Intel[®] Switch Interoperability Guide





Intel[®] Server Platform SB-HE Fibre Channel Switch Interoperability Guide

Version 1.0

Disclaimer

Information in this document is provided in connection with Intel® products. No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted by this document. Except as provided in Intel's Terms and Conditions of Sale for such products, Intel assumes no liability whatsoever, and Intel disclaims any express or implied warranty, relating to sale and/or use of Intel products including liability or warranties relating to fitness for a particular purpose, merchantability, or infringement of any patent, copyright or other intellectual property right. Intel products are not intended for use in medical, life saving, or life sustaining applications. Intel may make changes to specifications and product descriptions at any time, without notice.

Information furnished in this document is believed to be accurate and reliable. However, QLogic Corporation assumes no responsibility for its use, nor for any infringements of patents or other rights of third parties which may result from its use. QLogic Corporation reserves the right to change product specifications at any time without notice. Applications described in this document for any of these products are for illustrative purposes only. QLogic makes no representations nor warranties regarding non-QLogic products or services. QLogic Corporation makes no representation nor warranty that such applications are suitable for the specified use without further testing or modification. QLogic Corporation assumes no responsibility for any errors that may appear in this document. References herein to QLogic products and services do not imply that QLogic intends to make them available to other countries.

THE INFORMATION PROVIDED IN THIS DOCUMENT IS PROVIDED "AS IS" WITHOUT WARRANTY OF ANY KIND, INCLUDING ANY WARRANTY OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, INTEROPERABILTIY, OR COMPATIBILITY. INTEL AND ITS SUPPLIERS MAKE NO REPRESENTATIONS OR WARRANTIES REGARIDNG THE PRODUCTS AND NO WARRANTY IS PROVIDED FOR EITHER THE FUNCTIONALITY OR PROBLEM RESOLUTION OF ANY PRODUCTS.

Intel® Server Platform SB-HE may contain design defects or errors known as errata which may cause the product to deviate from published specifications. Current characterized errata are available on request.

Contact your local Intel sales office or your distributor to obtain the latest specifications and before placing your product order.

Copies of documents which have an ordering number and are referenced in this document, or other Intel literature, may be obtained from Intel Corporation by going to the World Wide Web site at <u>http://www.intel.com</u> or by calling 1-800-548-4725.

Intel reserves the right to change specifications or other product information without notice. This publication could include technical inaccuracies or typographical errors. Intel makes no representations nor warranties regarding non-Intel products or services. References herein to Intel products and services do not imply that Intel intends to make them available to other countries.

Brocade, the Brocade logo, and Silkworm are trademarks or registered trademarks of Brocade Communications Systems, Inc. in the United States, other countries, or both.

Cisco, Cisco IOS, Cisco Systems, and the Cisco Systems logo are trademarks or registered trademarks of Cisco Systems, Inc.

IBM, the IBM logo, e(logo)server, and BladeCenter are trademarks or registered trademarks of International Business Machines Corporation in the United States, other countries, or both.

INRANGE and the INRANGE logo are trademarks or registered trademarks of Inrange Technologies Corporation in the United States, other countries, or both.

Intel and the Intel logo are registered trademarks of Intel Corporation or its subsidiaries in the United States and other countries.

McDATA, the McDATA logo, Intrepid, and Sphereon are trademarks or registered trademarks of McDATA Corporation in the United States, other countries, or both.

Microsoft is a trademark or registered trademark of Microsoft corporation in the United States, other countries, or both.

QLogic, the QLogic logo, SANblade, and SANbox are trademarks or registered trademarks of QLogic Corporation in the United States, other countries, or both.

Sun, Sun Microsystems, the Sun logo, Solaris, Sun Management Center, and Sun StorEdge are trademarks or registered trademarks of Sun Microsystems, Inc. in the United States, other countries, or both.

Other names and brands may be claimed as the property of others.

Copyright © 2003, Intel Corporation. All rights reserved.

Table of Contents

Introduction	1
Contacting Intel	1
The FC-SW-2 Standard	1
Supported Switches and Firmware Versions	3
	5
	5
Merging Intel and Brocade Fabrics	7
Brocade SilkWorm 3200 and SilkWorm 3800 Switches	9
Integration Checklist	9
Configuration Limitations	10
Supported Switches and Firmware Versions	10
Domain ID Configuration	11
Timeout Values	17
Principal Switch Configuration	22
Zone Configuration	23
Active Zone Set Names	23
Zone Types	27
Operating Mode Configuration	31
Brocade Specific Configuration	31
Intel Specific Configuration	31
Successful Integration Checklist	32
Brocade SilkWorm 3900 and SilkWorm 12000 Switches	33
Integration Checklist	33
Configuration Limitations	34
Supported Switches and Firmware Versions	34
Domain ID Configuration	35
Timeout Values	41
Principal Switch Configuration	46
Zone Configuration	47
Active Zone Set Names	47
Zone Types	52
Operating Mode Configuration	56

Brocade Specific Configuration	56
Intel Specific Configuration	56
Successful Integration Checklist	57
Merging Intel and Cisco Fabrics	59
Cisco SN 5428 Storage Router	61
Integration Checklist	61
Configuration Limitations	61
Supported Switches and Firmware Versions	62
Domain ID Configuration	63
Timeout Values	68
Principal Switch Configuration	71
Zone Configuration	72
Active Zone Set Names	72
Zone Types	74
Operating Mode Configuration	74
Cisco Specific Configuration	75
Intel Specific Configuration	76
Successful Integration Checklist	76
Cisco MDS 9000 Series Switches	77
Integration Checklist	77
Configuration Limitations	77
Supported Switches and Firmware Versions	78
Domain ID Configuration	78
Timeout Values	83
Principal Switch Configuration	89
Zone Configuration	89
Active Zone Set Names	89
Zone Types	93
Operating Mode Configuration	96
Cisco Specific Configuration	96
Intel Specific Configuration	96
Successful Integration Checklist	96

Merging Intel and IBM BladeCenter Fabrics	97
IBM eServer BladeCenter Fibre Channel Switch Module	99
Integration Checklist	99
Configuration Limitations	99
Supported Switches and Firmware Versions	100
Domain ID Configuration	101
Timeout Values	107
Principal Switch Configuration	112
Zone Configuration	113
Active Zone Set Names	113
Zone Types	116
Operating Mode Configuration	117
IBM BladeCenter Specific Configuration	117
Intel Specific Configuration	117
Successful Integration Checklist	117
Merging Intel and INRANGE Fabrics	119
Merging Intel and INRANGE Fabrics INRANGE FC/9000 Switches	119 121
Merging Intel and INRANGE Fabrics INRANGE FC/9000 Switches Integration Checklist	119 121 121
Merging Intel and INRANGE Fabrics	119 121 121 122
Merging Intel and INRANGE Fabrics	119 121 121 122 122
Merging Intel and INRANGE Fabrics	119 121 122 122 122
Merging Intel and INRANGE Fabrics	 119 121 122 122 122 126
Merging Intel and INRANGE Fabrics	119 121 122 122 122 122 126 130
Merging Intel and INRANGE Fabrics	 119 121 122 122 126 130 131
Merging Intel and INRANGE Fabrics INRANGE FC/9000 Switches Integration Checklist Configuration Limitations Supported Switches and Firmware Versions Domain ID Configuration Timeout Values Principal Switch Configuration Zone Configuration Active Zone Set Names	119 121 122 122 122 126 130 131 131
Merging Intel and INRANGE Fabrics INRANGE FC/9000 Switches Integration Checklist Configuration Limitations Supported Switches and Firmware Versions Domain ID Configuration Timeout Values Principal Switch Configuration Zone Configuration Active Zone Set Names Zone Types	119 121 122 122 122 126 130 131 131 139
Merging Intel and INRANGE Fabrics INRANGE FC/9000 Switches Integration Checklist Configuration Limitations Supported Switches and Firmware Versions Domain ID Configuration Timeout Values Principal Switch Configuration Zone Configuration Active Zone Set Names Zone Types Operating Mode Configuration	119 121 122 122 122 126 130 131 131 139 144
Merging Intel and INRANGE Fabrics INRANGE FC/9000 Switches Integration Checklist Configuration Limitations Supported Switches and Firmware Versions Domain ID Configuration Timeout Values Principal Switch Configuration Zone Configuration Active Zone Set Names Zone Types Operating Mode Configuration INRANGE Specific Configuration	 119 121 122 122 122 126 130 131 139 144 144
Merging Intel and INRANGE Fabrics INRANGE FC/9000 Switches Integration Checklist Configuration Limitations Supported Switches and Firmware Versions Domain ID Configuration Timeout Values Principal Switch Configuration Zone Configuration Active Zone Set Names Zone Types Operating Mode Configuration INRANGE Specific Configuration Intel Specific Configuration	119 121 122 122 122 126 130 131 131 139 144 144 145

Merging Intel and McDATA Fabrics	147
McDATA Sphereon 4500 Switch	149
Integration Checklist	149
Configuration Limitations	149
Supported Switches and Firmware Versions	150
Domain ID Configuration	150
Timeout Values	157
Principal Switch Configuration	164
Zone Configuration	165
Active Zone Set Names	165
Zone Types	170
Operating Mode Configuration	174
McDATA Specific Configuration	178
Intel Specific Configuration	178
Successful Integration Checklist	179
McDATA Intrepid 6000 Series Directors	181
Integration Checklist	181
Configuration Limitations	181
Supported Switches and Firmware Versions	182
Domain ID Configuration	182
Timeout Values	190
Principal Switch Configuration	197
Zone Configuration	198
Active Zone Set Names	198
Zone Types	203
Operating Mode Configuration	208
McDATA Specific Configuration	212
Intel Specific Configuration	212
Successful Integration Checklist	213

Merging Intel and QLogic Fabrics	215
QLogic SANbox2 Series Switches	217
Integration Checklist	217
	217
Supported Switches and Firmware Versions	218
Domain ID Configuration	219
Timeout Values	226
Principal Switch Configuration	232
Zone Configuration	233
Active Zone Set Names	233
Zone Types	238
Operating Mode Configuration	239
QLogic Specific Configuration	239
Intel Specific Configuration	239
Successful Integration Checklist	239
Merging Intel and Sun Fabrics	241
Sun StorEdge Network 2 Gb FC Series Switches	243
Sun StorEdge Network 2 Gb FC Series Switches	243 243
Sun StorEdge Network 2 Gb FC Series Switches	243 243 243
Sun StorEdge Network 2 Gb FC Series Switches Integration Checklist Configuration Limitations Supported Switches and Firmware Versions	243 243 243 244
Sun StorEdge Network 2 Gb FC Series Switches	243 243 243 244 245
Sun StorEdge Network 2 Gb FC Series Switches	243 243 243 244 245 252
Sun StorEdge Network 2 Gb FC Series Switches Integration Checklist Configuration Limitations Supported Switches and Firmware Versions Domain ID Configuration Timeout Values Principal Switch Configuration	 243 243 243 244 245 252 259
Sun StorEdge Network 2 Gb FC Series Switches Integration Checklist Configuration Limitations Supported Switches and Firmware Versions Domain ID Configuration Timeout Values Principal Switch Configuration Zone Configuration	243 243 244 245 252 259 260
Sun StorEdge Network 2 Gb FC Series Switches Integration Checklist Configuration Limitations Supported Switches and Firmware Versions Domain ID Configuration Timeout Values Principal Switch Configuration Zone Configuration Active Zone Set Names	243 243 244 245 252 259 260 260
Sun StorEdge Network 2 Gb FC Series Switches Integration Checklist Configuration Limitations Supported Switches and Firmware Versions Domain ID Configuration Timeout Values Principal Switch Configuration Zone Configuration Active Zone Set Names Zone Types	243 243 244 245 252 259 260 260 260
Sun StorEdge Network 2 Gb FC Series Switches Integration Checklist Configuration Limitations Supported Switches and Firmware Versions Domain ID Configuration Timeout Values Principal Switch Configuration Zone Configuration Active Zone Set Names Zone Types Operating Mode Configuration	243 243 244 245 252 259 260 260 267 273
Sun StorEdge Network 2 Gb FC Series Switches Integration Checklist Configuration Limitations Supported Switches and Firmware Versions Domain ID Configuration Timeout Values Principal Switch Configuration Zone Configuration Active Zone Set Names Zone Types Operating Mode Configuration Sun StorEdge Specific Configuration	243 243 244 245 252 259 260 260 267 273 273
Sun StorEdge Network 2 Gb FC Series Switches Integration Checklist Configuration Limitations Supported Switches and Firmware Versions Domain ID Configuration Timeout Values Principal Switch Configuration Zone Configuration Active Zone Set Names Zone Types Operating Mode Configuration Sun StorEdge Specific Configuration Intel Specific Configuration	243 243 244 245 252 259 260 260 267 273 273 273
Sun StorEdge Network 2 Gb FC Series Switches Integration Checklist Configuration Limitations Supported Switches and Firmware Versions Domain ID Configuration Timeout Values Principal Switch Configuration Zone Configuration Active Zone Set Names Zone Types Operating Mode Configuration Sun StorEdge Specific Configuration Intel Specific Configuration Sun StorEdge Specific Configuration Sun StorEdge Specific Configuration Intel Specific Configuration	243 243 244 245 252 259 260 260 267 273 273 273 273
Sun StorEdge Network 2 Gb FC Series Switches Integration Checklist Configuration Limitations Supported Switches and Firmware Versions Domain ID Configuration Timeout Values Principal Switch Configuration Zone Configuration Active Zone Set Names Zone Types Operating Mode Configuration Sun StorEdge Specific Configuration Intel Specific Configuration Successful Integration Checklist	 243 243 244 245 252 259 260 267 273 273 273 273 275

Introduction

The Intel Server Platform SB-HE Fibre Channel 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 Intel Server Switch Module SBCEFCSWs (Intel Fibre Channel Switch Modules) with Brocade, Cisco, IBM, INRANGE, McDATA, QLogic, and Sun Fibre Channel switched fabrics that comply with the second revision of the Fibre Channel switch standard (FC-SW-2).

Contacting Intel

For more information about merging Intel Server Fibre Channel Switches with other switched fabrics, please contact your Intel Representative.

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 Intel Server Fibre Channel Switch, along with switches from Brocade, Cisco, IBM, INRANGE, McDATA, QLogic, and Sun 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.

Supported Switches and Firmware Versions

The following Intel Server Fibre Channel Switch has been tested in the Intel environment and complies with the FC-SW-2 standard.

Switch Model	Firmware Version	
Intel Server Switch Module SBCEFCSW (Intel Server Fibre Channel Switch)	1.4.0.42.0 and above	

Intel Supported Switch and Firmware Versions

The Intel Server Fibre Channel Switch has tested interoperable with the following switches from Brocade, Cisco, IBM, INRANGE, McDATA, QLogic, and Sun that comply with the FC-SW-2 standard. See the referenced page for detailed instructions on merging Intel and these fabrics.

Manufacturer	Switch Model	Firmware Version
Brocade (see page 7)	Silkworm 3200 Switch	3.0.2j and above
	Silkworm 3800 Switch	3.0.2j and above
	SilkWorm 3900 Switch	4.0.2b and above
	SilkWorm 12000 Switch	4.0.0e and above
Cisco (see page 59)	SN 5428 Storage Router	2.3.1-k9 and above
	MDS 9216 Switch	1.0(1) [build 1.0(0.281)]
	MDS 9509 Director	1.0(1) [build 1.0(0.281)]
IBM (see page 97)	IBM eServer BladeCenter Fibre Channel Switch Module	1.4.0.42.0 and above
INRANGE (see page 119)	FC/9000 Switch	Code set 3.0.3.2 and above
McDATA (see page 147)	Sphereon 4500 Switch	04.01.00 12 and above
	Intrepid 6064 Director	04.01.02.4 and above
	Intrepid 6140 Director	04.01.02.4 and above
QLogic (see page 215)	SANbox2-8 Switch	1.5.x and above
	SANbox2-16 Switch	1.5.x and above
	SANbox2-64 Switch	1.5.x and above
Sun (see page 241)	Sun StorEdge Network 2 Gb FC Switch-8	1.5.x and above
	Sun StorEdge Network 2 Gb FC Switch-16	1.5.x and above
	Sun StorEdge Network 2 Gb FC Switch-64	1.5.x and above

Brocade, Cisco, IBM, INRANGE, McDATA, QLogic, and Sun Supported Switch and Firmware Versions

How to Use this Guide

The Intel Server Platform SB-HE Fibre Channel Switch Interoperability Guide provides detailed switch configuration data and step-by-step configuration procedures for merging the Intel Server Fibre Channel Switch with Brocade, Cisco, IBM, INRANGE, McDATA, QLogic, and Sun Fibre Channel switched fabrics.

NOTE: Updated versions of this guide can be obtained from your Intel Representative.

All chapters within the *Intel Server Platform SB-HE Fibre Channel Switch Interoperability Guide* are organized the same way. For a visual representation, see page 6.

- Integration Checklist. Lists the steps that must be completed to successfully merge the fabrics.
- Configuration Limitations. Details the configuration limitations, including features not supported by the vendor switches and the Intel Server Fibre Channel Switch.
- Supported Switches and Firmware Versions. The supported switches and firmware versions for which this information applies.
- For the vendor switch and the Intel Server Fibre Channel Switch, 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**
 - Operating Mode Configuration
 - Vendor and Intel Specific 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 275) for terms used in this guide and to the **Index** (see page 281) for quick reference to key topics.



Visual Representation of How the Chapters Are Organized

Merging Intel and Brocade Fabrics

The following Intel Server Fibre Channel Switch has been tested in the Intel environment and complies with the FC-SW-2 standard. The Intel Server Fibre Channel Switch has tested interoperable with the following switches from Brocade that comply with the FC-SW-2 standard.

Manufacturer	Switch Model	Firmware Version
Intel	Intel Server Fibre Channel Switch	1.4.0.42.0 and above
Brocade	SilkWorm 3200 Switch	3.0.2j and above
	SilkWorm 3800 Switch	3.0.2j and above
	SilkWorm 3900 Switch	4.0.2b and above
	SilkWorm 12000 Switch	4.0.0e and above

Intel and Brocade Supported Switch and Firmware Versions

The following chapters provide detailed information about merging Brocade and Intel fabrics:

- Brocade SilkWorm 3200 and SilkWorm 3800 Switches (see page 9)
- Brocade SilkWorm 3900 and SilkWorm 12000 Switches (see page 33)

Brocade SilkWorm 3200 and SilkWorm 3800 Switches

Integration Checklist

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

ATTENTION!!

- Backup the current configuration prior to performing the following steps so that the configuration is available if something goes wrong.
- 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.
- ✓ Verify that the correct version of switch firmware is installed on each switch (see "Supported Switches and Firmware Versions" on page 10).
- Ensure that each switch has a unique Domain ID and that it falls within the proper range (see "Domain ID Configuration" on page 11).
- ✓ Set all switches to the appropriate timeout values (see "Timeout Values" on page 17).
- ✓ Ensure that all Zone set and Zone names are unique and conform to ANSI T11 standards (see "Active Zone Set Names" on page 23).
- ✓ Ensure that all zone members are specified by WWPN (see "Zone Types" on page 27).
- ✓ Ensure that all Brocade switches are configured for Interoperability mode (see "Operating Mode Configuration" on page 31).
- ✓ Ensure that Brocade's Platform Management Server is disabled (see "Brocade Specific Configuration" on page 31).
- ✓ Verify that the fabrics have successfully merged (see "Successful Integration Checklist" on page 32).

Configuration Limitations

The configuration limitations are as follows:

- The following Brocade software implementations may not be supported in Intel fabrics.
 - **NOTE:** Existing Brocade switches retain all features that are available with Brocade switches once the Intel Server Fibre Channel Switch is merged into a heterogeneous fabric. Brocade features do not generate interswitch traffic. As such, they can be included in multi-vendor fabrics, but function on Brocade switches only.
 - Brocade QuickLoop
 - Brocade QuickLoop Fabric Assist
 - Brocade Remote Switch
 - Brocade Extended Fabric
 - Brocade Trunking
 - Brocade Advanced Performance Monitor
 - Brocade Secure Fabric OS
 - Brocade Fabric Services
 - Alias Server
 - Management Server
 - Platform Support
 - Virtual Channels
 - Broadcast Zones
- When merging Brocade and Intel fabrics, a maximum of 31 switches can be configured.

Supported Switches and Firmware Versions

The following Intel Server Fibre Channel Switch has been tested in the Intel environment and complies with the FC-SW-2 standard. The Intel Server Fibre Channel Switch has tested interoperable with the following switches from Brocade that comply with the FC-SW-2 standard.

Manufacturer	Manufacturer Switch Model	
Intel	Intel Server Fibre Channel Switch	1.4.0.42.0 and above
Brocade	SilkWorm 3200 Switch	3.0.2j and above
	SilkWorm 3800 Switch	3.0.2j and above

Intel and Brocade Supported Switch and Firmware Versions

<u>ATTENTION!!</u> 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 31).

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 Intel Server Fibre Channel Switch.

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 **Fabric View** dialog box displays.
- 2. From the Fabric View dialog box, click the Administration button.

