Extreme™
Customer-Driven Networking

# Extreme Network OS MIB Reference, 7.4.0

## Supporting Network OS 7.4.0

# Legal Notice

Extreme Networks, Inc. reserves the right to make changes in specifications and other information contained in this document and its website without prior notice. The reader should in all cases consult representatives of Extreme Networks to determine whether any such changes have been made.

The hardware, firmware, software or any specifications described or referred to in this document are subject to change without notice.

# Trademarks

Extreme Networks and the Extreme Networks logo are trademarks or registered trademarks of Extreme Networks, Inc. in the United States and/or other countries.

All other names (including any product names) mentioned in this document are the property of their respective owners and may be trademarks or registered trademarks of their respective companies/owners.

For additional information on Extreme Networks trademarks, please see: www.extremenetworks.com/company/legal/trademarks

# Open Source Declarations

Some software files have been licensed under certain open source or third-party licenses. End-user license agreements and open source declarations can be found at: www.extremenetworks.com/support/policies/software-licensing

# Contents

# Preface

This section discusses the conventions used in this guide, ways to provide feedback, additional help, and other Extreme Networks® publications.

# Conventions

This section discusses the conventions used in this guide.

## Notes, cautions, and warnings

Notes, cautions, and warning statements may be used in this document. They are listed in the order of increasing severity of potential hazards.

**NOTE**
A Note provides a tip, guidance, or advice, emphasizes important information, or provides a reference to related information.

**ATTENTION**
An Attention statement indicates a stronger note, for example, to alert you when traffic might be interrupted or the device might reboot.

**CAUTION**
A Caution statement alerts you to situations that can be potentially hazardous to you or cause damage to hardware, firmware, software, or data.

**DANGER**
*A Danger statement indicates conditions or situations that can be potentially lethal or extremely hazardous to you. Safety labels are also attached directly to products to warn of these conditions or situations.*

## Text formatting conventions

Text formatting conventions such as boldface, italic, or Courier font may be used to highlight specific words or phrases.

| Format | Description |
| --- | --- |
| **bold** text | Identifies command names. |
| | Identifies keywords and operands. |
| | Identifies the names of GUI elements. |
| | Identifies text to enter in the GUI. |
| *italic* text | Identifies emphasis. |
| | Identifies variables. |
| | Identifies document titles. |

| Format | Description |
|---|---|
| `Courier font` | Identifies CLI output. |
| | Identifies command syntax examples. |

## Command syntax conventions

Bold and italic text identify command syntax components. Delimiters and operators define groupings of parameters and their logical relationships.

| Convention | Description |
|---|---|
| **bold** text | Identifies command names, keywords, and command options. |
| *italic* text | Identifies a variable. |
| [ ] | Syntax components displayed within square brackets are optional. |
| | Default responses to system prompts are enclosed in square brackets. |
| { **x** \| **y** \| **z** } | A choice of required parameters is enclosed in curly brackets separated by vertical bars. You must select one of the options. |
| **x** \| **y** | A vertical bar separates mutually exclusive elements. |
| < > | Nonprinting characters, for example, passwords, are enclosed in angle brackets. |
| … | Repeat the previous element, for example, *member*[*member*…]. |
| \ | Indicates a "soft" line break in command examples. If a backslash separates two lines of a command input, enter the entire command at the prompt without the backslash. |

# Documentation and Training

To find Extreme Networks product guides, visit our documentation pages at:

| Current Product Documentation | www.extremenetworks.com/documentation/ |
|---|---|
| Archived Documentation (for earlier versions and legacy products) | www.extremenetworks.com/support/documentation-archives/ |
| Release Notes | www.extremenetworks.com/support/release-notes |
| Hardware/Software Compatibility Matrices | https://www.extremenetworks.com/support/compatibility-matrices/ |
| White papers, data sheets, case studies, and other product resources | https://www.extremenetworks.com/resources/ |

## Training

Extreme Networks offers product training courses, both online and in person, as well as specialized certifications. For more information, visit www.extremenetworks.com/education/.

# Getting Help

If you require assistance, contact Extreme Networks using one of the following methods:

Extreme Portal | Search the GTAC (Global Technical Assistance Center) knowledge base, manage support cases and service contracts, download software, and obtain product licensing, training, and certifications.

The Hub | A forum for Extreme Networks customers to connect with one another, answer questions, and share ideas and feedback. This community is monitored by Extreme Networks employees, but is not intended to replace specific guidance from GTAC.

Call GTAC | For immediate support: 1-800-998-2408 (toll-free in U.S. and Canada) or +1 408-579-2826. For the support phone number in your country, visit: www.extremenetworks.com/support/contact

Before contacting Extreme Networks for technical support, have the following information ready:

- Your Extreme Networks service contract number and/or serial numbers for all involved Extreme Networks products
- A description of the failure
- A description of any action(s) already taken to resolve the problem
- A description of your network environment (such as layout, cable type, other relevant environmental information)
- Network load at the time of trouble (if known)
- The device history (for example, if you have returned the device before, or if this is a recurring problem)
- Any related RMA (Return Material Authorization) numbers

## Subscribing to Service Notifications

You can subscribe to email notifications for product and software release announcements, Vulnerability Notices, and Service Notifications.

1. Go to www.extremenetworks.com/support/service-notification-form.

2. Complete the form with your information (all fields are required).

3. Select the products for which you would like to receive notifications.

> **NOTE**
> You can modify your product selections or unsubscribe at any time.

4. Click **Submit**.

# Providing Feedback to Us

Quality is our first concern at Extreme Networks, and we have made every effort to ensure the accuracy and completeness of this document. We are always striving to improve our documentation and help you work better, so we want to hear from you! We welcome all feedback but especially want to know about:

- Content errors or confusing or conflicting information.
- Ideas for improvements to our documentation so you can find the information you need faster.
- Broken links or usability issues.

If you would like to provide feedback to the Extreme Networks Information Development team, you can do so in two ways:

- Use our short online feedback form at https://www.extremenetworks.com/documentation-feedback/.
- Email us at documentation@extremenetworks.com.

Please provide the publication title, part number, and as much detail as possible, including the topic heading and page number if applicable, as well as your suggestions for improvement.

# About This Document

## What's new in this document

After Network OS 3.0.1b, the Network OS MIB Reference guide returned as of Network OS 6.0.1. For few releases prior to that, this guide was not produced; instead a list of new, updated, and deprecated MIBs and objects were provided in the release notes.

> **NOTE**
> Fibre Channel (FC) is no longer supported; commands related to FC and "FCoE" (Fibre Channel over Ethernet) have been either removed or modified. However, instances of "FC" and "FCoE" and related services may still appear in CLI "show" outputs and elsewhere.

The following is the high-level summary of changes for 7.4.0 release.

**TABLE 1** Summary of enhancements in Network OS release 7.4.0

| Feature | Description | Described in |
|---------|-------------|--------------|
| Optical lane monitoring | The optical lane monitoring table objects display the optical parameters table per lane for 100G of type LR4, LR10, ER4, SR4, SR10, CWDM4, and 40G of type LR4 and SR4. | Optical lane monitoring table |
| Optical monitoring information | The optical monitoring information table displays the optical monitoring information table for Temperature, Tx Power, Rx Power, and Tx Bias Current values and the status values. | Optical monitoring information table |
| Entity MIB | Updated the RFC 4133: Entity MIBs for VDX series. | RFC 4133: Entity MIB (Version 3) |
| BGP4v2 | Updated the MIB objects from .1991.3.5.1 to .1916.1.51. to support IPv6 only. | BGP4v2: Draft 15 MIB |

For the complete list of supported features and the summary of enhancements and configuration notes for this release, refer to the Extreme Network OS release notes.

## Supported hardware and software

In those instances in which procedures or parts of procedures documented here apply to some devices but not to others, this guide identifies exactly which devices are supported and which are not.

Although many different software and hardware configurations are tested and supported by Extreme Networks, Inc. for Network OS, documenting all possible configurations and scenarios is beyond the scope of this document.

The following hardware platforms are supported by this release of Network OS:

- ExtremeSwitching VDX 6740-48
- ExtremeSwitching VDX 6740T
  - ExtremeSwitching VDX 6740T-64

- – ExtremeSwitching VDX 6740T-1G
- • ExtremeSwitching VDX 6940-144S
- • ExtremeSwitching VDX 6940-36Q
- • ExtremeSwitching VDX 8770
    - – ExtremeSwitching VDX 8770-4
    - – ExtremeSwitching VDX 8770-8

To obtain information about a Network OS version other than this release, refer to the documentation specific to that version.

# Overview

Simple Network Management Protocol (SNMP) is a set of protocols for managing complex networks. SNMP protocols are application layer protocols. Using SNMP, devices within a network send messages, called protocol data units (PDUs), to different parts of a network. Network management using SNMP requires three components:

- SNMP Manager
- SNMP Agent
- Management Information Base (MIB)
- Port Information

# SNMP Manager

The SNMP Manager can communicate to the devices within a network using SNMP. Typically, the SNMP Manager is a network management system (NMS) that manages networks by monitoring the network parameters, and optionally, setting parameters in managed devices. Normally, the SNMP Manager sends read requests to the devices that host the SNMP Agent, to which the SNMP Agent responds with the requested data. In some cases, the managed devices can initiate the communication, and send data to the SNMP Manager using asynchronous events called traps.

