Reference Guide
Simple Network Management Protocol

QLogic 3000/5000/9000 Series Fibre Channel Switch
QLogic Intelligent Pass-thru Module for IBM BladeCenter
QLogic 20-Port SAN Switch Module for IBM BladeCenter
QLogic Virtual Fabric Extension Module for IBM BladeCenter
Firmware Version 7.x, 8.x, 9.x
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Preface

This guide describes the support for Simple Network Management Protocol (SNMP) used with QLogic switch products. This Simple Network Management Protocol Reference Guide describes how to use SNMP to manage and monitor the QLogic switch products.

This guide is organized as follows:

- **Section 1** provides an overview of SNMP objectives, managers and agents, traps, Management Information Bases (MIB), and User Datagram Protocol.
- **Section 2** describes how to configure a QLogic switch using Telnet and the Enterprise Fabric Suite graphical user interface.
- **Section 3** describes the Management Information Bases (MIB-II).
- **Section 4** describes the Fibre Alliance - Management Information Bases (FA-MIB version 4.0).
- **Section 5** describes the Fabric Element - Management Information Bases (FE-MIB).
- **Section 6** describes the QLOGIC Management Information Bases (QLOGIC-MIB).
- **Section 7** describes the Firmware Download Management Information Bases (FD-MIB).

**Intended Audience**

This guide is intended for users responsible for the support of SNMP and QLogic switch configurations.

**Related Materials**

Refer to your product documentation.
Documentation Conventions

This guide uses the following documentation conventions:

- **NOTE:** provides additional information.

- **CAUTION!** indicates the presence of a hazard that has the potential of causing damage to data or equipment.

- **WARNING!!** indicates the presence of a hazard that has the potential of causing personal injury.

- Text in blue font indicates a hyperlink (jump) to a figure, table, or section in this guide, and links to Web sites are shown in underlined blue. For example:
  - Table 9-2 lists problems related to the user interface and remote agent.
  - See “Installation Checklist” on page 3-6.
  - For more information, visit www.qlogic.com.

- Text in bold font indicates user interface elements such as a menu items, buttons, check boxes, or column headings. For example:
  - Click the Start button, point to Programs, point to Accessories, and then click Command Prompt.
  - Under Notification Options, select the Warning Alarms check box.

- Text in Courier font indicates a file name, directory path, or command line text. For example:
  - To return to the root directory from anywhere in the file structure: Type cd /root and press ENTER.
  - Enter the following command: sh ./install.bin

- Key names and key strokes are indicated with UPPERCASE:
  - Press CTRL+P.
  - Press the UP ARROW key.
Text in italics indicates terms, emphasis, variables, or document titles. For example:

- For a complete listing of license agreements, refer to the QLogic Software End User License Agreement.
- What are shortcut keys?
- To enter the date type mm/dd/yyyy (where mm is the month, dd is the day, and yyyy is the year).

Topic titles between quotation marks identify related topics either within this manual or in the online help, which is also referred to as the help system throughout this document.

Technical Support

Customers should contact their authorized maintenance provider for technical support of their QLogic products. QLogic-direct customers may contact QLogic Technical Support; others will be redirected to their authorized maintenance provider. Visit the QLogic support Web site listed in Contact Information for the latest firmware and software updates.

For details about available service plans, or for information about renewing and extending your service, visit the Service Program web page at http://www.qlogic.com/services.

Training

QLogic offers training for technical professionals for all iSCSI, InfiniBand, and Fibre Channel products. From the main QLogic web page at www.qlogic.com, click the Support tab at the top, and then click Training and Certification on the left. The QLogic Global Training portal offers online courses, certification exams, and scheduling of in-person training.

Technical Certification courses include installation, maintenance and troubleshooting QLogic products. Upon demonstrating knowledge using live equipment, QLogic awards a certificate identifying the student as a certified professional. You can reach the training professionals at QLogic by e-mail at training@qlogic.com.
Contact Information

QLogic Technical Support for products under warranty is available during local standard working hours excluding QLogic Observed Holidays. For customers with extended service, consult your plan for available hours. For Support phone numbers, see the Contact Support link at support.qlogic.com.

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Knowledge Base

The QLogic knowledge base is an extensive collection of QLogic product information that you can search for specific solutions. We are constantly adding to the collection of information in our knowledge base to provide answers to your most urgent questions. Access the knowledge base from the QLogic Support Center: http://support.qlogic.com.
1 SNMP Overview

Simple Network Management Protocol is the protocol governing network management and monitoring of network devices. This Simple Network Management Protocol Reference Guide describes how to use SNMP to manage and monitor the QLogic switch products. Specifically, this guide describes the SNMP agent that resides on the switch.

The following topics are covered in this section:

- SNMP interface objectives
- Manager and agent
- Traps
- Management information bases (MIBs)
- User datagram protocol (UDP)
- Numbering system conventions

SNMP Interface Objectives

The objectives of the SNMP Interface are as follows:

- Connect to the SNMP agent that resides on the switch using a management workstation.
- Support of Fabric Element Management Information Bases (FE-MIB) (rfc2837) and Fibre Alliance Management Information Bases (FA-MIB) draft.
- Support of version 1 and 2 traps.
- The SNMP agent supports SNMPv1 and SNMPv2c.

Manager and Agent

The two primary elements of SNMP are:

- Manager — the application that runs on the management workstation.
- Agent — the daemon application that runs on the switch.
The Manager is the application through which the network administrator performs network management functions. The SNMP agent is the direct interface on the switch for any SNMP manager connecting to the switch using the SNMP protocol, as shown in Figure 1-1. The agent will be started by the script file(s) responsible for switch initialization when the switch powers up or when the switch is reset.

When an SNMP request arrives at the agent, the agent will compose a message and pass it on to Switch Management to process the message and provide a response to the agent. The agent then provides a response to the originator of the SNMP request. The SNMP agent does not have direct access to the internal database of the switch.

Traps are notification messages sent from the switch to a registered manager when a change of state occurs within the switch. A change of state can be an alarm condition or simply a configuration change.

The Fibre Alliance MIB defines a trap table configurable through SNMP. A trap table may have up to 5 entries, and can be configured using the SNMP Manager or Enterprise Fabric Suite graphical user interface. The same trap table information is available to both SNMP Manager and Enterprise Fabric Suite.

A trap event is reported when the incoming error has a severity level less than or equal to the configured severity level. The trap event types and trap severity levels are listed in Table 1-1. Refer to Table 4-1 for information on specific traps.
Management Information Base

Management information bases (MIBs) define the properties of the managed object within the device to be managed. Every managed device keeps a database of values for each definition written in the MIB. It is not the actual database itself; it is implementation dependant. Definition of the MIB conforms to the Structure of Management Information (SMI) given in Request For Comment (RFC) 1155. The latest Internet MIB is given in RFC 1213, and is sometimes called MIB-II.

User Datagram Protocol

QLogic switches support the following User Datagram Protocol (UDP) settings:

- Agents “listen” on UDP port 161.
- Responses are sent back to the originating Network Management Station (NMS) port from a dynamic port, although many agents use port 161 also for this target.
- The maximum SNMP message size is 65507 octets (maximum UDP message size).
- The minimum receive packet size for SNMP implementations is 484 octets in length.
- Agent and Network Monitoring Systems are responsible for determining error recovery.

### Table 1-1. Trap Severity Levels

<table>
<thead>
<tr>
<th>Event Type</th>
<th>Severity Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unknown</td>
<td>1</td>
</tr>
<tr>
<td>Emergency</td>
<td>2</td>
</tr>
<tr>
<td>Alert</td>
<td>3</td>
</tr>
<tr>
<td>Critical</td>
<td>4</td>
</tr>
<tr>
<td>Error</td>
<td>5</td>
</tr>
<tr>
<td>Warning</td>
<td>6</td>
</tr>
<tr>
<td>Notify</td>
<td>7</td>
</tr>
<tr>
<td>Info</td>
<td>8</td>
</tr>
<tr>
<td>Debug</td>
<td>9</td>
</tr>
<tr>
<td>Mark</td>
<td>10</td>
</tr>
</tbody>
</table>
Numbering System Conventions

The conventions for numbering systems in this guide are as follows:

- Decimal = 101
- Hexadecimal = 0x101
- Binary = 101b
2 Configuring a Switch

This section describes how to configure a QLogic switch to support SNMP. The following topics are covered:

- System specifications and requirements
- Configuring a switch using the Telnet command line interface
- Configuring a switch using the Enterprise Fabric Suite application

System Specifications and Requirements

- QLogic switches support SNMPv1 and SNMPv2c.
- Version 1 and 2 traps are supported.
- Hardware — one out-of-band Ethernet connection is required.
- Software — one switch management software application allows you to:
  - Monitor and control the switch.
  - Read, write, and receive trap information, if supported.
- Ports on the switch reserved for SNMP:
  - Port 161 is not configurable, and is used for the standard SNMP commands.
  - Port 162 is configurable and is the default port used for traps.
- One or more in-band switches can be managed by an out-of-band QLogic switch acting as a proxy switch.
- QLogic can only act as a proxy for other QLogic switches.
- QLogic proxy capability can be disabled.
The Telnet command line interface offers a convenient way to change SNMP parameters. SNMP parameter defaults are preset during manufacturing. For security purposes, these default values should be changed. For specific information about SNMP parameters, refer to the SNMP Configuration section in the corresponding QLogic Switch Management User Guide. To configure a switch using the command line interface, do the following.
Press ENTER to accept the default value for each parameter.

SB5600.116.50 (admin) #> set setup snmp
A list of attributes with formatting and current values will follow. Enter a new value or simply press the ENTER key to accept the current value. If you wish to terminate this process before reaching the end of the attributes for the category being processed, press 'q' or 'Q' and the ENTER key to do so. If you wish to terminate the configuration process completely, press 'qq' or 'QQ' and the ENTER key to do so.

SNMP System Configuration - may optionally use 'set setup snmp common' command.

Current Values:
- SnmpEnabled: True
- Contact: <sysContact undefined>
- Location: <sysLocation undefined>
- ReadCommunity: public
- WriteCommunity: private
- AuthFailureTrap: False
- ProxyEnabled: True
- SNMPv3Enabled: False

New Value (press ENTER to not specify value, 'q' to quit):
- SnmpEnabled: (True / False)
- Contact: (string, max=64 chars)
- Location: (string, max=64 chars)
- ReadCommunity: (string, max=32 chars)
- WriteCommunity: (string, max=32 chars)
- AuthFailureTrap: (True / False)
- ProxyEnabled: (True / False)
- SNMPv3Enabled: (True / False)

SNMP Trap 1 Configuration - may optionally use 'set setup snmp trap 1' command.

Current Values:
- Trap1Enabled: False
- Trap1Address: 10.0.0.254
- Trap1Port: 5001
- Trap1Severity: info
- Trap1Version: 2
- Trap1Community: public

New Value (press ENTER to not specify value, 'q' to quit):
- Trap1Enabled: (True / False)
- Trap1Address: (hostname, IPv4, or IPv6 Address)
- Trap1Port: (decimal value, 1-65535)
- Trap1Severity: (select a severity level)
  1=unknown  6=warning
2–Configuring a Switch
Configuring a Switch Using the Command Line Interface

SNMP Trap 2 Configuration - may optionally use 'set setup snmp trap 2' command.

Current Values:

Trap2Enabled    False
Trap2Address    10.20.43.231
Trap2Port       162
Trap2Severity   info
Trap2Version    2
Trap2Community  public

New Value (press ENTER to not specify value, 'q' to quit):

Trap2Enabled    (True / False) : 
Trap2Address    (hostname, IPv4, or IPv6 Address) : 
Trap2Port       (decimal value, 1-65535) : 
Trap2Severity   (select a severity level)
  1=unknown       6=warning
  2=emergency     7=notify
  3>alert          8=info
  4=critical       9=debug
  5=error          10=mark  
Trap2Version    (1 / 2) : 
Trap2Community  (string, max=32 chars) : 

SNMP Trap 3 Configuration - may optionally use 'set setup snmp trap 3' command.

Current Values:

Trap3Enabled    False
Trap3Address    10.20.33.231
Trap3Port       162
Trap3Severity   warning
Trap3Version    2
Trap3Community  public

New Value (press ENTER to not specify value, 'q' to quit):

Trap3Enabled    (True / False) : 
Trap3Address    (hostname, IPv4, or IPv6 Address) : 
Trap3Port       (decimal value, 1-65535) : 
Trap3Severity   (select a severity level)
  1=unknown       6=warning
  2=emergency     7=notify
  3>alert          8=info
  4=critical       9=debug
  5=error          10=mark  
Trap3Version    (1 / 2) : 
Trap3Community  (string, max=32 chars) : 

SNMP Trap 4 Configuration - may optionally use 'set setup snmp trap 4' command.

Current Values:
- Trap4Enabled: False
- Trap4Address: 0.0.0.0
- Trap4Port: 162
- Trap4Severity: warning
- Trap4Version: 2
- Trap4Community: public

New Value (press ENTER to not specify value, 'q' to quit):
- Trap4Enabled: (True / False)
- Trap4Address: (hostname, IPv4, or IPv6 Address)
- Trap4Port: (decimal value, 1-65535)
- Trap4Severity: (select a severity level)
  1=unknown 6=warning
  2=emergency 7=notify
  3>alert 8=info
  4=critical 9=debug
  5=error 10=mark
- Trap4Version: (1 / 2)
- Trap4Community: (string, max=32 chars)

SNMP Trap 5 Configuration - may optionally use 'set setup snmp trap 5' command.

Current Values:
- Trap5Enabled: False
- Trap5Address: 0.0.0.0
- Trap5Port: 162
- Trap5Severity: warning
- Trap5Version: 2
- Trap5Community: public

New Value (press ENTER to not specify value, 'q' to quit):
- Trap5Enabled: (True / False)
- Trap5Address: (hostname, IPv4, or IPv6 Address)
- Trap5Port: (decimal value, 1-65535)
- Trap5Severity: (select a severity level)
  1=unknown 6=warning
  2=emergency 7=notify
  3>alert 8=info
To configure a QLogic switch using Enterprise Fabric Suite, use the SNMP Properties, Switch Properties, and Network Properties dialogs. For specific information, refer to the *Enterprise Fabric Suite User Guide*. 

**4-critical 9-debug**

**5-error 10-mark**

**Trap5Version (1 / 2)**

**Trap5Community (string, max=32 chars)**

Do you want to save and activate this snmp setup? (y/n): [n]

SNMP setup NEITHER saved NOR activated.
3 MIB-II Objects

This section covers the implementation details for the MIB-II on the QLogic switch. A MIB defines the properties of the managed object within the device to be managed. Every managed device keeps a database of values for each definition written in the MIB. It is not the actual database itself; it is implementation dependant. Definition of the MIB conforms to the SMI given in RFC 1155. The latest Internet MIB is given in RFC 1213, and is sometimes called MIB-II.

Groups in MIB-II

Refer the Table 3-1 for the syntax for MIB-II Groups.

Table 3-1. MIB-II Groups

<table>
<thead>
<tr>
<th>Group</th>
<th>Syntax</th>
</tr>
</thead>
<tbody>
<tr>
<td>system</td>
<td>OBJECT IDENTIFIER ::= { mib-2 1 }</td>
</tr>
<tr>
<td>interfaces</td>
<td>OBJECT IDENTIFIER ::= { mib-2 2 }</td>
</tr>
<tr>
<td>at</td>
<td>OBJECT IDENTIFIER ::= { mib-2 3 }</td>
</tr>
<tr>
<td>ip</td>
<td>OBJECT IDENTIFIER ::= { mib-2 4 }</td>
</tr>
<tr>
<td>icmp</td>
<td>OBJECT IDENTIFIER ::= { mib-2 5 }</td>
</tr>
<tr>
<td>tcp</td>
<td>OBJECT IDENTIFIER ::= { mib-2 6 }</td>
</tr>
<tr>
<td>udp</td>
<td>OBJECT IDENTIFIER ::= { mib-2 7 }</td>
</tr>
<tr>
<td>snmp</td>
<td>OBJECT IDENTIFIER ::= { mib-2 11 }</td>
</tr>
</tbody>
</table>

System Group

Implementation of the System group is mandatory for all systems. If an agent is not configured to have a value for any of these variables, a string of length 0 is returned.
sysDescr (1.3.6.1.2.1.1.1)

A textual description of the entity. This value should include the full name and version identification of the system's hardware type, operating-system, and networking software. It is mandatory that this only contain printable American Standard Code for Information Interchange (ASCII) characters.

Syntax: DisplayString (SIZE (0..255))
Access: read-only
Status: Mandatory
Return Value: The default values are: QLogic 5200 = SANbox 5200 FC Switch, QLogic 5202 = SANbox 5202 FC Switch, QLogic 5600 = SANbox 5600 FC Switch, QLogic 5602 = SANbox 5602 FC Switch

sysObjectID (1.3.6.1.2.1.1.2)

The vendor's authoritative identification of the network management subsystem contained in the entity. This value is allocated within the SMI enterprise subtree (1.3.6.1.4.1) and provides an easy and unambiguous means for determining 'what kind of box' is being managed. For example, if vendor `Flintstones, Inc.' was assigned the subtree 1.3.6.1.4.1.4242, it could assign the identifier 1.3.6.1.4.1.4242.1.1 to its `Fred Router'.

Syntax: OBJECT IDENTIFIER
Access: read-only
Status: mandatory
Return Value: The values are: QLogic 5200 = 1.3.6.1.4.1.1663.1.1.1.1.17, QLogic 5202 = 1.3.6.1.4.1.1663.1.1.1.1.30, QLogic 5600 = 1.3.6.1.4.1.1663.1.1.1.1.23, and QLogic 5602 = 1.3.6.1.4.1.1663.1.1.1.1.24
sysUpTime (1.3.6.1.2.1.1.3)

The time, in hundredths of a second, since the network management portion of the system was last re-initialized.

**Syntax**

TimeTicks

**Access**

read-only

**Status**

mandatory

**Return Value**

The time since the switch was powered on, or last reset (reset, hard reset, or hot reset) was executed. For example, 3 days 21 hours, 5 minutes, and 26.84 seconds. The value will roll over after approximately 497 days of continuous up time.

---

sysContact (1.3.6.1.2.1.1.4)

The textual identification of the contact person for this managed Node, together with information on how to contact this person.

**Syntax**

DisplayString (SIZE (0..255))

**Access**

read-write

**Status**

mandatory

**Return Value**

The default is: <sysContact undefined>. The string size is limited to a maximum of 64.

---

sysName (1.3.6.1.2.1.1.5)

An administratively-assigned name for this managed Node. By convention, this is the Node’s fully-qualified domain name.

**Syntax**

DisplayString (SIZE (0..255))

**Access**

read-write

**Status**

mandatory

**Return Value**

The defaults are: QLogic 5200 Series = SANbox, QLogic 5600 Series = SANbox
3–MIB-II Objects
sysLocation (1.3.6.1.2.1.1.6)

**sysLocation (1.3.6.1.2.1.1.6)**

The physical location of this Node, such as telephone closet and 3rd floor.

**Syntax**
DisplayString (SIZE (0..255))

**Access**
read-write

**Status**
mandatory

**Return Value**
The default is: <sysLocation undefined>. The string size is limited to a maximum of 64.

**sysServices (1.3.6.1.2.1.1.7)**

A value that indicates the set of services that this entity primarily offers. The value is a sum. This sum initially takes the value zero. Then, for each layer L in the range 1 through 7 that this Node performs transactions for, 2 raised to (L - 1) is added to the sum. For example, a Node that performs primarily routing functions would have a value of 4 (2^(3-1)). In contrast, a Node that is a host offering application services would have a value of 72 (2^(4-1) + 2^(7-1)).

**Syntax**
INTEGER (0..127)

**Access**
read-only

**Status**
mandatory

**Return Value**
The default is: 2
The Interfaces Group

Implementation of the Interfaces group is mandatory for all systems.

**ifNumber (1.3.6.1.2.1.2.1.2.1)**

The number of network interfaces (regardless of their current state) present on this system.

- **Syntax**: INTEGER
- **Access**: read-only
- **Status**: mandatory
- **Return Value**: The default is: 2

**The Interfaces Table**

The Interfaces table contains information on the entity’s interfaces. Each interface is thought of as being attached to a `subnetwork`. This term should not be confused with `subnet` which refers to an addressing partitioning scheme used in the Internet suite of protocols.

**ifIndex (1.3.6.1.2.1.2.2.1.1)**

A unique value for each interface. Its value ranges between 1 and the value of ifNumber. The value for each interface must remain constant at least from one re-initialization of the entity’s network management system to the next re-initialization. The range will be non-contiguous.

- **Syntax**: INTEGER
- **Access**: read-only
- **Status**: mandatory
ifDescr (1.3.6.1.2.1.2.2.1.2)

A textual string containing information about the interface. This string should include the name of the manufacturer, the product name, and the version of the hardware interface.

Syntax: DisplayString (SIZE (0..255))
Access: read-only
Status: mandatory

ifType (1.3.6.1.2.1.2.2.1.3)

The type of interface distinguished according to the physical/link protocol(s) immediately 'below' the network layer in the protocol stack.

Syntax: INTEGER
Access: read-only
Status: mandatory

ifMtu (1.3.6.1.2.1.2.2.1.4)

The size of the largest datagram which can be sent/received on the interface, specified in octets. For interfaces that are used for transmitting network datagrams, this is the size of the largest network datagram that can be sent on the interface.

Syntax: INTEGER
Access: read-only
Status: mandatory
ifSpeed (1.3.6.1.2.1.2.2.1.5)

An estimate of the interface’s current bandwidth in bits per second. For interfaces that do not vary in bandwidth or for those where no accurate estimation can be made, this object should contain the nominal bandwidth. If the bandwidth of the interface is greater than the maximum value reportable by this object, then this object reports its maximum value (4,294,967,295) and ifHighSpeed must be used to report the interface’s speed.

Syntax       Gauge
Access        read-only
Status        mandatory

ifPhysAddress (1.3.6.1.2.1.2.2.1.6)

The interface’s address at the protocol layer immediately “below” the network layer in the protocol stack. For interfaces that do not have such an address, such as a serial line, this object should contain an octet string of zero length.

Syntax       PhysAddress
Access        read-only
Status        mandatory

ifAdminStatus (1.3.6.1.2.1.2.2.1.7)

The desired state of the interface. The testing(3) state indicates that no operational packets can be passed.

Syntax       INTEGER
Access        read-only
Status        mandatory
Return Value  Writes not supported.
ifOperStatus (1.3.6.1.2.1.2.2.1.8)
The current operational state of the interface. The testing(3) state indicates that no operational packets can be passed.

Syntax INTEGER
Access  read-only
Status  mandatory

ifLastChange (1.3.6.1.2.1.2.2.1.9)
The value of sysUpTime at the time the interface entered its current operational state. If the current state was entered prior to the last re-initialization of the local network management subsystem, then this object contains a zero value.

Syntax TimeTicks
Access  read-only
Status  mandatory

ifInOctets (1.3.6.1.2.1.2.2.1.10)
The total number of octets received on the interface, including framing characters.

Syntax Counter
Access  read-only
Status  mandatory

ifInUcastPkts (1.3.6.1.2.1.2.2.1.11)
The number of subnetwork-unicast packets delivered to a higher-layer protocol.

Syntax Counter
Access  read-only
Status  mandatory
ifInNUcastPkts (1.3.6.1.2.1.2.2.1.12)
  The number of non-unicast (that is, subnetwork-broadcast or subnetwork-multicast) packets delivered to a higher-layer protocol.

Syntax  Counter
Access  read-only
Status  mandatory

ifInDiscards (1.3.6.1.2.1.2.2.1.13)
  The number of inbound packets that were chosen to be discarded even though no errors had been detected to prevent their being deliverable to a higher-layer protocol. One possible reason for discarding such a packet could be to free up buffer space.

Syntax  Counter
Access  read-only
Status  mandatory

ifInErrors (1.3.6.1.2.1.2.2.1.14)
  The number of inbound packets that contained errors preventing them from being deliverable to a higher-layer protocol.

Syntax  Counter
Access  read-only
Status  mandatory

ifInUnknownProtos (1.3.6.1.2.1.2.2.1.15)
  The number of packets received from the interface that were discarded because of an unknown or unsupported protocol.

Syntax  Counter
Access  read-only
Status  mandatory
ifOutOctets (1.3.6.1.2.1.2.2.1.16)
The total number of octets transmitted out of the interface, including framing characters.

Syntax: Counter
Access: read-only
Status: mandatory

ifOutUcastPkts (1.3.6.1.2.1.2.2.1.17)
The total number of packets that higher level protocols requested be transmitted to a subnetwork unicast address, including those that were discarded or not sent.

Syntax: Counter
Access: read-only
Status: mandatory

ifOutNUcastPkts (1.3.6.1.2.1.2.2.1.18)
The total number of packets that higher level protocols requested be transmitted to a non-unicast (subnetwork broadcast or subnetwork multicast) address, including those that were discarded or not sent.

Syntax: Counter
Access: read-only
Status: mandatory

ifOutDiscards (1.3.6.1.2.1.2.2.1.19)
The number of outbound packets that were chosen to be discarded even though no errors had been detected to prevent their being transmitted. One possible reason for discarding such a packet could be to free up buffer space.

Syntax: Counter
Access: read-only
Status: mandatory
**ifOutErrors (1.3.6.1.2.1.2.2.1.20)**

The number of outbound packets that could not be transmitted because of errors.

- **Syntax**: Counter
- **Access**: read-only
- **Status**: mandatory

**ifOutQLen (1.3.6.1.2.1.2.2.1.21)**

The length (in packets) of the output packet queue.

- **Syntax**: Gauge
- **Access**: read-only
- **Status**: mandatory

**ifSpecific (1.3.6.1.2.1.2.2.1.22)**

A reference to MIB definitions specific to the particular media being used to realize the interface. For example, if the interface is realized by an Ethernet, then the value of this object refers to a document that defines objects specific to Ethernet. If this information is not present, its value should be set to the OBJECT IDENTIFIER { 0 0 }, which is a syntactically valid object identifier, and any conformant implementation of ASN.1 (Abstract Syntax Notation) and BER must be able to generate and recognize this value.

- **Syntax**: OBJECT IDENTIFIER
- **Access**: read-only
- **Status**: mandatory
The Address Translation Group

Implementation of the Address Translation group is mandatory for all systems. However, this group is deprecated by MIB-II. That is, it is being included solely for compatibility with MIB-I Nodes, and will most likely be excluded from MIB-III Nodes. From MIB-II and onwards, each network protocol group contains its own address translation tables.

The Address Translation group contains one table which is the union across all interfaces of the translation tables for converting a NetworkAddress (for example, an IP address) into a subnetwork-specific address. For lack of a better term, this document refers to such a subnetwork-specific address as a `physical' address.

Examples of such translation tables are for: broadcast media where ARP is in use, the translation table is equivalent to the ARP cache, or on an X.25 network where non-algorithmic translation to X.121 addresses is required. The translation table contains the NetworkAddress to X.121 address equivalences.

atIfIndex (1.3.6.1.2.1.3.1.1.1)

The interface on which this entry's equivalence is effective. The interface identified by a particular value of this index is the same interface as identified by the same value of ifIndex.

**Syntax**

INTEGER

**Access**

read-write

**Status**

deprecated
atPhysAddress (1.3.6.1.2.1.3.1.1.2)

The media-dependent “physical” address. Setting this object to a null string (one of zero length) has the effect of invalidating the corresponding entry in the atTable object. That is, it effectively disassociates the interface identified with the entry from the mapping identified with the entry. It is an implementation-specific matter as to whether the agent removes an invalidated entry from the table. Accordingly, management workstations must be prepared to receive tabular information from agents that corresponds to entries not currently in use. Proper interpretation of such entries requires examination of the relevant atPhysAddress object.

Syntax
PhysAddress

Access
read-write

Status
deprecated

atNetAddress (1.3.6.1.2.1.3.1.1.3)

The NetworkAddress corresponding to the media-dependent `physical' address.

Syntax
NetworkAddress

Access
read-write

Status
deprecated
The IP Group

Implementation of the IP group is mandatory for all systems.

**ipForwarding (1.3.6.1.2.1.4.1)**

The indication of whether this entity is acting as an IP Gateway with respect to the forwarding of datagrams received by, but not addressed to, this entity. IP Gateways forward datagrams; IP hosts do not (except those source-routed from the host).

For some managed Nodes, this object may take on only a subset of the values possible. Accordingly, it is appropriate for an agent to return a “badValue” response if a management station attempts to change this object to an inappropriate value.

- **Syntax**: INTEGER
- **Access**: read-write
- **Status**: mandatory
- **Return Value**: Returns forwarding (1). Writes not supported.

**ipDefaultTTL (1.3.6.1.2.1.4.2)**

The default value inserted into the Time-To-Live field of the IP header of datagrams originated at this entity whenever a TTL value is not supplied by the transport layer protocol.

- **Syntax**: INTEGER
- **Access**: read-write
- **Status**: mandatory
- **Return Value**: Returns 64 (0x40). Writes not supported.
**ipInReceives (1.3.6.1.2.1.4.3)**

The total number of input datagrams received from interfaces, including those received in error.

- **Syntax**: Counter
- **Access**: read-only
- **Status**: mandatory

**ipInHdrErrors (1.3.6.1.2.1.4.4)**

The number of input datagrams discarded due to errors in their IP headers. These include bad checksums, version number mismatch, other format errors, time-to-live exceeded, and errors discovered in processing their IP options.

- **Syntax**: Counter
- **Access**: read-only
- **Status**: mandatory

**ipInAddrErrors (1.3.6.1.2.1.4.5)**

The number of input datagrams discarded because the IP address in their IP header's destination field was not a valid address to be received at this entity. This count includes invalid addresses (for example, 0.0.0.0) and addresses of unsupported Classes (for example, Class E). For entities which are not IP Gateways and therefore do not forward datagrams, this counter includes datagrams discarded because the destination address was not a local address.

