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Using the 10 Gigabit Ethernet Modules: 8681XLR and 8681XLW

Passport 8000 Series Software Release 3.5



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Preface

The 8681XLR Module and the 8681XLW Module are part of the Nortel Networks Passport line of 10GE LAN/WAN communications products. They are 128K records modules which allow support for large layer 2 and layer 3 configurations. This guide describes the features, operations, and configuration requirements for both modules.

For technical specifications and information about how to install your 10GE LAN/WAN modules, see *Installing 8600 Switch Modules*. This document is provided on the hardware documentation CD purchased with your 8000 Series Chassis, or can be found on the Nortel Networks documentation Web site at www.nortelnetworks.com/documentation, search term: Passport 8000 Series.

A complete list of related publications can be found in the release notes that accompanied your software release.

Before you begin

This guide is intended for network installers and system administrators who are responsible for installing, configuring, or maintaining networks. This guide assumes that you have the following background:

- Understanding of the transmission and management protocols used on your network
- Experience with windowing systems or graphical user interfaces (GUIs)

Text conventions

This guide uses the following text conventions:

angle brackets (<>)	Indicate that you choose the text to enter based on the description inside the brackets. Do not type the brackets when entering the command. Example: If the command syntax is <code>ping <ip_address></code> , you enter <code>ping 192.32.10.12</code>
bold Courier text	Indicates command names and options and text that you need to enter. Example: Use the dinfo command. Example: Enter show ip {alerts routes} .
braces ({})	Indicate required elements in syntax descriptions where there is more than one option. You must choose only one of the options. Do not type the braces when entering the command. Example: If the command syntax is <code>show ip {alerts routes}</code> , you must enter either <code>show ip alerts</code> or <code>show ip routes</code> , but not both.
brackets ([])	Indicate optional elements in syntax descriptions. Do not type the brackets when entering the command. Example: If the command syntax is <code>show ip interfaces [-alerts]</code> , you can enter either <code>show ip interfaces</code> or <code>show ip interfaces -alerts</code> .
ellipsis points (...)	Indicate that you repeat the last element of the command as needed. Example: If the command syntax is <code>ethernet/2/1 [<parameter> <value>]...</code> , you enter <code>ethernet/2/1</code> and as many parameter-value pairs as needed.
<i>italic text</i>	Indicates new terms, book titles, and variables in command syntax descriptions. Where a variable is two or more words, the words are connected by an underscore. Example: If the command syntax is <code>show at <valid_route></code> , <i>valid_route</i> is one variable and you substitute one value for it.
plain Courier text	Indicates command syntax and system output, for example, prompts and system messages. Example: <code>Set Trap Monitor Filters</code>

separator (>)	Shows menu paths. Example: Protocols > IP identifies the IP option on the Protocols menu.
vertical line ()	Separates choices for command keywords and arguments. Enter only one of the choices. Do not type the vertical line when entering the command. Example: If the command syntax is <code>show ip {alerts routes}</code> , you enter either <code>show ip alerts</code> or <code>show ip routes</code> , but not both.

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An Express Routing Code (ERC) is available for many Nortel Networks products and services. When you use an ERC, your call is routed to a technical support person who specializes in supporting that product or service. To locate an ERC for your product or service, go to the <http://www130.nortelnetworks.com/cgi-bin/eserv/common/essContactUs.jsp> URL.

Chapter 1

About 10 Gigabit Ethernet LAN/WAN Modules

This chapter describes the conceptual information and the configurable parameters for the 10 GE LAN/WAN modules, and contains the following topics:

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10GE LAN/WAN Modules concepts	17
Default 10GE LAN module configuration	20
Default 10GE WAN module configuration	21
Additional configurable 10GE LAN module parameters	22
Additional configurable 10GE WAN module parameters	24

10GE LAN/WAN Modules concepts

Ten Gigabit Ethernet (10GE) differs from Gigabit Ethernet not only in supporting an order of magnitude faster media speed, but also in providing both WAN and LAN connectivity.

Extending Ethernet over metropolitan and wide area networks provides more cost-effective solutions for larger geographic areas and ensures end-to-end Ethernet connectivity. WAN Ethernet frames going across a fiber-optic link are enclosed within SONET/SDH payload. Embedding Ethernet packets inside SONET frames requires support for SONET-like management, configuration and statistics.

Unlike the WAN 10GE, the LAN version of 10GE does not use SONET as the transport mechanism. WAN and LAN mode of operations are not programmable. Due to different clock frequencies, LAN and WAN versions of the 10GE module have different module IDs and part numbers as shown in [Table 1](#).

Table 1 10GE LAN/WAN module IDs and part numbers

Hardware	Product description	Minimum software version	Part number
8681XLW module	1-port 10 Gigabit Ethernet (1310nm WAN serial)	3.3.0	DS1404052
8681XLR module	1-port 10 Gigabit Ethernet (1310nm LAN serial)	3.3.0	DS1404053

LAN PHY features

The following 10GE [LAN PHY](#) features are available in release 3.3:

- LAN, MAN, WAN Ethernet pt-pt applications. Incompatible with SONET TDM/DWDM OC-192 optical networks
- PEC DS1404053 for single Port 1310 nm 10GE LAN serial module
- Compliant with IEEE 802.3ae standards
- 802.3 Ethernet frame format, MAC, Layer functionality
- 10.3125 Gbps data rate.
- 64B/66B line encoding
- Asynchronous Ethernet Interface
- 128K records

LAN PHY FEFI

The LAN version of 10 Gigabit Ethernet supports far end fault indication (FEFI). Remote failure is detected at the MAC level. Upon receiving FEFI notification from the remote site, the 10GE module's port changes its link state to non-operational.

WAN PHY features

The following displays the 10GE WAN PHY features available in release 3.3:

- LAN, MAN, WAN Ethernet pt-pt applications. Simple, low cost access to SONET TDM/DWDM OC-192 optical networks.
- PEC DS1404052 for single port 1310 nm 10GE WAN serial module
- Compliant with IEEE 802.3ae standards
- 9.9532 Gbps data rate. Compatible with SONET OC-192/SDH STM-64 payload rate. SONET framer and Ethernet MAC functionality
- 64B/66B line encoding and simplified SONET/SDH framer
- Asynchronous Ethernet Interface
- 128K records

WAN PHY clocking

Although the default mode for each 10GE WAN port is to generate its transmit clock from its own internal clock, a loop timing option is provided for applications involving synchronization to Sonet/SDH equipment and a timing hierarchy. You need to manually configure the Passport 8000 Switch Series to change the clock setting from internal to line timing.

When using the internal clock and directly connected to another 10GE WAN port, the other side of the link may be set to either internal or line (loop) clocking. If one side of the link is set for line clocking, care must be taken to configure the other side for internal clocking in order to avoid a potential timing loop.

Unless there is a specific requirement for loop timing in a system, internal timing is recommended, since the transmit side will then continue to operate even if there is a failure on the incoming Receive Side Signal.

For more information about WAN PHY clocking and synchronization applications, see *Network Design Guidelines (Passport 8000 Switch Series Release 3.3 Implementation Notes)* (part number 313197-B).

WAN PHY FEFI

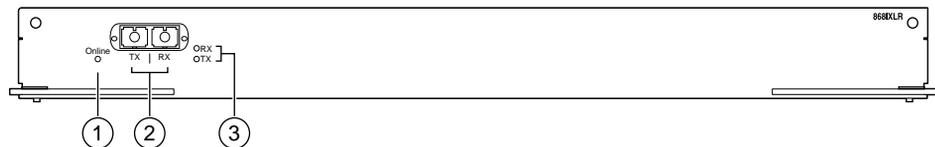
The WAN PHY version of 10GE WAN module supports FEFI. When one end of a 10GE WAN module link detects a link-down condition or is administratively disabled, it notifies the other end of the link through the use of SONET Alarm Indication Signal (AIS). Upon receiving this notification, the other end changes its link state to down.

For an in depth study of 10GE WAN technology in your network, see *Network Design Guidelines (Passport 8000 Switch Series Release 3.3 Implementation Notes)* (part number 313197-B).

Default 10GE LAN module configuration

The 8681XLR (10GE LAN) Module ([Figure 1](#)) consists of a printed circuit board with status LEDs, and one 10GBASE-LR 1310nm 10gigabit Ethernet serial LAN port. The 10GBASE-LR port (10.3 Gb/s LAN PHY) operates in full-duplex mode and provides transmission ranges of up to 10 km using 9/125 μm single-mode fiber cable.

Figure 1 8681XLR (10GE LAN) Module



- 1 = Online LED
- 2 = 10GBASE LR port
- 3 = Port RX and TX LEDs

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[Table 2](#) describes the default 10GE LAN Module configuration.

Table 2 10GE LAN Module default settings

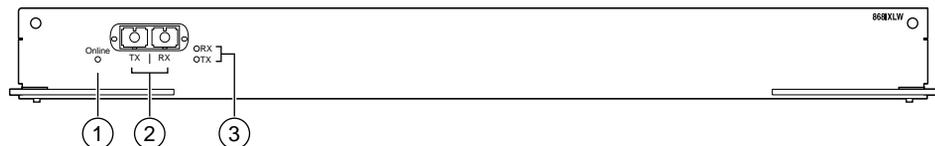
Parameter	Default
Debug	Disabled
Lock	False

Table 2 10GE LAN Module default settings (continued)

Parameter	Default
Oversize frame	Disabled
Perform tagging	Enabled
Spanning Tree Protocol 802.1D	Enabled
Tagged frame discard	Disabled
Unknown MAC discard	Disabled
Untagged frame discard	Disabled

Default 10GE WAN module configuration

The 8681XLW (10GE WAN) Module ([Figure 2](#)) consists of a printed circuit board with status LEDs, and one 10GBASE-LW 1310nm 10 gigabit Ethernet serial WAN port. The 10GBASE-LW port (9.953 Gb/s WAN PHY) operates in full-duplex mode and provides transmission ranges of up to 10 km using 9/125 μm single-mode fiber cable.

Figure 2 8681XLW (10GE WAN) Module

- 1 = Online LED
- 2 = 10GBASE LW port
- 3 = Port RX and TX LEDs

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Table 3 describes the default 10GE WAN Module configuration.

Table 3 10GE WAN Module default settings

Parameter	Default
Clock source	Internal
Debug	Disabled
Framing	SONET
Lock	False
Oversize frame	Disabled
Perform tagging	Enabled
Spanning Tree Protocol RFC 1638	Enabled
Tagged frame discard	Disabled
Unknown MAC discard	Disabled
Untagged frame discard	Disabled

Additional configurable 10GE LAN module parameters

Table 4 describes the additional parameters that can be configured for the 10GE LAN Module.

Table 4 10GE LAN Module configurable parameters

Parameter	Option	Default setting
<code>config ethernet <slot/port> lock</code>	true (enable) false (disable)	false (disabled)
<code>config ethernet <slot/port> name</code>	<name> (1..20 characters)	No name assigned
<code>config ethernet <slot/port> enable-diffserv</code>	true (enable) false (disable)	false (disabled)
<code>config ethernet <slot/port> access-diffserv</code>	true (enable) false (disable)	false (disabled)

Table 4 10GE LAN Module configurable parameters (continued)

Parameter	Option	Default setting
config ethernet <slot/port> qos-level For more information about quality of service (Qos), see "Quality of Service (QoS)" on page 29 .	0 = none 1 = standard 2 = bronze 3 = silver 4 = gold 5 = platinum 6 = premium 7 = net control	1
config ethernet <slot/port> unknown-mac-discard	enable disable	disabled
config ethernet <slot/port> default-vlan-id	<vlan id> (1..4092)	1
config ethernet <slot/port> tagged-frames-discard	enable disable	disabled
config ethernet <slot/port> perform-tagging	enable disable	enabled
config ethernet <slot/port> untagged-frames-discard	enable disable	disabled
config ethernet <slot/port> loop-detect	enable disable	disabled
config ethernet <slot/port> state	enable (up) disable (down) test	up
config ethernet <slot/port> linktrap	enable disable	enabled
config ethernet <slot/port> rate-limit <multicast broadcast>	enable disable	disabled
config ethernet <slot/port> tx-flow-control	enable disable	disabled
config ethernet <slot/port> fc-pause0	enable disable	enabled

Table 4 10GE LAN Module configurable parameters (continued)

Parameter	Option	Default setting
<code>config ethernet <slot/port> fc-pause-time</code>	(1..65535) This parameter is set in slots. One slot equals 512-bit transmission time. For 10Gb/s, one slot corresponds to ~51.2 nanoseconds.	65535
<code>config ethernet <slot/port> cp-limit</code>	enable disable	enabled
Additional parameters: <code>multicast-limit</code> <code>broadcast-limit</code>	multicast control frame rate (1000..100000) broadcast frame rate (1000..100000)	multicast-limit 15000 broadcast-limit 10000

Additional configurable 10GE WAN module parameters

[Table 5](#) describes the parameters that can be configured for the 10GE WAN Module.

