# Cisco Management Information Base (MIB) User Quick Reference

**Internetwork Operating System 10.3**

Digital Equipment Corporation

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# Preface—Network Management System, MIBs, and MIB User Quick Reference

From the perspective of a network manager, network management takes place between two major types of systems: those in control, called managing systems, and those observed and controlled, called managed systems. The most common managing system is called a Network Management System (NMS). Managed systems can include hosts, servers, or network components such as routers or intelligent repeaters.

To promote interoperability, cooperating systems must adhere to a common framework and a common language, called a protocol. In the Internet Network Management Framework, that protocol is the Simple Network Management Protocol, commonly called SNMP.

The exchange of information between managed network devices and a robust NMS is essential for reliable performance of a managed network. Because some of these devices may have a limited ability to run management software, the software must minimize its performance impact on the managed device. The bulk of the computer processing burden, therefore, is assumed by the NMS. The NMS in turn runs the network management applications, such as CiscoWorks or CiscoView, that present management information to network managers and other users.

In a managed device, the specialized low-impact software modules, called *agents*, access information about the managed devices and make it available to the NMS. Managed devices maintain values for a number of variables and report those, as required, to the NMS. For example, an agent might report such data as the number of bytes and packets in and out of the device, or the number of broadcast messages that were sent and received. In the Internet Network Management Framework, each of these variables is referred to as a *managed object*. A managed object is a classification of anything that can be managed, anything that an agent

can access and report back to the NMS. All managed objects are contained in the *Management Information Base (MIB)*, a database of the managed objects.

An NMS can control a managed device by sending a message to the agent (of that managed device) requiring the device to change the value of one or more of its variables. The managed devices can respond to commands such as Sets or Gets. Sets are used by the NMS to control the device. Gets are used by the NMS to monitor the device.

The *Cisco MIB User Quick Reference* lists the MIB variables that are proprietary to Cisco devices. However, many other internet-standard MIBS are supported by Cisco agents. These standard MIBs are defined in documents called Requests for Comments (RFCs). (For information on the RFC MIBs supported by Cisco, refer to the section "Cisco-Supported MIBs" later in this guide.) Therefore, in order to find specific MIB information, examine the Cisco proprietary MIB structure and the standard RFC MIBs supported by Cisco.

If your NMS is unable to get requested information from a managed device, such as a Cisco router, the MIB that allows that specific data collection might be missing. Typically, if an NMS cannot retrieve a particular MIB variable, either the NMS does not recognize the MIB variable or the agent does not support the MIB variable. If the NMS does not recognize a specified MIB variable, the MIB might need to be loaded into the NMS, usually by means of a MIB compiler. As an NMS administrator, you might need to load the Cisco MIB or the supported RFC MIB into the NMS in order to execute a specified data collection. If the agent does not support a specified MIB variable, you need to find out what version of IOS or system software you are running. Different MIBs are supported in different software releases.

Use this guide to determine whether your version of software actually supports the specified MIB variable. (See the section "MIBs Supported by Cisco Software Releases" at the end of this guide.) Or, you might want to use this guide to see what variables are available for a given software release. As you reference this guide, read the descriptions of the variables to learn what they are and what they do. Check the Access or Max-Access type to learn what operations, such as reading Gets or writing Sets, can be performed on a particular MIB variable. Check the Syntax type to determine the data type for the MIB variable. Some variables provide textual information (for example, syntax of

DisplayString), while others provide numeric information (for example, syntax of Integers or Counters). Once you identify a needed MIB variable, you can easily load the file into the NMS. To learn how to access a Cisco MIB file, refer to the section "Accessing Cisco MIB Files." Cisco Systems also supports many MIB variables developed by other vendors. To learn about other-vendor supported MIBs, refer to the section "Accessing Other-Vendor MIB Variables Supported by Cisco."