- **Syntax**: Counter
- **Access**: read-only
- **Status**: mandatory
ipForwDatagrams (1.3.6.1.2.1.4.6)
The number of input datagrams for which this entity was not their final IP destination. As a result, an attempt was made to find a route to forward them to that final destination. In entities that do not act as IP Gateways, this counter will include only those packets that were Source Routed from this entity, and the Source Route option processing was successful.

Syntax: Counter
Access: read-only
Status: mandatory

ipInUnknownProtos (1.3.6.1.2.1.4.7)
The number of locally-addressed datagrams received successfully but discarded because of an unknown or unsupported protocol.

Syntax: Counter
Access: read-only
Status: mandatory

ipInDiscards (1.3.6.1.2.1.4.8)
The number of input IP datagrams for which no problems were encountered to prevent their continued processing, but which were discarded (for example, for lack of buffer space). This counter does not include any datagrams discarded while awaiting reassembly.

Syntax: Counter
Access: read-only
Status: mandatory
ipInDelivers (1.3.6.1.2.1.4.9)
The total number of input datagrams successfully delivered to IP user protocols (including ICMP).

Syntax: Counter
Access: read-only
Status: mandatory

ipOutRequests (1.3.6.1.2.1.4.10)
The total number of IP datagrams that local IP user protocols (including ICMP) supplied to IP in requests for transmission. This counter does not include any datagrams counted in ipForwDatagrams.

Syntax: Counter
Access: read-only
Status: mandatory

ipOutDiscards (1.3.6.1.2.1.4.11)
The number of output IP datagrams for which no problem was encountered to prevent their transmission to their destination, but which were discarded (for example, for lack of buffer space). This counter would include datagrams counted in ipForwDatagrams if any such packets met this (discretionary) discard criterion.

Syntax: Counter
Access: read-only
Status: mandatory
ipOutNoRoutes (1.3.6.1.2.1.4.12)

The number of IP datagrams discarded because no route could be found to transmit them to their destination. This counter includes any packets counted in ipForwDatagrams which meet this “no-route” criterion. This includes any datagrams that a host cannot route because all of its default gateways are down.

Syntax: Counter
Access: read-only
Status: mandatory

ipReasmTimeout (1.3.6.1.2.1.4.13)

The maximum number of seconds which received fragments are held while they are awaiting reassembly at this entity.

Syntax: INTEGER
Access: read-only
Status: mandatory

ipReasmReqds (1.3.6.1.2.1.4.14)

The number of IP fragments received that needed to be reassembled at this entity.

Syntax: Counter
Access: read-only
Status: mandatory

ipReasmOKs (1.3.6.1.2.1.4.15)

The number of IP datagrams successfully reassembled.

Syntax: Counter
Access: read-only
Status: mandatory
ipReasmFails (1.3.6.1.2.1.4.16)

The number of failures detected by the IP reassembly algorithm for example, timed out, errors). This is not necessarily a count of discarded IP fragments, since some algorithms (notably the algorithm in RFC 815) can lose track of the number of fragments by combining them as they are received.

Syntax Counter
Access read-only
Status mandatory

ipFragOKs (1.3.6.1.2.1.4.17)

The number of IP datagrams that have been successfully fragmented at this entity.

Syntax Counter
Access read-only
Status mandatory

ipFragFails (1.3.6.1.2.1.4.18)

The number of IP datagrams that have been discarded because they needed to be fragmented at this entity, but could not because their Don't Fragment flag was set.

Syntax Counter
Access read-only
Status mandatory
ipFragCreates (1.3.6.1.2.1.4.19)

The number of IP datagram fragments that have been generated as a result of fragmentation at this entity.

Syntax: Counter
Access: read-only
Status: mandatory

The IP Address Table

The IP address table contains this entity's IP addressing information.

ipAdEntAddr (1.3.6.1.2.1.4.20.1.1)

The IP address to which this entry's addressing information pertains.

Syntax: IpAddress
Access: read-only
Status: mandatory

ipAdEntIfIndex (1.3.6.1.2.1.4.20.1.2)

The index value which uniquely identifies the interface to which this entry is applicable. The interface identified by a particular value of this index is the same interface as identified by the same value of ifIndex.

Syntax: INTEGER
Access: read-only
Status: mandatory
**ipAdEntNetMask (1.3.6.1.2.1.4.20.1.3)**

The subnet mask associated with the IP address of this entry. The value of the mask is an IP address with all the network bits set to 1 and all the hosts bits set to 0.

- **Syntax**: IpAddress
- **Access**: read-only
- **Status**: mandatory

**ipAdEntBcastAddr (1.3.6.1.2.1.4.20.1.4)**

The value of the least-significant bit in the IP broadcast address used for sending datagrams on the (logical) interface associated with the IP address of this entry. For example, when the Internet standard all-ones broadcast address is used, the value will be 1. This value applies to both the subnet and network broadcasts addresses used by the entity on this (logical) interface.

- **Syntax**: INTEGER
- **Access**: read-only
- **Status**: mandatory

**ipAdEntReasmMaxSize (1.3.6.1.2.1.4.20.1.5)**

The size of the largest IP datagram which this entity can reassemble from incoming IP fragmented datagrams received on this interface.

- **Syntax**: INTEGER (0..65535)
- **Access**: read-only
- **Status**: mandatory
The IP Routing Table

The IP routing table contains an entry for each route presently known to this entity.

**ipRouteDest (1.3.6.1.2.1.4.21.1.1)**

The destination IP address of this route. An entry with a value of 0.0.0.0 is considered a default route. Multiple routes to a single destination can appear in the table, but access to such multiple entries is dependent on the table-access mechanisms defined by the network management protocol in use.

- **Syntax**: IpAddress
- **Access**: read-write
- **Status**: mandatory
- **Return Value**: Writes not supported.

**ipRouteIfIndex (1.3.6.1.2.1.4.21.1.2)**

The index value which uniquely identifies the local interface through which the next hop of this route should be reached. The interface identified by a particular value of this index is the same interface as identified by the same value of ifIndex.

- **Syntax**: INTEGER
- **Access**: read-write
- **Status**: mandatory
- **Return Value**: Writes not supported.
ipRouteMetric1 (1.3.6.1.2.1.4.21.1.3)

The primary routing metric for this route. The semantics of this metric are determined by the routing protocol specified in the route’s ipRouteProto value. If this metric is not used, its value should be set to -1.

Syntax  INTEGER
Access  read-write
Status  mandatory
Return Value  Writes not supported.

ipRouteMetric2 (1.3.6.1.2.1.4.21.1.4)

An alternate routing metric for this route. The semantics of this metric are determined by the routing protocol specified in the route’s ipRouteProto value. If this metric is not used, its value should be set to -1.

Syntax  INTEGER
Access  read-write
Status  mandatory
Return Value  Writes not supported.

ipRouteMetric3 (1.3.6.1.2.1.4.21.1.5)

An alternate routing metric for this route. The semantics of this metric are determined by the routing protocol specified in the route’s ipRouteProto value. If this metric is not used, its value should be set to -1.

Syntax  INTEGER
Access  read-write
Status  mandatory
Return Value  Writes not supported.
ipRouteMetric4 (1.3.6.1.2.1.4.21.1.6)

An alternate routing metric for this route. The semantics of this metric are determined by the routing protocol specified in the route’s ipRouteProto value. If this metric is not used, its value should be set to -1.

**Syntax**
INTEGER

**Access**
read-write

**Status**
mandatory

**Return Value**
Writes not supported.

ipRouteNextHop (1.3.6.1.2.1.4.21.1.7)

The IP address of the next hop of this route. In the case of a route bound to an interface which is realized from a broadcast media, the value of this field is the agent's IP address on that interface.

**Syntax**
IpAddress

**Access**
read-write

**Status**
mandatory

**Return Value**
Writes not supported.
**ipRouteType (1.3.6.1.2.1.4.21.1.8)**

The type of route. The values direct(3) and indirect(4) refer to the notion of direct and indirect routing in the IP architecture. Setting this object to the value invalid(2) has the effect of invalidating the corresponding entry in the ipRouteTable object. That is, it effectively disassociates the destination identified with the entry from the route identified with the entry. It is an implementation-specific matter as to whether the agent removes an invalidated entry from the table. Accordingly, management stations must be prepared to receive tabular information from agents that corresponds to entries not currently in use. Proper interpretation of such entries requires examination of the relevant ipRouteType object.

- **Syntax**: INTEGER
- **Access**: read-write
- **Status**: mandatory
- **Return Value**: Writes not supported.

**ipRouteProto (1.3.6.1.2.1.4.21.1.9)**

The routing mechanism through which this route was learned. Inclusion of values for gateway routing protocols is not intended to imply that hosts should support those protocols.

- **Syntax**: INTEGER
- **Access**: read-only
- **Status**: mandatory

**ipRouteAge (1.3.6.1.2.1.4.21.1.10)**

The number of seconds since this route was last updated or otherwise determined to be correct. No semantics of `too old` can be implied except through knowledge of the routing protocol by which the route was learned.

- **Syntax**: INTEGER
- **Access**: read-write
- **Status**: mandatory
- **Return Value**: Writes not supported.
ipRouteMask (1.3.6.1.2.1.4.21.1.11)

Indicate the mask to be logical-ANDed with the destination address before being compared to the value in the ipRouteDest field.

Syntax: IpAddress
Access: read-write
Status: mandatory
Return Value: Writes not supported.

ipRouteMetric5 (1.3.6.1.2.1.4.21.1.12)

An alternate routing metric for this route. The semantics of this metric are determined by the routing-protocol specified in the route's ipRouteProto value. If this metric is not used, its value should be set to -1.

Syntax: INTEGER
Access: read-write
Status: mandatory
Return Value: Writes not supported.

ipRouteInfo (1.3.6.1.2.1.4.21.1.13)

A reference to MIB definitions specific to the particular routing protocol which is responsible for this route, as determined by the value specified in the route's ipRouteProto value. If this information is not present, its value should be set to the OBJECT IDENTIFIER { 0 0 }, which is a syntactically valid object identifier. Any conformant implementation of ASN.1 and BER must be able to generate and recognize this value.

Syntax: OBJECT IDENTIFIER
Access: read-only
Status: mandatory
The IP Address Translation Table

The IP address translation table contain the IpAddress to `physical' address equivalences. Some interfaces do not use translation tables for determining address equivalences (for example, DDN-X.25 has an algorithmic method). If all interfaces are of this type, then the Address Translation table is empty, that is, has zero entries.

**ipNetToMedialfIndex (1.3.6.1.2.1.4.22.1.1)**

The interface on which this entry's equivalence is effective. The interface identified by a particular value of this index is the same interface as identified by the same value of ifIndex.

- **Syntax** INTEGER
- **Access** read-write
- **Status** mandatory
- **Return Value** Writes not supported.

**ipNetToMediaPhysAddress (1.3.6.1.2.1.4.22.1.2)**

The media-dependent `physical' address.

- **Syntax** PhysAddress
- **Access** read-write
- **Status** mandatory
- **Return Value** Writes not supported.
**ipNetToMediaNetAddress (1.3.6.1.2.1.4.22.1.3)**

The IpAddress corresponding to the media-dependent `physical` address.

- **Syntax**: IpAddress
- **Access**: read-write
- **Status**: mandatory
- **Return Value**: Writes not supported.

**ipNetToMediaType (1.3.6.1.2.1.4.22.1.4)**

The type of mapping. Setting this object to the value invalid(2) has the effect of invalidating the corresponding entry in the ipNetToMediaTable. That is, it effectively disassociates the interface identified with the entry from the mapping identified with the entry. It is an implementation-specific matter as to whether the agent removes an invalidated entry from the table. Accordingly, management stations must be prepared to receive tabular information from agents that corresponds to entries not currently in use. Proper interpretation of such entries requires examination of the relevant ipNetToMediaType object.

- **Syntax**: INTEGER
- **Access**: read-write
- **Status**: mandatory
- **Return Value**: Writes not supported.
Additional IP Objects

Following are the additional IP objects.

**ipRoutingDiscards (1.3.6.1.2.1.4.23)**

The number of routing entries which were chosen to be discarded even though they are valid. One possible reason for discarding such an entry could be to free-up buffer space for other routing entries.

- **Syntax**: Counter
- **Access**: read-only
- **Status**: mandatory

**The ICMP Group**

Implementation of the ICMP group is mandatory for all systems.

**icmpInMsgs (1.3.6.1.2.1.5.1)**

The total number of ICMP messages received by the entity. This counter includes all those counted by icmpInErrors.

- **Syntax**: Counter
- **Access**: read-only
- **Status**: mandatory

**icmpInErrors (1.3.6.1.2.1.5.2)**

The number of ICMP messages received by the entity but were determined as having ICMP-specific errors (such as, bad ICMP checksums, bad length).

- **Syntax**: Counter
- **Access**: read-only
- **Status**: mandatory
icmpInDestUnreaches (1.3.6.1.2.1.5.3)

The number of ICMP Destination Unreachable messages received.

Syntax: Counter
Access: read-only
Status: mandatory

icmpInTimeExcds (1.3.6.1.2.1.5.4)

The number of ICMP Time Exceeded messages received.

Syntax: Counter
Access: read-only
Status: mandatory

icmpInParmProbs (1.3.6.1.2.1.5.5)

The number of ICMP Parameter Problem messages received.

Syntax: Counter
Access: read-only
Status: mandatory

icmpInSrcQuenchs (1.3.6.1.2.1.5.6)

The number of ICMP Source Quench messages received.

Syntax: Counter
Access: read-only
Status: mandatory
**icmpInRedirects (1.3.6.1.2.1.5.7)**
The number of ICMP Redirect messages received.

- **Syntax**: Counter
- **Access**: read-only
- **Status**: mandatory

**icmpInEchos (1.3.6.1.2.1.5.8)**
The number of ICMP Echo (request) messages received.

- **Syntax**: Counter
- **Access**: read-only
- **Status**: mandatory

**icmpInEchoReps (1.3.6.1.2.1.5.9)**
The number of ICMP Echo Reply messages received.

- **Syntax**: Counter
- **Access**: read-only
- **Status**: mandatory

**icmpInTimestamps (1.3.6.1.2.1.5.10)**
The number of ICMP Timestamp (request) messages received.

- **Syntax**: Counter
- **Access**: read-only
- **Status**: mandatory
icmpInTimestampReps (1.3.6.1.2.1.5.11)
The number of ICMP Timestamp Reply messages received.

Syntax: Counter
Access: read-only
Status: mandatory

icmpInAddrMasks (1.3.6.1.2.1.5.12)
The number of ICMP Address Mask Request messages received.

Syntax: Counter
Access: read-only
Status: mandatory

icmpInAddrMaskReps (1.3.6.1.2.1.5.13)
The number of ICMP Address Mask Reply messages received.

Syntax: Counter
Access: read-only
Status: mandatory

icmpOutMsgs (1.3.6.1.2.1.5.14)
The total number of ICMP messages which this entity attempted to send. This counter includes all those counted by icmpOutErrors.

Syntax: Counter
Access: read-only
Status: mandatory
3–MIB-II Objects

icmpOutErrors (1.3.6.1.2.1.5.15)
The number of ICMP messages which this entity did not send due to problems discovered within ICMP, such as a lack of buffers. This value should not include errors discovered outside the ICMP layer such as the inability of IP to route the resultant datagram. In some implementations, there may be no types of errors which contribute to this counter’s value.

Syntax  Counter
Access   read-only
Status   mandatory

icmpOutDestUnreachs (1.3.6.1.2.1.5.16)
The number of ICMP Destination Unreachable messages sent.

Syntax  Counter
Access   read-only
Status   mandatory

icmpOutTimeExcds (1.3.6.1.2.1.5.17)
The number of ICMP Time Exceeded messages sent.

Syntax  Counter
Access   read-only
Status   mandatory

icmpOutParmProbs (1.3.6.1.2.1.5.18)
The number of ICMP Parameter Problem messages sent.

Syntax  Counter
Access   read-only
Status   mandatory
**icmpOutSrcQuenchs (1.3.6.1.2.1.5.19)**
The number of ICMP Source Quench messages sent.

- **Syntax**: Counter
- **Access**: read-only
- **Status**: mandatory

**icmpOutRedirects (1.3.6.1.2.1.5.20)**
The number of ICMP Redirect messages sent. For a host, this object will always be zero, since hosts do not send redirects.

- **Syntax**: Counter
- **Access**: read-only
- **Status**: mandatory

**icmpOutEchos (1.3.6.1.2.1.5.21)**
The number of ICMP Echo (request) messages sent.

- **Syntax**: Counter
- **Access**: read-only
- **Status**: mandatory

**icmpOutEchoReps (1.3.6.1.2.1.5.22)**
The number of ICMP Echo Reply messages sent.

- **Syntax**: Counter
- **Access**: read-only
- **Status**: mandatory
**icmpOutTimestamps (1.3.6.1.2.1.5.23)**

The number of ICMP Timestamp (request) messages sent.

**Syntax**  
Counter

**Access**  
read-only

**Status**  
mandatory

**icmpOutTimestampReps (1.3.6.1.2.1.5.24)**

The number of ICMP Timestamp Reply messages sent.

**Syntax**  
Counter

**Access**  
read-only

**Status**  
mandatory

**icmpOutAddr Masks (1.3.6.1.2.1.5.25)**

The number of ICMP Address Mask Request messages sent.

**Syntax**  
Counter

**Access**  
read-only

**Status**  
mandatory

**icmpOutAddrMaskReps (1.3.6.1.2.1.5.26)**

The number of ICMP Address Mask Reply messages sent.

**Syntax**  
Counter

**Access**  
read-only

**Status**  
mandatory
The TCP Group

Implementation of the TCP group is mandatory for all systems that implement the TCP. Instances of object types that represent information about a particular TCP connection are transient; they persist only as long as the connection in question.

tcpRtoAlgorithm (1.3.6.1.2.1.6.1)

The algorithm used to determine the timeout value used for retransmitting unacknowledged octets.

Syntax INTEGER
Access read-only
Status mandatory

tcpRtoMin (1.3.6.1.2.1.6.2)

The minimum value permitted by a TCP implementation for the retransmission timeout, measured in milliseconds. More refined semantics for objects of this type depend upon the algorithm used to determine the retransmission timeout. In particular, when the timeout algorithm is rsre(3), an object of this type has the semantics of the LBOUND quantity described in RFC 793.

Syntax INTEGER
Access read-only
Status mandatory

tcpRtoMax (1.3.6.1.2.1.6.3)

The maximum value permitted by a TCP implementation for the retransmission timeout, measured in milliseconds. More refined semantics for objects of this type depend upon the algorithm used to determine the retransmission timeout. In particular, when the timeout algorithm is rsre(3), an object of this type has the semantics of the UBOUND quantity described in RFC 793.

Syntax INTEGER
Access read-only
Status mandatory
tcpMaxConn (1.3.6.1.2.1.6.4)

The limit on the total number of TCP connections the entity can support. In entities where the maximum number of connections is dynamic, this object should contain the value -1.

**Syntax**
INTEGER

**Access**
read-only

**Status**
mandatory

tcpActiveOpens (1.3.6.1.2.1.6.5)

The number of times TCP connections have made a direct transition to the SYN-SENT state from the CLOSED state.

**Syntax**
Counter

**Access**
read-only

**Status**
mandatory

tcpPassiveOpens (1.3.6.1.2.1.6.6)

The number of times TCP connections have made a direct transition to the SYN-RCVD state from the LISTEN state.

**Syntax**
Counter

**Access**
read-only

**Status**
mandatory
**tcpAttemptFails (1.3.6.1.2.1.6.7)**

The number of times TCP connections have made a direct transition to the CLOSED state from either the SYN-SENT state or the SYN-RCVD state, plus the number of times TCP connections have made a direct transition to the LISTEN state from the SYN-RCVD state.

**Syntax** Counter

**Access** read-only

**Status** mandatory

**tcpEstabResets (1.3.6.1.2.1.6.8)**

The number of times TCP connections have made a direct transition to the CLOSED state from either the ESTABLISHED state or the CLOSE-WAIT state.

**Syntax** Counter

**Access** read-only

**Status** mandatory

**tcpCurrEstab (1.3.6.1.2.1.6.9)**

The number of TCP connections for which the current state is either ESTABLISHED or CLOSE-WAIT.

**Syntax** Gauge

**Access** read-only

**Status** mandatory

**tcpInSegs (1.3.6.1.2.1.6.10)**

The total number of segments received, including those received in error. This count includes segments received on currently established connections.

**Syntax** Counter

**Access** read-only

**Status** mandatory
tcpOutSegs (1.3.6.1.2.1.6.11)
The total number of segments sent including those on current connections, but excluding those containing only retransmitted octets.

Syntax: Counter
Access: read-only
Status: mandatory

tcpRetransSegs (1.3.6.1.2.1.6.12)
The total number of segments retransmitted. That is, the number of TCP segments transmitted containing one or more previously transmitted octets.

Syntax: Counter
Access: read-only
Status: mandatory
The TCP Connection Table

The TCP connection table contains information about this entity's existing TCP connections.

tcpConnState (1.3.6.1.2.1.6.13.1.1)

The state of this TCP connection. The only value which may be set by a management station is deleteTCB(12). Accordingly, it is appropriate for an agent to return a "badValue" response if a management station attempts to set this object to any other value.

If a management station sets this object to the value deleteTCB(12), then this has the effect of deleting the TCB (as defined in RFC 793) of the corresponding connection on the managed Node. The result is an immediate termination of the connection.

Syntax: INTEGER
Access: read-write
Status: mandatory
Return Value: Writes not supported.

tcpConnLocalAddress (1.3.6.1.2.1.6.13.1.2)

The local IP address for this TCP connection. In the case of a connection in the listen state which is willing to accept connections for any IP interface associated with the Node, the value 0.0.0.0 is used.

Syntax: IpAddress
Access: read-only
Status: mandatory
tcpConnLocalPort (1.3.6.1.2.1.6.13.1.3)
The local port number for this TCP connection.

Syntax                   INTEGER (0..65535)
Access                   read-only
Status                   mandatory

tcpConnRemAddress (1.3.6.1.2.1.6.13.1.4)
The remote IP address for this TCP connection.

Syntax                   IpAddress
Access                   read-only
Status                   mandatory

tcpConnRemPort (1.3.6.1.2.1.6.13.1.5)
The remote port number for this TCP connection.

Syntax                   INTEGER (0..65535)
Access                   read-only
Status                   mandatory
Additional TCP Objects

Following are the additional TCP objects.

**tcpInErrs (1.3.6.1.2.1.6.14)**

The total number of segments received in error (for example, bad TCP checksums).

- **Syntax**: Counter
- **Access**: read-only
- **Status**: mandatory

**tcpOutRsts (1.3.6.1.2.1.6.15)**

The number of TCP segments sent containing the RST flag.

- **Syntax**: Counter
- **Access**: read-only
- **Status**: mandatory
The UDP Group

Implementation of the UDP group is mandatory for all systems which implement the UDP.

**udpInDatagrams (1.3.6.1.2.1.7.1)**

The total number of UDP datagrams delivered to UDP users.

- **Syntax**: Counter
- **Access**: read-only
- **Status**: mandatory

**udpNoPorts (1.3.6.1.2.1.7.2)**

The total number of received UDP datagrams for which there was no application at the destination port.

- **Syntax**: Counter
- **Access**: read-only
- **Status**: mandatory

**udpInErrors (1.3.6.1.2.1.7.3)**

The number of received UDP datagrams that could not be delivered for reasons other than the lack of an application at the destination port.

- **Syntax**: Counter
- **Access**: read-only
- **Status**: mandatory
udpOutDatagrams (1.3.6.1.2.1.7.4)
The total number of UDP datagrams sent from this entity.

Syntax: Counter
Access: read-only
Status: mandatory

The UDP Listener Table
The UDP listener table contains information about this entity's UDP end-points on which a local application is currently accepting datagrams.

udpLocalAddress (1.3.6.1.2.1.7.5.1.1)
The local IP address for this UDP listener. In the case of a UDP listener which is willing to accept datagrams for any IP interface associated with the Node, the value 0.0.0.0 is used.

Syntax: IpAddress
Access: read-only
Status: mandatory

udpLocalPort (1.3.6.1.2.1.7.5.1.2)
The local port number for this UDP listener.

Syntax: INTEGER (0..65535)
Access: read-only
Status: mandatory
The EGP Group

Implementation of the EGP group is mandatory for all systems which implement the EGP.

egpInMsgs (1.3.6.1.2.1.8.1)
The number of EGP messages received without error.

Syntax  Counter
Access  read-only
Status  mandatory

egpInErrors (1.3.6.1.2.1.8.2)
The number of EGP messages received that proved to be in error.

Syntax  Counter
Access  read-only
Status  mandatory

egpOutMsgs (1.3.6.1.2.1.8.3)
The total number of locally generated EGP messages.

Syntax  Counter
Access  read-only
Status  mandatory
egpOutErrors (1.3.6.1.2.1.8.4)

The number of locally generated EGP messages not sent due to resource limitations within an EGP entity.

Syntax: Counter
Access: read-only
Status: mandatory

The EGP Neighbor Table

The EGP neighbor table contains information about this entity's EGP neighbors.

egpNeighState (1.3.6.1.2.1.8.5.1.1)

The EGP state of the local system with respect to this entry's EGP neighbor. Each EGP state is represented by a value that is one greater than the numerical value associated with the state in RFC 904.

Syntax: INTEGER
Access: read-only
Status: mandatory

egpNeighAddr (1.3.6.1.2.1.8.5.1.2)

The IP address of this entry's EGP neighbor.

Syntax: IpAddress
Access: read-only
Status: mandatory
egpNeighAs (1.3.6.1.2.1.8.5.1.3)

The autonomous system of this EGP peer. Zero should be specified if the autonomous system number of the neighbor is not yet known.

Syntax INTEGER
Access read-only
Status mandatory

egpNeighInMsgs (1.3.6.1.2.1.8.5.1.4)

The number of EGP messages received without error from this EGP peer.

Syntax Counter
Access read-only
Status mandatory

egpNeighInErrs (1.3.6.1.2.1.8.5.1.5)

The number of EGP messages received from this EGP peer that proved to be in error (for example, bad EGP checksum).

Syntax Counter
Access read-only
Status mandatory

egpNeighOutMsgs (1.3.6.1.2.1.8.5.1.6)

The number of locally generated EGP messages to this EGP peer.

Syntax Counter
Access read-only
Status mandatory
egpNeighOutErrs (1.3.6.1.2.1.8.5.1.7)

The number of locally generated EGP messages not sent to this EGP peer due to resource limitations within an EGP entity.

Syntax  Counter
Access  read-only
Status  mandatory

egpNeighInErrMsgs (1.3.6.1.2.1.8.5.1.8)

The number of EGP-defined error messages received from this EGP peer.

Syntax  Counter
Access  read-only
Status  mandatory

egpNeighOutErrMsgs (1.3.6.1.2.1.8.5.1.9)

The number of EGP-defined error messages sent to this EGP peer.

Syntax  Counter
Access  read-only
Status  mandatory

egpNeighStateUps (1.3.6.1.2.1.8.5.1.10)

The number of EGP state transitions to the UP state with this EGP peer.

Syntax  Counter
Access  read-only
Status  mandatory
egpNeighStateDowns (1.3.6.1.2.1.8.5.1.11)

The number of EGP state transitions from the UP state to any other state with this EGP peer.

- **Syntax**: Counter
- **Access**: read-only
- **Status**: mandatory

egpNeighIntervalHello (1.3.6.1.2.1.8.5.1.12)

The interval between EGP Hello command retransmissions, in hundredths of a second. This represents the t1 timer as defined in RFC 904.

- **Syntax**: INTEGER
- **Access**: read-only
- **Status**: mandatory

egpNeighIntervalPoll (1.3.6.1.2.1.8.5.1.13)

The interval between EGP poll command retransmissions, in hundredths of a second. This represents the t3 timer as defined in RFC 904.

- **Syntax**: INTEGER
- **Access**: read-only
- **Status**: mandatory

egpNeighMode (1.3.6.1.2.1.8.5.1.14)

The polling mode of this EGP entity, either passive or active.

- **Syntax**: INTEGER { active(1), passive(2) }
- **Access**: read-only
- **Status**: mandatory
egpNeighEventTrigger (1.3.6.1.2.1.8.5.1.15)

A control variable used to trigger operator-initiated Start and Stop events. When read, this variable always returns the most recent value that egpNeighEventTrigger was set to. If it has not been set since the last initialization of the network management subsystem on the Node, it returns a value of “stop”.

When set, this variable causes a Start or Stop event on the specified neighbor, as specified on pages 8-10 of RFC 904. Briefly, a Start event causes an Idle peer to begin neighbor acquisition and a non-Idle peer to re-initiate neighbor acquisition. A stop event causes a non-Idle peer to return to the Idle state until a Start event occurs, either by egpNeighEventTrigger or otherwise.

Syntax
INTEGER { start(1), stop(2) }

Access
read-write

Status
mandatory

egpAs (1.3.6.1.2.1.8.6)

The autonomous system number of this EGP entity.

Syntax
INTEGER

Access
read-only

Status
mandatory

The Transmission Group

Based on the transmission media underlying each interface on a system, the corresponding portion of the Transmission group is mandatory for that system.

When Internet-standard definitions for managing transmission media are defined, the transmission group is used to provide a prefix for the names of those objects.

Typically, such definitions reside in the experimental portion of the MIB until they are "proven", then as a part of the Internet standardization process, the definitions are accordingly elevated and a new object identifier, under the transmission group is defined. By convention, the name assigned is:

type OBJECT IDENTIFIER ::= { transmission number }.

Where "type" is the symbolic value used for the media in the ifType column of the ifTable object, and "number" is the actual integer value corresponding to the symbol.
The dot3StatTable

EtherLike-MIB:dot3StatsIndex (1.3.6.1.2.1.10.7.2.1.1)
An index value that uniquely identifies an interface to an ethernet-like medium. The interface identified by a particular value of this index is the same interface as identified by the same value of ifIndex.