Table 5 10GE WAN Module configurable parameters

Parameter	Option	Default setting
<code>config ethernet <slot/port> lock</code>	true (enable) false (disable)	false (disabled)
<code>config ethernet <slot/port> name</code>	<name> (1..20 characters)	No name assigned
<code>config ethernet <slot/port> enable-diffserv</code>	true (enable) false (disable)	false (disabled)
<code>config ethernet <slot/port> access-diffserv</code>	true (enable) false (disable)	false (disabled)

Table 5 10GE WAN Module configurable parameters (continued)

Parameter	Option	Default setting
config ethernet <slot/port> qos-level	0 = none 1 = standard 2 = bronze 3 = silver 4 = gold 5 = platinum 6 = premium 7 = net control	1 (standard)
config ethernet <slot/port> unknown-mac-discard	enable disable	disabled
config ethernet <slot/port> default-vlan-id	<vlan id> (1..4092)	1
config ethernet <slot/port> tagged-frames-discard	enable disable	disabled
config ethernet <slot/port> perform-tagging	enable disable	enabled
config ethernet <slot/port> untagged-frames-discard	enable disable	disabled
config ethernet <slot/port> loop-detect	enable disable	disabled
config ethernet <slot/port> state	enable (up) disable (down) test	up
config ethernet <slot/port> linktrap	enable disable	enabled
config ethernet <slot/port> rate-limit <multicast broadcast>	enable disable	disabled
config ethernet <slot/port> clock-source	line internal	internal
config ethernet <slot/port> framing	sonet sdh	sonet
config ethernet <slot/port> tx-flow-control	enable disable	disabled

Table 5 10GE WAN Module configurable parameters (continued)

Parameter	Option	Default setting
config ethernet <slot/port> fc-pause0	enable disable	enabled
config ethernet <slot/port> fc-pause-time	(1..65535) This parameter is set in slots. One slot equals 512-bit transmission time. For 10Gb/s, one slot corresponds to ~51.2 nanoseconds.	65535
config ethernet <slot/port> cp-limit	enable disable	enabled
Additional parameters: multicast-limit broadcast-limit	multicast control frame rate (1000..100000) broadcast frame rate (1000..100000)	multicast-limit 15000 broadcast-limit 10000

Chapter 2

Configuration considerations and limitations

This chapter describes configuration limitations and interoperability issues that you should consider when configuring your 10GE LAN/WAN modules.

This chapter includes the following topics:

Topic	Page
Switching fabric recommendations	28
Multimode fiber (MMF)	28
Jumbo packet support	28
Internal MLT	29
Quality of Service (QoS)	29
Flow control	30
Trunk vs access mode	31
Non-supported features	31
LED information	31
10GE WAN SONET/SDH overhead bytes	32

Switching fabric recommendations

The 10GE LAN/WAN modules are 128K records modules which allows support for large layer 2 and layer 3 configurations. These modules only operate with 8000 Series software release 3.3 and later.

For 128K record support the following configurations are required:

- For best performance of the 10GE LAN/WAN modules, Nortel Networks recommends that you install two SF CPU modules. If the chassis includes a 8690SF module, the mode defaults back to 32K mode.
- All modules installed in the chassis must support 128K records (M modules) running 3.3 and later software.
- MMode (128K records mode) must be enabled. If one, or more modules installed in the chassis is a 32K records module, these modules will be disabled if the chassis is configured to operate in MMode (128K records mode). For instructions on enabling MMode, see *Platform and System Management*.

For more information about your hardware and software compatibility, see *Important information about your hardware and supporting software release compatibility* (part number 314937-A).

Multimode fiber (MMF)

There is no support for MMF in WAN or LAN interfaces.

Jumbo packet support

Jumbo packets are larger than the maximum Ethernet frame size specified in the IEEE 802.3 standard. For untagged frames, the maximum standard size is 1518 bytes. For tagged frames, it increases by 4 bytes to 1522 bytes.

The default maximum Ethernet frame size supported by the Passport 8000 Switch Series is 1950 bytes. The 10GE LAN/WAN module also supports this frame size. Passport 8000 Switch Series has a box-wide jumbo frame enable feature, where *all* of the ports in the system can support 9600 byte frames. With the addition of this feature, the 10GE LAN/WAN modules support the increased frame size. Note that if a jumbo frame enters on a 10GE LAN/WAN interface, and is destined to egress a chassis interface which does not support jumbo frames, it is gracefully dropped.

Internal MLT

Every 10GE LAN/WAN module uses one MLT ID of the 32 MLT IDs available in the Passport 8000 Switch Series. The MLT ID is configured automatically when a 10GE LAN/WAN module is detected in the chassis. For more information about internal MLT and load balancing, see *Network Design Guidelines (Passport 8000 Switch Series Release 3.x Implementation Notes)*.

Quality of Service (QoS)

10GE LAN/WAN modules provide quality of service features, including 802.1p and DiffServ support. Eight levels of QoS are supported. The highest level is reserved for control packets, while the remaining three levels, high, medium and low priority are used for data traffic.

[Table 6](#) provides the default mappings for differentiated services code point (DSCP) to 10GE Class of Service (CoS).

Table 6 DSCP to 10GigE CoS default mapping

DSCP	Traffic Service Class	10GigE CoS
CS7 (111000), CS6 (110000)	Network	High
EF (101110), CS5 (101000)	Premium	High
AF41 (100010), AF42 (100100), AF43 (100110), CS4 (100000)	Platinum	Medium
AF31 (011010), AF32 (011100), AF33 (011110), CS3 (011000)	Gold	Medium

Table 6 DSCP to 10GigE CoS default mapping

DSCP	Traffic Service Class	10GigE CoS
AF21 (010010), AF22 (010100), AF23 (010110), CS2 (010000)	Silver	Medium
AF11 (001010), AF12 (001100), AF13 (001110), CS1 (001000)	Bronze	Low
DE (000000) and all undefined codepoints	Standard	Low
User-defined codepoints	Standby	Low

[Table 7](#) provides the default mappings for 802.1p to 10GE CoS.

Table 7 QoS 802.1p to 10GigE CoS default mapping

.1p value	7	6	5	4	3	2	1	0
10 GigE CoS	High	High	Med	Med	Med	Low	Low	Low

You can change CoS default mappings by using the following CLI commands:

- `config qos ingressmap ds`
- `config qos ingressmap lp`

To change Quality of Service (QoS) mappings, you can use a module-level command to control QoS settings for all modules in the Passport 8000 Switch Series, including 10GE LAN/WAN modules. In addition, for 10 GigE, this command also controls CoS settings for the previously-mentioned QoS registers.

Flow control

The Passport 8000 Switch Series 10GE LAN module interface supports IEEE 802.3x flow control. The 10GE LAN module interface can generate 802.3x flow control PAUSE frames when it becomes congested. It also responds to 802.3x PAUSE frames entering on the other side of the link. The 10GE module interface temporarily halts packet transmission when an 802.3x PAUSE frame is received from the remote end.

Trunk vs access mode

By default, the 10GE LAN/WAN module port comes up as a trunk port with tagging enabled. This is opposite behavior to Passport 8000 Switch Series 10/100 and GigE modules where tagging is disabled by default. As a result, the 10GE LAN/WAN module port belongs to multiple VLANs and STGs by default. When you change tagging mode from trunk (port mode) to access, the port's previous association of VLANs and STGs is lost.

Nortel Networks recommends that you use the 10GE LAN/WAN module port as trunk only.

Non-supported features

The following features are not supported by the 10GE LAN/WAN modules.

- **External MLT:** Nortel Networks recommends that you use a layer 3 protocol for resiliency, for example, OSPF associated to Equal Cost MultiPath (ECMP)
- **APS** (Automatic Protection Switching) is a SONET feature, which per IEEE P802.3ae is not supported for 10 GBASE Ethernet)
- **IPX** routing
- **Egress port mirroring**
- **Split MultiLink Trunking (SMLT)**
- **WSM feature set**

LED information

The 10GE LAN/WAN module LEDs for TX and RX are in opposite positions of those on other 8600 modules.

Using the 10 Gigabit Ethernet Modules: 8681XLR and 8681XLW (315893-A)

When a 10 GE LAN/WAN module is in a chassis with redundant CPU configuration the Switch Utilization LEDs report switch utilization on the primary CPU only. (Q00259692)

10GE WAN SONET/SDH overhead bytes

The Sonet/SDH overhead bytes: D1-D3, E1, F1, D4-12, and E2, which are unused and not supported by the 10GE WAN module, are set to values of all ones in the first STS-1, while they are zeros in all other STS-Ns (where N=2...192).



Note: For more information about these limitations, contact your local Nortel Networks representative.

Chapter 3

Configuring and Monitoring the 10GE LAN/WAN modules using Device Manager

Two management tools enable you to configure your 10GE LAN/WAN modules: Device Manager and the command line interface (CLI). This chapter describes only those Device Manager tasks specific to the 10GE LAN/WAN module. For information on other configuration options, refer to your release notes for a list of related publications for your software release.

Device Manager is an SNMP-based graphical user interface tool designed to manage single devices. To use Device Manager, you must have network connectivity to a management station running Device Manager on one of the supported platforms. For information on all aspects of installing and running Device Manager, refer to *Getting Started with the Management Software*.

This chapter includes the following topics:

- [“Configuring the 10GE LAN/WAN module, next](#)
- [“Viewing 10GE LAN/WAN port statistics” on page 46](#)

Configuring the 10GE LAN/WAN module

This section describes the specific commands used to configure the 10GE LAN/WAN modules using Device Manager, and includes the following topics:

Topic	Page
Configuring the WAN clock source	34
Changing the module's administrative status	34
Configuring the port's administrative status	36
Configuring the WAN framing type	40
Configuring flow control	41
Performing a 10GE LAN/WAN loopback test	42
Viewing the Trap Log	44

Configuring the WAN clock source

You use the CLI to configure the 10GE WAN module clock source. See [“Configuring the clock source” on page 68](#).

Changing the module's administrative status

To enable or disable the 10GE LAN/WAN module's administrative status:

- ➔ On the Device View, double-click on the 10GE LAN/WAN module ([Figure 3](#)).

Figure 3 Device View with the 10GE LAN/WAN module selected



The Card dialog box opens (Figure 4).

Figure 4 Card dialog box

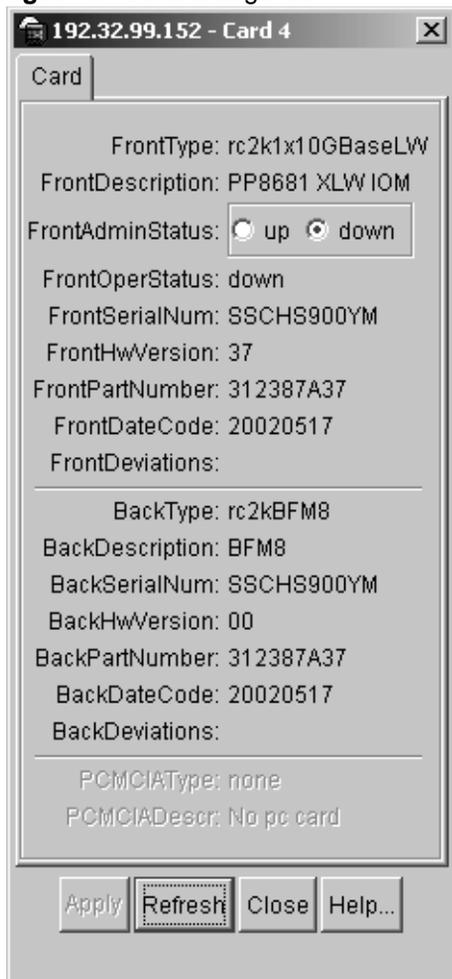


Table 8 describes the Card dialog box fields.

