



**NORTEL**

Nortel Ethernet Routing Switch 5000 Series

# Configuration — System Monitoring

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NN47200-505

Nortel Ethernet Routing Switch 5000 Series

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## New in this release

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The following sections detail what's new in *Nortel Ethernet Routing Switch 5000 Series Configuration — System Monitoring* (NN47200-505) for Release 6.2.

- [“Features”](#) (page 9)
- [“Other changes”](#) (page 10)

### Features

See the following sections for information about feature changes:

- [“Dual Syslog Server Support”](#) (page 9)
- [“Port Mirroring–Bi-directional Monitor Port”](#) (page 10)
- [“Debug trace command”](#) (page 10)

### Dual Syslog Server Support

In Release 6.2, you can use the Dual Syslog Server Support feature to configure a second syslog server to run in tandem with the first. If you configure Dual Syslog Server Support, the system sends syslog messages simultaneously to both servers to ensure that syslog messages are logged, even if one of the servers becomes unavailable. For more information, see:

- [“Dual syslog server support”](#) (page 18)
- [“Remote system logging configuration using the NNCLI”](#) (page 55)
- [“Remote system logging using EDM”](#) (page 83)

### **Port Mirroring–Bi-directional Monitor Port**

You can enable bi-directional traffic on the monitor port to allow a connected IDS/IPS device to recognize traffic posing a threat to the network and disable the port. For more information, see:

- [“Bi-directional Monitor Port” \(page 25\)](#)
- [“Configuring port mirroring ” \(page 58\)](#)
- [“Configuring Many-to-Many port-mirroring ” \(page 61\)](#)
- [“Port Mirroring using EDM” \(page 87\)](#)

### **Debug trace command**

A Trace command is available that is supported in OSPF, RIP, SMLT, IPMC, IGMP, and PIM in four levels for each module or application. For more information, see:

- [“Debug trace commands” \(page 31\)](#)
- [“Trace diagnosis of problems” \(page 33\)](#)

### **Other changes**

See the following sections for information about changes that are not feature-related:

#### **Enterprise Device Manager**

Enterprise Device Manager (EDM) replaces both the Java-based Device Manager and Web-based management user interfaces. EDM is an embedded element management and configuration application for Ethernet Routing Switch 5000 Series switches. EDM provides a Web-based graphical user interface through a standard web browser for the convenience of full configuration and management on the switch, and retains the look and feel of Device Manager. For more information, see:

- [“System diagnostics and statistics using Enterprise Device Manager” \(page 77\)](#)
- [“Network monitoring configuration using Enterprise Device Manager” \(page 79\)](#)
- [“RMON configuration using Enterprise Device Manager” \(page 127\)](#)
- [“IPFIX configuration using Enterprise Device Manager” \(page 147\)](#)

**Multiple Port Configuration** Among the many functions available in EDM, you can configure port-specific features for a single port, a group of ports, or all ports. Multiple Port Configuration appears as a pane in the work area wherever this function is available. By default the pane

appears and you can close and open it with a click of the task bar. For more information about EDM, see *Ethernet Routing Switch 5000 Series Fundamentals* (NN47200-104).



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## Introduction

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This document provides information you need to configure and use system monitoring for the Ethernet Routing Switch 5000 Series.

### NNCLI command modes

NNCLI provides the following command modes:

- User Executive
- Privileged Executive
- Global Configuration
- Interface Configuration
- Router Configuration

Mode access is determined by access permission levels and password protection.

If no password is set, you can enter NNCLI in User Executive mode and use the `enable` command to move to the next level (Privileged Executive mode). However, if you have read-only access, you cannot progress beyond User Executive mode, the default mode. If you have read-write access you can progress from the default mode through all of the available modes.

With sufficient permission, you can use the rules in the following table to move between the command modes.

**Table 1**  
**NNCLI command modes**

Command mode and sample prompt	Entrance commands	Exit commands
User Executive ERS5000>	No entrance command, default mode	<code>exit</code> or <code>logout</code>

Command mode and sample prompt	Entrance commands	Exit commands
Privileged Executive ERS5000#	<b>enable</b>	<b>exit</b> or <b>logout</b>
Global Configuration ERS5000 (config)#	From Privileged Executive mode, enter: <b>configure</b>	To return to Privileged Executive mode, enter:  <b>end</b> or <b>exit</b>  To exit NNCLI completely, enter:  <b>logout</b>
Interface Configuration ERS5000 (config-if)#	From Global Configuration mode: To configure a port, enter: interface fastethernet <port number> To configure a VLAN, enter: interface vlan <vlan number>	To return to Global Configuration mode, enter:  <b>exit</b>  To return to Privileged Executive mode, enter:  <b>end</b>  To exit NNCLI completely, enter:  <b>logout</b>
Router Configuration ERS5000 (config-router)#	From Global Configuration mode:  To configure router OSPF, type: <b>router ospf</b>  To configure router RIP, type: <b>router rip</b>  To configure router VRRP, type: <b>router vrrp</b>	To return to Global Configuration mode, enter: <b>exit</b>  To return to Privileged EXEC mode, type: <b>end</b>  To exit NNCLI completely, type: <b>logout</b>

See *Nortel Ethernet Routing Switch <2500/4500/5000> Series Fundamentals <NN47215-102/NN47205-102/NN47200-104>*

## Navigation

- [“System diagnostics and statistics using NNCLI” \(page 33\)](#)
- [“System diagnostics and statistics using Enterprise Device Manager” \(page 77\)](#)
- [“Network monitoring configuration using NNCLI” \(page 51\)](#)
- [“Network monitoring configuration using Enterprise Device Manager” \(page 79\)](#)
- [“RMON configuration using NNCLI” \(page 63\)](#)
- [“RMON configuration using Enterprise Device Manager” \(page 127\)](#)
- [“IPFIX Configuration using NNCLI” \(page 71\)](#)
- [“IPFIX configuration using Enterprise Device Manager” \(page 147\)](#)





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# System monitoring fundamentals

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System monitoring is an important aspect of switch operation. The Nortel Ethernet Routing Switch 5500 Series provides a wide range of system monitoring options that you can use to closely monitor the operation of a switch or stack.

This chapter describes two general system monitoring aspects that you must consider when you use the Ethernet Routing Switch 5000 Series: system logging and port mirroring. Subsequent chapters provide information about specific system monitoring tools and how to use them.

## System logging

The Nortel Ethernet Routing Switch 5500 Series supports system logging (syslog), a software tool to log system events for debugging and analysis.

The syslog tool can log application events. The logged events are stored in volatile RAM, nonvolatile RAM, or in a remote host. You can select the storage location by using the Nortel Networks command line interface (NNCLI) or DM.

## Remote logging

Starting with release 5.0, the remote logging feature provides an enhanced level of logging by replicating system messages on a syslog server. System log messages from several switches can be collected at a central location to alleviate you from individually querying each switch to interrogate the log files.

You must configure the remote syslog server on the unit to log informational, serious, and critical messages to this remote server. The UDP packet is sent to port 514 of the configured remote syslog server.

After the IP address is in the system, syslog messages can be sent to the remote syslog server. If a syslog message is generated prior to capturing the IP address of the server is captured the system stores up to 10 messages that are sent after the IP address of the remote server is on the system.

To configure this feature, enable remote logging, specify the IP address of the remote syslog server, and specify the severity level of the messages to be sent to the remote server.

### Dual syslog server support

You can enable dual syslog server support by configuring and enabling a secondary remote syslog server to run in tandem with the first. The system then sends syslog messages simultaneously to both servers to ensure that syslog messages are logged, even if one of the servers becomes unavailable.

## Alarms

Alarms are useful for identifying values of a variable that have gone out of range. Define an RMON alarm for a MIB variable that resolves to an integer value. String variables cannot be used. All alarms share the following characteristics:

- An upper and lower threshold value is defined.
- A corresponding rising and falling event occurs.
- An alarm interval or polling period is reached.

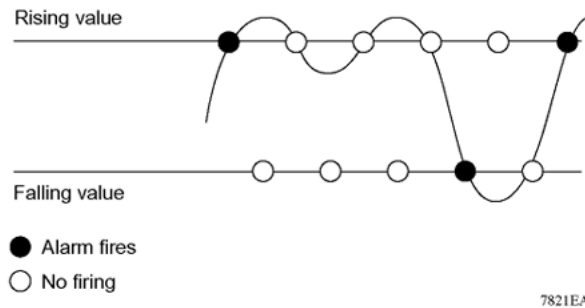
After alarms are activated, view the activity in a log or a trap log, or a script can be created to provide notification by beeping a console, sending e-mail messages, or calling a pager.

### How RMON alarms work

The alarm variable is polled and the result is compared against upper and lower limit values you select after you create the alarm. If either limit is reached or crossed during the polling period; then the alarm fires and generates an event that you can view in the event log or the trap log.

The upper limit of the alarm is called the *rising value*, and its lower limit is called the *falling value*. RMON periodically samples the data based upon the alarm interval. During the *first* interval that the data passes above the rising value, the alarm fires as a rising event. During the first interval that the data drops below the falling value, the alarm fires as a falling event.

The following figure describes how alarms fire.



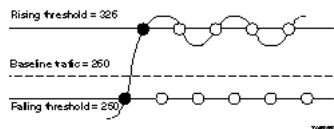
The alarm fires during the first interval that the sample goes out of range. No additional events are generated for that threshold until the opposite threshold is crossed. Therefore, it is important to carefully define the rising and falling threshold values for alarms to work as expected. Otherwise, incorrect thresholds cause an alarm to fire at every alarm interval.

A general guideline is to define one of the threshold values to an expected baseline value, and then define the opposite threshold as the out-of-bounds limit. Because of sample averaging, the value may be equal to  $\pm 1$  of the baseline units. For example, assume an alarm is defined on octets going out of a port as the variable. The intent of the alarm is to provide notification to you after excessive traffic occurs on that port. If spanning tree is enabled, 52 octets are transmitted out of the port every 2 seconds, which is equivalent to baseline traffic of 260 octets every 10 seconds. This alarm provides notification to you if the lower limit of octets going out is defined at 260 and the upper limit is defined at 320 (or at a value greater than  $260 + 52 = 312$ ).

The first time outbound traffic other than spanning tree Bridge Protocol Data Units (BPDU) occurs, the rising alarm fires. After outbound traffic other than spanning tree ceases, the falling alarm fires. This process provides you with time intervals of a non-baseline outbound traffic.

If the alarm is defined with a falling threshold less than 260 (assuming the alarm polling interval is 10 seconds) the rising alarm can fire only once. For the rising alarm to fire a second time, the falling alarm (the opposite threshold) must fire. Unless the port becomes inactive or spanning tree is disabled (which will cause the value for outbound octets to drop to zero), the falling alarm cannot fire because the baseline traffic is always greater than the value of the falling threshold. By definition, the failure of the falling alarm to fire prevents the rising alarm from firing a second time.

The following figure describes an alarm with a threshold less than 260.



### Creating alarms

Select a variable from the variable list and a port, or other switch component, to which it is connected. Some variables require port IDs, card IDs, or other indices (for example, spanning tree group IDs). Then select a rising and a falling threshold value. The rising and falling values are compared against the actual value of the variable that you choose. If the variable falls outside of the rising or falling value range, an alarm is triggered and an event is logged or trapped.

After an alarm is created a sample type is also selected, which can be either absolute or delta. *Absolute* alarms are defined on the cumulative value of the alarm variable. An example of an alarm defined with absolute value is card operating status. Because this value is not cumulative, but instead represents states, such as card up (value 1) and card down (value 2), you set it for absolute value. You can create an alarm with a rising value of 2 and a falling value of 1 to alert a user to whether the card is up or down.

Most alarm variables related to Ethernet traffic are set to *delta* value. Delta alarms are defined based on the difference in the value of the alarm variable between the start of the polling period and the end of the polling period. Delta alarms are sampled twice for each polling period. For each sample, the last two values are added together and compared to the threshold values. This process increases precision and allows for the detection of threshold crossings that span the sampling boundary. If you track the current values of a delta-valued alarm and add them together, therefore, the result is twice the actual value. (This result is not an error in the software.)

### Trap Web page

SNMP Trap web page provides a graphical method to enable or disable traps you want to send. In case multiple trap receivers are selected you can specify which traps are sent to which receiver. The selection of traps to be sent to a certain receiver can be based on criteria like security, network connectivity, or other information that might be important to that particular receiver.

You can access a separate Trap web page for every host, from which you can enable or disable any of the listed traps. The access to those pages is through the SNMP Trap Web page, which contains two options for every

trap. The first option enables the trap. The second option disables the trap. Select an option to enable or disable a specific trap for a specific host.

## Management Information Base Web page

With Web-based management, you can see the response of an SNMP Get and Get-Next request for an Object Identifier (OID) or object name.

With the SNMP walk, you can retrieve a subtree of the Management Information Base (MIB) that has the object as root by using Get-Next requests.

The MIB Web page does not support the following features:

- SNMP SET requests
- displaying SNMP tables
- translating MIB enumerations that are displaying the name (interpretation) of number values of objects defined as enumerations in the MIB

## IGMP and the system event log

IGMP uses the components provided by the syslog tool. The syslog tool performs functions, such as storing messages in the NVRAM or remote host and displaying these log messages through the NNCLI, console menu, or Telnet.

The IGMP log events can be in one of the following three categories based on their severity:

- Critical
- Serious
- Informational

IGMP logs the messages whenever any of the following types of events occur in the system:

- IGMP initialization
- Configuration changes from the user
- Stack Join events
- IGMP messages: Report, Leave and Query messages received by the switch

Events such as reception of IGMP messages occur frequently in the switch whenever a new host joins or leaves a group. Logging such messages consumes a large amount of log memory.

Therefore, such messages should not be logged in all the time. By default, such message logging is disabled. You must enable this feature through the NNCLI to view the messages.

In [Table 2 " IGMP syslog messages" \(page 22\)](#):

- %d represents a decimal value for the preceding parameter. For example, 5 for VLAN 5
- %x represents a hexadecimal value for the preceding parameter. For example, 0xe000a01 for Group 224.0.10.1

[Table 2 " IGMP syslog messages" \(page 22\)](#) describes the IGMP syslog messages and the severity.

**Table 2**  
**IGMP syslog messages**

Severity	Log messages
Informational	IGMP initialization success
Critical	IGMP initialization failed: Error code %d
Informational	IGMP policy initialized
Informational	IGMP configuration loaded successfully
Informational	IGMP configuration failed. Loaded to factory default
Informational	IGMP configuration changed: Snooping enabled on VLAN %d
Informational	IGMP configuration changed: Snooping disabled on VLAN %d
Informational	IGMP configuration changed: Proxy enabled on VLAN %d
Informational	IGMP configuration changed: Proxy disabled on VLAN %d
Informational	IGMP configuration changed: Query time set to %d on VLAN %d
Informational	IGMP configuration changed: Robust value set to %d on VLAN %d
Informational	IGMP configuration changed: Version %d router port mask 0x%x set on VLAN %d
Informational	IGMP configuration changed: Unknown multicast filter enabled
Informational	IGMP configuration changed: Unknown multicast filter enabled
Informational	IGMP configuration changed: Trunk %d created for IGMP
Informational	IGMP configuration changed: Trunk %d removed for IGMP ports

**Table 2**  
**IGMP syslog messages (cont'd.)**

Severity	Log messages
Informational	IGMP configuration changed: Mirror ports set
Informational	IGMP configuration changed: Port %d added to VLAN %d
Informational	IGMP configuration changed: Port %d removed from VLAN %d
Informational	IGMP new Querier IP %x learned on port %d
Informational	IGMP exchange database sent by unit %d
Informational	IGMP exchange database received on unit %d from %d
Informational	IGMP exchange database done
Informational	IGMP stack join completed
Serious	IGMP not able to join stack: Error code %d
Informational	IGMP exchange group database sent by unit %d
Informational	IGMP exchange group database received on unit %d from %d
Informational	IGMP received report on VLAN %d for Group 0x%x on port %d
Informational	IGMP received leave on VLAN %d for Group 0x%x on port %d
Informational	IGMP received query on VLAN %d for Group 0x%x on port %d
Informational	IGMP dynamic router port %d added
Informational	IGMP dynamic router port %d removed

## Port mirroring

You can designate a switch port to monitor traffic on any other specified switch ports (port-based) or to monitor traffic to or from any two specified addresses that the switch learned (address-based).

A probe device, such as the Nortel StackProbe or equivalent, must connect to the designated monitor port to use this feature. Contact a Nortel sales agent for details about the StackProbe.

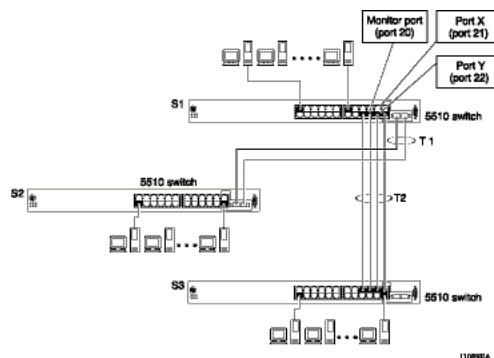
### Port-based mirroring configuration

Figure 1 "Port-based mirroring example" (page 24) shows an example of a port-based mirroring configuration in which port 20 is designated as the monitor port for ports 21 and 22 of Switch S1. Although this example shows ports 21 and 22 monitored by the monitor port (port 20), any trunk member of T1 and T2 can also be monitored.

In this example, Figure 1 "Port-based mirroring example" (page 24) shows port X and port Y as members of Trunk T1 and Trunk T2. Port X and port Y are not required to always be members of Trunk T1 and Trunk T2.

You cannot monitor trunks and you cannot configure trunk members as monitor ports.

**Figure 1**  
**Port-based mirroring example**



In the preceding configuration example, you can configure the designated monitor port (port 20) to monitor traffic in any of the following modes:

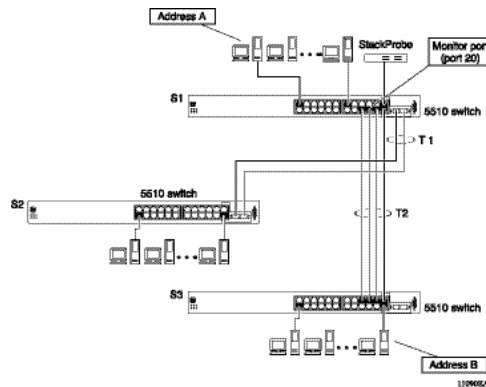
- Monitor all traffic received by port X.
- Monitor all traffic transmitted by port X.
- Monitor all traffic received and transmitted by port X.
- Monitor all traffic received by port X or transmitted by port Y.
- Monitor all traffic received by port X (destined to port Y) and then transmitted by port Y.
- Monitor all traffic received or transmitted by port X and transmitted or received by port Y (conversations between port X and port Y).
- Monitor all traffic received on many ports.
- Monitor all traffic transmitted on many ports.
- Monitor all traffic received or transmitted on many ports.

### Address-based mirroring configuration

The following example shows an address-based mirroring configuration in which port 20, the designated monitor port for Switch S1, monitors traffic occurring between address A and address B.



**Figure 2**  
**Address-based mirroring example**



In this configuration, the designated monitor port (port 20) can be set to monitor traffic in any of the following modes:

- Monitor all traffic transmitted from address A to any address.
- Monitor all traffic received by address A from any address.
- Monitor all traffic received by or transmitted by address A.
- Monitor all traffic transmitted by address A to address B.
- Monitor all traffic between address A and address B (conversation between the two stations).

### Bi-directional Monitor Port

With this feature, you can configure the monitor port (MTP) to participate in bi-directional traffic flows. A device with intrusion detection software (IDS) or intrusion protection software (IPS) or with both, and connected to the monitor port, can recognize a traffic threat and initiate a session to disable the port. Mono-directional traffic flow is the default. Nortel recommends that you enable this feature only if the devices to connect through MTP use telnet, SSH, or SNMP.

### Many-to-Many Port Mirroring

Many-to-Many Port Mirroring is an extension of the Port Mirroring application, to allow multiple sessions of mirroring configuration to exist simultaneously, each with a Monitor Port and mirrored ports.

You can configure this the feature by using NNCLI. The configuration process for each instance is similar to Port Mirroring configuration.

### Port-based modes

The following port-based modes are supported:

- **ManytoOneRx**: Many-to-One port mirroring on ingress packets.
- **ManytoOneTx**: Many to one port mirroring on egress packets.
- **ManytoOneRxTx**: Many to one port mirroring on ingress and egress traffic.
- **Xrx**: Mirror packets received on port X.
- **Xtx**: Mirror packets transmitted on port X.
- **XrxOrXtx**: Mirror packets received or transmitted on port X.
- **XrxYtx**: Mirror packets received on port X and transmitted on port Y.
- **XrxYtxOrYrxXtx**: Mirror packets received on port X and transmitted on port Y or packets received on port Y and transmitted on port X.
- **XrxOrYtx**: Mirror packets received on port X or transmitted on port Y

### MAC address-based modes

- **Asrc**: Mirror packets with source MAC address A.
- **Adst**: Mirror packets with destination MAC address A
- **AsrcOrAdst**: Mirror packets with source or destination MAC address A.
- **AsrcBdst**: Mirror packets with source MAC address A and destination MAC address B.
- **AsrcBdstOrBsrcAdst**: Mirror packets with source MAC address A and destination MAC address B or packets with source MAC address B and destination MAC address A.