Syntax Interger32
Access read-only
Status current

EtherLike-MIB:dot3StatsFCSErrors (1.3.6.1.2.1.10.7.2.1.3)
A count of frames received on a particular interface that are an integral number of octets in length but do not pass the FCS check. This count does not include frames received with frame-too-long or frame-too-short error.

Syntax Counter32
Access read-only
Status current

EtherLike-MIB:dot3StatsInternalMacReceiveErrors (1.3.6.1.2.1.10.7.2.1.16)
A count of frames for which reception on a particular interface fails due to an internal MAC sublayer receive error.

The precise meaning of the count represented by an instance of this object is implementation-specific. In particular, an instance of this object may represent a count of receive errors on a particular interface that are not otherwise counted.

Syntax Counter32
Access read-only
Status current
EtherLike-MIB:dot3StatsSymbolErrors (1.3.6.1.2.1.10.7.2.1.18)
For an interface operating at 10 Gbps, the number of times the receiving media is non-idle (a carrier event) for a period of time equal to or greater than minFrameSize, and during which there was at least one occurrence of an event that causes an indication of a receive error.

Syntax: Counter32
Access: read-only
Status: current

The dot3ControlTable

EtherLike-MIB:dot3ControlFunctionsSupported (1.3.6.1.2.1.10.7.9.1.1)
A list of the possible MAC Control functions implemented for this interface.

Syntax: Bits
pause (0)
Access: read-only
Status: current

The dot3PauseTable

EtherLike-MIB:dot3PauseAdminMode (1.3.6.1.2.1.10.7.10.1.1)
This object represents the administratively-configured PAUSE mode for this interface.

disabled (1)
enabledXmit (2)
enabledRcv (3)
enabledXmitAndRcv (4)
Syntax: integer
Access: read-only
Status: current
EtherLike-MIB:dot3PauseOperMode (1.3.6.1.2.1.10.7.10.1.2)

This object reflects the PAUSE mode currently in use on this interface.

- disabled (1)
- enabledXmit (2)
- enabledRcv (3)
- enabledXmitAndRcv (4)

**Syntax**
integer

**Access**
read-only

**Status**
current

EtherLike-MIB:dot3InPauseFrames (1.3.6.1.2.1.10.7.10.1.3)

A count of MAC Control frames received on this interface with an opcode indicating the PAUSE operation.

**Syntax**
counter32

**Access**
read-only

**Status**
current

EtherLike-MIB:dot3OutPauseFrames (1.3.6.1.2.1.10.7.10.1.4)

A count of MAC Control frames transmitted on this interface with an opcode indicating the PAUSE operation.

**Syntax**
counter32

**Access**
read-only

**Status**
current
The SNMP Group

Implementation of the SNMP group is mandatory for all systems which support an
SNMP protocol entity. Some of the objects defined below will be zero-valued in
those SNMP implementations that are optimized to support only those functions
specific to either a management agent or a management station. In particular, it
should be observed that the objects below refer to an SNMP entity, and there may
be several SNMP entities residing on a managed Node.

**snmpInPkts (1.3.6.1.2.1.11.1)**

The total number of messages delivered to the SNMP entity from the transport
service.

<table>
<thead>
<tr>
<th>Syntax</th>
<th>Counter</th>
</tr>
</thead>
<tbody>
<tr>
<td>Access</td>
<td>read-only</td>
</tr>
<tr>
<td>Status</td>
<td>mandatory</td>
</tr>
</tbody>
</table>

**snmpOutPkts (1.3.6.1.2.1.11.2)**

The total number of SNMP messages passed from the SNMP protocol entity to
the transport service.

<table>
<thead>
<tr>
<th>Syntax</th>
<th>Counter</th>
</tr>
</thead>
<tbody>
<tr>
<td>Access</td>
<td>read-only</td>
</tr>
<tr>
<td>Status</td>
<td>mandatory</td>
</tr>
</tbody>
</table>

**snmpInBadVersions (1.3.6.1.2.1.11.3)**

The total number of SNMP messages delivered to the SNMP protocol entity and
were for an unsupported SNMP version.

<table>
<thead>
<tr>
<th>Syntax</th>
<th>Counter</th>
</tr>
</thead>
<tbody>
<tr>
<td>Access</td>
<td>read-only</td>
</tr>
<tr>
<td>Status</td>
<td>mandatory</td>
</tr>
</tbody>
</table>
**snmpInBadCommunityNames (1.3.6.1.2.1.11.4)**

The total number of SNMP messages delivered to the SNMP protocol entity which used a SNMP community name not known to the entity.

**Syntax**

Counter

**Access**

read-only

**Status**

mandatory

**snmpInBadCommunityUses (1.3.6.1.2.1.11.5)**

The total number of SNMP messages delivered to the SNMP protocol entity which represented an SNMP operation which was not allowed by the SNMP community named in the message.

**Syntax**

Counter

**Access**

read-only

**Status**

mandatory

**snmpInASNParseErrs (1.3.6.1.2.1.11.6)**

The total number of ASN.1 or BER errors encountered by the SNMP protocol entity when decoding received SNMP messages.

**Syntax**

Counter

**Access**

read-only

**Status**

mandatory

**snmpInTooBigs (1.3.6.1.2.1.11.8)**

The total number of SNMP PDUs delivered to the SNMP protocol entity and for which the value of the error-status field is “tooBig”.  

**Syntax**

Counter

**Access**

read-only

**Status**

mandatory
snmpInNoSuchNames (1.3.6.1.2.1.11.9)
The total number of SNMP PDUs delivered to the SNMP protocol entity and for which the value of the error-status field is "NoSuchName".

Syntax
Counter
Access
read-only
Status
mandatory

snmpInBadValues (1.3.6.1.2.1.11.10)
The total number of SNMP PDUs delivered to the SNMP protocol entity and for which the value of the error-status field is “badValue”.

Syntax
Counter
Access
read-only
Status
mandatory

snmpInReadOnlys (1.3.6.1.2.1.11.11)
The total number valid SNMP PDUs delivered to the SNMP protocol entity and for which the value of the error-status field is “readOnly”. It should be noted that it is a protocol error to generate an SNMP PDU which contains the value "readOnly" in the error-status field, as such, this object is provided as a means of detecting incorrect implementations of the SNMP.

Syntax
Counter
Access
read-only
Status
mandatory
3–MIB-II Objects

**snmpInGenErrs (1.3.6.1.2.1.11.12)**

The total number of SNMP PDUs delivered to the SNMP protocol entity and for which the value of the error-status field is “genErr”.

**Syntax**
Counter

**Access**
read-only

**Status**
mandatory

**snmpInTotalReqVars (1.3.6.1.2.1.11.13)**

The total number of MIB objects retrieved successfully by the SNMP protocol entity as the result of receiving valid SNMP Get-Request and Get-Next PDUs.

**Syntax**
Counter

**Access**
read-only

**Status**
mandatory

**snmpInTotalSetVars (1.3.6.1.2.1.11.14)**

The total number of MIB objects altered successfully by the SNMP protocol entity as the result of receiving valid SNMP Set-Request PDUs.

**Syntax**
Counter

**Access**
read-only

**Status**
mandatory

**snmpInGetRequests (1.3.6.1.2.1.11.15)**

The total number of SNMP Get-Request PDUs accepted and processed by the SNMP protocol entity.

**Syntax**
Counter

**Access**
read-only

**Status**
mandatory
snmpInGetNexts (1.3.6.1.2.1.11.16)
The total number of SNMP Get-Next PDUs accepted and processed by the SNMP protocol entity.

Syntax Counter
Access read-only
Status mandatory

snmpInSetRequests (1.3.6.1.2.1.11.17)
The total number of SNMP Set-Request PDUs accepted and processed by the SNMP protocol entity.

Syntax Counter
Access read-only
Status mandatory

snmpInGetResponses (1.3.6.1.2.1.11.18)
The total number of SNMP Get-Response PDUs accepted and processed by the SNMP protocol entity.

Syntax Counter
Access read-only
Status mandatory

snmpInTraps (1.3.6.1.2.1.11.19)
The total number of SNMP Trap PDUs accepted and processed by the SNMP protocol entity.

Syntax Counter
Access read-only
Status mandatory
snmpOutTooBigs (1.3.6.1.2.1.11.20)
The total number of SNMP PDUs generated by the SNMP protocol entity and for which the value of the error-status field is “tooBig”

Syntax: Counter  
Access: read-only  
Status: mandatory

snmpOutNoSuchNames (1.3.6.1.2.1.11.21)
The total number of SNMP PDUs generated by the SNMP protocol entity and for which the value of the error-status is "NoSuchName".

Syntax: Counter  
Access: read-only  
Status: mandatory

snmpOutBadValues (1.3.6.1.2.1.11.22)
The total number of SNMP PDUs generated by the SNMP protocol entity and for which the value of the error-status field is “badValue”.

Syntax: Counter  
Access: read-only  
Status: mandatory

snmpOutGenErrs (1.3.6.1.2.1.11.24)
The total number of SNMP PDUs generated by the SNMP protocol entity and for which the value of the error-status field is “genErr”.

Syntax: Counter  
Access: read-only  
Status: mandatory
<table>
<thead>
<tr>
<th><strong>snmpOutGetRequests (1.3.6.1.2.1.11.25)</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>The total number of SNMP Get-Request PDUs generated by the SNMP protocol entity.</td>
</tr>
<tr>
<td><strong>Syntax</strong></td>
</tr>
<tr>
<td><strong>Access</strong></td>
</tr>
<tr>
<td><strong>Status</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>snmpOutGetNexts (1.3.6.1.2.1.11.26)</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>The total number of SNMP Get-Next PDUs generated by the SNMP protocol entity.</td>
</tr>
<tr>
<td><strong>Syntax</strong></td>
</tr>
<tr>
<td><strong>Access</strong></td>
</tr>
<tr>
<td><strong>Status</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>snmpOutSetRequests (1.3.6.1.2.1.11.27)</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>The total number of SNMP Set-Request PDUs generated by the SNMP protocol entity.</td>
</tr>
<tr>
<td><strong>Syntax</strong></td>
</tr>
<tr>
<td><strong>Access</strong></td>
</tr>
<tr>
<td><strong>Status</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>snmpOutGetResponses (1.3.6.1.2.1.11.28)</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>The total number of SNMP Get-Response PDUs generated by the SNMP protocol entity.</td>
</tr>
<tr>
<td><strong>Syntax</strong></td>
</tr>
<tr>
<td><strong>Access</strong></td>
</tr>
<tr>
<td><strong>Status</strong></td>
</tr>
</tbody>
</table>
3–MIB-II Objects

snmpOutTraps (1.3.6.1.2.1.11.29)

The total number of SNMP Trap PDUs generated by the SNMP protocol entity.

**Syntax**

Counter

**Access**

read-only

**Status**

mandatory

**snmpEnableAuthenTraps (1.3.6.1.2.1.11.30)**

Indicates whether the SNMP agent process is permitted to generate authentication-failure traps. The value of this object overrides any configuration information; as such, it provides a means whereby all authentication-failure traps may be disabled.

It is strongly recommended that this object be stored in non-volatile memory so that it remains constant between re-initializations of the network management system.

**Syntax**

INTEGER { enabled(1), disabled(2) }

**Access**

read-write

**Status**

mandatory

**Return Value**

Read returns enabled (1) if AuthFailureTrap = True, otherwise disabled (2). Writes not supported.

The ifXTable

**ifName (1.3.6.1.2.1.31.1.1.1.1)**

The textual name of the interface. The value of this object should be the name of the interface as assigned by the local device. If there is no local name, or this object is otherwise not applicable, then this object contains a zero-length string.

**Syntax**

DisplayString

**Access**

read-only

**Status**

current
ifInMulticastPkts \(1.3.6.1.2.1.31.1.1.1.2\)

The number of packets, delivered by this sub-layer to a higher (sub-)layer, which were addressed to a multicast address at this sub-layer. For a MAC layer protocol, this includes both Group and Functional addresses.

**Syntax**  
Counter32

**Access**  
read-only

**Status**  
current

ifInBroadcastPkts \(1.3.6.1.2.1.31.1.1.1.3\)

The number of packets, delivered by this sub-layer to a higher (sub-)layer, which were addressed to a broadcast address at this sub-layer.

**Syntax**  
Counter32

**Access**  
read-only

**Status**  
current

ifOutMulticastPkts \(1.3.6.1.2.1.31.1.1.1.4\)

The total number of packets that higher-level protocols requested be transmitted, and which were addressed to a multicast address at this sub-layer, including those that were discarded or not sent. For a MAC layer protocol, this includes both Group and Functional addresses.

**Syntax**  
Counter32

**Access**  
read-only

**Status**  
current
ifOutBroadcastPkts (1.3.6.1.2.1.31.1.1.1.5)

The total number of packets that higher-level protocols requested be transmitted, and which were addressed to a broadcast address at this sub-layer, including those that were discarded or not sent.

Syntax: Counter32
Access: read-only
Status: current

ifHighSpeed (1.3.6.1.2.1.31.1.1.1.15)

An estimate of the interface's current bandwidth in units of 1,000,000 bits per second. If this object reports a value of `n' then the speed of the interface is somewhere in the range of `n-500,000' to `n+499,999'. For interfaces which do not vary in bandwidth or for those where no accurate estimation can be made, this object should contain the nominal bandwidth. For a sub-layer which has no concept of bandwidth, this object should be zero.

Syntax: Gauge32
Access: read-only
Status: current

ifPromiscuousMode (1.3.6.1.2.1.31.1.1.1.16)

This object has a value of false(2) if this interface only accepts packets/frames that are addressed to this station. This object has a value of true(1) when the station accepts all packets/frames transmitted on the media.

- true(1)
- false(2)

Syntax: TruthValue
Access: read-only
Status: current
ifConnectorPresent (1.3.6.1.2.1.31.1.1.1.17)

This object has the value 'true(1)' if the interface sublayer has a physical connector and the value 'false(2)' otherwise.

- true(1)
- false(2)

Syntax: TruthValue
Access: read-only
Status: current

ifAlias (1.3.6.1.2.1.31.1.1.1.18)

This object is an 'alias' name for the interface as specified by a network manager, and provides a non-volatile 'handle' for the interface.

Syntax: DisplayString
Access: read-only
Status: current

ifCounterDiscontinuityTime (1.3.6.1.2.1.31.1.1.1.19)

The value of sysUpTime on the most recent occasion at which any one or more of this interface's counters suffered a discontinuity. The relevant counters are the specific instances associated with this interface of any Counter32 or Counter64 object contained in the ifTable or ifXTable. If no such discontinuities have occurred since the last re-initialization of the local management subsystem, then this object contains a zero value.

Syntax: TimeStamp
Access: read-only
Status: current
ifTableLastChange (1.3.6.1.2.1.31.5)

The value of sysUpTime at the time of the last creation or deletion of an entry in the ifTable. If the number of entries has been unchanged since the last re-initialization of the local network management subsystem, then this object contains a zero value.

Syntax          TimeTicks
Access          read-only
Status          current
3–MIB-II Objects
ifTableLastChange (1.3.6.1.2.1.31.5)
4 Fibre Alliance MIB Objects

This section covers the implementation details for the Fibre Alliance Management Information Bases (FA-MIB) version 6.0 on the QLogic switch.

**FA MIB Definitions**

The FA-MIB version 4.0 is a collection of structured objects that resides on the workstation with the manager application. These objects define the syntax for information exchanged between the manager and the agent. The textual substitutions in Table 4-1 are specific to the FA-MIB and can be used in place of primitive data types.

**Table 4-1. FA-MIB Textual Substitutions**

<table>
<thead>
<tr>
<th>Description</th>
<th>Syntax</th>
</tr>
</thead>
<tbody>
<tr>
<td>FcNameId</td>
<td>OCTET STRING (SIZE(8))</td>
</tr>
<tr>
<td>FcGlobalId</td>
<td>OCTET STRING (SIZE(16))</td>
</tr>
<tr>
<td>FcAddressId</td>
<td>OCTET STRING (SIZE(3))</td>
</tr>
<tr>
<td>FcEventSeverity</td>
<td>INTEGER { unknown (1), emergency (2), alert (3), critical (4), error (5), warning (6), notify (7), info (8), debug (9), mark (10) - All messages logged }</td>
</tr>
<tr>
<td>Description</td>
<td>Syntax</td>
</tr>
<tr>
<td>-------------------</td>
<td>-------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>FcUnitType</td>
<td>INTEGER {</td>
</tr>
<tr>
<td></td>
<td>unknown(1)</td>
</tr>
<tr>
<td></td>
<td>other(2) - none of the following</td>
</tr>
<tr>
<td></td>
<td>hub(3) - passive connectivity unit supporting loop protocol.</td>
</tr>
<tr>
<td></td>
<td>switch(4) - active connectivity unit supporting multiple protocols.</td>
</tr>
<tr>
<td></td>
<td>gateway(5) - unit that converts not only the interface but also encapsulates the frame into another protocol. The assumption is that there is always two gateways connected together. For example, FC &lt;-&gt; ATM.</td>
</tr>
<tr>
<td></td>
<td>converter(6) - unit that converts from one interface to another. For example, FC &lt;-&gt; SCSI.</td>
</tr>
<tr>
<td></td>
<td>hba(7) - host bus adapter</td>
</tr>
<tr>
<td></td>
<td>proxy-agent(8) - software proxy-agent</td>
</tr>
<tr>
<td></td>
<td>storage-device(9) - disk, cd, tape, etc.</td>
</tr>
<tr>
<td></td>
<td>host(10) - host computer</td>
</tr>
<tr>
<td></td>
<td>storage-subsystem(11) - raid, library, etc.</td>
</tr>
<tr>
<td></td>
<td>module(12) - subcomponent of a system</td>
</tr>
<tr>
<td></td>
<td>swdriver(13) - software driver</td>
</tr>
<tr>
<td></td>
<td>storage-access-device(14) - Provides storage management and access for heterogeneous hosts and heterogeneous devices</td>
</tr>
<tr>
<td></td>
<td>wdm(15) - waveform division multiplexer</td>
</tr>
<tr>
<td></td>
<td>ups(16) - uninterruptable power supply</td>
</tr>
<tr>
<td></td>
<td>}</td>
</tr>
</tbody>
</table>
revisionNumber

The revision number for this MIB. The format of the revision value is as follows:

- (0) = high order major revision number
- (1) = low order major revision number
- (2) = high order minor revision number
- (3) = low order minor revision number

The value will be stored as an ASCII value. The following is the current value of 04.00 for this object.

- (0) = '0'
- (1) = '4'
- (2) = '0'
- (3) = '0'

**Syntax**  
DisplayString (SIZE (4))

**Access**  
read-only

**Status**  
mandatory

**Return Value**  
A four digit ASCII value (for example, 0400 for MIB revision 4.0).
Connectivity Unit Group

The objects described in this section are not in a table format. An example of how to access one of these objects is:

"snmpget localhost public fcmgmt.connSet.uNumber.0".

uNumber (1.3.6.1.3.94.1.1)

The number of connectivity units present on this system (represented by this agent). May be a count of the boards in a chassis or the number of full boxes in a rack.

Syntax : INTEGER
Access : read-only
Status : mandatory
Return Value : The number of switches in fabric.

systemURL (1.3.6.1.3.94.1.2)

The top-level URL of the system. If it does not exist, the value is an empty string. The URL format is implementation dependant and can have keywords embedded that are preceded by a percent sign (for example, %USER).

Syntax : DisplayString
Access : read-write
Status : mandatory
Return Value : The switch IP address. For example, http://10.0.0.1. Writes not supported, returns "NoSuchName".
statusChangeTime (1.3.6.1.3.94.1.3)
The sysUpTime timestamp at which the last status change occurred for any members of the set, in centiseconds.

Syntax: TimeTicks
Access: read only
Status: obsolete
Return Value: The sysUpTime timestamp at which the last status change occurred.

configurationChangeTime (1.3.6.1.3.94.1.4)
The sysUpTime timestamp at which the last configuration change occurred for any members of the set, in centiseconds. This represents a union of change information for connUnitConfigurationChangeTime.

Syntax: TimeTicks
Access: read only
Status: obsolete
Return Value: The sysUpTime timestamp at which the last configuration change occurred.

connUnitTableChangeTime (1.3.6.1.3.94.1.5)
The sysUpTime timestamp at which the connUnitTable was updated (an entry was either added or deleted), in centiseconds.

Syntax: TimeTicks
Access: read only
Status: obsolete
Return Value: The sysUpTime timestamp at which the connUnitTable was updated.
Connectivity Table

The objects described in this section are in a table format indexed by switch World Wide Name. An example of how to access one of these objects given a WWN of 100000c0dd0090a7 is:

"snmpget localhost public
fcmgmt.connSet.connUnitTable.connUnitEntry.connUnitId..16.0.0.192.221.0.144.167.0.0.0.0.0.0.0.0.0".

connUnitId (1.3.6.1.3.94.1.6.1.1)

The unique identification for this connectivity unit among those within this proxy domain. The value must be unique within the proxy domain because it is the index variable for connUnitTable. The value assigned to a given connectivity unit should be persistent across agent and unit resets. It should be the same as connUnitGlobalId if connUnitGlobalId is known and stable.

Syntax FcGlobalId
Access read-only
Status mandatory
Return Value The World Wide Name of the switch followed by 8 bytes of zeros. For example: 10 00 00 C0 DD 00 71 C9 00 00 00 00 00 00 00 00.

connUnitGlobalId (1.3.6.1.3.94.1.6.1.2)

An optional global-scope identifier for this connectivity unit. It must be a WWN for this connectivity unit or 16 octets of value zero.

Syntax connUnitGlobalId
Access read-only
Status mandatory
Return Value The World Wide Name of the switch followed by 8 bytes of zeros. For example: 10 00 00 C0 DD 00 71 C9 00 00 00 00 00 00 00 00.
connUnitType (1.3.6.1.3.94.1.6.1.3)
The type of this connectivity unit.

Syntax FcUnitType
Access read-only
Status mandatory
Return Value switch (4)

connUnitNumports (1.3.6.1.3.94.1.6.1.4)
Number of physical ports in the connectivity unit (internal/embedded, external).

Syntax INTEGER
Access read-only
Status mandatory
Return Value The number of ports on the switch.

connUnitState (1.3.6.1.3.94.1.6.1.5)
The operational state of the switch mapped. The overall state of connectivity unit.

Syntax INTEGER
Access read-only
Status mandatory
Return Value Refer to Table 4-2 for switch operational states.

Table 4-2. Switch Operational States

<table>
<thead>
<tr>
<th>Switch State</th>
<th>Return State</th>
</tr>
</thead>
<tbody>
<tr>
<td>online</td>
<td>online (2)</td>
</tr>
<tr>
<td>offline</td>
<td>offline (3)</td>
</tr>
<tr>
<td>diagnostics</td>
<td>offline (3)</td>
</tr>
</tbody>
</table>
4–Fibre Alliance MIB Objects

connUnitStatus (1.3.6.1.3.94.1.6.1.6)

Overall status of the connectivity unit. The goal of this object is to be the single poll point to check the status of the connunit. If there is any other component that has warning, then this should be set to warning. Any of these values may occur with any of the ConnUnitState values.

Syntax
INTEGER

Access
read-only

Status
mandatory

Return Value
Refer to Table 4-3 for connectivity unit return values. Return value will be OK (3), unless one or more of the following occurs.

Table 4-3. QLogic 5000 Series Connectivity Unit Return Values

<table>
<thead>
<tr>
<th>Status</th>
<th>Return Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>If one power supply is reporting Bad and/or not installed</td>
<td>warning (4)</td>
</tr>
<tr>
<td>If both power supplies are reporting Bad and/or not installed</td>
<td>failed (5)</td>
</tr>
<tr>
<td>If one or more cooling fan failed</td>
<td>warning (4)</td>
</tr>
<tr>
<td>If all cooling fans failed</td>
<td>failed (5)</td>
</tr>
<tr>
<td>If temperature status = &quot;Warm&quot;</td>
<td>warning (4)</td>
</tr>
<tr>
<td>If temperature status = &quot;Overheating&quot;</td>
<td>failed (5)</td>
</tr>
<tr>
<td>If any port down</td>
<td>warning (4)</td>
</tr>
<tr>
<td>If POST failed</td>
<td>failed (5)</td>
</tr>
<tr>
<td>If switch Offline or in Diagnostics mode</td>
<td>warning (4)</td>
</tr>
</tbody>
</table>
Refer to Table 4-4 for connectivity unit return values. Return value will be OK (3), uninstalled IO or CPU boards are ignored.

**Table 4-4. QLogic 9000 Series Connectivity Unit Return Values**

<table>
<thead>
<tr>
<th>Status</th>
<th>Return Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>If either FAN or PS boards are not installed</td>
<td>warning (4)</td>
</tr>
<tr>
<td>If all FANs or all PS boards are not installed</td>
<td>failed (5)</td>
</tr>
<tr>
<td>If installed board's faultList is not NONE</td>
<td>warning (4)</td>
</tr>
</tbody>
</table>

**connUnitProduct (1.3.6.1.3.94.1.6.1.7)**

The `sml` attribute Config.Snmp.SysDescr. This is the system description shown on the 'show version' Telnet screen. It can also be read on the 'show setup snmp' screen and written using the 'set setup snmp' Telnet screen.

**Syntax**
DisplayString (SIZE (0..79))

**Access**
read-only

**Status**
mandatory

**Return Value**
Returns the switch SystemDescription: QLogic 5200 = SANbox 5200 FC Switch, QLogic 5202 = SANbox 5602 FC Switch, QLogic 5600 = SANbox 5600 FC Switch, QLogic 5602 = SANbox 5602 FC Switch, QLogic 9100 = SANbox 9100 FC Switch, QLogic 9200 = SANbox 9200 FC Switch.

**connUnitSn (1.3.6.1.3.94.1.6.1.8)**

The serial number for this connectivity unit.

**Syntax**
DisplayString (SIZE (0..79))

**Access**
read-only

**Status**
mandatory

**Return Value**
The chassis serial number.
**connUnitUpTime (1.3.6.1.3.94.1.6.1.9)**

The number of centiseconds since the last unit initialization.

**Syntax**

TimeTicks

**Access**

read-only

**Status**

mandatory

**Return Value**

The time interval since either POST or a reset (not including hotreset command for the NDCLA feature). POST (Power-On Self-Test) occurs during Power-On, or hardreset.

**connUnitUrl (1.3.6.1.3.94.1.6.1.10)**

URL to launch a management application, if applicable. Otherwise, it's an empty string. In a standalone unit, this would be the same as the top-level URL. This has the same definition as systemURL for keywords. If write is not supported, then the return value is invalid. This value will be retained across boots.

**Syntax**

DisplayString

**Access**

read-write

**Status**

mandatory

**Return Value**

The switch IP address. For example, http://10.0.0.1. Writes not supported, returns "NoSuchName".

**connUnitDomainId (1.3.6.1.3.94.1.6.1.11)**

24 bit Fibre Channel address ID of this connectivity unit, right justified with leading zeros if required. This should be set to the Fibre Channel address ID, or if it is a switch, it would be set to the Domain Controller address. If this value is not applicable, return all bits set to one.

**Syntax**

OCTET STRING (SIZE(3))

**Access**

read-only

**Status**

mandatory

**Return Value**

The domain controller address. For example, FF FC 65.
connUnitProxyMaster (1.3.6.1.3.94.1.6.1.12)

A value of “yes” means this is the proxy master unit for a set of managed units. For example, this could be the only unit with a management card in it for a set of units. A standalone unit should return “yes” for this object.

Syntax

INTEGER {
  unknown(1),
  no(2),
  yes(3)
}

Access
read-only

Status
mandatory

Return Value
If out-of-band switch, returns yes (3). If in-band switch, returns no (2).

connUnitPrincipal (1.3.6.1.3.94.1.6.1.13)

Whether this connectivity unit is the principal unit within the group of fabric elements. If this value is not applicable, the return is unknown.

Syntax

INTEGER {
  unknown(1),
  no(2),
  yes(3)
}

Access
read-only

Status
mandatory

Return Value
For the principal switch, returns yes (3); otherwise returns no (2).
**connUnitNumSensors (1.3.6.1.3.94.1.6.1.14)**

Number of sensors in the connUnitSensorTable elements. If this value is not applicable, return unknown.

**Syntax** INTEGER

**Access** read-only

**Status** mandatory

**Return Value** Returns the number of sensors listed in the connUnitSensorTable. QLogic 5200 = 3, QLogic 5202 = 6, QLogic 5600 = 3, QLogic 5602 = 6, QLogic 9000 Series is dependent on number of blades installed

**connUnitStatusChangeTime (1.3.6.1.3.94.1.6.1.15)**

The sysUpTime timestamp, in centiseconds, at which the last status change occurred.

**Syntax** TimeTicks

**Access** read-only

**Status** obsolete

**Return Value** This object is obsolete. Always returns error status "NoSuchName".

**connUnitConfigurationChangeTime (1.3.6.1.3.94.1.6.1.16)**

The sysUpTime timestamp, in centiseconds, at which the last configuration change occurred.

**Syntax** TimeTicks

**Access** read-only

**Status** obsolete

**Return Value** This object is obsolete. Always returns error status "NoSuchName".
connUnitNumRevs (1.3.6.1.3.94.1.6.1.17)

The number of revisions in the connUnitRevsTable.

Syntax: INTEGER
Access: read-only
Status: mandatory
Return Value: The number of entries in the revision table. The revision numbers of all components of the switch. QLogic 5200 = 3, QLogic 5202 = 3, QLogic 5600 = 3, QLogic 5602 = 3, QLogic 9000 Series is dependent on number of blades installed.

connUnitNumZones (1.3.6.1.3.94.1.6.1.18)

Number of zones defined in connUnitZoneTable.

