CHAPTER 3

FibreAlliance FCMGMT-MIB Objects

This section covers the implementation details for the FibreAlliance Management Information Base (FCMGMT-MIB) version 4.0 on the Cisco MDS 9020 Fabric Switch. The FCMGMT-MIB version 4.0 is a collection of structured objects that resides on the workstation with the manager application.

Note You can download the FCMGMT-MIB version 4.0 from the FibreAlliance website at the following link http://www.fibrealliance.org/fb/mib_intro.htm.

FCMGMT-MIB Definitions

These objects define the syntax for information exchanged between the manager and the agent. The textual substitutions in Table 3-1 are specific to the FCMGMT-MIB and can be used in place of primitive data types.

Table 3-1 FCMGMT-MIB Textual Substitutions

Description	Syntax
FcNameId	OCTET STRING (SIZE(8))
FcGlobalId	OCTET STRING (SIZE(16))
FcAddressId	OCTET STRING (SIZE(3))

Table 3-1 FCMGMT-MIB Textual Substitutions (continued)

Description	Syntax

FcEventSeverity	INTEGER{
	unknown (1),
	emergency (2),
	alert (3),
	critical (4),
	error (5),
	warning (6),
	notify (7),
	info (8),
	debug (9),
	mark (10) - All messages logged
	}

FcUnitType	INTEGER {
	unknown(1).
	other(2) - none of the following.
	hub(3) - passive connectivity unit supporting loop protocol.
	switch(4) - active connectivity unit supporting multiple protocols.
	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 <-> ATM.
	converter(6) - unit that converts from one interface to another. For example, FC <-> SCSI.
	hba(7) - host bus adapter.
	proxy-agent(8) - software proxy-agent.
	storage-device(9) - disk, cd, tape, and so on.
	host(10) - host computer.
	storage-subsystem(11) - raid, library, and so on.
	module(12) - subcomponent of a system.
	swdriver(13) - software driver.
	storage-access-device(14) - Provides storage management and access for heterogeneous hosts and heterogeneous devices.
	wdm(15) - waveform division multiplexer.
	ups(16) - uninterruptable power supply.
	}

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 Description 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 Description 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 Description 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 Description TimeTicks

Access Read only

Status Obsolete

Return Value Returns the time when 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 Description TimeTicks

Access Read only

Status Obsolete

Return Value Returns the time when 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 Description TimeTicks

