge Brocade and IBM eServer BladeCenter fabrics. The remainder of this section provides detailed instructions and examples.

ATTENTION!!

- Back up the current switch configuration data prior to performing the following steps so that the configuration is available if something goes wrong (see the first step for details).
 - Disruptions in the fabric can occur as a result of performing the following steps. Therefore, it is recommended that these changes be done during down time or off-peak hours.
-
- ✓ Back up the current switch configuration data (see [“Backing Up and Restoring the Current Configuration Settings” on page 17](#)).
 - ✓ Verify that the correct version of switch firmware is installed on each switch (see [“Supported Switches” on page 16](#)).
 - ✓ Ensure that each switch has a unique Domain ID and that it falls within the proper range (see [“Domain ID Configuration” on page 19](#)).
 - ✓ Set all switches to the appropriate timeout values (see [“Timeout Values” on page 28](#)).
 - ✓ Ensure that all Zone set and Zone names are unique and conform to ANSI T11 standards (see [“Active Zone Set Names” on page 43](#)).
 - ✓ Ensure that all zone members are specified by WWPN (see [“Zone Types” on page 50](#)).
 - ✓ Ensure that Brocade’s Platform Management Server is disabled (see [“Brocade Specific Configuration” on page 56](#)).
 - ✓ Ensure that all Brocade switches are configured for Interoperability mode (see [“Operating Mode Configuration” on page 57](#)).
 - ✓ Verify that the fabrics have successfully merged (see [“Successful Integration Checklist” on page 58](#)).
 - ✓ Contact IBM Technical Support to obtain the document, *IBM eServer BladeCenter Remote Boot*, if you are planning to use the boot form SAN functionality.

Supported Switches

The following IBM eServer BladeCenter switch modules have been tested in the IBM eServer BladeCenter environment and comply with the FC-SW-2 standard. They have tested interoperable with the following switches from Brocade that comply with the FC-SW-2 standard.

IBM eServer BladeCenter and Brocade Supported Switches

Manufacturer	Switch Model ^a
IBM eServer BladeCenter	IBM eServer BladeCenter 2-port Fibre Channel Switch Module QLogic 6-port Enterprise Fibre Channel Switch Module for IBM eServer BladeCenter
Brocade	SilkWorm 3200/IBM 3534 F08 ^b SilkWorm 3250/IBM 2005 H08 ^b SilkWorm 3800/IBM 2109 F16 ^b SilkWorm 3850/IBM 2005 H16 ^b

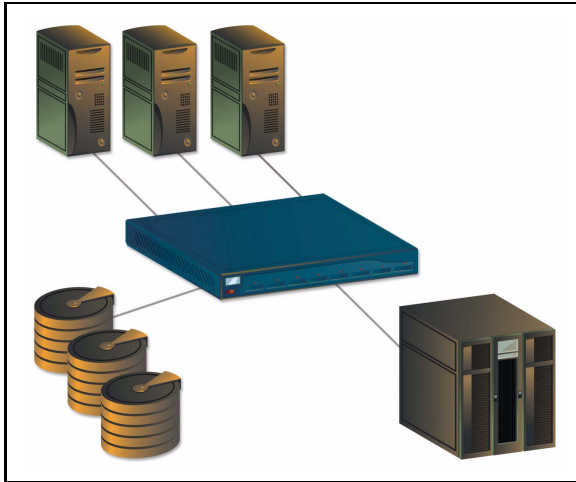
Notes

^aFor the current firmware versions, please see the *IBM eServer BladeCenter Fibre Channel Switch Interoperability Quick Reference Guide* located at <http://www.ibm.com/support>.

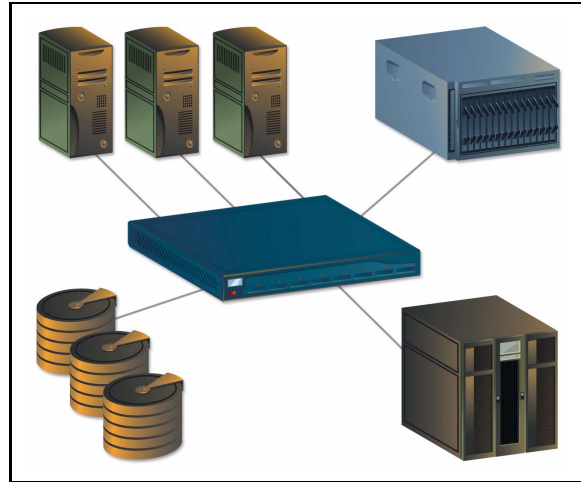
^bThe IBM 3534 F08, IBM 2005 H08, IBM 2109 F16, and IBM 2005 H16 are IBM TotalStorage SAN Switches.

ATTENTION!! When updating Brocade firmware, the switch may default to a proprietary operating mode. Therefore, after a firmware update, verify that the switch is still set to Interoperability mode (see “Operating Mode Configuration” on page 57).

The following figures illustrate a Brocade Fibre Channel fabric prior to and after merging with an IBM eServer BladeCenter.



Brocade Fibre Channel Fabric Prior to Merging with the IBM eServer BladeCenter



Brocade Fibre Channel Fabric with the IBM eServer BladeCenter

Backing Up and Restoring the Current Configuration Settings

Back up the current Brocade switch configuration data prior to following the steps to merge Brocade and IBM eServer BladeCenter fabrics so that the configuration can be restored if something goes wrong.

NOTE: For additional information, refer to the documentation provided with the switch.

Backup Procedure

Do the following to create a software copy backup of the switch configuration.

NOTE: This procedure requires access to an FTP server for Fabric OS 4.x, and an FTP or RSHD server for Fabric OS 3.x.

1. Verify that the FTP (or RSHD, as appropriate) service is running on the host workstation.
2. Log into the switch as the admin user.
3. Enter the configupload command.
4. Provide the information requested at the prompts.

For example:

```
switch:admin> configupload  
Server Name or IP Address [host]: 192.168.15.42  
User Name [none]: user21  
File Name [config.txt]: config-switch.txt  
Password: xxxxxxx  
upload complete  
switch:admin>
```

Restore Procedure

If you need to restore the Brocade configuration settings that you backed up, do the following:

ATTENTION!! This procedure requires a reboot of the switch.

NOTE: This procedure requires access to an FTP server for Fabric OS 4.x, and an FTP or RSHD server for Fabric OS 3.x.

1. Verify that the FTP (or RSHD, as appropriate) service is running on the host workstation.
2. Log into the switch as the admin user.
3. Shut down the switch by entering the **switchdisable** command.
4. Enter the **configdownload** command.
5. Provide the information requested at the prompts.
6. Reboot the switch by entering the **reboot** command:

For example:

```
switch:admin> configdownload  
Server Name or IP Address [host]: 192.168.15.42  
User Name [None]: user21  
File Name [config.txt]: config-file.txt  
Password: xxxxxxx  
download complete  
switch:admin>  
switch:admin> reboot
```

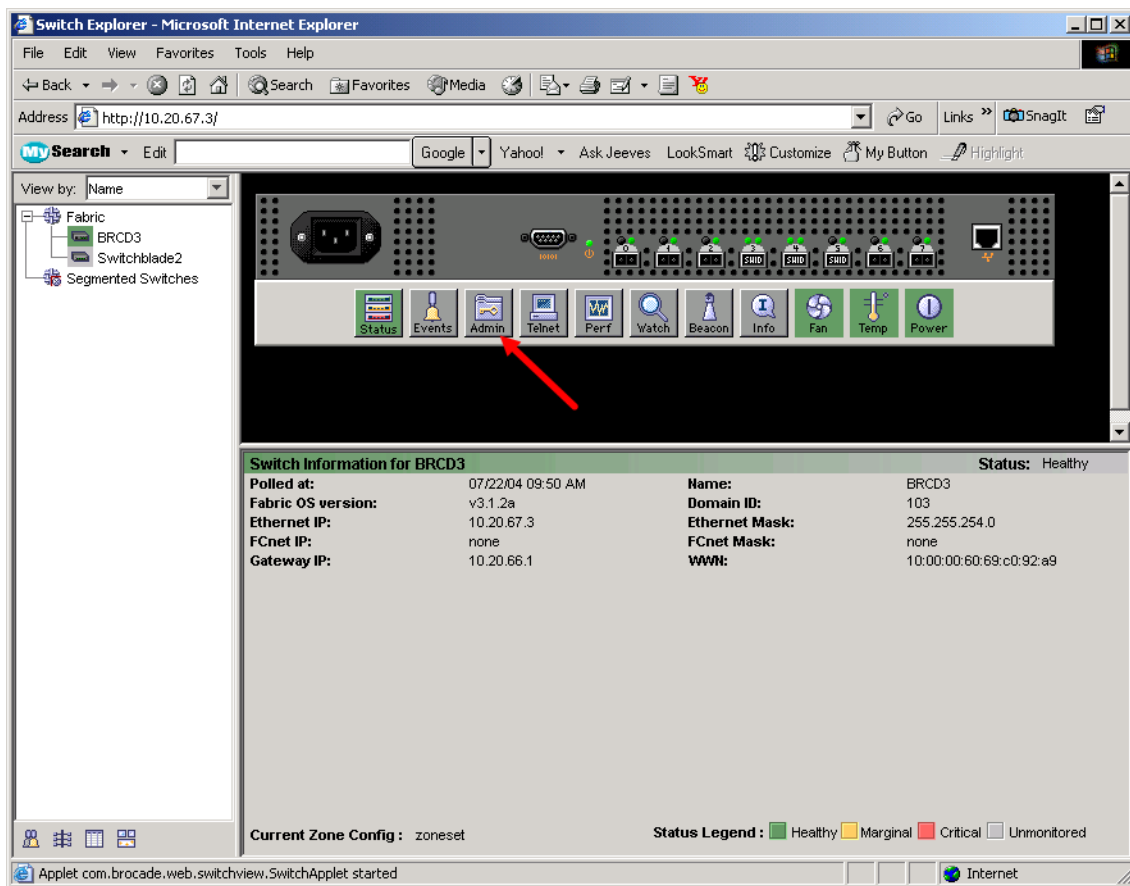
Domain ID Configuration

To ensure that there are no conflicts between switches, we recommend that each switch have an assigned Domain ID. The following steps show how to set the Domain ID on both the Brocade switch and the IBM eServer BladeCenter switch module.

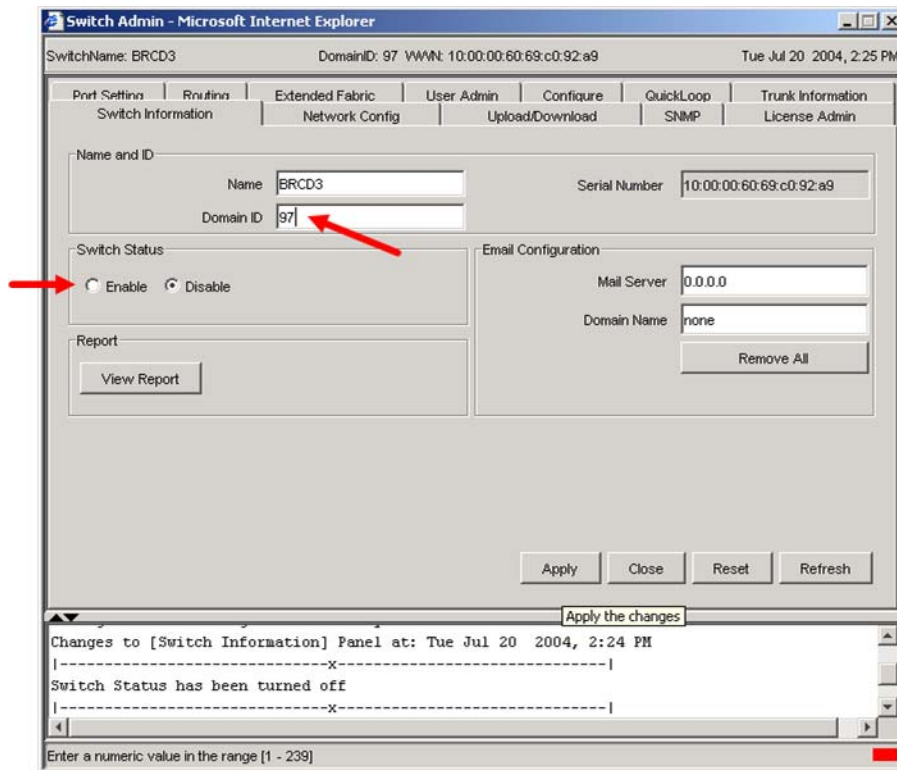
NOTE: The Domain ID should be locked and unique within the 97–127 (0x61–0x7f) range.

Brocade's Web Tools

1. Start Brocade's Web Tools. The **Switch Explorer** dialog box displays.
2. From the **Switch Explorer** dialog box, click the **Admin** button.



3. From the **Switch Admin** dialog box, select the **Switch Information** tab. Do the following:
 - a. In the Switch Status section, select the **Disable** radio button. Click **Apply**.
 - b. In the Name and ID section **Domain ID** field, type or edit the Domain ID as appropriate. Click **Apply**.
 - c. In the Switch Status section, select the **Enable** radio button. Click **Apply**.
 - d. Click **Close**.



Brocade CLI

NOTE: Use the following CLI commands when Brocade's Web tools are not available.

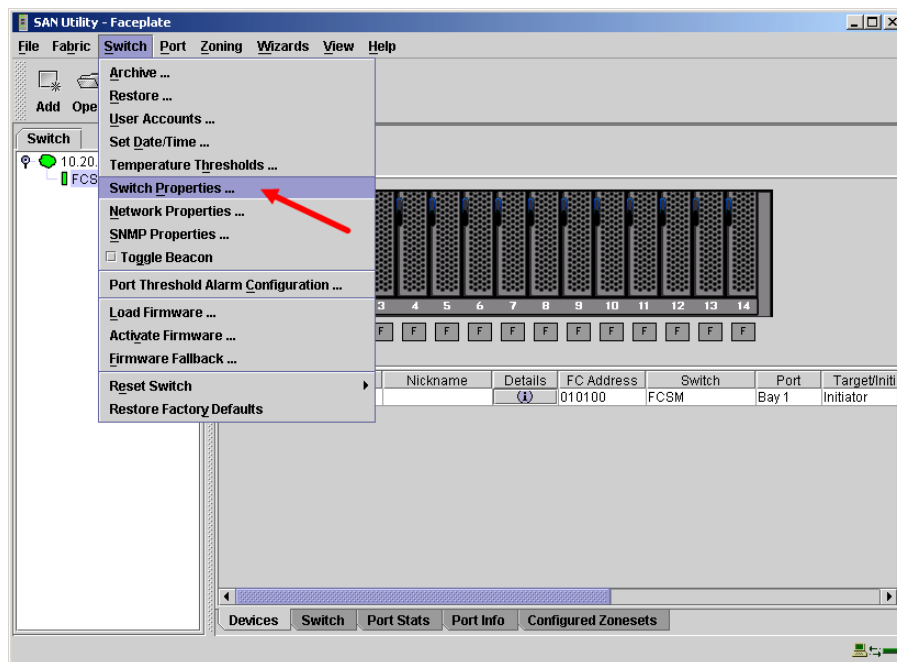
```
Login: admin
Password: xxxxxxxx
BRCD3:admin> switchdisable
BRCD3:admin> configure
Configure...
  Fabric parameters (yes, y, no, n): [no] yes
    Domain: (1..239) [1] 103
    BB credit: (1..27) [16]
    R_A_TOV: (4000..120000) [10000]
    E_D_TOV: (1000..5000) [2000]
    Data field size: (256..2112) [2112]
    Sequence Level Switching: (0..1) [0]
    Disable Device Probing: (0..1) [0]
    Suppress Class F Traffic: (0..1) [0]
    SYNC IO mode: (0..1) [0]
    VC Encoded Address Mode: (0..1) [0]
    Switch PID Format: (0..2) [1]
    Per-frame Route Priority: (0..1) [0]
    Long Distance Fabric: (0..1) [0]
  Virtual Channel parameters (yes, y, no, n): [no]
  Zoning Operation parameters (yes, y, no, n): [no]
  RSCN Transmission Mode (yes, y, no, n): [no]
  Arbitrated Loop parameters (yes, y, no, n): [no]
  System services (yes, y, no, n): [no]
  Portlog events enable (yes, y, no, n): [no]
Committing configuration...done.
BRCD3:admin> switchenable
```

IBM eServer BladeCenter GUI

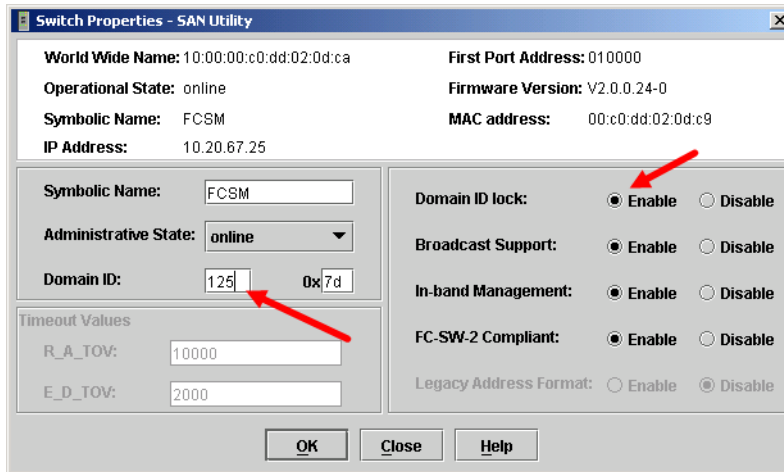
NOTE: You can use the SAN Utility to modify all IBM eServer BladeCenter switch modules. You can use the SAN Browser to modify only the QLogic 6-port Enterprise Fibre Channel Switch Module for IBM eServer BladeCenter. The screen images differ, but the procedures for the SAN Utility and SAN Browser are the same.

Do the following to modify IBM eServer BladeCenter switch modules using the SAN Utility:

1. Start the SAN Utility. The **SAN Utility—Faceplate** dialog box displays.
2. From the **SAN Utility—Faceplate** dialog box **Switch** menu, select **Switch Properties**.

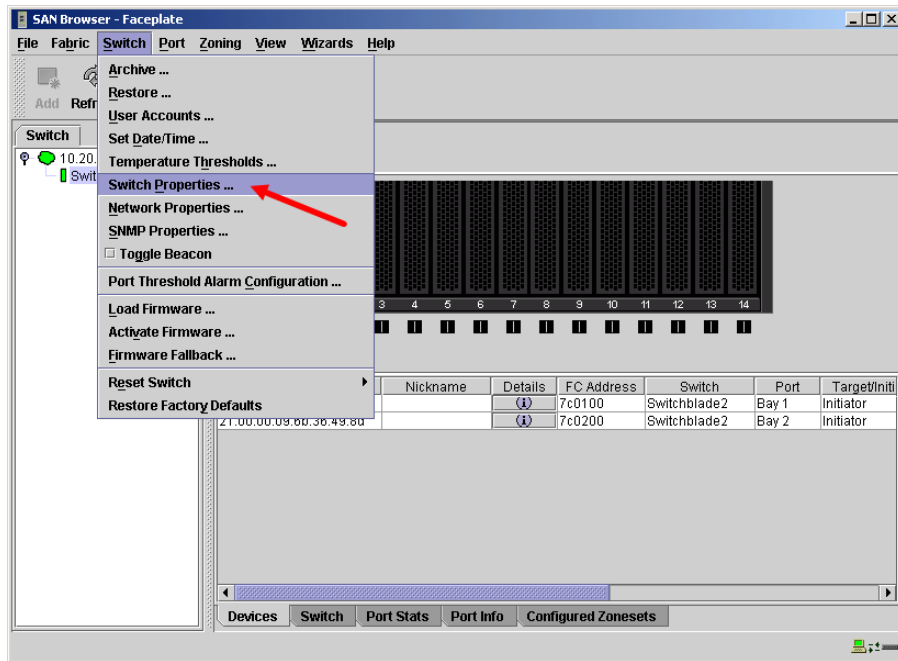


3. From the **Switch Properties—SAN Utility** dialog box, do the following:
 - a. In the **Domain ID** box, type a unique Domain ID in the 97–127 range for the switch.
 - b. Select the **Domain ID Lock Enable** radio button to ensure that the switch always has that Domain ID.
 - c. Click **OK**.

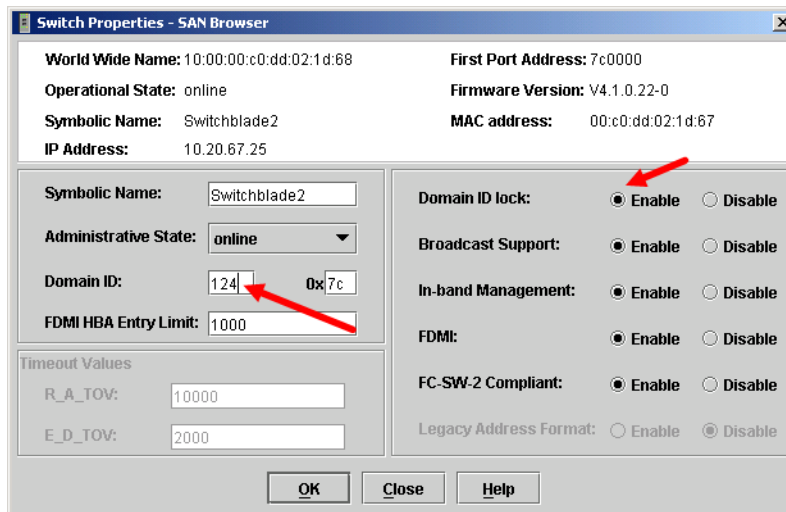


Do the following to modify the QLogic 6-port Enterprise Fibre Channel Switch Module for IBM eServer BladeCenter using the SAN Browser:

1. Start the SAN Browser. The **SAN Browser—Faceplate** dialog box displays.
2. From the **SAN Browser—Faceplate** dialog box **Switch** menu, select **Switch Properties**.



3. From the **Switch Properties—SAN Browser** dialog box, do the following:
 - a. In the **Domain ID** box, type a unique Domain ID in the 97–127 range for the switch.
 - b. Select the **Domain ID Lock Enable** radio button to ensure that the switch always has that Domain ID.
 - c. Click **OK**.



IBM eServer BladeCenter CLI

NOTE: The procedures differ based on the IBM eServer BladeCenter switch module.

Use the following CLI commands to modify the IBM eServer BladeCenter 2-port Fibre Channel Switch Module when the SAN Utility is not available:

```
Login: USERID
Password: xxxxxxxx
IBM eServer BladeCenter #> admin start
IBM eServer BladeCenter (admin) #> config edit
IBM eServer BladeCenter (admin-config) #> set config switch

  The following options display:
  AdminState (1=Online, 2=Offline, 3=Diagnostics) [Online]
  BroadcastEnabled (True / False) [True]
  InbandEnabled (True / False) [True]
  DefaultDomainID (decimal value, 1-239) [1] <97-127>
  DomainIDLock (True / False) [False] True
  SymbolicName (string, max=32 chars) [Fibre Channel Switch Module]
  R_T_TOV (decimal value, 1-1000 msec) [100]
  R_A_TOV (decimal value, 100-100000 msec) [10000]
  E_D_TOV (decimal value, 10-20000 msec) [2000]
  FS_TOV (decimal value, 100-100000 msec) [5000]
  DS_TOV (decimal value, 100-100000 msec) [5000]
  PrincipalPriority (decimal value, 1-255) [254]
  ConfigDescription (string, max=64 chars) [Default Config]
IBM eServer BladeCenter (admin-config) #> config save
IBM eServer BladeCenter (admin) #> config activate
The configuration will be activated. Please confirm (y/n): [n] y
```

Use the following CLI commands to modify the QLogic 6-port Enterprise Fibre Channel Switch Module for IBM eServer BladeCenter when the SAN Utility and SAN Browser are not available:

```
Login: USERID
Password: xxxxxxxx
Switchblade2: admin> admin start
Switchblade2 (admin): admin> config edit
    The config named default is being edited.
Switchblade2 (admin-config): admin> set config switch
    A list of attributes with formatting and current values will follow.
    Enter a new value or simply press the ENTER key to accept the current
    value. If you wish to terminate this process before reaching the end of
    the list press 'q' or 'Q' and the ENTER key to do so.
    AdminState (1=Online, 2=Offline, 3=Diagnostics) [Online]
    BroadcastEnabled (True / False) [True]
    InbandEnabled (True / False) [True]
    FdmiEnabled (True / False) [True]
    FdmiEntries (decimal value, 0-1000) [1000]
    DefaultDomainID (decimal value, 1-239) [1] 124
    DomainIDLock (True / False) [False] true
    SymbolicName (string, max=32 chars) [Switchblade2]
    R_A_TOV (decimal value, 100-100000 msec) [10000]
    E_D_TOV (decimal value, 10-20000 msec) [2000]
    PrincipalPriority (decimal value, 1-255) [254]
    ConfigDescription (string, max=64 chars) [Qlogic 6-port Enterprise
    Switch Module for IBM eServer BladeCenter]
    FC-SW-2 Compliant (True / False) [True]
    Finished configuring attributes.
    This configuration must be saved (see config save command) and activated
    (see config activate command) before it can take effect.
    To discard this configuration use the config cancel command.
Switchblade2 (admin-config): admin> config save
    The config named default has been saved.
Switchblade2 (admin): admin> config activate
    The currently active configuration will be activated.
    Please confirm (y/n): [n] y
Switchblade2 (admin): admin> admin end
```

Timeout Values

As per FC-SW-2 Fibre Channel standards, set all switches to the following timeout values (TOV) in order to successfully establish an E_port connection.

R_A_TOV = 10 seconds (The setting is **10000**.)

E_D_TOV = 2 seconds (The setting is **2000**.)

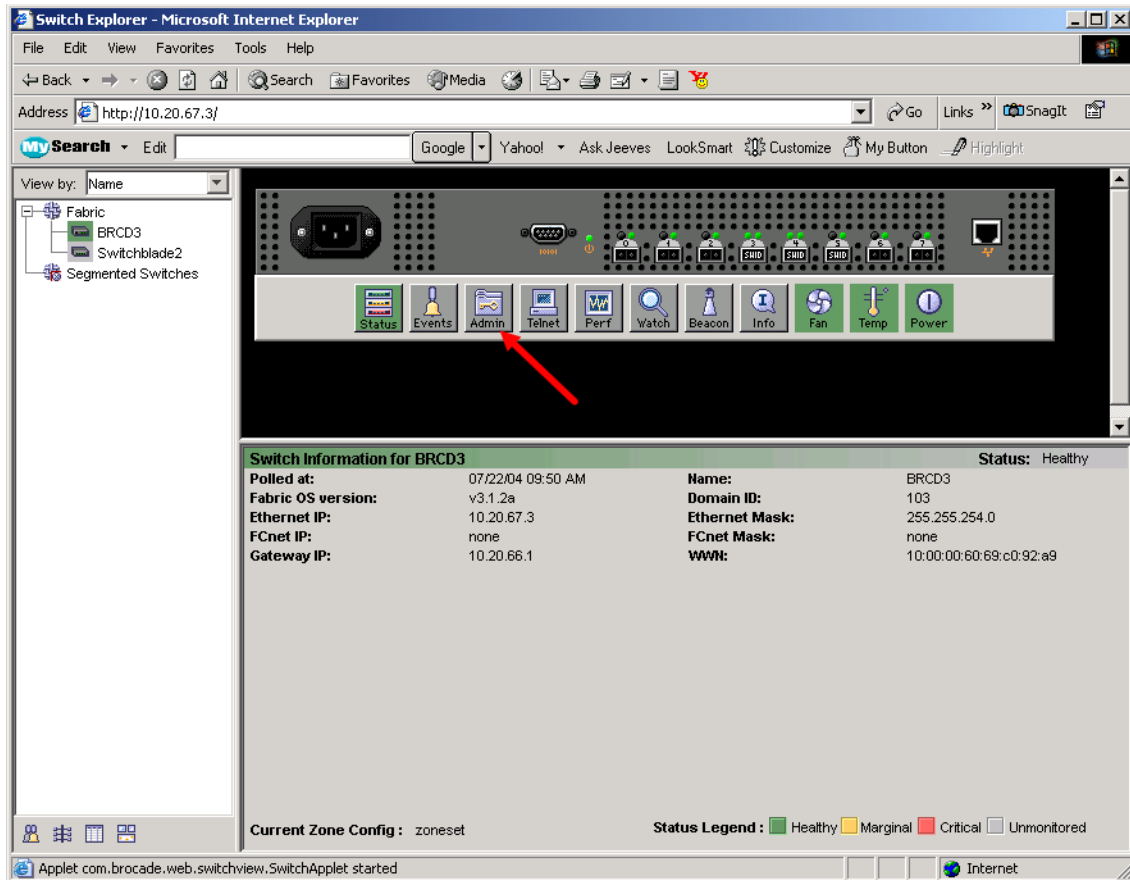
NOTE: These are the default values for **R_A_TOV** and **E_D_TOV**. In addition, **BB Credits** needs to be set to **12** (the default is **16**).

This section provides the steps to change these values.

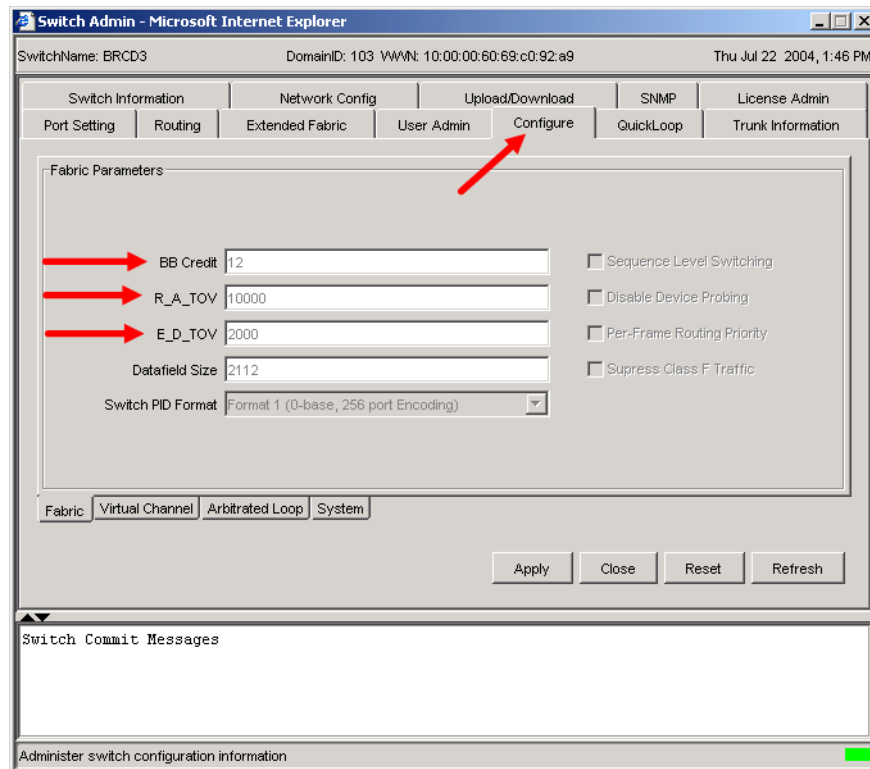
Brocade's Web Tools

ATTENTION!! The following steps take the switch offline; therefore, do not perform them on a switch being managed in-band.

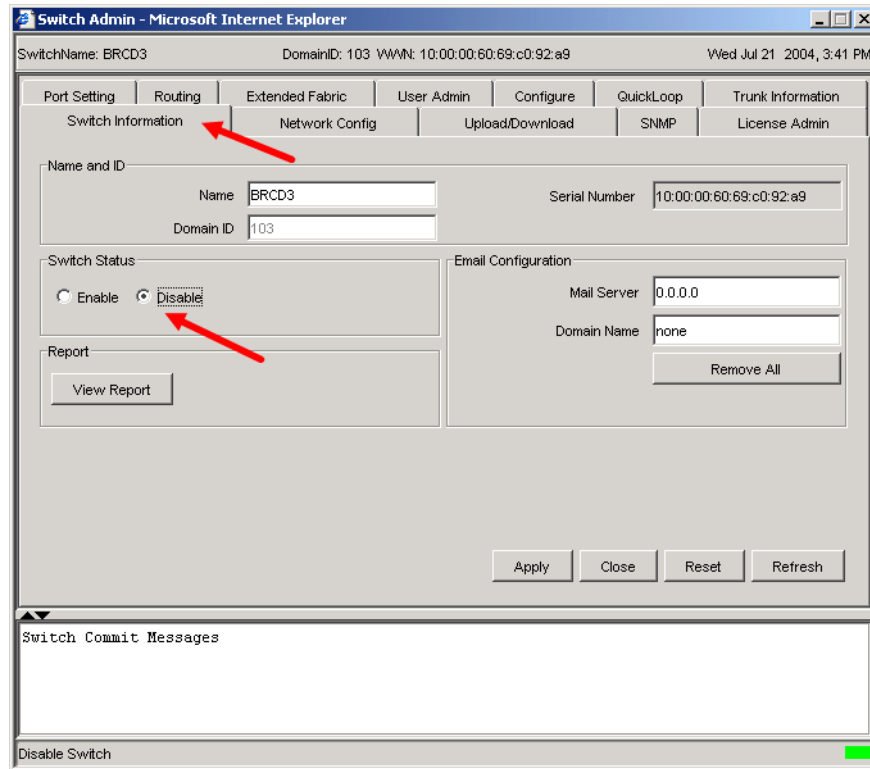
1. Start Brocade's Web Tools. The **Switch Explorer** dialog box displays.
2. From the **Switch Explorer** dialog box, click the **Admin** button.



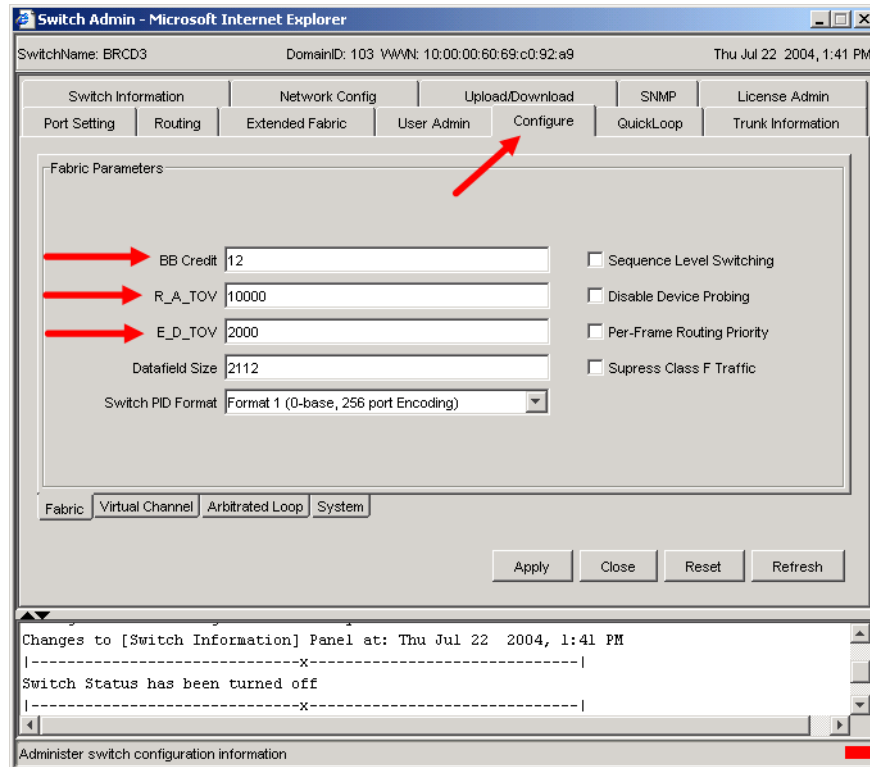
- From the **Switch Admin** dialog box, select the **Configure** tab. Verify that **R_A_TOV** is set to **10000**, **E_D_TOV** is set to **2000**, and **BB Credit** is set to **12**. If the settings are *not* correct, proceed to [step 4](#). If the settings are correct, no changes need to be made; proceed to the next appropriate section.



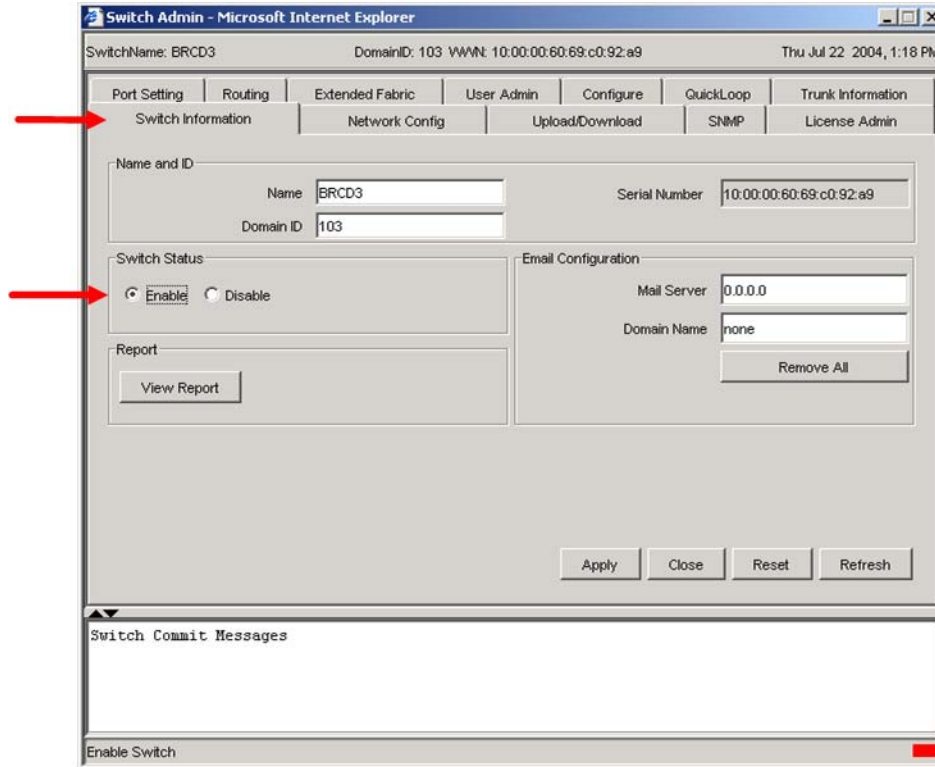
4. Select the **Switch Information** tab. In the Switch Status section, select the **Disable** radio button. Click **Apply**.



5. Select the **Configure** tab, do the following as appropriate:
 - a. In the **BB Credit** box, change the setting to **12**.
 - b. In the **R_A_TOV** box, change the setting to **10000**.
 - c. In the **E_D_TOV** box, change the setting to **2000**.
 - d. Click **Apply**.



6. Select the **Switch Information** tab. In the Switch Status section, select the **Enable** radio button to re-enable to switch. Click **Apply**.



Brocade CLI

NOTE: Use the following CLI commands when Brocade's Web tools are not available.

```
Login: admin  
Password: xxxxxxxxxx
```

Use the following command to verify that R_A_TOV is set to 10000, E_D_TOV is set to 2000, and BB credit is set to 12.

```
BRCD3:admin> configshow
```

If these timeout and BB credit values are *not* correct, continue with this section. If the settings are correct, no changes need to be made; proceed with the next appropriate section.

```
BRCD3:admin> switchdisable  
BRCD3:admin> configure  
Configure...  
Fabric parameters (yes, y, no, n): [no] yes  
Domain: (97..127) [103]  
BB credit: (1..27) [16] 12  
R_A_TOV: (4000..120000) [9000] 10000  
E_D_TOV: (1000..5000) [1500] 2000  
Data field size: (256..2112) [2112]  
Sequence Level Switching: (0..1) [0]  
Disable Device Probing: (0..1) [0]  
Suppress Class F Traffic: (0..1) [0]  
SYNC IO mode: (0..1) [0]  
Switch PID Format: (0..2) [1]  
Per-frame Route Priority: (0..1) [0]  
Long Distance Fabric: (0..1) [0]  
Virtual Channel parameters (yes, y, no, n): [no]  
Zoning Operation parameters (yes, y, no, n): [no]  
RSCN Transmission Mode (yes, y, no, n): [no]  
Arbitrated Loop parameters (yes, y, no, n): [no]  
System services (yes, y, no, n): [no]  
Portlog events enable (yes, y, no, n): [no]  
BRCD3:admin> switchenable
```

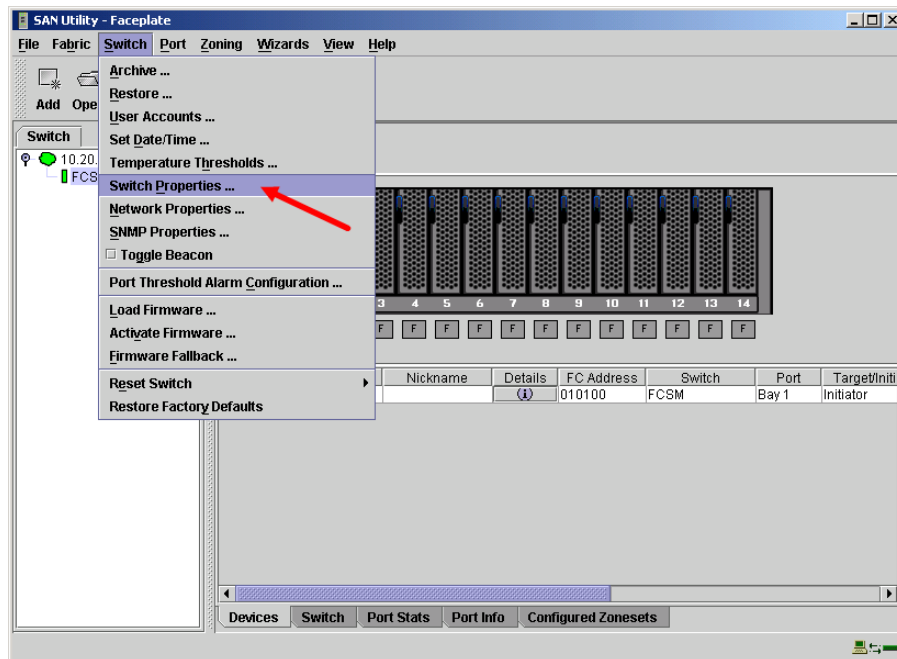
IBM eServer BladeCenter GUI

ATTENTION!! The following steps take the switch offline; therefore, do not perform them on a switch being managed in-band.

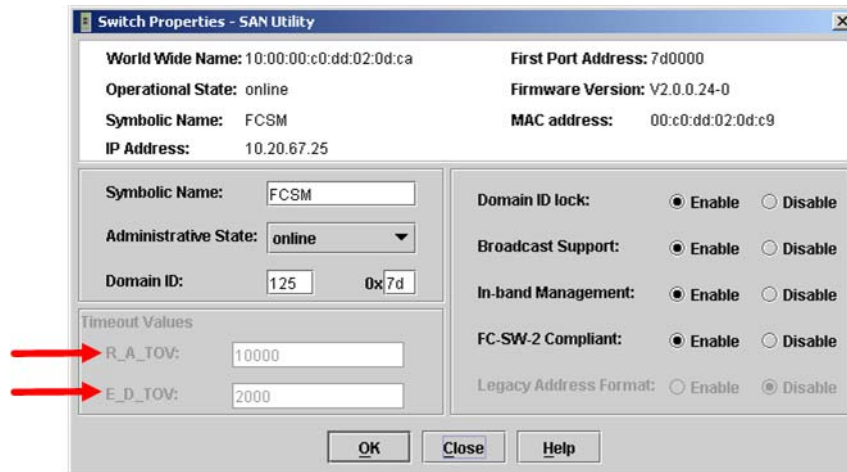
NOTE: You can use the SAN Utility to modify all IBM eServer BladeCenter switch modules. You can use the SAN Browser to modify only the QLogic 6-port Enterprise Fibre Channel Switch Module for IBM eServer BladeCenter. The screen images differ, but the procedures for the SAN Utility and SAN Browser are the same.

Do the following to modify IBM eServer BladeCenter switch modules using the SAN Utility:

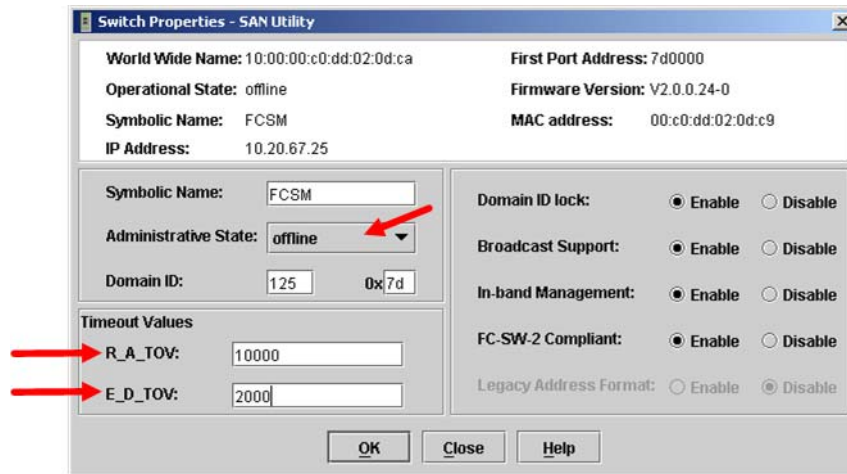
1. Start the SAN Utility. The **SAN Utility—Faceplate** dialog box displays.
2. From the **SAN Utility—Faceplate** dialog box **Switch** menu, select **Switch Properties**.



3. From the **Switch Properties—SAN Utility** dialog box, verify that **R_A_TOV** is set to **10000** and **E_D_TOV** is set to **2000**. If the settings are *not* correct, proceed to [step 4](#). If the settings are correct, no changes need to be made; proceed to the next appropriate section.



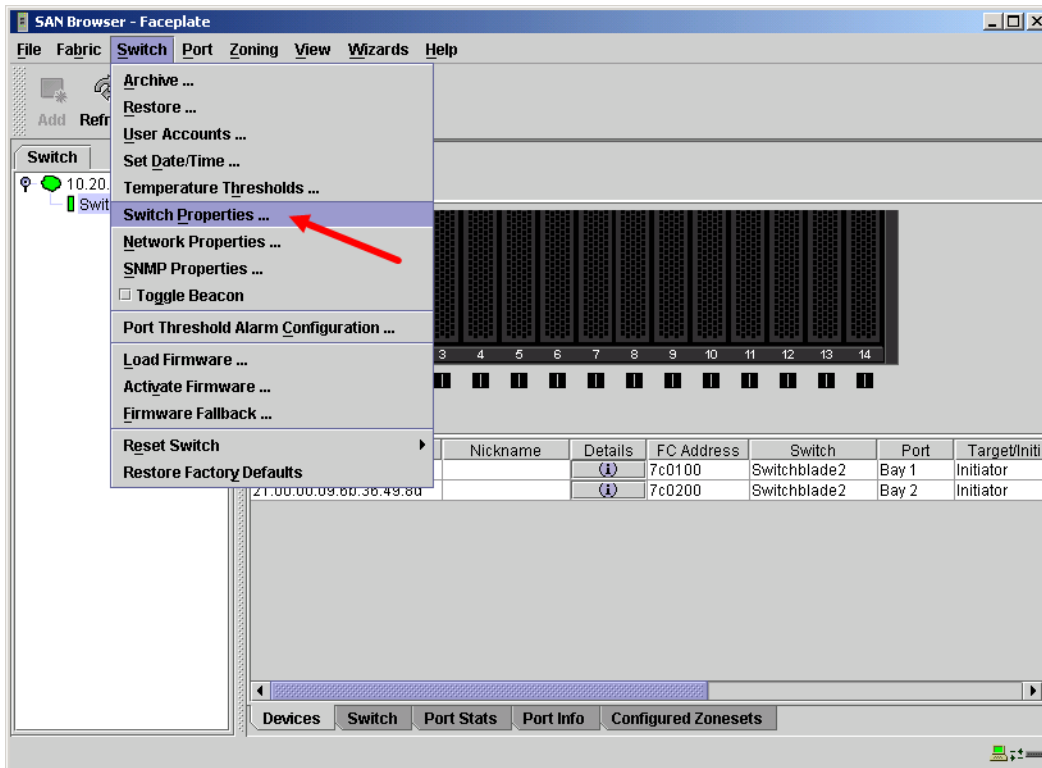
4. To modify the timeout value settings, do the following:
 - a. In the **Administrative State** drop-down box, select **offline**. Click **OK**.
 - b. The **SAN Utility—Faceplate** dialog box redisplay. Repeat [step 2](#) to redisplay the **Switch Properties—SAN Utility** dialog box.
 - c. In the Timeout Values section **R_A_TOV** box, enter **10000**.
 - d. In the Timeout Values section **E_D_TOV** box, enter **2000**.
 - e. In the **Administrative State** drop-down box, select **online**. Click **OK**.



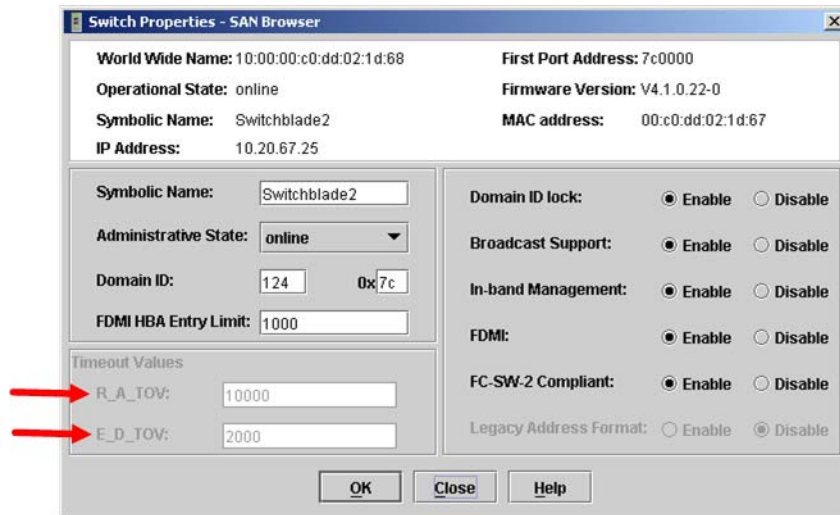
5. The **SAN Utility—Faceplate** dialog box redisplay. Repeat [step 2](#) to redisplay the **Switch Properties—SAN Utility** dialog box. Verify your changes ([see step 3](#)).

Do the following to modify the QLogic 6-port Enterprise Fibre Channel Switch Module for IBM eServer BladeCenter using the SAN Browser:

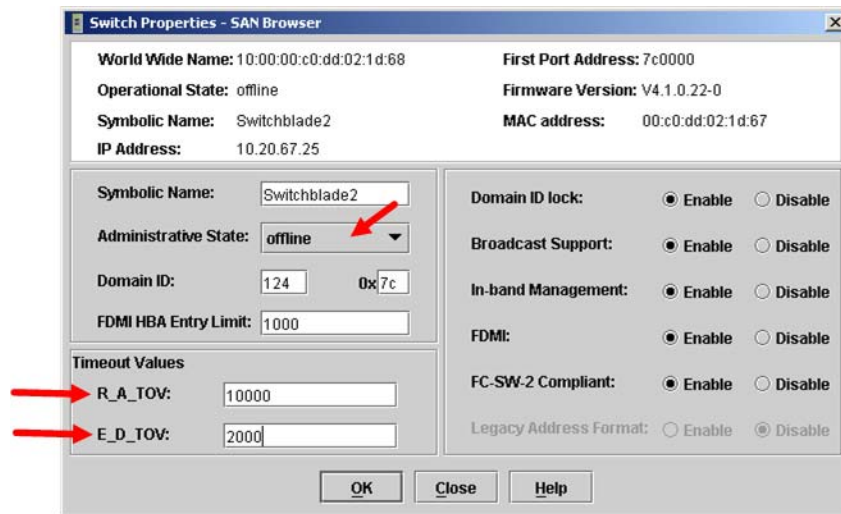
1. Start the SAN Browser. The **SAN Browser—Faceplate** dialog box displays.
2. From the **SAN Browser—Faceplate** dialog box **Switch** menu, select **Switch Properties**.



- From the **Switch Properties—SAN Browser** dialog box, verify that **R_A_TOV** is set to **10000** and **E_D_TOV** is set to **2000**. If the settings are *not* correct, proceed to [step 4](#). If the settings are correct, no changes need to be made; proceed to the next appropriate section.



4. To modify the timeout value settings, do the following:
 - a. In the **Administrative State** drop-down box, select **offline**. Click **OK**.
 - b. The **SAN Browser—Faceplate** dialog box redisplay. Repeat [step 2](#) to redisplay the **Switch Properties—SAN Browser**.
 - c. In the Timeout Values section **R_A_TOV** box, enter **10000**.
 - d. In the Timeout Values section **E_D_TOV** box, enter **2000**.
 - e. In the **Administrative State** drop-down box, select **online**. Click **OK**.



5. The **SAN Browser—Faceplate** dialog box redisplay. Repeat [step 2](#) to redisplay the **Switch Properties—SAN Browser** dialog box. Verify your changes ([see step 3](#)).

IBM eServer BladeCenter CLI

ATTENTION!! The following steps take the switch offline; therefore, do not perform them on a switch being managed in-band.

NOTE: The procedures differ based on the IBM eServer BladeCenter switch module.

Use the following CLI commands to modify the IBM eServer BladeCenter 2-port Fibre Channel Switch Module when the SAN Utility is not available:

Login: **USERID**

Password: **xxxxxxxx**

Use the following command to verify that R_A_TOV is set to 10000 and E_D_TOV is set to 2000.

```
IBM eServer BladeCenter #> show config switch
```

If these timeout values are *not* correct, continue with this section. If the settings are correct, no changes need to be made; proceed with the next appropriate section.

```
IBM eServer BladeCenter #> admin start
```

```
IBM eServer BladeCenter (admin) #> config edit
```

```
IBM eServer BladeCenter (admin-config) #> set config switch
```

The following options display:

```
AdminState (1=Online, 2=Offline, 3=Diagnostics) [Online]
BroadcastEnabled (True / False) [True]
InbandEnabled (True / False) [True]
DefaultDomainID (decimal value, 1-239) [1]
DomainIDLock (True / False) [True]
SymbolicName (string, max=32 chars) [Fibre Channel Switch Module]
R_T_TOV (decimal value, 1-1000 msec) [100]
R_A_TOV (decimal value, 100-100000 msec) [9000]    10000
E_D_TOV (decimal value, 10-20000 msec) [1000]    2000
FS_TOV (decimal value, 100-100000 msec) [5000]
DS_TOV (decimal value, 100-100000 msec) [5000]
PrincipalPriority (decimal value, 1-255) [254]
ConfigDescription (string, max=64 chars) [Default Config]
```

```
IBM eServer BladeCenter (admin-config) #> config save
```

```
IBM eServer BladeCenter (admin) #> config activate
```

```
The configuration will be activated. Please confirm (y/n): [n] y
```

Use the following CLI commands to modify the QLogic 6-port Enterprise Fibre Channel Switch Module for IBM eServer BladeCenter when the SAN Utility and SAN Browser are not available:

```
Login: USERID  
Password: xxxxxxxx
```

Use the following command to verify that R_A_TOV is set to 10000 and E_D_TOV is set to 2000.

```
Switchblade2: admin> show config switch
```

If these timeout values are *not* correct, continue with this section. If the settings are correct, no changes need to be made; proceed with the next appropriate section.

```
Switchblade2: admin>  
Switchblade2: admin> admin start  
Switchblade2 (admin): admin> config edit  
The config named default is being edited.  
Switchblade2 (admin-config): admin> set config switch  
A list of attributes with formatting and current values will follow.  
Enter a new value or simply press the ENTER key to accept the current  
value. If you wish to terminate this process before reaching the end of  
the list press 'q' or 'Q' and the ENTER key to do so.  
AdminState (1=Online, 2=Offline, 3=Diagnostics) [Online]  
BroadcastEnabled (True / False) [True]  
InbandEnabled (True / False) [True]  
FDMIEnabled (True / False) [True]  
FDMIEntries (decimal value, 0-1000) [1000]  
DefaultDomainID (decimal value, 1-239) [124]  
DomainIDLock (True / False) [True]  
SymbolicName (string, max=32 chars) [Switchblade2]  
R_A_TOV (decimal value, 100-100000 msec) [9000] 10000  
E_D_TOV (decimal value, 10-20000 msec) [1000] 2000  
PrincipalPriority (decimal value, 1-255) [254]  
ConfigDescription (string, max=64 chars) [Qlogic 6-port Enterprise  
Switch Module for IBM eServer BladeCenter]  
FC-SW-2 Compliant (True / False) [True]
```

Finished configuring attributes.
This configuration must be saved (see config save command) and activated
(see config activate command) before it can take effect.
To discard this configuration use the config cancel command.

```
Switchblade2 (admin-config): admin> config save
```

The config named default has been saved.

```
Switchblade2 (admin): admin> config activate
```

The currently active configuration will be activated.

Please confirm (y/n): [n] **y**

```
Switchblade2 (admin): admin> admin end
```

Principal Switch Configuration

Brocade switches and IBM eServer BladeCenter switch modules negotiate for principal switch automatically. Therefore, there are no steps to take.

Zone Configuration

This section discusses configuring active Zone Set names and Zone types.

Active Zone Set Names

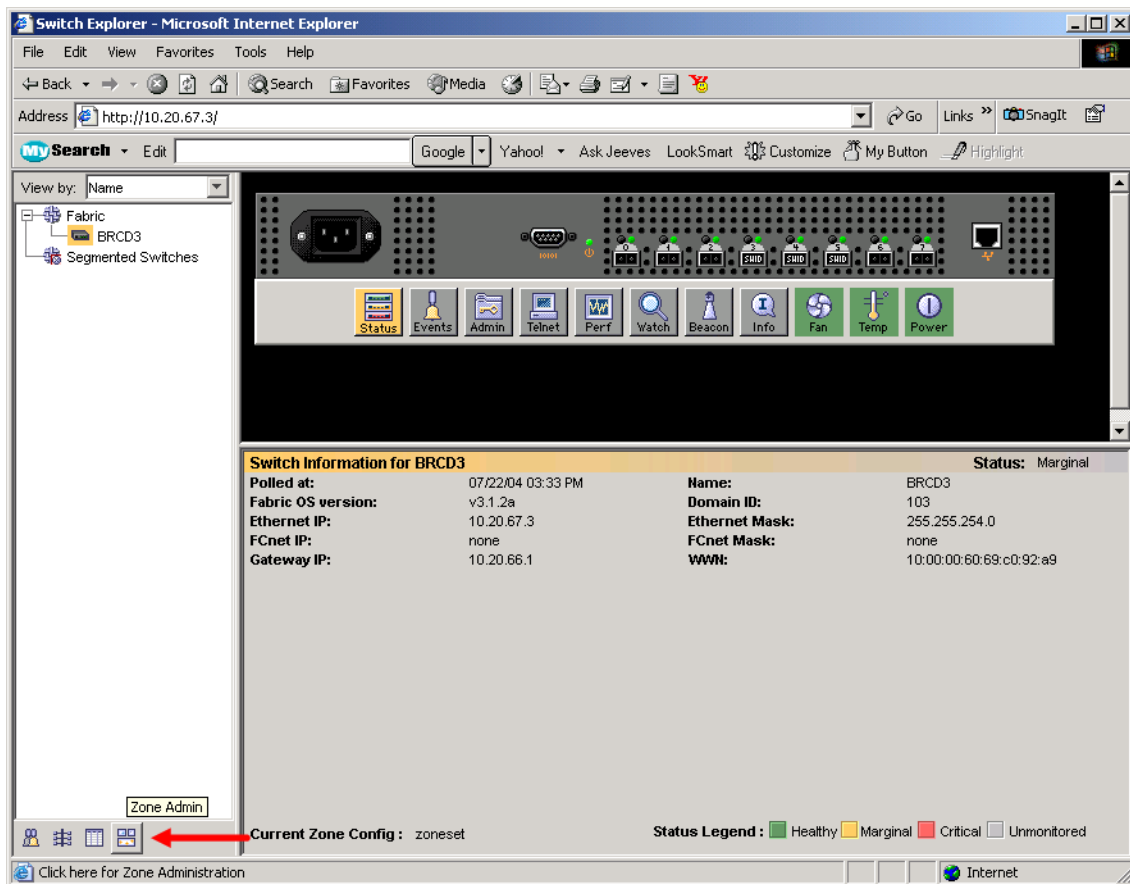
NOTE: For Brocade, Zone Set is referred to as Zone Configuration.

The Zone and Zone Set names on each switch must be unique. If not, change one of the duplicate names. All Zone Set and Zone names must conform to the Fibre Channel (FC) Standards for Zone Naming (ANSI T11/00-427v3):

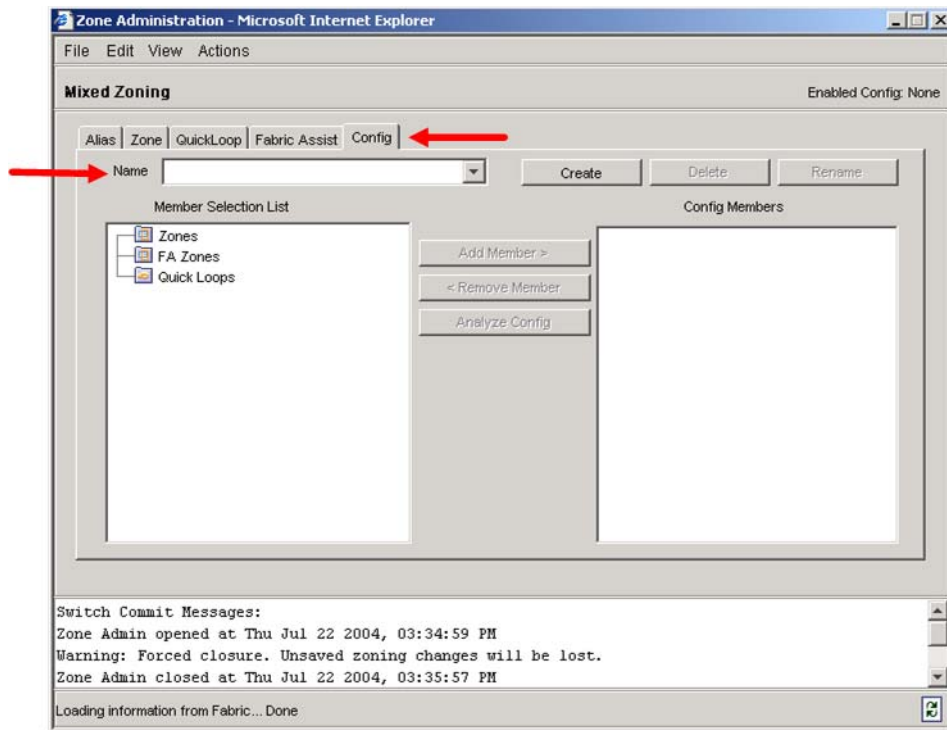
1. Must be 1–64 characters in length.
2. All characters are ASCII.
3. First character is [a–z] or [A–Z].
4. All other characters must be [a–z], [A–Z], [0–9], or the _ character. Other characters (\$-^) may not be supported by all vendors and should be avoided.

Brocade's Web Tools

1. Start Brocade's Web Tools. The **Switch Explorer** dialog box displays.
2. From the **Switch Explorer** dialog box, click the **Zone Admin** button.



- From the **Zone Administration** dialog box, select the **Config** tab. Click the **Name** drop-down list to verify that all config names conform to the standards discussed under “[Active Zone Set Names](#)” on page 43 and are unique between the switches.



Brocade CLI

NOTE: Use the following CLI commands when Brocade's Web tools are not available.

Login: **admin**

Password: **xxxxxxxx**

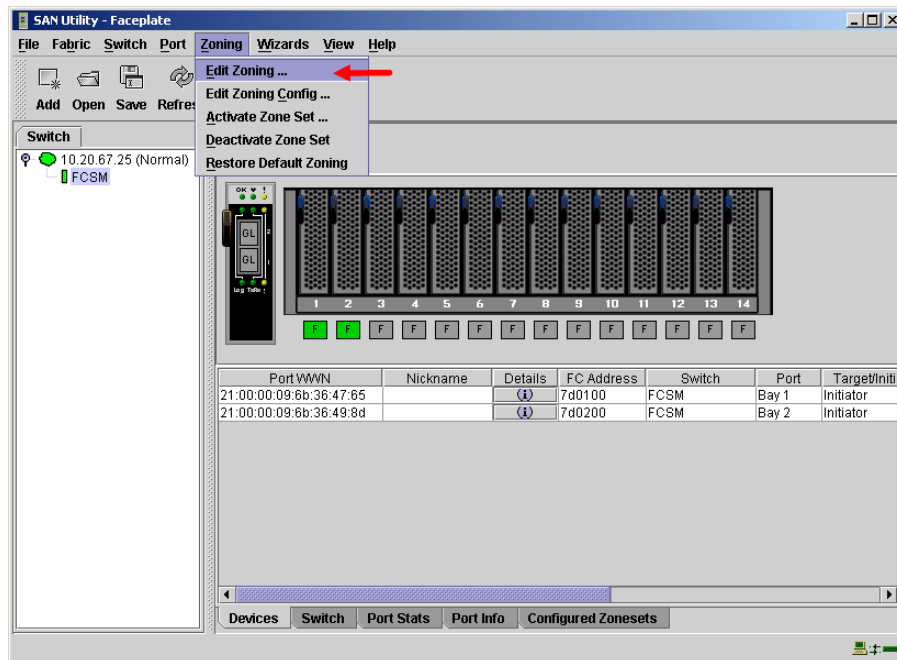
Brocade3800:admin> **cfgshow**

IBM eServer BladeCenter GUI

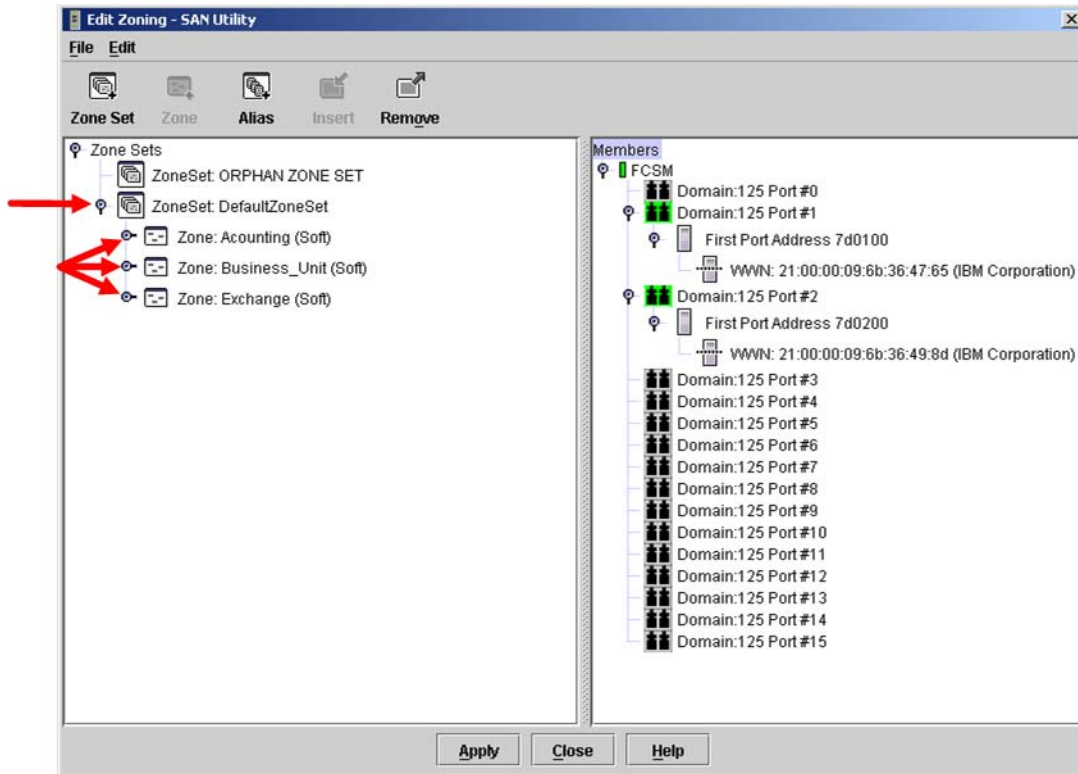
NOTE: You can use the SAN Utility to modify all IBM eServer BladeCenter switch modules. You can use the SAN Browser to modify only the QLogic 6-port Enterprise Fibre Channel Switch Module for IBM eServer BladeCenter. The screen images differ, but the procedures for the SAN Utility and SAN Browser are the same.

Do the following to modify IBM eServer BladeCenter switch modules using the SAN Utility:

1. Start the SAN Utility. The **SAN Utility—Faceplate** dialog box displays.
2. From the **SAN Utility—Faceplate** dialog box **Zoning** menu, select **Edit Zoning**.

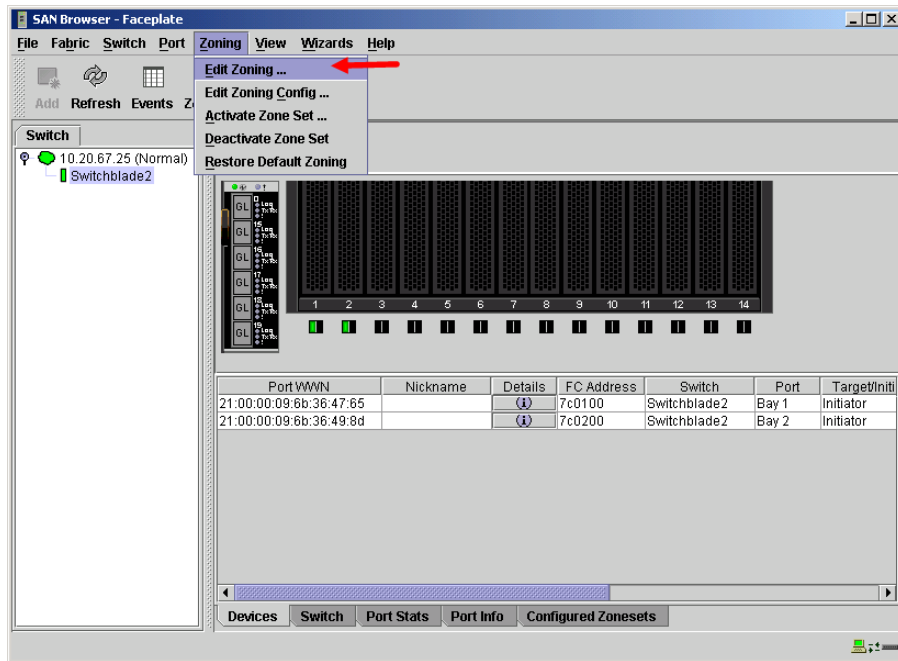


3. From the **Edit Zoning — SAN Utility** dialog box, compare the Zone Set and Zone names from each switch to ensure that none have the same name and the names conform to the standards for zone naming as discussed under [“Active Zone Set Names”](#) on page 43.

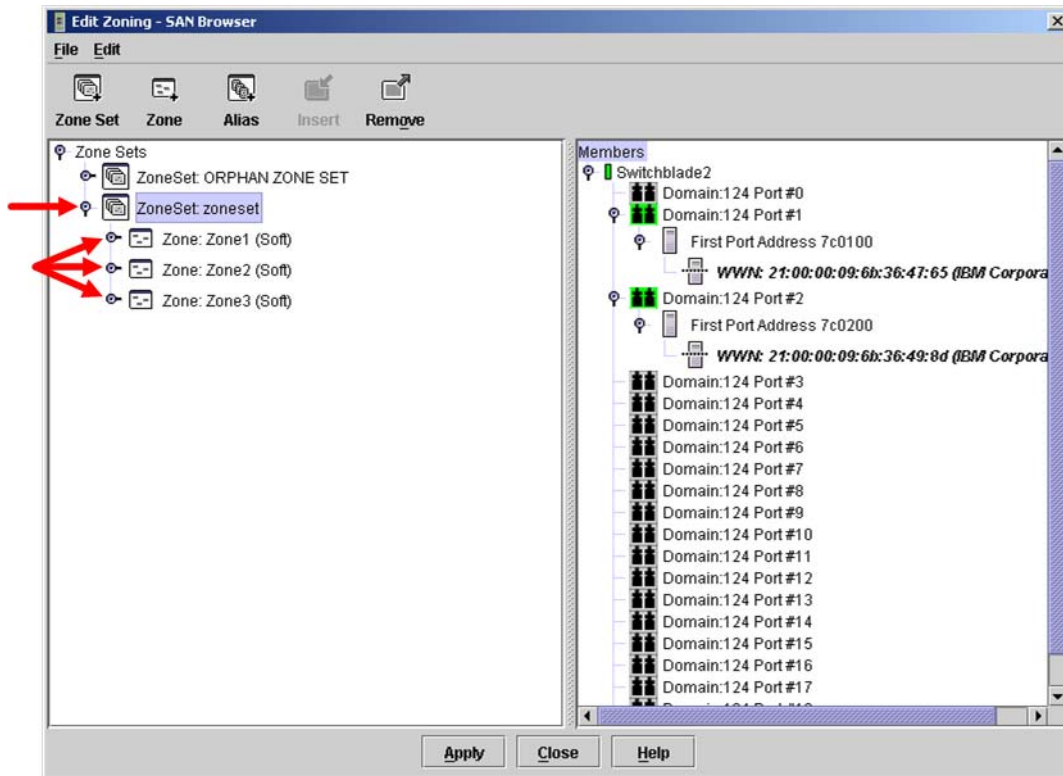


Do the following to modify the QLogic 6-port Enterprise Fibre Channel Switch Module for IBM eServer BladeCenter using the SAN Browser:

1. Start the SAN Browser. The **SAN Browser—Faceplate** dialog box displays.
2. From the **SAN Browser—Faceplate** dialog box **Zoning** menu, select **Edit Zoning**.



3. From the **Edit Zoning—SAN Browser** dialog box, compare the Zone Set and Zone names from each switch to ensure that none have the same name and the names conform to the standards for zone naming as discussed under “Active Zone Set Names” on page 43.



IBM eServer BladeCenter CLI

NOTE: Use the following CLI commands when the IBM eServer BladeCenter GUI is not available.

Login: **USERID**

Password: **xxxxxxxx**

IBM eServer BladeCenter #> **zone list**

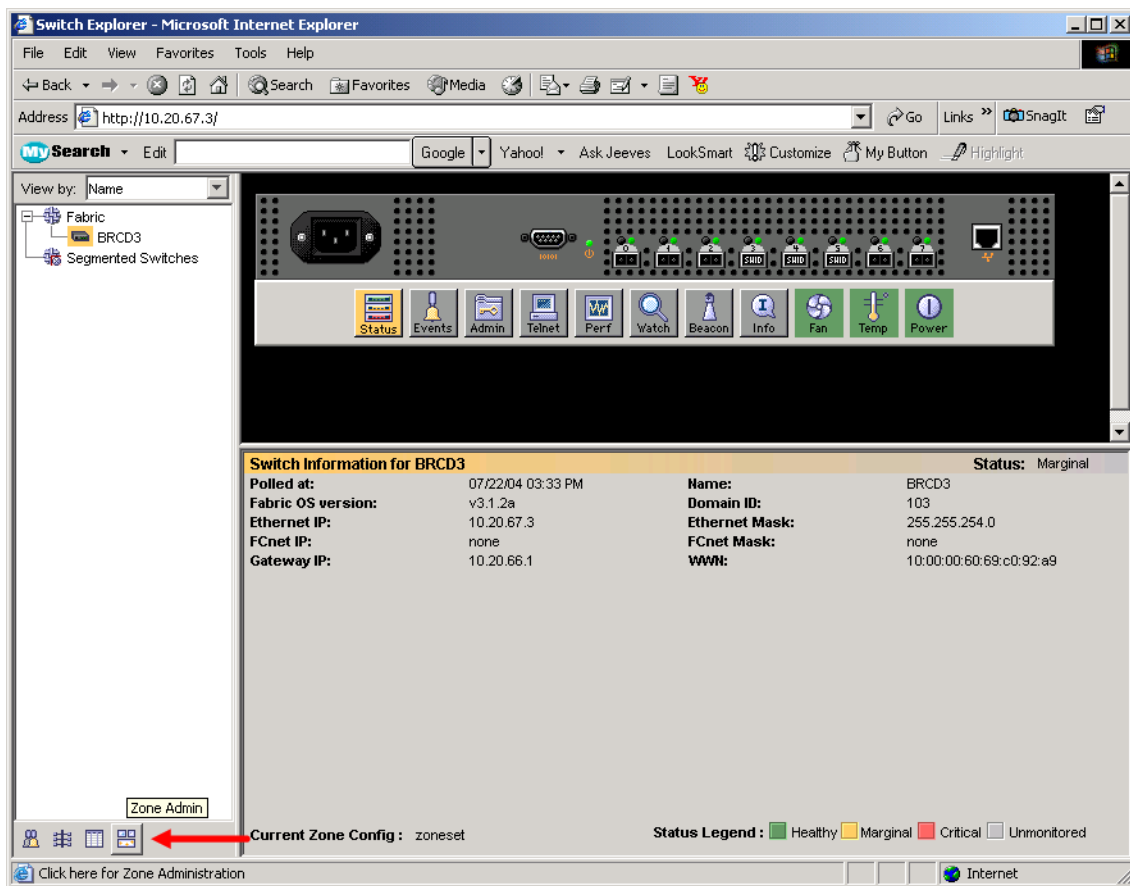
Zone Types

All zones members must be specified by a world wide port name (WWPN) in order to comply with Fibre Channel standards. Any zone member not specified by WWPN cannot participate in the fabric. Below are steps to confirm the zone types.

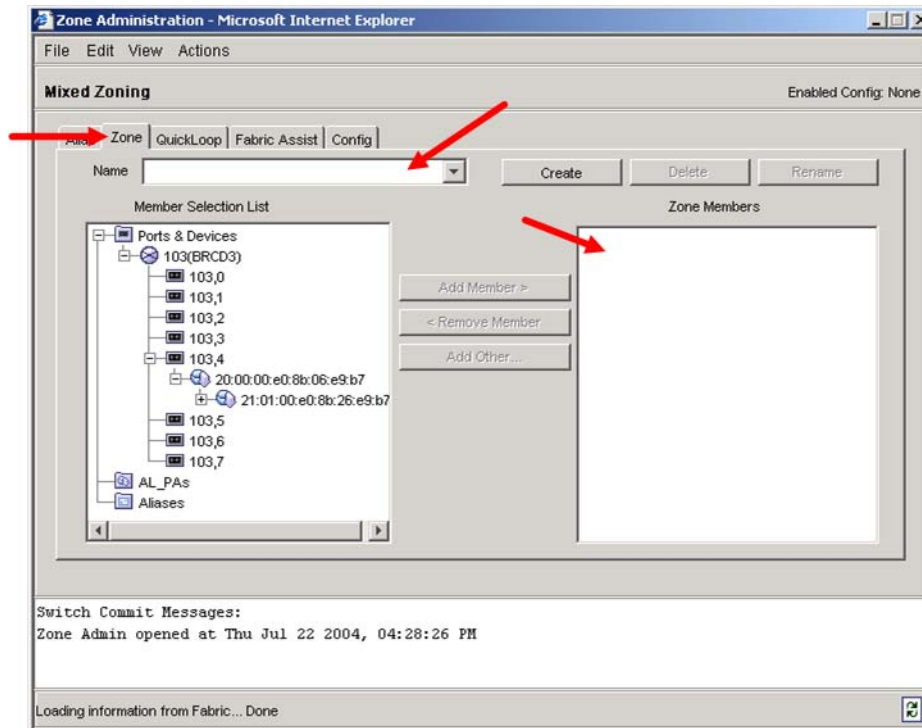
NOTE: A world wide name (WWN) consists of a world wide node name (WWNN) and one or more WWPNs. References in this guide to WWN actually refer to the WWPN.

Brocade's Web Tools

1. Start Brocade's Web Tools. The **Switch Explorer** dialog box displays.
2. From the **Switch Explorer** dialog box, click the **Zone Admin** button.



3. From the **Zone Administration** dialog box, select the **Zone** tab. Verify that all zone names conform to the standards discussed under “[Active Zone Set Names](#)” on page 43 and are unique between the switches. Do the following:
 - a. In the **Name** drop-down box, select a zone.
 - b. In the Zone Members section, verify the WWNs.
 - c. Repeat [steps a](#) and [b](#) for each zone.



Brocade CLI

NOTE: Use the following CLI commands when Brocade’s Web tools are not available.

Login: **admin**

Password: **xxxxxxxx**

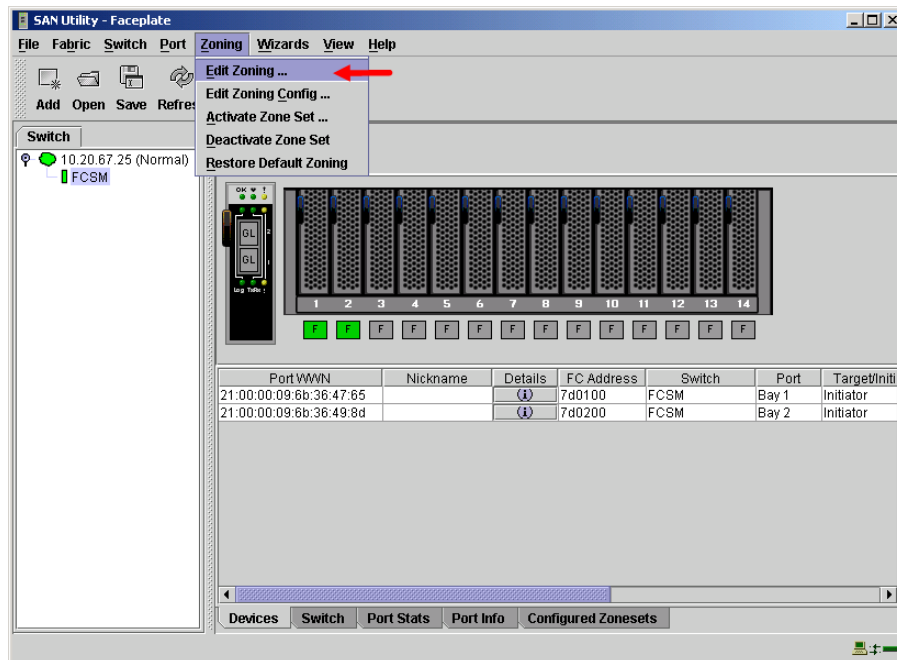
Brocade3800:admin> **zonestow**

IBM eServer BladeCenter GUI

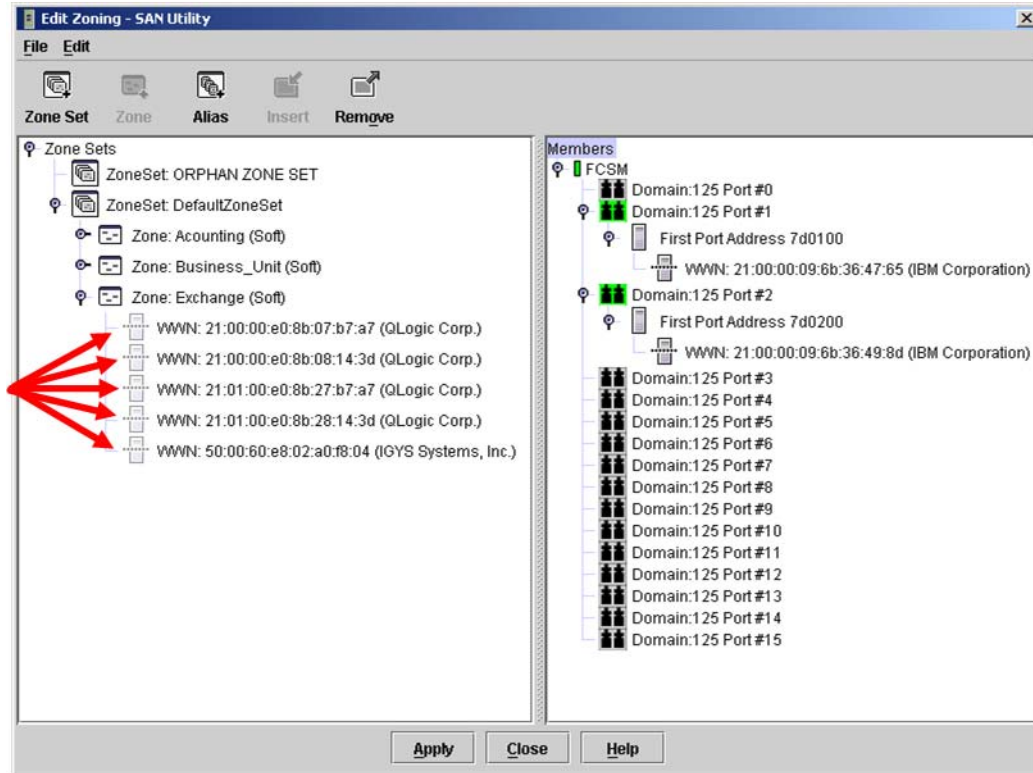
NOTE: You can use the SAN Utility to modify all IBM eServer BladeCenter switch modules. You can use the SAN Browser to modify only the QLogic 6-port Enterprise Fibre Channel Switch Module for IBM eServer BladeCenter. The screen images differ, but the procedures for the SAN Utility and SAN Browser are the same.

Do the following to modify IBM eServer BladeCenter switch modules using the SAN Utility:

1. Start the SAN Utility. The **SAN Utility—Faceplate** dialog box displays.
2. From the **SAN Utility—Faceplate** dialog box **Zoning** menu, select **Edit Zoning**.