Fabric View - Microsoft Inter	met Explorer		×
<u>File Edit View Favorites Too</u>	ols <u>H</u> elp		
🌀 Back 🔹 🜍 🕤 💌 💈] 🏠 🔎 Search 👷 Favorites 🜒 Media	🚱 🍰 🗟 • 📃 🖓	
Address 🛃 http://10.20.10.171/		So Link	s »
Fabric Events Fabric Topology Thame Server Cone Admin Summary View	Loading Java Applet	Polled at: 1/8/902 12:56 FM Name: Broads800 Patrio 0S version: v30.28 Domain 10: 127 Bhemmet IP: 10.20.10.171 Bhemmet IP: 10.25.25.21 Croadsware IP: 262.55.25.21 Greenware IP: 10.20.245.21 Greenware IP: 10.20.25.24 WMWN: 10.20.00.65.69.20.56	3
Status Legend Healthy Marginal Down Unmonitored			2
🗃 (1 item remaining) Opening page htt	p://10.20.10.171/	🗰 🗰 👘 👘 Internet	

- 3. From the **Switch Admin for Brocade** dialog box, select the **Switch Settings** tab. Do the following:
 - a. In the **Domain ID** field, type or edit the Domain ID as appropriate.
 - b. Click OK.

witchName: Brocade3800	DomainId: 127 WW	N: 10:00:00:60:69:50:0	b:6c Fri	Nov 8 2002, 1:00 P
Report Port Setting Switch Settings	User Admin Network Config	Configure Ro	uting SNMP	Extended Fabric
Name and Id Name Brocade38 Domain Id 127		Serial Number	10:00:00:60:6	9:50:0b:6c
Status				
Enable C Disable				
F Extended Fabric Mode				
Extended Fabric Mode		ОК Арр	ly Clos	e Reset
Extended Fabric Mode		_ОК _Арр	ly Clos	e Reset

Brocade CLI

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

```
Login: admin
Password: xxxxxxx
Brocade3800:admin> switchdisable
Brocade3800:admin> configure
  The following options display:
  Fabric parameters (yes, y, no, n): [no] yes
  Domain: (1-239) [98] <97-127>
  BB credits: 91-27) [16]
  R A TOV: (4000..120000) [10000]
  E D TOV: (1000..5000) [2000]
  WAN TOV: (1000..120000) [0]
  WAN RTT DLY MAX: (100..5000) [200]
  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]
  Core Switch PID Format: (0..1) [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]
  NS Operation Parameters (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]
Brocade:3800:admin> switchenable
```

Intel Fibre Channel Module Manager GUI

- 1. Start the Intel Fibre Channel Module Manager GUI. The **Fibre Channel Module Manager—Faceplate** dialog box displays.
- 2. From the Fibre Channel Module Manager—Faceplate dialog box Switch menu, select Switch Properties.



- 3. From the Switch Properties—Fibre Channel Module Manager 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. In the **Domain ID Lock** field, select **Enable** to ensure that the switch always has that Domain ID.
 - c. Click OK.

World Wide Name: 10: Operational State: onl Symbolic Name: FC IP Address: 10.	00:00:c0:dd:00:91: ine SM 20.8.188	05 F F M	C Address: irmware Versior IAC address:	010000 x V1.4.0.47-0. 00:c0:dd:00:91:0
Symbolic Name: Administrative State:	FCSM online	•	Timeout Value	s
→ Domain ID:	98		R_A_TOV:	10000
→ Domain ID lock:	🖲 Enable 🛛 🔿 D	isable	R_T_TOV:	100
Broadcast Support:	• Enable 🔿 D	isable	E_D_TOV:	2000
In-band Management:	🖲 Enable 🛛 D	isable		

Intel Fibre Channel Switch Module CLI

NOTE: Use the following CLI commands when the Intel Fibre Channel Module Manager GUI is not available.

```
Login: admin
Password: xxxxxxx
Intel FCSW #> admin start
Intel FCSW (admin) #> config edit
Intel FCSW (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]
Intel FCSW (admin-config) #> config save
Intel FCSW (admin) #> config activate
The configuration will be activated. Please confirm (y/n): [n] y
```

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 E_D_TOV = 2 seconds

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 Fabric View dialog box displays.
- 2. From the **Fabric View** dialog box, click the **Administration** button.



- From the Switch Admin for Brocade dialog box, select the Configure 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 OK.

vitchName: brocade	DomainId: 104 WWN: 1	0:00:00:60:69:50:1):64 Thu De	c 5 2002, 5:41 PM
Switch Settings Report Port Setting	Network Config	Firm Upgd Configure	SNMP	Lic Admin ended Fabric
Fabric Parameters				
BB Credit 16	R_A_TOV 10000	E_D_TOV 2000	Data Size	2112
Sequence Switching	🔽 Disable Devic	e Probing	Per-Frame Routing	Priority
VC Encoded Address	Mode 🦵 Supress Cla	ss F Traffic		
Virtual Channel Paramet	ers			
VC Priority 2 2	VC Priority	3 2	VC Priority 4 2	
VC Priority 5 2	VC Priority	6 3	VC Priority 7 3	
Arbitrated Loop Paramet	ers	System Service:	5	
🔽 Send Fan Frames		rstatd	✓ rapid	
Always Send RSCN				
Do Not Allow AL_PA 0	x00	☐ rusersd	RLS Probing	
		1. L.		
		OK A	pply Close	Reset
-				
witch Connit Magazan				

Brocade CLI

Login: admin Password: xxxxxxxx Brocade3800:admin> configshow

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.

```
Brocade3800:admin> switchdisable
Brocade3800:admin> configure
  The following options display:
  Fabric parameters (yes, y, no, n): [no] yes
  Domain: (1-239) [98]
  BB credits: 91-27) [16]
  R A TOV: (4000..120000) [9000] 10000
  E D TOV: (1000..5000) [1000] 2000
  WAN TOV: (1000..120000) [0]
  WAN RTT DLY MAX: (100..5000) [200]
  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]
  Core Switch PID Format: (0..1) [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]
  NS Operation Parameters (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]
Brocade:3800:admin> switchenable
```

Intel Fibre Channel Module Manager GUI

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

- 1. Start the Intel Fibre Channel Module Manager GUI. The **Fibre Channel Module Manager—Faceplate** dialog box displays.
- 2. From the Fibre Channel Module Manager—Faceplate dialog box Switch menu, select Switch Properties.



 From the Switch Properties—Fibre Channel Module 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.

World Wide Name: 10. Operational State: on Symbolic Name: FC IP Address: 10.	00:00:c0:dd:0 line SM 20.8.188	0:91:05	FC Address: Firmware Version MAC address:	010000 n: V1.4.0.47-0. 00:c0:dd:00:91:04
Symbolic Name: Administrative State:	FCSM online	•	Timeout Value	ç
Domain ID:	98		R_A_TOV:	10000
Domain ID lock:	• Enable	O Disable	R_T_TOV:	100
Broadcast Support:	Enable	O Disable	E_D_TOV:	2000
In-band Management:	• Enable	() Disable		

- 4. From the Switch Properties—Fibre Channel Module Manager dialog box Administrative State list, select offline. Click OK.
- 5. Re-enter the **Switch Properties**—**Fibre Channel Module Manager** dialog box (see step 2). Do the following:
 - a. In the **R_A_TOV** box, enter **10000**.
 - b. In the **E_D_TOV** box, enter **2000**.
 - c. Click OK.
- 6. Re-enter the Switch Properties—Fibre Channel Module Manager dialog box (see step 2). In the Administrative State list, select Online. Click OK.

Intel Fibre Channel Switch Module CLI

NOTE: Use the CLI commands when the Intel Fibre Channel Module Manager GUI is not available.

Login: admin Password: xxxxxxxx Intel FCSW #> show config switch

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.

Intel FCSW #> admin start Intel FCSW (admin) #> config edit Intel FCSW (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] Intel FCSW (admin-config) #> config save Intel FCSW (admin) #> config activate The configuration will be activated. Please confirm (y/n): [n] **y**

Principal Switch Configuration

Brocade switches and Intel Server Fibre Channel Switches 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.

Brocade's Web Tools

- 1. Start Brocade's Web Tools. The Fabric View dialog box displays.
- 2. From the Fabric View dialog box, click the Zone Admin button.

🗟 Fabric View - Microsoft Internet Exp	orer			
<u>Eile Edit View Favorites Tools Help</u>				
🌀 Back 🔹 🐑 🔹 🐔	🔎 Search 🤺 Favorites 🜒 Media 🎸	3 🔗 🌺 🖸 ·	_ &	
Address 🗃 http://10.20.10.171/			🔽 🔁 Go	Links »
Fabric Events Fabric Topology Name Server Zone Admin Summary View Status Legend Healthy Marginal Down Unmonitored	Loading Java Applet	polici at: Norma: Partic 05 version: Domain 10: Ethernet IP: Ethernet Mask: F Cost IP: F Cost Mask: Cost Mask: WWWN:	A Constant Const	
(1 item remaining) Opening page http://10.20.3	0.171/		🥥 Internet	

3. From the **Zone Administration** dialog box, select the **WWN Config** tab. Verify that all config names conform to the standards discussed under "Active Zone Set Names" on page 23 and are unique between the switches.

Ya Name		Create Cia	Delete Ofo	Rename Cfg	-1
Zone Selection List			Config Me	mbers	_
🔶 Zones		< <u>S</u> earch Mem			
		Add <u>M</u> em>			
		Remove Mem			
		Analyze Config			
		Refresh Fabric			
Enable Config		Enabled config:		_	
Save Config					_
Ret Zone A/D WWN	Rpl <u>W</u> WN	<u>O</u> k	Apply Clos	se Cir All	

Brocade CLI

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

Login: **admin** Password: **xxxxxxxx** Brocade3800:admin> **cfgshow**
Intel Fibre Channel Module Manager GUI

- 1. Start the Intel Fibre Channel Module Manager GUI. The **Fibre Channel Module Manager—Faceplate** dialog box displays.
- 2. From the Fibre Channel Module Manager—Faceplate dialog box Zoning menu, select Edit Zoning.



3. From the **Edit Zoning—Fibre Channel Module Manager** 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 23.



Intel Fibre Channel Switch Module CLI

NOTE: Use the following CLI commands when the Intel Fibre Channel Module Manager GUI is not available.

Login: admin Password: xxxxxxx Intel FCSW #> 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 Fabric View dialog box displays.
- 2. From the Fabric View dialog box, click the Zone Admin button.

Fabric View - Microsoft Interpreter - Microsoft - M	rnet Explorer			
<u>File Edit View Favorites I</u> d	ools <u>H</u> elp			
🕝 Back 🔹 🕥 - 💌 🙎	🕽 🏠 🔎 Search 🤺 Favorites 🜒 Media 🧭	🖉 · 🎽 🖸 ·	🔜 🚳	
Address Address Address Address			🔽 🄁 Go	Links »
Fabric Events Fabric Topology Fabric Topology To	Loading Java Applet	polled at: Name: Fabrio OS version: Domain ID: Bhemme IP: Bhemme Ibak: F Content Ibak: Cateet Mark: Gateet Mark: WMWN:	Image: Control of the system Image: Control of the system 11/20/02 12:56 PM Emocade3800 Brocade3800 127 127 10.2.10.171 128:52 252 20 1292:52 255 20 10:2.0.265 255 0.1 10:2.0.5674 10:00:00:60:60:50:00:50 10:00:00:60:60:50:00:50	
	No. (10.20.10.121)		Takanat	~
 (1 kem remanning) Opening page h 	abili 10:20:10:17 1/		Jinternet	

3. From the **Zone Administration** dialog box, select the **WWN Zone** tab. Verify that all zone names conform to the standards discussed under "Active Zone Set Names" on page 23 and are unique between the switches.

Zone Adminis	tration - Micro	oft Internet I	ixplorer					36
WWN Alias W	WN Zone WW	N Config						
Zone Name		-	Create Zone	Delete	Zone	Rename Zone		
Memi	ber Selection Li	st		1	Zone Member	re Rename a zi	one.	
 WWNs Aliases 			< <u>S</u> earch Mem			_		
			Add <u>M</u> em>					
			< <u>R</u> emove Mem					
			Add ₩₩N>					
Re <u>f</u> Zone	A/ <u>D</u> WWN	Rpl <u>W</u> WN	Qk	Apply	Close	CĮr All	1	
	,				,		5	

Brocade CLI

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

Login: admin Password: xxxxxxxx Brocade3800:admin> zoneshow

Intel Fibre Channel Module Manager GUI

- 1. Start the Intel Fibre Channel Module Manager GUI. The **Fibre Channel Module Manager—Faceplate** dialog box displays.
- 2. From the Fibre Channel Module Manager—Faceplate dialog box Zoning menu, select Edit Zoning.



3. The **Edit Zoning—Fibre Channel Module Manager** dialog box displays. Confirm that all zone members are listed as WWN.



Intel Fibre Channel Switch Module CLI

NOTE: Use the following CLI commands when the Intel Fibre Channel Module Manager GUI is not available.

Login: **admin** Password: **xxxxxxx**

Intel FCSW #> zone members <zone name>

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

Operating Mode Configuration

The Brocade switch must be in Interoperability mode to be FC-SW2 compliant.

Brocade's Web Tools

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

Brocade CLI

The Brocade switch must be in Interoperability mode to be FC-SW2 compliant.

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

Login: admin Password: xxxxxxx Brocade3800:admin> switchdisable Brocade3800:admin> interopmode 1 Run this command without the 1 to see its current setting. Brocade3800:admin> fastboot

Intel Fibre Channel Module Manager GUI Not applicable.

Intel Fibre Channel Switch Module CLI

Not applicable.

Brocade Specific Configuration

The Platform Management Server must be disabled.

Brocade's Web Tools

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

Brocade CLI

Login: admin Password: xxxxxxx Brocade3800:admin> msplmgmtdeactivate

Intel Specific 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 Brocade and Intel 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 Intel support.

Brocade SilkWorm 3900 and SilkWorm 12000 Switches

Integration Checklist

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

ATTENTION!!

- Backup the current configuration prior to performing the following steps so that the configuration is available if something goes wrong.
- 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.
- ✓ Verify that the correct version of switch firmware is installed on each switch (see "Supported Switches and Firmware Versions" on page 34).
- Ensure that each switch has a unique Domain ID and that it falls within the proper range (see "Domain ID Configuration" on page 35).
- ✓ Set all switches to the appropriate timeout values (see "Timeout Values" on page 41).
- ✓ Ensure that all Zone set and Zone names are unique and conform to ANSI T11 standards (see "Active Zone Set Names" on page 47).
- ✓ Ensure that all zone members are specified by WWPN (see "Zone Types" on page 52).
- ✓ Ensure that all Brocade switches are configured for Interoperability mode (see "Operating Mode Configuration" on page 56).
- ✓ Ensure that Brocade's Platform Management Server is disabled (see "Brocade Specific Configuration" on page 56).
- ✓ Verify that the fabrics have successfully merged (see "Successful Integration Checklist" on page 57).

Configuration Limitations

The configuration limitations are as follows.

- The following Brocade software implementations may not be supported in Intel fabrics.
 - **NOTE:** Existing Brocade switches retain all features that are available with Brocade switches once the Intel Server Fibre Channel Switch is merged into a heterogeneous fabric. Brocade features do not generate interswitch traffic. As such, they can be included in multi-vendor fabrics, but function on Brocade switches only.
 - Brocade QuickLoop
 - Brocade QuickLoop Fabric Assist
 - Brocade Remote Switch
 - Brocade Extended Fabric
 - Brocade Trunking
 - Brocade Advanced Performance Monitor
 - Brocade Secure Fabric OS
 - Brocade Fabric Services
 - Alias Server
 - Management Server
 - Platform Support
 - Virtual Channels
 - Broadcast Zones
- When merging Brocade and Intel fabrics, a maximum of 31 switches can be configured.

Supported Switches and Firmware Versions

The following Intel Server Fibre Channel Switch has been tested in the Intel environment and complies with the FC-SW-2 standard. The Intel Server Fibre Channel Switch has tested interoperable with the following switches from Brocade that comply with the FC-SW-2 standard.

Manufacturer	Switch Model	Firmware Version
Intel	Intel Server Fibre Channel Switch	1.4.0.42.0 and above
Brocade	SilkWorm 3900 Switch	4.0.2b and above
	SilkWorm 12000 Switch	4.0.0e and above

Intel and Brocade Supported Switch and Firmware Versions

<u>ATTENTION!!</u> 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 56).

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 Intel Server Fibre Channel Switch.

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 Fabric View dialog box displays.
- 2. From the Fabric View dialog box, click the Administration button.



- 3. From the **Switch Admin for Brocade** dialog box, select the **Switch Settings** tab. Do the following:
 - a. In the **Domain ID** field, type or edit the Domain ID as appropriate.
 - b. Click OK.

ort Setting	Configure	Routing	Extende	ed Fabric Trunk I	nformation	
Switch Info	mation 🔫	Notwork Ca	nfig	Upload/Download	SNMP	License Admin
Name and II)					
	Name san	40_44		Serial Num	er FT02X8047	'EE
Do	main ID 100					
Status				Report		
• Enable	O Disable			View Repor	t	
Extende	d Fabric Mode	3				
_ Extended	d Fabric Mode	3				
Extender	d Fabric Mode		ОК	Apply	ise Rese	t Refresh
Extended	d Fabric Mode	; :d): Fri Feb 14	ОК \$ 2003, 6	Аррју Си :00 РМ	ISE Rese	t Refresh
Extended	d Fabric Mode	2	ок	Apply Cla	ise Rese	t Refresh

Brocade CLI

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

```
Fabric OS (cp1)
cp1 login: admin
Password:
Brocade12000:admin> switchdisable
Brocade12000:admin> configure
Configure...
  Fabric parameters (yes, y, no, n): [no] yes
    Domain: (97..127) [100]
    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]
    VC Encoded Address Mode: (0..1) [0]
    Per-frame Route Priority: (0..1) [0]
    BB credit: (1..16) [16]
  Virtual Channel parameters (yes, y, no, n): [no]
  Zoning Operation parameters (yes, y, no, n): [no]
  RSCN Transmission Mode (yes, y, no, n): [no]
  NS Operation Parameters (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]
No changes.
Brocade12000:admin> switchenable
10 Brocade12000:admin> 9 8 7 6 5 4 3 2 1
fabric: Principal switch
fabric: Domain 100
```

Intel Fibre Channel Module Manager GUI

- 1. Start the Intel Fibre Channel Module Manager GUI. The **Fibre Channel Module Manager—Faceplate** dialog box displays.
- 2. From the Fibre Channel Module Manager—Faceplate dialog box Switch menu, select Switch Properties.



- 3. From the Switch Properties—Fibre Channel Module Manager 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. In the **Domain ID Lock** field, select **Enable** to ensure that the switch always has that Domain ID.
 - c. Click OK.

World Wide Name: 10 Operational State: on Symbolic Name: FC IP Address: 10	00:00:c0:dd:00:91: ine SM 20.8.188	05 F F N	C Address: irmware Versior AAC address:	010000 x V1.4.0.47-0. 00:c0:dd:00:91:04
Symbolic Name: Administrative State:	FCSM online		Timeout Value	s.
→ Domain ID:	98		R_A_TOV:	10000
→ Domain ID lock:	🖲 Enable 🛛 🔿 D)isable	R_T_TOV:	100
Broadcast Support:	• Enable 🔿 C)isable	E_D_TOV:	2000
In-band Management:	🖲 Enable 🛛 C)isable		

Intel Fibre Channel Switch Module CLI

NOTE: Use the following CLI commands when the Intel Fibre Channel Module Manager GUI is not available.

```
Login: admin
Password: xxxxxxx
Intel FCSW #> admin start
Intel FCSW (admin) #> config edit
Intel FCSW (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]
Intel FCSW (admin-config) #> config save
Intel FCSW (admin) #> config activate
The configuration will be activated. Please confirm (y/n): [n] y
```

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 E_D_TOV = 2 seconds

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 Fabric View dialog box displays.
- 2. From the Fabric View dialog box, click the Administration button.



- From the Switch Admin for Brocade dialog box, select the Configure 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 OK.

Port Setting Switch Infor	Configure mation	Routing Network Co	Extend onfig	ed Fabric Upload/D	Trunk Infor ownioad	mation SNMP	License Admin	
-Fabric Para	meters							
-	BE	3 Credit 16 A_TOV 10 D_TOV 20 eld Size 21	000		Second	equence Le sable Devic er-Frame Ro C Encoded <i>I</i> upress Clas	vel Switching e Probing buting Priority Address Mode es F Traffic	
Fabric V	irtual Channe	I Arbitrat	ted Loop OK	System Apply	Close	Rese	t Refresh	
Switch Adminis	stration opene	d]: Fri Feb 1	4 2003, 8	3:00 PM				

Brocade CLI

Fabric OS (cp1)
cp1 login: admin
Password: xxxxxxx
Brocade12000:admin> configshow

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.

```
Brocade12000:admin> switchdisable
Brocade12000:admin> configure
Configure...
  Fabric parameters (yes, y, no, n): [no] yes
    Domain: (97..127) [100]
    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]
    VC Encoded Address Mode: (0..1) [0]
    Per-frame Route Priority: (0..1) [0]
    BB credit: (1..16) [16]
  Virtual Channel parameters (yes, y, no, n): [no]
  Zoning Operation parameters (yes, y, no, n): [no]
  RSCN Transmission Mode (yes, y, no, n): [no]
  NS Operation Parameters (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]
Brocade12000:admin> switchenable
10 Brocade12000:admin> 9 8 7 6 5 4 3 2 1
fabric: Principal switch
fabric: Domain 100
```

Intel Fibre Channel Module Manager GUI

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

- 1. Start the Intel Fibre Channel Module Manager GUI. The **Fibre Channel Module Manager—Faceplate** dialog box displays.
- 2. From the Fibre Channel Module Manager—Faceplate dialog box Switch menu, select Switch Properties.



3. From the **Switch Properties—Fibre Channel Module 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.

World Wide Name: 10. Operational State: on Symbolic Name: FC IP Address: 10.	:00:00:c0:dd:0 line SM 20.8.188	0:91:05	FC Address: Firmware Version MAC address:	010000 n:V1.4.0.47-0. 00:c0:dd:00:91:04
Symbolic Name: Administrative State:	FCSM online	•	Timeout Value	ç
Domain ID:	98		R_A_TOV:	10000
Domain ID lock:	• Enable	O Disable	R_T_TOV:	100
Broadcast Support:	Enable	O Disable	E_D_TOV:	2000
In-band Management:	Enable	() Disable		

- 4. From the Switch Properties—Fibre Channel Module Manager dialog box Administrative State list, select offline. Click OK.
- 5. Re-enter the **Switch Properties**—**Fibre Channel Module Manager** dialog box (see step 2). Do the following:
 - a. In the **R_A_TOV** box, enter **10000**.
 - b. In the **E_D_TOV** box, enter **2000**.
 - c. Click OK.
- 6. Re-enter the Switch Properties—Fibre Channel Module Manager dialog box (see step 2). In the Administrative State list, select Online. Click OK.

Intel Fibre Channel Switch Module CLI

NOTE: Use the CLI commands when the Intel Fibre Channel Module Manager GUI is not available.

Login: admin Password: xxxxxxxx Intel FCSW #> show config switch

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.

Intel FCSW #> admin start Intel FCSW (admin) #> config edit Intel FCSW (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] Intel FCSW (admin-config) #> config save Intel FCSW (admin) #> config activate The configuration will be activated. Please confirm (y/n): [n] **y**

Principal Switch Configuration

Brocade switches and Intel Server Fibre Channel Switches 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.