# SNMP Agent

The SNMP Agent is a software that resides in the managed devices in the network, and collects data from these devices. Each device hosts an SNMP Agent. The SNMP Agent stores the data, and sends the data when requested by an SNMP Manager. In addition, the SNMP Agent can asynchronously alert the SNMP Manager about events by using special PDUs called traps.

# Management information base

SNMP Agents in the managed devices store the data about these devices in a database called the management information base (MIB). The MIB is a hierarchical database, which is structured on the standard specified in RFC 2578 (Structure of Management Information Version 2 [SMIv2]).

The MIB is a database of objects that can be used by a network management system to manage and monitor devices on the network. The MIB can be retrieved by a network management system that uses SNMP. The MIB structure determines the scope of management access allowed by a device. By using SNMP, a manager application can issue read or write operations within the scope of the MIB.

# Port Information

The following table provides information on ports that the device uses. When configuring the switch for various policies, take into consideration firewalls and other devices that may sit between device and your network or between the managers and the device.

TABLE 2 Port Information

| Port | Type | Common use | Comment |
|------|------|-----------|---------|
| 161 | UDP | SNMP GET/SET/GETNEXT/ BULK | Disable the SNMP service on the remote host if you do not use it, or filter incoming UDP packets going to this port. |
| 162 | UDP | SNMP TRAPS/INFORMS | Sends traps/informs. Uses CLI command "no snmp-server enable trap" to disable the SNMP trap service. For outgoing source port, the available port number is picked in the port range. |

# Basic SNMP operation

Every Extreme device carries an agent and management information base (MIB). The agent accesses information about a device and makes it available to an SNMP network management station.

FIGURE 1 SNMP structure
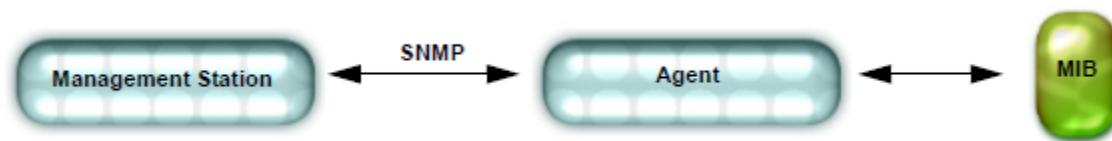


When active, the management station can "get" information or "set" information when it queries an agent. SNMP commands, such as get, set, getnext, and getresponse, are sent from the management station, and the agent replies once the value is obtained or modified. Agents use variables to report such data as the number of bytes and packets in and out of the device, or the number of broadcast messages sent and received. These variables are also known as managed objects. All managed objects are contained in the MIB.

FIGURE 2 SNMP query
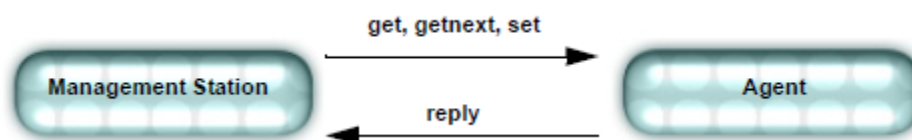


The management station can also receive traps, unsolicited messages from the switch agent, if an unusual event occurs.

**FIGURE 3** SNMP trap



The agent can receive queries from one or more management stations and can send traps to up to six management stations.

# Understanding MIBs

The management information base (MIB) is a database of monitored and managed information on an Extreme device. The MIB structure can be represented by a tree hierarchy. The root splits into three main branches: International Organization for Standardization (ISO), Consultative Committee for International Telegraph and Telephone (CCITT), and joint ISO/CCITT. These branches have short text strings and integers (OIDs) to identify them. Text strings describe object names, while integers allow software to create compact, encoded representations of the names.

## Extreme MIB structure

Each MIB variable is assigned an object identifier (OID). The OID is the sequence of numeric labels on the nodes along a path from the root to the object. For example, as shown in the following figure, the sysDescr is:

```
1.3.6.1.2.1.1.1
```

The corresponding name is:

```
iso.org.dod.internet.mgmt.mib-2.system.sysDescr
```

Each MIB variable is assigned an object identifier (OID). The OID is the sequence of numeric labels on the nodes along a path from the root to the object. For example, as shown in the following figure, the Entity MIB OID is:

```
1.3.6.1.2.1.47
```

The corresponding name is:

```
iso.org.dod.internet.mgmt.mib-2.entityMIB
```

The other branches are part of the standard MIBs, and the portions relevant to configuring SNMP on an Extreme device are referenced in the remainder of this chapter.

FIGURE 4 Extreme MIB tree
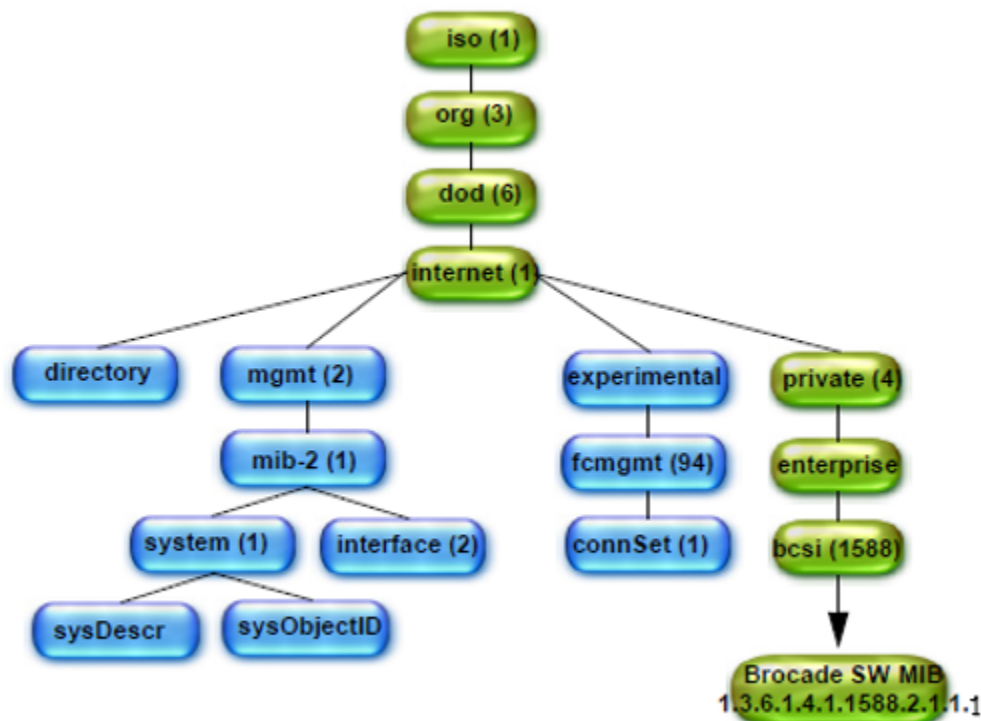


## Access to MIB variables

You can use a MIB browser to access the MIB variables. All MIB browsers load MIBs and perform queries.

Once loaded, MAX-ACCESS provides access levels between the agent and management station. The access levels are described in the following table.

TABLE 3 MIB access levels

| Access level | Description |
|---|---|
| Not accessible/None | You cannot read or write to this variable. |
| Read-create | Specifies a tabular object that can be read, modified, or created as a new row in a table. |
| Read-only | You can only monitor information. |
| Read-write | You can read or modify this variable. |
| Accessible-to-notify | You can read this information only through traps. |

## Extreme MIBs

The Extreme MIB is a set of variables that are private extensions to the Internet standard MIBs. The Extreme agents support many Internet-standard MIBs. These standard MIBs are defined in RFC publications. To find specific MIB information, examine the Extreme proprietary MIB structure and the standard RFC MIBs supported by Extreme.

### Extreme MIB files

The Extreme MIB files are as follows:

- BRCD_NOS_PRODUCTS.mib
- BROCADE_PRODUCTS.mib
- BROCADE-REG-MIB.mib
- SWBase.mib
- Resource.mib
- System.mib
- FA.mib
- HA.mib
- BROCADE-SN-NOTIFICATION.mib
- BROCADE-MAPS-MIB.mib
- BROCADE-CONTEXT-MAPPING-MIB.mib
- BROCADE-VCS-MIB.mib

### Obtaining the Extreme MIBs

You can download the Extreme-specific MIB files required for this release from the downloads area of Extreme.com. To download the Extreme-specific MIBs from Extreme.com, you must have a user name and password.

1. From your web browser, go to http://my.extreme.com.
2. Log in with your username and password.
3. Click the downloads tab.
4. On the downloads tab, under Product Downloads, select All Operating Systems from the Download by list.
5. Select Network Operating System (NOS), and then navigate to the release.
6. Navigate to the link for the MIBs package and either open the file or save it to disk.