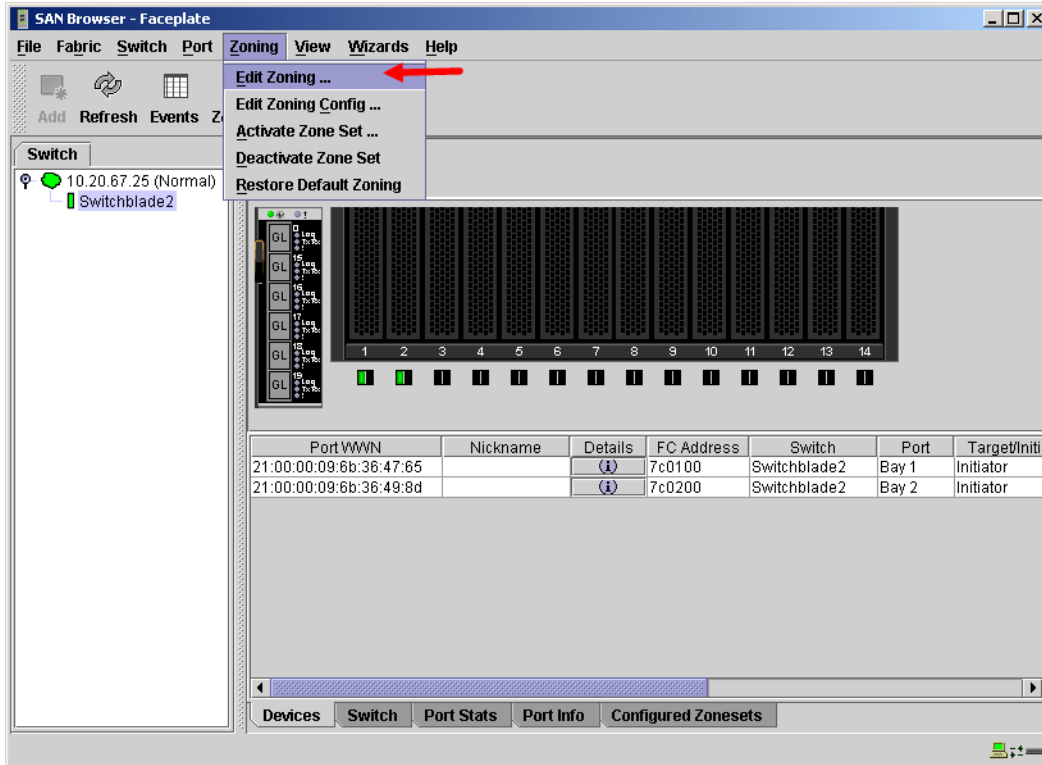


3. The **Edit Zoning—SAN Utility** dialog box displays. Confirm that all zone members are listed as WWN.

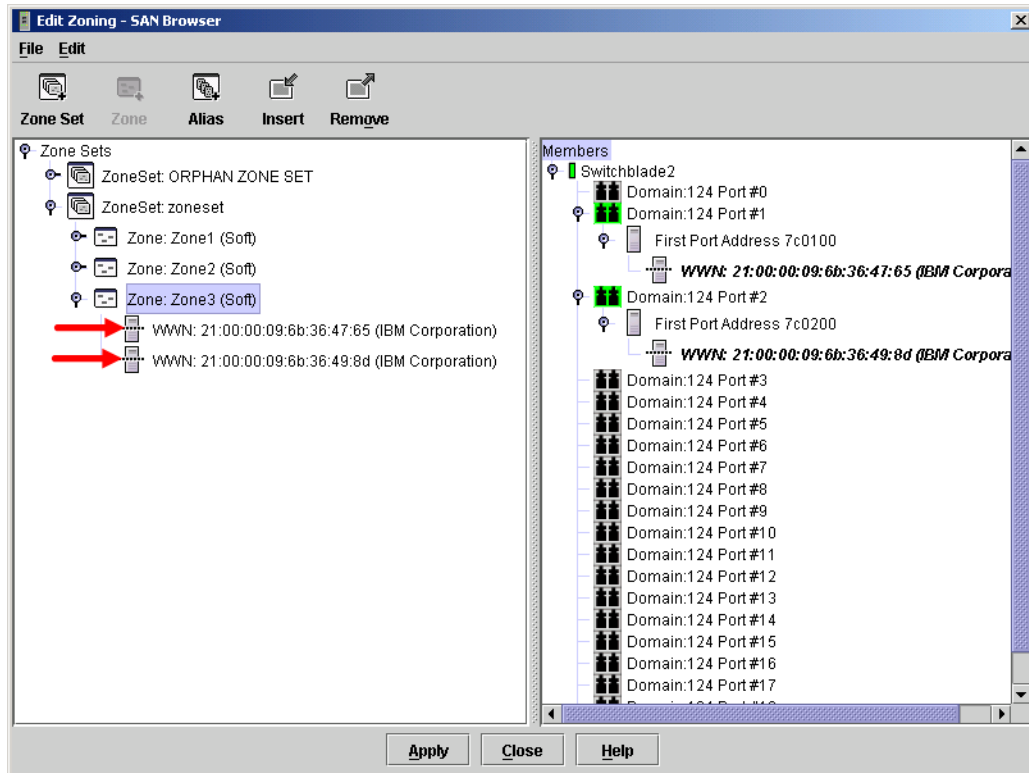


Do the following to modify the QLogic 6-port Enterprise Fibre Channel Switch Module for IBM eServer BladeCenter using the SAN Browser:

1. Start the SAN Browser. The **SAN Browser—Faceplate** dialog box displays.
2. From the **SAN Browser—Faceplate** dialog box **Zoning** menu, select **Edit Zoning**.



3. The **Edit Zoning—SAN Browser** dialog box displays. Do the following:
 - a. Select a ZoneSet.
 - b. Select a Zone.
 - c. In the Zone Members section, confirm that all zone members are listed as WWN.
 - d. Repeat the above steps for each zone.



IBM eServer BladeCenter CLI

NOTE: Use the following CLI commands when the IBM eServer BladeCenter GUI is not available.

Login: **USERID**

Password: **xxxxxxxx**

IBM eServer BladeCenter #> **zone members <zone name>**

Repeat this statement for each zone and confirm that only WWNs are listed.

Brocade Specific Configuration

The platform manager server must be disabled.

Brocade's Web Tools

This function cannot be done using Brocade's Web Tools; use the Brocade CLI.

Brocade CLI

Enter the following command to verify that Platform Management is disabled:

```
BRCD3:admin> msPlatShow  
Platform Management is NOT enabled.  
BRCD3:admin>
```

If Platform Management is enabled, enter the following command to disable platform management:

```
BRCD3:admin> msPlMgmtDeactivate
```

IBM eServer BladeCenter Specific Configuration

Not applicable.

Operating Mode Configuration

The Brocade switch must be in Interoperability mode to be FC-SW2 compliant. Therefore, the current operating status must be Interopmode on. Note the following:

- ❑ InteropMode = 0 (disabled, which is Brocade proprietary mode)
- ❑ InteropMode = 1 (enabled, which is FC-SW-2 compliant mode)

Brocade's Web Tools

Interoperability mode cannot be set using Brocade's Web Tools; use the Brocade CLI.

Brocade CLI

Do the following to set the Brocade switch to Interoperability mode.

ATTENTION!! This procedure requires a reboot of the switch.

Enter the following command to verify that the current operating status is Interopmode:

```
BRCD3:admin> interopmode
InteropMode: Off

Usage: InteropMode 0|1
  0: to turn it off
  1: to turn it on
BRCD3:admin>
```

If Interopmode is disabled, enter the following commands to enable Interopmode:

```
BRCD3:admin> switchdisable
BRCD3:admin> interopmode 1
```

```
The switch effective configuration will be lost when the operating mode
is changed; do you want to continue? (yes, y, no, n): [no] yes
```

```
Interopmode is enabled
```

Enter the following command to reboot the switch for the new change to take effect:

```
BRCD3:admin> fastboot
```

IBM eServer BladeCenter GUI

Not applicable.

IBM eServer BladeCenter CLI

Not applicable.

Successful Integration Checklist

Perform the following steps after the E_port connection has been established and the fabric has had time to update. If everything verifies, the Brocade and IBM eServer BladeCenter fabrics have successfully merged.

- ✓ Compare and verify that all Zoning information has been propagated on all switches.
- ✓ Verify that the correct Zone Set is activated.
- ✓ Compare and verify that all devices are in the Name Server of each switch.
- ✓ Verify that all initiators continue to detect and have access to all targets that existed prior to the fabric merger.

NOTE: When zones are merged upon connecting an IBM eServer BladeCenter to any Brocade fabric operating in interopmode or when zones are modified using the IBM eServer BladeCenter GUI after the connection is made, Brocade's Web Tools do not display the zones. To verify that a successful zone merge has occurred, use the Brocade CLI `zoneshow` command.

After everything is verified, your fabric has merged successfully and no additional steps need to be taken. If any of the above tasks did not complete successfully, please contact IBM support.

Brocade SilkWorm Switches / IBM TotalStorage SAN Switches (32-Port and 64-Port)

Configuration Considerations

Brocade configuration considerations are as follows:

- When merging Brocade and IBM eServer BladeCenter fabrics, be sure to enable Interoperability mode on all Brocade switches in the fabric. Brocade switches that are not in Interoperability mode are unable to communicate with IBM eServer BladeCenter FC-SW-2 fabrics and Brocade fabrics in proprietary mode.
- Existing Brocade switches retain the following features that are available once the IBM eServer BladeCenter switch module is merged into a heterogeneous fabric. The features will function on Brocade switches that are in Interoperability mode:
 - **Trunking.** Operates on all Brocade switches configured with this feature. Additionally, traffic submitted to and from a IBM eServer BladeCenter switch module-attached device (initiator/target) can pass through Brocade Trunked ISL ports.
 - **Aliasing.** Operates on all Brocade switches configured with this feature. Can only be managed by the originating switch vendor's management utility or CLI. Aliased names do not propagate between vendors' management utilities, but when an Alias is created and entered into a zone, the WWPNs that were in the Alias propagate correctly.
- Brocade proprietary features that may not function in multi-vendor fabrics include:
 - Brocade QuickLoop
 - Brocade Fabric Assist
 - Brocade Remote Switch
 - Brocade Extended Fabric
 - Brocade Advanced Performance Monitor
 - Brocade Secure Fabric OS
 - Brocade Fabric Services
 - Management Server
 - Platform Support
 - Virtual Channels
 - Broadcast Zones
- When merging Brocade and QLogic fabrics, a maximum of 31 switches can be configured.

- When forming an ISL between these larger port Brocade switches and another vendor in the Interoperability mode, Brocade switches no longer have default zones. Therefore, the attached switches—without extended addressing—cannot adequately address the higher Brocade switch ports without Name Server propagation. To enable upper port connectivity, follow these steps:
 1. Establish the ISL between switches with a port lower than 16.
 2. Apply any required zones in ports lower than 16.
 3. After applying zones in the lower numbered ports, the devices in port greater than 16 should be visible for zoning or establishing an ISL.
- When zones are merged upon connecting an IBM eServer BladeCenter to any Brocade fabric operating in interopmode or when zones are modified using the IBM eServer BladeCenter GUI after the connection is made, Brocade's Web Tools do not display the zones. To verify that a successful zone merge has occurred, use the Brocade CLI `zonestow` command.
- It is recommended that you use Brocade's Web Tools or the Brocade CLI to create and manage zones with an active zoneset that contains 450 or more zone members. If you are using the IBM eServer BladeCenter GUI or IBM eServer BladeCenter CLI, note the following:
 - If there is an active zoneset on the IBM eServer BladeCenter switch module that contains 450 or more zone members, the Brocade switches and IBM eServer BladeCenter switch modules will not connect.
 - If the Brocade and IBM eServer BladeCenter fabrics are connected and you create a zoneset on the IBM eServer BladeCenter switch module that contains 450 or more zone members, the zoneset will not activate when connected to the Brocade switch.

IBM eServer BladeCenter configuration considerations are as follows:

- If you will be implementing the I/O stream guard feature, please contact your IBM technical support representative prior to configuring. Additional configuration procedures may be required.
- Contact IBM Technical Support to obtain the document, *IBM eServer BladeCenter Remote Boot*, if you are planning to use the boot form SAN functionality.

Integration Checklist

The following steps must be completed to successfully merge Brocade and IBM eServer BladeCenter fabrics. The remainder of this section provides detailed instructions and examples.

ATTENTION!!

- Back up the current switch configuration data prior to performing the following steps so that the configuration is available if something goes wrong (see the first step for details).
 - Disruptions in the fabric can occur as a result of performing the following steps. Therefore, it is recommended that these changes be done during down time or off-peak hours.
-
- ✓ Back up the current switch configuration data (see [“Backing Up and Restoring the Current Configuration Settings”](#) on page 63).
 - ✓ Verify that the correct version of switch firmware is installed on each switch (see [“Supported Switches”](#) on page 62).
 - ✓ Ensure that each switch has a unique Domain ID and that it falls within the proper range (see [“Domain ID Configuration”](#) on page 65).
 - ✓ Set all switches to the appropriate timeout values (see [“Timeout Values”](#) on page 76).
 - ✓ Ensure that all Zone set and Zone names are unique and conform to ANSI T11 standards (see [“Active Zone Set Names”](#) on page 96).
 - ✓ Ensure that all zone members are specified by WWPN (see [“Zone Types”](#) on page 106).
 - ✓ Ensure that Brocade’s Platform Management Server is disabled (see [“Brocade Specific Configuration”](#) on page 114).
 - ✓ Ensure that all Brocade switches are configured for Interoperability mode (see [“Operating Mode Configuration”](#) on page 115).
 - ✓ Verify that the fabrics have successfully merged (see [“Successful Integration Checklist”](#) on page 116).
 - ✓ Contact IBM Technical Support to obtain the document, *IBM eServer BladeCenter Remote Boot*, if you are planning to use the boot form SAN functionality.

Supported Switches

The following IBM eServer BladeCenter switch modules have been tested in the IBM eServer BladeCenter environment and comply with the FC-SW-2 standard. They have tested interoperable with the following switches from Brocade that comply with the FC-SW-2 standard.

IBM eServer BladeCenter and Brocade Supported Switches

Manufacturer	Switch Model ^a
IBM eServer BladeCenter	IBM eServer BladeCenter 2-port Fibre Channel Switch Module QLogic 6-port Enterprise Fibre Channel Switch Module for IBM eServer BladeCenter
Brocade	SilkWorm 3900/IBM 2109 F32 ^b SilkWorm 12000/IBM 2109 M12 ^b

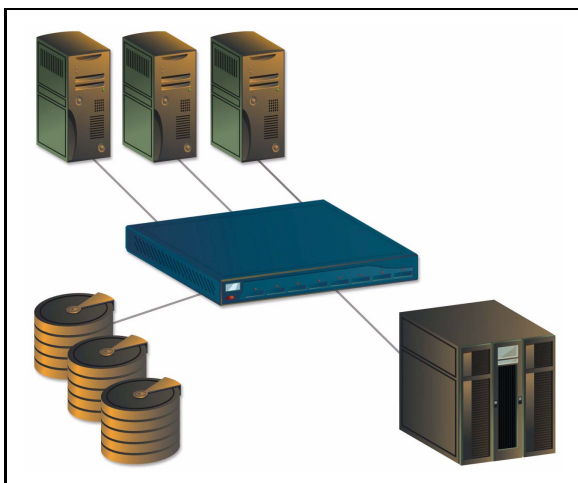
Notes

^aFor the current firmware versions, please see the *IBM eServer BladeCenter Fibre Channel Switch Interoperability Quick Reference Guide* located at <http://www.ibm.com/support>.

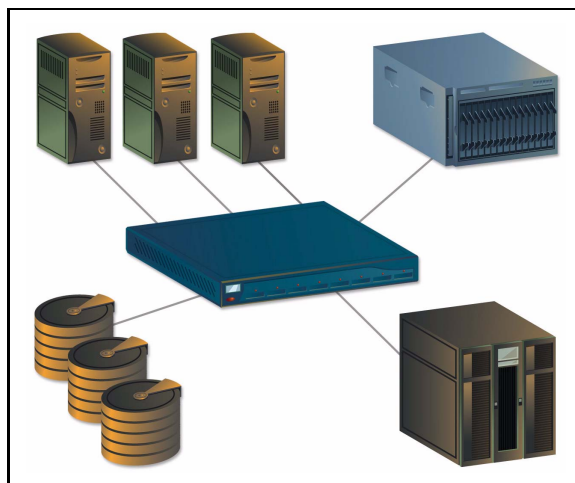
^bThe IBM 2109 F32 and IBM 2109 M12 are IBM TotalStorage SAN Switches.

ATTENTION!! When updating Brocade firmware, the switch may default to a proprietary operating mode. Therefore, after a firmware update, verify that the switch is still set to Interoperability mode (see “Operating Mode Configuration” on page 115).

The following figures illustrate a Brocade Fibre Channel fabric prior to and after merging with an IBM eServer BladeCenter.



Brocade Fibre Channel Fabric Prior to Merging with the IBM eServer BladeCenter



Brocade Fibre Channel Fabric with the IBM eServer BladeCenter

Backing Up and Restoring the Current Configuration Settings

Back up the current Brocade switch configuration data prior to following the steps to merge Brocade and IBM eServer BladeCenter fabrics so that the configuration can be restored if something goes wrong.

NOTE: For additional information, refer to the documentation provided with the switch.

Backup Procedure

Do the following to create a software copy backup of the switch configuration.

NOTE: This procedure requires access to an FTP server for Fabric OS 4.x, and an FTP or RSHD server for Fabric OS 3.x.

1. Verify that the FTP (or RSHD, as appropriate) service is running on the host workstation.
2. Log into the switch as the admin user.
3. Enter the `configupload` command.
4. Provide the information requested at the prompts.

For example:

```
switch:admin> configupload
Server Name or IP Address [host]: 192.168.15.42
User Name [none]: user21
File Name [config.txt]: config-switch.txt
Password: xxxxxxxx
upload complete
switch:admin>
```

Restore Procedure

If you need to restore the Brocade configuration settings that you backed up, do the following:

ATTENTION!! This procedure requires a reboot of the switch.

NOTE: This procedure requires access to an FTP server for Fabric OS 4.x, and an FTP or RSHD server for Fabric OS 3.x.

1. Verify that the FTP (or RSHD, as appropriate) service is running on the host workstation.
2. Log into the switch as the admin user.
3. Shut down the switch by entering the `switchdisable` command.
4. Enter the `configdownload` command.

5. Provide the information requested at the prompts.
6. Reboot the switch by entering the **reboot** command:

For example:

```
switch:admin> configdownload  
Server Name or IP Address [host]: 192.168.15.42  
User Name [None]: user21  
File Name [config.txt]: config-file.txt  
Password: xxxxxxx  
download complete  
switch:admin>  
switch:admin> reboot
```

Domain ID Configuration

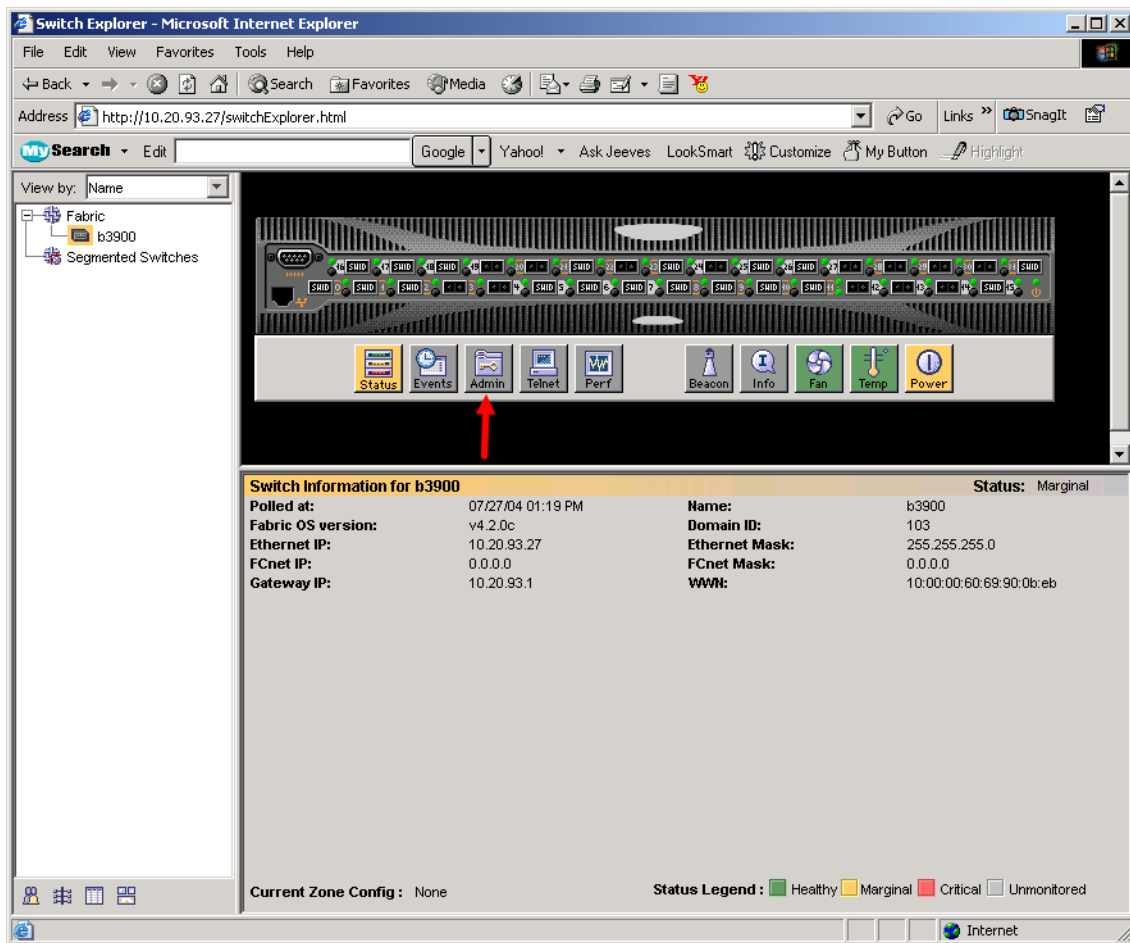
To ensure that there are no conflicts between switches, we recommend that each switch have an assigned Domain ID. The following steps show how to set the Domain ID on both the Brocade switch and IBM eServer BladeCenter switch module.

NOTE: The Domain ID should be locked and unique within the 97–127 (0x61–0x7f) range.

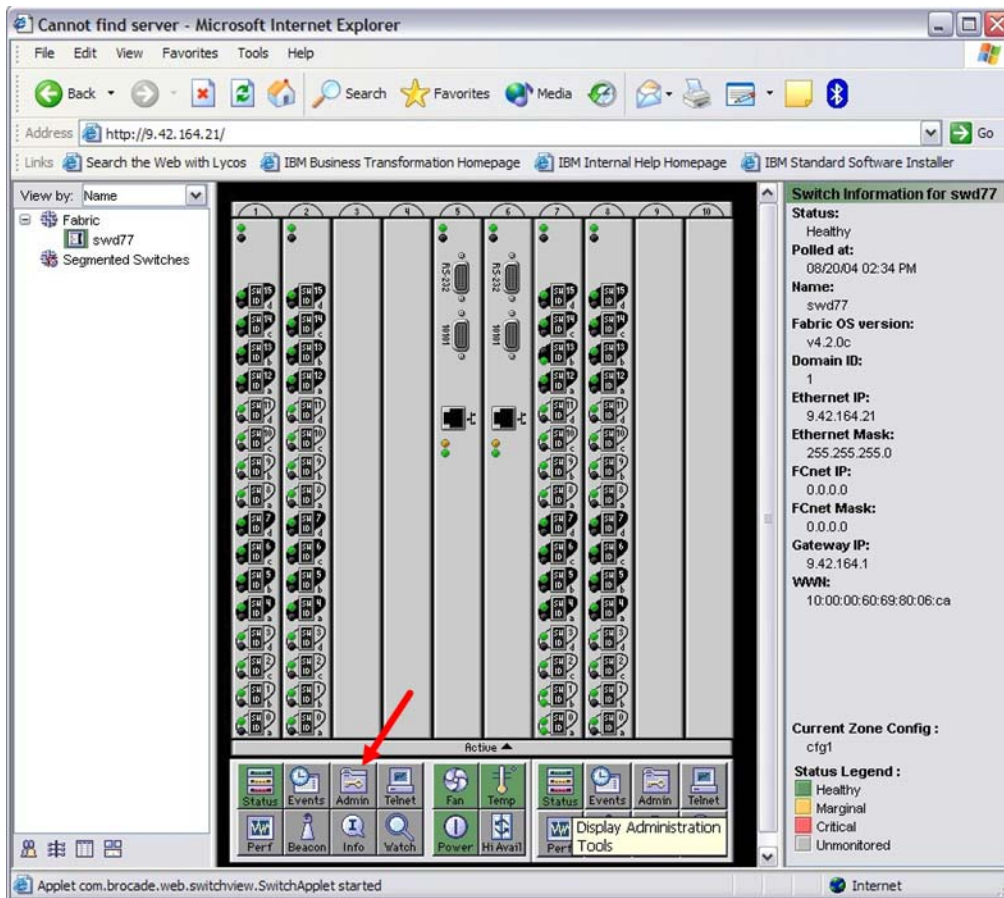
Brocade's Web Tools

1. Start Brocade's Web Tools. The **Switch Explorer** dialog box displays.
2. From the **Switch Explorer** dialog box, click the **Admin** button.

For the Brocade SilkWorm 3900/IBM 2109 F32, the following displays:

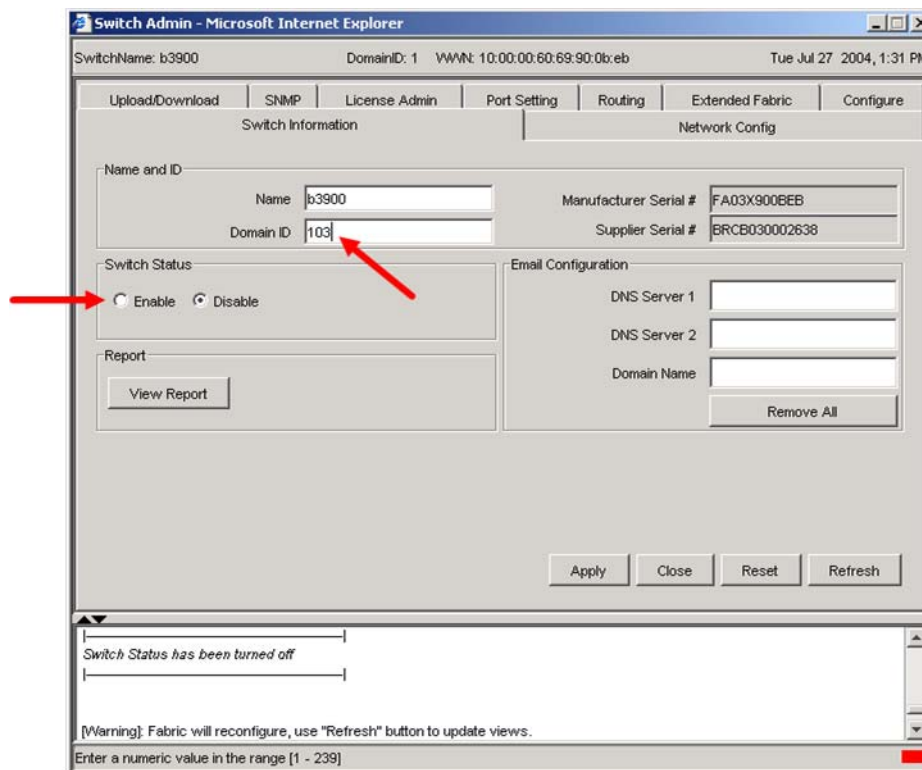


For the Brocade SilkWorm 12000/IBM 2109 M12, the following displays:

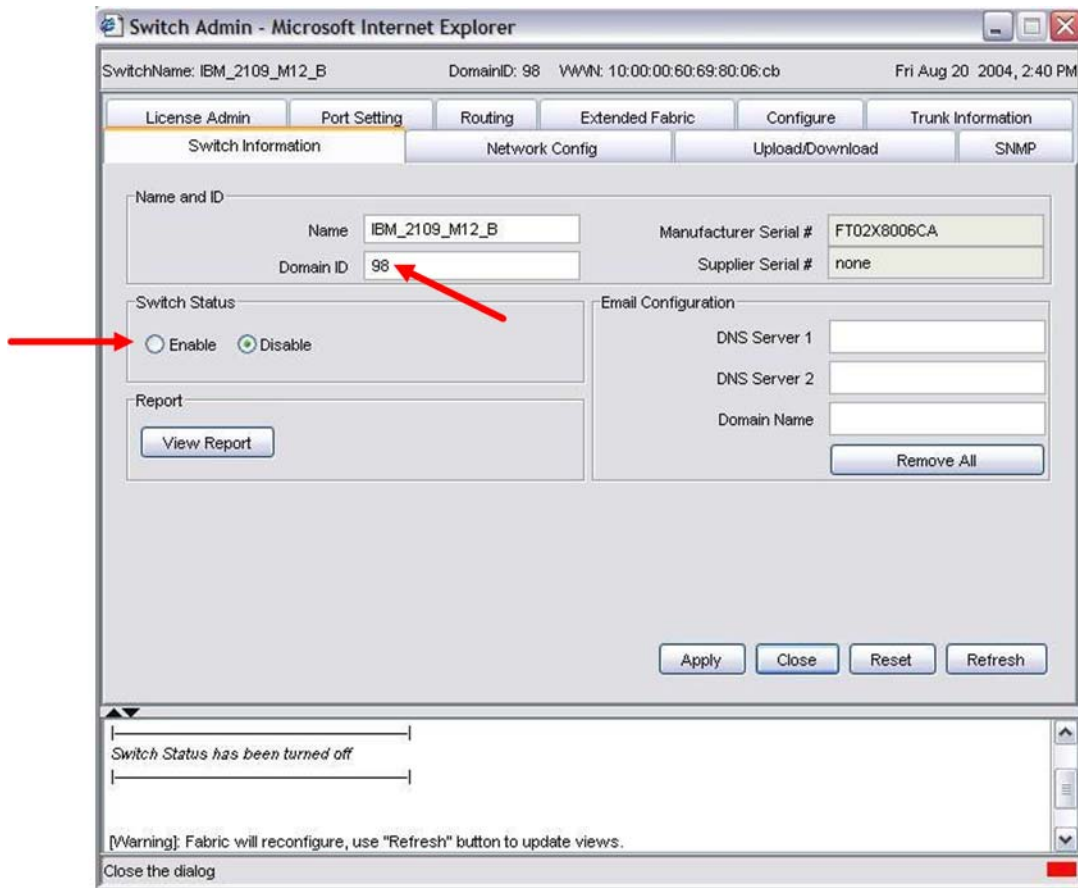


3. From the **Switch Admin** dialog box, select the **Switch Information** tab. Do the following:
 - a. In the Switch Status section, select the **Disable** radio button. Click **Apply**.
 - b. The **Switch Information: Confirm Action** message warns that disabling the switch may reconfigure the fabric. Click **Yes** to continue.
 - c. In the Name and ID section **Domain ID** field, type or edit the Domain ID as appropriate. Click **Apply**.
 - d. The **Switch Information: Confirm Action** message warns that changing the Domain ID can affect port level zoning. Click **Yes** to continue.
 - e. In the Switch Status section, select the **Enable** radio button. Click **Apply**.
 - f. Click **Close**.

For the Brocade SilkWorm 3900/IBM 2109 F32, the following displays:



For the Brocade SilkWorm 12000/IBM 2109 M12, the following displays:



Brocade CLI

NOTE: Use the following CLI commands when Brocade's Web tools are not available.

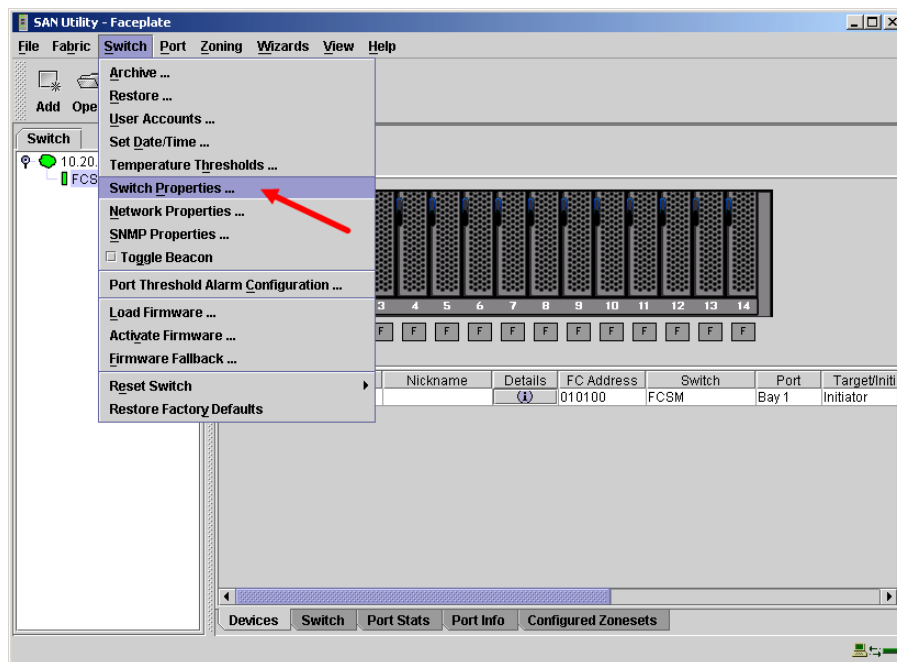
```
Fabric OS (b3900)
b3900 login: admin
Password:
b3900:admin> switchdisable
b3900:admin> configure
Configure...
Fabric parameters (yes, y, no, n): [no] yes
  Domain: (1..239) [1] 103
  R_A_TOV: (4000..120000) [10000]
  E_D_TOV: (1000..5000) [2000]
  Data field size: (256..2112) [2112]
  Sequence Level Switching: (0..1) [0]
  Disable Device Probing: (0..1) [0]
  Suppress Class F Traffic: (0..1) [0]
  Switch PID Format: (1..2) [1]
  Per-frame Route Priority: (0..1) [0]
  Long Distance Fabric: (0..1) [0]
  BB credit: (1..27) [16]
Insistent Domain ID Mode (yes, y, no, n): [no]
Virtual Channel parameters (yes, y, no, n): [no]
Zoning Operation parameters (yes, y, no, n): [no]
RSCN Transmission Mode (yes, y, no, n): [no]
Arbitrated Loop parameters (yes, y, no, n): [no]
System services (yes, y, no, n): [no]
Portlog events enable (yes, y, no, n): [no]
WARNING: The domain ID will be changed. The port level zoning may be affected
b3900:admin> switchenable
```

IBM eServer BladeCenter GUI

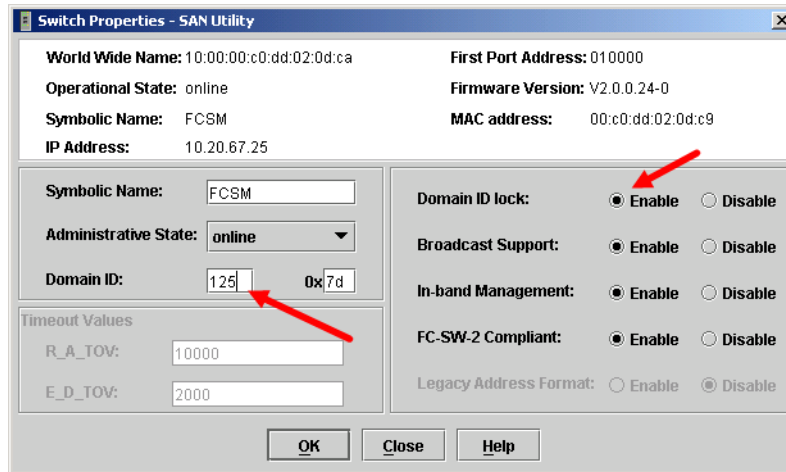
NOTE: You can use the SAN Utility to modify all IBM eServer BladeCenter switch modules. You can use the SAN Browser to modify only the QLogic 6-port Enterprise Fibre Channel Switch Module for IBM eServer BladeCenter. The screen images differ, but the procedures for the SAN Utility and SAN Browser are the same.

Do the following to modify IBM eServer BladeCenter switch modules using the SAN Utility:

1. Start the SAN Utility. The **SAN Utility—Faceplate** dialog box displays.
2. From the **SAN Utility—Faceplate** dialog box **Switch** menu, select **Switch Properties**.

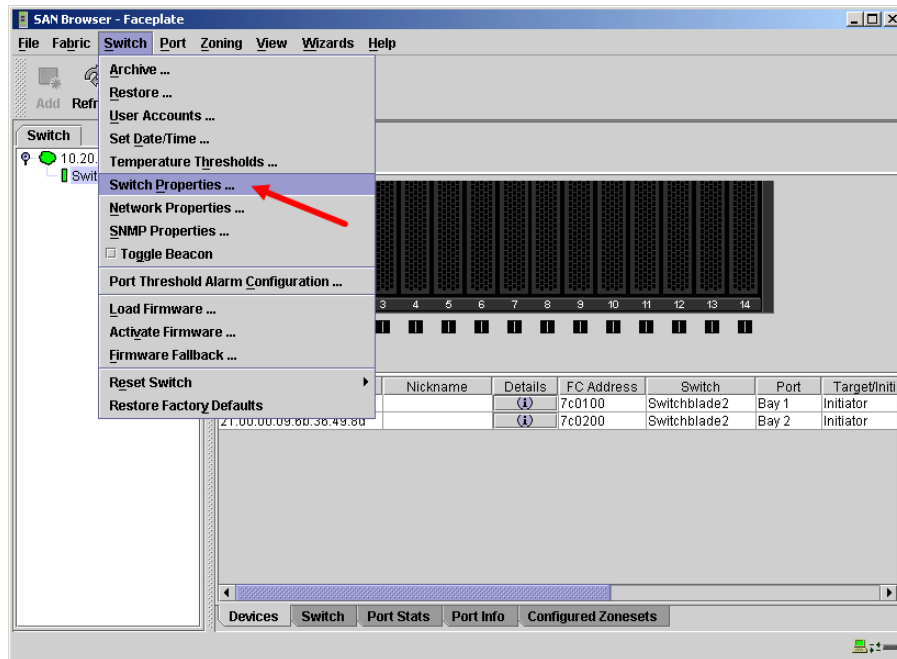


3. From the **Switch Properties—SAN Utility** dialog box, do the following:
 - a. In the **Domain ID** box, type a unique Domain ID in the 97–127 range for the switch.
 - b. Select the **Domain ID Lock Enable** radio button to ensure that the switch always has that Domain ID.
 - c. Click **OK**.

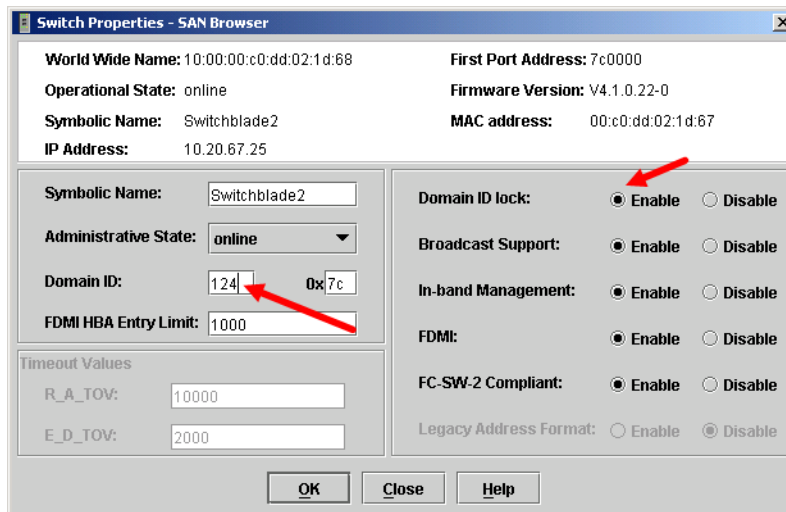


Do the following to modify the QLogic 6-port Enterprise Fibre Channel Switch Module for IBM eServer BladeCenter using the SAN Browser:

1. Start the SAN Browser. The **SAN Browser—Faceplate** dialog box displays.
2. From the **SAN Browser—Faceplate** dialog box **Switch** menu, select **Switch Properties**.



3. From the **Switch Properties—SAN Browser** dialog box, do the following:
 - a. In the **Domain ID** box, type a unique Domain ID in the 97–127 range for the switch.
 - b. Select the **Domain ID Lock Enable** radio button to ensure that the switch always has that Domain ID.
 - c. Click **OK**.



IBM eServer BladeCenter CLI

NOTE: The procedures differ based on the IBM eServer BladeCenter switch module.

Use the following CLI commands to modify the IBM eServer BladeCenter 2-port Fibre Channel Switch Module when the SAN Utility is not available:

```
Login: USERID
Password: xxxxxxxx
IBM eServer BladeCenter #> admin start
IBM eServer BladeCenter (admin) #> config edit
IBM eServer BladeCenter (admin-config) #> set config switch

  The following options display:
  AdminState (1=Online, 2=Offline, 3=Diagnostics) [Online]
  BroadcastEnabled (True / False) [True]
  InbandEnabled (True / False) [True]
  DefaultDomainID (decimal value, 1-239) [1] <97-127>
  DomainIDLock (True / False) [False] True
  SymbolicName (string, max=32 chars) [Fibre Channel Switch Module]
  R_T_TOV (decimal value, 1-1000 msec) [100]
  R_A_TOV (decimal value, 100-100000 msec) [10000]
  E_D_TOV (decimal value, 10-20000 msec) [2000]
  FS_TOV (decimal value, 100-100000 msec) [5000]
  DS_TOV (decimal value, 100-100000 msec) [5000]
  PrincipalPriority (decimal value, 1-255) [254]
  ConfigDescription (string, max=64 chars) [Default Config]
IBM eServer BladeCenter (admin-config) #> config save
IBM eServer BladeCenter (admin) #> config activate
The configuration will be activated. Please confirm (y/n): [n] y
```

Use the following CLI commands to modify the QLogic 6-port Enterprise Fibre Channel Switch Module for IBM eServer BladeCenter when the SAN Utility and SAN Browser are not available:

```
Login: USERID
Password: xxxxxxxx
Switchblade2: admin> admin start
Switchblade2 (admin): admin> config edit
    The config named default is being edited.
Switchblade2 (admin-config): admin> set config switch
    A list of attributes with formatting and current values will follow.
    Enter a new value or simply press the ENTER key to accept the current
    value. If you wish to terminate this process before reaching the end of
    the list press 'q' or 'Q' and the ENTER key to do so.
    AdminState (1=Online, 2=Offline, 3=Diagnostics) [Online]
    BroadcastEnabled (True / False) [True]
    InbandEnabled (True / False) [True]
    FdmiEnabled (True / False) [True]
    FdmiEntries (decimal value, 0-1000) [1000]
    DefaultDomainID (decimal value, 1-239) [1] 124
    DomainIDLock (True / False) [False] true
    SymbolicName (string, max=32 chars) [Switchblade2]
    R_A_TOV (decimal value, 100-100000 msec) [10000]
    E_D_TOV (decimal value, 10-20000 msec) [2000]
    PrincipalPriority (decimal value, 1-255) [254]
    ConfigDescription (string, max=64 chars) [Qlogic 6-port Enterprise
    Switch Module for IBM eServer BladeCenter]
    FC-SW-2 Compliant (True / False) [True]
    Finished configuring attributes.
    This configuration must be saved (see config save command) and activated
    (see config activate command) before it can take effect.
    To discard this configuration use the config cancel command.
Switchblade2 (admin-config): admin> config save
    The config named default has been saved.
Switchblade2 (admin): admin> config activate
    The currently active configuration will be activated.
    Please confirm (y/n): [n] y
Switchblade2 (admin): admin> admin end
```

Timeout Values

As per FC-SW-2 Fibre Channel standards, set all switches to the following timeout values (TOV) in order to successfully establish an E_port connection:

R_A_TOV = 10 seconds (The setting is **10000**.)

E_D_TOV = 2 seconds (The setting is **2000**.)

NOTE: These are the default values for **R_A_TOV** and **E_D_TOV**. In addition, **BB Credits** needs to be set to **12** (the default is **16**).

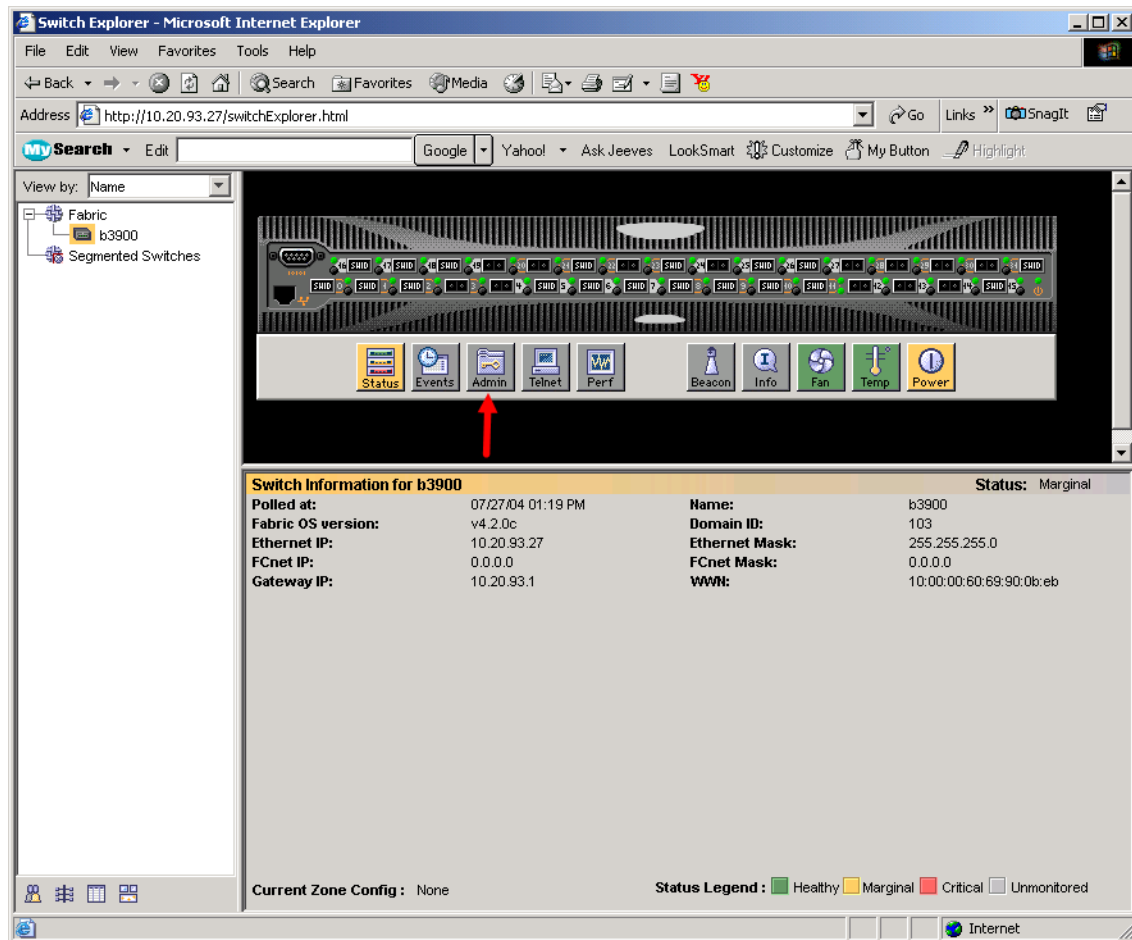
This section provides the steps to change these values.

Brocade's Web Tools

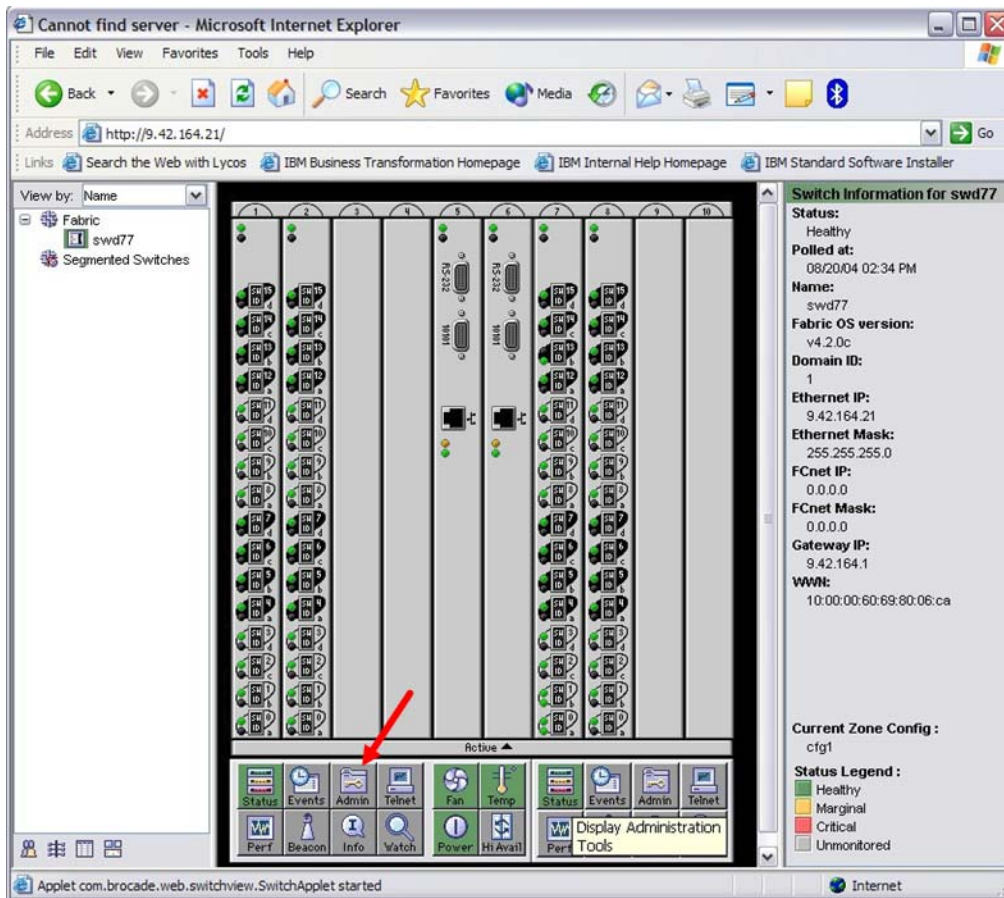
ATTENTION!! The following steps take the switch offline; therefore, do not perform them on a switch being managed in-band.

1. Start Brocade's Web Tools. The **Switch Explorer** dialog box displays.
2. From the **Switch Explorer** dialog box, click the **Admin** button.

For the Brocade SilkWorm 3900/IBM 2109 F32, the following displays:

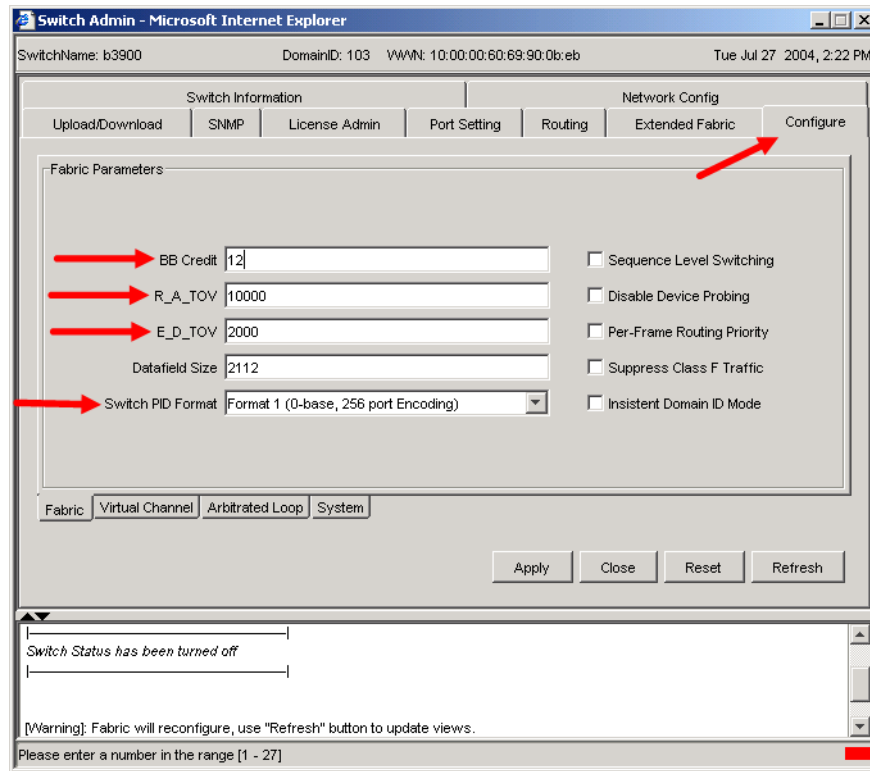


For the Brocade SilkWorm 12000/IBM 2109 M12, the following displays:

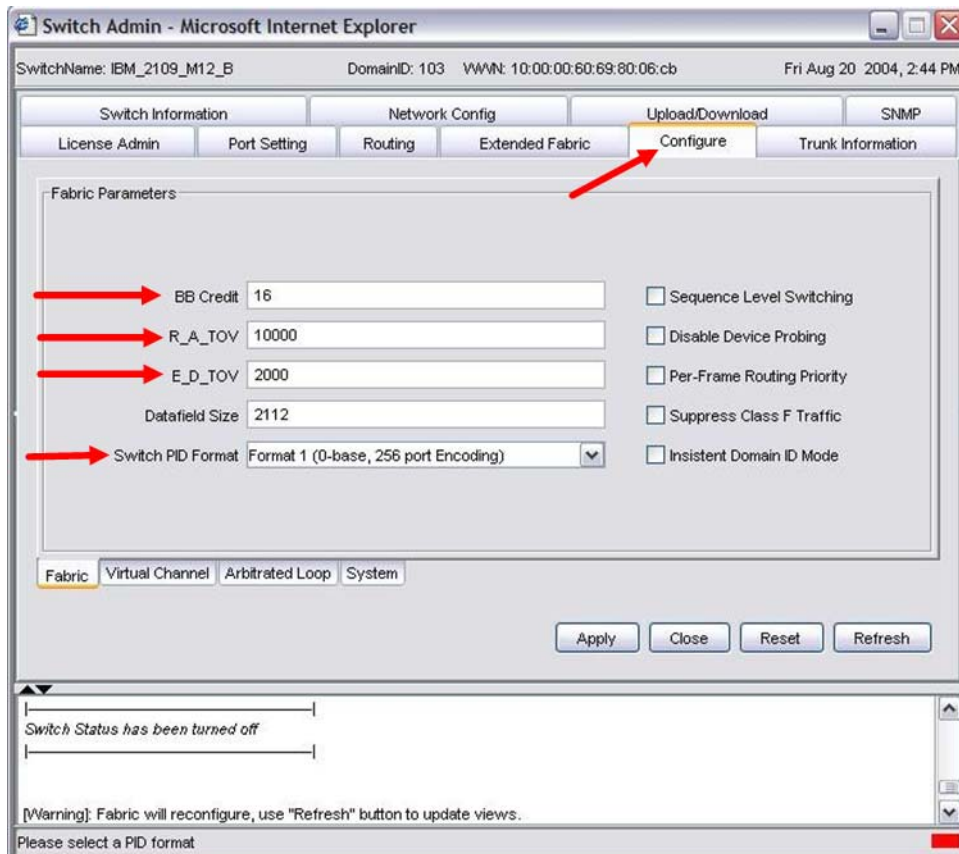


- From the **Switch Admin** dialog box, select the **Configure** tab. Verify that **BB Credit** is set to **12**, **R_A_TOV** is set to **10000**, **E_D_TOV** is set to **2000**, and the **Switch PID Format** is set to **Format 1**. If the settings are *not* correct, proceed to [step 4](#). If the settings are correct, no changes need to be made; proceed to the next appropriate section.

For the Brocade SilkWorm 3900/IBM 2109 F32, the following displays:

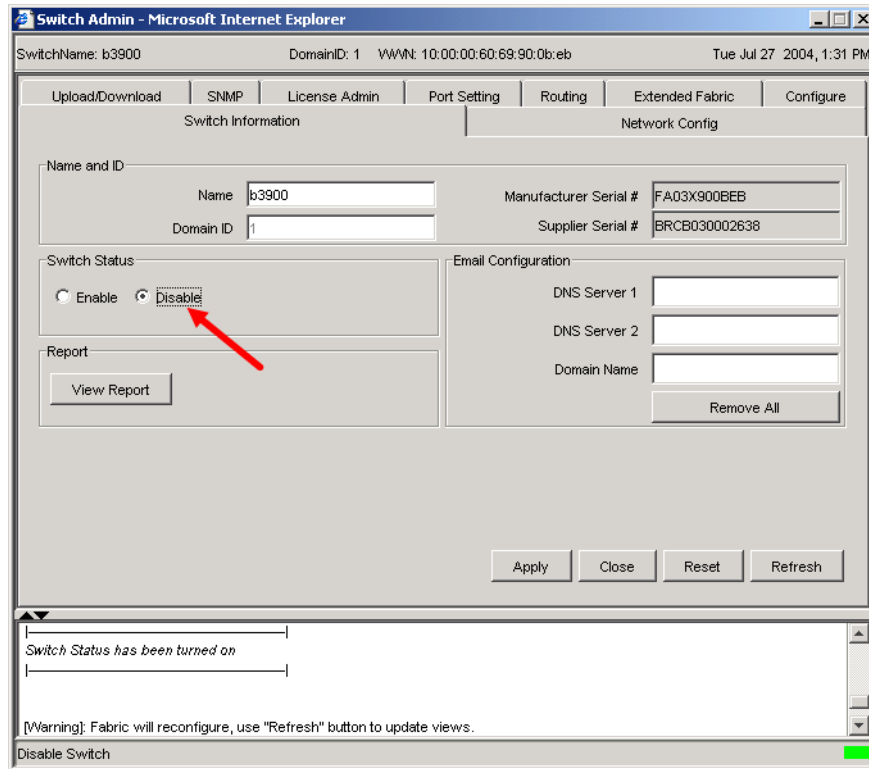


For the Brocade SilkWorm 12000/IBM 2109 M12, the following displays:

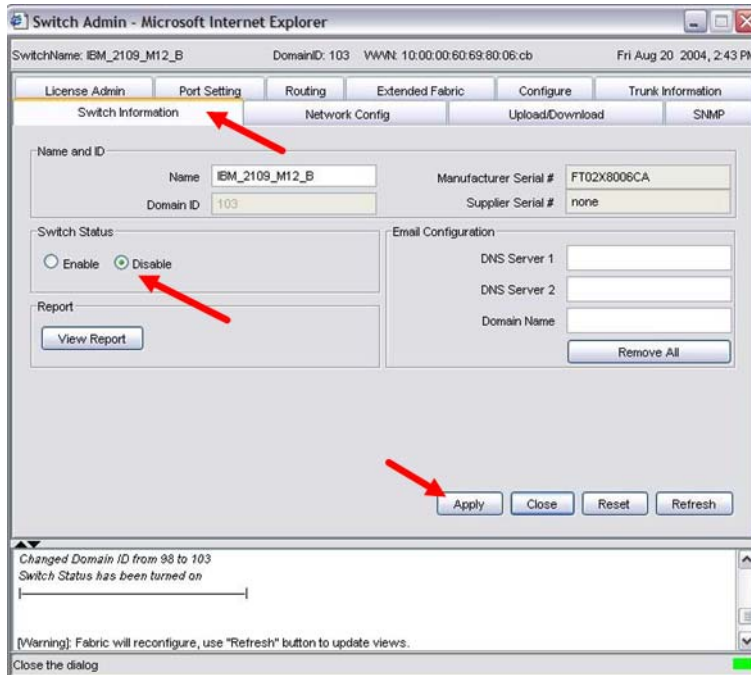


4. Select the **Switch Information** tab. In the Switch Status section, select the **Disable** radio button. Click **Apply**.

For the Brocade SilkWorm 3900/IBM 2109 F32, the following displays:

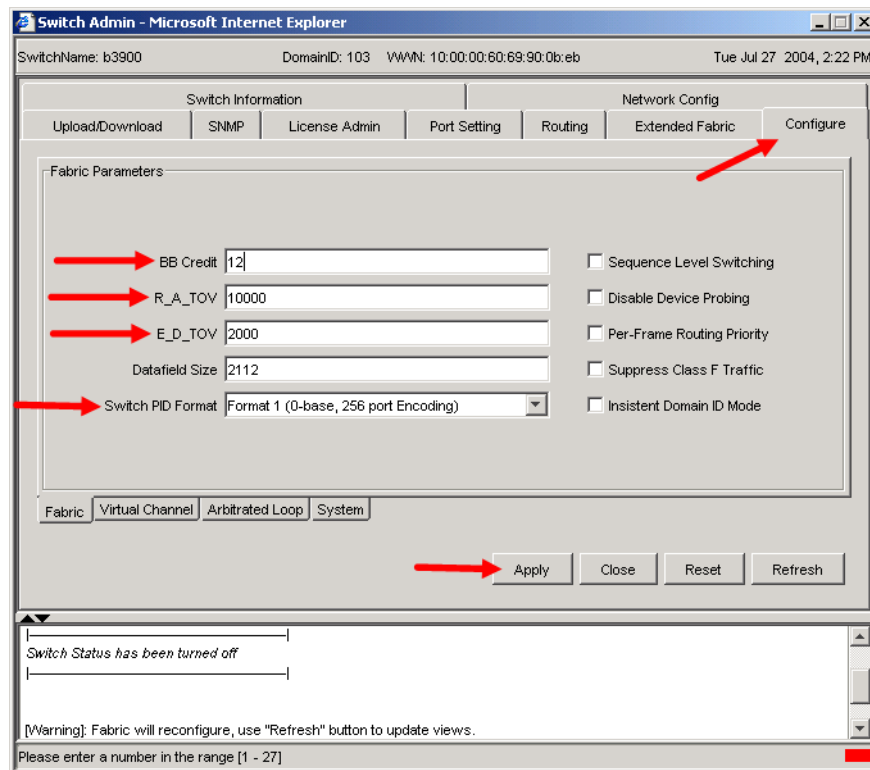


For the Brocade SilkWorm 12000/IBM 2109 M12, the following displays:

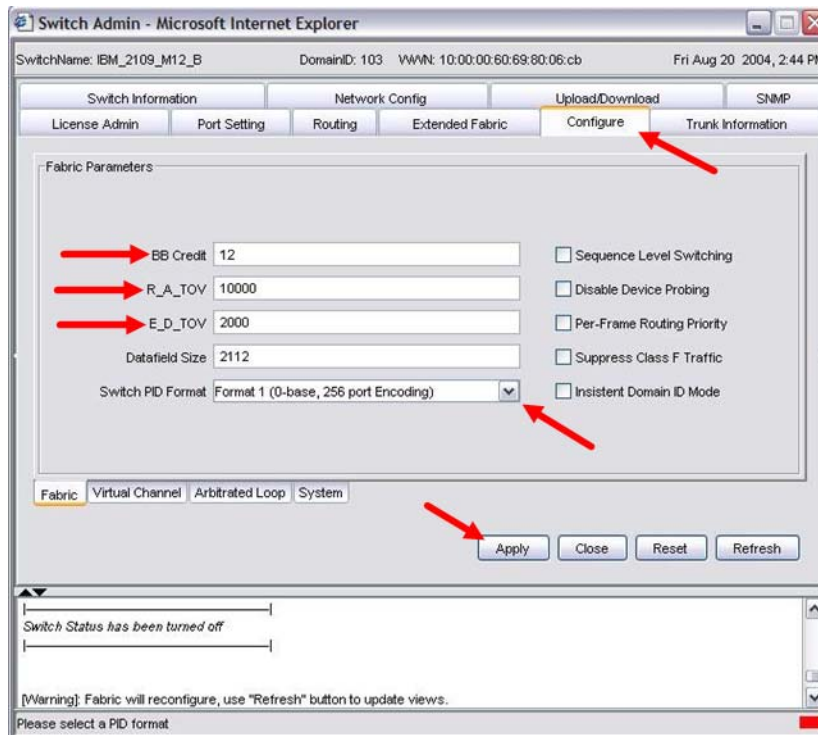


5. Select the **Configure** tab, do the following as appropriate:
 - a. In the **BB Credit** box, change the setting to **12**.
 - b. In the **R_A_TOV** box, change the setting to **10000**.
 - c. In the **E_D_TOV** box, change the setting to **2000**.
 - d. In the **Switch PID Format** drop-down, select **Format 1**.
 - e. Click **Apply**.

For the Brocade SilkWorm 3900/IBM 2109 F32, the following displays:

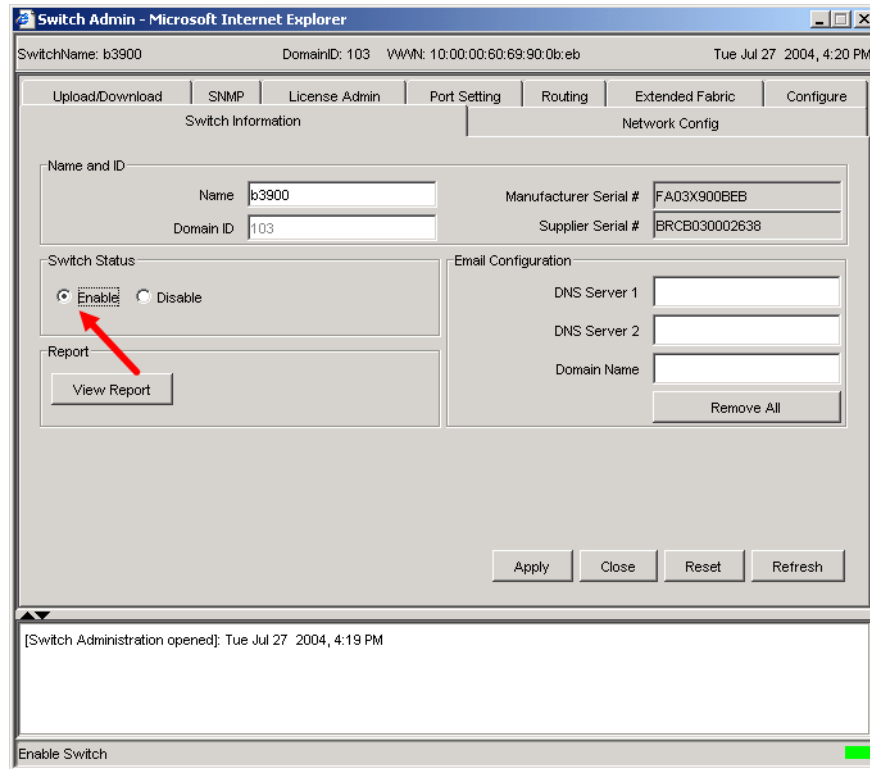


For the Brocade SilkWorm 12000/IBM 2109 M12, the following displays:

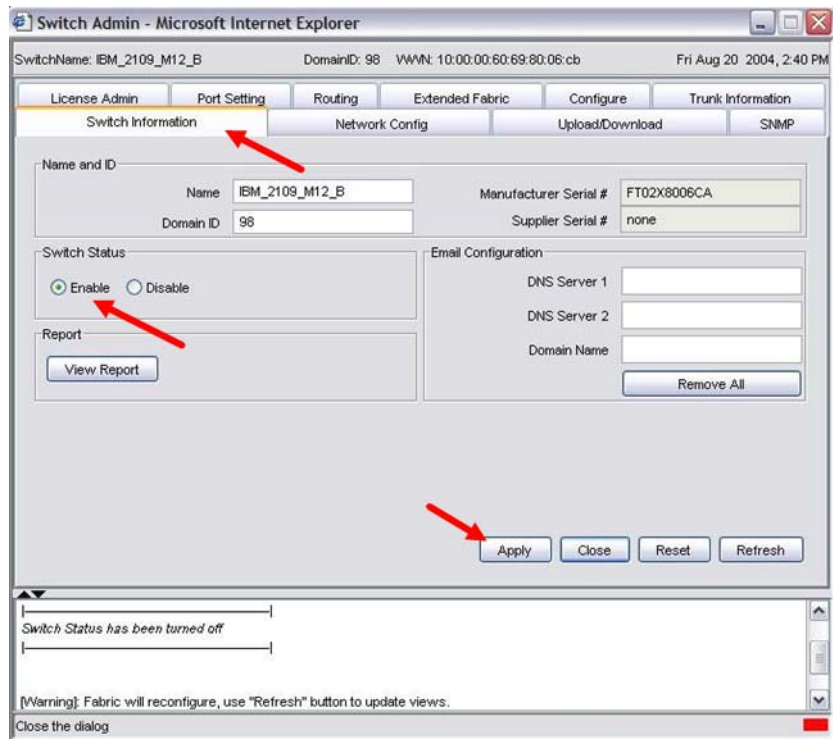


6. Select the **Switch Information** tab. In the Switch Status section, select the **Enable** radio button to re-enable to switch. Click **Apply**.

For the Brocade SilkWorm 3900/IBM 2109 F32, the following displays:



For the Brocade SilkWorm 12000/IBM 2109 M12, the following displays:



Brocade CLI

NOTE: Use the following CLI commands when Brocade's Web tools are not available.

```
Fabric OS (b3900)
b3900 login: admin
Password: xxxxxxxx
```

Use the following command to verify that R_A_TOV is set to 10000, E_D_TOV is set to 2000, BB credit is set to 12, and Switch PID Format is set to 1.

```
b3900:admin> configshow
```

If these timeout, BB credit, and Switch PID Format values are *not* correct, continue with this section. If the settings are correct, no changes need to be made; proceed with the next appropriate section.

```
b3900:admin> switchdisable
b3900:admin> configure
Configure...
Fabric parameters (yes, y, no, n): [no] y
Domain: (1..239) [103]
R_A_TOV: (4000..120000) [9000] 10000
E_D_TOV: (1000..5000) [1500] 2000
Data field size: (256..2112) [2112]
Sequence Level Switching: (0..1) [0]
Disable Device Probing: (0..1) [0]
Suppress Class F Traffic: (0..1) [0]
Switch PID Format: (1..2) [2] 1
Per-frame Route Priority: (0..1) [0]
Long Distance Fabric: (0..1) [0]
BB credit: (1..27) [16] 12
Insistent Domain ID Mode (yes, y, no, n): [no]
Virtual Channel parameters (yes, y, no, n): [no]
Zoning Operation parameters (yes, y, no, n): [no]
RSCN Transmission Mode (yes, y, no, n): [no]
Arbitrated Loop parameters (yes, y, no, n): [no]
System services (yes, y, no, n): [no]
Portlog events enable (yes, y, no, n): [no]
```

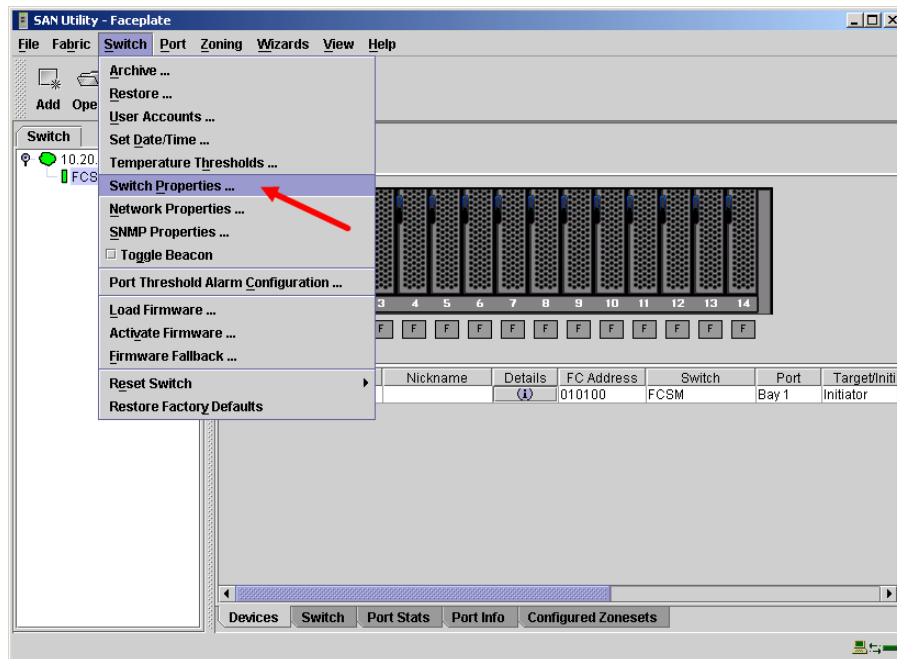
IBM eServer BladeCenter GUI

ATTENTION!! The following steps take the switch offline; therefore, do not perform them on a switch being managed in-band.

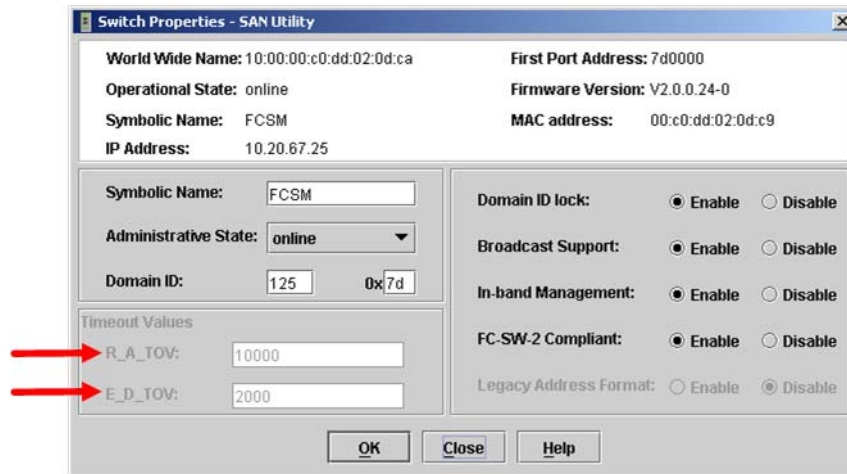
NOTE: You can use the SAN Utility to modify all IBM eServer BladeCenter switch modules. You can use the SAN Browser to modify only the QLogic 6-port Enterprise Fibre Channel Switch Module for IBM eServer BladeCenter. The screen images differ, but the procedures for the SAN Utility and SAN Browser are the same.

Do the following to modify IBM eServer BladeCenter switch modules using the SAN Utility:

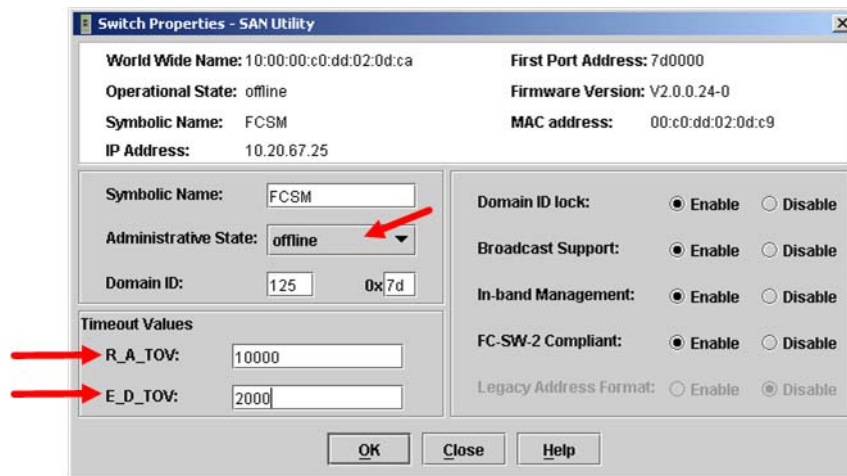
1. Start the SAN Utility. The **SAN Utility—Faceplate** dialog box displays.
2. From the **SAN Utility—Faceplate** dialog box **Switch** menu, select **Switch Properties**.



- From the **Switch Properties—SAN Utility** dialog box, verify that **R_A_TOV** is set to **10000** and **E_D_TOV** is set to **2000**. If the settings are *not* correct, proceed to [step 4](#). If the settings are correct, no changes need to be made; proceed to the next appropriate section.



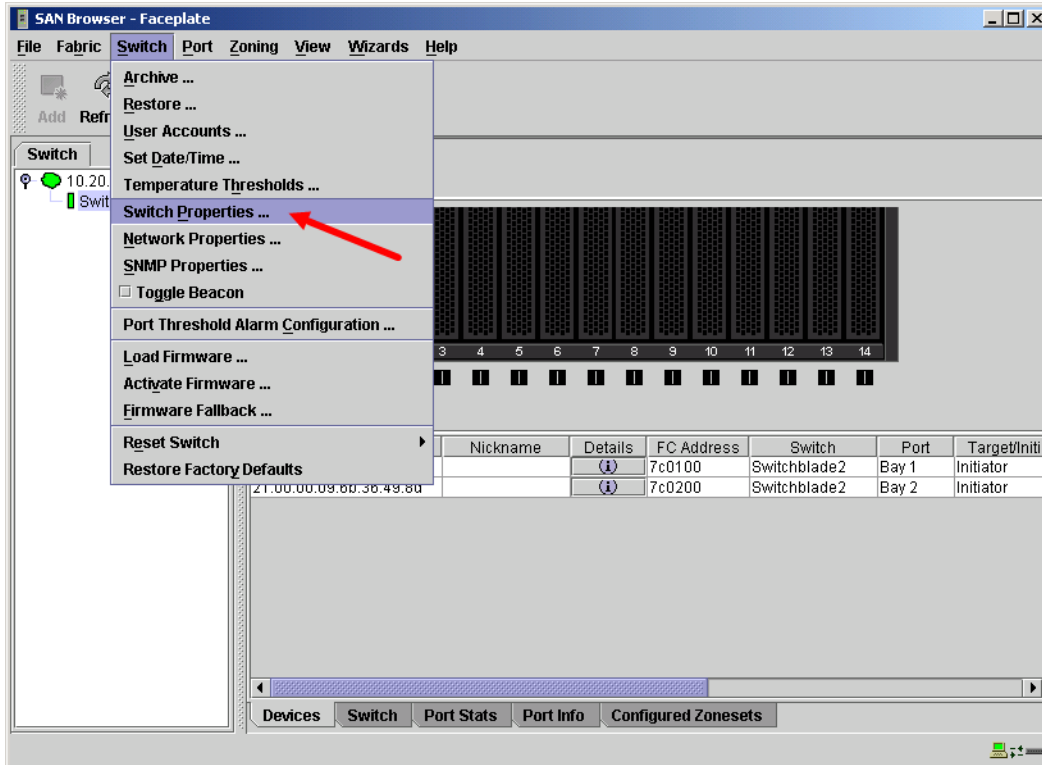
4. To modify the timeout value settings, do the following:
 - a. In the **Administrative State** drop-down box, select **offline**. Click **OK**.
 - b. The **SAN Utility—Faceplate** dialog box redisplay. Repeat [step 2](#) to redisplay the **Switch Properties—SAN Utility** dialog box.
 - c. In the Timeout Values section **R_A_TOV** box, enter **10000**.
 - d. In the Timeout Values section **E_D_TOV** box, enter **2000**.
 - e. In the **Administrative State** drop-down box, select **online**. Click **OK**.



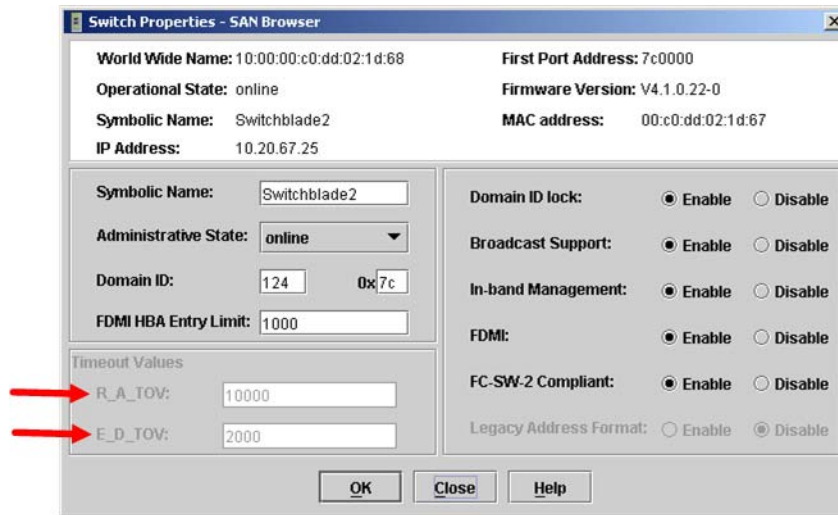
5. The **SAN Utility—Faceplate** dialog box redisplay. Repeat [step 2](#) to redisplay the **Switch Properties—SAN Utility** dialog box. Verify your changes ([see step 3](#)).

Do the following to modify the QLogic 6-port Enterprise Fibre Channel Switch Module for IBM eServer BladeCenter using the SAN Browser:

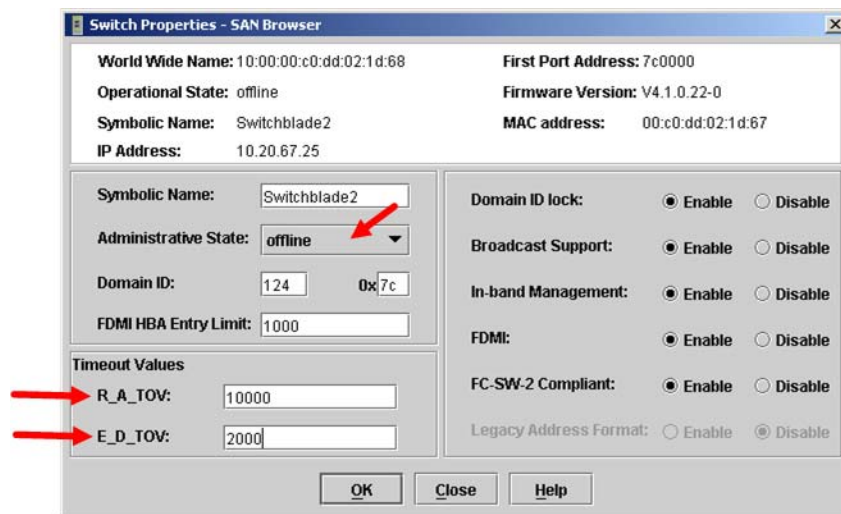
1. Start the SAN Browser. The **SAN Browser—Faceplate** dialog box displays.
2. From the **SAN Browser—Faceplate** dialog box **Switch** menu, select **Switch Properties**.



3. From the **Switch Properties—SAN Browser** dialog box, verify that **R_A_TOV** is set to **10000** and **E_D_TOV** is set to **2000**. If the settings are *not* correct, proceed to [step 4](#). If the settings are correct, no changes need to be made; proceed to the next appropriate section.



4. To modify the timeout value settings, do the following:
 - a. In the **Administrative State** drop-down box, select **offline**. Click **OK**.
 - b. The **SAN Browser—Faceplate** dialog box redisplay. Repeat [step 2](#) to redisplay the **Switch Properties—SAN Browser**.
 - c. In the Timeout Values section **R_A_TOV** box, enter **10000**.
 - d. In the Timeout Values section **E_D_TOV** box, enter **2000**.
 - e. In the **Administrative State** drop-down box, select **online**. Click **OK**.



5. The **SAN Browser—Faceplate** dialog box redisplay. Repeat [step 2](#) to redisplay the **Switch Properties—SAN Browser** dialog box. Verify your changes ([see step 3](#)).

IBM eServer BladeCenter CLI

ATTENTION!! The following steps take the switch offline; therefore, do not perform them on a switch being managed in-band.

NOTE: The procedures differ based on the IBM eServer BladeCenter switch module.

Use the following CLI commands to modify the IBM eServer BladeCenter 2-port Fibre Channel Switch Module when the SAN Utility is not available:

Login: **USERID**

Password: **xxxxxxxx**

Use the following command to verify that R_A_TOV is set to 10000 and E_D_TOV is set to 2000.

```
IBM eServer BladeCenter #> show config switch
```

If these timeout values are *not* correct, continue with this section. If the settings are correct, no changes need to be made; proceed with the next appropriate section.

```
IBM eServer BladeCenter #> admin start
```

```
IBM eServer BladeCenter (admin) #> config edit
```

```
IBM eServer BladeCenter (admin-config) #> set config switch
```

The following options display:

```
AdminState (1=Online, 2=Offline, 3=Diagnostics) [Online]
```

```
BroadcastEnabled (True / False) [True]
```

```
InbandEnabled (True / False) [True]
```

```
DefaultDomainID (decimal value, 1-239) [1]
```

```
DomainIDLock (True / False) [True]
```

```
SymbolicName (string, max=32 chars) [Fibre Channel Switch Module]
```

```
R_T_TOV (decimal value, 1-1000 msec) [100]
```

```
R_A_TOV (decimal value, 100-100000 msec) [9000] 10000
```

```
E_D_TOV (decimal value, 10-20000 msec) [1000] 2000
```

```
FS_TOV (decimal value, 100-100000 msec) [5000]
```

```
DS_TOV (decimal value, 100-100000 msec) [5000]
```

```
PrincipalPriority (decimal value, 1-255) [254]
```

```
ConfigDescription (string, max=64 chars) [Default Config]
```

```
IBM eServer BladeCenter (admin-config) #> config save
```

```
IBM eServer BladeCenter (admin) #> config activate
```

```
The configuration will be activated. Please confirm (y/n): [n] y
```

Use the following CLI commands to modify the QLogic 6-port Enterprise Fibre Channel Switch Module for IBM eServer BladeCenter when the SAN Utility and SAN Browser are not available:

Use the following command to verify that R_A_TOV is set to 10000 and E_D_TOV is set to 2000.

```
Login: USERID
Password: xxxxxxxx
Switchblade2 #> show config switch
```

If these timeout values are *not* correct, continue with this section. If the settings are correct, no changes need to be made; proceed with the next appropriate section.

```
Switchblade2: admin>
Switchblade2: admin> admin start
Switchblade2 (admin): admin> config edit
    The config named default is being edited.
Switchblade2 (admin-config): admin> set config switch
A list of attributes with formatting and current values will follow.
Enter a new value or simply press the ENTER key to accept the current
value. If you wish to terminate this process before reaching the end of
the list press 'q' or 'Q' and the ENTER key to do so.
AdminState (1=Online, 2=Offline, 3=Diagnostics) [Online]
BroadcastEnabled (True / False) [True]
InbandEnabled (True / False) [True]
FDMIEnabled (True / False) [True]
FDMIEntries (decimal value, 0-1000) [1000]
DefaultDomainID (decimal value, 1-239) [124]
DomainIDLock (True / False) [True]
SymbolicName (string, max=32 chars) [Switchblade2]
R_A_TOV (decimal value, 100-100000 msec) [9000] 10000
E_D_TOV (decimal value, 10-20000 msec) [1000] 2000
PrincipalPriority (decimal value, 1-255) [254]
ConfigDescription (string, max=64 chars) [Qlogic 6-port Enterprise
Switch Module for IBM eServer BladeCenter]
FC-SW-2 Compliant (True / False) [True]
```

Finished configuring attributes.