Brocade's Web Tools

- 1. Start Brocade's Web Tools. The Fabric View dialog box displays.
- 2. From the Fabric View dialog box, click the Zone Admin button.



3. From the **Zone Administration** dialog box, select the **WWN Config** tab. Verify that all config names conform to the standards discussed under "Active Zone Set Names" on page 47 and are unique between the switches.

g Name li	iterop_Broc_QIg	• •	Grea <u>t</u> e Cfg	D <u>e</u> lete Cfg	Re <u>n</u> ame Cfg
Zone/QLoop	FA Zone Selecti	on List		Interop_Broc_Qlg	jc Members
Zones QuickLo FaZones	pps	<u>s></u>	earch Mem Add <u>M</u> em>	Z1 Zone member	list.
		< <u>R</u> (emove Mem		
		<u>A</u> na Rej	Ilyze Config fresh Fabric		
) Enable G) <u>D</u> isable Z • Save <u>C</u> on	onfig oning fig		Enabled config	GHECKK	

Brocade CLI

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

```
Fabric OS (cp1)
cp1 login: admin
Password: xxxxxxx
Brocade12000:admin> cfgshow
Defined configuration:
  cfg: Interop_Broc_Intel
           Z1
                 21:00:00:e0:8b:06:01:e6; 21:00:00:e0:8b:06:00:e6;
  zone:
           Z1
           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
```

Intel Fibre Channel Module Manager GUI

- 1. Start the Intel Fibre Channel Module Manager GUI. The **Fibre Channel Module Manager—Faceplate** dialog box displays.
- 2. From the Fibre Channel Module Manager—Faceplate dialog box Zoning menu, select Edit Zoning.



3. From the **Edit Zoning**— **Fibre Channel Module Manager** 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 47.



Intel Fibre Channel Switch Module CLI

NOTE: Use the following CLI commands when the Intel Fibre Channel Module Manager GUI is not available.

Login: **admin** Password: **xxxxxxx** Intel FCSW #> **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 Fabric View dialog box displays.
- 2. From the Fabric View dialog box, click the Zone Admin button.



3. From the **Zone Administration** dialog box, select the **WWN Zone** tab. Verify that all zone names conform to the standards discussed under "Active Zone Set Names" on page 47 and are unique between the switches.

na Nama 74		_	Carata Zana	Dalata Zana	Basama Zasa	
ne Name 21			Greate Zone	Delete Zone	Kename Zone	
Memt	er Selection Li	st		Z1 Men	nbers	
WWNs			< <u>S</u> earch Mem			
- HIIG969				- Allases		
			Add <u>M</u> em>			
				_		
			< <u>R</u> emove Mem			
			Add WWN>			
		I				

Brocade CLI

Login: admin

Password: **xxxxxxxx**

Brocade12000:admin> **zoneshow**

Intel Fibre Channel Module Manager GUI

- 1. Start the Intel Fibre Channel Module Manager GUI. The **Fibre Channel Module Manager—Faceplate** dialog box displays.
- 2. From the Fibre Channel Module Manager—Faceplate dialog box Zoning menu, select Edit Zoning.



3. The **Edit Zoning—Fibre Channel Module Manager** dialog box displays. Confirm that all zone members are listed as WWN.



Intel Fibre Channel Switch Module CLI

NOTE: Use the following CLI commands when the Intel Fibre Channel Module Manager GUI is not available.

Login: **admin** Password: **xxxxxxx**

Intel FCSW #> zone members <zone name>

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

Operating Mode Configuration

The Brocade switch must be in Interoperability mode to be FC-SW2 compliant.

Brocade's Web Tools

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

Brocade CLI

The Brocade switch must be in Interoperability mode to be FC-SW2 compliant.

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

Login: admin Password: xxxxxxx Brocade12000:admin> switchdisable Brocade12000:admin> interopmode 1 Run this command without the 1 to see its current setting. Brocad12000:admin> fastboot

Intel Fibre Channel Module Manager GUI Not applicable.

Intel Fibre Channel Switch Module CLI

Not applicable.

Brocade Specific Configuration

The Platform Management Server must be disabled.

Brocade's Web Tools

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

Brocade CLI

Login: admin Password: xxxxxxx Brocade12000:admin> msplmgmtdeactivate

Intel Specific 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 Brocade and Intel 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 Intel support.

Merging Intel and Cisco Fabrics

The following Intel Server Fibre Channel Switch has been tested in the Intel environment and complies with the FC-SW-2 standard. The Intel Server Fibre Channel Switch has tested interoperable with the following switches from Cisco that comply with the FC-SW-2 standard.

Manufacturer	Switch Model	Firmware Version
Intel	Intel Server Fibre Channel Switch	1.4.0.42.0 and above
Cisco	SN 5428 Storage Router	2.3.1-k9 and above
	MDS 9216 Switch	1.0(1) [build 1.0(0.281)]
	MDS 9509 Director	1.0(1) [build 1.0(0.281)]

Intel and Cisco Supported Switch and Firmware Versions

The following chapters provides detailed information about merging Cisco and Intel fabrics:

- Cisco SN 5428 Storage Router (see page 61)
- Cisco MDS 9000 Series Switches (see page 77).
Cisco SN 5428 Storage Router

Integration Checklist

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

ATTENTION!!

- Backup the current configuration prior to performing the following steps so that the configuration is available if something goes wrong.
- 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.
- ✓ Verify that the correct version of switch firmware is installed on each switch (see "Supported Switches and Firmware Versions" 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 63).
- ✓ Set all switches to the appropriate timeout values (see "Timeout Values" on page 68).
- ✓ Ensure that all Zone set and Zone names are unique and conform to ANSI T11 standards (see "Active Zone Set Names" on page 72).
- ✓ Ensure that Zoning Merge type is set to SW2 (see "Cisco Specific Configuration" on page 75).
- ✓ Verify that the fabrics have successfully merged (see "Successful Integration Checklist" on page 76).

Configuration Limitations

No limitations exist when merging Cisco and Intel fabrics; all features are fully supported and comply with industry standards.

Supported Switches and Firmware Versions

The following Intel Server Fibre Channel Switch has been tested in the Intel environment and complies with the FC-SW-2 standard. The Intel Server Fibre Channel Switch has tested interoperable with the following switch from Cisco that complies with the FC-SW-2 standard.

Intel and Cisco Supported Switch and Firmware Versions

Manufacturer	Switch Model	Firmware Version
Intel	Intel Server Fibre Channel Switch	1.4.0.42.0 and above
Cisco	SN 5428 Storage Router	2.3.1-k9 and above

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 the Intel Server Fibre Channel Switch.

Cisco SN 5428 Management Interface

- 1. Start the Cisco SN 5428 Management Interface. The **Cisco Storage Network 5428 Storage Router** dialog box displays.
- 2. From the Cisco Storage Network 5428 Storage Router dialog box, do the following:
 - a. Select the primary link **Configuration**.
 - b. From the function link System, click FC Interface.
 - c. In the **Global Information Domain ID** box, type or edit the Domain ID as appropriate.
 - d. Select the Global Information Domain ID Lock check box.
 - e. Click Apply.



Cisco CLI

NOTE: Use the following CLI commands when the Cisco SN 5428 Management Interface is not available.

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

```
CISCO SN 5428 Storage Router
Password: *****
[Cisco_5428]$ ena
Enter admin password: *****
[Entering Administrator mode]
[Cisco_5428]# interface fc domainid <domain id>
[Cisco_5428]# interface fc domainid lock enable
*[Cisco_5428]# save all bootconfig
```

Intel Fibre Channel Module Manager GUI

- 1. Start the Intel Fibre Channel Module Manager GUI. The **Fibre Channel Module Manager—Faceplate** dialog box displays.
- 2. From the Fibre Channel Module Manager—Faceplate dialog box Switch menu, select Switch Properties.



- 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.

World Wide Name: 10 Operational State: on	:00:00:c0:dd:1 line	00:91:05	FC Address: Firmware Versior	010000 • V1.4.0.47-0
Symbolic Name: FC IP Address: 10	SM 20.8.188		MAC address:	00:c0:dd:00:91:0
Symbolic Name:	FCSM			
Administrative State:	online	•	Timeout Value:	5
→ Domain ID:	98		R_A_TOV:	10000
→ Domain ID lock:	• Enable	O Disable	R_T_TOV:	100
Broadcast Support:	Enable	O Disable	E_D_TOV:	2000
In-band Management:	Enable	O Disable		

Intel Fibre Channel Switch Module CLI

NOTE: Use the following CLI commands when the Intel Fibre Channel Module Manager GUI is not available.

```
Login: admin
Password: xxxxxxx
Intel FCSW #> admin start
Intel FCSW (admin) #> config edit
Intel FCSW (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]
Intel FCSW (admin-config) #> config save
Intel FCSW (admin) #> config activate
The configuration will be activated. Please confirm (y/n): [n] y
```

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 E_D_TOV = 2 seconds

This section provides the steps to change these values.

NOTE: Timeout values cannot be set using the Cisco SN 5428 Management Interface nor the Cisco CLI. Use the Intel Fibre Channel Module Manager GUI or Intel Fibre Channel Switch Module CLI.

Cisco SN 5428 Management Interface

Not applicable.

Cisco CLI

Not applicable.

Intel Fibre Channel Module Manager GUI

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

- 1. Start the Intel Fibre Channel Module Manager GUI. The **Fibre Channel Module Manager—Faceplate** dialog box displays.
- 2. From the Fibre Channel Module Manager—Faceplate dialog box Switch menu, select Switch Properties.



3. From the **Switch Properties—Fibre Channel Module 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.

World Wide Name: 10:00:00:c0:dd:00:91:05 Operational State: online Symbolic Name: FCSM IP Address: 10.20.8.188		5 FC Address: Firmware Versi MAC address:	010000 on: V1.4.0.47-0. 00:c0:dd:00:91:04
Symbolic Name:	FCSM		
Administrative State:	online	Timeout Valu	IES
Domain ID:	98	R_A_TOV	10000
Domain ID lock:	🖲 Enable 🛛 🔿 Di	sable R_T_TOV	100
Broadcast Support:	• Enable 🔿 Di	E_D_TOV	2000
In-band Management:	🖲 Enable 🛛 Di	sable	

- 4. From the Switch Properties—Fibre Channel Module Manager dialog box Administrative State list, select offline. Click OK.
- 5. Re-enter the **Switch Properties**—**Fibre Channel Module Manager** dialog box (see step 2). Do the following:
 - a. In the **R_A_TOV** box, enter **10000**.
 - b. In the **E_D_TOV** box, enter **2000**.
 - c. Click OK.
- 6. Re-enter the Switch Properties—Fibre Channel Module Manager dialog box (see step 2). In the Administrative State list, select Online. Click OK.

Intel Fibre Channel Switch Module CLI

NOTE: Use the CLI commands when the Intel Fibre Channel Module Manager GUI is not available.

Login: admin Password: xxxxxxxx Intel FCSW #> show config switch

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.

Intel FCSW #> admin start Intel FCSW (admin) #> config edit Intel FCSW (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] Intel FCSW (admin-config) #> config save Intel FCSW (admin) #> config activate The configuration will be activated. Please confirm (y/n): [n] **y**

Principal Switch Configuration

Cisco switches and Intel Server Fibre Channel Switches 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.
- **NOTE:** Zone and Zone Set names cannot be set using the Cisco SN 5428 Management Interface nor the Cisco CLI. Use the Intel Fibre Channel Module Manager GUI or Intel Fibre Channel Switch Module CLI.

Cisco SN 5428 Management Interface

Not applicable.

Cisco CLI

Not applicable.

Intel Fibre Channel Module Manager GUI

- 1. Start the Intel Fibre Channel Module Manager GUI. The **Fibre Channel Module Manager—Faceplate** dialog box displays.
- 2. From the Fibre Channel Module Manager—Faceplate dialog box Zoning menu, select Edit Zoning.



3. From the **Edit Zoning**— **Fibre Channel Module Manager** 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 72.



Intel Fibre Channel Switch Module CLI

NOTE: Use the following CLI commands when the Intel Fibre Channel Module Manager GUI is not available.

Login: admin Password: xxxxxxx Intel FCSW #> zone list

Zone Types

Not applicable.

Operating Mode Configuration

Not applicable.

Cisco Specific Configuration

Set the Zoning Merge type to SW2.

Cisco SN 5428 Management Interface

- 1. Start the Cisco SN 5428 Management Interface. The **Cisco Storage Network 5428 Storage Router** dialog box displays.
- 2. From the Cisco Storage Network 5428 Storage Router dialog box, do the following:
 - a. Select the primary link Configuration.
 - b. From the function link System, click FC Interface.
 - c. In the Global Information Zoning Merge box, select SW2.
 - d. Click Apply.

Eile Edit View Fav	vorites <u>T</u> ools	Help	is militar	31				
🚱 Back 🔹 🕥 -		6	Search	Favo	rites 🔿 Me	da 🚱 🔗 .	🎐 🛛 🔹	3
Auguress 110.20.	67.2/admin/cor	itiguration/h	ame_conh	guration.shtr	nl			W 🛃 90
CISCO SYSTEMS						CISCO STO	G F	TWORK
EMPOWERING THE INTERNET GENERATION*	Monitor	Config	guratio	n - Mai	nten ance	Troubleshoo	oting Su	ipport Ho
Configuration	Configu	re globa	al FC In	terface	attributes			
System Mgmt Interface	Global	nformat	ion					
GbE Interface FC Interface	Domain II)	1					
HA Interface	Domain II) lock	~					
Passwords	Buffer to	Buffer	12					
Admin Information	Zoning M	erge	SW2					
Date and Time AAA	Zoning De	fault	All					
Security Debug	Zoning Au	ntosave						
VLANS			Apply	2				
Static Routes Modify Routes	Choose	an FC I	nterfac	e to con	figure			
Configure SCSI	Interface	State	Link State	Туре	Linkspeed	FAN-enable	MFS- bundle	AL- Fairness
SCSI Routers Add SCSI Router Access Lists	<u>fc1</u>	enabled	Active	gl-port	auto	enabled	enabled timeout 10	disabled
Add Access List				1			a manufacture of	1

Cisco CLI

NOTE: Use the following CLI commands when the Cisco SN 5428 Management Interface is not available.

<u>ATTENTION!!</u> This procedure requires a reboot of the switch.

```
CISCO SN 5428 Storage Router
Password: *****
[Cisco_5428]$ ena
Enter admin password: *****
[Entering Administrator mode]
[Cisco_5428]# interface fc domainid zoning merge sw2
*[Cisco_5428]# save all bootconfig
```

Intel Specific 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 Intel 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 Intel support.

Cisco MDS 9000 Series Switches

Integration Checklist

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

ATTENTION!!

- Backup the current configuration prior to performing the following steps so that the configuration is available if something goes wrong.
- 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.
- ✓ Verify that the correct version of switch firmware is installed on each switch (see "Supported Switches and Firmware Versions" on page 78).
- Ensure that each switch has a unique Domain ID and that it falls within the proper range (see "Domain ID Configuration" on page 78).
- ✓ Set all switches to the appropriate timeout values (see "Timeout Values" on page 83).
- ✓ Ensure that all Zone set and Zone names are unique and conform to ANSI T11 standards (see "Active Zone Set Names" on page 89).
- ✓ Ensure that all zone members are specified by WWPN (see "Zone Types" on page 93).
- ✓ Verify that the fabrics have successfully merged (see "Successful Integration Checklist" on page 96).

Configuration Limitations

No limitations exist when merging Cisco and Intel fabrics; all features are fully supported and comply with industry standards.

Supported Switches and Firmware Versions

The following Intel Server Fibre Channel Switch has been tested in the Intel environment and complies with the FC-SW-2 standard. The Intel Server Fibre Channel Switch has tested interoperable with the following switches from Cisco that comply with the FC-SW-2 standard.

Intel and Cisco	Supported S	Switch and	Firmware	Versions
-----------------	-------------	------------	----------	----------

Manufacturer	Switch Model	Firmware Version
Intel	Intel Server Fibre Channel Switch	1.4.0.42.0 and above
Cisco	MDS 9216 Switch	1.0(1) [build 1.0(0.281)]
	MDS 9509 Director	1.0(1) [build 1.0(0.281)]

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 the Intel Server Fibre Channel Switch.

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:
 - a. In the **Domain ID** field, type or edit the Domain ID as appropriate.
 - b. Set the ConfigDomain IdType field to Static.
 - c. Click Apply.

 10.20.	67.4 - I	lomai	in Manage	r				
Running	⊆onfigu	ration		Statistics Interfaces Area	s Area Ports			
G 🗘	5 6	9						
		Con	higDomain					
VsanId	Enable	Id	IdType	FabricName	Priority	ContiguousAllocation	AutoReconfigure	Restart
1	V	n/a	preferred	20:01:00:05:30:00:28:df	128	Г	Г	noOp
2	V	34	static	20.01100105150100:28:df	128	Г	Г	noOp
2 1011(2)						Apply R	efresh Help	Close

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

Intel Fibre Channel Module Manager GUI

- 1. Start the Intel Fibre Channel Module Manager GUI. The **Fibre Channel Module Manager—Faceplate** dialog box displays.
- 2. From the Fibre Channel Module Manager—Faceplate dialog box Switch menu, select Switch Properties.



- 3. From the Switch Properties—Fibre Channel Module Manager 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. In the **Domain ID Lock** field, select **Enable** to ensure that the switch always has that Domain ID.
 - c. Click OK.

World Wide Name: 10:	00:00:c0:dd:00:91:05	FC Address:	010000
Operational State: onl	ine	Firmware Version	V1.4.0.47-0.
IP Address: 10.	20.8.188	MAC address:	00.00.00.91.0
Symbolic Name:	FCSM		
Administrative State:	online	Timeout Values	
→ Domain ID:	98	R_A_TOV:	10000
→ Domain ID lock:	🖲 Enable 🛛 🔿 Disab	le R_T_TOV:	100
Broadcast Support:	🖲 Enable 🔿 Disab	E_D_TOV:	2000
In-band Management:	🖲 Enable 🛛 Disab	le	

Intel Fibre Channel Switch Module CLI

NOTE: Use the following CLI commands when the Intel Fibre Channel Module Manager GUI is not available.

```
Login: admin
Password: xxxxxxx
Intel FCSW #> admin start
Intel FCSW (admin) #> config edit
Intel FCSW (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]
Intel FCSW (admin-config) #> config save
Intel FCSW (admin) #> config activate
The configuration will be activated. Please confirm (y/n): [n] y
```

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 E_D_TOV = 2 seconds

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.

- 1. Start Cisco Device Manager. The **Device Manager** dialog box displays.
- 2. From the Device Manager dialog box FC menu, select Timers/Policies.



- 3. From the **Timers Policies** 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, 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.

- Timeou	ts	_
R_A_TOV:	10000	5000100000 ms
E_D_TOV:	2000	1000100000 ms
F_S_TOV:	5000 ms	
D_S_TOV:	5000	5000100000 ms
-Drop La	tencies	
Network:	2000	am 000030
Switch:	500 ms	
- Policies		
	Inord	lerDelivery
	Trunk	Protocol