# Supported Standard MIB Objects

# RFC 1213 (MIB-II)

The following tables, groups, and variables are supported in this MIB.

| Table/Group | Supported Variables | Comments |
|---|---|---|
| System group scalars | All objects | The sysServices object always returns the value 79.<br><br>**NOTE**<br>The allowed character set is A-Z, a-z, 0-9, +-@_..:;()/ " for sysName, sysLocation, sysContact. |
| Interfaces group | | Supported as per RFC 2233. |
| IP Group scalars | All objects | |
| ipAddrTable | All objects | |
| ipRouteTable | All objects | Supported as read only. Routes are indexed by prefix only. |
| ipNetToMediaTable | All objects | context support is available for the ipNetToMediaTable in MIB-2. In order to retrieve entries in various VRs for ipNetToMediaTable in MIB-2, VRs can be mentioned as contexts. For example, to get the entries in , the following net–snmp query needs to be used:<br><br>snmpwalk –v3 –n "VR-Mgmt" –u <v3username> –a md5 –a <v3user-authentication password> <deviceIpAddress/Hostname> ipNetToMediaTable<br><br>Here –n has the context value of "VR-Mgmt". If no context is specified in the query, then only the entries in the are shown. |
| ICMP group | All objects | |
| TCP group scalars | All objects | |

| Table/Group | Supported Variables | Comments |
|---|---|---|
| tcpConnTable | All objects | |
| UDP group scalars | All objects | |
| udpTable | All objects | |
| EGP Group | Not supported | |
| SNMP group | All objects | |
| At group | All objects | Supported as read only. |

## History

| Release version | History |
|---|---|
| NOS 7.2.0 | This MIB was introduced. |

# BGP4 MIB

The MIB module for the BGP-4 protocol. The BGP4 MIB module defines the MIB objects for management of Border Gateway Protocol Version 4 (BGPv4). Both read-only and read-write operations are supported on this MIB through SNMP.

## Supported object groups

| Object group name | OID | Supported? |
|---|---|---|
| bgpVersion | 1.3.6.1.2.1.15.1 | Yes |
| bgpLocalAs | 1.3.6.1.2.1.15.2 | Yes |
| bgpPeerIdentifier | 1.3.6.1.2.1.15.4 | Yes |
| bgpRcvdPathAttrTable | 1.3.6.1.2.1.15.5 | No |
| bgp4PathAttrTable | 1.3.6.1.2.1.15.6 | Yes |
| bgpMIBConformance | 1.3.6.1.2.1.15.8 | Yes |
| bgpPeerTable | 1.3.6.1.2.1.15.3 | Yes |

## History

| Release version | History |
|---|---|
| NOS 7.2.0 | This MIB was introduced. |

# Bridge MIB

The Bridge MIB module for managing devices that support IEEE 802.1D.

> **NOTE**
> Though BRIDGE-MIB objects are retrievable in VCS mode, SNMP is not VCS-aware. An SMNP query will return the switch-specific response.

## Supported object groups

The following groups from LLDP-EXT-DOT1-MIB are fully supported.

| Object group name | OID | Supported? |
|---|---|---|
| dot1dBase | 1.3.6.1.2.1.17.1 | Yes<br><br>This contains the objects that are applicable to all types of bridges (support only for default VLAN). |
| dot1dStp | 1.3.6.1.2.1.17.2 | Yes<br><br>This contains objects that denote the bridge's state with respect to the Spanning Tree Protocol. |
| dot1dTp | 1.3.6.1.2.1.17.4 | Yes<br><br>Implementation of the dot1dTp sub-tree is optional. It is implemented by those bridges that support the transparent bridging mode. A transparent or SRT bridge will implement this sub-tree. |
| dot1dStatic | 1.3.6.1.2.1.17.5 | Yes |

## History

| Release version | History |
|---|---|
| NOS 7.2.0 | This MIB was introduced. |

# P-Bridge MIB

The P-Bridge MIB Extension module for managing Priority and Multicast Filtering, defined by IEEE 802.1D-1998, including Restricted Group Registration defined by IEEE 802.1t-2001.

> **NOTE**
> Though P-Bridge MIB objects are retrievable in VCS mode, SNMP is not VCS-aware. An SMNP query returns the switch-specific response.

The following tables are not supported:

- dot1dTpHCPortTable
- dot1dUserPriorityRegenTable
- dot1dTrafficClassTable
- dot1dPortOutboundAccessPriorityTable
- dot1dPortGarpTable
- dot1dPortGmrpTable

## Supported object groups

| Object group name | OID | Supported? |
|---|---|---|
| dot1dBase | 1.3.6.1.2.1.17.1 | Yes |
| dot1dExtBase | 1.3.6.1.2.1.17.6.1.1 | Yes |
| dot1dPortPriority | 1.3.6.1.2.1.17.6.1.2 | Yes |

## History

| Release version | History |
|---|---|
| NOS 7.2.0 | This MIB was introduced. |

# Host Resource MIB

The Host Resource MIB module defines a uniform set of MIB objects useful for the management of host computers. Only read-only operation is supported on this MIB through SNMP.

## Supported object groups

| Object group name | OID | Supported? |
|---|---|---|
| hrSystem | 1.3.6.1.2.1.25.1 | Yes |
| hrStorage | 1.3.6.1.2.1.25.2 | Yes |
| hrDevice | 1.3.6.1.2.1.25.3 | Yes |
| hrSWRun | 1.3.6.1.2.1.25.4 | Yes (Read-Only) |
| hrSWRunPerf | 1.3.6.1.2.1.25.5 | Yes |
| hrSWInstalled | 1.3.6.1.2.1.25.6 | Yes |
| hrMIBAdminInfo | 1.3.6.1.2.1.25.7 | Yes |

## History

| Release version | History |
|---|---|
| NOS 7.2.0 | This MIB was introduced. |

# Definitions of Managed Objects for BGP4v2

This MIB supports IPv6 only, for BGP IPv4 sessions please refer the BGP4 MIB RFC 4273.

This MIB supports the BGPIPv6 parameters and it defines the objects as per the ITEF draft-15 which helps in demonstrating the BGP routing protocol and to populate the required BGPIPv6 tables and notifications.

**TABLE 4** extremeBGP4v2 Peer table

| Object group name | OID | Notes |
|---|---|---|
| extremeBgp4V2PeerInstance | .1.3.6.1.4.1.1916.1.51.1.2.1.1 | The routing instance index. Some BGP implementations permit the creation of multiple instances of a BGP routing process. An example includes routers running BGP/MPLS IP Virtual Private Networks Implementations that do not support multiple routing instances should return 1 for this object. |
| extremeBgp4V2PeerLocalAddrType | .1.3.6.1.4.1.1916.1.51.1.2.1.2 | The address family of the local end of the peering session. |
| extremeBgp4V2PeerLocalAddr | .1.3.6.1.4.1.1916.1.51.1.2.1.3 | The local IPv6 address of this entry's BGP connection. |
| extremeBgp4V2PeerRemoteAddrType | .1.3.6.1.4.1.1916.1.51.1.2.1.4 | The address family of the remote end of the peering session. |
| extremeBgp4V2PeerRemoteAddr | .1.3.6.1.4.1.1916.1.51.1.2.1.5 | The remote IPV6 address of this entry's BGP peer. |
| extremeBgp4V2PeerLocalPort | .1.3.6.1.4.1.1916.1.51.1.2.1.6 | The local port for the TCP connection between the BGP peers. |

**TABLE 4** extremeBGP4v2 Peer table (continued)

| Object group name | OID | Notes |
|---|---|---|
| extremeBgp4V2PeerLocalAs | .1.3.6.1.4.1.1916.1.51.1.2.1.7 | Some implementations of BGP can represent themselves as multiple ASes. This is the AS that this peering session is representing itself as to the remote peer. |
| extremeBgp4V2PeerLocalIdentifier | .1.3.6.1.4.1.1916.1.51.1.2.1.8 | The BGP Identifier of the local system for this peering session. It is REQUIRED that all extremeBgp4V2PeerLocalIdentifier values for the same extremeBgp4V2PeerInstance be identical. |
| extremeBgp4V2PeerRemotePort | .1.3.6.1.4.1.1916.1.51.1.2.1.9 | The remote port for the TCP connection between the BGP peers. Note that the objects extremeBgp4V2PeerLocalAddr,extremeBgp4V2PeerLocalPort, extremeBgp4V2PeerRemoteAddr and extremeBgp4V2PeerRemotePort provide the appropriate reference to the standard MIB TCP connection table, or even the ipv6 TCP MIB as in RFC 4022. |
| extremeBgp4V2PeerRemoteAs | .1.3.6.1.4.1.1916.1.51.1.2.1.10 | The remote autonomous system number received in the BGP OPEN message |
| extremeBgp4V2PeerRemoteIdentifier | .1.3.6.1.4.1.1916.1.51.1.2.1.11 | The BGP Identifier of this entry's remote BGP peer. This entry should be 0:0:0:0:0:0:0:0 unless the extremeBgp4V2PeerState is in the open confirm or the established state. |
| extremeBgp4V2PeerAdminStatus | .1.3.6.1.4.1.1916.1.51.1.2.1.12 | Whether the BGP FSM for this remote peer is halted or running. The BGP FSM for a remote peer is halted after processing a Stop event. Likewise, it is in the running state after a Start event. The extremeBgp4V2PeerState will generally be in the idle state when the FSM is halted, although some extensions such as Graceful Restart will leave the peer in the Idle state but with the FSM running.<br><br>**NOTE**<br>halted (1), running (2) are supported. |
| extremeBgp4V2PeerState | .1.3.6.1.4.1.1916.1.51.1.2.1.13 | The BGP peer connection state. |
| extremeBgp4V2PeerDescription | .1.3.6.1.4.1.1916.1.51.1.2.1.14 | A user configured description identifying this peer. When this object is not the empty string, this object SHOULD contain a description that is unique within a given BGP instance for this peer. |