## Introduction to the MIB Guide

This guide describes the Cisco Systems private, or local, Management Information Base (MIB) for Internetwork Operating System (IOS) Release 10.3. The Cisco MIB is provided with all Cisco software releases and with CiscoWorks router management software. The MIB file contains variables that can be set or read to provide information on network devices and interfaces.

The Cisco MIB is a set of variables that are private extensions to the Internet standard MIB II and many other internet standard MIBs. MIB II is documented in RFC 1213, Management Information Base for Network Management of TCP/IP-based Internets: MIB-II.

The Cisco MIB is described by a number of MIB files, which can be obtained by FTP from the Cisco server. The listing of Cisco MIB variables in those files is identical to the listing in this guide.

## Accessing Cisco MIB Files

You can obtain the files that describe the Cisco MIB by using the **ftp ftp.cisco.com** command. Log in with the username **anonymous** and enter your e-mail name when prompted for the password. Use the **cd pub/mibs** command to go to the directory that contains the MIB files, and then issue the **get README** command to display the *readme* file containing a list of available files. IOS Release 10.2 MIB files are in the subdirectory mib.dir102, which has its own README file. You can then use the **get filename** command to retrieve the desired MIB file (for example, after using **cd mib.dir102**, use **CISCO-PING-MIB-mib.my** to retrieve the Cisco ping MIB).

## Accessing Other-Vendor MIB Variables Supported by Cisco

You can obtain the files that describe other-vendor MIB variables supported by Cisco by using the **ftp ftp.venera.isi.edu** command. Log in with the username **anonymous** and enter your e-mail name when prompted for the password. Use the **cd mib** command to go to the directory that contains the MIB files, and then issue the **get README** command to display the readme file containing a list of available files. You can then use the **get filename** command to retrieve the desired MIB file (for example, use **get novell-nlsp-mib.my** to retrieve the Novell NLSP MIB).

## Working with SNMP

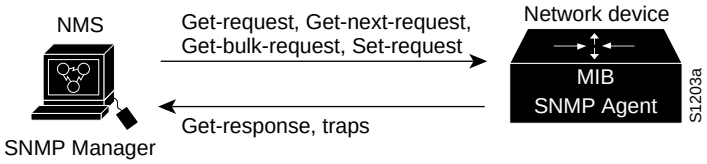
The Cisco MIB variables are accessible via the Simple Network Management Protocol (SNMP), which is an application-layer protocol designed to facilitate the exchange of management information between network devices. The SNMP system consists of three parts: SNMP manager, SNMP agent, and MIB.

Instead of defining a large set of commands, SNMP places all operations in a *get-request*, *get-next-request*, *get-bulk-request*, and *set-request* format. For example, an SNMP manager can get a value from an SNMP agent or store a value into that SNMP agent. The SNMP manager can be part of a network management system (NMS), and the SNMP agent can reside on a networking device such as a router. You can compile the Cisco MIB with your network management software. If SNMP is configured on a router, the SNMP agent can respond to MIB-related queries being sent by the NMS.

An example of an NMS is the CiscoWorks network management software. CiscoWorks uses the Cisco MIB variables to set device variables and to poll devices on the internetwork for specific information. The results of a poll can be graphed and analyzed in order to troubleshoot internetwork problems, increase network performance, verify the configuration of devices, monitor traffic loads, and more.

As shown in Figure 1, the SNMP agent gathers data from the MIB, which is the repository for information about device parameters and network data. The agent also can send traps, or notification of certain events, to the manager. The Cisco trap file, *mib.traps*, which documents the format of the Cisco traps, is available on the Cisco host `ftp.cisco.com`.

**Figure 1 SNMP Network**




The SNMP manager uses information in the MIB to perform the operations described in Table 1.