Syntax: INTEGER
Access: read-only
Status: obsolete
Return Value: This object is obsolete. Always returns error status "NoSuchName".

connUnitModuleId (1.3.6.1.3.94.1.6.1.19)

This is a unique ID, persistent between boots, that can be used to group a set of connUnits together into a module. The intended use would be to create a connUnit with a connUnitType of "module" to represent a physical or logical group of connectivity units. Then, the value of the group would be set to the value of connUnitId for this “container” connUnit. connUnitModuleId should be zeros if this connUnit is not part of a module.

Syntax: FcGlobalId
Access: read-only
Status: mandatory
Return Value: The World Wide Name of the switch followed by 8 bytes of zeros. For example: 10 00 00 C0 DD 00 71 C9 00 00 00 00 00 00 00 00.
connUnitName (1.3.6.1.3.94.1.6.1.20)

A display string containing a name for this connectivity unit. This object value should be persistent between boots.

**Syntax**
DisplayString (SIZE(0..79))

**Access**
read-write

**Status**
mandatory

**Return Value**
The SymbolicName of Switch. The default's are: QLogic 5200 = SANbox, QLogic 5202 = SANbox, QLogic 5600 = SANbox, QLogic 5602 = SANbox, QLogic 9100 = SANbox, QLogic 9200 = SANbox

connUnitInfo (1.3.6.1.3.94.1.6.1.21)

A display string containing information about this connectivity unit. This object value should be persistent between boots.

**Syntax**
DisplayString

**Access**
read-write

**Status**
mandatory

**Return Value**
Returns the ConfigDescription field for the switch. The default for QLogic 5000/9000 Series = Default Config.
connUnitControl (1.3.6.1.3.94.1.6.1.22)

This object is used to control the addressed connUnit. “Cold Start” and “Warm Start” are as defined in MIB-II and are not meant to be a factory reset.

- resetConnUnitColdStart: the addressed unit performs a “Cold Start” reset.
- resetConnUnitWarmStart: the addressed unit performs a “Warm Start” reset.
- offlineConnUnit: the addressed unit puts itself into an implementation dependant “offline” state. In general, if a unit is in an offline state, it cannot be used to perform meaningful Fibre Channel work.
- onlineConnUnit: the addressed unit puts itself into an implementation dependant “online” state. In general, if a unit is in an online state, it is capable of performing meaningful Fibre Channel work.

Each implementation may chose not to allow any or all of these values on a SET.

Syntax

 INTEGER {
    unknown(1),
    invalid(2),
    resetConnUnitColdStart(3),
    resetConnUnitWarmStart(4),
    offlineConnUnit(5),
    onlineConnUnit(6)
}

Access

read-write

Status

mandatory

Return Value

Refer to the following tables for connUnitControl values.

Table 4-5. connUnitControl Read Return Values

<table>
<thead>
<tr>
<th>Switch Setting</th>
<th>Return Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Online</td>
<td>Online (6)</td>
</tr>
<tr>
<td>Offline</td>
<td>Offline (5)</td>
</tr>
<tr>
<td>Diagnostics</td>
<td>Offline (5)</td>
</tr>
<tr>
<td>Other</td>
<td>Unknown (1)</td>
</tr>
</tbody>
</table>
connUnitContact (1.3.6.1.3.94.1.6.1.23)

Contact information for this connectivity unit, and is persistent across boots.

Syntax: DisplayString (SIZE (0..79))
Access: read-write
Status: mandatory
Return Value: The default is: <sysContact undefined>. The string size is limited to a maximum of 64.

connUnitLocation (1.3.6.1.3.94.1.6.1.24)

Location information for this connectivity unit, and is persistent across boots.

Syntax: DisplayString (SIZE (0..79))
Access: read-write
Status: mandatory
Return Value: The default is: <sysLocation undefined>. The string size is limited to a maximum of 64.

Table 4-6. connUnitContol Write Control Values

<table>
<thead>
<tr>
<th>Control Value</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cold Reset (3)</td>
<td>Reset</td>
</tr>
<tr>
<td>Offline (5)</td>
<td>Offline</td>
</tr>
<tr>
<td>Online (6)</td>
<td>Online</td>
</tr>
<tr>
<td>other</td>
<td>Not supported</td>
</tr>
</tbody>
</table>
connUnitEventFilter (1.3.6.1.3.94.1.6.1.25)

This value defines the event severity that will be logged by this connectivity unit. All events of severity less than or equal to connUnitEventFilter are logged in connUnitEventTable.

**Syntax**: FcEventSeverity

**Access**: read-write

**Status**: mandatory

**Return Value**: The switch log level setting. Refer to the following tables for connUnitEventFilter values.

### Table 4-7. connUnitEventFilter Read Return Values

<table>
<thead>
<tr>
<th>Severity Levels</th>
<th>Return Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Critical</td>
<td>Critical (4)</td>
</tr>
<tr>
<td>Warn</td>
<td>Warning (6)</td>
</tr>
<tr>
<td>Info</td>
<td>Info (8)</td>
</tr>
<tr>
<td>None</td>
<td>Unknown (1)</td>
</tr>
</tbody>
</table>

### Table 4-8. connUnitEventFilter Control Write Values

<table>
<thead>
<tr>
<th>Control Value</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Emergency (2)</td>
<td>Critical</td>
</tr>
<tr>
<td>Alert (3)</td>
<td>Critical</td>
</tr>
<tr>
<td>Critical (4)</td>
<td>Critical</td>
</tr>
<tr>
<td>Error (5)</td>
<td>Warn</td>
</tr>
<tr>
<td>Warning (6)</td>
<td>Warn</td>
</tr>
<tr>
<td>Notify (7)</td>
<td>Info</td>
</tr>
<tr>
<td>Info (8)</td>
<td>Info</td>
</tr>
<tr>
<td>Debug (9)</td>
<td>Info</td>
</tr>
<tr>
<td>Mark (10)</td>
<td>Info</td>
</tr>
<tr>
<td>Unknown (1)</td>
<td>None</td>
</tr>
</tbody>
</table>
connUnitNumEvents (1.3.6.1.3.94.1.6.1.26)
Number of events currently in the connUnitEventTable.

Syntax INTEGER
Access read-only
Status mandatory
Return Value An integer indicating the number of events in the event table.

connUnitMaxEvents (1.3.6.1.3.94.1.6.1.27)
Maximum number of events that can be defined in connUnitEventTable.

Syntax INTEGER
Access read-only
Status mandatory
Return Value Always returns 30.

connUnitEventCurrID (1.3.6.1.3.94.1.6.1.28)
The last used event ID (connUnitEventIndex).

Syntax INTEGER
Access read-only
Status mandatory
Return Value The event ID of the last event.
connUnitFabricID (1.3.6.1.3.94.1.6.1.29)
A globally unique value to identify the fabric that this ConnUnit belongs to, otherwise empty string. This would typically be equal to the connUnitGlobalID of the primary switch in a Fibre Channel fabric.

Syntax FcGlobalId
MaxAccess read-only
Status mandatory
Return Value Returns the World Wide Name of the principal switch followed by 8 bytes of zeros. For example: 10 00 00 C0 DD 00 71 C9 00 00 00 00 00 00 00 00.

connUnitNumLinks (1.3.6.1.3.94.1.6.1.30)
The number of links in the link table.

Syntax INTEGER
MaxAccess read-only
Status mandatory
Return Value Returns the number of link table entries for each switch.

connUnitVendorId (1.3.6.1.3.94.1.6.1.31)
The connectivity unit vendor's name.

Syntax DisplayString (SIZE (0..79))
read-only
Status mandatory
Return Value "QLogic"
Revision Table

The objects described in this section are in a table format indexed by World Wide Name and Index. The Table of revisions for hardware and software elements. There are four revision items in each switch. An example of how to access one of these objects given a WWN of 100000c0dd0090a7 is:

```
"snmpget localhost public
fcmgmt.connSet.connUnitRevsTable.connUnitRevsEntry.connUnitRevsUnitId.16.0.0.192.221.0.144.167.0.0.0.0.0.0.0.1"
```

The number of entries in this table will be variable depending on which platform is being examined and the number of blades installed. SNMP first reports the firmware revision and flasher shell version. It then iterates through each of the installed blades reporting the PCB revision and ASIC version.

**connUnitRevsUnitId (1.3.6.1.3.94.1.7.1.1)**

The connUnitId of the connectivity unit that contains this revision table.

<table>
<thead>
<tr>
<th>Syntax</th>
<th>FcGlobalId</th>
</tr>
</thead>
<tbody>
<tr>
<td>Access</td>
<td>read-only</td>
</tr>
<tr>
<td>Status</td>
<td>mandatory</td>
</tr>
<tr>
<td>Return Value</td>
<td>Returns the World Wide Name of the switch followed by 8 bytes of zeros. For example: 10 00 00 C0 DD 00 71 C9 00 00 00 00 00 00 00.</td>
</tr>
</tbody>
</table>

**connUnitRevsIndex (1.3.6.1.3.94.1.7.1.2)**

A unique value among all connUnitRevsEntries with the same value of connUnitRevsUnitId, in the range between 1 and connUnitNumRevs[connUnitRevsUnitId].

<table>
<thead>
<tr>
<th>Syntax</th>
<th>INTEGER (1..2147483647)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Access</td>
<td>read-only</td>
</tr>
<tr>
<td>Status</td>
<td>mandatory</td>
</tr>
<tr>
<td>Return Value</td>
<td>The revision table index.</td>
</tr>
</tbody>
</table>
connUnitRevsRevId (1.3.6.1.3.94.1.7.1.3)
A vendor-specific string identifying a revision of a component of the connUnit indexed by connUnitRevsUnitld.

Syntax DisplayString
Access read-only
Status mandatory
Return Value Refer to Table 4-9 for QLogic 5000/9000 Series connUnitRevsRevId return values.

Table 4-9. QLogic 5000/9000 Series ConnUnitRevsRevId Return Values

<table>
<thead>
<tr>
<th>Table Index</th>
<th>Return Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Active Firmware Image</td>
</tr>
<tr>
<td>2</td>
<td>Flasher Shell Version</td>
</tr>
<tr>
<td>3</td>
<td>Hardware ASIC Version (1 per blade)</td>
</tr>
</tbody>
</table>

connUnitRevsDescription (1.3.6.1.3.94.1.7.1.4)
Description of a component to which the revision corresponds.

Syntax DisplayString
Access read-only
Status mandatory
Return Value Refer to Table 4-10 for QLogic 5200/5600 Series connUnitRevsDescription return values.

Table 4-10. QLogic 5200/5600 Series ConnUnitRevsDescription Return Values

<table>
<thead>
<tr>
<th>Table Index</th>
<th>Return Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Active Firmware Version</td>
</tr>
<tr>
<td>2</td>
<td>Flasher Shell Version</td>
</tr>
<tr>
<td>3</td>
<td>Hardware ASIC Version</td>
</tr>
</tbody>
</table>
Sensor Table

The objects described in this section are in a table format indexed by World Wide Name and Index. The Index is the sensor number being interrogated. There are six sensor items in each switch. An example of how to access one of these objects given a WWN of 100000c0dd0090a7 is:

"snmpget localhost public
fcmgmt.connSet.connUnitSensorTable.connUnitSensorEntry.connUnitSensorUnitId.16.0.0.192.221.0.144.167.0.0.0.0.0.0.0.0.0.1".

**connUnitSensorUnitId (1.3.6.1.3.94.1.8.1.1)**

The connUnitId of the connectivity unit that contains this sensor table.

- **Syntax**: FcGlobalId
- **Access**: read-only
- **Status**: mandatory
- **Return Value**: Returns the World Wide Name of the switch followed by 8 bytes of zeros. For example: 10 00 00 C0 DD 00 71 C9 00 00 00 00 00 00 00 00.

**connUnitSensorIndex (1.3.6.1.3.94.1.8.1.2)**

A unique value among all connUnitSensorEntries with the same value of connUnitSensorUnitId, in the range between 1 and connUnitNumSensor[connUnitSensorUnitId].

- **Syntax**: INTEGER (1..2147483647)
- **Access**: read-only
- **Status**: mandatory
- **Return Value**: The sensor table index.
connUnitSensorName (1.3.6.1.3.94.1.8.1.3)

A textual identification of the sensor intended primarily for operator use.

**Syntax**
DisplayString

**Access**
read-only

**Status**
mandatory

**Return Value**
Refer to Table 4-11 for QLogic 5200/5600 connUnitSensorName return values.

### Table 4-11. QLogic 5200/5600 ConnUnitSensorName Return Values

<table>
<thead>
<tr>
<th>Table Index</th>
<th>Return Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Power Supply 1 Status</td>
</tr>
<tr>
<td>2</td>
<td>Temperature Status</td>
</tr>
<tr>
<td>3</td>
<td>Temperature Sensor 1 Value</td>
</tr>
</tbody>
</table>

Refer to Table 4-12 for QLogic 5202/5602 connUnitSensorName return values.

### Table 4-12. QLogic 5202/5602 ConnUnitSensorName Return Values

<table>
<thead>
<tr>
<th>Table Index</th>
<th>Return Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Power Supply 1 Status</td>
</tr>
<tr>
<td>2</td>
<td>Power Supply 2 Status</td>
</tr>
<tr>
<td>3</td>
<td>Fan 1 Status</td>
</tr>
<tr>
<td>4</td>
<td>Fan 2 Status</td>
</tr>
<tr>
<td>5</td>
<td>Temperature Status</td>
</tr>
<tr>
<td>6</td>
<td>Temperature Sensor 1 Value</td>
</tr>
</tbody>
</table>

Refer to Table 4-12 for QLogic 9000 connUnitSensorName return values.
connUnitSensorStatus (1.3.6.1.3.94.1.8.1.4)

The status indicated by the sensor.

**Syntax**

```
INTEGER {
  unknown(1)
  other(2) - the sensor indicates other than ok (warning or failure).
  ok(3) - the sensor indicates ok
  warning(4) - the sensor indicates a warning
  failed(5) - the sensor indicates failure
}
```

**Access**

read-only

**Status**

mandatory

**Return Value**

Refer to the following tables for connUnitSensorStatus return values.

### Table 4-13. QLogic 9000 ConnUnitSensorName Return Values

<table>
<thead>
<tr>
<th>Table Index</th>
<th>Return Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Power Supply 1 Status</td>
</tr>
<tr>
<td>2</td>
<td>Power Supply 2 Status</td>
</tr>
<tr>
<td>3</td>
<td>Fan 1 Status</td>
</tr>
<tr>
<td>4</td>
<td>Fan 2 Status</td>
</tr>
<tr>
<td>5-19</td>
<td>Temperature Status (1 value per blade)</td>
</tr>
<tr>
<td>20-45</td>
<td>Temperature Value (I/O blades have 4 values, CPU blades have 7 values)</td>
</tr>
<tr>
<td>46-60</td>
<td>Voltage Status (all blade types have 1 value)</td>
</tr>
</tbody>
</table>

### Table 4-14. ConnUnitSensorStatus Return Values for Board Temperature

<table>
<thead>
<tr>
<th>Switch Value</th>
<th>Return Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal</td>
<td>OK (3)</td>
</tr>
<tr>
<td>Warm</td>
<td>Warning (4)</td>
</tr>
<tr>
<td>Overheating</td>
<td>Failed (5)</td>
</tr>
</tbody>
</table>
Table 4-14. ConnUnitSensorStatus Return Values for Board Temperature (Continued)

<table>
<thead>
<tr>
<th>Switch Value</th>
<th>Return Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Other</td>
<td>Unknown (1)</td>
</tr>
</tbody>
</table>

Table 4-15. ConnUnitSensorStatus Return Values for Fan Status

<table>
<thead>
<tr>
<th>Switch Value</th>
<th>Return Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Good</td>
<td>OK (3)</td>
</tr>
<tr>
<td>Bad</td>
<td>Failed (5)</td>
</tr>
<tr>
<td>Other</td>
<td>Unknown (1)</td>
</tr>
</tbody>
</table>

Table 4-16. ConnUnitSensorStatus Return Values for Voltage Status

<table>
<thead>
<tr>
<th>Switch Value</th>
<th>Return Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Good</td>
<td>OK (3)</td>
</tr>
<tr>
<td>Bad</td>
<td>Failed (5)</td>
</tr>
<tr>
<td>Other</td>
<td>Unknown (1)</td>
</tr>
</tbody>
</table>

connUnitSensorInfo (1.3.6.1.3.94.1.8.1.5)

Miscellaneous static information about the sensor, such as its serial number.

Syntax: DisplayString

Access: read-only

Status: mandatory

Return Value: Always returns an empty string.
connUnitSensorMessage (1.3.6.1.3.94.1.8.1.6)

This describes the status of the sensor as a message. It may also provide more resolution on the sensor indication. For example, “Cover temperature 1503K, above nominal operating range” ::= { connUnitSensorEntry 6 }.

Syntax
DisplayString

Access
read-only

Status
mandatory

Return Value
Refer to Table 4-17 for QLogic 5200/5600 Series connUnitSensorMessage values.

Table 4-17. ConnUnitSensorMessage Values

<table>
<thead>
<tr>
<th>Sensor</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power Supply</td>
<td>Good/Bad/NotInstalled</td>
</tr>
<tr>
<td>Fan</td>
<td>Good/Bad/NotInstalled</td>
</tr>
<tr>
<td>Temperature Status</td>
<td>Normal/Warm/Overheating/NotInstalled</td>
</tr>
<tr>
<td>Temperature Value</td>
<td>Degrees in C</td>
</tr>
</tbody>
</table>
**connUnitSensorType (1.3.6.1.3.94.1.8.1.7)**

The type of component being monitored by this sensor.

**Syntax**

```
INTEGER {
  unknown(1),
  other(2),
  battery(3),
  fan(4),
  power-supply(5),
  transmitter(6),
  enclosure(7),
  board(8),
  receiver(9)
}
```

**Access**

read-only

**Status**

mandatory

**Return Value**

Refer to Table 4-18 for connUnitSensorType return values.

---

**Table 4-18. ConnUnitSensorType Return Values**

<table>
<thead>
<tr>
<th>Sensor</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Temperature</td>
<td>Board (8)</td>
</tr>
<tr>
<td>Fan</td>
<td>Fan (4)</td>
</tr>
<tr>
<td>Power Supply</td>
<td>Power Supply (5)</td>
</tr>
<tr>
<td>Voltage</td>
<td>Board (8)</td>
</tr>
</tbody>
</table>
connUnitSensorCharacteristic (1.3.6.1.3.94.1.8.1.8)

The characteristics being monitored by this sensor.

Syntax

```
INTEGER {
  unknown(1),
  other(2),
  temperature(3),
  pressure(4),
  emf(5),
  currentValue(6), - current is a keyword
  airflow(7),
  frequency(8),
  power(9),
  door(10)
}
```

Access

read-only

Status

mandatory

Return Value

Refer to Table 4-19 for connUnitSensorCharacteristic values.

Table 4-19. ConnUnitSensorCharacteristic Values

<table>
<thead>
<tr>
<th>Sensor</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Temperature Value</td>
<td>Temperature (3)</td>
</tr>
<tr>
<td>Temperature Status</td>
<td>Temperature (3)</td>
</tr>
<tr>
<td>Fan</td>
<td>Airflow (7)</td>
</tr>
<tr>
<td>Power Supply</td>
<td>Power (9)</td>
</tr>
</tbody>
</table>
Port Table

The objects described in this section are in a table format indexed by World Wide Name and Index. The Index is the port number being interrogated. There may be different numbers of ports in each switch so the agent must determine the maximum allowable index on a switch by switch basis. An example of how to access one of these objects given a WWN of 100000c0dd0090a7 is:

"snmpget localhost public
fcmgmt.connSet.connUnitPortTable.connUnitPortEntry.connUnitPortUnitId.16.0.0.192.221.0.144.167.0.0.0.0.0.0.0.0.1".

connUnitPortUnitId (1.3.6.1.3.94.1.10.1.1)

The connUnitId of the connectivity unit that contains this port.

Syntax: FcGlobalId
Access: read-only
Status: mandatory
Return Value: Returns the World Wide Name of the switch followed by 8 bytes of zeros. For example: 10 00 00 C0 DD 00 71 C9 00 00 00 00 00 00 00.

connUnitPortIndex (1.3.6.1.3.94.1.10.1.2)

A unique value among all connUnitPortEntries on this connectivity unit, between 1 and connUnitNumPort[connUnitPortUnitId].

Syntax: INTEGER (1..2147483647)
Access: read-only
Status: mandatory
Return Value: The index for each port on the switch. QLogic 5200/5600 Series = 1 - 8,12,16,20 (varies depending on number of licensed ports)
connUnitPortType (1.3.6.1.3.94.1.10.1.3)

The port type.

**Syntax**

```
INTEGER {
  unknown(1),
  other(2),
  not-present(3),
  hub-port(4),
  n-port(5), - end port for fabric
  nl-port(6), - end port for loop
  fl-port(7), - public loop
  f-port(8), - fabric port
  e-port(9), - fabric expansion port
  g-port(10), - generic fabric port
  domain-ctl(11), - domain controller
  hub-controller(12),
  scsi(13), - parallel SCSI port
  escon(14),
  lan(15),
  wan(16),
  ac(17), - AC power line
  dc(18), - DC power line
  ssa(19) - serial storage architecture
  wdm(20),-- optical wave division multiplex
  ib 21), - Infiniband
  ipstore(22) - IP storage
}
```

**Access**

read-only

**Status**

mandatory

**Return Value**

Refer to Table 4-20 for connUnitPortType return values.

**Table 4-20. ConnUnitPortType Return Values**

<table>
<thead>
<tr>
<th>Switch Port Type</th>
<th>Return Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>G</td>
<td>g-port (10)</td>
</tr>
<tr>
<td>FL</td>
<td>fl-port (7)</td>
</tr>
<tr>
<td>F</td>
<td>f-port (8)</td>
</tr>
<tr>
<td>E</td>
<td>e-port (9)</td>
</tr>
<tr>
<td>Donor</td>
<td>other (2)</td>
</tr>
</tbody>
</table>
connUnitPortFCClassCap (1.3.6.1.3.94.1.10.1.4)

Bit mask that specifies the classes of service capability of this port. If this is not applicable, return all bits set to zero.

The bits have the following definition:

- unknown - 0
- class-f - 1
- class-one - 2
- class-two - 4
- class-three - 8
- class-four - 16
- class-five - 32
- class-six - 64

Syntax: OCTET STRING (SIZE (2))
Access: read-only
Status: mandatory
Return Value: Always returns 0x0d (Class f, Class 2, and Class 3).

Table 4-20. ConnUnitPortType Return Values (Continued)

<table>
<thead>
<tr>
<th>Switch Port Type</th>
<th>Return Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>other</td>
<td>unknown (1)</td>
</tr>
</tbody>
</table>

Table 4-20. ConnUnitPortType Return Values (Continued)
connUnitPortFCClassOp (1.3.6.1.3.94.1.10.1.5)

Bit mask that specifies the classes of service that are currently operational. If this is not applicable, return all bits set to zero. This object has the same definition as connUnitPortFCClassCap" ::= { connUnitPortEntry 5 }.

Syntax

OCTET STRING (SIZE (2))

Access

read-only

Status

mandatory

Return Value

If F or FL, returns 0x0c (Class 2, and Class 3), else returns 0x0d (Class f, Class 2, and Class 3).

connUnitPortState (1.3.6.1.3.94.1.10.1.6)

The user selected state of the port hardware.

Syntax

INTEGER {
  unknown(1),
  online(2), - available for meaningful work
  offline(3), - not available for meaningful work
  bypassed(4), - no longer used (4/12/00)
  diagnostics(5)
}

Access

read-only

Status

mandatory

Return Value

Refer to Table 4-21 for connUnitPortState return values.

Table 4-21. ConnUnitPortState Return Values

<table>
<thead>
<tr>
<th>Port Value</th>
<th>Return Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Online</td>
<td>online (2)</td>
</tr>
<tr>
<td>Offline</td>
<td>offline (3)</td>
</tr>
<tr>
<td>Downed</td>
<td>offline (3)</td>
</tr>
<tr>
<td>Diagnostics</td>
<td>diagnostics (5)</td>
</tr>
<tr>
<td>other</td>
<td>unknown (1)</td>
</tr>
</tbody>
</table>
connUnitPortStatus (1.3.6.1.3.94.1.10.1.7)

An overall protocol status for the port. This value of connUnitPortState is not online, then this is reported Unknown.

**Syntax**

```
INTEGER {
  unknown(1),
  unused(2), - device cannot report this status
  ready(3), - FCAL Loop or FCPH Link reset protocol; initialization complete
  warning(4), - do not use (4/12/00)
  failure(5), - do not use (4/12/00)
  notparticipating(6), - loop not participating and does not have a loop address
  initializing(7), - protocol is proceeding
  bypass(8), - do not use (4/12/00)
  ols(9) - FCP offline status
  other(10) - status not described above
}
```

**Access**

read-only

**Status**

mandatory

**Return Value**

Always returns unused (2).
connUnitPortTransmitterType (1.3.6.1.3.94.1.10.1.8)

The technology of the port transceiver.

**Syntax**

INTEGER {
  unknown(1),
  other(2),
  unused(3),
  shortwave(4),
  longwave(5),
  copper(6),
  scsi(7),
  longwaveNoOFC(8),
  shortwaveNoOFC(9),
  longwaveLED(10),
  ssa(11)
}

**Access**

read-only

**Status**

mandatory

**Return Value**

Refer to Table 4-22 for connUnitPortTransmitterType return values.

<table>
<thead>
<tr>
<th>SFP Transmitter Type</th>
<th>Return Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not Installed</td>
<td>Unused (3)</td>
</tr>
<tr>
<td>SL</td>
<td>Shortwave (4)</td>
</tr>
<tr>
<td>LL</td>
<td>Longwave (5)</td>
</tr>
<tr>
<td>LC</td>
<td>LongwaveNoOFC (8)</td>
</tr>
<tr>
<td>SN</td>
<td>ShortwaveNoOFC (9)</td>
</tr>
<tr>
<td>EL</td>
<td>Copper (6)</td>
</tr>
<tr>
<td>Other</td>
<td>Unknown (1)</td>
</tr>
</tbody>
</table>
**connUnitPortModuleType (1.3.6.1.3.94.1.10.1.9)**

The module type of the port connector.

**Syntax**

```
INTEGER {
  unknown(1),
  other(2),
  gbic(3),
  embedded(4), - fixed (oneXnine)
  glm(5),
  gbicSerialId(6),
  gbicNoSerialId(7),
  gbicNotInstalled(8),
  smallFormFactor(9) - this is generically a small form factor connector.
}
```

**Access**

read-only

**Status**

mandatory

**Return Value**

Refer to Table 4-23 for connUnitPortModuleType return values.

<table>
<thead>
<tr>
<th>Type</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Gb/2Gb Ports</td>
<td>smallFormFactor(9)</td>
</tr>
<tr>
<td>10 Gb Ports</td>
<td>Other (2)</td>
</tr>
</tbody>
</table>

**Table 4-23. ConnUnitPortModuleType Return Values**

**connUnitPortWwn (1.3.6.1.3.94.1.10.1.10)**

The World Wide Name of the port, if applicable, otherwise returns all zeros.

**Syntax**

FcGlobalId

**Access**

read-only

**Status**

mandatory

**Return Value**

Returns the Port World Wide Name followed by 8 bytes of zeros. For example, the return value for port #2 would be 20 02 00 C0 DD 00 71 C9 00 00 00 00 00 00 00 00 00, and the return value for port #2 would be 20 0E 00 C0 DD 00 71 C9 00 00 00 00 00 00 00 00 00. If a port is configured as a Donor, return value = 0.
connUnitPortFCId (1.3.6.1.3.94.1.10.1.11)
This is the assigned Fibre Channel ID of this port. This value is expected to be a Big Endian value of 24 bits. If this is a loop, then it is the ALPA that is connected. If this is an E_Port, then it will only contain the domain ID left justified, zero filled. If this port does not have a Fibre Channel address, returns all bits set to 1.

Syntax: FcAddressId
Access: read-only
Status: mandatory
Return Value: The address for each port based on Domain, Area, and ALPA. For example, port #15 would be equal to 640F00 (Domain = 0x64, Area = 0x0F, ALPA = 0x00).

connUnitPortSn (1.3.6.1.3.94.1.10.1.12)
The serial number of the unit. If not applicable, returns an empty string.

Syntax: DisplayString (SIZE(0..79))
Access: read-only
Status: unsupported
Return Value: Return Value = The media part number of the SFP (or MediaPartNumber) if installed.

connUnitPortRevision (1.3.6.1.3.94.1.10.1.13)
The port revision. For example, for a GBIC.

Syntax: DisplayString (SIZE(0..79))
Access: read-only
Status: unsupported
Return Value: Return Value = The media revision of the SFP (or MediaRevision) if installed.
connUnitPortVendor (1.3.6.1.3.94.1.10.1.14)
The port vendor. For example, for a GBIC.

Syntax       DisplayString (SIZE(0..79))
Access       read-only
Status       unsupported
Return Value The port vendor as reported by the SFP (if supported).

connUnitPortSpeed (1.3.6.1.3.94.1.10.1.15)
The speed of the port in kilobytes per second.

Syntax       INTEGER
Access       read-only
Status       mandatory
Return Value The operational speed, otherwise returns the administrative speed setting. If 1 Gbps, returns 106250. If 2 Gbps, returns 212500. If 4 Gbps, returns 425000. If 10 Gbps, returns 1062500.
connUnitPortControl (1.3.6.1.3.94.1.10.1.16)

This object is used to control the addressed connUnit's port.

- **resetConnUnitPort**: If the addressed connUnit allows this operation to be performed to this port, the addressed port performs a vendor-specific "reset" operation. Examples of these operations are: the Link Reset protocol, the Loop Initialization protocol, or a re-synchronization occurring between the transceiver in the addressed port to the transceiver that the port is connected to.

- **bypassConnUnitPort**: If the addressed connUnit allows this operation to be performed to this port, the addressed port performs a vendor-specific "bypass" operation. Examples of these operations are transitioning from online to offline, a request (non-participating) command to the Loop Port state machine, or removal of the port from an arbitrated loop by a hub.