Table 8 Card dialog box fields

Field	Description
FrontType/BackType	Used to indicate module types in the 8000 Series. <i>Front</i> refers to the I/O portion of the module.
FrontDescription/BackDescription	Model number of the module (for example, 8681XLW).
FrontAdminStatus	Allows you to change the administrative status of the module, up (enabled) or down (disabled).
FrontOperStatus	Indicates the operational status of this module.
FrontHwVersion/BackHwVersion	Hardware version of the I/O module.
FrontPartNumber/BackPartNumber	Part number of the module.
FrontDateCode/BackDateCode	Manufacturing date code for the module.
FrontDeviations/BackDeviations	Deviations.
PCMCIAType	Used to indicate the type of PCMCIA card currently installed in this CPU module, if any. For non-CPU modules, this variable has no meaning and will always be set to none.
PCMCIADescr	PCMCIA description.

Configuring the port's administrative status

To change the a port's administrative status on the 10GE LAN/WAN module:

- 1 On the Device view, double-click on the 10GE LAN/WAN port ([Figure 5](#)).

Figure 5 Device view with 10GE LAN/WAN port selected

The Port dialog box opens with the 10GE Interface tab displayed ([Figure 6](#)).

Figure 6 10GE Interface tab—Port dialog box

192.32.99.152 - Port 7/1

10GE Interface | 10GE WIS | VLAN | STG | MAC Learning | Rate Limiting | Test | IP Address | ARP | DHCP | DVMRP | IGMP | OSPF | RIP | PIM | PGM | VRRP | Ro

Index: 448
 Name:
 Descr: 10GbLW Port 7/1
 Type: rc10GbLW
 Mtu: 1950
 PhysAddress: 00:e0:7b:b7:5d:00
 VendorDescr:

AdminStatus: up down testing
 OperStatus: up
 LastChange: 00h:35m:11s
 LinkTrap: enabled disabled

OperDuplex: full
 OperSpeed: 10000

QoSLevel: level0 level1 level2 level3 level4 level5 level6 level7
 DiffServEnable
 DiffServType: none access core

TelephonyAndMultimediaFilterEnable
 MultimediaPlatformAndDevice:

Mtld: 0
 Locked: false
 UnknownMacDiscard
 DirectBroadcastEnable

Action: none flushMacFdb flushArp flushIp flushAll triggerRipUpdate clearLoopDetectAlarm
 Result: none

Apply Refresh Close Help...

Table 9 describes the 10GE Interface tab fields.

Table 9 10GE Interface tab field descriptions

Field	Description
Index	Unique value assigned to each interface. The value ranges between 16 and 255.
Name	Displays the name of this port. To assign or change a name to the port, highlight the field and enter alphanumeric characters.
Descr	Displays the port type of this interface and the slot/port number.
Type	Displays the media type of this interface.
Mtu	The size of the largest packet, in octets, that can be sent/received on the interface.
PhysAddress	MAC address assigned to a particular interface.
VendorDescr	Vendor description.
AdminStatus	Sets the port to either of the following states: <ul style="list-style-type: none"> • up • down • testing When a managed system initializes, all interfaces start with AdminStatus in the down state. As a result of either management or configuration action, the AdminStatus is changed to the up state (or remains in the down state).
OperStatus	Displays the current operational state of the interface: <ul style="list-style-type: none"> • up • down If AdminStatus is down, then OperStatus should be down. If AdminStatus is changed to up, then OperStatus should change to up if the interface is ready to transmit and receive network traffic. It should remain in the down state if and only if there is a fault that prevents it from going to the up state.
LastChange	Displays the value of sysUpTime at the time the interface entered its current operational state. If the current state was entered prior to the last reinitialization of the local network management subsystem, the value is zero.
LinkTrap	Indicates whether or not link Up/link Down traps should be generated for this interface.
OperDuplex	The current operational duplex mode of the port (always full for the 10GE LAN/WAN module).

Table 9 10GE Interface tab field descriptions (continued)

Field	Description
OperSpeed	Displays the current operating speed of the 10GBASE-LR/LW port.
QosLevel	Quality of service level.
DiffServEnable	Used to enable differentiated services on this port.
DiffServType	Sets the type of differentiated service to none, access or core.
TelephonyAndMultimediaFilterEnable	Enables IP telephony and MultiMedia Filters.
MultiMediaPlatformAndDevice	Opens a dialog box that allows you to select the platform and device for multimedia.
MltId	MultiLink Trunk to which the port is assigned (if any).
Locked	Displays whether or not the port is locked. When locked, the port configuration cannot be changed. To lock or unlock a port, select Edit > Security > Port Lock.
UnknownMacDiscard	If rcUnknownMacDiscard is set to True, then a packet with an unknown source MAC address is dropped on that port, and other ports then will discard any packets with this MAC address in the destination field. For example, suppose 11:22:33:44:55:66 is an unknown source MAC. Packets with source MAC 11:22:33:44:55 coming from this port are discarded; furthermore, packets with destination MAC 11:22:33:44:55:66 coming from other ports are also discarded, unless this address is later learned on another port or the restriction ages out.
DirectBroadcastEnable	Used to indicate whether this interface should forward direct broadcast traffic.
Action	Sets one of the following port-related actions: <ul style="list-style-type: none"> • none • flushMacFdb—flush MAC forwarding table for port • flushArp—flush ARP table for port • flushIp—flush IP route table for port • flushAll—flush all tables for port • triggerRipUpdate—manually update the RIP table
Result	Displays result from the last system action.

Configuring the WAN framing type

To configure the WAN framing type:

- 1 On the Device View, double-click on the 10GE WAN port (Figure 5).
The Port dialog box opens with the 10GE Interface tab displayed (Figure 6).
- 2 Click the 10GE WIS tab.
The 10GE WIS tab opens (Figure 7).



Note: The 10GE WIS tab is displayed only when configuring the 10GE WAN module. If you attempt to configure the transport type of the 10GE LAN module, the error message `noSuchInstance` will display.

Figure 7 10GE WIS tab—Port dialog box.



Table 10 describes the 10GE WIS tab fields.

Table 10 10GE WIS tab fields

Field	Description
Index	Unique value assigned to each interface. The value ranges between 16 and 255.
Transport (framing)	Select your framing type based on your WAN connection type: <ul style="list-style-type: none"> sonet (SONET - Synchronous Optical Network); standard format in North America sdh (SDH - Synchronous Digital Hierarchy); standard format used in Europe
MediumType	The current framing (SONET or SDH) operating on this interface.
MediumTimeElapsed	Number of seconds, including partial seconds, that have elapsed since the beginning of the current measurement period. If, for some reason, such as an adjustment in the system's time-of-day clock, the current interval exceeds the maximum value, the agent will return the maximum value.
MediumValidIntervals	Number of previous 15-minute intervals for which performance monitoring data was collected.
MediumLineCoding	Line coding for this interface. This is always Non-Return to Zero (NRZ) for 10GE WAN.
MediumLineType	Line type for this interface. Currently, this will be only LongSingle, indicating long-range, single-mode fiber.
MediumCircuitIdentifier	Transmission vendor's circuit identifier, for the purpose of facilitating troubleshooting. Note that the circuit identifier, if available, is also represented by ifPhysAddress.

Configuring flow control

Flow control for 10GE LAN/WAN modules can be configured only using the command line interface. See [“Configuring flow control” on page 68](#) for instructions on how to configure flow control.

Performing a 10GE LAN/WAN loopback test

This section describes the loopback test features in Device Manager available for the 10GE LAN/WAN Module.

You can perform two types of loopback test, internal and external. The internal loopback test is the default.



Note: All ports must be in test mode to conduct any testing.

To test for loopback:

- 1 On the Device View, double-click on the port (Figure 5 on page 36).
The Port dialog box opens with the Interface tab displayed (Figure 6 on page 37).
- 2 In the AdminStatus field, click testing.
- 3 Click Apply.
- 4 Click the Test tab.

The Test tab opens (Figure 8).

Figure 8 Port dialog box—Test tab

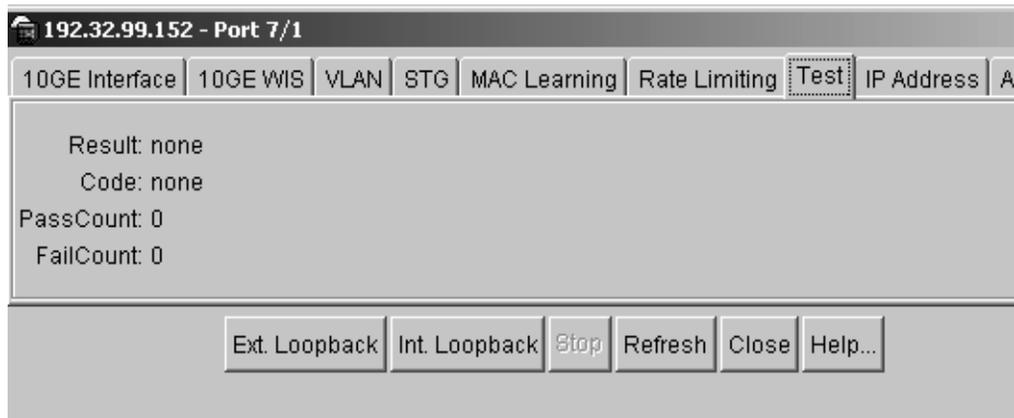


Table 11 describes the Test tab fields.

Table 11 Test tab fields

Result	Result of the test.
Code	Code used for test.
PassCount	Number of events which passed the test.
FailCount	Number of events which failed the test.

- 5** Click Ext. Loopback to test the external loopback or click Int. Loopback to test the internal loopback.

A dialog box displays the test results.

- 6** Click Stop to cease testing.
- 7** Click Close.
- 8** Click the Interface tab.
- 9** In the AdminStatus field, click up.
- 10** Click Apply.



Note: To run the external loopback test, you need a loopback cable on that port.

The test statistics are available only when the test has finished, unlike Ethernet ports where the test statistics can be viewed during testing.

Viewing the Trap Log

To view the Trap Log that contains SONET-specific traps:

→ Click the bell icon on the toolbar.



The Trap dialog box opens (Figure 9).

Figure 9 Trap Log dialog box

Trap Log			
Node	Time	Type	Description
192.32.99.152	2002/08/19-09:29:54	linkDown.0	Index.0=4/1 , AdminStatus.0=up , OperStat
192.32.99.152	2002/08/19-09:29:54	rc2kCardDown.0	rc2kCardIndex.0=4 , rc2kCardFrontAdminS
192.32.99.152	2002/08/19-09:29:58	rcStpTCN.0	rcStgId.0=1 , rcPortIndex.0=9/6 , rcStgBridg
192.32.99.152	2002/08/19-09:29:59	linkUp.0	Index.0=4/1 , AdminStatus.0=up , OperStat
192.32.99.152	2002/08/19-09:30:00	linkDown.0	Index.0=4/1 , AdminStatus.0=up , OperStat
192.32.99.152	2002/08/19-09:30:01	linkUp.0	Index.0=4/1 , AdminStatus.0=up , OperStat
192.32.99.152	2002/08/19-09:30:09	linkDown.0	Index.0=4/1 , AdminStatus.0=up , OperStat
192.32.99.152	2002/08/19-09:30:09	rc2kCardDown.0	rc2kCardIndex.0=4 , rc2kCardFrontAdminS
192.32.99.152	2002/08/19-09:30:28	rc2kCardDown.0	rc2kCardIndex.0=7 , rc2kCardFrontAdminS
192.32.99.152	2002/08/19-09:30:35	rc2kCardDown.0	rc2kCardIndex.0=7 , rc2kCardFrontAdminS

Export... Clear ▼ Close

Table 12 describes the fields in the Trap Log dialog box.