**Table 1 SNMP Manager Operations**

| Operation | Description |
|---|---|
| get-request | Retrieve a value from a specific variable. |
| get-next-request | Retrieve the value following the named variable. Often used to retrieve variables from within a table[1]. |
| get-response | The reply to a get-request, get-next-request, get-bulk-request, and set-request sent by an NMS. |
| get-bulk-request | Similar to get-next-request, but fill the get-response with up to max-repetition number of get-next interactions. |
| set-request | Store a value in a specific variable. |
| trap | An unsolicited message sent by an SNMP agent to an SNMP manager indicating that some event has occurred. |

1. With this operation, an SNMP manager does not need to know the exact variable name. A sequential search is performed to find the needed variable from within the MIB.

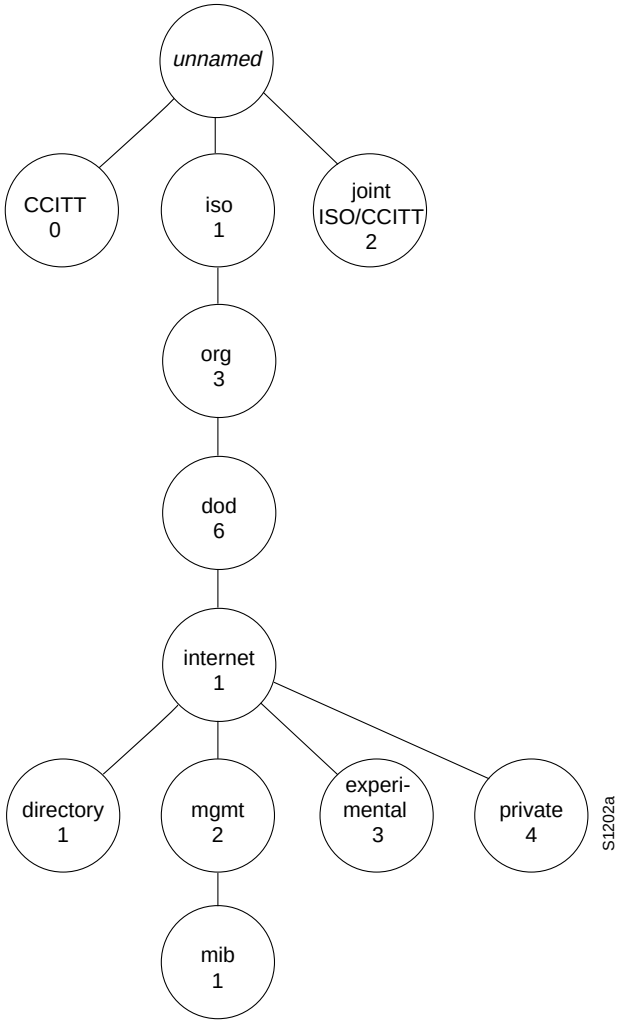
## Internet MIB Hierarchy

The MIB structure is logically represented by a tree hierarchy. (See Figure 2.) The *root* of the tree is unnamed and splits into three main branches: Consultative Committee for International Telegraph and Telephone (CCITT), International Organization for Standardization (ISO), and joint ISO/CCITT.

These branches and those that fall below each category have short text strings and integers to identify them. Text strings describe *object names*, while integers allow computer software to create compact, encoded representations of the names. For example, the Cisco MIB variable *authAddr* is an object name and is denoted by number 5, which is listed at the end of its object identifier number *1.3.6.1.4.1.9.2.1.5*.

The *object identifier* in the Internet MIB hierarchy is the sequence of numeric labels on the nodes along a path from the root to the object. The Internet standard MIB is represented by the object identifier *1.3.6.1.2.1*. It also can be expressed as *iso.org.dod.internet.mgmt.mib*. (See Figure 2.)