Access Read only

Status Obsolete

Return Value Returns the time when the last fabric change occurred

Connectivity Table

The objects described in this section are in a table format indexed by switch World Wide Name (WWN). 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".
```

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 Description FcGlobalId

Access Read-only

Status Mandatory

Return Value The switch WWN 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 Description connUnitGlobalId

Access Read-only

Status Mandatory

Return Value The switch WWN 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 Description 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 Description 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 Description INTEGER

Access Read-only

Status Mandatory

Return Value See Table 3-2 for switch operational states.

Table 3-2 Switch Operational States

Switch State	Return State
online	online (2)
offline	offline (3)
diagnostics	offline (3)
other	unknown (1)

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 Description INTEGER

Access Read-only

Syntax Description Mandatory

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

Table 3-3 Connectivity Unit Return Values

Status	Return Value
If one power supply is reporting Bad and/or not installed	warning (4)
If both power supplies are reporting Bad and/or not installed	failed (5)
If one or more cooling fan failed	warning (4)
If all cooling fans failed	failed (5)
If temperature status = “Warm”	warning (4)
If temperature status = “Overheating”	failed (5)
If any port down	warning (4)
If POST failed	failed (5)
If switch Offline or in Diagnostics mode	warning (4)

connUnitProduct (1.3.6.1.3.94.1.6.1.7)

The sml attribute Config.Snmp.SysDescr. This is the system description displayed by the Show Version command. It can also be read on the Show Setup SNMP command and written using the Set Setup SNMP command.

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

Access Read-only

Status Mandatory

Return Value Returns the system description, for example, “MDS 9020 FC Switch”.

connUnitSn (1.3.6.1.3.94.1.6.1.8)

The serial number for this connectivity unit.

Syntax Description 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 Description TimeTicks

Access Read-only

Status Mandatory

Return Value The time interval since either Power-on Self Test (POST) or a reset (not including Hotreset command for the NDCLA feature). POST occurs during power-on, or hard reset.

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 Description DisplayString

Access Read-write

Status Mandatory

Return Value The switch IP address (for example, http://10.0.0.1). Writes are 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 Description 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 Description 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, return 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 Description 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, the return is unknown.

Syntax Description INTEGER

Access Read-only

Status Mandatory

Return Value Returns the number of sensors listed in the connUnitSensorTable (3)

connUnitStatusChangeTime (1.3.6.1.3.94.1.6.1.15)

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

Syntax Description 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 Description 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 Description INTEGER

Access Read-only

Status Mandatory

Return Value The number of entries in the revision table (3). The revision table contains the revision numbers of all components of the switch.

connUnitNumZones (1.3.6.1.3.94.1.6.1.18)

Number of zones defined in connUnitZoneTable.

Syntax Description 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 Description FcGlobalId

Access Read-only

Status Mandatory

Return Value The switch WWN 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 Description DisplayString (SIZE(0..79))

Access Read-write

Status Mandatory

Return Value The default is switch.

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 Description DisplayString

Access Read-write

Status Mandatory

Return Value Returns the ConfigDescription field for the switch

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

Access Read-write

Status Mandatory

Return Value See Table 3-4 and Table 3-5 for connUnitControl values.

Table 3-4 connUnitContol Read Return Values

Switch Setting	Return Value
Online	Online (6)
Offline	Offline (5)
Diagnostics	Offline (5)
Other	Unknown (1)

Table 3-5 connUnitContol Write Control Values

Control Value	Result
Cold Reset (3)	Reset
Offline (5)	Offline
Online (6)	Online
other	Not supported

connUnitContact (1.3.6.1.3.94.1.6.1.23)

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

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

Access Read-write

Status Mandatory

Return Value The default is “ ” (empty string).

connUnitLocation (1.3.6.1.3.94.1.6.1.24)

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

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

Access Read-write

Status Mandatory

Return Value The default is “ ” (empty string).

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 Description FcEventSeverity

Access Read-write

Status Mandatory

Return Value The switch log level setting. See Table 3-6 and Table 3-7 for connUnitEventFilter values.

Table 3-6 connUnitEventFilter Read Return Values

Severity Levels	Return Value
Critical	Critical (4)
Warn	Warning (6)
Info	Info (8)
None	Unknown (1)

Table 3-7 connUnitEventFilter Control Write Values

Control Value	Result
Emergency (2)	Critical
Alert (3)	Critical
Critical (4)	Critical
Error (5)	Warn
Warning (6)	Warn
Notify (7)	Info
Info (8)	Info
Debug (9)	Info
Mark (10)	Info
Unknown (1)	None

connUnitNumEvents (1.3.6.1.3.94.1.6.1.26)

Number of events currently in the connUnitEventTable.

Syntax Description 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 Description 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 Description 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 Description FcGlobalId

Access Read-only

Status mandatory

Return Value Returns the principal switch WWN 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 Description INTEGER

Access 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 Description DisplayString (SIZE (0..79))

Access Read-only

Status mandatory

Return Value Cisco Systems, Inc

Revision Table

The objects described in this section are in a table format indexed by WWN 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), page 3-43
- connUnitRevsIndex (1.3.6.1.3.94.1.7.1.2), page 3-44
- connUnitRevsRevId (1.3.6.1.3.94.1.7.1.3), page 3-45
- connUnitRevsDescription (1.3.6.1.3.94.1.7.1.4), page 3-46

connUnitRevsUnitId (1.3.6.1.3.94.1.7.1.1)

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

Syntax Description FcGlobalId

Access Read-only

Status Mandatory

Return Value Returns the switch WWN followed by 8 bytes of zeros.
For example: 10 00 00 C0 DD 00 71 C9 00 00 00 00 00 00 00 00.

connUnitRevsIndex (1.3.6.1.3.94.1.7.1.2)

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

Syntax Description INTEGER (1..2147483647)

Access Read-only

Status Mandatory

Return Value The revision table index

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 connUnitRevsUnitId.

Syntax Description DisplayString

Access Read-only

Status Mandatory

Return Value See Table 3-8 for connUnitRevsRevtId return values.

Table 3-8 ConnUnitRevsRevId Return Values

Table Index	Return Value
1	Active Firmware Image
2	Flasher Shell Version
3	Hardware ASIC Version

connUnitRevsDescription (1.3.6.1.3.94.1.7.1.4)

Description of a component to which the revision corresponds.

Syntax Description DisplayString

Access Read-only

Status Mandatory

Return Value See Table 3-9 for connUnitRevsDescription return values.

Table 3-9 ConnUnitRevsDescription Return Values

Table Index	Return Value
1	Active Firmware Version
2	Flasher Shell Version
3	Hardware ASIC Version

Sensor Table

The objects described in this section are in a table format indexed by WWN 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
.221.0.144.167.0.0.0.0.0.0.0.0.1".
```

connUnitSensorUnitId (1.3.6.1.3.94.1.8.1.1)