### Many-to-many port mirroring functionality

Many-to-Many Port Mirroring builds on the existing Port Mirroring application. Multiple instances are each configurable by using the existing interface. Each instance is attached to one Monitor Port (MTP). In some cases a monitor port can be used in more than one instance. Up to four instances are available.

The ports which are configured as MTP are not allowed to be part of a MLT group.

### Many-to-many port mirroring restrictions

Many-to-Many Port Mirroring is only available on pure Ethernet Routing Switch 5600 Series stacks or stand-alone Ethernet Routing Switch 5600 Switches.

On startup, if a hybrid stack or standalone 5500 series unit is detected (stack oper-mode should be configured to hybrid), only the default instance is available and the user interface does not provide a way to configure another instance. An error message is returned if this is attempted.

If a 5500 series unit is inserted in a pure 5600 stack (stack oper-mode should be configured to hybrid), and multiple instances of Port Mirroring are configured on the stack, because the stack is now a hybrid one, only the default instance is kept active and the user interface changes such that only this instance is applied and can be configured. If this is the case, the user can only use only this instance entirely. If all the 5500 series units are removed from a Stack (stack oper-mode should be changed to pure) all the enabled instances are re-applied.

In a hybrid stack if all 5500 series units are removed and only one 5600 series unit remains all port mirroring instances will become available. (the 5600 series unit remains in standalone mode and stack oper-mode has no sense in this case).

An MTP cannot be a mirrored port for another MTP. Frames mirrored to one MTP are not taken into account in MAC address-based mirroring on another MTP.

A port cannot be configured as MTP in an instance if it is already a mirrored port in another instance.

If a port is egress-mirrored in one instance, it cannot be egress-mirrored in another instance (to another MTP). The same applies to ingress-mirrored ports. A port can be ingress-mirrored in one instance and egress-mirrored in another.

The ports that are configured as MTP cannot participate in a normal frame switching operation.

### Stack loopback tests

You can quickly test your stack ports and stack cable by using the stack loopback test. The stack loopback test is useful after you need to determine whether the source of the problem is a defective stack cable or a damaged stack port. The test can help prevent unnecessarily sending switches for service.

Two types of loopback tests exist. The internal loopback test verifies that the stack ports are functional.

The external loopback test checks the stack cable to determine if it is the source of the problem. Perform the external loopback test by connecting the stack uplink port with the stack downlink port, sending a packet from the uplink port, and verifying that the packet is received on the downlink port.

Always run the internal test first. Because the cable tests are not conclusive until you ensure the stack ports work correctly.

## Stack monitor

The Stack Monitor uses a set of control values to enable its operation, to set the expected stack size, and to control the frequency of trap sending. The stack monitor, if enabled, detects problems with the units in the stack and sends a trap.

The stack monitor sends a trap for the following events.

- The number of units in a stack changes.
- The trap sending timer expires.

Each time the number of units in a stack changes, the trap sending timer resets and the stack monitor compares the current number of stack units with the configured number of stack units. If the values are not equal, the switch sends a trap and logs a message to syslog. The stack monitor sends traps from a stand-alone unit or the base unit of the stack.

After the trap sending timer reaches the configured number of seconds at which traps are sent, the switch sends a trap and logs a message to syslog and restarts the trap sending timer. The syslog message is not repeated unless the stack configuration changes. To prevent the log from being filled with stack configuration messages.

After you enable the stack monitor on a stack, the stack monitor captures the current stack size and uses it as the expected stack size. You can choose a different value and set it after you enable the feature.

## CPU and memory utilization

The CPU utilization feature provides data for CPU and memory utilization. You can view CPU utilization information for the past 10 seconds (s), 1 minute (min), 1 hour (hr), 24 hr, or since system startup. The switch displays CPU utilization as a percentage. With CPU utilization information you can see how the CPU was used during a specific time interval.

The memory utilization provides information about the percentage of the dynamic memory currently used by the system. The switch displays memory utilization in terms of the lowest percentage of dynamic memory available since system startup.

No configuration is required for this display-only feature.

## Light Emitting Diode display

The device displays diagnostic and operation information through the Light Emitting Diodes (LED) on the unit. Familiarize yourself with the interpretation of the LEDs on the Ethernet Routing Switch 5000 Series device. For information about the LED display see *Nortel Ethernet Routing Switch 5000 Series — Installation* (NN47200-300).

## Power over Ethernet allocations

Devices such as IP phones, Web cameras, wireless access points that utilize Power over Ethernet (PoE). The switch displays the PoE allocations for each port. The PoE standard (802.3af) imposes the Power Devices (PD) that require power to run at 48 V and not draw more than 16 W.

The switch has multiple ports that are PoE capable. You must make consideration for the total power and maximum power provided required for each port and unit. Another important aspect is that of device priority. You must decide which device receives power when there is not enough for all.

Use the syslog to check the parameters. The following traps are logged:

- **pethPsePortOnOffNotification**: indicates if the switch port delivers power to the connected device. This notification is sent on every status change except in the search mode.
- **pethMainPowerUsageOnNotification**: indicates that the switch threshold usage indication is on and the usage power is higher than the threshold.
- **pethMainPowerUsageOffNotification** : indicates that the switch threshold usage indication is off and the usage power is lower than the threshold.

## Displaying PoE allocations using NNCLI

Use this procedure to display the PoE status for the switch.

**Procedure Steps**

Step	Action
1	Use the <code>show poe-main-status</code> command to display the overall status of PoE.
2	Observe the NNCLI output.
3	Use the <code>show poe-port-status</code> command to display the port-level PoE status.
4	Observe the NNCLI output.
5	Use the <code>show poe-power-measurement</code> command to display power allocations on the switch.
6	Observe the NNCLI output.

---

--End--

---

**Displaying PoE allocations using EDM**

Use the following procedure to display the PoE status for the switch.

Step	Action
1	From the navigation tree, double-click <b>Power Management</b> .
2	In Power Management tree, double-click <b>PoE</b> .
3	In the work area, click <b>Globals - PoE Units</b> tab to view overall PoE status on the switch.
4	Click <b>PoE Ports</b> tab to view port-level PoE information.

---

--End--

---

**IP Flow Information Export**

IP Flow Information Export (IPFIX) is a protocol used to export flow information from traffic observed on a switch. Because IPFIX is still in development with the IETF, the current implementation is based on Netflow Version 9.

IP traffic is sampled and classified into various flows based the following parameters:

- protocol type
- destination IP address
- source IP address.

- ingress port
- TOS

You can not use IPFIX on secondary interfaces.

If the protocol type is TCP or UDP, a flow is defined by two additional parameters:

- source port
- destination port

Release 5.0 and later supports IPFIX through the creation and display of sampled information as well as the ability to export this sampled information. You can access IPFIX accessed through Enterprise Device Manager (EDM).

The IPFIX feature shares resources with QoS. If the IPFIX feature is enabled, a QoS policy precedence is used. For further information about QoS policies, see the *Nortel Ethernet Routing Switch 5500 Series Configuration — Quality of Service (NN47200-504)*.

## Remote Network Monitoring

The Remote Network Monitoring (RMON) MIB is an interface between the RMON agent on the Nortel Ethernet Routing Switch 5500 Series and an RMON management application, such as the Device Manager.

RMON defines objects that are suitable for managing any type of network, but some groups are targeted specifically for Ethernet networks.

The RMON agent continuously collects statistics and monitors switch performance.

RMON has three major functions:

- creating and displaying alarms for user-defined events
- gathering cumulative statistics for Ethernet interfaces
- tracking a history of statistics for Ethernet interfaces

## Debug trace commands

The trace feature provides useful information about the error events detected by the device. You can use this information to help you resolve an issue.

A trace command is available that is supported in OSPF, RIP, SMLT, IPMC, IGMP, and PIM . Release 6.2 supports four levels of the trace command for each module or application:

- Very Terse
- Terse
- Verbose
- Very Verbose

Each succeeding level provides more detailed information on the specific module. You can enable or disable trace globally or independently for each module, and you can specify the trace level for each module. The system delivers the information from this command to the console screen.

Use trace only for active troubleshooting because it is resource intensive.

The NNCLI supports this feature.

### **Stack Health Check**

The Stack Health Check feature provides information on the stacking state of each switch rear port. It is used to run a high-level test to monitor the rear port status for each unit, confirm the number of switching units in stack, detect if the stack runs with a temporary base unit, and to monitor stack continuity.

This feature is available through the NNCLI.

### **Displaying environmental information**

This feature provides information on the status of the environment of each unit in a stack. It is used to perform the following tasks:

- Monitor the hardware status for each unit.
- Detect the presence of AC, DC, or AC/DC power.
- Monitor the CPUs temperature.
- Identify damaged or missing hardware.



---

# System diagnostics and statistics using NNCLI

---

This chapter describes the procedures you can use to perform system diagnostics and gather statistics using NNCLI.

## Navigation

- [“Trace diagnosis of problems” \(page 33\)](#)
- [“Port statistics” \(page 36\)](#)
- [“Configuring Stack Monitor” \(page 37\)](#)
- [“Viewing Stack Port Counters ” \(page 38\)](#)
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- [“Clearing stack port counters ” \(page 40\)](#)
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- [“Validating port operational status ” \(page 42\)](#)
- [“Showing port information ” \(page 43\)](#)
- [“Showing stack health information” \(page 44\)](#)
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## Trace diagnosis of problems

The following sections describe how to use trace to diagnose problems.

### Trace diagnosis of problems navigation

- [“Using trace to diagnose problems” \(page 34\)](#)
- [“Viewing the trace level” \(page 35\)](#)
- [“Viewing the trace mode ID list” \(page 36\)](#)

## Using trace to diagnose problems

Use trace to observe the status of a software module at a given time.



### CAUTION

#### Risk of traffic loss

Using the trace tool inappropriately can cause primary CPU lockup conditions, loss of access to the switch, loss of protocols, and service degradation.

## Procedure steps

Step	Action
1	Enter Global Configuration mode.
2	Set the trace level by using the following command:  <code>trace level &lt;1-6&gt; &lt;0-4&gt;</code>
3	Set the trace screen on by using the following command:  <code>trace screen enable</code>
4	Set the trace screen off by using the following command:  <code>trace screen disable</code>
5	Disable the trace by using the following command:  <code>trace shutdown</code>
--End--	

## Variable definitions

Use the data in the following table to help you use the trace feature.

Variable	Value
<code>level &lt;1-6&gt; &lt;0-4&gt;</code>	Sets the trace level: <ul style="list-style-type: none"> <li>• <code>&lt;1-6&gt;</code> sets the trace module ID list:               <ul style="list-style-type: none"> <li>— 1 is OSPF</li> <li>— 2 is IGMP</li> <li>— 3 is PIM</li> <li>— 4 is RIP</li> <li>— 5 is SMLT</li> <li>— 6 is IPMC</li> </ul> </li> <li>• <code>&lt;0-4&gt;</code> sets the trace level:</li> </ul>

Variable	Value
	<ul style="list-style-type: none"> <li>— 0 indicates that the trace is disabled.</li> <li>— 1 is very terse.</li> <li>— 2 is terse.</li> <li>— 3 is verbose.</li> <li>— 4 is very verbose.</li> </ul>
<code>screen &lt;enable   disable&gt;</code>	Enables or disables the trace screen. You can use this command to control the trace output to the console. The default is disable.
<code>shutdown</code>	Disables the trace. Shutdown sets all the modules level to 0, and produces a "NO_DISPLAY" message.

### Viewing the trace level

Use this procedure to view the trace level information for the modules.

#### Procedure steps

Step	Action
1	Enter the Privileged EXEC mode.
2	Display the trace level by using the following command: <code>show trace level</code>
--End--	

#### Job aid

The following table describes the fields for the `show trace level` command.

Variable	Value
TraceModId	Indicates the Trace mode ID.
Name	Indicates the name of the mode.
Level	Indicates the trace level. <ul style="list-style-type: none"> <li>• 1 is very terse.</li> <li>• 2 is terse.</li> <li>• 3 is verbose.</li> <li>• 4 is very verbose.</li> </ul>

### Viewing the trace mode ID list

Use this procedure to view the supported module list for the trace feature.

#### Procedure steps

Step	Action
1	Enter the Privileged EXEC mode.
2	Display the trace mode ID list by using the following command: <code>show trace nodid-list</code>
--End--	

#### Job aid

The following table describes the fields for the `show trace modid-list` command.

Variable	Value
TraceModID	Indicates the trace mode ID.
ModId	Indicates the ID of the mode.
Name	Indicates the name of the mode.

## Port statistics

Use the NNCLI commands in this section to derive port statistics from the switch.

### Viewing port-statistics

Use this procedure to view the statistics for the port on both received and transmitted traffic.

#### Procedure steps

Step	Action
1	Enter Global Configuration mode.
2	Enter the <code>show port-statistics [port &lt;portlist&gt;]</code> command.
--End--	

#### Variable definitions

The following table describes the command parameters.

Variable	Definition
port <portlist>	The ports to display statistics for. When no port list is specified, all ports are shown.

## Configuring Stack Monitor

The following NNCLI commands are used to configure the Stack Monitor.

### Viewing the stack-monitor

Use this procedure to display the status of the Stack Monitor.

#### Procedure Steps

Step	Action
1	Enter Privileged Executive mode.
2	Enter the <code>show stack monitor</code> command.
--End--	

#### Variable definitions

The following is an example of the `show stack monitor` command output.

```
5698TFD#show stack-monitor
Status: disabled
Stack size: 2
Trap interval: 60
5698TFD#
```

### Configuring the stack-monitor

Use this procedure to configure the Stack Monitor.

#### ATTENTION

If you do not specify a parameter for this command, all Stack Monitor parameters are set to their default values.

#### Procedure Steps

Step	Action
1	Enter Global Configuration mode.
2	Enter the <code>stack-monitor [enable] [stack-size &lt;2-8&gt;] [trap-interval &lt;30-300&gt;</code> command.
--End--	

**Table 3**  
**Variable Definitions**

Variable	Definition
enable	Enables stack monitoring.
stack-size <2-8>	Sets the size of the stack to monitor. Valid range is from 2 to 8. By default the stack size is 2.
trap-interval <30-300>	Sets the interval between traps, in seconds. Valid range is from 30 to 300 seconds. By default the trap-interval is 60 seconds.

### Setting default stack-monitor values

Use this procedure to set the Stack Monitor parameters to their default values.

#### Configuring default stack monitor using NNCLI

Step	Action
1	Enter Global Configuration mode.
2	Enter the <code>default stack-monitor</code> command.
--End--	

### Disabling the stack monitor

Use this procedure to disable the stack monitor.

#### Procedure Steps

Step	Action
1	Enter Global Configuration mode.
2	Enter the <code>no stack monitor</code> command.
--End--	

### Viewing Stack Port Counters

Use this procedure to configure the stack port counters.

**ATTENTION**

The stack counters measure the size of packets received on HiGig ports. The size of these packets is greater than the size of the packets received on front panel ports since ASIC HiGig+ header is added to each of them. The size of this header is 12 bytes, therefore another range of stack counters is incremented when sending packets having length close to the stack counters upper intervals limit.

**ATTENTION**

The number of received/transmitted packets can be greater than the number of packets transmitted on front panel ports since there are different stack management packets transmitted/received.

**Procedure Steps**

Step	Action
1	Use the <code>show stack port-statistics [unit &lt;1-8&gt;]</code> command to show stacking statistics.
2	Observe the output

--End--

**Variable Definitions**

The following table describes the command parameters.

Variable	Definition
unit <1-8>	Specifies the unit in the stack.

**Job aid**

The following tables describes the output from the show stack port-statistics command.

Received	UP	DOWN
Packets	1052	391 283
Multicasts	1052	1582
Broadcasts	0	94
Total Octets	1869077	29862153
Packets 64 bytes	0	389600
65-127 bytes	204	763
128-225 bytes	21	27
256-511 bytes	409	492
512-1023 bytes	2	18

Received	UP	DOWN
1024-1518 bytes	18	19
Jumbo	398	364
Control Packets	0	0
FCS Errors	0	0
Undersized Packets	0	0
Oversized Packets	0	0
Filtered Packets	0	0

Transmitted	UP	DOWN
Packets	1257	1635
Multicasts	1246	1624
Broadcasts	11	11
Total Octets	407473	1765434
FCS Errors	0	0
Undersized Packets	0	0
Pause Frames	0	0
Dropped On No Resources	0	0

## Clearing stack port counters

Use the following procedure to clear the stack port counters

### Procedure Steps

Step	Action
1	Use the <code>clear stack port-statistics [unit &lt;1-8&gt;]</code> command to clear stacking statistics.
--End--	

Variable	Definition
unit <1-8>	Specifies the unit in the stack.

## Using the stack loopback test

Use this procedure to complete a stack loopback test.



---

### Configuring stack loopback test using NNCLI

Step	Action
1	Enter Privileged Executive mode.
2	Enter the <code>stack loopback-test internal</code> command.
3	Observe the NNCLI output.
4	Enter the <code>stack loopback-test external</code> command.
5	Observe the NNCLI output.

---

--End--

---

### Job aid

If a problem exists with a units stack port or a stack cable, an internal loopback test using the `stack loopback-test internal` command is performed. If the test displays an error then the stack port is damaged.

If the internal test passes, the external test can be run using the `stack loopback-test external` command. If the test displays an error then the stack cable is damaged.

The output of the `stack loopback-test internal` command is as follows:

```
5698TFD#stack loopback-test internal
Testing uplink port ... ok

Testing downlink port ... ok
Internal loopback test PASSED.
5698TFD#
5698TFD#stack loopback-test external
External loopback test PASSED.
5698TFD#
```

If one of the stack ports is defective (for example, such as the uplink), the output of the internal loopback test is as follows:

```
5698TFD#stack loopback-test internal
Testing uplink port ... Failed
Testing downlink port ... ok
Internal loopback test FAILED.
5698TFD#
```

If both the stack ports are functional, but the stack cable is defective, the external loopback test detects this, and the output is as follows:

```
5698TFD#stack loopback-test external
External loopback test FAILED. Your stack cable might be
damaged.
5698TFD#
```

If you run the command on any unit of a stack, you see the following error message:

```
5698TFD#stack loopback-test internal
Stack loopback test affects the functioning of the stack.
You should run this in stand-alone mode
5698TFD#stack loopback-test external
Stack loopback test affects the functioning of the stack.
You should run this in stand-alone mode
```

### Displaying port operational status

Use this procedure to display the port operational status.

#### ATTENTION

If you use a terminal with a width of greater than 80 characters, the output is displayed in a tabular format.

#### Procedure Steps

Step	Action
1	Enter Privileged Executive mode.
2	Enter the <code>show interfaces [port list] verbose</code> command. If you issue the command with no parameters the port status is shown for all ports.
3	Observe the NNCLI output.

--End--

### Validating port operational status

EAP: Configure EAP status to be unauthorized for some ports from NNCLI. When you type `show interfaces`, EAP Status is Down for those ports.

VLACP: Configure VLACP on port 1 from a 5000 series unit and on port 2 on another 5000 series unit. Have a link between these 2 ports. When `show interfaces` command is typed, VLACP status is up for port on the unit where the command is typed. Pull out the link from the other switch, VLACP status goes Down.

STP: After switch boots, type `show interfaces` command. STP Status is Listening (wait a few seconds and try again). STP Status becomes Learning.

After a while (15 seconds is the forward delay default value, only if you did not configure another time interval for STP forward delay), if you type `show interfaces` again, STP Status should be forwarding.

## Showing port information

Perform this procedure to display port configuration information.

### Procedure Steps

Step	Action
1	Enter Privileged Executive mode.
2	Enter the <code>show interfaces &lt;portlist&gt; config</code> command.
3	Observe the NNCLI output.
--End--	

### Job aid

The following is an example of the `show interfaces <portlist> config` command.

```
5698TFD#show interfaces 1/1-2 config
```

#### Unit/Port: 1/1

```
Trunk:
Admin: Disable
Oper: Down
Oper EAP: Up
Oper VLACP: Down
Oper STP: Disabled
Link: Down
LinkTrap: Enabled
Autonegotiation: Enabled
```

#### Unit/Port: 1/2

```
Trunk:
Admin: Enable
Oper: Down
Oper EAP: Up
Oper VLACP: Down
Oper STP: Forwarding
```

Link: Down  
 LinkTrap: Enabled  
 Autonegotiation: Enabled

**Table 4**  
**VLAN interfaces configuration**

	Filter Untagged	Filter Unregistered				
Unit/Port	Frames	Frames	PVID	PRI	Tagging	Name
1/1	No	Yes	256	0	UntagAll	Unit 1, Port 1
1/2	No	Yes	2	0	UntagAll	Unit 1, Port 2

**Table 5**  
**VLAN ID port member configuration**

Unit/Port	VLAN	VLAN Name	VLAN	VLAN Name	VLAN	VLAN Name
1/1	256	VLAN #256				
1/2	2	VLAN-2				

**Table 6**  
**Spanning-tree port configurations**

Unit	Port	Trunk	Participation	Priority	Path	Cost	State
1	1		Disabled				
1	2		Normal	Learning	128	20000	Forwarding

## Showing stack health information

Perform this procedure to display stack health information.