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 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
```

Intel Fibre Channel Module Manager GUI

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

- 1. Start the Intel Fibre Channel Module Manager GUI. The **Fibre Channel Module Manager—Faceplate** dialog box displays.
- 2. From the Fibre Channel Module Manager—Faceplate dialog box Switch menu, select Switch Properties.



3. From the **Switch Properties**—**Fibre Channel Module 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.

World Wide Name: 10:00:00:c0:dd:00:91:05 Operational State: online Symbolic Name: FCSM IP Address: 10:20.8.188		FC Address: 010000 Firmware Version: V1.4.0.47-0. MAC address: 00:c0:dd:00:91:0			
Symbolic Name:	FCSM				
Administrative State:	online		Timeout Values		
Domain ID:	98		R_A_TOV:	10000	
Domain ID lock:	Enable	O Disable	R_T_TOV:	100	
Broadcast Support:	• Enable	O Disable	E_D_TOV:	2000	
In-band Management:	Enable	O Disable			

- 4. From the Switch Properties—Fibre Channel Module Manager dialog box Administrative State list, select offline. Click OK.
- 5. Re-enter the **Switch Properties**—**Fibre Channel Module Manager** dialog box (see step 2). Do the following:
 - a. In the **R_A_TOV** box, enter **10000**.
 - b. In the **E_D_TOV** box, enter **2000**.
 - c. Click OK.
- 6. Re-enter the Switch Properties—Fibre Channel Module Manager dialog box (see step 2). In the Administrative State list, select Online. Click OK.

Intel Fibre Channel Switch Module CLI

NOTE: Use the CLI commands when the Intel Fibre Channel Module Manager GUI is not available.

Login: admin Password: xxxxxxx Intel FCSW #> show config switch

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.

Intel FCSW #> admin start Intel FCSW (admin) #> config edit Intel FCSW (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] Intel FCSW (admin-config) #> config save Intel FCSW (admin) #> config activate The configuration will be activated. Please confirm (y/n): [n] **y**

Principal Switch Configuration

Cisco switches and Intel Server Fibre Channel Switches 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 VSAN/Zone 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 89 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.

Intel Fibre Channel Module Manager GUI

- 1. Start the Intel Fibre Channel Module Manager GUI. The **Fibre Channel Module Manager—Faceplate** dialog box displays.
- 2. From the Fibre Channel Module Manager—Faceplate dialog box Zoning menu, select Edit Zoning.



3. From the **Edit Zoning—Fibre Channel Module Manager** 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 89.



Intel Fibre Channel Switch Module CLI

NOTE: Use the following CLI commands when the Intel Fibre Channel Module Manager GUI is not available.

Login: admin Password: xxxxxxx Intel FCSW #> 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 Intel, 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 **VSAN/Zone** 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 89 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.

Intel Fibre Channel Module Manager GUI

- 1. Start the Intel Fibre Channel Module Manager GUI. The **Fibre Channel Module Manager—Faceplate** dialog box displays.
- 2. From the Fibre Channel Module Manager—Faceplate dialog box Zoning menu, select Edit Zoning.



3. The **Edit Zoning—Fibre Channel Module Manager** dialog box displays. Confirm that all zone members are listed as WWN.



Intel Fibre Channel Switch Module CLI

NOTE: Use the following CLI commands when the Intel Fibre Channel Module Manager GUI is not available.

Login: **admin** Password: **xxxxxxx**

Intel FCSW #> zone members <zone name>

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

Operating Mode Configuration

Not applicable.

Cisco Specific Configuration

Not applicable.

Intel Specific 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 Intel 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 Intel support.
Merging Intel and IBM BladeCenter Fabrics

The following Intel Server Fibre Channel Switch has been tested in the Intel environment and complies with the FC-SW-2 standard. The Intel Server Fibre Channel Switch has tested interoperable with the following IBM eServer BladeCenter Fibre Channel Switch Module that complies with the FC-SW-2 standard.

Manufacturer	Switch Model	Firmware Version
Intel	Intel Server Fibre Channel Switch	1.4.0.42.0 and above
IBM	IBM eServer BladeCenter Fibre Channel Switch Module	1.4.0.42.0 and above

Intel and IBM Supported Switch and Firmware Versions

The following chapter provides detailed information about merging Intel and IBM BladeCenter fabrics: **IBM eServer BladeCenter Fibre Channel Switch Module (see page 99)**.

IBM eServer BladeCenter Fibre Channel Switch Module

Integration Checklist

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

ATTENTION!!

- Backup the current configuration prior to performing the following steps so that the configuration is available if something goes wrong.
- 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.
- ✓ Verify that the correct version of switch firmware is installed on each switch (see "Supported Switches and Firmware Versions" on page 100).
- ✓ Ensure that each switch has a unique Domain ID (see "Domain ID Configuration" on page 101).
- ✓ Set all switches to the appropriate timeout values (see "Timeout Values" on page 107).
- ✓ Ensure that all Zone set and Zone names are unique and conform to ANSI T11 standards (see "Active Zone Set Names" on page 113).
- ✓ Verify that the fabrics have successfully merged (see "Successful Integration Checklist" on page 117).

Configuration Limitations

No limitations exist when merging IBM BladeCenter and Intel fabrics; all features are fully supported and comply with industry standards.

Supported Switches and Firmware Versions

The following Intel Server Fibre Channel Switch has been tested in the Intel environment and complies with the FC-SW-2 standard. The Intel Server Fibre Channel Switch has tested interoperable with the following IBM eServer BladeCenter Fibre Channel Switch Module that complies with the FC-SW-2 standard.

Manufacturer	Manufacturer Switch Model	
Intel	Intel Server Fibre Channel Switch	1.4.0.42.0 and above
IBM	IBM eServer BladeCenter Fibre Channel Switch Module	1.4.0.42.0 and above

Intel and IBM Supported Switch and Firmware Versions

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 Intel Server Fibre Channel Switch and the IBM eServer BladeCenter Fibre Channel Switch Module.

IBM eServer BladeCenter SAN Utility

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

BM Blade	Center® SAN Utility - Faceplate		
<u>File</u> Fabric	Switch Port Zoning View	Help	
	Archive	2	
Add	Restore	Zoning	
FC Fabrics	Load Firmware	deCenter Switch	
• • 10.20.	Set Date/Time	rmal	
P 🗢 10.20.	Switch Properties		-
	Network Properties		
	Toggle Beacon		
	Export Alarm Log		
	Configure Alarm Thresholds		
	Reset Switch		
	Restore Factory Defaults		
		Dev Switch Port Address Type WWNN	
		,,	
			Þ
	Nai	ne Server Switch Port Stats Port Info Configured Zonesets Alarm Le	og
			<u>.</u>

- 3. From the Switch Properties—IBM BladeCenter SAN Utility 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.

World Wide Name: 10 Operational State: or	l:00:00:c0:dd Iline	:00:72:c7	FC Address: Firmware Versio	630000 n: V1.4.0.26-5
Chassis Name: IB IP Address: 10	M BladeCent 1.20.78.93	er Switch	MAC address:	00:c0:dd:00:72:c6
Chassis Name:	IBM BladeC	enter Switch		
Administrative State:	online	•	Timeout Value	S
🕨 Domain ID:	99		R_A_TOV:	10000
- Domain ID lock:	• Enable	O Disable	R_T_TOV:	100
Broadcast Support:	• Enable	O Disable	E_D_TOV:	2000
In-band Management	• Enable	O Disable		

IBM eServer BladeCenter Fibre Channel Switch Module CLI

NOTE: Use the CLI commands when the IBM eServer BladeCenter SAN Utility is not available.

```
Login: admin
Password: xxxxxxxx
IBM BladeCenter #> admin start
IBM BladeCenter (admin) #> config edit
IBM 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 BladeCenter (admin-config) #> config save
IBM BladeCenter (admin) #> config activate
The configuration will be activated. Please confirm (y/n): [n] y
```

Intel Fibre Channel Module Manager GUI

- 1. Start the Intel Fibre Channel Module Manager GUI. The **Fibre Channel Module Manager—Faceplate** dialog box displays.
- 2. From the Fibre Channel Module Manager—Faceplate dialog box Switch menu, select Switch Properties.



- 3. From the Switch Properties—Fibre Channel Module Manager 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. In the **Domain ID Lock** field, select **Enable** to ensure that the switch always has that Domain ID.
 - c. Click OK.

World Wide Name: 10: Operational State: onl Symbolic Name: FC IP Address: 10.	00:00:c0:dd:00:91: ine SM 20.8.188	05 F F M	C Address: irmware Versior IAC address:	010000 x V1.4.0.47-0. 00:c0:dd:00:91:0
Symbolic Name: Administrative State:	FCSM online	•	Timeout Value	s
→ Domain ID:	98		R_A_TOV:	10000
→ Domain ID lock:	🖲 Enable 🛛 🔿 D	isable	R_T_TOV:	100
Broadcast Support:	• Enable 🔿 D	isable	E_D_TOV:	2000
In-band Management:	🖲 Enable 🛛 D	isable		

Intel Fibre Channel Switch Module CLI

NOTE: Use the following CLI commands when the Intel Fibre Channel Module Manager GUI is not available.

```
Login: admin
Password: xxxxxxx
Intel FCSW #> admin start
Intel FCSW (admin) #> config edit
Intel FCSW (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]
Intel FCSW (admin-config) #> config save
Intel FCSW (admin) #> config activate
The configuration will be activated. Please confirm (y/n): [n] y
```

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 E_D_TOV = 2 seconds

This section provides the steps to change these values.

IBM eServer BladeCenter SAN Utility

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

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



3. From the **Switch Properties**—IBM BladeCenter 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.

World Wide Name: 10:	00:00:c0:dd:00:72:c7	FC Address:	630000
Operational State: on	ine	Firmware Version	n:∨1.4.0.26-5
Chassis Name: IBN IP Address: 10.	I BladeCenter Switch 20.78.93	MAC address:	00:c0:dd:00:72:c6
Chassis Name:	IBM BladeCenter Switch		
Administrative State:	online 🔻	Timeout Value	S
Domain ID:	99	R_A_TOV:	10000
Domain ID lock:	Enable Oisable	R_T_TOV:	100
Broadcast Support:	Enable Oisable	E_D_TOV:	2000
In-band Management:	Enable O Disable		

- 4. From the Switch Properties—IBM BladeCenter SAN Utility dialog box Administrative State list, select offline. Click OK.
- 5. Re-enter the **Switch Properties**—IBM BladeCenter SAN Utility dialog box (see step 2). DO the following:
 - a. In the **R_A_TOV** box, enter **10000**.
 - b. In the **E_D_TOV** box, enter **2000**.
 - c. Click OK.
- 6. Re-enter the Switch Properties—IBM BladeCenter SAN Utility dialog box (see step 2). In the Administrative State list, select Online. Click OK.

IBM eServer BladeCenter Fibre Channel Switch Module CLI

NOTE: Use the CLI commands when the IBM eServer BladeCenter SAN Utility is not available.

```
Login: admin
Password: xxxxxxxx
IBM BladeCenter #> show config switch
```

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.

```
IBM BladeCenter #> admin start
IBM BladeCenter (admin) #> config edit
IBM 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 BladeCenter (admin-config) #> config save
IBM BladeCenter (admin) #> config activate
The configuration will be activated. Please confirm (y/n): [n] y
```

Intel Fibre Channel Module Manager GUI

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

- 1. Start the Intel Fibre Channel Module Manager GUI. The **Fibre Channel Module Manager—Faceplate** dialog box displays.
- 2. From the Fibre Channel Module Manager—Faceplate dialog box Switch menu, select Switch Properties.



3. From the **Switch Properties—Fibre Channel Module 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.

World Wide Name: 10 Operational State: on Symbolic Name: FC IP Address: 10	00:00:c0:dd:00 ine SM 20.8.188	0:91:05	FC Address: Firmware Version MAC address:	010000 n: V1.4.0.47-0. 00:c0:dd:00:91:04
Symbolic Name:	FCSM			
Administrative State:	online	•	Timeout Value	s
Domain ID:	98		R_A_TOV:	10000
Domain ID lock:	Enable	O Disable	R_T_TOV:	100
Broadcast Support:	• Enable	O Disable	E_D_TOV:	2000
In-band Management:	Enable	O Disable		

- 4. From the Switch Properties—Fibre Channel Module Manager dialog box Administrative State list, select offline. Click OK.
- 5. Re-enter the **Switch Properties**—**Fibre Channel Module Manager** dialog box (see step 2). Do the following:
 - a. In the **R_A_TOV** box, enter **10000**.
 - b. In the **E_D_TOV** box, enter **2000**.
 - c. Click OK.
- 6. Re-enter the Switch Properties—Fibre Channel Module Manager dialog box (see step 2). In the Administrative State list, select Online. Click OK.

Intel Fibre Channel Switch Module CLI

NOTE: Use the CLI commands when the Intel Fibre Channel Module Manager GUI is not available.

Login: admin Password: xxxxxxxx Intel FCSW #> show config switch

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.

Intel FCSW #> admin start Intel FCSW (admin) #> config edit Intel FCSW (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] Intel FCSW (admin-config) #> config save Intel FCSW (admin) #> config activate The configuration will be activated. Please confirm (y/n): [n] **y**

Principal Switch Configuration

IBM eServer BladeCenter Fibre Channel Switch Modules and Intel Server Fibre Channel Switches 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.

IBM eServer BladeCenter SAN Utility

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



3. From the **Edit Zoning—IBM BladeCenter 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 113.



IBM eServer BladeCenter Fibre Channel Switch Module CLI

NOTE: Use the CLI commands when the IBM eServer BladeCenter SAN Utility is not available.

Login: admin Password: xxxxxxxx IBM BladeCenter #> zone list

Intel Fibre Channel Module Manager GUI

- 1. Start the Intel Fibre Channel Module Manager GUI. The **Fibre Channel Module Manager—Faceplate** dialog box displays.
- 2. From the Fibre Channel Module Manager—Faceplate dialog box Zoning menu, select Edit Zoning.



3. From the **Edit Zoning—Fibre Channel Module Manager** 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 113.



Intel Fibre Channel Switch Module CLI

NOTE: Use the following CLI commands when the Intel Fibre Channel Module Manager GUI is not available.

Login: admin Password: xxxxxxxx Intel FCSW #> zone list

Zone Types

This configuration supports all IBM eServer BladeCenter Fibre Channel Switch Module and Intel Server Fibre Channel Switch types.

Operating Mode Configuration

Not applicable.

IBM BladeCenter Specific Configuration

Not applicable.

Intel Specific 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 IBM BladeCenter and Intel 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 Intel support.

Merging Intel and INRANGE Fabrics

The following Intel Server Fibre Channel Switch has been tested in the Intel environment and complies with the FC-SW-2 standard. The Intel Server Fibre Channel Switch has tested interoperable with the following switch from INRANGE that complies with the FC-SW-2 standard.

Manufacturer	Switch Model	Firmware Version
Intel	Intel Server Fibre Channel Switch	1.4.0.42.0 and above
INRANGE	FC/9000 Switch	Code set 3.0.3.2 and above

Intel and INRANGE Supported Switch and Firmware Versions

The following chapter provides detailed information about merging Intel and INRANGE fabrics: **INRANGE FC/9000 Switches (see page 121)**.

INRANGE FC/9000 Switches

Integration Checklist

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

ATTENTION!!

- Backup the current configuration prior to performing the following steps so that the configuration is available if something goes wrong.
- 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.
- ✓ Verify that the correct version of switch firmware is installed on each switch (see "Supported Switches and Firmware Versions" on page 122).
- 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 126).
- ✓ Ensure that all Zone set and Zone names are unique and conform to ANSI T11 standards (see "Active Zone Set Names" on page 131).
- ✓ Ensure that the zone member type is set to Port WWN (see "Zone Types" on page 139).
- ✓ Verify that the fabrics have successfully merged (see "Successful Integration Checklist" on page 145).

Configuration Limitations

When merging INRANGE and Intel fabrics, the maximum number of switches that can be configured depends upon the INRANGE 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.

Otherwise, all features are fully supported and comply with industry standards.

Supported Switches and Firmware Versions

The following Intel Server Fibre Channel Switch has been tested in the Intel environment and complies with the FC-SW-2 standard. The Intel Server Fibre Channel Switch has tested interoperable with the following switches from INRANGE that comply with the FC-SW-2 standard.

Intel and INRANGE Supported Switch and Firmware Versions

Manufacturer	Switch Model	Firmware Version
Intel	Intel Server Fibre Channel Switch	1.4.0.42.0 and above
INRANGE	FC/9000 Switch	Code set 3.0.3.2 and above

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 INRANGE switch and the Intel Server Fibre Channel Switch.

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

INRANGE IN-VSN Enterprise Manager

- 1. Start the INRANGE 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.
 - b. In the Lock Director Domain ID list, select Yes.
 - c. Click Apply.

💭 IN-VSN Enterprise Manager			
<u>File View Traps Director Help</u>)		
◆ ⇒ ✓	🗶 🖸 🕷	Z	
Back Forward Apply	Cancel Refresh Devic	es Zoning	
E-Fabrics		Fab_E_FC-64 : FC-64	
E- FC-64	General	Port Config	Offline Port Config
E	Name Service	System Conliguration	Version Trap Setting
FIO-2	Configuration Type System		~
E FIO-4	System Configuration		
FIO-5	Inter Switch Link Type	E Port 💌	
	WWN	10000060DF200C0C	
E ■ FIO-8	Serial Number	N/A	
FCM-1	RTTOV	100	
Users	RATOV	10000	
AuditTrail	EDTOV	2000	
Evenieog	MFSTOV	640	
	FICON Mode	Disabled	
	FICON Management Server (CUP	Disabled 💌	
	Director Domain Id Range	1-239(0x01-0xEF)	Select Range
	Max No. of Domains	56	
	Lock Director Domain Id	Yes	←
	Director Domain Id	107	0x6B
	WWN of Principal Switch	10000060DF200C0C	
2002 12 06 15:43:52 CST/N/A Ping	I Påddress = 10 20 9 46		
2002.12.00 10.40.02 COT.NWA Pility	10 00 0 17		<u>.</u>
Ready			Administrator

INRANGE CLI

Not applicable.

Intel Fibre Channel Module Manager GUI

- 1. Start the Intel Fibre Channel Module Manager GUI. The **Fibre Channel Module Manager—Faceplate** dialog box displays.
- 2. From the Fibre Channel Module Manager—Faceplate dialog box Switch menu, select Switch Properties.



- 3. From the Switch Properties—Fibre Channel Module Manager 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. In the **Domain ID Lock** field, select **Enable** to ensure that the switch always has that Domain ID.
 - c. Click OK.

World Wide Name: 10:	00:00:c0:dd:00:91:05	FC Address:	010000
Operational State: onl	ine	Firmware Version	V1.4.0.47-0.
IP Address: 10.	20.8.188	MAC address:	00.00.00.91.0
Symbolic Name:	FCSM		
Administrative State:	online	Timeout Values	
→ Domain ID:	98	R_A_TOV:	10000
→ Domain ID lock:	🖲 Enable 🛛 🔿 Disab	le R_T_TOV:	100
Broadcast Support:	🖲 Enable 🛛 Disab	E_D_TOV:	2000
In-band Management:	🖲 Enable 🛛 Disab	le	

Intel Fibre Channel Switch Module CLI

NOTE: Use the following CLI commands when the Intel Fibre Channel Module Manager GUI is not available.