This configuration must be saved (see config save command) and activated (see config activate command) before it can take effect.

To discard this configuration use the config cancel command.

```
Switchblade2 (admin-config): admin> config save
```

The config named default has been saved.

```
Switchblade2 (admin): admin> config activate
```

The currently active configuration will be activated.

Please confirm (y/n): [n] **y**

```
Switchblade2 (admin): admin> admin end
```

Principal Switch Configuration

Brocade switches and IBM eServer BladeCenter switch modules negotiate for principal switch automatically. Therefore, there are no steps to take.

Zone Configuration

This section discusses configuring active Zone Set names and Zone types.

Active Zone Set Names

NOTE: For Brocade, Zone Set is referred to as Zone Configuration.

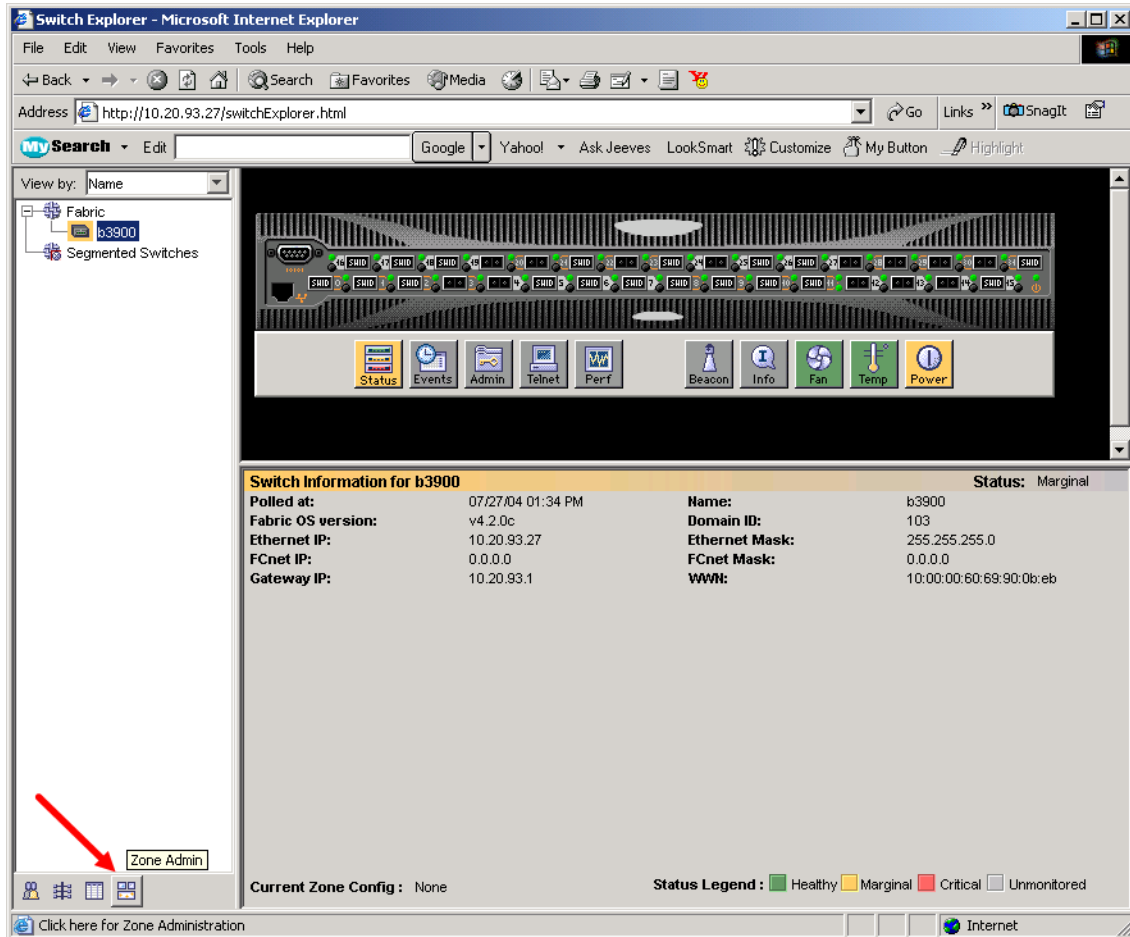
The Zone and Zone Set names on each switch must be unique. If not, change one of the duplicate names. All Zone Set and Zone names must conform to the Fibre Channel (FC) Standards for Zone Naming (ANSI T11/00-427v3):

1. Must be 1–64 characters in length.
2. All characters are ASCII.
3. First character is [a–z] or [A–Z].
4. All other characters must be [a–z], [A–Z], [0–9], or the _ character. Other characters (\$-^) may not be supported by all vendors and should be avoided.

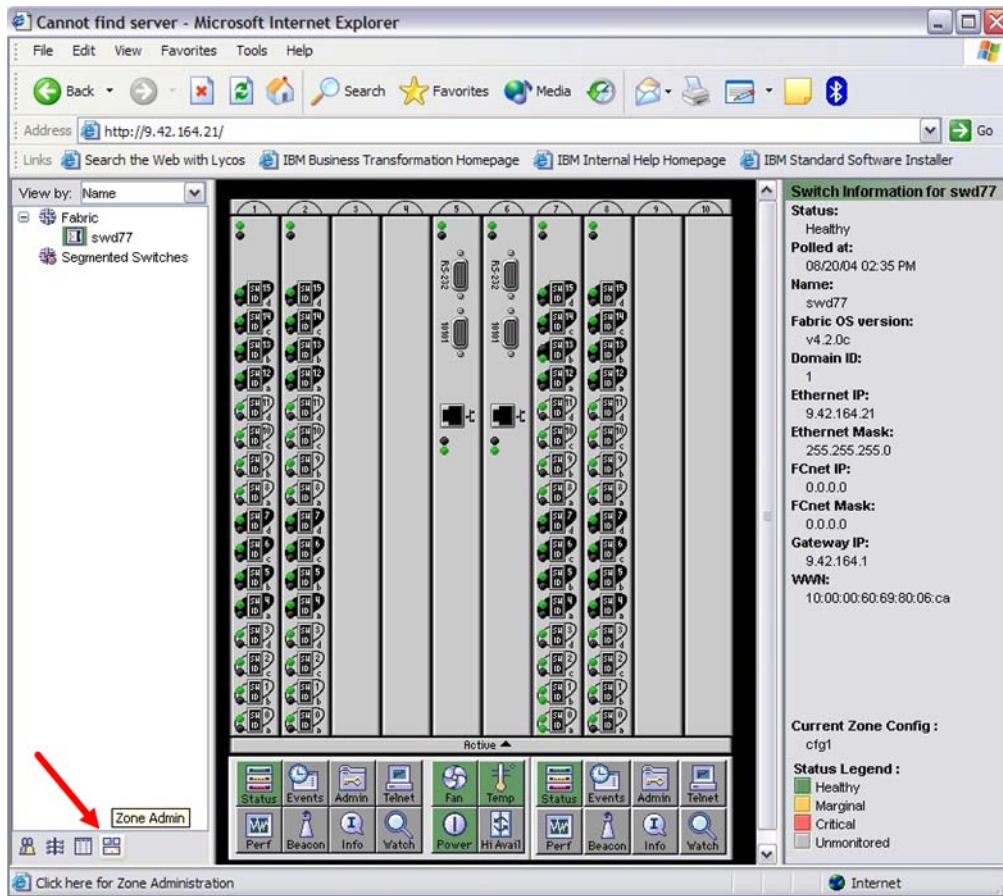
Brocade's Web Tools

1. Start Brocade's Web Tools. The **Switch Explorer** dialog box displays.
2. From the **Switch Explorer** dialog box, click the **Zone Admin** button.

For the Brocade SilkWorm 3900/IBM 2109 F32, the following displays:

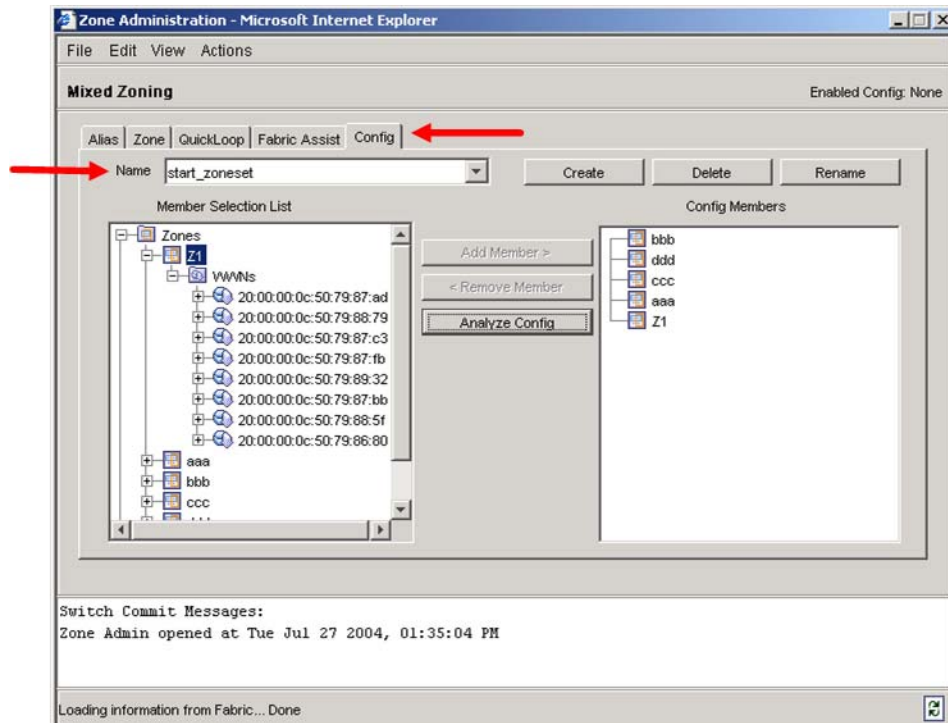


For the Brocade SilkWorm 12000/IBM 2109 M12, the following displays:

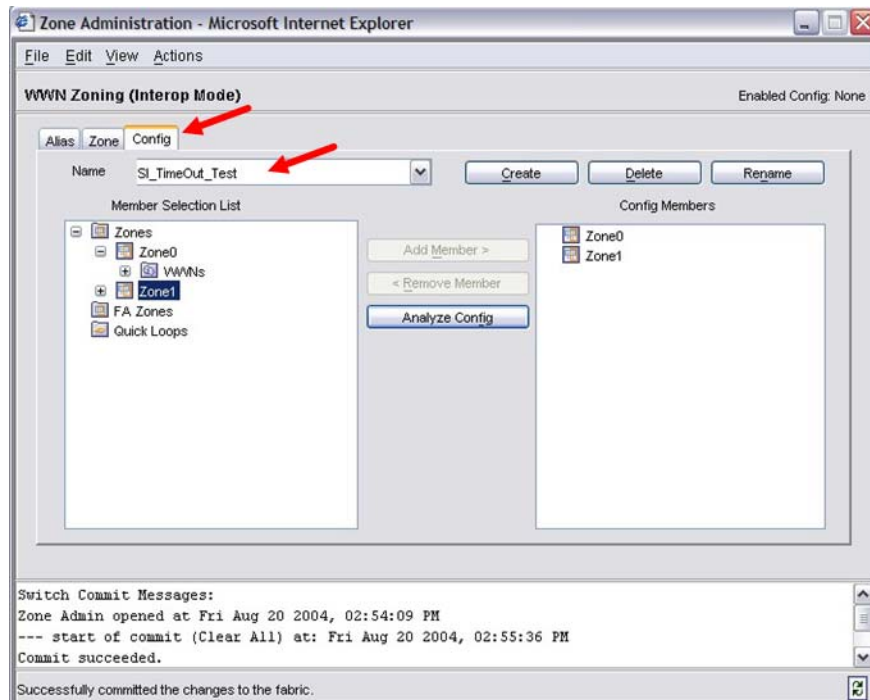


- From the **Zone Administration** dialog box, select the **Config** tab. Click the **Name** drop-down list to verify that all config names conform to the standards discussed under “[Active Zone Set Names](#)” on page 96 and are unique between the switches.

For the Brocade SilkWorm 3900/IBM 2109 F32, the following displays:



For the Brocade SilkWorm 12000/IBM 2109 M12, the following displays:



Brocade CLI

NOTE: Use the following CLI commands when Brocade's Web tools are not available.

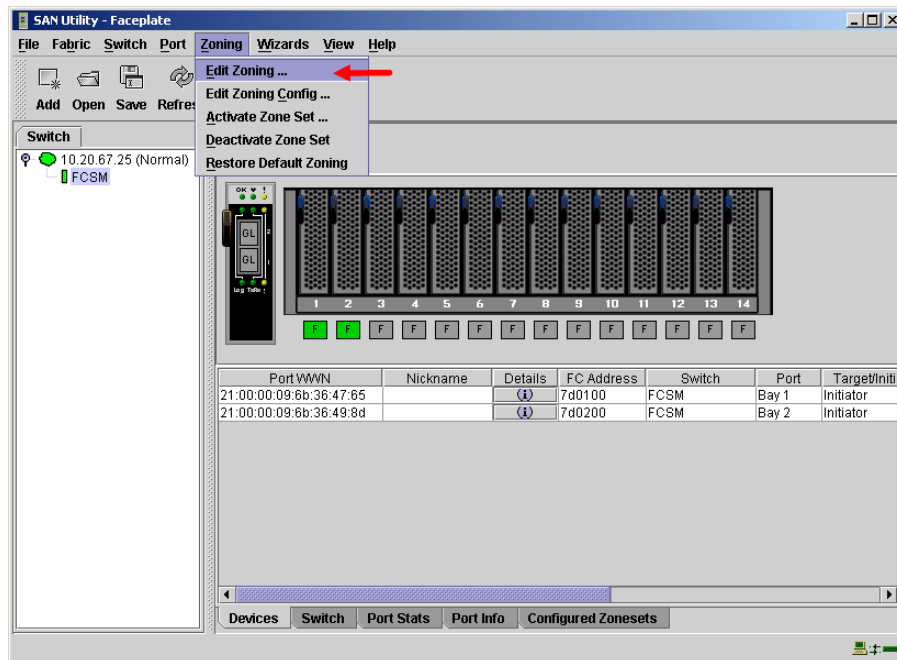
```
Fabric OS (cp1)
cp1 login: admin
Password: xxxxxxxx
Brocade12000:admin> cfgshow
Defined configuration:
  cfg: Interop_Broc_IBM
      Z1
zone:   Z1      21:00:00:e0:8b:06:01:e6; 21:00:00:e0:8b:06:00:e6;
        21:00:00:e0:8b:06:04:e6; 21:00:00:e0:8b:06:99:67;
        50:02:0f:23:00:00:03:58
Effective configuration:
  cfg: CHECKK
zone:   Z1      21:00:00:e0:8b:06:01:e6
        21:00:00:e0:8b:06:00:e6
        21:00:00:e0:8b:06:04:e6
        21:00:00:e0:8b:06:99:67
        50:02:0f:23:00:00:03:58
```

IBM eServer BladeCenter GUI

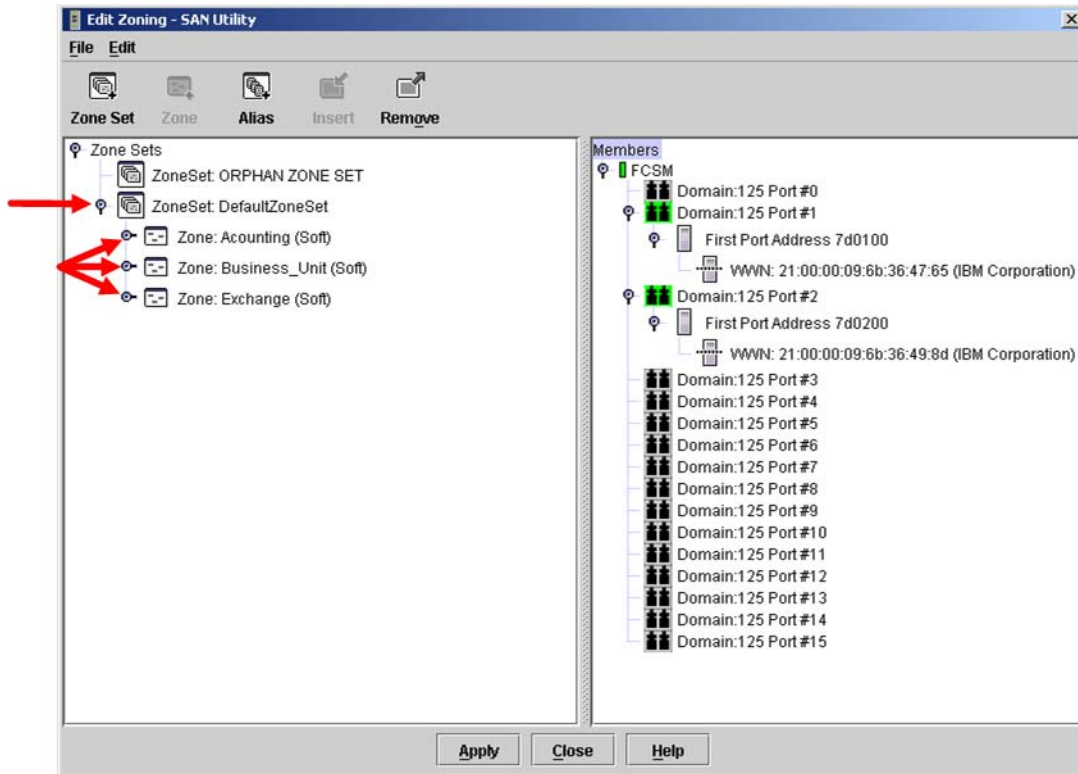
NOTE: You can use the SAN Utility to modify all IBM eServer BladeCenter switch modules. You can use the SAN Browser to modify only the QLogic 6-port Enterprise Fibre Channel Switch Module for IBM eServer BladeCenter. The screen images differ, but the procedures for the SAN Utility and SAN Browser are the same.

Do the following to modify IBM eServer BladeCenter switch modules using the SAN Utility:

1. Start the SAN Utility. The **SAN Utility—Faceplate** dialog box displays.
2. From the **SAN Utility—Faceplate** dialog box **Zoning** menu, select **Edit Zoning**.

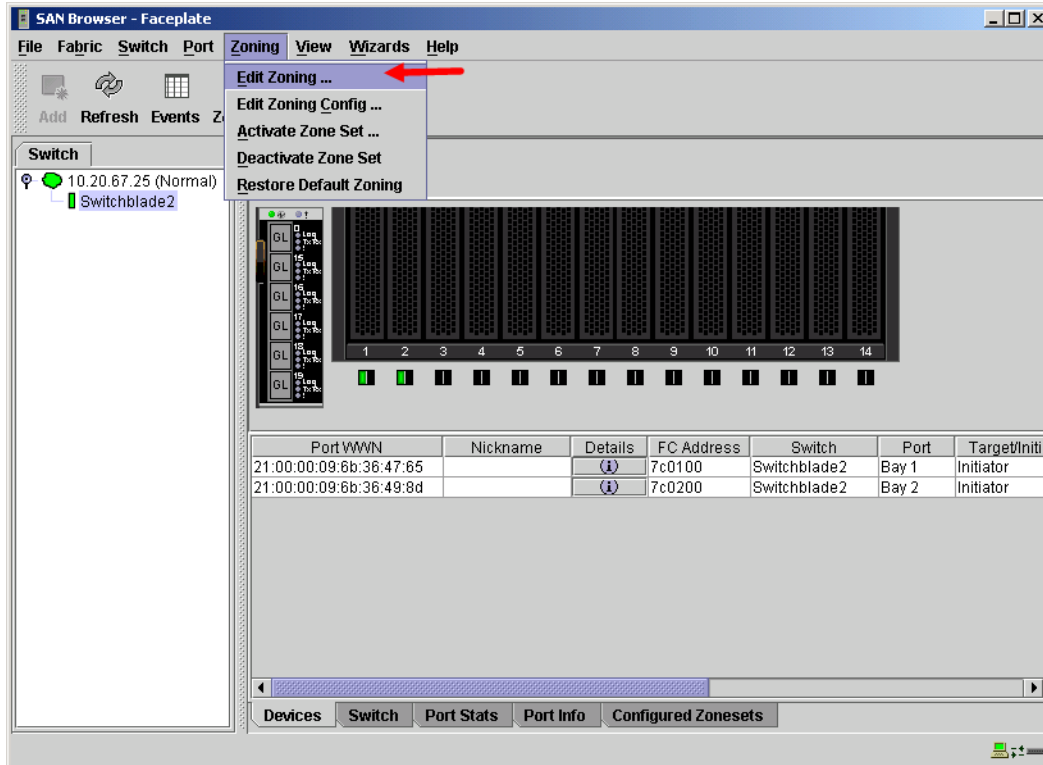


3. From the **Edit Zoning — SAN Utility** dialog box, compare the Zone Set and Zone names from each switch to ensure that none have the same name and the names conform to the standards for zone naming as discussed under [“Active Zone Set Names”](#) on page 96.

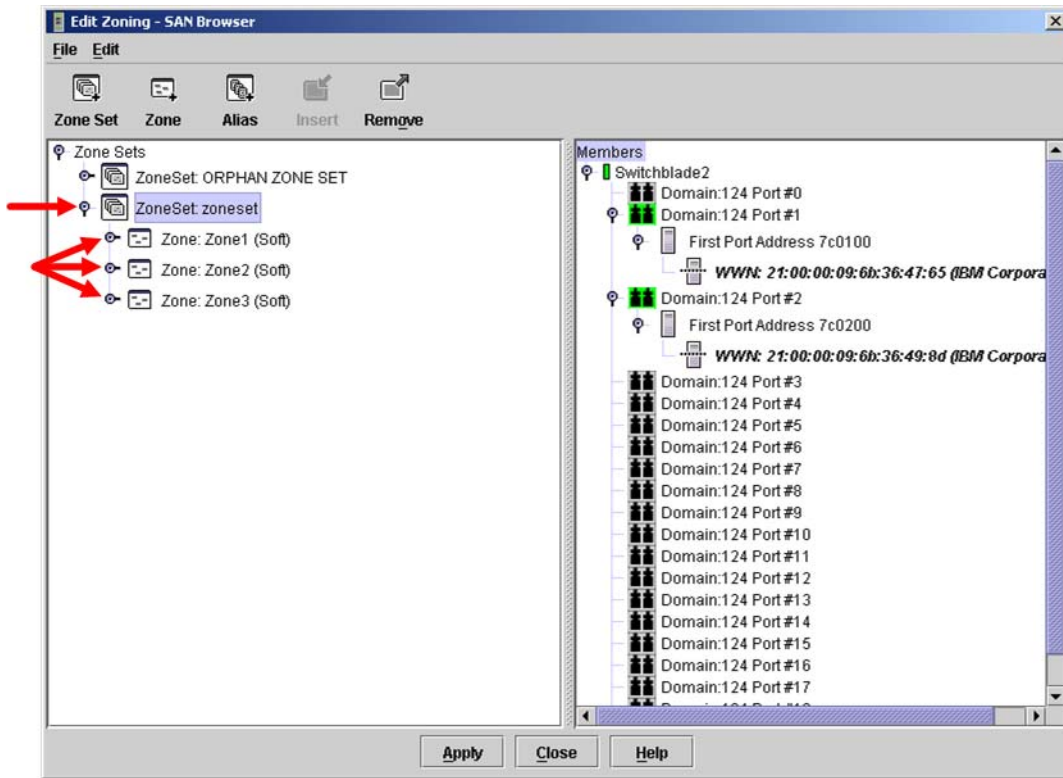


Do the following to modify the QLogic 6-port Enterprise Fibre Channel Switch Module for IBM eServer BladeCenter using the SAN Browser:

1. Start the SAN Browser. The **SAN Browser—Faceplate** dialog box displays.
2. From the **SAN Browser—Faceplate** dialog box **Zoning** menu, select **Edit Zoning**.



3. From the **Edit Zoning— SAN Browser** dialog box, compare the Zone Set and Zone names from each switch to ensure that none have the same name and the names conform to the standards for zone naming as discussed under “Active Zone Set Names” on page 96.



IBM eServer BladeCenter CLI

NOTE: Use the following CLI commands when the IBM eServer BladeCenter GUI is not available.

Login: **USERID**

Password: **xxxxxxxx**

IBM eServer BladeCenter #> **zone list**

Zone Types

All zone members must be specified by a world wide port name (WWPN) in order to comply with Fibre Channel standards. Any zone member not specified by WWPN cannot participate in the fabric. Below are steps to confirm the zone types.

NOTE: A world wide name (WWN) consists of a world wide node name (WWNN) and one or more WWPNs. References in this guide to WWN actually refer to the WWPN.

Brocade's Web Tools

1. Start Brocade's Web Tools. The **Switch Explorer** dialog box displays.
2. From the **Switch Explorer** dialog box, click the **Zone Admin** button.

For the Brocade SilkWorm 3900/IBM 2109 F32, the following displays:

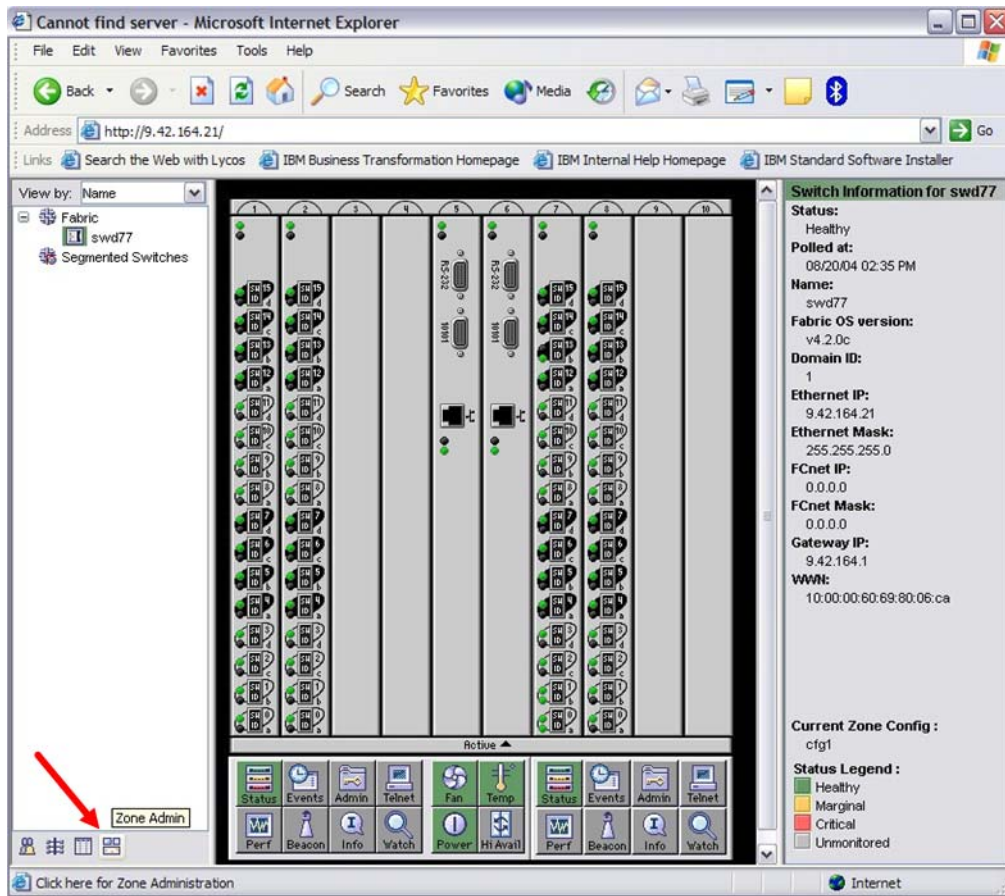
Switch Information for b3900 Status: Marginal

Polled at:	07/27/04 01:34 PM	Name:	b3900
Fabric OS version:	v4.2.0c	Domain ID:	103
Ethernet IP:	10.20.93.27	Ethernet Mask:	255.255.255.0
FCnet IP:	0.0.0.0	FCnet Mask:	0.0.0.0
Gateway IP:	10.20.93.1	WWN:	10:00:00:60:69:90:0b:eb

Current Zone Config : None Status Legend : ■ Healthy ■ Marginal ■ Critical ■ Unmonitored

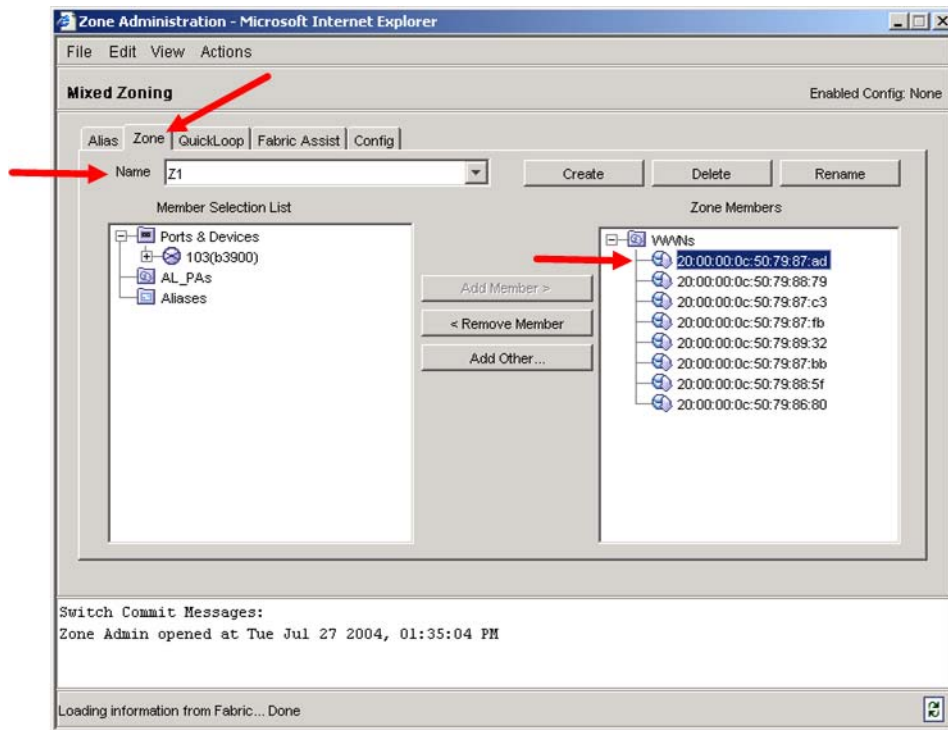
Click here for Zone Administration

For the Brocade SilkWorm 12000/IBM 2109 M12, the following displays:

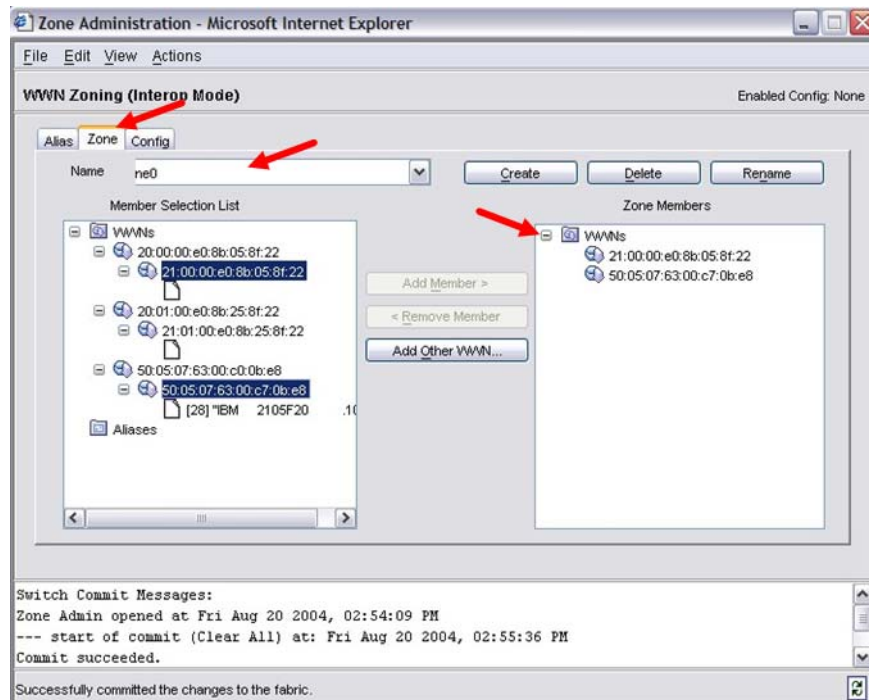


3. From the **Zone Administration** dialog box, select the **Zone** tab. Verify that all zone names conform to the standards discussed under “[Active Zone Set Names](#)” on page 96 and are unique between the switches. Do the following:
 - a. In the **Name** drop-down box, select a zone.
 - b. In the Zone Members section, verify the WWNs.
 - c. Repeat [steps a](#) and [b](#) for each zone.

For the Brocade SilkWorm 3900/IBM 2109 F32, the following displays:



For the Brocade SilkWorm 12000/IBM 2109 M12, the following displays:



Brocade CLI

NOTE: Use the following CLI commands when Brocade's Web tools are not available.

Login: **admin**

Password: **xxxxxxxx**

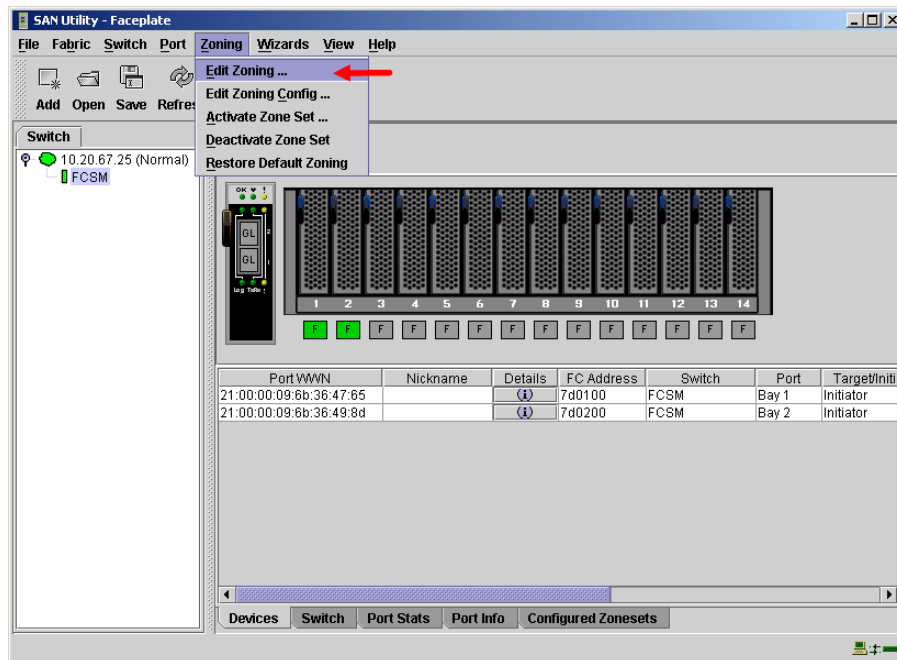
Brocade12000:admin> **zonestow**

IBM eServer BladeCenter GUI

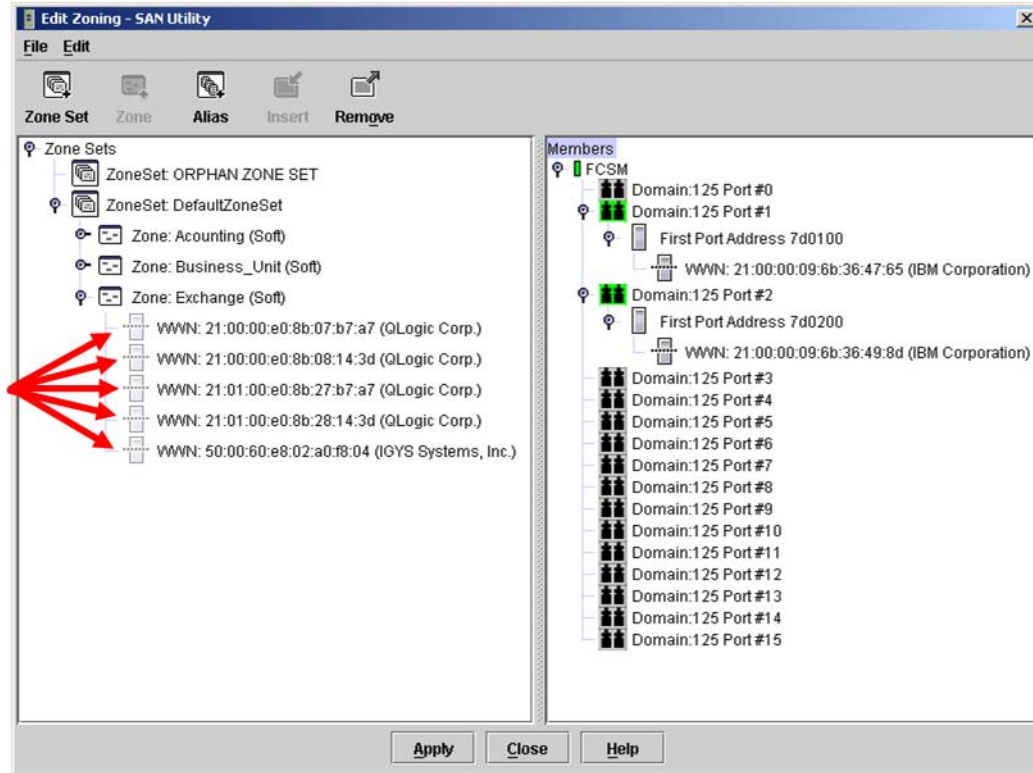
NOTE: You can use the SAN Utility to modify all IBM eServer BladeCenter switch modules. You can use the SAN Browser to modify only the QLogic 6-port Enterprise Fibre Channel Switch Module for IBM eServer BladeCenter. The screen images differ, but the procedures for the SAN Utility and SAN Browser are the same.

Do the following to modify IBM eServer BladeCenter switch modules using the SAN Utility:

1. Start the SAN Utility. The **SAN Utility—Faceplate** dialog box displays.
2. From the **SAN Utility—Faceplate** dialog box **Zoning** menu, select **Edit Zoning**.

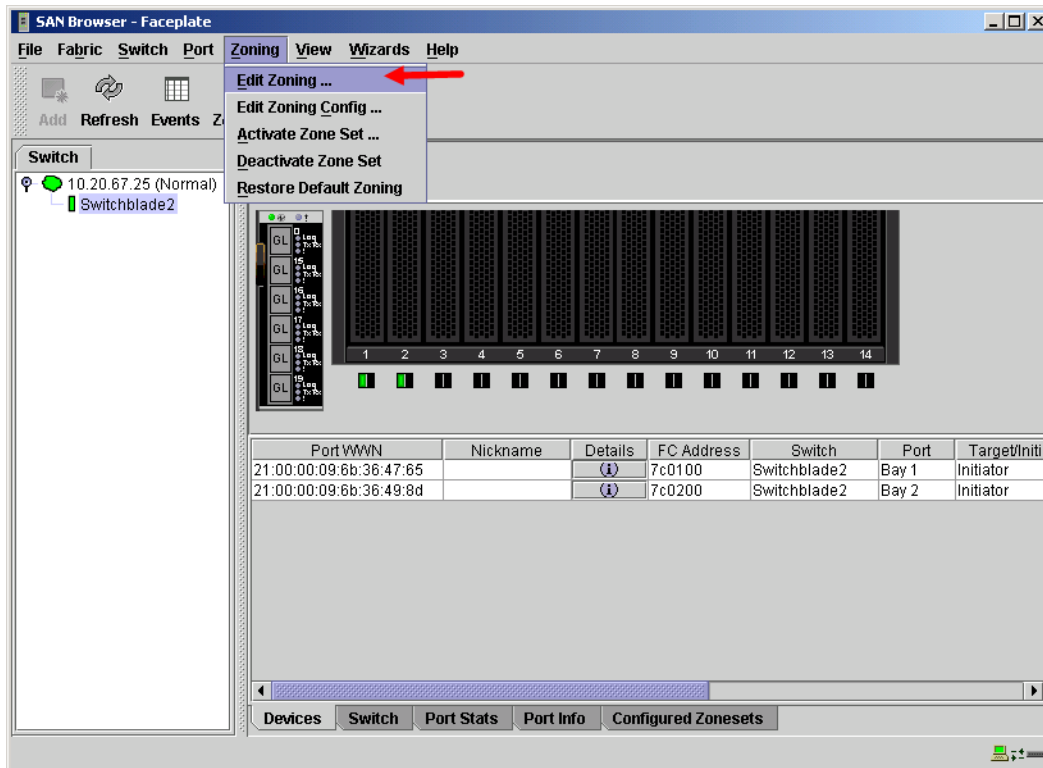


3. The **Edit Zoning—SAN Utility** dialog box displays. Confirm that all zone members are listed as WWN.

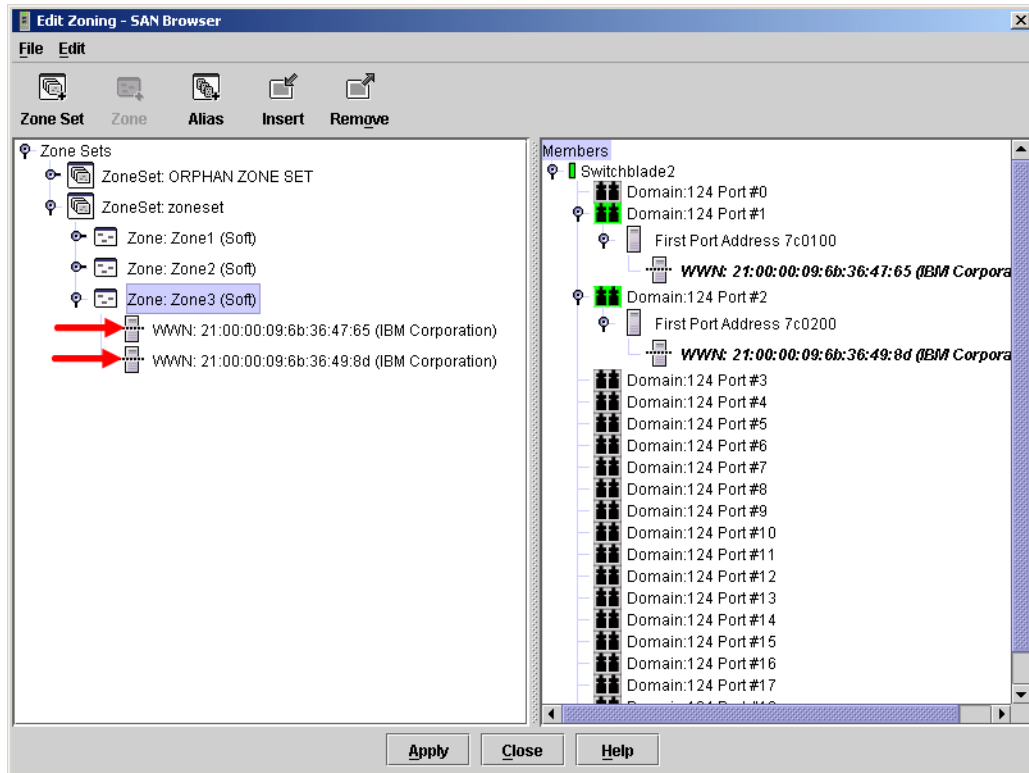


Do the following to modify the QLogic 6-port Enterprise Fibre Channel Switch Module for IBM eServer BladeCenter using the SAN Browser:

1. Start the SAN Browser. The **SAN Browser—Faceplate** dialog box displays.
2. From the **SAN Browser—Faceplate** dialog box **Zoning** menu, select **Edit Zoning**.



3. The **Edit Zoning—SAN Browser** dialog box displays. Do the following:
 - a. Select a ZoneSet.
 - b. Select a Zone.
 - c. In the Zone Members section, confirm that all zone members are listed as WWN.
 - d. Repeat the above steps for each zone.



IBM eServer BladeCenter CLI

NOTE: Use the following CLI commands when the IBM eServer BladeCenter GUI is not available.

Login: **USERID**

Password: **xxxxxxxx**

IBM eServer BladeCenter #> **zone members <zone name>**

Repeat this statement for each zone and confirm that only WWNs are listed.

Brocade Specific Configuration

The platform manager server must be disabled.

Brocade's Web Tools

These functions cannot be done using Brocade's Web Tools; use the Brocade CLI.

Brocade CLI

Enter the following command to verify that Platform Management is disabled:

```
b3900:admin> msPlatShow  
Platform Management is NOT enabled.  
b3900:admin>
```

If Platform Management is enabled, enter the following command to disable platform management:

```
b3900:admin> msPlMgmtDeactivate
```

IBM eServer BladeCenter Specific Configuration

Not applicable.

Operating Mode Configuration

The Brocade switch must be in Interoperability mode to be FC-SW2 compliant. Therefore, the current operating status must be Interopmode on. Note the following:

- ❑ InteropMode = 0 (disabled, which is Brocade proprietary mode)
- ❑ InteropMode = 1 (enabled, which is FC-SW-2 compliant mode)

Brocade's Web Tools

Interoperability mode cannot be set using Brocade's Web Tools; use the Brocade CLI.

Brocade CLI

Do the following to set the Brocade switch to Interoperability mode.

ATTENTION!! This procedure requires a reboot of the switch.

Enter the following command to verify that the current operating status is Interopmode:

```
Login: admin
Password: xxxxxxxx
b3900:admin> interopmode
InteropMode: Off

Usage: InteropMode 0|1
    0: to turn it off
    1: to turn it on
b3900:admin>
```

If the Interopmode is disabled, enter the following commands to enable Interopmode:

```
b3900:admin> switchdisable
b3900:admin> interopmode 1
```

```
The switch effective configuration will be lost when the operating mode
is changed; do you want to continue? (yes, y, no, n): [no] yes
```

```
Interopmode is enabled
```

Enter the following command to reboot the switch for the new change to take effect:

```
b3900:admin> fastboot
```

IBM eServer BladeCenter GUI

Not applicable.

IBM eServer BladeCenter CLI

Not applicable.

Successful Integration Checklist

Perform the following steps after the E_port connection has been established and the fabric has had time to update. If everything verifies, the Brocade and IBM eServer BladeCenter fabrics have successfully merged.

- ✓ Compare and verify that all Zoning information has been propagated on all switches.
- ✓ Verify that the correct Zone Set is activated.
- ✓ Compare and verify that all devices are in the Name Server of each switch.
- ✓ Verify that all initiators continue to detect and have access to all targets that existed prior to the fabric merger.

NOTE: When zones are merged upon connecting an IBM eServer BladeCenter to any Brocade fabric operating in interopmode or when zones are modified using the IBM eServer BladeCenter GUI after the connection is made, Brocade's Web Tools do not display the zones. To verify that a successful zone merge has occurred, use the Brocade CLI zoneshow command.

After everything is verified, your fabric has merged successfully and no additional steps need to be taken. If any of the above tasks did not complete successfully, please contact IBM support.

Merging IBM eServer BladeCenter and Cisco Fabrics

The following IBM eServer BladeCenter switch modules have been tested in the IBM eServer BladeCenter environment and comply with the FC-SW-2 standard. They have tested interoperable with the following switches from Cisco that comply with the FC-SW-2 standard.

IBM eServer BladeCenter and Cisco Supported Switches

Manufacturer	Switch Model*
IBM eServer BladeCenter	IBM eServer BladeCenter 2-port Fibre Channel Switch Module QLogic 6-port Enterprise Fibre Channel Switch Module for IBM eServer BladeCenter
Cisco	MDS 9120 Switch MDS 9140 Switch MDS 9216 Switch MDS 9509 Director

Note

*For the current firmware versions, please see the *IBM eServer BladeCenter Fibre Channel Switch Interoperability Quick Reference Guide* located at <http://www.ibm.com/support>.

The following chapter provides detailed information about merging Cisco and IBM eServer BladeCenter fabrics: **Cisco MDS 9000 Series Switches (see page 119)**.

Cisco MDS 9000 Series Switches

Configuration Considerations

The Cisco configuration consideration is that VSAN functionality is specific to the Cisco switch. Refer to the Cisco manuals for configuration steps.

IBM eServer BladeCenter configuration considerations are as follows:

- If you will be implementing the I/O stream guard feature, please contact your IBM technical support representative prior to configuring. Additional configuration procedures may be required.
- Contact IBM Technical Support to obtain the document, *IBM eServer BladeCenter Remote Boot*, if you are planning to use the boot form SAN functionality.

Integration Checklist

The following steps must be completed to successfully merge Cisco and IBM eServer BladeCenter fabrics. The remainder of this section provides detailed instructions and examples.

ATTENTION!!

- Back up the current switch configuration data prior to performing the following steps so that the configuration is available if something goes wrong (see the first step for details).
 - Disruptions in the fabric can occur as a result of performing the following steps. Therefore, it is recommended that these changes be done during down time or off-peak hours.
-
- ✓ Back up the current switch configuration data (see [“Backing Up and Restoring the Current Configuration Settings”](#) on page 121).
 - ✓ Verify that the correct version of switch firmware is installed on each switch (see [“Supported Switches”](#) on page 120).
 - ✓ Ensure that each switch has a unique Domain ID and that it falls within the proper range (see [“Domain ID Configuration”](#) on page 122).
 - ✓ Set all switches to the appropriate timeout values (see [“Timeout Values”](#) on page 130).
 - ✓ Ensure that all Zone set and Zone names are unique and conform to ANSI T11 standards (see [“Active Zone Set Names”](#) on page 140).
 - ✓ Ensure that all zone members are specified by WWPN (see [“Zone Types”](#) on page 146).
 - ✓ Verify that the fabrics have successfully merged (see [“Successful Integration Checklist”](#) on page 151).
 - ✓ Contact IBM Technical Support to obtain the document, *IBM eServer BladeCenter Remote Boot*, if you are planning to use the boot form SAN functionality.

Supported Switches

The following IBM eServer BladeCenter switch modules have been tested in the IBM eServer BladeCenter environment and comply with the FC-SW-2 standard. They have tested interoperable with the following switches from Cisco that comply with the FC-SW-2 standard.

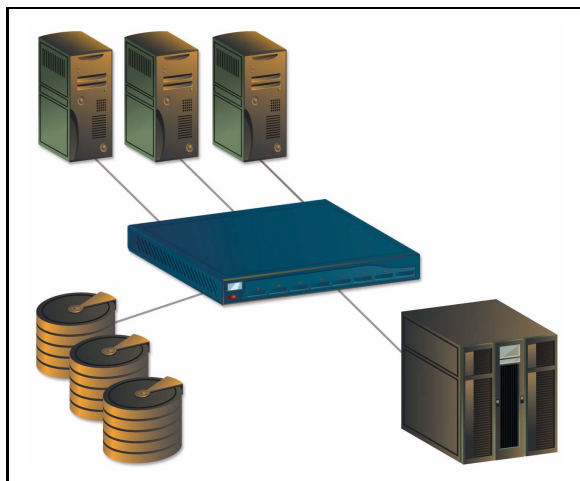
IBM eServer BladeCenter and Cisco Supported Switches

Manufacturer	Switch Model*
IBM eServer BladeCenter	IBM eServer BladeCenter 2-port Fibre Channel Switch Module QLogic 6-port Enterprise Fibre Channel Switch Module for IBM eServer BladeCenter
Cisco	MDS 9120 Switch MDS 9140 Switch MDS 9216 Switch MDS 9509 Director

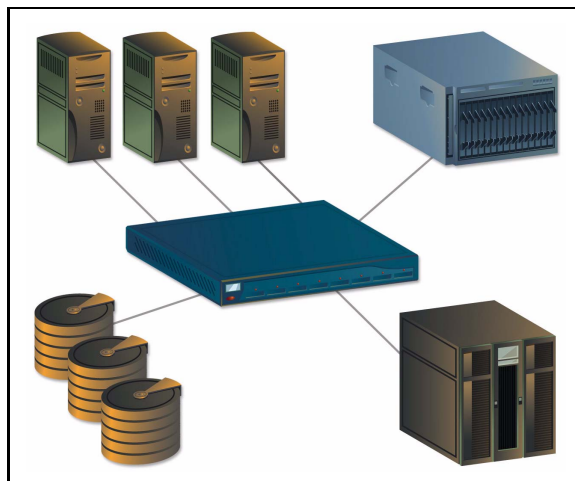
Note

*For the current firmware versions, please see the *IBM eServer BladeCenter Fibre Channel Switch Interoperability Quick Reference Guide* located at <http://www.ibm.com/support>.

The following figures illustrate a Cisco Fibre Channel fabric prior to and after merging with an IBM eServer BladeCenter.



Cisco Fibre Channel Fabric Prior to Merging with the IBM eServer BladeCenter



Cisco Fibre Channel Fabric with the IBM eServer BladeCenter

Backing Up and Restoring the Current Configuration Settings

Back up the current Cisco switch configuration data prior to following the steps to merge Cisco and IBM eServer BladeCenter fabrics so that the configuration can be restored if something goes wrong.

NOTE: For additional information, refer to the documentation provided with the switch.

Backup Procedure

Do the following to save the Cisco configuration settings:

1. Start Cisco Device Manager. The **Device Manager** dialog box displays.
2. From the **Device Manager** dialog box **Admin** menu, select **Save Configuration**.
3. A dialog prompts whether you want to copy the running configuration to the startup configuration. Click **Yes** to save the configuration.

Restore Procedure

If you need to restore the Cisco configuration settings that you backed up, do the following:

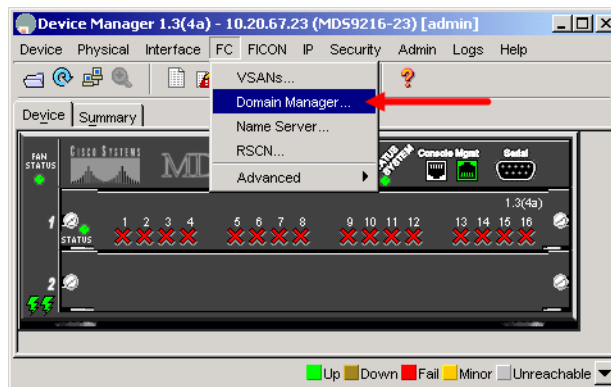
1. Start Cisco Device Manager. The **Device Manager** dialog box displays.
2. From the **Device Manager** dialog box **Admin** menu, select **Copy Configuration**.
3. The **Copy Configuration** dialog box displays. Specify the following:
 - Server address from which you want to copy the file
 - File name of the file you want to copy
 - Protocol you want to use
 - User name and password for the switch from which you want to copy the file (if required)
4. Do one of the following:
 - To copy the configuration, click **Apply**.
 - To close the **Copy Configuration** dialog without downloading, click **Cancel**.

Domain ID Configuration

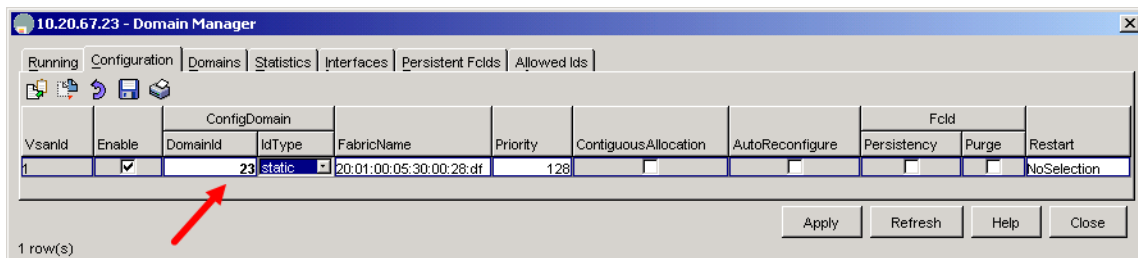
To ensure that there are no conflicts between switches, we recommend that each switch have an assigned Domain ID. The following steps show how to set the Domain ID on both the Cisco switch and IBM eServer BladeCenter switch module.

Cisco Device Manager

1. Start Cisco Device Manager. The **Device Manager** dialog box displays.
2. From the **Device Manager** dialog box **FC** menu, select **Domain Manager**.



3. From the **Domain Manager** dialog box, select the **Configuration** tab. For the VSAN to which you will connect the E_port, do the following as appropriate:
 - a. In the **ConfigDomain DomainId** field, type a unique Domain ID for the switch.
 - b. In the **ConfigDomain IdType** drop-down box, select **static**.
 - c. Click **Apply**.



Cisco CLI

NOTE: Use the following CLI commands when the Cisco Device Manager is not available.

```
login: admin
Password: *****
Cisco_9216# config t
Cisco_9216(config)# fcdomain domain <domain id> static vsan <vsan id>
Cisco_9216(config)# fcdomain restart disruptive vsan <vsan id>
Cisco_9216(config)# end
```

If you want these changes to remain through a switch reset, enter the following command.

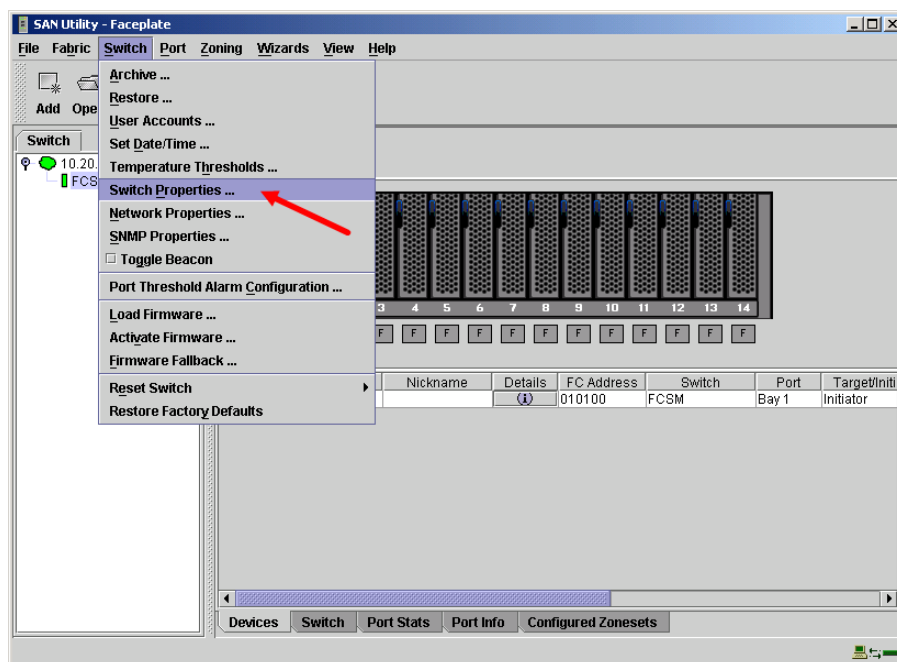
```
Cisco_9216# copy running-config startup-config
```

IBM eServer BladeCenter GUI

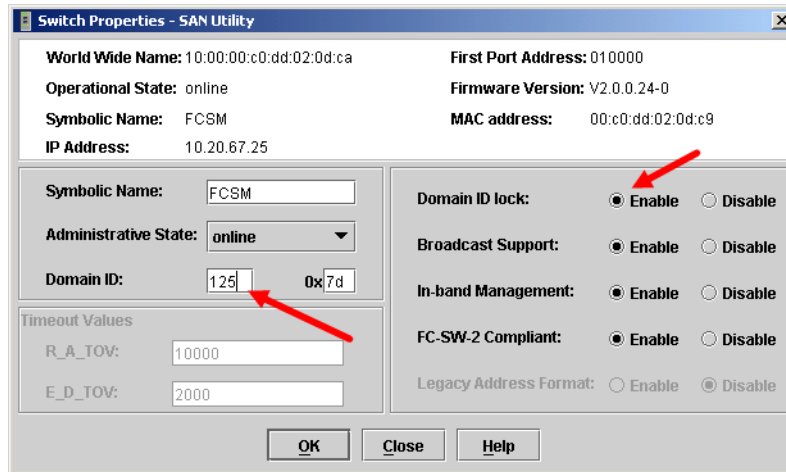
NOTE: You can use the SAN Utility to modify all IBM eServer BladeCenter switch modules. You can use the SAN Browser to modify only the QLogic 6-port Enterprise Fibre Channel Switch Module for IBM eServer BladeCenter. The screen images differ, but the procedures for the SAN Utility and SAN Browser are the same.

Do the following to modify IBM eServer BladeCenter switch modules using the SAN Utility:

1. Start the SAN Utility. The **SAN Utility—Faceplate** dialog box displays.
2. From the **SAN Utility—Faceplate** dialog box **Switch** menu, select **Switch Properties**.

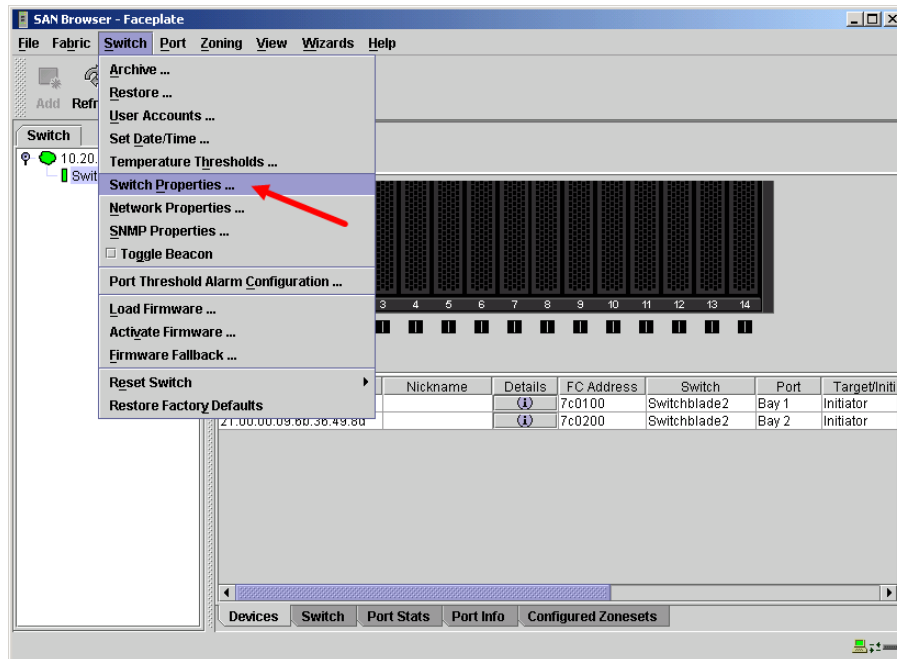


3. From the **Switch Properties—SAN Utility** dialog box, do the following:
 - a. In the **Domain ID** box, type a unique Domain ID for the switch.
 - b. Select the **Domain ID Lock Enable** radio button to ensure that the switch always has that Domain ID.
 - c. Click **OK**.

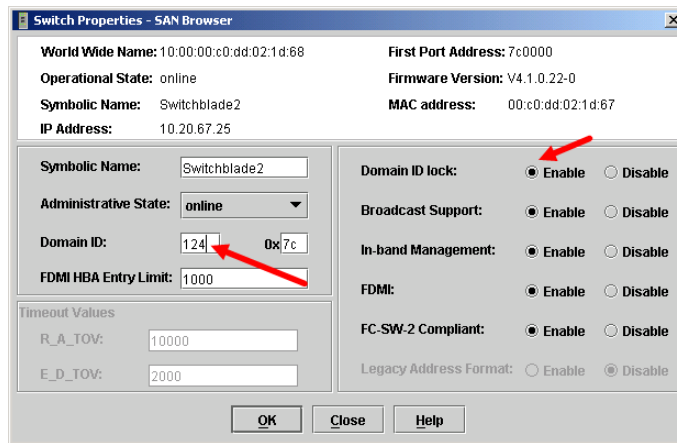


Do the following to modify the QLogic 6-port Enterprise Fibre Channel Switch Module for IBM eServer BladeCenter using the SAN Browser:

1. Start the SAN Browser. The **SAN Browser—Faceplate** dialog box displays.
2. From the **SAN Browser—Faceplate** dialog box **Switch** menu, select **Switch Properties**.



3. From the **Switch Properties—SAN Browser** dialog box, do the following:
 - a. In the **Domain ID** box, type a unique Domain ID for the switch.
 - b. Select the **Domain ID Lock Enable** radio button to ensure that the switch always has that Domain ID.
 - c. Click **OK**.



IBM eServer BladeCenter CLI

NOTE: The procedures differ based on the IBM eServer BladeCenter switch module.

Use the following CLI commands to modify the IBM eServer BladeCenter 2-port Fibre Channel Switch Module when the SAN Utility is not available:

```
Login: USERID
Password: xxxxxxxx
IBM eServer BladeCenter #> admin start
IBM eServer BladeCenter (admin) #> config edit
IBM eServer BladeCenter (admin-config) #> set config switch

The following options display:
AdminState (1=Online, 2=Offline, 3=Diagnostics) [Online]
BroadcastEnabled (True / False) [True]
InbandEnabled (True / False) [True]
DefaultDomainID (decimal value, 1-239) [1] <choose a unique number>
DomainIDLock (True / False) [False] True
SymbolicName (string, max=32 chars) [Fibre Channel Switch Module]
R_T_TOV (decimal value, 1-1000 msec) [100]
R_A_TOV (decimal value, 100-100000 msec) [10000]
E_D_TOV (decimal value, 10-20000 msec) [2000]
FS_TOV (decimal value, 100-100000 msec) [5000]
DS_TOV (decimal value, 100-100000 msec) [5000]
PrincipalPriority (decimal value, 1-255) [254]
ConfigDescription (string, max=64 chars) [Default Config]
IBM eServer BladeCenter (admin-config) #> config save
IBM eServer BladeCenter (admin) #> config activate
The configuration will be activated. Please confirm (y/n): [n] y
```

Use the following CLI commands to modify the QLogic 6-port Enterprise Fibre Channel Switch Module for IBM eServer BladeCenter when the SAN Utility and SAN Browser are not available:

```
Login: USERID
Password: xxxxxxxx
Switchblade2: admin> admin start
Switchblade2 (admin): admin> config edit
    The config named default is being edited.
Switchblade2 (admin-config): admin> set config switch
    A list of attributes with formatting and current values will follow.
    Enter a new value or simply press the ENTER key to accept the current
    value. If you wish to terminate this process before reaching the end of
    the list press 'q' or 'Q' and the ENTER key to do so.
    AdminState (1=Online, 2=Offline, 3=Diagnostics) [Online]
    BroadcastEnabled (True / False) [True]
    InbandEnabled (True / False) [True]
    FdmiEnabled (True / False) [True]
    FdmiEntries (decimal value, 0-1000) [1000]
    DefaultDomainID (decimal value, 1-239) [1] <choose a unique number>
    DomainIDLock (True / False) [False] true
    SymbolicName (string, max=32 chars) [Switchblade2]
    R_A_TOV (decimal value, 100-100000 msec) [10000]
    E_D_TOV (decimal value, 10-20000 msec) [2000]
    PrincipalPriority (decimal value, 1-255) [254]
    ConfigDescription (string, max=64 chars) [Qlogic 6-port Enterprise
    Switch Module for IBM eServer BladeCenter]
    FC-SW-2 Compliant (True / False) [True]
    Finished configuring attributes.
    This configuration must be saved (see config save command) and activated
    (see config activate command) before it can take effect.
    To discard this configuration use the config cancel command.
Switchblade2 (admin-config): admin> config save
    The config named default has been saved.
Switchblade2 (admin): admin> config activate
    The currently active configuration will be activated.
    Please confirm (y/n): [n] y
Switchblade2 (admin): admin> admin end
```

Timeout Values

As per FC-SW-2 Fibre Channel standards, set all switches to the following timeout values (TOV) in order to successfully establish an E_port connection:

R_A_TOV = 10 seconds (The setting is **10000**.)

E_D_TOV = 2 seconds (The setting is **2000**.)

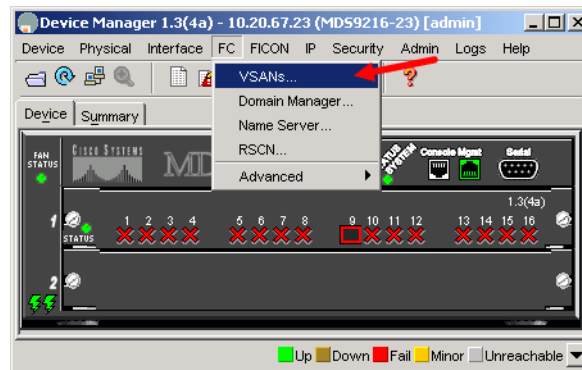
This section provides the steps to change these values.

Cisco Device Manager

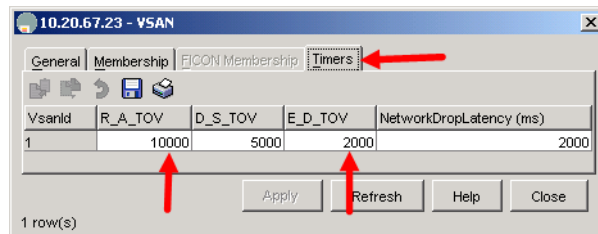
ATTENTION!! The following steps take the switch offline; therefore, do not perform them on a switch being managed in-band.

Cisco Device Manager

1. Start Cisco Device Manager. The **Device Manager** dialog box displays.
2. From the **Device Manager** dialog box **FC** menu, select **VSANs**.



3. From the **VSAN** dialog box, select the **Timers** tab. Verify that **R_A_TOV** is set to **10000** and **E_D_TOV** is set to **2000**. If the settings are not correct, do the following:
 - a. In the **R_A_TOV** box, change the setting to **10000**.
 - b. In the **E_D_TOV** box, change the setting to **2000**.
 - c. Click **Apply**.



Cisco CLI

```
login: admin
Password: *****
Cisco_9216# show fctimer
```

Use the above command to verify that R_A_TOV is set to 10000 and E_D_TOV is set to 2000. If these timeout values are not correct, continue with this section. If the settings are correct, no changes need to be made; proceed with the next appropriate section.

```
Cisco_9216# config t
Cisco_9216(config)# vsan database
Cisco_9216(config-vsan-db)# vsan <vsan id> suspend (do this for all vsan)
Cisco_9216(config-vsan-db)# exit
Cisco_9216(config)# fctimer r_a_tov 10000
Cisco_9216(config)# fctimer e_d_tov 2000
Cisco_9216(config)# vsan database
Cisco_9216(config-vsan-db)# no vsan <vsan id> suspend (do this for all vsan)
Cisco_9216(config-vsan-db)# exit
Cisco_9216(config)# end
```

If you want these changes to remain through a switch reset, enter the following command.

```
Cisco_9216# copy running-config startup-config
```

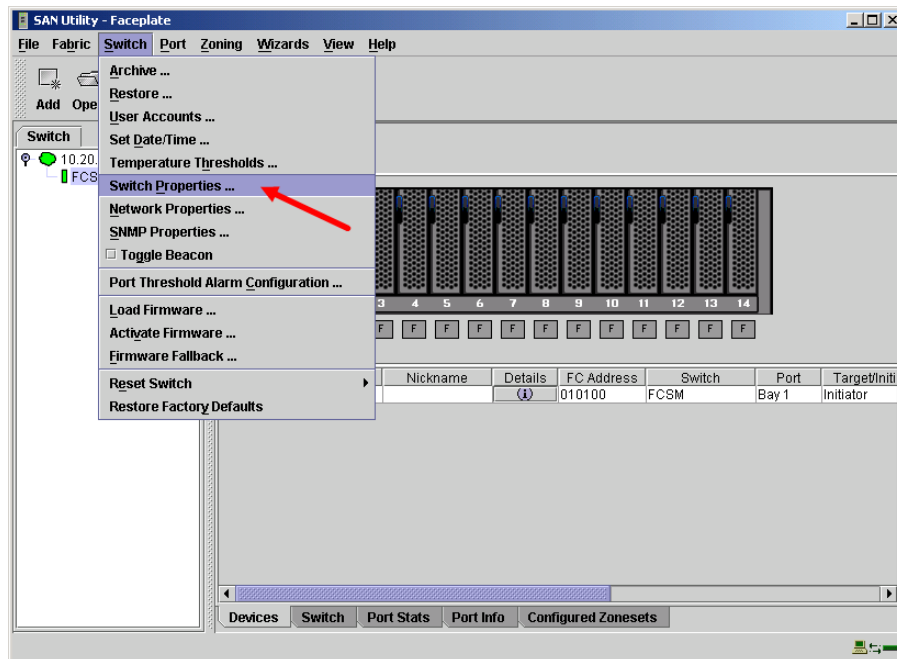
IBM eServer BladeCenter GUI

ATTENTION!! The following steps take the switch offline; therefore, do not perform them on a switch being managed in-band.

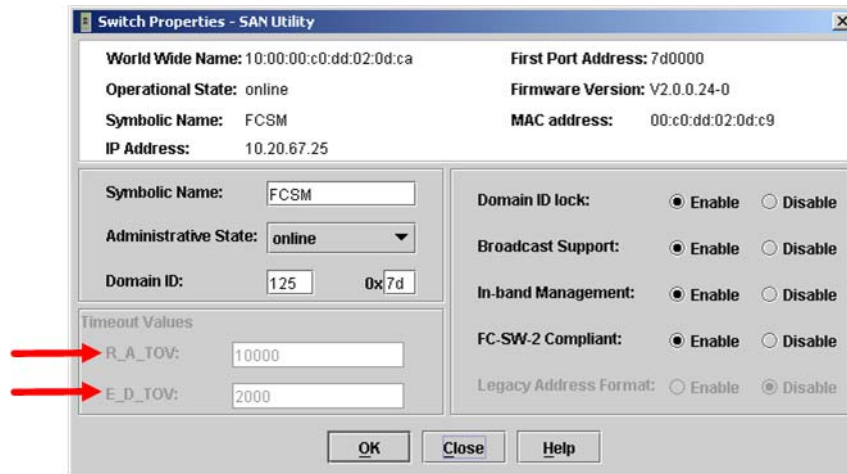
NOTE: You can use the SAN Utility to modify all IBM eServer BladeCenter switch modules. You can use the SAN Browser to modify only the QLogic 6-port Enterprise Fibre Channel Switch Module for IBM eServer BladeCenter. The screen images differ, but the procedures for the SAN Utility and SAN Browser are the same.

Do the following to modify IBM eServer BladeCenter switch modules using the SAN Utility:

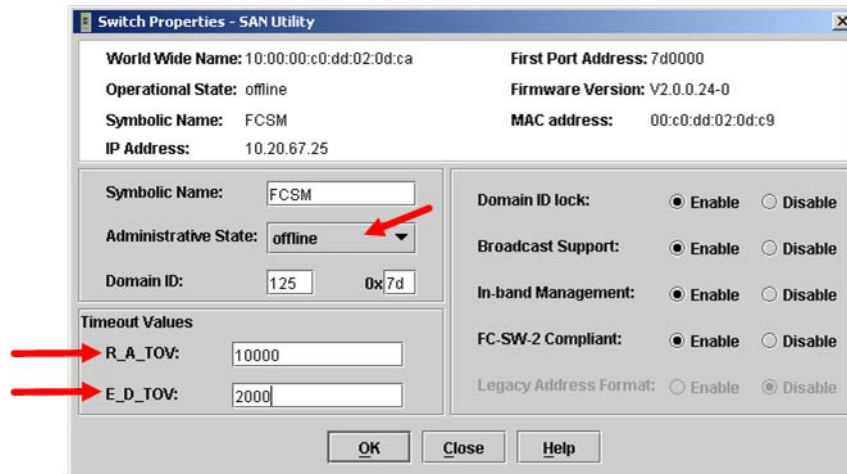
1. Start the SAN Utility. The **SAN Utility—Faceplate** dialog box displays.
2. From the **SAN Utility—Faceplate** dialog box **Switch** menu, select **Switch Properties**.



- From the **Switch Properties—SAN Utility** dialog box, verify that **R_A_TOV** is set to **10000** and **E_D_TOV** is set to **2000**. If the settings are *not* correct, proceed to [step 4](#). If the settings are correct, no changes need to be made; proceed to the next appropriate section.



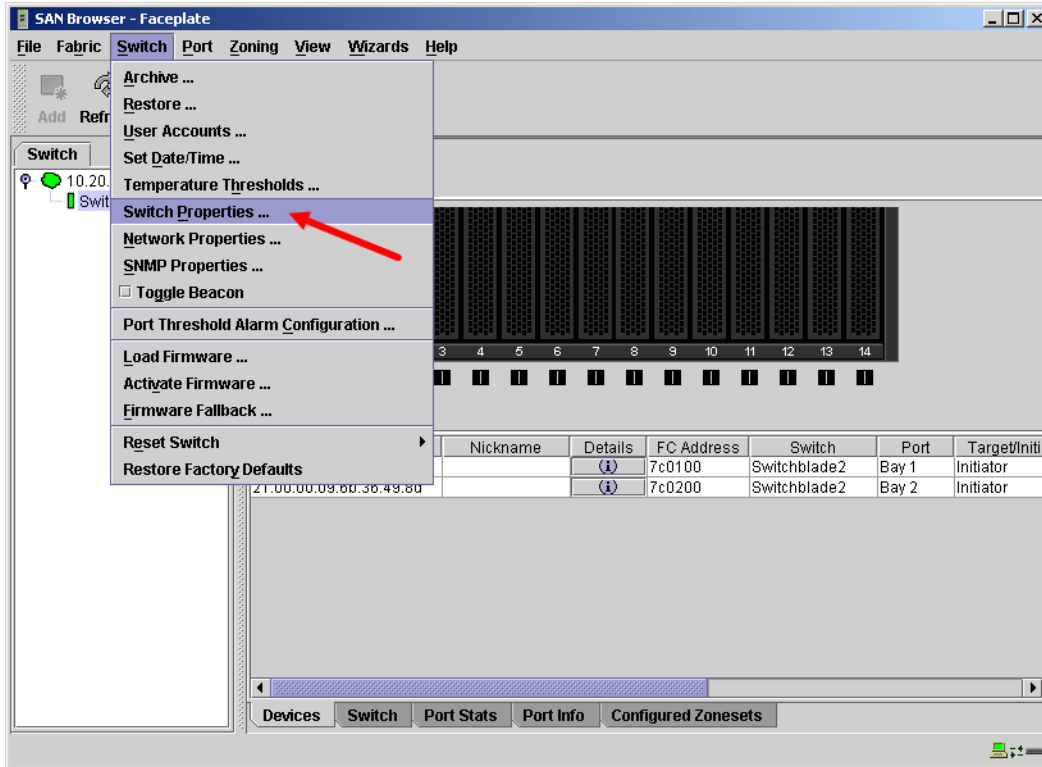
4. To modify the timeout value settings, do the following:
 - a. In the **Administrative State** drop-down box, select **offline**. Click **OK**.
 - b. The **SAN Utility—Faceplate** dialog box redisplay. Repeat [step 2](#) to redisplay the **Switch Properties—SAN Utility** dialog box.
 - c. In the Timeout Values section **R_A_TOV** box, enter **10000**.
 - d. In the Timeout Values section **E_D_TOV** box, enter **2000**.
 - e. In the **Administrative State** drop-down box, select **online**. Click **OK**.



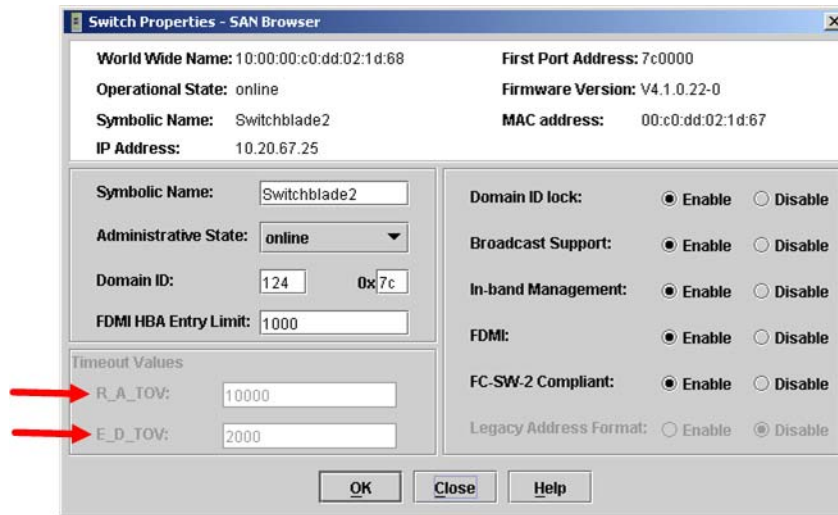
5. The **SAN Utility—Faceplate** dialog box redisplay. Repeat [step 2](#) to redisplay the **Switch Properties—SAN Utility** dialog box. Verify your changes ([see step 3](#)).

Do the following to modify the QLogic 6-port Enterprise Fibre Channel Switch Module for IBM eServer BladeCenter using the SAN Browser:

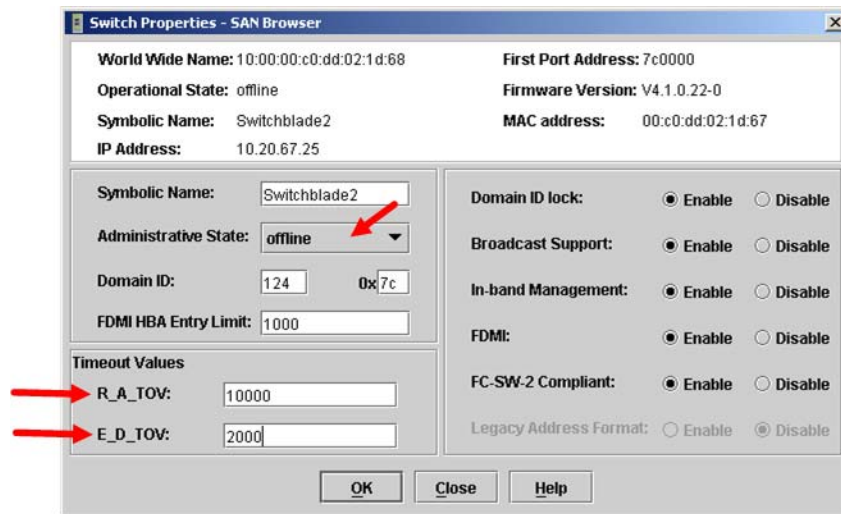
1. Start the SAN Browser. The **SAN Browser—Faceplate** dialog box displays.
2. From the **SAN Browser—Faceplate** dialog box **Switch** menu, select **Switch Properties**.



3. From the **Switch Properties—SAN Browser** dialog box, verify that **R_A_TOV** is set to **10000** and **E_D_TOV** is set to **2000**. If the settings are *not* correct, proceed to [step 4](#). If the settings are correct, no changes need to be made; proceed to the next appropriate section.



4. To modify the timeout value settings, do the following:
 - a. In the **Administrative State** drop-down box, select **offline**. Click **OK**.
 - b. The **SAN Browser—Faceplate** dialog box redisplay. Repeat [step 2](#) to redisplay the **Switch Properties—SAN Browser**.
 - c. In the Timeout Values section **R_A_TOV** box, enter **10000**.
 - d. In the Timeout Values section **E_D_TOV** box, enter **2000**.
 - e. In the **Administrative State** drop-down box, select **online**. Click **OK**.



5. The **SAN Browser—Faceplate** dialog box redisplay. Repeat [step 2](#) to redisplay the **Switch Properties—SAN Browser** dialog box. Verify your changes ([see step 3](#)).

IBM eServer BladeCenter CLI

ATTENTION!! The following steps take the switch offline; therefore, do not perform them on a switch being managed in-band.

NOTE: The procedures differ based on the IBM eServer BladeCenter switch module.