**TABLE 5** extremeBGPv2PeerError table

| Object group name | Object identifier | Notes |
|---|---|---|
| extremeBgp4V2PeerLastErrorCodeReceived | 1.3.6.1.4.1.1916.1.51.1.3.1.1 | The last error code received from this peer via NOTIFICATION message on this connection. If no error has occurred, this field is zero. |
| extremeBgp4V2PeerLastErrorSubCodeReceived | .1.3.6.1.4.1.1916.1.51.1.3.1.2 | The last subcode received from this peer via NOTIFICATION message on this connection. If no error has occurred, this field is zero. |
| extremeBgp4V2PeerLastErrorReceivedTime | .1.3.6.1.4.1.1916.1.51.1.3.1.3 | The timestamp that the last NOTIFICATION was received from this peer. |

**TABLE 5** extremeBGPv2PeerError table (continued)

| Object group name | Object identifier | Notes |
|---|---|---|
| extremeBgp4V2PeerLastErrorReceivedText | .1.3.6.1.4.1.1916.1.51.1.3.1.4 | This object contains an implementation specific explanation of the error that was reported. |
| extremeBgp4V2PeerLastErrorCodeSent | .1.3.6.1.4.1.1916.1.51.1.3.1.6 | The last error code sent to this peer via NOTIFICATIONmessage on this connection. If no error has occurred, this field is zero. |
| extremeBgp4V2PeerLastErrorSubCodeSent | .1.3.6.1.4.1.1916.1.51.1.3.1.7 | The last subcode sent to this peer via NOTIFICATIONmessage on this connection. If no error has occurred, this field is zero. |
| extremeBgp4V2PeerLastErrorSentTime | .1.3.6.1.4.1.1916.1.51.1.3.1.8 | The timestamp that the last NOTIFICATION was sent to this peer. |
| extremeBgp4V2PeerLastErrorSentText | .1.3.6.1.4.1.1916.1.51.1.3.1.9 | This object contains an implementation specific explanation of the error that is being reported. |

**TABLE 6** extremeBgp4V2PeerEventTimesTable

| Object group name | Object identifier | Notes |
|---|---|---|
| extremeBgp4V2PeerFsmEstablishedTime | 1.3.6.1.4.1.1916.1.51.1.4.1.1 | This timer indicates how long (in seconds) this peer has been in the established state or how long since this peer was last in the established state. It is set to zero when a new peer is configured or when the router is booted. If the peer has never reached the established state, the value remains zero. |
| extremeBgp4V2PeerInUpdatesElapsedTime | .1.3.6.1.4.1.1916.1.51.1.4.1.2 | Elapsed time (in seconds) since the last BGP UPDATEmessage was received from the peer. Each time bgpPeerInUpdates is incremented, the value of this object is set to zero (0)." |

**TABLE 7** extremeBgp4V2NlriTable

| Object group name | Object identifier | Notes |
|---|---|---|
| extremeBgp4V2NlriIndex | .1.3.6.1.4.1.1916.1.51.1.9.1.1 | This index allows for multiple instances of a base prefix for a certain AFI-SAFI from a given peer.This is currently useful for two things<br><br>1. Allowing for a peer in future implementations to send more than a single route instance.<br><br>2. Allow for extensions which extend the NLRI field to send the same prefix while utilizing other extension specific information.<br>An example of this is RFC 3107 - Carrying MPLS labels in BGP. |
| extremeBgp4V2NlriAfi | .1.3.6.1.4.1.1916.1.51.1.9.1.2 | The address family of the prefix for this NLRI. Note that the AFI is not necessarily equivalent to the an InetAddressType. |
| extremeBgp4V2NlriSafi | .1.3.6.1.4.1.1916.1.51.1.9.1.3 | The subsequent address family of the prefix for this NLRI |
| extremeBgp4V2NlriPrefixType | .1.3.6.1.4.1.1916.1.51.1.9.1.4 | The type of the IP address prefix in the Network Layer Reachability Information field. The value of this object is derived from the appropriate value from the extremeBgp4V2NlriAfi field. Where an |

**TABLE 7** extremeBgp4V2NlriTable (continued)

| Object group name | Object identifier | Notes |
|---|---|---|
| | | appropriate InetAddressType is not available, the value of the object must be unknown(0). |
| extremeBgp4V2NlriPrefix | .1.3.6.1.4.1.1916.1.51.1.9.1.5 | An IP address prefix in the Network Layer Reachability Information field. This object is an IP address containing the prefix with length specified by extremeBgp4V2NlriPrefixLen. Any bits beyond the length specified by extremeBgp4V2NlriPrefixLen are zeroed. |
| extremeBgp4V2NlriPrefixLen | .1.3.6.1.4.1.1916.1.51.1.9.1.6 | Length in bits of the address prefix in the Network Layer Reachability Information field. |
| extremeBgp4V2NlriBest | .1.3.6.1.4.1.1916.1.51.1.9.1.7 | An indication of whether or not this route was chosen as the best BGP4 route for this destination. |
| extremeBgp4V2NlriCalcLocalPref | .1.3.6.1.4.1.1916.1.51.1.9.1.8 | The degree of preference calculated by the receiving BGP4 speaker for an advertised route. In the case where this prefix is ineligible, the value of this object will be zero (0). |
| extremeBgp4V2NlriOrigin | .1.3.6.1.4.1.1916.1.51.1.9.1.9 | The ultimate origin of the path information. |
| extremeBgp4V2NlriNextHopAddrType | .1.3.6.1.4.1.1916.1.51.1.9.1.10 | The address family of the address for the border router that should be used to access the destination network. |
| extremeBgp4V2NlriNextHopAddr | .1.3.6.1.4.1.1916.1.51.1.9.1.11 | The address of the border router that should be used to access the destination network. This address is the nexthop address received in the UPDATE packet associated with this prefix. Note that for RFC2545 style double nexthops, this object will always contain the global scope nexthop. bgpPathAttrLinkLocalNextHop contains the linklocal scope nexthop, if it is present. In the case a mechanism is developed to use only a link local nexthop, extremeBgp4V2NlriNextHopAddr will contain the link local nexthop. |
| extremeBgp4V2NlriLinkLocalNextHopAddrType | .1.3.6.1.4.1.1916.1.51.1.9.1.12 | The address type for IPv6 link local addresses. This is present only when receiving RFC 2545 style double nexthops. This object is optionally present in BGP implementations that do not support IPv6. When no IPv6 link local nexthop is present, the value of this object should be unknown(0). |
| extremeBgp4V2NlriLinkLocalNextHopAddr | .1.3.6.1.4.1.1916.1.51.1.9.1.13 | This value contains an IPv6 link local address and is present only when receiving RFC 2545 style double nexthops. This object is optionally present in BGP implementations that do not support IPv6 When no IPv6 link local nexthop is present, the length of this object should be zero. |
| extremeBgp4V2NlriLocalPrefPresent | .1.3.6.1.4.1.1916.1.51.1.9.1.14 | This value is true when the LOCAL_PREF value was sent in the UPDATE message. |
| extremeBgp4V2NlriLocalPref | .1.3.6.1.4.1.1916.1.51.1.9.1.15 | The originating BGP4 speaker's degree of preference for an advertised route. |
| extremeBgp4V2NlriMedPresent | .1.3.6.1.4.1.1916.1.51.1.9.1.16 | This value is true when the MED value was sent in the UPDATE message. |
| extremeBgp4V2NlriMed | .1.3.6.1.4.1.1916.1.51.1.9.1.17 | This metric is used to discriminate between multiple exit points to an adjacent autonomous |

**TABLE 7** extremeBgp4V2NlriTable (continued)

| Object group name | Object identifier | Notes |
|---|---|---|
| | | system. When the MED value is absent but has a calculated default value, this object will contain the calculated value. |
| extremeBgp4V2NlriAtomicAggregate | 1.3.6.1.4.1.1916.1.51.1.9.1.18 | This value is true when the ATOMIC_AGGREGATE Path Attribute is present and indicates that the NLRI MUST NOT be made more specific. |
| extremeBgp4V2NlriAggregatorPresent | .1.3.6.1.4.1.1916.1.51.1.9.1.19 | This value is true when the AGGREGATOR path attribute was sent in the UPDATE message. |
| extremeBgp4V2NlriAggregatorAS | 1.3.6.1.4.1.1916.1.51.1.9.1.20 | The AS number of the last BGP4 speaker that performed route aggregation. When extremeBgp4V2NlriAggregatorPresent is false, the value of this object should be zero (0). |
| extremeBgp4V2NlriAggregatorAddr | .1.3.6.1.4.1.1916.1.51.1.9.1.21 | The IP address of the last BGP4 speaker that performed route aggregation. When extremeBgp4V2NlriAggregatorPresent is false, the value of this object should be a default value. |
| extremeBgp4V2NlriAsPathCalcLength | .1.3.6.1.4.1.1916.1.51.1.9.1.22 | This value represents the calculated length of the AS Path according to the rules of the BGP specification. This value is used in route selection. |
| extremeBgp4V2NlriAsPathString | .1.3.6.1.4.1.1916.3.5.1.1.9.1.23 | This is a string depicting the autonomous system path to this network which was received from the peer which advertised it. The format of the string is implementation-dependent, and should be designed for operator readability. Note that SnmpAdminString is only capable of representing a maximum of 255 characters. This may lead to the string being truncated in the presence of a large AS Path. It is RECOMMENDED that when this object's contents will be truncated that the final 3 octets be reserved for the ellipses string, '...'. extremeBgp4V2NlriAsPath may give access to the full AS Path. |
| extremeBgp4V2NlriAsPath | .1.3.6.1.4.1.1916.1.51.1.9.1.24 | In order to provide a canonicalized form of the BGP-4 AS_PATH along with the human-readable extremeBgp4V2NlriAsPathString, which may be truncated, this object contains the contents of the BGP-4 AS_PATH Path Attribute. This object may be parsed using the rules defined for Four-octet as defined in RFC 4893. The AS_PATH is composed of a sequence of AS Segments. Each AS Segment is represented by a triple: <path segment type, path segment length, path segment value>. The path segment type and path segment length fields are one octet in length each. The path segment type field may be one of the following :<br><br>1. AS_SET (RFC 4721, section 4.3)<br><br>2. AS_SEQUENCE (RFC 4721,section 4.3)<br><br>3. AS_CONFED_SEQUENCE (RFC 3065, section 5) |