- **unbypassConnUnitPort**: If the addressed connUnit allows this operation to be performed to this port, the addressed port performs a vendor-specific "unbypass" operation. Examples of these operations are the Link Failure protocol, a request (participating) command to the Loop Port state machine, or addition of the port to an arbitrated loop by a hub.

- **offlineConnUnitPort**: If the addressed connUnit allows this operation to be performed to this port, the addressed port performs a vendor-specific "offline" operation. Examples of these operations are disabling a port's transceiver, the Link Failure protocol, request (non-participating) command to the Loop Port state machine, or removal of the port from an arbitrated loop by a hub.

- **onlineConnUnitPort**: If the addressed connUnit allows this operation to be performed to this port, the addressed port performs a vendor-specific "online" operation. Examples of these operations are enabling a port's transceiver, the Link Failure protocol, request (participating) command to the Loop Port state machine, or addition of the port from an arbitrated loop by a hub.

- **resetConnUnitPortCounters**: If the addressed connUnit allows this operation to be performed to this port, the addressed port statistics table counters will be set to zero.
Each implementation may choose not to allow any or all of these values on a SET. On a read, if you do not support write, then return invalid. Otherwise, return the last control operation attempted.

**Syntax**

```
INTEGER {
  unknown(1),
  invalid(2),
  resetConnUnitPort(3),
  bypassConnUnitPort(4),
  unbypassConnUnitPort(5),
  offlineConnUnitPort(6),
  onlineConnUnitPort(7),
  resetConnUnitPortCounters(8)
}
```

**Access**

read-write

**Status**

mandatory

**Return Value**

Refer to Table 4-24 for connUnitPortControl read return values.

Refer to Table 4-25 for connUnitPortControl write command values.

<table>
<thead>
<tr>
<th>Port Value</th>
<th>Return Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Online</td>
<td>online (7)</td>
</tr>
<tr>
<td>Offline</td>
<td>offline (6)</td>
</tr>
<tr>
<td>Diagnostics</td>
<td>offline (6)</td>
</tr>
<tr>
<td>other</td>
<td>unknown (1)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Control Value</th>
<th>Command Sent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Online (7)</td>
<td>online</td>
</tr>
<tr>
<td>Offline (6)</td>
<td>offline</td>
</tr>
<tr>
<td>ResetCounters (8)</td>
<td>clear counters</td>
</tr>
<tr>
<td>other</td>
<td>error returned</td>
</tr>
</tbody>
</table>
### connUnitPortName (1.3.6.1.3.94.1.10.1.17)

A user-defined name for this port. This means that up to DisplayString characters may be supported. If less than, then the name will be truncated in the connunit.

**Syntax**  INTEGER

**Access**  read-write

**Status**  mandatory

**Return Value**  The symbolic port name. A 1G or 2G only capable port, would return port followed by the port number. 10G ports would return 10G followed by the port number. For example, a 1G/2G port#2 would return 'Port2' and a 10G port#18 would return '10G-18' by default.

### connUnitPortPhysicalNumber (1.3.6.1.3.94.1.10.1.18)

This is the internal port number this port is known by. In many implementations, this should be the same as connUnitPortIndex. Some implementations may have an internal port representation not compatible with the rules for table indexes. In that case, provide the internal representation of this port in this object. This value may also be used in the connUnitLinkPortNumberX or connUnitLinkPortNumberY objects of the connUnitLinkTable.

**Syntax**  INTEGER

**Access**  read-only

**Status**  mandatory

**Return Value**  The physical port number.
**connUnitPortStatObject (1.3.6.1.3.94.1.10.1.19)**

This contains the OID of the first object of the table that contains the statistics for this particular port. If this has a value of zero, then there are no statistics available for this port. The port type information will help identify the statistics objects that will be found in the table.

**Syntax**

OBJECT IDENTIFIER

**Access**

read-only

**Status**

deprecated

**Return Value**

The port object ID (1.2.6.1.3.94.4.5.1.1).

---

**connUnitPortProtocolCap (1.3.6.1.3.94.1.10.1.20)**

Bit mask that specifies the driver level protocol capability of this port. If this is not applicable, returns all bits set to zero.

The bits have the following definitions:

- unknown - 0
- Loop - 1
- Fabric - 2
- SCSI - 4
- TCP/IP - 8
- VI - 16
- FICON - 32

**Syntax**

OCTET STRING (SIZE (2))

**Access**

read-only

**Status**

mandatory

**Return Value**

Always returns 0x03 (Loop, Fabric).
connUnitPortProtocolOp (1.3.6.1.3.94.1.10.1.21)

Bit mask that specifies the driver level protocol(s) that are currently operational. If not applicable, return all bits set to zero. This object has the same definition as connUnitPortProtocolCap.

Syntax OCTET STRING (SIZE (2))
Access read-only
Status unsupported
Return Value Always returns error status "NoSuchName".

connUnitPortNodeWwn (1.3.6.1.3.94.1.10.1.22)

The Node World Wide Name of the port if applicable, otherwise all zeros. This should have the same value for a group of related ports. The container is defined as the largest physical entity. For example, all ports on HBAs on a host will have the same Node WWN. All ports on the same storage subsystem will have the same Node WWN." ::= { connUnitPortEntry 22 }.

Syntax FcNameId
Access read-only
Status mandatory
Return Value Returns the World Wide Node Name of the switch. For example: 10 00 00 C0 DD 00 71 C9.
**connUnitPortHWState (1.3.6.1.3.94.1.10.1.23)**

The hardware detected state of the port.

**Syntax**

```
INT 6ER {
    unknown(1),
    failed(2), - port failed diagnostics
    bypassed(3), - FCAL bypass, loop only
    active(4), - connected to a device
    loopback(5), - Port in external loopback
    txfault(6), - Transmitter fault
    noMedia(7), - media not installed linkDown
    (8) - waiting for activity (rx sync)
}
```

**Access**

read-only

**Status**

mandatory

**Return Value**

Refer to Table 4-26 for connUnitPortHWState port state return values.

**Table 4-26. ConnUnitPortHWState Port State Return Values**

<table>
<thead>
<tr>
<th>Port State</th>
<th>Return Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>If DiagStatus = Failed</td>
<td>Failed (2)</td>
</tr>
<tr>
<td>If SFP = Not Installed</td>
<td>NoMedia (7)</td>
</tr>
<tr>
<td>If SyncStatus = SyncAcquired</td>
<td>Active (4)</td>
</tr>
<tr>
<td>If SyncStatus = SyncLost</td>
<td>LinkDown (8)</td>
</tr>
<tr>
<td>Other</td>
<td>Unknown (1)</td>
</tr>
</tbody>
</table>
Event Table

The objects described in this section are in a table format indexed by World Wide Name and Index. The maximum index is determined based on the number of events in the table. An example of how to access one of these objects given a WWN of 100000c0dd0090a7 is:

"snmpget localhost public fcmgmt.connSet.connUnitEventTable.connUnitEventEntry.connUnitEventUnitId.16.0.0.192.221.0.144.167.0.0.0.0.0.0.0.0.1".

**connUnitEventUnitId (1.3.6.1.3.94.1.11.1.1.1)**

The connUnitId of the connectivity unit that contains this event table.

**Syntax** FcGlobalId

**Access** read-only

**Status** mandatory

**Return Value** The World Wide Name of the switch followed by 8 bytes of zeros. For example, 10 00 00 C0 DD 00 71 C9 00 00 00 00 00 00 00 00.
connUnitEventIndex (1.3.6.1.3.94.1.11.1.2)

Each connectivity unit has its own event buffer. As it wraps, it may write over previous events. This object is an index into the buffer. It is recommended that this table be read using getNext's to retrieve the initial table. The management application should read the event table at periodic intervals and then determine if any new entries were added by comparing the last known index value with the current highest index value. The management application should then update its copy of the event table. If the read interval is too long, it is possible that there may be events that may not be contained in the agent's internal event buffer. For example, an agent may read events 50-75. At the next read interval, connUnitEventCurrID is 189. If the management application tries to read event index 76, and the agent's internal buffer is 100 entries max, event index 76 will no longer be available.

The index value is an incrementing integer starting from one every time there is a table reset. On table reset, all contents are emptied and all indexes are set to zero. When an event is added to the table, the event is assigned the next higher integer value than the last item entered into the table. If the index value reaches its maximum value, the next item entered will cause the index value to roll over and start at one again.

**Syntax**

INTEGER (1..2147483647)

**Access**

read-only

**Status**

mandatory

**Return Value**

The table index.
connUnitEventId (1.3.6.1.3.94.1.11.1.3)

The internal event ID. Incremented for each event, ranging between 1 and connUnitMaxEvents. Not used as table index to simplify the agent implementation. When this reaches the end of the range specified by connUnitMaxEvents, the ID will roll over to start at one. This value will be set back to one at reset. The relationship of this value to the index is that internal event ID may represent a smaller number than a 32 bit integer (for example, maximum 100 entries) and would only have a value range up to connUnitMaxEvents.

Syntax INTEGER
Access read-only
Status deprecated
Return Value Unsupported. Always returns error status "NoSuchName".

connUnitREventTime (1.3.6.1.3.94.1.11.1.4)

The real time when the event occurred. It has the following format.

DDMMYYYY HHMMSS
DD=day number
MM=month number
YYYY=year number
HH=hour number
MM=minute number
SS=seconds number

If not applicable, return either a NULL string or “00000000 000000”.

Syntax DisplayString (SIZE (0..15))
Access read-only
Status mandatory
Return Value The timestamp of the event.
connUnitSEventTime (1.3.6.1.3.94.1.11.1.5)
This is the sysUpTime timestamp when the event occurred.

Syntax connUnitSEventTime
Access read-only
Status mandatory
Return Value Always returns error status "NoSuchName".

connUnitEventSeverity (1.3.6.1.3.94.1.11.1.6)
The event severity level.

Syntax FcEventSeverity
Access read-only
Status mandatory
Return Value Always returns error status "NoSuchName".

connUnitEventType (1.3.6.1.3.94.1.11.1.7)
The type of this event.

Syntax INTEGER {
unknown(1),
other(2),
status(3),
configuration(4),
topology(5)
}
Access read-only
Status mandatory
Return Value Always returns 3 (Status).
connUnitEventObject (1.3.6.1.3.94.1.11.1.8)

This is used with the connUnitEventType to identify which object the event refers to. Examples include connUnitPortStatus.connUnitId.connUnitPortIndex and connUnitStatus.connUnitId.

**Syntax**
OBJECT IDENTIFIER

**Access**
read-only

**Status**
mandatory

**Return Value**
Always returns error status "NoSuchName".

connUnitEventDescr (1.3.6.1.3.94.1.11.1.9)

The description of the event.

**Syntax**
DisplayString

**Access**
read-only

**Status**
mandatory

**Return Value**
The event description in the form: 
"[Id][timestamp][severity][module][Description]"

### Link Table

The objects described in this section are in a table format indexed by World Wide Name and Index. The index is an index into the link table for the switch. There may be as many link entries as there are ports. An example of how to access one of these objects given a WWN of 100000c0dd0090a7 is:

"snmpget localhost public fcmgmt.connSet.connUnitLinkTable.connUnitLinkEntry.connUnitLinkUnitId.16.0.0.192.221.0.144.167.0.0.0.0.0.0.0.0.1".

If the agent is able to discover links which do not directly attach to members of its agency and its discovery algorithm gives some assurance the links are recently valid, it may include these links. Link information entered by administrative action may be included even if not validated directly if the link has at least one endpoint in this agency, but should not be included otherwise.

A connectivity unit should fill the table in as best it can. One of the methods to fill this in would be to use the RNID ELS (ANSI document 99-422v0). This allows one to query a port for the information needed for the link table.
This table is accessed either directly if the management software has an index value or via GetNexths. The value of the indexes are not required to be contiguous. Each entry created in this table will be assigned an index. This relationship is kept persistent until the entry is removed from the table or the system is reset. The total number of entries are defined by the size of the table.

**connUnitLinkUnitId (1.3.6.1.3.94.1.12.1.1)**

The connUnitld of the connectivity unit that contains this link table.

- **Syntax**
  connUnitLinkUnitld
- **Access**
  read-only
- **Status**
  mandatory
- **Return Value**
  The World Wide Name of the switch followed by 8 bytes of zeros. For example, 10 00 00 C0 DD 00 71 C9 00 00 00 00 00 00 00 00.

**connUnitLinkIndex (1.3.6.1.3.94.1.12.1.2)**

This index is used to create a unique value for each entry in the link table with the same connUnitLinkUnitld. The value can only be reused if it is not currently in use and the value is the next candidate to be used. This value wraps at the highest value represented by the size of INTEGER. This value is reset to zero when the system is reset, and the first value to be used is one.

- **Syntax**
  INTEGER (1..2147483647)
- **Access**
  read-only
- **Status**
  mandatory
- **Return Value**
  The table index.
connUnitLinkNodeIdX (1.3.6.1.3.94.1.12.1.3)

The Node WWN of the unit at one end of the link. If the Node WWN is unknown and the Node is a connUnit in the responding agent, then the value of this object must be equal to its connUnitID.

**Syntax**

OCTET STRING (SIZE(16))

**Access**

read-only

**Status**

mandatory

**Return Value**

The World Wide Name of the local switch for each entry in the link table. For example, 10 00 00 C0 DD 00 71 C9 00 00 00 00 00 00 00 00.

connUnitLinkPortNumberX (1.3.6.1.3.94.1.12.1.4)

The port number on the unit specified by connUnitLinkNodeIdX if known, otherwise -1. If the value is non-negative, then it will be equal to connUnitPortPhysicalNumber.

**Syntax**

INTEGER

**Access**

read-only

**Status**

mandatory

**Return Value**

The local port number for each entry in the link table.

connUnitLinkPortWwnX (1.3.6.1.3.94.1.12.1.5)

The port WWN of the unit specified by connUnitLinkNodeIdX if known, otherwise 16 octets of binary 0": = { connUnitLinkEntry 5 }.

**Syntax**

connUnitLinkPortWwnX

**Access**

read-only

**Status**

mandatory

**Return Value**

The local World Wide port number for each entry in the link table.
connUnitLinkNodeIdY (1.3.6.1.3.94.1.12.1.6)

The Node WWN of the unit at the other end of the link. If the Node WWN is unknown and the Node is a connUnit in the responding SNMP agency, then the value of this object must be equal to its connUnitID.

Syntax OCTET STRING (SIZE(16))
Access read-only
Status mandatory
Return Value The remote World Wide Node number for each entry in the link table.

connUnitLinkPortNumberY (1.3.6.1.3.94.1.12.1.7)

The port number on the unit specified by connUnitLinkNodeIdY if known, otherwise -1. If the value is non-negative, then it will be equal to connUnitPortPhysicalNumber.

Syntax OCTET STRING (SIZE(16))
Access read-only
Status mandatory
Return Value The remote port number for inter-switch link, if known. Otherwise, -1 (0xFFFFFFFF).

connUnitLinkPortWwnY (1.3.6.1.3.94.1.12.1.8)

The port WWN on the unit specified by connUnitLinkNodeIdY if known, otherwise 16 octets of binary 0" ::= { connUnitLinkEntry 8 }.

Syntax FcGlobalId
Access read-only
Status mandatory
Return Value The remote Port World Wide Name for each entry in the link table, if known.
connUnitLinkAgentAddressY (1.3.6.1.3.94.1.12.1.9)

The address of an FCMGMT MIB agent for the Node identified by connUnitLinkNodeIdY, if known. Otherwise 16 octets of binary 0" ::= {connUnitLinkEntry 9}.

Syntax OCTET STRING (SIZE(16))
Access read-only
Status mandatory
Return Value The remote IP address of the remote switch, if known. Otherwise, returns sixteen zeroes.

connUnitLinkAgentAddressTypeY (1.3.6.1.3.94.1.12.1.10)

If connUnitLinkAgentAddressY is nonzero, it is a protocol address. ConnUnitLinkAgentAddressTypeY is the “address family number” assigned by IANA to identify the address format.

Syntax INTEGER
Access read-only
Status mandatory
Return Value Always returns 1 (Ipv4).

connUnitLinkAgentPortY (1.3.6.1.3.94.1.12.1.11)

The IP port number for the agent. This is provided in case the agent is at a non-standard SNMP port.

Syntax INTEGER
Access read-only
Status mandatory
Return Value Returns value of 0.
connUnitLinkUnitTypeY (1.3.6.1.3.94.1.12.1.12)

Type of the Fibre Channel connectivity unit as defined in connUnitType.

**Syntax**
FcUnitType

**Access**
read-only

**Status**
mandatory

**Return Value**
The type of remote device in the link table. For example, switch (4).

connUnitLinkConnIdY (1.3.6.1.3.94.1.12.1.13)

This is the Fibre Channel ID of this port. If the connectivity unit is a switch, this is expected to be a Big Endian value of 24 bits. If this is loop, then it is the ALPA that is connected. If this is an E_Port, then it will only contain the domain ID. If not any of those, unknown or cascaded loop, returns all bits set to 1.

**Syntax**
OCTET STRING (SIZE(3))

**Access**
read-only

**Status**
mandatory

**Return Value**
The remote Fibre Channel address of each entry in the link table.

connUnitLinkCurrIndex (1.3.6.1.3.94.1.12.1.14)

The last used link index.

**Syntax**
INTEGER

**Access**
read-only

**Status**
mandatory

**Return Value**
The last used link table index number.
Zone Table

The objects described in this section are in a table format indexed Zone number and Index. The zones are numbered 1 to connUnitZoneSetNumZones, the index represents the members within the zones.

An example of how to access one of these objects:

```
fcmgmt.connSet.connUnitZoneTable.connUnitZoneEntry.connUnitZoneIndex.1.1
```

**connUnitZoneIndex (1.3.6.1.3.94.1.13.1.1)**

Unique table index for each zone. Valid values are between 1 and connUnitZoneSetNumZones.

- **Syntax**: INTEGER (1..2147483647)
- **Access**: read-only
- **Status**: mandatory
- **Return Value**: Returns index number for each zone within the active zone set.

**connUnitZoneMemberIndex (1.3.6.1.3.94.1.13.1.2)**

Unique table index for each zone member. Valid values are between 1 and connUnitZoneNumMembers.

- **Syntax**: INTEGER (1..2147483647)
- **Access**: read-only
- **Status**: mandatory
- **Return Value**: Returns index number for each member within a zone.
connUnitZoneSetName (1.3.6.1.3.94.1.13.1.3)

Name of the active zone set to which the zone and zone member belong.

Syntax     DisplayString (SIZE (0..79))
Access     read-only
Status     mandatory
Return Value     Returns the zone set name.

connUnitZoneSetNumZones (1.3.6.1.3.94.1.13.1.4)

The number of zones in the active zone set.

Syntax     INTEGER
Access     read-only
Status     mandatory
Return Value     Returns the number of zones within the active zone set.

connUnitZoneName (1.3.6.1.3.94.1.13.1.5)

Name of the zone.

Syntax     DisplayString (SIZE (0..79))
Access     read-only
Status     mandatory
Return Value     Returns the name of the zone.

connUnitZoneCapabilities (1.3.6.1.3.94.1.13.1.6)

1-byte bit mask that specifies the zoning capabilities supported by the fabric.
Bit 7 - Soft zones supported.
Bit 6 - Hard zones supported.
Bits 5-0 - Reserved.
**connUnitZoneEnforcementState (1.3.6.1.3.94.1.13.1.7)**

1-byte bit mask that specifies the current enforcement of the Zone Set.

- Bit 7 - Soft zone set enforced.
- Bit 6 - Hard zone set enforced.
- Bits 5-0 - Reserved.

**Syntax**

OCTET STRING (SIZE(1))

**Access**

read-only

**Status**

mandatory

**Return Value**

Always returns 0xC0.

**connUnitZoneAttributeBlock (1.3.6.1.3.94.1.13.1.8)**

A variable length structure that contains extended zone attributes defined in the FC-GS-4 enhanced zone server. See FC-GS-4 draft standard for details and format of the structure. Support of this object is optional.

**Syntax**

OCTET STRING (SIZE(80))

**Access**

read-only

**Status**

mandatory

**Return Value**

Not supported. Always returns SNMP error NoSuchName.
**connUnitZoneNumMembers (1.3.6.1.3.94.1.13.1.9)**

Number of zone members in the zone: connUnitZoneName.

**Syntax** INTEGER

**Access** read-only

**Status** mandatory

**Return Value** Returns total number of members in a zone.

**connUnitZoneMemberIdType (1.3.6.1.3.94.1.13.1.10)**

Type of zone member ID:

1- Port WWN  
2- Domain & Port ID  
3- FC Address  
4- Node WWN  
5- Alias Name  
6- 'FF'h - Vendor specified.

**Syntax** INTEGER

**Access** read-only

**Status** mandatory

**Return Value** Retrieves the member ID type.

- WWN..............0x01 // Port WWN  
- Domain/Port....0x02 // Domain & Port ID  
- FCAddress.......0x03 // FC Address  
- [other]...............0xff // Vendor specific
connUnitZoneMemberID (1.3.6.1.3.94.1.13.1.11)

ID of the zone member based on connUnitZoneMemberIdType.

Syntax       FcGlobalId
Access        read-only
Status        mandatory
Return Value  Returns the zone member name as a 16 8-bit octets. Mapped as follows:
               WWN member - WWN (8 bytes) followed by 8 bytes of zeros.
               FC address - FC address (3 bytes) followed by 13 bytes of zeros.
               Domain/Port - Domain/Port address (2 bytes) followed by 14 bytes of zeros.
Zoning Alias Table

The objects described in this section are in a table format indexed by Alias Number and Index. The aliases are numbered 1 to connUnitZoningAliasNumAliases, the index represents the members within the alias. An example of how to access one of these objects:

"fcmgmt.connSet.connUnitZoneTable.connUnitZoneEntry.connUnitZoningAliasIn dex.1.1"

**connUnitZoningAliasIndex (1.3.6.1.3.94.1.14.1.1)**

Unique table index for each alias. Valid values are between 1 and connUnitZoningAliasNumAliases.

- **Syntax**: INTEGER (1..2147483647)
- **Access**: read-only
- **Status**: mandatory
- **Return Value**: Returns the alias index.

**connUnitZoningAliasMemberIndex (1.3.6.1.3.94.1.14.1.2)**

Unique table index for each alias member. Valid values are between 1 and connUnitZoningAliasNumMembers.

- **Syntax**: INTEGER (1..2147483647)
- **Access**: read-only
- **Status**: mandatory
- **Return Value**: Returns the alias member index.
connUnitZoningAliasNumAliases (1.3.6.1.3.94.1.14.1.3)  
The number of aliases defined in this table.

Syntax          INTEGER
Access          read-only
Status          mandatory
Return Value    Returns number of aliases defined.

connUnitZoningAliasName (1.3.6.1.3.94.1.14.1.4)  
The alias name.

Syntax          DisplayString (SIZE (0..79))
Access          read-only
Status          mandatory
Return Value    Returns Alias name.

connUnitZoningAliasNumMembers (1.3.6.1.3.94.1.14.1.5)  
Number of members in the alias: connUnitZoningAliasName.

Syntax          INTEGER
Access          read-only
Status          mandatory
Return Value    Returns number of members in a defined Alias zone.
connUnitZoningAliasMemberIdType (1.3.6.1.3.94.1.14.1.6)
Type of alias member ID:
1- Port WWN
2- Domain & Port ID
3- FC Address
Others: reserved.

Syntax INTEGER
Access read-only
Status mandatory

Return Value Returns the alias member Id type. Mapped as follows:
WWN................. 0x01 // Port WWN
DomainPort........ 0x02 // Domain & Port ID
FC Address........ 0x03 // FC Address
[other]............... 0xff // Vendor specific

connUnitZoningAliasMemberID (1.3.6.1.3.94.1.14.1.7)
ID of the alias member based on connUnitZoningAliasMemberIdType.

Syntax FcGlobalId
Access read-only
Status mandatory

Return Value Returns the alias zone member name as 16 8-bit octets. Mapped as follows:
WWN member - WWN (8 bytes) followed by 8 bytes of zeros.
FC address - FC address (3 bytes) followed by 13 bytes of zeros.
Domain/Port - Domain/Port address (2 bytes) followed by 14 bytes of zeros.
Port Statistics Table

The objects described in this section are in a table format indexed by World Wide Name and Index. The index represents the port number to interrogate. An example of how to access one of these objects given a WWN of 100000c0dd0090a7 is:

```
"snmpget localhost public
fcmgmt.statSet.connUnitPortStatTable.connUnitPortStatEntry.connUnitPortStatUnitId.16.0.0.192.221.0.144.167.0.0.0.0.0.0.0.0.1".
```

There is one and only one statistics table for each individual port. For all objects in statistics table, if the object is not supported by the conn unit then the high order bit is set to 1 with all other bits set to zero. The high order bit is reserved to indicate if the object if supported or not. All objects start at a value of zero at hardware initialization and continue incrementing until end of 63 bits and then wrap to zero.

**connUnitPortStatUnitId (1.3.6.1.3.94.4.5.1.1)**

A unique value among all entries in this table having the same connUnitPortStatUnitId, between 1 and connUnitNumPort[connUnitPortStatUnitId].

**Syntax**

FcGlobalId

**Access**

read-only

**Status**

mandatory

**Return Value**

Returns the World Wide Name of the switch followed by 8 bytes of zeros. For example: 10 00 00 C0 DD 00 71 C9 00 00 00 00 00 00 00 00.

**connUnitPortStatIndex (1.3.6.1.3.94.4.5.1.2)**

A unique value among all entries in this table, between 0 and connUnitNumPort[connUnitPortStatUnitId].

**Syntax**

INTEGER (0..2147483647)

**Access**

read-only

**Status**

mandatory

**Return Value**

The port table index.
**connUnitPortStatCountError (1.3.6.1.3.94.4.5.1.3)**

A count of the errors that have occurred on this port.

**Syntax**

OCTET STRING (SIZE (8))

**Access**

read-only

**Status**

mandatory

**Return Value**

A hexadecimal value indicating the total number of errors for a port.

**connUnitPortStatCountTxObjects (1.3.6.1.3.94.4.5.1.4)**

The number of frames/packets/IOs/etc transmitted by this port. A Fibre Channel frame starts with SOF and ends with EOF. Fibre Channel loop devices should not count frames passed through. This value represents the sum total for all other Tx objects.

**Syntax**

OCTET STRING (SIZE (8))

**Access**

read-only

**Status**

mandatory

**Return Value**

A hexadecimal value indicating the total number of bytes transmitted by a port.

**connUnitPortStatCountRxObjects (1.3.6.1.3.94.4.5.1.5)**

The number of frames/packets/IOs/etc received by this port. A Fibre Channel frame starts with SOF and ends with EOF. Fibre Channel loop devices should not count frames passed through. This value represents the sum total for all other Rx objects.

**Syntax**

OCTET STRING (SIZE (8))

**Access**

read-only

**Status**

mandatory

**Return Value**

A hexadecimal value indicating the total number of bytes received by a port.
connUnitPortStatCountTxElements (1.3.6.1.3.94.4.5.1.6)

The number of octets or bytes that have been transmitted by this port. One second periodic polling of the port. This value is saved and compared with the next polled value to compute net throughput. For Fibre Channel, ordered sets are not included in the count.

**Syntax**

OCTET STRING (SIZE (8))

**Access**

read-only

**Status**

mandatory

**Return Value**

A hexadecimal value indicating the total number of bytes transmitted by a port.

connUnitPortStatCountRxElements (1.3.6.1.3.94.4.5.1.7)

The number of octets or bytes that have been received by this port. One second periodic polling of the port. This value is saved and compared with the next polled value to compute net throughput. For Fibre Channel, ordered sets are not included in the count.

**Syntax**

OCTET STRING (SIZE (8))

**Access**

read-only

**Status**

mandatory

**Return Value**

A hexadecimal value indicating the total number of bytes received by a port.

connUnitPortStatCountBBCreditZero (1.3.6.1.3.94.4.5.1.8)

Count of transitions in/out of BBcredit zero state. The other side is not providing any credit. This is a Fibre Channel statistic only.

**Syntax**

OCTET STRING (SIZE (8))

**Access**

read-only

**Status**

mandatory

**Return Value**

Unsupported. Always returns high order bit to 1 with all other bits set to zero.
connUnitPortStatCountInputBuffersFull (1.3.6.1.3.94.4.5.1.9)
Count of occurrences when all input buffers of a port were full and outbound
buffer-to-buffer credit transitioned to zero. There is no credit to provide to other
side. This is a Fibre Channel statistic only.

Syntax OCTET STRING (SIZE (8))
Access read-only
Status mandatory
Return Value Unsupported. Always returns high order bit to 1 with all other bits set to zero.

connUnitPortStatCountFBSYFrames (1.3.6.1.3.94.4.5.1.10)
Count of times that FBSY was returned to this port as a result of a frame that
could not be delivered to the other end of the link. This occurs if either the fabric or
the destination port is temporarily busy. Port can only occur on SOFc1 frames (the
frames that establish a connection). This is a Fibre Channel-only statistic. This is
the sum of all classes. If you cannot keep the by-class counters, then keep the
sum counters.

Syntax OCTET STRING (SIZE (8))
Access read-only
Status mandatory
Return Value A hexadecimal number indicating the total number of FBUsy on a port.
### connUnitPortStatCountPBSYFrames (1.3.6.1.3.94.4.5.1.11)

Count of times that PBSY was returned to this port as a result of a frame that could not be delivered to the other end of the link. This occurs if the destination port is temporarily busy. PBSY can only occur on SOFc1 frames (the frames that establish a connection). This is a Fibre Channel-only statistic. This is the sum of all classes. If you cannot keep the by-class counters, then keep the sum counters.

**Syntax**

OCTET STRING (SIZE (8))

**Access**

read-only

**Status**

mandatory

**Return Value**

Unsupported. Always returns high order bit set to 1 with remaining bits set to zero.