Table 12 Trap Log dialog box fields

Field	Description
Node	IP address of the device sending SONET trap.
Time	Timestamp in the trap.
Type	Type of SONET trap: Section/Line/Path alarm.
Description	Description of the alarm: LOS, LOF, and so forth.

Table 13 lists the alarms that are specific to the 10GE WAN module. The alarms are listed in order of priority.

Table 13 10GE WAN alarms

Name	Description
Section alarms	
NO DEFECT	No SONET/SDH defects are present.
LOS	Loss of signal - not enough Rx power or fiber disconnected.
LOF	Loss of frame - unable to frame the signal correctly, possibly due to improper timing setup.
Line Alarms	
L-AIS	Alarm Indication Signal - sent out when a port is disabled or indicates another line failure.
L-RDI	Remote Defect Indication - the result of a L-AIS or LOS/LOF at the remote end.
Path Alarms	
P-AIS	Path Alarm Indication Signal - indicates a propagation upstream of a downstream L-AIS alarm or another path failure.
P-LOP	Path Loss of Pointer - the pointer to the Sonet SPE is not correct; sometimes due to dirty fiber, or timing slips.
P-RDI	Path Remote Defect Indication- the result of a P-AIS alarm at the remote end.

Table 13 10GE WAN alarms (continued)

Name	Description
P-SLM	Path Signal Label Mismatch - path labels do not match, in particular the C2 label is mismatched. (The C2 label for 10GE WAN is 0x1A.)
P-UNEQ	Path unequipped - the Sonet path may not be fully provisioned to handle traffic cross-connects.

Viewing 10GE LAN/WAN port statistics

Device Manager allows you to graph and display certain read-only statistics for the 10GE LAN/WAN.

The values for the 10GE Interface, 10GE Ethernet Errors, 10GE Bridging, 10GE Spanning Tree, and 10GE Routing tabs are displayed for absolute, cumulative, average, minimum, maximum, and last values.

[Table 14](#) describes these values.

Table 14 Types of statistics

Field	Description
AbsoluteValue	The total count since the last reset of counters. A system reboot resets all counters.
Cumulative	The total count since the statistics tab was first opened. The elapsed time for the cumulative counter is displayed at the bottom of the statistics window.
Average	The cumulative count divided by the cumulative elapsed time.
Minimum	The minimum average for the counter for a given polling interval over the cumulative elapsed time.
Maximum	The maximum average for the counter for a given polling interval over the cumulative elapsed time.
LastValue	The average for the counter over the last polling period.

The values for the Section, Line, FE Line, Path, and FE Path tabs are updated based on the poll interval.

The 10GE LAN/WAN Modules provides the following read-only statistics tabs:

- “Viewing 10GE WAN section statistics,” next
- “Viewing 10GE WAN Line statistics” on page 49
- “Viewing 10GE WAN FE Line statistics” on page 51
- “Viewing 10GE WAN path statistics” on page 52
- “Viewing 10GE WAN FE path statistics” on page 54
- “Viewing 10GE LAN/WAN interface statistics” on page 55
- “Viewing 10GE LAN/WAN Ethernet errors statistics” on page 58
- “Viewing 10GE LAN/WAN bridging statistics” on page 61
- “Viewing 10GE LAN/WAN Spanning Tree statistics” on page 62
- “Viewing 10GE LAN/WAN routing statistics” on page 64

Viewing 10GE WAN section statistics



Note: The 10GE WAN module displays only the 10GE SONET statistics.

To display Section statistics:

- 1 On the device view, right-click the port.
- 2 Choose Graph 10GE SONET.

The GraphPort dialog box opens with the Section statistics tab displayed (Figure 10).

Figure 10 GraphPort dialog box—Section tab

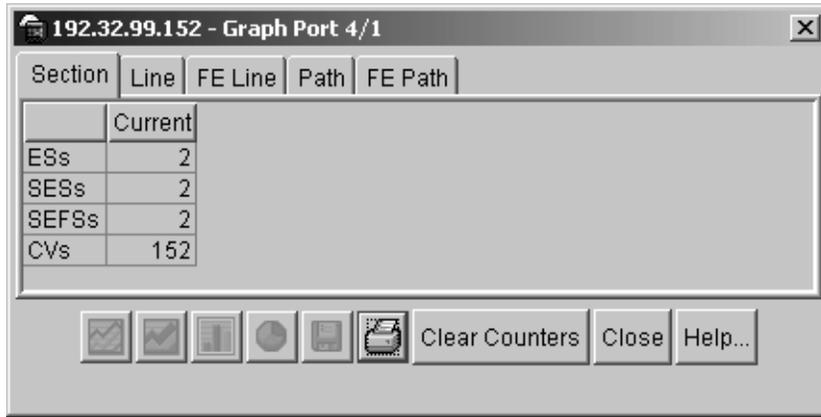


Table 15 describes the fields in the Section tab.

Table 15 Section tab fields

Field	Description
ESs	Errored Second (ES) is a second with one or more Coding Violations or one or more incoming defects, for example, SEF, LOS, AIS, LOP.
SESs	Severely Errored Second (SES) is a second with x or more Coding Violations (CV), or a second with at least one or more incoming defects. The value of x is defined for a given Bit Error Rate (BER) as outlined in Annex 50A of the IEEE 802.3ae specification ¹ .
SEFSs	Severely Errored Framing Second (SEFS) is a second containing one or more SEF events.
CVs	Coding Violations (CV) are Bit Interleaved Parity (BIP) errors that are detected in the incoming signal. CV counters are incremented for each BIP error detected.

¹ A BER of 10⁻⁶ corresponds to the default Section SES threshold of 8554.

Viewing 10GE WAN Line statistics

To display Line statistics:

- 1 On the device view, right-click the port.
- 2 Choose Graph Port.

The graphPort dialog box opens with the Section statistics tab displayed (Figure 10 on page 48).

- 3 Click the Line tab.

The Line tab opens (Figure 11).

Figure 11 GraphPort dialog box—Line tab

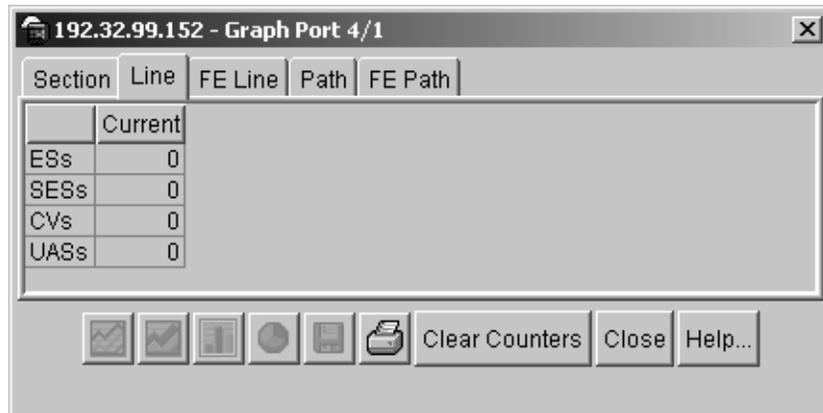


Table 16 describes the fields in the Line tab.

Table 16 Line tab fields

Field	Description
ESs	Errored Second (ES) is a second with one or more Coding Violations or one or more incoming defects, for example, SEF, LOS, AIS, or LOP.
SEsSs	Severely Errored Second (SES) is a second with x or more Coding Violations (CV), or a second with at least one or more incoming defects. The value of x is defined for a given Bit Error Rate (BER) as outlined in Annex 50A of the IEEE 802.3ae specification ¹ .
CVs	Coding Violations (CV) are Bit Interleaved Parity (BIP) errors that are detected in the incoming signal. CV counters are incremented for each BIP error detected.
UASs	Number of seconds that the interface is unavailable.

¹ A BER of 10^{-6} corresponds to the default Line SES threshold of 9835.

Viewing 10GE WAN FE Line statistics

To display FE Line statistics:

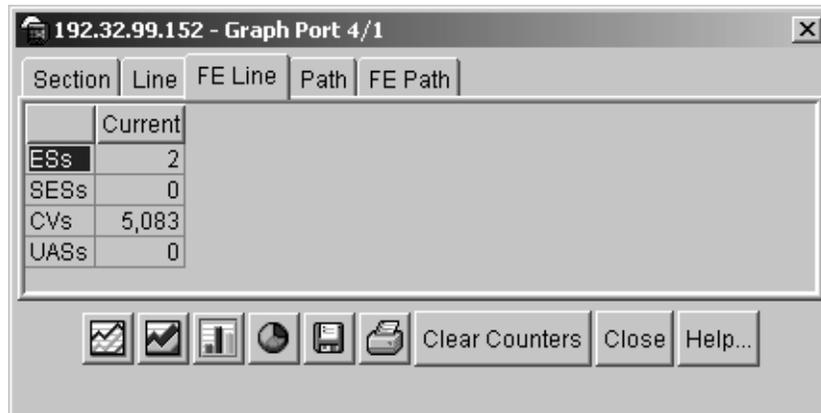
- 1 On the device view, right-click the port.
- 2 Choose Graph Port.

The graphPort dialog box opens with the Section statistics tab displayed (Figure 10 on page 48).

- 3 Click the FE Line tab.

The FE Line tab opens (Figure 12).

Figure 12 GraphPort dialog box—FE Line tab



[Table 17](#) describes the fields in the FE Line tab.

Table 17 FE Line tab fields

Field	Description
ESs	Errored Second (ES) is a second with one or more Coding Violations or one or more incoming defects, for example, SEF, LOS, AIS, or LOP.
SESs	Severely Errored Second (SES) is a second with x or more Coding Violations (CV), or a second with at least one or more incoming defects. The value of x is defined for a given Bit Error Rate (BER) as outlined in Annex 50A of the IEEE 802.3ae specification.
CVs	Coding Violations (CV) are Bit Interleaved Parity (BIP) errors that are detected in the incoming signal. CV counters are incremented for each BIP error detected.
UASs	Number of seconds that the interface is unavailable.

Viewing 10GE WAN path statistics

To display path statistics:

- 1 On the device view, right-click the port.
- 2 Choose Graph Port.

The graphPort dialog box opens with the Section statistics tab displayed ([Figure 10 on page 48](#)).

- 3 Click the Path tab.

The Path tab opens ([Figure 13](#)).

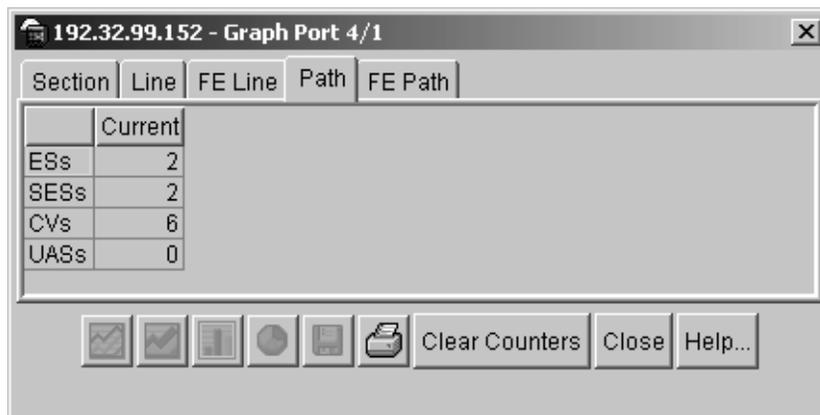
Figure 13 GraphPort dialog box — Path tab

Table 18 describes the fields in the Path tab.