Use the following CLI commands to modify the IBM eServer BladeCenter 2-port Fibre Channel Switch Module when the SAN Utility is not available:

```
Login: USERID
```

```
Password: xxxxxxxx
```

Use the following command to verify that R_A_TOV is set to 10000 and E_D_TOV is set to 2000.

```
IBM eServer BladeCenter #> show config switch
```

If these timeout values are *not* correct, continue with this section. If the settings are correct, no changes need to be made; proceed with the next appropriate section.

```
IBM eServer BladeCenter #> admin start
```

```
IBM eServer BladeCenter (admin) #> config edit
```

```
IBM eServer BladeCenter (admin-config) #> set config switch
```

The following options display:

```
AdminState (1=Online, 2=Offline, 3=Diagnostics) [Online]
BroadcastEnabled (True / False) [True]
InbandEnabled (True / False) [True]
DefaultDomainID (decimal value, 1-239) [1]
DomainIDLock (True / False) [True]
SymbolicName (string, max=32 chars) [Fibre Channel Switch Module]
R_T_TOV (decimal value, 1-1000 msec) [100]
R_A_TOV (decimal value, 100-100000 msec) [9000]    10000
E_D_TOV (decimal value, 10-20000 msec) [1000]    2000
FS_TOV (decimal value, 100-100000 msec) [5000]
DS_TOV (decimal value, 100-100000 msec) [5000]
PrincipalPriority (decimal value, 1-255) [254]
ConfigDescription (string, max=64 chars) [Default Config]
```

```
IBM eServer BladeCenter (admin-config) #> config save
```

```
IBM eServer BladeCenter (admin) #> config activate
```

```
The configuration will be activated. Please confirm (y/n): [n] y
```

Use the following CLI commands to modify the QLogic 6-port Enterprise Fibre Channel Switch Module for IBM eServer BladeCenter when the SAN Utility and SAN Browser are not available:

```
Login: USERID
Password: xxxxxxxx
```

Use the following command to verify that R_A_TOV is set to 10000 and E_D_TOV is set to 2000.

```
Switchblade2: admin> show config switch
```

If these timeout values are *not* correct, continue with this section. If the settings are correct, no changes need to be made; proceed with the next appropriate section.

```
Switchblade2: admin>
Switchblade2: admin> admin start
Switchblade2 (admin): admin> config edit
    The config named default is being edited.
Switchblade2 (admin-config): admin> set config switch
A list of attributes with formatting and current values will follow.
Enter a new value or simply press the ENTER key to accept the current
value. If you wish to terminate this process before reaching the end of
the list press 'q' or 'Q' and the ENTER key to do so.
AdminState (1=Online, 2=Offline, 3=Diagnostics) [Online]
BroadcastEnabled (True / False) [True]
InbandEnabled (True / False) [True]
FDMIEnabled (True / False) [True]
FDMIEntries (decimal value, 0-1000) [1000]
DefaultDomainID (decimal value, 1-239) [124]
DomainIDLock (True / False) [True]
SymbolicName (string, max=32 chars) [Switchblade2]
R_A_TOV (decimal value, 100-100000 msec) [9000] 10000
E_D_TOV (decimal value, 10-20000 msec) [1000] 2000
PrincipalPriority (decimal value, 1-255) [254]
ConfigDescription (string, max=64 chars) [Qlogic 6-port Enterprise
Switch Module for IBM eServer BladeCenter]
FC-SW-2 Compliant (True / False) [True]
```

Finished configuring attributes.
This configuration must be saved (see config save command) and activated
(see config activate command) before it can take effect.
To discard this configuration use the config cancel command.

```
Switchblade2 (admin-config): admin> config save
```

The config named default has been saved.

```
Switchblade2 (admin): admin> config activate
```

The currently active configuration will be activated.

Please confirm (y/n): [n] **y**

```
Switchblade2 (admin): admin> admin end
```

Principal Switch Configuration

Cisco switches and IBM eServer BladeCenter switch modules negotiate for principal switch automatically. Therefore, there are no steps to take.

Zone Configuration

This section discusses configuring active Zone Set names and Zone types.

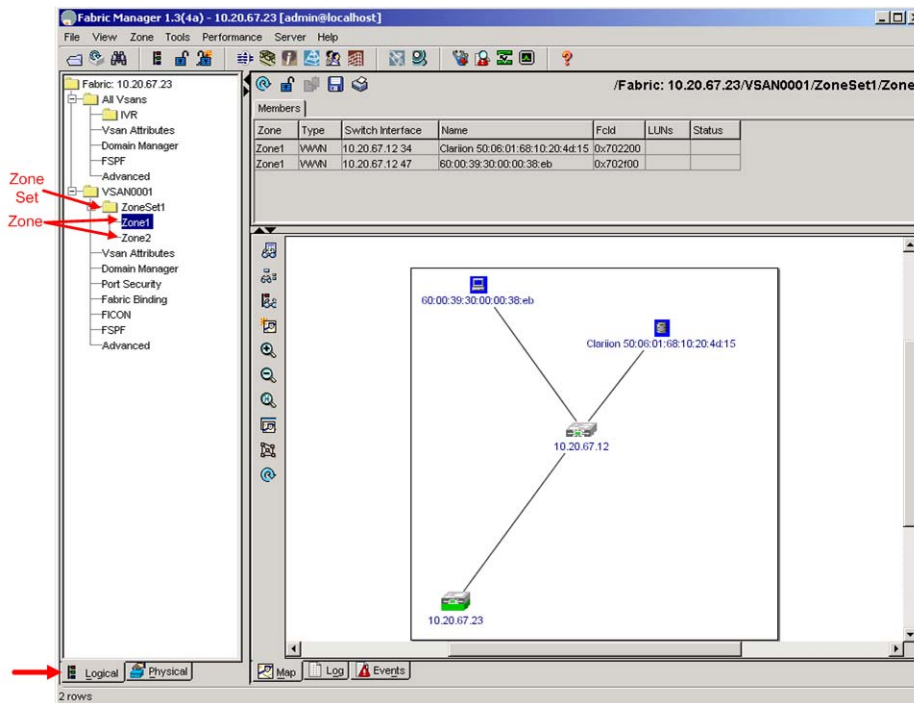
Active Zone Set Names

The Zone and Zone Set names on each switch must be unique. If not, change one of the duplicate names. All Zone Set and Zone names must conform to the Fibre Channel (FC) Standards for Zone Naming (ANSI T11/00-427v3):

1. Must be 1–64 characters in length.
2. All characters are ASCII.
3. First character is [a–z] or [A–Z].
4. All other characters must be [a–z], [A–Z], [0–9], or the _ character. Other characters (\$-^) may not be supported by all vendors and should be avoided.

Cisco Fabric Manager

1. Start Cisco Fabric Manager. The **Fabric Manager** dialog box displays.
2. From the **Fabric Manager** dialog box left panel, do the following:
 - a. Select the **Logical** tab.
 - b. Expand the VSAN to which you plan to connect the E_port.
 - c. Verify that the Zone Set names and Zone names conform to the standards discussed under [“Active Zone Set Names”](#) on page 140 and are unique between the switches.



Cisco CLI

NOTE: Use the following CLI commands when the Cisco Fabric Manager is not available.

```
login: admin
Password: *****
Cisco_9216# show zoneset vsan <vsan id>
```

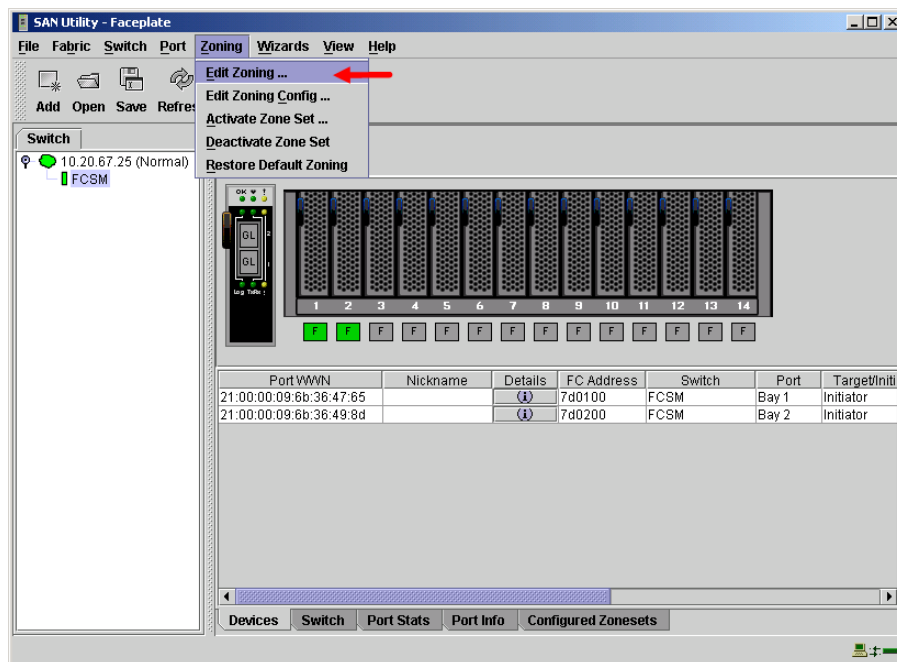
Use the above command to verify that all Zone and Zone Set names in the VSAN conform to FC standards.

IBM eServer BladeCenter GUI

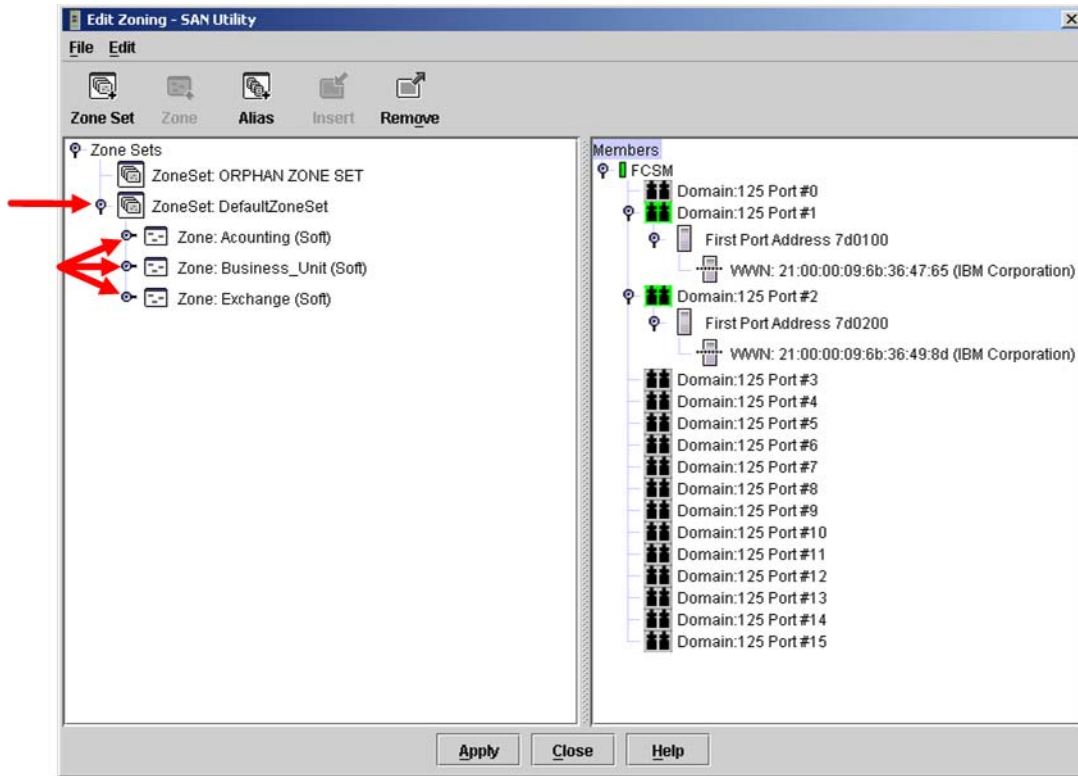
NOTE: You can use the SAN Utility to modify all IBM eServer BladeCenter switch modules. You can use the SAN Browser to modify only the QLogic 6-port Enterprise Fibre Channel Switch Module for IBM eServer BladeCenter. The screen images differ, but the procedures for the SAN Utility and SAN Browser are the same.

Do the following to modify IBM eServer BladeCenter switch modules using the SAN Utility:

1. Start the SAN Utility. The **SAN Utility—Faceplate** dialog box displays.
2. From the **SAN Utility—Faceplate** dialog box **Zoning** menu, select **Edit Zoning**.

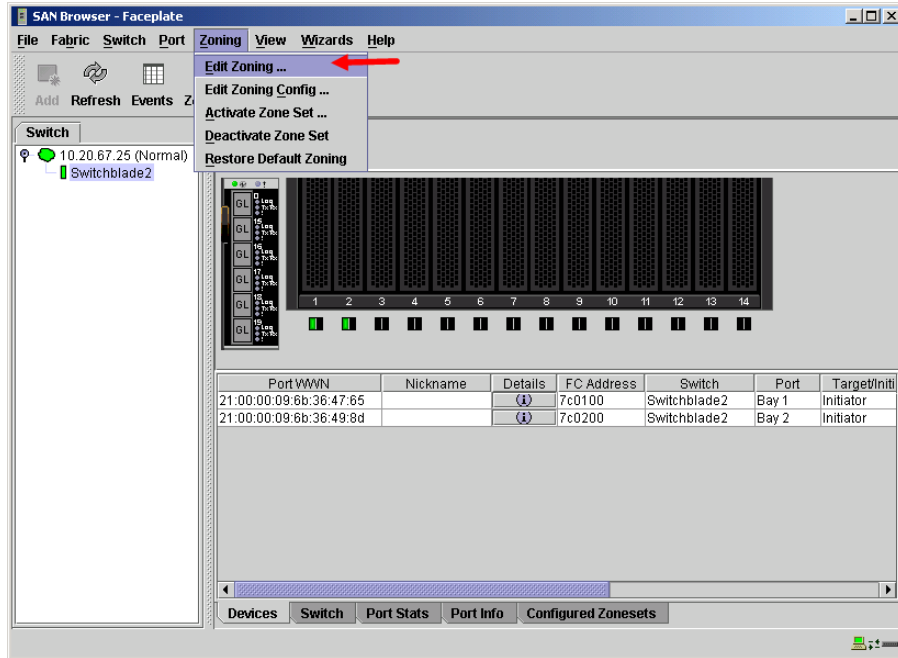


3. From the **Edit Zoning— SAN Utility** dialog box, compare the Zone Set and Zone names from each switch to ensure that none have the same name and the names conform to the standards for zone naming as discussed under [“Active Zone Set Names”](#) on page 140.

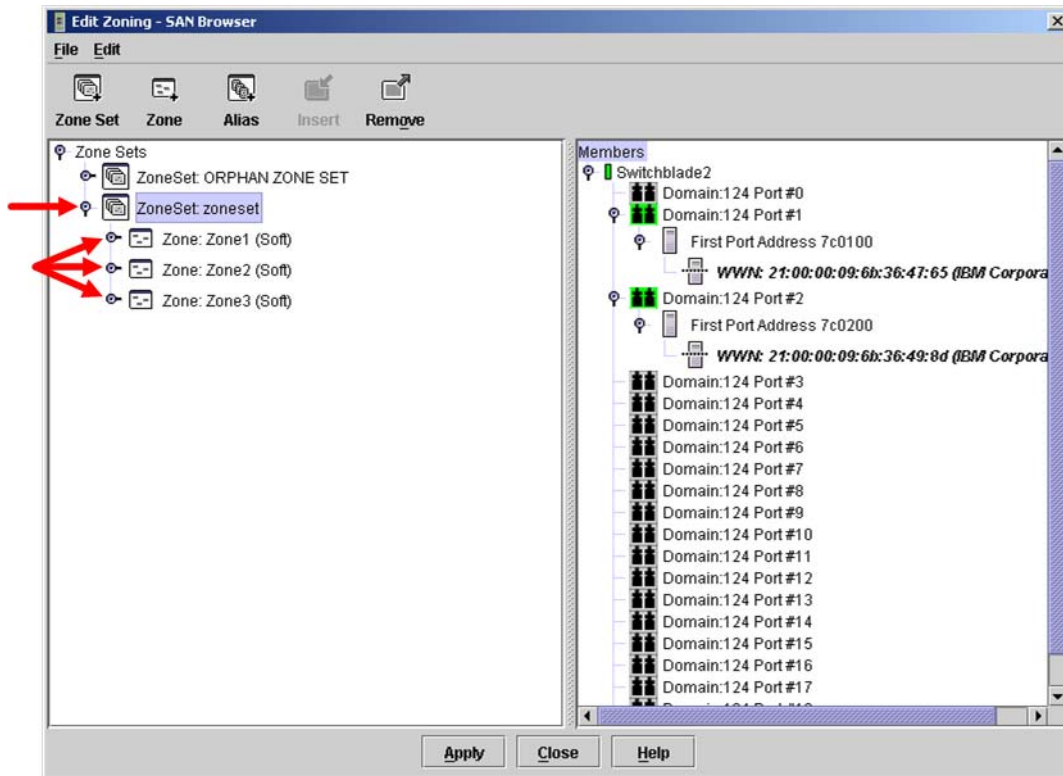


Do the following to modify the QLogic 6-port Enterprise Fibre Channel Switch Module for IBM eServer BladeCenter using the SAN Browser:

1. Start the SAN Browser. The **SAN Browser—Faceplate** dialog box displays.
2. From the **SAN Browser—Faceplate** dialog box **Zoning** menu, select **Edit Zoning**.



3. From the **Edit Zoning—SAN Browser** dialog box, compare the Zone Set and Zone names from each switch to ensure that none have the same name and the names conform to the standards for zone naming as discussed under “Active Zone Set Names” on page 140.



IBM eServer BladeCenter CLI

NOTE: Use the following CLI commands when the IBM eServer BladeCenter GUI is not available.

Login: **USERID**

Password: **xxxxxxxx**

IBM eServer BladeCenter #> **zone list**

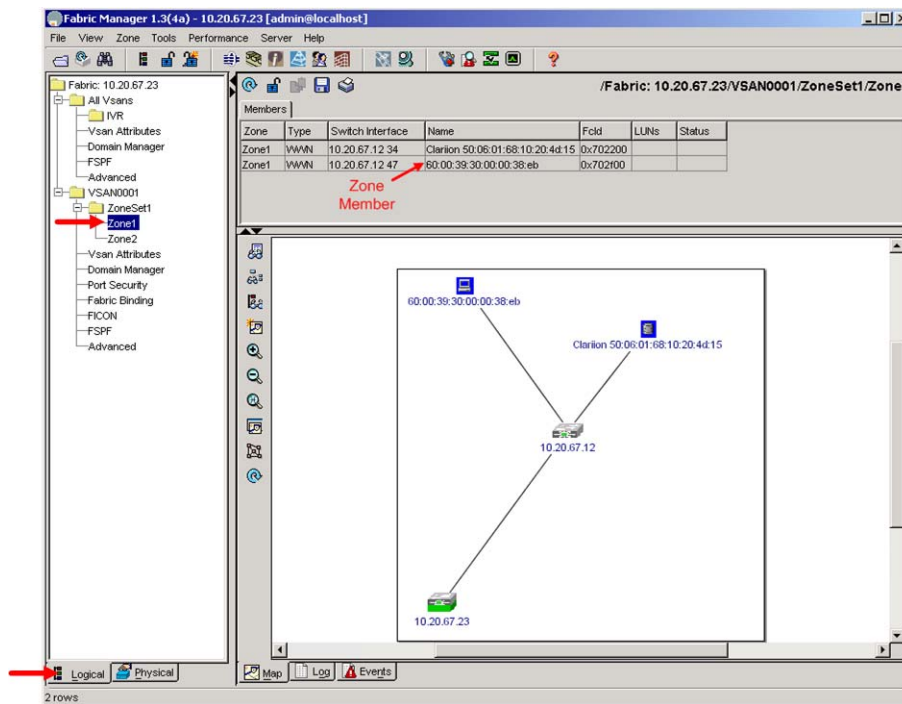
Zone Types

All zone members must be specified by a world wide port name (WWPN) in order to comply with Fibre Channel standards. Any zone member not specified by WWPN cannot participate in the fabric. Below are steps to confirm the zone types.

NOTE: A world wide name (WWN) consists of a world wide node name (WWNN) and one or more WWPNs. For Cisco, references to pwwn refer to the WWPN. For IBM, references to WWN refer to the WWPN.

Cisco Fabric Manager

1. Start Cisco Fabric Manager. The **Fabric Manager** dialog box displays.
2. From the **Fabric Manager** dialog box left panel, do the following:
 - a. Select the **Logical** tab.
 - b. Expand the VSAN to which you plan to connect the E_port.
 - c. Verify that the zone member names conform to the standards discussed under “[Active Zone Set Names](#)” on page 140 and are unique between the switches.



Cisco CLI

NOTE: Use the following CLI commands when the Cisco Fabric Manager is not available.

```
login: admin
Password: *****
Cisco_9216# show zone vsan <vsan id>
```

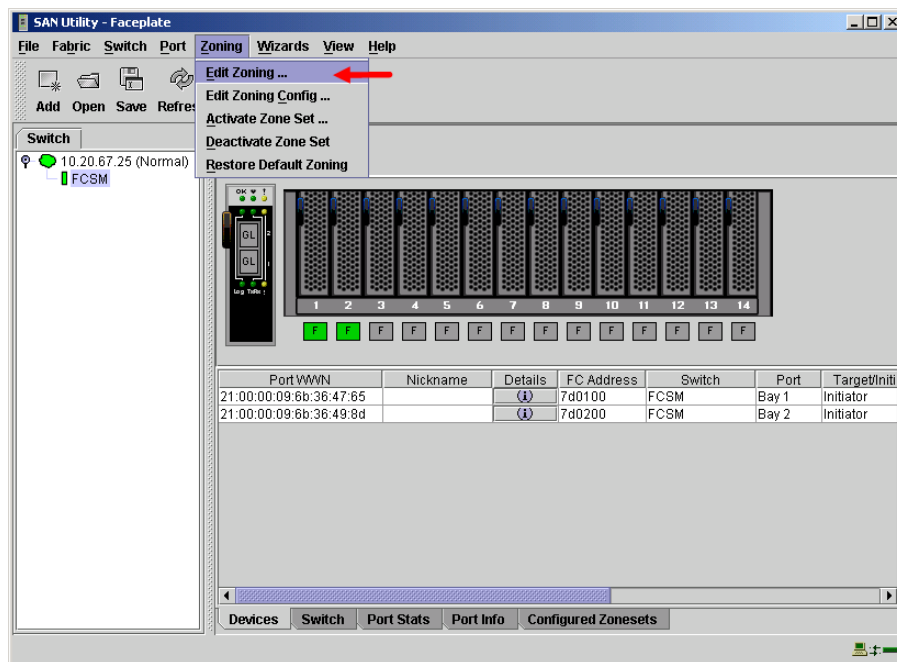
Use the above command to verify that all zone members are specified by pwwn.

IBM eServer BladeCenter GUI

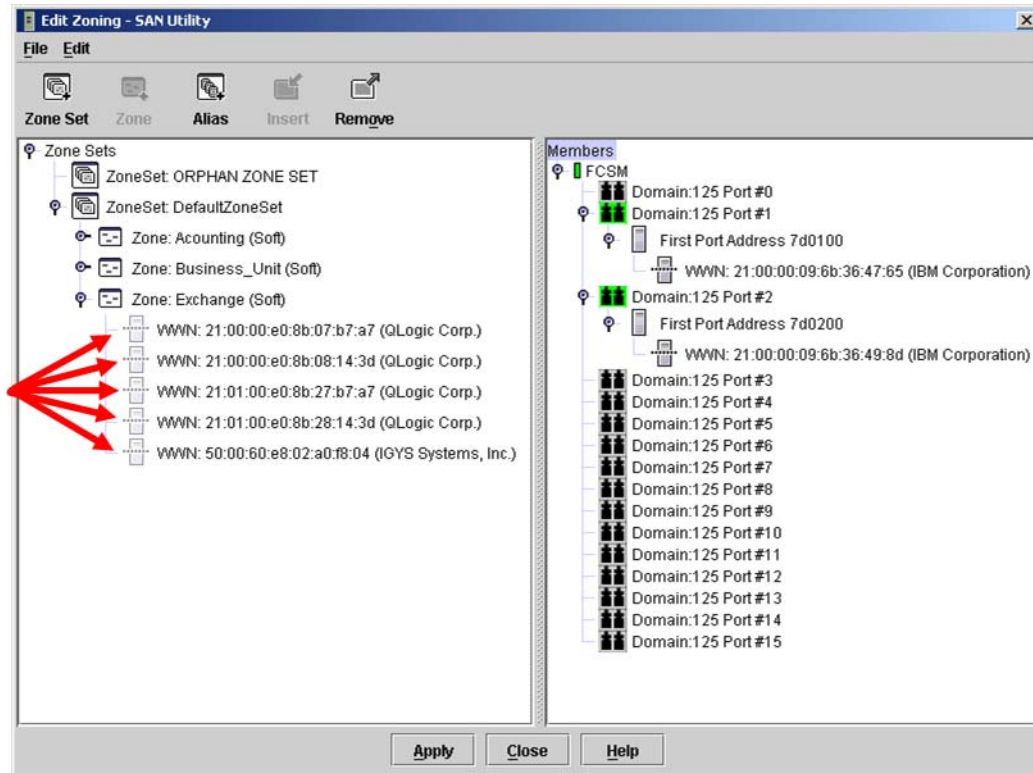
NOTE: You can use the SAN Utility to modify all IBM eServer BladeCenter switch modules. You can use the SAN Browser to modify only the QLogic 6-port Enterprise Fibre Channel Switch Module for IBM eServer BladeCenter. The screen images differ, but the procedures for the SAN Utility and SAN Browser are the same.

Do the following to modify IBM eServer BladeCenter switch modules using the SAN Utility:

1. Start the SAN Utility. The **SAN Utility—Faceplate** dialog box displays.
2. From the **SAN Utility—Faceplate** dialog box **Zoning** menu, select **Edit Zoning**.

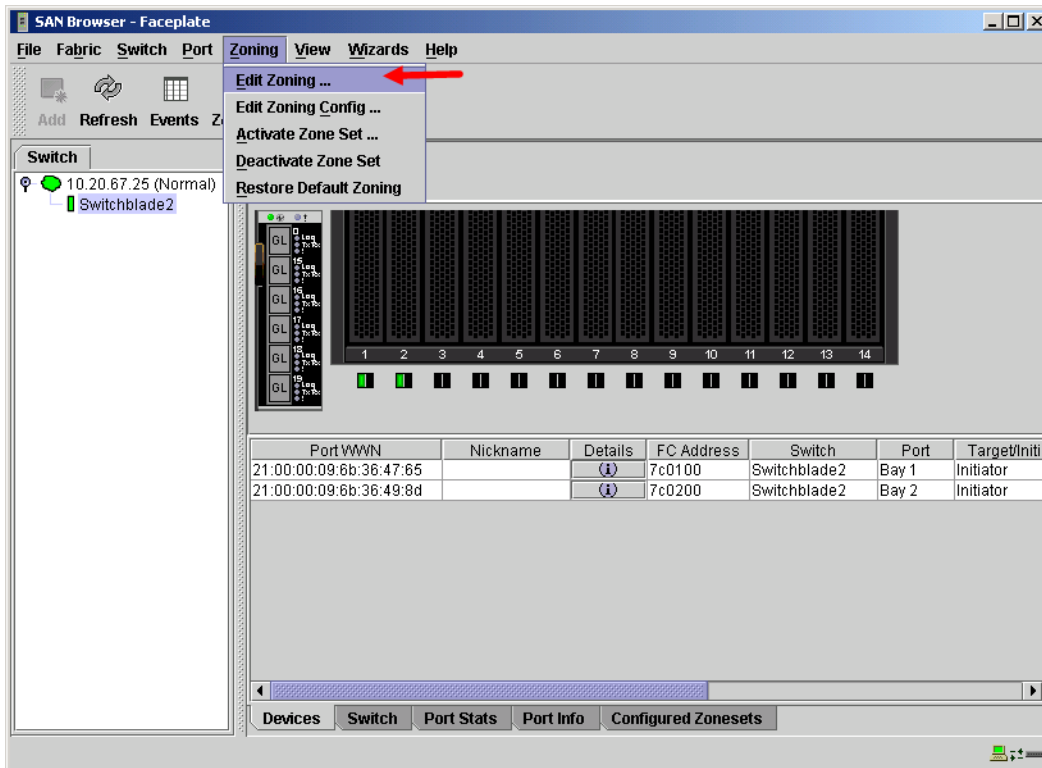


3. The **Edit Zoning—SAN Utility** dialog box displays. Confirm that all zone members are listed as WWN.

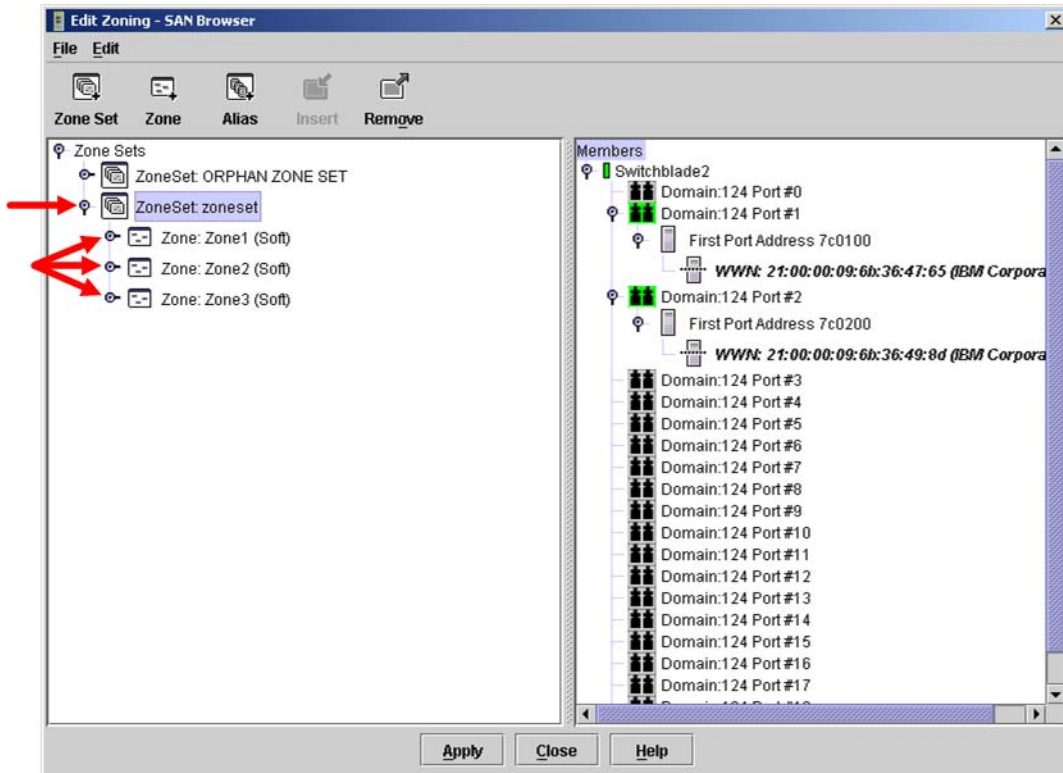


Do the following to modify the QLogic 6-port Enterprise Fibre Channel Switch Module for IBM eServer BladeCenter using the SAN Browser:

1. Start the SAN Browser. The **SAN Browser—Faceplate** dialog box displays.
2. From the **SAN Browser—Faceplate** dialog box **Zoning** menu, select **Edit Zoning**.



3. The **Edit Zoning—SAN Browser** dialog box displays. Do the following:
 - a. Select a ZoneSet.
 - b. Select a Zone.
 - c. In the Zone Members section, confirm that all zone members are listed as WWN.
 - d. Repeat the above steps for each zone.



IBM eServer BladeCenter CLI

NOTE: Use the following CLI commands when the IBM eServer BladeCenter GUI is not available.

Login: **USERID**

Password: **xxxxxxxx**

IBM eServer BladeCenter #> **zone members <zone name>**

Repeat this statement for each zone and confirm that only WWNs are listed.

Cisco Specific Configuration

Not applicable.

IBM eServer BladeCenter Specific Configuration

Not applicable.

Operating Mode Configuration

Not applicable.

Successful Integration Checklist

Perform the following steps after the E_port connection has been established and the fabric has had time to update. If everything verifies, the Cisco and IBM eServer BladeCenter fabrics have successfully merged.

- ✓ Compare and verify that all Zoning information has been propagated on all switches.
- ✓ Verify that the correct Zone Set is activated.
- ✓ Compare and verify that all devices are in the Name Server of each switch.
- ✓ Verify that all initiators continue to detect and have access to all targets that existed prior to the fabric merger.

After everything is verified, your fabric has merged successfully and no additional steps need to be taken. If any of the above tasks did not complete successfully, please contact IBM support.

ADMINISTRATIVE NOTE!!

If the Cisco Fabric Manager is unable to see initiators on the IBM eServer BladeCenter, verify that the **InBandEnabled** parameter on the IBM eServer BladeCenter switch module is set to **True**.

Use the following CLI commands to verify that **InbandEnabled** is set to **True**.

```
Login: USERID  
Password: *****  
#> show config switch
```

The following displays:

```
Switch Configuration Information
-----
AdminState           Online
BroadcastEnabled    True
* InbandEnabled      True
```

If **InbandEnabled** is set to **False**, use the following CLI commands to change the setting.

```
#> admin start
(admin)#> config edit
(admin-config)#> set config switch
```

A list of attributes with formatting and current values displays. Enter a new value or press **ENTER** to accept the current value. If you want to terminate this process before reaching the end of the list, press **q + ENTER** or **Q + ENTER**.

```
AdminState (1=Online, 2=Offline, 3=Diagnostics) [Online]
BroadcastEnabled (True / False) [True]
InbandEnabled (True / False) [False] True
DefaultDomainID (decimal value, 1-239) [6]
```

This configuration must be saved (using the **config save** command) and activated (using the **config activate** command) before it can take effect. If you want to discard this configuration, use the **config cancel** command.

```
(admin-config) #> config save
(admin) #> config act
```

The Cisco Fabric Manager is now able to display within its topology map the initiators present in the IBM eServer BladeCenter fabric.

Merging IBM eServer BladeCenter and CNT Fabrics

The following IBM eServer BladeCenter switch modules have been tested in the IBM eServer BladeCenter environment and comply with the FC-SW-2 standard. They have tested interoperable with the following switch from CNT that complies with the FC-SW-2 standard.

IBM eServer BladeCenter and CNT Supported Switches

Manufacturer	Switch Model*
IBM eServer BladeCenter	IBM eServer BladeCenter 2-port Fibre Channel Switch Module QLogic 6-port Enterprise Fibre Channel Switch Module for IBM eServer BladeCenter
CNT	FC/9000 Switch

Note

*For the current firmware versions, please see the *IBM eServer BladeCenter Fibre Channel Switch Interoperability Quick Reference Guide* located at <http://www.ibm.com/support>.

The following chapter provides detailed information about merging IBM eServer BladeCenter and CNT fabrics: **CNT FC/9000 Switches** (see page 155).

CNT FC/9000 Switches

Configuration Considerations

CNT configuration considerations are as follows.

- When merging CNT and IBM eServer BladeCenter fabrics, the maximum number of switches that can be configured depends upon the CNT switch model.
 - For the FC9000-64, the maximum is 56 interconnected switches per fabric.
 - For the FC9000-128, the maximum is 48 interconnected switches per fabric.
- You may need to manually enter the WWPN for an expansion card if an "Unknown Device" error is reported during configuration.
- Otherwise, all features are fully supported and comply with industry standards.

IBM eServer BladeCenter configuration considerations are as follows:

- If you will be implementing the I/O stream guard feature, please contact your IBM technical support representative prior to configuring. Additional configuration procedures may be required.
- Contact IBM Technical Support to obtain the document, *IBM eServer BladeCenter Remote Boot*, if you are planning to use the boot form SAN functionality.

Integration Checklist

The following steps must be completed to successfully merge CNT and IBM eServer BladeCenter fabrics. The remainder of this section provides detailed instructions and examples.

ATTENTION!!

- Back up the current switch configuration data prior to performing the following steps so that the configuration is available if something goes wrong (see the first step for details).
 - Disruptions in the fabric can occur as a result of performing the following steps. Therefore, it is recommended that these changes be done during down time or off-peak hours.
-
- ✓ Back up the current switch configuration data (see [“Backing Up and Restoring the Current Configuration Settings”](#) on page 157).
 - ✓ Verify that the correct version of switch firmware is installed on each switch (see [“Supported Switches”](#) on page 156).
 - ✓ Ensure that each switch has a unique Domain ID and that it falls within the proper range (see [“Domain ID Configuration”](#) on page 157).

- ✓ Set all switches to the appropriate timeout values (see “Timeout Values” on page 165).
- ✓ Ensure that all Zone set and Zone names are unique and conform to ANSI T11 standards (see “Active Zone Set Names” on page 175).
- ✓ Ensure that the zone member type is set to Port WWN (see “Zone Types” on page 185).
- ✓ Verify that the fabrics have successfully merged (see “Successful Integration Checklist” on page 193).
- ✓ Contact IBM Technical Support to obtain the document, *IBM eServer BladeCenter Remote Boot*, if you are planning to use the boot form SAN functionality.

Supported Switches

The following IBM eServer BladeCenter switch modules have been tested in the IBM eServer BladeCenter environment and comply with the FC-SW-2 standard. They have tested interoperable with the following switch from CNT that complies with the FC-SW-2 standard.

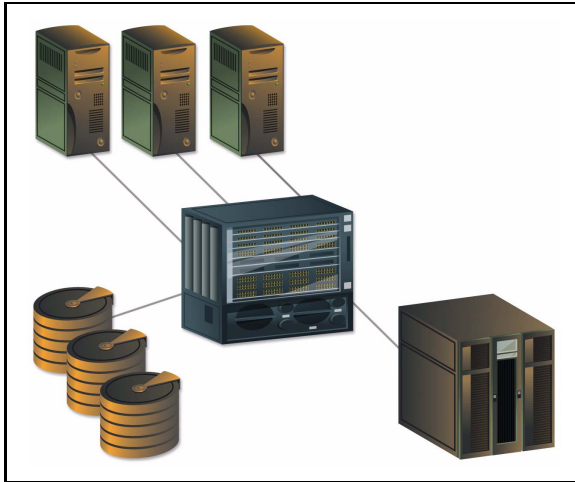
IBM eServer BladeCenter and CNT Supported Switches

Manufacturer	Switch Model*
IBM eServer BladeCenter	IBM eServer BladeCenter 2-port Fibre Channel Switch Module QLogic 6-port Enterprise Fibre Channel Switch Module for IBM eServer BladeCenter
CNT	FC/9000 Switch

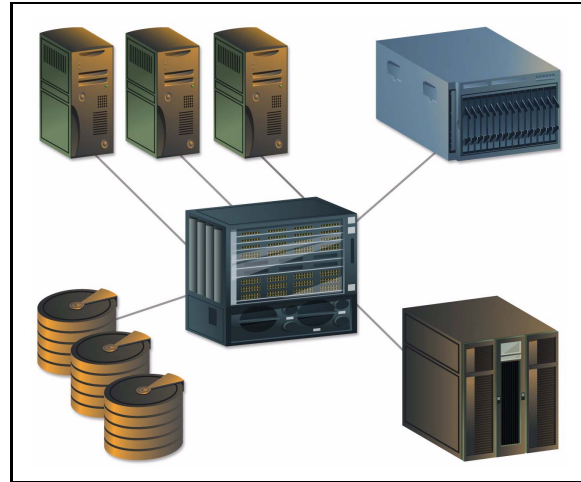
Note

*For the current firmware versions, please see the *IBM eServer BladeCenter Fibre Channel Switch Interoperability Quick Reference Guide* located at <http://www.ibm.com/support>.

The following figures illustrate an CNT Fibre Channel fabric prior to and after merging with an IBM eServer BladeCenter.



*CNT Fibre Channel Fabric Prior to Merging
with the IBM eServer BladeCenter*



*CNT Fibre Channel Fabric
with the IBM eServer BladeCenter*

Backing Up and Restoring the Current Configuration Settings

Back up the current CNT switch configuration data prior to following the steps to merge CNT and IBM eServer BladeCenter fabrics so that the configuration can be restored if something goes wrong.

NOTE: Refer to the documentation provided with the switch.

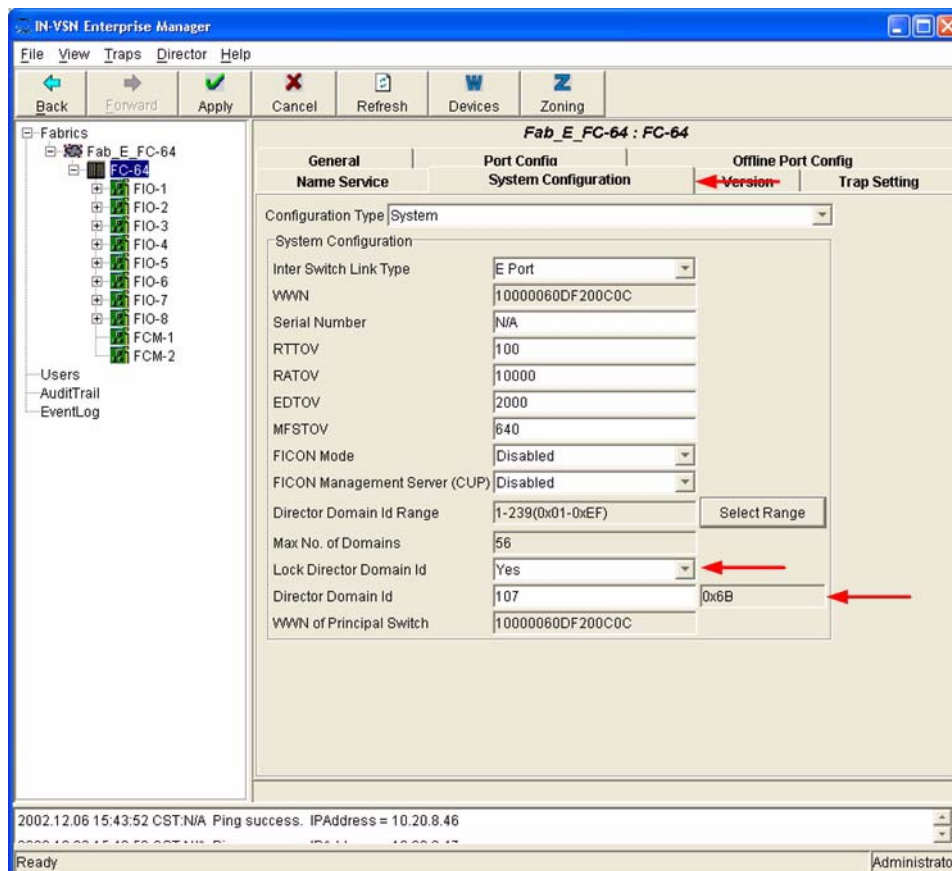
Domain ID Configuration

To ensure that there are no conflicts between switches, we recommend that each switch have an assigned Domain ID. The following steps show how to set the Domain ID on both the CNT switch and the IBM eServer BladeCenter switch module.

NOTE: The Domain ID should be locked and unique within the 1–239 range.

CNT IN-VSN Enterprise Manager

1. Start the CNT IN-VSN Enterprise Manager. The **IN-VNS Enterprise Manager** dialog box displays.
2. From the **IN-VNS Enterprise Manager** dialog box, select the **System Configuration** tab and do the following:
 - a. In the **Director Domain ID** box, type a unique Domain ID in the 1–239 range for the switch.
 - b. In the **Lock Director Domain ID** list, select **Yes**.
 - c. Click **Apply**.



CNT CLI

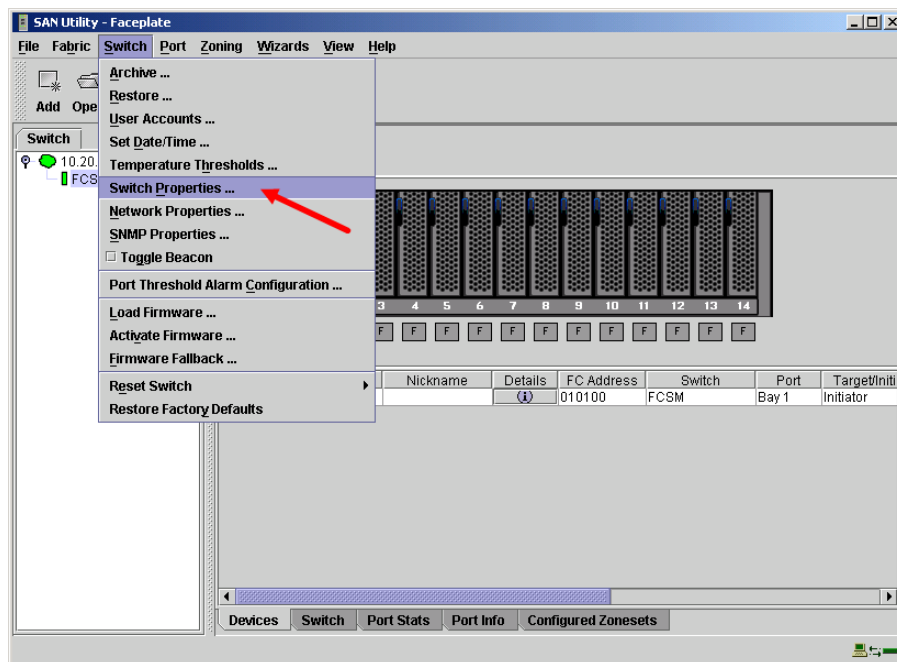
Not applicable.

IBM eServer BladeCenter GUI

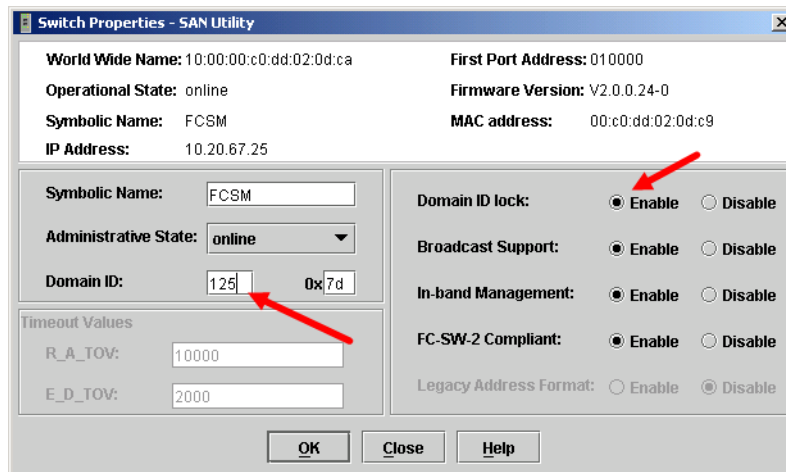
NOTE: You can use the SAN Utility to modify all IBM eServer BladeCenter switch modules. You can use the SAN Browser to modify only the QLogic 6-port Enterprise Fibre Channel Switch Module for IBM eServer BladeCenter. The screen images differ, but the procedures for the SAN Utility and SAN Browser are the same.

Do the following to modify IBM eServer BladeCenter switch modules using the SAN Utility:

1. Start the SAN Utility. The **SAN Utility—Faceplate** dialog box displays.
2. From the **SAN Utility—Faceplate** dialog box **Switch** menu, select **Switch Properties**.

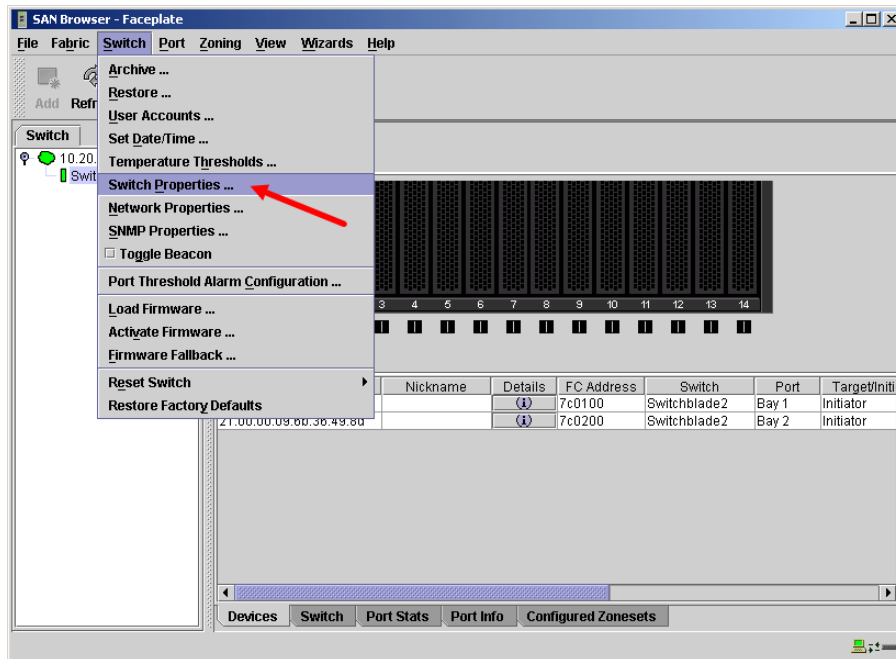


3. From the **Switch Properties—SAN Utility** dialog box, do the following:
 - a. In the **Domain ID** box, type a unique Domain ID in the 1–239 range for the switch.
 - b. Select the **Domain ID Lock Enable** radio button to ensure that the switch always has that Domain ID.
 - c. Click **OK**.

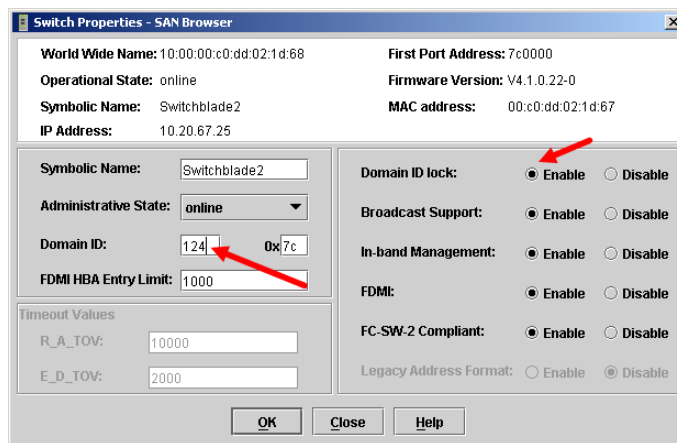


Do the following to modify the QLogic 6-port Enterprise Fibre Channel Switch Module for IBM eServer BladeCenter using the SAN Browser:

1. Start the SAN Browser. The **SAN Browser—Faceplate** dialog box displays.
2. From the **SAN Browser—Faceplate** dialog box **Switch** menu, select **Switch Properties**.



3. From the **Switch Properties—SAN Browser** dialog box, do the following:
 - a. In the **Domain ID** box, type a unique Domain ID in the 1–239 range for the switch.
 - b. Select the **Domain ID Lock Enable** radio button to ensure that the switch always has that Domain ID.
 - c. Click **OK**.



IBM eServer BladeCenter CLI

NOTE: The procedures differ based on the IBM eServer BladeCenter switch module.

Use the following CLI commands to modify the IBM eServer BladeCenter 2-port Fibre Channel Switch Module when the SAN Utility is not available:

```
Login: USERID
Password: xxxxxxxx
IBM eServer BladeCenter #> admin start
IBM eServer BladeCenter (admin) #> config edit
IBM eServer BladeCenter (admin-config) #> set config switch

  The following options display:
  AdminState (1=Online, 2=Offline, 3=Diagnostics) [Online]
  BroadcastEnabled (True / False) [True]
  InbandEnabled (True / False) [True]
  DefaultDomainID (decimal value, 1-239) [1] <97-127>
  DomainIDLock (True / False) [False] True
  SymbolicName (string, max=32 chars) [Fibre Channel Switch Module]
  R_T_TOV (decimal value, 1-1000 msec) [100]
  R_A_TOV (decimal value, 100-100000 msec) [10000]
  E_D_TOV (decimal value, 10-20000 msec) [2000]
  FS_TOV (decimal value, 100-100000 msec) [5000]
  DS_TOV (decimal value, 100-100000 msec) [5000]
  PrincipalPriority (decimal value, 1-255) [254]
  ConfigDescription (string, max=64 chars) [Default Config]
IBM eServer BladeCenter (admin-config) #> config save
IBM eServer BladeCenter (admin) #> config activate
The configuration will be activated. Please confirm (y/n): [n] y
```

Use the following CLI commands to modify the QLogic 6-port Enterprise Fibre Channel Switch Module for IBM eServer BladeCenter when the SAN Utility and SAN Browser are not available:

```
Login: USERID
Password: xxxxxxxx
Switchblade2: admin> admin start
Switchblade2 (admin): admin> config edit
    The config named default is being edited.
Switchblade2 (admin-config): admin> set config switch
    A list of attributes with formatting and current values will follow.
    Enter a new value or simply press the ENTER key to accept the current
    value. If you wish to terminate this process before reaching the end of
    the list press 'q' or 'Q' and the ENTER key to do so.
    AdminState (1=Online, 2=Offline, 3=Diagnostics) [Online]
    BroadcastEnabled (True / False) [True]
    InbandEnabled (True / False) [True]
    FdmiEnabled (True / False) [True]
    FdmiEntries (decimal value, 0-1000) [1000]
    DefaultDomainID (decimal value, 1-239) [1] 124
    DomainIDLock (True / False) [False] true
    SymbolicName (string, max=32 chars) [Switchblade2]
    R_A_TOV (decimal value, 100-100000 msec) [10000]
    E_D_TOV (decimal value, 10-20000 msec) [2000]
    PrincipalPriority (decimal value, 1-255) [254]
    ConfigDescription (string, max=64 chars) [Qlogic 6-port Enterprise
    Switch Module for IBM eServer BladeCenter]
    FC-SW-2 Compliant (True / False) [True]
    Finished configuring attributes.
    This configuration must be saved (see config save command) and activated
    (see config activate command) before it can take effect.
    To discard this configuration use the config cancel command.
Switchblade2 (admin-config): admin> config save
    The config named default has been saved.
Switchblade2 (admin): admin> config activate
    The currently active configuration will be activated.
    Please confirm (y/n): [n] y
Switchblade2 (admin): admin> admin end
```


Timeout Values

As per FC-SW-2 Fibre Channel standards, set all switches to the following timeout values (TOV) in order to successfully establish an E_port connection:

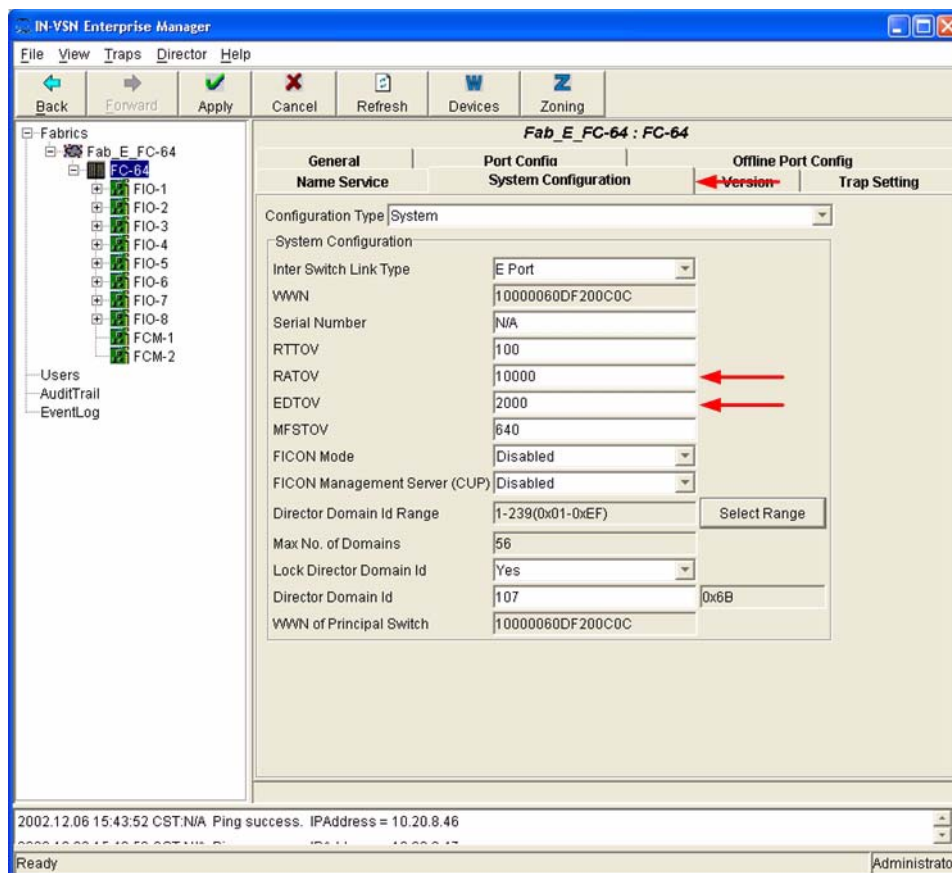
R_A_TOV = 10 seconds (The setting is **10000**.)

E_D_TOV = 2 seconds (The setting is **2000**.)

This section provides the steps to change these values.

CNT IN-VSN Enterprise Manager

1. Start the CNT IN-VSN Enterprise Manager. The **IN-VNS Enterprise Manager** dialog box displays.
2. From the **IN-VNS Enterprise Manager** dialog box, select the **System Configuration** tab. Verify that **R_A_TOV** is set to **10000** and **E_D_TOV** is set to **2000**. If the settings are not correct, do the following.
 - a. In the **R_A_TOV** box, change the setting to **10000**.
 - b. In the **E_D_TOV** box, change the setting to **2000**.
 - c. Click **Apply**.



CNT CLI

Not applicable.

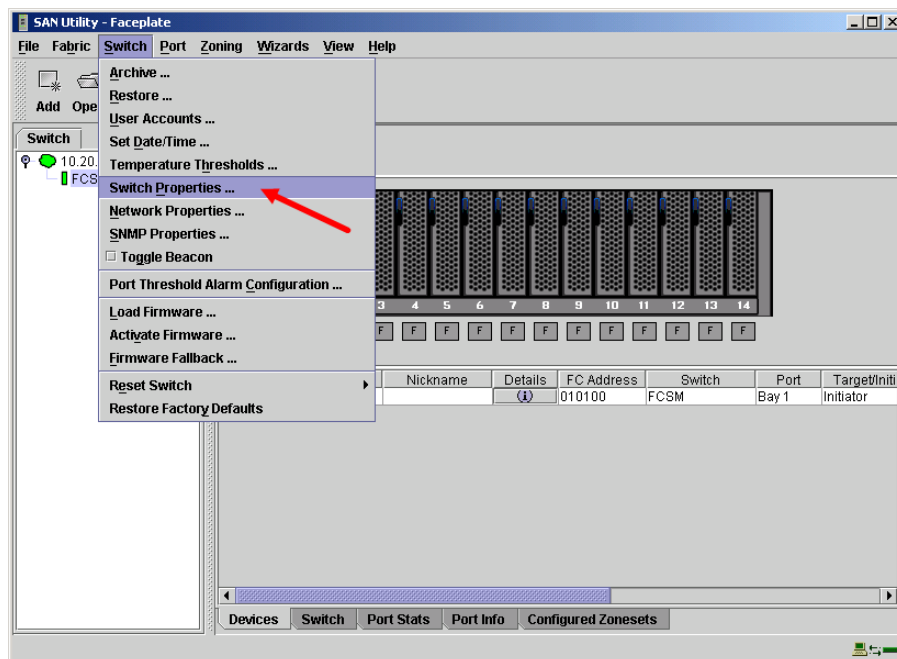
IBM eServer BladeCenter GUI

ATTENTION!! The following steps take the switch offline; therefore, do not perform them on a switch being managed in-band.

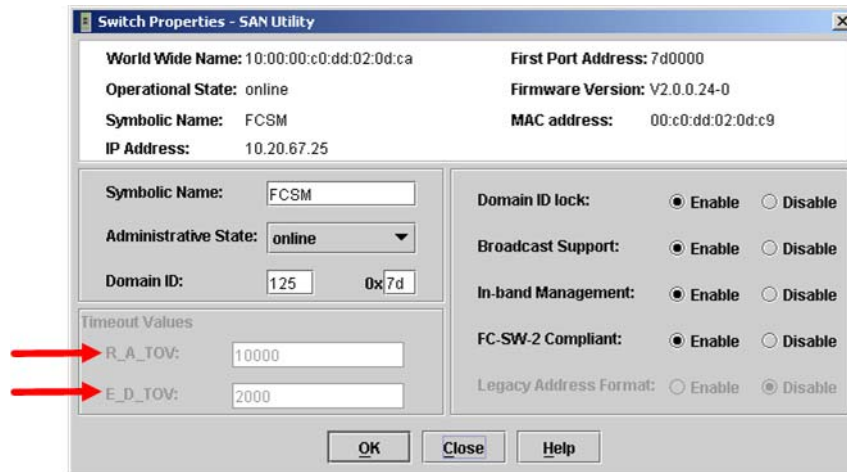
NOTE: You can use the SAN Utility to modify all IBM eServer BladeCenter switch modules. You can use the SAN Browser to modify only the QLogic 6-port Enterprise Fibre Channel Switch Module for IBM eServer BladeCenter. The screen images differ, but the procedures for the SAN Utility and SAN Browser are the same.

Do the following to modify IBM eServer BladeCenter switch modules using the SAN Utility:

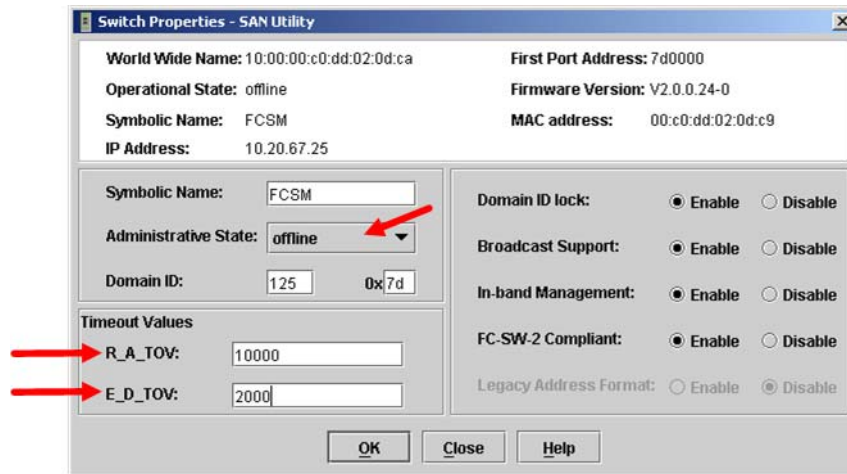
1. Start the SAN Utility. The **SAN Utility—Faceplate** dialog box displays.
2. From the **SAN Utility—Faceplate** dialog box **Switch** menu, select **Switch Properties**.



3. From the **Switch Properties—SAN Utility** dialog box, verify that **R_A_TOV** is set to **10000** and **E_D_TOV** is set to **2000**. If the settings are *not* correct, proceed to [step 4](#). If the settings are correct, no changes need to be made; proceed to the next appropriate section.



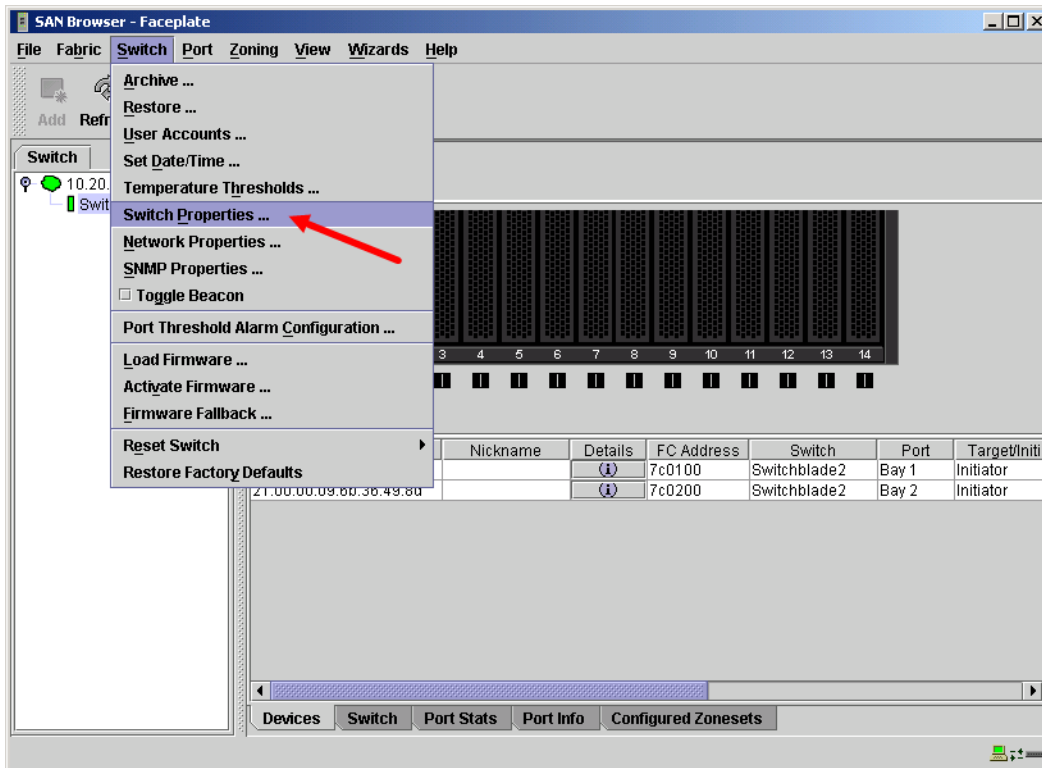
4. To modify the timeout value settings, do the following:
 - a. In the **Administrative State** drop-down box, select **offline**. Click **OK**.
 - b. The **SAN Utility—Faceplate** dialog box redisplay. Repeat [step 2](#) to redisplay the **Switch Properties—SAN Utility** dialog box.
 - c. In the Timeout Values section **R_A_TOV** box, enter **10000**.
 - d. In the Timeout Values section **E_D_TOV** box, enter **2000**.
 - e. In the **Administrative State** drop-down box, select **online**. Click **OK**.



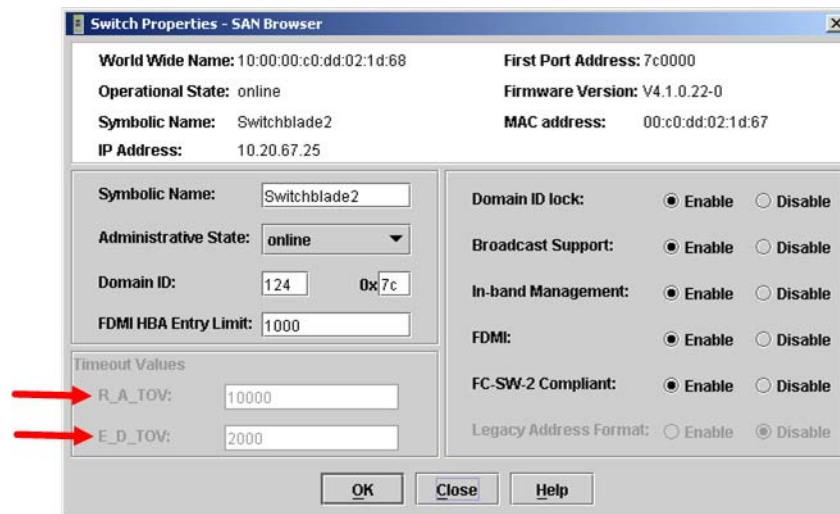
5. The **SAN Utility—Faceplate** dialog box redisplay. Repeat [step 2](#) to redisplay the **Switch Properties—SAN Utility** dialog box. Verify your changes ([see step 3](#)).

Do the following to modify the QLogic 6-port Enterprise Fibre Channel Switch Module for IBM eServer BladeCenter using the SAN Browser:

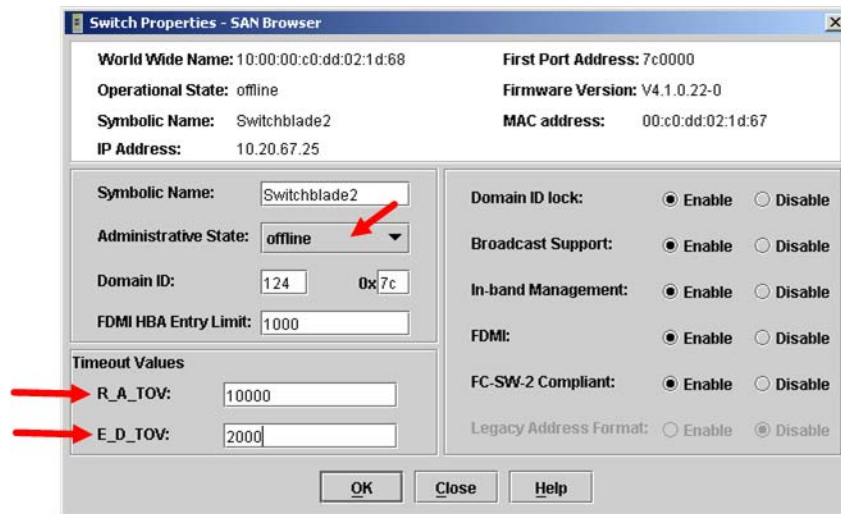
1. Start the SAN Browser. The **SAN Browser—Faceplate** dialog box displays.
2. From the **SAN Browser—Faceplate** dialog box **Switch** menu, select **Switch Properties**.



- From the **Switch Properties—SAN Browser** dialog box, verify that **R_A_TOV** is set to **10000** and **E_D_TOV** is set to **2000**. If the settings are *not* correct, proceed to [step 4](#). If the settings are correct, no changes need to be made; proceed to the next appropriate section.



4. To modify the timeout value settings, do the following:
 - a. In the **Administrative State** drop-down box, select **offline**. Click **OK**.
 - b. The **SAN Browser—Faceplate** dialog box redisplay. Repeat [step 2](#) to redisplay the **Switch Properties—SAN Browser**.
 - c. In the Timeout Values section **R_A_TOV** box, enter **10000**.
 - d. In the Timeout Values section **E_D_TOV** box, enter **2000**.
 - e. In the **Administrative State** drop-down box, select **online**. Click **OK**.



5. The **SAN Browser—Faceplate** dialog box redisplay. Repeat [step 2](#) to redisplay the **Switch Properties—SAN Browser**. Verify your changes ([see step 3](#)).

IBM eServer BladeCenter CLI

ATTENTION!! The following steps take the switch offline; therefore, do not perform them on a switch being managed in-band.

NOTE: The procedures differ based on the IBM eServer BladeCenter switch module.

Use the following CLI commands to modify the IBM eServer BladeCenter 2-port Fibre Channel Switch Module when the SAN Utility is not available:

```
Login: USERID
Password: xxxxxxxx
```

Use the following command to verify that R_A_TOV is set to 10000 and E_D_TOV is set to 2000.

```
IBM eServer BladeCenter #> show config switch
```

If these timeout values are *not* correct, continue with this section. If the settings are correct, no changes need to be made; proceed with the next appropriate section.

```
IBM eServer BladeCenter #> admin start
IBM eServer BladeCenter (admin) #> config edit
IBM eServer BladeCenter (admin-config) #> set config switch
```

The following options display:

```
AdminState (1=Online, 2=Offline, 3=Diagnostics) [Online]
BroadcastEnabled (True / False) [True]
InbandEnabled (True / False) [True]
DefaultDomainID (decimal value, 1-239) [1]
DomainIDLock (True / False) [True]
SymbolicName (string, max=32 chars) [Fibre Channel Switch Module]
R_T_TOV (decimal value, 1-1000 msec) [100]
R_A_TOV (decimal value, 100-100000 msec) [9000]    10000
E_D_TOV (decimal value, 10-20000 msec) [1000]    2000
FS_TOV (decimal value, 100-100000 msec) [5000]
DS_TOV (decimal value, 100-100000 msec) [5000]
PrincipalPriority (decimal value, 1-255) [254]
ConfigDescription (string, max=64 chars) [Default Config]
IBM eServer BladeCenter (admin-config) #> config save
IBM eServer BladeCenter (admin) #> config activate
The configuration will be activated. Please confirm (y/n): [n] y
```

Use the following CLI commands to modify the QLogic 6-port Enterprise Fibre Channel Switch Module for IBM eServer BladeCenter when the SAN Utility and SAN Browser are not available:

```
Login: USERID  
Password: xxxxxxxx
```

Use the following command to verify that R_A_TOV is set to 10000 and E_D_TOV is set to 2000.

```
Switchblade2: admin> show config switch
```

If these timeout values are *not* correct, continue with this section. If the settings are correct, no changes need to be made; proceed with the next appropriate section.

```
Switchblade2: admin>  
Switchblade2: admin> admin start  
Switchblade2 (admin): admin> config edit  
The config named default is being edited.  
Switchblade2 (admin-config): admin> set config switch  
A list of attributes with formatting and current values will follow.  
Enter a new value or simply press the ENTER key to accept the current  
value. If you wish to terminate this process before reaching the end of  
the list press 'q' or 'Q' and the ENTER key to do so.  
AdminState (1=Online, 2=Offline, 3=Diagnostics) [Online]  
BroadcastEnabled (True / False) [True]  
InbandEnabled (True / False) [True]  
FDMIEnabled (True / False) [True]  
FDMIEntries (decimal value, 0-1000) [1000]  
DefaultDomainID (decimal value, 1-239) [124]  
DomainIDLock (True / False) [True]  
SymbolicName (string, max=32 chars) [Switchblade2]  
R_A_TOV (decimal value, 100-100000 msec) [9000] 10000  
E_D_TOV (decimal value, 10-20000 msec) [1000] 2000  
PrincipalPriority (decimal value, 1-255) [254]  
ConfigDescription (string, max=64 chars) [Qlogic 6-port Enterprise  
Switch Module for IBM eServer BladeCenter]  
FC-SW-2 Compliant (True / False) [True]
```

Finished configuring attributes.
This configuration must be saved (see config save command) and activated (see config activate command) before it can take effect.
To discard this configuration use the config cancel command.

```
Switchblade2 (admin-config): admin> config save  
The config named default has been saved.  
Switchblade2 (admin): admin> config activate  
The currently active configuration will be activated.  
Please confirm (y/n): [n] y  
Switchblade2 (admin): admin> admin end
```

Principal Switch Configuration

CNT switches and IBM eServer BladeCenter switch modules negotiate for principal switch automatically. Therefore, there are no steps to take.

Zone Configuration

This section discusses configuring active Zone Set names and Zone types.

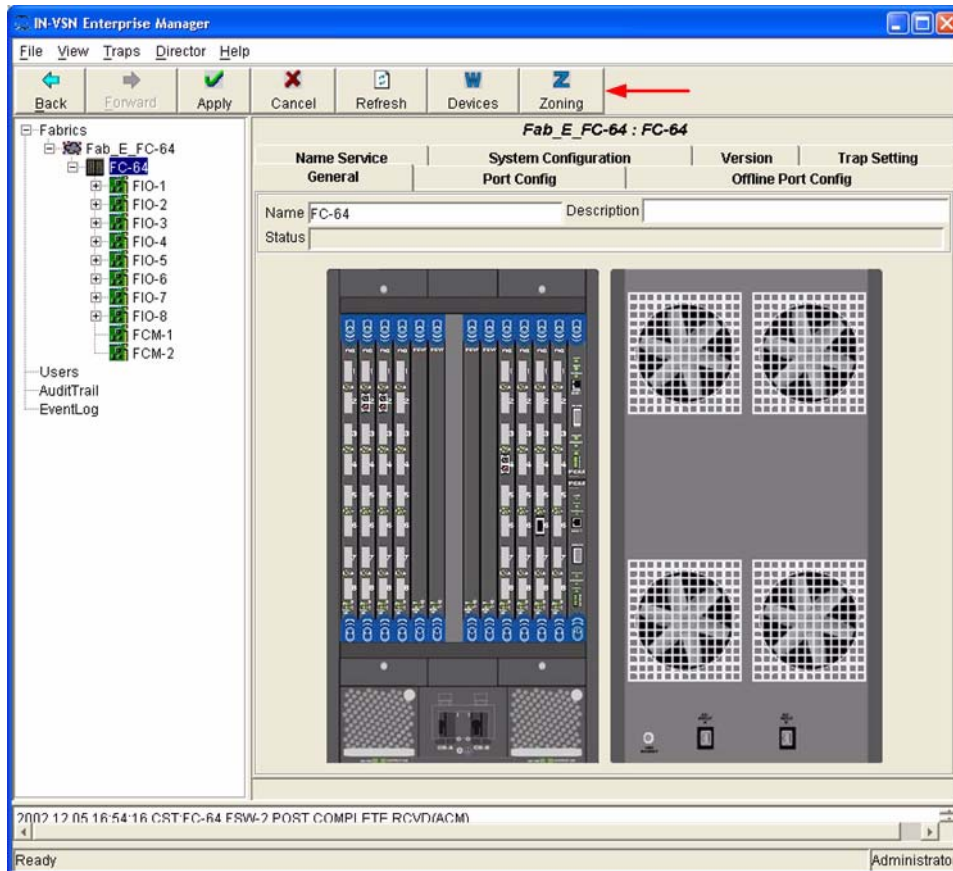
Active Zone Set Names

The Zone and Zone Set names on each switch must be unique. If not, change one of the duplicate names. All Zone Set and Zone names must conform to the Fibre Channel (FC) Standards for Zone Naming (ANSI T11/00-427v3):

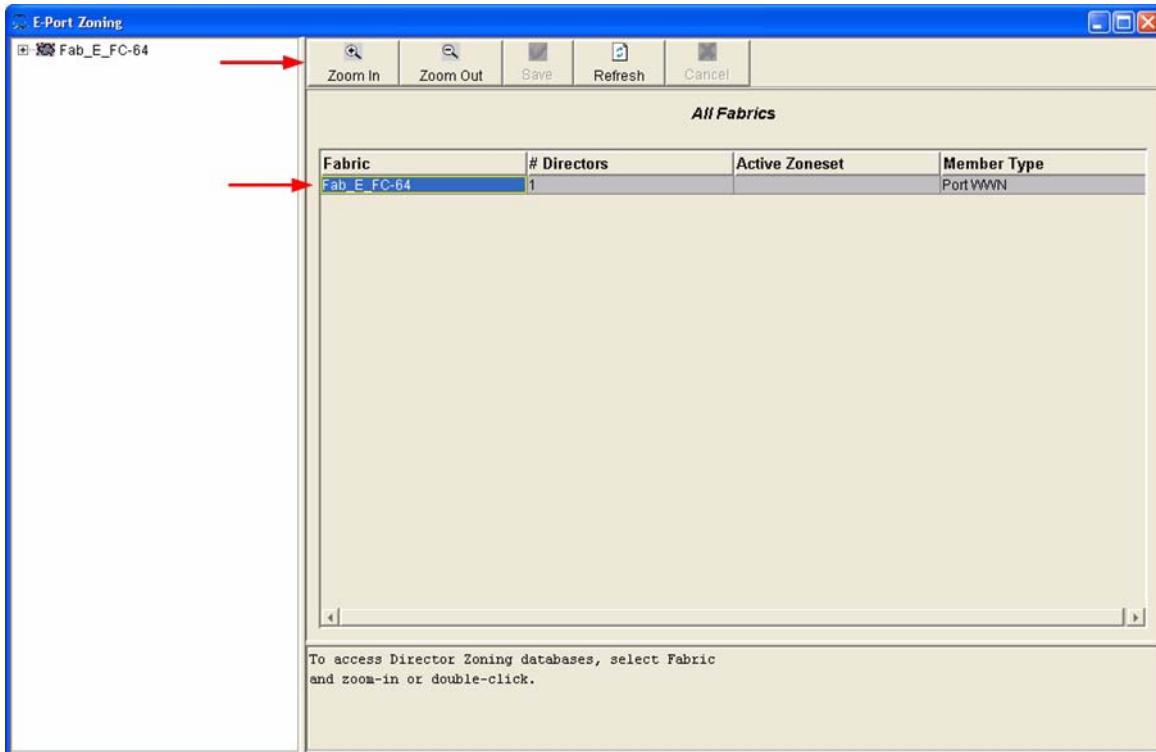
1. Must be 1–64 characters in length.
2. All characters are ASCII.
3. First character is [a–z] or [A–Z].
4. All other characters must be [a–z], [A–Z], [0–9], or the _ character. Other characters (\$-^) may not be supported by all vendors and should be avoided.

CNT IN-VSN Enterprise Manager

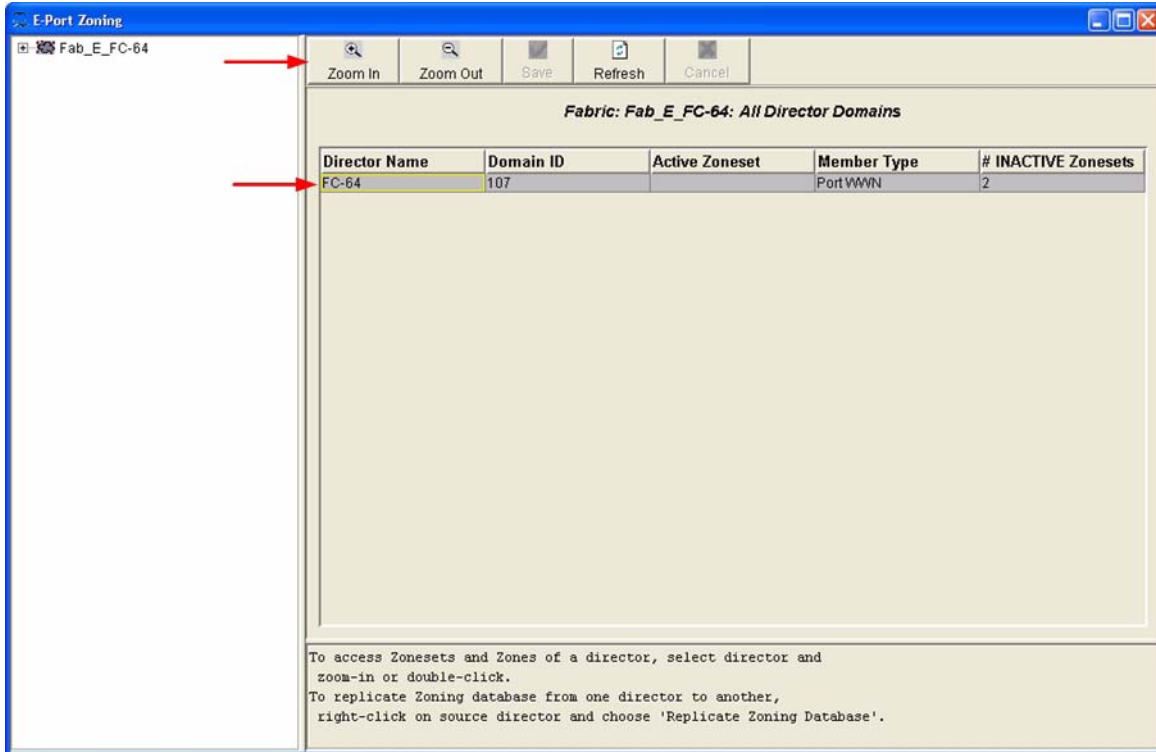
1. Start the CNT IN-VSN Enterprise Manager. The **IN-VNS Enterprise Manager** dialog box displays. Click the **Zoning** button.



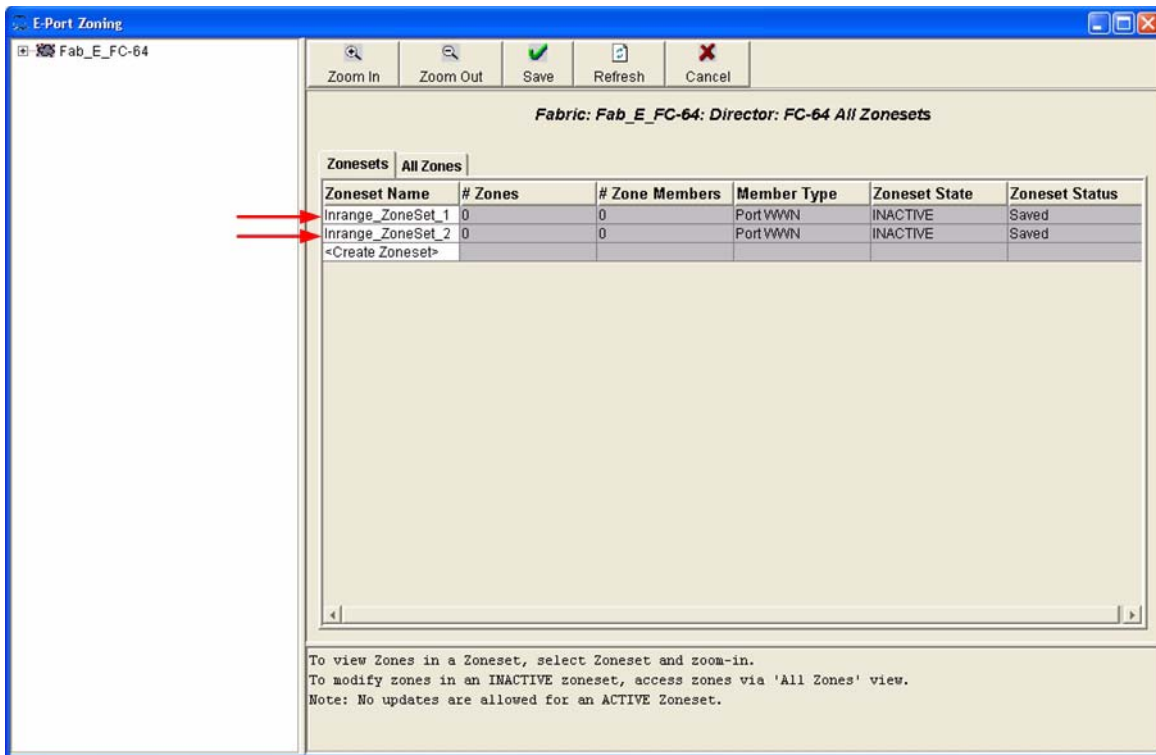
- From the **E-Port Zoning (All Fabrics)** dialog box, select the fabric and click the **Zoom In** button.