### connUnitPortStatCountFRJTFrames (1.3.6.1.3.94.4.5.1.12)

Count of times that FRJT was returned to this port as a result of a frame that was rejected by the fabric. This is the total for all classes and is a Fibre Channel-only statistic.

**Syntax**

OCTET STRING (SIZE (8))

**Access**

read-only

**Status**

mandatory

**Return Value**

A hexidecimal number indicating the total number of Frame Rejects on a port.

### connUnitPortStatCountPRJTFrames (1.3.6.1.3.94.4.5.1.13)

Count of times that FRJT was returned to this port as a result of a frame that was rejected at the destination N_Port. This is the total for all classes and is a Fibre Channel-only statistic.

**Syntax**

OCTET STRING (SIZE (8))

**Access**

read-only

**Status**

mandatory

**Return Value**

Unsupported. Always returns high order bit to 1 with all other bits set to zero.
connUnitPortStatCountClass1RxFrames (1.3.6.1.3.94.4.5.1.14)
Count of Class 1 frames received at this port. This is a Fibre Channel-only statistic.

Syntax: OCTET STRING (SIZE (8))
Access: read-only
Status: mandatory
Return Value: Unsupported. Always returns high order bit to 1 with all other bits set to zero.

connUnitPortStatCountClass1TxFrames (1.3.6.1.3.94.4.5.1.15)
Count of Class 1 frames transmitted out this port. This is a Fibre Channel-only statistic.

Syntax: OCTET STRING (SIZE (8))
Access: read-only
Status: mandatory
Return Value: Unsupported. Always returns high order bit to 1 with all other bits set to zero.

connUnitPortStatCountClass1FBSYFrames (1.3.6.1.3.94.4.5.1.16)
Count of times that FBSY was returned to this port as a result of a Class 1 frame that could not be delivered to the other end of the link. This occurs if either the fabric or the destination port is temporarily busy. FBSY can only occur on SOFc1 frames (the frames that establish a connection). This is a Fibre Channel-only statistic.

Syntax: OCTET STRING (SIZE (8))
Access: read-only
Status: mandatory
Return Value: Unsupported. Always returns high order bit to 1 with all other bits set to zero.
**connUnitPortStatCountClass1PBSYFrames (1.3.6.1.3.94.4.5.1.17)**

Count of times that PBSY was returned to this port as a result of a Class 1 frame that could not be delivered to the other end of the link. This occurs if the destination N_Port is temporarily busy. PBSY can only occur on SOFc1 frames (the frames that establish a connection). This is a Fibre Channel-only statistic.

**Syntax**
OCTET STRING (SIZE (8))

**Access**
read-only

**Status**
mandatory

**Return Value**
Unsupported. Always returns high order bit to 1 with all other bits set to zero.

---

**connUnitPortStatCountClass1FRJTFrames (1.3.6.1.3.94.4.5.1.18)**

Count of times that FRJT was returned to this port as a result of a Class 1 frame that was rejected by the fabric. This is a Fibre Channel-only statistic.

**Syntax**
OCTET STRING (SIZE (8))

**Access**
read-only

**Status**
mandatory

**Return Value**
Unsupported. Always returns high order bit to 1 with all other bits set to zero.

---

**connUnitPortStatCountClass1PRJTFrames (1.3.6.1.3.94.4.5.1.19)**

Count of times that FRJT was returned to this port as a result of a Class 1 frame that was rejected at the destination N_Port. This is a Fibre Channel-only statistic.

**Syntax**
OCTET STRING (SIZE (8))

**Access**
read-only

**Status**
mandatory

**Return Value**
Unsupported. Always returns high order bit to 1 with all other bits set to zero.
connUnitPortStatCountClass2RxFrames (1.3.6.1.3.94.4.5.1.20)

Count of Class 2 frames received at this port. This is a Fibre Channel-only statistic.

Syntax: OCTET STRING (SIZE (8))
Access: read-only
Status: mandatory
Return Value: The total number of Class 2 frames received by a port.

connUnitPortStatCountClass2TxFrames (1.3.6.1.3.94.4.5.1.21)

Count of Class 2 frames transmitted out this port. This is a Fibre Channel-only statistic.

Syntax: OCTET STRING (SIZE (8))
Access: read-only
Status: mandatory
Return Value: The total number of Class 2 frames transmitted by a port.

connUnitPortStatCountClass2FBSYFrames (1.3.6.1.3.94.4.5.1.22)

Count of times that FBSY was returned to this port as a result of a Class 2 frame that could not be delivered to the other end of the link. This occurs if either the fabric or the destination port is temporarily busy. FBSY can only occur on SOFc1 frames (the frames that establish a connection). This is a Fibre Channel-only statistic.

Syntax: OCTET STRING (SIZE (8))
Access: read-only
Status: mandatory
Return Value: Unsupported. Always returns high order bit to 1 with all other bits set to zero.
connUnitPortStatCountClass2PBSYFrames (1.3.6.1.3.94.4.5.1.23)
Count of times that PBSY was returned to this port as a result of a Class 2 frame that could not be delivered to the other end of the link. This occurs if the destination N_Port is temporarily busy. PBSY can only occur on SOFc1 frames (the frames that establish a connection). This is a Fibre Channel-only statistic.

Syntax OCTET STRING (SIZE (8))
Access read-only
Status mandatory
Return Value Unsupported. Always returns high order bit to 1 with all other bits set to zero.

connUnitPortStatCountClass2FRJTFrames (1.3.6.1.3.94.4.5.1.24)
Count of times that FRJT was returned to this port as a result of a Class 2 frame that was rejected by the fabric. This is a Fibre Channel-only statistic.

Syntax OCTET STRING (SIZE (8))
Access read-only
Status mandatory
Return Value Unsupported. Always returns high order bit to 1 with all other bits set to zero.

connUnitPortStatCountClass2PRJTFrames (1.3.6.1.3.94.4.5.1.25)
Count of times that FRJT was returned to this port as a result of a Class 2 frame that was rejected at the destination N_Port. This is a Fibre Channel-only statistic.

Syntax OCTET STRING (SIZE (8))
Access read-only
Status mandatory
Return Value Unsupported. Always returns high order bit to 1 with all other bits set to zero.
connUnitPortStatCountClass3RxFrames (1.3.6.1.3.94.4.5.1.26)

Count of Class 3 frames received at this port. This is a Fibre Channel-only statistic.

Syntax OCTET STRING (SIZE (8))
Access read-only
Status mandatory
Return Value The total number of Class 3 frames received by a port.

connUnitPortStatCountClass3TxFrames (1.3.6.1.3.94.4.5.1.27)

Count of Class 3 frames transmitted out this port. This is a Fibre Channel-only statistic.

Syntax OCTET STRING (SIZE (8))
Access read-only
Status mandatory
Return Value The total number of Class 3 frames transmitted by a port.

connUnitPortStatCountClass3Discards (1.3.6.1.3.94.4.5.1.28)

Count of Class 3 frames that were discarded upon reception at this port. There is no FBSY or FRJT generated for Class 3 frames. They are simply discarded if they cannot be delivered. This is a Fibre Channel-only statistic.

Syntax OCTET STRING (SIZE (8))
Access read-only
Status mandatory
Return Value The total number of Class3Toss frames for a port.
connUnitPortStatCountRxMulticastObjects (1.3.6.1.3.94.4.5.1.29)
Count of Multicast frames or packets received at this port.

Syntax
OCTET STRING (SIZE (8))

Access
read-only

Status
mandatory

Return Value
Unsupported. Always returns high order bit to 1 with all other bits set to zero.

connUnitPortStatCountTxMulticastObjects (1.3.6.1.3.94.4.5.1.30)
Count of Multicast frames or packets transmitted out this port.

Syntax
OCTET STRING (SIZE (8))

Access
read-only

Status
mandatory

Return Value
Unsupported. Always returns high order bit to 1 with all other bits set to zero.

connUnitPortStatCountRxBroadcastObjects (1.3.6.1.3.94.4.5.1.31)
Count of Broadcast frames or packets received at this port.

Syntax
OCTET STRING (SIZE (8))

Access
read-only

Status
mandatory

Return Value
Unsupported. Always returns high order bit to 1 with all other bits set to zero.
connUnitPortStatCountTxBroadcastObjects (1.3.6.1.3.94.4.5.1.32)
Count of Broadcast frames or packets transmitted out this port. On a Fibre Channel loop, count only OPNr frames generated.

Syntax OCTET STRING (SIZE (8))
Access read-only
Status mandatory
Return Value Unsupported. Always returns high order bit to 1 with all other bits set to zero.

connUnitPortStatCountRxLinkResets (1.3.6.1.3.94.4.5.1.33)
Count of link resets. This is the number of LRs received. This is a Fibre Channel-only statistic.

Syntax OCTET STRING (SIZE (8))
Access read-only
Status mandatory
Return Value The total number of RxLinkResets received by a port.

connUnitPortStatCountTxLinkResets (1.3.6.1.3.94.4.5.1.34)
Count of link resets. The number of LRs transmitted. This is a Fibre Channel-only statistic.

Syntax OCTET STRING (SIZE (8))
Access read-only
Status mandatory
Return Value The total number of TxLinkResets transmitted by a port.
connUnitPortStatCountNumberLinkResets (1.3.6.1.3.94.4.5.1.35)

Count of link resets and LIPs detected at this port. The number of times the reset link protocol is initiated. These are the count of the logical resets, and a count of the number of primitives. This is a Fibre Channel-only statistic.

**Syntax**
OCTET STRING (SIZE (8))

**Access**
read-only

**Status**
mandatory

**Return Value**
The total number of TotalLinkResets for a port.

connUnitPortStatCountRxOfflineSequences (1.3.6.1.3.94.4.5.1.36)

Count of offline primitive OLSs received at this port. This is a Fibre Channel-only statistic.

**Syntax**
OCTET STRING (SIZE (8))

**Access**
read-only

**Status**
mandatory

**Return Value**
The total number of RxOfflineSeqs received by a port.

connUnitPortStatCountTxOfflineSequences (1.3.6.1.3.94.4.5.1.37)

Count of offline primitive OLSs transmitted by this port. This is a Fibre Channel-only statistic.

**Syntax**
OCTET STRING (SIZE (8))

**Access**
read-only

**Status**
mandatory

**Return Value**
The total number of TxOfflineSeqs transmitted by a port.
connUnitPortStatCountNumberOfflineSequences (1.3.6.1.3.94.4.5.1.38)
Count of offline primitive sequences received at this port. This is a Fibre Channel-only statistic.

**Syntax**
OCTET STRING (SIZE (8))

**Access**
read-only

**Status**
mandatory

**Return Value**
The total number of TotalOfflineSeqs received by a port.

connUnitPortStatCountLinkFailures (1.3.6.1.3.94.4.5.1.39)
Count of link failures. This count is part of the Link Error Status Block (LESB). (FC-PH 29.8). This is a Fibre Channel-only statistic.

**Syntax**
OCTET STRING (SIZE (8))

**Access**
read-only

**Status**
mandatory

**Return Value**
The total number of LinkFailures for a port.

connUnitPortStatCountInvalidCRC (1.3.6.1.3.94.4.5.1.40)
Count of frames received with invalid CRC. This count is part of the Link Error Status Block (LESB). (FC-PH 29.8). Loop ports should not count CRC errors passing through when monitoring. This is a Fibre Channel-only statistic.

**Syntax**
OCTET STRING (SIZE (8))

**Access**
read-only

**Status**
mandatory

**Return Value**
The total number of InvalidCRCs received by a port.
connUnitPortStatCountInvalidTxWords (1.3.6.1.3.94.4.5.1.41)

Count of invalid transmission words received at this port. This count is part of the Link Error Status Block (LESB). (FC-PH 29.8). This is a Fibre Channel-only statistic.

Syntax OCTET STRING (SIZE (8))
Access read-only
Status mandatory
Return Value The total number of DecodeErrors for a port.

connUnitPortStatCountPrimitiveSequenceProtocolErrors (1.3.6.1.3.94.4.5.1.42)

Count of primitive sequence protocol errors detected at this port. This count is part of the Link Error Status Block (LESB). (FC-PH 29.8). This is a Fibre Channel-only statistic.

Syntax OCTET STRING (SIZE (8))
Access read-only
Status mandatory
Return Value The total number of PrimSeqErrors for a port.

connUnitPortStatCountLossOfSignal (1.3.6.1.3.94.4.5.1.43)

Count of instances of signal loss detected at port. This count is part of the Link Error Status Block (LESB). (FC-PH 29.8). This is a Fibre Channel-only statistic.

Syntax OCTET STRING (SIZE (8))
Access read-only
Status mandatory
Return Value Unsupported. Always returns high order bit to 1 with all other bits set to zero.
connUnitPortStatCountLossOfSynchronization (1.3.6.1.3.94.4.5.1.144)
Count of instances of synchronization loss detected at port. This count is part of the Link Error Status Block (LESB). (FC-PH 29.8). This is a Fibre Channel-only statistic.

**Syntax**
OCTET STRING (SIZE (8))

**Access**
read-only

**Status**
mandatory

**Return Value**
The total number LossOfSyncs detected by this port.

connUnitPortStatCountInvalidOrderedSets (1.3.6.1.3.94.4.5.1.145)
Count of invalid ordered sets received at port. This count is part of the Link Error Status Block (LESB). (FC-PH 29.8). This is a Fibre Channel-only statistic.

**Syntax**
OCTET STRING (SIZE (8))

**Access**
read-only

**Status**
mandatory

**Return Value**
Unsupported. Always returns high order bit to 1 with all other bits set to zero.

connUnitPortStatCountFramesTooLong (1.3.6.1.3.94.4.5.1.146)
Count of frames received at this port where the frame length was greater than what was agreed to in FLOGI/PLOGI. This could be caused by losing the end of frame delimiter. This is a Fibre Channel-only statistic.

**Syntax**
OCTET STRING (SIZE (8))

**Access**
read-only

**Status**
mandatory

**Return Value**
Unsupported. Always returns high order bit to 1 with all other bits set to zero.
connUnitPortStatCountFramesTruncated (1.3.6.1.3.94.4.5.1.47)

Count of frames received at this port where the frame length was less than the minimum indicated by the frame header (normally 24 bytes). It could be more if the DFCTL field indicates an optional header should have been present. This is a Fibre Channel-only statistic.

Syntax
OCTET STRING (SIZE (8))

Access
read-only

Status
mandatory

Return Value
Unsupported. Always returns high order bit to 1 with all other bits set to zero.

connUnitPortStatCountAddressErrors (1.3.6.1.3.94.4.5.1.48)

Count of frames received with unknown addressing.

Syntax
OCTET STRING (SIZE (8))

Access
read-only

Status
mandatory

Return Value
The total number of InvalidDestAddr frames received by a port.

connUnitPortStatCountDelimiterErrors (1.3.6.1.3.94.4.5.1.49)

Count of invalid frame delimiters received at this port. An example is a frame with a Class 2 start and a Class 3 at the end. This is a Fibre Channel-only statistic.

Syntax
OCTET STRING (SIZE (8))

Access
read-only

Status
mandatory

Return Value
Unsupported. Always returns high order bit to 1 with all other bits set to zero.
connUnitPortStatCountEncodingDisparityErrors (1.3.6.1.3.94.4.5.1.50)

Count of disparity errors received at this port. This is a Fibre Channel-only statistic.

**Syntax**
OCTET STRING (SIZE (8))

**Access**
read-only

**Status**
mandatory

**Return Value**
Unsupported. Always returns high order bit to 1 with all other bits set to zero.
Simple Name Server Table

The objects described in this section are in a table format indexed by World Wide Name and Index. The index represents the table index. An example of how to access one of these objects given a WWN of 100000c0dd0090a7 is:

"snmpget localhost public fcmgmt.connUnitServiceSet.connUnitServiceTables.connUnitSnsTable.connUnitSnsEntry.connUnitSnsId.16.0.0.192.221.0.144.167.0.0.0.0.0.0.0.0.1.0.0.1".

The Fibre Channel Simple Name Server table contains an entry for each device presently known to this connUnit. There will not be any version on this since FC-GS3 does not define a version today.

This table is accessed either directly if the management software has an index value or using GetNexts. The value of the indexes are not required to be contiguous. Each entry created in this table will be assigned an index. This relationship is kept persistent until the entry is removed from the table or the system is reset. The total number of entries are defined by the size of the table.

**connUnitSnsMaxEntry (1.3.6.1.3.94.5.1.1)**

The current number of entries in the table.

<table>
<thead>
<tr>
<th>Syntax</th>
<th>INTEGER</th>
</tr>
</thead>
<tbody>
<tr>
<td>MaxAccess</td>
<td>read-only</td>
</tr>
<tr>
<td>Status</td>
<td>mandatory</td>
</tr>
<tr>
<td>Return Value</td>
<td>Returns the number of entries registered in the Simple Name Server for all switches.</td>
</tr>
</tbody>
</table>
connUnitSnsId (1.3.6.1.3.94.5.2.1.1.1)

The connUnitId of the connectivity unit that contains this Name Server table.

**Syntax**

OCTET STRING (SIZE (16))

**Access**

read-only

**Status**

mandatory

**Return Value**

Returns the World Wide Name of the switch followed by 8 bytes of zeros. For example: 10 00 00 C0 DD 00 71 C9 00 00 00 00 00 00 00 00.

connUnitSnsPortIndex (1.3.6.1.3.94.5.2.1.1.2)

The physical port number of this SNS table entry. Each physical port has an SNS table with 1-n entries indexed by ConnUnitSnsPortIdentifier (port address).

**Syntax**

INTEGER

**Access**

read-only

**Status**

mandatory

**Return Value**

The name server table index.

connUnitSnsPortIdentifier (1.3.6.1.3.94.5.2.1.1.3)

The port identifier for this entry in the SNS table.

**Syntax**

FcAddressId

**Access**

read-only

**Status**

mandatory

**Return Value**

The 24-bit Fibre Channel address for each entry in the name server table based on Domain, Area, and ALPA.
connUnitSnsPortName (1.3.6.1.3.94.5.2.1.1.4)
The Port World Wide Name for this entry in the SNS table.

- **Syntax**: FcNameId
- **Access**: read-only
- **Status**: mandatory
- **Return Value**: The Port World Wide Name of the device in the name server table.

connUnitSnsNodeName (1.3.6.1.3.94.5.2.1.1.5)
The Node name for this entry in the SNS table.

- **Syntax**: FcNameId
- **Access**: read-only
- **Status**: mandatory
- **Return Value**: The Node World Wide Name of the device in the name server table.

connUnitSnsClassOfSvc (1.3.6.1.3.94.5.2.1.1.6)
The classes of service offered by this entry in the SNS table.

- **Syntax**: OCTET STRING (SIZE (1))
- **Access**: read-only
- **Status**: mandatory
- **Return Value**: A value indicating the first registered class of service for an entry in the name server table. This is a bit mask where each bit that represents the class of service is set to a value of one if the class is supported. Class 1 is bit zero.
connUnitSnsNodeIPAddress (1.3.6.1.3.94.5.2.1.1.7)

The IPv6 formatted address of the Node for this entry in the SNS table.

- **Syntax**: OCTET STRING (SIZE (16))
- **Access**: read-only
- **Status**: mandatory
- **Return Value**: The switch IP address in IPv6 format.

connUnitSnsProcAssoc (1.3.6.1.3.94.5.2.1.1.8)

The process associator for this entry in the SNS table.

- **Syntax**: OCTET STRING (SIZE (16))
- **Access**: read-only
- **Status**: mandatory
- **Return Value**: Unsupported. Always returns error status "NoSuchName".

connUnitSnsFC4Type (1.3.6.1.3.94.5.2.1.1.9)

The FC-4 types supported by this entry in the SNS table.

- **Syntax**: OCTET STRING (SIZE (32))
- **Access**: read-only
- **Status**: mandatory
- **Return Value**: A value indicating the FC-4 Types registered for the device in the name server table. This is a 32 byte field with each bit uniquely identifying the FC-4 Type registered as defined in FC-GS-3 specification. Example: SCSI FCP (bit 8) = 00 00 00 01 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00.
**connUnitSnsPortType (1.3.6.1.3.94.5.2.1.1.10)**

The port type of this entry in the SNS table.

**Syntax**

OCTET STRING (SIZE (1))

**Access**

read-only

**Status**

mandatory

**Return Value**

A value indicating the PortType for the entry in the name server table. Refer to Table 4-27 for connUnitPortType port type return values.

### Table 4-27. ConnUnitPortType State Return Values

<table>
<thead>
<tr>
<th>Port Type</th>
<th>Return Value (hexidecimal)</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>1</td>
</tr>
<tr>
<td>NL</td>
<td>2</td>
</tr>
<tr>
<td>F/NL</td>
<td>3</td>
</tr>
<tr>
<td>NX</td>
<td>7F</td>
</tr>
<tr>
<td>F</td>
<td>8</td>
</tr>
<tr>
<td>FL</td>
<td>82</td>
</tr>
<tr>
<td>E</td>
<td>84</td>
</tr>
<tr>
<td>B</td>
<td>85</td>
</tr>
</tbody>
</table>

**connUnitSnsPortIPAddress (1.3.6.1.3.94.5.2.1.1.11)**

The IPv6 formatted address of this entry in the SNS table.

**Syntax**

OCTET STRING (SIZE (16))

**Access**

read-only

**Status**

mandatory

**Return Value**

Unsupported. Always returns error status "NoSuchName".
connUnitSnsFabricPortName (1.3.6.1.3.94.5.2.1.1.12)
The fabric port name of this entry in the SNS table.

Syntax FcNameId
Access read-only
Status mandatory
Return Value The switch port Port World Wide Name for the device in the name server table.

connUnitSnsHardAddress (1.3.6.1.3.94.5.2.1.1.13)
The hard ALPA of this entry in the SNS table.

Syntax FcAddressId
Access read-only
Status mandatory
Return Value Unsupported. Always returns error status "NoSuchName".

connUnitSnsSymbolicPortName (1.3.6.1.3.94.5.2.1.1.14)
The symbolic port name of this entry in the SNS table.

Syntax DisplayString (SIZE (0..79))
Access read-only
Status mandatory
Return Value The symbolic Port Name registered by the device in the name server table. If not registered, returns (NULL).
connUnitSnsSymbolicNodeName (1.3.6.1.3.94.5.2.1.1.15)

The symbolic Node name of this entry in the SNS table.

Syntax
DisplayString (SIZE (0..79))

Access
read-only

Status
mandatory

Return Value
The symbolic Node Name registered by the device in the name server table. If not registered, returns (NULL).
Platform Table

The Platform Table is a simple, read-only view of platform registration entries. Platform registry is a service hosted by the connectivity unit, in a very similar manner as the SNS table. The platform table is contained by the connectivity unit. A platform can register its attributes and platform nodes with the registry service.

The platform table is a flat, double-indexed MIB table. To keep the table simple, only one platform management URL is exposed. If a platform registers more than one management URL, the first one is reported in this table. This table is based on the fabric configuration server defined in the FC-GS-3 standard and enhanced platform attributes proposed for FC-GS-4. Note that the information contained in this table may only contain the platforms that this connUnit can see or it may contain a fabric wide view of the platforms.

connUnitPlatformMaxEntry (1.3.6.1.3.94.5.1.2)
The maximum number of entries in the platform table.

Syntax INTEGER
Access read-only
Status mandatory
Return Value Unsupported. Always returns error status "NoSuchName"

connUnitPlatformIndex (1.3.6.1.3.94.5.2.2.1.1)
Unique table index for each platform. Valid values are between 1 and connUnitPlatformsMaxEntry.

Syntax INTEGER (1..2147483647)
Access read-only
Status mandatory
Return Value Unsupported. Always returns error status "NoSuchName"
connUnitPlatformNodeIndex (1.3.6.1.3.94.5.2.2.1.2)

Unique table index for each platform node. Valid values are between 1 and connUnitPlatformsNumNodes.

Syntax: INTEGER (1..2147483647)
Access: read-only
Status: mandatory
Return Value: Unsupported. Always returns error status "NoSuchName"

connUnitPlatformUnitID (1.3.6.1.3.94.5.2.2.1.3)

The connUnitId of the connectivity unit that contains this Platform table.

Syntax: FcGlobalId
Access: read-only
Status: mandatory
Return Value: Unsupported. Always returns error status "NoSuchName"

connUnitPlatformName (1.3.6.1.3.94.5.2.2.1.4)

The platform name. May be either a readable string or a unique ID format as specified in the FC-GS-4 draft standard.

Syntax: OCTET STRING (SIZE(79))
Access: read-only
Status: mandatory
Return Value: Unsupported. Always returns error status "NoSuchName"
**connUnitPlatformType (1.3.6.1.3.94.5.2.2.1.6)**

The platform type.

**Syntax**

FcUnitType

**Access**

read-only

**Status**

mandatory

**Return Value**

Unsupported. Always returns error status "NoSuchName"

**connUnitPlatformLabel (1.3.6.1.3.94.5.2.2.1.7)**

An administratively assigned symbolic name for the platform. The Platform Label shall only contain print-able ASCII characters.

**Syntax**

DisplayString (SIZE (0..79))

**Access**

read-only

**Status**

mandatory

**Return Value**

Unsupported. Always returns error status "NoSuchName"

**connUnitPlatformDescription (1.3.6.1.3.94.5.2.2.1.8)**

A textual description of the platform. This value should include the full name and version identification of the platform's hardware type and software operating system. The Platform Description shall only contain printable ASCII characters.

**Syntax**

DisplayString (SIZE (0..79))

**Access**

read-only

**Status**

mandatory

**Return Value**

Unsupported. Always returns error status "NoSuchName"
**connUnitPlatformLocation (1.3.6.1.3.94.5.2.2.1.9)**

The physical location of the platform (e.g., telephone closet, 3rd floor). The Platform Location shall only contain printable ASCII characters.

- **Syntax**: DisplayString (SIZE (0..79))
- **Access**: read-only
- **Status**: mandatory
- **Return Value**: Unsupported. Always returns error status "NoSuchName"

**connUnitPlatformManagementUrl (1.3.6.1.3.94.5.2.2.1.10)**

Primary management URL for the platform. If the platform registers more than one URL, then this URL is equal to the first in the list.

- **Syntax**: DisplayString (SIZE (0..79))
- **Access**: read-only
- **Status**: mandatory
- **Return Value**: Unsupported. Always returns error status "NoSuchName"

**connUnitPlatformNumNodes (1.3.6.1.3.94.5.2.2.1.11)**

Number of nodes contained in the platform.

- **Syntax**: INTEGER
- **Access**: read-only
- **Status**: mandatory
- **Return Value**: Unsupported. Always returns error status "NoSuchName"
connUnitPlatformNodeName (1.3.6.1.3.94.5.2.2.1.12)

The name (WWN - world wide name) of the node contained by the platform.

Syntax: FcGlobalId

Access: read-only

Status: read-only

Return Value: Unsupported. Always returns error status "NoSuchName"
Trap Table

Traps are asynchronous messages sent from the agent (residing on the switch) to the manager (residing on the workstation) to identify significant events.

There can be up to 5 trap addresses within the trap table. All trap information is stored within the switch and is accessible to Telnet and the SNMP agent, and is persistent between boots. An example of how to access one of these objects given an IP address of 10.32.165.4 is:

"snmpget localhost public
fcmgmt.trapReg.trapRegTable.trapRegEntry.trapRegFilter.10.32.165.4.162".

A trap event is reported when the incoming error has a severity level less than or equal to the configured severity level. The trap event types and trap severity levels are listed in Table 4-28.

Table 4-28. Trap Severity Levels

<table>
<thead>
<tr>
<th>Event Type</th>
<th>Severity Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unknown</td>
<td>1</td>
</tr>
<tr>
<td>Emergency</td>
<td>2</td>
</tr>
<tr>
<td>Alert</td>
<td>3</td>
</tr>
<tr>
<td>Critical</td>
<td>4</td>
</tr>
<tr>
<td>Error</td>
<td>5</td>
</tr>
<tr>
<td>Warning</td>
<td>6</td>
</tr>
<tr>
<td>Notify</td>
<td>7</td>
</tr>
<tr>
<td>Info</td>
<td>8</td>
</tr>
<tr>
<td>Debug</td>
<td>9</td>
</tr>
<tr>
<td>Mark</td>
<td>10</td>
</tr>
</tbody>
</table>
trapMaxClients (1.3.6.1.3.94.2.1)
The maximum number of SNMP trap recipients supported by the connectivity unit.

Syntax    INTEGER
Access      read-only
Status      mandatory
Return Value    Always returns 5.

trapClientCount (1.3.6.1.3.94.2.2)
The current number of rows in the trap table.

Syntax    INTEGER
Access      read-only
Status      mandatory
Return Value    A value (1-5) indicating number of configured trap clients.

trapRegIpAddress (1.3.6.1.3.94.2.3.1.1)
The IP address of a client registered for traps.

Syntax    IpAddress
Access      read-only
Status      mandatory
Return Value    The IP addresses (as defined in the trap table) of where to send traps when they occur.
4–Fibre Alliance MIB Objects

**trapRegPort (1.3.6.1.3.94.2.3.1.2)**

The UDP port to send traps to for this host. Normally this would be the standard trap port (162). This object is an index and must be specified to create a row in this table.

**Syntax**

INTEGER (1..2147483647)

**Access**

read-only

**Status**

mandatory

**Return Value**

The configured port number of where to send traps when they occur. The port number can be configured in the switch SNMP setup parameters. Default is 162.

---

**trapRegFilter (1.3.6.1.3.94.2.3.1.3)**

This value defines the trap severity filter for this trap host. The connUnit will send traps to this host that have a severity level less than or equal to this value. The default value of this object is “warning”.

**Syntax**

FcEventSeverity

**Access**

read-write

**Status**

mandatory

**Return Value**

A value indicating the trap severity level. Refer to Table 4-28 for trap severity levels.
trapRegRowState (1.3.6.1.3.94.2.3.1.4)

Specifies the state of the row.

- rowDestroy
  - READ: Can never happen.
  - WRITE: Remove this row from the table.