```
Login: admin
Password: xxxxxxx
Intel FCSW #> admin start
Intel FCSW (admin) #> config edit
Intel FCSW (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]
Intel FCSW (admin-config) #> config save
Intel FCSW (admin) #> config activate
The configuration will be activated. Please confirm (y/n): [n] y
```

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 E_D_TOV = 2 seconds

This section provides the steps to change these values.

INRANGE IN-VSN Enterprise Manager

- 1. Start the INRANGE IN-VSN Enterprise Manager. The **IN-VNS Enterprise Manager** dialog box displays.
- 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.

💭 IN-VSN Enterprise Manager			
<u>File View Traps Director Help</u>	1		
🗢 🔿 🗹	🗶 🔄 🕷	Z	
Back Forward Apply	Cancel Refresh Device	es Zoning	
E-Fabrics		Fab_E_FC-64 : FC-64	
E-564	General	Port Confia	Offline Port Config
FIO-1	Name Service	System Configuration	Version Trap Setting
E 127 FIO-2	Configuration Type System		-
10-3 FIO-4	System Configuration		
FIO-5	Inter Switch Link Type	E Port 💌	
	WWN	10000060DF200C0C	
⊞- 10 FIO-8	Serial Number	N/A	
FCM-1	RTTOV	100	
Users	RATOV	10000	←
AuditTrail	EDTOV	2000	←
Lysincog	MFSTOV	640	
	FICON Mode	Disabled	
	FICON Management Server (CUP)	Disabled	
	Director Domain Id Range	1-239(0x01-0xEF)	Select Range
	Max No. of Domains	56	
	Lock Director Domain Id	Yes	
	Director Domain Id	107	0x6B
	WWWN of Principal Switch	10000060DF200C0C	
2002 12 06 15:43:52 CST:N/A Ping s	I IPAddress = 10 20 9 46		
2002.12.00 10.40.02 COT.N/A Pilig 8	1000000 IF/Add(000 = 10.20.0.40		<u> </u>
Ready			Administrator

INRANGE CLI

Not applicable.

Intel Fibre Channel Module Manager GUI

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

- 1. Start the Intel Fibre Channel Module Manager GUI. The **Fibre Channel Module Manager—Faceplate** dialog box displays.
- 2. From the Fibre Channel Module Manager—Faceplate dialog box Switch menu, select Switch Properties.



 From the Switch Properties—Fibre Channel Module 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.

World Wide Name: 10 Operational State: on Symbolic Name: FC IP Address: 10	00:00:c0:dd:00:91:0 ine SM 20.8.188	5 FC Fir M/	Address: mware Version AC address:	010000 n: V1.4.0.47-0. 00:c0:dd:00:91:04	
Symbolic Name:	FCSM				
Administrative State:	online	•	Timeout Values		
Domain ID:	98		R_A_TOV:	10000	
Domain ID lock:	🖲 Enable 🛛 Di	sable	R_T_TOV:	100	
Broadcast Support:	• Enable 🔿 Di	sable	E_D_TOV:	2000	
In-band Management:	🖲 Enable 🛛 Di	sable			

- 4. From the Switch Properties—Fibre Channel Module Manager dialog box, Administrative State list, select offline. Click OK.
- 5. Re-enter the **Switch Properties**—**Fibre Channel Module Manager** dialog box (see step 2). Do the following:
 - a. In the **R_A_TOV** box, enter **10000**.
 - b. In the **E_D_TOV** box, enter **2000**.
 - c. Click OK.
- 6. Re-enter the Switch Properties—Fibre Channel Module Manager dialog box (see step 2). In the Administrative State list, select Online. Click OK.

Intel Fibre Channel Switch Module CLI

NOTE: Use the CLI commands when the Intel Fibre Channel Module Manager GUI is not available.

Login: admin Password: xxxxxxxx Intel FCSW #> show config switch

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.

Intel FCSW #> admin start Intel FCSW (admin) #> config edit Intel FCSW (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] Intel FCSW (admin-config) #> config save Intel FCSW (admin) #> config activate The configuration will be activated. Please confirm (y/n): [n] **y**

Principal Switch Configuration

INRANGE switches and Intel Server Fibre Channel Switches 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.

INRANGE IN-VSN Enterprise Manager

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


💭 E-Port Zoning					
田一篇 Fab_E_FC-64	Zoom In	R IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII	resh Cancel		
			All Fabric	cs	
	Fabric	# Directors	Acti	ive Zoneset	Member Type
	Fab_E_FC-64	t totor Zoning databases, s double-click.	elect Fabric		PortVWWN

2. 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.

🔍 E-Port Zoning					
. ● 😹 Fab_E_FC-64	ञ् ञ् Zoom In Zoom Ou	ut Save Refresh	Cancel		
		Fabric: Fa	b_E_FC-64: All Dire	ector Domains	
	Director Name	Domain ID	Active Zoneset	Member Type	# INACTIVE Zonesets
	FC-64 To access Zonesets an zom-in or double-cl To replicate Zoning d right-click on source	nd Zones of a directo lick. jatabase from one dir ze director and choos	r, select director ector to another, e 'Replicate Zoning	Port WWN and J Database'.	2

 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 131.

🙃 E-Port Zoning						
. Brab_E_FC-64	A 6	2 🗸 🖌	3 X			
	Zoom In Zoor	n Out Save	Refresh Cance	<u> </u>		
		Fabric	Fab_E_FC-64: Di	rector: FC-64 Al	Zonesets	
	Zonesets All Zone	es				1
	Zoneset Name	# Zones	# Zone Members	Member Type	Zoneset State	Zoneset Status
	Inrange_ZoneSet_1	0	0	Port WWN	INACTIVE	Saved
	Inrange_ZoneSet_2	U	U	Port WWW	INACTIVE	Saved
	Circuit Zoneser					
						20.002
	4					
	To view Zones in	a Zoneset, select	Zoneset and zoom-	in.	1	
	Note: No undates	are allowed for a	access zones ACTIVE Zoneset.	via All Zones	view.	
	inter interaption	and an and a sol a				

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 131.

E-Port Zoning				1 0		-		
. E_FC-64 E_FC-64	€	e,	v	2	×			
	Zoom In	Zoom Out	Save	Refresh	Cancel			
	Zonesets	All Zones	Fabi	ric: Fab_E_F	C-64: Di	rector: FC-64 Al	Zonesets	
	Zoneset N	ame #Z	ones	# Zone N	lembers	Member Type	Zoneset State	Zoneset Status
	Inrange Zor	neSet 1 0		0		Port WWN	INACTIVE	Saved
	Inrange_Zor	neSet_2 0		0		Port WWN	INACTIVE	Saved
	<create td="" zor<=""><td>neset></td><td></td><td></td><td></td><td></td><td></td><td></td></create>	neset>						
	4							1
	<	es in a 70		ct Zoneset /	and zoom	-10].
	To view Zon To podify z	es in a Zoo	neset, sele INACTIVF =	ct Zoneset ;	and zoom-	in.	· viev.].

INRANGE CLI

Not applicable.

Intel Fibre Channel Module Manager GUI

- 1. Start the Intel Fibre Channel Module Manager GUI. The **Fibre Channel Module Manager—Faceplate** dialog box displays.
- 2. From the Fibre Channel Module Manager—Faceplate dialog box Zoning menu, select Edit Zoning.



3. From the **Edit Zoning—Fibre Channel Module Manager** 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 131.



Intel Fibre Channel Switch Module CLI

NOTE: Use the following CLI commands when the Intel Fibre Channel Module Manager GUI is not available.

Login: admin Password: xxxxxxx Intel FCSW #> 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.

INRANGE IN-VSN Enterprise Manager

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



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

💭 E-Port Zoning								
⊞-ﷺ Fab_E_FC-64	€ Zoom In	् Zoom Out	Save	Refresh	Cancel			
					Ali Fa	brics		
	Fabric	4	# Dire	ctors		Active Zoneset	Member Type	
		9					LOU AMAIN	
	•							•
	To access D: and zoom-in	irector Zonir or double-cl	ng databa: lick.	ses, select	Fabric			

🔍 E-Port Zoning					
	લ્ લ્		100		
-	Zoom In Zoom Out	Save Refresh	Cancel		
		Fabric: Fa	b_E_FC-64: All Dir	ector Domains	
	Director Name	Domain ID	Active Zoneset	Member Type	# INACTIVE Zonesets
	FC-64	107		Port WWN	2
	To access Zonesets and zoom-in or double-cli To replicate Zoning da	d Zones of a directo ick. atabase from one dir	c, select director	and	

3. 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.

💭 E-Port Zoning							
	€.	୍	V	2	×		
	Zoom In	Zoom Out	Save	Refresh	Cancel		
	Zonesets	All Zones	Fabri	c: Fab_E_F	C-64: Direct	or: FC-64 All Zones Pool	
	Zone Name	e	Member Tv	npe i	Zone Memb	ers # Assigned Zonesets	Zone Status
	Payroll		Port WWN		2	0	Saved
	HSM .		Port WWN		3	0	Saved
	<create td="" zon<=""><td>e></td><td></td><td></td><td></td><td></td><td></td></create>	e>					
	To delete or followed by To access or	: replicate 7 Save tooll : modify Zon	a Zone, u bar button ne Members	se right mo , select Zo	ouse click m	enu -in.	

INRANGE CLI

Not applicable.

Intel Fibre Channel Module Manager GUI

- 1. Start the Intel Fibre Channel Module Manager GUI. The **Fibre Channel Module Manager—Faceplate** dialog box displays.
- 2. From the Fibre Channel Module Manager—Faceplate dialog box Zoning menu, select Edit Zoning.



3. The Edit Zoning—Fibre Channel Module Manager dialog box displays Confirm that all zone members are listed as WWN.



Intel Fibre Channel Switch Module CLI

NOTE: Use the following CLI commands when the Intel Fibre Channel Module Manager GUI is not available.

Login: admin Password: xxxxxxxx Intel FCSW #> zone members <zone name>

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

Operating Mode Configuration

Not applicable.

INRANGE Specific Configuration

Not applicable.

Intel Specific 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 INRANGE and Intel 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 Intel support.

Merging Intel and McDATA Fabrics

The following Intel Server Fibre Channel Switch has been tested in the Intel environment and complies with the FC-SW-2 standard. The Intel Server Fibre Channel Switch has tested interoperable with the following switches from McDATA that comply with the FC-SW-2 standard.

Manufacturer	Switch Model	Firmware Version
Intel	Intel Server Fibre Channel Switch	1.4.0.42.0 and above
McDATA	Sphereon 4500 Switch	04.01.00 12 and above
	Intrepid 6064 Director	04.01.02.4 and above
	Intrepid 6140 Director	04.01.02.4 and above

Intel and McDATA Supported Switch and Firmware Versions

The following chapters provide detailed information about merging McDATA and Intel fabrics:

- McDATA Sphereon 4500 Switch (see page 149)
- McDATA Intrepid 6000 Series Directors (see page 181)

McDATA Sphereon 4500 Switch

Integration Checklist

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

ATTENTION!!

- Backup the current configuration prior to performing the following steps so that the configuration is available if something goes wrong.
- 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.
- ✓ Verify that the correct version of switch firmware is installed on each switch (see "Supported Switches and Firmware Versions" on page 150).
- Ensure that each switch has a unique Domain ID and that it falls within the proper range (see "Domain ID Configuration" on page 150).
- ✓ Set all switches to the appropriate timeout values (see "Timeout Values" on page 157).
- ✓ Ensure that all Zone set and Zone names are unique and conform to ANSI T11 standards (see "Active Zone Set Names" on page 165).
- ✓ Ensure that all zone members are specified by WWPN (see "Zone Types" on page 170).
- Ensure that all McDATA switches are configured for Open Fabric Interoperability mode (see "Operating Mode Configuration" on page 174).
- ✓ Verify that the fabrics have successfully merged (see "Successful Integration Checklist" on page 179).

Configuration Limitations

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

Supported Switches and Firmware Versions

The following Intel Server Fibre Channel Switch has been tested in the Intel environment and complies with the FC-SW-2 standard. The Intel Server Fibre Channel Switch has tested interoperable with the following switch from McDATA that complies with the FC-SW-2 standard.

Intel and McDATA Supported Switch and Firmware Versions

Manufacturer	Switch Model	Firmware Version
Intel	Intel Server Fibre Channel Switch	1.4.0.42.0 and above
McDATA	Sphereon 4500 Switch	04.01.00 12 and above

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 the Intel Server Fibre Channel Switch.

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 Intel Domain ID.

McDATA Domain ID	Intel Domain ID	McDATA Domain ID	Intel Domain ID	McDATA Domain ID	Intel 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 Versus Intel Domain IDs

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.
 - b. From the Insistent Domain ID list, select Enabled.
 - c. Click Activate.

Sphereon 4500: - Micros	soft Internet Explorer
Eile Edit View Favorites	: Icols Help
🌀 Back 🔹 🐑 - 💌	🖸 🐔 🔎 Search 👷 Favorites 🜒 Media 🤣 🖾 - 🌉 🔯 - 🛄 🍇
Address Address http://10.20.67.61/c	(cfg_sw_opparms_fs.htm 🛛 🕑 🔂 Go 🛛 Linko
	Configure: Ports Switch Management Zoning User Rights
View Configure	Identification Date / Time Parameters Constraint Preferred Domain ID: 7 Insistent Domain ID: Enabled Rerouting Delay: Disabled Domain RSCN's: Disabled
Monitor Operations	Activate Cancel
Help	
Done	S Internet

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.

Sphereon 4500: - Micr	rosoft Internet Explorer	×
<u>File Edit View Favorit</u>	tes Iools Help	
🚱 Back 🔹 🕥 - 🚺	🖹 🛃 🏠 🔎 Search 👷 Favorites 🜒 Media 🧐 😥 - 🌺 🔯 - 🛄 🍇	
Address 🗃 http://10.20.67.6	1/operations_online_fs.htm 🔽 🛃 Go Links	>>
	Operations: Switch Port Maintenance Feature Installation	
	Beacon Online State	
View Configure Monitor Operations Help	Current state is OFFLINE Set Online	
Done	Internet	

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)				
Config.Switch> insistDomainId enable				
Config.Switch> root				
Root> maint system				
Maint.System> setOnlineState true				

Intel Fibre Channel Module Manager GUI

- 1. Start the Intel Fibre Channel Module Manager GUI. The **Fibre Channel Module Manager—Faceplate** dialog box displays.
- 2. From the Fibre Channel Module Manager—Faceplate dialog box Switch menu, select Switch Properties.



- 3. From the Switch Properties—Fibre Channel Module Manager 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. In the **Domain ID Lock** field, select **Enable** to ensure that the switch always has that Domain ID.
 - c. Click OK.

World Wide Name: 10: Operational State: onl Symbolic Name: FC IP Address: 10.	00:00:c0:dd:00:9 ine SM 20.8.188	1:05 F F	°C Address: Tirmware Versior MAC address:	010000 1: V1.4.0.47-0. 00:c0:dd:00:91:0
Symbolic Name: Administrative State:	FCSM online	•	Timeout Value:	5
→ Domain ID:	98		R_A_TOV:	10000
→ Domain ID lock:	• Enable O	Disable	R_T_TOV:	100
Broadcast Support:	• Enable 🔿	Disable	E_D_TOV:	2000
In-band Management:	🖲 Enable 🛛 🔿	Disable		

Intel Fibre Channel Switch Module CLI

NOTE: Use the following CLI commands when the Intel Fibre Channel Module Manager GUI is not available.

```
Login: admin
Password: xxxxxxx
Intel FCSW #> admin start
Intel FCSW (admin) #> config edit
Intel FCSW (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]
Intel FCSW (admin-config) #> config save
Intel FCSW (admin) #> config activate
The configuration will be activated. Please confirm (y/n): [n] y
```

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 E_D_TOV = 2 seconds

This section provides the steps to change these values.

McDATA Sphereon Web Management

- 1. Start McDATA Sphereon Web Management. The Main Switch View dialog box displays.
- 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.

a Sphereon 4500: - Microsoft Internet Explorer	
Elle Edit View Favorites Iools Help	A.
🚱 Back 🔹 🐑 - 🐹 😰 🏠 🔎 Search 👷 Favorites 🔮 Media 🤣 🖾 - 🖕 🔯	• 🔜 🚜
Address 💩 http://10.20.67.61/operations_online_fs.htm	Go Links 🎽
Operations:	Refresh-12/5/02 at 14:26:48
View Configure Monitor Operations Help	
a) Done	Internet

- 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.

🗿 Sphereon 4500: - Micro	soft Internet Explorer				
<u>File E</u> dit <u>V</u> iew F <u>a</u> vorites	<u>T</u> ools <u>H</u> elp				A
🕝 Back 🔹 🕥 🕤 🗙	😰 🏠 🔎 Search	📌 Favorites 🕺 Medi	• 🥝 🍰	🖸 • 🗾 🍇	
Address Address http://10.20.67.61/4	cfg_fab_params_fs.htm				Go Links
	Configu	re:		Refresh-12	/ 6 / 02 at 11:54:45
	Ports	Switch Mana	gement Zoning	User Rights	
	Identi	fication Date / Tim	e Parameters	Fabric Parameters	-ieiwork
View	R_A_TOV: E_D_TOV:	100 4	(to	enths of a second) enths of a second)	
Configure	Switch Priority: Interop Mode:	Default Open Fabric 1.0	~		
Monitor	Online State: Online	st he offline to activ	ate any changes		
Operations	Activate Cancel		ate any changes		
Help					
Cone Done					Internet

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.

Sphereon 4500: - Microse	oft Internet Explorer	
<u>File Edit View Favorites</u>	<u>I</u> ools <u>H</u> elp	<u>ar</u>
🌀 Back 🔹 🕥 🕤 💌	😰 🏠 🔎 Search 👷 Favorites 🜒 Media 🤣 🎯 🍓 🔯	• 🔜 🖓
Address a http://10.20.67.61/op	perations_online_fs.htm	Go Links »
	Operations:	Refresh-12/5/02 at 14:36:05
l l		
	Online state	
View	Current state is OFFLINE	
Configure	Set Online	
Monitor		
Onerations		
Operations		
Help		
🕘 Done		Internet

McDATA Telnet CLI

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

Username: Administrator Password: xxxxxxx Root> show Show> switch

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

Intel Fibre Channel Module Manager GUI

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

- 1. Start the Intel Fibre Channel Module Manager GUI. The **Fibre Channel Module Manager—Faceplate** dialog box displays.
- 2. From the Fibre Channel Module Manager—Faceplate dialog box Switch menu, select Switch Properties.



3. From the **Switch Properties—Fibre Channel Module 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.

World Wide Name: 10. Operational State: on Symbolic Name: FC IP Address: 10.	00:00:c0:dd:(line SM 20.8.188	00:91:05	FC Address: Firmware Version MAC address:	010000 n: V1.4.0.47-0. 00:c0:dd:00:91:04
Symbolic Name:	FCSM			
Administrative State:	online	•	Timeout Value	s
Domain ID:	98		R_A_TOV:	10000
Domain ID lock:	Enable	O Disable	R_T_TOV:	100
Broadcast Support:	• Enable	O Disable	E_D_TOV:	2000
In-band Management:	Enable	O Disable		

- 4. From the Switch Properties—Fibre Channel Module Manager dialog box Administrative State list, select offline. Click OK.
- 5. Re-enter the **Switch Properties**—**Fibre Channel Module Manager** dialog box (see step 2). Do the following:
 - a. In the **R_A_TOV** box, enter **10000**.
 - b. In the **E_D_TOV** box, enter **2000**.
 - c. Click OK.
- 6. Re-enter the Switch Properties—Fibre Channel Module Manager dialog box (see step 2). In the Administrative State list, select Online, then click OK.

Intel Fibre Channel Switch Module CLI

NOTE: Use the CLI commands when the Intel Fibre Channel Module Manager GUI is not available.

Login: admin Password: xxxxxxxx Intel FCSW #> show config switch

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.

Intel FCSW #> admin start Intel FCSW (admin) #> config edit Intel FCSW (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] Intel FCSW (admin-config) #> config save Intel FCSW (admin) #> config activate The configuration will be activated. Please confirm (y/n): [n] **y**

Principal Switch Configuration

McDATA switches and Intel Server Fibre Channel Switches 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 165.

Sphereon 4500: - Micros	soft Internet Explorer	
Eile Edit View Favorites	Took Help	1
🕝 Back 🔹 🐑 🕤 봄	😰 🏠 🔎 Search 🤺 Favorites 🜒 Media 🚱 🔗 - 嫨 🔯 - 🛄 🦓	
Address Address http://10.20.67.61/c	zfg_zoning_zset_fs.htm 🛛 🛃 G	o Links »
(Configure: Ports Switch Management Zoning User Rights Zone Set	6:21:19
View	Displayed Zoning Configuration is: Saved	
Configure	Save and Activate Zoning Configuration	
Monitor	Zone Set Name: McData_ZoneSet_1	
Operations	Default Zone: Enabled Disable Default Zone	
Help	Disable Zone Set (Place all attached devices in the Default Zone)	
	Discard Changes (Revert to Saved Zoning Configuration)	
🗃 Done	🥥 Internet	

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 165.

Sphereon 4500: - Mic	crosoft Internet Explorer	
<u>File Edit View Favori</u>	ites <u>I</u> ools <u>H</u> elp	.
🕝 Back 🝷 🐑 - 🚦	🗙 🙆 🏠 🔎 Search 👷 Favorites 🜒 Media 🤣 🔗 - 嫨 🔯 - 🛄 🍇	
Address 🙆 http://10.20.67.8	61/cfg_zoning_zone_fs.htm 🔽 🄁 Go 🛛	inks »
	Configure: Refresh-12/5/02 at 16:28:22	
	Ports Switch Management Zoning User Rights	
	Zone Set Zones	
View	Displayed Zoning Configuration is: Saved	
Configure		
	Add New Zone	
Monitor		
	Delate All Zerose	
Operations	Delete Au Zories	
Help	Display Previous Zones Display More Zones	
	Delete Accounting	
	Delete Development	
	Delete Email_Cluster	
	All Trans Directory	
	All Zones Displayed	
	Display Previous Zones Display More Zones	
e	🔮 Internet	

McDATA Telnet CLI

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

Username: Administrator Password: xxxxxxx 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 165.

Intel Fibre Channel Module Manager GUI

- 1. Start the Intel Fibre Channel Module Manager GUI. The **Fibre Channel Module Manager—Faceplate** dialog box displays.
- 2. From the Fibre Channel Module Manager—Faceplate dialog box Zoning menu, select Edit Zoning.


3. From the **Edit Zoning—Fibre Channel Module Manager** 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 165.



Intel Fibre Channel Switch Module CLI

NOTE: Use the following CLI commands when the Intel Fibre Channel Module Manager GUI is not available.

Login: admin Password: xxxxxxx Intel FCSW #> 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.

Sphereon 4500: - Microsoft Internet Explore		
Eile Edit View Favorites Tools Help		1
😋 Back 🔹 🐑 👻 😰 🏠 🔎 Sea	rch 👷 Favorites 🜒 Media 🚱 🔗 - 嫨 🔯 - 🛄 🦓	
Address 🕘 http://10.20.67.61/cfg_zoning_zone_fs.htm	💌 🄁 Go	Links »
Config	gure: Refresh-12 / 5 / 02 at 18:26:22	2
Ports	Switch Management Zoning User Rights	
	Zone Set Zones	
View Displayed Zoning	Configuration is: Saved	
Configure	Add New Zera	
Monitor		
Operations Delete All Zones)	
Help Display	Previous Zones Display More Zones	
Delete Acco Delete Dev Delete Ema All Zones D Display	unting elopment il Cluster isplayed Previous Zones Display More Zones	
æ		

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



McDATA Telnet CLI

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

Userna	ame:	Administrator
Passwo	ord:	****
Root>	show	NT
Show>	zon	ing

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

Intel Fibre Channel Module Manager GUI

- 1. Start the Intel Fibre Channel Module Manager GUI. The **Fibre Channel Module Manager—Faceplate** dialog box displays.
- 2. From the Fibre Channel Module Manager—Faceplate dialog box Zoning menu, select Edit Zoning.



3. The **Edit Zoning—Fibre Channel Module Manager** dialog box displays. Confirm that all zone members are listed as WWN.



Intel Fibre Channel Switch Module CLI

NOTE: Use the following CLI commands when the Intel Fibre Channel Module Manager GUI is not available.

Login: **admin** Password: **xxxxxxx**

Intel FCSW #> zone members <zone name>

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

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.

a Sphereon 4500: - Microse	koft Internet Explorer
<u>Eile E</u> dit <u>V</u> iew F <u>a</u> vorites	Iools Help
🚱 Back 🔹 🐑 - 💌	😰 🐔 🔎 Search 🧙 Favorites 🜒 Media 🤣 🔗 - 🌉 🔯 - 🛄 🍇
Address Address http://10.20.67.61/op	iperations_online_fs.htm 🕑 🔂 Go Links 🕺
	Operations: Switch Port Maintenance Feature Installation
la de la companya de	Beacon Online State
View Configure Monitor Operations Help	Current state is ONLINE Set Offline
Done	🍅 Internet

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.

🗃 Sphereon 4500: - Micro	soft Internet Explorer
<u>File Edit View Favorites</u>	: Iools Help 🥂
🕝 Back 🝷 🕥 🕤 💌	😰 🏠 🔎 Search 👷 Favorites 🜒 Media 🤣 🔗 - 🌺 🔯 - 🛄 🍇
Address 🙆 http://10.20.67.61/	(fg_zoning_zset_fs.htm 🛛 💽 🚱 Links 🎽
	Configure: Ports Switch Management Zoning User Rights Zone Set Zonese
View	Displayed Zoning Configuration is: Saved
Configure	
Monitor	Zone Set Name: McData_ZoneSet_1 Rename Zone Set
Operations	Default Zone: Enabled Disable Default Zone
Help	Disable Zone Set (Place all attached devices in the Default Zone) Discard Changes (Revert to Saved Zoning Configuration)
Ð	 Internet

- 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.

Sphereon 4500: - Micr	rosoft Internet Explorer	
Eile Edit View Favorite	es Iools Help	-
🕝 Back 🔹 🕥 - 🗙	👔 🚮 🔎 Search 🤺 Favorites 🜒 Media 🕢 🎯 + 🍡 🔯 + 🛄 🦓	
Address 🙆 http://10.20.67.61	1/cfg_fab_params_fs.htm	nks »
	Configure: Refresh-12/6/02 at 8:13:59	
	Ports Switch Management Zoning User Rights	
	Identification Date / Time Parameters Fabric Parameters Network	
View	R_A_TOV: 100 (tenths of a second)	
Configure	Switch Priority: Default	
Conligure	Interop Mode: Open Fabric 1.0	
Monitor	Online State: Offline	
Onemations	Note: The device must be offline to activate any changes	
Operations	Activate Cancel	
Help		
Done	😮 Internet	

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.

a Sphereon 4500: - Microsoft Internet Explorer	
Ele Edit View Favorites Iools Help	20 A
🚱 Back 🔹 🕞 - 🐹 😰 🏠 🔎 Search 🤺 Favorites 🔮 Media 🤣 🙆 - 头 🔯	• 🔜 🚳
Address 💩 http://10.20.67.61/operations_online_fs.htm	Go Links »
Operations:	Refresh-12/5/02 at 14:36:05
Basson O. V. Stat. Fordat	
Deacon Online State	
View Current state is OFFLINE	
Configure Set Online	
Monitor	
Operations	
Help	
2 Done	🔮 Internet

McDATA Telnet CLI

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

Username: Administrator Password: xxxxxxx 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

Intel Fibre Channel Module Manager GUI Not applicable.

Intel Fibre Channel Switch Module CLI Not applicable.

McDATA Specific Configuration

Not applicable.

Intel Specific 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 Intel support.

McDATA Intrepid 6000 Series Directors

Integration Checklist

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

ATTENTION!!

- Backup the current configuration prior to performing the following steps so that the configuration is available if something goes wrong.
- 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.
- ✓ Verify that the correct version of switch firmware is installed on each switch (see "Supported Switches and Firmware Versions" on page 182).
- Ensure that each switch has a unique Domain ID and that it falls within the proper range (see "Domain ID Configuration" on page 182).
- ✓ Set all switches to the appropriate timeout values (see "Timeout Values" on page 190).
- ✓ Ensure that all Zone set and Zone names are unique and conform to ANSI T11 standards (see "Active Zone Set Names" on page 198).
- ✓ Ensure that all zone members are specified by WWPN (see "Zone Types" on page 203).
- Ensure that all McDATA switches are configured for Open Fabric Interoperability mode (see "Operating Mode Configuration" on page 208).
- ✓ Verify that the fabrics have successfully merged (see "Successful Integration Checklist" on page 213).

Configuration Limitations

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

Supported Switches and Firmware Versions

The following Intel Server Fibre Channel Switch has been tested in the Intel environment and complies with the FC-SW-2 standard. The Intel Server Fibre Channel Switch has tested interoperable with the following switches from McDATA that comply with the FC-SW-2 standard.

Intel and McDATA Supported Switch and Firmware Versions

Manufacturer	Switch Model	Firmware Version
Intel	Intel Server Fibre Channel Switch	1.4.0.42.0 and above
McDATA	Intrepid 6064 Director	04.01.02.4 and above
	Intrepid 6140 Director	04.01.02.4 and above

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 the Intel Server Fibre Channel Switch.

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 Intel Domain ID.

McDATA Domain ID	Intel Domain ID	McDATA Domain ID	Intel Domain ID	McDATA Domain ID	Intel 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 Versus Intel Domain IDs

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.

🚰 ED-6064: san40-71 - Microsc	ft Internet Explorer		_ 8 ×
File Edit View Favorites 1	ools Help		i 🥂
🌀 Back 🔹 🕥 🖌 💌 🙎	🏠 🔎 Search 🥂 Favorites 🜒 Media 🧭 🗟 + 🌽 🐨 🚽 🦓		
Address Address http://10.4.40.71/ope	rations_online_fs.htm	💌 🛃 Go	Links »
View Configure Monitor Operations Help	Operations:		
🛃 Done		o Internet	

- 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.
 - b. From the Insistent Domain ID list, select Enabled.
 - c. Click Activate.

ED-6064: san40-71 - Microsoft Internet Explorer		_ 8 ×	
File Edit View Favorites Tools Help			
😋 Back + 🕥 - 🗷 🙆 🏠 🔎 Search 🤺 Favorites 🜒 Media 🤣 🍰 + 😓 🐷 - 📒 🖄			
Address 🗃 http://10.4.40.71/cfg_sw_opparms_fs.htm	💌 🏓 Go	Links »	
Address I http://10.4.40.71/dg_sw_oppering_fs.htm Configure: View Configure Monitor Operations Help	3		
	📄 📄 🔮 Internet		

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.

ED-6064: san40-71 - Microsoft Internet Explorer		_ 8 ×
File Edit View Favorites Tools Help		A
😋 Back + 🕥 - 🖹 😰 🏠 🔎 Search 🤺 Favorites 🜒 Media 🤣 😒 + 😓 🔟 - 🗾 🔏		
Address 👜 http://10.4.40.71/operations_online_fs.htm	💌 🄁 Go	Links »
View Configure Monitor Operations Help		
	🔮 Internet	

McDATA Telnet CLI

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

Username: Administrator Password: xxxxxxx Root> maint system Maint.System> setOnlineState False Maint.System> root Root> config switch Config.Switch> prefDomainId 1 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

Intel Fibre Channel Module Manager GUI

- 1. Start the Intel Fibre Channel Module Manager GUI. The **Fibre Channel Module Manager—Faceplate** dialog box displays.
- 2. From the Fibre Channel Module Manager—Faceplate dialog box Switch menu, select Switch Properties.



- 3. From the Switch Properties—Fibre Channel Module Manager 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. In the **Domain ID Lock** field, select **Enable** to ensure that the switch always has that Domain ID.
 - c. Click OK.

World Wide Name: 10: Operational State: onl	00:00:c0:dd:00:91:(ine)5 F F	C Address: irmware Versior	010000 x V1.4.0.47-0
Symbolic Name: FC IP Address: 10.	SM 20.8.188	r	AAC address:	00:c0:dd:00:91:0
Symbolic Name:	FCSM			
Administrative State:	online	•	Timeout Value	s
→ Domain ID:	98		R_A_TOV:	10000
→ Domain ID lock:	• Enable 🔿 D	isable	R_T_TOV:	100
Broadcast Support:	🖲 Enable 🔿 D	isable	E_D_TOV:	2000
In-band Management:	🖲 Enable 🛛 D	isable		

Intel Fibre Channel Switch Module CLI

NOTE: Use the following CLI commands when the Intel Fibre Channel Module Manager GUI is not available.