**Figure 2 Internet MIB Hierarchy**

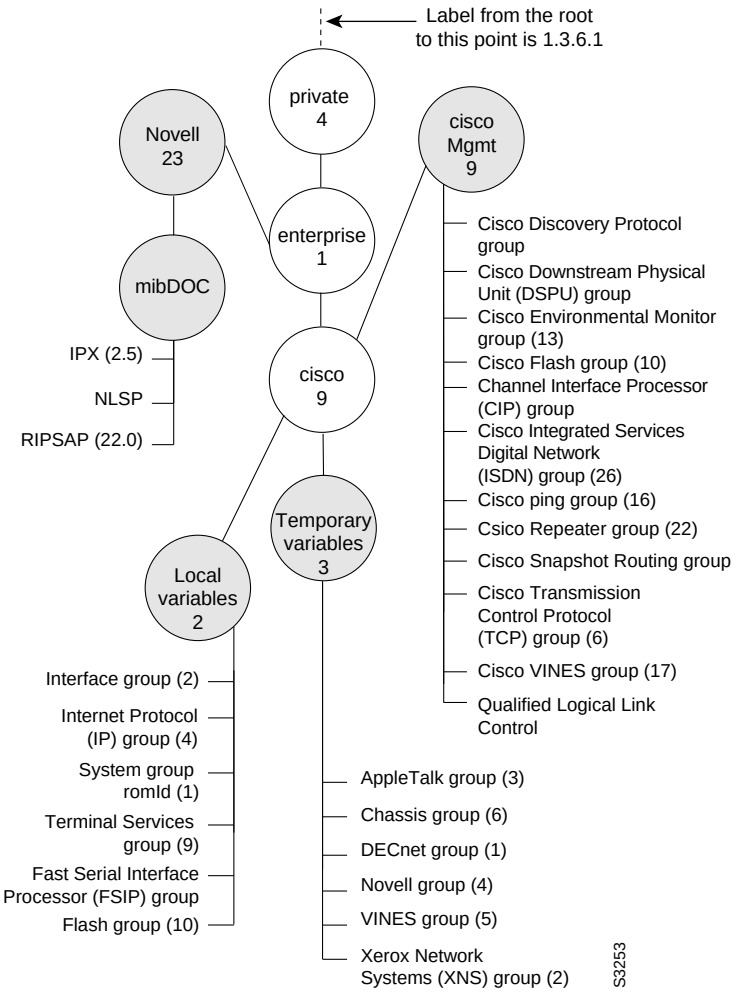


## Cisco MIB

The private Cisco MIB is represented by the object identifier 1.3.6.1.4.1.9, or *iso.org.dod.internet.private.enterprise.cisco*. The Cisco MIB includes the following subtrees: local (2), temporary (3), and, ciscoMgmt (9).

The local subtree contains MIB objects defined prior to Internetwork Operating System (IOS) Release 10.2. MIB objects defined prior to Software Release 10.2 implemented the SNMPv1 Structure of Management Information (SMI). Beginning with IOS 10.2, however, Cisco MIBs are defined using the SNMPv2 SMI. MIBs defined using SNMPv2 are being placed in the ciscoMgmt tree. (See Figure 3.) MIBs currently defined in the local subtree are being deprecated by Cisco as an ongoing process, and being replaced with new objects defined in the ciscoMgmt subtree. For example, the TCP group that was in the local group has been deprecated and replaced with a new TCP group in the ciscoMgmt tree.

**Figure 3 Cisco Private MIB Hierarchy**




In Figure 3, the local variables group is identified by 2; its subgroup, called *lsystem*, is identified by 1; and the first variable is *romId* with a value of 1. Therefore, the variable *romId* has a value of 1.3.6.1.4.1.9.2.1.1.0. The appended 0 indicates that 1.3.6.1.4.1.9.2.1.1.0 is the one and only instance of *romId*.

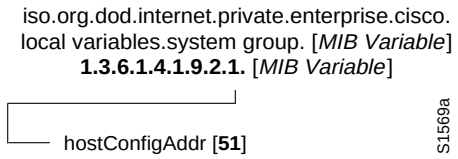
**Note** Although variables are arranged as shown in Figure 3 and as described in the compilable Cisco MIB file, this quick reference guide organizes variable groups and variables within groups alphabetically, so that you can quickly look up descriptions of MIB variables.