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

Syntax Description FcGlobalId

Access Read-only

Status Mandatory

Return Value Returns the switch WWN 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 connUnitSensorEntrys with the same value of connUnitSensorUnitId, in the range between 1 and connUnitNumSensor[connUnitSensorUnitId].

Syntax Description 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 Description DisplayString

Access Read-only

Status Mandatory

Return Value See Table 3-10 for connUnitSensorName return values.

Table 3-10 ConnUnitSensorName Return Values

Table Index	Return Value
1	Power Supply 1 Status
2	Temperature Status
3	Temperature Sensor 1 Value

connUnitSensorStatus (1.3.6.1.3.94.1.8.1.4)

The status indicated by the sensor.

INTEGER {unknown(1), other(2), ok(3), warning(4), failed(5)}

Syntax Description

other(2)	Sensor indicates other than ok (warning or failure).
ok(3)	Sensor indicates ok.
warning(4)	Sensor indicates a warning.
failed(5)	Sensor indicates failure.

Access

Read-only

Status

Mandatory

Return Value

See Table 3-11 through Table 3-14 for connUnitSensorStatus return values.

Table 3-11 ConnUnitSensorStatus Return Values for Board Temperature

Switch Value	Return Value
Normal	OK (3)
Warm	Warning (4)
Overheating	Failed (5)
Other	Unknown (1)

Table 3-12 ConnUnitSensorStatus Return Values for Fan Status

Switch Value	Return Value
Good	OK (3)
Bad	Failed (5)
Other	Unknown (1)

Table 3-13 ConnUnitSensorStatus Return Values for Voltage Status

Switch Value	Return Value
Good	OK (3)
Bad	Failed (5)
Other	Unknown (1)

Table 3-14 ConnUnitSensorStatus Return Values for Fan Status

Switch Value	Return Value
Good	OK (3)
Bad	Failed (5)
Other	Unknown (1)

connUnitSensorInfo (1.3.6.1.3.94.1.8.1.5)

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

Syntax Description 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 Description DisplayString

Access Read-only

Status Mandatory

Return Value See Table 3-15 for connUnitSensorMessage values.

Table 3-15 ConnUnitSensorMessage Values

Sensor	Value
Power Supply	Good/Bad/NotInstalled
Fan	Good/Bad/NotInstalled
Temperature Status	Normal/Warm/Overheating/NotInstalled
Temperature Value	Degrees in C

connUnitSensorType (1.3.6.1.3.94.1.8.1.7)

The type of component being monitored by this sensor.

Syntax Description 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 See Table 3-16 for connUnitSensorType return values.

Table 3-16 ConnUnitSensorType Return Values

Sensor	Value
Temperature	Board (8)
Fan	Fan (4)
Power Supply	Power Supply (5)
Voltage	Board (8)

connUnitSensorCharacteristic (1.3.6.1.3.94.1.8.1.8)

The characteristics being monitored by this sensor.

Syntax Description

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

Note Current is a keyword.

Access

Read-only

Status

Mandatory

Return Value

See Table 3-17 for connUnitSensorCharacterisitic values.

Table 3-17 ConnUnitSensorCharacteristic Values

Sensor	Value
Temperature Value	Temperature (3)
Temperature Status	Temperature (3)
Fan	Airflow (7)
Power Supply	Power (9)