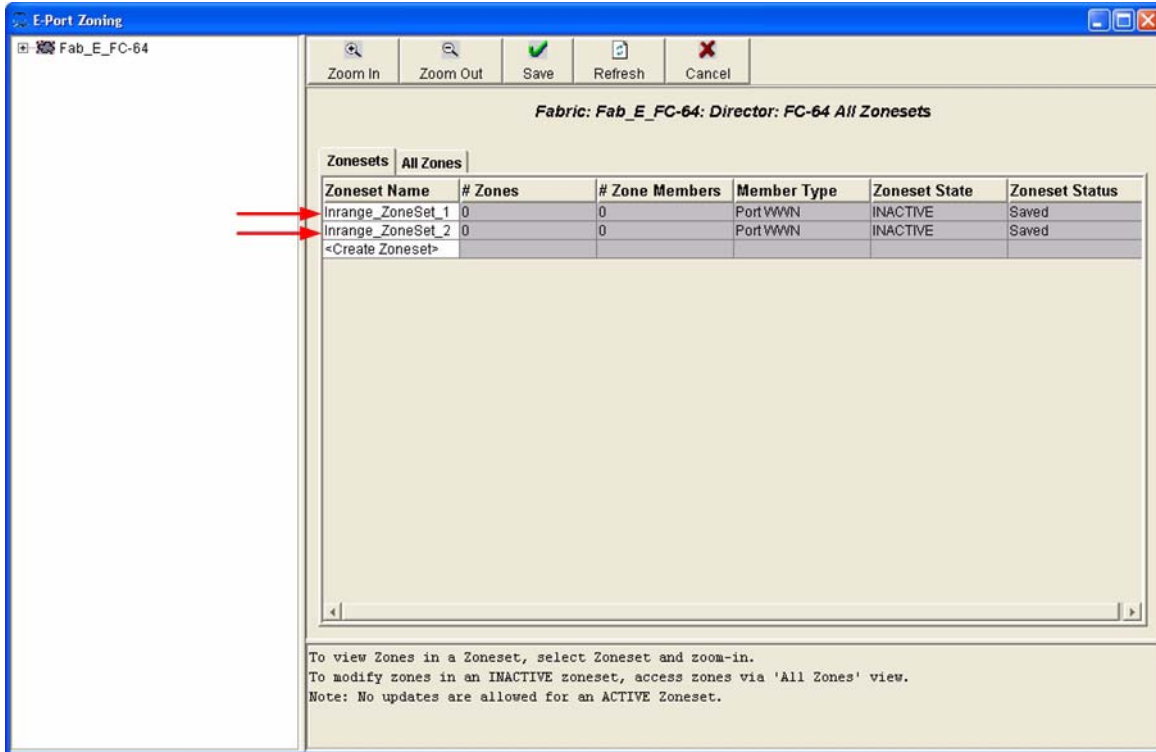
3. From the **E-Port Zoning (Fabric x: All Director Domains)** dialog box, select the director and click the **Zoom In** button.



- From the **E-Port Zoning (Fabric x: Director y: All Zonesets)** dialog box, select the **Zonesets** tab. Verify that all Zone Set names conform to the standards for zone naming as discussed under [“Active Zone Set Names”](#) on page 175.



5. Select the **All Zones** tab. Verify that all Zone names conform to the standards for zone naming as discussed under “Active Zone Set Names” on page 175.



CNT CLI

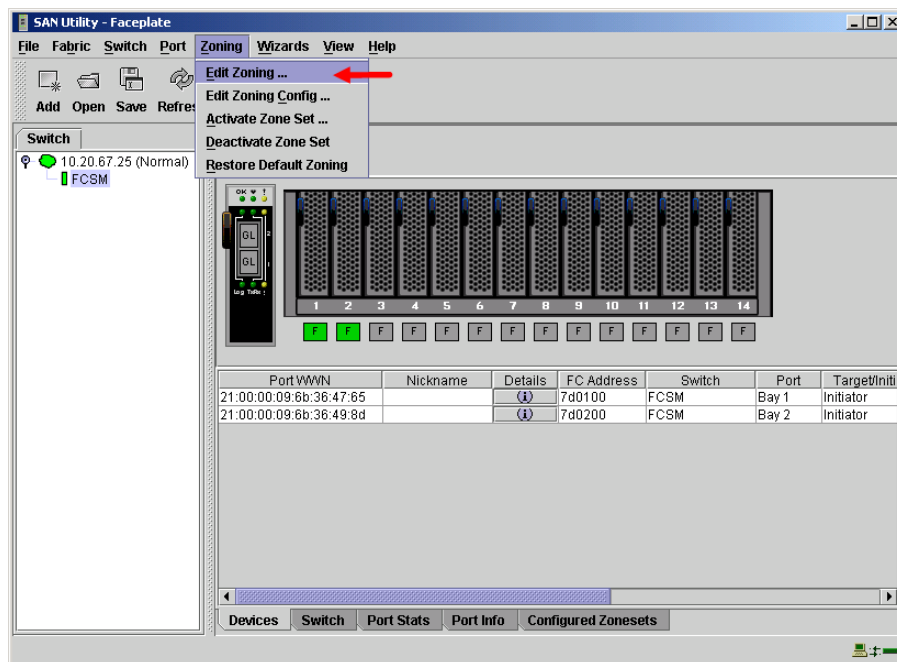
Not applicable.

IBM eServer BladeCenter GUI

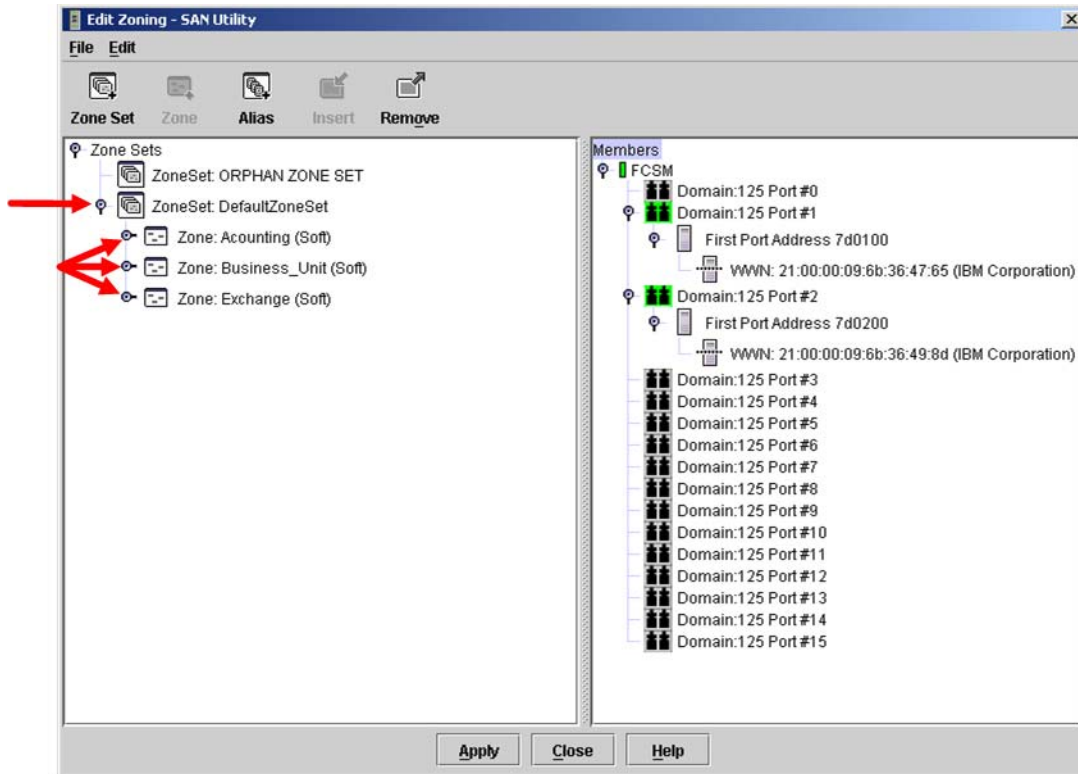
NOTE: You can use the SAN Utility to modify all IBM eServer BladeCenter switch modules. You can use the SAN Browser to modify only the QLogic 6-port Enterprise Fibre Channel Switch Module for IBM eServer BladeCenter. The screen images differ, but the procedures for the SAN Utility and SAN Browser are the same.

Do the following to modify IBM eServer BladeCenter switch modules using the SAN Utility:

1. Start the SAN Utility. The **SAN Utility—Faceplate** dialog box displays.
2. From the **SAN Utility—Faceplate** dialog box **Zoning** menu, select **Edit Zoning**.

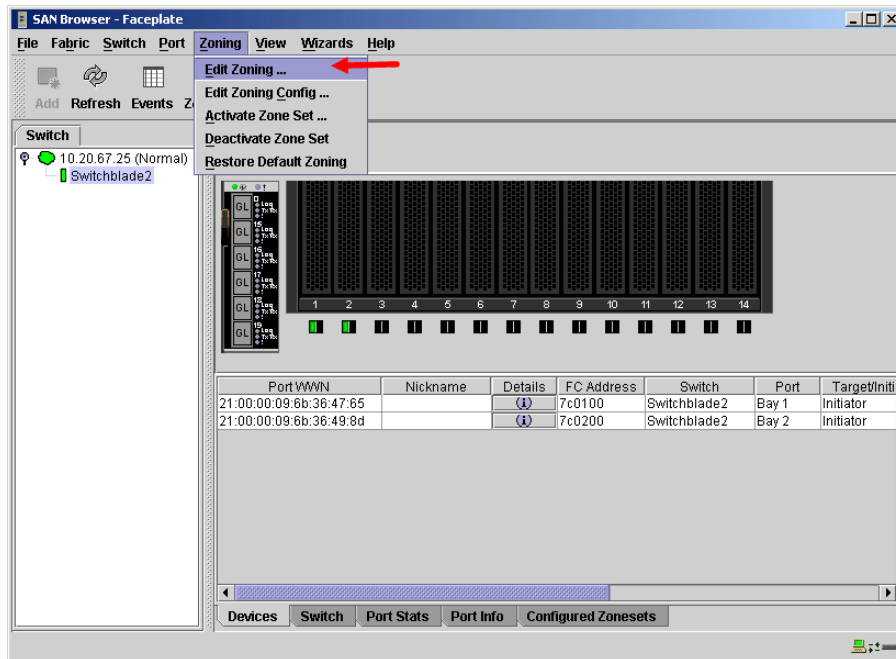


3. From the **Edit Zoning — SAN Utility** dialog box, compare the Zone Set and Zone names from each switch to ensure that none have the same name and the names conform to the standards for zone naming as discussed under [“Active Zone Set Names”](#) on page 175.

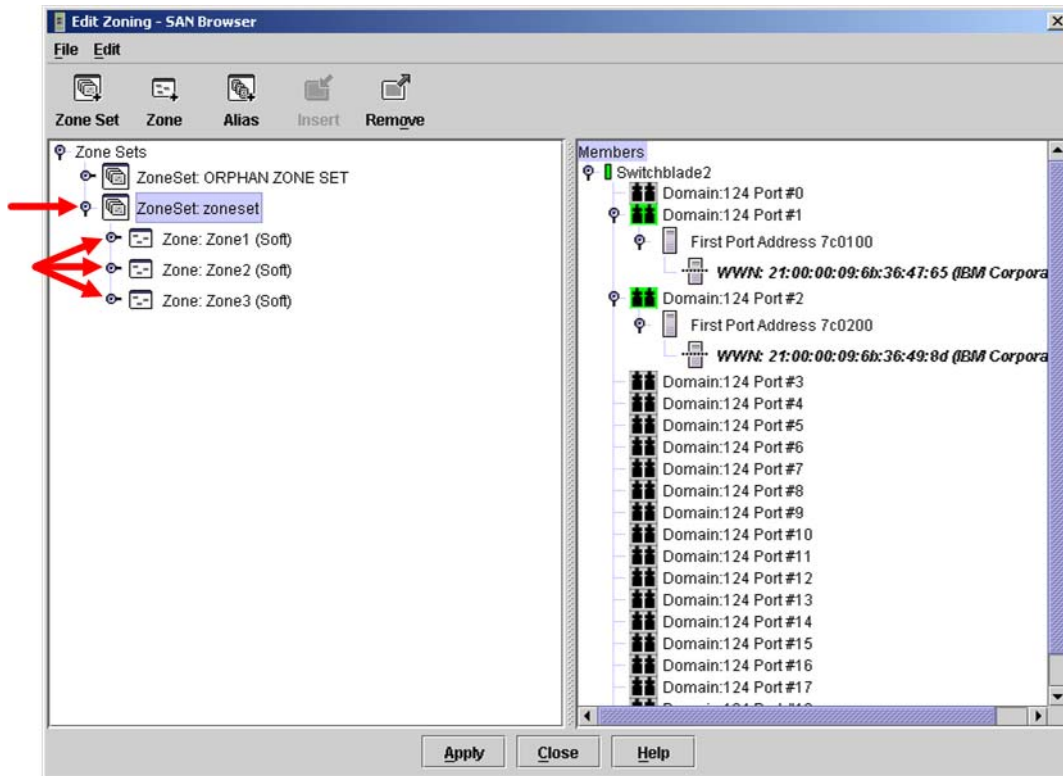


Do the following to modify the QLogic 6-port Enterprise Fibre Channel Switch Module for IBM eServer BladeCenter using the SAN Browser:

1. Start the SAN Browser. The **SAN Browser—Faceplate** dialog box displays.
2. From the **SAN Browser—Faceplate** dialog box **Zoning** menu, select **Edit Zoning**.



3. From the **Edit Zoning—SAN Browser** dialog box, compare the Zone Set and Zone names from each switch to ensure that none have the same name and the names conform to the standards for zone naming as discussed under “Active Zone Set Names” on page 175.



IBM eServer BladeCenter CLI

NOTE: Use the following CLI commands when the IBM eServer BladeCenter GUI is not available.

Login: **USERID**

Password: **xxxxxxxx**

IBM eServer BladeCenter #> **zone list**

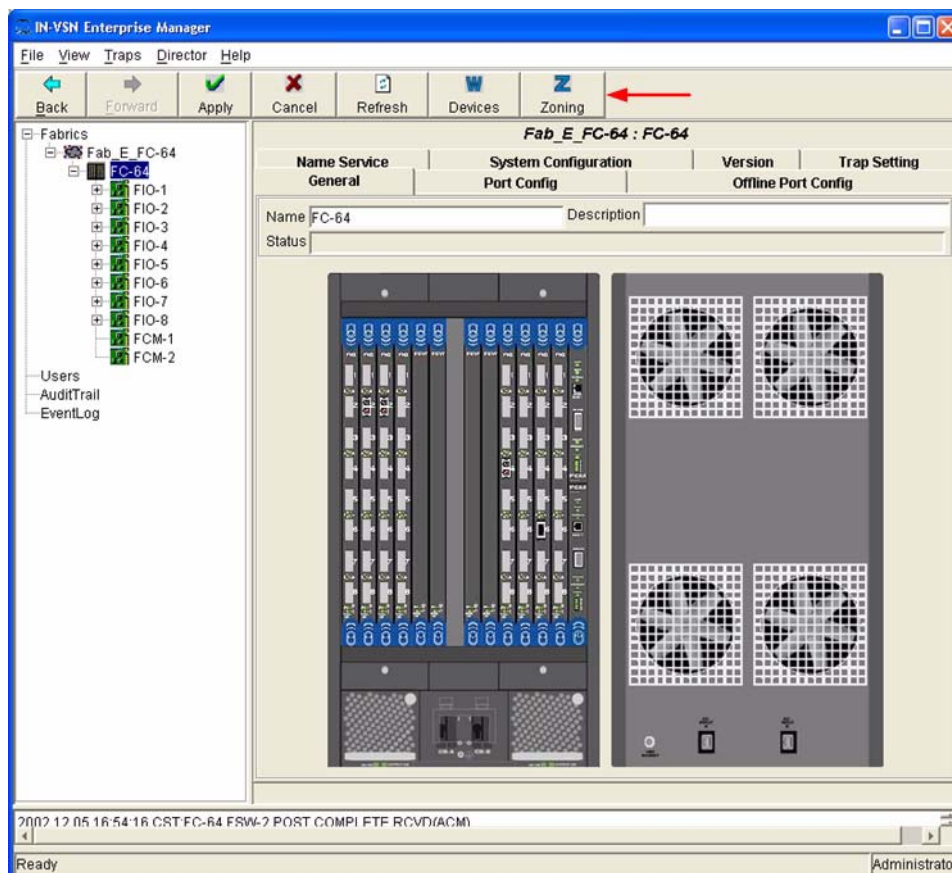
Zone Types

All zones members must be specified by a world wide port name (WWPN) in order to comply with Fibre Channel standards. Any zone member not specified by WWPN cannot participate in the fabric. Below are steps to confirm the zone types.

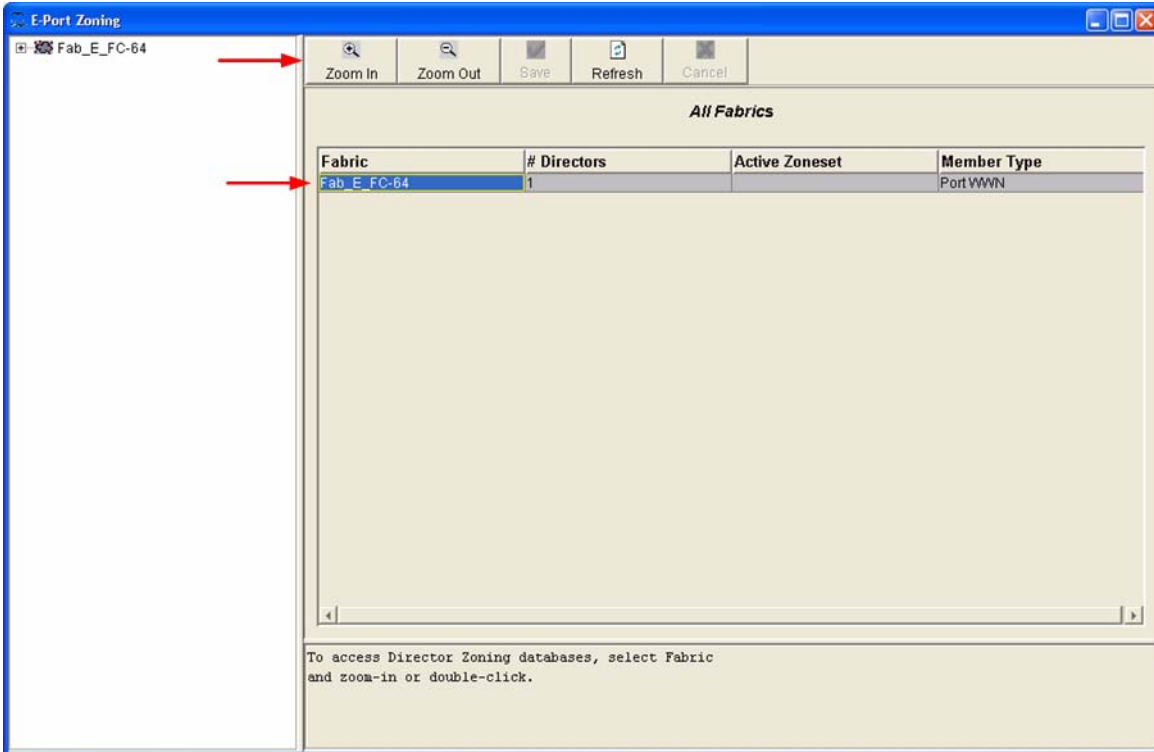
NOTE: A world wide name (WWN) consists of a world wide node name (WWNN) and one or more WWPNs. References in this guide to WWN actually refer to the WWPN.

CNT IN-VSN Enterprise Manager

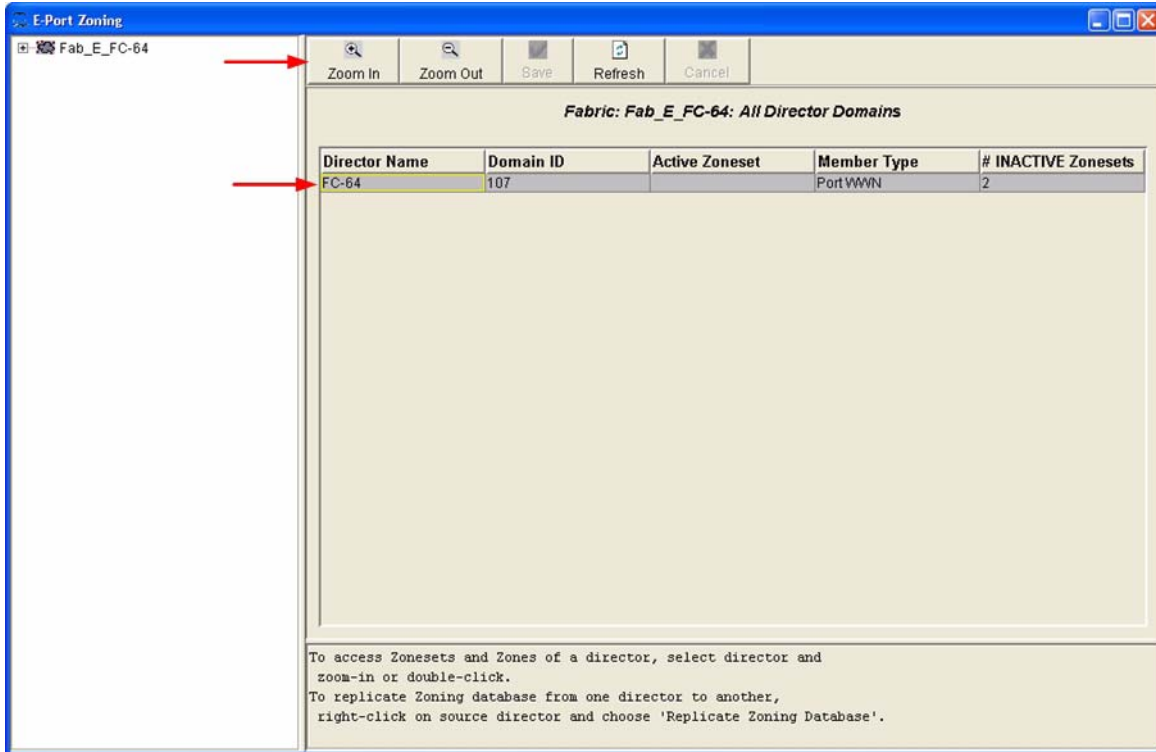
1. Start the CNT IN-VSN Enterprise Manager. The **IN-VNS Enterprise Manager** dialog box displays. Click the **Zoning** button.



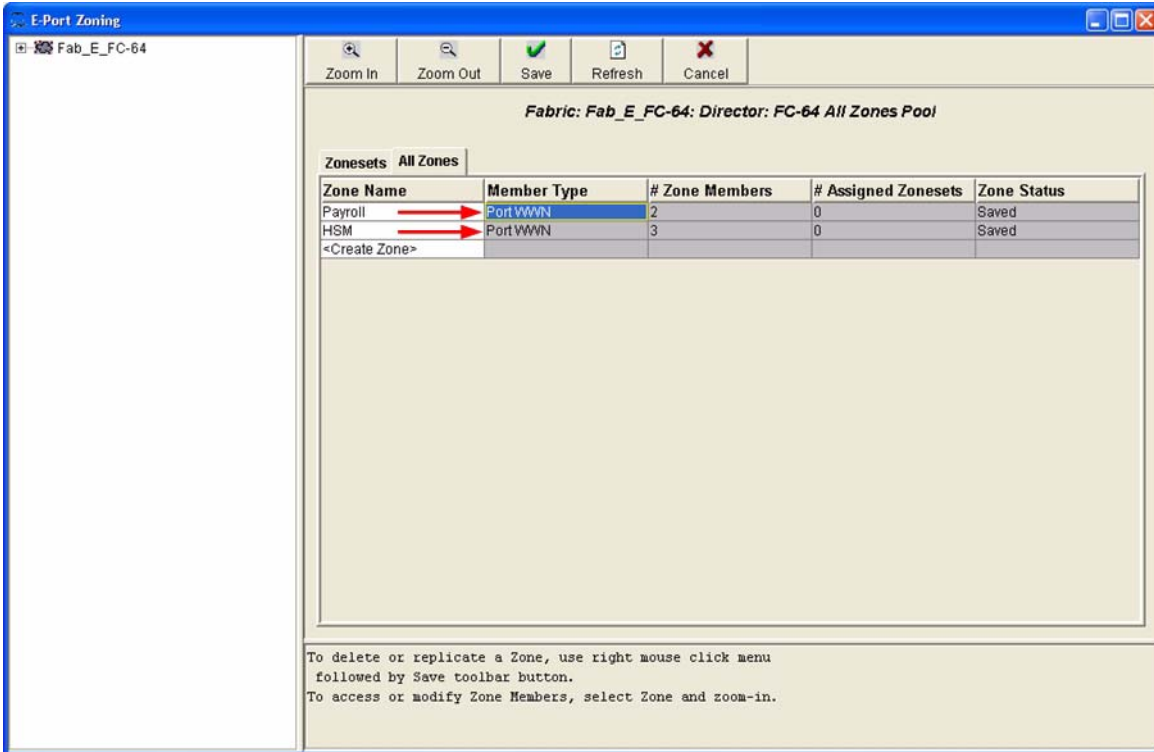
- From the **E-Port Zoning (All Fabrics)** dialog box, select the fabric and click the **Zoom In** button.



- From the **E-Port Zoning (Fabric x: All Director Domains)** dialog box, select the director and click the **Zoom In** button.



4. From the **E-Port Zoning (Fabric x: Director y: All Zones)** dialog box, select the **All Zones** tab. Verify that all **Zone Member Types** are set to **Port WWN**.



CNT CLI

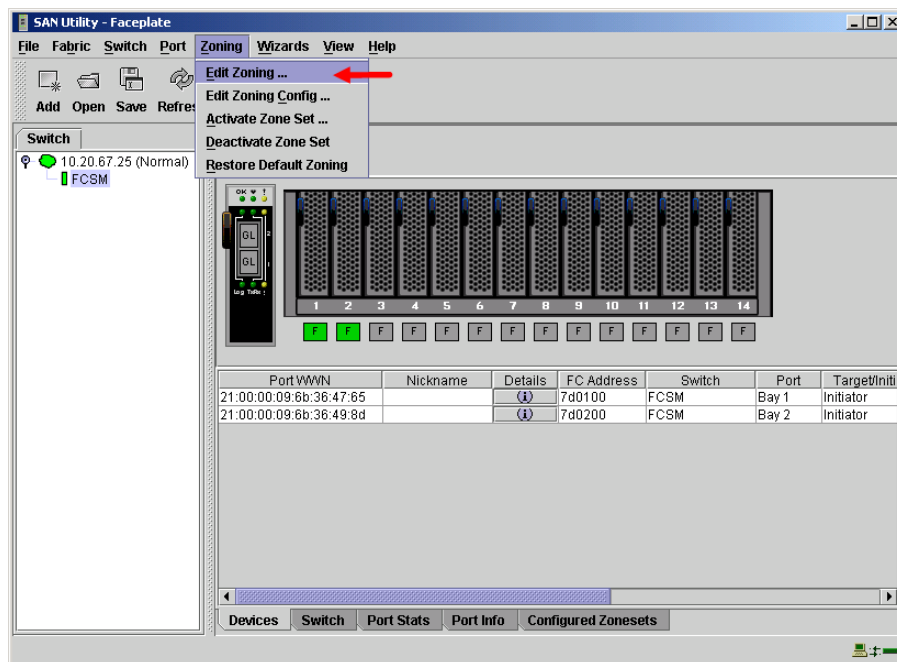
Not applicable.

IBM eServer BladeCenter GUI

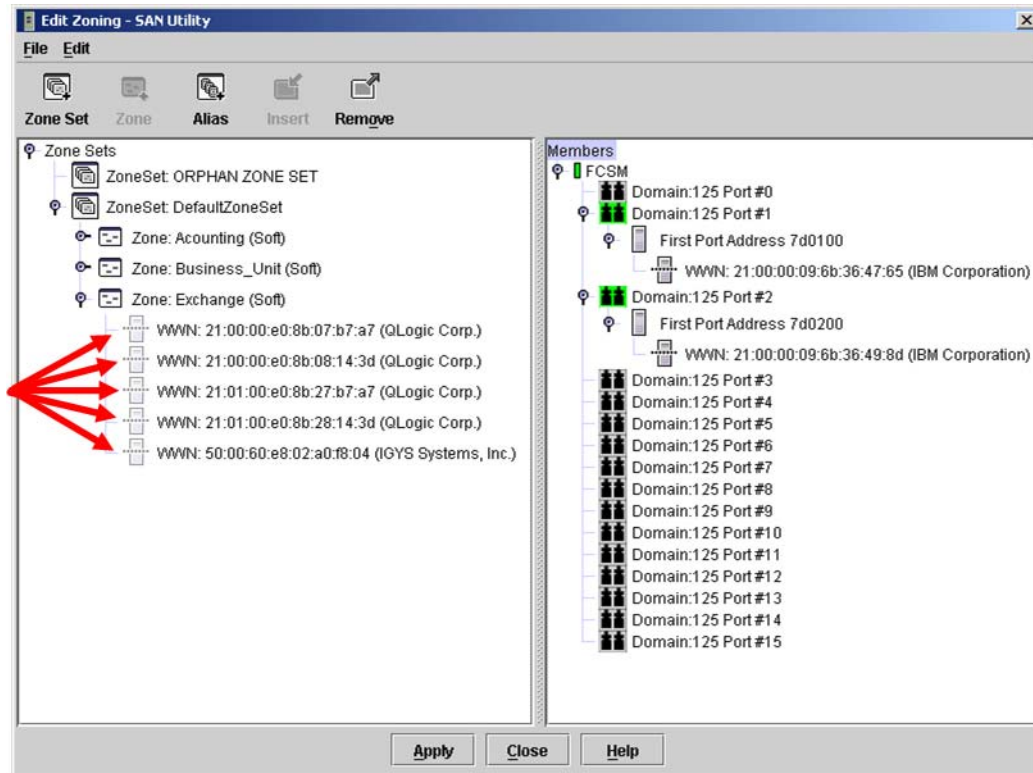
NOTE: You can use the SAN Utility to modify all IBM eServer BladeCenter switch modules. You can use the SAN Browser to modify only the QLogic 6-port Enterprise Fibre Channel Switch Module for IBM eServer BladeCenter. The screen images differ, but the procedures for the SAN Utility and SAN Browser are the same.

Do the following to modify IBM eServer BladeCenter switch modules using the SAN Utility:

1. Start the SAN Utility. The **SAN Utility—Faceplate** dialog box displays.
2. From the **SAN Utility—Faceplate** dialog box **Zoning** menu, select **Edit Zoning**.

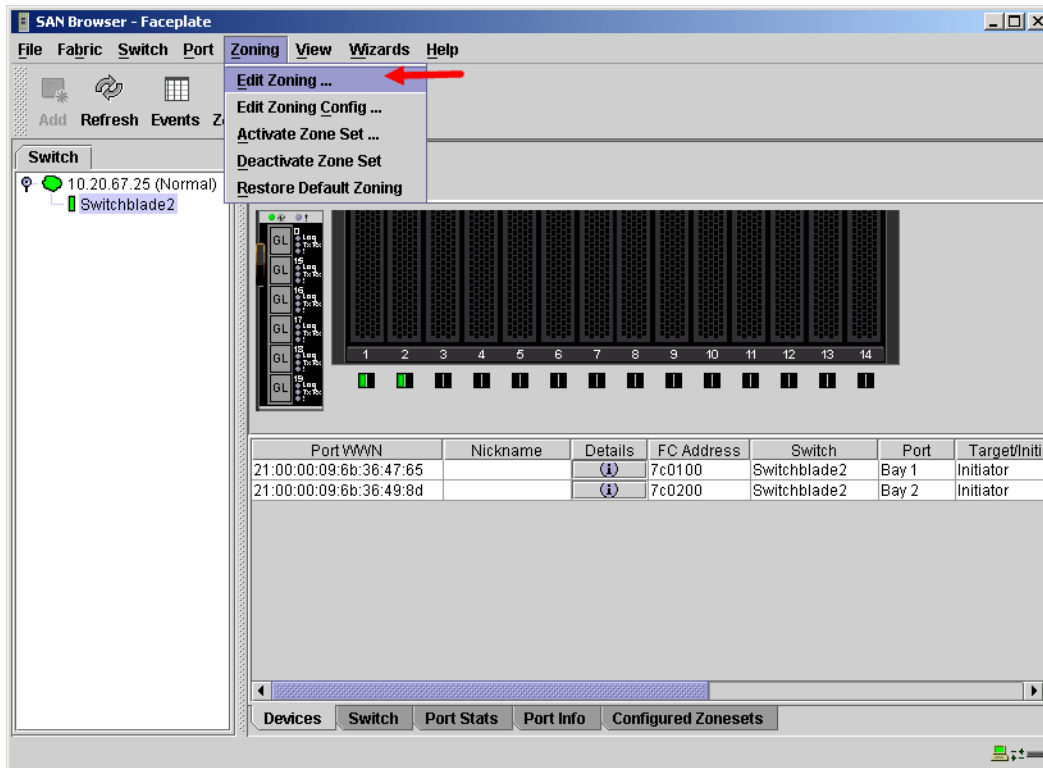


3. The **Edit Zoning—SAN Utility** dialog box displays. Confirm that all zone members are listed as WWN.

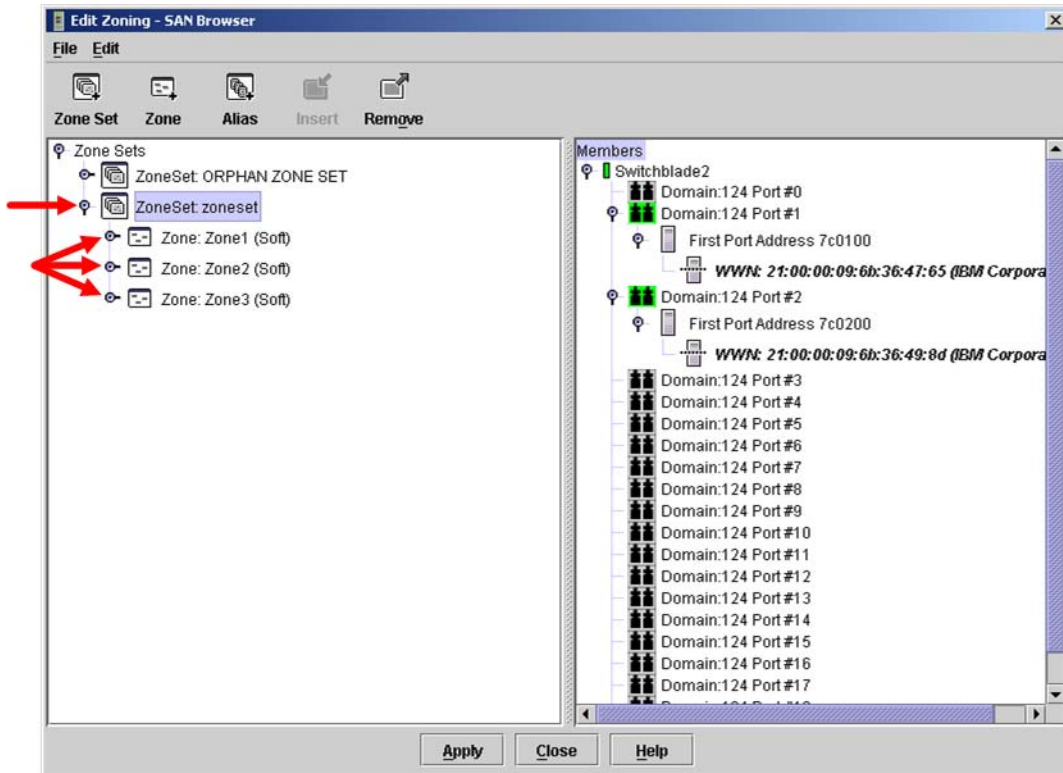


For the QLogic 6-port Enterprise Fibre Channel Switch Module for IBM eServer BladeCenter, do the following using the SAN Browser:

1. Start the SAN Browser. The **SAN Browser—Faceplate** dialog box displays.
2. From the **SAN Browser—Faceplate** dialog box **Zoning** menu, select **Edit Zoning**.



3. The **Edit Zoning—SAN Browser** dialog box displays. Do the following:
 - a. Select a ZoneSet.
 - b. Select a Zone.
 - c. In the Zone Members section, confirm that all zone members are listed as WWN.
 - d. Repeat the above steps for each zone.



IBM eServer BladeCenter CLI

NOTE: Use the following CLI commands when the IBM eServer BladeCenter GUI is not available.

Login: **USERID**

Password: **xxxxxxxx**

IBM eServer BladeCenter #> **zone members <zone name>**

Repeat this statement for each zone and confirm that only WWNs are listed.

CNT Specific Configuration

Not applicable.

IBM eServer BladeCenter Specific Configuration

Not applicable.

Operating Mode Configuration

Not applicable.

Successful Integration Checklist

Perform the following steps after the E_port connection has been established and the fabric has had time to update. If everything verifies, the fabrics have successfully merged.

- ✓ Compare and verify that all Zoning information has been propagated on all switches.
- ✓ Verify that the correct Zone Set is activated.
- ✓ Compare and verify that all devices are in the Name Server of each switch.
- ✓ Verify that all initiators continue to detect and have access to all targets that existed prior to the fabric merger.

After everything is verified, your fabric has merged successfully and no additional steps need to be taken. If any of the above tasks did not complete successfully, please contact IBM support.

Merging IBM eServer BladeCenter and McDATA Fabrics

The following IBM eServer BladeCenter switch modules have been tested in the IBM eServer BladeCenter environment and comply with the FC-SW-2 standard. They have tested interoperable with the following switches from McDATA that comply with the FC-SW-2 standard.

IBM eServer BladeCenter and McDATA Supported Switches

Manufacturer	Switch Model*
IBM eServer BladeCenter	IBM eServer BladeCenter 2-port Fibre Channel Switch Module QLogic 6-port Enterprise Fibre Channel Switch Module for IBM eServer BladeCenter
McDATA	ES-3016/IBM 2031-16 ES-3032/IBM 2031-32 Sphereon 3032/IBM 2031-216 Sphereon 3232/IBM 2031-232 Sphereon 4300/IBM 2034-212 Sphereon 4500/IBM 2031-224 Intrepid 6064 Director/IBM 2032-064 Intrepid 6140 Director/IBM 2032-140

Note

*For the current firmware versions, please see the *IBM eServer BladeCenter Fibre Channel Switch Interoperability Quick Reference Guide* located at <http://www.ibm.com/support>.

The following chapters provide detailed information about merging McDATA and IBM eServer BladeCenter fabrics:

- **McDATA Edge Switches (see page 197)**
- **McDATA Intrepid 6000 Series Directors (see page 243)**

McDATA Edge Switches

Configuration Considerations

McDATA configuration considerations are as follows.

- When merging McDATA and IBM eServer BladeCenter fabrics, a maximum of 31 interconnected switches per fabric can be configured.
- Otherwise, all features are fully supported and comply with industry standards.

IBM eServer BladeCenter configuration considerations are as follows:

- If you will be implementing the I/O stream guard feature, please contact your IBM technical support representative prior to configuring. Additional configuration procedures may be required.
- Contact IBM Technical Support to obtain the document, *IBM eServer BladeCenter Remote Boot*, if you are planning to use the boot form SAN functionality.

Integration Checklist

The following steps must be completed to successfully merge McDATA and IBM eServer BladeCenter fabrics. The remainder of this section provides detailed instructions and examples.

ATTENTION!!

- Back up the current switch configuration data prior to performing the following steps so that the configuration is available if something goes wrong (see the first step for details).
 - Disruptions in the fabric can occur as a result of performing the following steps. Therefore, it is recommended that these changes be done during down time or off-peak hours.
-
- ✓ Back up the current switch configuration data (see [“Backing Up and Restoring the Current Configuration Settings”](#) on page 200).
 - ✓ Verify that the correct version of switch firmware is installed on each switch (see [“Supported Switches”](#) on page 198).
 - ✓ Ensure that each switch has a unique Domain ID and that it falls within the proper range (see [“Domain ID Configuration”](#) on page 201).
 - ✓ Set all switches to the appropriate timeout values (see [“Timeout Values”](#) on page 212).
 - ✓ Ensure that all Zone set and Zone names are unique and conform to ANSI T11 standards (see [“Active Zone Set Names”](#) on page 225).
 - ✓ Ensure that all zone members are specified by WWPN (see [“Zone Types”](#) on page 232).

- ✓ Ensure that all McDATA switches are configured for Open Fabric Interoperability mode (see “Operating Mode Configuration” on page 238).
- ✓ Verify that the fabrics have successfully merged (see “Successful Integration Checklist” on page 242).
- ✓ Contact IBM Technical Support to obtain the document, *IBM eServer BladeCenter Remote Boot*, if you are planning to use the boot form SAN functionality.

Supported Switches

The following IBM eServer BladeCenter switch modules have been tested in the IBM eServer BladeCenter environment and comply with the FC-SW-2 standard. They have tested interoperable with the following switches from McDATA that comply with the FC-SW-2 standard.

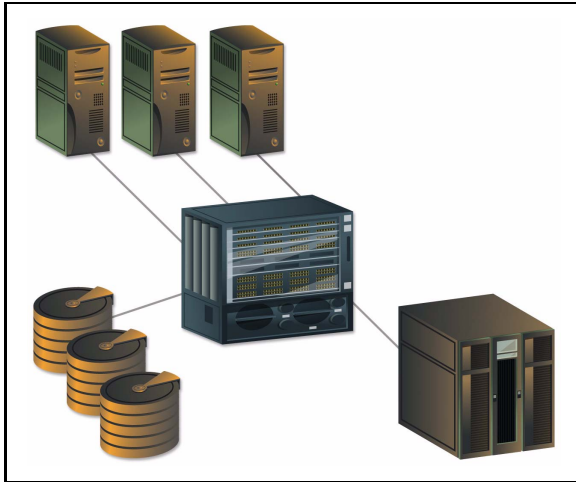
IBM eServer BladeCenter and McDATA Supported Switches

Manufacturer	Switch Model*
IBM eServer BladeCenter	IBM eServer BladeCenter 2-port Fibre Channel Switch Module QLogic 6-port Enterprise Fibre Channel Switch Module for IBM eServer BladeCenter
McDATA	ES-3016/IBM 2031-16 ES-3032/IBM 2031-32 Sphereon 3032/IBM 2031-216 Sphereon 3232/IBM 2031-232 Sphereon 4300/IBM 2034-212 Sphereon 4500/IBM 2031-224

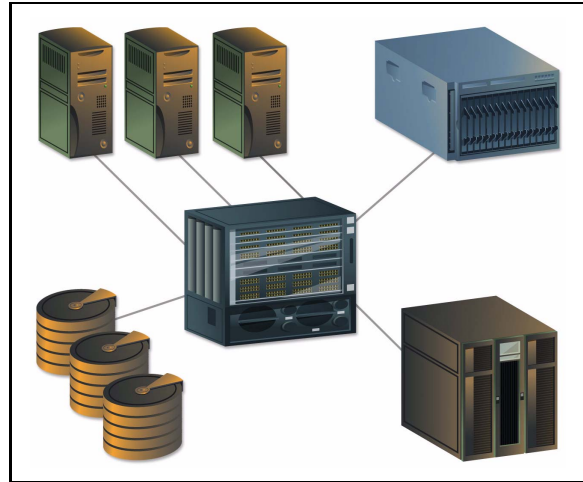
Note

*For the current firmware versions, please see the *IBM eServer BladeCenter Fibre Channel Switch Interoperability Quick Reference Guide* located at <http://www.ibm.com/support>.

The following figures illustrate a McDATA Fibre Channel fabric prior to and after merging with an IBM eServer BladeCenter.



McDATA Fibre Channel Fabric Prior to Merging with the IBM eServer BladeCenter



McDATA Fibre Channel Fabric with the IBM eServer BladeCenter

Backing Up and Restoring the Current Configuration Settings

Back up the current McDATA switch configuration data prior to following the steps to merge McDATA and IBM eServer BladeCenter fabrics so that the configuration can be restored if something goes wrong.

NOTE: For additional information, refer to the documentation provided with the switch.

Note the following:

- Only a single copy of the configuration is kept on the McDATA server hard disk drive.
- The location and file name of the saved configuration cannot be modified.
- The configuration can only be restored to a switch with the same IP address.

Backup Procedure

To backup the current McDATA configuration settings, do the following:

1. Start McDATA Sphereon Web Management. The **Main Switch View** dialog box displays.
2. On the navigation panel, select **Operations**. The **Operations** dialog box displays. Select the **Maintenance** tab. The **Maintenance** dialog box displays.
3. From the **Maintenance** dialog box, select **Backup and Restore Configuration**. The **Backup and Restore Configuration** dialog box displays. Click **Backup**.
4. When the backup of the configuration completes, a message displays. Click **OK**.

NOTE: If the backup fails, a message informs you that the backup to the server failed.

Restore Procedure

If you need to restore the McDATA configuration settings that you backed up, do the following.

NOTE: The backed up configuration is restored to the nonvolatile random access memory (NVRAM) on the switch. The restore operation initiates an initial product load (IPL).

1. Start McDATA Sphereon Web Management. The **Main Switch View** dialog box displays.
2. On the navigation panel, select **Operations**. The **Operations** dialog box displays. Select the **Switch** tab, select the **Online State** tab, then click the **Set Offline** button.
3. Select the **Maintenance** tab. The **Maintenance** dialog box displays.
4. From the **Maintenance** dialog box, select **Backup and Restore Configuration**. The **Backup and Restore Configuration** dialog box displays. Click **Restore**.
5. A confirmation dialog box displays, stating that the restore overwrites the existing configuration on the switch and the date of the restored backup. Click **OK**.
6. When the restore completes, select the **Switch** tab, select the **Online State** tab, then click the **Set Online** button.

Domain ID Configuration

To ensure that there are no conflicts between switches, we recommend that each switch have an assigned Domain ID. The following steps show how to set the Domain ID on both the McDATA switch and IBM eServer BladeCenter switch module.

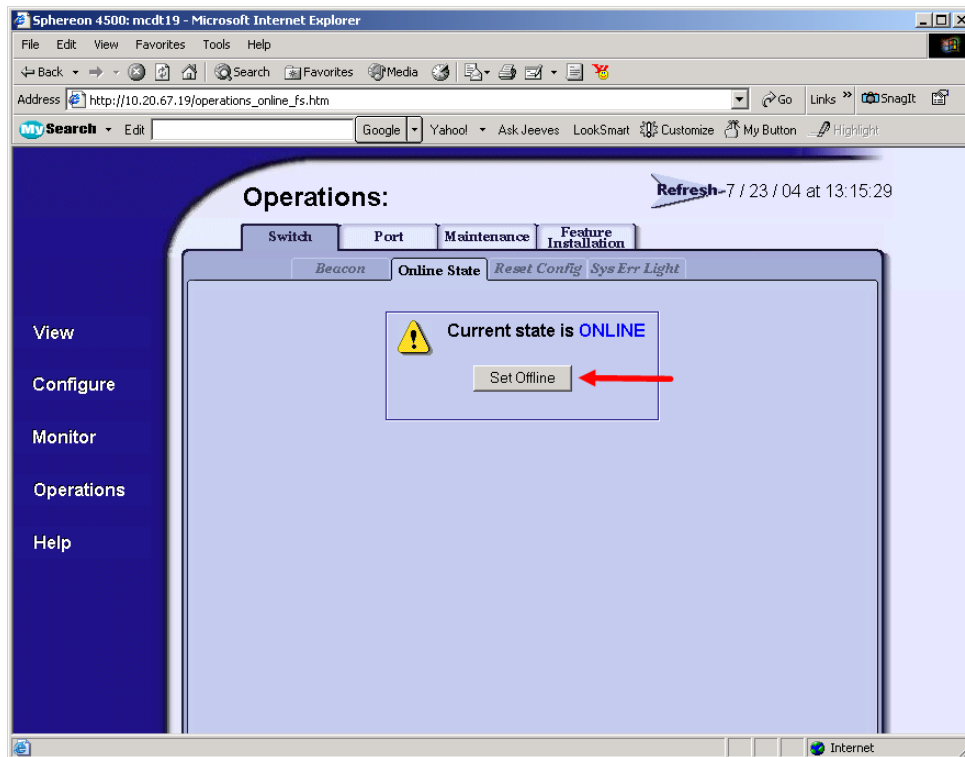
The Domain ID should be locked and unique within the 97–127 (0x61–0x7f) range. This is equivalent to 1–31 on the McDATA switch. The following chart lists the McDATA Domain ID and the corresponding IBM eServer BladeCenter Domain ID.

McDATA Versus IBM eServer BladeCenter Domain IDs

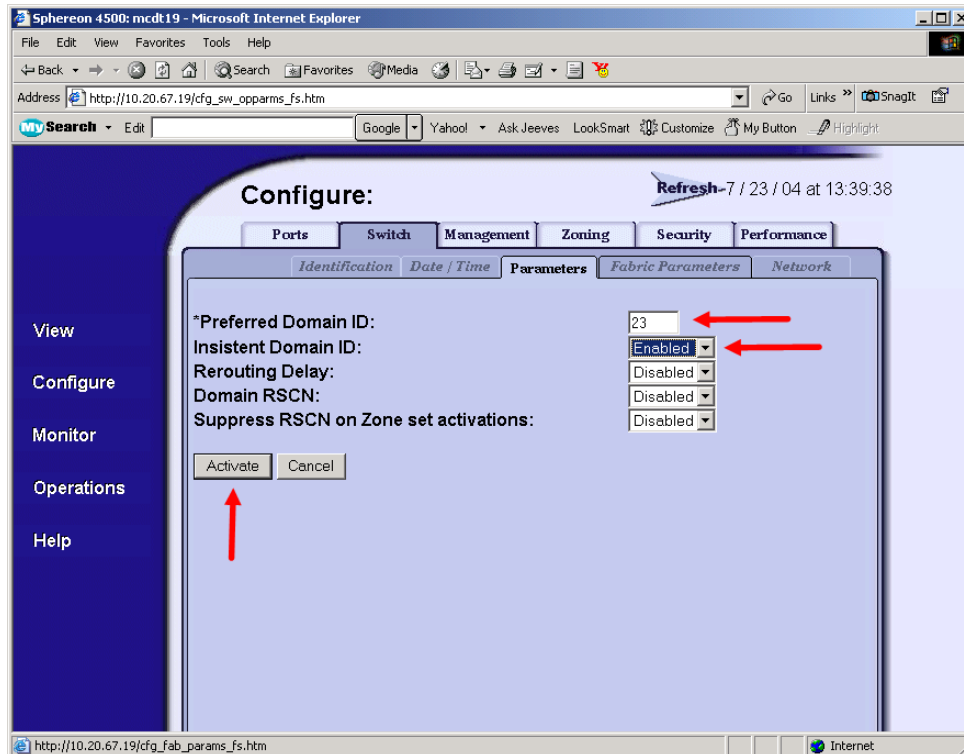
McDATA Domain ID	IBM eServer BladeCenter Domain ID	McDATA Domain ID	IBM eServer BladeCenter Domain ID	McDATA Domain ID	IBM eServer BladeCenter Domain ID
1	97	11	107	21	117
2	98	12	108	22	118
3	99	13	109	23	119
4	100	14	110	24	120
5	101	15	111	25	121
6	102	16	112	26	122
7	103	17	113	27	123
8	104	18	114	28	124
9	105	19	115	29	125
10	106	20	116	30	126
—	—	—	—	31	127

McDATA Sphereon Web Management

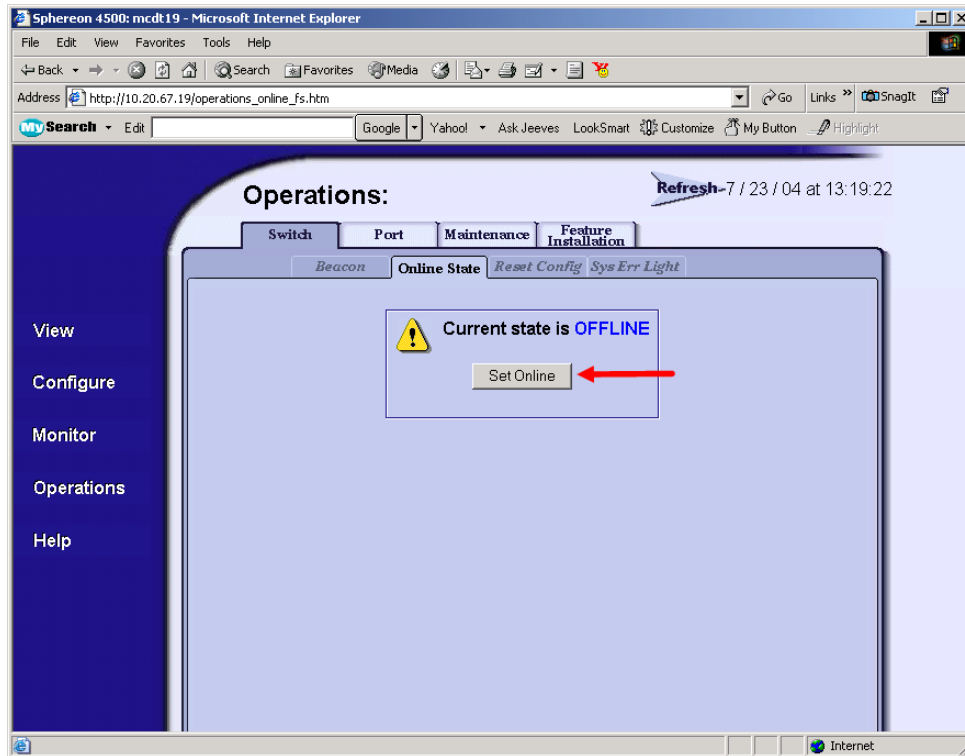
1. Start McDATA Sphereon Web Management. The **Main Switch View** dialog box displays.
2. On the navigation panel, select **Operations**. The **Operations** dialog box displays. Select the **Switch** tab, select the **Online State** tab, then click the **Set Offline** button.



3. On the navigation panel, select **Configure**. The **Configure** dialog box displays. Select the **Switch** tab, select the **Parameters** tab, and do the following:
 - a. In the **Preferred Domain ID** box, type a unique Domain ID in the 1–31 range for the switch (see table "McDATA Versus IBM eServer BladeCenter Domain IDs" on page 201).
 - b. From the **Insistent Domain ID** list, select **Enabled**.
 - c. Click **Activate**.



4. On the navigation panel, select **Operations**. The **Operations** dialog box displays. Select the **Switch** tab, select the **Online State** tab, then click the **Set Online** button.



McDATA Telnet CLI

NOTE: Use the following CLI commands when McDATA Sphereon Web Management is not available.

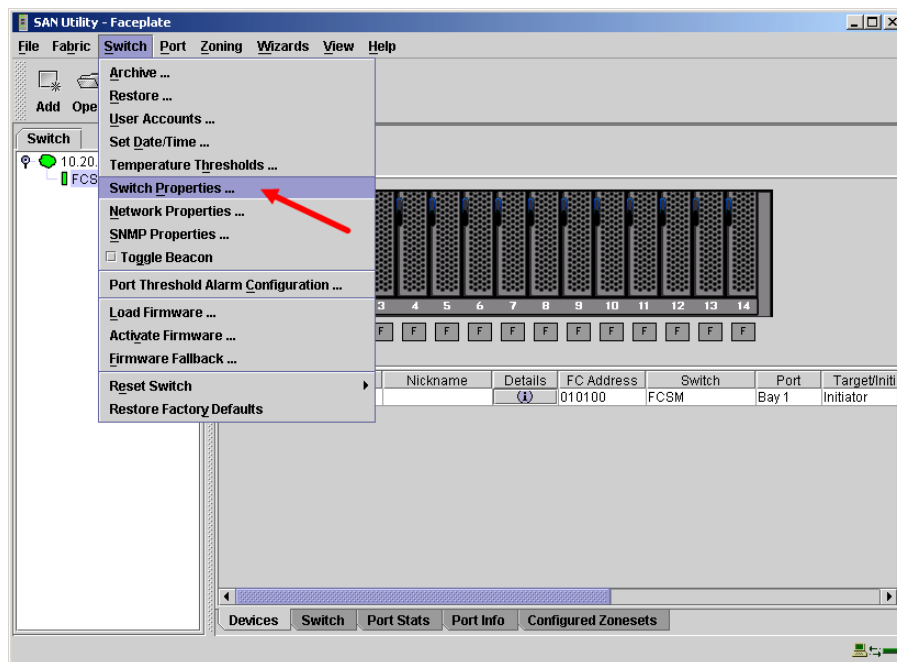
```
Username: Administrator
Password: xxxxxxxx
Root> maint system
Maint.System> setOnlineState false
Maint.System> root
Root> config switch
Config.Switch> prefDomainId xx (xx=unique Domain ID in the range 1-31)
Config.Switch> insistDomainId enable
Config.Switch> root
Root> maint system
Maint.System> setOnlineState true
```

IBM eServer BladeCenter GUI

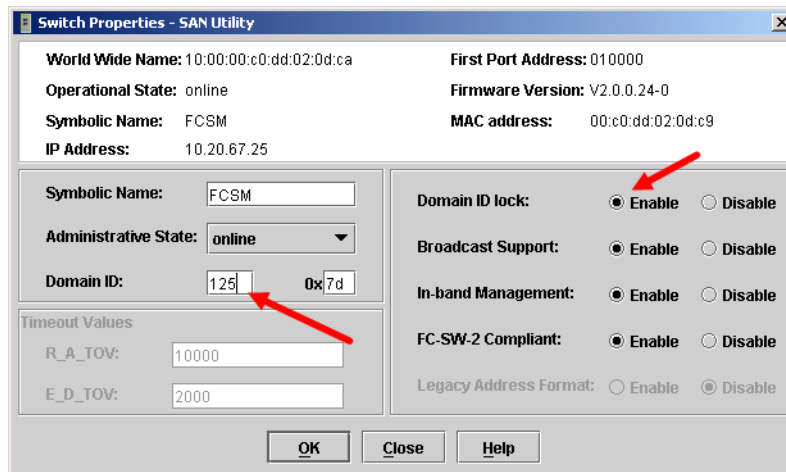
NOTE: You can use the SAN Utility to modify all IBM eServer BladeCenter switch modules. You can use the SAN Browser to modify only the QLogic 6-port Enterprise Fibre Channel Switch Module for IBM eServer BladeCenter. The screen images differ, but the procedures for the SAN Utility and SAN Browser are the same.

Do the following to modify IBM eServer BladeCenter switch modules using the SAN Utility:

1. Start the SAN Utility. The **SAN Utility—Faceplate** dialog box displays.
2. From the **SAN Utility—Faceplate** dialog box **Switch** menu, select **Switch Properties**.

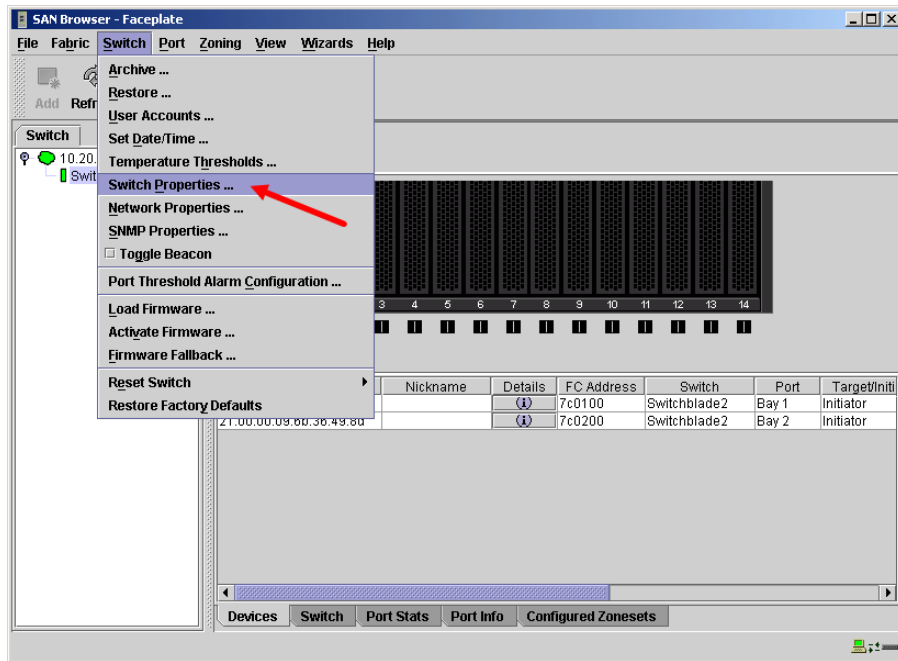


3. From the **Switch Properties—SAN Utility** dialog box, do the following:
 - a. In the **Domain ID** box, type a unique Domain ID in the 97–127 range for the switch.
 - b. Select the **Domain ID Lock Enable** radio button to ensure that the switch always has that Domain ID.
 - c. Click **OK**.

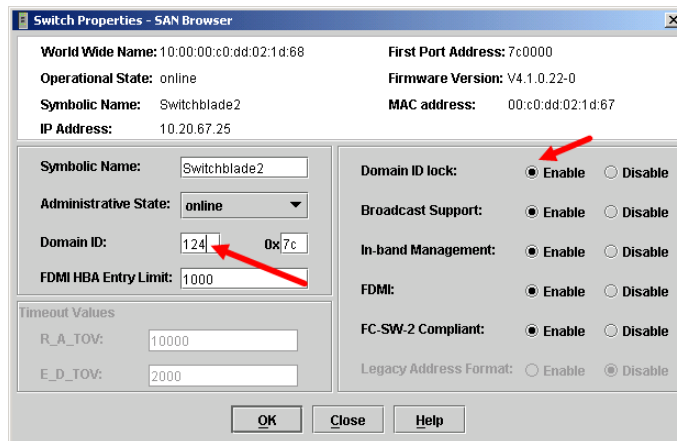


Do the following to modify the QLogic 6-port Enterprise Fibre Channel Switch Module for IBM eServer BladeCenter using the SAN Browser:

1. Start the SAN Browser. The **SAN Browser—Faceplate** dialog box displays.
2. From the **SAN Browser—Faceplate** dialog box **Switch** menu, select **Switch Properties**.



3. From the **Switch Properties—SAN Browser** dialog box, do the following:
 - a. In the **Domain ID** box, type a unique Domain ID in the 97–127 range for the switch.
 - b. Select the **Domain ID Lock Enable** radio button to ensure that the switch always has that Domain ID.
 - c. Click **OK**.



IBM eServer BladeCenter CLI

NOTE: The procedures differ based on the IBM eServer BladeCenter switch module.

Use the following CLI commands to modify the IBM eServer BladeCenter 2-port Fibre Channel Switch Module when the SAN Utility is not available:

```
Login: USERID
Password: xxxxxxxx
IBM eServer BladeCenter #> admin start
IBM eServer BladeCenter (admin) #> config edit
IBM eServer BladeCenter (admin-config) #> set config switch

  The following options display:
  AdminState (1=Online, 2=Offline, 3=Diagnostics) [Online]
  BroadcastEnabled (True / False) [True]
  InbandEnabled (True / False) [True]
  DefaultDomainID (decimal value, 1-239) [1] <97-127>
  DomainIDLock (True / False) [False] True
  SymbolicName (string, max=32 chars) [Fibre Channel Switch Module]
  R_T_TOV (decimal value, 1-1000 msec) [100]
  R_A_TOV (decimal value, 100-100000 msec) [10000]
  E_D_TOV (decimal value, 10-20000 msec) [2000]
  FS_TOV (decimal value, 100-100000 msec) [5000]
  DS_TOV (decimal value, 100-100000 msec) [5000]
  PrincipalPriority (decimal value, 1-255) [254]
  ConfigDescription (string, max=64 chars) [Default Config]
IBM eServer BladeCenter (admin-config) #> config save
IBM eServer BladeCenter (admin) #> config activate
The configuration will be activated. Please confirm (y/n): [n] y
```

Use the following CLI commands to modify the QLogic 6-port Enterprise Fibre Channel Switch Module for IBM eServer BladeCenter when the SAN Utility and SAN Browser are not available:

```

Login: USERID
Password: xxxxxxxx
Switchblade2: admin> admin start
Switchblade2 (admin): admin> config edit
    The config named default is being edited.
Switchblade2 (admin-config): admin> set config switch
    A list of attributes with formatting and current values will follow.
    Enter a new value or simply press the ENTER key to accept the current
    value. If you wish to terminate this process before reaching the end of
    the list press 'q' or 'Q' and the ENTER key to do so.
    AdminState (1=Online, 2=Offline, 3=Diagnostics) [Online]
    BroadcastEnabled (True / False) [True]
    InbandEnabled (True / False) [True]
    FdmiEnabled (True / False) [True]
    FdmiEntries (decimal value, 0-1000) [1000]
    DefaultDomainID (decimal value, 1-239) [1] 124
    DomainIDLock (True / False) [False] true
    SymbolicName (string, max=32 chars) [Switchblade2]
    R_A_TOV (decimal value, 100-100000 msec) [10000]
    E_D_TOV (decimal value, 10-20000 msec) [2000]
    PrincipalPriority (decimal value, 1-255) [254]
    ConfigDescription (string, max=64 chars) [Qlogic 6-port Enterprise
    Switch Module for IBM eServer BladeCenter]
    FC-SW-2 Compliant (True / False) [True]
    Finished configuring attributes.
    This configuration must be saved (see config save command) and activated
    (see config activate command) before it can take effect.
    To discard this configuration use the config cancel command.
Switchblade2 (admin-config): admin> config save
    The config named default has been saved.
Switchblade2 (admin): admin> config activate
    The currently active configuration will be activated.
    Please confirm (y/n): [n] y
Switchblade2 (admin): admin> admin end

```

Timeout Values

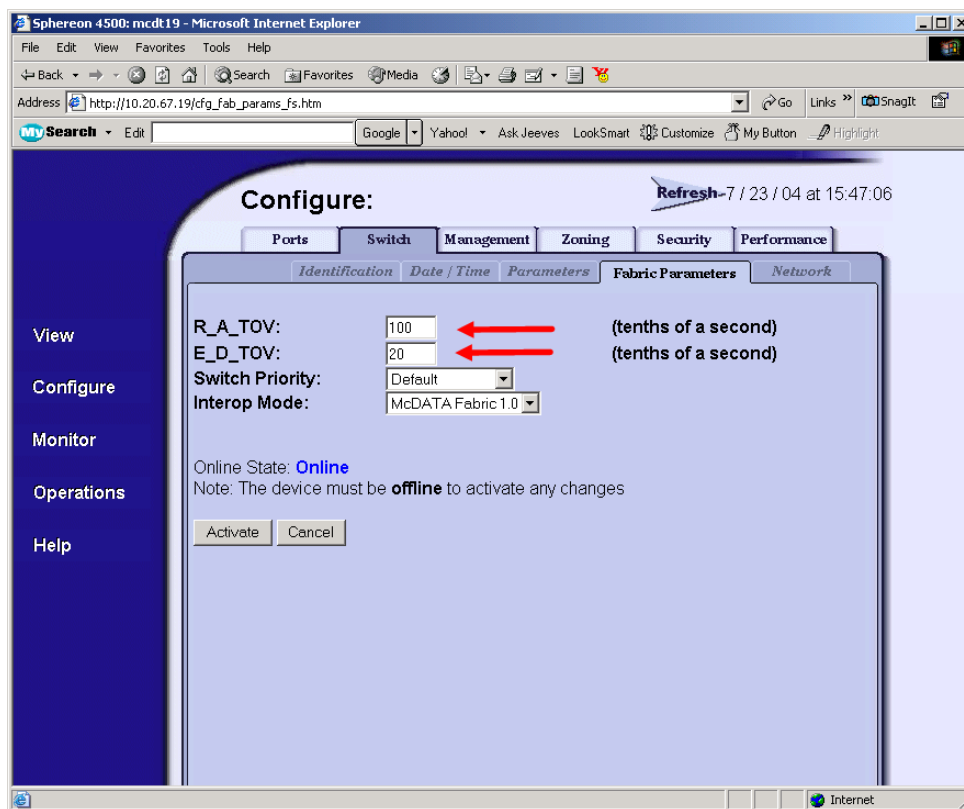
As per FC-SW-2 Fibre Channel standards, set all switches to the following timeout values (TOV) in order to successfully establish an E_port connection:

R_A_TOV = 10 seconds (The setting is **100**.)
E_D_TOV = 2 seconds (The setting is **20**.)

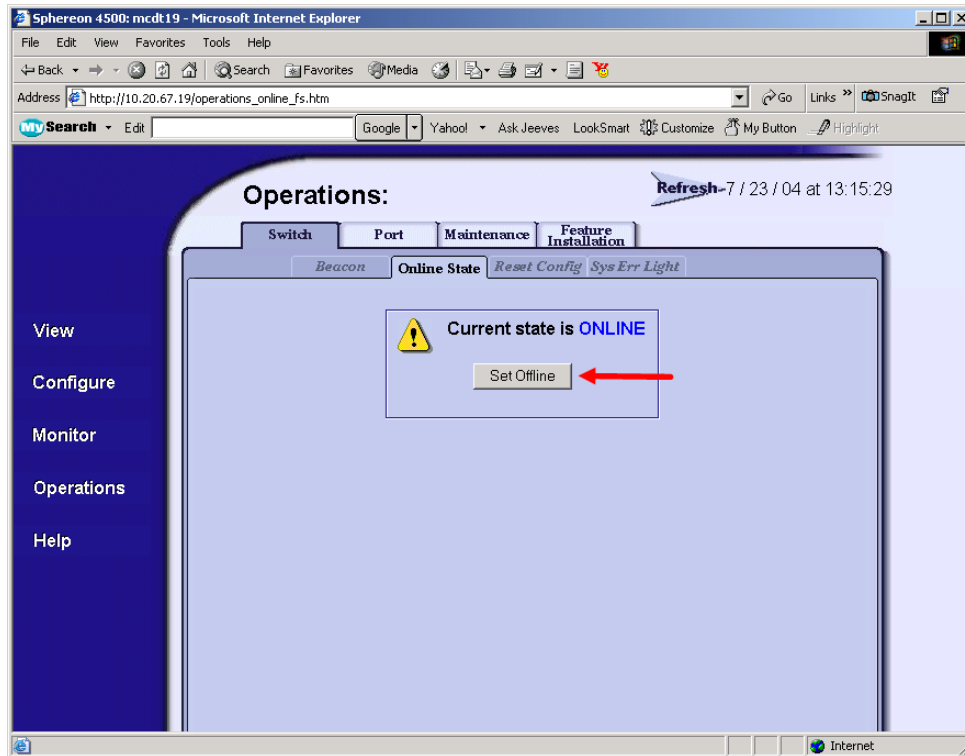
This section provides the steps to change these values.

McDATA Spheron Web Management

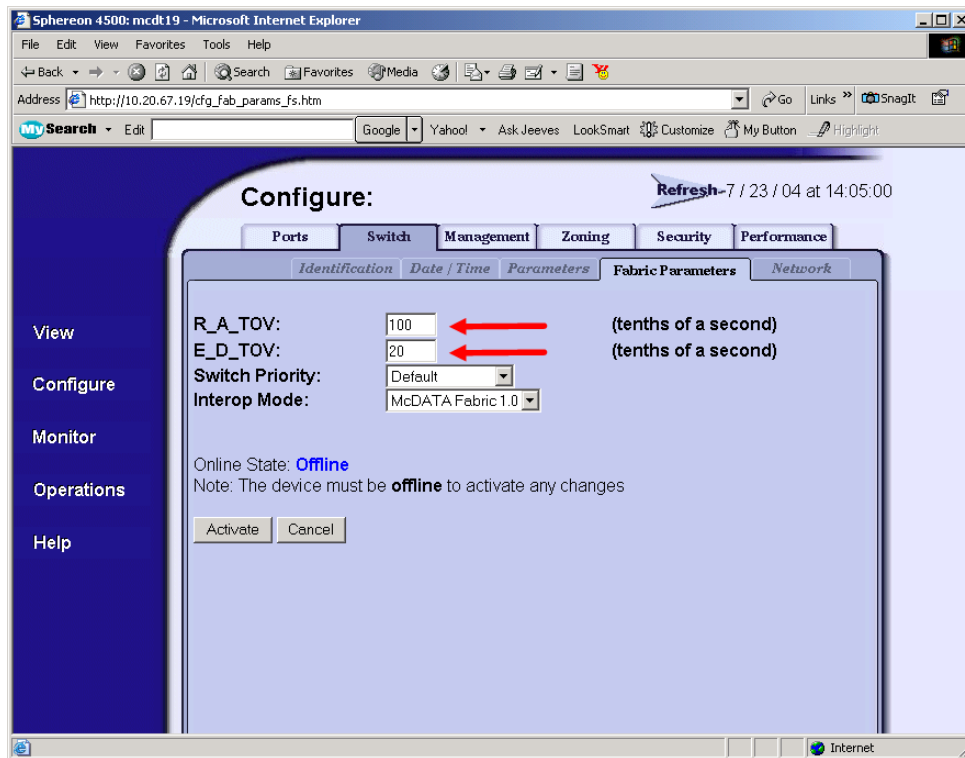
1. Start McDATA Spheron Web Management. The **Main Switch View** dialog box displays.
2. On the navigation panel, select **Configure**. The **Configure** dialog box displays. Select the **Switch** tab, then select the **Fabric Parameters** tab. Verify that **R_A_TOV** is set to **100** and **E_D_TOV** is set to **20**. If the settings are *not* correct, proceed to [step 3](#). If the settings are correct, no changes need to be made; proceed to the next appropriate section.



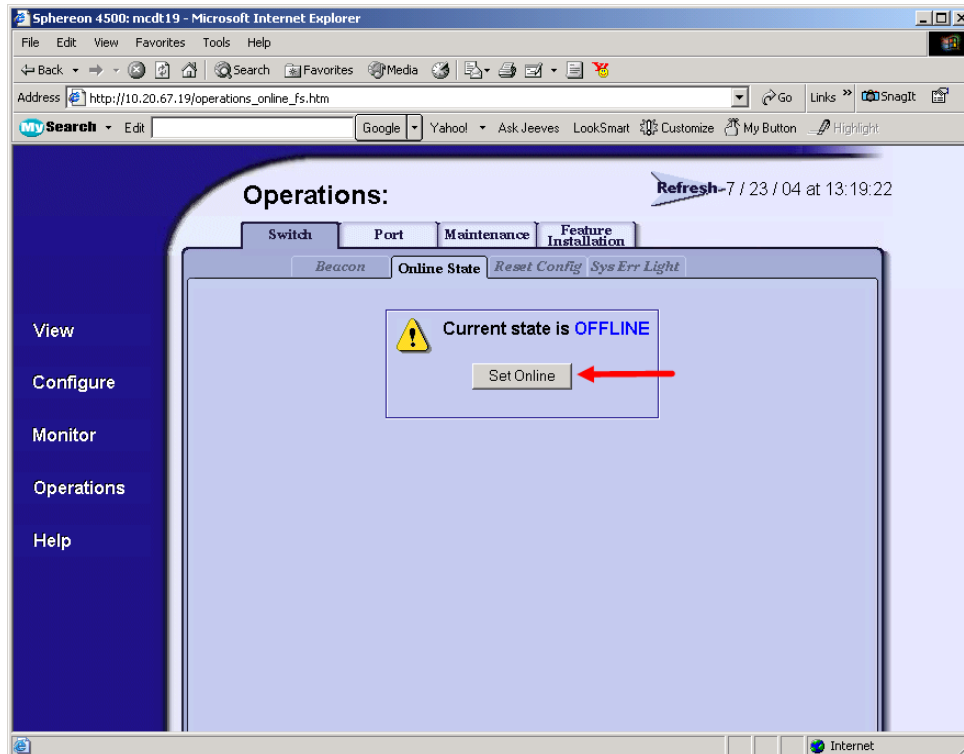
3. On the navigation panel, select **Operations**. The **Operations** dialog box displays. Select the **Switch** tab, select **Online State** tab, then click the **Set Offline** button.



4. On the navigation panel, select **Configure**. The **Configure** dialog box displays. Select the **Switch** tab, select the **Fabric Parameters** tab, then do the following:
 - a. In the **R_A_TOV** box, change the setting to **100**.
 - b. In the **E_D_TOV** box, change the setting to **20**.
 - c. Click **Activate**.



5. On the navigation panel, select **Operations**. The **Operations** dialog box displays. Select the **Switch** tab, select the **Online State** tab, then click the **Set Online** button.



McDATA Telnet CLI

NOTE: Use the following CLI commands when McDATA Sphereon Web Management is not available.

Username: **Administrator**

Password: **xxxxxxxx**

Use the following command to verify that R_A_TOV is set to 100 and E_D_TOV is set to 20.

```
Root> show
```

```
Show> switch
```

If these timeout values are not correct, continue with this section. If the settings are correct, no changes need to be made; proceed with the next appropriate section.

```
Show> root
```

```
Root> maint system
```

```
Maint.System> setOnlineState false
```

```
Maint.System> root
```

```
Root> config switch
```

```
Config.Switch> raTOV 100
```

```
Config.Switch> edTOV 20
```

```
Config.Switch> root
```

```
Root> maint system
```

```
Maint.System> setOnlineState true
```

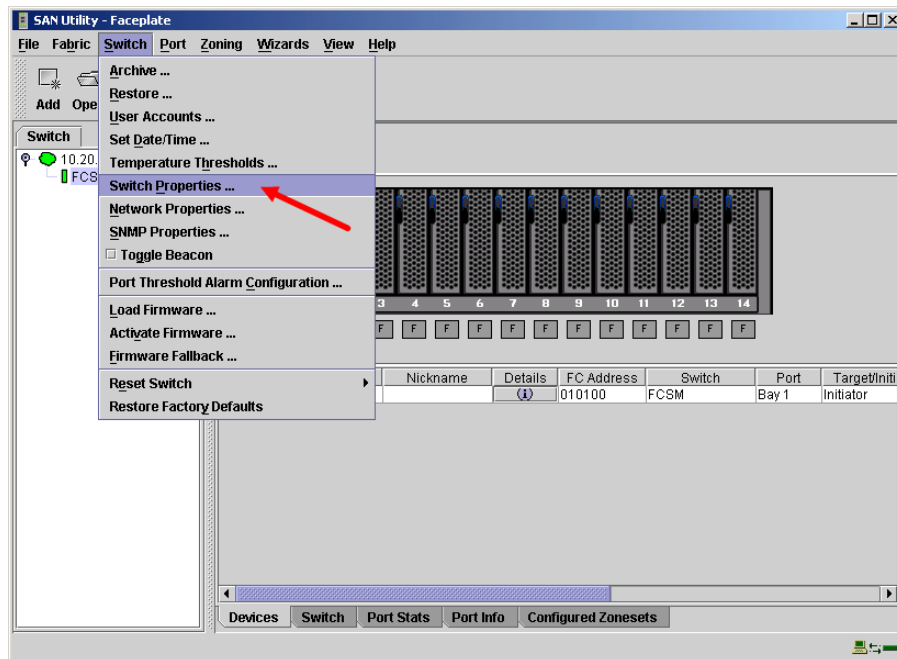
IBM eServer BladeCenter GUI

ATTENTION!! The following steps take the switch offline; therefore, do not perform them on a switch being managed in-band.

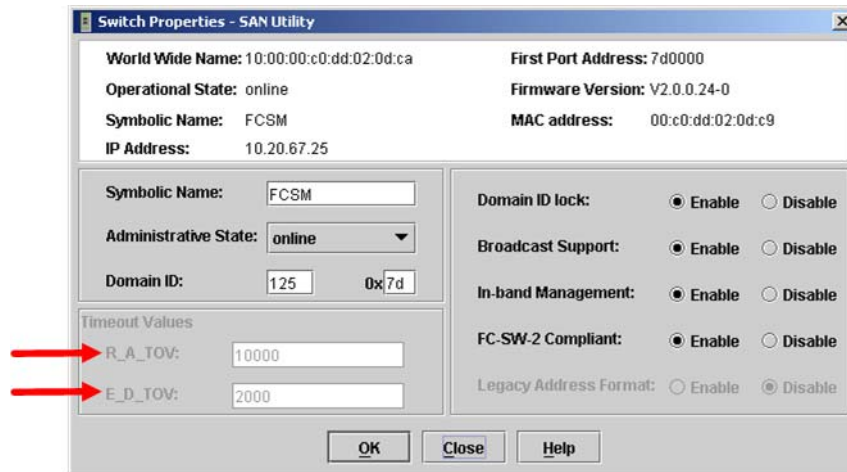
NOTE: You can use the SAN Utility to modify all IBM eServer BladeCenter switch modules. You can use the SAN Browser to modify only the QLogic 6-port Enterprise Fibre Channel Switch Module for IBM eServer BladeCenter. The screen images differ, but the procedures for the SAN Utility and SAN Browser are the same.

Do the following to modify IBM eServer BladeCenter switch modules using the SAN Utility:

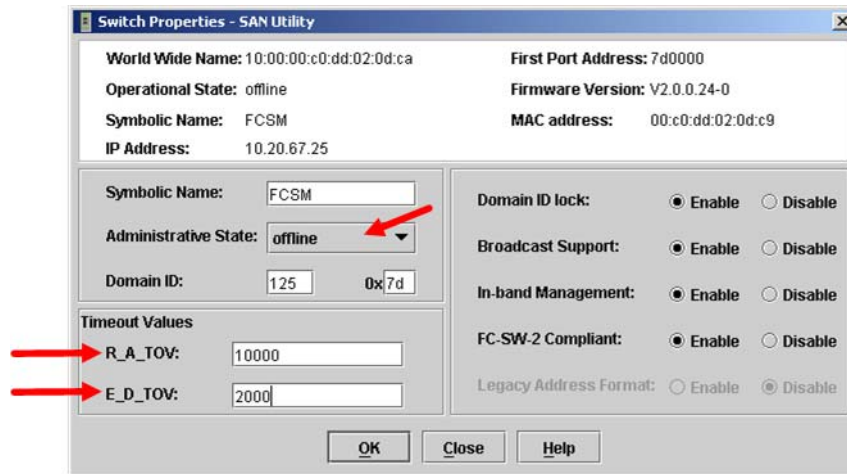
1. Start the SAN Utility. The **SAN Utility—Faceplate** dialog box displays.
2. From the **SAN Utility—Faceplate** dialog box **Switch** menu, select **Switch Properties**.



- From the **Switch Properties—SAN Utility** dialog box, verify that **R_A_TOV** is set to **10000** and **E_D_TOV** is set to **2000**. If the settings are *not* correct, proceed to [step 4](#). If the settings are correct, no changes need to be made; proceed to the next appropriate section.



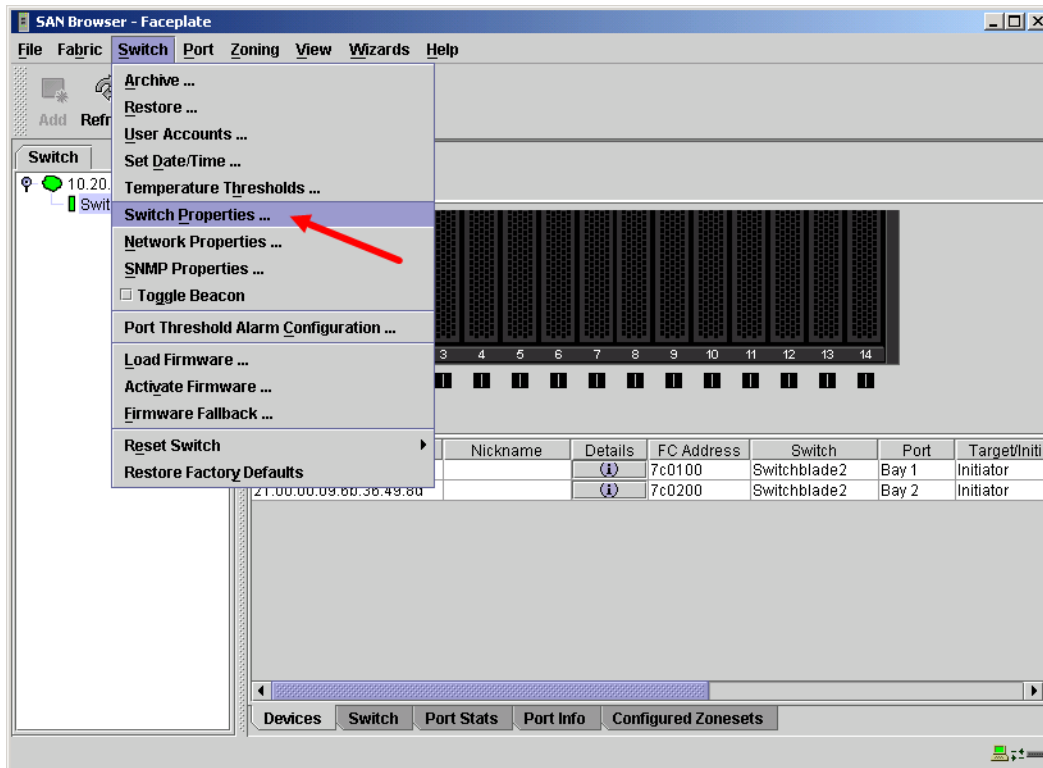
4. To modify the timeout value settings, do the following:
 - a. In the **Administrative State** drop-down box, select **offline**. Click **OK**.
 - b. The **SAN Utility—Faceplate** dialog box redisplay. Repeat [step 2](#) to redisplay the **Switch Properties—SAN Utility** dialog box.
 - c. In the Timeout Values section **R_A_TOV** box, enter **10000**.
 - d. In the Timeout Values section **E_D_TOV** box, enter **2000**.
 - e. In the **Administrative State** drop-down box, select **online**. Click **OK**.