## Interpreting the Object Identifier

In this guide, each group of Cisco MIB variables is accompanied by an illustration that indicates the specific *object identifier* for each variable.

For example, in Figure 4 the *object identifier* 1.3.6.1.4.1.9.2.1 at the top of the illustration indicates the labeled nodes. The last value is the number of the Cisco MIB variable. For example, the MIB variable *hostConfigAddr* is indicated by the number 51. The object identifier for *hostConfigAddr* is *iso.org.dod.internet.private.enterprise.cisco.local variables.system group.hostConfigAddr* or *1.3.6.1.4.1.9.2.1.51*.

**Figure 4 Object Identifier Example for a Cisco MIB Variable**




## Tables

When network management protocols use names of MIB variables in messages, each name has a suffix appended. For simple variables, the suffix 0 refers to the instance of the variable with that name. A MIB also can contain tables of related variables.

Following is an excerpt of the information on the IP Routing table (known as *lipRoutingTable*) from the associated mib file:

```
lipRoutingTable OBJECT-TYPE
   SYNTAX  SEQUENCE OF LIpRouteEntry
   ACCESS  not-accessible
   STATUS  mandatory
   DESCRIPTION
       "A list of IP routing entries."
::= { lip 2 }
```

```
lipRouteEntry OBJECT-TYPE
   SYNTAX LIpRouteEntry
   ACCESS  not-accessible
   STATUS  mandatory
   DESCRIPTION
       "A collection of additional objects in the
       cisco IP routing implementation."
   INDEX { ipRouteDest }
::= { lipRoutingTable 1 }

LIpRouteEntry ::=
   SEQUENCE {
     locRtMask
        IpAddress,
     locRtCount
        INTEGER,
}
```

The local IP Routing table, *lipRoutingTable*, is described in Table 7. The *lipRoutingTable* contains two variables: *locRtMask* and *locRtCount*. The index for this table is the destination address of the IP route, or *ipRouteDest*. If there are *n* number of routes available to a device, there will be *n* rows in the IP Routing table.

In Table 2, for the route with the destination IP address of 131.104.111.1, the IP Routing table network mask is 255.255.255.0. The number of parallel routes within the routing table is 3.

**Table 2 IP Routing**

| ipRouteDest | locRtMask | locRtCount |
|---|---|---|
| 131.104.111.1 | 255.255.255.0 | 3 |
| 133.45.244.245 | 255.255.255.0 | 1 |

Typically, an instance identifier might be a unique interface number or a 0, as described earlier with the *romId* example. An instance identifier can also be an (IP) address. For example, to find the network mask for the route with a destination address of *131.104.211.243*, use the variable *locRtMask* with an instance identifier of *131.104.211.243*. The format is *locRtMask.131.104.211.243*.

In this guide, when variables belong to a table, they are listed in the section describing the table. The following tag is used to indicate the end of a table:

**End of Table**

All variables before this tag are part of the table.

## Local Variables

The local variables section pertains to all Cisco devices and contains the following groups.

**Note** This quick reference guide organizes variable groups and variables within groups alphabetically, so that you can quickly look up descriptions of MIB variables.

- Flash group

  Pertains to the Flash memory used to store, boot, and write system software images. Includes information such as Flash memory size and the contents of flash. Operations can be invoked by SETing MIB variables such as erasing Flash memory and transferring a Flash memory file to a Trivial File Transfer Protocol (TFTP) server. The Flash group supports Cisco 7000, 7010, and AGS+. The Flash group in Local Variables has been deprecated by the Cisco Flash group found in CiscoMgmt.

- Interface group

  Provides information on Cisco device interfaces, such as traffic statistics, line status, average speed of input and output packets, and error checking.

- Internet Protocol (IP) group

  Provides information about devices running IP. Includes information such as how and from whom an interface obtained its address, Internet Control Message Protocol (ICMP) messages, and number of packets lost.

- System group

  Provides information on system-wide parameters for Cisco devices, such as software version, host name, domain name, buffer size, configuration files, and environmental statistics.