TABLE 7 extremeBgp4V2NlriTable (continued)

| Object group name | Object identifier | Notes |
|---|---|---|
| | | 4.  AS_CONFED_SET (RFC 3065, section 5)<br>The path segment length field contains the number of ASes(not the number of octets) in the path segment value field. The path segment value field contains one or more AS numbers, each encoded as a 4-octet length field in network byte order. Note that since an SNMP agent may truncate this object to less than its maximum theoretical length of 4072 octets users of this object should be prepared to deal with a truncated and thus malformed AS_PATH. It is RECOMMENDED that when such truncation would occur on the boundary of an encoded AS that the partial AS be discarded from this object and the object's size be adjusted accordingly. Further, it is also RECOMMENDED that when such truncation, either alone or in conjuction with the truncation of a partially encoded AS described previously, would yield an empty path segment value field that the path segment type and path segment length components of the truncated AS_PATH also be discarded and the object's size be adjusted accordingly. |
| extremeBgp4V2NlriPathAttrUnknown | .1.3.6.1.4.1.1916.1.51.1.9.1.25 | Path Attributes not understood by this implementation SHOULD be, be presented in this object. Those Path Attributes use the type, length, value encoding documented in RFC 4271, Section 4.3, 'Path Attributes'. Note that since an SNMP agent may truncate this object to less than its maximum theoretical length of 4072 octets users of this object should be prepared to deal with a truncated and thus malformed Path Attribute. |

TABLE 8 extremeBgp4V2Notifications

| Object group name | Object identifier | Notes |
|---|---|---|
| extremeBgp4V2EstablishedNotification | .1.3.6.1.4.1.1916.1.51.0.1 | The BGP Established event is generated when the BGP FSM enters the established state. |
| extremeBgp4V2BackwardTransitionNotification | .1.3.6.1.4.1.1916.1.51.0.2 | The BGPBackwardTransition Event is generated when the BGP FSM moves from a higher numbered state to a lower numbered state. Due to the nature of the BGP state machine, an implementation MAY rate limit the generation of this event. An implementation MAY also generate this notification ONLY when the state machine moves out of the established state. An implementation should document its specific behavior. |

# RFC 4133: Entity MIB (Version 3)

RFC 4133, Entity MIB (Version 3) is supported on the VDX devices.

| Object group name | OID | Supported? |
|---|---|---|
| entPhysicalTable | 1.3.6.1.2.1.47.1.1.1 | Yes |
| entPhysicalIndex | 1.3.6.1.2.1.47.1.1.1.1.1 | Yes. Not-accessible. |
| entPhysicalDescr | 1.3.6.1.2.1.47.1.1.1.1.2 | Yes |
| entPhysicalVendorType | 1.3.6.1.2.1.47.1.1.1.1.3 | Yes<br><br>**NOTE**<br>This object is defined for assigning vendor type OIDs (For example, brcdIp.1.17.1.3.2.2 and brcdIp.1.17.1.5.2) to various physical entities like chassis, power supply, Fan, MP, SFM, and various types of LP modules. |
| entPhysicalContainedIn | 1.3.6.1.2.1.47.1.1.1.1.4 | Yes |
| entPhysicalClass | 1.3.6.1.2.1.47.1.1.1.1.5 | Yes |
| entPhysicalParentRelPos | 1.3.6.1.2.1.47.1.1.1.1.6 | Yes |
| entPhysicalName | 1.3.6.1.2.1.47.1.1.1.1.7 | Yes |
| entPhysicalHardwareRev | 1.3.6.1.2.1.47.1.1.1.1.8 | Yes.<br><br>**NOTE**<br>The information is available only for MP, SFM, and LP modules. |
| entPhysicalFirmwareRev | 1.3.6.1.2.1.47.1.1.1.1.9 | Yes<br><br>**NOTE**<br>The information is available only for MP, SFM, and LP modules. |
| entPhysicalSoftwareRev | 1.3.6.1.2.1.47.1.1.1.1.10 | Yes<br><br>**NOTE**<br>The information is available only for MP, SFM, and LP modules. |
| entPhysicalSerialNum | 1.3.6.1.2.1.47.1.1.1.1.11 | Yes. Read-only |
| entPhysicalMfgName | 1.3.6.1.2.1.47.1.1.1.1.12 | Yes |
| entPhysicalModelName | 1.3.6.1.2.1.47.1.1.1.1.13 | Yes |
| entPhysicalAlias | 1.3.6.1.2.1.47.1.1.1.1.14 | Yes. Read-only |
| entPhysicalAssetID | 1.3.6.1.2.1.47.1.1.1.1.15 | Yes. Read-only |
| entPhysicalIsFRU | 1.3.6.1.2.1.47.1.1.1.1.16 | Yes |
| entPhysicalMfgDate | 1.3.6.1.2.1.47.1.1.1.1.17 | Yes |
| entPhysicalUris | 1.3.6.1.2.1.47.1.1.1.1.18 | Yes. Read-only |
| entPhysicalContainsTable | 1.3.6.1.2.1.47.1.3.3 | Yes |
| entLastChangeTime | 1.3.6.1.2.1.47.1.4.1 | Yes |
| entConfigChange | 1.3.6.1.2.1.47.2.0.1 | Yes |

| Object group name | OID | Supported? |
|---|---|---|
| | | **NOTE**<br>This notification is generated when the value of entLastChangeTime is changed, and occurs if the time interval is 5 mins between the changes in the entLastChangeTime. |

## History

| Release version | History |
|---|---|
| NOS 7.4.0 | This MIB was introduced. |

# IANA-ADDRESS-FAMILY-NUMBERS-MIB

The ianaAddressFamilyNumbers MIB module defines the AddressFamilyNumbers textual convention.

| Name | Description |
|------|-------------|
| AddressFamilyNumbers<br><br>Syntax: Integer | The definition of this textual convention with the addition of newly assigned values is published periodically by the IANA, in either the Assigned Numbers RFC, or some derivative of it specific to Internet Network Management number assignments. (The latest arrangements can be obtained by contacting the IANA.) |

## History

| Release version | History |
|-----------------|---------|
| NOS 7.2.0 | This MIB was introduced. |

# IANAifType-MIB

The ianaifType MIB module defines the IANAifType textual convention, and thus the enumerated values of the ifType object defined in MIB-II's ifTable.

## ianaifType textual convention

| Name | Description |
| --- | --- |
| IANAifType<br><br>Syntax: Integer | This data type is used as the syntax of the ifType object in the (updated) definition of MIB-II's ifTable. The definition of this textual convention with the addition of newly assigned values is published periodically by the IANA, in either the Assigned Numbers RFC, or some derivative of it specific to Internet Network Management number assignments. (The latest arrangements can be obtained by contacting the IANA.) |
| IANAtunnelType<br><br>Syntax: Integer | The encapsulation method used by a tunnel. |

## History

| Release version | History |
| --- | --- |
| NOS 7.2.0 | This MIB was introduced. |

# IANA-RTPROTO-MIB

The ianaRtProtoMIB module defines the IANAipRouteProtocol and IANAipMRouteProtocol textual conventions for use in MIBs which need to identify unicast or multicast routing mechanisms. Any additions or changes to the contents of this MIB module require either publication of an RFC, or Designated Expert Review as defined in RFC 2434, Guidelines for Writing an IANA Considerations Section in RFCs. The Designated Expert will be selected by the IESG Area Director(s) of the Routing Area.

## ianaRtProtoMIB textual convention

| Name | Description |
|---|---|
| IANAipRouteProtocol<br><br>Syntax: Integer | A mechanism for learning routes. Inclusion of values for routing protocols is not intended to imply that those protocols need be supported. |
| IANAipMRouteProtocol<br><br>Syntax: Integer | The multicast routing protocol. Inclusion of values for multicast routing protocols is not intended to imply that those protocols need be supported. |

## History

| Release version | History |
|---|---|
| NOS 7.2.0 | This MIB was introduced. |

# Interface group MIB

The interface entry table is based on the RFC 2863 and it obsoletes RFC 2233. It contains information about the interfaces. Each sub-layer is considered to be an interface.

## History

| Release version | History |
| --- | --- |
| NOS 7.2.0 | This MIB was introduced. |

# IP MIB

The Internet Protocol (IP) MIB module provides MIB objects for management of IP modules in an IP version-independent manner.

The IP MIB table is based on the RFC 4293.

## History

| Release version | History |
| --- | --- |
| NOS 7.2.0 | This MIB was introduced. |

# LAG MIB

The Link Aggregation module for managing IEEE 802.3ad.