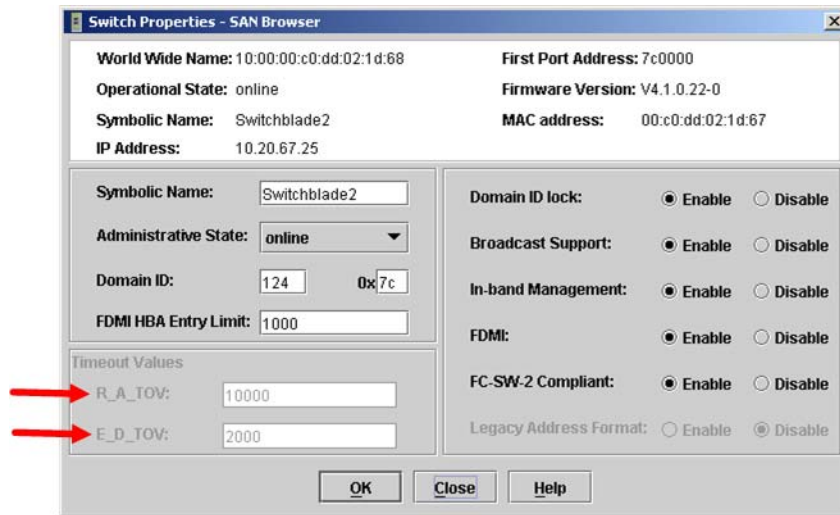
5. The **SAN Utility—Faceplate** dialog box redisplay. Repeat [step 2](#) to redisplay the **Switch Properties—SAN Utility** dialog box. Verify your changes ([see step 3](#)).

Do the following to modify the QLogic 6-port Enterprise Fibre Channel Switch Module for IBM eServer BladeCenter using the SAN Browser:

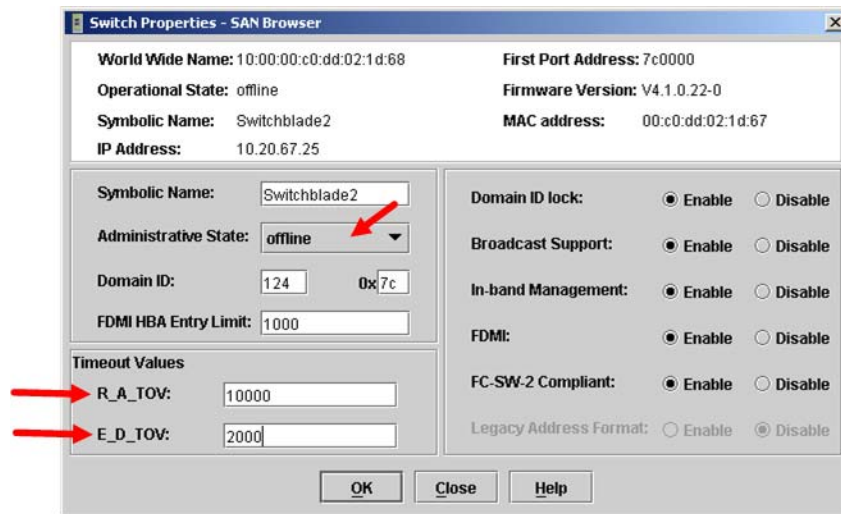
1. Start the SAN Browser. The **SAN Browser—Faceplate** dialog box displays.
2. From the **SAN Browser—Faceplate** dialog box **Switch** menu, select **Switch Properties**.



3. From the **Switch Properties—SAN Browser** dialog box, verify that **R_A_TOV** is set to **10000** and **E_D_TOV** is set to **2000**. If the settings are *not* correct, proceed to [step 4](#). If the settings are correct, no changes need to be made; proceed to the next appropriate section.



4. To modify the timeout value settings, do the following:
 - a. In the **Administrative State** drop-down box, select **offline**. Click **OK**.
 - b. The **SAN Browser—Faceplate** dialog box redisplay. Repeat [step 2](#) to redisplay the **Switch Properties—SAN Browser**.
 - c. In the Timeout Values section **R_A_TOV** box, enter **10000**.
 - d. In the Timeout Values section **E_D_TOV** box, enter **2000**.
 - e. In the **Administrative State** drop-down box, select **online**. Click **OK**.



5. The **SAN Browser—Faceplate** dialog box redisplay. Repeat [step 2](#) to redisplay the **Switch Properties—SAN Browser** dialog box. Verify your changes ([see step 3](#)).

IBM eServer BladeCenter CLI

ATTENTION!! The following steps take the switch offline; therefore, do not perform them on a switch being managed in-band.

NOTE: The procedures differ based on the IBM eServer BladeCenter switch module.

Use the following CLI commands to modify the IBM eServer BladeCenter 2-port Fibre Channel Switch Module when the SAN Utility is not available:

Login: **USERID**

Password: **xxxxxxxx**

Use the following command to verify that R_A_TOV is set to 10000 and E_D_TOV is set to 2000.

```
IBM eServer BladeCenter #> show config switch
```

If these timeout values are *not* correct, continue with this section. If the settings are correct, no changes need to be made; proceed with the next appropriate section.

```
IBM eServer BladeCenter #> admin start
```

```
IBM eServer BladeCenter (admin) #> config edit
```

```
IBM eServer BladeCenter (admin-config) #> set config switch
```

The following options display:

```
AdminState (1=Online, 2=Offline, 3=Diagnostics) [Online]
BroadcastEnabled (True / False) [True]
InbandEnabled (True / False) [True]
DefaultDomainID (decimal value, 1-239) [1]
DomainIDLock (True / False) [True]
SymbolicName (string, max=32 chars) [Fibre Channel Switch Module]
R_T_TOV (decimal value, 1-1000 msec) [100]
R_A_TOV (decimal value, 100-100000 msec) [9000]    10000
E_D_TOV (decimal value, 10-20000 msec) [1000]    2000
FS_TOV (decimal value, 100-100000 msec) [5000]
DS_TOV (decimal value, 100-100000 msec) [5000]
PrincipalPriority (decimal value, 1-255) [254]
ConfigDescription (string, max=64 chars) [Default Config]
```

```
IBM eServer BladeCenter (admin-config) #> config save
```

```
IBM eServer BladeCenter (admin) #> config activate
```

```
The configuration will be activated. Please confirm (y/n): [n] y
```

Use the following CLI commands to modify the QLogic 6-port Enterprise Fibre Channel Switch Module for IBM eServer BladeCenter when the SAN Utility and SAN Browser are not available:

```
Login: USERID  
Password: xxxxxxxx
```

Use the following command to verify that R_A_TOV is set to 10000 and E_D_TOV is set to 2000.

```
Switchblade2: admin> show config switch
```

If these timeout values are *not* correct, continue with this section. If the settings are correct, no changes need to be made; proceed with the next appropriate section.

```
Switchblade2: admin>  
Switchblade2: admin> admin start  
Switchblade2 (admin): admin> config edit  
The config named default is being edited.  
Switchblade2 (admin-config): admin> set config switch  
A list of attributes with formatting and current values will follow.  
Enter a new value or simply press the ENTER key to accept the current  
value. If you wish to terminate this process before reaching the end of  
the list press 'q' or 'Q' and the ENTER key to do so.  
AdminState (1=Online, 2=Offline, 3=Diagnostics) [Online]  
BroadcastEnabled (True / False) [True]  
InbandEnabled (True / False) [True]  
FDMIEnabled (True / False) [True]  
FDMIEntries (decimal value, 0-1000) [1000]  
DefaultDomainID (decimal value, 1-239) [124]  
DomainIDLock (True / False) [True]  
SymbolicName (string, max=32 chars) [Switchblade2]  
R_A_TOV (decimal value, 100-100000 msec) [9000] 10000  
E_D_TOV (decimal value, 10-20000 msec) [1000] 2000  
PrincipalPriority (decimal value, 1-255) [254]  
ConfigDescription (string, max=64 chars) [Qlogic 6-port Enterprise  
Switch Module for IBM eServer BladeCenter]  
FC-SW-2 Compliant (True / False) [True]
```

Finished configuring attributes.
This configuration must be saved (see config save command) and activated (see config activate command) before it can take effect.
To discard this configuration use the config cancel command.

```
Switchblade2 (admin-config): admin> config save
```

The config named default has been saved.

```
Switchblade2 (admin): admin> config activate
```

The currently active configuration will be activated.

Please confirm (y/n): [n] **y**

```
Switchblade2 (admin): admin> admin end
```

Principal Switch Configuration

McDATA switches and IBM eServer BladeCenter switch modules negotiate for principal switch automatically. Therefore, there are no steps to take.

Zone Configuration

This section discusses configuring active Zone Set names and Zone types.

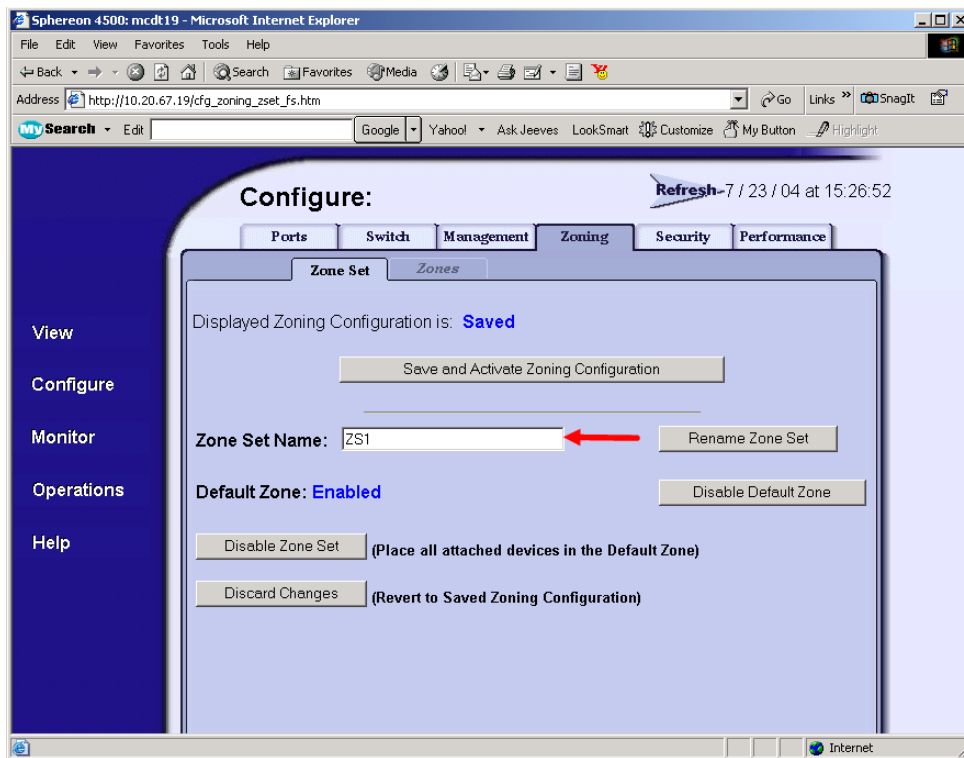
Active Zone Set Names

The Zone and Zone Set names on each switch must be unique. If not, change one of the duplicate names. All Zone Set and Zone names must conform to the Fibre Channel (FC) Standards for Zone Naming (ANSI T11/00-427v3):

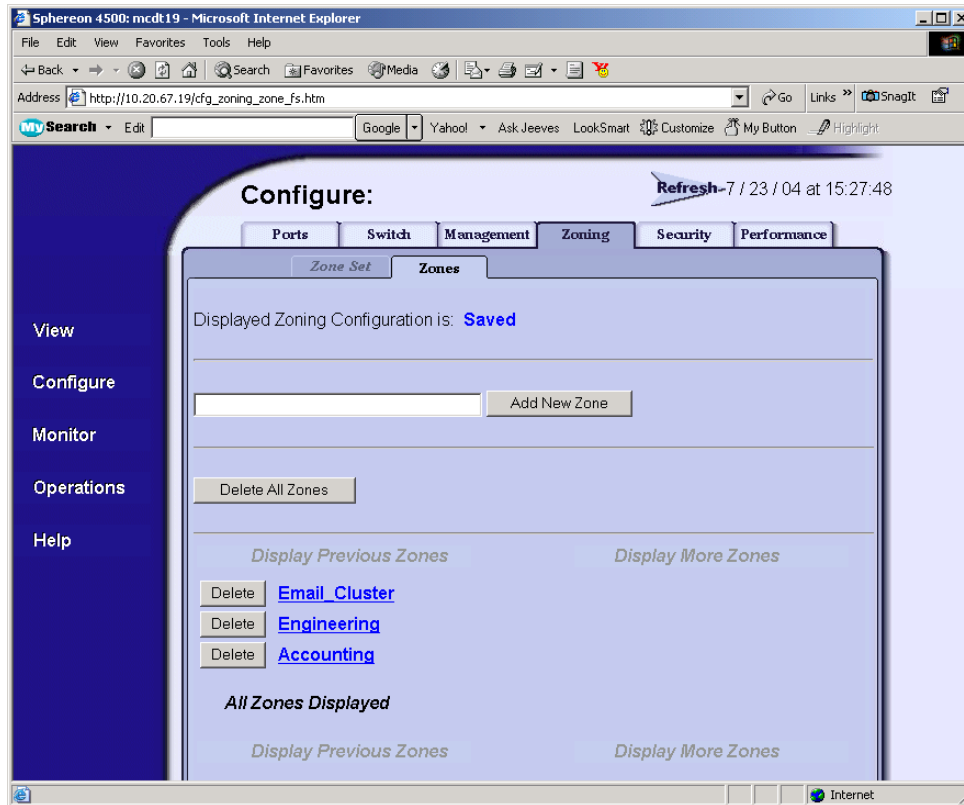
1. Must be 1–64 characters in length.
2. All characters are ASCII.
3. First character is [a–z] or [A–Z].
4. All other characters must be [a–z], [A–Z], [0–9], or the _ character. Other characters (\$-^) may not be supported by all vendors and should be avoided.

McDATA Sphereon Web Management

1. Start McDATA Sphereon Web Management. The **Main Switch View** dialog box displays.
2. On the navigation panel, select **Configure**. The **Configure** dialog box displays. Select the **Zoning** tab, then select the **ZoneSet** tab. Verify that the Zone Set name conforms to the standards for zone naming as discussed under “[Active Zone Set Names](#)” on page 225.



3. Select the **Zones** tab. Verify that the Zone names conform to the standards for zone naming as discussed under “Active Zone Set Names” on page 225.



McDATA Telnet CLI

NOTE: Use the following CLI commands when McDATA Spheron Web Management is not available.

```
Username: Administrator
Password: xxxxxxxx
Root> show
Show> zoning
```

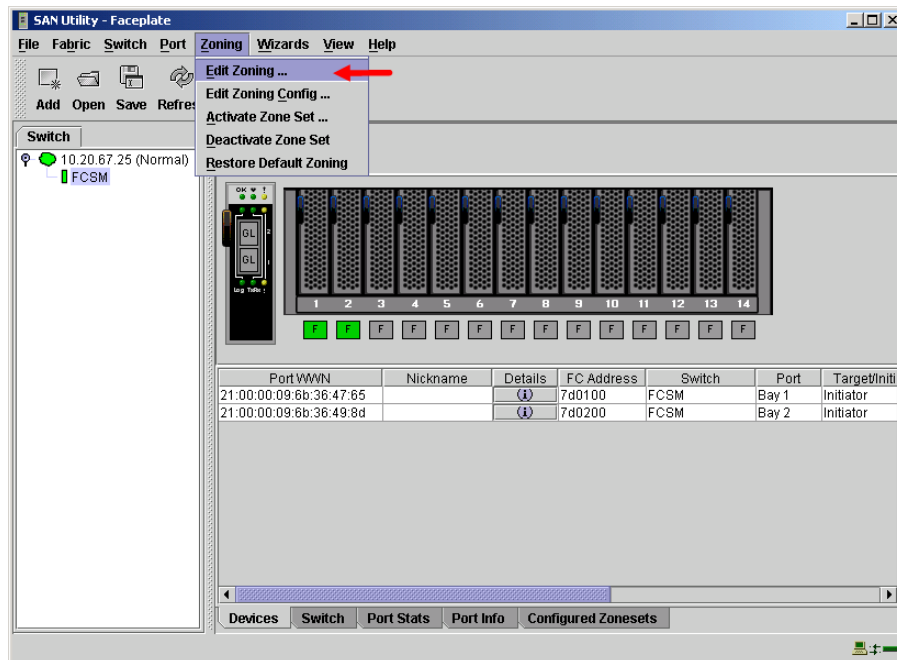
Verify that the Zone Set and Zone Names conform to the standards for zone naming as discussed under “Active Zone Set Names” on page 225.

IBM eServer BladeCenter GUI

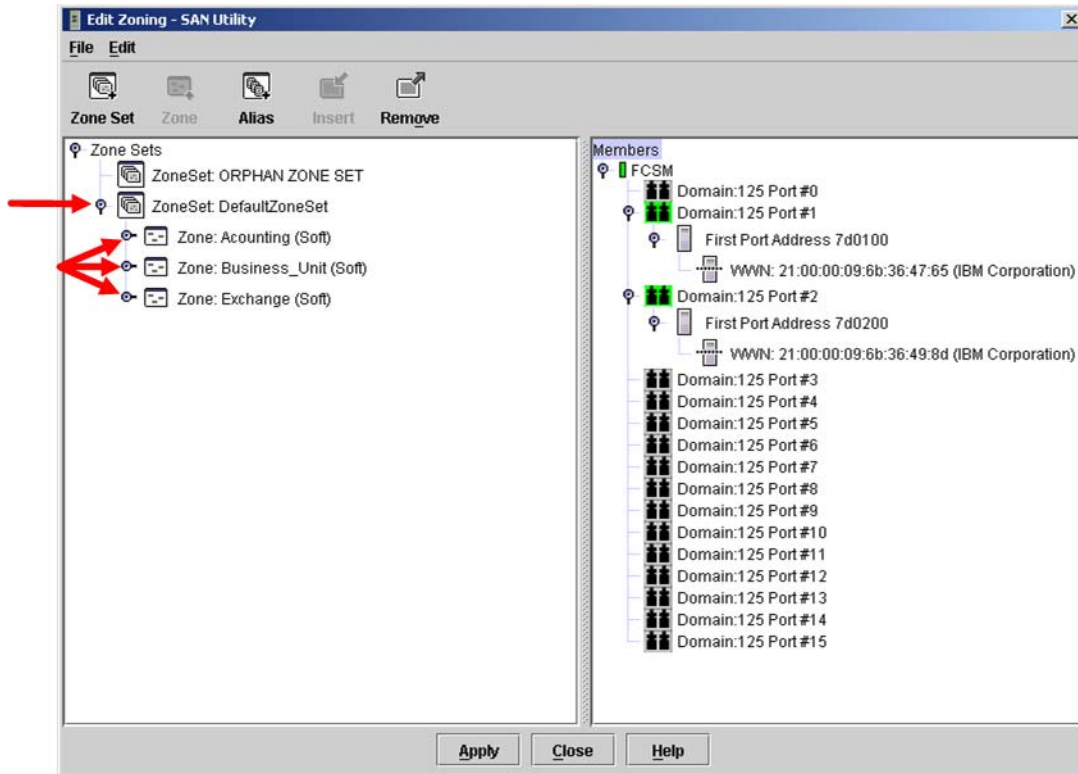
NOTE: You can use the SAN Utility to modify all IBM eServer BladeCenter switch modules. You can use the SAN Browser to modify only the QLogic 6-port Enterprise Fibre Channel Switch Module for IBM eServer BladeCenter. The screen images differ, but the procedures for the SAN Utility and SAN Browser are the same.

Do the following to modify IBM eServer BladeCenter switch modules using the SAN Utility:

1. Start the SAN Utility. The **SAN Utility—Faceplate** dialog box displays.
2. From the **SAN Utility—Faceplate** dialog box **Zoning** menu, select **Edit Zoning**.

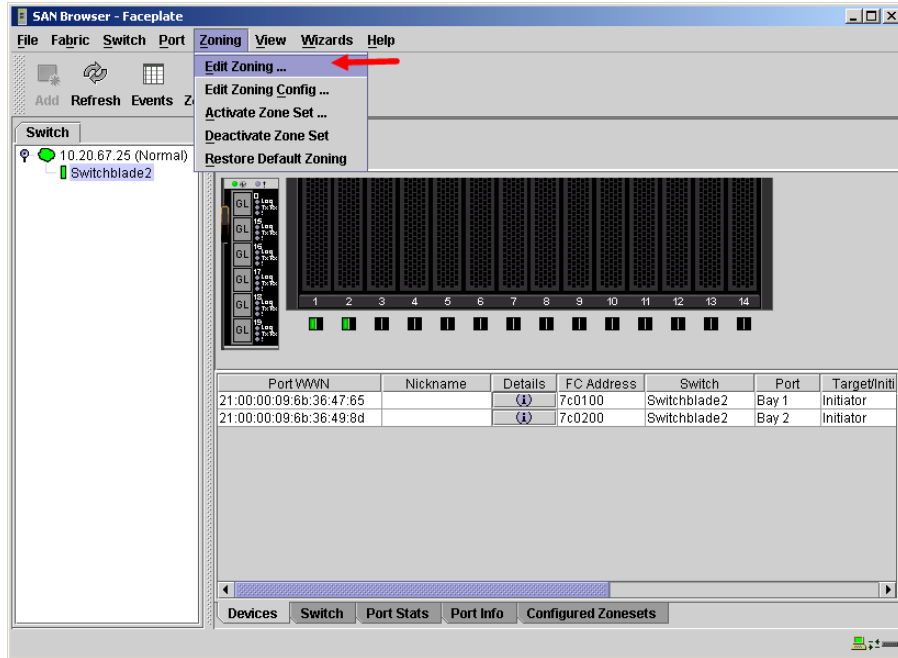


3. From the **Edit Zoning — SAN Utility** dialog box, compare the Zone Set and Zone names from each switch to ensure that none have the same name and the names conform to the standards for zone naming as discussed under [“Active Zone Set Names”](#) on page 225.

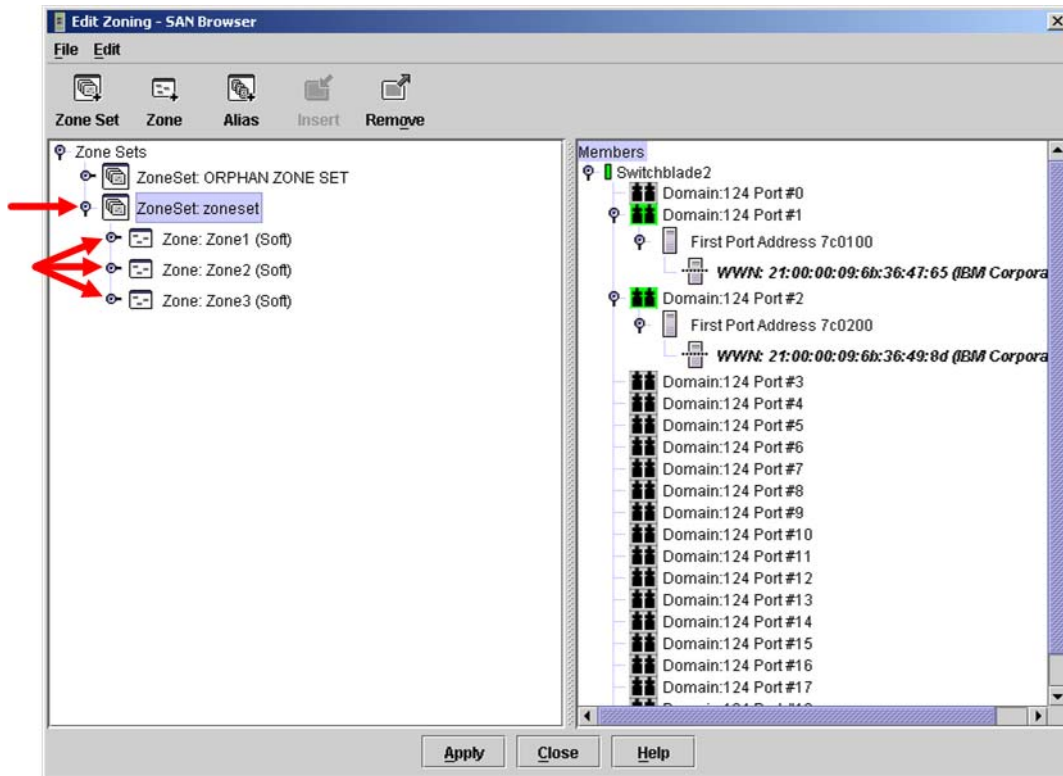


Do the following to modify the QLogic 6-port Enterprise Fibre Channel Switch Module for IBM eServer BladeCenter using the SAN Browser:

1. Start the SAN Browser. The **SAN Browser—Faceplate** dialog box displays.
2. From the **SAN Browser—Faceplate** dialog box **Zoning** menu, select **Edit Zoning**.



3. From the **Edit Zoning—SAN Browser** dialog box, compare the Zone Set and Zone names from each switch to ensure that none have the same name and the names conform to the standards for zone naming as discussed under “[Active Zone Set Names](#)” on page 225.



IBM eServer BladeCenter CLI

NOTE: Use the following CLI commands when the IBM eServer BladeCenter GUI is not available.

Login: **USERID**

Password: **xxxxxxxx**

IBM eServer BladeCenter #> **zone list**

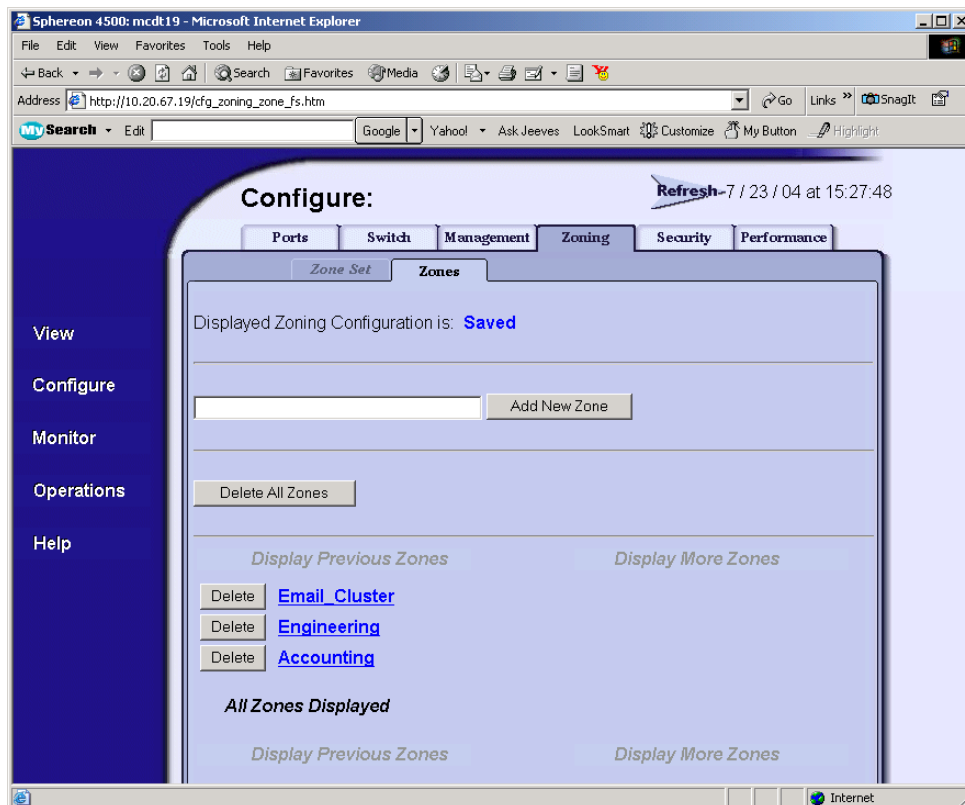
Zone Types

All zones members must be specified by a world wide port name (WWPN) in order to comply with Fibre Channel standards. Any zone member not specified by WWPN cannot participate in the fabric. Below are steps to confirm the zone types.

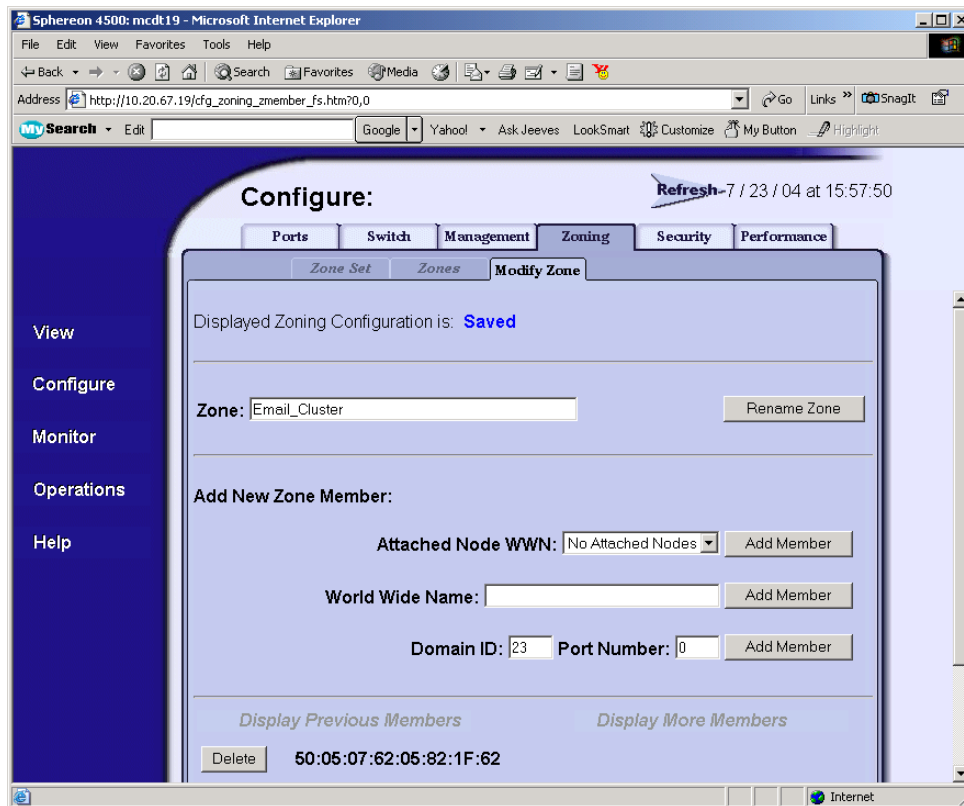
NOTE: A world wide name (WWN) consists of a world wide node name (WWNN) and one or more WWPNs. References in this guide to WWN actually refer to the WWPN.

McDATA Sphereon Web Management

1. Start McDATA Sphereon Web Management. The **Main Switch View** dialog box displays.
2. On the navigation panel, select **Configure**. The **Configure** dialog box displays. Select the **Zoning** tab, then select the **Zones** tab.



3. Select each zone and verify that all members are specified by WWN.



McDATA Telnet CLI

NOTE: Use the following CLI commands when McDATA Spheron Web Management is not available.

```
Username: Administrator
Password: xxxxxxxxx
Root> show
Show> zoning
```

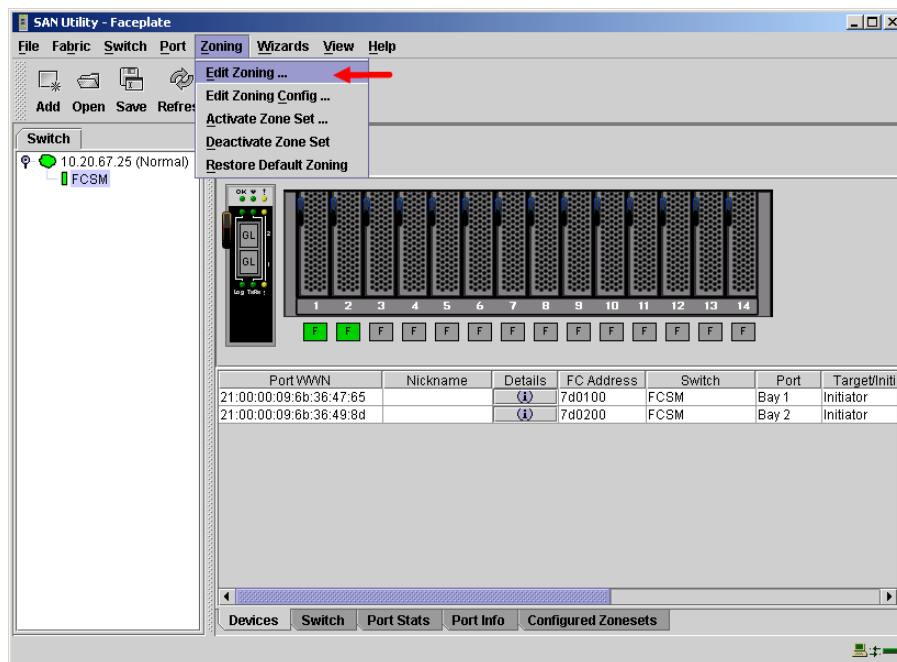
Verify that all of the Zone members are specified by WWN.

IBM eServer BladeCenter GUI

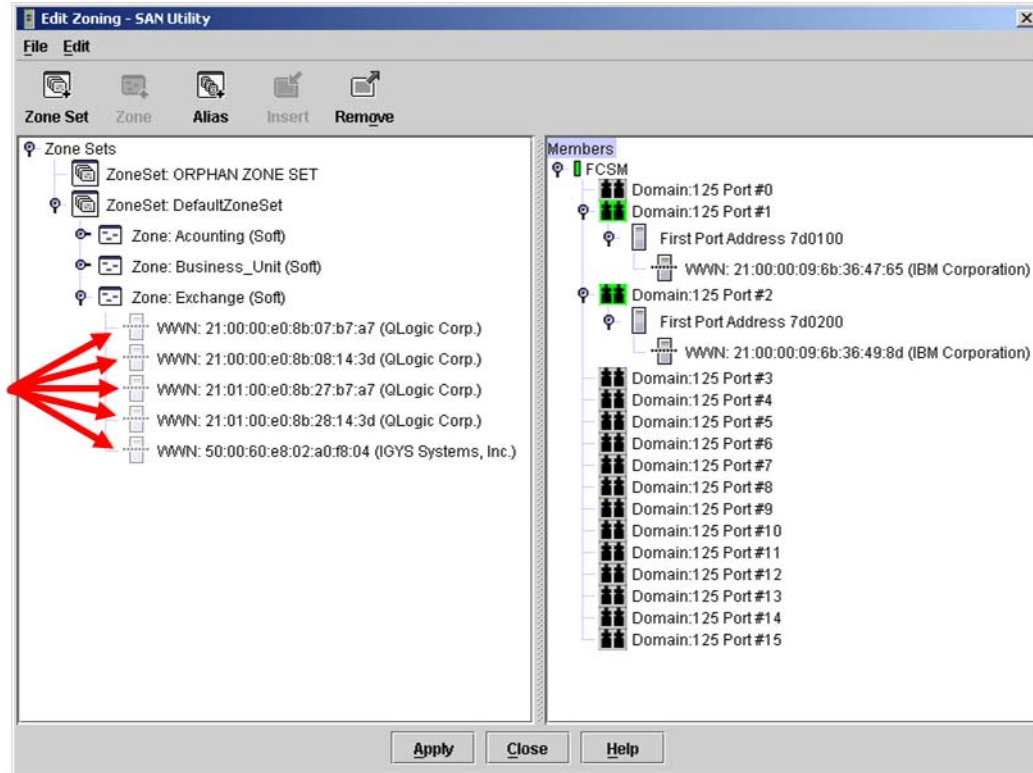
NOTE: You can use the SAN Utility to modify all IBM eServer BladeCenter switch modules. You can use the SAN Browser to modify only the QLogic 6-port Enterprise Fibre Channel Switch Module for IBM eServer BladeCenter. The screen images differ, but the procedures for the SAN Utility and SAN Browser are the same.

Do the following to modify IBM eServer BladeCenter switch modules using the SAN Utility:

1. Start the SAN Utility. The **SAN Utility—Faceplate** dialog box displays.
2. From the **SAN Utility—Faceplate** dialog box **Zoning** menu, select **Edit Zoning**.

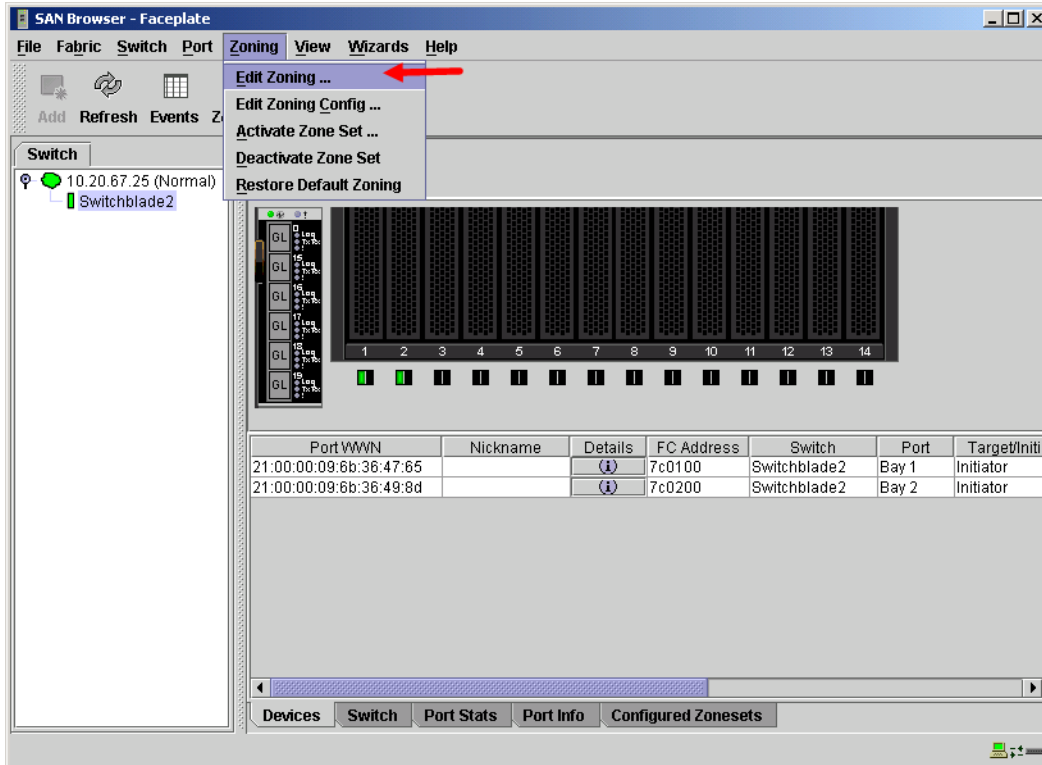


3. The **Edit Zoning—SAN Utility** dialog box displays. Confirm that all zone members are listed as WWN.

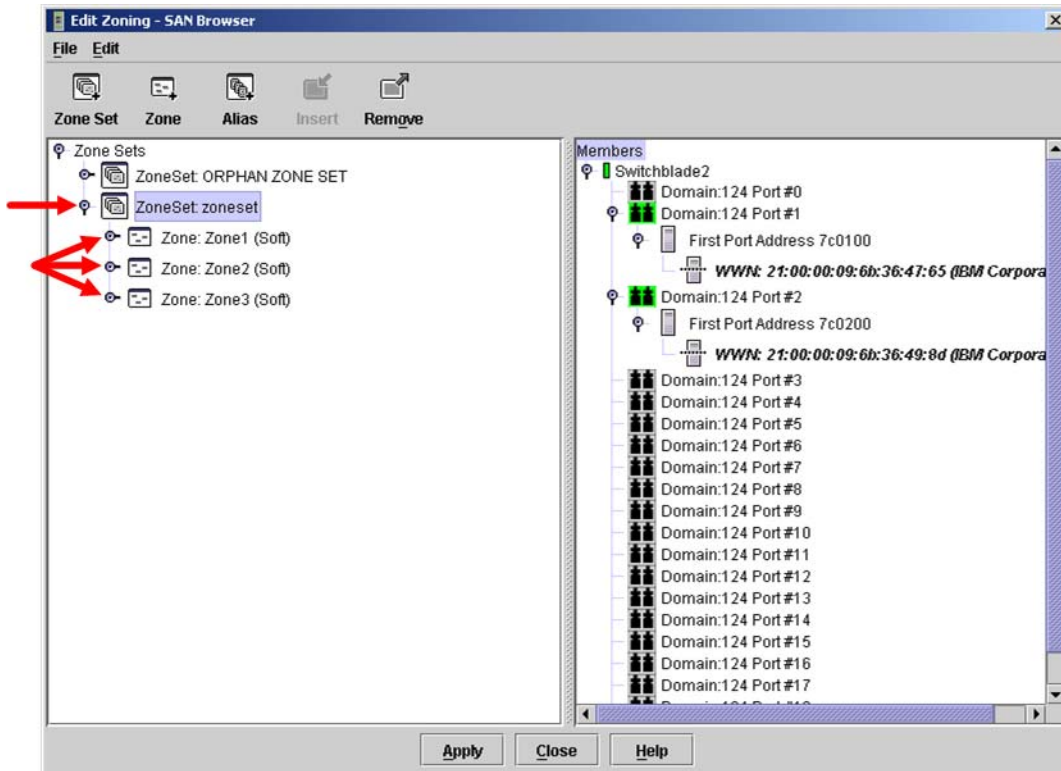


Do the following to modify the QLogic 6-port Enterprise Fibre Channel Switch Module for IBM eServer BladeCenter using the SAN Browser:

1. Start the SAN Browser. The **SAN Browser—Faceplate** dialog box displays.
2. From the **SAN Browser—Faceplate** dialog box **Zoning** menu, select **Edit Zoning**.



3. The **Edit Zoning—SAN Browser** dialog box displays. Do the following:
 - a. Select a ZoneSet.
 - b. Select a Zone.
 - c. In the Zone Members section, confirm that all zone members are listed as WWN.
 - d. Repeat the above steps for each zone.



IBM eServer BladeCenter CLI

NOTE: Use the following CLI commands when the IBM eServer BladeCenter GUI is not available.

Login: **USERID**

Password: **xxxxxxxx**

IBM eServer BladeCenter #> **zone members <zone name>**

Repeat this statement for each zone and confirm that only WWNs are listed.

McDATA Specific Configuration

Not applicable.

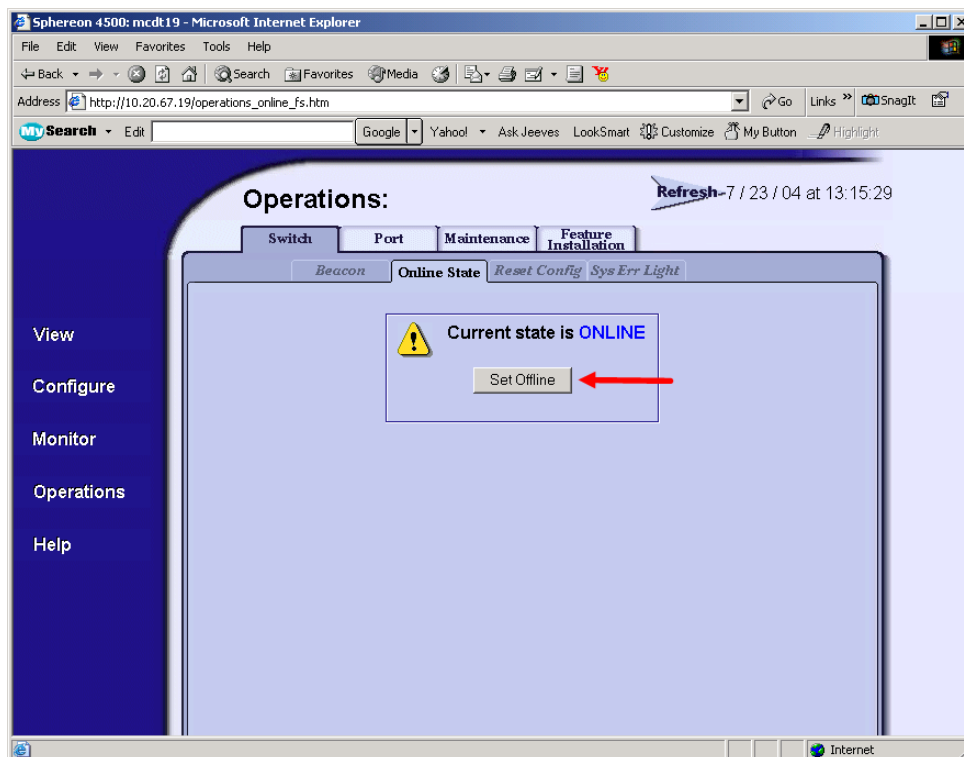
IBM eServer BladeCenter Specific Configuration

Not applicable.

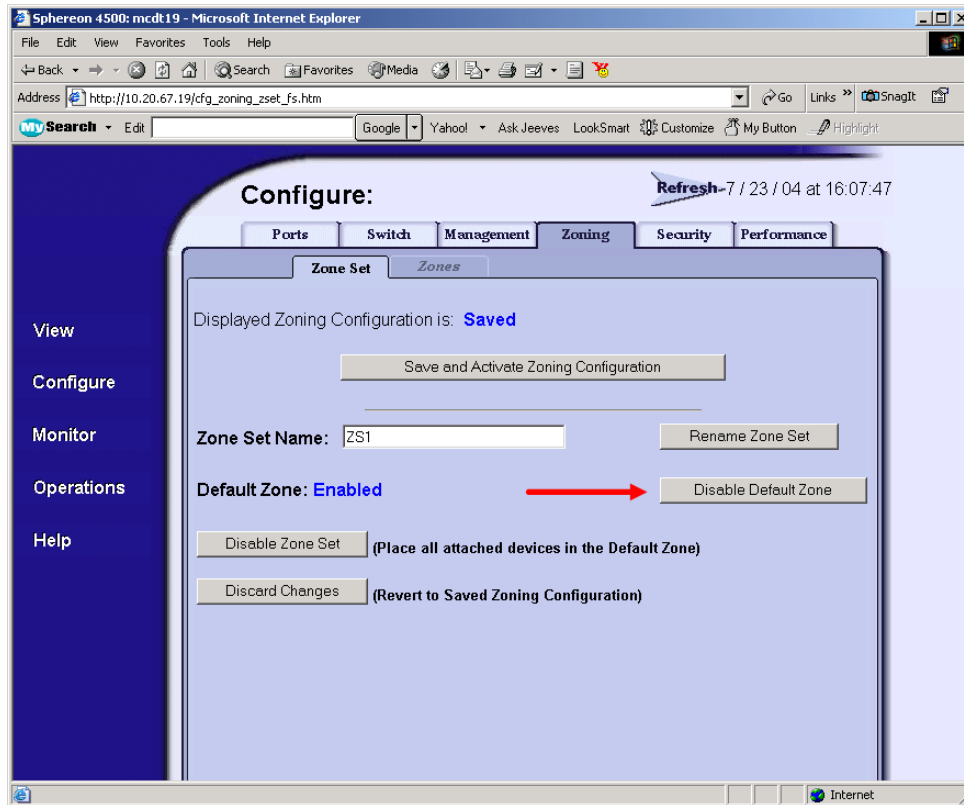
Operating Mode Configuration

McDATA Sphereon Web Management

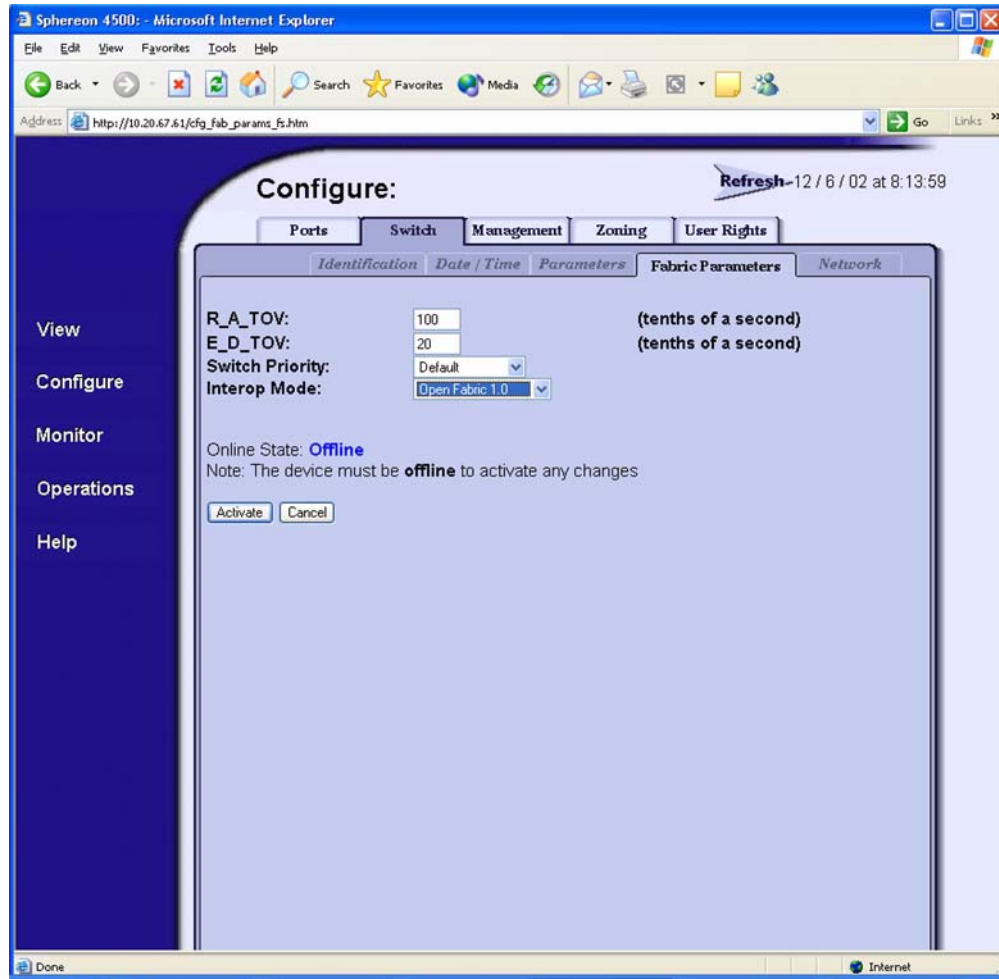
1. Start McDATA Sphereon Web Management. The **Main Switch View** dialog box displays.
2. On the navigation panel, select **Operations**. The **Operations** dialog box displays. Select the **Switch** tab, select **Online State** tab, then click the **Set Offline** button.



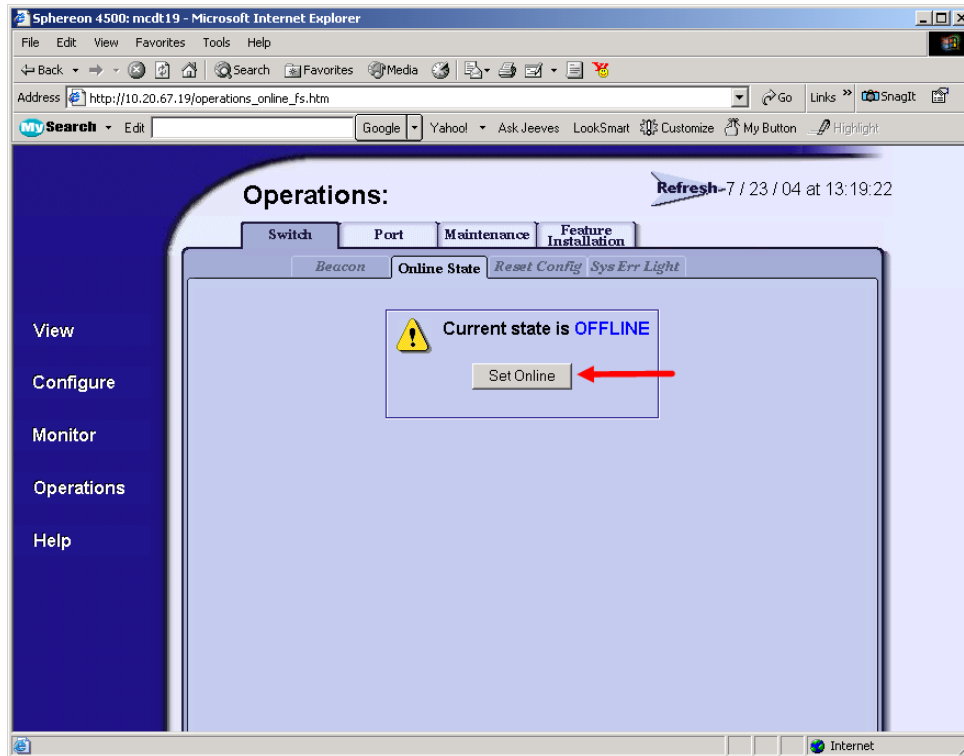
3. On the navigation panel, select **Configure**. The **Configure** dialog box displays. Select the **Zoning** tab, select the **Zone Set** tab, then the **Disable Default Zone** button.



4. On the navigation panel, select **Configure**. The **Configure** dialog box displays. Select the **Switch** tab, select the **Fabric Parameters** tab, then do the following:
 - a. From the **Interop Mode** list, select **Open Fabric 1.0**.
 - b. Click **Activate**.



5. On the navigation panel, select **Operations**. The **Operations** dialog box displays. Select the **Switch** tab, select **Online State** tab, then click the **Set Online** button.



McDATA Telnet CLI

NOTE: Use the following CLI commands when McDATA Sphereon Web Management is not available.

```
Username: Administrator
Password: xxxxxxxx
Root> maint system
Maint.System> setOnlineState false
Maint.System> root
Root> config zoning
Config.Zoning> setDefZoneState false
Config.Zoning> root
Root> config switch
Config.Switch> interopMode open
Config.Switch> root
Root> maint system
Maint.System> setOnlineState true
```

IBM eServer BladeCenter SAN Utility

Not applicable.

IBM eServer BladeCenter CLI

Not applicable.

Successful Integration Checklist

Perform the following steps after the E_port connection has been established and the fabric has had time to update. If everything verifies, the fabrics have successfully merged.

- ✓ Compare and verify that all Zoning information has been propagated on all switches.
- ✓ Verify that the correct Zone Set is activated.
- ✓ Compare and verify that all devices are in the Name Server of each switch.
- ✓ Verify that all initiators continue to detect and have access to all targets that existed prior to the fabric merger.

After everything is verified, your fabric has merged successfully and no additional steps need to be taken. If any of the above tasks did not complete successfully, please contact IBM support.

McDATA Intrepid 6000 Series Directors

Configuration Considerations

McDATA configuration considerations are as follows.

- When merging McDATA and IBM eServer BladeCenter fabrics, a maximum of 31 interconnected switches per fabric can be configured.
- Otherwise, all features are fully supported and comply with industry standards.

IBM eServer BladeCenter configuration considerations are as follows:

- If you will be implementing the I/O stream guard feature, please contact your IBM technical support representative prior to configuring. Additional configuration procedures may be required.
- Contact IBM Technical Support to obtain the document, *IBM eServer BladeCenter Remote Boot*, if you are planning to use the boot form SAN functionality.

Integration Checklist

The following steps must be completed to successfully merge McDATA and IBM eServer BladeCenter fabrics. The remainder of this section provides detailed instructions and examples.

ATTENTION!!

- Back up the current switch configuration data prior to performing the following steps so that the configuration is available if something goes wrong (see the first step for details).
 - Disruptions in the fabric can occur as a result of performing the following steps. Therefore, it is recommended that these changes be done during down time or off-peak hours.
-
- ✓ Back up the current switch configuration data (see [“Backing Up and Restoring the Current Configuration Settings”](#) on page 246).
 - ✓ Verify that the correct version of switch firmware is installed on each switch (see [“Supported Switches”](#) on page 244).
 - ✓ Ensure that each switch has a unique Domain ID and that it falls within the proper range (see [“Domain ID Configuration”](#) on page 247).
 - ✓ Set all switches to the appropriate timeout values (see [“Timeout Values”](#) on page 258).
 - ✓ Ensure that all Zone set and Zone names are unique and conform to ANSI T11 standards (see [“Active Zone Set Names”](#) on page 271).
 - ✓ Ensure that all zone members are specified by WWPN (see [“Zone Types”](#) on page 278).

- ✓ Ensure that all McDATA switches are configured for Open Fabric Interoperability mode (see “Operating Mode Configuration” on page 285).
- ✓ Verify that the fabrics have successfully merged (see “Successful Integration Checklist” on page 289).
- ✓ Contact IBM Technical Support to obtain the document, *IBM eServer BladeCenter Remote Boot*, if you are planning to use the boot form SAN functionality.

Supported Switches

The following IBM eServer BladeCenter switch modules have been tested in the IBM eServer BladeCenter environment and comply with the FC-SW-2 standard. They have tested interoperable with the following switches from McDATA that comply with the FC-SW-2 standard.

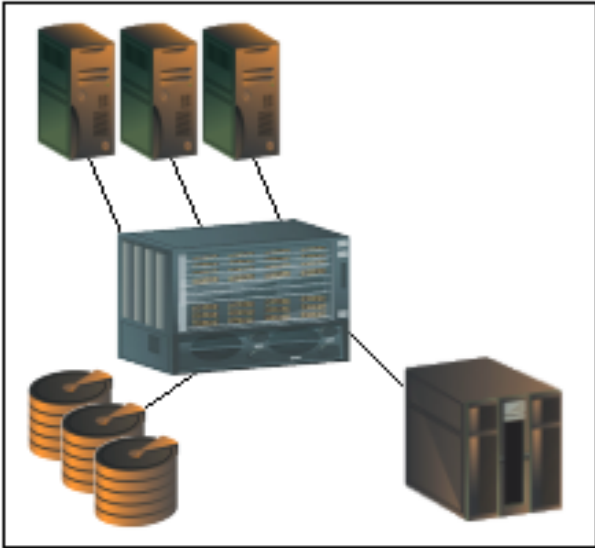
IBM eServer BladeCenter and McDATA Supported Switches

Manufacturer	Switch Model*
IBM eServer BladeCenter	IBM eServer BladeCenter 2-port Fibre Channel Switch Module QLogic 6-port Enterprise Fibre Channel Switch Module for IBM eServer BladeCenter
McDATA	Intrepid 6064 Director/IBM 2109F32 Intrepid 6140 Director/IBM 2109M12

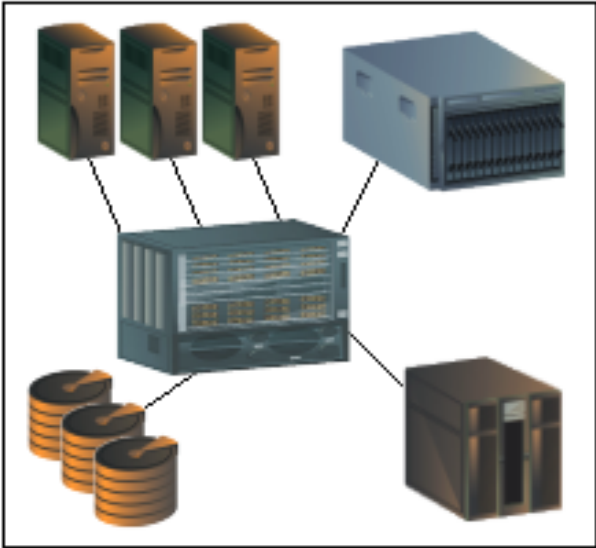
Note

*For the current firmware versions, please see the *IBM eServer BladeCenter Fibre Channel Switch Interoperability Quick Reference Guide* located at <http://www.ibm.com/support>.

The following figures illustrate a McDATA Fibre Channel fabric prior to and after merging with an IBM eServer BladeCenter.



McDATA Fibre Channel Fabric Prior to Merging with the IBM eServer BladeCenter



McDATA Fibre Channel Fabric with the IBM eServer BladeCenter

Backing Up and Restoring the Current Configuration Settings

Back up the current McDATA switch configuration data prior to following the steps to merge McDATA and IBM eServer BladeCenter fabrics so that the configuration can be restored if something goes wrong.

NOTE: For additional information, refer to the documentation provided with the switch.

Note the following:

- Only a single copy of the configuration is kept on the McDATA server hard disk drive.
- The location and file name of the saved configuration cannot be modified.
- The configuration can only be restored to a switch with the same IP address.

Backup Procedure

To backup the current McDATA configuration settings, do the following:

1. Start McDATA Sphereon Web Management. The **Main Switch View** dialog box displays.
2. On the navigation panel, select **Operations**. The **Operations** dialog box displays. Select the **Maintenance** tab. The **Maintenance** dialog box displays.
3. From the **Maintenance** dialog box, select **Backup and Restore Configuration**. The **Backup and Restore Configuration** dialog box displays. Click **Backup**.
4. When the backup of the configuration completes, a message displays. Click **OK**.

NOTE: If the backup fails, a message informs you that the backup to the server failed.

Restore Procedure

If you need to restore the McDATA configuration settings that you backed up, do the following.

NOTE: The backed up configuration is restored to the nonvolatile random access memory (NVRAM) on the switch. The restore operation initiates an initial product load (IPL).

1. Start McDATA Sphereon Web Management. The **Main Switch View** dialog box displays.
2. On the navigation panel, select **Operations**. The **Operations** dialog box displays. Select the **Switch** tab, select the **Online State** tab, then click the **Set Offline** button.
3. Select the **Maintenance** tab. The **Maintenance** dialog box displays.
4. From the **Maintenance** dialog box, select **Backup and Restore Configuration**. The **Backup and Restore Configuration** dialog box displays. Click **Restore**.
5. A confirmation dialog box displays, stating that the restore overwrites the existing configuration on the switch and the date of the restored backup. Click **OK**.
6. When the restore completes, select the **Switch** tab, select the **Online State** tab, then click the **Set Online** button.

Domain ID Configuration

To ensure that there are no conflicts between switches, we recommend that each switch have an assigned Domain ID. The following steps show how to set the Domain ID on both the McDATA switch and IBM eServer BladeCenter switch module.

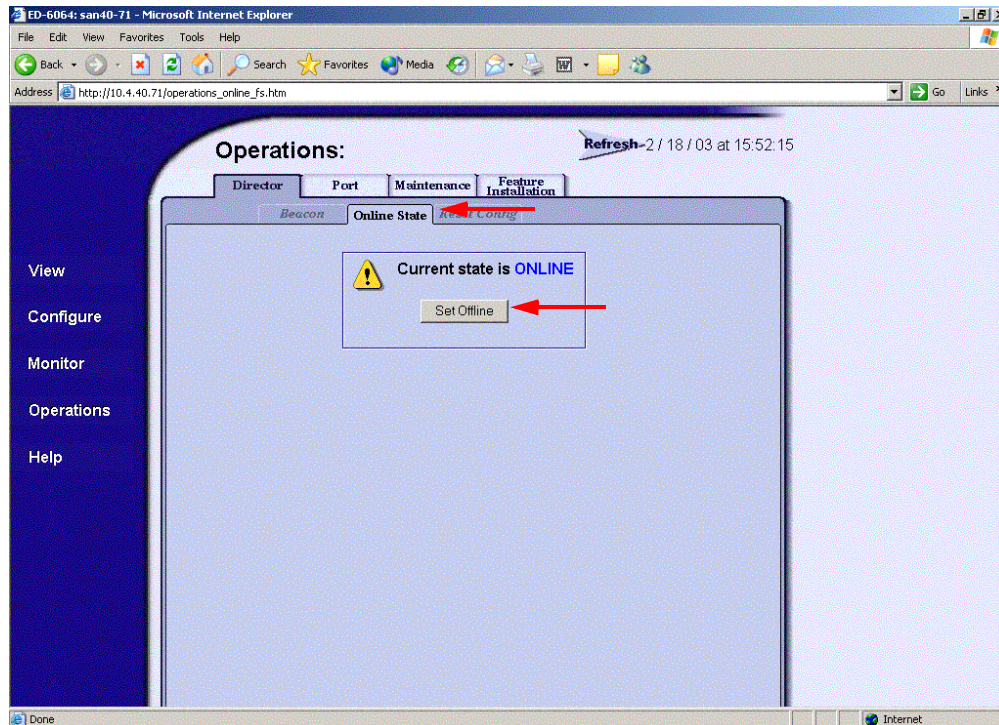
The Domain ID should be locked and unique within the 97–127 (0x61–0x7f) range. This is equivalent to 1–31 on the McDATA switch. The following chart lists the McDATA Domain ID and the corresponding IBM eServer BladeCenter Domain ID.

McDATA Versus IBM eServer BladeCenter Domain IDs

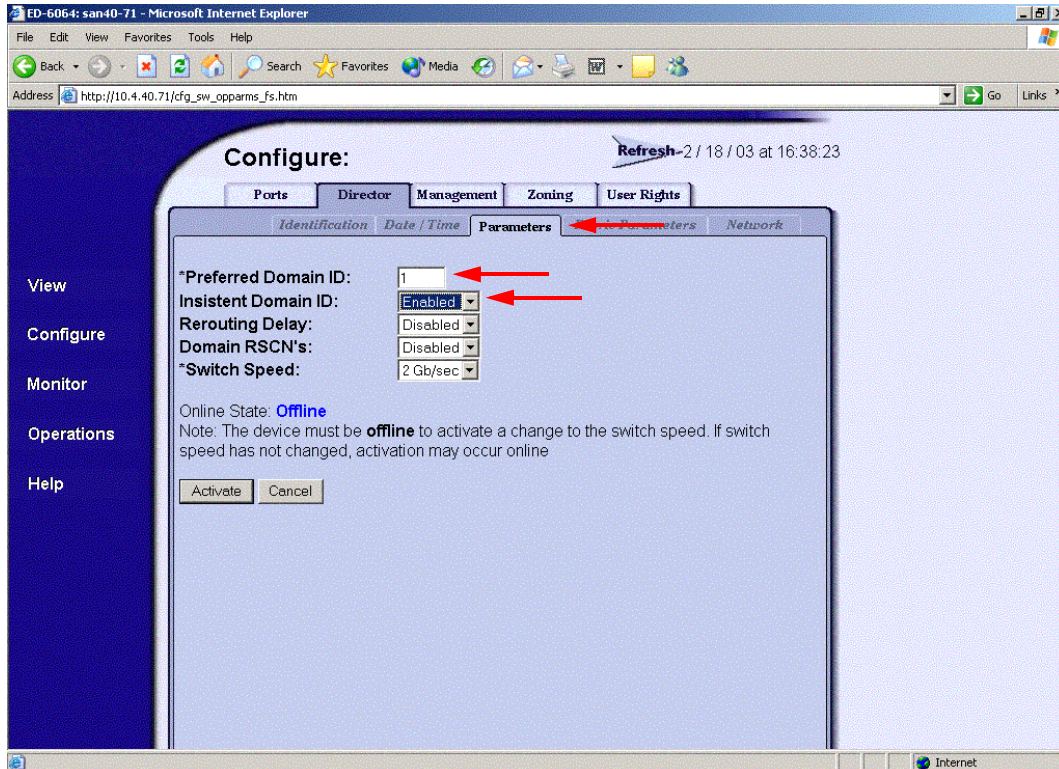
McDATA Domain ID	IBM eServer BladeCenter Domain ID	McDATA Domain ID	IBM eServer BladeCenter Domain ID	McDATA Domain ID	IBM eServer BladeCenter Domain ID
1	97	11	107	21	117
2	98	12	108	22	118
3	99	13	109	23	119
4	100	14	110	24	120
5	101	15	111	25	121
6	102	16	112	26	122
7	103	17	113	27	123
8	104	18	114	28	124
9	105	19	115	29	125
10	106	20	116	30	126
—	—	—	—	31	127

McDATA SANpilot Web Management

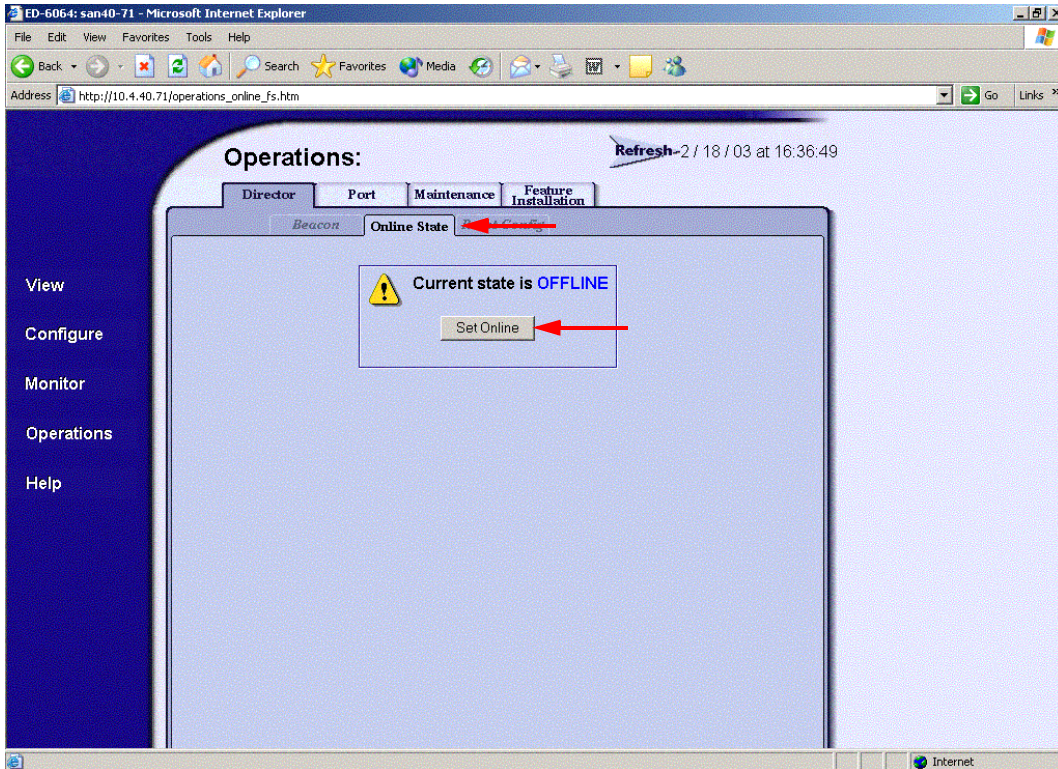
1. Start McDATA SANpilot Web Management. The **Main Director View** dialog box displays.
2. On the navigation panel, select **Operations**. The **Operations** dialog box displays. Select the **Director** tab, select the **Online State** tab, then click the **Set Offline** button.



3. On the navigation panel, select **Configure**. The **Configure** dialog box displays. Select the **Director** tab, select the **Parameters** tab, and do the following:
 - a. In the **Preferred Domain ID** box, type a unique Domain ID in the 1–31 range for the switch (see table “McDATA Versus IBM eServer BladeCenter Domain IDs” on page 247).
 - b. From the **Insistent Domain ID** list, select **Enabled**.
 - c. Click **Activate**.



4. On the navigation panel, select **Operations**. The **Operations** dialog box displays. Select the **Director** tab, select the **Online State** tab, then click the **Set Online** button.



McDATA Telnet CLI

NOTE: Use the following CLI commands when McDATA SANpilot Web Management is not available.

```
Username: Administrator
Password: xxxxxxxx
Root> maint system
Maint.System> setOnlineState False
Maint.System> root
Root> config switch
Config.Switch> prefDomainId xx (xx=unique Domain ID in the range 1-31)
Config.Switch> insistDomainId enable
Config.Switch> show

Switch Information
BB Credit:                16
R_A_TOV:                  100
E_D_TOV:                  20
Preferred Domain ID:      1
Switch Priority:           Default
Speed:                    2 Gb/sec
Rerouting Delay:          Disabled
Interop Mode:              Open Fabric 1.0
Insistent Domain ID:      Enabled
Domain RSCN:               Disabled

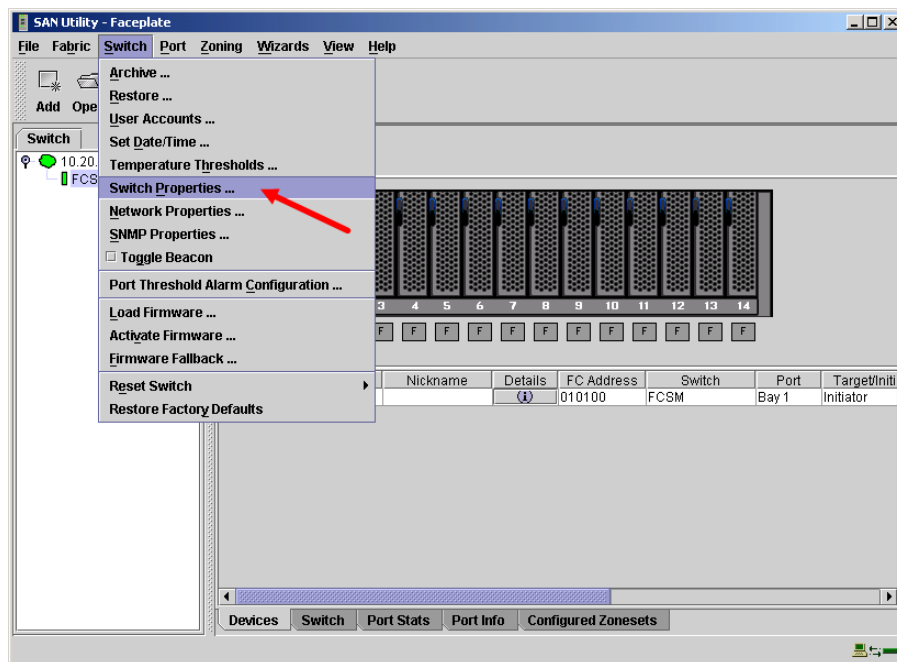
Config.Switch> root
Root> maint system
Maint.System> setOnlineState True
```

IBM eServer BladeCenter GUI

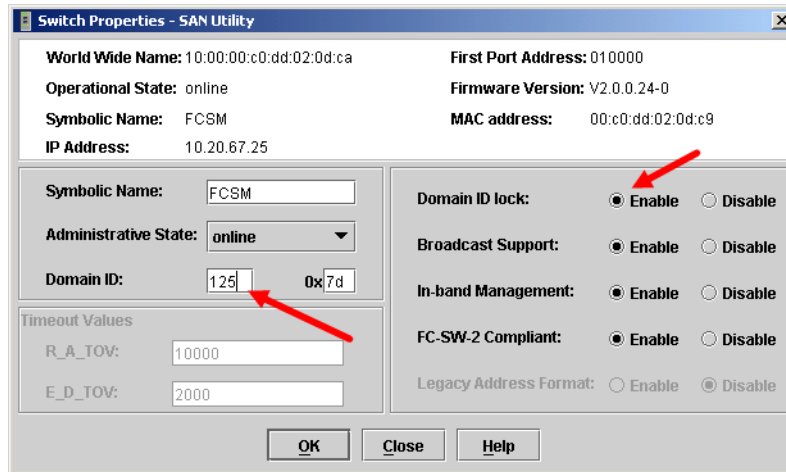
NOTE: You can use the SAN Utility to modify all IBM eServer BladeCenter switch modules. You can use the SAN Browser to modify only the QLogic 6-port Enterprise Fibre Channel Switch Module for IBM eServer BladeCenter. The screen images differ, but the procedures for the SAN Utility and SAN Browser are the same.

Do the following to modify IBM eServer BladeCenter switch modules using the SAN Utility:

1. Start the SAN Utility. The **SAN Utility—Faceplate** dialog box displays.
2. From the **SAN Utility—Faceplate** dialog box **Switch** menu, select **Switch Properties**.

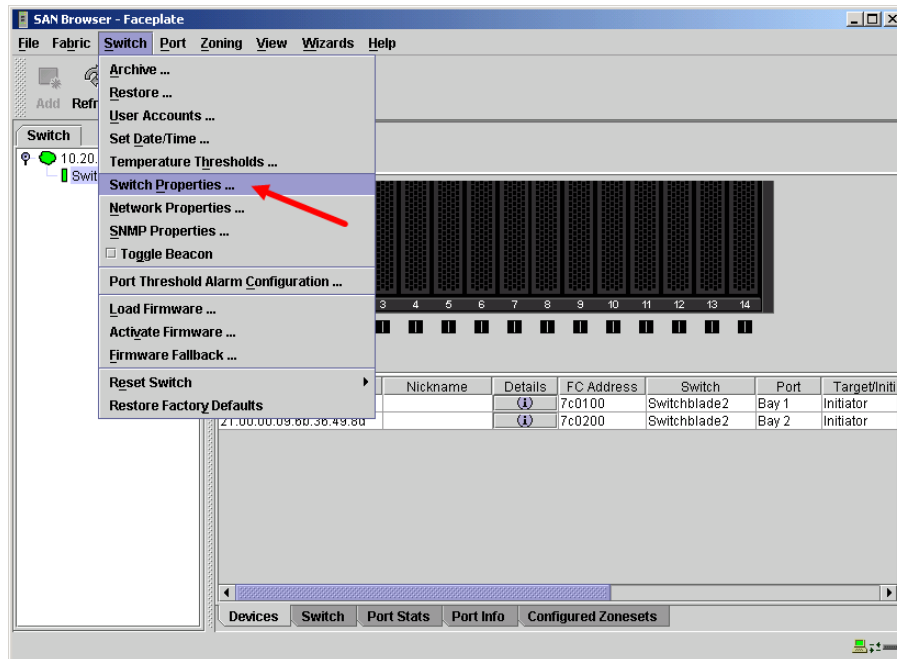


3. From the **Switch Properties—SAN Utility** dialog box, do the following:
 - a. In the **Domain ID** box, type a unique Domain ID in the 97–127 range for the switch.
 - b. Select the **Domain ID Lock Enable** radio button to ensure that the switch always has that Domain ID.
 - c. Click **OK**.

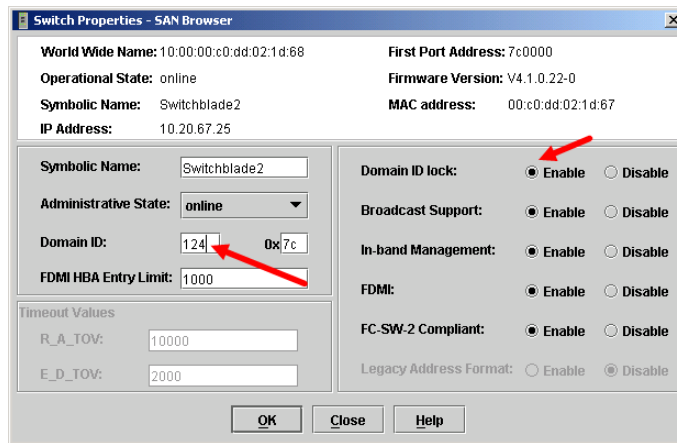


Do the following to modify the QLogic 6-port Enterprise Fibre Channel Switch Module for IBM eServer BladeCenter using the SAN Browser:

1. Start the SAN Browser. The **SAN Browser—Faceplate** dialog box displays.
2. From the **SAN Browser—Faceplate** dialog box **Switch** menu, select **Switch Properties**.



3. From the **Switch Properties—SAN Browser** dialog box, do the following:
 - a. In the **Domain ID** box, type a unique Domain ID in the 97–127 range for the switch.
 - b. Select the **Domain ID Lock Enable** radio button to ensure that the switch always has that Domain ID.
 - c. Click **OK**.



IBM eServer BladeCenter CLI

NOTE: The procedures differ based on the IBM eServer BladeCenter switch module.

Use the following CLI commands to modify the IBM eServer BladeCenter 2-port Fibre Channel Switch Module when the SAN Utility is not available:

```
Login: USERID
Password: xxxxxxxx
IBM eServer BladeCenter #> admin start
IBM eServer BladeCenter (admin) #> config edit
IBM eServer BladeCenter (admin-config) #> set config switch

  The following options display:
  AdminState (1=Online, 2=Offline, 3=Diagnostics) [Online]
  BroadcastEnabled (True / False) [True]
  InbandEnabled (True / False) [True]
  DefaultDomainID (decimal value, 1-239) [1] <97-127>
  DomainIDLock (True / False) [False] True
  SymbolicName (string, max=32 chars) [Fibre Channel Switch Module]
  R_T_TOV (decimal value, 1-1000 msec) [100]
  R_A_TOV (decimal value, 100-100000 msec) [10000]
  E_D_TOV (decimal value, 10-20000 msec) [2000]
  FS_TOV (decimal value, 100-100000 msec) [5000]
  DS_TOV (decimal value, 100-100000 msec) [5000]
  PrincipalPriority (decimal value, 1-255) [254]
  ConfigDescription (string, max=64 chars) [Default Config]
IBM eServer BladeCenter (admin-config) #> config save
IBM eServer BladeCenter (admin) #> config activate
The configuration will be activated. Please confirm (y/n): [n] y
```

Use the following CLI commands to modify the QLogic 6-port Enterprise Fibre Channel Switch Module for IBM eServer BladeCenter when the SAN Utility and SAN Browser are not available:

```
Login: USERID
Password: xxxxxxxx
Switchblade2: admin> admin start
Switchblade2 (admin): admin> config edit
    The config named default is being edited.
Switchblade2 (admin-config): admin> set config switch
    A list of attributes with formatting and current values will follow.
    Enter a new value or simply press the ENTER key to accept the current
    value. If you wish to terminate this process before reaching the end of
    the list press 'q' or 'Q' and the ENTER key to do so.
    AdminState (1=Online, 2=Offline, 3=Diagnostics) [Online]
    BroadcastEnabled (True / False) [True]
    InbandEnabled (True / False) [True]
    FdmiEnabled (True / False) [True]
    FdmiEntries (decimal value, 0-1000) [1000]
    DefaultDomainID (decimal value, 1-239) [1] 124
    DomainIDLock (True / False) [False] true
    SymbolicName (string, max=32 chars) [Switchblade2]
    R_A_TOV (decimal value, 100-100000 msec) [10000]
    E_D_TOV (decimal value, 10-20000 msec) [2000]
    PrincipalPriority (decimal value, 1-255) [254]
    ConfigDescription (string, max=64 chars) [Qlogic 6-port Enterprise
    Switch Module for IBM eServer BladeCenter]
    FC-SW-2 Compliant (True / False) [True]
    Finished configuring attributes.
    This configuration must be saved (see config save command) and activated
    (see config activate command) before it can take effect.
    To discard this configuration use the config cancel command.
Switchblade2 (admin-config): admin> config save
    The config named default has been saved.
Switchblade2 (admin): admin> config activate
    The currently active configuration will be activated.
    Please confirm (y/n): [n] y
Switchblade2 (admin): admin> admin end
```

Timeout Values

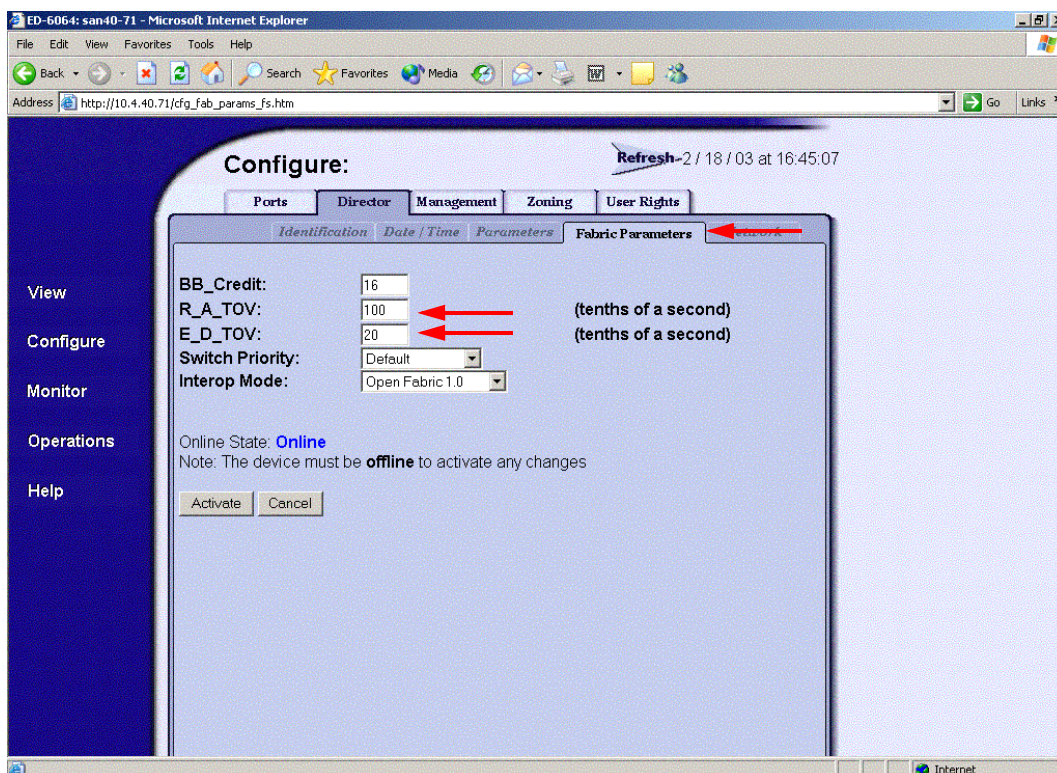
As per FC-SW-2 Fibre Channel standards, set all switches to the following timeout values (TOV) in order to successfully establish an E_port connection:

R_A_TOV = 10 seconds (The setting is **100**.)
E_D_TOV = 2 seconds (The setting is **20**.)