### Procedure 1 Procedure steps

Step	Action
1	Enter Privileged Executive mode
2	Enter the <code>show stack health</code> command.
3	Observe the NNCLI output.

--End--

### Job aid

The following is an example of the `show stack health` command output when the stack is formed but did not end the initialization process.

```
#show stack health
Stack in progress
```

The following is an example of the **show stack health** command output when the stack is formed and initialized, and all the rear ports are up.

```
#show stack health
-----
-
Unit# Switch Model Cascade Up Cascade Down
-----
--
1 (Base) 5698TFD-PWR OK OK
2 5650TD OK OK
3 5520-48T-PWR OK OK
4 5510-24T OK OK
5 5510-48T OK OK
6 5698TFD OK OK
7 5510-24T OK OK
-----
--
Switch Units Found = 8
Stack Health Check = OK - RESILIENT
Stack Diagnosis = Stack in full resilient mode
```

The following is an example of the **show stack health** command output when the stack is formed and initialized, and there are damaged or missing rear links.

```
#show stack health
-----
-
Unit# Switch Model Cascade Up Cascade Down
-----
--
1 (Base) 5698TFD-PWR OK OK
2 5650TD OK OK
3 5520-48T-PWR OK OK
4 5510-24T OK LINK DOWN OR MISSING
6 5510-48T LINK DOWN OR MISSING OK
7 5698TFD OK OK
8 5510-24T OK OK
-----
--
Switch Units Found = 8
Stack Health Check = WARNING - NON-RESILIENT
Stack Diagnosis = Stack in non-resilient mode
Recommend to add/replace the identified cable(s).
```

The following is an example of the **show stack health** command output when the stack is formed and some of the rear ports are not functioning properly.

```
#show stack health
-----
-
Unit# Switch Model Cascade Up Cascade Down
-----
--
1 (Base) 5698TFD-PWR OK OK
2 5650TD OK OK
3 5520-48T-PWR OK OK
4 5510-24T OK OK
5 5510-24T OK OK
6 5510-48T OK UP WITH ERRORS
7 5698TFD UP WITH ERRORS OK
8 5510-24T OK OK
-----
--
Switch Units Found = 8
Stack Health Check = WARNING - NON-RESILIENT
Stack Diagnosis = Stack in non-resilient mode
Recommend to add/replace the identified cable(s) .
```

A cable is not considered problematic (UP WITH ERRORS) when the switch connected to the other side is up but not in stack, or when the switch connected to the other side is up and in stack. A cable is considered problematic after several changes of status (between OK and LINK DOWN) occur in a short amount of time.

The following is an example of **show stack health** command output when the stack is running with a temporary base.

```
#show stack health
-----
-
Unit# Switch Model Cascade Up Cascade Down
-----
--
1 5698TFD-PWR OK OK
2 (Temporary Base) 5650TD OK OK
3 5520-48T-PWR OK OK
4 5510-24T OK OK
5 5510-24T OK OK
6 5510-48T OK OK
7 5698TFD OK OK
8 5510-24T OK OK
-----
```

```
--
Switch Units Found = 8
Stack Health Check = OK - RESILIENT
Stack Diagnosis = Stack in full resilient mode.
```

The following is an example of the **show stack health** command output when the stack is formed and initialized and there are damaged or missing rear links and a temporary base unit.

```
#show stack health
-----
-
Unit# Switch Model Cascade Up Cascade Down
-----
--
2 (Temporary Base) 5698TFD-PWR LINK DOWN OR MISSING OK
3 5650TD OK OK
4 5520-48T-PWR OK OK
5 5510-24T OK OK
6 5510-24T OK OK
7 5510-48T OK OK
8 5698TFD OK LINK DOWN OR MISSING
-----
--
Switch Units Found = 7
Stack Health Check = WARNING - NON-RESILIENT WITH TEMPORARY BASE
Stack Diagnosis = Stack in non-resilient mode, with temporary
base unit.
Recommend replacing failed base unit or to add/replace the
identified cables.
```

## Job aid

Perform this procedure to ensure that the stack has the correct number of switching units and that it is running in resilient mode. If the stack is not running in resilient mode, use this procedure to identify damaged or missing cables and to repair faulty stacks.

### Procedure 2 Procedure steps

Step	Action
1	Display the stack health status from the NNCLI.
2	If the number of units is the same as expected and the stack is resilient, this procedure is complete.
3	If the number of units is the same as expected, but the stack is not resilient, add or replace the identified cables and repeat the entire procedure.

- 4 If the number of units is not the same as expected, ensure all switching units are present and running and that they are properly connected.
- 5 If all the units are operational, but the number of units is not properly shown, remove or replace the units that do not appear.

---

--End--

---

## Viewing environmental information

Perform this procedure to view the status of the unit or stack environment.

### Procedure steps

Step	Action
1	Enter Privileged Executive mode
2	Enter the <code>show environmental</code> command.
3	Observe the NNCLI output.

---

--End--

---

### Job aid

The following is an example of the `show environmental` command output.

```
5698TFD-PWR#show environmental
Unit #1
Power Supply 1: AC-DC-12V-300W
Power Supply 2: Unavailable
Power Supply 3: Unavailable
Fan #1: OK
Fan #2: OK
Fan #3: OK
Fan #4: OK
Fan #5: OK
Fan #6: OK
Temperature: OK 36C
Unit #2
Power Supply 1: Unavailable
Power Supply 2: Unavailable
Power Supply 3: AC-DC-48V-100W
Fan #1: OK
Fan #2: OK
Fan #3: OK
Fan #4: OK
Fan #5: OK
```



Fan #6: OK  
Temperature: OK 37C

**Job aid**

Perform this procedure to ensure that the unit or stack works in proper conditions.

**Procedure steps**

---

<b>Step</b>	<b>Action</b>
1	Display the unit or stack environmental information from the NNCLI.
2	If the information that appears indicates that each unit hardware environment is in good condition you have completed this procedure.
3	If the temperature is High or the fans have a Fail status,check the hardware.
4	Execute hardware maintenance.
5	Repeat steps 1 to 5 if necessary.

---

--End--

---



---

# Network monitoring configuration using NNCLI

---

This chapter describes using NNCLI to view and configure network monitoring.

## Navigation

- “Viewing CPU utilization” (page 51)
- “Viewing memory utilization” (page 51)
- “Configuring the system log ” (page 52)
- “Configuring port mirroring ” (page 58)
- “Displaying Many-to-Many port-mirroring ” (page 60)
- “Configuring Many-to-Many port-mirroring ” (page 61)
- “Disabling Many-to-Many port-mirroring ” (page 62)

## Viewing CPU utilization

Use this procedure to view the CPU utilization

### Viewing CPU utilization using NNCLI

Step	Action
1	Enter Privileged Executive mode.
2	Enter the <code>show cpu-utilization</code> command.
3	Observe the displayed information.

---

--End--

---

## Viewing memory utilization

Use this procedure to view the memory utilization

### Viewing memory utilization using NNCLI

Step	Action
1	Enter Privileged Executive mode.
2	Enter the <code>show memory-utilization</code> command.
3	Observe the displayed information.

---

--End--

---

## Configuring the system log

This section outlines the NNCLI commands used in the configuration and management of the system log.

### Displaying the system log

Use this procedure to displays the configuration, and the current contents, of the system event log.

#### Procedure Steps

Step	Action
1	Enter the <code>show show logging [config] [critical] [serious] [informational] [sort-reverse]</code> command Privileged Executive mode.

---

--End--

---

### Variable definitions

The following table describes the command variables.

Variable	Value
config	Displays configuration of event logging.
critical	Displays critical log messages.
serious	Displays serious log messages.
informational	Displays informational log messages.

Variable	Value
sort-reverse	Displays informational log messages in reverse chronological order (beginning with most recent).
unit <1-8>	Displays log messages for a specific switch in a stack. <b>ATTENTION</b> You cannot use this command variable for a standalone switch.

## Configuring the system log

Use this procedure to configure the system settings for the system event log.

### Procedure Steps

Step	Action
1	Enter the <code>logging [enable   disable] [level critical   serious   informational   none] [nv-level critical   serious   none]</code> command Privileged Executive mode.
--End--	

### Variable definitions

The following table describes the command variables.

Variable	Value
enable   disable	Enables or disables the event log (default is Enabled).
level critical   serious   informational   none	Specifies the level of logging stored in DRAM.
nv-level critical   serious   none	Specifies the level of logging stored in NVRAM.

## Disabling the system log

Use this procedure to disable the system event log.

**Procedure Steps**

Step	Action
1	Enter the <code>no logging</code> command in global configuration mode.
--End--	

**Setting the system log to default**

Use this procedure to default the system event log configuration.

**Procedure Steps**

Step	Action
1	Enter the <code>default logging</code> command in global configuration mode.
--End--	

**Clearing the system log**

Use this procedure to clear all log messages in DRAM.

**Procedure Steps**

Step	Action
1	Enter the <code>clear logging [non-volatile] [nv] [volatile]</code> command in global configuration mode.
--End--	

**Variable definitions**

The following table describes the command variables.

**Table 7**  
**clear logging parameters**

Variable	Value
non-volatile	Clears log messages from NVRAM.
nv	Clears log messages from NVRAM and DRAM.
volatile	Clears log messages from DRAM.

## Remote system logging configuration using the NNCLI

The following sections describe remote system logging.

### Remote system logging configuration navigation

- [“Configuring remote system logging” \(page 55\)](#)
- [“Disabling remote system logging” \(page 56\)](#)
- [“Restoring remote system logging to default” \(page 57\)](#)

### Configuring remote system logging

Use this procedure to configure and manage the logging of system messages on a remote server.

#### Procedure steps

Step	Action
1	Enter the Global Configuration mode.
2	Configure the remote system log by using the following command:  <code>logging remote [address &lt;A.B.C.D WORD&gt;] [secondary -address &lt;A.B.C.D WORD&gt;] [enable] [level &lt;critical   informational   serious   none&gt;]</code>
3	Display the configuration and the current contents of the system event log by using the following command:  <code>show logging</code>
--End--	

#### Variable definitions

The following table defines parameters that you can enter with the `logging remote [address <A.B.C.D|WORD>] [secondary-address <A.B.C.D|WORD>] [enable] [level <critical | informational | serious | none>]` command.

Variable	Value
<code>address &lt;A.B.C.D   WORD&gt;</code>	<p>Specifies the primary remote system log server IP address.</p> <ul style="list-style-type: none"> <li>• <b>A.B.C.D</b>—the IPv4 address of the remote server</li> <li>• <b>WORD</b>—the remote host IPv6 address. The value is a character string with a maximum of 45 characters.</li> </ul>
<code>enable</code>	<p>Enables the system message logging on remote server.</p> <div style="border: 1px solid black; padding: 5px;"> <p><b>ATTENTION</b> You must configure either the primary or secondary remote server address before you enable remote logging.</p> </div>
<code>level &lt;critical   informationa l   serious   none&gt;</code>	<p>Specifies the remote logging level:</p> <ul style="list-style-type: none"> <li>• <b>critical</b>—only messages classified as critical are sent to the remote system log server.</li> <li>• <b>serious</b>—only messages classified as serious are sent to the remote system log server.</li> <li>• <b>informational</b>—only messages classified as informational are sent to the remote system log server.</li> <li>• <b>none</b>—no remote log messages are sent to the remote system log server.</li> </ul>
<code>secondary-address &lt;A.B.C.D   WORD&gt;</code>	<p>Specifies the secondary remote system log server IP address.</p> <ul style="list-style-type: none"> <li>• <b>A.B.C.D</b>—the IPv4 address of the remote server</li> <li>• <b>WORD</b>—the remote host IPv6 address. The value is a character string with a maximum of 45 characters.</li> </ul>

### Disabling remote system logging

Use this procedure to disable the logging of system messages on a remote server.



### Procedure steps

Step	Action
1	Enter the Global Configuration mode.
2	Disable the remote system log by using the following command:  <pre>no logging remote [address] [secondary-address] [enable] [level]</pre>
--End--	

### Variable definitions

The following table defines parameters that you can enter with the `no logging remote [address] [secondary-address] [enable] [level]` command.

Variable	Value
<code>address</code>	Clears the primary remote system log server IP address.
<code>enable</code>	Disables system message logging on the remote server.
<code>level</code>	Clears the remote server logging level.
<code>secondary-address</code>	Clears the secondary remote system log server IP address.

### Restoring remote system logging to default

Use this procedure to restore the logging of system messages on a remote server to factory defaults.

### Procedure steps

Step	Action
1	Enter the Global Configuration mode.
2	Disable the remote system log by using the following command:  <pre>default logging remote [address] [secondary-address] [ enable] [level]</pre>
--End--	

### Variable definitions

The following table defines parameters that you can enter with the `default logging remote [address] [secondary-address] [enable] [level]` command.

Variable	Value
<code>address</code>	Restores the primary remote system log server IP address to the factory default (0.0.0.0).
<code>level</code>	Restores the remote server logging level to the factory default (none).
<code>secondary-address</code>	Restores the secondary remote system log server IP address to the factory default (0.0.0.0).

## Configuring port mirroring

Port mirroring can be configured with the NNCLI commands detailed in this section.

### Displaying the port-mirroring configuration

Use this procedure to display the existing port-mirroring configuration.

#### Procedure Steps

Step	Action
1	Enter Privileged Executive mode.
2	Enter the <code>show port-mirroring</code> command to display the port-mirroring configuration.
--End--	

## Configure port-mirroring

Use this procedure to set the port-mirroring configuration

#### Procedure Steps

Step	Action
1	Enter Global Configuration mode.
2	Enter the <code>port-mirroring [allow-traffic] mode {disable   Xrx monitor-port &lt;portlist&gt; mirror-ports &lt;portlist&gt;   Xtx monitor-port &lt;portlist&gt; mirror-ports &lt;portlist&gt;   ManyToOneRx monitor-port &lt;portlist&gt; mirror-ports &lt;portlist&gt;   ManyToOneTx monitor-port &lt;portlist&gt; mirror-port-X</code>

```

<portlist> | ManytoOneRxTx monitor-port
<portlist> mirror-port-X <portlist> | XrxOrXtx
monitor-port <portlist> mirror-port-X
<portlist> | XrxOrYtx monitor-port <portlist>
mirror-port-X <portlist> mirror-port-Y
<portlist> | XrxYtx monitor-port <portlist>
mirror-port-X <portlist> mirror-port-Y <portlist>
| XrxYtxOrYrxXtx monitor-port <portlist>
mirror-port-X <portlist> mirror-port-Y <portlist>
| Asrc monitor-port <portlist> mirror-MAC-A
<macaddr> | Adst monitor-port <portlist>
mirror-MAC-A <macaddr> | AsrcOrAdst monitor-port
<portlist> mirror-MAC-A <macaddr> | AsrcBdst
monitor-port <portlist> mirror-MAC-A <macaddr>
mirror-MAC-B <macaddr> | AsrcBdstOrBsrcAdst
monitor-port <portlist> mirror-MAC-A <macaddr>
mirror-MAC-B <macaddr>} command to display the
port-mirroring configuration.

```

---

--End--

---

### Variable definitions

The following table outlines the parameters for this command.

Parameter	Description
allow-traffic	Enables bi-direction Monitor Port.
disable	Disables port-mirroring.
monitor-port	Specifies the monitor port.
mirror-port-X	Specifies the mirroring port X.
mirror-port-Y	Specifies the mirroring port Y.
mirror-MAC-A	Specifies the mirroring MAC address A.
mirror-MAC-B	Specifies the mirroring MAC address B.
portlist	Enter the port numbers.
ManytoOneRx	Many to one port mirroring on ingress packets.
ManytoOneTx	Many to one port mirroring on egress packets.
ManytoOneRxTx	Many to one port mirroring on ingress and egress traffic.
Xrx	Mirror packets received on port X.
Xtx	Mirror packets transmitted on port X.
XrxOrXtx	Mirror packets received or transmitted on port X.

Parameter	Description
XrxYtx	Mirror packets received on port X and transmitted on port Y. This mode is not recommended for mirroring broadcast and multicast traffic.
XrxYtxOrXtxYrx	Mirror packets received on port X and transmitted on port Y or packets received on port Y and transmitted on port X.
XrxOrYtx	Mirror packets received on port X or transmitted on port Y.
macaddr	Enter the MAC address in format H.H.H.
Asrc	Mirror packets with source MAC address A.
Adst	Mirror packets with destination MAC address A.
AsrcOrAdst	Mirror packets with source or destination MAC address A.
AsrcBdst	Mirror packets with source MAC address A and destination MAC address B.
AsrcBdstOrBsrcAdst	Mirror packets with source MAC address A and destination MAC address B or packets with source MAC address B and destination MAC address A.

### Disabling port-mirroring

Use this procedure to disable port-mirroring

#### Procedure Steps

Step	Action
1	Enter Global Configuration mode
2	Enter the <code>no port-mirroring</code> command to disable port-mirroring.
--End--	

### Displaying Many-to-Many port-mirroring

Use this procedure to display Many-to-Many port-mirroring settings

#### Procedure Steps

Step	Action
1	Enter Privileged Executive mode

- 2 Enter the `show port-mirroring` command.
- 3 Observe the displayed information.

---

--End--

---

## Configuring Many-to-Many port-mirroring

Use this procedure to configure Many-to-Many port-mirroring

### Procedure Steps

Step	Action
1	Enter Global Configuration mode
2	Enter the <code>port-mirroring &lt;1-4&gt; [allow-traffic] mode {disable   Adst   Asrc   AsrcBdst   AsrcBdstOrBsrcAdst   AsrcOrAdst   ManyToOneRx   ManyToOneRxTx   ManyToOneTx   Xrx   XrxOrXtx   XrxOrYtx   XrxYtx   XrxYtxOrYrxXtx   Xtx}</code> command.
3	Enter the command from step 2 for up to four instances.

---

--End--

---

### Variable definitions

The following table describes the command variables

Variable	Value
allow-traffic	Enables bi-direction Monitor Port.
disable	Disable mirroring.
Adst	Mirror packets with destination MAC address A
Asrc	Mirror packets with source MAC address A.
AsrcBdst	Mirror packets with source MAC address A and destination MAC address B.
AsrcBdstOrBsrcAdst	Mirror packets with source MAC address A and destination MAC address B or packets with source MAC address B and destination MAC address A.
AsrcOrAdst	Mirror packets with source or destination MAC address A.

ManyToOneRx	Mirror many to one port mirroring on ingress packets.
ManyToOneRxTx	Mirror many to one port mirroring on ingress and egress packets.
ManyToOneTx	Mirror many to one port mirroring on egress packets.
Xrx	Mirror packets received on port X.
XrxOrXtx	Mirror packets received on port X and transmitted on port Y.
XrxYtx	Mirror packets received on port X and transmitted on port Y.
XrxYtxOrYrxXtx	Mirror packets received on port X and transmitted on port Y or packets received on port Y and transmitted on port X.
Xtx	Mirror packets received on port X or transmitted on port Y

## Disabling Many-to-Many port-mirroring

### Procedure Steps

Step	Action
1	Enter Global Configuration mode
2	Enter the <code>port-mirroring [&lt;1-4&gt;] mode disable</code> or <code>no port-mirroring [&lt;1-4&gt;]</code> command to disable a specific instance.
3	Enter the <code>no port-mirroring</code> command to disable all instances.
--End--	

### Variable definitions

The following paragraph describes the command variables.

Variable	Definition
<1-4>	The port-mirroring instance.

---

## RMON configuration using NNCLI

---

### Configuring RMON with the NNCLI

This section describes the NNCLI commands used to configure and manage RMON.

#### Viewing RMON alarms

Use the following procedure to view RMON alarms.

##### Procedure Steps

Step	Action
1	Enter Privileged Executive mode.
2	Use the <code>show rmon alarm</code> command to display information about RMON alarms.

---

--End--

---

#### Viewing RMON events

Use the following procedure to display information regarding RMON events.

##### Procedure Steps

Step	Action
1	Enter Privileged Executive mode.
2	Enter the <code>show rmon event</code> command.

---

--End--

---

#### Viewing RMON history

Use this procedure to display information regarding the configuration of RMON history.

**Procedure Steps**

Step	Action
1	Enter Privileged Executive mode.
2	Enter the <code>show rmon history [&lt;port&gt;]</code> command.
--End--	

**Variable Definitions**

The following table describes the command variables.