## Supported object groups

**NOTE**

An Extreme device provides only read-only support to the following object groups listed here.

| Object group name | OID |
|---|---|
| dot3adAggIndex | 1.2.840.10006.300.43.1.1.1.1.1 |
| dot3adAggMACAddress | 1.2.840.10006.300.43.1.1.1.1.2 |
| dot3adAggActorSystemPriority | 1.2.840.10006.300.43.1.1.1.1.3 |
| dot3adAggActorSystemID | 1.2.840.10006.300.43.1.1.1.1.4 |
| dot3adAggAggregateOrIndividual | 1.2.840.10006.300.43.1.1.1.1.5 |
| dot3adAggActorAdminKey | 1.2.840.10006.300.43.1.1.1.1.6 |
| dot3adAggActorOperKey | 1.2.840.10006.300.43.1.1.1.1.7 |
| dot3adAggPartnerSystemID | 1.2.840.10006.300.43.1.1.1.1.8 |
| dot3adAggPartnerSystemPriority | 1.2.840.10006.300.43.1.1.1.1.9 |
| dot3adAggPartnerOperKey | 1.2.840.10006.300.43.1.1.1.1.10 |
| dot3adAggCollectorMaxDelay | 1.2.840.10006.300.43.1.1.1.1.11 |

## History

| Release version | History |
|---|---|
| NOS 7.2.0 | This MIB was introduced. |

# LLDP MIB

The MIB module for LLDP configuration, statistics, local system data and remote systems data components.

## Supported object groups

| Object group name | OID | Supported? |
|---|---|---|
| lldpConfiguration | 1.0.8802.1.1.2.1.1 | Yes |
| lldpStatistics | 1.0.8802.1.1.2.1.2 | Yes |
| lldpLocalSystemData | 1.0.8802.1.1.2.1.3 | Yes |
| lldpRemoteSystemsData | 1.0.8802.1.1.2.1.4 | Yes |
| lldpExtensions | 1.0.8802.1.1.2.1.5 | Yes |

## History

| Release version | History |
|---|---|
| NOS 7.2.0 | This MIB was introduced. |

# LLDP-EXT-DOT1 MIB

The LLDP MIB extension module for IEEE 802.1 organizationally defined discovery information.

## Supported object groups

| Object group name | OID | Supported? |
| --- | --- | --- |
| lldpXdot1Config | 1.0.8802.1.1.2.1.5.32962.1.1 | Yes |
| lldpXdot1LocalData | 1.0.8802.1.1.2.1.5.32962.1.2 | Yes |
| lldpXdot1RemoteData | 1.0.8802.1.1.2.1.5.32962.1.3 | Yes |

## History

| Release version | History |
| --- | --- |
| NOS 7.2.0 | This MIB was introduced. |

# LLDP-EXT-DOT3 MIB

The LLDP MIB extension module for IEEE 802.3 organizationally defined discovery information.

## Supported object groups

| Object group name | OID | Supported? |
| --- | --- | --- |
| lldpXdot3Config | 1.0.8802.1.1.2.1.5.4623.1.1 | Yes |
| lldpXdot3LocalData | 1.0.8802.1.1.2.1.5.4623.1.2 | Yes |
| lldpXdot3RemoteData | 1.0.8802.1.1.2.1.5.4623.1.3 | Yes |

## History

| Release version | History |
| --- | --- |
| NOS 7.2.0 | This MIB was introduced. |

# RIPv2-MIB

The MIB module to describe the RIP2 Version 2 Protocol.

## Supported object groups

| Objects group name | OID | Supported? |
|---|---|---|
| rip2Globals | 1.3.6.1.2.1.23.1 | Yes |
| rip2IfStatTable | 1.3.6.1.2.1.23.2 | Yes |

## History

| Release version | History |
|---|---|
| NOS 7.2.0 | This MIB was introduced. |

# RSTP MIB

The Bridge MIB Extension module for managing devices that support the Rapid Spanning Tree Protocol (RSTP) defined by IEEE 802.1w.

## Supported object groups

| Objects group name | OID | Supported? |
|---|---|---|
| dot1dStpVersion | 1.3.6.1.2.1.17.2.16 | Yes |
| dot1dStpTxHoldCount | 1.3.6.1.2.1.17.2.17 | Yes |
| dot1dStpExtPortTable | 1.3.6.1.2.1.17.2.19 | Yes |

## History

| Release version | History |
|---|---|
| NOS 7.2.0 | This MIB was introduced. |

# SFLOW MIB (Version 5)

The sFlowMIB module manages the generation and transportation of sFlow data records.

## Supported object groups

| Objects group name | OID | Supported? |
|---|---|---|
| sFlowVersion | 1.3.6.1.4.1.14706.1.1.1 | Yes |
| sFlowAgentAddressType | 1.3.6.1.4.1.14706.1.1.2 | Yes |
| sFlowAgentAddress | 1.3.6.1.4.1.14706.1.1.3 | Yes |
| sFlowRcvrTable | 1.3.6.1.4.1.14706.1.1.4 | Yes |
| sFlowFsTable | 1.3.6.1.4.1.14706.1.1.5 | Yes |
| sFlowCpTable | 1.3.6.1.4.1.14706.1.1.6 | Yes |

## History

| Release version | History |
|---|---|
| NOS 7.2.0 | This MIB was introduced. |

# SNMP-FRAMEWORK MIB

The SNMP Management Architecture MIB.

## Supported object group

| Object group name | OID | Supported? |
|---|---|---|
| snmpFrameworkAdmin | 1.3.6.1.6.3.10.1 | Yes |
| snmpFrameworkMIBObjects | 1.3.6.1.6.3.10.2 | Yes |
| snmpFrameworkMIBConformance | 1.3.6.1.6.3.10.3 | Yes |

## History

| Release version | History |
|---|---|
| NOS 7.2.0 | This MIB was introduced. |

# SW-MIB overview

The descriptions of the MIB variables in this chapter come directly from the Switch MIB. The notes that follow the descriptions typically pertain to Extreme-specific information as provided by Extreme.

TABLE 9 Switch base MIB

| Objects and OID | Access | Description |
|---|---|---|
| sw<br><br>1.3.6.1.4.1.1588.2.1.1.1 | None | The OID sub-tree for the Brocade Silkworm Series of Fibre Channel Switches. |

TABLE 10 Switch system group MIBs

| Objects and OID | Access | Description |
|---|---|---|
| swSystem<br><br>1.3.6.1.4.1.1588.2.1.1.1.1 | None | The MIB module is for system information. |
| swCurrentDate<br><br>1.3.6.1.4.1.1588.2.1.1.1.1.1 | Read-only | The object displays the current date in textual format. |
| swBootDate<br><br>1.3.6.1.4.1.1588.2.1.1.1.1.2 | Read-only | The date and time when the system last booted. |
| swFWLastUpdated<br><br>1.3.6.1.4.1.1588.2.1.1.1.1.3 | Read-only | The date when the firmware was last updated to the switch. |
| swFlashLastUpdated<br><br>1.3.6.1.4.1.1588.2.1.1.1.1.4 | Read-only | The date and time when the flash was last updated. |
| swBootPromLastUpdated<br><br>1.3.6.1.4.1.1588.2.1.1.1.1.5 | Read-only | The date and time when the Boot PROM was last updated. |
| swFirmwareVersion<br><br>1.3.6.1.4.1.1588.2.1.1.1.1.6 | Read-only | The current version of the firmware. |
| swOperStatus<br><br>1.3.6.1.4.1.1588.2.1.1.1.1.7 | Read-only | The current operational status of the switch.<br><br>Possible values:<br><br>• online (1) – The switch is accessible by an external FC port.<br>• offline (2) – The switch is not accessible.<br>• testing (3) – The switch is in a built-in test mode and is not accessible by an external Fibre Channel port.<br>• faulty (4) – The switch is not operational. |
| swFlashDLOperStatus<br><br>1.3.6.1.4.1.1588.2.1.1.1.1.11 | Read-only | The operational status of the flash.<br><br>Possible values:<br><br>• unknown (0) – Indicates that the operational status of the flash is unknown.<br>• swCurrent (1) – Indicates that the flash contains the current firmware image or configuration file.<br>• swFwUpgraded (2) – Indicates that the flash contains the upgraded image from the swFlashDLHost.0.<br>• swCfUploaded (3) – Indicates that the switch configuration file has been uploaded to the host. |