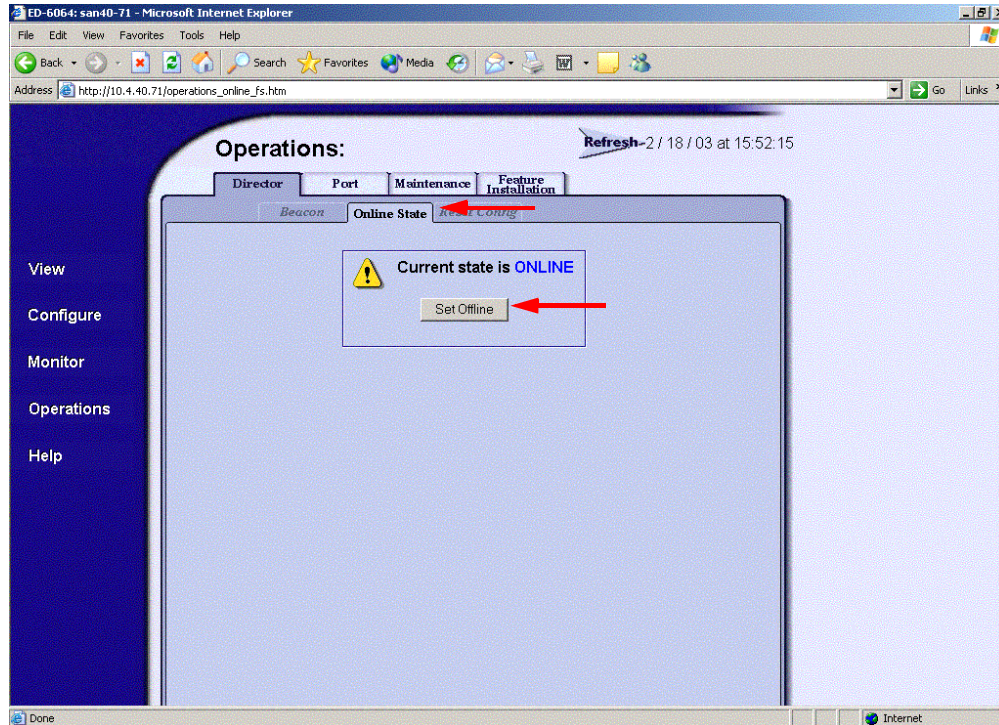
This section provides the steps to change these values.

McDATA SANpilot Web Management

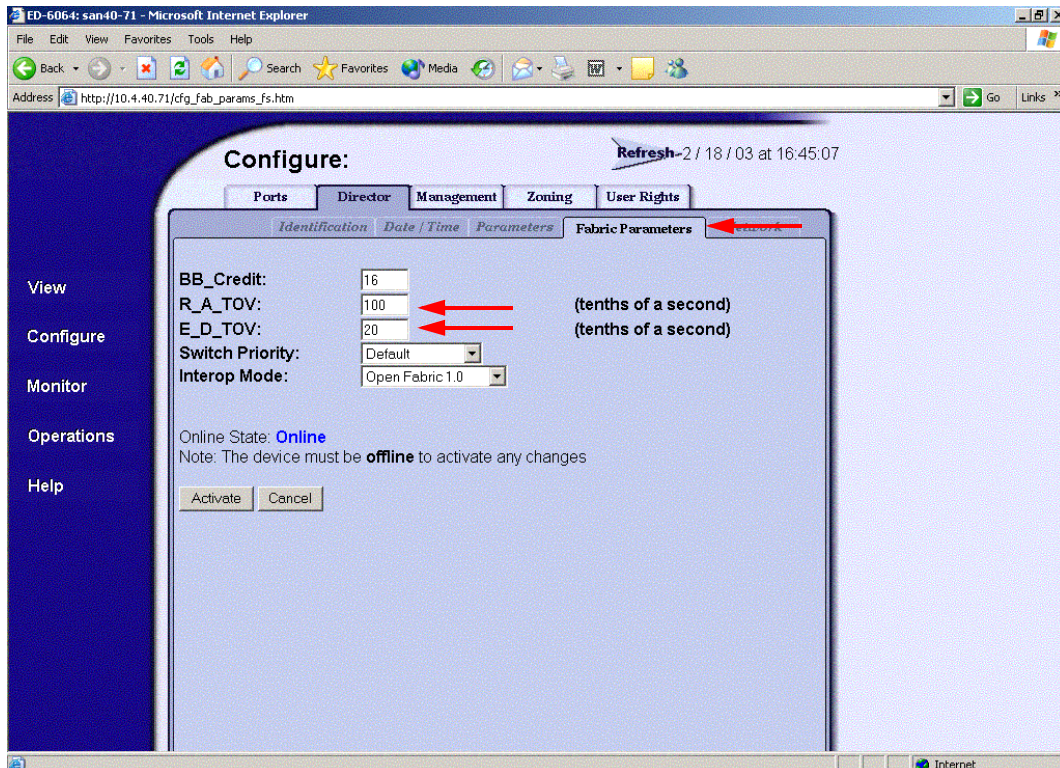
1. Start McDATA SANpilot Web Management. The **Main Director View** dialog box displays.
2. On the navigation panel, select **Configure**. The **Configure** dialog box displays. Select the **Director** tab, then select the **Fabric Parameters** tab. Verify that **R_A_TOV** is set to **100** and **E_D_TOV** is set to **20**. If the settings are not correct, proceed to [step 3](#). If the settings are correct, no changes need to be made; proceed to the next appropriate section.



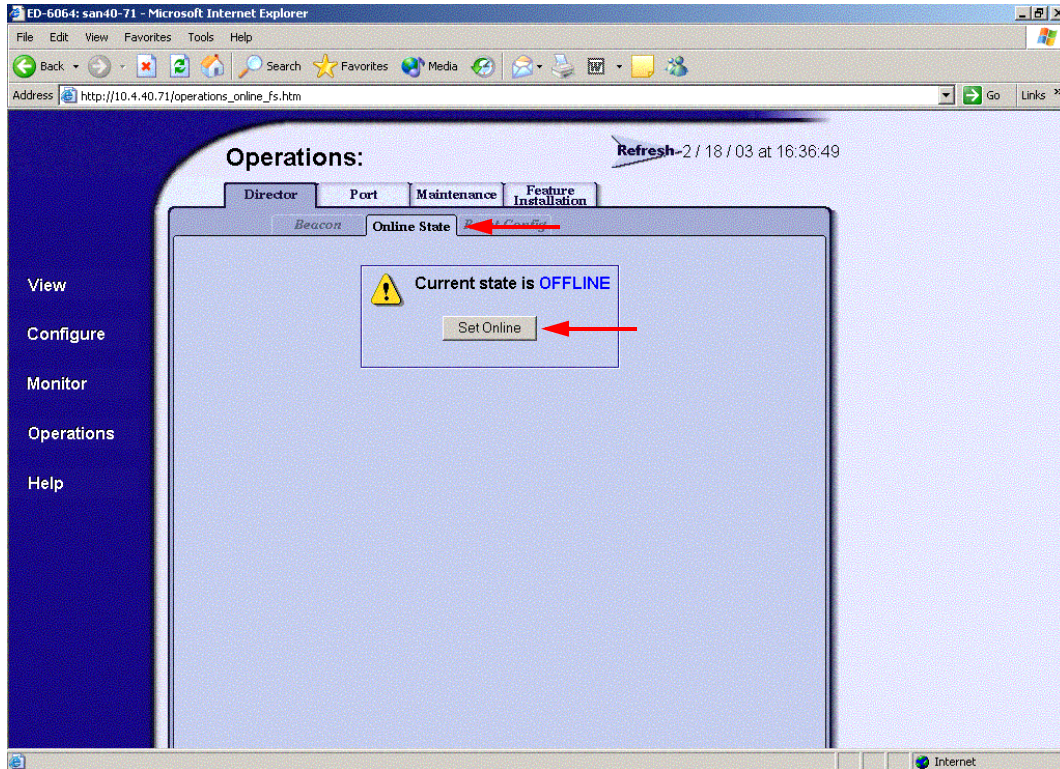
3. On the navigation panel, select **Operations**. The **Operations** dialog box displays. Select the **Director** tab, select **Online State** tab, then click the **Set Offline** button.



4. On the navigation panel, select **Configure**. The **Configure** dialog box displays. Select the **Director** tab, select the **Fabric Parameters** tab, then do the following:
 - a. In the **R_A_TOV** box, change the setting to **100**.
 - b. In the **E_D_TOV** box, change the setting to **20**.
 - c. Click **Activate**.



5. On the navigation panel, select **Operations**. The **Operations** dialog box displays. Select the **Director** tab, select the **Online State** tab, then click the **Set Online** button.



McDATA Telnet CLI

NOTE: Use the following CLI commands when McDATA SANpilot Web Management is not available.

```
Username: Administrator
Password: XXXXXXXX
Root> main system

Maint.System> setOnlineState False
Maint.System> root
Root> config switch
Config.Switch> raTOV 100
Config.Switch> edTOV 20
Config.Switch> show

Switch Information
BB Credit:                16
R_A_TOV:                  100
E_D_TOV:                  20
Preferred Domain ID:     1
Switch Priority:          Default
Speed:                   2 Gb/sec
Rerouting Delay:         Disabled
Interop Mode:            Open Fabric 1.0
Insistent Domain ID:     Enabled
Domain RSCN:             Disabled
Root> maint system
Maint.System> setOnlineState True
```

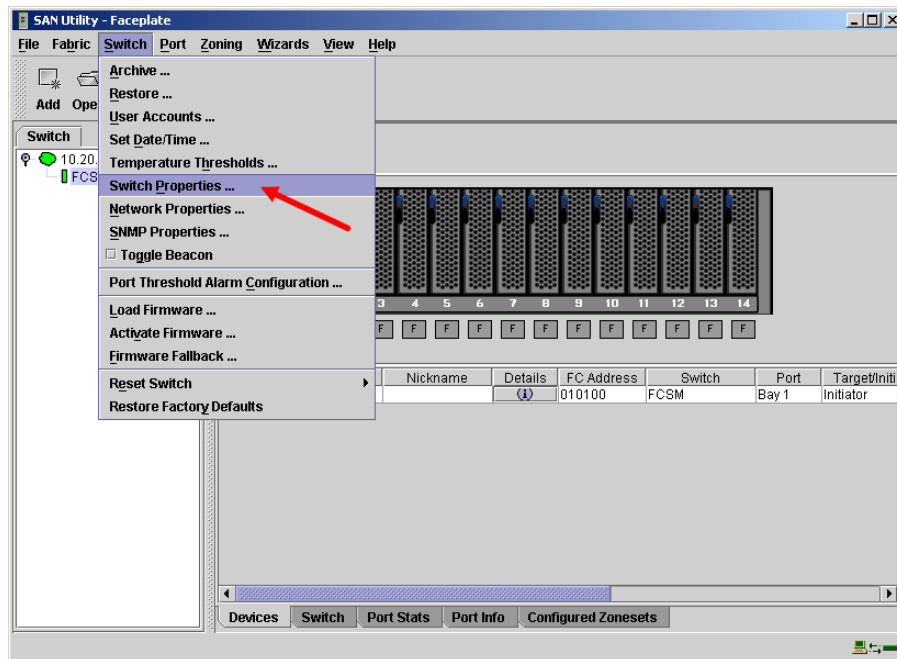
IBM eServer BladeCenter GUI

ATTENTION!! The following steps take the switch offline; therefore, do not perform them on a switch being managed in-band.

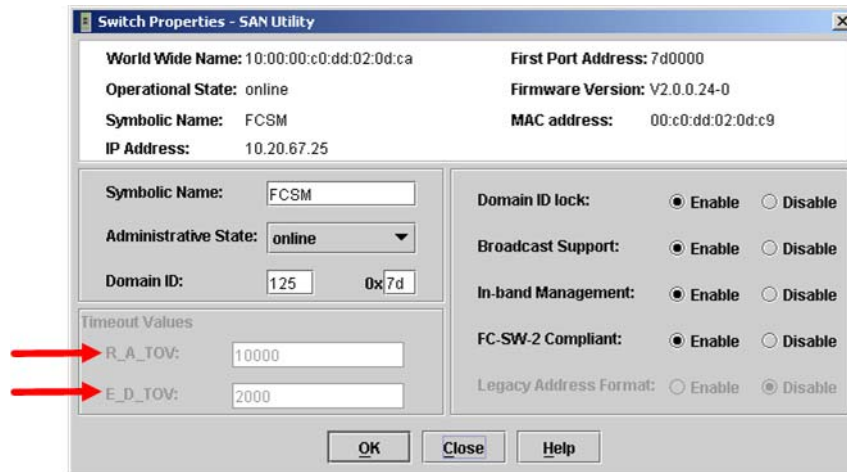
NOTE: You can use the SAN Utility to modify all IBM eServer BladeCenter switch modules. You can use the SAN Browser to modify only the QLogic 6-port Enterprise Fibre Channel Switch Module for IBM eServer BladeCenter. The screen images differ, but the procedures for the SAN Utility and SAN Browser are the same.

Do the following to modify IBM eServer BladeCenter switch modules using the SAN Utility:

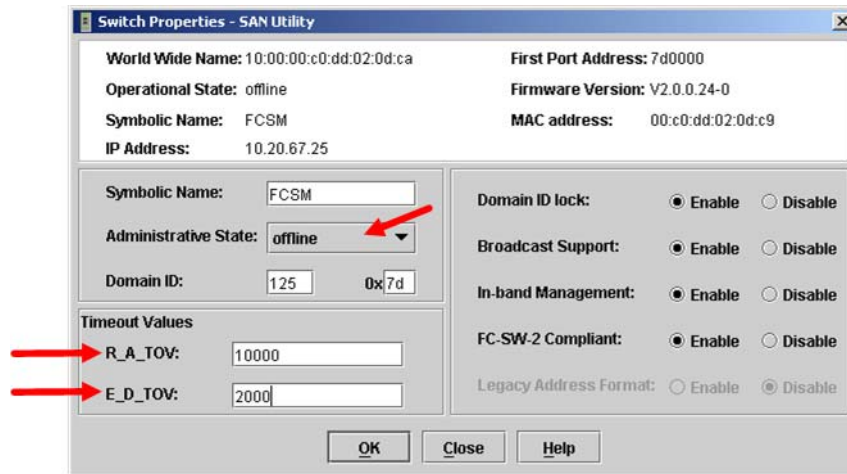
1. Start the SAN Utility. The **SAN Utility—Faceplate** dialog box displays.
2. From the **SAN Utility—Faceplate** dialog box **Switch** menu, select **Switch Properties**.



3. From the **Switch Properties—SAN Utility** dialog box, verify that **R_A_TOV** is set to **10000** and **E_D_TOV** is set to **2000**. If the settings are *not* correct, proceed to [step 4](#). If the settings are correct, no changes need to be made; proceed to the next appropriate section.



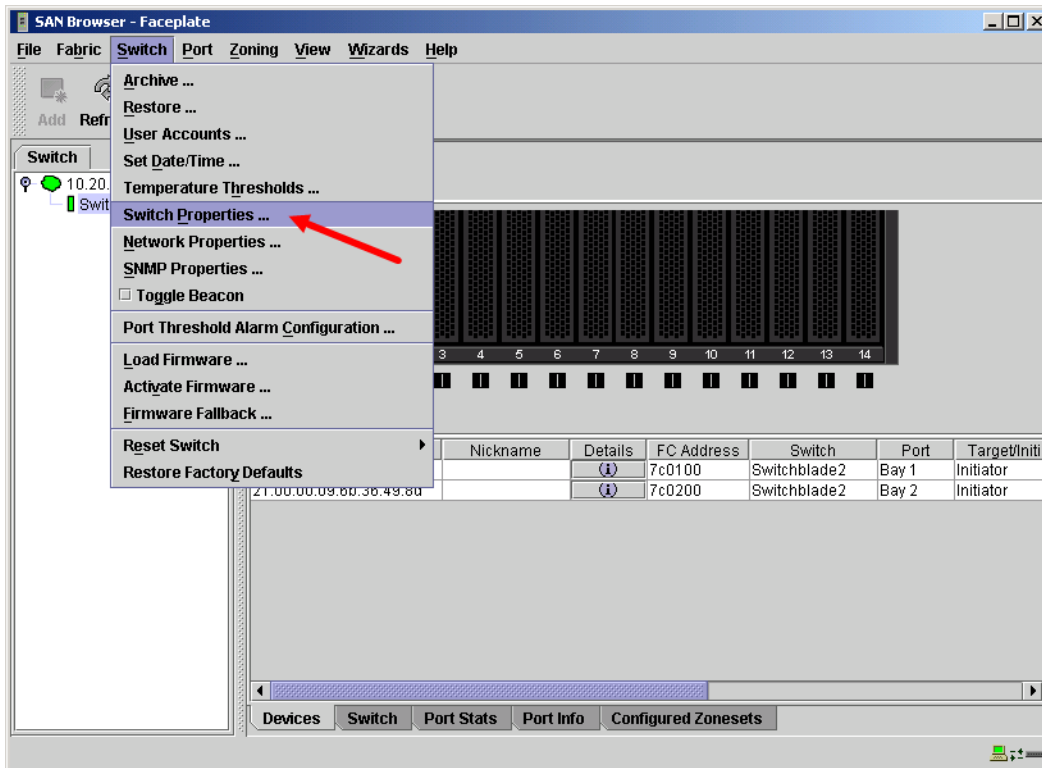
4. To modify the timeout value settings, do the following:
 - a. In the **Administrative State** drop-down box, select **offline**. Click **OK**.
 - b. The **SAN Utility—Faceplate** dialog box redisplay. Repeat [step 2](#) to redisplay the **Switch Properties—SAN Utility** dialog box.
 - c. In the Timeout Values section **R_A_TOV** box, enter **10000**.
 - d. In the Timeout Values section **E_D_TOV** box, enter **2000**.
 - e. In the **Administrative State** drop-down box, select **online**. Click **OK**.



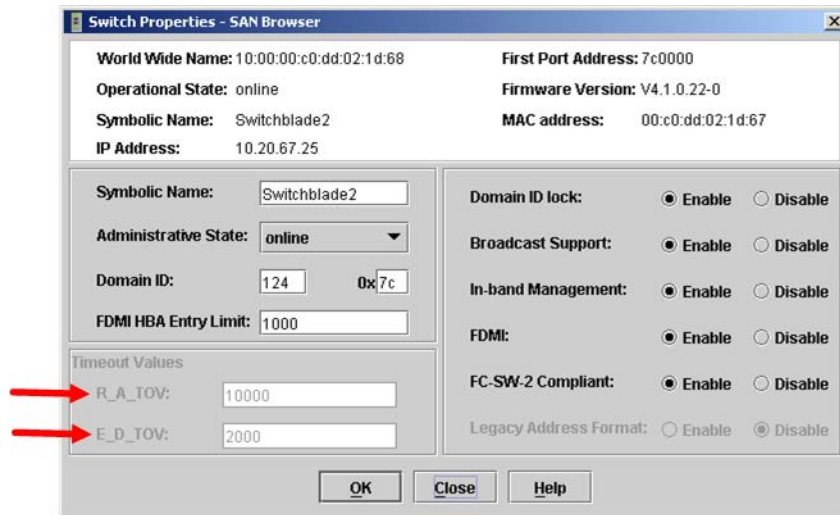
5. The **SAN Utility—Faceplate** dialog box redisplay. Repeat [step 2](#) to redisplay the **Switch Properties—SAN Utility** dialog box. Verify your changes ([see step 3](#)).

Do the following to modify the QLogic 6-port Enterprise Fibre Channel Switch Module for IBM eServer BladeCenter using the SAN Browser:

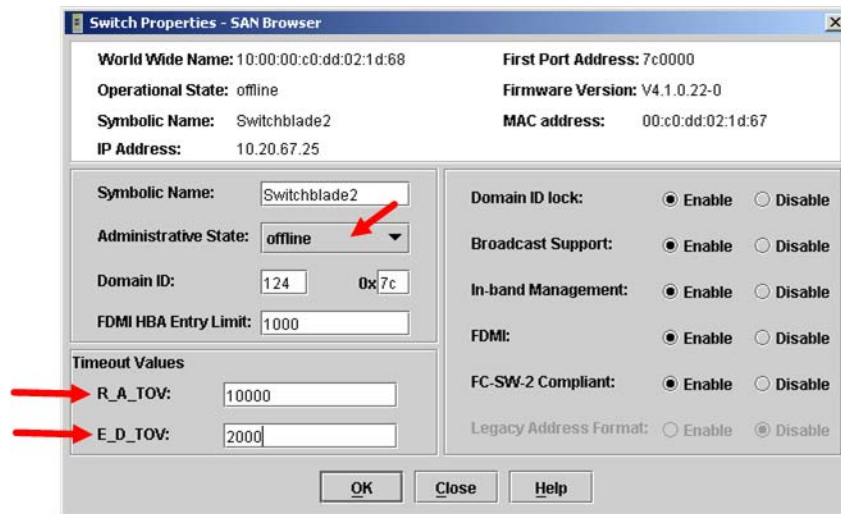
1. Start the SAN Browser. The **SAN Browser—Faceplate** dialog box displays.
2. From the **SAN Browser—Faceplate** dialog box **Switch** menu, select **Switch Properties**.



- From the **Switch Properties—SAN Browser** dialog box, verify that **R_A_TOV** is set to **10000** and **E_D_TOV** is set to **2000**. If the settings are *not* correct, proceed to [step 4](#). If the settings are correct, no changes need to be made; proceed to the next appropriate section.



4. To modify the timeout value settings, do the following:
 - a. In the **Administrative State** drop-down box, select **offline**. Click **OK**.
 - b. The **SAN Browser—Faceplate** dialog box redisplay. Repeat [step 2](#) to redisplay the **Switch Properties—SAN Browser**.
 - c. In the Timeout Values section **R_A_TOV** box, enter **10000**.
 - d. In the Timeout Values section **E_D_TOV** box, enter **2000**.
 - e. In the **Administrative State** drop-down box, select **online**. Click **OK**.



5. The **SAN Browser—Faceplate** dialog box redisplay. Repeat [step 2](#) to redisplay the **Switch Properties—SAN Browser** dialog box. Verify your changes ([see step 3](#)).

IBM eServer BladeCenter CLI

ATTENTION!! The following steps take the switch offline; therefore, do not perform them on a switch being managed in-band.

NOTE: The procedures differ based on the IBM eServer BladeCenter switch module.

Use the following CLI commands to modify the IBM eServer BladeCenter 2-port Fibre Channel Switch Module when the SAN Utility is not available:

Login: **USERID**

Password: **xxxxxxxx**

Use the following command to verify that R_A_TOV is set to 10000 and E_D_TOV is set to 2000.

```
IBM eServer BladeCenter #> show config switch
```

If these timeout values are *not* correct, continue with this section. If the settings are correct, no changes need to be made; proceed with the next appropriate section.

```
IBM eServer BladeCenter #> admin start
```

```
IBM eServer BladeCenter (admin) #> config edit
```

```
IBM eServer BladeCenter (admin-config) #> set config switch
```

The following options display:

```
AdminState (1=Online, 2=Offline, 3=Diagnostics) [Online]
```

```
BroadcastEnabled (True / False) [True]
```

```
InbandEnabled (True / False) [True]
```

```
DefaultDomainID (decimal value, 1-239) [1]
```

```
DomainIDLock (True / False) [True]
```

```
SymbolicName (string, max=32 chars) [Fibre Channel Switch Module]
```

```
R_T_TOV (decimal value, 1-1000 msec) [100]
```

```
R_A_TOV (decimal value, 100-100000 msec) [9000] 10000
```

```
E_D_TOV (decimal value, 10-20000 msec) [1000] 2000
```

```
FS_TOV (decimal value, 100-100000 msec) [5000]
```

```
DS_TOV (decimal value, 100-100000 msec) [5000]
```

```
PrincipalPriority (decimal value, 1-255) [254]
```

```
ConfigDescription (string, max=64 chars) [Default Config]
```

```
IBM eServer BladeCenter (admin-config) #> config save
```

```
IBM eServer BladeCenter (admin) #> config activate
```

```
The configuration will be activated. Please confirm (y/n): [n] y
```

Use the following CLI commands to modify the QLogic 6-port Enterprise Fibre Channel Switch Module for IBM eServer BladeCenter when the SAN Utility and SAN Browser are not available:

```
Login: USERID  
Password: xxxxxxxx
```

Use the following command to verify that R_A_TOV is set to 10000 and E_D_TOV is set to 2000.

```
Switchblade2: admin> show config switch
```

If these timeout values are *not* correct, continue with this section. If the settings are correct, no changes need to be made; proceed with the next appropriate section.

```
Switchblade2: admin>  
Switchblade2: admin> admin start  
Switchblade2 (admin): admin> config edit  
The config named default is being edited.  
Switchblade2 (admin-config): admin> set config switch  
A list of attributes with formatting and current values will follow.  
Enter a new value or simply press the ENTER key to accept the current  
value. If you wish to terminate this process before reaching the end of  
the list press 'q' or 'Q' and the ENTER key to do so.  
AdminState (1=Online, 2=Offline, 3=Diagnostics) [Online]  
BroadcastEnabled (True / False) [True]  
InbandEnabled (True / False) [True]  
FDMIEnabled (True / False) [True]  
FDMIEntries (decimal value, 0-1000) [1000]  
DefaultDomainID (decimal value, 1-239) [124]  
DomainIDLock (True / False) [True]  
SymbolicName (string, max=32 chars) [Switchblade2]  
R_A_TOV (decimal value, 100-100000 msec) [9000] 10000  
E_D_TOV (decimal value, 10-20000 msec) [1000] 2000  
PrincipalPriority (decimal value, 1-255) [254]  
ConfigDescription (string, max=64 chars) [Qlogic 6-port Enterprise  
Switch Module for IBM eServer BladeCenter]  
FC-SW-2 Compliant (True / False) [True]
```

Finished configuring attributes.
This configuration must be saved (see config save command) and activated (see config activate command) before it can take effect.
To discard this configuration use the config cancel command.

```
Switchblade2 (admin-config): admin> config save  
The config named default has been saved.  
Switchblade2 (admin): admin> config activate  
The currently active configuration will be activated.  
Please confirm (y/n): [n] y  
Switchblade2 (admin): admin> admin end
```

Principal Switch Configuration

McDATA switches and IBM eServer BladeCenter switch modules negotiate for principal switch automatically. Therefore, there are no steps to take.

Zone Configuration

This section discusses configuring active Zone Set names and Zone types.

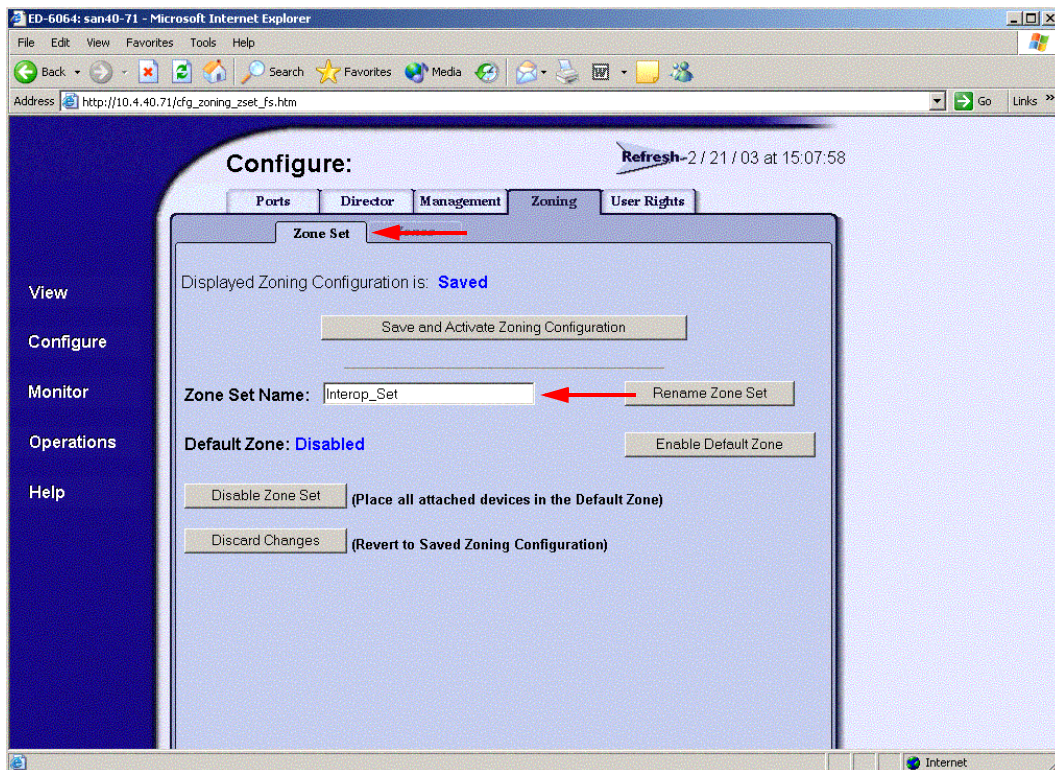
Active Zone Set Names

The Zone and Zone Set names on each switch must be unique. If not, change one of the duplicate names. All Zone Set and Zone names must conform to the Fibre Channel (FC) Standards for Zone Naming (ANSI T11/00-427v3):

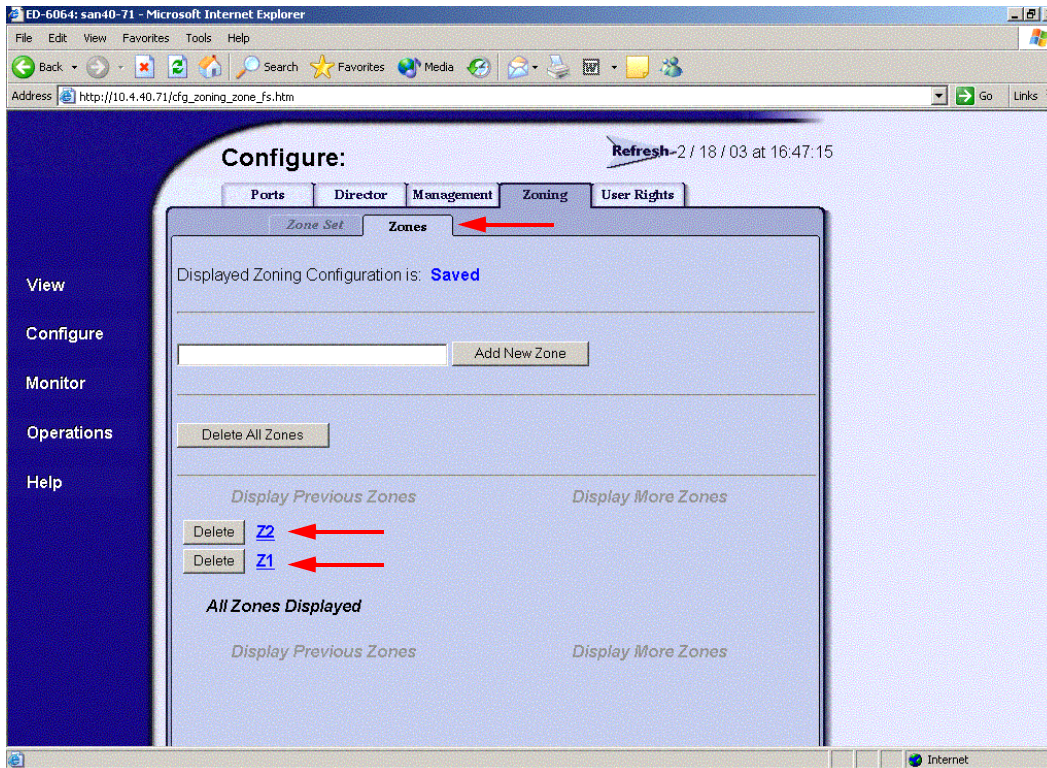
1. Must be 1–64 characters in length.
2. All characters are ASCII.
3. First character is [a–z] or [A–Z].
4. All other characters must be [a–z], [A–Z], [0–9], or the _ character. Other characters (\$-^) may not be supported by all vendors and should be avoided.

McDATA SANpilot Web Management

1. Start McDATA SANpilot Web Management. The **Main Director View** dialog box displays.
2. On the navigation panel, select **Configure**. The **Configure** dialog box displays. Select the **Zoning** tab, then select the **ZoneSet** tab. Verify that the Zone Set name conforms to the standards for zone naming as discussed under “[Active Zone Set Names](#)” on page 271.



3. On the navigation panel, select **Configure**. The **Configure** dialog box displays. Select the **Zoning** tab, then select the **Zones** tab. Verify that the Zone names conform to the standards for zone naming as discussed under “Active Zone Set Names” on page 271.



McDATA Telnet CLI

NOTE: Use the following CLI commands when McDATA SANpilot Web Management is not available.

```
Username: Administrator
Password: xxxxxxxx
Root> show
Show> zoning
```

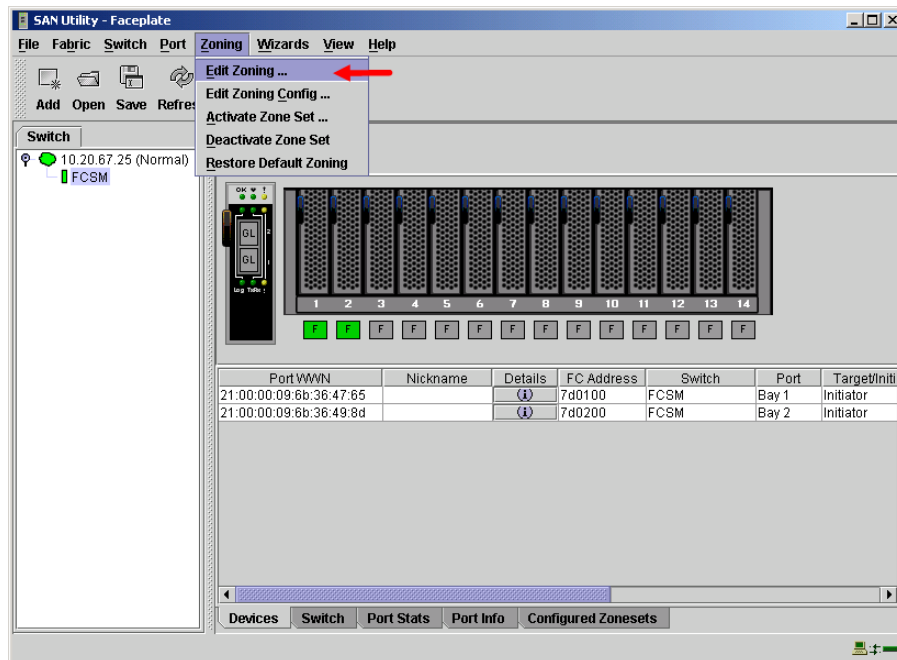
Verify that the Zone Set and Zone Names conform to the standards for zone naming as discussed under “Active Zone Set Names” on page 271.

IBM eServer BladeCenter GUI

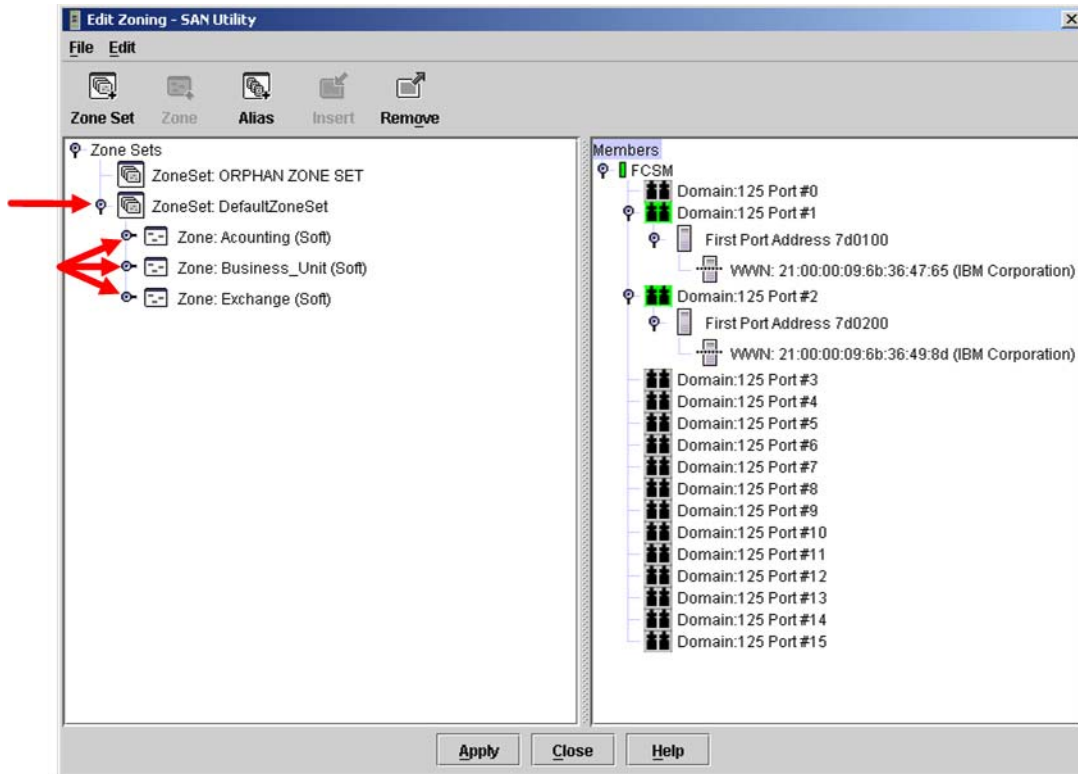
NOTE: You can use the SAN Utility to modify all IBM eServer BladeCenter switch modules. You can use the SAN Browser to modify only the QLogic 6-port Enterprise Fibre Channel Switch Module for IBM eServer BladeCenter. The screen images differ, but the procedures for the SAN Utility and SAN Browser are the same.

Do the following to modify IBM eServer BladeCenter switch modules using the SAN Utility:

1. Start the SAN Utility. The **SAN Utility—Faceplate** dialog box displays.
2. From the **SAN Utility—Faceplate** dialog box **Zoning** menu, select **Edit Zoning**.

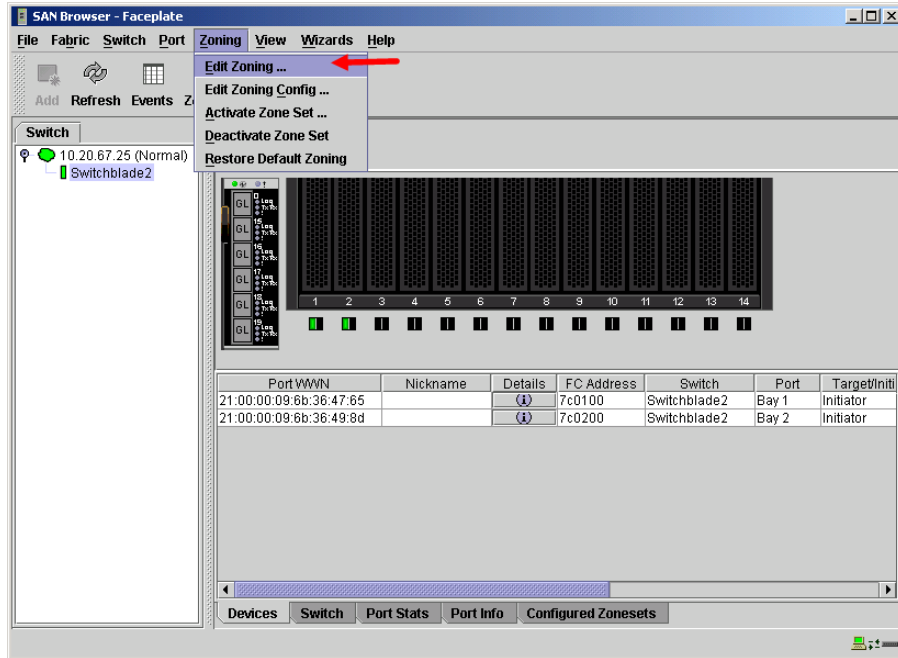


3. From the **Edit Zoning — SAN Utility** dialog box, compare the Zone Set and Zone names from each switch to ensure that none have the same name and the names conform to the standards for zone naming as discussed under [“Active Zone Set Names”](#) on page 271.

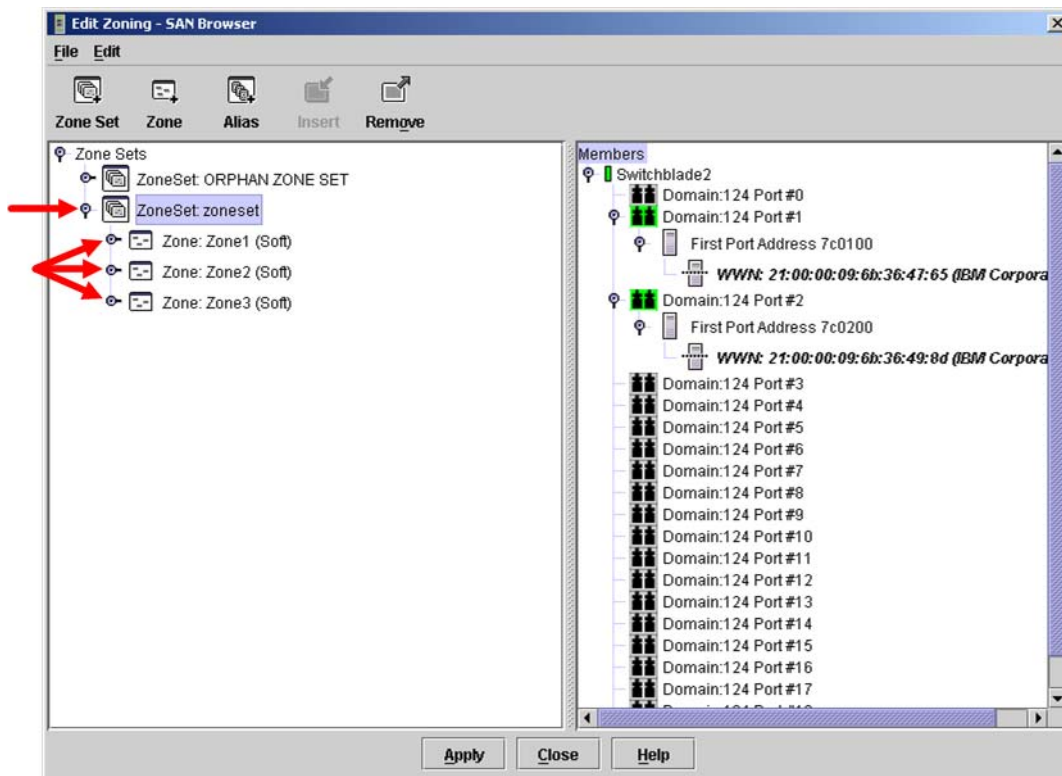


Do the following to modify the QLogic 6-port Enterprise Fibre Channel Switch Module for IBM eServer BladeCenter using the SAN Browser:

1. Start the SAN Browser. The **SAN Browser—Faceplate** dialog box displays.
2. From the **SAN Browser—Faceplate** dialog box **Zoning** menu, select **Edit Zoning**.



3. From the **Edit Zoning—SAN Browser** dialog box, compare the Zone Set and Zone names from each switch to ensure that none have the same name and the names conform to the standards for zone naming as discussed under “[Active Zone Set Names](#)” on page 271.



IBM eServer BladeCenter CLI

NOTE: Use the following CLI commands when the IBM eServer BladeCenter GUI is not available.

Login: **USERID**

Password: **xxxxxxxx**

IBM eServer BladeCenter #> **zone list**

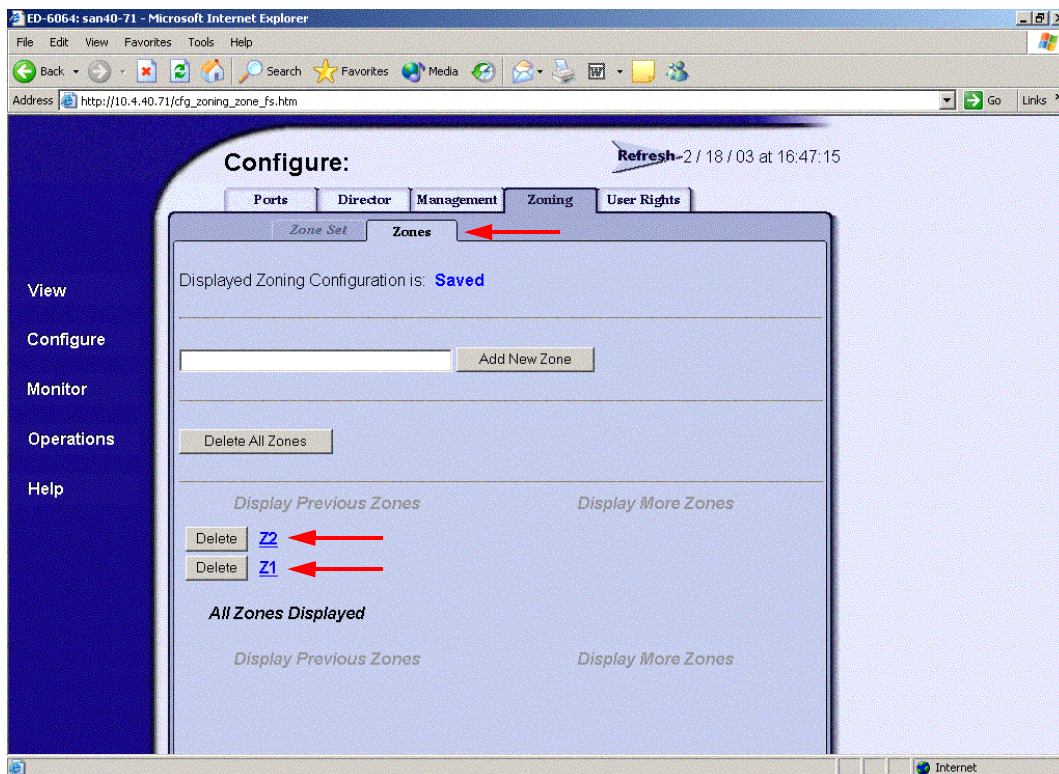
Zone Types

All zone members must be specified by a world wide port name (WWPN) in order to comply with Fibre Channel standards. Any zone member not specified by WWPN cannot participate in the fabric. Below are steps to confirm the zone types.

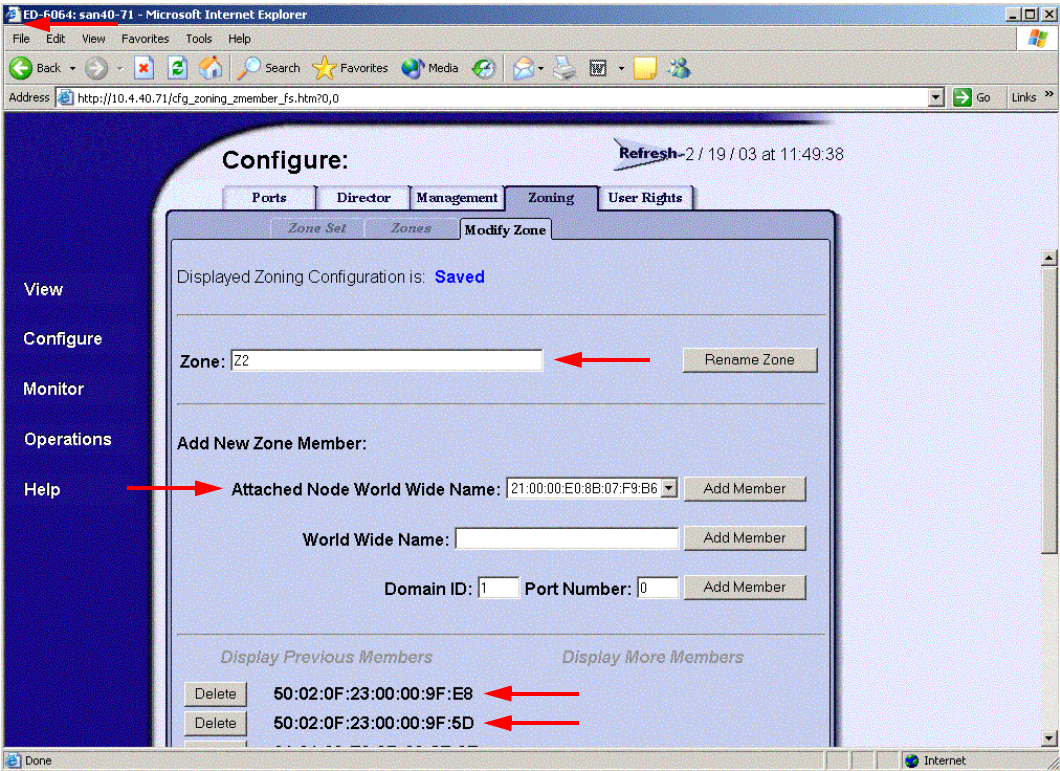
NOTE: A world wide name (WWN) consists of a world wide node name (WWNN) and one or more WWPNs. References in this guide to WWN actually refer to the WWPN.

McDATA Spheron Web Management

1. Start McDATA SANpilot Web Management. The **Main Director View** dialog box displays.
2. On the navigation panel, select **Configure**. The **Configure** dialog box displays. Select the **Zoning** tab, then select the **Zones** tab. Select each zone.



3. For each the zone selected in step 2, verify that all members are specified by WWN.



McDATA Telnet CLI

NOTE: **NOTE:** Use the following CLI commands when McDATA SANpilot Web Management is not available.

Username: **Administrator**

Password: **xxxxxxxx**

Verify that all of the Zone members are specified by WWN.

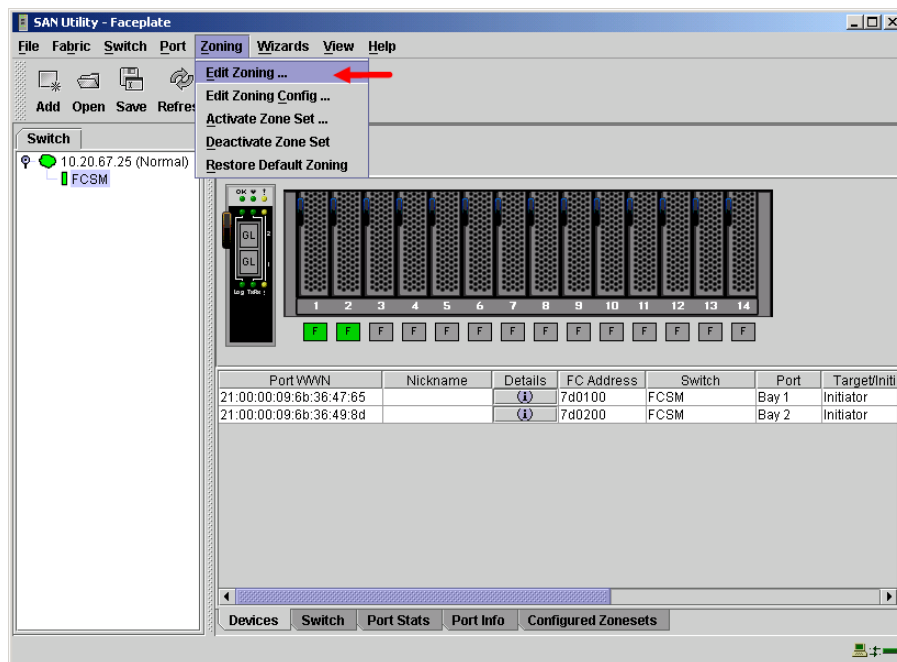
```
Root> show
Show> zoning
Active Zone Set
Default Zone Enabled:      False
Zone Set:  Interop_Set
  Zone:  Z2
    Zone Member:  50:02:0F:23:00:00:9F:E8
    Zone Member:  50:02:0F:23:00:00:9F:5D
    Zone Member:  21:01:00:E0:8B:22:6E:2E
    Zone Member:  21:00:00:E0:8B:09:CA:63
    Zone Member:  21:00:00:E0:8B:09:8F:5E
    Zone Member:  21:00:00:E0:8B:07:4C:B7
    Zone Member:  21:00:00:E0:8B:06:8E:67
    Zone Member:  21:00:00:E0:8B:06:8A:67
```

IBM eServer BladeCenter GUI

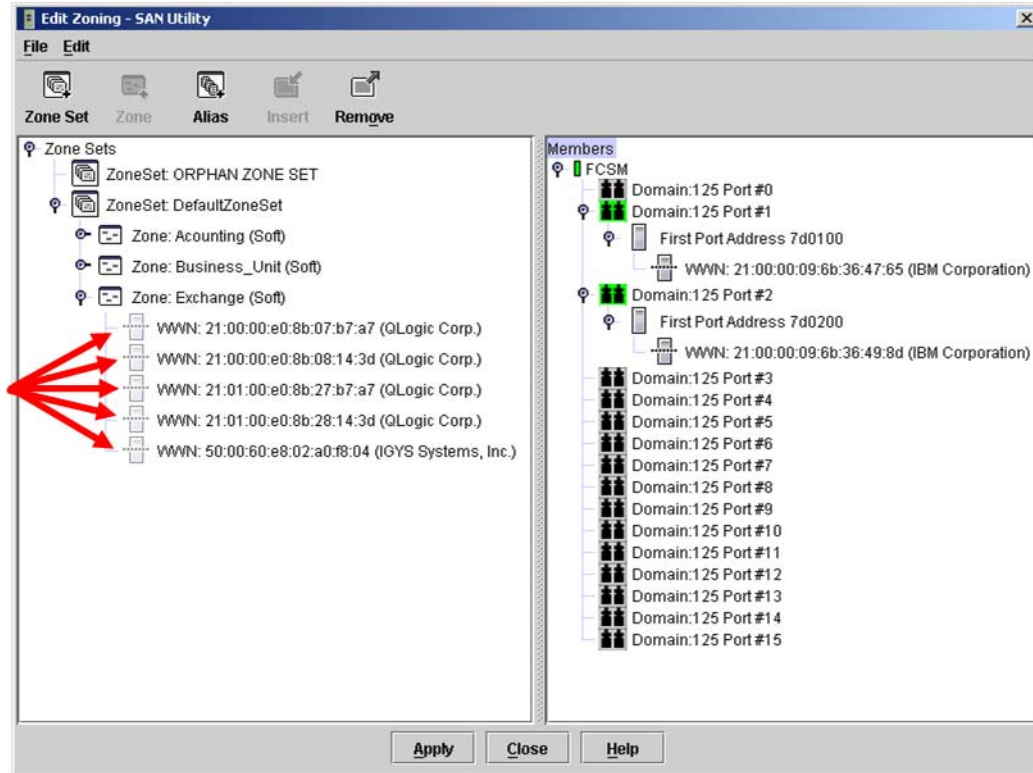
NOTE: You can use the SAN Utility to modify all IBM eServer BladeCenter switch modules. You can use the SAN Browser to modify only the QLogic 6-port Enterprise Fibre Channel Switch Module for IBM eServer BladeCenter. The screen images differ, but the procedures for the SAN Utility and SAN Browser are the same.

Do the following to modify IBM eServer BladeCenter switch modules using the SAN Utility:

1. Start the SAN Utility. The **SAN Utility—Faceplate** dialog box displays.
2. From the **SAN Utility—Faceplate** dialog box **Zoning** menu, select **Edit Zoning**.

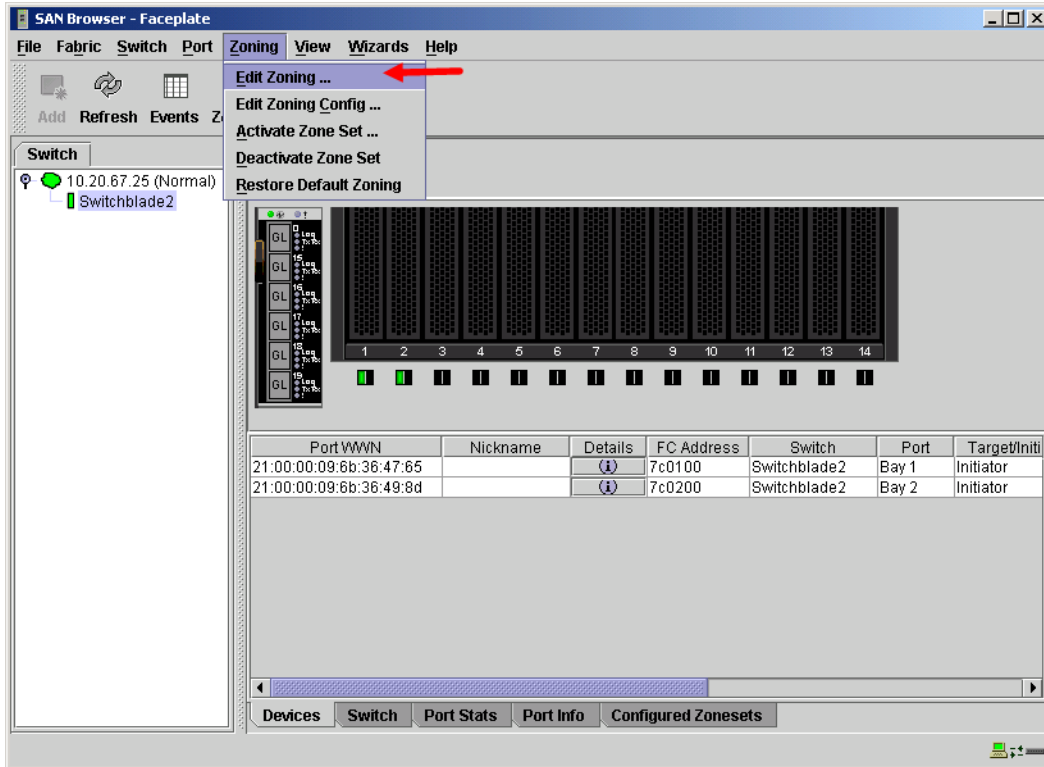


3. The **Edit Zoning—SAN Utility** dialog box displays. Confirm that all zone members are listed as WWN.

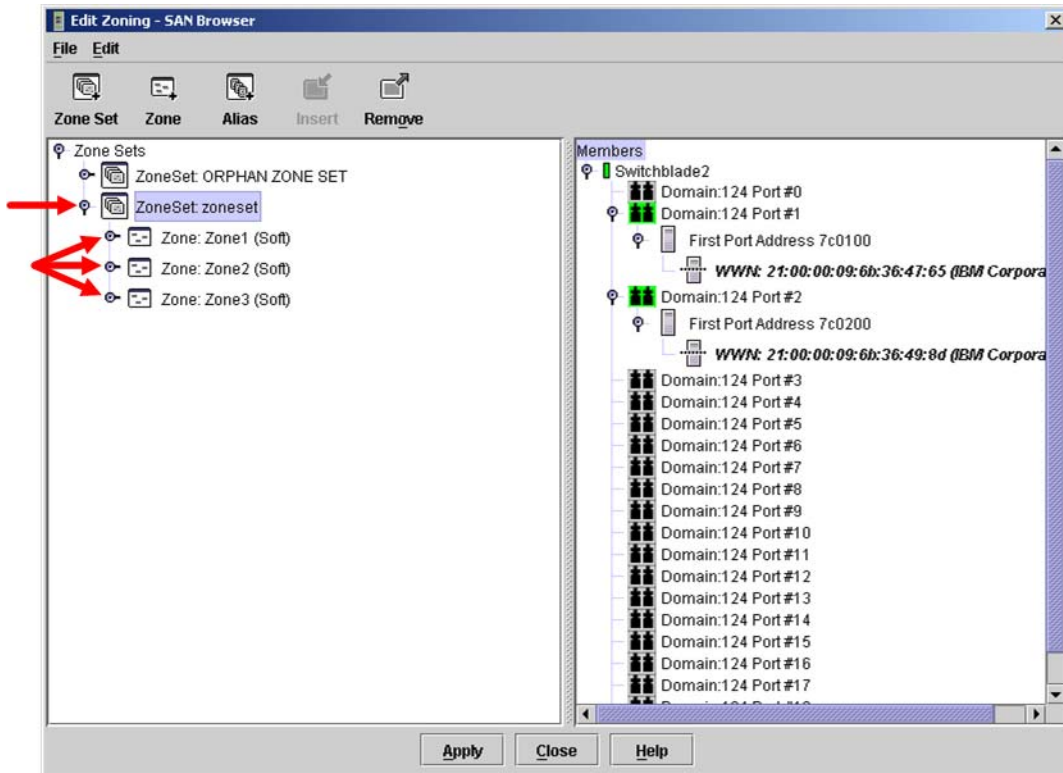


Do the following to modify the QLogic 6-port Enterprise Fibre Channel Switch Module for IBM eServer BladeCenter using the SAN Browser:

1. Start the SAN Browser. The **SAN Browser—Faceplate** dialog box displays.
2. From the **SAN Browser—Faceplate** dialog box **Zoning** menu, select **Edit Zoning**.



3. The **Edit Zoning—SAN Browser** dialog box displays. Do the following:
 - a. Select a ZoneSet.
 - b. Select a Zone.
 - c. In the Zone Members section, confirm that all zone members are listed as WWN.
 - d. Repeat the above steps for each zone.



IBM eServer BladeCenter CLI

NOTE: Use the following CLI commands when the IBM eServer BladeCenter GUI is not available.

Login: **USERID**

Password: **xxxxxxxx**

IBM eServer BladeCenter #> **zone members <zone name>**

Repeat this statement for each zone and confirm that only WWNs are listed.

McDATA Specific Configuration

Not applicable.

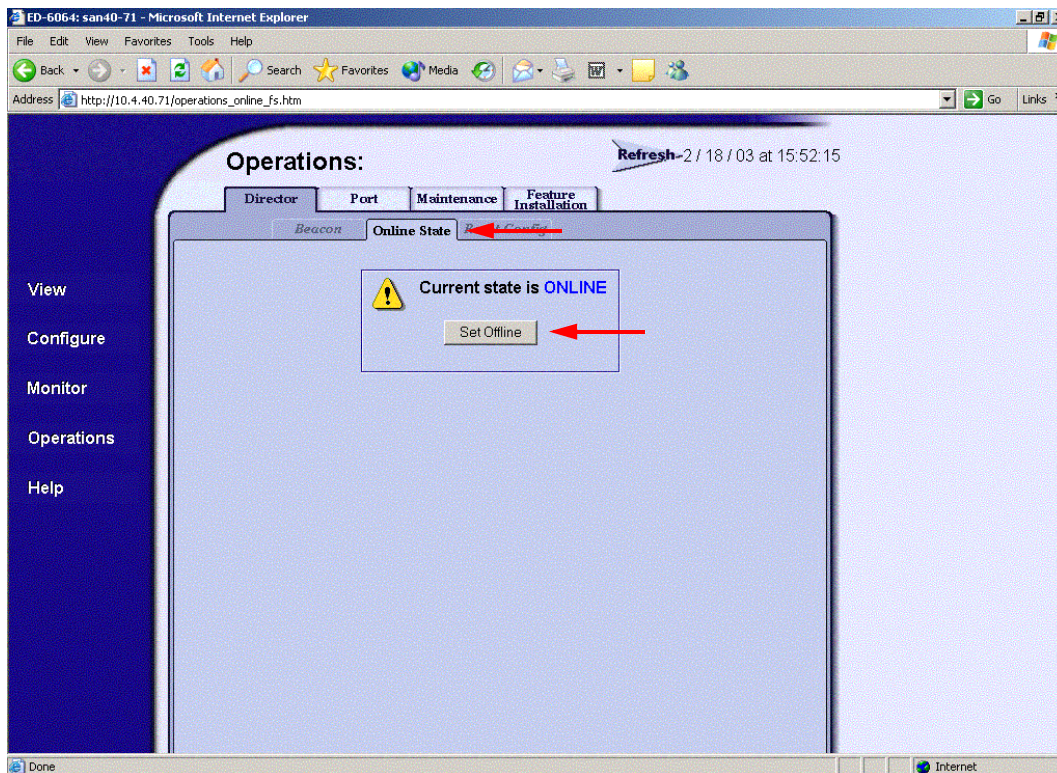
IBM eServer BladeCenter Specific Configuration

Not applicable.

Operating Mode Configuration

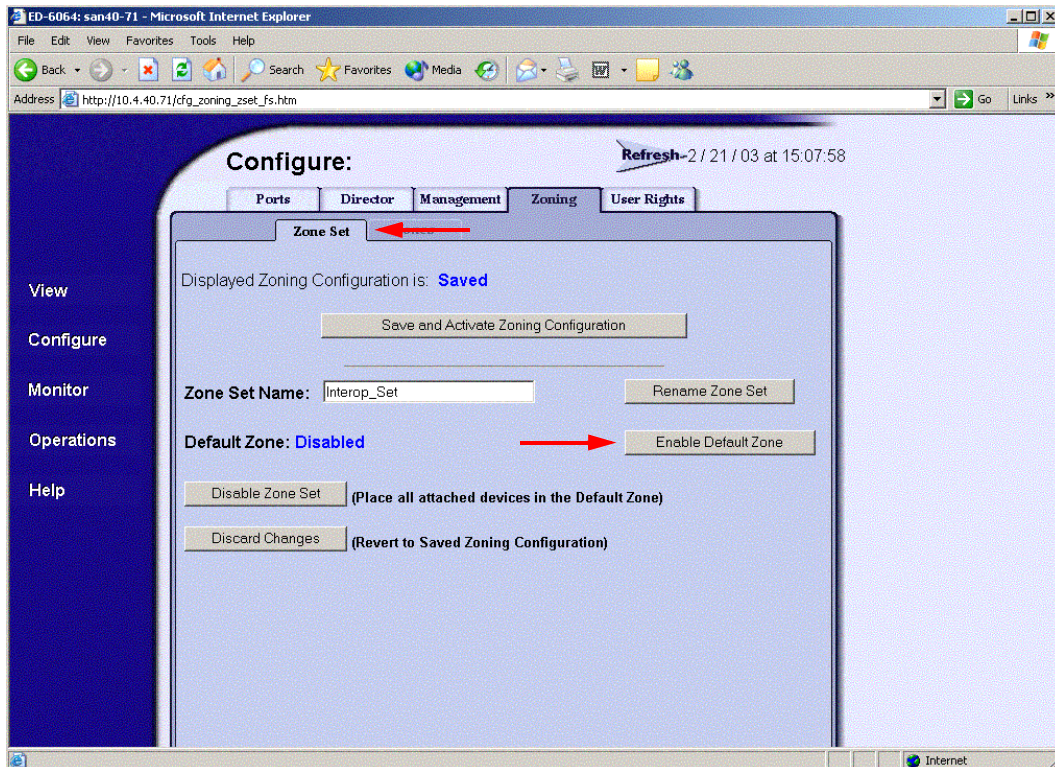
McDATA SANpilot Web Management

1. Start McDATA SANpilot Web Management. The **Main Director View** dialog box displays.
2. On the navigation panel, select **Operations**. The **Operations** dialog box displays. Select the **Director** tab, select the **Online State** tab, then click the **Set Offline** button.

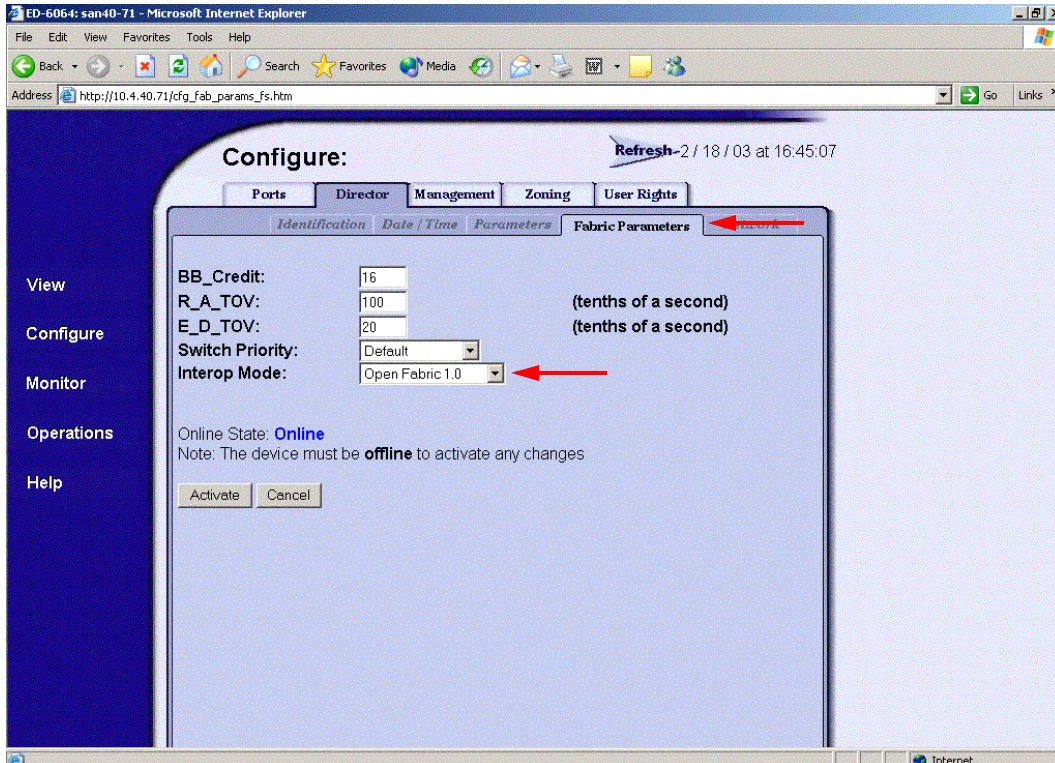


3. On the navigation panel, select **Configure**. The **Configure** dialog box displays. Select the **Zoning** tab, select the **Zone Set** tab, then the **Disable Default Zone** button.

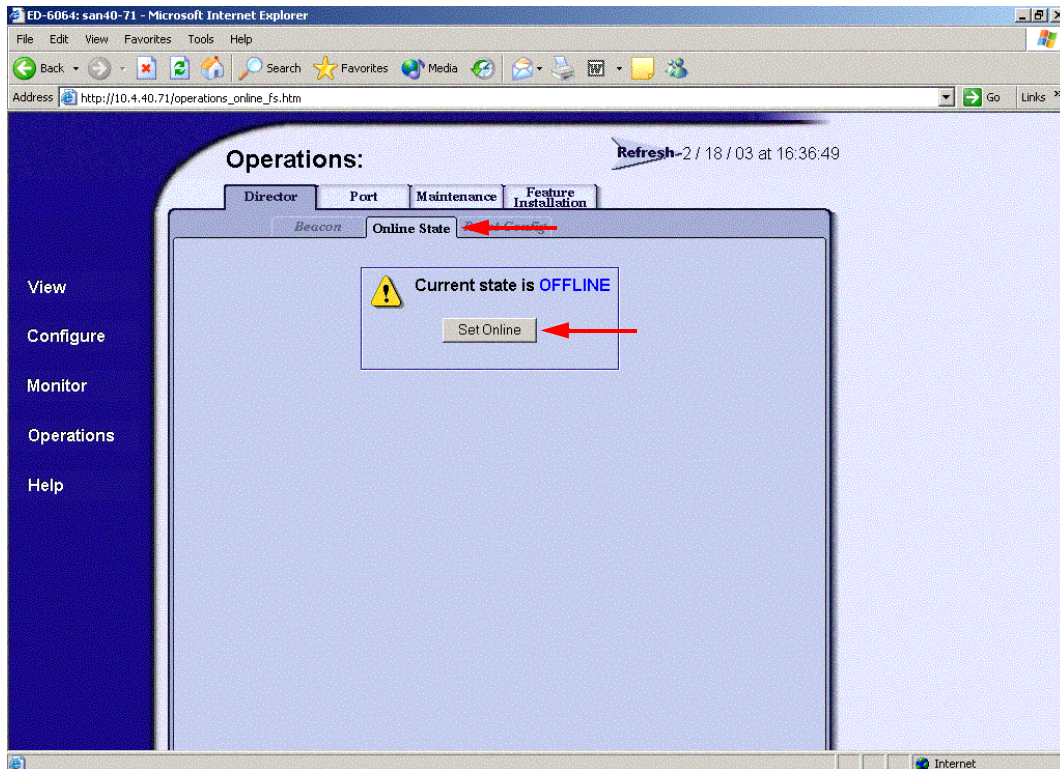
NOTE: The figure below shows what displays when the **Disable Default Zone** button is selected.



4. On the navigation panel, select **Configure**. The **Configure** dialog box displays. Select the **Director** tab, select the **Fabric Parameters** tab, then do the following:
 - a. From the **Interop Mode** list, select **Open Fabric 1.0**.
 - b. Click **Activate**.



5. On the navigation panel, select **Operations**. The **Operations** dialog box displays. Select the **Director** tab, select the **Online State** tab, then click the **Set Online** button.



McDATA Telnet CLI

NOTE: Use the following CLI commands when McDATA Sphereon Web Management is not available.

```
Username: Administrator
Password: xxxxxxxx
Root> maint system
Maint.System> setOnlineState False
Maint.System> root
Root> config zoning
Config.Zoning> setDefZoneState False
Config.Zoning> root
Root> config switch
Config.Switch> interopMode Open
Config.Switch> root
Root> maint system
Maint.System> setOnlineState True
```

IBM eServer BladeCenter SAN Utility

Not applicable.

IBM eServer BladeCenter CLI

Successful Integration Checklist

Perform the following steps after the E_port connection has been established and the fabric has had time to update. If everything verifies, the McDATA and IBM eServer BladeCenter fabrics have successfully merged.

- ✓ Compare and verify that all Zoning information has been propagated on all switches.
- ✓ Verify that the correct Zone Set is activated.
- ✓ Compare and verify that all devices are in the Name Server of each switch.
- ✓ Verify that all initiators continue to detect and have access to all targets that existed prior to the fabric merger.

After everything is verified, your fabric has merged successfully and no additional steps need to be taken. If any of the above tasks did not complete successfully, please contact IBM support.

Merging IBM eServer BladeCenter and QLogic Fabrics

The following IBM eServer BladeCenter switch modules have been tested in the IBM eServer BladeCenter environment and comply with the FC-SW-2 standard. They have tested interoperable with the following switches from QLogic that comply with the FC-SW-2 standard.

IBM eServer BladeCenter and QLogic Supported Switches

Manufacturer	Switch Model*
IBM eServer BladeCenter	IBM eServer BladeCenter 2-port Fibre Channel Switch Module QLogic 6-port Enterprise Fibre Channel Switch Module for IBM eServer BladeCenter
QLogic	SANbox 5200 SANbox2-8 SANbox2-16 SANbox2-64

Note

*For the current firmware versions, please see the *IBM eServer BladeCenter Fibre Channel Switch Interoperability Quick Reference Guide* located at <http://www.ibm.com/support>.

The following chapter provides detailed information about merging QLogic and IBM eServer BladeCenter fabrics: **QLogic SANbox 5000 Series and SANbox2 Series Switches** (see [page 293](#)).

QLogic SANbox 5000 Series and SANbox2 Series Switches

Configuration Considerations

There are no QLogic configuration considerations. No limitations exist when merging QLogic and IBM eServer BladeCenter fabrics; all features are fully supported and comply with industry standards.

IBM eServer BladeCenter configuration considerations are as follows:

- If you will be implementing the I/O stream guard feature, please contact your IBM technical support representative prior to configuring. Additional configuration procedures may be required.
- Contact IBM Technical Support to obtain the document, *IBM eServer BladeCenter Remote Boot*, if you are planning to use the boot form SAN functionality.

Integration Checklist

The following steps must be completed to successfully merge QLogic and IBM eServer BladeCenter fabrics. The remainder of this section provides detailed instructions and examples.

ATTENTION!!

- Back up the current switch configuration data prior to performing the following steps so that the configuration is available if something goes wrong (see the first step for details).
 - Disruptions in the fabric can occur as a result of performing the following steps. Therefore, it is recommended that these changes be done during down time or off-peak hours.
-
- ✓ Back up the current switch configuration data (see [“Backing Up and Restoring the Current Configuration Settings”](#) on page 295).
 - ✓ Verify that the correct version of switch firmware is installed on each switch (see [“Supported Switches”](#) on page 294).
 - ✓ Ensure that each switch has a unique Domain ID (see [“Domain ID Configuration”](#) on page 296).
 - ✓ Set all switches to the appropriate timeout values (see [“Timeout Values”](#) on page 308).
 - ✓ Ensure that all Zone set and Zone names are unique and conform to ANSI T11 standards (see [“Active Zone Set Names”](#) on page 322).
 - ✓ Verify that the fabrics have successfully merged (see [“Successful Integration Checklist”](#) on page 333).
 - ✓ Contact IBM Technical Support to obtain the document, *IBM eServer BladeCenter Remote Boot*, if you are planning to use the boot form SAN functionality.

Supported Switches

The following IBM eServer BladeCenter switch modules have been tested in the IBM eServer BladeCenter environment and comply with the FC-SW-2 standard. They have tested interoperable with the following switches from QLogic that comply with the FC-SW-2 standard.

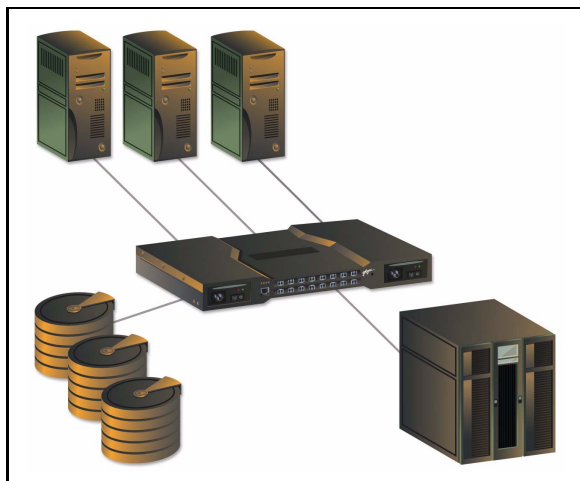
IBM eServer BladeCenter and QLogic Supported Switches

Manufacturer	Switch Model*
IBM eServer BladeCenter	IBM eServer BladeCenter 2-port Fibre Channel Switch Module
	QLogic 6-port Enterprise Fibre Channel Switch Module for IBM eServer BladeCenter
QLogic	SANbox 5200
	SANbox2-8
	SANbox2-16
	SANbox2-64

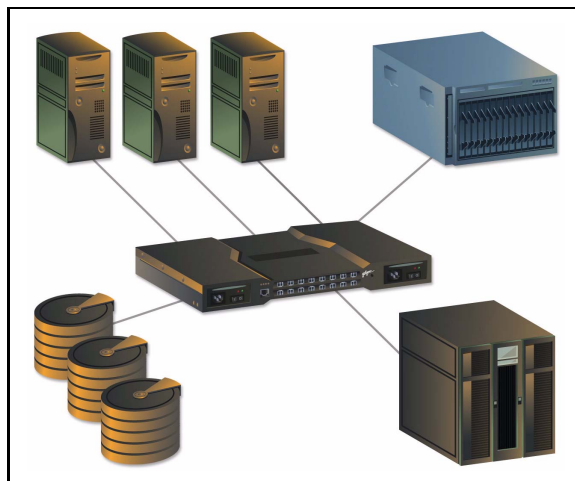
Note

*For the current firmware versions, please see the *IBM eServer BladeCenter Fibre Channel Switch Interoperability Quick Reference Guide* located at <http://www.ibm.com/support>.

The following figures illustrate a QLogic Fibre Channel fabric prior to and after merging with an IBM eServer BladeCenter.



QLogic Fibre Channel Fabric Prior to Merging with the IBM eServer BladeCenter



QLogic Fibre Channel Fabric with the IBM eServer BladeCenter

Backing Up and Restoring the Current Configuration Settings

Back up the current QLogic switch configuration data prior to following the steps to merge QLogic and IBM eServer BladeCenter fabrics so that the configuration can be restored if something goes wrong.

NOTE: For additional information, refer to the documentation provided with the switch.

This backup and restore process uses the SANbox Manager function. Note the following:

- The archive file can be used for restoring the configuration on the same switch or a replacement switch, and as a template for configuring new switches to add to a fabric.
- The switch archive must be compatible with the switch to be restored. For example, you cannot restore a SANbox2-8c switch with a SANbox2-16 archive.

Backup Procedure

Do the following to create an .XML archive file containing the QLogic configuration settings.

1. Open the **Switch** menu and select **Archive**.
2. In the **Save** window, enter a file name.
3. Click the **Save** button.

Restore Procedure

If you need to restore the QLogic switch settings, do the following using the .XML archive file:

1. Log into the fabric through the switch you want to restore. You cannot restore a switch over an inter-switch link (ISL).
2. Open the **Switch** menu and select **Restore**.
3. In the **Restore** window, enter the archive file name or browse for the file.
4. Click the **Restore** button.

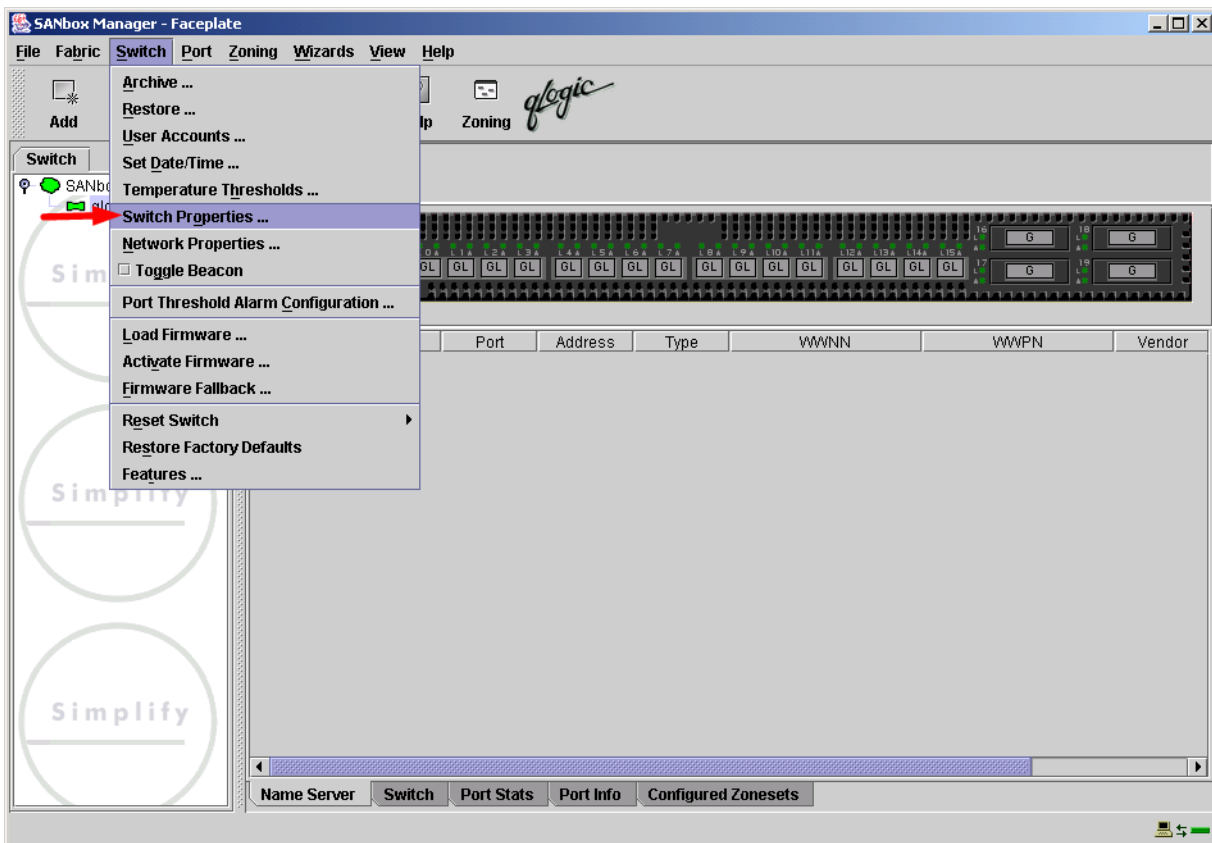
Domain ID Configuration

To ensure that there are no conflicts between switches, we recommend that each switch have an assigned Domain ID. The following steps show how to set the Domain ID on both the QLogic switch and IBM eServer BladeCenter switch module.

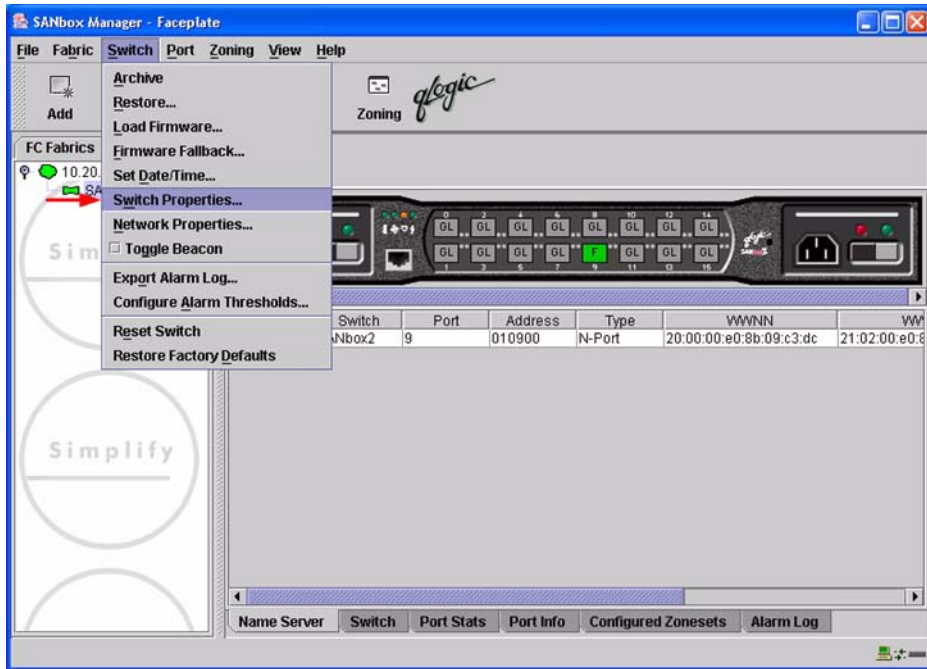
QLogic SANbox Manager GUI

1. Start the SANbox Manager application. The **SANbox Manager—Faceplate** dialog box displays.
2. From the **SANbox Manager—Faceplate** dialog box **Switch** menu, select **Switch Properties**.