```
Login: admin
Password: xxxxxxx
Intel FCSW #> admin start
Intel FCSW (admin) #> config edit
Intel FCSW (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]
Intel FCSW (admin-config) #> config save
Intel FCSW (admin) #> config activate
The configuration will be activated. Please confirm (y/n): [n] y
```

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 E_D_TOV = 2 seconds

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.
- 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.

🚰 ED-6064: san40-71 - Microsoft	Internet Explorer		_ 8 ×
File Edit View Favorites Too	ols Help		- -
🌏 Back 🝷 🕥 🖌 💌 💋 🕇	🏠 🔎 Search 🤺 Favorites 🜒 Media 🚱 😥 🍓 🐨 🚽 为		
Address 🙆 http://10.4.40.71/opera	tions_online_fs.htm	💌 🄁 Go	Links »
View Configure Monitor Operations Help	Port Maintenance Freeduation Beacon Online State Tereturing Current state is ONLINE Set Offline		
E Done		o Internet	

- 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.

🚰 ED-6064: san40-71 - M	icrosoft Internet Explorer	
File Edit View Favorit	ies Tools Help	A.
🕝 Back 🔹 🕥 👻 🛃	😰 🏠 🔎 Search 🤺 Favorites 🜒 Media 🊱 😒 - 🎐 🖬 👻 🛄 🕉	
Address 🙆 http://10.4.40.	71/cfg_fab_params_fs.htm	💌 芛 Go 🛛 Links 🌺
View Configure Monitor Operations Help	Ports Director Management Zoning User Rights Identification Date / Time Parameters Fabric Parameters BB_Credit: 16 (tenths of a second) BB_DTOV: 20 (tenths of a second) Switch Priority: Default (tenths of a second) Interop Mode: Open Fabric 1.0 (tenths of a second) Online State: Online Activate Cancel	
(E)		Internet

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.

🗿 ED-6064: san40-71 - Mi	icrosoft Internet Explorer	_ 8 ×
File Edit View Favorib	es Tools Help	
🌀 Back 🝷 🕥 🖌 💌	😰 🏠 🔎 Search 🤺 Favorites 🜒 Media 🧭 😥 - 🦆 👿 🔹 📴 🕉	
Address 🙆 http://10.4.40.7	71/operations_online_fs.htm	💽 🔁 Go 🛛 Links »
View Configure Monitor Operations Help	Operations:	
۲		🥑 Internet

McDATA Telnet CLI

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

Username: Administrator Password: XXXXXXX 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> setOnline:	State True		

Intel Fibre Channel Module Manager GUI

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

- 1. Start the Intel Fibre Channel Module Manager GUI. The **Fibre Channel Module Manager—Faceplate** dialog box displays.
- 2. From the Fibre Channel Module Manager—Faceplate dialog box Switch menu, select Switch Properties.



3. From the **Switch Properties—Fibre Channel Module 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.

World Wide Name: 10 Operational State: on Symbolic Name: FC IP Address: 10	00:00:c0:dd:00:91:0 ine SM 20.8.188	5 FC Address: Firmware Versi MAC address:	010000 on: V1.4.0.47-0. 00:c0:dd:00:91:04
Symbolic Name:	FCSM		
Administrative State:	online	Timeout Valu	IES
Domain ID:	98	R_A_TOV	10000
Domain ID lock:	🖲 Enable 🛛 🔿 Di	sable R_T_TOV	100
Broadcast Support:	• Enable 🔿 Di	E_D_TOV	2000
In-band Management:	🖲 Enable 🛛 Di	sable	

- 4. From the Switch Properties—Fibre Channel Module Manager dialog box Administrative State list, select offline. Click OK.
- 5. Re-enter the **Switch Properties**—**Fibre Channel Module Manager** dialog box (see step 2). Do the following:
 - a. In the **R_A_TOV** box, enter **10000**.
 - b. In the **E_D_TOV** box, enter **2000**.
 - c. Click OK.
- 6. Re-enter the Switch Properties—Fibre Channel Module Manager dialog box (see step 2). In the Administrative State list, select Online, then click OK.

Intel Fibre Channel Switch Module CLI

NOTE: Use the CLI commands when the Intel Fibre Channel Module Manager GUI is not available.

Login: admin Password: xxxxxxxx Intel FCSW #> show config switch

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.

Intel FCSW #> admin start Intel FCSW (admin) #> config edit Intel FCSW (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] Intel FCSW (admin-config) #> config save Intel FCSW (admin) #> config activate The configuration will be activated. Please confirm (y/n): [n] **y**

Principal Switch Configuration

McDATA switches and Intel Server Fibre Channel Switches 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 198.

🛃 ED-6064: san40-71 - Mic	crosoft Internet Explorer	
File Edit View Favorite	is Tools Help	
🚱 Back 🔹 💮 🕗 💌	😰 🚮 🔎 Search 🤺 Favorites 🔌 Media 🚱 😒 - 😓 🔟 - 🔜 🦓	
Address 🙋 http://10.4.40.7	1/cfg_zoning_zset_fs.htm	💌 🛃 Go 🛛 Links ≫
	Configure: Refresh-2/21/03 at 15:07:58	
1	Ports Director Management Zoning User Rights	
	Zone Set	
View	Displayed Zoning Configuration is: Saved	
Configure	Save and Activate Zoning Configuration	
Monitor	Zone Set Name: Interop_Set	
Operations	Default Zone: Disabled Enable Default Zone	
Help	Disable Zone Set (Place all attached devices in the Default Zone)	
	Discard Changes (Revert to Saved Zoning Configuration)	
e 1		🔮 Internet 🏼 ///

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 198.

🏄 ED-6064: san40-71 - M	icrosoft Internet Explorer		_ 8 ×
File Edit View Favorit	es Tools Help		N 100
🕝 Back 🔹 🕥 🖌 💌	📓 🐔 🔎 Search 🤺 Favorites 🜒 Media 🧭 🔗 😓 📓 🕶 📙 🦓		
Address 🙆 http://10.4.40.	71/cfg_zoning_zone_fs.htm	💌 🔁 Go	Links »
	Configure: Refresh-2 / 18 / 03 at 16:47:15		
	Ports Director Management Zoning Liser Bights		
	Zong Set Zong		
View	Displayed Zoning Configuration is: Saved		
1000			
Configure			
	Add New Zone		
Monitor			
Operations	Delete All Zones		
Help	Display Provinus Zonos Display Mara Zonos		
	Display more Lones		
	All Zones Displayed		
	Display Previous Zones Display More Zones		
()		internet	

McDATA Telnet CLI

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

Username: Administrator Password: xxxxxxx 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 198.

Intel Fibre Channel Module Manager GUI

- 1. Start the Intel Fibre Channel Module Manager GUI. The **Fibre Channel Module Manager—Faceplate** dialog box displays.
- 2. From the Fibre Channel Module Manager—Faceplate dialog box Zoning menu, select Edit Zoning.



3. From the **Edit Zoning—Fibre Channel Module Manager** 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 198



Intel Fibre Channel Switch Module CLI

NOTE: Use the following CLI commands when the Intel Fibre Channel Module Manager GUI is not available.

Login: admin Password: xxxxxxx Intel FCSW #> 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 Sphereon 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.

ED-6064: san40-71 - Mi	icrosoft Internet Explorer	<u>X</u>
	😰 🏠 🔎 Search 👷 Favorites 📢 Media 🚱 😞 + 🤤 👿 + 🦲 🖓	
Address Address Address	Tl/cfg_zonig_zone_fs.htm	💽 🔁 Go 🛛 Links 🌺
Address Mttp://10.4.40.	Parts Director Management Zoning User Rights Ports Director Management Zoning User Rights Josplayed Zoning Configuration is: Saved Add New Zone Display Previous Zones Display More Zones Display Previous Zones Display More Zones Display More Zones Display Previous Zones Dielete 21 Image: Cones Display More Zones Display More Zones	Co Unics "
6		Internet

3. For each the zone selected in step 2, verify that all members are specified by WWN.

🚰 ED-6064: san40-71 - Mic	rosoft Internet Explorer	_ _ _ _ _ _
File Edit View Favorite	s Tools Help	
😋 Back 🔹 💮 🖌 💌	😰 🚮 🔎 Search 👷 Favorites 🜒 Media 🤣 🎅 🎭 🕎 👻 🛄 🕉	
Address 🙆 http://10.4.40.7	1/cfg_zoning_zmember_fs.htm?0,0	💌 芛 Go 🛛 Links 🌺
Address Mttp://10.4.40.7	I/dg_zoning_zmember_fs.htm?0,0 Configure: Ports Director Management Zoning User Rights Zone Set Zones Modify Zone Displayed Zoning Configuration is: Saved Zone: [Z2 Rename Zone Add New Zone Member: Attached Node World Wide Name: [21:00:00:E0:8B:07:F9:B6] Add Member World Wide Name: [21:00:00:E0:8B:07:F9:B6] Add Member Domain ID: [1] Port Number: [0] Add Member	Go Links >>
	Display Previous Members Display More Members	
	Delete 50:02:0F:23:00:00:9F:E8	
	Delete 50:02:0F:23:00:00:9F:5D	
Done		V Internet
McDATA Telnet CLI

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

Username: Administrator Password: xxxxxxx

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

Root> show		
Show> zonin	g	
Active Zone	Set	
Default Zon	e Enabled	: False
Zone Set:	Interop_S	et
Zone: Z2	2	
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

Intel Fibre Channel Module Manager GUI

- 1. Start the Intel Fibre Channel Module Manager GUI. The **Fibre Channel Module Manager—Faceplate** dialog box displays.
- 2. From the Fibre Channel Module Manager—Faceplate dialog box Zoning menu, select Edit Zoning.



3. The **Edit Zoning—Fibre Channel Module Manager** dialog box displays. Confirm that all zone members are listed as WWN.



Intel Fibre Channel Switch Module CLI

NOTE: Use the following CLI commands when the Intel Fibre Channel Module Manager GUI is not available.

Login: **admin** Password: **xxxxxxx**

Intel FCSW #> zone members <zone name>

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

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.

ED-6064: san40-71 - Micros Ele Edit View Envertee	soft Internet Explorer		_ & ×
	1 🔗 🔎 Search 🐈 Favorites 📢 Media 🍘 😞 😓 🗑 - 🧠		
Address filtp://10.4.40.71/op	perations_online_fs.htm	💌 🏓 Go	Links »
View Configure Monitor Operations Help	Operations: Director Port Meintensne Installation Beacon Online State Current state is ONLINE Set Offline		
E Done		S Internet	

- 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.

🛃 ED-6064: san40-71 - M	icrosoft Internet Explorer	-OX
File Edit View Favorit	tes Tools Help	🥂 🕺
😋 Back 🔹 🌍 🖌 💌	😰 🏠 🔎 Search 🧙 Favorites 🔇 Media 🧭 🍰 - 😓 🐷 - 📒 🖓	
Address 🛃 http://10.4.40.3	71/cfg_zoning_zset_fs.htm	🗾 🔁 Go 🛛 Links »
	Configure: Refresh-2/21/03 at 15:07:58	
, see	Ports Director Management Zoning User Rights	
View	Displayed Zoning Configuration is: Saved	
Configure	Save and Activate Zoning Configuration	
Monitor	Zone Set Name: Interop_Set Rename Zone Set	
Operations	Default Zone: Disabled Enable Default Zone	
Help	Disable Zone Set (Place all attached devices in the Default Zone)	
	Discard Changes (Revert to Saved Zoning Configuration)	
ē)		🥑 Internet

- 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.

🚰 ED-6064: san40-71 - Mi	crosoft Internet Explorer		_ 8 ×
File Edit View Favorite	es Tools Help		A
🌀 Back 👻 🕥 🖌 💌	😰 🏠 🔎 Search 🧙 Favorites 🜒 Media 🚱 🎅 + 🧽 🖬 🛛 🗾 🖄		
Address 🚳 http://10.4.40.7	71/cfg_fab_params_fs.htm	💌 🄁 Go	Links »
View Configure Monitor Operations Help	Configure: Refresh-2/18/03 at 16:45:07 Ports Director Management Zoning User Rights Identification Date / Time Parameters Fabric Parameters BB_Credit: 16 (tenths of a second) E_D_TOV: 20 (tenths of a second) Switch Priority: Default • Interop Mode: Open Fabric 1.0 • Online State: Online Note: The device must be offline to activate any changes Activate Cancel		
()		🔮 Internet	

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.

🚈 ED-6064: san40-71 - Mi	crosoft Internet Explorer	_ 8 ×
File Edit View Favorite	es Tools Help	1
🌀 Back 👻 🕥 🖌 💌	😰 🏠 🔎 Search 🧙 Favorites 🜒 Media 🚱 🎅 💐 🖬 🔹 🔜 %	
Address 🙆 http://10.4.40.7	1/operations_online_fs.htm	💌 🄁 Go 🛛 Links 🂙
View Configure Monitor Operations Help	Operations:	
٢		🌍 Internet

McDATA Telnet CLI

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

Username: Administrator Password: xxxxxxx 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

Intel Fibre Channel Module Manager GUI Not applicable.

Intel Fibre Channel Switch Module CLI Not applicable.

McDATA Specific Configuration

Not applicable.

Intel Specific 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 McDATA and Intel 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 Intel support.

Merging Intel and QLogic Fabrics

The following Intel Server Fibre Channel Switch has been tested in the Intel environment and complies with the FC-SW-2 standard. The Intel Server Fibre Channel Switch has tested interoperable with the following switches from QLogic that comply with the FC-SW-2 standard.

Manufacturer	Switch Model	Firmware Version
Intel	Intel Server Fibre Channel Switch	1.4.0.42.0 and above
QLogic	SANbox2-8 Switch	1.5.x and above
	SANbox2-16 Switch	1.5.x and above
	SANbox2-64 Switch	1.5.x and above

Intel and QLogic Supported Switch and Firmware Versions

The following chapter provides detailed information about merging Intel and QLogic fabrics: **QLogic SANbox2 Series Switches (see page 217)**.

QLogic SANbox2 Series Switches

Integration Checklist

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

ATTENTION!!

- Backup the current configuration prior to performing the following steps so that the configuration is available if something goes wrong.
- 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.
- ✓ Verify that the correct version of switch firmware is installed on each switch (see "Supported Switches and Firmware Versions" on page 218).
- ✓ Ensure that each switch has a unique Domain ID (see "Domain ID Configuration" on page 219).
- ✓ Set all switches to the appropriate timeout values (see "Timeout Values" on page 226).
- ✓ Ensure that all Zone set and Zone names are unique and conform to ANSI T11 standards (see "Active Zone Set Names" on page 233).
- ✓ Verify that the fabrics have successfully merged (see "Successful Integration Checklist" on page 239).

Configuration Limitations

No limitations exist when merging QLogic and Intel fabrics; all features are fully supported and comply with industry standards.

Supported Switches and Firmware Versions

The following Intel Server Fibre Channel Switch has been tested in the Intel environment and complies with the FC-SW-2 standard. The Intel Server Fibre Channel Switch has tested interoperable with the following switches from QLogic that comply with the FC-SW-2 standard.

Intel and QLogic Supported Switch and Firmware Versions

Manufacturer	Switch Model	Firmware Version
Intel	Intel Server Fibre Channel Switch	1.4.0.42.0 and above
QLogic	SANbox2-8 Switch	1.5.x and above
	SANbox2-16 Switch	1.5.x and above
	SANbox2-64 Switch	1.5.x and above

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 the Intel Server Fibre Channel Switch.

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 SANbox2-8 and SANbox2-16, the following displays:

😤 SANbox M	anager - Faceplate		
<u>File</u> Fabric	Switch Port Zoning View	Help	
□ Add	Archive Restore Load Firmware	zoning glogic	
FC Fabrics ♀ ● 10.20.	_ Firmware Fallback Set Date/Time		
SA SA	Switch Properties Network Properties	· ·····/·	•
Sim	Toggle Beacon	• / • . • . • . • . • . • . • . • . • .	
	Export Alarm Log Configure <u>A</u> larm Thresholds		
	Reset Switch	Switch Port Address Type WWNN Nbox2 9 010900 N-Port 20:00:00:e0:8b:09:c3:dc 21:02	VW 2:00:e0:8
	Restore Factory Defaults		
Sim	plify		
	1	rer Switch Port Stats Port Info Configured Zonesets Alarm Log	
		Configured conesets And the Configured conesets And the Cog	
a second s			

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 SANbox2-8 and SANbox2-16, the following displays:

World Wide Name: 10:00:00:c0:dd:00:72:19 Operational State: online	FC Address: 010000 Firmware Version: V1.3-56-0
Chassis Name: SANbox2 IP Address: 10.20.67.16	MAC address: 00:c0:dd:00:72:1
Chassis Name: SANbox2	
Administrative State: online 🔹	R A TOV: 10000
Domain ID: 1	R_T_TOV: 100
Domain ID lock: Enable Disable	E_D_TOV: 2000
Broadcast Support: Enable Disable	

For the QLogic SANbox2-64, the following displays:

World Wide Name: 10: Operational State: onli Chassis Name: QL	00:00:c0:dd:00:72:bb ine ogic SANbox2-64	FC Address: Firmware Version MAC address:	780000 x V1.4.0.36-0 00:c0:dd:00:72:b
IP Address: 10. Chassis Name: Administrative State:	QLogic SANbox2-64	Timeout Value	S
Domain ID:Domain ID lock:	Enable Obisable	R_A_TOV: R_T_TOV:	10000
Broadcast Support:	Enable Oisable Enable Oisable	E_D_TOV:	2000

QLogic CLI

NOTE: Use the CLI commands when the QLogic SANbox Manager GUI is not available. The procedures are the same for the QLogic SANbox2-8, SANbox2-16, and SANbox2-64.