- rowInactive
  - READ: Indicates that this row does exist, but that traps are not enabled to be sent to the target.
  - WRITE: If the row does not exist, and the agent allows writes to the trap table, then a new row is created. The values of the optional columns will be set to default values. Traps are not enabled to be sent to the target. If the row already existed, then traps are disabled from being sent to the target.

- rowActive
  - READ: Indicates that this row exists, and that traps are enabled to be sent to the target.
  - WRITE: If the row does not exist, and the agent allows writes to the trap table, then a new row is created. The values of the optional columns will be set to default values. Traps are enabled to be sent to the target. If the row already exists, then traps are enabled to be sent to the target.

A value of “rowActive” or “rowInactive” must be specified to create a row in the table.

Syntax

INTEGER {
  rowDestroy(1), - Remove row from table.
  rowInactive(2), - Row exists, but traps disabled
  rowActive(3)   - Row exists and is enabled for sending traps
}

Access read-write

Status mandatory

Return Value Returns rowActive (3), if valid entry in trap table.
Related Traps

The following traps contain the trap information being sent from the agent to the manager.

connUnitStatusChange (1.3.6.1.3.94.0.1)

The overall status of the connectivity unit has changed. The recommended severity level (for filtering) is “alert”. Sent whenever a Switch.OperChange or Switch.StateChange event occurs.

Variables: { connUnitStatus, connUnitState }

connUnitDeletedTrap (1.3.6.1.3.94.0.3)

A connUnit has been deleted from this agent. The recommended severity level (for filtering) is “warning”. Sent whenever an Eport.OperChange event occurs and the connUnitTable is smaller than previously noted (A connUnit has gone away).

Variables: { connUnitId }

connUnitEventTrap (1.3.6.1.3.94.0.4)

An event has been generated by the connectivity unit. The recommended severity level (for filtering) is “info”. Sent when a change notification occurs that does not fit into any other specific category.

Variables:

{ connUnitEventId, connUnitEventType, connUnitEventObject, connUnitEventDescr }

Figure 4-1 provides the standard format of the connUnitEventDescr variable. Chassis, Blade, and Port are always 0.

---

Figure 4-1. connUnitEventDescr Variable Format
Table 4-29 lists the fields in the connUnitEventDescr variable.

**Table 4-29. connUnitEventDescr Variable Field Descriptions**

<table>
<thead>
<tr>
<th>connUnitEventDescr Variable</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tag #</td>
<td>The number that identifies the event.</td>
</tr>
<tr>
<td>Event #</td>
<td>The event counter.</td>
</tr>
<tr>
<td>Chassis</td>
<td>The switch on which the event occurred.</td>
</tr>
<tr>
<td>Blade</td>
<td>The I/O blade on which the event occurred.</td>
</tr>
<tr>
<td>Port</td>
<td>The port on which the event occurred.</td>
</tr>
<tr>
<td>TimeDate</td>
<td>The time stamp of the event.</td>
</tr>
<tr>
<td>Module</td>
<td>The software module where the event was initiated.</td>
</tr>
<tr>
<td>Addr</td>
<td>The address in the software module where the event was initiated.</td>
</tr>
<tr>
<td>Descr</td>
<td>The description of the event.</td>
</tr>
</tbody>
</table>

Table 4-30 lists the trap information returned for the connUnitEventDescr variable.

**Table 4-30. Filter Trap Levels**

<table>
<thead>
<tr>
<th>Trap Type</th>
<th>Cause</th>
<th>Filter Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>connUnitPortStatusChange</td>
<td>User port config change</td>
<td>eventSeverity_info</td>
</tr>
<tr>
<td></td>
<td>User port state change</td>
<td>eventSeverity_info</td>
</tr>
<tr>
<td></td>
<td>E_Port alarm</td>
<td>eventSeverity_critical</td>
</tr>
<tr>
<td>connUnitDeletedTrap</td>
<td>Fabric change and unit deleted</td>
<td>eventSeverity_info</td>
</tr>
<tr>
<td>connUnitStatusChange</td>
<td>Switch state change</td>
<td>eventSeverity_info</td>
</tr>
<tr>
<td></td>
<td>Switch reset</td>
<td>eventSeverity_critical</td>
</tr>
</tbody>
</table>
**connUnitSensorStatusChange (1.3.6.1.3.94.0.5)**

The overall status of the connectivity unit has changed. The recommended severity level (for filtering) is “alert”. Sent whenever any of the following notifications occur:

- Chassis.PsBadAlarm
- Chassis.PsOkAlarm
- Chassis.FanBadAlarm
- Chassis.FanOkAlarm
- Blade.OverheatAlarm
- Blade.OverwarmAlarm

Variables: { connUnitSensorStatus }

---

**Table 4-30. Filter Trap Levels (Continued)**

<table>
<thead>
<tr>
<th>Trap Type</th>
<th>Cause</th>
<th>Filter Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>connUnitSensorStatusChange</td>
<td>Power supply bad alarm</td>
<td>eventSeverity_critical</td>
</tr>
<tr>
<td></td>
<td>Power supply OK alarm</td>
<td>eventSeverity_critical</td>
</tr>
<tr>
<td></td>
<td>Fan bad alarm</td>
<td>eventSeverity_critical</td>
</tr>
<tr>
<td></td>
<td>Fan OK alarm</td>
<td>eventSeverity_critical</td>
</tr>
<tr>
<td></td>
<td>Overheat alarm</td>
<td>eventSeverity_critical</td>
</tr>
<tr>
<td></td>
<td>Overwarm alarm</td>
<td>eventSeverity_critical</td>
</tr>
<tr>
<td></td>
<td>Temperature OK alarm</td>
<td>eventSeverity_critical</td>
</tr>
<tr>
<td>connUnitEventTrap</td>
<td>SNMP config change</td>
<td>eventSeverity_info</td>
</tr>
<tr>
<td></td>
<td>Switch config change</td>
<td>eventSeverity_info</td>
</tr>
<tr>
<td></td>
<td>System config change</td>
<td>eventSeverity_info</td>
</tr>
<tr>
<td></td>
<td>Topology change</td>
<td>eventSeverity_info</td>
</tr>
<tr>
<td></td>
<td>Zoning change</td>
<td>eventSeverity_info</td>
</tr>
<tr>
<td></td>
<td>Zoning merge failure</td>
<td>eventSeverity_info</td>
</tr>
<tr>
<td></td>
<td>NameServer change</td>
<td>eventSeverity_info</td>
</tr>
<tr>
<td></td>
<td>Generic alarm</td>
<td>eventSeverity_critical</td>
</tr>
<tr>
<td></td>
<td>Generic event</td>
<td>eventSeverity_critical</td>
</tr>
</tbody>
</table>

---
connUnitPortStatusChange (1.3.6.1.3.94.0.6)

The overall status of the connectivity unit has changed. The recommended severity level (for filtering) is “alert”. Sent whenever a UserPort.StateChange or UserPort.OperChange event occurs.

Enterprise: fcmgmt
Variables: { connUnitPortStatus, connUnitPortState }

coldStart

A coldStart trap signifies that the SNMPv2 entity, acting in an agent role, is re-initializing itself and that its configuration may have been altered.

authenticationFailure

An authenticationFailure trap signifies that the SNMPv2 entity, acting in an agent role, has received a protocol message that is not properly authenticated. While all implementations of the SNMPv2 must be capable of generating this trap, the snmpEnableAuthenTraps object indicates whether this trap will be generated.
authenticationFailure
This section covers the implementation details for the Fabric Element Management Information Bases (FE-MIB) on the QLogic switch.

Fibre Channel FE MIB Definitions

The textual substitutions in Table 5-1 are specific to the FE-MIB and can be used in place of primitive data types.

Table 5-1. FA-MIB Textual Substitutions

<table>
<thead>
<tr>
<th>Description</th>
<th>Syntax</th>
</tr>
</thead>
<tbody>
<tr>
<td>MilliSeconds</td>
<td>Unsigned32</td>
</tr>
<tr>
<td>MicroSeconds</td>
<td>Unsigned32</td>
</tr>
<tr>
<td>FcNameId</td>
<td>OCTET STRING (SIZE (8))</td>
</tr>
<tr>
<td>FcAddressId</td>
<td>OCTET STRING (SIZE (3))</td>
</tr>
<tr>
<td>FcRxDataFieldSize</td>
<td>Integer32 (128..2112)</td>
</tr>
<tr>
<td>FcBbCredit</td>
<td>Integer32 (0..32767)</td>
</tr>
<tr>
<td>FcphVersion</td>
<td>Integer32 (0..255)</td>
</tr>
<tr>
<td>FcStackedConnMode</td>
<td>INTEGER { none(1), transparent(2), lockedDown(3) }</td>
</tr>
</tbody>
</table>
Table 5-1. FA-MIB Textual Substitutions

<table>
<thead>
<tr>
<th>Description</th>
<th>Syntax</th>
</tr>
</thead>
<tbody>
<tr>
<td>FcCosCap</td>
<td>BITS {</td>
</tr>
<tr>
<td></td>
<td>classF(0),</td>
</tr>
<tr>
<td></td>
<td>class1(1),</td>
</tr>
<tr>
<td></td>
<td>class2(2),</td>
</tr>
<tr>
<td></td>
<td>class3(3),</td>
</tr>
<tr>
<td></td>
<td>class4(4),</td>
</tr>
<tr>
<td></td>
<td>class5(5),</td>
</tr>
<tr>
<td></td>
<td>class6(6) }</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>FcCosCap</td>
<td>BITS {</td>
</tr>
<tr>
<td></td>
<td>classF(0),</td>
</tr>
<tr>
<td></td>
<td>class1(1),</td>
</tr>
<tr>
<td></td>
<td>class2(2),</td>
</tr>
<tr>
<td></td>
<td>class3(3),</td>
</tr>
<tr>
<td></td>
<td>class4(4),</td>
</tr>
<tr>
<td></td>
<td>class5(5),</td>
</tr>
<tr>
<td></td>
<td>class6(6) }</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>FcFeModuleCapacity</td>
<td>Unsigned32</td>
</tr>
<tr>
<td>FcFeFxPortCapacity</td>
<td>Unsigned32</td>
</tr>
<tr>
<td>FcFeModuleIndex</td>
<td>Unsigned32</td>
</tr>
<tr>
<td>FcFeFxPortIndex</td>
<td>Unsigned32</td>
</tr>
<tr>
<td>FcFeNxPortIndex</td>
<td>Integer32 (1..126)</td>
</tr>
<tr>
<td>FcBbCreditModel</td>
<td>INTEGER { regular(1), alternate (2) }</td>
</tr>
</tbody>
</table>

Configuration Group

This group consists of scalar objects and tables. It contains the configuration and service parameters of the Fabric Element and the FxPorts. The group represents a set of parameters associated with the Fabric Element or an FxPort to support its NxPorts. The objects described in this section are not in a table format. An example of how to access one of these objects is:

"snmpget localhost public fcFeFabricName.0".
**fcFeFabricName (1.3.6.1.2.1.75.1.1.1)**

The Name_Identifier of the Fabric to which this Fabric Element belongs.

- **Syntax**: FcNameId
- **Access**: read-write
- **Status**: Current
- **Return Value**: The World Wide Name of the principal switch. For example, 10 00 00 C0 DD 00 71 C2. Writes are not supported.

**fcFeElementName (1.3.6.1.2.1.75.1.1.2)**

The Name_Identifier of the Fabric Element.

- **Syntax**: FcNameId
- **Access**: read-write
- **Status**: Current
- **Return Value**: The World Wide Name of the switch. For example, 10 00 00 C0 DD 00 71 C9. Writes are not supported.

**fcFeModuleCapacity (1.3.6.1.2.1.75.1.1.3)**

The maximum number of modules in the Fabric Element, regardless of their current state.

- **Syntax**: FcFeModuleCapacity
- **Access**: read-only
- **Status**: Current
- **Return Value**: The total number of switches in the fabric if ProxyEnable setting is Enabled on the out-of-band switch. If ProxyEnable setting is disabled on the out-of-band switch, return value = 1.
Module Table

The objects described in this section are in table format indexed by switch. An example of how to access one of these objects is: "snmpget localhost public fcFeModuleDescr.1". This table contains one entry for each module.

**fcFeModuleDescr (1.3.6.1.2.1.75.1.1.4.1.2)**
A textual description of the module. This value should include the full name and version identification of the module.

**Syntax**
SnmpAdminString

**Access**
read-only

**Status**
current

**Return Value**
A configuration description of the module table entry. The defaults are: QLogic 5200 = SANbox 5200 FC Switch, QLogic 5202 = SANbox 5202 FC Switch, QLogic 5600 = SANbox 5600 FC Switch, QLogic 5602 = SANbox 5602 FC Switch

**fcFeModuleObjectID (1.3.6.1.2.1.75.1.1.4.1.3)**
The vendor's authoritative identification of the module. This value may be allocated within the SMI enterprises subtree (1.3.6.1.4.1), and provides a means for determining what kind of module is being managed.

For example, this object could take the value 1.3.6.1.4.1.99649.3.9 if vendor "Neufe Inc." was assigned the subtree 1.3.6.1.4.1.99649, and had assigned the identifier 1.3.6.1.4.1.99649.3.9 to its FeFiFo-16 PlugInCard.

**Syntax**
OBJECT IDENTIFIER

**Access**
read-only

**Status**
current

**Return Value**
The module identification numbers are: QLogic 5200 = 1.3.6.1.4.1.1663.1.1.1.1.1.17, QLogic 5202 = 1.3.6.1.4.1.1663.1.1.1.1.30, QLogic 5600 = 1.3.6.1.4.1.1663.1.1.1.1.23, QLogic 5602 = 1.3.6.1.4.1.1663.1.1.1.1.24
Switch definitions map 1-to-1 with the MIB definitions. This object indicates the operational status of the module.

- online (1) - the module is functioning properly
- offline (2) - the module is not available
- testing (3) - the module is under testing
- faulty (4) - the module is defective in some way

**Syntax**

```
INTEGER {
    online(1), - functional
    offline(2), - not available
    testing(3), - under testing
    faulty(4) - defective
}
```

**Access**

read-only

**Status**

Current

**Return Value**

The operational status of that module.

### Table 5-2. Module Operational Status Return Values

<table>
<thead>
<tr>
<th>Mode</th>
<th>Return Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>online</td>
<td>online(1)</td>
</tr>
<tr>
<td>offline</td>
<td>offline(2)</td>
</tr>
<tr>
<td>diagnostics</td>
<td>testing(3)</td>
</tr>
<tr>
<td>other</td>
<td>faulty(4)</td>
</tr>
</tbody>
</table>
fcFeModuleLastChange (1.3.6.1.2.1.75.1.1.4.1.5)

This object contains the value of sysUpTime when the module entered its current operational status. A value of zero indicates that the operational status of the module has not changed since the agent last restarted.

Syntax
TimeStamp

Access
read-only

Status
Current

Return Value
Unsupported. Always returns error status "NoSuchName".

fcFeModuleFxPortCapacity (1.3.6.1.2.1.75.1.1.4.1.6)

The number of FxPort that can be contained within the module. Within each module, the ports are uniquely numbered in the range from 1 to fcFeModuleFxPortCapacity inclusive. However, the numbers are not required to be contiguous.

Syntax
FcFeFxPortCapacity

Access
read-only

Status
current

Return Value
The total number of ports capability on the switch. QLogic 5200/5600 Series = 1 - 8, 12, 16, 20 (varies depending on number of licensed ports)

fcFeModuleName (1.3.6.1.2.1.75.1.1.4.1.7)

The Name_Identifier of the switch.

Syntax
FcNameld

Access
read-write

Status
current

Return Value
The World Wide Name of the switch. Writes are not supported. For example, 10 00 00 C0 DD 00 71 C9.
FxPort Configuration Table

The objects described in this section are in table format indexed by switch index and port index. An example of how to access one of these objects is: snmpget localhost public fcFxPortName.1.1. This table contains one entry for each FxPort and Configuration parameters of the ports. This table contains, one entry for each FxPort, configuration parameters of the ports.

fcFxPortName (1.3.6.1.2.1.75.1.1.5.1.2)

The World Wide Name of this FxPort. Each FxPort has a unique Port World Wide Name within the Fabric.

Syntax
FcNameId

Access
read-only

Status
current

Return Value
Returns the Port World Wide Name for each port on switch. For example, the return value for port #2 would be 20 02 00 C0 DD 00 71 C9, and the return value for port #14 would be 20 0E 00 C0 DD 00 71 C9.

fcFxPortFcpVersionHigh (1.3.6.1.2.1.75.1.1.5.1.3)

The highest or most recent version of FC-PH that the FxPort is configured to support.

Syntax
FcphVersion

Access
read-only

Status
Current

Return Value
Always returns 32 (0x20).
**fcFxPortFcphVersionLow (1.3.6.1.2.1.75.1.1.5.1.4)**

The lowest or earliest version of FC-PH that the FxPort is configured to support.

**Syntax**  
FcphVersion

**Access**  
read-only

**Status**  
current

**Return Value**  
Always returns 9.

**fcFxPortBbCredit (1.3.6.1.2.1.75.1.1.5.1.5)**

The total number of receive buffers available for holding Class 1 connect-request, Class 2, or Class3 frames from the attached NxPort. It is for buffer-to-buffer flow control in the direction from the attached NxPort (if applicable) to FxPort.

**Syntax**  
FcBbCredit

**Access**  
read-only

**Status**  
current

**Return Value**  
The default number of receive buffers for each port, unless extended credits are used. QLogic 5200/5600 Series = 16

**fcFxPortRxBufSize (1.3.6.1.2.1.75.1.1.5.1.6)**

The largest Data_Field Size (in octets) for an FT_1 frame that can be received by the FxPort.

**Syntax**  
FcRxDataFieldSize

**Access**  
read-only

**Status**  
current

**Return Value**  
Always returns 2112 (0x840).
**fcFxPortRatov (1.3.6.1.2.1.75.1.1.5.1.7)**

The Resource_Allocation_Timeout Value configured for the FxPort. This is used as the timeout value for determining when to reuse an NxPort resource such as a Recovery_Qualifier. It represents E_D_TOV plus twice the maximum time that a frame may be delayed within the fabric and still be delivered. Refer to “fcFxPortEdtov (1.3.6.1.2.1.75.1.1.5.1.8)” on page 5-9 for more information.

**Syntax**
MilliSeconds

**Access**
read-only

**Status**
Current

**Return Value**
The default is: 10000 (0x2710).

**fcFxPortEdtov (1.3.6.1.2.1.75.1.1.5.1.8)**

The E_D_TOV value configured for the FxPort. The Error_Detect_Timeout Value is used as the timeout value for detecting an error condition.

**Syntax**
MilliSeconds

**Access**
read-only

**Status**
current

**Return Value**
The default is: 2000 (0x7D0).

**fcFxPortCosSupported (1.3.6.1.2.1.75.1.1.5.1.9)**

A value indicating the set of classes of service supported by the FxPort.

**Syntax**
FcCosCap

**Access**
read-only

**Status**
Current

**Return Value**
Always returns Class 3, 2, and F (0x0D).
fcFxPortIntermixSupported (1.3.6.1.2.1.75.1.1.5.1.10)
A flag indicating whether or not the FxPort supports an Intermixed Dedicated Connection.

Syntax   TruthValue
Access    read-only
Status    current
Return Value Always returns False (2).

fcFxPortStackedConnMode (1.3.6.1.2.1.75.1.1.5.1.11)
A value indicating the mode of Stacked Connect supported by the FxPort.

Syntax   FcStackedConnMode
Access    read-only
Status    current
Return Value Always returns None (1).

fcFxPortClass2SeqDeliv (1.3.6.1.2.1.75.1.1.5.1.12)
A flag indicating whether or not Class 2 Sequential Delivery is supported by the FxPort.

Syntax   TruthValue
Access    read-only
Status    current
Return Value Always returns True (1).
fcFxPortClass3SeqDeliv (1.3.6.1.2.1.75.1.1.5.1.13)
A flag indicating whether or not Class 3 Sequential Delivery is supported by the FxPort.

Syntax TruthValue
Access read-only
Status current
Return Value Always returns True (1).

fcFxPortHoldTime (1.3.6.1.2.1.75.1.1.5.1.14)
The maximum time, in microseconds, that the FxPort shall hold a frame before discarding the frame if it is unable to deliver the frame. The value 0 means that the FxPort does not support this parameter.

Syntax MicroSeconds
Access read-only
Status current
Return Value The default ED_TOV parameter is: 2000 (0x7D0).

The Status Group
The objects described in this section are in table format indexed by switch index and port index. An example of how to access one of these objects is: "snmpget localhost public fcFxPortId.1.1". This group consists of tables that contain operational status and established service parameters for the Fabric Element and the attached NxPorts.

This group consists of tables that contains operational status and established service parameters for the Fabric Element and the attached NxPorts. This table contains one entry for each FxPort, and the operational status and parameters of the FxPorts.
fcFxPortID (1.3.6.1.2.1.75.1.2.1.1.1)
The address identifier by which this FxPort is identified within the fabric. The FxPort may assign its address identifier to its attached NxPort(s) during Fabric Login.

Syntax
FcAddressId

Access
read-only

Status
current

Return Value
The address of each port based on Domain, Area, and ALPA. Example, 64 03 00.

fcFxPortBbCreditAvailable (1.3.6.1.2.1.75.1.2.1.1.2)
The number of buffers currently available for receiving frames from the attached port in the buffer-to-buffer flow control. The value should be less than or equal to fcFxPortBbCredit.

Syntax
Gauge32

Access
read-only

Status
Current

Return Value
Unsupported. Always returns error status "NoSuchName".

fcFxPortOperMode (1.3.6.1.2.1.75.1.2.1.1.3)
The current operational mode of the FxPort.

Syntax
INTEGER { unknown(1), fPort(2), flPort(3) }

Access
read-only

Status
current

Return Value
Refer to Table 5-3 for fcFxPortOperMode return values.
fcFxPortAdminMode (1.3.6.1.2.1.75.1.2.1.1.4)

The desired operational mode of the FxPort.

**Syntax**

INTEGER { fPort(2), flPort(3) }

**Access**

read-write

**Status**

Current

**Return Value**

Unsupported. Always returns error status 'NoSuchName'.

### Table 5-3. Port Operational Modes

<table>
<thead>
<tr>
<th>Mode</th>
<th>Return Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unknown</td>
<td>1</td>
</tr>
<tr>
<td>F_Port</td>
<td>2</td>
</tr>
<tr>
<td>FL_Port</td>
<td>3</td>
</tr>
</tbody>
</table>
FxPort Physical Level Table

The objects described in this section are in table format indexed by switch index and port index. An example of how to access one of these objects is: "snmpget localhost public fcFxPortPhysAdminStatus.1.1". This table contains one entry for each FxPort in the Fabric Element, the physical level status, and parameters of the FxPorts.

This table contains one entry for each FxPort in the Fabric Element, and the physical level status and parameters of the FxPorts.

fcFxPortPhysAdminStatus (1.3.6.1.2.1.75.1.2.2.1.1)

The desired state of the FxPort. A management station may place the FxPort in a desired state by setting this object accordingly. The testing(3) state indicates that no operational frames can be passed. When a Fabric Element initializes, all FxPorts start with fcFxPortPhysAdminStatus in the offline(2) state. As the result of either explicit management action or per configuration information accessible by the Fabric Element, fcFxPortPhysAdminStatus is then changed to either the online(1) or testing(3) states, or remains in the offline state.

Syntax

| INTEGER {       |
| online(1), - place port online |
| offline(2), - take port offline |
| testing(3) - initiate test procedures |
|

Access  
read-write

Status  
current

Return Value  
Refer to Table 5-4 for fcFxPortPhysAdminStatus read values.

Table 5-4. fcFxPortPhysAdminStatus Read Return Values

<table>
<thead>
<tr>
<th>Port</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Online</td>
<td>online (1)</td>
</tr>
<tr>
<td>Offline</td>
<td>offline (2)</td>
</tr>
<tr>
<td>Diagnostics</td>
<td>testing (3)</td>
</tr>
<tr>
<td>Down</td>
<td>offline (2)</td>
</tr>
</tbody>
</table>

Refer to Table 5-5 for fcFxPortPhysAdminStatus write values.
The current operational status of the FxPort. The testing(3) indicates that no operational frames can be passed. If fcFxPortPhysAdminStatus is offline(2), then fcFxPortPhysOperStatus should be offline(2). If fcFxPortPhysAdminStatus is changed to online(1), then fcFxPortPhysOperStatus should change to online(1). If the FxPort is ready to accept Fabric Login request from the attached NxPort, it should proceed and remain in the link-failure(4) state if, and only if, there is a fault that prevents it from going to the online(1) state.

Syntax

```
INTEGER {
  online(1), - Login may proceed
  offline(2), - Login cannot proceed
  testing(3), - port is under test
  linkFailure(4) - failure after online/testing
}
```

Access  
read-only

Status  
current

Return Value  
Refer to Table 5-6 for fcFxPortPhysOperStatus return values.

### Table 5-5. fcFxPortPhysAdminStatus Write Values

<table>
<thead>
<tr>
<th>Port</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Online</td>
<td>online (1)</td>
</tr>
<tr>
<td>Offline</td>
<td>offline (2)</td>
</tr>
<tr>
<td>Diagnostics</td>
<td>testing (3)</td>
</tr>
</tbody>
</table>

### Table 5-6. fcFxPortPhysOperStatus Return Values

<table>
<thead>
<tr>
<th>Status</th>
<th>Return Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Online</td>
<td>online (1)</td>
</tr>
<tr>
<td>Offline</td>
<td>offline (2)</td>
</tr>
<tr>
<td>Diagnostic</td>
<td>testing (3)</td>
</tr>
<tr>
<td>Down</td>
<td>linkfailure (4)</td>
</tr>
</tbody>
</table>
fcFxPortPhysLastChange (1.3.6.1.2.1.75.1.2.2.1.3)

The value of sysUpTime at the time the FxPort entered its current operational status. A value of zero indicates that the FxPort's operational status has not changed since the agent last restarted.

**Syntax**
TimeStamp

**Access**
read-only

**Status**
current

**Return Value**
Unsupported. Always returns error status "NoSuchName".

fcFxPortPhysRttov (1.3.6.1.2.1.75.1.2.2.1.4)

The Receiver_Transmitter_Timeout value of the FxPort. This is used by the receiver logic to detect a loss of synchronization.

**Syntax**
Milliseconds

**Access**
read-write

**Status**
current

**Return Value**
The default RT_TOV parameter is: 100 (0x64). This is a global setting for the switch. If writing value to a port, all ports will reflect this new value.

Fx Port Fabric Login Table

The objects described in this section are in table format indexed by switch index and port index. An example of how to access one of these objects is: "snmpget localhost public fcFxPortFcphVersionAgreed.1.1". This table contains one entry for each FxPort in the fabric element and the service parameters that have been established from the most recent Fabric Login (implicit or explicit).

This table contains one entry for each FxPort in the fabric element, and the service parameters that have been established from the most recent Fabric Login, implicit or explicit.
fcFxPortFcphVersionAgreed (1.3.6.1.2.1.75.1.2.3.1.2)

The version of FC-PH that the FxPort has agreed to support from the Fabric Login.

Syntax: FcphVersion
Access: read-only
Status: current
Return Value: Unsupported.

fcFxPortNxPortBbCredit (1.3.6.1.2.1.75.1.2.3.1.3)

The total number of buffers available for holding class 1 connect-request, class 2, or class 3 frames to be transmitted to the attached NxPort. It is for buffer-to-buffer flow control in the direction from FxPort to NxPort. The buffer-to-buffer flow control mechanism is indicated in the respective fcFxPortBbCreditModel.

Syntax: FcBbCredit
Access: read-only
Status: current
Return Value: Unsupported.

fcFxPortNxPortRxDataFieldSize (1.3.6.1.2.1.75.1.2.3.1.4)

The Receive Data Field Size of the attached NxPort. This object specifies the largest Data Field Size for an FT_1 frame that can be received by the NxPort.

Syntax: FcRxDataFieldSize
Access: read-only
Status: current
Return Value: Unsupported.
fcFxPortCosSuppAgreed (1.3.6.1.2.1.75.1.2.3.1.5)
A variable indicating that the attached NxPort has requested the FxPort for the support of classes of services and the FxPort has granted the request.

Syntax FcCosCap
Access read-only
Status current
Return Value The bits have the following bit-mapped definition:

- Bit 7 Class-six
- Bit 6 Class-five
- Bit 5 Class-four
- Bit 4 Class-three
- Bit 3 Class-two
- Bit 2 Class-one
- Bit 1 Class F

For example: If Class 3, return value 0x10.

fcFxPortIntermixSuppAgreed (1.3.6.1.2.1.75.1.2.3.1.6)
A variable indicating that the attached NxPort has requested the FxPort for the support of Intermix and the FxPort has granted the request. This flag is only valid if Class 1 service is supported.

Syntax TruthValue
Access read-only
Status current
Return Value Always returns false (2).
fcFxPortStackedConnModeAgreed (1.3.6.1.2.1.75.1.2.3.1.7)
A variable indicating whether the FxPort has agreed to support stacked connect from the Fabric Login. This is only meaningful if the ports are using Class 1 service.

Syntax FcStackedConnMode
Access read-only
Status current
Return Value Always returns none (1).

fcFxPortClass2SeqDelivAgreed (1.3.6.1.2.1.75.1.2.3.1.8)
A variable indicating whether the FxPort has agreed to support Class 2 sequential delivery from the Fabric Login. This is only meaningful if the ports are using Class 2 service.

Syntax TruthValue
Access read-only
Status Current
Return Value Always returns true (1).

fcFxPortClass3SeqDelivAgreed (1.3.6.1.2.1.75.1.2.3.1.9)
A flag indicating whether the FxPort has agreed to support Class 3 sequential delivery from the Fabric Login. This is only meaningful if the ports are using Class 3 service.