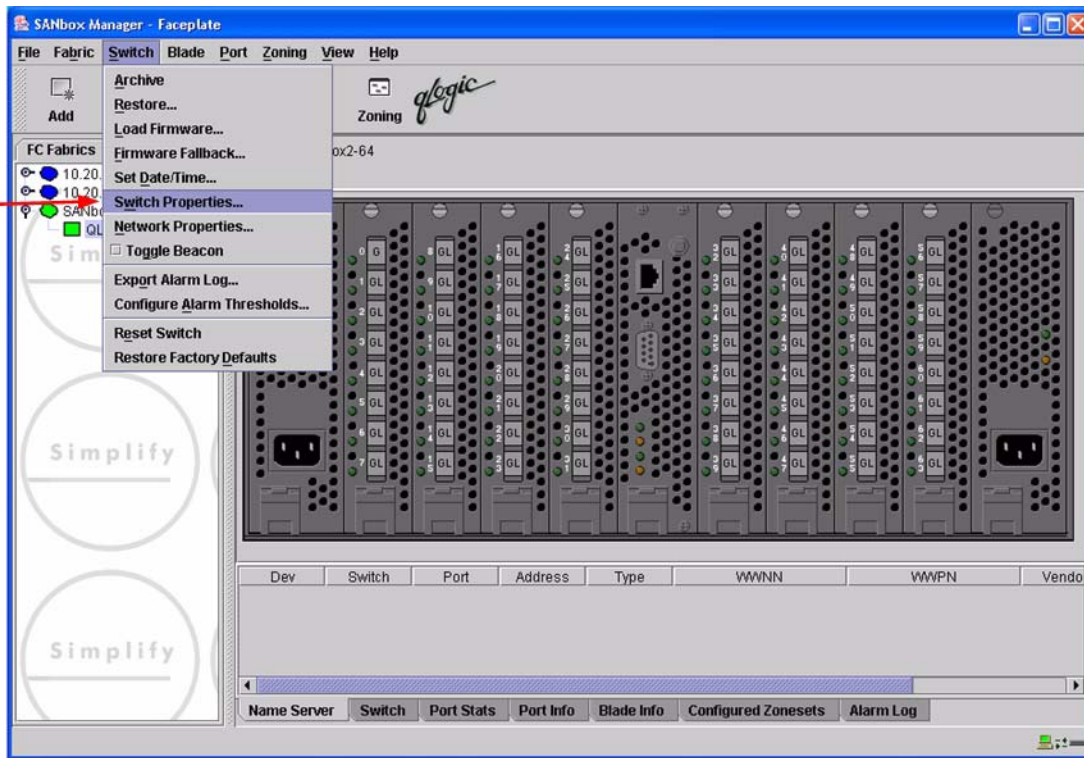
For the QLogic SANbox 5200, the following displays:



For the QLogic SANbox2-8 and SANbox2-16, the following displays:

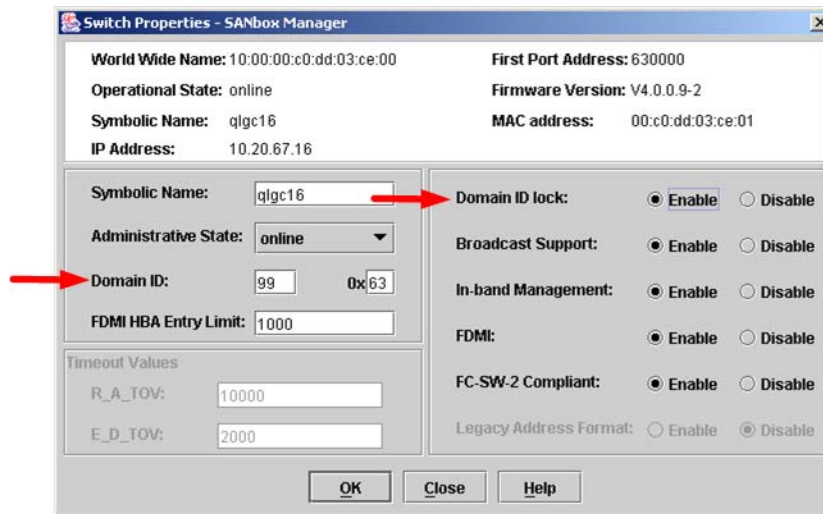


For the QLogic SANbox2-64, the following displays:

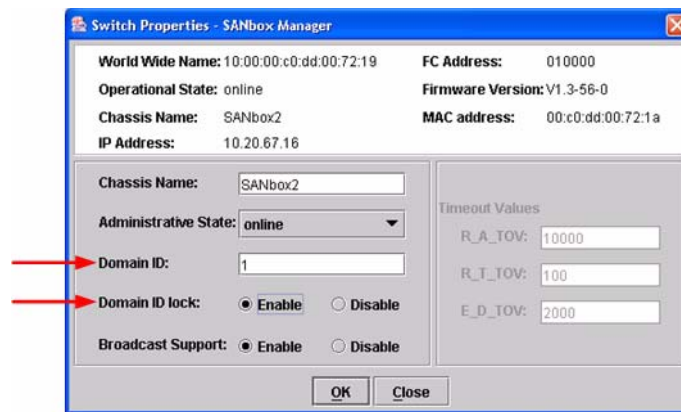


3. From the **Switch Properties—SANbox Manager** dialog box, do the following:
 - a. In the **Domain ID** box, type a unique Domain ID for the switch.
 - b. In the **Domain ID Lock** field, select **Enable** to ensure that the switch always has that Domain ID.
 - c. Click **OK**.

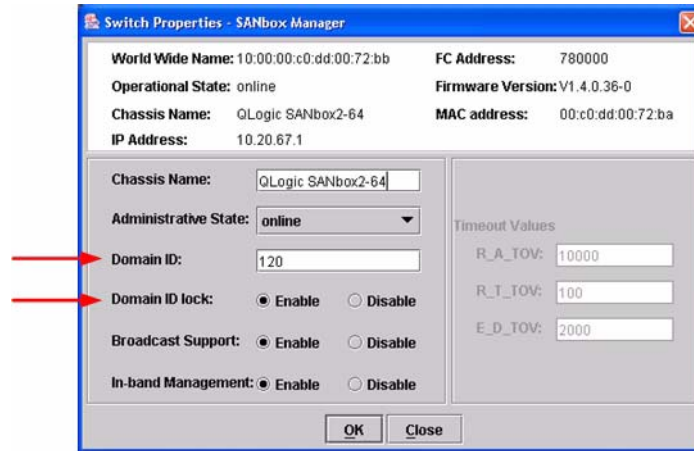
For the QLogic SANbox 5200, the following displays:



For the QLogic SANbox2-8 and SANbox2-16, the following displays:



For the QLogic SANbox2-64, the following displays:



QLogic CLI

NOTE: Use the CLI commands when the QLogic SANbox Manager GUI is not available.

```
Login: admin
Password: xxxxxxxx
SANbox 5200 #> admin start
SANbox 5200 (admin) #> config edit
SANbox 5200 (admin-config) #> set config switch

  The following options display:
  AdminState (1=Online, 2=Offline, 3=Diagnostics) [Online]
  BroadcastEnabled (True / False) [True]
  InbandEnabled (True / False) [True]
  FdmiEnabled (True / False) [True]
  FdmiEntries (decimal value, 0-1000) [1000]
  DefaultDomainID (decimal value, 1-239) [1] <choose a unique number>
  DomainIDLock (True / False) [False] True
  SymbolicName (string, max=32 chars) [SANbox 5200]
  R_A_TOV (decimal value, 100-100000 msec) [10000]
  E_D_TOV (decimal value, 10-20000 msec) [2000]
  PrincipalPriority (decimal value, 1-255) [254]
  ConfigDescription (string, max=64 chars) [SANbox 5200 FC Switch]
  FC-SW-2 Compliant (True / False) [True]
SANbox 5200 (admin-config) #> config save
SANbox 5200 (admin) #> config act

The currently active configuration will be activated.

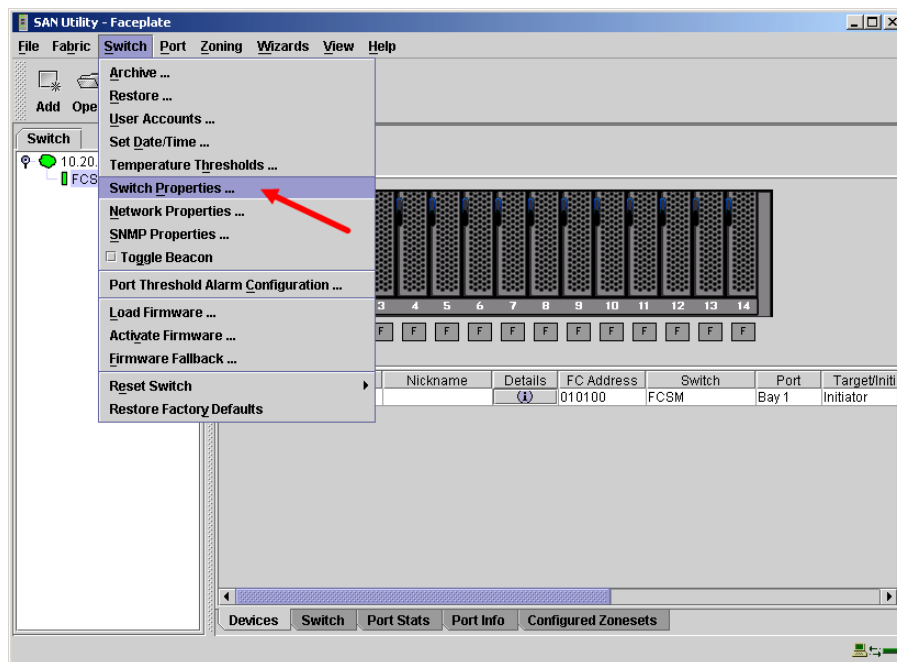
Please confirm (y/n): [n] y
```

IBM eServer BladeCenter GUI

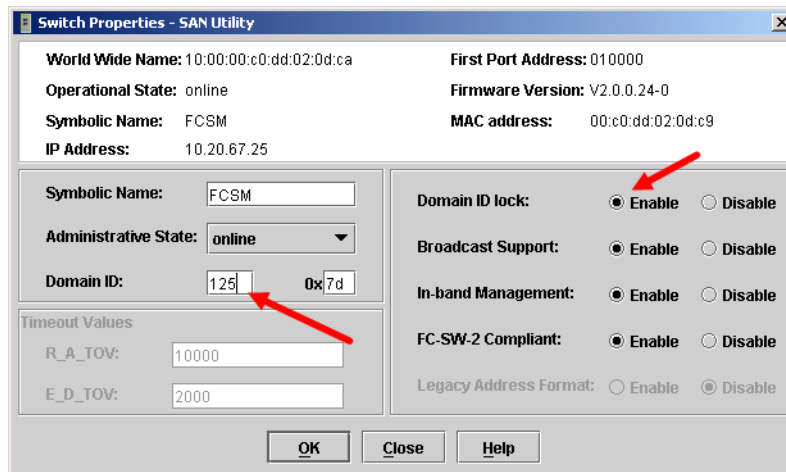
NOTE: You can use the SAN Utility to modify all IBM eServer BladeCenter switch modules. You can use the SAN Browser to modify only the QLogic 6-port Enterprise Fibre Channel Switch Module for IBM eServer BladeCenter. The screen images differ, but the procedures for the SAN Utility and SAN Browser are the same.

Do the following to modify IBM eServer BladeCenter switch modules using the SAN Utility:

1. Start the SAN Utility. The **SAN Utility—Faceplate** dialog box displays.
2. From the **SAN Utility—Faceplate** dialog box **Switch** menu, select **Switch Properties**.

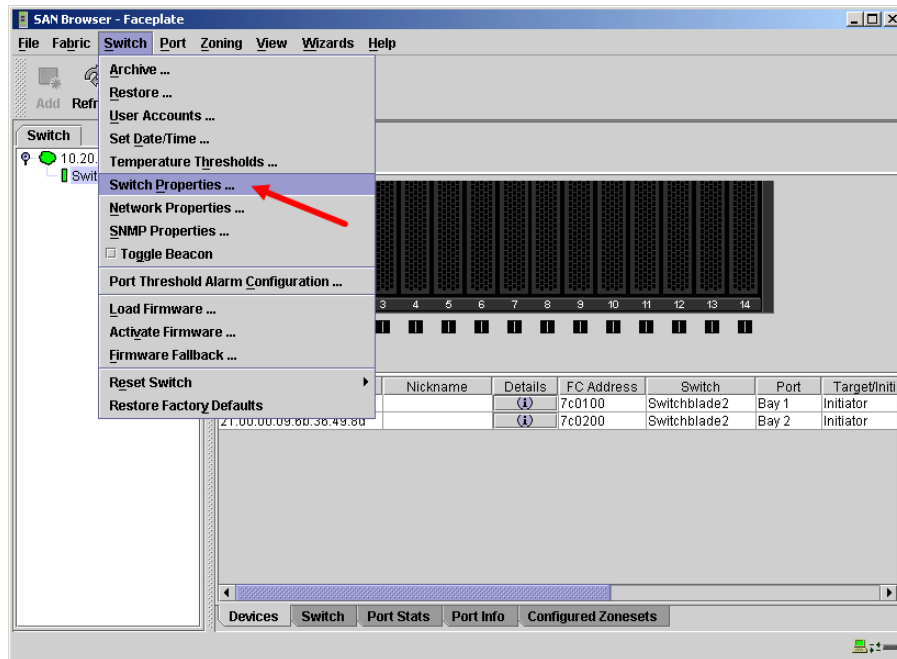


3. From the **Switch Properties—SAN Utility** dialog box, do the following:
 - a. In the **Domain ID** box, type a unique Domain ID for the switch.
 - b. Select the **Domain ID Lock Enable** radio button to ensure that the switch always has that Domain ID.
 - c. Click **OK**.

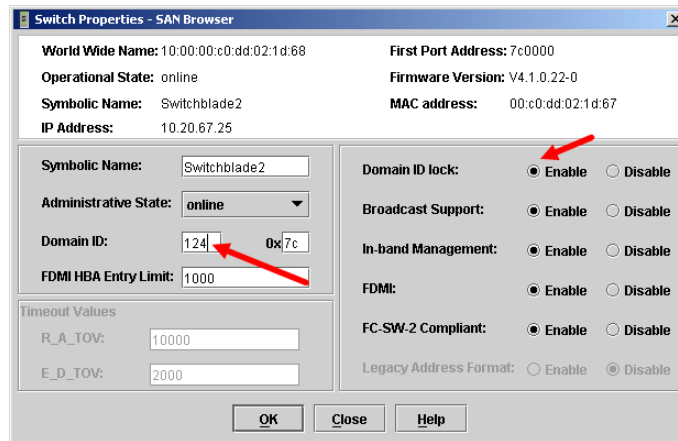


Do the following to modify the QLogic 6-port Enterprise Fibre Channel Switch Module for IBM eServer BladeCenter using the SAN Browser:

1. Start the SAN Browser. The **SAN Browser—Faceplate** dialog box displays.
2. From the **SAN Browser—Faceplate** dialog box **Switch** menu, select **Switch Properties**.



3. From the **Switch Properties—SAN Browser** dialog box, do the following:
 - a. In the **Domain ID** box, type a unique Domain ID for the switch.
 - b. Select the **Domain ID Lock Enable** radio button to ensure that the switch always has that Domain ID.
 - c. Click **OK**.



IBM eServer BladeCenter CLI

NOTE: The procedures differ based on the IBM eServer BladeCenter switch module.

Use the following CLI commands to modify the IBM eServer BladeCenter 2-port Fibre Channel Switch Module when the SAN Utility is not available:

```
Login: USERID
Password: xxxxxxxx
IBM eServer BladeCenter #> admin start
IBM eServer BladeCenter (admin) #> config edit
IBM eServer BladeCenter (admin-config) #> set config switch

  The following options display:
  AdminState (1=Online, 2=Offline, 3=Diagnostics) [Online]
  BroadcastEnabled (True / False) [True]
  InbandEnabled (True / False) [True]
  DefaultDomainID (decimal value, 1-239) [1] <choose a unique number>
  DomainIDLock (True / False) [False] True
  SymbolicName (string, max=32 chars) [Fibre Channel Switch Module]
  R_T_TOV (decimal value, 1-1000 msec) [100]
  R_A_TOV (decimal value, 100-100000 msec) [10000]
  E_D_TOV (decimal value, 10-20000 msec) [2000]
  FS_TOV (decimal value, 100-100000 msec) [5000]
  DS_TOV (decimal value, 100-100000 msec) [5000]
  PrincipalPriority (decimal value, 1-255) [254]
  ConfigDescription (string, max=64 chars) [Default Config]
IBM eServer BladeCenter (admin-config) #> config save
IBM eServer BladeCenter (admin) #> config activate
The configuration will be activated. Please confirm (y/n): [n] y
```

Use the following CLI commands to modify the QLogic 6-port Enterprise Fibre Channel Switch Module for IBM eServer BladeCenter when the SAN Utility and SAN Browser are not available:

```
Login: USERID
Password: xxxxxxxx
Switchblade2: admin> admin start
Switchblade2 (admin): admin> config edit
    The config named default is being edited.
Switchblade2 (admin-config): admin> set config switch
    A list of attributes with formatting and current values will follow.
    Enter a new value or simply press the ENTER key to accept the current
    value. If you wish to terminate this process before reaching the end of
    the list press 'q' or 'Q' and the ENTER key to do so.
    AdminState (1=Online, 2=Offline, 3=Diagnostics) [Online]
    BroadcastEnabled (True / False) [True]
    InbandEnabled (True / False) [True]
    FdmiEnabled (True / False) [True]
    FdmiEntries (decimal value, 0-1000) [1000]
    DefaultDomainID (decimal value, 1-239) [1] <choose a unique number>
    DomainIDLock (True / False) [False] true
    SymbolicName (string, max=32 chars) [Switchblade2]
    R_A_TOV (decimal value, 100-100000 msec) [10000]
    E_D_TOV (decimal value, 10-20000 msec) [2000]
    PrincipalPriority (decimal value, 1-255) [254]
    ConfigDescription (string, max=64 chars) [Qlogic 6-port Enterprise
    Switch Module for IBM eServer BladeCenter]
    FC-SW-2 Compliant (True / False) [True]
    Finished configuring attributes.
    This configuration must be saved (see config save command) and activated
    (see config activate command) before it can take effect.
    To discard this configuration use the config cancel command.
Switchblade2 (admin-config): admin> config save
    The config named default has been saved.
Switchblade2 (admin): admin> config activate
    The currently active configuration will be activated.
    Please confirm (y/n): [n] y
Switchblade2 (admin): admin> admin end
```

Timeout Values

As per FC-SW-2 Fibre Channel standards, set all switches to the following timeout values (TOV) in order to successfully establish an E_port connection:

R_A_TOV = 10 seconds (The setting is **10000**.)

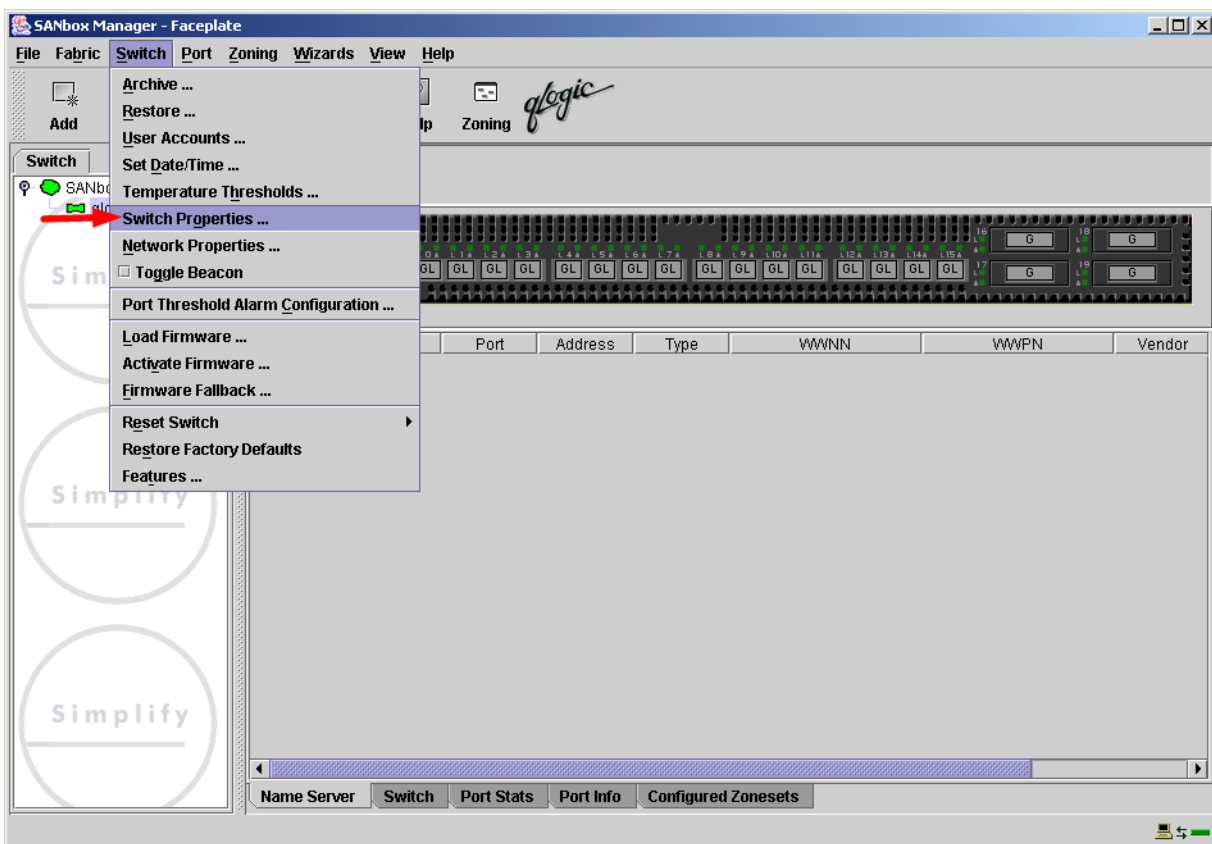
E_D_TOV = 2 seconds (The setting is **2000**.)

This section provides the steps to change these values.

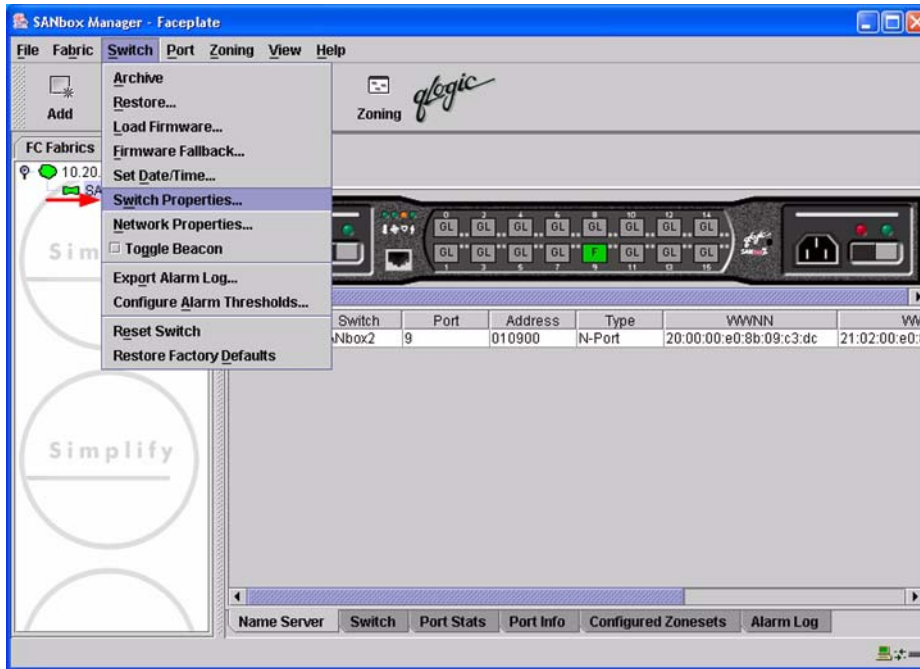
QLogic SANbox Manager GUI

ATTENTION!! The following steps take the switch offline; therefore, do not perform them on a switch being managed in-band.

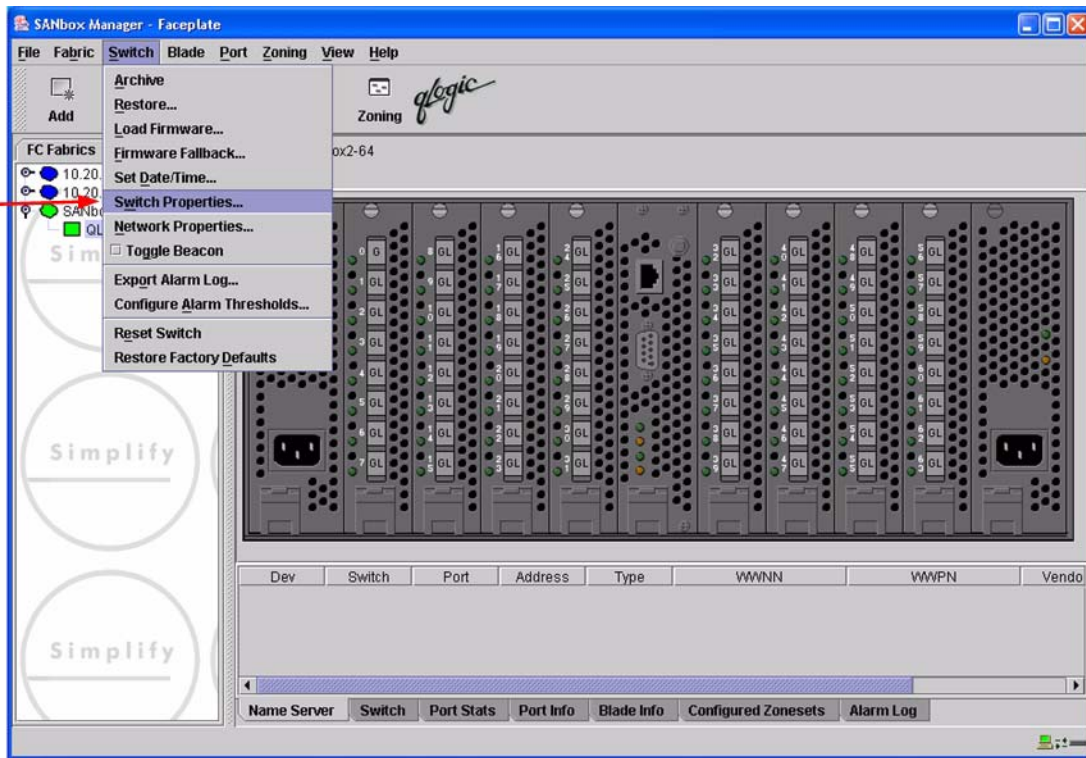
1. Start the **SANbox Manager** application. The **SANbox Manager—Faceplate** dialog box displays.
2. From the **SANbox Manager—Faceplate** dialog box **Switch** menu, select **Switch Properties**.
For the QLogic SANbox 5200, the following displays:



For the QLogic SANbox2-8 and SANbox2-16, the following displays:

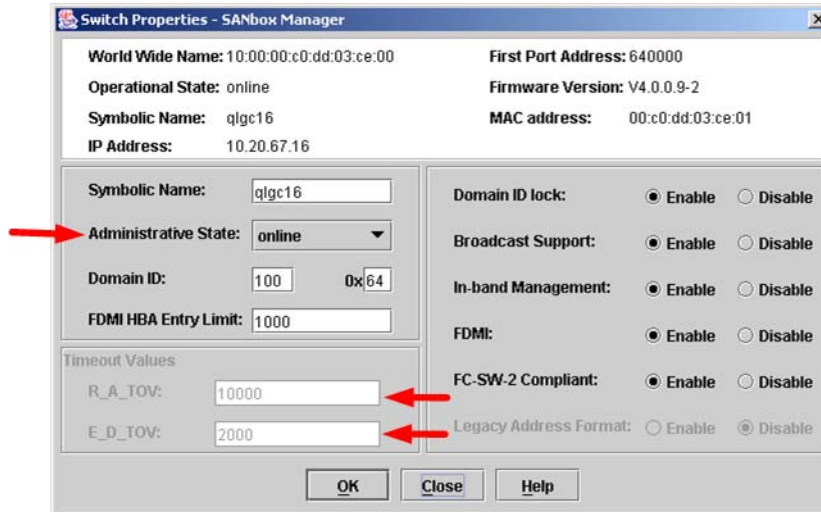


For the QLogic SANbox2-64, the following displays:

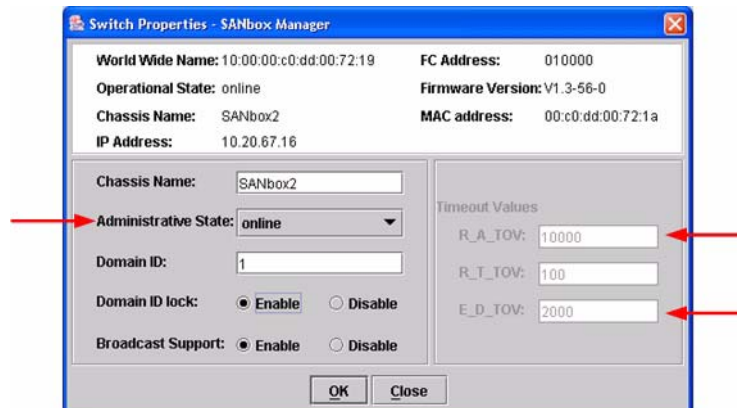


- From the **Switch Properties—SANbox Manager** dialog box, verify that **R_A_TOV** is set to **10000** and **E_D_TOV** is set to **2000**. If the settings are not correct, proceed to [step 4](#). If the settings are correct, no changes need to be made; proceed to the next appropriate section.

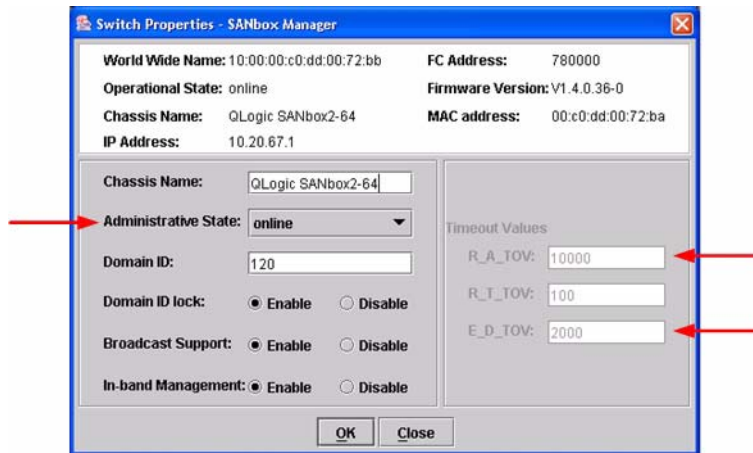
For the QLogic SANbox 5200, the following displays:



For the QLogic SANbox2-8 and SANbox2-16, the following displays:



For the QLogic SANbox2-64, the following displays:



4. From the **Switch Properties—SANbox Manager** dialog box **Administrative State** list, select **offline**. Click **OK**.
5. Re-enter the **Switch Properties—SANbox Manager** dialog box (see step 2). Do the following:
 - a. In the **R_A_TOV** box, change the setting to **10000**.
 - b. In the **E_D_TOV** box, change the setting to **2000**.
 - c. Click **OK**.
6. Re-enter the **Switch Properties—SANbox Manager** dialog box (see step 2). In the **Administrative State** list, select **Online**. Click **OK**.

QLogic CLI

NOTE: Use the following CLI commands when the QLogic SANbox Manager GUI is not available.

Login: **admin**

Password: **xxxxxxxx**

Use the following command to verify that R_A_TOV is set to 10000 and E_D_TOV is set to 2000.

```
SANbox2 #> show config switch
```

Use the following command to verify that R_A_TOV is set to 10000 and E_D_TOV is set to 2000.

If these timeout values are *not* correct, continue with this section. If the settings are correct, no changes need to be made; proceed with the next appropriate section.

```
SANbox 5200 #> admin start
```

```
SANbox 5200 (admin) #> config edit
```

```
SANbox 5200 (admin-config) #> set config switch
```

The following options display:

```
AdminState (1=Online, 2=Offline, 3=Diagnostics) [Online]
```

```
BroadcastEnabled (True / False) [True]
```

```
InbandEnabled (True / False) [True]
```

```
FdmiEnabled (True / False) [True]
```

```
FdmiEntries (decimal value, 0-1000) [1000]
```

```
DefaultDomainID (decimal value, 1-239) [100]
```

```
DomainIDLock (True / False) [True]
```

```
SymbolicName (string, max=32 chars) [SANbox 5200]
```

```
R_A_TOV (decimal value, 100-100000 msec) [9000] 10000
```

```
E_D_TOV (decimal value, 10-20000 msec) [200] 2000
```

```
PrincipalPriority (decimal value, 1-255) [254]
```

```
ConfigDescription (string, max=64 chars) [SANbox 5200 FC Switch]
```

```
FC-SW-2 Compliant (True / False) [True]
```

```
SANbox 5200 (admin-config) #> config save
```

```
SANbox 5200 (admin) #> config act
```

The currently active configuration will be activated.

```
Please confirm (y/n): [n] y
```

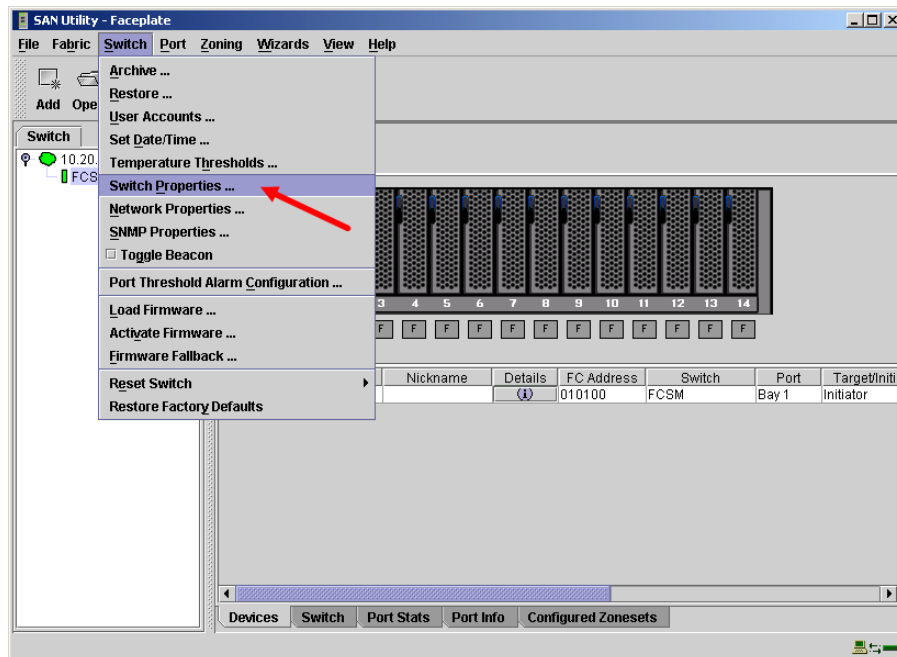
IBM eServer BladeCenter GUI

ATTENTION!! The following steps take the switch offline; therefore, do not perform them on a switch being managed in-band.

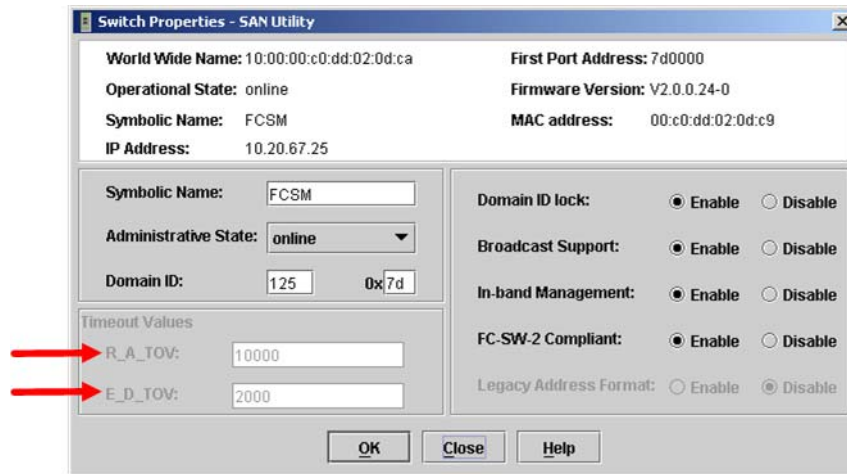
NOTE: You can use the SAN Utility to modify all IBM eServer BladeCenter switch modules. You can use the SAN Browser to modify only the QLogic 6-port Enterprise Fibre Channel Switch Module for IBM eServer BladeCenter. The screen images differ, but the procedures for the SAN Utility and SAN Browser are the same.

Do the following to modify IBM eServer BladeCenter switch modules using the SAN Utility:

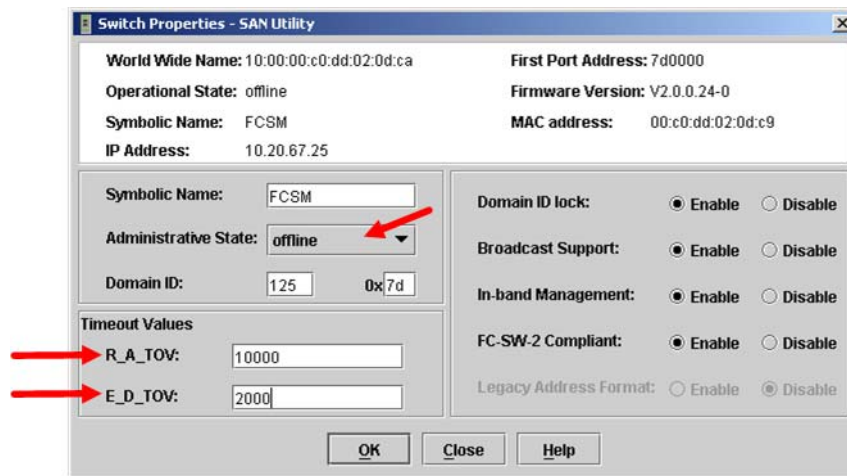
1. Start the SAN Utility. The **SAN Utility—Faceplate** dialog box displays.
2. From the **SAN Utility—Faceplate** dialog box **Switch** menu, select **Switch Properties**.



- From the **Switch Properties—SAN Utility** dialog box, verify that **R_A_TOV** is set to **10000** and **E_D_TOV** is set to **2000**. If the settings are *not* correct, proceed to [step 4](#). If the settings are correct, no changes need to be made; proceed to the next appropriate section.



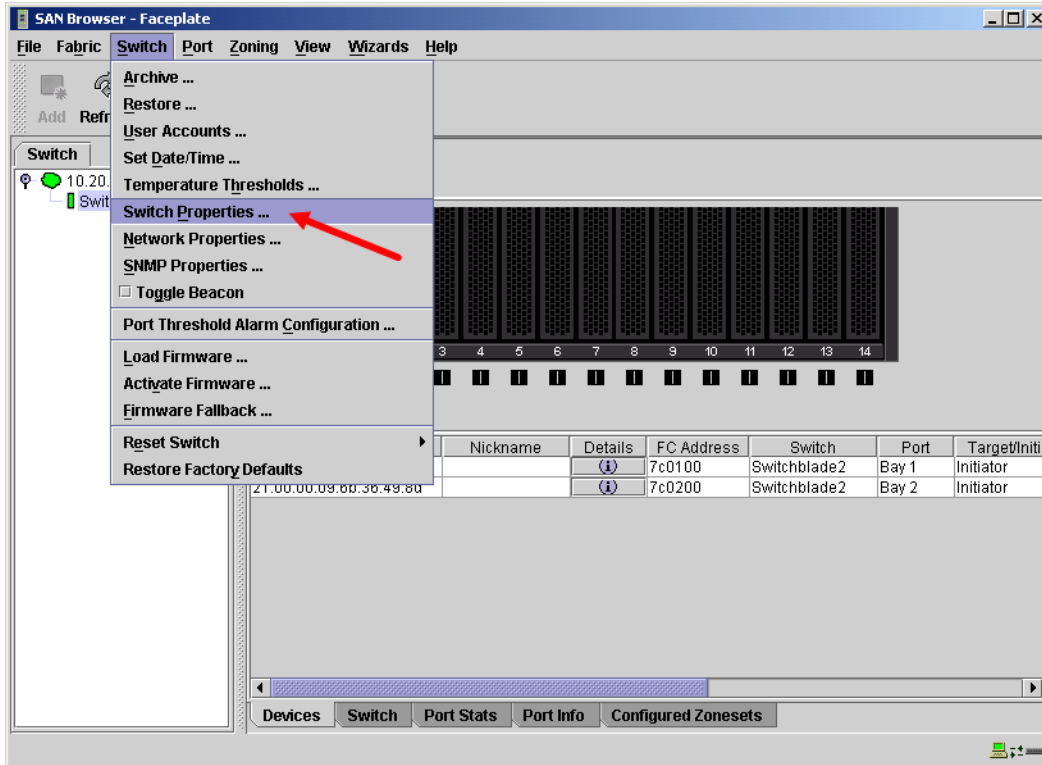
4. To modify the timeout value settings, do the following:
 - a. In the **Administrative State** drop-down box, select **offline**. Click **OK**.
 - b. The **SAN Utility—Faceplate** dialog box redisplay. Repeat [step 2](#) to redisplay the **Switch Properties—SAN Utility** dialog box.
 - c. In the Timeout Values section **R_A_TOV** box, enter **10000**.
 - d. In the Timeout Values section **E_D_TOV** box, enter **2000**.
 - e. In the **Administrative State** drop-down box, select **online**. Click **OK**.



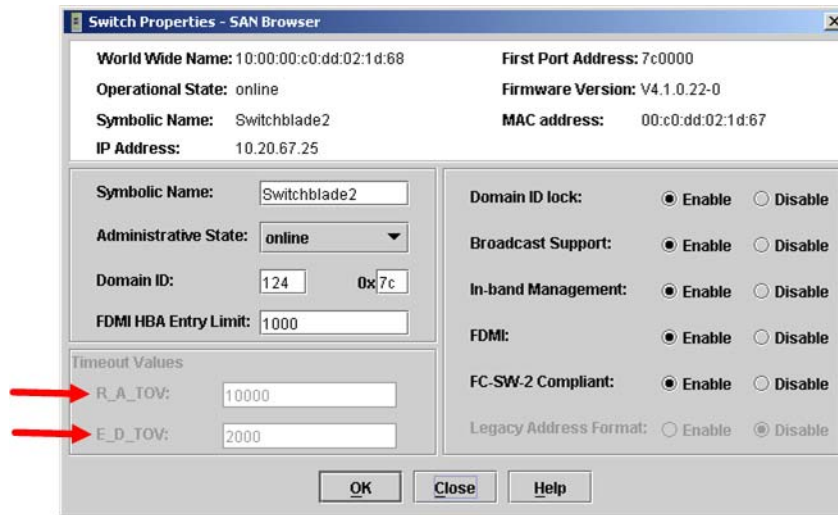
5. The **SAN Utility—Faceplate** dialog box redisplay. Repeat [step 2](#) to redisplay the **Switch Properties—SAN Utility** dialog box. Verify your changes ([see step 3](#)).

Do the following to modify the QLogic 6-port Enterprise Fibre Channel Switch Module for IBM eServer BladeCenter using the SAN Browser:

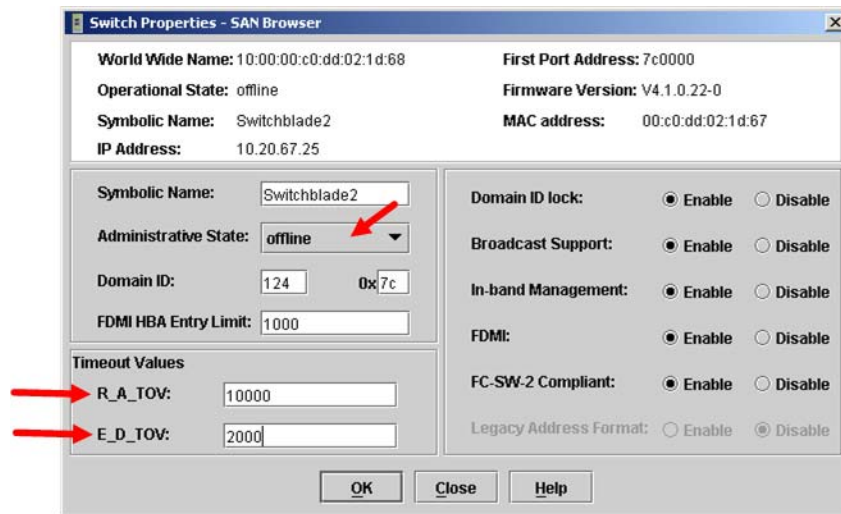
1. Start the SAN Browser. The **SAN Browser—Faceplate** dialog box displays.
2. From the **SAN Browser—Faceplate** dialog box **Switch** menu, select **Switch Properties**.



3. From the **Switch Properties—SAN Browser** dialog box, verify that **R_A_TOV** is set to **10000** and **E_D_TOV** is set to **2000**. If the settings are *not* correct, proceed to [step 4](#). If the settings are correct, no changes need to be made; proceed to the next appropriate section.



4. To modify the timeout value settings, do the following:
 - a. In the **Administrative State** drop-down box, select **offline**. Click **OK**.
 - b. The **SAN Browser—Faceplate** dialog box redisplay. Repeat [step 2](#) to redisplay the **Switch Properties—SAN Browser**.
 - c. In the Timeout Values section **R_A_TOV** box, enter **10000**.
 - d. In the Timeout Values section **E_D_TOV** box, enter **2000**.
 - e. In the **Administrative State** drop-down box, select **online**. Click **OK**.



5. The **SAN Browser—Faceplate** dialog box redisplay. Repeat [step 2](#) to redisplay the **Switch Properties—SAN Browser** dialog box. Verify your changes ([see step 3](#)).

IBM eServer BladeCenter CLI

ATTENTION!! The following steps take the switch offline; therefore, do not perform them on a switch being managed in-band.

NOTE: The procedures differ based on the IBM eServer BladeCenter switch module.

Use the following CLI commands to modify the IBM eServer BladeCenter 2-port Fibre Channel Switch Module when the SAN Utility is not available:

Login: **USERID**

Password: **xxxxxxxx**

Use the following command to verify that R_A_TOV is set to 10000 and E_D_TOV is set to 2000.

```
IBM eServer BladeCenter #> show config switch
```

If these timeout values are *not* correct, continue with this section. If the settings are correct, no changes need to be made; proceed with the next appropriate section.

```
IBM eServer BladeCenter #> admin start
```

```
IBM eServer BladeCenter (admin) #> config edit
```

```
IBM eServer BladeCenter (admin-config) #> set config switch
```

The following options display:

```
AdminState (1=Online, 2=Offline, 3=Diagnostics) [Online]
BroadcastEnabled (True / False) [True]
InbandEnabled (True / False) [True]
DefaultDomainID (decimal value, 1-239) [1]
DomainIDLock (True / False) [True]
SymbolicName (string, max=32 chars) [Fibre Channel Switch Module]
R_T_TOV (decimal value, 1-1000 msec) [100]
R_A_TOV (decimal value, 100-100000 msec) [9000]    10000
E_D_TOV (decimal value, 10-20000 msec) [1000]    2000
FS_TOV (decimal value, 100-100000 msec) [5000]
DS_TOV (decimal value, 100-100000 msec) [5000]
PrincipalPriority (decimal value, 1-255) [254]
ConfigDescription (string, max=64 chars) [Default Config]
```

```
IBM eServer BladeCenter (admin-config) #> config save
```

```
IBM eServer BladeCenter (admin) #> config activate
```

```
The configuration will be activated. Please confirm (y/n): [n] y
```

Use the following CLI commands to modify the QLogic 6-port Enterprise Fibre Channel Switch Module for IBM eServer BladeCenter when the SAN Utility and SAN Browser are not available:

```
Login: USERID  
Password: xxxxxxxx
```

Use the following command to verify that R_A_TOV is set to 10000 and E_D_TOV is set to 2000.

```
Switchblade2: admin> show config switch
```

If these timeout values are *not* correct, continue with this section. If the settings are correct, no changes need to be made; proceed with the next appropriate section.

```
Switchblade2: admin>
```

```
Switchblade2: admin> admin start
```

```
Switchblade2 (admin): admin> config edit
```

```
The config named default is being edited.
```

```
Switchblade2 (admin-config): admin> set config switch
```

```
A list of attributes with formatting and current values will follow.  
Enter a new value or simply press the ENTER key to accept the current  
value. If you wish to terminate this process before reaching the end of  
the list press 'q' or 'Q' and the ENTER key to do so.
```

```
AdminState (1=Online, 2=Offline, 3=Diagnostics) [Online]
```

```
BroadcastEnabled (True / False) [True]
```

```
InbandEnabled (True / False) [True]
```

```
FdmiEnabled (True / False) [True]
```

```
FdmiEntries (decimal value, 0-1000) [1000]
```

```
DefaultDomainID (decimal value, 1-239) [124]
```

```
DomainIDLock (True / False) [True]
```

```
SymbolicName (string, max=32 chars) [Switchblade2]
```

```
R_A_TOV (decimal value, 100-100000 msec) [9000] 10000
```

```
E_D_TOV (decimal value, 10-20000 msec) [1000] 2000
```

```
PrincipalPriority (decimal value, 1-255) [254]
```

```
ConfigDescription (string, max=64 chars) [Qlogic 6-port Enterprise  
Switch Module for IBM eServer BladeCenter]
```

```
FC-SW-2 Compliant (True / False) [True]
```

```
Finished configuring attributes.  
This configuration must be saved (see config save command) and activated  
(see config activate command) before it can take effect.  
To discard this configuration use the config cancel command.
```

```
Switchblade2 (admin-config): admin> config save
```

```
The config named default has been saved.
```

```
Switchblade2 (admin): admin> config activate
```

```
The currently active configuration will be activated.
```

```
Please confirm (y/n): [n] y
```

```
Switchblade2 (admin): admin> admin end
```

Principal Switch Configuration

QLogic switches and IBM eServer BladeCenter switch modules negotiate for principal switch automatically. Therefore, there are no steps to take.

Zone Configuration

This section discusses configuring active Zone Set names and Zone types.

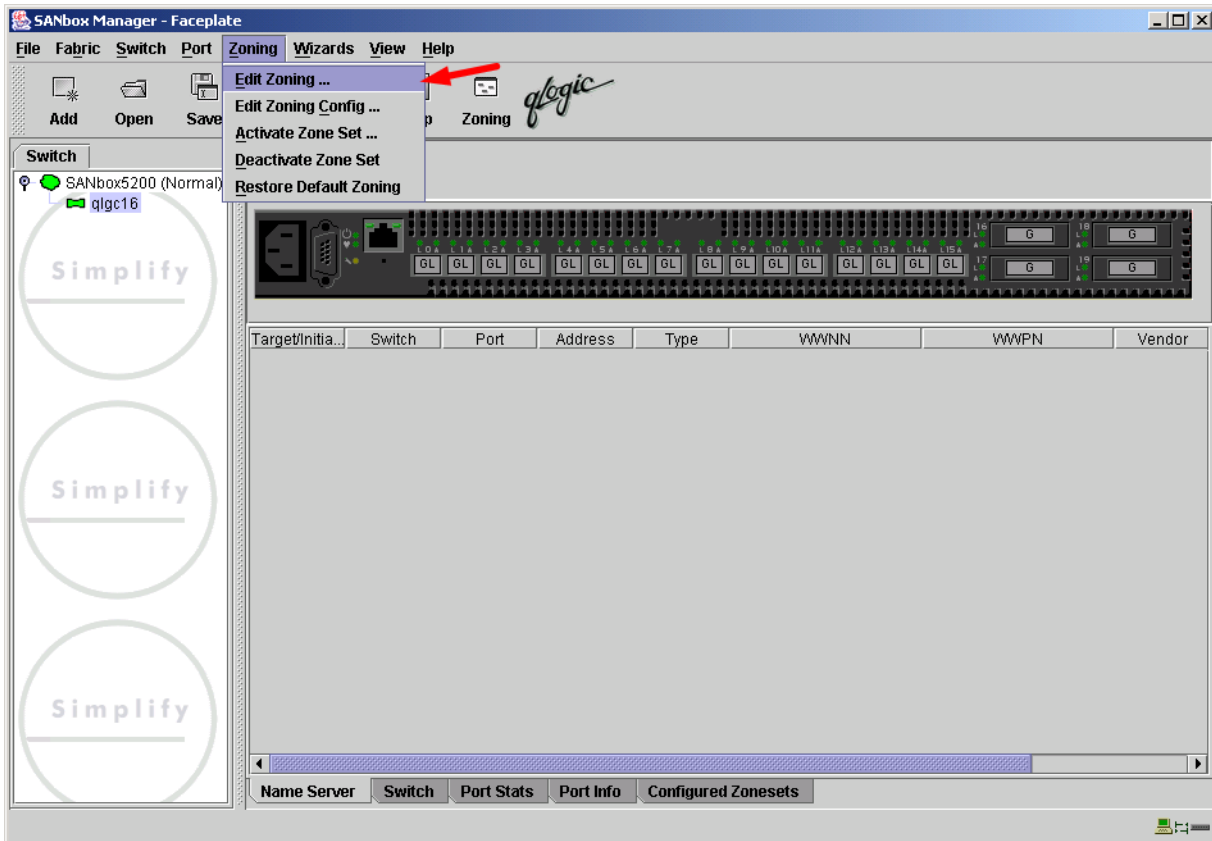
Active Zone Set Names

The Zone and Zone Set names on each switch must be unique. If not, change one of the duplicate names. All Zone Set and Zone names must conform to the Fibre Channel (FC) Standards for Zone Naming (ANSI T11/00-427v3):

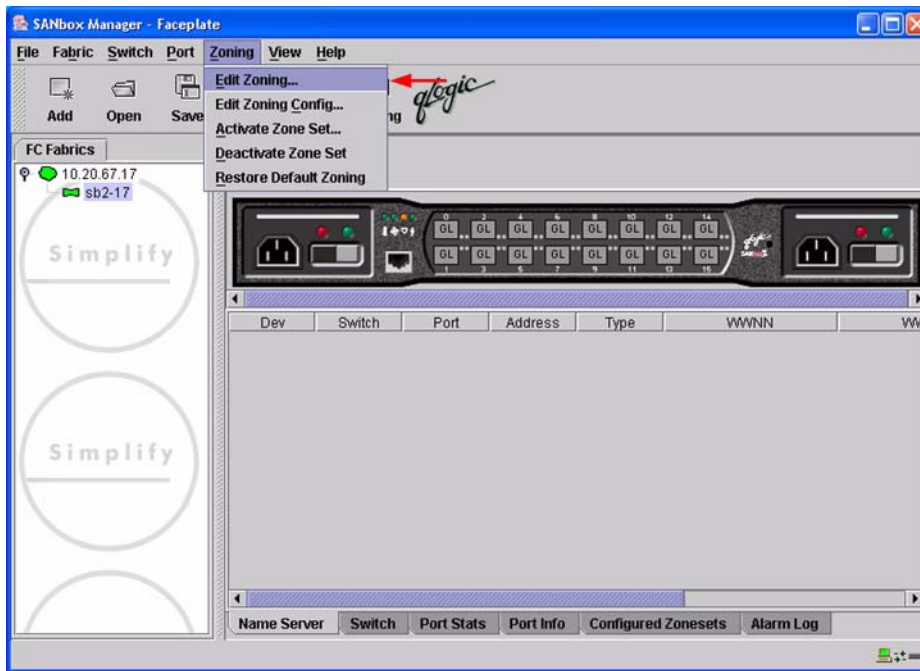
1. Must be 1–64 characters in length.
2. All characters are ASCII.
3. First character is [a–z] or [A–Z].
4. All other characters must be [a–z], [A–Z], [0–9], or the _ character. Other characters (\$-^) may not be supported by all vendors and should be avoided.

QLogic SANbox Manager GUI

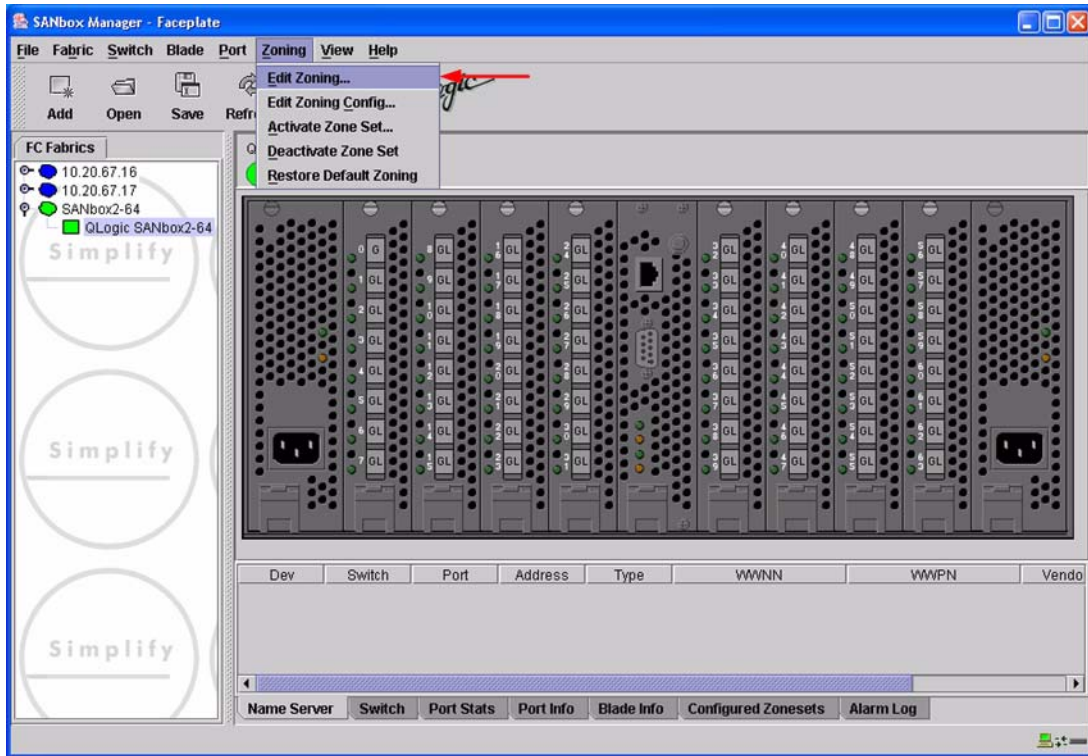
1. Start the SANbox Manager application. The **SANbox Manager—Faceplate** dialog box displays.
2. From the **SANbox Manager—Faceplate** dialog box **Zoning** menu, select **Edit Zoning**.
For the QLogic SANbox 5200, the following displays:



For the QLogic SANbox2-8 and SANbox2-16, the following displays:

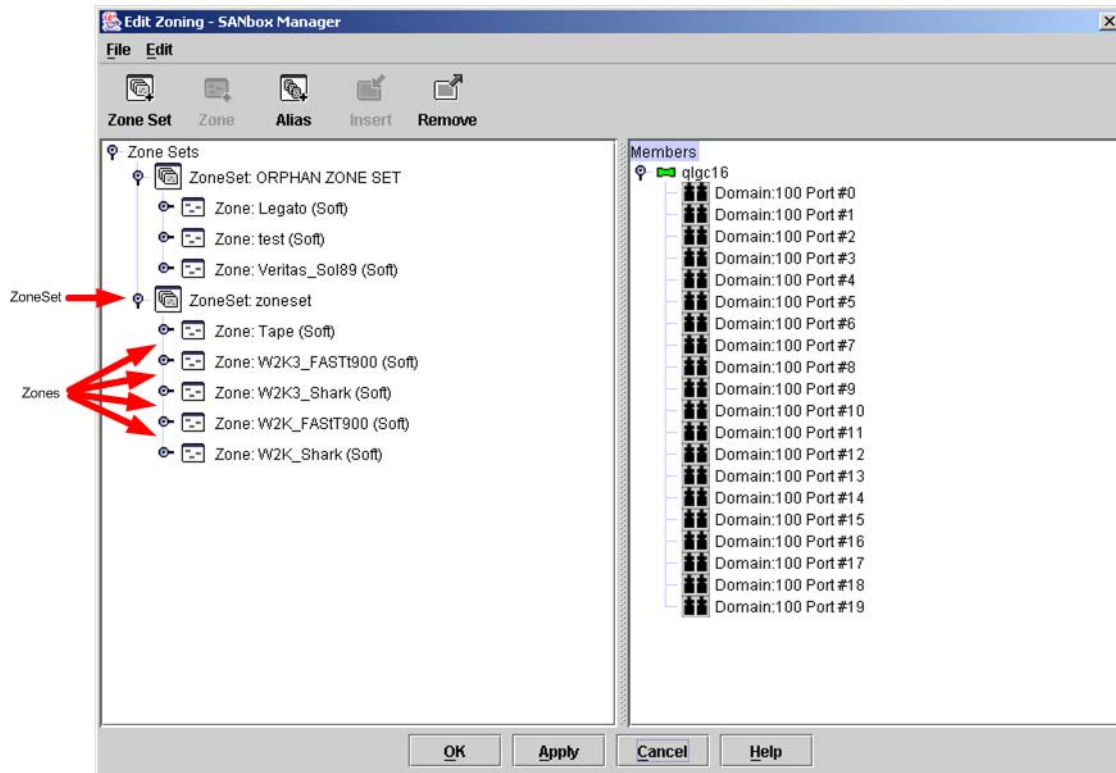


For the QLogic SANbox2-64, the following displays:

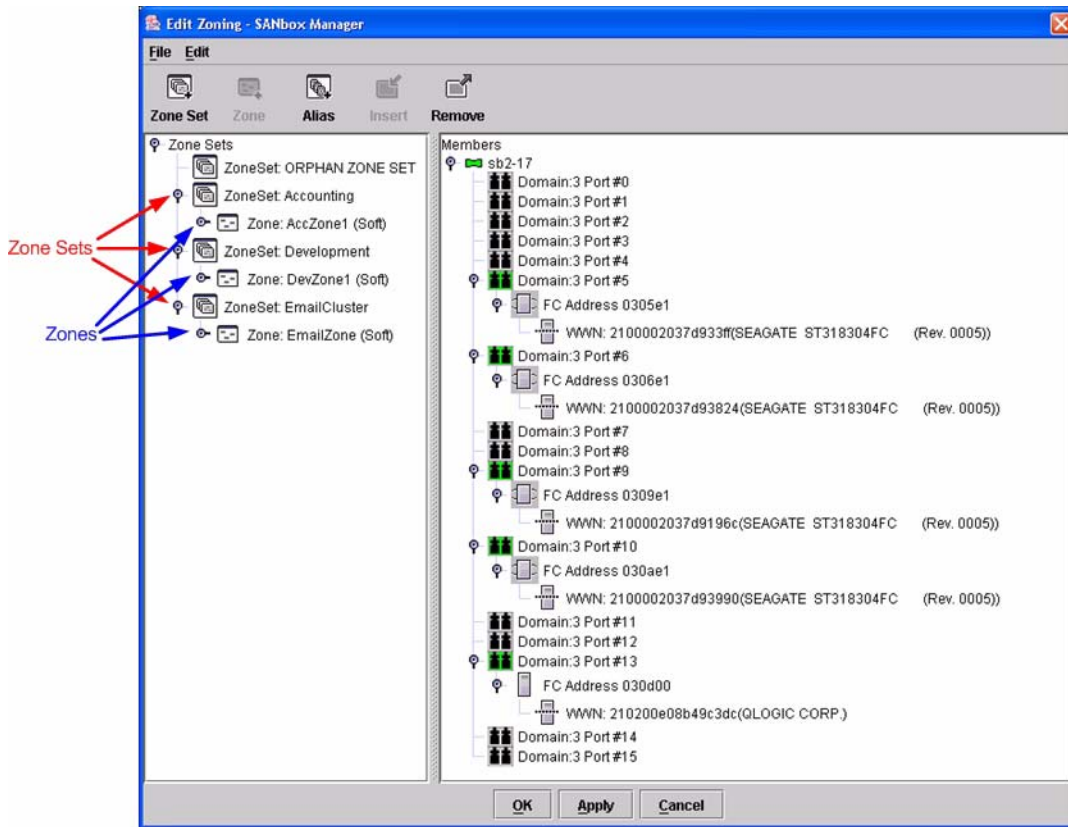


3. From the **Edit Zoning—SANbox Manager** dialog box, compare the Zone Set and Zone names from each switch to ensure there are none with the same name and the names conform to the standards for zone naming as discussed under “Active Zone Set Names” on page 322.

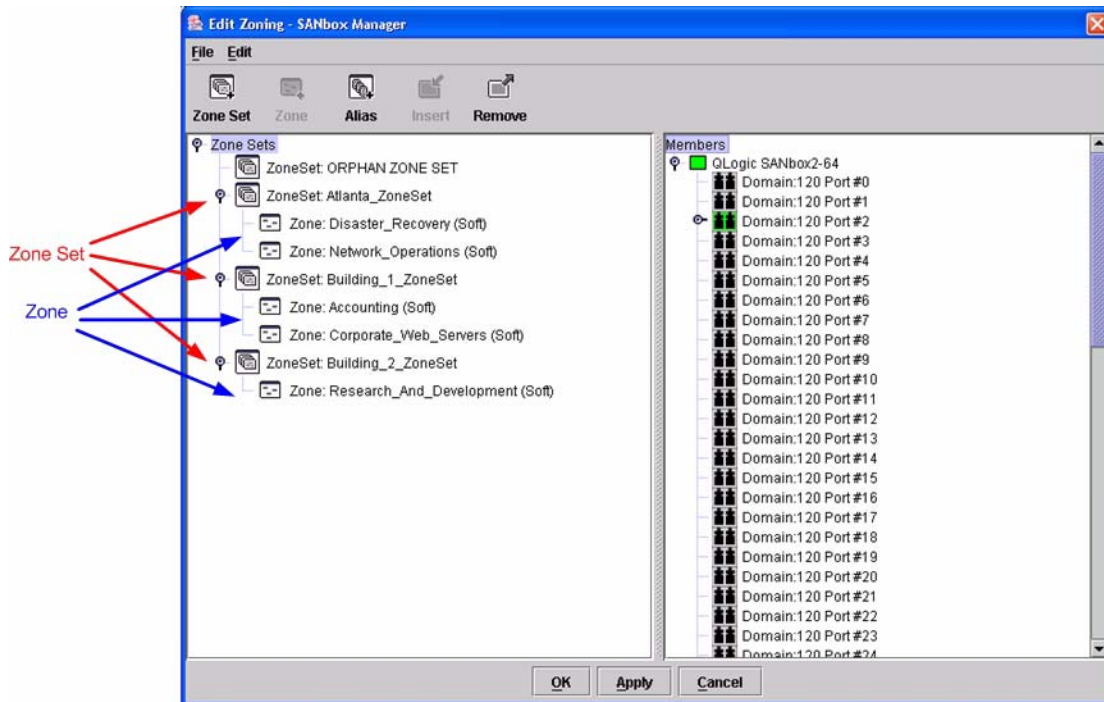
For the QLogic SANbox 5200, the following displays:



For the QLogic SANbox2-8 and SANbox2-16, the following displays:



For the QLogic SANbox2-64, the following displays:



QLogic CLI

NOTE: Use the following CLI commands when the QLogic SANbox Manager GUI is not available. The procedures are the same for the QLogic SANbox 5000 series and SANbox2 series switches.

Login: **admin**

Password: **xxxxxxxx**

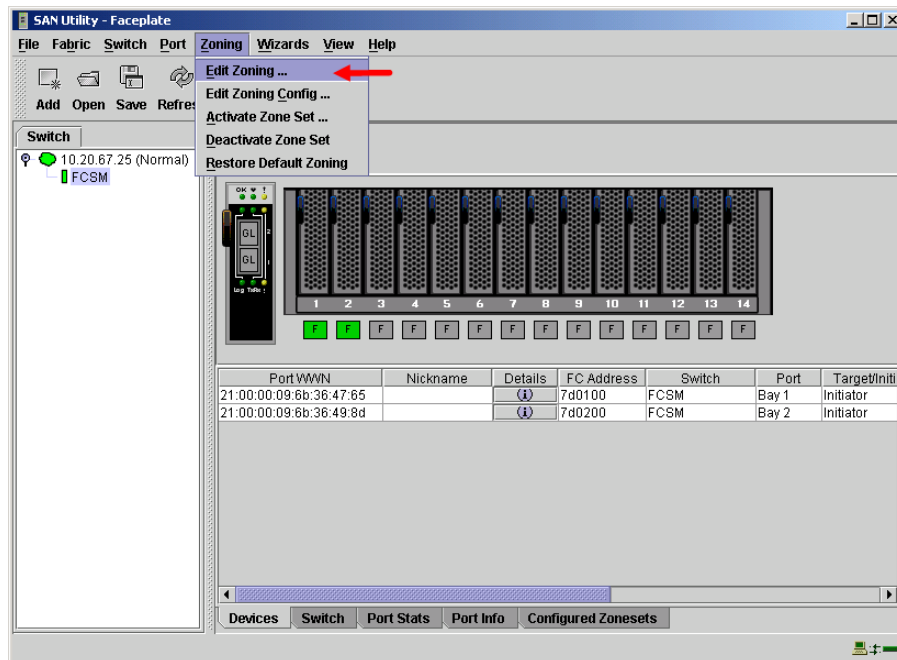
SANbox2 #> **zone list**

IBM eServer BladeCenter GUI

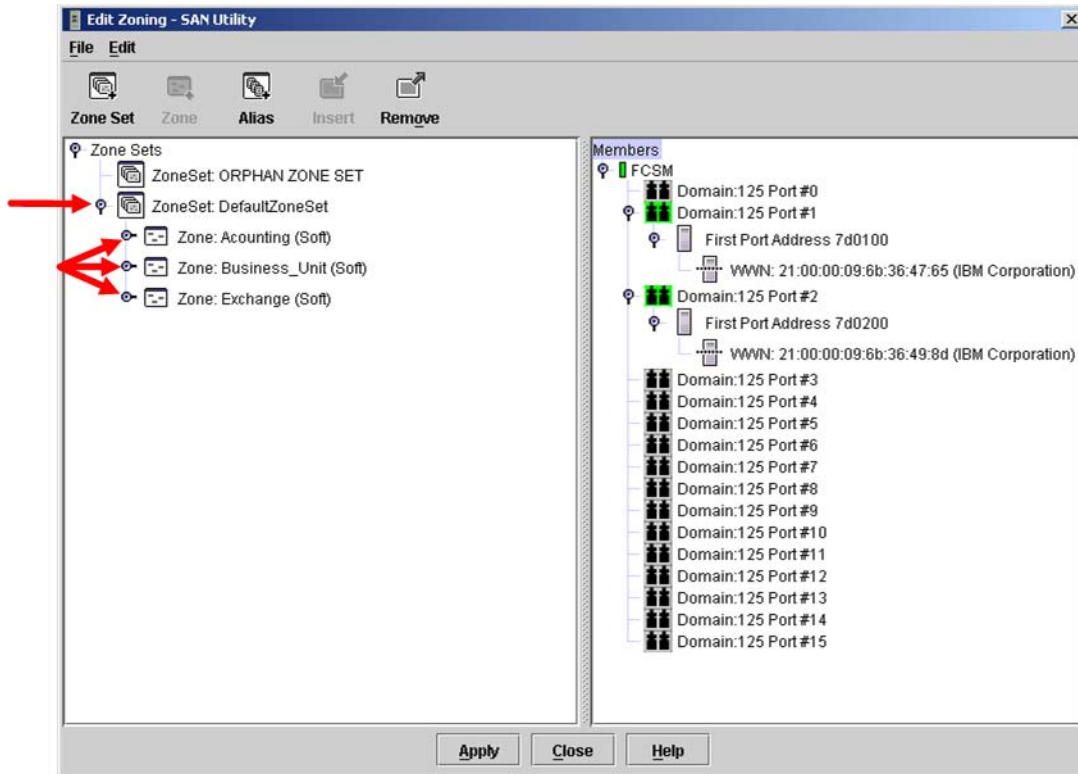
NOTE: You can use the SAN Utility to modify all IBM eServer BladeCenter switch modules. You can use the SAN Browser to modify only the QLogic 6-port Enterprise Fibre Channel Switch Module for IBM eServer BladeCenter. The screen images differ, but the procedures for the SAN Utility and SAN Browser are the same.

Do the following to modify IBM eServer BladeCenter switch modules using the SAN Utility:

1. Start the SAN Utility. The **SAN Utility—Faceplate** dialog box displays.
2. From the **SAN Utility—Faceplate** dialog box **Zoning** menu, select **Edit Zoning**.

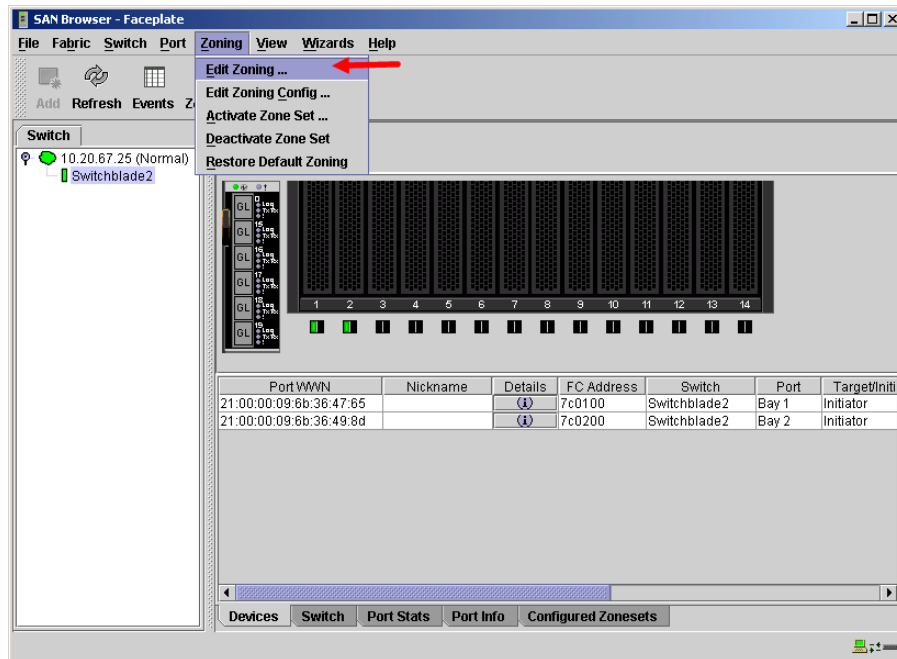


3. From the **Edit Zoning — SAN Utility** dialog box, compare the Zone Set and Zone names from each switch to ensure that none have the same name and the names conform to the standards for zone naming as discussed under [“Active Zone Set Names”](#) on page 322.

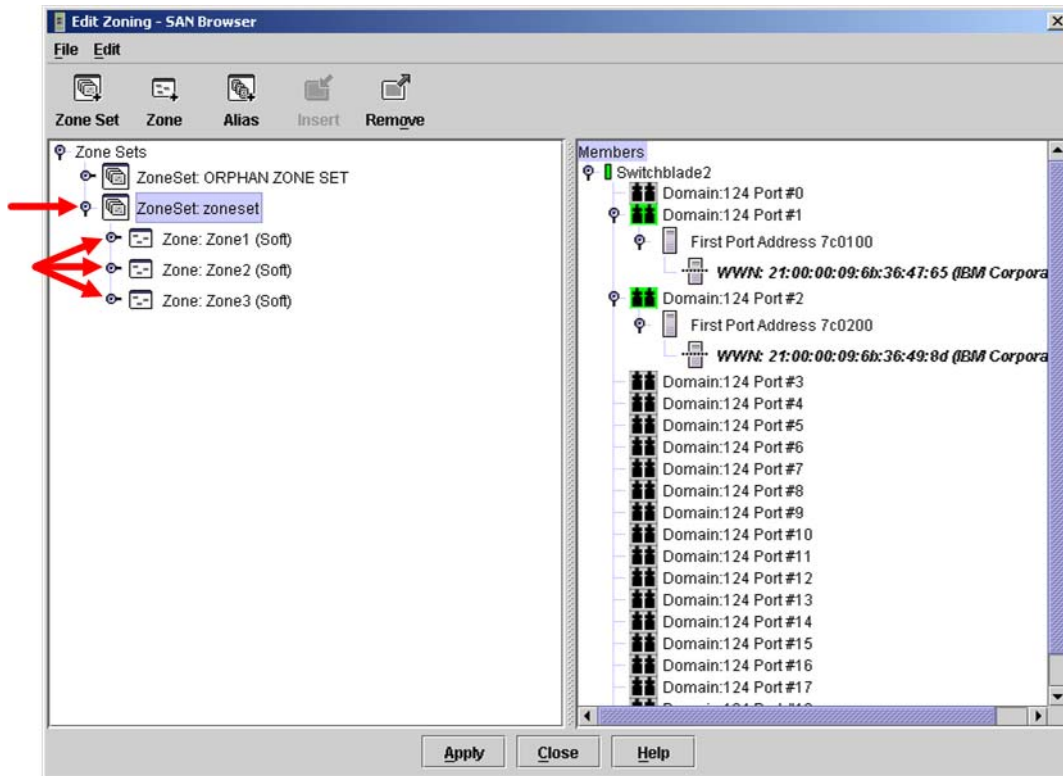


Do the following to modify the QLogic 6-port Enterprise Fibre Channel Switch Module for IBM eServer BladeCenter using the SAN Browser:

1. Start the SAN Browser. The **SAN Browser—Faceplate** dialog box displays.
2. From the **SAN Browser—Faceplate** dialog box **Zoning** menu, select **Edit Zoning**.



3. From the **Edit Zoning—SAN Browser** dialog box, compare the Zone Set and Zone names from each switch to ensure that none have the same name and the names conform to the standards for zone naming as discussed under “Active Zone Set Names” on page 322.



IBM eServer BladeCenter CLI

NOTE: Use the following CLI commands when the IBM eServer BladeCenter GUI is not available.

```
Login: USERID  
Password: xxxxxxxx  
IBM eServer BladeCenter #> zone list
```

Zone Types

This configuration supports all QLogic switch and IBM eServer BladeCenter switch module Zone types.

QLogic Specific Configuration

Not applicable.

IBM eServer BladeCenter Specific Configuration

Not applicable.

Operating Mode Configuration

Not applicable.

Successful Integration Checklist

Perform the following steps after the E_port connection has been established and the fabric has had time to update. If everything verifies, the QLogic and IBM eServer BladeCenter fabrics have successfully merged.

- ✓ Compare and verify that all Zoning information has been propagated on all switches.
- ✓ Verify that the correct Zone Set is activated.
- ✓ Compare and verify that all devices are in the Name Server of each switch.
- ✓ Verify that all initiators continue to detect and have access to all targets that existed prior to the fabric merger.

After everything is verified, your fabric has merged successfully and no additional steps need to be taken. If any of the above tasks did not complete successfully, contact IBM support.

Glossary

Activity LED

A port LED that indicates when frames are entering or leaving the port.

Alias

A collection of objects that can be zoned together. An alias is not a zone, and can not have a zone or another alias as a member.

ALFairness

On an arbitrated loop, the switch is always highest priority when arbitrating for the right to transfer. To prevent other devices from being locked out, the standard provides for a fairness mode, which if enabled, requires an arbitrator to let all other devices win arbitration before arbiting a second time.

AL PA

Arbitrated loop physical address

ANSI

American National Standards Institute

API

Application programming interface

Arbitrated Loop

A Fibre Channel topology where ports use arbitration to establish a point-to-point circuit.

Arbitrated Loop Physical Address (AL PA)

A unique one-byte valid value assigned during loop initialization to each NL port on a loop.

ARB_FF

When ARB_FF is enabled, it causes the switch to send the ARB_FF primitive when it is in monitoring mode, rather than idles. The only reason to do this is since the ARB_FF has less bit transitions than does an idle, it produces less EMI. It has no other effect.

ASIC

Application specific integrated circuit

BootP

A type of network server.

Buffer Credit

A measure of port buffer capacity equal to one frame.

Class 2 Service

A service which multiplexes frames at frame boundaries to or from one or more N_Ports with acknowledgment provided.

Class 3 Service

A service which multiplexes frames at frame boundaries to or from one or more N_Ports without acknowledgment.

CLI

Command line interface

Domain ID

User defined name that identifies the switch in the fabric.

E_D_TOV

Error-detect timeout value

E_Port

Expansion port. A switch port that connects to another FC-SW-2 compliant switch.

Expansion Port

See *E_Port*.

ExtCredit

Allows full speed operation over distances greater than 10 kilometers. Additional credit buffers are borrowed from other ports (which must be set to donor state). Decimal value 0–65535.

Fabric Management Switch

The switch through which the fabric is managed.

Fabric Name

User-defined name associated with the file that contains user list data for the fabric.

FSPF

Fabric shortest path first

Fan Fail LED

An LED that indicates that a cooling fan in the switch is operating below standard.

FC PLDA

Fibre Channel-private loop direct attach

FC-SW-2

Fibre Channel switch fabric 2. For detailed information, see the **The FC-SW-2 Standard** on page 1.

Flash Memory

Memory on the switch that contains the chassis control firmware.

Frame

Data unit consisting of a start-of-frame (SOF) delimiter, header, data payload, CRC, and an end-of-frame (EOF) delimiter.

FRU

Field replaceable unit

GUI

Graphical user interface

Heartbeat LED

A chassis LED that indicates the status of the internal switch processor and the results of the power-on self-test.

Initiator

The device that initiates a data exchange with a target device.

In-Order-Delivery

A feature that requires that frames be received in the same order in which they were sent.

Input Power LED

A chassis LED that indicates that the switch logic circuitry is receiving proper DC voltages.

InteropCredit

This variable determines the number of credits we will advertise on an ISL. Older versions of Brocade software required that we match their offering. Decimal value is 0–255.

IP

Internet protocol

ISLSecurity

ISLSecurity determines which switches a port will establish a link with. Any: we will link with any switch. Ours: we will only link to another QLogic switch. None: the port will not establish an ISL link.

LIP

Loop initialization primitive sequence

Logged-in LED

A port LED that indicates device login or loop initialization status.

Management Information Base

A set of guidelines and definitions for the Fibre Channel functions.

Management Workstation

PC workstation that manages the fabric through the fabric management switch.

MIB

Management information base

NL_Port

Node Loop Port. A Fibre Channel device port that supports arbitrated loop protocol.

N_Port

Node Port. A Fibre Channel device port in a point-to-point or fabric connection.

NoClose

Causes the switch to keep the loop open, if no other device is arbitrating. It is intended to improve performance when there is a single L_Port device connected to the switch.

Output Power LED

A power supply LED that indicates that the power supply is providing DC voltage to the switch

Over Temperature LED

A chassis LED or a power supply LED that indicates that the switch or power supply is overheating.

POST

Power-on self-test

Power-On Self-Test

Diagnostics that the switch chassis performs at start up.

Principal Switch

A switch that has been selected to perform certain fabric configuration duties.

Private Device

A device that can communicate only with other devices on the same loop.

Private Loop

A loop of private devices connected to a single switch port.

pwwn

Port world wide name. See *World Wide Port Name*.

R_A_TOV

Resource-allocation timeout value

SAN

Storage area network

SANbox Manager

Switch management application

SFF

Small form-factor transceiver

SFP

Small form-factor pluggable. A transceiver device, smaller than a gigabit interface converter, that plugs into the Fibre Channel port.

Small Form Factor

A transceiver device, smaller than a gigabit interface converter, that is permanently attached to the circuit board.

Small Form-Factor Pluggable

A transceiver device, smaller than a gigabit interface converter, that plugs into the Fibre Channel port.

SNMP

Simple network management protocol

Target

A storage device that responds to an initiator device.

Timeout Values

The timeout values (TOV) required by the FC-SW-2 standard to successfully establish an E_port connection.

TOV

Timeout values. The timeout values required by the FC-SW-2 standard to successfully establish an E_port connection.

VCCI

Voluntary control council for interference

VIEnable

Diagnostics that the switch chassis performs at start up.

World Wide Name (WWN)

A unique 64-bit address assigned to a device. The WWN consists of a world wide node name and a world wide port name.

World Wide Node Name (WWNN)

A unique address assigned to a device.

World Wide Port Name (WWPN)

A unique address assigned to a port on a device. There can be more than one WWPN per WWNN.

WWN

World wide name

WWNN

World wide node name

WWPN

World wide port name

Zone

A set of ports or devices grouped together to control the exchange of information.

Zone Configuration

See *Zone Set*.

Zone Set

A set of zones grouped together. The active zone set defines the zoning for a fabric. For Brocade, Zone Set is referred to as Zone Configuration.

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- *Fortune's* 100 Fastest Growing Companies
- Bloomberg Top 10 High Tech Company
- *Network Computing* Editor's Choice
- *Network Computing* "Well-Connected Award"
- *Business 2.0* 100 Fastest Growing Tech Companies
- *BusinessWeek* Global 1000



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