Variable	Definition
<port>	The specified port number for which RMON history settings is displayed.

**Viewing RMON statistics**

Use the following procedure to display information regarding the configuration of RMON statistics.

**Procedure Steps**

Step	Action
1	Enter Privileged Executive mode.
2	Enter the <code>show rmon stats</code> command.
--End--	

**Setting RMON alarms**

Use the following procedure to set

**Procedure Steps**

Step	Action
1	Enter Global Configuration mode.
2	Enter the <code>rmon alarm &lt;1-65535&gt; &lt;WORD&gt; &lt;1-2147483647&gt; {absolute   delta} rising-threshold &lt;-2147483648-2147483647&gt; [&lt;1-65535&gt;] falling-threshold &lt;-2147483648-2147483647&gt;</code>



```
[<1-65535>]
[owner <LINE>] command.
```

---

--End--

---

### Variable definitions

The following table describes the command variables.

Parameter	Description
<1-65535>	Unique index for the alarm entry.
<WORD>	The MIB object to be monitored. This object identifier can be an English name.
<1-2147483647>	The sampling interval, in seconds.
absolute	Use absolute values (value of the MIB object is compared directly with thresholds).
delta	Use delta values (change in the value of the MIB object between samples is compared with thresholds).
rising-threshold <-2147483648-2147483647 > [<1-65535>]	The first integer value is the rising threshold value. The optional second integer specifies the event entry to be triggered after the rising threshold is crossed. If omitted, or if an invalid event entry is referenced, no event is triggered.
falling-threshold <-2147483648-2147483647 > [<1-65535>]	The first integer value is the falling threshold value. The optional second integer specifies the event entry to be triggered after the falling threshold is crossed. If omitted, or if an invalid event entry is referenced, no event is triggered.
[owner <LINE>]	Specify an owner string to identify the alarm entry.

### Deleting RMON alarm table entries

Use the following procedure to delete RMON alarm table entries.

#### Procedure Steps

Step	Action
1	Enter Global Configuration mode.
2	Enter the <code>no rmon alarm [&lt;1-65535&gt;]</code> command.

---

--End--

---

### Variable definitions

The following table describes the command parameters.

Variable	Definition
[<1-65535>]	The number assigned to the alarm. If no number is selected, all RMON alarm table entries are deleted.

### Configuring RMON event log and traps

Use the following procedure to configure RMON event log and trap settings.

#### Procedure Steps

Step	Action
1	Enter Global Configuration mode.
2	Enter the <code>rmon event &lt;1-65535&gt; [log] [trap] [description &lt;LINE&gt;] [owner &lt;LINE&gt;]</code> command.
--End--	

### Variable definitions

The following table describes the command parameters.

Parameter	Description
<1-65535>	Unique index for the event entry.
[log]	Record events in the log table.
[trap]	Generate SNMP trap messages for events.
[description <LINE>]	Specify a textual description for the event.
[owner <LINE>]	Specify an owner string to identify the event entry.

### Deleting RMON event table entries

Use the following procedure to clear entries in the table.

#### Procedure Steps

Step	Action
1	Enter Global Configuration mode.
2	Enter the <code>no rmon event [&lt;1-65535&gt;]</code> command to delete the entries.
--End--	

**Variable definitions**

The following table describes the command parameters.

Variable	Definition
[<1-65535>]	Unique identifier of the event. If not given, all table entries are deleted.

**Configuring RMON history**

Use the following procedure to configure RMON history settings.

**Procedure Steps**

Step	Action
1	Enter Global Configuration mode.
2	Enter the <code>rmon history &lt;1-65535&gt; &lt;LINE&gt; &lt;1-65535&gt; &lt;1-3600&gt; [owner &lt;LINE&gt;]</code> command to configure the RMON history..
--End--	

The `rmon history` command is executed in the Global Configuration command mode.

**Variable definitions**

The following table describes the command variables

**Table 8**  
**rmon history parameters**

Parameter	Description
<1-65535>	Unique index for the history entry.
<LINE>	Specify the port number to be monitored.
<1-65535>	The number of history buckets (records) to keep.
<1-3600>	The sampling rate (how often a history sample is collected).
[owner <LINE>]	Specify an owner string to identify the history entry.

**Deleting RMON history table entries.**

Use this procedure to delete RMON history table entries.

**Procedure Steps**

Step	Action
1	Enter Global Configuration mode.

- 2 Enter the `no rmon history [<1-65535>]` command to delete the entries.

---

--End--

---

### Variable definitions

The following table describes the command parameters.

Variable	Definition
[<1-65535>]	Unique identifier of the event. If not given, all table entries are deleted.

### Configuring RMON statistics

Use this procedure to configure RMON statistics settings.

#### Procedure Steps

Step	Action
1	Enter Global Configuration mode.
2	Enter the <code>rmon stats &lt;1-65535&gt; &lt;LINE&gt; [owner &lt;LINE&gt;]</code> command to configure RMON statistics.

---

--End--

---

### Variable definitions

The following table describes the command variables.

Parameter	Description
<1-65535>	Unique index for the stats entry.
[owner <LINE>]	Specify an owner string to identify the stats entry.

### Disabling RMON statistics

Use this procedure to disable RMON statistics. If the variable is omitted, all entries in the table are cleared.

#### Procedure Steps

Step	Action
1	Enter Global Configuration mode.

- 2 Enter the `no rmon stats [<1-65535>]` command to disable RMON statistics.

---

--End--

---

### Variable definitions

The following table describes the command parameters.

Variable	Definition
<1-65535>	Unique index for the statistics entry. If omitted, all statistics are disabled.



---

## IPFIX Configuration using NNCLI

---

This section describes the commands used in the configuration and management of IP Flow Information Export (IPFIX) using the NNCLI.

### Configuring IPFIX collectors

The `ip ipfix collector` command is used to configure IPFIX collectors. IPFIX collectors are used to collect and analyze data exported from an IPFIX compliant switch. In Software Release 5.0, the only external collector supported is **NetQOS**. At this time, up to two collectors can be supported.

IPFIX data is exported from the switch in *Netflow version 9* format. Data is exported using UDP port 9995.

IPFIX data is not load balanced when two collectors are in use. Identical information is sent to both collectors.

Use the following procedure to configure the IPFIX collectors.

#### Procedure Steps

Step	Action
1	Enter Global Configuration mode.
2	Use the <code>ip ipfix collector &lt;collector_ip_address&gt;</code> command to configure the IPFIX collector.
--End--	

The `ip ipfix collector` command is executed in the Global Configuration mode.

#### Variable definitions

The following table describes the parameters for this command.

Parameter	Description
<collector_ip_address>	The IP address of the collector.

## Enabling IPFIX globally

Use the following procedure to globally enable IPFIX on the switch.

### Procedure Steps

Step	Action
1	Enter Global Configuration mode.
2	Use the <code>ip ipfix enable</code> command to enable IPFIX on the switch.
--End--	

## Configuring unit specific IPFIX

Use the following command to configure unit specific IPFIX parameters.

### Procedure Steps

Step	Action
1	Enter Global Configuration mode.
2	Use the <code>ip ipfix slot &lt;unit_number&gt; [aging-interval &lt;aging_interval&gt;] [export-interval &lt;export_interval&gt;] [exporter-enable] [template-refresh-interval &lt;template_refresh_interval&gt;] [template-refresh-packets &lt;template_refresh_packets&gt;]</code> command to enable IPFIX on the switch.
--End--	

## Variable definitions

The parameters of this command are described in the following table.

Parameter	Description
<unit_number>	The unit number of the collector. Currently up to two collectors are supported so the values 1 or 2 are valid.
<aging_interval>	The IPFIX aging interval. This value is in seconds from 0 to 2147400.



Parameter	Description
<export_interval>	The IPFIX export interval. This interval is the value at which IPFIX data is exported in seconds from 10 to 3600.
<template_refresh_interval>	The IPFIX template refresh interval. This value is in seconds from 300 to 3600.
<template_refresh_packets>	The IPFIX template refresh packet setting. This value is the number of packets from 10000 - 100000.

## Enabling IPFIX on the interface

Use the following procedure to enable IPFIX on the interface.

### Procedure Steps

Step	Action
1	Enter Interface Configuration mode.
2	Use the <code>ip ipfix enable</code> command to enable IPFIX on the interface.
--End--	

## Enabling IPFIX export through ports

Use the following procedure to enable the ports exporting data through IPFIX.

### Procedure Steps

Step	Action
1	Enter Interface Configuration mode.
2	Use the <code>ip ipfix port &lt;port_list&gt;</code> command to enable IPFIX on the interface.
--End--	

## Variable definitions

The following table describes the command parameters

Variable	Definition
port-list	Single or comma-separated list of ports.

## Deleting the IPFIX information for a port

Use the following procedure to delete the collected IPFIX information for a port.

### Procedure Steps

Step	Action
1	Enter Privileged Executive mode.
2	Use the <code>ip ipfix flush port &lt;port_list&gt; [export-and-flush]</code> command to delete the collected IPFIX information for the port or ports.
--End--	

### Variable definitions

The following table describes the command parameters.

Variable	Definition
port-list	Single or comma-separated list of ports.
export-and-flush	Export data to a collector before it is deleted.

## Viewing the IPFIX table

Use the following procedure to display IPFIX data collected from the switch.

### Procedure Steps

Step	Action
1	Enter Privileged Executive mode.
2	Use the <code>show ip ipfix table &lt;unit_number&gt; sort-by &lt;sort_by&gt; sort-order &lt;sort_order&gt; display &lt;num_entries&gt;</code> command view the IPFIX data.
--End--	

### Variable definitions

The following table describes the command parameters.

Variable	Definition
<unit_number>	The unit number of the collector. Currently up to two collectors are supported so the values 1 or 2 are valid.

---

Variable	Definition
<sort_by>	The value on which the data is sorted. Valid options are: <ul style="list-style-type: none"><li>• byte-count</li><li>• dest-addr</li><li>• first-pkt-time</li><li>• last-pkt-time</li><li>• pkt-count</li><li>• port</li><li>• protocol</li><li>• source-addr</li><li>• TCP-UDP-dest-port</li><li>• TCP-UDP-src-port</li><li>• TOS</li></ul>
<sort_order>	The order in which the data is sorted. Valid options are ascending and descending.
<num_entries>	The number of data rows to display. Valid options are: <ul style="list-style-type: none"><li>• all</li><li>• top-10</li><li>• top-25</li><li>• top-50</li><li>• top-100</li><li>• top-200</li></ul>



---

## System diagnostics and statistics using Enterprise Device Manager

---

This chapter describes the procedures you can use to perform system diagnostics and gather statistics using Enterprise Device Manager (EDM).

### Prerequisites

- Open one of the supported browsers.
- Enter the IP address of the switch to open an EDM session.

### Configuring Stack Monitor using EDM

Use the following procedure to configure Stack Monitor using EDM.

#### Prerequisites

- Open one of the supported browsers.
- Enter the IP address of the switch to open an EDM session.

#### Procedure Steps

Step	Action
1	From the navigation tree, double-click <b>Edit</b> .
2	In the Edit tree, double-click <b>Chassis</b> .
3	In the Chassis tree, double-click <b>Chassis</b> .
4	In the work area, click the <b>Stack Monitor</b> tab.
5	In the Stack Monitor tab, configure the required parameters.
6	On the toolbar, click <b>Apply</b> .

---

--End--

---

### Variable definitions

The following table describes the fields of Stack Monitor tab.

Field	Description
StackErrorNotificationEnabled	Enables or disables the Stack Monitoring feature.
ExpectedStackSize	Specifies the size of the stack to monitor. Valid range is 2–8. Default value is 2.
StackErrorNotificationInterval	Specifies the time interval between traps, in seconds. Valid range is 30–300 seconds. Default value is 60.

### Viewing stack health using EDM

Use this procedure to display stack health information.

#### Procedure steps

Step	Action
1	From the navigation tree, double-click <b>Edit</b> .
2	In the Edit tree, double-click <b>Chassis</b> .
3	In the Chassis tree, double-click <b>Switch/Stack</b> .
4	In the work area, click the <b>Stack Health</b> tab to display the stack health.
--End--	

### Variable definitions

Use the data in the following table to help you understand the stack health.

Variable	Value
Switch Units Found	Indicates the number of switch units in the stack.
Stack Health Check	Indicates the stack health.
Stack Diagnosis	Indicates the stack mode.

---

# Network monitoring configuration using Enterprise Device Manager

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This chapter describes the procedures you can use to perform network monitoring configuration using Enterprise Device Manager (EDM).

## Prerequisites

- Open one of the supported browsers.
- Enter the IP address of the switch to open an EDM session.

## Navigation

- [“CPU and memory utilization using EDM” \(page 79\)](#)
- [“Configuring the system log using EDM” \(page 80\)](#)
- [“Configuring remote system logging using EDM” \(page 84\)](#)
- [“Viewing system logs using EDM” \(page 82\)](#)
- [“Remote system logging using EDM” \(page 83\)](#)
- [“EDM MIB Web page” \(page 86\)](#)
- [“Port Mirroring using EDM” \(page 87\)](#)
- [“Creating a graph using EDM” \(page 91\)](#)
- [“Graphing switch chassis data using EDM” \(page 91\)](#)
- [“Graphing switch port data using EDM” \(page 101\)](#)
- [“Graphing multilink trunk statistics using EDM” \(page 117\)](#)
- [“Graphing VLAN DHCP statistics using EDM” \(page 123\)](#)
- [“Viewing unit statistics using EDM” \(page 124\)](#)

## CPU and memory utilization using EDM

Use the following procedure to view CPU and memory utilization.

### Prerequisites

- Open one of the supported browsers.
- Enter the IP address of the switch to open an EDM session.

### Procedure steps

Step	Action
1	From the navigation tree, double-click <b>Edit</b> .
2	In the Edit tree, double-click <b>Chassis</b> .
3	In the Chassis tree, double-click <b>Chassis</b> .
4	On the work area, click the <b>CPU/Memory Utilization</b> tab.
5	On the toolbar, click the <b>Refresh</b> button to update the data.

---

--End--

---

### Variable definitions

The following table describes the fields on the CPU/Mem Utilization tab.

Field	Description
Unit	Indicates the unit.
Last10Seconds	Indicates the CPU usage, in percentage, for the last 10 seconds.
Last1Minute	Indicates the CPU usage, in percentage, for the last minute.
Last10Minutes	Indicates the CPU usage, in percentage, for the last 10 minutes.
Last1Hour	Indicates the CPU usage, in percentage, for the last hour.
Last24Hours	Indicates the CPU usage, in percentage, for the last 24 hours.
TotalCPUUsage	Indicates the memory usage in megabytes.
MemoryTotalMB	Indicates the total memory present, in megabytes, on the unit.
MemoryAvailableMB	Indicates the remaining memory on the unit.
MemoryUsedMB	<b>Author's note – Kindly provide the info.</b>

## Configuring the system log using EDM

Use the following procedure to configure the system log.



## Prerequisites

- Open one of the supported browsers.
- Enter the IP address of the switch to open an EDM session.

## Procedure steps

Step	Action
1	From the navigation tree, double-click <b>Edit</b> .
2	In the Edit tree, double-click <b>Diagnostics</b> .
3	In the Diagnostics tree, double-click <b>System Log</b> .
4	In the <b>System Log Settings</b> tab, configure the required parameters.
5	On the toolbar, click <b>Apply</b> .

--End--

## Variable definitions

The following table describes the fields in the System Log Settings tab.

Field	Description
Operation	Turns the system log on or off.
BufferFullAction	Specifies whether the system log overwrites itself or discontinues the storage of messages when the buffer is full.
Volatile - CurSize	Shows the current number of messages stored in volatile memory.
Volatile - SaveTargets	Indicates the severity of system messages to save. Available options are: <ul style="list-style-type: none"> <li>• critical</li> <li>• critical/serious</li> <li>• critical/serious/inform</li> <li>• none</li> </ul> Default value is critical/serious/inform.
non - Volatile - CurSize	Shows the current number of messages stored in non-volatile memory.

Field	Description
non-Volatile - SaveTargets	Indicates the severity of system messages to save. Available options are: <ul style="list-style-type: none"> <li>• critical</li> <li>• critical/serious</li> <li>• none</li> </ul> Default value is critical/serious.
ClearMessageBuffers	Selects the sections of the system log to delete. Available options are: <ul style="list-style-type: none"> <li>• volCritical</li> <li>• volSerious</li> <li>• volInformational</li> <li>• nonVolCritical</li> <li>• nonVolSerious</li> </ul>

## Viewing system logs using EDM

Use the following procedure to display system log information.

### Prerequisites

- Open one of the supported Web browsers.
- Access the switch.

### Procedure steps

Step	Action
1	From the navigation tree, double-click <b>Edit</b> .
2	In the Edit tree, double-click <b>Diagnostics</b> .
3	In the Diagnostics tree, double-click <b>System Log</b> .
4	In the work area, click the <b>System Logs</b> tab.

--End--

### Variable definitions

Use the data in the following table to help you understand the system log display.

Variable	Value
OrigUnitNumber	Indicates the slot or unit number of the originator of a log message.
MsgTime	Indicates the time (in one hundredths of a second) between system initialization and the appearance of a log message in the system log.
MsgIndex	Indicates a sequential number the system assigns to a log message when it enters the system log.
MsgSrc	Indicates whether a log message was loaded from non-volatile memory at system initialization or was generated since system initialization.
MsgString	Indicates the log message originator and the reason the log message was generated.

## Remote system logging using EDM

The following sections describes remote system logging procedures using EDM.

### Remote system logging using EDM navigation

- [“Viewing remote system logs using EDM” \(page 83\)](#)
- [“Configuring remote system logging using EDM” \(page 84\)](#)

### Viewing remote system logs using EDM

Use this procedure to view the remote system logs.

#### Procedure steps

Step	Action
1	From the navigation tree, double-click <b>Edit</b> .
2	In the Edit tree, double-click <b>Diagnostics</b> .
3	In the Diagnostics tree, double-click <b>System Log</b> .
4	in the work area, click the <b>Remote System Log</b> tab.
--End--	

### Variable definitions

Use the data in the following table to help you understand the remote system logs.

Variable	Value
RemoteSyslogAddressType	Specifies the type of IP address of the remote system log server.
RemoteSyslogAddress	Specifies the IP address of the remote system log server to which to send system log messages.
SecondarySyslogAddressType	Specifies the type of IP address of the secondary remote system log server.
SecondarySyslogAddress	Specifies the IP address of the secondary remote system log server to send system log messages to.
Enabled	Enables or disables the remote logging of system messages.
SaveTargets	Specifies the type of system messages to send to the remote system log server. <ul style="list-style-type: none"> <li>• critical—only messages classified as critical are sent to the remote system log server</li> <li>• critical/serious—only messages classified as critical and serious are sent to the remote system log server</li> <li>• critical/serious/inform—only messages classified as critical, serious, and informational are sent to the remote system log server</li> <li>• none—no system log messages are sent to the remote system log server</li> </ul>

### Configuring remote system logging using EDM

Use this procedure to configure and manage the logging of system messages on a secondary, remote syslog server.

#### Procedure steps

Step	Action
1	From the navigation tree, double-click <b>Edit</b> .
2	In the Edit tree, double-click <b>Diagnostics</b> .

- 3 In the Diagnostics tree, double-click **System Log**.
- 4 in the work area, click the **Remote System Log** tab.
- 5 In the **RemoteSyslogAddressType** section, click the type of IP address of the remote system log server.
- 6 In the **RemoteSyslogAddress** box, type the IP address of the remote system log server.
- 7 In the **SecondarySyslogAddressType** section, click the type of IP address of the remote system log server.
- 8 In the **SecondarySyslogAddress** box, type the IP address of the remote system log server.
- 9 Click the **Enabled** box to enable remote system logging.  
**OR**  
Click the **Enabled** box to disable remote system logging.
- 10 In the **SaveTargets** section, click the type of system messages.
- 11 On the tool bar, click **Apply**.

---

--End--

---

### Variable definitions

Use the data in the following table to help you configure the remote system log.

Variable	Value
RemoteSyslogAddressType	Specifies the type of IP address of the remote system log server.
RemoteSyslogAddress	Specifies the IP address of the remote system log server to which to send system log messages.
SecondarySyslogAddressType	Specifies the type of IP address of the secondary remote system log server.
SecondarySyslogAddress	Specifies the IP address of the secondary remote system log server to send system log messages to.

Variable	Value
Enabled	Enables or disables the remote logging of system messages.
SaveTargets	Specifies the type of system messages to send to the remote system log server. <ul style="list-style-type: none"> <li>critical—only messages classified as critical are sent to the remote system log server</li> <li>critical/serious—only messages classified as critical and serious are sent to the remote system log server</li> <li>critical/serious/inform—only messages classified as critical, serious, and informational are sent to the remote system log server</li> <li>none—no system log messages are sent to the remote system log server</li> </ul>

## EDM MIB Web page

Use the information in this section to use the EDM MIB Web page to monitor network SNMP characteristics.