Port Table

The objects described in this section are in a table format indexed by WWN 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
.144.167.0.0.0.0.0.0.0.1".
```

connUnitPortUnitId (1.3.6.1.3.94.1.10.1.1)

The connUnitId of the connectivity unit that contains this port.

Syntax Description FcGlobalId

Access Read-only

Status Mandatory

Return Value Returns the switch WWN followed by 8 bytes of zeros.
For example: 10 00 00 C0 DD 00 71 C9 00 00 00 00 00 00 00 00.

connUnitPortIndex (1.3.6.1.3.94.1.10.1.2)

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

Syntax Description INTEGER (1..2147483647)

Access Read-only

Status Mandatory

Return Value The index for each port on the switch

connUnitPortType (1.3.6.1.3.94.1.10.1.3)

The port type.

INTEGER { unknown(1), other(2), not-present(3), hub-port(4), n-port(5), nl-port(6), fl-port(7), f-port(8), e-port(9), g-port(10), domain-ctl(11), hub-controller(12), scsi(13), escon(14), lan(15), wan(16), ac(17), dc(18), ssa(19) wdm(20), ib(21), ipstore(22) }

Syntax Description

n-port(5)	End port for fabric
nl-port(6)	Public loop
f-port(8)	Fabric port
e-port(9)	Fabric expansion port
g-port(10)	Generic fabric port
scsi(13)	Parallel SCSI port
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

See Table 3-18 for connUnitPortType return values.

Table 3-18 ConnUnitPortType Return Values

Switch Port Type	Return Value
G	g-port (10)
FL	fl-port (7)
F	f-port (8)
E	e-port (9)
Donor	other (2)
other	unknown (1)

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 Description OCTET STRING (SIZE (2))

Access Read-only

Status Mandatory

Return Value Always returns 0x0d (Class f, Class 2, and Class 3)

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 Description 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.

INTEGER { unknown(1), online(2), offline(3), bypassed(4), diagnostics(5) }

Syntax Description

online(2)	Available for meaningful work
offline(3)	Unavailable for meaningful work
bypassed(4)	Deprecated

Access

Read-only

Status

Mandatory

Return Value

See Table 3-19 for connUnitPortState return values.

Table 3-19 ConnUnitPortState Return Values

Port Value	Return Value
Online	online (2)
Offline	offline (3)
Downed	offline (3)
Diagnostics	diagnostics (5)
other	unknown (1)

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.

INTEGER { unknown(1), unused(2), ready(3), warning(4), failure(5), notparticipating(6), initializing(7), bypass(8), ols(9) other(10) }

Syntax Description

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 Description 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 See Table 3-20 for connUnitPortTransmitterType return values.

Table 3-20 ConnUnitPortTransmitterType Return Values

SFP Transmitter Type	Return Value
Not Installed	Unused (3)
SL	Shortwave (4)
LL	Longwave (5)
LC	LongwaveNoOFC (8)
SN	ShortwaveNoOFC (9)
EL	Copper (6)
Other	Unknown (1)

connUnitPortModuleType (1.3.6.1.3.94.1.10.1.9)

The module type of the port connector.

INTEGER { unknown(1), other(2), gbic(3), embedded(4), glm(5), gbicSerialId(6), gbicNoSerialId(7), gbicNotInstalled(8), smallFormFactor(9) }

Syntax Description

embedded(4)	Fixed (oneXnine).
smallFormFactor (9)	This is generically a small form factor connector.

Access

Read-only

Status

Mandatory

Return Value

See Table 3-21 for connUnitPortModuleType return values.

Table 3-21 ConnUnitPortModuleType Return Values

Type	Value
1 Gb/2Gb Ports	smallFormFactor(9)
10 Gb Ports	Other(2)

connUnitPortWwn (1.3.6.1.3.94.1.10.1.10)

The World Wide Port Name (WWPN), if applicable, otherwise returns all zeros.

Syntax Description FcGlobalId

Access Read-only

Status Mandatory

Return Value Returns the WWPN 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, 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. 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 Description 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 Description DisplayString (SIZE(0..79))

Access Read-only

Status Unsupported

Return Value Returns the SFP serial number if supplied by the SFP vendor

connUnitPortRevision (1.3.6.1.3.94.1.10.1.13)

The port revision. For example, for a GBIC.

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

Access Read-only

Status Unsupported

Return Value Returns the SFP firmware revision if supplied by the SFP vendor

connUnitPortVendor (1.3.6.1.3.94.1.10.1.14)

The port vendor. For example, for a GBIC.

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

Access Read-only

Status Unsupported

Return Value Returns the SFP vendor name if supplied by the SFP vendor

connUnitPortSpeed (1.3.6.1.3.94.1.10.1.15)

The speed of the port in kilobytes per second.

Syntax Description INTEGER

Access Read-only

Status Mandatory

Return Value The operational speed, otherwise returns the administrative speed setting. If 1 Gbps, returns 106,250. If 2 Gbps, returns 212,500. If 4 Gbps, returns 425,000. If 10 Gbps, returns 1,062,500.

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

Access Read-write

Status Mandatory

Return Value See Table 3-22 for connUnitPortControl read return values.

Table 3-22 ConnUnitPortControl Read Return Values

Port Value	Return Value
Online	online (7)
Offline	offline (6)

Table 3-22 ConnUnitPortControl Read Return Values

Port Value	Return Value
Diagnostics	offline (6)
other	unknown (1)

See Table 3-23 for connUnitPortControl write command values.

Table 3-23 ConnUnitPortControl Write Command Values

Control Value	Command Sent
Online (7)	online
Offline (6)	offline
ResetCounters (8)	clear counters
other	error returned

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 the name has more than DisplayString characters, then the name will be truncated in the connunit.

Syntax Description INTEGER

Access Read-write

Status Mandatory

Return Value The default is “--”.

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 Description 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 Description 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 Description 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 Description 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 World Wide Node Name (WWNN) 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 WWNN. All ports on the same storage subsystem will have the same WWNN." ::= { connUnitPortEntry 22 }.

Syntax Description FcNameId

Access Read-only

Status Mandatory

Return Value Returns the switch WWN.
For example: 10 00 00 C0 DD 00 71 C9 00 00 00 00 00 00 00 00.

connUnitPortHWState (1.3.6.1.3.94.1.10.1.23)

The hardware detected state of the port.

INTEGER { unknown(1), failed(2), bypassed(3), active(4), loopback(5), txfault(6), noMedia(7), linkDown(8) }

Syntax Description

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

See Table 3-24 for connUnitPortHWState port state return values.

Table 3-24 ConnUnitPortHWState Port State Return Values

Port State	Return Value
If DiagStatus = Failed	Failed (2)
If SFP = Not Installed	NoMedia (7)
If SyncStatus = SyncAcquired	Active (4)
If SyncStatus = SyncLost	LinkDown (8)
Other	Unknown (1)

Event Table

The objects described in this section are in a table format indexed by WWN 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.16.0.0.192.22
1.0.144.167.0.0.0.0.0.0.0.1".
```