Table 18 Path tab fields

Field	Description
ESs	Errored Second (ES) is a second with one or more Coding Violations or one or more incoming defects, for example, SEF, LOS, AIS, or LOP.
SESs	Severely Errored Second (SES) is a second with x or more Coding Violations (CV), or a second with at least one or more incoming defects. The value of x is defined for a given Bit Error Rate (BER) as outlined in Annex 50A of the IEEE 802.3ae specification ¹ .
CVs	Coding Violations (CV) are Bit Interleaved Parity (BIP) errors that are detected in the incoming signal. CV counters are incremented for each BIP error detected.
UASs	Number of seconds that the interface is unavailable.

¹ The default Path SES threshold of 2400 corresponds to a situation where 30% of all of the SPEs being received have parity errors detected via the Path BIP checks.

Viewing 10GE WAN FE path statistics

To display FE path statistics:

- 1 On the device view, right-click the port.
- 2 Choose Graph Port.

The GraphPort dialog box opens with the Section statistics tab displayed (Figure 10 on page 48).

- 3 Click the FE Path tab.

The FE Path tab opens (Figure 14).

Figure 14 GraphPort dialog box— FE Path tab

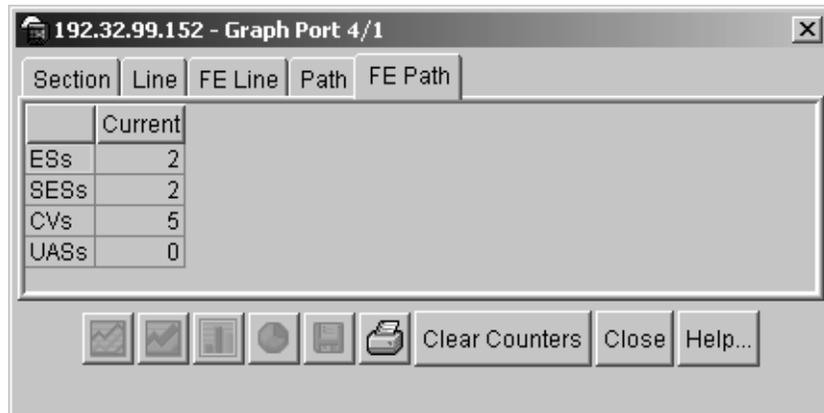


Table 19 describes the fields in the FE Path tab.

Table 19 FE Path tab fields

Field	Description
ESs	Errored Second (ES) is a second with one or more Coding Violations or one or more incoming defects, for example, SEF, LOS, AIS, or LOP.
SESSs	Severely Errored Second (SES) is a second with x or more Coding Violations (CV), or a second with at least one or more incoming defects. The value of x is defined for a given Bit Error Rate (BER) as outlined in Annex 50A of the IEEE 802.3ae specification.
CVs	Coding Violations (CV) are Bit Interleaved Parity (BIP) errors that are detected in the incoming signal. CV counters are incremented for each BIP error detected.
UASs	Number of seconds that the interface is unavailable.

Viewing 10GE LAN/WAN interface statistics

To view interface statistics:

- 1 On the Device View, select a port ([Figure 5](#)).
- 2 From the Device Manager menu bar, select Graph > Port.

The GraphPort dialog box opens with the 10GE Interface tab displayed ([Figure 15](#)).

Figure 15 GraphPort dialog box—10GE Interface tab

	AbsoluteValue	Cumulative	Average/sec	Minimum/sec	Maximum/sec	LastVal/sec
InOctets	320					
OutOctets	320					
InUcastPkts	0					
OutUcastPkts	0					
InMulticastPkts	5					
OutMulticastPkts	5					
InBroadcastPkts	0					
OutBroadcastPkts	0					
InDiscards	0					
InErrors	0					
InUnknownProtos	0					
InFlowCtrlPkts	0					
OutFlowCtrlPkts	0					
NumStateTransition	0					

Table 20 describes the fields in the 10GE Interface tab.

Table 20 10GE Interface tab fields

Field	Description
InOctets	The total number of octets received on the interface, including framing characters.
OutOctets	The total number of octets transmitted out of the interface, including framing characters.
InUcastPkts	The number of packets delivered by this sublayer to a higher sublayer that were not addressed to a multicast or broadcast address at this sublayer.
OutUcastPkts	The number of packets that higher-level protocols requested be transmitted that were not addressed to a multicast address at this sublayer. This total number includes those packets discarded or not sent.
InMulticastPkts	The number of packets delivered by this sublayer to a higher sublayer that were addressed to a multicast address at this sublayer. For a MAC layer protocol, this number includes both Group and Functional addresses.

Table 20 10GE Interface tab fields (continued)

Field	Description
OutMulticastPkts	The total number of packets that higher-level protocols requested be transmitted, and that were addressed to a multicast address at this sublayer, including those that were discarded or not sent. For a MAC layer protocol, this number includes both Group and Functional addresses.
InBroadcastPkts	The number of packets delivered by this sublayer to a higher sublayer that were addressed to a broadcast address at this sublayer.
OutBroadcastPkts	The total number of packets that higher-level protocols requested be transmitted, and that were addressed to a broadcast address at this sublayer, including those that were discarded or not sent.
InDiscards	The number of inbound packets that were discarded because of frames with errors or invalid frames or, in some cases, to fill up buffer space.
InErrors	Number of inbound packets that contained errors preventing them from being deliverable to a higher-layer protocol.
InUnknownProtos	Number of packets received via the interface which were discarded because of an unknown or unsupported protocol.
InFlowCtrlPkts	The total number of flow control packets received by this interface.
OutFlowCtrlPkts	The total number of flow control packets transmitted by this interface.
NumStateTransition	The number of times the port went in and out of service; the number of state transitions from up to down.

Viewing 10GE LAN/WAN Ethernet errors statistics

To view Ethernet errors statistics:

- 1 On the Device View, select a port (Figure 5).
- 2 From the Device Manager menu bar, select Graph > Port.

The GraphPort dialog box opens with the 10GE Interface tab displayed (Figure 15).

- 3 Click the 10GE Ethernet Errors tab.

The 10GE Ethernet Errors tab opens (Figure 16).

Figure 16 GraphPort dialog box—10GE Ethernet Errors tab

	AbsoluteValue	Cumulative	Average/sec	Minimum/sec	Maximum/sec	LastVal/sec
AlignmentErrors	0					
FCSErrors	0					
InternalMacTransmitErrors	0					
InternalMacReceiveErrors	0					
CarrierSenseErrors	0					
FrameTooLongs	0					
SQETestErrors	0					
DeferredTransmissions	0					
SingleCollisionFrames	0					
MultipleCollisionFrames	0					
LateCollisions	0					
ExcessiveCollisions	0					
FrameTooShorts	0					
LinkFailures	4					
PacketErrors	0					
CarrierErrors	0					
LinkInactiveErrors	0					

Table 21 describes the 10GE Ethernet Errors tab fields.

Table 21 10GE Ethernet Errors tab fields

Field	Description
AlignmentErrors	A count of frames received on a particular interface that are not an integral number of octets in length and do not pass the FCS check. The count represented by an instance of this object is incremented when the alignmentError status is returned by the MAC service to the LLC (or other MAC user). Received frames for which multiple error conditions obtain are, according to the conventions of IEEE 802.3 Layer Management, counted exclusively according to the error status presented to the LLC.
FCSErrors	A count of frames received on a particular interface that are an integral number of octets in length but do not pass the FCS check. The count represented by an instance of this object is incremented when the frameCheckError status is returned by the MAC service to the LLC (or other MAC user). Received frames for which multiple error conditions obtained are, according to the conventions of IEEE 802.3 Layer Management, counted exclusively according to the error status presented to the LLC.
InternalMacTransmitErrors	A count of frames for which transmission on a particular interface fails due to an internal MAC sublayer transmit error. A frame is only counted by an instance of this object if it is not counted by the corresponding instance of either the dot3StatsLateCollisions object, the dot3StatsExcessiveCollisions object, or the dot3StatsCarrierSenseErrors object. The precise meaning of the count represented by an instance of this object is implementation specific. In particular, an instance of this object may represent a count of transmission errors on a particular interface that are not otherwise counted.
InternalMacReceiveErrors	A count of frames for which reception on a particular interface fails due to an internal MAC sublayer receive error. A frame is only counted by an instance of this object if it is not counted by the corresponding instance of either the dot3StatsFrameTooLongs object, the dot3StatsAlignmentErrors object, or the dot3StatsFCSErrors object. The precise meaning of the count represented by an instance of this object is implementation specific. In particular, an instance of this object may represent a count of receive errors on a particular interface that are not otherwise counted.

Table 21 10GE Ethernet Errors tab fields (continued)

Field	Description
CarrierSenseErrors	The number of times that the carrier sense condition was lost or never asserted when attempting to transmit a frame on a particular interface. The count represented by an instance of this object is incremented at most once per transmission attempt, even if the carrier sense condition fluctuates during a transmission attempt.
FrameTooLongs	A count of frames received on a particular interface that exceed the maximum permitted frame size. The count represented by an instance of this object is incremented when the frameTooLong status is returned by the MAC service to the LLC (or other MAC user). Received frames for which multiple error conditions obtained are, according to the conventions of IEEE 802.3 Layer Management, counted exclusively according to the error status presented to the LLC.
SQETestErrors	A count of times that the SQE TEST ERROR message is generated by the PLS sublayer for a particular interface. The SQE TEST ERROR message is defined in section 7.2.2.2.4 of ANSI/IEEE 802.3-1985 and its generation described in section 7.2.4.6 of the same document.
DeferredTransmissions	A count of frames for which the first transmission attempt on a particular interface is delayed because the medium is busy. The count represented by an instance of this object does not include frames involved in collisions.
SingleCollisionFrames	A count of successfully transmitted frames on a particular interface for which transmission is inhibited by exactly one collision. A frame that is counted by an instance of this object is also counted by the corresponding instance of either the ifOutUcastPkts, ifOutMulticastPkts, or ifOutBroadcastPkts, objects and is not counted by the corresponding instance of the dot3StatsMultipleCollisionFrames object.
MultipleCollisionFrames	A count of successfully transmitted frames on a particular interface for which transmission is inhibited by more than one collision. A frame that is counted by an instance of this object is also counted by the corresponding instance of either the ifOutUcastPkts, ifOutMulticastPkts, or ifOutBroadcastPkts, objects and is not counted by the corresponding instance of the dot3StatsSingleCollisionFrames object.

Table 21 10GE Ethernet Errors tab fields (continued)

Field	Description
LateCollisions	The number of times that a collision is detected on a particular interface later than 512 bit-times into the transmission of a packet; 512 corresponds to 51.2 microseconds on a 10 Mb/s system. A (late) collision included in a count represented by an instance of this object is also considered as a (generic) collision for purposes of other collision-related statistics.
ExcessiveCollisions	A count of frames for which transmission on a particular interface fails due to excessive collisions.
FrameTooShorts	The total number of frames that are too short that were encountered on this interface.
LinkFailures	The total number of link failures encountered on this interface.
PacketErrors	The total number of packet errors encountered on this interface.
CarrierErrors	The total number of carrier errors encountered on this interface.
LinkInactiveErrors	The total number of link inactive errors encountered on this interface.

Viewing 10GE LAN/WAN bridging statistics

To view bridging statistics:

- 1 On the Device View, select a port (Figure 5).
- 2 From the Device Manager menu bar, select Graph > Port.
The GraphPort dialog box opens with the 10GE Interface tab displayed (Figure 15).
- 3 Click the 10GE Bridging tab.
The 10GE Bridging tab opens (Figure 17).