### EDM MIB Web page navigation

- [“Using the EDM MIB Web page for SNMP Get and Get-Next ” \(page 86\)](#)
- [“Using the EDM MIB Web page for SNMP walk” \(page 87\)](#)

### Using the EDM MIB Web page for SNMP Get and Get-Next

You can use the EDM Management Information Base (MIB) Web page to view the response of an SNMP Get and Get-Next request for any Object Identifier (OID).

#### Procedure steps

Step	Action
1	From the navigation tree, double-click <b>Administration</b> .
2	In the Administration tree, double-click <b>MIB Web Page</b> .
3	In the <b>MIB Name/ OID</b> box, enter the object name or OID.
4	Click <b>Get</b> .

The result of the request appears in the Result area of the window. If the request is unsuccessful, a description of the received error appears.

- 5 Click **Get Next** to retrieve the information of the next object in the MIB.
- 6 Repeat step 3 as required.

---

--End--

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### Using the EDM MIB Web page for SNMP walk

You can use SNMP walk to retrieve a subtree of the MIB that has the SNMP object as root.

Perform this procedure to request the result of MIB Walk.

#### Procedure steps

Step	Action
1	From the navigation tree, double-click <b>Administration</b> .
2	In the Administration tree, double-click <b>MIB Web Page</b> .
3	In the <b>MIB Name/ OID</b> box, enter the object name or OID.
4	Click <b>Walk</b> .
	The result of the request appears in the Result area. If the request is unsuccessful, a description of the received error appears.

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--End--

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## Port Mirroring using EDM

The following sections describe Port Mirroring.

### Port Mirroring using EDM navigation

- [“Viewing Port Mirroring using EDM” \(page 87\)](#)
- [“Configuring Port Mirroring using EDM” \(page 88\)](#)

### Viewing Port Mirroring using EDM

View Port Mirroring to troubleshoot the network.

**Procedure steps**

Step	Action
1	From the navigation tree, double-click <b>Edit</b> .
2	In the Edit tree, double-click <b>Diagnostics</b> .
3	In the Diagnostics tree, double-click <b>Port Mirrors</b> .
--End--	

**Variable definitions**

Use the data in the following table to help you understand the Port Mirroring parameters.

Variable	Value
Instance	Specifies the numerical assignment of the port mirroring.
Port Mode	Specifies the port monitoring mode.
Monitor Port	Identifies the monitoring port.
PortListX	Identifies the ports monitored for Xrx/Xtx, and manytoOne related mode.
PortListY	Identifies the ports monitored for Yrx/Ytx related mode.
MacAddressA	Specifies the MAC address of the monitored port using Sarc/Adst related mode.
MacAddressB	Specifies the MAC address of the monitored port using Bsrc/Bdst related mode.
AllowTraffic	Indicates whether bi-directional mirroring traffic is enabled.

**Configuring Port Mirroring using EDM**

Configure Port Mirroring to troubleshoot the network.

**Procedure steps**

Step	Action
1	From the navigation tree, double-click <b>Edit</b> .
2	In the Edit tree, double-click <b>Diagnostics</b> .
3	In the Diagnostics tree, double-click <b>Port Mirrors</b> .
4	In the work area, click <b>Insert</b>
5	In the <b>Instance</b> box, type 1.



- 6 In the **PortMode** section, click a mode.
- 7 Click the **MonitorPort** ellipsis (...).
- 8 In the **MonitorPort** list, click a monitor port.
- 9 Click **Ok**.
- 10 If the PortMode is Xrx, Xtx, or both, or manytoOne related modes, click the **PortListX** ellipsis (...).
- 11 In the **PortListX** list, click a port, ports, or **All** to add to the list.
- 12 Click **Ok**.
- 13 If the PortMode is Yrx, Ytx, or both related modes, click the **PortListY** ellipsis (...).
- 14 In the **PortListY**, click a port, ports, or **All** to add to the list.
- 15 Click **Ok**.
- 16 If the PortMode is Asrc, Adst, or both related modes, in the **MacAddressA**, type an address.
- 17 If the PortMode is Bsrc, Bdst, or both related modes, in the **MacAddressA**, type an address.
- 18 To enable bi-directional traffic, click the **AllowTraffic** box.
- 19 Click **Insert**.

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--End--

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### Variable definitions

Use the data in the following table to help you understand the Port Mirroring parameters.

Variable	Value
Instance	Indicates the Port Mirroring instance number. Release 6.2 supports only one instance.
PortMode	Indicates the supported Port Mirroring modes. The modes are: <ul style="list-style-type: none"> <li>• Adst—Mirror packets with destination MAC address A.</li> <li>• Asrc—Mirror packets with source MAC address A.</li> <li>• AsrcBdst—Mirror packets with source MAC address A and destination MAC address B.</li> <li>• AsrcBdstOrBsrcAdst—Mirror packets with source MAC address</li> </ul>

Variable	Value
	<p>A and destination MAC address B or packets with source MAC address B and destination MAC address A.</p> <ul style="list-style-type: none"> <li>• AsrcOrAdst—Mirror packets with source or destination MAC address A.</li> <li>• manytoOneRx—Many to one port mirroring on ingress packets.</li> <li>• manytoOneRxTx—Many to one port mirroring on ingress and egress traffic.</li> <li>• manytoOneTx—Many to one port mirroring on egress packets.</li> <li>• Xrx—Mirror packets received on port X.</li> <li>• XrxOrXtx—Mirror packets received or transmitted on port X.</li> <li>• XrxOrYtx—Mirror packets received on port X or transmitted on port Y.</li> <li>• XrxYtx—Mirror packets received on port X and transmitted on port Y. This mode is not recommended for mirroring broadcast and multicast traffic.</li> <li>• XrxYtxOrXtxYrx—Mirror packets received on port X and transmitted on port Y or packets received on port Y and transmitted on port X.</li> <li>• Xtx—Mirror packets transmitted on port X.</li> </ul> <p>The default value is Disabled.</p>
MonitorPort	Specifies the monitor port.
PortListX	Indicates the switch port to be monitored by the designated monitor port. This port is monitored according to the value X in the Monitoring Mode field.

Variable	Value
PortListY	Indicates the switch port to be monitored by the designated monitor port. This port is monitored according to the value Y in the Monitoring Mode field.
MacAddressA	Specifies the mirroring MAC address A.
MacAddressB	Specifies the mirroring MAC address B.
AllowTraffic	Indicates whether bi-directional traffic is enabled.

## Creating a graph using EDM

Several screens in the EDM provide a means to view and make use of statistical information gathered by the switch.

Use the following procedure to turn this statistical information in either a bar, line, area, or pie graph.

### Prerequisites

- Open one of the supported browsers.
- Enter the IP address of the switch to open an EDM session.

### Procedure steps

Step	Action
1	Open a window that provides graphing capabilities.
2	Click the desired tab.
3	Select the information that you want to graph.
4	In the toolbar, click the graph button that corresponds to the type of graph you want to create.
--End--	

## Graphing switch chassis data using EDM

Use the following procedure to view switch statistical information in a variety of graphs.

### Prerequisites

- Open one of the supported browsers.
- Enter the IP address of the switch to open an EDM session.

### Procedure steps

Step	Action
1	From the navigation tree, double-click <b>Graph</b> .
2	In the Graph tree, double-click <b>Chassis</b> .
3	In the work area, click the tab you want to view.

---

--End--

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### Graphing switch chassis data using EDM navigation

- [“Graphing the SNMP tab using EDM” \(page 92\)](#)
- [“Graphing the IP tab using EDM” \(page 94\)](#)
- [“Graphing the ICMP In tab using EDM” \(page 96\)](#)
- [“Graphing the ICMP Out tab using EDM” \(page 98\)](#)
- [“Graphing the TCP tab using EDM” \(page 99\)](#)
- [“Graphing the UDP tab using EDM” \(page 100\)](#)

### Graphing the SNMP tab using EDM

Use the following procedure to view read-only statistical information about SNMP traffic in the SNMP tab.

#### Prerequisites

- Open one of the supported browsers.
- Enter the IP address of the switch to open an EDM session.

#### Procedure steps

Step	Action
1	From the navigation tree, double-click <b>Graph</b> .
2	In the Graph tree, double-click <b>Chassis</b> .

- 3 In the work area, click the **SNMP** tab to view the SNMP statistical information.

---

--End--

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### Variable definitions

The following table describes the fields of SNMP tab.

Field	Description
InPkts	Indicates the total number of messages delivered to the SNMP from the transport service.
OutPkts	Indicates the total number of SNMP messages passed from the SNMP protocol to the transport service.
InTotalReqVars	Indicates the total number of MIB objects retrieved successfully by the SNMP protocol as the result of receiving valid SNMP Get-Request and Get-Next PDUs.
InTotalSetVars	Indicates the total number of MIB objects altered successfully by the SNMP protocol as the result of receiving valid SNMP Set-Request PDUs.
InGetRequests	Indicates the total number of SNMP Get-Request PDUs that have been accepted and processed by the SNMP protocol.
InGetNexts	Indicates the total number of SNMP Get-Next PDUs accepted and processed by the SNMP protocol.
InSetRequests	Indicates the total number of SNMP Set-Request PDUs accepted and processed by the SNMP protocol.
InGetResponses	Indicates the total number of SNMP Get-Response PDUs accepted and processed by the SNMP protocol.
OutTraps	Indicates the total number of SNMP Trap PDUs generated by the SNMP protocol.
OutTooBigs	Indicates the total number of SNMP PDUs generated by the SNMP protocol for which the value of the error-status field is tooBig.
OutNoSuchNames	Indicates the total number of SNMP PDUs generated by the SNMP protocol for which the value of the error-status field is noSuchName.
OutBadValues	Indicates the total number of SNMP PDUs generated by the SNMP protocol for which the value of the error-status field is badValue.

Field	Description
OutGenErrs	Indicates the total number of SNMP PDUs generated by the SNMP protocol for which the value of the error-status field is genErr.
InBadVersions	Indicates the total number of SNMP messages delivered to the SNMP protocol for an unsupported SNMP version.
InBadCommunityNames	Indicates the total number of SNMP messages delivered to the SNMP protocol that used an unknown SNMP community name.
InBadCommunityUses	Indicates the total number of SNMP messages delivered to the SNMP protocol that represented an SNMP operation not allowed by the SNMP community named in the message.
InASNParseErrs	Indicates the total number of ASN.1 or BER errors encountered by the SNMP protocol after decoding received SNMP messages.
InTooBigs	Indicates the total number of SNMP PDUs delivered to the SNMP protocol for which the value of the error-status field is tooBig.
InNoSuchNames	Indicates the total number of SNMP PDUs delivered to the SNMP protocol for which the value of the error-status field is noSuchName.
InBadValues	Indicates the total number of SNMP PDUs delivered to the SNMP protocol for which the value of the error-status field is badValue.
InReadOnlys	Indicates the total number of SNMP PDUs delivered to the SNMP protocol for which the value of the error-status field is readOnly. This error is a protocol error to generate an SNMP PDU containing the value "readOnly" in the error-status field. This object is provided to detect incorrect implementations of the SNMP.
InGenErrs	Indicates the total number of SNMP PDUs delivered to the SNMP protocol for which the value of the error-status field is genErr.

### Graphing the IP tab using EDM

Use this procedure to graph information about the IP packets that are interfaced with the switch

#### Prerequisites

- Open one of the supported browsers.
- Enter the IP address of the switch to open an EDM session.

## Procedure steps

Step	Action
1	From the navigation tree, double-click <b>Graph</b> .
2	In the Graph tree, double-click <b>Chassis</b> .
3	In the work area, click the <b>IP</b> tab to view the SNMP statistical information.
--End--	

## Variable definitions

The following table outlines the fields of IP tab.

Field	Description
InReceives	Indicates the total number of input datagrams received from interfaces, including those received in error.
InHdrErrors	Indicates the number of input datagrams discarded due to errors in their IP headers, including bad checksums, version number mismatch, other format errors, time-to-live exceeded, errors discovered in processing their IP options.
InAddrErrors	Indicates the number of input datagrams discarded because the IP address in the IP header destination field was not a valid address. This count includes invalid addresses (for example, 0.0.0.0) and addresses of unsupported Classes (for example, Class E). For addresses that are not IP Gateways and therefore do not forward datagrams, this counter includes datagrams discarded because the destination address was not a local address.
ForwDatagrams	Indicates the number of input datagrams for which this entity was not their final IP destination, as a result of which an attempt was made to find a route to forward them to that final destination. For addresses that do not act as IP Gateways, this counter includes only those packets that were Source-Routed by way of this address and had successful Source-Route option processing.
InUnknownProtos	Indicates the number of locally addressed datagrams received successfully but discarded because of an unknown or unsupported protocol.
InDiscards	Indicates the number of input IP datagrams for which no problems were encountered to prevent their continued processing but that were discarded (for example, for lack of buffer space). This counter does not include any datagrams discarded while awaiting reassembly.

Field	Description
InDelivers	Indicates the total number of input datagrams successfully delivered to IP user-protocols (including ICMP).
OutRequests	Indicates the total number of IP datagrams that local IP user-protocols (including ICMP) supplied to IP in requests for transmission. This counter does not include any datagrams counted in ipForwDatagrams.
OutDiscards	Indicates the number of output IP datagrams for which no problem was encountered to prevent their transmission to their destination, but that were discarded (for example, for lack of buffer space). This counter will include datagrams counted in ipForwDatagrams if any such packets met this (discretionary) discard criterion.
OutNoRoutes	Indicates the number of IP datagrams discarded because no route could be found to transmit them to their destination. This counter includes any packets counted in ipForwDatagrams that meet this no-route criterion. This includes any datagrams a host cannot route because all of its default gateways are down.
FragOKs	Indicates the number of IP datagrams that have been successfully fragmented at this entity.
FragFails	Indicates the number of IP datagrams that have been discarded because they needed to be fragmented at this entity but could not be, for example, because their Don't Fragment flag was set.
FragCreates	Indicates the number of IP datagram fragments that have been generated as a result of fragmentation at this entity.
ReasmReqds	Indicates the number of IP fragments received that needed to be reassembled at this entity.
ReasmOKs	Indicates the number of IP datagrams successfully reassembled.
ReasmFails	Indicates the number of failures detected by the IP reassembly algorithm. This is not necessarily a count of discarded IP fragments because some algorithms (notably the algorithm in RFC 815) can lose track of the number of fragments by combining them as they are received.

### Graphing the ICMP In tab using EDM

Use the following procedure to view read-only information about inbound ICMP messages.



### Prerequisites

- Open one of the supported browsers.
- Enter the IP address of the switch to open an EDM session.

### Procedure steps

Step	Action
1	From the navigation tree, double-click <b>Graph</b> .
2	In the Graph tree, double-click <b>Chassis</b> .
3	In the work area, click the <b>ICMP In</b> tab to view the information about inbound ICMP messages.
--End--	

### Variable definitions

The following table describes the fields of ICMP In tab.

Field	Description
SrcQuenchs	Indicates the number of ICMP Source Quench messages received.
Redirects	Indicates the number of ICMP Redirect messages received.
Echos	Indicates the number of ICMP Echo (request) messages received.
EchoReps	Indicates the number of ICMP Echo Reply messages received.
Timestamps	Indicates the number of ICMP Timestamp (request) messages received.
TimestampReps	Indicates the number of ICMP Timestamp Reply messages received.
AddrMasks	Indicates the number of ICMP Address Mask Request messages received.
AddrMaskReps	Indicates the number of ICMP Address Mask Reply messages received.
ParmProbs	Indicates the number of ICMP Parameter Problem messages received.
DestUnreachs	Indicates the number of ICMP Destination Unreachable messages received.
TimeExcds	Indicates the number of ICMP Time Exceeded messages received.

## Graphing the ICMP Out tab using EDM

Use the following procedure to view read-only information about outbound ICMP messages.

### Prerequisites

- Open one of the supported browsers.
- Enter the IP address of the switch to open an EDM session.

### Procedure steps

Step	Action
1	From the navigation tree, double-click <b>Graph</b> .
2	In the Graph tree, double-click <b>Chassis</b> .
3	In the work area, click the <b>ICMP Out</b> tab to view the information about outbound ICMP messages.
--End--	

### Variable definitions

The following table describes the fields of ICMP Out tab.

Field	Description
SrcQuenchs	Indicates the number of ICMP Source Quench messages sent.
Redirects	Indicates the number of ICMP Redirect messages received. For a host, this object will always be zero, because hosts do not send redirects.
Echos	Indicates the number of ICMP Echo (request) messages sent.
EchoReps	Indicates the number of ICMP Echo Reply messages sent.
Timestamps	Indicates the number of ICMP Timestamp (request) messages sent.
TimestampReps	Indicates the number of ICMP Timestamp Reply messages sent.
AddrMasks	Indicates the number of ICMP Address Mask Request messages sent.
AddrMaskReps	Indicates the number of ICMP Address Mask Reply messages sent.
ParmProbs	Indicates the number of ICMP Parameter Problem messages sent.

Field	Description
DestUnreachs	Indicates the number of ICMP Destination Unreachable messages sent.
TimeExcds	Indicates the number of ICMP Time Exceeded messages sent.

### Graphing the TCP tab using EDM

Use the following procedure to view read-only information about TCP activity on the switch.

#### Prerequisites

- Open one of the supported browsers.
- Enter the IP address of the switch to open an EDM session.

#### Procedure steps

Step	Action
1	From the navigation tree, double-click <b>Graph</b> .
2	In the Graph tree, double-click <b>Chassis</b> .
3	In the work area, click the <b>TCP</b> tab to view the information about TCP activity on the switch.
--End--	

#### Variable definitions

The following table describes the fields of TCP tab.

Field	Description
ActiveOpens	Indicates the number of times TCP connections have made a direct transition to the SYN-SENT state from the CLOSED state.
PassiveOpens	Indicates the number of times TCP connections have made a direct transition to the SYN-RCVD state from the LISTEN state.
AttemptFails	Indicates the number of times TCP connections have made a direct transition to the CLOSED state from either the SYN-SENT state or the SYN-RCVD state, plus the number of times TCP connections have made a direct transition to the LISTEN state from the SYN-RCVD state.
EstabResets	Indicates the number of times TCP connections have made a direct transition to the CLOSED state from either the ESTABLISHED state or the CLOSE-WAIT state.

Field	Description
CurrEstab	Indicates the number of TCP connections for which the current state is either ESTABLISHED or CLOSE-WAIT.
InSegs	Indicates the total number of segments received, including those received in error. This count includes segments received on currently established connections.
OutSegs	Indicates the total number of segments sent, including those on current connections but excluding those containing only retransmitted octets.
RetransSegs	Indicates the total number of segments retransmitted -- that is, the number of TCP segments transmitted containing one or more previously transmitted octets.
InErrs	Indicates the total number of segments received in error (for example, bad TCP checksums).
OutRsts	Indicates the number of TCP segments sent containing the RST flag.
HCInSegs	Indicates the number of segments received, including those received in error. This count includes segments received on currently established connections. This object is the 64-bit equivalent of InSegs.
HCOutSegs	Indicates the number of segments sent, including those on current connections, but excluding those containing only retransmitted octets. This object is the 64-bit equivalent of OutSegs.

### Graphing the UDP tab using EDM

Use the following procedure to view read-only information about UDP activity on the switch.

#### Prerequisites

- Open one of the supported browsers.
- Enter the IP address of the switch to open an EDM session.

#### Procedure steps

Step	Action
1	From the navigation tree, double-click <b>Graph</b> .
2	In the Graph tree, double-click <b>Chassis</b> .

- 3 In the work area, click the **UDP** tab to view the information about UDP activity on the switch.

---

--End--

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### Variable definitions

The following table describes the fields of UDP tab.

Field	Description
InDatagrams	Indicates the total number of UDP datagrams delivered to UDP users
NoPorts	Indicates the total number of received UDP datagrams for which there was no application at the destination port.
InErrors	Indicates the number of received UDP datagrams that could not be delivered for reasons other than the lack of an application at the destination port.
OutDatagrams	Indicates the total number of UDP datagrams sent from this entity.
HCInDatagrams	Indicates the number of TCP connections for which the current state is either ESTABLISHED or CLOSE-WAIT.
HCOutDatagrams	Indicates the number of UDP datagrams sent from this entity, for devices that can transmit more than 1 million UDP datagrams for each second. Discontinuities in the value of this counter can occur at reinitialization of the management system, and at other times as indicated by discontinuities in the value of sysUpTime.

## Graphing switch port data using EDM

This section describes the procedures you can use to view port statistical information in a variety of graphs.

Use the following procedure to select a port or ports to graph.

### Prerequisites

- Open one of the supported browsers.
- Enter the IP address of the switch to open an EDM session.

### Procedure steps

Step	Action
1	In the <b>Device Physical View</b> , select one or multiple ports.
2	From the navigation tree, double-click <b>Graph</b> .
3	In the Graph tree, double-click <b>Port</b> .
4	In the work area, click the tab you want to view.