connUnitEventUnitId (1.3.6.1.3.94.1.11.1.1)

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

Syntax Description FcGlobalId

Access Read-only

Status Mandatory

Return Value The switch WWN. 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 Description 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 Description INTEGER

Access Read-only

Status Deprecated

Access 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 Description 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 Description 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 Description 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 Description 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 Description 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 Description 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 WWN 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
.144.167.0.0.0.0.0.0.0.1".
```

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 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.

connUnitLinkUnitId (1.3.6.1.3.94.1.12.1.1)

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

Syntax Description connUnitLinkUnitId

Access Read-only

Status Mandatory

Return Value The switch WWN. 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 connUnitLinkUnitId. 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 Description 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 Description OCTET STRING (SIZE(16))

Access Read-only

Status Mandatory

Return Value The local switch WWN 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 Description 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 Description connUnitLinkPortWwnX

Access Read-only

Status Mandatory

Return Value The local WWPN 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 Description OCTET STRING (SIZE(16))

Access Read-only

Status Mandatory

Return Value The remote WWNN 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 Description 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 Description FcGlobalId

Access Read-only

Status Mandatory

Return Value The remoteWWPN 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 Description 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 Description 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 Description 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 Description 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 Description 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 Description 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 Description INTEGER (1..2147483647)

Access Read-only

Status Mandatory

Return Value Returns index number for each zone within the active zoneset

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 Description 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 Description 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 Description INTEGER

Access Read-only

Status Mandatory

Return Value Returns the number of zones within the active zoneset

connUnitZoneName (1.3.6.1.3.94.1.13.1.5)

Name of the zone.

Syntax Description 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.

Syntax Description OCTET STRING (SIZE(1))

Access Read-only

Status Mandatory

Return Value Always returns 0xC0

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 Description OCTET STRING (SIZE(1))

Access Read-only

Status Mandatory

Return Value Returns the zone type mapped as follows:

- Soft.....0x80
- Hard.....0x40

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 Description 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 Description 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 Description 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 Description 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.connUnitZoningAliasIndex.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 Description 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 Description 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 Description 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 Description 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 Description 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 Description 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 Description 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 WWN 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
.0.192.221.0.144.167.0.0.0.0.0.0.0.1".
```

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 till 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 Description FcGlobalId

Access Read-only

Status Mandatory

Return Value Returns the switch WWN 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[connUnitPortUnitId].