- Terminal Services group

Provides information about terminal services, such as number of physical lines, line status, line type, line speed, type of flow control, and type of modem.

- Transmission Control Protocol (TCP) group

  Provides statistics on the number of input and output bytes and packets for TCP connections. The "local" TCP group has been deprecated, and replaced with a new TCP group in the ciscoMgmt group which provides more functionality.

## Temporary Variables

This section is equivalent to the experimental space defined by the Structure of Management Information (SMI). These variables are subject to change for each Cisco Systems software release.

Temporary variables consists of the following groups, which are presented in alphabetical order. (See Figure 3.)

- AppleTalk group

  Pertains to devices running the AppleTalk protocol. Includes information such as total number of input and output packets, number of packets with errors, and number of packets with Address Resolution Protocol (ARP) requests and replies.

- Chassis group

  Pertains to hardware information about Cisco devices. Includes information such as the types of cards used by the device, the hardware version of the cards, and the number of slots in the chassis. The cardTableIfIndex Table, introduced in Release IOS 10.3, provides logical mapping between the device interface and a card's presence in the chassis. The variables in this table support only the Cisco 4000, Cisco 4500, Cisco 7000, and Cisco7010. By implementing the new MIB table in supported configurations, you can discover statistics about the card. The new MIB table provides significant solutions for CiscoWorks and CiscoView users.

- DECnet group

Pertains to devices running the DECnet protocol. Includes information such as hop count, host name, total packets received and sent, and number of packets with header errors.

- IPX Accounting Variables
- IPX Checkpoint Accounting
- Novell group

  Pertains to devices running the Novell protocol. Includes information such as total number of input and output packets, number of packets with errors, and number of packets with service access point (SAP) requests and replies.

- Virtual Integrated Network System (VINES) group

  Pertains to devices running the VINES protocol. Includes information such as total number of input and output packets, number of packets with errors, and number of packets with Internet Control Message Protocol (ICMP) requests and replies.

- Xerox Network Systems (XNS) group

  Pertains to devices running the XNS protocol. Includes information such as number of packets forwarded, total number of input packets, and total number of packets with errors.

## ciscoMgmt Variables

The ciscoMgmt subtree consists of the following variables:

- Channel Interface Processor (CIP) group

  Specifies the MIB module for objects used to manage the Cisco CIP card.

- ping group

  Provides user with the ability to initiate a ping (ICMP echo request) from the Cisco device to a specified destination address.

- Cisco Environmental Monitor group

Provides the status of the Environmental Monitor on those devices that support one. The Cisco Environmental Monitor MIB is new and contains enhanced functionality over its predecessor, including support for redundant power supplies.

- Cisco Flash group

  Provides support for the Dual Flash Bank feature of IOS 10.3(4). The Cisco Flash group is also supported in IOS 10.2.

- Cisco Integrated Services Digital Network (ISDN) MIB group

  Provides the status of the ISDN Interfaces on the routers. The ISDN MIB is new with IOS 10.3(3).

- Cisco Transmission Control Protocol (TCP) group

  Provides statistics on the number of input and output bytes and packets for TCP connections; ciscoTCP, however, provides more functionality over its counterpart in the Local Variables subtree.

- Cisco DownStream Physical Unit (DSPU) group

  Contains the information necessary for the definition and management of DSPU objects. Supported DSPU objects include dspuNode (Global DSPU node information), dspuPoolClass (LU pool class information), dspuPooledLu (Pooled LU information), dspuPu (Upstream/Downstream PU node information), dspuLu (Upstream/Downstream LU information), and dspuSap (Local SAP information)

- ciscoVINES group

  Pertains to devices running the VINES protocol. Includes information such as total number of input and output packets, number of packets with errors, and number of packets with ARP and RTP requests and replies. Also includes tables of routes and neighbors. This MIB incorporates objects from the Cisco VINES command line interface, and was influenced by Banyan VINES MIB. The ciscoVINES provides VINES routing information with enhanced functionality over its predecessor located in the temporary variables subtree.