---

--End--

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Some statistics are only available after a single port is graphed.

### Graphing switch port data using EDM navigation

- [“Graphing the Interface tab using EDM” \(page 102\)](#)
- [“Graphing Ethernet Errors tab using EDM” \(page 104\)](#)
- [“Graphing the Bridge tab using EDM” \(page 107\)](#)
- [“Graphing the Rmon tab using EDM” \(page 108\)](#)
- [“Graphing the EAPOL Stats tab using EDM” \(page 111\)](#)
- [“Viewing and graphing the EAPOL Diag tab using EDM” \(page 112\)](#)
- [“Graphing the LACP tab using EDM” \(page 115\)](#)
- [“Graphing the Misc tab” \(page 117\)](#)

### Graphing the Interface tab using EDM

Use the following procedure to view read-only information about the selected interfaces.

#### Prerequisites

- Open one of the supported browsers.
- Enter the IP address of the switch to open an EDM session.

### Procedure steps

#### Procedure Steps

Step	Action
1	In the <b>Device Physical View</b> , select one or multiple ports.
2	From the navigation tree, double-click <b>Graph</b> .
3	In the Graph tree, double-click <b>Port</b> .

- 4 In the work area, click the **Interface** tab to view information about the selected interfaces.

---

--End--

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### Variable definitions

The following table describes the fields of Interface tab.

Field	Description
InOctets	Indicates the total number of octets received on the interface, including framing characters.
OutOctets	Indicates the total number of octets transmitted out of the interface, including framing characters.
InUcastPkts	Indicates 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	Indicates 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 unsend.
InMulticastPkts	<b>AUTHOR'S Note : NEED INFO</b>
OutMulticastPkts	<b>AUTHOR'S Note : NEED INFO</b>
InBroadcastPkts	<b>AUTHOR'S Note : NEED INFO</b>
OutBroadcastPkts	<b>AUTHOR'S Note : NEED INFO</b>
InNUcastPkts	Indicates the number of packets delivered by this sublayer to a higher (sub)layer, which were addressed to a multicast or broadcast address at this sublayer.
OutNUcastPkts	Indicates the total number of packets that higher-level protocols requested be transmitted, and which were addressed to a multicast or broadcast address at this sublayer, including those that were discarded or not sent.
InDiscards	Indicates the number of inbound packets that were chosen to be discarded even though no errors had been detected to prevent their being deliverable to a higher-layer protocol. One possible reason for discarding such a packet could be to free up buffer space.
OutDiscards	Indicates the number of outbound packets which were chosen to be discarded even though no errors had been detected to prevent their being transmitted. One possible reason for discarding such a packet is to free up buffer space.

Field	Description
InErrors	For packet-oriented interfaces, the number of inbound packets that contained errors preventing them from being deliverable to a higher-layer protocol. For character-oriented or fixed-length interfaces, the number of inbound transmission units that contained errors preventing them from being deliverable to a higher-layer protocol.
OutErrors	For packet-oriented interfaces, the number of outbound packets that could not be transmitted because of errors. For character-oriented or fixed-length interfaces, the number of outbound transmission units that could not be transmitted because of errors.
InUnknownProtos	For packet-oriented interfaces, the number of packets received through the interface that were discarded because of an unknown or unsupported protocol. For character-oriented or fixed-length interfaces that support protocol multiplexing, the number of transmission units received through the interface that were discarded because of an unknown or unsupported protocol. For an interface that does not support protocol multiplexing, this counter will always be 0.

### Graphing Ethernet Errors tab using EDM

Use the following procedure to view read-only information about port Ethernet error statistics.

#### Prerequisites

- Open one of the supported browsers.
- Enter the IP address of the switch to open an EDM session.

#### Procedure steps

Step	Action
1	In the <b>Device Physical View</b> , select one or multiple ports.
2	From the navigation tree, double-click <b>Graph</b> .
3	In the Graph tree, double-click <b>Port</b> .
4	In the work area, click the <b>Ethernet Errors</b> tab to view information about port Ethernet error statistics.
--End--	



## Variable definitions

The following table describes the fields of Ethernet Errors tab.

Field	Description
AlignmentErrors	Indicates the 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 after the alignmentError status is returned by the MAC service to the LLC (or other MAC user). Received frames for which multiple error conditions occur are, according to the conventions of IEEE 802.3 Layer management, counted exclusively according to the error status presented to the LLC.
FCSErrors	Indicates the 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 after the frameCheckError status is returned by the MAC service to the LLC (or other MAC user). Received frames for which multiple error conditions occur are, according to the conventions of IEEE 802.3 Layer management, counted exclusively according to the error status presented to the LLC.
InternalMacTransmitErrors	Indicates the 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 LateCollisions object, the ExcessiveCollisions object, or the CarrierSenseErrors object.

Field	Description
InternalMacReceiveErrors	<p>Indicates the 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 FrameTooLongs object, the AlignmentErrors object, or the FCSErrors object.</p> <p>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.</p>
CarrierSenseErrors	<p>Indicates the number of times that the carrier sense condition was lost or never asserted after attempting to transmit a frame on a particular interface. The count represented by an instance of this object is incremented at most once for each transmission attempt, even if the carrier sense condition fluctuates during a transmission attempt.</p>
FrameTooLongs	<p>Indicates the 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 after the frameTooLong status is returned by the MAC service to the LLC (or other MAC user). Received frames for which multiple error conditions occur are, according to the conventions of IEEE 802.3 Layer Management, counted exclusively according to the error status presented to the LLC.</p>
SQETestErrors	<p>Indicates the 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 is described in section 7.2.4.6 of the same document.</p>

Field	Description
DeferredTransmissions	Indicates the 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	Indicates the 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, and is not counted by the corresponding instance of the MultipleCollisionFrames object.
MultipleCollisionFrames	Indicates the 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, and is not counted by the corresponding instance of the SingleCollisionFrames object.
LateCollisions	Indicates the number of times that a collision is detected on a particular interface later than 512 bit-times into the transmission of a packet. Five hundred and twelve bit-times 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	Indicates the count of frames for which transmission on a particular interface fails due to excessive collisions.

### Graphing the Bridge tab using EDM

Use the following procedure to view read-only information about port frame statistics.

**Prerequisites**

- Open one of the supported browsers.
- Enter the IP address of the switch to open an EDM session.

**Procedure steps**

Step	Action
1	In the <b>Device Physical View</b> , select one or multiple ports.
2	From the navigation tree, double-click <b>Graph</b> .
3	In the Graph tree, double-click <b>Port</b> .
4	In the work area, click the <b>Bridge</b> tab to view information about port frame statistics.

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--End--

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**Variable definitions**

The following table describes the fields of Bridge tab.

Field	Description
DelayExceededDiscards	Indicates the number of frames discarded by the port due to excessive transit delays through the bridge, incremented by both transparent and source route bridges.
MtuExceededDiscards	Indicates the number of frames discarded by the port due to an excessive size, incremented by both transparent and source route bridges.
InFrames	Indicates the number of frames that have been received by this port from its segment.
OutFrames	Indicates the number of frames that have been received by this port from its segment.
InDiscards	Indicates the count of valid frames received which were discarded (filtered) by the Forwarding Process.

**Graphing the Rmon tab using EDM**

Use the following procedure to view read-only remote monitoring statistics.

**Prerequisites**

- Open one of the supported browsers.
- Enter the IP address of the switch to open an EDM session.

## Procedure steps

Step	Action
1	In the <b>Device Physical View</b> , select one or multiple ports.
2	From the navigation tree, double-click <b>Graph</b> .
3	In the Graph tree, double-click <b>Port</b> .
4	In the work area, click the <b>Rmon</b> tab to view information about remote monitoring statistics.
--End--	

## Variable definitions

The following table describes the fields of Rmon tab.

Field	Description
Octets	Indicates the total number of octets of data (including those in bad packets) received on the network (excluding framing bits but including FCS octets). You can use this object as a reasonable estimate of Ethernet utilization. For greater precision, sample the etherStatsPkts and etherStatsOctets objects before and after a common interval.
Pkts	Indicates the total number of packets (including bad packets, broadcast packets, and multicast packets) received.
BroadcastPkts	Indicates the total number of good packets received that were directed to the broadcast address. This does not include multicast packets.
MulticastPkts	Indicates the total number of good packets received that were directed to a multicast address. This number does not include packets directed to the broadcast address.
CRCAAlignErrors	Indicates the total number of packets received that had a length (excluding framing bits, but including FCS octets) of between 64 and 1518 octets, inclusive, but had either a bad Frame Check Sequence (FCS) with an integral number of octets (FCS Error) or a bad FCS with a nonintegral number of octets (Alignment Error).
UndersizePkts	Indicates the total number of packets received that were less than 64 octets long (excluding framing bits but including FCS octets) and were otherwise well formed.

Field	Description
OversizePkts	Indicates the total number of packets received that were longer than 1518 octets (excluding framing bits but including FCS octets) and were otherwise well formed.
Fragments	Indicates the total number of packets received that were less than 64 octets in length (excluding framing bits but including FCS octets) and had either a bad Frame Check Sequence (FCS) with an integral number of octets (FCS Error) or a bad FCS with a nonintegral number of octets (Alignment Error). Normal behavior is for etherStatsFragments is to increment because it counts both runts (which are normal occurrences due to collisions) and noise hits.
Collisions	Indicates the best estimate of the total number of collisions on this Ethernet segment.
Jabbers	Indicates the total number of packets received that were longer than 1518 octets (excluding framing bits, but including FCS octets), and had either a bad Frame Check Sequence (FCS) with an integral number of octets (FCS Error) or a bad FCS with a non-integral number of octets (Alignment Error). Jabber is defined as the condition where a packet exceeds 20 ms. The allowed range to detect jabber is between 20 ms and 150 ms.
1..64	Indicates the total number of packets (including bad packets) received that were between 1 and 64 octets in length (excluding framing bits but including FCS octets).
65..127	Indicates the total number of packets (including bad packets) received that were between 65 and 127 octets in length (excluding framing bits but including FCS octets).
128..255	Indicates the total number of packets (including bad packets) received that were between 128 and 255 octets in length (excluding framing bits but including FCS octets).
256..511	Indicates the total number of packets (including bad packets) received that were between 256 and 511 octets in length (excluding framing bits but including FCS octets).

Field	Description
511..1023	Indicates the total number of packets (including bad packets) received that were between 511 and 1023 octets in length (excluding framing bits but including FCS octets).
1024..1518	Indicates the total number of packets (including bad packets) received that were between 1024 and 1518 octets in length (excluding framing bits but including FCS octets).

### Graphing the EAPOL Stats tab using EDM

Use the following procedure to view read-only EAPOL statistics.

#### Prerequisites

- Open one of the supported browsers.
- Enter the IP address of the switch to open an EDM session.

#### Procedure steps

Step	Action
1	In the <b>Device Physical View</b> , select one or multiple ports.
2	From the navigation tree, double-click <b>Graph</b> .
3	In the Graph tree, double-click <b>Port</b> .
4	In the work area, click the <b>EAPOL Stats</b> tab to view information about EAPOL statistics.
--End--	

#### Variable definitions

The following table describes the fields of EAPOL Stats tab.

Field	Description
EapolFramesRx	Indicates the number of valid EAPOL frames that have been received by this authenticator.
EapolFramesTx	Indicates the number of EAPOL frame types that have been transmitted by this authenticator.
EapolStartFramesRx	Indicates the number of EAPOL start frames that have been received by this authenticator.

Field	Description
EapolLogoffFramesRx	Indicates the number of EAPOL Logoff frames that have been received by this authenticator.
EapolRespIdFramesRx	Indicates the number of EAPOL Resp/Id frames that have been received by this authenticator.
EapolRespFramesRx	Indicates the number of valid EAP Response frames (other than Resp/Id frames) that have been received by this authenticator.
EapolReqIdFramesTx	Indicates the number of EAPOL Req/Id frames that have been transmitted by this authenticator.
EapolReqFramesTx	Indicates the number of EAP Req/Id frames (Other than Rq/Id frames) that have been transmitted by this authenticator.
InvalidEapolFramesRx	Indicates the number of EAPOL frames that have been received by this authenticator in which the frame type is not recognized.
EapLengthErrorFramesRx	Indicates the number of EAPOL frames that have been received by this authenticator in which the packet body length field is not valid.

### Viewing and graphing the EAPOL Diag tab using EDM

Use the following procedure to view read-only EAPOL diagnostic statistics.

#### Prerequisites

- Open one of the supported browsers.
- Enter the IP address of the switch to open an EDM session.

#### Procedure steps

Step	Action
1	In the <b>Device Physical View</b> , select one or multiple ports.
2	From the navigation tree, double-click <b>Graph</b> .
3	In the Graph tree, double-click <b>Port</b> .
4	In the work area, click the <b>EAPOL Diag</b> tab to view information about EAPOL diagnostic statistics.

--End--



## Variable definitions

The following table describes the fields of EAPOL Diag tab.

Field	Description
EntersConnecting	Counts the number of times that the Authenticator PAE state machine transitions to the Connecting state from another state.
EapLogoffsWhileConnecting	Counts the number of times that the Authenticator PAE state machine transitions from Connected to Disconnected as a result of receiving an EAPOL-Logoff message.
EntersAuthenticating	Counts the number of times that the Authenticator PAE state machine transitions from Connecting to Authenticating as a result of receiving an EAP-Response/Identity message from the supplicant.
AuthSuccessWhileAuthenticating	Counts the number of times that the Authenticator PAE state machine transitions from Authenticating to Authenticated as a result of the Backend authentication state machine indicating successful authentication of the supplicant.
AuthTimeoutsWhileAuthenticating	Counts the number of times that the Authenticator PAE state machine transitions from Authenticating to Aborting as a result of the Backend authentication state machine indicating authentication timeout.
AuthFailWhileAuthenticating	Counts the number of times that the Authenticator PAE state machine transitions from Authenticating to Held as a result of the Backend authentication state machine indicating authentication failure.

Field	Description
AuthReauthsWhileAuthenticating	Counts the number of times that the Authenticator PAE state machine transitions from Authenticating to Aborting as a result of a reauthentication request.
AuthEapStartsWhileAuthenticating	Counts the number of times that the Authenticator PAE state machine transitions from Authenticating to Aborting as a result of an EAPOL-Start message being received from the supplicant.
AuthEapLogoffWhileAuthenticating	Counts the number of times that the Authenticator PAE state machine transitions from Authenticating to Aborting as a result of an EAPOL-Logoff message being received from the supplicant.
AuthReauthsWhileAuthenticated	Counts the number of times that the Authenticator PAE state machine transitions from Authenticated to Connecting as a result of a reauthentication request.
AuthEapStartsWhileAuthenticated	Counts the number of times that the Authenticator PAE state machine transitions from Authenticated to Connecting as a result of an EAPOL-Start message being received from the supplicant.
AuthEapLogoffWhileAuthenticated	Counts the number of times that the Authenticator PAE state machine transitions from Authenticated to Disconnected as a result of an EAPOL-Logoff message being received from the supplicant.
BackendResponses	Counts the number of times that the Backend Authentication state machine sends an Initial-Access request packet to the Authentication server.

Field	Description
BackendAccessChallenges	Counts the number of times that the Backend Authentication state machine receives an Initial-Access challenge packet from the Authentication server.
BackendOtherRequestsToSupplicant	Counts the number of times that the Backend Authentication state machine sends an EAP request packet (other than an Identity, Notification, failure, or success message) to the supplicant.
BackendNonNakResponsesFromSupplicant	Counts the number of times that the Backend Authentication state machine receives a response from the supplicant to an initial EAP request and the response is something other than EAP-NAK.
BackendAuthSuccesses	Counts the number of times that the Backend Authentication state machine receives an EAP-success message from the Authentication server.
BackendAuthFails	Counts the number of times that the Backend Authentication state machine receives an EAP-failure message from the Authentication server.

### Graphing the LACP tab using EDM

Use the following procedure to view read-only Link Aggregation Control Protocol (LACP) diagnostic statistics.

#### ATTENTION

The Marker Protocol Generator/Receiver is currently not a supported feature.

### Prerequisites

- Open one of the supported browsers.
- Enter the IP address of the switch to open an EDM session.

### Procedure steps

Step	Action
1	In the <b>Device Physical View</b> , select one or multiple ports.

- 2 From the navigation tree, double-click **Graph**.
- 3 In the Graph tree, double-click **Port**.
- 4 In the work area, click the **LACP** tab to view information about LACP diagnostic statistics.

---

--End--

---

### Variable definitions

The following table describes the fields of LACP tab.

Field	Description
LACPDUsRX	Denotes the number of valid LACPDUs received on this Aggregation Port. This value is read-only.
MarkerPDUsRX	Signifies the number of valid Marker PDUs received on this Aggregation Port. This value is read-only.
MarkerResponsePDUsRX	The number of valid Marker Response PDUs received on this Aggregation Port. This value is read-only.
UnknownRX	Indicates the number of frames received that can <ul style="list-style-type: none"> <li>• Carry the Slow Protocols Ethernet Type value (43B.4), but contain an unknown PDU.</li> <li>• Are addressed to the Slow Protocols group MAC Address (43B.3), but do not carry the Slow Protocols Ethernet Type.</li> </ul> This value is read-only.
IllegalRX	Denotes the number of frames received that carry the Slow Protocols Ethernet Type value (43B.4), but contain a badly formed PDU or an illegal value of Protocol Subtype (43B.4). This value is read-only.
LACPDUsTX	Signifies the number of LACPDUs that are transmitted on this Aggregation Port. This value is read-only.

Field	Description
MarkerPDUsTX	Displays the number of Marker PDUs transmitted on this Aggregation Port. This value is read-only.
MarkerResponsePDUsTX	Indicates the number of Marker Response PDUs that are transmitted on this Aggregation Port. This value is read-only.

### Graphing the Misc tab

Use the following procedure to view statistical information that does not belong grouped with the other tabs.

#### Prerequisites

- Open one of the supported browsers.
- Enter the IP address of the switch to open an EDM session.

#### Procedure steps

Step	Action
1	In the <b>Device Physical View</b> , select one or multiple ports.
2	From the navigation tree, double-click <b>Graph</b> .
3	In the Graph tree, double-click <b>Port</b> .
4	In the work area, click the <b>Misc</b> tab.
--End--	

#### Variable definitions

The following table describes the fields of Misc. tab.

Field	Description
NoResourcesPktsDropped	Indicates the number of packets dropped due to a lack of resources.

## Graphing multilink trunk statistics using EDM

This section describes the procedures you can use to view Multilink Trunk (MLT) statistical information in a variety of graphs.

### Prerequisites

- Open one of the supported browsers.
- Enter the IP address of the switch to open an EDM session.

### Graphing multilink trunk statistics using EDM navigation

- [“Accessing MLT statistics window” \(page 118\)](#)
- [“Viewing the Interface tab using EDM” \(page 118\)](#)
- [“Viewing the Ethernet Errors tab using EDM” \(page 120\)](#)

### Accessing MLT statistics window

Use the following procedure to access the MLT statistics window.

#### Prerequisites

- Open one of the supported browsers.
- Enter the IP address of the switch to open an EDM session.

#### Procedure steps

---

Step	Action
1	From the navigation tree, double-click <b>VLAN</b> .
2	In the VLAN tree, double-click <b>MLT/LACP</b> .
3	In the Multilink Trunk tab, select a row that represents the MLT.
4	On the toolbar, click <b>Graph</b> to view the MLT statistics.

---

--End--

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### Viewing the Interface tab using EDM

Use the following procedure to view read-only statistical information about the selected Multilink Trunk.

#### Prerequisites

- Open one of the supported browsers.
- Enter the IP address of the switch to open an EDM session.

## Procedure steps

Step	Action
1	From the navigation tree, double-click <b>VLAN</b> .
2	In the VLAN tree, double-click <b>MLT/LACP</b> .
3	In the Multilink Trunk tab, select a row that represents the MLT.
4	On the toolbar, click <b>Graph</b> . <i>The Multilink Trunks- Graph, 1 screen appears.</i>
5	In the work area click the <b>Interface</b> tab.

--End--

## Variable definitions

The following table describes the fields of Interface tab.

Field	Description
InMulticastPkts	Indicates the number of packets delivered to this MLT that were addressed to a multicast address at this sublayer. For a MAC layer protocol, this number includes both Group and Functional addresses.
OutMulticastPkts	Indicates the total number of packets that higher-level protocols requested be transmitted, and that were addressed to a multicast address at this MLT, including those that were discarded or not sent. For a MAC layer protocol, this number includes both Group and Functional addresses.
InBroadcastPkts	Indicates the number of packets delivered to this MLT that were addressed to a broadcast address at this sublayer.
OutBroadcastPkts	Indicates the total number of packets that higher-level protocols requested be transmitted, and that were addressed to a broadcast address at this MLT, including those that were discarded or not sent.
HCInOctets	Indicates the total number of octets received on the MLT interface, including framing characters.
HCOctets	Indicates the total number of octets transmitted out of the MLT interface, including framing characters.
HCInUcastPkts	Indicates the number of packets delivered by this MLT to higher level protocols that were not addressed to a multicast or broadcast address at this sublayer.