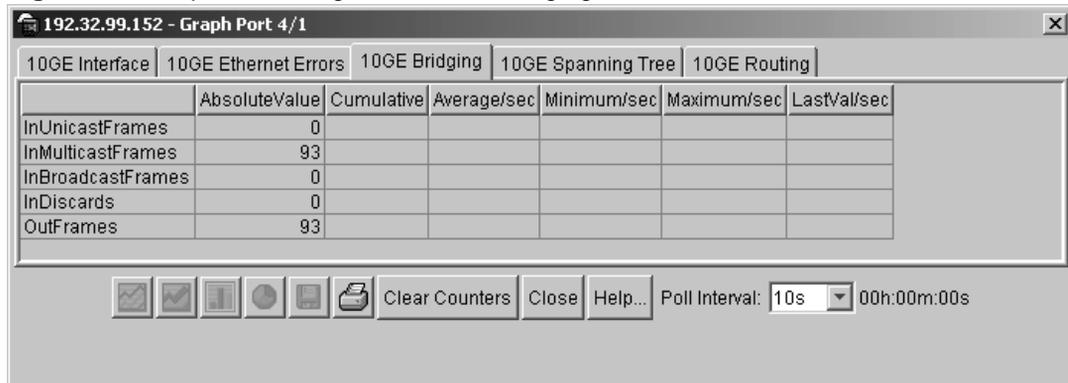
Figure 17 GraphPort dialog box—10GE Bridging tab

Table 22 describes the fields in the 10GE Bridging tab.

Table 22 10GE Bridging tab fields

Field	Description
InUnicastFrames	The total number of incoming unicast frames bridged.
InMulticastFrames	The total number of incoming multicast frames bridged.
InBroadcastFrames	The total number of incoming broadcast frames bridged.
InDiscards	The total number of frames discarded by the bridging entity.
OutUnicastFrames	The total number of outgoing unicast frames bridged.
OutMulticastFrames	The total number of outgoing multicast frames bridged.
OutBroadcastFrames	The total number of outgoing broadcast frames bridged.

Viewing 10GE LAN/WAN Spanning Tree statistics

To view Spanning Tree statistics:

- 1 On the Device View, select a port (Figure 5).
- 2 From the Device Manager menu bar, select Graph > Port.

The GraphPort dialog box opens with the 10GE Interface tab displayed (Figure 15).

3 Click the 10GE Spanning Tree tab.

The 10GE Spanning Tree tab opens (Figure 18).

Figure 18 GraphPort dialog box—10GE Spanning Tree tab

	AbsoluteValue	Cumulative	Average/sec	Minimum/sec	Maximum/sec	LastVal/sec
InConfigBpdus	134					
InTcnBpdus	0					
InBadBpdus	0					
OutConfigBpdus	67					
OutTcnBpdus	0					

Table 23 describes the 10GE Spanning Tree tab fields.

Table 23 10GE Spanning Tree tab fields

Field	Description
InConfigBpdus	The number of Config BPDUs received.
InTcnBpdus	The number of Topology Change Notification BPDUs received.
InBadBpdus	The number of unknown or malformed BPDUs received.
OutConfigBpdus	The number of Config BPDUs transmitted.
OutTcnBpdus	The number of Topology Change Notification BPDUs transmitted.

Viewing 10GE LAN/WAN routing statistics

To view routing statistics:

- 1 On the Device View, select a port (Figure 5).
- 2 From the Device Manager menu bar, select Graph > Port.

The GraphPort dialog box opens with the 10GE Interface tab displayed (Figure 15).

- 3 Click the 10GE Routing tab.

The 10GE Routing tab opens (Figure 19).

Figure 19 GraphPort dialog box—10GE Routing tab

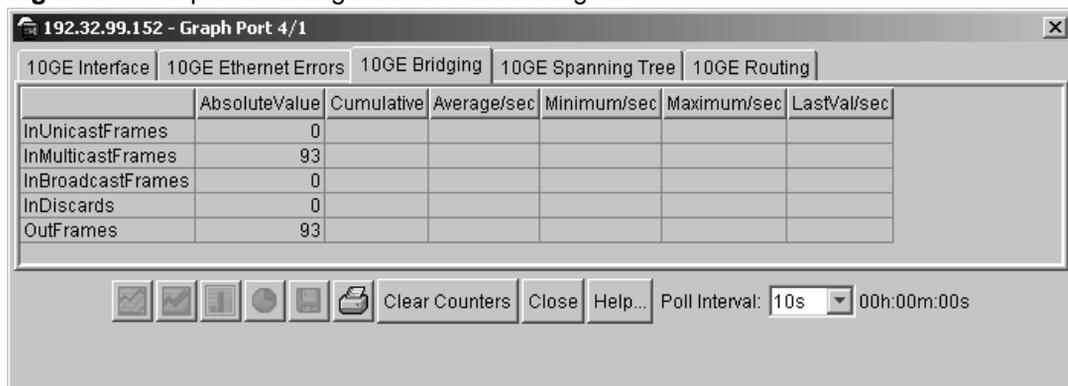


Table 24 describes the fields in the 10GE Routing tab.

Table 24 10GE Routing tab fields

Field	Description
InUnicastFrames	The total number of incoming unicast frames routed.
InMulticastFrames	The total number of incoming multicast frames routed.
InDiscards	The total number of frames discarded by the routing entity.
OutUnicastFrames	The total number of outgoing unicast frames routed.
OutMulticastFrames	The total number of outgoing multicast frames routed.

Chapter 4

Configuring and monitoring the 10GE LAN/WAN modules using the CLI

Two management tools enable you to configure your 10GE LAN/WAN modules: Device Manager and the command line interface (CLI). This chapter describes only those CLI commands specific to the 10GE LAN/WAN module. For information on other configuration options, refer to your release notes for a list of related publications for your software release.

This chapter describes how to configure the 10GE LAN/WAN module using the CLI, and includes the following topics:

Topic	Page
Roadmap of 10GE commands	66
Configuring the 10GE LAN/WAN module with the CLI	67
Viewing 10GE WAN port statistics with the CLI	70

Roadmap of 10GE commands

The following roadmap lists some of the 10GE commands. Use this list as a quick reference or click on any command entry for more information.

Command

```
config ethernet <port>
clock-source [<internal|line>]

config ethernet <slot/port>
[<enable | disable>]

config ethernet <port> framing
[<sonet|sdh>]

config ethernet <port/slot> tx
flow control [enable|disable]

config ethernet <port/slot>
fc-pause0 [enable|disable]

config ethernet <port/slot>
fc-pause-time <1...65535>

test loopback <ports> [<int |
ext>]

show ports stats wis activealarms
[<ports>]

show ports stats wis
sectioncurrent [<ports>]

show ports stats wis
sectioninterval <intervalid>
[<ports>]

show ports stats wis linecurrent
[<ports>]

show ports stats wis lineinterval
<intervalid> [<ports>]

show ports stats wis felinecurrent
[<ports>]

show ports stats wis
felineinterval <intervalid>
[<ports>]
```

Command

```
show ports stats wis pathcurrent  
[<ports>]  
  
show ports stats wis pathinterval  
<intervalid> [<ports>]  
  
show ports stats wis fepathcurrent  
[<ports>]  
  
show ports stats wis  
fepathinterval <intervalid>  
[<ports>]  
  
show ports stats wis sonetmedium  
[<port>]
```

Configuring the 10GE LAN/WAN module with the CLI

This section describes the specific commands used to configure the 10GE LAN/WAN modules using the command line interface, and includes the following topics:

Topic	Page
Configuring the clock source	68
Configuring the port's administrative status	68
Configuring the WAN framing type	68
Configuring flow control	68
Performing a 10GE LAN/WAN loopback test	70
Displaying active alarms	70

Configuring the clock source

To configure the clock source of your 10GE WAN module, use the CLI command:

```
config ethernet <port> clock-source [<internal|line>]
```

where:

- *internal* mode uses the onboard oscillator to generate the Tx clock
- *line* mode uses the recovered Rx clock to generate the Tx clock

The default value is *internal*.

Configuring the port's administrative status

To enable or disable port settings on the 10GE LAN/WAN module, use the CLI command:

```
config ethernet <slot/port> [<enable | disable>]
```

Configuring the WAN framing type

To configure the WAN framing type, use the CLI command:

```
config ethernet <port> framing [<sonet|sdh>]
```

where:

- *sonet* is Synchronous Optical Network; standard format in North America
- *sdh* is Synchronous Digital Hierarchy; standard format in Europe

The default value is *sonet*.

Configuring flow control

This section describes how to enable or disable flow control, how to enable or disable flow-control pause0, and how to set flow-control pause0 time.

Enabling or disabling flow control

When `tx-flow-control` is enabled, the TX port will transmit MAC control pause frames to indicate congestion on the receive side of the port interface. The link partner will cease transmission based on the MAC control frame pause-timer value.

To enable or disable flow control for the 10GE LAN/WAN module, use the CLI command:

```
config ethernet <port/slot> tx flow control [enable|disable]
```

The default value is `disable`.

Enabling or disabling flow-control-pause0

When `tx-flow-control` is enabled and `fc-pause0` is enabled, the TX port will transmit MAC control pause frames with a timer value of 0 to indicate to its link partner to resume transmission.

To enable or disable flow control pause0 for the 10GE LAN/WAN module, use the CLI command:

```
config ethernet <port/slot> fc-pause0 [enable|disable]
```

The default value is `enable`.

Setting the flow control pause timer

Setting the `flow-control-pause` time sets the timer value in the MAC control pause frame to indicate to the link partner how long to pause transmission. The pause time is in 512 bit-times.



Note: Do not set the `fc-pause-time` to a low value, such as 1 or 2. These lower values will not have a useful effect on network congestion.

To set the flow-control-pause0 time, use the CLI command:

```
config ethernet <port/slot> fc-pause-time <1...65535>
```

The default value is 65535.

Performing a 10GE LAN/WAN loopback test

This section describes the loopback test CLI command available for the 10GIGE LAN/WAN module.

You can perform two types of loopback test, internal and external. The internal loopback test is the default.



Note: All ports must be in test mode to conduct any testing.

To test for loopback, use the CLI command:

```
test loopback <ports> [<int | ext>]
```

Viewing 10GE WAN port statistics with the CLI

This section describes the CLI commands available to view 10GE WAN active alarms and port statistics:

Displaying active alarms

To display information about active alarms on specified ports, use the CLI command:

```
show ports stats wis activealarms [<ports>]
```

[Figure 20](#) shows sample output for this command.

Figure 20 show ports stats wis activealarms [<ports>] command output

```

Passport-8610:5# show ports stats wis activealarms

=====
                                Active Alarms
=====
PORT
NUM      ACTIVE ALARM
-----
4/1      No Defect
7/1      LOS

Passport-8610:5#

```

[Table 25](#) describes the show ports stats wis activealarms [<ports>] parameters.

Table 25 show ports stats wis active alarms field parameters

Field	Description
Section alarms	
NO DEFECT	No SONET/SDH defects are present.
LOS	Loss of signal - not enough Rx power or fiber disconnected.
LOF	Loss of frame - unable to frame the signal correctly, possibly due to improper timing setup.
Line Alarms	
L-AIS	Alarm Indication Signal - sent out when a port is disabled or indicates another line failure.
L-RDI	Remote Defect Indication - the result of a L-AIS or LOS/LOF at the remote end.
Path Alarms	
P-AIS	Path Alarm Indication Signal - indicates a propagation upstream of a downstream L-AIS alarm or another path failure.
P-LOP	Path Loss of Pointer - the pointer to the Sonet SPE is not correct; sometimes due to dirty fiber, or timing slips.
P-RDI	Path Remote Indicator - the result of a P-AIS alarm at the remote end.

Table 25 show ports stats wis active alarms field parameters (continued)

Field	Description
P-SLM	Path Signal Label Mismatch - path labels do not match, in particular the C2 label is mismatched. (The C2 label for 10GE WAN is 0x1A.)
P-UNEQ	Path unequipped - the Sonet path may not be fully provisioned to handle traffic cross-connects.

Viewing 10GE WAN section statistics

To display current section statistics on specified ports, use the CLI command:

```
show ports stats wis sectioncurrent [<ports>]
```

[Figure 20](#) shows sample output for this command.