- ciscoDiscovery Protocol Group

Provides The MIB module for management of the Cisco Discovery Protocol in Cisco devices.

- Cisco Repeater MIB (ciscoRptrMIB) Group

  Provides standard repeater (hub) features that are not in RFC 1516. The objects in this MIB support features such as link-test, auto-polarity, and source-address control, and the MDI/MDI-X switch status. The Cisco Repeater MIB is new with IOS 10.3(3).

- Qualified Logical Link Control (QLLC) and Conversion Features Group

  The QLLC is a data link protocol defined by IBM that allows SNA data to be transported across X.25 networks. The QLLC MIB includes a managed entity, called a *link station.* The link station includes objects to configure and monitor logical connections.

- Snapshot Routing MIB Group

  Provides access to the cisco Snapshot support and is present in all router based products.

  Snapshot routing provides easy solutions to two common problems:

  1) The need to configure static routes for Dial on Demand Routing (DDR) interfaces, and 2) the overhead of periodic updates for routing protocols to remote branch offices over dedicated serial lines.

  When snapshot routing is configured on an interface, normal routing updates can be sent across the interface for a short time (determined by the user). When this user-configured period of activity has elapsed, the routing updates are suspended, and the routes known to the snapshot interface are locked, putting the interface into a “frozen period.” The duration of this period is also user configurable. During this time, changes in network topology are typically not transmitted across the snapshot interface, although some network protocols provide the capability to transmit changes.

## Novell Variables

The MIB variables of other vendors, including Novell, that are supported by Cisco are identified in the section "Accessing Other-Vendor MIB Variables Supported by Cisco" later in this document. The Novell subtree consists of the following variables:

- Novell IPX System group

  Contains general information about all instances of IPX on one system.

- Novell Link State Protocol (NLSP) group

  Defines the management information for the NLSP protocol running in an IPX environment.

- Novell RIP/SAP group

  Defines the management information for the Routing Information Protocol (RIP) and Service Access Point (SAP) protocols running in an IPX environment.

## Terminology

This section presents the syntax and access type categories used to describe each variable. For details on syntax, refer to RFC 1155, and to RCF 1442 for SNMPv2.

### Syntax

The syntax describes the format of the information, or value, that is returned upon monitoring or setting information in a device with a MIB variable.

**Note** Some MIBs are defined using the SNMPv1 SMI while others are defined using the SNMPv2 SMI, and so the two have slightly different syntaxes. For example, an SNMPv1 "Counter" is a "Counter32" in SNMPv2.

The syntax can be any one of the following categories:

- TruthValue

  An integer of 1 or 2, where 1 = true or 2 = false. TruthValue is defined in "Textual Conventions for version 2 of the Simple Network Management Protocol (SNMPv2)," RFC 1443.

- Counter/Counter32

  A counter is a nonnegative integer that increases until it reaches some maximum value. After reaching the maximum value, it rolls back to zero. For example, the variable *locIfipInPkts* counts the number of IP protocol input packets on an interface.

- Display string

  A display string is a printable ASCII string. It is typically a name or description. For example, the variable *netConfigName* provides the name of the network configuration file for a device.

- Integer

  An integer is a numeric value. It can be an actual number, for example, the number of lost IP packets on an interface. It also can be a number that represents a nonnumeric value. For example, the variable *tsLineType* returns the type of terminal services line to the SNMP manager. A 2 indicates a console line; a 3 indicates a terminal line; and so on.

- Integer32

  An integer from $-2^{32}$ to $2^{32}-1$.

- TimeStamp

  TimeStamp is defined in RFC 1443 as the value of the MIB-II sysUpTime object at which a specific event occurred.

- IP address

  The variable *hostConfigAddr* indicates the IP address of the host that provided the host configuration file for a device.

- Timeticks

  Timeticks is a nonnegative integer that counts the hundredths of a second since an event. For example, the variable *loctcpConnElapsed* provides the length of time that a TCP connection has been established.