```
Login: admin
Password: xxxxxxx
SANbox2 #> admin start
SANbox2 (admin) #> config edit
SANbox2 (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) [QLogic SANbox 2-64]
  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]
SANbox2 (admin-config) #> config save
SANbox2 (admin) #> config activate
The configuration will be activated. Please confirm (y/n): [n] y
```

Intel Fibre Channel Module Manager GUI

- 1. Start the Intel Fibre Channel Module Manager GUI. The **Fibre Channel Module Manager—Faceplate** dialog box displays.
- 2. From the Fibre Channel Module Manager—Faceplate dialog box Switch menu, select Switch Properties.



- 3. From the Switch Properties—Fibre Channel Module 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.

World Wide Name: 10: Operational State: onl	00:00:c0:dd:00:91:(ine)5 F F	C Address: irmware Versior	010000 1:V1.4.0.47-0	
Symbolic Name: FC IP Address: 10.	SM 20.8.188	r	AAC address:	00:c0:dd:00:91:0	
Symbolic Name:	FCSM				
Administrative State:	online 👻		Timeout Value	s	
→ Domain ID:	98		R_A_TOV:	10000	
→ Domain ID lock:	• Enable 🔿 D	isable	R_T_TOV:	100	
Broadcast Support:	🖲 Enable 🔿 D	isable	E_D_TOV:	2000	
In-band Management:	🖲 Enable 🛛 D	isable			

Intel Fibre Channel Switch Module CLI

```
NOTE: Use the CLI commands when the Intel Fibre Channel Module Manager GUI is not available.
```

```
Login: admin
Password: xxxxxxx
Intel FCSW #> admin start
Intel FCSW (admin) #> config edit
Intel FCSW (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]
Intel FCSW (admin-config) #> config save
Intel FCSW (admin) #> config activate
The configuration will be activated. Please confirm (y/n): [n] y
```

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 E_D_TOV = 2 seconds

This section provides the steps to change these values.

QLogic SANbox Manager GUI

<u>ATTENTION!!</u> 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 SANbox2-8 and SANbox2-16, the following displays:



For the QLogic SANbox2-64, the following displays:

🗟 SANbox Manager - Faceplate								
File Fabric Switch Blade F	ort Zoning Vie	w <u>H</u> elp						
Archive			alogic					
Add Restore		Zoning	gr o					
FC Fabrics Firmware Fallbac	k 00	(2-64						
• • 10.20. Set Date/Time								
Switch Propertie	S							
SANDO	es		.	_		Ĩ .	`	
Sim 🗆 Toggle Beacon	1	6	.• GL	GL GL		Ĵ _ 2 GL 5 GL	GL S	GL
Export Alarm Log		1 GL	9 GL	GL CL		GL	4 GL 5	GL
Configure <u>A</u> larm	Thresholds	2 GL	1 GL	GL GL		GL SGL	S GL S	GL
Reset Switch	1	GL		GL 2 GL		GL		GL
Restore Factory	efaults							9
		S GL						
Simplify								
/		3 BL	35 CT - 37		•			
						⊕ <u> </u>		
	Dev	Switch	Port	Address	Туре	WWNN	W	MPN Vend
Simplify								
	Name Server	Switch	Port Stats	Port Info	Blade Info	Configured Zonesets	alarm Log	
								≣ ;±

3. 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 SANbox2-8 and SANbox2-16, the following displays:

World Wide Name: 10:00:00:c0:dd:00:72:19	FC Address: 010000	
Operational State: online	Firmware Version: V1.3-56-0	
Chassis Name: SANbox2	MAC address: 00:c0:dd:00:72:1a	
IP Address: 10.20.67.16		
Chassis Name: SANbox2		
Administrative Olater	Timeout Values	
Administrative State: online	R_A_TOV: 10000	
Domain ID: 1	B T TOY: 100	
Domain iD lock:	E_D_TOV: 2000	
Broadcast Support: Enable Disable		

For the QLogic SANbox2-64, the following displays:

World Wide Name: 10:00:00:c0:dd:00:72:bb	FC Address: 780000
Operational State: online	Firmware Version: V1.4.0.36-0
Chassis Name: QLogic SANbox2-64 IP Address: 10.20.67.1	MAC address: 00:c0:dd:00:72:ba
Chassis Name: QLogic SANbox2-64	
Administrative State: online	Timeout Values
Domain ID: 120	R_A_TOV: 10000
Domain ID lock:	R_T_TOV: 100
Broadcast Support:	E_D_TOV: 2000
In-band Management: Enable O Disable	

- 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 CLI commands when the QLogic SANbox Manager GUI is not available. The procedures are the same for the QLogic SANbox2-8, SANbox2-16, and SANbox2-64.

Login: admin Password: xxxxxxxx SANbox2 #> show config switch

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.

```
SANbox2 #> admin start
SANbox2 (admin) #> config edit
SANbox2 (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) [QLogic SANbox2-64]
  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]
SANbox2 (admin-config) #> config save
SANbox2 (admin) #> config activate
The configuration will be activated. Please confirm (y/n): [n] y
```

Intel Fibre Channel Module Manager GUI

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

- 1. Start the Intel Fibre Channel Module Manager GUI. The **Fibre Channel Module Manager—Faceplate** dialog box displays.
- 2. From the Fibre Channel Module Manager—Faceplate dialog box Switch menu, select Switch Properties.



3. From the **Switch Properties**—**Fibre Channel Module 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.

World Wide Name: 10:00:00:c0:dd:00:91:05 Operational State: online Symbolic Name: FCSM IP Address: 10:20:8:188		FC Address: 010000 Firmware Version: V1.4.0.47-0. MAC address: 00:c0:dd:00:91:04		
Symbolic Name:	FCSM online			
Administrative State:			Timeout Values	
Domain ID:	98		R_A_TOV:	10000
Domain ID lock:	Enable	O Disable	R_T_TOV:	100
Broadcast Support:	• Enable	O Disable	E_D_TOV:	2000
In-band Management:	Enable	O Disable		

- 4. From the Switch Properties—Fibre Channel Module Manager dialog box Administrative State list, select offline. Click OK.
- 5. Re-enter the **Switch Properties**—**Fibre Channel Module Manager** dialog box (see step 2). DO the following:
 - a. In the **R_A_TOV** box, enter **10000**.
 - b. In the **E_D_TOV** box, enter **2000**.
 - c. Click OK.
- 6. Re-enter the Switch Properties—Fibre Channel Module Manager dialog box (see step 2). In the Administrative State list, select Online. Click OK.

Intel Fibre Channel Switch Module CLI

NOTE: Use the CLI commands when the Intel Fibre Channel Module Manager GUI is not available.

Login: admin Password: xxxxxxxx Intel FCSW #> show config switch

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.

Intel FCSW #> admin start Intel FCSW (admin) #> config edit Intel FCSW (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) [xxxx] 10000 E D TOV (decimal value, 10-20000 msec) [xxxx] 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] Intel FCSW (admin-config) #> config save Intel FCSW (admin) #> config activate The configuration will be activated. Please confirm (y/n): [n] **y**

Principal Switch Configuration

QLogic SANblade switches and Intel Server Fibre Channel Switches 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 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 233.

For the QLogic SANbox2-8 and SANbox2-16, the following displays:



🕵 Edit Zoning - SANbox Manager File Edit Q 6 Alias Remove Zone Set Insert Zone Sets
 Members P D QLogic SANbox2-64 🐻 ZoneSet: ORPHAN ZONE SET Domain:120 Port #0 Domain:120 Port #1 Domain:120 Port #1 Domain:120 Port #2 Domain:120 Port #3 🕈 🛅 ZoneSet: Atlanta_ZoneSet -- Zone: Disaster_Recovery (Soft) - Zone: Network_Operations (Soft) Zone Set Domain:120 Port#4 ZoneSet: Building_1_ZoneSet
 Set
 Domain:120 Port #5 Domain:120 Port #6 Zone: Accounting (Soft) Zone Domain:120 Port #7 - Zone: Corporate_Web_Servers (Soft) Domain:120 Port #8 ZoneSet: Building_2_ZoneSet
 Set
 Domain:120 Port #9 Domain:120 Port #10 Zone: Research_And_Development (Soft) Domain:120 Port #11 Domain:120 Port #12 Domain:120 Port#13 Domain:120 Port#14 15 Domain:120 Port 16 Domain:120 Port Domain:120 Port #17 Domain:120 Port#18 Domain:120 Port #19 Domain:120 Port#20 Domain:120 Port#21 Domain:120 Port #23 Domain:120 Port #24 <u>o</u>ĸ Apply Cancel

For the QLogic SANbox2-64, the following displays:

QLogic CLI

NOTE: Use the CLI commands when the QLogic SANbox Manager GUI is not available. The procedures are the same for the QLogic SANbox2-8, SANbox2-16, and SANbox2-64.

Login: **admin** Password: **xxxxxxxx** SANbox2 **#> zone list**

Intel Fibre Channel Module Manager GUI

- 1. Start the Intel Fibre Channel Module Manager GUI. The **Fibre Channel Module Manager—Faceplate** dialog box displays.
- 2. From the Fibre Channel Module Manager—Faceplate dialog box Zoning menu, select Edit Zoning.



3. From the **Edit Zoning—Fibre Channel Module Manager** 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 233.



Intel Fibre Channel Switch Module CLI

NOTE: Use the CLI commands when the Intel Fibre Channel Module Manager GUI is not available.

Login: admin Password: xxxxxxxx Intel FCSW #> zone list

Zone Types

This configuration supports all QLogic SANbox2 and Intel Server Fibre Channel Switch Zone types.

Operating Mode Configuration

Not applicable.

QLogic Specific Configuration

Not applicable.

Intel Specific 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 Intel 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 Intel support.
Merging Intel and Sun Fabrics

The following Intel Server Fibre Channel Switch has been tested in the Intel environment and complies with the FC-SW-2 standard. The Intel Server Fibre Channel Switch has tested interoperable with the following switches from Sun that comply with the FC-SW-2 standard.

Manufacturer	Switch Model	Firmware Version
Intel	Intel Server Fibre Channel Switch	1.4.0.42.0 and above
Sun	Sun StorEdge Network 2 Gb FC Switch-8	1.5.x and above
	Sun StorEdge Network 2 Gb FC Switch-16	1.5.x and above
	Sun StorEdge Network 2 Gb FC Switch-64	1.5.x and above

Intel and Sun Supported Switch and Firmware Versions

The following chapter provides detailed information about merging Intel and Sun fabrics: **Sun StorEdge Network 2 Gb FC Series Switches (see page 243)**.

Sun StorEdge Network 2 Gb FC Series Switches

Integration Checklist

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

ATTENTION!!

- Backup the current configuration prior to performing the following steps so that the configuration is available if something goes wrong.
- 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.
- ✓ Verify that the correct version of switch firmware is installed on each switch (see "Supported Switches and Firmware Versions" 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 245).
- ✓ Set all switches to the appropriate timeout values (see "Timeout Values" on page 252).
- ✓ Ensure that all Zone set and Zone names are unique and conform to ANSI T11 standards (see "Active Zone Set Names" on page 260).
- ✓ Ensure that all zone members are specified by WWPN (see "Zone Types" on page 267).
- ✓ Verify that the fabrics have successfully merged (see "Successful Integration Checklist" on page 273).

Configuration Limitations

The following Intel Server Blade Chassis Enterprise software features are not supported in Sun fabrics.

- Virtual Private Fabric (VPF) Zoning
- Access Control List (ACL) Zoning
- I/O PathGuard
- I/O StreamGuard

No limitations exist when merging Sun and Intel fabrics; all features are fully supported and comply with industry standards.

Supported Switches and Firmware Versions

The following Intel Server Fibre Channel Switch has been tested in the Intel environment and complies with the FC-SW-2 standard. The Intel Server Fibre Channel Switch has tested interoperable with the following switches from Sun that comply with the FC-SW-2 standard.

inter and Sun Supported Switch and Firmware versions
--

Manufacturer	Switch Model	Firmware Version
Intel	Intel Server Fibre Channel Switch	1.4.0.42.0 and above
Sun	Sun StorEdge Network 2 Gb FC Switch-8	1.5.x and above
	Sun StorEdge Network 2 Gb FC Switch-16	1.5.x and above
	Sun StorEdge Network 2 Gb FC Switch-64	1.5.x and above

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 Sun switch and the Intel Server Fibre Channel Switch.

Sun StorEdge 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 Sun StorEdge Network 2 Gb FC Switch-8 and Sun StorEdge Network 2 Gb FC Switch-16, the following displays:

-			SANbox	k Manager	- Faceplat	e		•			
File Fabric	Switch Port Zo	ning <u>View</u>	Help								
Add	Archive Restore Load Firmware		Zoning	9							
FC Fabrics	Firmware Fallbac	:k	-C Switch	16							
🌳 🔵 10.20.	Switch Propertie	S									
- 🛤 Sté	Network Properties										
	Export Alarm Log Configure <u>A</u> larm	j Thresholds			a u '' au '' au	" GL " GL "					
	Reset Switch										
	- Restore Factory	Defaults	Switch	Port	Address	Type	WWNN	W			
		L-	brEdge 2	. 14	100ec3	NL-Port	20:00:00:20:37:a7:30:79	21:00:00:20:			
		2	StorEdge 2	. 14	100ec5	NL-Port	20:00:00:20:37:a7:13:a3	21:00:00:20:			
		3	StorEdge 2	. 14	100000	NL-Port	20:00:00:20:37:a7:89:2a	21:00:00:20:			
		4	StorEdge 2	14	100ec7	NL-PUR	20.00.00.20.37.87.13.10	21.00.00.20.			
		6	StorEdge 2	14	100000	NL-Port	20:00:00:20:37:a7:32:05	21:00:00:20			
		7	StorEdge 2	14	100eca	NL-Port	20:00:00:20:37:47:50:54 20:00:00:04:cf4c:52:d9	21:00:00:20			
		ľ	StorEuge 2	. 14	Tobecb	INC-FUIL	20.00.00.04.01.40.55.09	21.00.00.04.			
		1 Name Serv	er Switch	Port Stat	s Port Info	Configure	ed Zonesets Alarm Log))			
		\						-			
								-7-			

For the Sun StorEdge Network 2 Gb FC Switch-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 Sun StorEdge Network 2 Gb FC Switch-8 and Sun StorEdge Network 2 Gb FC Switch-16, the following displays:

World wide name: 10: Operational state: onl Chassis name: Sto IP address: 10.	00:00:c0:dd:00:72:19 ine rEdge 2Gb FC Switch 16 20.67.16	FC address: 100000 Firmware version: V1.4.2.3-0 MAC address: 00:c0:dd:00:72:1a
Chassis name: Administrative state: Domain ID:	torEdge 2Gb FC Switch 16	Timeout values R_A_TOV: 10000
Domain ID lock: Broadcast support:	Enable Disable Enable Disable	R_T_TOV: 100 E_D_TOV: 2000
Inband management:	• Enable 🔿 Disable	

For the Sun StorEdge Network 2 Gb FC Switch-64, the following displays:

World wide name: 10:	00:00:c0:dd:00:72:bb	FC address: 170000				
Operational state: onl	ine	Firmware version: V1.4.2.3-0				
Chassis name: Sto	rEdge 2Gb FC Switc	MAC address: 00:c0:dd:00:7				
IP address: 10.	20.67.1					
Chassis name:	StorEdge 2Gb FC Switch 64	4				
Administrative state:	online	▼ Timeout values				
Domain ID:	23	R_A_TOV: 10000				
Domain ID lock:	• Enable 🛛 🔿 Disabl	e R_T_TOV: 100				
Broadcast support:	• Enable 🔿 Disabl	E_D_TOV: 2000				
Inband management:	• Enable 🔿 Disabl	e				

Sun StorEdge CLI

NOTE: Use the CLI commands when the Sun StorEdge SANbox Manager GUI is not available. The procedures are the same for the Sun StorEdge Network 2 Gb FC Switch-8, Sun StorEdge Network 2 Gb FC Switch-16, and Sun StorEdge Network 2 Gb FC Switch-64.

Login: **admin**

```
Password: xxxxxxx
StorEdge 2Gb FC Switch 16 #> admin start
StorEdge 2Gb FC Switch 16 (admin) #> config edit
StorEdge 2Gb FC Switch 16 (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) [StorEdge 2Gb FC Switch 16]
  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]
StorEdge 2Gb FC Switch 16 (admin-config) #> config save
StorEdge 2Gb FC Switch 16 (admin) #> config activate
The configuration will be activated. Please confirm (y/n): [n] y
```

Intel Fibre Channel Module Manager GUI

- 1. Start the Intel Fibre Channel Module Manager GUI. The **Fibre Channel Module Manager—Faceplate** dialog box displays.
- 2. From the Fibre Channel Module Manager—Faceplate dialog box Switch menu, select Switch Properties.



- 3. From the Switch Properties—Fibre Channel Module Manager 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. In the **Domain ID Lock** field, select **Enable** to ensure that the switch always has that Domain ID.
 - c. Click OK.

World Wide Name: 10	:00:00:c0:dd:	00:91:05	FC Address:	010000	
Operational State: onl	line CM	Firmware Version	1. V1.4.0.47-0.		
IP Address: 10	20.8.188	MAC duu ess.	00.00.00.00.01.0		
Symbolic Name:	FCSM				
Administrative State:	online	•	Timeout Value:	ues	
→ Domain ID:	98		R_A_TOV:	10000	
→ Domain ID lock:	• Enable	O Disable	R_T_TOV:	100	
Broadcast Support:	Enable	O Disable	E_D_TOV:	2000	
In-band Management:	Enable	O Disable			

Intel Fibre Channel Switch Module CLI

NOTE: Use the following CLI commands when the Intel Fibre Channel Module Manager GUI is not available.

```
Login: admin
Password: xxxxxxx
Intel FCSW #> admin start
Intel FCSW (admin) #> config edit
Intel FCSW (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]
Intel FCSW (admin-config) #> config save
Intel FCSW (admin) #> config activate
The configuration will be activated. Please confirm (y/n): [n] y
```

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 E_D_TOV = 2 seconds

This section provides the steps to change these values.

Sun StorEdge SANbox Manager GUI

<u>ATTENTION!!</u> 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 Sun StorEdge Network 2 Gb FC Switch-8 and Sun StorEdge Network 2 Gb FC Switch-16, the following displays:

File Fabric	Switch	Port 2	Zoning <u>V</u> iew	SANbox Help	k Mar	nager – Fa	aceplate	e	erentinter treferer	nanante statute arai	
Add	Archive Restore Load Fi	e e rmware ire Fallbi	 ack	Zoning FC Switch	9 16						
	Switch	Propert	ies	-							
Sto	Networ	k Prope le Beaco	rties n			å. å.	á, á				
	Exp <u>o</u> rt Configu	Alarm Lo ire <u>A</u> larr	og n Thresholds.			er er	er er		œ"œ")		
	Reset Swi Restore F		<u>y D</u> efaults	Switch	14	Port /	Address Dec3	Type NL-Port	20:00:00:20	WNN 37:a7:30:79	21:00:00:20:
	0		2	StorEdge 2	14	10	Dec5	NL-Port	20:00:00:20	:37:a7:13:a3	21:00:00:20:
			3	StorEdge 2	. 14	10	Dec6	NL-Port	20:00:00:20	:37:a7:89:2a	21:00:00:20:
			4	StorEdge 2	. 14	10	Dec7	NL-Port	20:00:00:20	:37:a7:13:10	21:00:00:20:
			5	StorEdge 2	. 14	10	Dec9	NL-Port	20:00:00:20	:37:a7:32:05	21:00:00:20
			6	StorEdge 2	. 14	10	Deca	NL-Port	20:00:00:20	:37:a7:30:ba	21:00:00:20
			7	StorEdge 2	. 14	10	Decb	NL-Port	20:00:00:04	:cf:4c:53:d9	21:00:00:04
			A Name Set	wer Switch	Pr	urt Stats	Port Info	Configure	d Zonesets	Alarming	•
 Homesessessesses 								Comigare			
											=+=



For the Sun StorEdge Network 2 Gb FC Switch-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 Sun StorEdge Network 2 Gb FC Switch-8 and Sun StorEdge Network 2 Gb FC Switch-16, the following displays:

World wide name: 10	:00:00:c0:dd:00:72:19	FC address: 100000
Operational state: on	line	Firmware version: V1.4.2.3-0
Chassis name: Sto IP address: 10	orEdge 2Gb FC Switch 16 .20.67.16	MAC address: 00:c0:dd:00:72:1a
Chassis name:	storEdge 2Gb FC Switch 16	
Administrative state:	online 👻	Timeout values
Domain ID:	16	R_A_TOV: 10000
Domain ID lock:	Enable Oisable	R_T_TOV: 100
Broadcast support:	Enable Oisable	E_D_TOV: 2000
Inband management:	Enable O Disable	

For the Sun StorEdge Network 2 Gb FC Switch-64, the following displays:

Norld wide name: 10	:00:00:c0:dd:00:72:bb	FC address: 170000				
Operational state: or	line	Firmware version: V1.4.2.3-0				
Chassis name: St	orEdge 2Gb FC Switc	MAC address: 00:c0:dd:00:7				
Paddress: 10	.20.67.1					
Chassis name:	StorEdge 2Gb FC Switch	64				
Administrative state:	online	▼ Timeout values				
Domain ID:	23	R_A_TOV: 10000				
Domain ID lock:	Enable Olisa	ble R_T_TOV: 100				
Broadcast support:	• Enable 🛛 Disa	E_D_TOV: 2000				
nband management	🖲 Enable 💦 🔿 Disa	ble				

- 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.

Sun StorEdge CLI

NOTE: Use the CLI commands when the Sun StorEdge SANbox Manager GUI is not available. The procedures are the same for the Sun StorEdge Network 2 Gb FC Switch-8, Sun StorEdge Network 2 Gb FC Switch-16, and Sun StorEdge Network 2 Gb FC Switch-64.

Login: admin Password: xxxxxxxx StorEdge 2Gb FC Switch 16 #> show config switch

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.