Field	Description
HCOUtUcastPkts	Indicates the number of packets that higher-level protocols requested be transmitted that were not addressed to a multicast address at this MLT. This total number includes those packets discarded or unsent.
HCInMulticastPkt	Indicates the number of packets delivered to this MLT that were addressed to a multicast address at this sublayer. For a MAC layer protocol, this number includes both Group and Functional addresses.
HCOUtMulticast	Indicates the total number of packets that higher-level protocols requested be transmitted, and that were addressed to a multicast address at this MLT, including those that were discarded or not sent. For a MAC layer protocol, this number includes both Group and Functional addresses.
HCInBroadcastPkt	Indicates the number of packets delivered to this MLT that were addressed to a broadcast address at this sublayer.
HCOUtBroadcast	Indicates the total number of packets that higher-level protocols requested be transmitted, and that were addressed to a broadcast address at this MLT, including those that were discarded or not sent.

### Viewing the Ethernet Errors tab using EDM

Use the following procedure to view read-only statistical information about Ethernet errors that have occurred on the selected Multilink Trunk.

#### Prerequisites

- Open one of the supported browsers.
- Enter the IP address of the switch to open an EDM session.

#### Procedure steps

Step	Action
1	From the navigation tree, double-click <b>VLAN</b> .
2	In the VLAN tree, double-click <b>MLT/LACP</b> .
3	In the Multilink Trunk tab, select a row that represents the MLT.
4	On the toolbar, click <b>Graph</b> . <i>The Multilink Trunks- Graph, 1 screen appears.</i>



5 In the work area click the **Ethernet Errors** tab.

--End--

### Variable definitions

The following table describes the fields of Ethernet Errors tab.

Field	Description
AlignmentErrors	Indicates the count of frames received on a particular MLT 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 after the alignmentError status is returned by the MAC service to the LLC (or other MAC user). Received frames for which multiple error conditions occur are, according to the conventions of IEEE 802.3 Layer Management, counted exclusively according to the error status presented to the LLC.
FCSErrors	Indicates the count of frames received on an MLT 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 after the frameCheckError status is returned by the MAC service to the LLC (or other MAC user). Received frames for which multiple error conditions occur are, according to the conventions of IEEE 802.3 Layer Management, counted exclusively according to the error status presented to the LLC.
IMacTransmitError	Indicates the count of frames for which transmission on a particular MLT 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 LateCollisions object, the ExcessiveCollisions object, or the CarrierSenseErrors object.

Field	Description
IMacReceiveError	<p>Indicates the count of frames for which reception on a particular MLT 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 FrameTooLongs object, the AlignmentErrors object, or the FCSErrors object.</p> <p>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.</p>
CarrierSenseErrors	<p>Indicates the number of times that the carrier sense condition was lost or never asserted after attempting to transmit a frame on a particular MLT. The count represented by an instance of this object is incremented at most once for each transmission attempt, even if the carrier sense condition fluctuates during a transmission attempt.</p>
FrameTooLong	<p>Indicates the count of frames received on a particular MLT that exceed the maximum permitted frame size. The count represented by an instance of this object is incremented after the frameTooLong status is returned by the MAC service to the LLC (or other MAC user). Received frames for which multiple error conditions occur are, according to the conventions of IEEE 802.3 Layer Management, counted exclusively according to the error status presented to the LLC.</p>
SQETestError	<p>Indicates the count of times that the SQE TEST ERROR message is generated by the PLS sublayer for a particular MLT. The SQE TEST ERROR message is defined in section 7.2.2.2.4 of ANSI/IEEE 802.3-1985 and its generation is described in section 7.2.4.6 of the same document.</p>
DeferredTransmiss	<p>Indicates the count of frames for which the first transmission attempt on a particular MLT is delayed because the medium is busy. The count represented by an instance of this object does not include frames involved in collisions.</p>

Field	Description
SingleCollFrames	Indicates the count of successfully transmitted frames on a particular MLT 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, and is not counted by the corresponding instance of the MultipleCollisionFrames object.
MultipleCollFrames	Indicates the count of successfully transmitted frames on a particular MLT 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, and is not counted by the corresponding instance of the SingleCollisionFrames object.
LateCollisions	Indicates the number of times that a collision is detected on a particular MLT later than 512 bit-times into the transmission of a packet. Five hundred and twelve bit-times 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.
ExcessiveColls	Indicates the count of frames for which transmission on a particular MLT fails due to excessive collisions.

## Graphing VLAN DHCP statistics using EDM

Use the following procedure to create a graph of VLAN DHCP configuration.

### Prerequisites

- Open one of the supported browsers.
- Enter the IP address of the switch to open an EDM session.

### Procedure steps

Step	Action
1	From the navigation tree, double-click <b>VLAN</b> .
2	In the VLAN tree, double-click <b>VLANs</b> .
3	In the work area, select the desired VLAN.
4	In the toolbar, click <b>IP</b> . <i>The IP, VLAN 1 tab appears.</i>
5	In the work area, click the <b>DHCP</b> tab.
6	In the toolbar, click <b>Graph</b> . <i>The DHCP-Graph tab appears.</i>
7	In the work area, highlight the required data.
8	In the toolbar, click the type of graph you want to produce.
--End--	

### Variable definitions

The following table explains the fields found on this window.

Field	Description
NumRequests	Indicates the number of DHCP requests handled.
NumReplies	Indicates the number of DHCP replies handled.

### Viewing unit statistics using EDM

Use the following procedure to view the statistical information of a unit.

#### Prerequisites

- Open one of the supported browsers.
- Enter the IP address of the switch to open an EDM session.

### Procedure steps

Step	Action
1	In the Device Physical View, select the unit.
2	From the navigation tree, double-click <b>Edit</b> .
3	In the Edit tree, double-click <b>Unit</b> .

- 4 In the work area, click the **Unit Stats** tab to view the statistical information of the selected unit.

---

--End--

---

### Variable definitions

The following table describes the fields of Unit Stats tab.

Field	Description
Absolute Value	Indicates the counter value of packets dropped for the unit.
Cumulative	Indicates the total value of packets dropped seen since dialog displayed.
Average/sec	Indicates the average value of packets dropped per second.
Minimum/sec	Indicates the smallest value of packets dropped seen per second.
Maximum/sec	Indicates the largest value of packets dropped seen per second.
LastVal/sec	Indicates the last value of packets dropped seen per second.



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# RMON configuration using Enterprise Device Manager

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This chapter describes the configuration and management of RMON using Enterprise Device Manager (EDM).

## Prerequisites

- Open one of the supported browsers.
- Enter the IP address of the switch to open an EDM session.

## Navigation

- [“Working with RMON information using EDM” \(page 127\)](#)
- [“Configuring Alarm Manager using EDM” \(page 137\)](#)
- [“Configuring Events using EDM” \(page 141\)](#)
- [“Viewing log information using EDM” \(page 144\)](#)

## Working with RMON information using EDM

RMON information is viewed by looking at the graphing information associated with the port or chassis.

### Prerequisites

- Open one of the supported browsers.
- Enter the IP address of the switch to open an EDM session.

### Working with RMON information using EDM navigation

- [“Viewing statistics using EDM” \(page 128\)](#)
- [“Viewing history using EDM” \(page 131\)](#)
- [“Creating a history using EDM” \(page 132\)](#)

- “Disabling history using EDM” (page 134)
- “Viewing RMON history statistics using EDM” (page 134)
- “Enabling ethernet statistics gathering using EDM” (page 135)
- “Disabling Ethernet statistics gathering using EDM” (page 136)

### Viewing statistics using EDM

EDM gathers Ethernet statistics that can be graphed in a variety of formats or saved to a file that can be exported to an outside presentation or graphing application.

Use the following procedures to view RMON ethernet statistics.

#### Prerequisites

- Open one of the supported browsers.
- Enter the IP address of the switch to open an EDM session.

#### Procedure steps

---

Step	Action
1	In the Device Physical View, select a port.
2	From the navigation tree, double-click <b>Graph</b> .
3	In the Graph tree, double-click <b>Port</b> . OR Right-click the port, and choose <b>Graph</b> . <i>The Graph Port screen appears.</i>
4	In the work area, click the <b>Rmon</b> tab to view RMON ethernet statistics.

---

--End--

---

#### Variable definitions

The following table describes the fields on the Rmon tab.



Field	Descriptions
Octets	Indicates the total number of octets of data (including those in bad packets) received on the network (excluding framing bits but including FCS octets). You can use this object as a reasonable estimate of Ethernet utilization. For greater precision, sample the etherStatsPkts and etherStatsOctets objects before and after a common interval.
Pkts	Indicates the total number of packets (including bad packets, broadcast packets, and multicast packets) received.
BroadcastPkts	Indicates the total number of good packets received that were directed to the broadcast address. This does not include multicast packets.
MulticastPkts	Indicates the total number of good packets received that were directed to a multicast address. This number does not include packets directed to the broadcast address.
CRCAAlignErrors	Indicates the total number of packets received that had a length (excluding framing bits, but including FCS octets) of between 64 and 1518 octets, inclusive, but had either a bad Frame Check Sequence (FCS) with an integral number of octets (FCS Error) or a bad FCS with a nonintegral number of octets (Alignment Error).
UndersizePkts	Indicates the total number of packets received that were less than 64 octets long (excluding framing bits but including FCS octets) and were otherwise well formed.
OversizePkts (>1518)	Indicates the total number of packets received that were longer than 1518 octets (excluding framing bits but including FCS octets) and were otherwise well formed.
Fragments	Indicates the total number of packets received that were less than 64 octets in length (excluding framing bits but including FCS octets) and had either a bad Frame Check Sequence (FCS) with an integral number of octets (FCS Error) or a bad FCS with a nonintegral number of octets (Alignment Error). Normal behavior for etherStatsFragments is to increment because it counts both runts (which are normal occurrences due to collisions) and noise hits.
Collisions	Indicates the best estimate of the total number of collisions on this Ethernet segment.

Field	Descriptions
Jabbers	Indicates the total number of packets received that were longer than 1518 octets (excluding framing bits, but including FCS octets), and had either a bad Frame Check Sequence (FCS) with an integral number of octets (FCS Error) or a bad FCS with a non-integral number of octets (Alignment Error). Jabber is defined as the condition where a packet exceeds 20 ms. The allowed range to detect jabber is between 20 ms and 150 ms.
1..64	Indicates the total number of packets (including bad packets) that were transmitted and received on this port between 1 and 64 octets in length (excluding framing bits but including FCS octets).
65..127	Indicates the total number of packets (including bad packets) that were transmitted and received on this port between 65 and 127 octets in length (excluding framing bits but including FCS octets).
128..255	Indicates the total number of packets (including bad packets) that were transmitted and received on this port between 128 and 255 octets in length (excluding framing bits but including FCS octets).
256..511	Indicates the total number of packets (including bad packets) that were transmitted and received on this port between 256 and 511 octets in length (excluding framing bits but including FCS octets).
512..1023	Indicates the total number of packets (including bad packets) that were transmitted and received on this port between 512 and 1023 octets in length (excluding framing bits but including FCS octets).
1024..1518	Indicates the total number of packets (including bad packets) that were transmitted and received on this port between 1024 and 1518 octets in length (excluding framing bits but including FCS octets).

Statistic	Description
Poll Interval	Statistics are updated based on the poll interval. The default value is 10s. Valid range is None, 2s, 5s, 10s, 30s, 1m, 5m, 30m 1h.
Absolute	Indicates the total count since the last time counters were reset. A system reboot resets all counters.
Cumulative	Indicates the total count since the statistics tab was first opened. The elapsed time for the cumulative counter is shown at the bottom of the graph window.

Statistic	Description
Average/sec	Indicates the cumulative count divided by the cumulative elapsed time.
Minimum/sec	Indicates the minimum average for the counter for a polling interval over the cumulative elapsed time.
Maximum/sec	Indicates the maximum average for the counter for a polling interval over the cumulative elapsed time.
LastVal/sec	Indicates the average for the counter over the last polling interval.

### Viewing history using EDM

Ethernet history records periodic statistical samples from a network. A sample is called a history and is gathered in time intervals referred to as "buckets."

Histories establish a time-dependent method for gathering RMON statistics on a port. The default values for history are:

- Buckets are gathered at 30-minute intervals.
- Number of buckets gathered is 50.

Both the time interval and the number of buckets is configurable. After the last bucket is reached, bucket 1 is dumped and "recycled" to hold a new bucket of statistics. Then bucket 2 is dumped.

Use the following procedure to view RMON history.

#### Prerequisites

- Open one of the supported browsers.
- Enter the IP address of the switch to open an EDM session.

#### Procedure steps

Step	Action
1	From the navigation tree, double-click <b>Serviceability</b> .
2	In the Serviceability tree, double-click <b>RMON</b> .
3	In the RMON tree, double-click <b>Control</b> .
4	In the work area, click the <b>History</b> tab to view RMON history.
--End--	

### Variable definitions

The following table describes the fields of the History tab.

Field	Description
Index	Indicates a unique value assigned to each interface. An index identifies an entry in a table.
Port	Indicates an Ethernet interface on the device.
BucketsRequested	Indicates the requested number of discrete time intervals over which data is to be saved in the part of the media-specific table associated with this entry.
BucketsGranted	Indicates the number of discrete sampling intervals over which data is saved in the part of the media-specific table associated with this entry. There are instances after the actual number of buckets associated with this entry is less than the value of this object. In this case, at the end of each sampling interval, a new bucket is added to the media-specific table.
Interval	Indicates the interval in seconds over which the data is sampled for each bucket in the part of the media-specific table associated with this entry. You can set this interval to a number of seconds between 1 and 3600 (1 hour). Because the counters in a bucket may overflow at their maximum value with no indication, note the possibility of overflow in the associated counters. Consider the minimum time in which a counter could overflow on a particular media type and set the historyControlInterval object to a value less than this interval. This interval is typically most important for the octets counter in a media-specific table. For example, on an Ethernet network, the etherHistoryOctets counter could overflow in about one hour at the Ethernet's maximum utilization.
Owner	Indicates the network management system that created this entry.

### Creating a history using EDM

RMON can be used to collect statistics at intervals. For example, if switch performance is monitored over a weekend, enough buckets to cover two days must be set aside. To do this, set the history to gather one bucket each hour, thus covering a 48-hour period. After history characteristics are set, they cannot be modified; the history must be deleted and another created.

Use the following procedure to establish a history for a port, and set the bucket interval.

Step	Action
1	From the navigation tree, double-click <b>Serviceability</b> .
2	In the Serviceability tree, double-click <b>RMON</b> .
3	In the RMON tree, double-click <b>Control</b> .
4	In the work area, click the <b>History</b> tab.
5	In the toolbar, click <b>Insert</b> . <i>The Insert History dialog box appears.</i>
6	In the fields provided, enter the information for the new RMON history.
7	Click <b>Insert</b> .
--End--	

**Variable Definitions** The following table describes the fields of the Insert History dialog box.

Field	Description
Index	Indicates a unique value assigned to each interface. An index identifies an entry in a table.
Port	Indicates any Ethernet interface on the device.
BucketsRequested	Indicates the requested number of discrete time intervals over which data is to be saved in the part of the media-specific table associated with this entry.
Interval	Indicates the interval in seconds over which the data is sampled for each bucket in the part of the media-specific table associated with this entry. You can set this interval to a number of seconds between 1 and 3600 (1 hour). Because the counters in a bucket may overflow at their maximum value with no indication, note the possibility of overflow in the associated counters. Consider the minimum time in which a counter could overflow on a particular media type and set the historyControlInterval object to a value less than this interval. This interval is typically most important for the octets counter in a media-specific table. For example, on an Ethernet network, the etherHistoryOctets counter could overflow in about one hour at the Ethernet's maximum utilization.
Owner	Indicates the network management system that created this entry.

### Disabling history using EDM

Use the following procedure to disable RMON history on a port.

Step	Action
1	From the navigation tree, double-click <b>Serviceability</b> .
2	In the Serviceability tree, double-click <b>RMON</b> .
3	In the RMON tree, double-click <b>Control</b> .
4	In the <b>History</b> tab, select the row that contains the record you want to delete.
5	In the toolbar, click <b>Delete</b> .

---

--End--

---

### Viewing RMON history statistics using EDM

Use the following procedure to display Rmon History statistics.

#### Prerequisites

- Open one of the supported browsers.
- Enter the IP address of the switch to open an EDM session.

#### Procedure steps

Step	Action
1	From the navigation tree, double-click <b>Serviceability</b> .
2	In the Serviceability tree, double-click <b>RMON</b> .
3	In the RMON tree, double-click <b>Control</b> .
4	In the work area, select a port.
5	In the toolbar, click <b>Display History Data</b> . <i>The Rmon History window appears for the selected port.</i>

---

--End--

---

#### Variable definitions

The following table describes the fields of Rmon History screen.

Field	Description
SampleIndex	Indicates the sample number. As history samples are taken, they are assigned greater sample numbers.
Utilization	Estimates the percentage of a link's capacity that was used during the sampling interval.
Octets	Indicates the number of octets received on the link during the sampling period.
Pkts	Indicates the number of packets received on the link during the sampling period.
BroadcastPkts	Indicates the number of packets received on the link during the sampling interval that were destined for the broadcast address.
MulticastPkts	Indicates the number of packets received on the link during the sampling interval that are destined for the multicast address. This does not include the broadcast packets.
DropEvents	Indicates the number of received packets that were dropped because of system resource constraints.
CRCAlignErrors	Indicates the number of packets received during a sampling interval that were between 64 and 1518 octets long. This length included Frame Check Sequence (FCS) octets but not framing bits. The packets had a bad FCS with either an integral number of octets (FCS Error), or a non-integral number of octets (Alignment Error).
UndersizePkts	Indicates the number of packets received during the sampling interval were less than 64 octets long (including FCS octets, but not framing bits).
OversizePkts	Indicates the number of packets received during the sampling interval were longer than 1518 octets (including FCS octets, but not framing bits, and were otherwise well formed).
Fragments	Indicates the number of packets received during the sampling interval were less than 64 octets long (including FCS octets, but not framing bits). The packets had a bad FCS with either an integral number of octets (FCS Error), or a non-integral number of octets (Alignment Error).
Collisions	Indicates the best estimate of the number of collisions on an Ethernet segment during a sampling interval.

### Enabling ethernet statistics gathering using EDM

Use the following procedure to gather ethernet statistics.

#### Prerequisites

- Open one of the supported browsers.
- Enter the IP address of the switch to open an EDM session.

### Procedure steps

Step	Action
1	From the navigation tree, double-click <b>Serviceability</b> .
2	In the Serviceability tree, double-click <b>RMON</b> .
3	In the RMON tree, double-click <b>Control</b> .
4	In the work area, click the <b>Ether Stats</b> tab.
5	In the toolbar, click <b>Insert</b> . <i>The Insert Ether Stats dialog box appears.</i>
6	Enter the port number you want to use in the <b>Port</b> field. You can either type the port number, or click Port ellipse ( ... ) to select a port number from the Port List..
7	Type the owner of this RMON entry in the <b>Owner</b> field.
8	Click <b>Insert</b> .
--End--	

### Variable definitions

The following table describes the fields of Insert Ether Stats screen.

Field	Description
Index	Indicates a unique value assigned to each interface. An index identifies an entry in a table.
Port	Indicates a port on the device.
Owner	Indicates the network management system that created this entry.

### Disabling Ethernet statistics gathering using EDM

Use the following procedure to disable Ethernet statistics.

- Open one of the supported browsers.
- Enter the IP address of the switch to open an EDM session.

Step	Action
1	From the navigation tree, double-click <b>Serviceability</b> .
2	In the Serviceability tree, double-click <b>RMON</b> .
3	In the RMON tree, double-click <b>Control</b> .



- 4 In the work area, click the **Ether Stats** tab.
- 5 Select the row that contains the record that you want to delete.
- 6 In the toolbar, click **Delete**.

---

--End--

---

## Configuring Alarm Manager using EDM

This section describes the procedure you can use for Alarm Manager.

### Prerequisites

- Open one of the supported browsers.
- Enter the IP address of the switch to open an EDM session.

### Configuring Alarm Manager using EDM navigation

- [“Creating an Alarm using EDM” \(page 137\)](#)
- [“Deleting an alarm using EDM” \(page 139\)](#)

### Creating an Alarm using EDM

Use the following procedure to create an alarm to receive statistics and history using default values.

#### Prerequisites

- Open one of the supported browsers.
- Enter the IP address of the switch to open an EDM session.