**TABLE 10** Switch system group MIBs (continued)

| Objects and OID | Access | Description |
|---|---|---|
| | | • swCfDownloaded (4) – Indicates that the switch configuration file has been downloaded from the host.<br>• swFwCorrupted (5) – Indicates that the firmware in the flash of the switch is corrupted. |
| swFlashDLAdmStatus<br><br>1.3.6.1.4.1.1588.2.1.1.1.1.12 | Read-write | The state of the flash.<br><br>Possible values:<br>• swCurrent (1) – The flash contains the current firmware image or configuration file.<br>• swFwUpgrade (2) – The firmware in the flash is to be upgraded from the host specified.<br>• swCfUpload (3) – The switch configuration file is to be uploaded to the host specified.<br>• swCfDownload (4) – The switch configuration file is to be downloaded from the host specified.<br>• swFwCorrupted (5) – The firmware in the flash is corrupted. This value is for informational purposes only; however, setting swFlashDLAdmStatus to this value is not allowed. |
| swBeaconOperStatus<br><br>1.3.6.1.4.1.1588.2.1.1.1.1.18 | Read-only | The current operational status of the switch beacon.<br><br>Possible values:<br>• on (1) – The LEDs on the front panel of the switch run alternately from left to right and right to left. The color is yellow.<br>• off (2) – Each LED is in its regular status, indicating color and state. |
| swBeaconAdmStatus<br><br>1.3.6.1.4.1.1588.2.1.1.1.1.19 | Read-write | The desired status of the switch beacon.<br><br>Possible values:<br>• on (1) – The LEDs on the front panel of the switch run alternately from left to right and right to left. Set the color to yellow.<br>• off (2) – Set each LED to its regular status, indicating color and state. |
| swDiagResult<br><br>1.3.6.1.4.1.1588.2.1.1.1.1.20 | Read-only | The result of the power-on self-test (POST) diagnostics.<br><br>Possible values:<br>• sw-ok (1) – The switch is okay.<br>• sw-faulty (2) – The switch has experienced an unknown fault.<br>• sw-embedded-port-fault (3) – The switch has experienced an embedded port fault. |
| swNumSensors<br><br>1.3.6.1.4.1.1588.2.1.1.1.1.21 | Read-only | The number of sensors inside the switch. |
| swEtherIPAddress<br><br>1.3.6.1.4.1.1588.2.1.1.1.1.25 | Read-only | The IP address of the Ethernet interface of this logical switch. |
| swEtherIPMask<br><br>1.3.6.1.4.1.1588.2.1.1.1.1.26 | Read-only | The IP mask of the Ethernet interface of this logical switch. |
| swIPv6Address<br><br>1.3.6.1.4.1.1588.2.1.1.1.1.29 | None | The IPv6 address. |
| swIPv6Status<br><br>1.3.6.1.4.1.1588.2.1.1.1.1.30 | None | The current status of the IPv6 address.<br><br>Possible values:<br>• tentative (1)<br>• preferred (2) |

**TABLE 10** Switch system group MIBs (continued)

| Objects and OID | Access | Description |
|---|---|---|
| | | • ipdeprecated (3) |
| | | • inactive (4) |

# History

| Release version | History |
|---|---|
| NOS 7.2.0 | This MIB was introduced. |

# Supported Enterprise MIB Objects

# Optical monitoring

## Optical lane monitoring table

The following table objects display temperature, Tx Power, Rx Power, and Tx Bias Current values along with the status for all lanes within a 40G Optic of type SR4 and LR4, 100G optic of type LR4 and LR10. LR4 and SR4 have 4 lanes per optic, LR10 has 10 lanes per optic.

**TABLE 11** bcsiOptMonLaneTable

| Name | OID | Description |
|---|---|---|
| bcsiOptMonLaneTable | .1.3.6.1.4.1.1588.3.1.8.1.1 | This table lists the instrumented parameters of all lanes within a 40G Optic of type SR4 and LR4, 100G optic of type LR4 and LR10. LR4 and SR4 have 4 lanes per optic, LR10 has 10 lanes per optic. 40G optics with breakout ports. |
| bcsiOptMonLaneEntry | .1.3.6.1.4.1.1588.3.1.8.1.1.1 | Only the ifIndices of optical interfaces whose parameters need to be monitored will be used to index this table.<br><br>INDEX { ifIndex, bcsiOptMonLaneNum } |
| bcsiOptMonLaneNum | .1.3.6.1.4.1.1588.3.1.8.1.1.1.1 | The lane number of this 40G or 100G optic. LR4 and SR4 have 4 lanes per optic. LR10 has 10 lanes per optic. |
| bcsiOptMonLaneTemperature | .1.3.6.1.4.1.1588.3.1.8.1.1.1.2 | This object holds the value of the transmitter laser diode temperature for the lane in the interface. This object indicates the health of the transmitter.<br><br>The format is xxx.yyyy C(elcius), followed by whether the measured value is normal, high/low alarm or high/low warning. |
| bcsiOptMonLaneTxPowerStatus | .1.3.6.1.4.1.1588.3.1.8.1.1.1.3 | This object holds the status of the transmitter optical signal power for the lane in the interface, indicating whether this is normal or an alarm is present.<br><br>Type : INTEGER<br><br>{ notSupported(1),<br><br>notApplicable(2),<br><br>highAlarm(3),<br><br>highWarn(4),<br><br>normal(5), |

**TABLE 11** bcsiOptMonLaneTable (continued)

| Name | OID | Description |
|------|-----|-------------|
| | | lowWarn(6), lowAlarm(7) } |
| bcsiOptMonLaneTxPower | .1.3.6.1.4.1.1588.3.1.8.1.1.1.4 | This object holds the value of the transmitter optical signal power for the lane in the interface, measured in dBm, followed by whether this is a normal value, or high/low warning or alarm. |
| bcsiOptMonLaneTxPowerVal | .1.3.6.1.4.1.1588.3.1.8.1.1.1.5 | This object holds the value of the transmitter optical signal power for the lane in the interface, measured in microWatt. |
| bcsiOptMonLaneRxPowerStatus | .1.3.6.1.4.1.1588.3.1.8.1.1.1.6 | This object holds the status of the receiver optical signal power for the lane in the interface, indicating whether this is normal or an alarm is present. Type : INTEGER { notSupported(1), notApplicable(2), highAlarm(3), highWarn(4), normal(5), lowWarn(6), lowAlarm(7) } |
| bcsiOptMonLaneRxPower | .1.3.6.1.4.1.1588.3.1.8.1.1.1.7 | This object holds the value of the receiver optical signal power for the lane in the interface, measured in dBm, followed by whether this is a normal value, or high/low warning or alarm |
| bcsiOptMonLaneRxPowerVal | .1.3.6.1.4.1.1588.3.1.8.1.1.1.8 | This object holds the value of the receiver optical signal power for the lane in the interface, measured in microWatt. |
| bcsiOptMonLaneTxBiasCurrent | .1.3.6.1.4.1.1588.3.1.8.1.1.1.9 | Tx Bias Current. It is measured in mA, and is followed by whether this is a normal value, or high/low warning or alarm. |

## History

| Release version | History |
|-----------------|---------|
| 7.4.0 | This MIB was introduced. |

# Optical monitoring information table

The following table displays the optical monitoring information table for Temperature, Tx Power, Rx Power, and Tx Bias Current values and the status values.

| Objects and OID | Access | Description |
|---|---|---|
| bcsiOptMonInfoTable<br><br>1.3.6.1.4.1.1588.3.1.8.1.2 | None | This table lists the instrumented parameters of all optical interfaces. |
| bcsiOptMonInfoEntry<br>1.3.6.1.4.1.1588.3.1.8.1.2.1 | None | Only the *ifIndices* of optical interfaces whose parameters need to be monitored will be used to index this table. |
| bcsiOptMonInfoTemperature<br><br>1.3.6.1.4.1.1588.3.1.8.1.2.1.1 | Read-only | This object holds the value of the transmitter laser diode temperature for the lane in the interface. It indicates the health of the transmitter.<br><br>The format is xxx.yyyy C (Celsius), followed by whether the measured value is normal, high/low alarm, or high/low warning. For 100G LR4 and LR10 optic, this object returns the average temperature for all lanes. |
| bcsiOptMonInfoTxPowerStatus<br><br>1.3.6.1.4.1.1588.3.1.8.1.2.1.2 | Read-only | This object holds the status of the transmitter optical signal power for the interface, indicating whether this is normal or an alarm is present.<br><br>bcsiOptMonInfoTxPowerStatus is one of the following status:<br>    • notSupported (1)<br>    • notApplicable (2)<br>    • highAlarm (3)<br>    • highWarn (4)<br>    • normal (5)<br>    • lowWarn (6)<br>    • lowAlarm (7) |
| bcsiOptMonInfoTxPower<br><br>1.3.6.1.4.1.1588.3.1.8.1.2.1.3 | Read-only | This object holds the value of the transmitter optical signal power for the interface, measured in dBm, followed by whether this is a normal value, or high/low warning or alarm. For 100G LR4 and LR10 optic, this returns the aggregated Tx Power for all lanes. |
| bcsiOptMonInfoTxPowerVal<br><br>1.3.6.1.4.1.1588.3.1.8.1.2.1.4 | Read-only | This object holds the value of the transmitter optical signal power for the interface, measured in microWatt. For 100G LR4 and LR10 optic, this returns the aggregated Tx Power for all lanes. |
| bcsiOptMonInfoRxPowerStatus<br><br>1.3.6.1.4.1.1588.3.1.8.1.2.1.5 | Read-only | This object holds the status of the receiver optical signal power for the interface, indicating whether this is normal or an alarm is present.<br><br>bcsiOptMonLaneTxPowerStatus is one of the following status:<br>    • notSupported (1)<br>    • notApplicable (2)<br>    • highAlarm (3)<br>    • highWarn (4)<br>    • normal (5)<br>    • lowWarn (6)<br>    • lowAlarm (7) |
| bcsiOptMonInfoRxPower<br><br>1.3.6.1.4.1.1588.3.1.8.1.2.1.6 | Read-only | This object holds the value of the receiver optical Signal power for the interface, measured in dBm, followed by whether this is a normal value, or high/low warning or alarm. For 100G LR4 and LR10 optic, this returns the aggregated Rx Power for all lanes. |
| bcsiOptMonInfoRxPowerVal<br><br>1.3.6.1.4.1.1588.3.1.8.1.2.1.7 | Read-only | This object holds the value of the receiver optical signal power for the interface, measured in microWatt. For 100G LR4 and LR10 optic, this returns the aggregated Rx Power for all lanes. |

| Objects and OID | Access | Description |
|---|---|---|
| bcsiOptMonInfoTxBiasCurrent 1.3.6.1.4.1.1588.3.1.8.1.2.1.8 | Read-only | The Tx Bias Current. It is measured in mA, and is followed by whether this is a normal value, or high/low warning or alarm. For 100G LR4 and LR10 optic, this returns the aggregated Tx Bias Current for all lanes. |

## History

| Release version | History |
|---|---|
| 7.4.0 | This MIB was introduced. |

# SW-MIB overview

The descriptions of the MIB variables in this chapter come directly from the Switch MIB. The notes that follow the descriptions typically pertain to Extreme-specific information as provided by Extreme.