Figure 21 show ports stats wis sectioncurrent [<ports>] command output

```

=====
                                WIS Section Current Stats
=====
PORT  ERRORED SECONDS SEVERELY ERRORED CODE VIOLATION SEVERELY ERRORED
NUM   COUNT (ES)      COUNT (SES)      COUNT (CV-S)    FRAMES (SEF)    STATUS
-----
2/1   32                  32                1027288         32              LOF
=====

```

[Table 26](#) describes the show ports stats wis sectioncurrent [<ports>] parameters.

Table 26 show ports stats wis sectioncurrent [<ports>] parameters

Field	Description
PORT NUM	Slot and port number
ERRORED SECONDS COUNT (ES)	Errored Second (ES) is a second with one or more Coding Violations or one or more incoming defects, for example, SEF, LOS, AIS, LOP.
SEVERELY ERRORED COUNT (SES)	Severely Errored Second (SES) is a second with x or more Coding Violations (CV), or a second with at least one or more incoming defects. The value of x is defined for a given BIT Error Rate (BER) as outlined in Annex 50A of the IEEE 802.3ae specification ¹ .
CODE VIOLATION COUNT (CV-S)	Coding Violations (CV) are Bit Interleaved Parity (BIP) errors that are detected in the incoming signal. CV counters are incremented for each BIP error detected.
SEVERELY ERRORED FRAMES (SEF)	Severely Errored Framing Second (SEFs) is a second containing one or more SEF events
STATUS	Status of defects.

¹ A BER of 10⁻⁶ corresponds to the default Section SES threshold of 8554.

Viewing current section statistics at a specified interval

To display current section statistics on specified ports at a specified interval, use the CLI command:

```
show ports stats wis sectioninterval <intervalid> [<ports>]
```

where:

- *intervalid* is the interval identifier (the interval range is 1 to 96 seconds)
- *ports* is an optional parameter that allows you to specify stats for a specific port.

Figure 20 shows sample output for this command.

Figure 22 show ports stats wis sectioninterval <intervalid> [<ports>] command output

```
=====
                                WIS Section Interval Stats
=====
PORT      ERRORED SECONDS  SEVERELY ERRORED  CODE VIOLATION  SEVERELY ERRORED
NUM      COUNT (ES)      COUNT (SES)       COUNT (CV-S)    FRAMES (SEF)
-----
2/1      900              900                28883030        900
INTERVAL ID = 1
```

Table 27 describes the `show ports stats wis sectioninterval <intervalid> [<ports>]` parameters.

Table 27 `show ports stats wis sectioninterval <intervalid> [<ports>]` parameters

Field	Description
PORT NUM	Slot and port number
ERRORED SECONDS COUNT (ES)	Errored Second (ES) is a second with one or more Coding Violations or one or more incoming defects, for example, SEF, LOS, AIS, LOP.
SEVERELY ERRORED COUNT (SES)	Severely Errored Second (SES) is a second with x or more Coding Violations (CV), or a second with at least one or more incoming defects. The value of x is defined for a given Bit Error Rate (BER) as outlined in Annex 50A of IEEE 802.3ae ¹ .
CODE VIOLATION COUNT (CV)	Coding Violations (CV) are Bit Interleaved Parity (BIP) errors that are detected in the incoming signal. CV counters are incremented for each BIP error detected.
UNAVAILABLE SECONDS (UAS)	Number of seconds that the interface is unavailable.
INTERVAL ID	Each interval (1..96) represents a 15-minute time period (sometimes called a bin). 96 bins represents 24 hours.

¹ A BER of 10^{-6} corresponds to the default Line SES threshold of 9835.

Viewing 10GE WAN current line statistics

To display current line statistics on specified ports, use the CLI command:

```
show ports stats wis linecurrent [<ports>]
```

Figure 20 shows sample output for this command.

Figure 23 show ports stats wis linecurrent [<ports>] command output

```

=====
                                WIS Line Current Stats
=====
PORT  ERRORED SECONDS  SEVERELY ERRORED  CODE VIOLATION  UNAVAILABLE
NUM   COUNT (ES)      COUNT (SES)       COUNT (CV-L)    SECONDS (UAS)  STATUS
-----
2/1   0                0                 0               115            NoDefect
=====

```

[Table 28](#) describes the show ports stats wis linecurrent [<ports>] parameters.

Table 28 show ports stats wis linecurrent [<ports>] parameters

Field	Description
PORT NUM	Slot and port number
ERRORED SECONDS COUNT (ES)	Errored Second (ES) is a second with one or more Coding Violations or one or more incoming defects, for example, SEF, LOS, AIS, LOP.
SEVERELY ERRORED COUNT (SES)	Severely Errored Second (SES) is a second with x or more Coding Violations (CV), or a second with at least one or more incoming defects. The value of x is defined for a given Bit Error Rate (BER) as outlined in Annex 50A of the IEEE 802.3ae specification.
CODE VIOLATION COUNT (CV-L)	Coding Violations (CV) are Bit Interleaved Parity (BIP) errors that are detected in the incoming signal. CV counters are incremented for each BIP error detected.
UNAVAILABLE SECONDS (UAS)	Number of seconds that the interface is unavailable.
STATUS	Status of defects.

Viewing 10GE WAN line statistics at a specified interval

To display current line statistics on specified ports at a specified interval, use the CLI command:

```
show ports stats wis lineinterval <intervalid> [<ports>]
```

where:

- *intervalid* is the interval identifier (the interval range is 1 to 96 seconds)
- *ports* is an optional parameter that allows you to specify stats for a specific port.

Figure 20 shows sample output for this command.

Figure 24 show ports stats wis lineinterval <intervalid> [<ports>] command output

```
=====
                                WIS Line Interval Stats
=====
PORT      ERRORED SECONDS   SEVERELY ERRORED   CODE VIOLATION   UNAVAILABLE
NUM      COUNT (ES)       COUNT (SES)       COUNT (CV-L)     SECONDS
                                      (UAS)
-----
2/1      0                 0                 0                 900
INTERVAL ID = 1
```

Table 29 describes the `show ports stats wis lineinterval <intervalid> [<ports>]` parameters.

Table 29 `show ports stats wis lineinterval <intervalid> [<ports>]` parameters

Field	Description
PORT NUM	Slot and port number
ERRORED SECONDS COUNT (ES)	Errored Second (ES) is a second with one or more Coding Violations or one or more incoming defects, for example, SEF, LOS, AIS, LOP.
SEVERELY ERRORED COUNT (SES)	Severely Errored Second (SES) is a second with x or more Coding Violations (CV), or a second with at least one or more incoming defects. The value of x is defined for a given Bit Error Rate (BER) as outlined in Annex 50A of the IEEE 802.3ae specification.
CODE VIOLATION COUNT (CV-L)	Coding Violations (CV) are Bit Interleaved Parity (BIP) errors that are detected in the incoming signal. CV counters are incremented for each BIP error detected.
UNAVAILABLE SECONDS (UAS)	Number of seconds that the interface is unavailable.
INTERVAL ID	Each interval (1..96) represents a 15-minute time period (sometimes called a bin). 96 bins represents 24 hours.

Viewing 10GE WAN FE line statistics

To display current FE line statistics on specified ports, use the CLI command:

```
show ports stats wis felinecurrent [<ports>]
```

Figure 20 shows sample output for this command.

Figure 25 show ports stats wis felinecurrent [<ports>] command output

```

=====
                                WIS Line Current Stats
=====
PORT  ERRORED SECONDS  SEVERELY ERRORED  CODE VIOLATION  UNAVAILABLE
NUM   COUNT (ES)      COUNT (SES)       COUNT (CV-L)    SECONDS (UAS)  STATUS
-----
2/1   0                0                 0               115            NoDefect
=====

```

Table 30 describes the show ports stats wis felinecurrent [<ports>] parameters.

Table 30 show ports stats wis felinecurrent [<ports>] parameters

Field	Description
PORT NUM	Slot and port number
ERRORED SECONDS COUNT (ES)	Errored Second (ES) is a second with one or more Coding Violations or one or more incoming defects, for example, SEF, LOS, AIS, LOP.
SEVERELY ERRORED COUNT (SES)	Severely Errored Second (SES) is a second with x or more Coding Violations (CV), or a second with at least one or more incoming defects The value of x is defined for a given Bit Error Rate (BER) as outlined in Annex 50A of the IEEE 802.3ae specification.
CODE VIOLATION COUNT (CV-L)	Coding Violations (CV) are Bit Interleaved Parity (BIP) errors that are detected in the incoming signal. CV counters are incremented for each BIP error detected.
UNAVAILABLE SECONDS (UAS)	Number of seconds that the interface is unavailable.
STATUS	Status of defects.

Viewing 10GE WAN FE line statistics at a specified interval

To display current FE line statistics on specified ports at a specified interval, use the CLI command:

```
show ports stats wis felineinterval <intervalid> [<ports>]
```

where:

- *intervalid* is the interval identifier (the interval range is 1 to 96 seconds)
- *ports* is an optional parameter that allows you to specify stats for a specific port.

Figure 20 shows sample output for this command.

Figure 26 show ports stats wis felineinterval <intervalid> [<ports>] command output

```
=====
                                WIS Far End Line Interval Stats
=====
PORT      ERRORED SECONDS  SEVERELY ERRORED  CODE VIOLATION  UNAVAILABLE
NUM      COUNT (ES)      COUNT (SES)       COUNT (CV-L)    SECONDS
                               (UAS)
-----
2/1      0                0                  0                900
INTERVAL ID = 1
```

Table 31 describes the `show ports stats wis felineinterval <intervalid> [<ports>]` parameters.

Table 31 `show ports stats wis felineinterval <intervalid> [<ports>]` parameters

Field	Description
PORT NUM	Slot and port number
ERRORED SECONDS COUNT (ES)	Errored Second (ES) is a second with one or more Coding Violations or one or more incoming defects, for example, SEF, LOS, AIS, LOP.
SEVERELY ERRORED COUNT (SES)	Severely Errored Second (SES) is a second with x or more Coding Violations (CV), or a second with at least one or more incoming defects. The value of x is defined for a given Bit Error Rate (BER) as outlined in Annex 50A of the IEEE 802.3ae specification.
CODE VIOLATION COUNT (CV-L)	Coding Violations (CV) are Bit Interleaved Parity (BIP) errors that are detected in the incoming signal. CV counters are incremented for each BIP error detected.
UNAVAILABLE SECONDS (UAS)	Number of seconds that the interface is unavailable.
INTERVAL ID	Each interval (1..96) represents a 15-minute time period (sometimes called a bin). 96 bins represents 24 hours.

Viewing 10GE WAN path statistics

To display current path statistics on specified ports, use the CLI command:

```
show ports stats wis pathcurrent [<ports>]
```

Figure 20 shows sample output for this command.

Figure 27 show ports stats wis pathcurrent [<ports>] command output

```

=====
                                WIS Path Current Stats
=====
PORT  ERRED SECS  SEVERELY ERRED CODE VIOLATION UNAVAILABLE
NUM   COUNT (ES)  COUNT (SES)    COUNT (CV-P)  SECONDS (UAS)  STATUS  WIDTH
-----
2/1   0           0              0              546            PLOP    6
=====

```

[Table 32](#) describes the show ports stats wis pathcurrent [<ports>] parameters.

Table 32 show ports stats wis pathcurrent [<ports>] parameters

Field	Description
PORT NUM	Slot and port number
ERRORED SECONDS COUNT (ES)	Errored Second (ES) is a second with one or more Coding Violations or one or more incoming defects, for example, SEF, LOS, AIS, LOP.
SEVERELY ERRORED COUNT (SES)	Severely Errored Second (SES) is a second with x or more Coding Violations (CV), or a second with at least one or more incoming defects. The value of x is defined for a given Bit Error Rate (BER) as outlined in Annex 50A of the IEEE 802.3ae specification. ¹
CODE VIOLATION COUNT (CV-P)	Coding Violations (CV) are Bit Interleaved Parity (BIP) errors that are detected in the incoming signal. CV counters are incremented for each BIP error detected.
UNAVAILABLE SECONDS (UAS)	Number of seconds that the interface is unavailable.
STATUS	Status of defects.
WIDTH	Number of defects.