Syntax Description 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 Description OCTET STRING (SIZE (8))

Access Read-only

Status Mandatory

Return Value A hexidecimal 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 Description OCTET STRING (SIZE (8))

Access Read-only

Status Mandatory

Return Value A hexidecimal 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 Description OCTET STRING (SIZE (8))

Access Read-only

Status Mandatory

Return Value A hexidecimal 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 Description OCTET STRING (SIZE (8))

Access Read-only

Status Mandatory

Return Value A hexidecimal 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 Description OCTET STRING (SIZE (8))

Access Read-only

Status Mandatory

Return Value A hexidecimal 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 Description 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 Description 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 Description OCTET STRING (SIZE (8))

Access Read-only

Status Mandatory

Return Value A hexidecimal 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 Description 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 Description 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 Description 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 Description 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 Description 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 Description 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 Description 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 Description 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 Description 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 Description 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 Description 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 Description 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 Description 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 Description 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 Description 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 Description 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 Description 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 Description 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 Description 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 Description 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 Description 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 Description 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 Description 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 Description 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 Description 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 Description 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 Description 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 Description 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 Description 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 Description 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 Description 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 Description 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 Description 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 (1.3.6.1.3.94.4.5.1.44)

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 Description OCTET STRING (SIZE (8))

Access Read-only

Status Mandatory

Return Value The total number LossOfSyncs detected by this port

connUnitPortStatCountInvalidOrderedSets (1.3.6.1.3.94.4.5.1.45)

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 Description 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 (1.3.6.1.3.94.4.5.1.46)

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 Description 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 Description 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 Description 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 Description 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 Description 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 WWN 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.conn
UnitSnsId.16.0.0.192.221.0.144.167.0.0.0.0.0.0.0.1".
```

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 because 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.

Syntax Description INTEGER

Access Read-only

Status Mandatory

Return Value Returns the number of entries registered in the Simple Name Server for all switches

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 Description OCTET STRING (SIZE (16))

Access Read-only

Status Mandatory

Return Value Returns the switch WWN 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 Description 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 Description 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 WWPN for this entry in the SNS table.

Syntax Description FcNameId

Access Read-only

Status Mandatory

Return Value The WWPN 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 Description FcNameId

Access Read-only

Status Mandatory

Return Value The WWNN 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 Description 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 Description OCTET STRING (SIZE (16))

Access Read-only

Status Mandatory

Return Value Returns IPV6 formatted value

connUnitSnsProcAssoc (1.3.6.1.3.94.5.2.1.1.8)

The process associator for this entry in the SNS table.

Syntax Description 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 Description 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 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 Description OCTET STRING (SIZE (1))

Access Read-only

Status Mandatory

Return Value A value indicating the PortType for the entry in the name server table. See Table 3-25 for connUnitPortType port type return values.

Table 3-25 ConnUnitPortType State Return Values

Port Type	Return Value (hexidecimal)
N	1
NL	2
F/NL	3
NX	7F
F	8
FL	82
E	84
B	85

connUnitSnsPortIPAddress (1.3.6.1.3.94.5.2.1.1.11)

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

Syntax Description OCTET STRING (SIZE (16))

Access Read-only

Status Mandatory

Return Value Returns IPV6 formatted value

connUnitSnsFabricPortName (1.3.6.1.3.94.5.2.1.1.12)

The fabric port name of this entry in the SNS table.

Syntax Description FcNameId

Access Read-only

Status Mandatory

Return Value The switch port WWPN 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 Description 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 Description 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 Description 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 it's 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 Description 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 Description 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 Description 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 Description 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 Description 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 Description 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 Description 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 Description 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 (for example, telephone closet, 3rd floor). The Platform Location shall only contain printable ASCII characters.

Syntax Description 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 Description 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 Description 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 WWNN contained by the platform.

Syntax Description FcGlobalId

Access Read-only

Status Mandatory

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 3-26.

Table 3-26 Trap Severity Levels

Event Type	Severity Level
Unknown	1
Emergency	2
Alert	3
Critical	4
Error	5
Warning	6
Notify	7
Info	8
Debug	9
Mark	10

trapMaxClients (1.3.6.1.3.94.2.1)

The maximum number of SNMP trap recipients supported by the connectivity unit.

Syntax Description 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 Description 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 Description 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.

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 Description 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 Description FcEventSeverity

Access Read-write

Status mandatory

Return Value A value indicating the trap severity level. See Table 3-26 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.

INTEGER { rowDestroy(1), rowInactive(2), rowActive(3) }

Syntax Description

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)

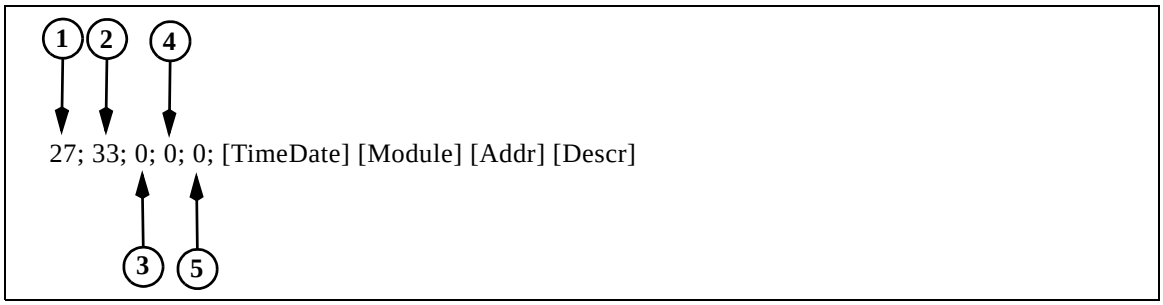
An event has been generated by the connectivity unit. The recommended severity level (for filtering) is “info”. Sent when a change notification occurs that does not fit into any other specific category.

Variables:

```
{ connUnitEventId, connUnitEventType, connUnitEventObject, connUnitEventDescr }
```

Figure 3-1 provides the standard format of the connUnitEventDescr variable. Chassis, Blade, and Port are always 0.

Figure 3-1 connUnitEventDescr Variable Format



1	Tag number	**4**	Blade
2	Event number	**5**	Port
3	Chassis number		

Table 3-27 lists the fields in the connUnitEventDescr variable.

Table 3-27 connUnitEventDescr Variable Field Descriptions

connUnitEventDescr Variable	Description
Tag #	The number that identifies the event.
Event #	The event counter.
Chassis	The switch on which the event occurred.
Blade	The I/O blade on which the event occurred.
Port	The port on which the event occurred.
TimeDate	The time stamp of the event.
Module	The software module where the event was initiated.
Addr	The address in the software module where the event was initiated.
Descr	The description of the event.

Table 3-28 lists the possible trap strings returned for the connUnitEventDescr variable.

Table 3-28 connUnitEventDescr Trap List

Trap Type	Filter Level	Notification
connUnitPortStatusChange	eventSeverity_info, eventSeverity_info, eventSeverity_critical, eventSeverity_info	UserPort.ConfigChange, UserPort.StateChange, Eport.ConvergeAlarm, UserPort.OperChange
connUnitDeletedTrap	eventSeverity_info, eventSeverity_info,	Fabric.OperChange, Eport.OperChange

Table 3-28 connUnitEventDescr Trap List

Trap Type	Filter Level	Notification
connUnitStatusChange	eventSeverity_info, eventSeverity_info, eventSeverity_critical, eventSeverity_info	Switch.OperChange, Switch.StateChange, Switch.ResetAlarm, Chassis.OperChange
connUnitSensorStatusChange	eventSeverity_critical, eventSeverity_critical, eventSeverity_critical, eventSeverity_critical, eventSeverity_critical, eventSeverity_critical, eventSeverity_critical	Chassis.PsBadAlarm, Chassis.PsOkAlarm, Chassis.FanBadAlarm, Chassis.FanOkAlarm, Blade.OverheatAlarm, Blade.OverwarmAlarm, Blade.TempOkAlarm
connUnitEventTrap	eventSeverity_info, eventSeverity_info, eventSeverity_info, eventSeverity_info, eventSeverity_info, eventSeverity_critical, eventSeverity_info, eventSeverity_warning, eventSeverity_warning, eventSeverity_critical, eventSeverity_info, eventSeverity_warning	Snmp.ConfigChange, Switch.ConfigChange, System.ConfigChange, Topology.OperChange, Zoning.Change, Zoning.MergeAlarm, NameServer.OperChange, Switch.AccessAlarm, Switch.AdminAlarm, Switch.GenericAlarm, Blade.OperChange, Switch.GenericEvent

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 }
```

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 reinitializing 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.