Syntax TruthValue
Access read-only
Status current
Return Value Always returns true (1).
### fcFxPortNxPortName (1.3.6.1.2.1.75.1.2.3.1.10)

The port name of the attached NxPort.

**Syntax**  
FcNameId

**Access**  
read-only

**Status**  
Current

**Return Value**  
Returns the Switch Port's Port World Wide Name for the attached device.

### fcFxPortConnectedNxPort (1.3.6.1.2.1.75.1.2.3.1.11)

The address identifier of the destination NxPort with which this FxPort is currently engaged in a either a Class 1 or loop connection. If this FxPort is not engaged in a connection, then the value of this object is “000000”H.

**Syntax**  
FcAddressId

**Access**  
read-only

**Status**  
Current

**Return Value**  
Unsupported.

### fcFxPortBbCreditModel (1.3.6.1.2.1.75.1.2.3.1.12)

This object identifies the BB_Credit model used by the FxPort.

**Syntax**  
FcBbCreditModel

**Access**  
read-write

**Status**  
current

**Return Value**  
Returns alternate (2). Writes not supported.
The Error Group

The objects described in this section are in table format indexed by switch index and port index. An example of how to access one of these objects is: "snmpget localhost public fcFxPortLinkFailures.1.1". This group consists of tables that contain information about the various types of errors detected. The management station may use the information in this group to determine the quality of the link between the FxPort and its attached NxPort.

The FxPort Error table contains, one entry for each FxPort in the Fabric Element, counters recording numbers of errors detected since the management agent re-initialized. The first 6 columnar objects after the port index corresponds to the counters in the Link Error Status Block.

**fcFxPortLinkFailures (1.3.6.1.2.1.75.1.3.1.1.1)**

The number of link failures detected by this FxPort.

**Syntax**  
Counter32

**Access**  
read-only

**Status**  
current

**Return Value**  
The total number of LinkFailures encountered for a port.

**fcFxPortSyncLosses (1.3.6.1.2.1.75.1.3.1.1.2)**

The number of loss of synchronizations detected by the FxPort.

**Syntax**  
Counter32

**Access**  
read-only

**Status**  
current

**Return Value**  
The total number of LossOfSyncs encountered for a port.
fcFxPortSigLosses (1.3.6.1.2.1.75.1.3.1.1.3)
The number of loss of signals detected by the FxPort.

Syntax       Counter32
Access       read-only
Status       current
Return Value Unsupported. Always returns error status "NoSuchName".

fcFxPortPrimSeqProtoErrors (1.3.6.1.2.1.75.1.3.1.1.4)
The number of primitive sequence protocol errors detected by the FxPort.

Syntax       Counter32
Access       read-only
Status       current
Return Value The total number of PrimSeqErrors encountered for a port.

fcFxPortInvalidTxWords (1.3.6.1.2.1.75.1.3.1.1.5)
The number of invalid transmission words detected by the FxPort.

Syntax       Counter32
Access       read-only
Status       current
Return Value The total number of DecodeErrors encountered for a port.
fcFxPortInvalidCrcs (1.3.6.1.2.1.75.1.3.1.1.6)
The number of invalid CRCs detected by this FxPort.

**Syntax**
Counter32

**Access**
read-only

**Status**
current

**Return Value**
The total number of InvalidCRCs encountered for a port.

fcFxPortDelimiterErrors (1.3.6.1.2.1.75.1.3.1.1.7)
The number of Delimiter Errors detected by this FxPort.

**Syntax**
Counter32

**Access**
read-only

**Status**
current

**Return Value**
Unsupported. Always returns error status "NoSuchName".

fcFxPortAddressIdErrors (1.3.6.1.2.1.75.1.3.1.1.8)
The number of address identifier errors detected by this FxPort.

**Syntax**
Counter32

**Access**
read-only

**Status**
current

**Return Value**
The total number of InvDestAddrs encountered for a port.
fcFxPortLinkResetIns (1.3.6.1.2.1.75.1.3.1.1.9)
The number of Link Reset Protocols received by this FxPort from the attached NxPort.

Syntax          Counter32
Access          read-only
Status          current
Return Value    The total number of RxLinkResets received by a port.

fcFxPortLinkResetOuts (1.3.6.1.2.1.75.1.3.1.1.10)
The number of Link Reset Protocols issued by this FxPort to the attached NxPort.

Syntax          Counter32
Access          read-only
Status          current
Return Value    The total number of TxLinkResets sent by a port.

fcFxPortOlsIns (1.3.6.1.2.1.75.1.3.1.1.11)
The number of Offline Sequences received by this FxPort.

Syntax          Counter32
Access          read-only
Status          current
Return Value    The total number of RxOfflineSeqs received by a port.
fcFxPortOlsOuts (1.3.6.1.2.1.75.1.3.1.1.12)

The number of Offline Sequences issued by this FxPort.

**Syntax**
Counter32

**Access**
read-only

**Status**
current

**Return Value**
The total number of TxOfflineSeqs sent by a port.

### Accounting Groups

Each group consists of a table that contains accounting information for the FxPorts in the Fabric Element: Class 1 Accounting Group, Class 2 Accounting Group, and Class 3 Accounting Group.

### Class 1 Accounting Table

The objects described in this section are in table format indexed by switch index and port index. An example of how to access one of these objects is: "snmpget localhost public fcFxPortC1InFrames.1.1". This table contains one entry for each FxPort in the Fabric Element and Counter32s for certain types of events that have occurred in the FxPorts since the management agent was re-initialized.

fcFxPortC1InFrames (1.3.6.1.2.1.75.1.4.1.1.1)

The number of Class 1 frames (other than Class 1 connect-request) received by this FxPort from its attached NxPort.

**Syntax**
Counter32

**Access**
read-only

**Status**
current

**Return Value**
Unsupported. Always returns error status "NoSuchName".
fcFxPortC1OutFrames (1.3.6.1.2.1.75.1.4.1.1.2)
The number of Class 1 frames (other than Class 1 connect-request) delivered through this FxPort to its attached NxPort.

Syntax: Counter32
Access: read-only
Status: current
Return Value: Unsupported. Always returns error status "NoSuchName".

fcFxPortC1InOctets (1.3.6.1.2.1.75.1.4.1.1.3)
The number of Class 1 frame octets, including the frame delimiters, received by this FxPort from its attached NxPort.

Syntax: Counter32
Access: read-only
Status: current
Return Value: Unsupported. Always returns error status "NoSuchName".

fcFxPortC1OutOctets (1.3.6.1.2.1.75.1.4.1.1.4)
The number of Class 1 frame octets, including the frame delimiters, delivered through this FxPort its attached NxPort.

Syntax: Counter32
Access: read-only
Status: current
Return Value: Unsupported. Always returns error status "NoSuchName".
fcFxPortC1Discards (1.3.6.1.2.1.75.1.4.1.1.5)  
The number of Class 1 frames discarded by this FxPort.

Syntax          Counter32  
Access          read-only  
Status          current  
Return Value    Unsupported. Always returns error status "NoSuchName".

fcFxPortC1FbsyFrames (1.3.6.1.2.1.75.1.4.1.1.6)  
The number of F_BSY frames generated by this FxPort against Class 1 connect-request.

Syntax          Counter32  
Access          read-only  
Status          current  
Return Value    Unsupported. Always returns error status "NoSuchName".

fcFxPortC1FrjtFrames (1.3.6.1.2.1.75.1.4.1.1.7)  
The number of F_RJT frames generated by this FxPort against Class 1 connect-request.

Syntax          Counter32  
Access          read-only  
Status          current  
Return Value    Unsupported. Always returns error status "NoSuchName".
fcFxPortC1InConnections (1.3.6.1.2.1.75.1.4.1.1.8)

The number of Class 1 connections successfully established in which the attached NxPort is the source of the connect-request.

**Syntax**
Counter32

**Access**
read-only

**Status**
current

**Return Value**
Unsupported. Always returns error status "NoSuchName".

fcFxPortC1OutConnections (1.3.6.1.2.1.75.1.4.1.1.9)

The number of Class 1 connections successfully established in which the attached NxPort is the destination of the connect-request.

**Syntax**
Counter32

**Access**
read-only

**Status**
current

**Return Value**
Unsupported. Always returns error status "NoSuchName".

fcFxPortC1ConnTime (1.3.6.1.2.1.75.1.4.1.1.10)

The cumulative time that this FxPort has been engaged in Class 1 connection. The amount of time is counted from after a connect-request has been accepted until the connection is disengaged, either by an EOFdt or Link Reset.

**Syntax**
Milliseconds

**Access**
read-only

**Status**
current

**Return Value**
Unsupported. Always returns error status "NoSuchName".
Class 2 Accounting Table

The objects described in this section are in table format indexed by switch index and port index. An example of how to access one of these objects is: "snmpget localhost public fcFxPortC2InFrames.1.1". This table contains one entry for each FxPort in the Fabric Element and Counter32s for certain types of events that have occurred in the FxPorts since the management agent was re-initialized.

fcFxPortC2InFrames (1.3.6.1.2.1.75.1.4.2.1.1)
The number of Class 2 frames received by this FxPort from its attached NxPort.

Syntax: Counter32
Access: read-only
Status: current
Return Value: The total number of Class2FramesIn received by a port.

fcFxPortC2OutFrames (1.3.6.1.2.1.75.1.4.2.1.2)
The number of Class 2 frames delivered through this FxPort to its attached NxPort.

Syntax: Counter32
Access: read-only
Status: current
Return Value: The total number of Class2FramesOut sent by a port.
fcFxPortC2InOctets (1.3.6.1.2.1.75.1.4.2.1.3)
The number of Class 2 frame octets, including the frame delimiters, received by this FxPort from its attached NxPort.

Syntax   Counter32
Access    read-only
Status    current
Return Value  The total number of Class2WordsIn received by a port.

fcFxPortC2OutOctets (1.3.6.1.2.1.75.1.4.2.1.4)
The number of Class 2 frame octets, including the frame delimiters, delivered through this FxPort to its attached NxPort.

Syntax   Counter32
Access    read-only
Status    current
Return Value  The total number of Class2WordsOut sent by a port.

fcFxPortC2Discards (1.3.6.1.2.1.75.1.4.2.1.5)
The number of Class 2 frames discarded by this FxPort.

Syntax   Counter32
Access    read-only
Status    current
Return Value  The total number of Class2Toss discarded by a port.
fcFxPortC2FbsyFrames (1.3.6.1.2.1.75.1.4.2.1.6)
The number of F_BSY frames generated by this FxPort.

Syntax: Counter32
Access: read-only
Status: current
Return Value: The total number of FBUsy frames generated by this port for Class 2 and 3 frames.

fcFxPortC2FrjtFrames (1.3.6.1.2.1.75.1.4.2.1.7)
The number of F_RJT frames generated by this FxPort against Class 2 frames.

Syntax: Counter32
Access: read-only
Status: current
Return Value: The total number of FReject frames generated by this port for Class 2 and 3 frames.

Class 3 Accounting Table
The objects described in this section are in table format indexed by switch index and port index. An example of how to access one of these objects is: "snmpget localhost public fcFxPortC3InFrames.1.1". This table contains one entry for each FxPort in the Fabric Element and Counter32s for certain types of events that have occurred in the FxPorts since the management agent has re-initialized.

fcFxPortC3InFrames (1.3.6.1.2.1.75.1.4.3.1.1)
The number of Class 3 frames received by this FxPort from its attached NxPort.

Syntax: Counter32
Access: read-only
Status: current
Return Value: The total number of Class3FramesIn received by a port.
5–Fabric Element MIB Objects
fcFxPortC3OutFrames (1.3.6.1.2.1.75.1.4.3.1.2)

The number of Class 3 frames delivered through this FxPort to its attached NxPort.

Syntax Counter32
Access read-only
Status current

Return Value The total number of Class3FramesOut sent by a port.

fcFxPortC3InOctets (1.3.6.1.2.1.75.1.4.3.1.3)

The number of Class 3 frame octets, including the frame delimiters, received by this FxPort from its attached NxPort.

Syntax Counter32
Access read-only
Status current

Return Value The total number of Class3WordsOut received by a port.

fcFxPortC3OutOctets (1.3.6.1.2.1.75.1.4.3.1.4)

The number of Class 3 frame octets, including the frame delimiters, delivered through this FxPort to its attached NxPort.

Syntax Counter32
Access read-only
Status current

Return Value The total number of Class3WordsOut sent by a port.
fcFxPortC3Discards (1.3.6.1.2.1.75.1.4.3.1.5)

The number of Class 3 frames discarded by this FxPort.

Syntax        Counter32
Access         read-only
Status         current
Return Value   The total number of Class3Toss discarded by a port.

Capability Group

The objects described in this section are in table format indexed by switch index and port index. An example of how to access one of these objects is: "snmpget localhost public fcFxPortName.1.1". The Capability Group consists of a table describing information about what each FxPort is inherently capable of operating or supporting. A capability may be used as expressed in its respective object value in the Configuration group.

fcFxPortCapFcphVersionHigh (1.3.6.1.2.1.75.1.5.1.1.1)

The highest or most recent version of FC-PH that the FxPort is capable of supporting.

Syntax        FcpvVersion
Access         read-only
Status         current
Return Value   Always returns 32 (0x20).

fcFxPortCapFcphVersionLow (1.3.6.1.2.1.75.1.5.1.1.2)

The lowest or earliest version of FC-PH that the FxPort is capable of supporting.

Syntax        FcpvVersion
Access         read-only
Status         current
Return Value   Always returns 9.
fcFxPortCapBbCreditMax (1.3.6.1.2.1.75.1.5.1.1.3)
The maximum number of receive buffers available for holding Class 1 connect-request, Class 2, or Class 3 frames from the attached NxPort.

Syntax: FcBbCredit
Access: read-only
Status: current
Return Value: The default is: 255 (0xFF).

fcFxPortCapBbCreditMin (1.3.6.1.2.1.75.1.5.1.1.4)
The minimum number of receive buffers available for holding Class 1 connect-request, Class 2, or Class 3 frames from the attached NxPort.

Syntax: FcBbCredit
Access: read-only
Status: current
Return Value: The default is: 0 (0x00).

fcFxPortCapRxDataFieldSizeMax (1.3.6.1.2.1.75.1.5.1.1.5)
The maximum size in bytes of the Data Field in a frame that the FxPort is capable of receiving from its attached NxPort.

Syntax: FcRxDataFieldSize
Access: read-only
Status: current
Return Value: 2112 (0x840).
fcFxPortCapRxDataFieldSizeMin (1.3.6.1.2.1.75.1.5.1.1.6)

The minimum size in bytes of the Data Field in a frame that the FxPort is capable of receiving from its attached NxPort.

Syntax
FcRxDataFieldSize

Access
read-only

Status
current

Return Value
128 (0x80).

fcFxPortCapCos (1.3.6.1.2.1.75.1.5.1.1.7)

A value indicating the set of classes of service that the FxPort is capable of supporting.

Syntax
FcCosCap

Access
read-only

Status
current

Return Value
Always returns Class F, 2, and 3 (0x0d).

fcFxPortCapIntermix (1.3.6.1.2.1.75.1.5.1.1.8)

A flag indicating whether or not the FxPort is capable of supporting the intermixing of Class 2 and Class 3 frames during a Class 1 connection. This flag is only valid if the port is capable of supporting Class 1 service.

Syntax
TruthValue

Access
read-only

Status
current

Return Value
Always returns False (2).
**fcFxPortCapStackedConnMode (1.3.6.1.2.1.75.1.5.1.1.9)**

A value indicating the mode of Stacked Connect request that the FxPort is capable of supporting.

- **Syntax**: FcStackedConnMode
- **Access**: read-only
- **Status**: current
- **Return Value**: Always returns None (1).

**fcFxPortCapClass2SeqDeliv (1.3.6.1.2.1.75.1.5.1.1.10)**

A flag indicating whether or not the FxPort is capable of supporting Class 2 Sequential Delivery.

- **Syntax**: TruthValue
- **Access**: read-only
- **Status**: current
- **Return Value**: Always returns true (1).

**fcFxPortCapClass3SeqDeliv (1.3.6.1.2.1.75.1.5.1.1.11)**

A flag indicating whether or not the FxPort is capable of supporting Class 3 Sequential Delivery.

- **Syntax**: TruthValue
- **Access**: read-only
- **Status**: current
- **Return Value**: Always returns true (1).
fcFxPortCapHoldTimeMaxv (1.3.6.1.2.1.75.1.5.1.1.12)

The maximum holding time that the FxPort is capable of supporting, in microseconds.

**Syntax**
MicroSeconds

**Access**
read-only

**Status**
current

**Return Value**
20000 (0x4E20)

fcFxPortCapHoldTimeMin (1.3.6.1.2.1.75.1.5.1.1.13)

The minimum holding time that the FxPort is capable of supporting, in microseconds.

**Syntax**
MicroSeconds

**Access**
read-only

**Status**
current

**Return Value**
10 (0x0A)
5–Fabric Element MIB Objects
fcFxPortCapHoldTimeMin (1.3.6.1.2.1.75.1.5.1.1.13)
QLOGIC MIB Objects

This section covers the implementation details for the QLogic Management Information Bases (QLOGIC-MIB) on the QLogic switch.

QLOGIC MIB Definitions

This MIB replaces the fcFxPortPhysTable module defined in FIBRE-CHANNEL-FE-MIB, and defines volatile control objects for ports in a QLogic switch. If the switch gets reset, these values revert back to the default values in the configuration file.

fcQxPortPhysAdminStatus (1.3.6.1.4.1.1663.1.3.10.1.1.3)

The desired state of the FxPort. A management station may place the FxPort in a desired state by setting this object accordingly. The testing(3) state indicates that no operational frames can be passed. When a Fabric Element initializes, all FxPorts start with fcQxPortPhysAdminStatus in the offline(2) state. As the result of either explicit management action or per configuration information accessible by the Fabric Element, fcQxPortPhysAdminStatus is then changed to either the online(1) or testing(3) states, or remains in the offline state.

Syntax: INTEGER {
  online(1), - place port online
  offline(2), - take port offline
  testing(3) - initiate test procedures
}

Access: read-write

Status: current

Return Value: Refer to Table 6-1 for fcQxPortPhysAdminStatus read values.
fcQxPortPhysOperStatus (1.3.6.1.4.1.1663.1.3.10.1.1.4)

The current operational status of the FxPort. The testing(3) indicates that no operational frames can be passed. If fcQxPortPhysAdminStatus is offline(2), then fcQxPortPhysOperStatus should be offline(2). If fcQxPortPhysAdminStatus is changed to online(1), then fcQxPortPhysOperStatus should change to online(1). If the FxPort is ready to accept Fabric Login request from the attached NxPort, it should proceed and remain in the link-failure(4) state if, and only if, there is a fault that prevents it from going to the online(1) state.

Syntax

```plaintext
INTEGER {
    online(1), - Login may proceed
    offline(2), - Login cannot proceed
    testing(3), - port is under test
    linkFailure(4) - failure after online/testing
}
```

Access

read-only

Status

current

Return Value

Refer to Table 6-3 for fcQxPortPhysOperStatus return values.
Table 6-3. fcFxPortPhysOperStatus Return Values

<table>
<thead>
<tr>
<th>Status</th>
<th>Return Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Online</td>
<td>online (1)</td>
</tr>
<tr>
<td>Offline</td>
<td>offline (2)</td>
</tr>
<tr>
<td>Diagnostic</td>
<td>testing (3)</td>
</tr>
<tr>
<td>Down</td>
<td>linkfailure (4)</td>
</tr>
</tbody>
</table>

Related Traps

The following traps contain the trap information being sent from the agent to the manager.

qlSB2PortLinkDown (qLogicExperimental 0 10)

A linkDown trap signifies that the SNMP entity, acting in an agent role, has detected that the fcQxPortPhysOperStatus object for one of its communication links has left the online state and transitioned to some other state. The current state is indicated by the included value of fcQxPortPhysOperStatus.

Variables:

{ fcQxPortPhysAdminStatus, fcQxPortPhysOperStatus }

qlSB2PortLinkUp (qLogicExperimental 0 11)

A linkUp trap signifies that the SNMP entity, acting in an agent role, has detected that the fcQxPortPhysOperStatus object for one of its communication links has entered the online state from some other state. The current state is indicated by the included value of fcQxPortPhysOperStatus.

Variables:

{ fcQxPortPhysAdminStatus, fcQxPortPhysOperStatus }

qlconnUnitAddedTrap (qLogicExperimental 0 12)

A connUnit has been added to this agent.

Variables:

{ connUnitId }
6–QLOGIC MIB Objects
qlconnUnitAddedTrap (qLogicExperimental 0 12)
7 Firmware Download MIB Objects

This section covers the implementation details for the Firmware Download Management Information Bases (FD-MIB) on the QLogic switch.

Firmware Download MIB Definitions

The FD-MIB enables you to download, install, and activate new firmware on QLogic switches using the Trivial File Transfer Protocol (TFTP). The downloaded firmware can be activated using a hot reset (non-disruptive) or a hard reset (disruptive).

A hot reset is a Non-Disruptive Code Load Activation (NDCLA) operation. The firmware will be activated, the switch will be reset without a Power On Self Test, and switch traffic will not be disrupted. The switch does not need to be rebooted after the firmware is activated. During a hot reset operation, fabric services will be unavailable for a short period (30-75 seconds depending on switch model). To ensure that the NDCLA operation is successful, verify that all administrative changes to the fabric (if any) are complete. When you need to do NDCLA/hot reset to multiple switches, only perform the NDCLA/hot reset on one switch at a time, and wait 75 seconds before performing the NDCLA/hot reset operation on the next switch.

A hard reset is a Normal (or regular) reset operation. The firmware will be activated, the switch will be reset with a Power On Self Test, and switch traffic will be disrupted. The switch must be rebooted after the firmware is activated.
qlgcChFwOpResult (1.3.6.1.4.1.3873.3.1.1.2.1)

The status of the last firmware download and/or installation attempt.

Syntax OBJECT IDENTIFIER
Access read-only
Status Current

Return Value
Returns the following:
- DownloadNoError: 1.3.6.1.4.1.3873.3.1.1.1.1.1
- DownloadHostError: 1.3.6.1.4.1.3873.3.1.1.1.1.2
- DownloadFileError: 1.3.6.1.4.1.3873.3.1.1.1.1.3
- InstallNoError: 1.3.6.1.4.1.3873.3.1.1.2.1
- InstallFileError: 1.3.6.1.4.1.3873.3.1.1.1.2.2
- InstallFileErrorNoAdmin: 1.3.6.1.4.1.3873.3.1.1.1.2.3
- ResetNoError: 1.3.6.1.4.1.3873.3.1.1.3.1
- ResetNoErr: 1.3.6.1.4.1.3873.3.1.1.1.3.2
- ResetNoAdmin: 1.3.6.1.4.1.3873.3.1.1.1.3.3

qlgcChFwOpRequest (1.3.6.1.4.1.3873.3.1.1.2.2)

Starts the operation to download/install firmware, and/or reset the switch.

Syntax INTEGER {
(1) - auto (downloads, installs, and resets the switch)
(2) - downloadOnly
(3) - installOnly
(4) - resetOnly
}
Access read-write
Status current

qlgcChFwDwldHostAddrType (1.3.6.1.4.1.3873.3.1.1.2.3)

The type of the IP address from which the firmware file is accessed.

Syntax INTEGER
Access read-write
Status current
The IP address from which the firmware file is accessed.

**Syntax**

IP ADDRESS

**Access**

read-write

**Status**

current

The port number (defaults is 69) used to transfer the firmware file.

**Syntax**

INTEGER

**Access**

read-write

**Status**

current

The full directory name on the server where the firmware file is located. If the firmware file to be downloaded is in a subdirectory, setting this path name to the name of that subdirectory is required.

**Syntax**

DisplayString

**Access**

read-write

**Status**

current

The filename of the firmware being transferred.

**Syntax**

DisplayString

**Access**

read-write

**Status**

current
qlgcChFwResetMethod (1.3.6.1.4.1.3873.3.1.1.2.8)

The value for the type of reset (hot reset or hard reset).

**Syntax**

INTEGER {
(1) - Normal (disruptive)
(2) - NDCLA (Non-Disruptive Code Load Activation)

**Access**

read-write

**Status**

current
8 Maintenance Panel Health Check MIB Objects

This section covers the implementation details for the Maintenance Panel (MP) MIB (QLGC-MP-MIB) on the QLogic 9000 switches. This MIB applies only to the QLogic 9000 switches.

Maintenance Panel MIB Definitions

The Maintenance Panel MIB allows you to monitor the health of the maintenance panel. This MIB consists of a single point status report object which reports the status of the EPROM (ok/alarm). It also defines a trap which will be reported if the status changes.

qlgcMPStatus (1.3.6.1.4.1.3873.3.2.1.1.1)

Represents the current status of eprom.

<table>
<thead>
<tr>
<th>Syntax</th>
<th>Integer32</th>
</tr>
</thead>
<tbody>
<tr>
<td>Access</td>
<td>ReadOnly</td>
</tr>
<tr>
<td>Status</td>
<td>Current</td>
</tr>
<tr>
<td>Return Value</td>
<td>ok (1)</td>
</tr>
<tr>
<td></td>
<td>alarm (2)</td>
</tr>
</tbody>
</table>
The following trap relates the status of the MP health check status when the status changes state.

**qlgcMPStatusChange (1.3.6.1.4.1.3873.3.2.0.1)**

The status of the maintenance panel eprom monitor changed.

Variables:

{ qlgcMPStatus }
## Glossary

**AL_PA**  
Arbitrated Loop Physical Address

**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 value assigned during loop initialization to each NL_Port on a Loop.

**Abstract Syntax Notation (ASN.1)**  
Abstract Syntax Notation number One (ASN.1) is an international standard that specifies data used in communication protocols.

**Authentication Trap**  
Enables or disables the reporting of SNMP authentication failures. If enabled, a notification trap is sent to the configured trap addresses in the event of an authentication failure. The default value is False.

**BER**  
Bit Error Rate

**Bit Error Rate**  
The probability that a transmitted bit will be erroneously received. The BER is measured by counting the number of bits in error at the output of a receiver and dividing by the total number of bits in the transmission. BER is typically expressed as a negative power of 10.

**Buffer Credit**  
A measure of port buffer capacity equal to one frame.

**Class 2 Service**  
A service that multiplexes frames at frame boundaries to or from one or more N_Ports with acknowledgment provided.

**Class 3 Service**  
A service that multiplexes frames at frame boundaries to or from one or more N_Ports without acknowledgment.

**Contact**  
Specifies the name of the contact person who is to be contacted to respond to trap events. The default is undefined.

**Datagram**  
A message sent between two communicating entities for which no explicit link level acknowledgement is expected.

**Domain ID**  
User defined name that identifies the switch in the fabric.
**Fabric Management Switch**
The switch through which the fabric is managed.

**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.

**ICMP**
Internet Control Message Protocol

**IETF**
Internet Engineering Task Force

**Initiator**
The device that initiates a data exchange with a target device.

**Internet Engineering Task Force**
A large open international community of network designers, operators, vendors, and researchers concerned with evolution and smooth operation of the Internet, and responsible for producing RFCs. The standards body responsible for Internet standards, including SNMP, TCP/IP and policy for QoS.

**Internet Control Message Protocol**
A control protocol strongly related to IP and TCP, and used to convey a variety of control and error indications.

**InteropCredit**
Port configuration parameter that adjusts the number of port buffer credits to allow interoperability with some non-QLogic switches.

**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**
LCFEnable 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. LCFEnable is incompatible with MFSEnable, and both cannot be selected. (True / False)

**LIP**
Loop Initialization Primitive sequence

**Location**
Specifies the switch location. The default is undefined.

**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. The specification and formal description of a set of objects and variables that can be read and possibly written using the SNMP protocol. Various standard MIBs are defined by the Internet Engineering Task Force.

**Management Workstation**
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. (True / False)

**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.

**NMS**
Network Management Station

**Network Management Station**
The console through which an administrator performs management functions.

**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. (True / False).

**Node**
An addressable entity connected to an I/O bus or network. Used primarily to refer to computers, storage devices, and storage subsystems. The component of a node that connects to the bus or network is a port.

**Object**
In the context of access control, an entity to which access is controlled and/or usage of which is restricted to authorized subjects.

**QoS**
Quality of Service

**POST**
Power On Self Test

**Power On Self Test (POST)**
Diagnostics that the switch chassis performs at start up.

**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.

**Read Community**
Read Community Authentication. A write-only field; the value on the switch and the SNMP management server must be the same. The default value is Public.

**Request For Comment (RFC)**
Internet-related specifications, including standards, experimental definitions, informational documents and best practice definitions, produced by the IETF.

**Enterprise Fabric Suite**
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.
Simple Network Management Protocol

The protocol governing network management and that allows monitoring of network devices.

SMI
Structure of Management Information

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

Structure of Management Information
A notation for setting or retrieving management variables over SNMP.

Target
A storage device that responds to an initiator device.

TCP
Transmission Control Protocol

Trap Address
Specifies the IP address to which SNMP traps are sent. The default is 127.0.0.1. A maximum of 5 trap addresses are supported.

Trap Community
Trap Community Authentication. A write-only field; the value on the switch and the SNMP management server must be the same. The default value is Public.

Trap Port
The port number on which the trap is set.

Trap Severity
Specifies a severity level to assign to the trap. Trap severity levels include Unknown, Emergency, Alert, Critical, Error, Warning, Notify, Info, Debug, and Mark.

UDP
User Datagram Protocol

User Datagram Protocol
An Internet protocol that provides connection-less datagram delivery service to applications. Abbreviated UDP. UDP over Internet Protocol adds the ability to address multiple endpoints within a single network node to IP.

VIEnable
FC-VI. When enabled, VI preference frames will be transmitted ahead of other frames. (True / False)

Worldwide Name (WWN)
A unique 64-bit address assigned to a device by the device manufacturer.

Write Community
Write Community Authentication. A write-only field; the value on the switch and the SNMP management server must be the same. The default value is Private.

WWN
Worldwide 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.
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