¹ The default Path SES threshold of 2400 corresponds to a situation where 30% of all of the SPEs being received have parity errors detected via the Path BIP checks.

Viewing 10GE WAN path statistics at a specified interval

To display current path statistics on specified ports at a specified interval, use the CLI command:

```
show ports stats wis pathinterval <intervalid> [<ports>]
```

where:

- *intervalid* is the interval identifier (the interval range is 1 to 96 seconds)
- *ports* is an optional parameter that allows you to specify stats for a specific port.

Figure 20 shows sample output for this command.

Figure 28 show ports stats wis pathinterval <intervalid> [<ports>] command output

```
=====
                                WIS Path Interval Stats
=====
PORT      ERRORED SECONDS   SEVERELY ERRORED   CODE VIOLATION     UNAVAILABLE
NUM      COUNT (ES)       COUNT (SES)        COUNT (CV-P)       SECONDS
                                      (UAS)
-----
2/1      0                 0                   0                   900
INTERVAL ID = 1
```

Table 33 describes the `show ports stats wis pathinterval <intervalid> [<ports>]` parameters.

Table 33 `show ports stats wis pathinterval <intervalid> [<ports>]` parameters

Field	Description
PORT NUM	Slot and port number
ERRORED SECONDS COUNT (ES)	Errored Second (ES) is a second with one or more Coding Violations or one or more incoming defects, for example, SEF, LOS, AIS, LOP.
SEVERELY ERRORED COUNT (SES)	Severely Errored Second (SES) is a second with x or more Coding Violations (CV), or a second with at least one or more incoming defects. The value of x is defined for a given Bit Error Rate (BER) as outlined in Annex 50A of the IEEE 802.3ae specification.
CODE VIOLATION COUNT (CV-P)	Coding Violations (CV) are Bit Interleaved Parity (BIP) errors that are detected in the incoming signal. CV counters are incremented for each BIP error detected.
UNAVAILABLE SECONDS (UAS)	Number of seconds that the interface is unavailable.
INTERVAL ID	Each interval (1..96) represents a 15-minute time period (sometimes called a bin). 96 bins represents 24 hours.

Viewing 10GE WAN FE path statistics

To display current FE path statistics on specified ports, use the CLI command:

```
show ports stats wis fepathcurrent [<ports>]
```

Figure 20 shows sample output for this command.

Figure 29 show ports stats wis fepathcurrent [<ports>] command output

```

=====
                                WIS Far End Path Current Stats
=====
PORT      ERRORED SECONDS SEVERELY ERRORED CODE VIOLATION      UNAVAILABLE
NUM       COUNT (ES)      COUNT (SES)      COUNT (CV-P)      SECONDS (UAS)
-----
2/1      0                0                0                116
=====

```

[Table 34](#) describes the show ports stats wis fepathcurrent [<ports>] parameters.

Table 34 show ports stats wis fepathcurrent [<ports>] parameters

Field	Description
PORT NUM	Slot and port number
ERRORED SECONDS COUNT (ES)	Errored Second (ES) is a second with one or more Coding Violations or one or more incoming defects, for example, SEF, LOS, AIS, LOP.
SEVERELY ERRORED COUNT (SES)	Severely Errored Second (SES) is a second with x or more Coding Violations (CV), or a second with at least one or more incoming defects. The value of x is defined for a given Bit Error Rate (BER) as outlined in Annex 50A of the IEEE 802.3ae specification.
CODE VIOLATION COUNT (CV-P)	Coding Violations (CV) are Bit Interleaved Parity (BIP) errors that are detected in the incoming signal. CV counters are incremented for each BIP error detected.
UNAVAILABLE SECONDS (UAS)	Number of seconds that the interface is unavailable.

Viewing 10GE WAN FE path statistics at a specified interval

To display current FE path statistics on specified ports at a specified interval, use the CLI command:

```
show ports stats wis fepathinterval <intervalid> [<ports>]
```

where:

- *intervalid* is the interval identifier (the interval range is 1 to 96 seconds)
- *ports* is an optional parameter that allows you to specify stats for a specific port.

Figure 20 shows sample output for this command.

Figure 30 show ports stats wis fepathinterval <intervalid> [<ports>] command output

```

=====
                        WIS FE Path Interval Stats
=====
PORT      ERRORED SECONDS   SEVERELY ERRORED   CODE VIOLATION   UNAVAILABLE
NUM      COUNT (ES)       COUNT (SES)        COUNT (CV-P)     SECONDS
                        (UAS)
-----
2/1      0                 0                   0                 900
INTERVAL ID = 1

```

Table 35 describes the `show ports stats wis fepathinterval <intervalid> [<ports>]` parameters.

Table 35 `show ports stats wis fepathinterval <intervalid> [<ports>]` parameters

Field	Description
PORT NUM	Slot and port number
ERRORED SECONDS COUNT (ES)	Errored Second (ES) is a second with one or more Coding Violations or one or more incoming defects, for example, SEF, LOS, AIS, LOP.
SEVERELY ERRORED COUNT (SES)	Severely Errored Second (SES) is a second with x or more Coding Violations (CV), or a second with at least one or more incoming defects. The value of x is defined for a given Bit Error Rate (BER) as outlined in Annex 50A of the IEEE 802.3ae specification.
CODE VIOLATION COUNT (CV-P)	Coding Violations (CV) are Bit Interleaved Parity (BIP) errors that are detected in the incoming signal. CV counters are incremented for each BIP error detected.
UNAVAILABLE SECONDS (UAS)	Number of seconds that the interface is unavailable.
INTERVAL ID	Each interval (1..96) represents a 15-minute time period (sometimes called a bin). 96 bins represents 24 hours.

Viewing 10GE LAN/WAN SONET medium statistics

To display current SONET medium statistics on a specified port, use the CLI command:

```
show ports stats wis sonetmedium [<port>]
```

Figure 31 shows sample output for this command.

Figure 31 show ports stats wis sonetmedium [<port>] command output

```

Passport-8610:5# show port stats wis sonetmedium

=====
                                WIS SONET Medium Table
=====
PORT      MEDIUM   TIME     VALID   LINE    LINE    CIRCUIT
NUM       TYPE     ELAPSED  INTERVALS CODING  TYPE     ID
-----
4/1       sonet    175      1       NRZ     LongSingle
7/1       sonet    69       1       NRZ     LongSingle

Passport-8610:5#

```

[Table 36](#) describes the show ports stats wis sonetmedium [<port>] parameters.

Table 36 show ports stats wis sonetmedium [<port>] parameters

Field	Description
PORT NUM	Slot and port number
MEDIUM TYPE	The current framing (SONET or SDH) operating on this interface.
TIME ELAPSED	Number of seconds, including partial seconds, that have elapsed since the beginning of the current measurement period. If, for some reason, such as an adjustment in the system's time-of-day clock, the current interval exceeds the maximum value, the agent will return the maximum value.
VALID INTERVALS	Number of previous 15-minute intervals for which performance monitoring data was collected.
LINE CODING	Line coding for this interface. This is always Non-Return to Zero (NRZ) for 10GE WAN.
LINE TYPE	Line type for this interface. Currently, this will be only LongSingle, indicating long-range, single-mode fiber.
CIRCUIT ID	Transmission vendor's circuit identifier, for the purpose of facilitating troubleshooting. Note that the circuit identifier, if available, is also represented by ifPhysAddress.

Appendix A

Technical Specifications

This appendix lists the technical specifications for the 10GE LAN/WAN modules

8681XLR (10GE LAN) Module

Physical specifications

Height:	1.5 in. (3.8 cm)
Width:	15.4 in. (39.1 cm)
Depth:	18.5 in. (47.0 cm)
Weight:	8.0 lb (3.6 kg)

Electrical specifications

Input power:	150 W maximum
Thermal rating:	512 BTU/hr maximum

MTBF rating 140,000 hr

Data Rate and encoding 64B/66B(IEEE 802.3ae specified)

Compatible with OC-192/STM-64 No

Module Performance (64 byte packets)

Aggregate throughput	8x1,488,100 pps
Routing and Switch Forwarding Rates	8x1,488,100 pps

Connector type SC Duplex

Port type 10GBASE-LR 1310nm serial PMD

Cable specifications

Type: 9/125 μ m single mode fiber optic cable
Distance: 6.2 miles (10 km)

Optical specifications

Wavelength: 1310 nm
Optical budget: 7.4 dB
Transmitter characteristics: Minimum optical power: -5 dBm
Maximum optical power: -1 dBm
Receiver characteristics: Minimum receiver sensitivity: -12.4 dBm
Maximum input power: 1 dBm

LED operation

Rx Amber during link-down
Tx/Rx Green during link-up state and activity

8681XLW (10GE WAN) Module

Physical specifications

Height:	1.5 in. (3.8 cm)
Width:	15.4 in. (39.1 cm)
Depth:	18.5 in. (47.0 cm)
Weight:	8.0 lb (3.6 kg)

Electrical specifications

Input power:	150 W maximum
Thermal rating:	512 BTU/hr maximum

MTBF rating 140,000 hr

Data Rate and encoding 64b/66b (IEEE 802.3ae specified)

Compatible with OC-192/STM-64 Yes

Module Performance (64 byte packets)

Aggregate throughput	8x1,488,100 pps
Routing and Switch Forwarding Rates	8x1,488,100 pps

Connector type SC Duplex

Port type 10GBASE-LW 1310nm serial PMD

Cable specifications

Type:	9/125 μ m single mode fiber optic cable
Distance:	6.2 miles (10 km)

Optical specifications

Wavelength:	1310 nm*
Optical budget:	7.4 dB
Transmitter characteristics:	Minimum output power: -5 dBm Maximum output power: -1 dBm
Receiver characteristics:	Minimum input sensitivity: -12.4 dBm Maximum input power: 1 dBm

LED operation

Rx	Amber during link-down or Sonet alarm condition
Tx/Rx	Green during link-up state and activity

* Refer to the *Network Design Guidelines* (Passport 8000 Switch Series Release 3.3 Implementation Notes) 313197-B for information on interworking with SONET/SDH 1550nm WAN equipment.

Appendix B

Error messages

This section describes the error messages may be generated with the 10GE LAN/WAN modules.

Error message	Generated node or leaf	Cause
Cannot set framing on this port	framing	You have attempted to set framing for a non-10Gigabit Ethernet module. (This attribute is valid for 10GE WAN modules only)
Cannot modify framing when in LAN mode	framing	You have attempted to set framing on a 10GE module running in LAN mode.
Cannot delete internal Mlt Id	delete	You have attempted to delete a 10GE internal MLT using the CLI command <code>config/mlt #/.</code>
Feature is not supported	create	You have attempted to create an IPX route for a 10GE module port using the CLI command <code>/config/ethernet <port>/ipx/create</code> . 10GE modules do not support IPX routing.
VLAN has a 10GE port member which doesn't support IPX	create	You have attempted to create an IPX route for a VLAN which has a 10GE module port member using the CLI command <code>//config/vlan <id>/ipx/create</code> . 10GE modules do not support IPX routing.
clock-source is only available on 10GE WAN port	clock-source	You have attempted to configure the clock-source for a non-10GE WAN module port using the CLI command <code>//config/ethernet <port>/clock-source</code> .
Port <port/slot> is not a 10GE port. Flow Control is only available on 10GE ports.	tx-flow-control	You have attempted to configure tx-flow-control for a non-10GE port using the CLI command <code>//config/ethernet <port>/tx-flow-control</code> .

Error message	Generated node or leaf	Cause
Port <port/slot> is not a 10GE port. Flow Control Pause Zero is only available on 10GE ports.	fc-pause0	You have attempted to configure fc-pause0 for a non-10GE port using the CLI command //config/ethernet <port>/fc-pause0.
Port <port/slot> is not a 10GE port. Flow Control is only available on 10GE ports.	fc-pause-time	You have attempted to configure fc-pause-time for a non-10GE port using the CLI command //config/ethernet <port>/fc-pause-time.

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