**TABLE 12** Switch base MIB

| Objects and OID | Access | Description |
|---|---|---|
| sw<br><br>1.3.6.1.4.1.1588.2.1.1.1 | None | The OID sub-tree for the Brocade Silkworm Series of Fibre Channel Switches. |

**TABLE 13** Switch system group MIBs

| Objects and OID | Access | Description |
|---|---|---|
| swSystem<br><br>1.3.6.1.4.1.1588.2.1.1.1.1 | None | The MIB module is for system information. |
| swCurrentDate<br><br>1.3.6.1.4.1.1588.2.1.1.1.1.1 | Read-only | The object displays the current date in textual format. |
| swBootDate<br><br>1.3.6.1.4.1.1588.2.1.1.1.1.2 | Read-only | The date and time when the system last booted. |
| swFWLastUpdated<br><br>1.3.6.1.4.1.1588.2.1.1.1.1.3 | Read-only | The date when the firmware was last updated to the switch. |
| swFlashLastUpdated<br><br>1.3.6.1.4.1.1588.2.1.1.1.1.4 | Read-only | The date and time when the flash was last updated. |
| swBootPromLastUpdated<br><br>1.3.6.1.4.1.1588.2.1.1.1.1.5 | Read-only | The date and time when the Boot PROM was last updated. |
| swFirmwareVersion<br><br>1.3.6.1.4.1.1588.2.1.1.1.1.6 | Read-only | The current version of the firmware. |
| swOperStatus<br><br>1.3.6.1.4.1.1588.2.1.1.1.1.7 | Read-only | The current operational status of the switch.<br><br>Possible values:<br>• online (1) – The switch is accessible by an external FC port.<br>• offline (2) – The switch is not accessible.<br>• testing (3) – The switch is in a built-in test mode and is not accessible by an external Fibre Channel port.<br>• faulty (4) – The switch is not operational. |
| swFlashDLOperStatus<br><br>1.3.6.1.4.1.1588.2.1.1.1.1.11 | Read-only | The operational status of the flash.<br><br>Possible values:<br>• unknown (0) – Indicates that the operational status of the flash is unknown.<br>• swCurrent (1) – Indicates that the flash contains the current firmware image or configuration file.<br>• swFwUpgraded (2) – Indicates that the flash contains the upgraded image from the swFlashDLHost.0.<br>• swCfUploaded (3) – Indicates that the switch configuration file has been uploaded to the host.<br>• swCfDownloaded (4) – Indicates that the switch configuration file has been downloaded from the host. |

**TABLE 13** Switch system group MIBs (continued)

| Objects and OID | Access | Description |
|---|---|---|
| | | • swFwCorrupted (5) – Indicates that the firmware in the flash of the switch is corrupted. |
| swFlashDLAdmStatus<br><br>1.3.6.1.4.1.1588.2.1.1.1.1.12 | Read-write | The state of the flash.<br><br>Possible values:<br>  • swCurrent (1) – The flash contains the current firmware image or configuration file.<br>  • swFwUpgrade (2) – The firmware in the flash is to be upgraded from the host specified.<br>  • swCfUpload (3) – The switch configuration file is to be uploaded to the host specified.<br>  • swCfDownload (4) – The switch configuration file is to be downloaded from the host specified.<br>  • swFwCorrupted (5) – The firmware in the flash is corrupted. This value is for informational purposes only; however, setting swFlashDLAdmStatus to this value is not allowed. |
| swBeaconOperStatus<br><br>1.3.6.1.4.1.1588.2.1.1.1.1.18 | Read-only | The current operational status of the switch beacon.<br><br>Possible values:<br>  • on (1) – The LEDs on the front panel of the switch run alternately from left to right and right to left. The color is yellow.<br>  • off (2) – Each LED is in its regular status, indicating color and state. |
| swBeaconAdmStatus<br><br>1.3.6.1.4.1.1588.2.1.1.1.1.19 | Read-write | The desired status of the switch beacon.<br><br>Possible values:<br>  • on (1) – The LEDs on the front panel of the switch run alternately from left to right and right to left. Set the color to yellow.<br>  • off (2) – Set each LED to its regular status, indicating color and state. |
| swDiagResult<br><br>1.3.6.1.4.1.1588.2.1.1.1.1.20 | Read-only | The result of the power-on self-test (POST) diagnostics.<br><br>Possible values:<br>  • sw-ok (1) – The switch is okay.<br>  • sw-faulty (2) – The switch has experienced an unknown fault.<br>  • sw-embedded-port-fault (3) – The switch has experienced an embedded port fault. |
| swNumSensors<br><br>1.3.6.1.4.1.1588.2.1.1.1.1.21 | Read-only | The number of sensors inside the switch. |
| swEtherIPAddress<br><br>1.3.6.1.4.1.1588.2.1.1.1.1.25 | Read-only | The IP address of the Ethernet interface of this logical switch. |
| swEtherIPMask<br><br>1.3.6.1.4.1.1588.2.1.1.1.1.26 | Read-only | The IP mask of the Ethernet interface of this logical switch. |
| swIPv6Address<br><br>1.3.6.1.4.1.1588.2.1.1.1.1.29 | None | The IPv6 address. |
| swIPv6Status<br><br>1.3.6.1.4.1.1588.2.1.1.1.1.30 | None | The current status of the IPv6 address.<br><br>Possible values:<br>  • tentative (1)<br>  • preferred (2)<br>  • ipdeprecated (3) |

**TABLE 13** Switch system group MIBs (continued)

| Objects and OID | Access | Description |
|---|---|---|
|  |  | • inactive (4) |

# History

| Release version | History |
|---|---|
| NOS 7.2.0 | This MIB was introduced. |

# swEventTable

| Objects and OID | Access | Description |
|---|---|---|
| swEvent<br><br>1.3.6.1.4.1.1588.2.1.1.1.8 | None | The OID sub-tree for the switch event group. |
| swEventTable<br><br>1.3.6.1.4.1.1588.2.1.1.1.8.5 | Read-only | The table of event entries. |
| swEventIndex<br><br>1.3.6.1.4.1.1588.2.1.1.1.8.5.1.1 | Read-only | This object identifies the event entry. |
| swEventTimeInfo<br><br>1.3.6.1.4.1.1588.2.1.1.1.8.5.1.2 | Read-only | The date and time that this event occurred. |
| swEventLevel<br><br>1.3.6.1.4.1.1588.2.1.1.1.8.5.1.3 | Read-only | The severity level of this event entry.<br><br>Possible values:<br>• critical (1)<br>• error (2)<br>• warning (3)<br>• informational (4)<br>• debug (5) |
| swEventRepeatCount<br><br>1.3.6.1.4.1.1588.2.1.1.1.8.5.1.4 | Read-only | This object indicates the number of times this particular event has occurred. |
| swEventDescr<br><br>1.3.6.1.4.1.1588.2.1.1.1.8.5.1.5 | Read-only | A textual description of the event. |
| swEventVfid<br><br>1.3.6.1.4.1.1588.2.1.1.1.8.5.1.6 | Read-only | This object identifies the Virtual Fabric ID. |

# History

| Release version | History |
|---|---|
| NOS 7.2.0 | This MIB was introduced. |

# swSensorTable

| Objects and OID | Access | Description |
|---|---|---|
| swSensorTable<br><br>1.3.6.1.4.1.1588.2.1.1.1.1.22 | None | The table of sensor entries. |
| swSensorIndex<br><br>1.3.6.1.4.1.1588.2.1.1.1.1.22.1.1 | Read-only | The index of the sensor. |
| swSensorType<br><br>1.3.6.1.4.1.1588.2.1.1.1.1.22.1.2 | Read-only | The type of sensor.<br><br>Possible values:<br>• temperature (1)<br>• fan (2)<br>• power-supply (3) |
| swSensorStatus<br><br>1.3.6.1.4.1.1588.2.1.1.1.1.22.1.3 | Read-only | The current status of the sensor.<br><br>Possible values:<br>• unknown (1)<br>• faulty (2)<br>• below-min (3) – The sensor value is below the minimal threshold.<br>• nominal (4)<br>• above-max (5) – The sensor value is above the maximum threshold.<br>• absent (6) – The sensor is missing. |
| swSensorValue<br><br>1.3.6.1.4.1.1588.2.1.1.1.1.22.1.4 | Read-only | The current value (reading) of the sensor.<br><br>The unknown value –2147483648 indicates the maximum value of integer value; it also means that the sensor does not have the capability to measure the actual value. The temperature sensor value is in Celsius, the fan value is in RPM (revolutions per minute), and the power supply sensor reading is unknown. |
| swSensorInfo<br><br>1.3.6.1.4.1.1588.2.1.1.1.1.22.1.5 | Read-only | Additional information on the sensor. It contains the sensor type and number, in textual format; for example: Temp 3, Fan 6, and so on. |

## History

| Release version | History |
|---|---|
| NOS 7.2.0 | This MIB was introduced. |