```
StorEdge 2Gb FC Switch 16 #> admin start
StorEdge 2Gb FC Switch 16 (admin) #> config edit
StorEdge 2Gb FC Switch 16 (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) [StorEdge 2Gb FC Switch 16]
  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]
StorEdge 2Gb FC Switch 16 (admin-config) #> config save
StorEdge 2Gb FC Switch 16 (admin) #> config activate
The configuration will be activated. Please confirm (y/n): [n] y
```

Intel Fibre Channel Module Manager GUI

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

- 1. Start the Intel Fibre Channel Module Manager GUI. The **Fibre Channel Module Manager—Faceplate** dialog box displays.
- 2. From the Fibre Channel Module Manager—Faceplate dialog box Switch menu, select Switch Properties.



3. From the **Switch Properties—Fibre Channel Module 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.

World Wide Name: 10 Operational State: on Symbolic Name: FC IP Address: 10	00:00:c0:dd:00:91:05 ine SM 20.8.188	5 FC Address: Firmware Versio MAC address:	FC Address: 010000 Firmware Version: V1.4.0.47-0. MAC address: 00:c0:dd:00:91:0				
Symbolic Name:	FCSM						
Administrative State:	online	Timeout Value	s				
Domain ID:	98	R_A_TOV:	10000				
Domain ID lock:	• Enable 🔿 Dis	able R_T_TOV:	100				
Broadcast Support:	• Enable 🔿 Dis	E_D_TOV:	2000				
In-band Management:	• Enable 🔿 Dis	able					

- 4. From the Switch Properties—Fibre Channel Module Manager dialog box Administrative State list, select offline. Click OK.
- 5. Re-enter the **Switch Properties**—**Fibre Channel Module Manager** dialog box (see step 2). Do the following:
 - a. In the **R_A_TOV** box, enter **10000**.
 - b. In the **E_D_TOV** box, enter **2000**.
 - c. Click OK.
- 6. Re-enter the Switch Properties—Fibre Channel Module Manager dialog box (see step 2). In the Administrative State list, select Online. Click OK.

Intel Fibre Channel Switch Module CLI

NOTE: Use the CLI commands when the Intel Fibre Channel Module Manager GUI is not available.

Login: admin Password: xxxxxxxx Intel FCSW #> show config switch

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.

Intel FCSW #> admin start Intel FCSW (admin) #> config edit Intel FCSW (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] Intel FCSW (admin-config) #> config save Intel FCSW (admin) #> config activate The configuration will be activated. Please confirm (y/n): [n] **y**

Principal Switch Configuration

Sun switches and Intel Server Fibre Channel Switches 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.

Sun StorEdge 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 Sun StorEdge Network 2 Gb FC Switch-8 and Sun StorEdge Network 2 Gb FC Switch-16, the following displays:

-						SANb	ox	Ma	nager –	Faceplat	e			r [
File	Fabric	Switch	Port	Zoning	View	Help								
			m	Edit Zo	nina	TE OF OF OF OF OF OF								
	L*	0	4	Edit Zo	ning Con	fia								
	Add	Open	Save	Activat	e Zone S	Set	ng							
FC	Fabrics	1		Deactiv	rate Zon	e Set	2	16						
0	10.20	67.16	00000000	Restor	o Dofaut	t Zonina								
1.	Ste	orEdge 20	Gb FC S	in a store	c Derdui	CLOIMING								
							-	1000	0 3	4	8 10	12 14	CONTRACT OF	i
					_		1+		GL GL	GL GL	GL GL	GL FL	1 100 -	. 🖉 🔍
					101		-		GL GL	GL GL	GL GL	GL GL	··)	
							-		1 3	5 7	9 11	13 15		
							2222	innen						
					Dev	Switch	1000		Port	Address	Type		3666(NIN	100
				1	001	StorEdge	2	14	· on	100ec3	NL-Port	20:00:00	:20:37:a7:30:79	21:00:00:20:
				2		StorEdge	2	14		100ec5	NL-Port	20:00:00	:20:37:a7:13:a3	21:00:00:20:
				3		StorEdge	2	14		100ec6	NL-Port	20:00:00	:20:37:a7:89:2a	21:00:00:20:
				4		StorEdge	2	14		100ec7	NL-Port	20:00:00	:20:37:a7:13:10	21:00:00:20:
				5		StorEdge	2	14		100ec9	NL-Port	20:00:00	:20:37:a7:32:05	21:00:00:20:
				6		StorEdge	2	14		100eca	NL-Port	20:00:00	:20:37:a7:30:ba	21:00:00:20:
				7		StorEdge	2	14		100ecb	NL-Port	20:00:00	:04:cf:4c:53:d9	21:00:00:04:
												NAMA I		
					00000000000			aanaid	*****	64664666666666666		1999399		
4	aaaaaa		•	Nar	ne Serve	er Swit	ch	P	ort Stats	Port Info	Configure	ed Zonesets	s Alarm Log	

For the Sun StorEdge Network 2 Gb FC Switch-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 260.

For the Sun StorEdge Network 2 Gb FC Switch-8 and Sun StorEdge Network 2 Gb FC Switch-16, the following displays:



For the Sun StorEdge Network 2 Gb FC Switch-64, the following displays:

File Edit Zone Set Zone Alias Insert Remove		Edit Zoni	ing – SANbox Manager
Zone Set Zone Sets		File Edit	
P Zone Sets Members Cone Set P ZoneSet. Main_ZoneSet P Zone Set. Main_ZoneSet Domain:23 Port #0 P Zones Domain:23 Port #1 P Zones Domain:23 Port #3 Domain:23 Port #5 Domain:23 Port #5 Domain:23 Port #1 Domain:23 Port #3 Domain:23 Port #1 Domain:23 Port #1 Domain:23 Port #14 Domain:23 Port #14 Domain:23 Port #15 Domain:23 Port #16 Domain:23 Port #18 Domain:23 Port #18 Domain:23 Port #21 Domain:23 Port #21 Domain:23 Port #22 Domain:23 Port #22 Domain:23 Port #22 Domain:23 Port #23 Domain:23 Port #24 Domain:23 Port #24 <th></th> <th>Zone Set Zone Alias Insert Remove</th> <th></th>		Zone Set Zone Alias Insert Remove	
	Zones	P Zone Sets P ZoneSet Main_ZoneSet P Zone: Accounting (Soft) Image: WWN: 5005076205824973 Image: WWN: 5005076205843f6f P Zone: Research (Soft) Image: WWN: 500507620583e482 Image: WWN: 500507650584c2ed	Members Image: StorEdge 2Gb FC Switch 64 Image: StorEdge 2Gb FC Switch 64 Image: Domain: 23 Port #0 Image: Domain: 23 Port #1 Image: Domain: 23 Port #2 Image: Domain: 23 Port #3 Image: Domain: 23 Port #3 Image: Domain: 23 Port #3 Image: Domain: 23 Port #4 Image: Domain: 23 Port #4 Image: Domain: 23 Port #6 Image: Domain: 23 Port #7 Image: Domain: 23 Port #7 Image: Domain: 23 Port #10 Image: Domain: 23 Port #10 Image: Domain: 23 Port #10 Image: Domain: 23 Port #12 Image: Domain: 23 Port #12 Image: Domain: 23 Port #12 Image: Domain: 23 Port #13 Image: Domain: 23 Port #14 Image: Domain: 23 Port #15 Image: Domain: 23 Port #16 Image: Domain: 23 Port #17 Image: Domain: 23 Port #17 Image: Domain: 23 Port #18 Image: Domain: 23 Port #18 Image: Domain: 23 Port #20 Image: Domain: 23 Port #21 Image: Domain: 23 Port #23 Image: Domain: 23 Port #23 Image: Domain: 23 Port #23 Image: Domain: 23 Port #23 Image: Domain: 23 Port #23 Image: Domain: 23 Port #24 Image: Domain: 23 Port #24 Image: Domain: 23 Port #24 Image: D

Sun StorEdge CLI

NOTE: Use the CLI commands when the Sun StorEdge SANbox Manager GUI is not available. The procedures are the same for the Sun StorEdge Network 2 Gb FC Switch-8, Sun StorEdge Network 2 Gb FC Switch-16, and Sun StorEdge Network 2 Gb FC Switch-64.

Login: admin

Password: xxxxxxxx

StorEdge 2Gb FC Switch 16 #> zone list

Intel Fibre Channel Module Manager GUI

- 1. Start the Intel Fibre Channel Module Manager GUI. The **Fibre Channel Module Manager—Faceplate** dialog box displays.
- 2. From the Fibre Channel Module Manager—Faceplate dialog box Zoning menu, select Edit Zoning.



3. From the **Edit Zoning—Fibre Channel Module Manager** 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 260.



Intel Fibre Channel Switch Module CLI

NOTE: Use the following CLI commands when the Intel Fibre Channel Module Manager GUI is not available.

Login: admin Password: xxxxxxx Intel FCSW #> 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.

Sun StorEdge 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 Sun StorEdge Network 2 Gb FC Switch-8 and Sun StorEdge Network 2 Gb FC Switch-16, the following displays:



For the Sun StorEdge Network 2 Gb FC Switch-64, the following displays:



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

For the Sun StorEdge Network 2 Gb FC Switch-8 and Sun StorEdge Network 2 Gb FC Switch-16, the following displays:



For the Sun StorEdge Network 2 Gb FC Switch-64, the following displays:

	Edit Zoning - SANbox Manager
	File Edit
Zone Member N	File Edit Cone Set Zone Sets ConeSet: ORPHAN ZONE SET ConeSet: Main_ZoneSet ConeSet: Main_ZoneSet ConeSet: Come: Accounting (Soft) Come: Co
	Image: WWWN: 500507650584c2ed Image: Domain:23 Port#9 Image: Domain:23 Port#11 Domain:23 Port#11 Image: Domain:23 Port#11 Image: Domain:23 Port#11 Image: Domain:23 Port#12 Image: Domain:23 Port#13 Image: Domain:23 Port#13 Image: Domain:23 Port#14 Image: Domain:23 Port#15 Image: Domain:23 Port#16 Image: Domain:23 Port#17 Image: Domain:23 Port#18 Image: Domain:23 Port#18 Image: Domain:23 Port#20 Image: Domain:23 Port#21 Image: Domain:23 Port#21 Image: Domain:23 Port#23 Image: Domain:23 Port#23 Image: Domain:23 Port#23 Image: Domain:23 Port#24 Image: Domain:23 Port#25 Image: Domain:23 Port#26

Sun StorEdge CLI

NOTE: Use the CLI commands when the Sun StorEdge SANbox Manager GUI is not available. The procedures are the same for the Sun StorEdge Network 2 Gb FC Switch-8, Sun StorEdge Network 2 Gb FC Switch-16, and Sun StorEdge Network 2 Gb FC Switch-64.

Login: **admin**

Password: **xxxxxxxx**

StorEdge 2Gb FC Switch 16 #> zone list <zone name>

Confirm that only WWNs are listed.

Intel Fibre Channel Module Manager GUI

- 1. Start the Intel Fibre Channel Module Manager GUI. The **Fibre Channel Module Manager—Faceplate** dialog box displays.
- 2. From the Fibre Channel Module Manager—Faceplate dialog box Zoning menu, select Edit Zoning.



3. The **Edit Zoning—Fibre Channel Module Manager** dialog box displays. Confirm that all zone members are listed as WWN.



Intel Fibre Channel Switch Module CLI

NOTE: Use the following CLI commands when the Intel Fibre Channel Module Manager GUI is not available.

Login: **admin** Password: **xxxxxxx**

Intel FCSW #> zone members <zone name>

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

Operating Mode Configuration

Not applicable.

Sun StorEdge Specific Configuration

Not applicable.

Intel Specific 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 Sun and Intel 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 Intel 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 arbing 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 **Introduction** 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.

LCFEnable

LCFEable gives preference to link control frames (such as class 2 ACK frames) over other frames, when queued for transmission in the switch. This may provide better performance when running Class 2 traffic. LCFEable is incompatible with MFSEnable, and both cannot be selected.

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

MSEnable

Determines whether GS-3 management server commands will be accepted on the port. It can be used to prevent in-band management of the switch on any or all ports.

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.

τον

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 Set

A set of zones grouped together. The active zone set defines the zoning for a fabric.

Glossary

Index

В

Brocade fabrics, merging with Intel fabrics 7 Brocade SilkWorm 3200 and SilkWorm 3800 switches Brocade specific configuration 31 configuration limitations 10 domain ID configuration 11 integration checklist 9 Intel specific configuration 31 operating mode configuration 31 principal switch configuration 22 successful integration checklist 32 switch and firmware versions 10 timeout values 17 zone configuration 23 Brocade SilkWorm 3900 and SilkWorm 12000 switches Brocade specific configuration 56 configuration limitations 34 domain ID configuration 35 integration checklist 33 Intel specific configuration 56 operating mode configuration 56 principal switch configuration 46 successful integration checklist 57 switch and firmware versions 34 timeout values 41 zone configuration 47

С

Cisco fabrics, merging with Intel fabrics 59 Cisco MDS 9000 series switches Cisco specific configuration 96 configuration limitations 77 domain ID configuration 78 integration checklist 77

Intel specific configuration 96 operating mode configuration 96 principal switch configuration 89 successful integration checklist 96 switch and firmware versions 78 timeout values 83 zone configuration 89 Cisco SN 5428 storage router Cisco specific configuration 75 configuration limitations 61 domain ID configuration 63 integration checklist 61 Intel specific configuration 76 operating mode configuration 74 principal switch configuration 71 successful integration checklist 76 switch and firmware versions 62 timeout values 68 zone configuration 72 **Configuration limitations** Brocade SilkWorm 3200 and SilkWorm 3800 switches 10 Brocade SilkWorm 3900 and SilkWorm 12000 switches 34 Cisco MDS 9000 series switches 77 Cisco SN 5428 storage router 61 IBM eServer BladeCenter Fibre Channel Switch Module 99 INRANGE FC/9000 switches 122 McDATA Intrepid 6000 series directors 181 McDATA Sphereon 4500 switch 149 QLogic SANbox2 series switches 217 Sun StorEdge Network 2 Gb FC series switches 243 Contacting Intel 1

D

Domain ID configuration
Brocade SilkWorm 3200 and SilkWorm 3800 *11*Brocade SilkWorm 3900 and SilkWorm 12000 switches *35*Cisco MDS 9000 series switches *78*Cisco SN 5428 storage router *63*IBM eServer BladeCenter Fibre Channel Switch Module *101*INRANGE FC/9000 switches *122*McDATA Intrepid 6000 series directors *182*McDATA Sphereon 4500 switch *150*QLogic SANbox2 series switches *219*Sun StorEdge Network 2 Gb FC series switches *245*

F

FC-SW-2 standard 1

G

Glossary 275

Н

How to use this guide 5

I

IBM BladeCenter fabrics, merging with Intel fabrics 97
IBM eServer BladeCenter Fibre Channel Switch Module
configuration limitations 99
domain ID configuration 101
IBM BladeCenter specific configuration 117
integration checklist 99
Intel specific configuration 117
operating mode configuration 117
principal switch configuration 112
successful integration checklist 117
switch and firmware versions 100

timeout values 107 zone configuration 113 INRANGE fabrics, merging with Intel fabrics 119 **INRANGE FC/9000 switches** configuration limitations 122 domain ID configuration 122 INRANGE specific configuration 144 integration checklist 121 Intel specific configuration 145 operating mode configuration 144 principal switch configuration 130 successful integration checklist 145 switch and firmware versions 122 timeout values 126 zone configuration 131 Integration checklist Brocade SilkWorm 3200 and SilkWorm 3800 switches 9 Brocade SilkWorm 3900 and SilkWorm 12000 switches 33 Cisco MDS 9000 series switches 77 Cisco SN 5428 storage router 61 IBM eServer BladeCenter Fibre Channel Switch Module 99 INRANGE FC/9000 switches 121 McDATA Intrepid 6000 series directors 181 McDATA Sphereon 4500 switch 149 QLogic SANbox2 series switches 217 Sun StorEdge Network 2 Gb FC series switches 243 Intel specific configuration Brocade SilkWorm 3200 and SilkWorm 3800 switches 31 Brocade SilkWorm 3900 and SilkWorm 12000 switches 56 Cisco MDS 9000 series switches 96 Cisco SN 5428 storage router 76 IBM eServer BladeCenter Fibre Channel Switch Module 117 INRANGE FC/9000 switches 145

McDATA Intrepid 6000 series directors 212 McDATA Sphereon 4500 switch 178 QLogic SANbox2 series switches 239 Sun StorEdge Network 2 Gb FC series switches 273 Introduction to this guide 1

Μ

McDATA fabrics, merging with Intel fabrics 147 McDATA Intrepid 6000 series directors configuration limitations 181 domain ID configuration 182 integration checklist 181 Intel specific configuration 212 McDATA specific configuration 212 operating mode configuration 208 principal switch configuration 197 successful integration checklist 213 switch and firmware versions 182 timeout values 190 zone configuration 198 McDATA Sphereon 4500 switch configuration limitations 149 domain ID configuration 150 integration checklist 149 Intel specific configuration 178 McDATA specific configuration 178 operating mode configuration 174 principal switch configuration 164 successful integration checklist 179 switch and firmware versions 150 timeout values 157 zone configuration 165 Merging Intel fabrics and Brocade fabrics 7 Cisco fabrics 59

IBM BladeCenter fabrics 97 INRANGE fabrics 119 McDATA fabrics 147 QLogic Fabrics 215 Sun fabrics 241

0

Operating mode configuration Brocade SilkWorm 3200 and SilkWorm 3800 switches *31* Brocade SilkWorm 3900 and SilkWorm 12000 switches *56* Cisco MDS 9000 series switches *96* Cisco SN 5428 storage router *74* IBM eServer BladeCenter Fibre Channel Switch Module *117* INRANGE FC/9000 switches *144* McDATA Intrepid 6000 series directors *208* McDATA Sphereon 4500 switch *174* QLogic SANbox2 series switches *239* Sun StorEdge Network 2 Gb FC series switches *273*

Ρ

Principal switch configuration
Brocade SilkWorm 3200 and SilkWorm 3800 switches 22
Brocade SilkWorm 3900 and SilkWorm 12000 switches 46
Cisco MDS 9000 series switches 89
Cisco SN 5428 storage router 71
IBM eServer BladeCenter Fibre Channel Switch Module 112
INRANGE FC/9000 switches 130
McDATA Intrepid 6000 series directors 197
McDATA Sphereon 4500 switch 164
QLogic SANbox2 series switches 232
Sun StorEdge Network 2 Gb FC series

Q

QLogic fabrics, merging with Intel fabrics 215 QLogic SANbox2 series switches configuration limitations 217 domain ID configuration 219 integration checklist 217 Intel specific configuration 239 operating mode configuration 239 principal switch configuration 232 QLogic specific configuration 239 successful integration checklist 239 switch and firmware versions 218 timeout values 226 zone configuration 233

S

Specific configuration Brocade SilkWorm 3200 and SilkWorm 3800 switches 31 Brocade SilkWorm 3900 and SilkWorm 12000 switches 56 Cisco MDS 9000 series switches 96 Cisco SN 5428 storage router 75 IBM eServer BladeCenter Fibre Channel Switch Module 117 INRANGE FC/9000 switches 144 McDATA Intrepid 6000 series directors 212 McDATA Sphereon 4500 switch 178 QLogic SANbox2 series switches 239 Sun StorEdge Network 2 Gb FC series switches 273 Successful integration checklist Brocade SilkWorm 3200 and SilkWorm 3800 switches 32 Brocade SilkWorm 3900 and SilkWorm 12000 switches 57 Cisco MDS 9000 series switches 96

Cisco SN 5428 storage router 76 IBM eServer BladeCenter Fibre Channel Switch Module 117 INRANGE FC/9000 switches 145 McDATA Intrepid 6000 series directors 213 McDATA Sphereon 4500 switch 179 QLogic SANbox2 series switches 239 Sun StorEdge Network 2 Gb FC series switches 273 Sun fabrics, merging with Intel fabrics 241 Sun StorEdge Network 2 Gb FC series switches configuration limitations 243 domain ID configuration 245 integration checklist 243 Intel specific configuration 273 operating mode configuration 273 principal switch configuration 259 successful integration checklist 273 Sun StorEdge specific configuration 273 switch and firmware versions 244 timeout values 252 zone configuration 260 Switch and firmware versions 3 Brocade SilkWorm 3200 and SilkWorm 3800 switches 10 Brocade SilkWorm 3900 and SilkWorm 12000 switches 34 Cisco MDS 9000 series switches 78 Cisco SN 5428 storage router 62 IBM eServer BladeCenter Fibre Channel Switch Module 100 INRANGE FC/9000 switches 122 McDATA Intrepid 6000 series directors 182 McDATA Sphereon 4500 switch 150 QLogic SANbox2 series switches 218 Sun StorEdge Network 2 Gb FC series switches 244

Т

Timeout values
Brocade SilkWorm 3200 and SilkWorm 3800 switches 17
Brocade SilkWorm 3900 and SilkWorm 12000 switches 41
Cisco MDS 9000 series switches 83
Cisco SN 5428 storage router 68
IBM eServer BladeCenter Fibre Channel Switch Module 107
INRANGE FC/9000 switches 126
McDATA Intrepid 6000 series directors 190
McDATA Sphereon 4500 switch 157
QLogic SANbox2 series switches 226
Sun StorEdge Network 2 Gb FC series switches 252

Ζ

Zone configuration Brocade SilkWorm 3200 and SilkWorm 3800 switches 23 Brocade SilkWorm 3900 and SilkWorm 12000 switches 47 Cisco MDS 9000 series switches 89 Cisco SN 5428 storage router 72 IBM eServer BladeCenter Fibre Channel Switch Module 113 INRANGE FC/9000 switches 131 McDATA Intrepid 6000 series directors 198 McDATA Sphereon 4500 switch 165 QLogic SANbox2 series switches 233 Sun StorEdge Network 2 Gb FC series switches 260

U

Using this guide 5

Index



QLOGIC



QLogic end-to-end solutions include industry-leading controller chips, host bus adapters, network switches and management software. Last year, more than 7 million products that shipped from leading storage companies were "Powered by QLogic."

That's why QLogic is widely recognized as a leader in the market for storage area networking. Recent accolades include: Member of NASDAQ 100 Index Member of S&P 500 Index Barron's 500 Bloomberg Top 10 High Tech Company Business 2.0 100 Fastest Growing Tech Companies BusinessWeek Global 1000 BusinessWeek Hot Growth Company Forbes Best 200 Small Companies Fortune's 100 Fastest Growing Companies Network Computing • Editor's Choice

 "Well Connected" Data Management and Storage Technology Product of the Year

WWW.QLOGIC.COM

QLogic Corporation | 26650 Aliso Viejo Parkway | Aliso Viejo, CA 92656 | 949.389.6000