#### Procedure steps

---

Step	Action
1	From the navigation tree, double-click <b>Serviceability</b> .
2	In the Serviceability tree, double-click <b>RMON</b> .
3	In the RMON tree, double-click <b>Alarms</b> .
4	In the work area, click the <b>Alarms</b> tab.
5	In the toolbar, click <b>Insert</b> . <i>The Insert Alarm dialog box appears.</i>
6	Configure the parameters as required for the alarm.

---

7 Click **Insert**.

--End--

**Variable definitions**

The following table describes the fields of Insert Alarm dialog box.

**Table 9**

Field	Description
Variable	Indicates the name and type of alarm.  <i>alarmname.x</i> Here x=0 indicates a chassis alarm.  <i>alarmname.</i> where the user must specify the index. This index is a card number for module-related alarms, an STG ID for spanning tree group alarms (the default STG is 1, other STG IDs are user-configured), or the Ether Statistics Control Index for RMON Stats alarms  <i>alarmname</i> with no dot or index is a port-related alarm and results in display of the port selection tool.
Sample Type	Indicates the sample type. Available options are: <ul style="list-style-type: none"> <li>• absoluteValue</li> <li>• deltaValue</li> </ul>
Interval	Indicates the time period (in seconds) over which the data is sampled and compared with the rising and falling thresholds.
Index	Uniquely identifies an entry in the alarm table. Each such entry defines a diagnostic sample at a particular interval for an object on the device.
RisingThresh old	Generates a single events if the current sampled value is greater than or equal to this threshold, and the value at the last sampling interval was less than this threshold.
RisingEventIn dex	Indicates the index of the event entry that is used after a rising threshold is crossed. The event entry identified by a particular value of this index is the same as identified by the same value of the event index object. (Generally, accept the default that is already filled in.)
RisingThresh old	Generates a single event if the current sampled value is less than or equal to this threshold, and the value at the last sampling interval was greater than this threshold.

**Table 9**  
(cont'd.)

Field	Description
FallingEventIndex	Indicates the index of the event entry that is used after a falling threshold is crossed. The event entry identified by a particular value of this index is the same as identified by the same value of the event index object. (Generally, accept the default that is already filled in.)
Owner	Indicates the network management system that created this entry.

### Deleting an alarm using EDM

Use the following procedure to delete an alarm.

#### Procedure steps

Step	Action
1	From the navigation tree, double-click <b>Serviceability</b> .
2	In the Serviceability tree, double-click <b>RMON</b> .
3	In the RMON tree, double-click <b>Alarms</b> .
4	In the work area, click the <b>Alarms</b> tab.
5	Select the alarm you want to delete.
6	In the toolbar, click <b>Delete</b> .
--End--	

#### Variable definitions

The following table describes the fields on the Alarms tab.

Field	Description
Index	Uniquely identifies an entry in the alarm table. Each such entry defines a diagnostic sample at a particular interval for an object on the device.
Interval	Indicates the interval in seconds over which data is sampled and compared with the rising and falling thresholds. After setting this variable, in the case of deltaValue sampling, you should set the interval short enough that the sampled variable is very unlikely to increase or decrease by a delta of more than $2^{31} - 1$ during a single sampling interval.

Field	Description
Variable	Indicates the object identifier of the particular variable to be sampled. Only variables that resolve to an ASN.1 primitive type of INTEGER (INTEGER, Counter, Gauge, or TimeTicks) may be sampled.
Sample Type	Indicates the method of sampling the selected variable and calculating the value to be compared against the thresholds. If the value of this object is absoluteValue(1), the value of the selected variable is compared directly with the thresholds at the end of the sampling interval. If the value of this object is deltaValue(2), the value of the selected variable at the last sample is subtracted from the current value, and the difference compared with the thresholds.
Value	Indicates the value of the statistic during the last sampling period. For example, if the sample type is deltaValue, this value is the difference between the samples at the beginning and end of the period. If the sample type is absoluteValue, this value is the sampled value at the end of the period. This value is compared with the rising and falling thresholds. The value during the current sampling period is not made available until the period is completed and remains available until the next period is completed.
StartupAlarm	Indicates the alarm that may be sent after this entry is first set to Valid. If the first sample after this entry becomes valid is greater than or equal to the risingThreshold and alarmStartupAlarm is equal to risingAlarm(1) or risingOrFallingAlarm(3), a single rising alarm is generated. If the first sample after this entry becomes valid is less than or equal to the fallingThreshold and alarmStartupAlarm is equal to fallingAlarm(2) or risingOrFallingAlarm(3) a single falling alarm is generated.
RisingThreshold	Indicates the threshold for the sampled statistic. After the current sampled value is greater than or equal to this threshold, and the value at the last sampling interval was less than this threshold, a single event is generated. A single event is also generated if the first sample after this entry becomes valid is greater than or equal to this threshold and the associated alarmStartupAlarm is equal to risingAlarm(1) or risingOrFallingAlarm(3). After a rising event is generated, another such event is not generated until the sampled value falls below this threshold and reaches the alarmFallingThreshold.

Field	Description
RisingEventIndex	Indicates the index of the eventEntry that is used after a rising threshold is crossed. The eventEntry identified by a particular value of this index is the same as identified by the same value of the eventIndex object. If there is no corresponding entry in the eventTable no association exists. In particular, if this value is zero, no associated event is generated, because zero is not a valid event index.
FallingThreshold	Indicates the threshold for the sampled statistic. After the current sampled value is less than or equal to this threshold, and the value at the last sampling interval was greater than this threshold, a single event is generated. A single event is also generated if the first sample after this entry becomes valid is less than or equal to this threshold and the associated alarmStartupAlarm is equal to fallingAlarm(2) or risingOrFallingAlarm(3). After a falling event is generated, another such event is not generated until the sampled value rises above this threshold and reaches the alarmRisingThreshold.
FallingEventIndex	Indicates the index of the eventEntry that is used after a falling threshold is crossed. The eventEntry identified by a particular value of this index is the same as identified by the same value of the eventIndex object. If there is no corresponding entry in the eventTable no association exists. In particular, if this value is zero, no associated event is generated, because zero is not a valid event index.
Owner	Indicates the network management system that created this entry.
Status	Indicates the status of this alarm entry.

## Configuring Events using EDM

This section describes how RMON events and alarms work together to provide notification after values in the network are outside of a specified range. After values pass the specified ranges, the alarm is triggered. The event specifies how the activity is recorded.

### Prerequisites

- Open one of the supported browsers.
- Enter the IP address of the switch to open an EDM session.

### Configuring Events using EDM navigation

- [“How events work” \(page 142\)](#)
- [“Viewing an event using EDM” \(page 142\)](#)

- [“Creating an event using EDM” \(page 143\)](#)
- [“Deleting an event using EDM” \(page 144\)](#)

### How events work

An event specifies whether a trap, a log, or a trap and a log are generated to view alarm activity. After RMON is globally enabled, two default events are generated:

- RisingEvent
- FallingEvent

The default events specify that after an alarm goes out of range, the "firing" of the alarm is tracked in both a trap and a log. For example, after an alarm fires at the rising threshold, the rising event specifies that this information be sent to both a trap and a log. Likewise, after an alarm passes the falling threshold, the falling event specifies that this information be sent to a trap and a log.

### Viewing an event using EDM

Use the following procedure to view a table of events.

#### Procedure steps

Step	Action
1	From the navigation tree, double-click <b>Serviceability</b> .
2	In the Serviceability tree, double-click <b>RMON</b> .
3	In the RMON tree, double-click <b>Alarms</b> .
4	In the work area, click the <b>Events</b> tab.

--End--

#### Variable definitions

The following table describes the fields of Events tab.

Field	Description
Index	Uniquely identifies an entry in the event table. Each entry defines one event that is to be generated after the appropriate conditions occur.
Description	Specifies whether the event is a rising or falling event.

Field	Description
Type	Indicates the type of notification that the EDM provides about this event. In the case of log, an entry is made in the log table for each event. In the case of trap, an SNMP trap is sent to one or more management stations. Possible notifications follow: <ul style="list-style-type: none"> <li>• none</li> <li>• log</li> <li>• trap</li> <li>• log-and-trap</li> </ul>
Community	Indicates the SNMP community string acts as a password. Only those management applications with this community string can view the alarms.
LastTimeSent	Indicates the value of sysUpTime at the time this event entry last generated an event. If this entry has not generated events, this value is zero.
Owner	If traps are specified to be sent to the owner, this is the name of the machine which receives traps.

### Creating an event using EDM

Use the following procedure to create an event.

#### Procedure steps

Step	Action
1	From the navigation tree, double-click <b>Serviceability</b> .
2	In the Serviceability tree, double-click <b>RMON</b> .
3	In the RMON tree, double-click <b>Alarms</b> .
4	In the work area, click the <b>Events</b> tab.
5	In the toolbar, click <b>Insert</b> . <i>The Insert Events dialog box appears.</i>
6	Configure the parameters as required.
7	Click <b>Insert</b> .
--End--	

#### Variable definitions

The following table describes the fields of Insert Events screen.

Field	Description
Index	Uniquely identifies an entry in the event table. Each entry defines one event that is to be generated after the appropriate conditions occur.
Description	Specifies whether the event is a rising or falling event.
Type	Indicates the type of notification that EDM provides about this event. In the case of log, an entry is made in the log table for each event. In the case of trap, an SNMP trap is sent to one or more management stations. Possible notifications follow: <ul style="list-style-type: none"> <li>• none</li> <li>• log</li> <li>• trap</li> <li>• log-and-trap</li> </ul>
Community	Indicates the SNMP community string acts as a password. Only those management applications with this community string can view the alarms.
Owner	If traps are specified to be sent to the owner, this is the name of the machine receives alarm traps.

### Deleting an event using EDM

Use the following procedure to delete an event.

#### Procedure steps

Step	Action
1	From the navigation tree, double-click <b>Serviceability</b> .
2	In the Serviceability tree, double-click <b>RMON</b> .
3	In the RMON tree, double-click <b>Alarms</b> .
4	In the work area, click the <b>Events</b> tab.
5	Select the event you want to delete from the list.
6	In the toolbar, click <b>Delete</b> .

--End--

### Viewing log information using EDM

Use the following procedure to view the alarm activity.



### Prerequisites

- Open one of the supported browsers.
- Enter the IP address of the switch to open an EDM session.

### Procedure steps

Step	Action
1	From the navigation tree, double-click <b>Serviceability</b> .
2	In the Serviceability tree, double-click <b>RMON</b> .
3	In the RMON tree, double-click <b>Alarms</b> .
4	In the work area, click the <b>Log</b> tab.

--End--

### Variable definitions

The following table describes the fields of Log tab.

Item	Description
Time	Specifies the time an event occurred that activated the log entry.
Description	Specifies whether the event is a rising or falling event.
EventIndex	Specifies the index of the event.



---

# IPFIX configuration using Enterprise Device Manager

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This section describes the configuration and management of IPFIX functionality using the Enterprise Device Manager (EDM).

## Prerequisites

- Open one of the supported browsers.
- Enter the IP address of the switch to open an EDM session.

## Navigation

- [“Configuring Global IPFIX using EDM” \(page 147\)](#)
- [“Configuring IPFIX flows using EDM” \(page 148\)](#)
- [“Configuring IPFIX collectors using EDM” \(page 149\)](#)
- [“Configuring IPFIX ports using EDM” \(page 152\)](#)
- [“Graphing Exporter Statistics using EDM” \(page 154\)](#)
- [“Exporter Stats Clear Time” \(page 155\)](#)

## Configuring Global IPFIX using EDM

IPFIX functionality can be globally enabled or disabled from the EDM. By default, IPFIX is disabled and must be enabled before it starts to collect flow information. This section contains the procedures for enabling and disabling IPFIX on a switch.

Use the following command to enable or disable IPFIX using the DM

### Prerequisites

- Open one of the supported browsers.
- Enter the IP address of the switch to open an EDM session.

### Procedure steps

Step	Action
1	From the navigation tree, double-click <b>Serviceability</b> .
2	In the Serviceability tree, double-click <b>IPFIX</b> .
3	In the <b>Global</b> tab work area, select the operational state of IPFIX functionality in the <b>State</b> area.
4	In the toolbar, click <b>Apply</b> .

---

--End--

---

### Configuring IPFIX flows using EDM

After IPFIX has been enabled on a switch, the ports IPFIX monitors must be configured. Configuration of flow information sources is performed in the EDM.

Use the following procedure to configure IPFIX flows.

#### Prerequisites

- Open one of the supported browsers.
- Enter the IP address of the switch to open an EDM session.

### Procedure steps

Step	Action
1	From the navigation tree, double-click <b>Serviceability</b> .
2	In the Serviceability tree, double-click <b>IPFIX</b> .
3	In the work area, click the <b>Exporters</b> tab. <i>The Exporters tab lists the IPFIX exporters that are currently available. If connected to a stand-alone unit, the export properties of that unit are listed. If connected to a stack, the export properties of all units in the stack are listed.</i>
4	In the table, in the port row, double-click the cell under the column heading for the parameter you want to change.
5	Select a parameter or value from the drop-down list.
6	Repeat the previous two steps until you have amended all of the parameters you want to change.

7 In the toolbar, click **Apply**.

---

--End--

---

### Variable definitions

The following table describes the fields of the Exporters tab.

Field	Description
Slot	Indicates the switch that is exporting IPFIX flows. This number corresponds to the unit number in a stack or is 1 for a stand-alone unit.
AgingIntv	Indicates the aging interval of the flow record in seconds. This value is an integer between 0 and 2147400.
ActiveTimeout	Indicates the flow record active timeout value in minutes.
ExportIntv	Indicates the frequency of data exports to the collector in seconds. This value is an integer between 10 and 3600.
ExportState	Indicates the current state of the exporter.
TempRefIntvSec	Indicates the template refresh time out in seconds. The template is sent out to the collector either at the interval specified in this value or after the number of packets specified in the <b>TempRefIntvPkts</b> value, whichever occurs first. This value is an integer between 300 and 3600.
TempRefIntvPkts	Indicates the template refresh time out in numbers of packets. The template is sent out to the collector either at the interval specified in this value or after the number of seconds specified in the <b>TempRefIntvSec</b> value, whichever occurs first. This value is an integer between 10000 and 100000.

## Configuring IPFIX collectors using EDM

IPFIX collectors are used to collect and analyze data exported from an IPFIX-compliant switch. At this time, up to two collectors can be supported.

IPFIX data is exported from the switch in *Netflow version 9* format. Data is exported using UDP port 9995.

IPFIX data is not load balanced when two collectors are in use. Identical information is sent to both collectors.

This section describes the procedures you need to configure an IPFIX collector.

### Prerequisites

- Open one of the supported browsers.
- Enter the IP address of the switch to open an EDM session.

### Configuring IPFIX collectors using EDM navigation

- [“Creating a collector using EDM” \(page 150\)](#)
- [“Modifying collectors using EDM” \(page 151\)](#)
- [“Deleting a collector using EDM” \(page 152\)](#)

### Creating a collector using EDM

Use the following procedure to create an IPFIX collector.

#### Prerequisites

- Open one of the supported browsers.
- Enter the IP address of the switch to open an EDM session.

#### Procedure steps

---

Step	Action
1	From the navigation tree, double-click <b>Serviceability</b> .
2	In the Serviceability tree, double-click <b>IPFIX</b> .
3	In the work area, click the <b>Collectors</b> tab.
4	In the toolbar, click <b>Insert</b> . <i>The Insert Collectors dialog box appears.</i>
5	In the work area, configure the parameters as required.
6	Click <b>Insert</b> .

---

--End--

---

#### Variable definitions

The following table describes the fields of the Insert Collectors tab.

The following table describes the fields in the Insert Collectors dialogue.

Field	Description
Slot	Indicates the unit number of the collector. Currently up to two collectors are supported so the values 1 or 2 are valid.

Field	Description
AddressType	Indicates the address type of the IP address of the collector. Currently only IPv4 addresses are supported.
Address	Indicates the IP address of the collector.
Protocol	Indicates the protocol used to transport the IPFIX data to the collector. Currently only the UDP protocol is supported for this task.
DestPort	Indicates the port on which the collector is listening for IPFIX data. Currently only port 9995 is supported for this task.
ProtoVer	Indicates the format in which IPFIX data is provided to the collector. Currently only Netflow version 9 formatting is supported for this task.
Enable	Indicates the operational state of this collector.

### Modifying collectors using EDM

Use the following procedure to modify an IPFIX collector.

#### Prerequisites

- Open one of the supported browsers.
- Enter the IP address of the switch to open an EDM session.

#### Procedure steps

Step	Action
1	From the navigation tree, double-click <b>Serviceability</b> .
2	In the Serviceability tree, double-click <b>IPFIX</b> .
3	In the work area, click the <b>Collectors</b> tab.
4	In the table, double-click a cell under the column heading for the parameter you want to change.
5	Select a parameter or value from the drop-down list.
6	Repeat the previous two steps until you have amended all of the parameters you want to change.
7	In the toolbar, click <b>Apply</b> .

--End--

#### Variable definitions

The following table describes the fields of Collectors tab.

Field	Description
Slot	Indicates the unit number of the collector. Currently up to two collectors are supported.
AddressType	Indicates the address type of the IP address of the collector. Currently only IPv4 addresses are supported.
Address	Indicates the IP address of the collector.
Protocol	Indicates the protocol used to transport the IPFIX data to the collector. Currently only the UDP protocol is supported for this task.
DestPort	Indicates the port on which the collector is listening for IPFIX data. Currently only port 9995 is supported for this task.
ProtoVer	Indicates the format in which IPFIX data is provided to the collector. Currently only Netflow version 9 formatting is supported for this task.
Enable	Indicates the operational state of this collector.

### Deleting a collector using EDM

Use the following procedure to delete an IPFIX collector.

#### Prerequisites

- Open one of the supported browsers.
- Enter the IP address of the switch to open an EDM session.

#### Procedure steps

Step	Action
1	From the navigation tree, double-click <b>Serviceability</b> .
2	In the Serviceability tree, double-click <b>IPFIX</b> .
3	In the work area, click the <b>Collectors</b> tab.
4	In the table, select the IPFIX collector you want to delete.
5	In the toolbar, click <b>Delete</b> .

--End--

### Configuring IPFIX ports using EDM

Use the following procedure to configure IPFIX ports.



## Prerequisites

- Open one of the supported browsers.
- Enter the IP address of the switch to open an EDM session.

## Procedure steps

Step	Action
1	From the navigation tree, double-click <b>Serviceability</b> .
2	In the Serviceability tree, double-click <b>IPFIX</b> .
3	In the work area, click <b>Ports</b> tab.
4	Click the Switch/Stack/Port ellipses ( ... ) to select a port or multiple ports.
5	In the table, double-click a cell under the <b>Flush</b> column heading.
6	Choose a value or parameter from the drop-down list.
7	Repeat the previous two steps for the column heading <b>AllTraffic</b> .
8	Click <b>Apply Selection</b> to commit the changes.
	OR
	Click <b>Undo Apply</b> or <b>Clear Selection</b> to cancel the changes.
	<i>The table reflects the modifications.</i>
--End--	

## Variable definitions

The following table describes the fields of the Ports tab.

Field	Description
Id	Indicates the individual port on which the IPFIX parameters are being configured. Ports are itemized in the format <i>Unit / Port</i> .

Field	Description
Flush	<p>Determines the flushing action to take on the port. Flushing the port of data involves deleting all previously gathered information about that port. This field provides three options:</p> <ul style="list-style-type: none"> <li>• none - The port data is not flushed.</li> <li>• flush - The port data is flushed; deleting it from switch memory.</li> <li>• exportAndFlush - The port data is exported to a configured collector and the data is then flushed.</li> </ul> <p>Although this field is displayed on a per port basis, flushing is only supported on a per unit basis in Software Release 5.0.</p>
AllTraffic	<p>Determines whether IPFIX data is collected on this port. This field provides two options:</p> <ul style="list-style-type: none"> <li>• enable - IPFIX data is collected.</li> <li>• disable - IPFIX data is not collected.</li> </ul>

## Graphing Exporter Statistics using EDM

Use the following procedure to view IPFIX exporter statistics.

### Prerequisites

- Open one of the supported browsers.
- Enter the IP address of the switch to open an EDM session.

### Procedure steps

Step	Action
1	From the navigation tree, double-click <b>Serviceability</b> .
2	In the Serviceability tree, double-click <b>IPFIX</b> .
3	In the work area, click the <b>Collectors</b> tab.
4	Select the record that you want to graph.
5	In the toolbar, click <b>Graph</b> .
	<i>The IPFIX Exporter Stats window opens with the Exporter tab selected.</i>
	--End--

### Variable definitions

The following table outlines the fields on this tab.

Field	Description
OutPkts	Indicates the total number of packets sent.
OutOctets	Indicates the total number of bytes sent.
PktsLoss	Indicates the total number of records lost.

## Exporter Stats Clear Time

In conjunction with the Exporters tab, the Clear Time tab indicates the system time after exporter statistics were last cleared (none if this has never occurred).





Nortel Ethernet Routing Switch 5000 Series

## Configuration — System Monitoring

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