### Access

The access type, which applies to SNMPv1, describes whether a MIB variable can be used under one of the following circumstances:

- Read-only

  This variable can be used to monitor information only. For example, the *locIPUnreach* variable, whose access is read-only, indicates whether Internet Control Message Protocol (ICMP) packets concerning an unreachable address will be sent.

- Read-write

  This variable can be used to monitor information and to set a new value for the variable. For example, the *tsMsgSend* variable, whose access is read-write, determines what action to take after a message has been sent.

  The possible integer values for this variable follow:

  1 = nothing
  2 = reload
  3 = message done
  4 = abort

- Write-only

  This variable can be used to set a new value for the variable only. For example, the *writeMem* variable, whose access is write-only, writes the current (running) router configuration into nonvolatile memory where it can be stored and retained even if the router is reloaded. If the value is set to 0, the *writeMem* variable erases the configuration memory.

### Max-Access

This variable, which applies to SNMPv2, can represent one of the following four states: read-create, read-write, read-only, and not-accessible.

- Not-Accessible

  You cannot read or write to this variable. Entry statements are typically among those variables that are not accessible.

- Read-Create

  This specifies a tabular object that can be read, modified, or created as a new row in a table.

- Read-Write

  You can read or modify this variable.

- Read-only

  This variable can be used only to monitor information .

## Internetwork Management

The International Organization for Standards (ISO) Network Management Forum defined five areas of network management: fault, configuration, security, performance, and accounting. Cisco MIB variables can be mapped to each of these areas (as described in this section) and used to manage your internetwork.

Although a variable might have a primary use for one aspect of network management, variables often overlap multiple areas. For example, *locIPhow* and *locIPwho*, discussed next under "Configuration Management," can also be used for fault management if a system is not loading properly.

- Fault Management

  Fault management involves running diagnostic tests on the internetwork, analyzing the results, and isolating and resolving problems.

  Example:

  Several of the variables described in the section "Basic" provide resources for troubleshooting. For example, the variables *freeMem*, and *whyReload* provide information on why a router was reloaded, and indicate how much memory is currently available in a device.

  The variables described in the section "Environmental Monitor Card and Environmental Monitoring" provide feedback on the physical status of the AGS+ router or Cisco 7000 router.

Statistics from variables in the section “Interface Table” record the number of packets dropped on particular interfaces so that they can be identified as potential trouble spots.

- Configuration Management

  Configuration management involves monitoring and controlling the configuration of devices on the internetwork.

  Example:

  The *locIPhow* and *locIPwho* variables described in the section “Internet Protocol (IP) Group” provide information on how a device received its IP address and the device that provided it with its address.

  The variables described in the sections “Host Configuration File” and “Network Configuration File” provide configuration file names and addresses of hosts supplying network configuration files.

  The variables described in the section “System Configuration” provide information such as the name of the host that supplied the system boot image for a device and the name of the boot image.

- Security Management

  Security management deals with controlling access to network resources through the use of authentication techniques and authorization policies.

  Example:

  The variable *authAddr* contains the address of the last SNMP manager that failed the authorization check. The *locIPSecurity* variable provides the IP security level assigned to an interface.

- Performance Management

  Performance management measures traffic flow across the internet, calculates the number of packets that are successfully transmitted against those that are dropped, and so on, in order to optimize efficiency.

  Example:

The variables described in the section “CPU Utilization” provide feedback on CPU performance. The variables described in the section “Interface Group” provide statistics on time between packets sent, number of packets transmitted successfully, and so on.

- Accounting Management

  Accounting management involves collecting and processing data related to resource consumption on the internet.

  Example:

  The variables described in the section “IP Checkpoint Accounting Table” later in this guide, provide numerous statistics such as packets and bytes sent successfully or dropped.

## Cisco-Supported MIBs

Cisco supports several MIBs, which are described in the following Requests for Comments (RFCs). Also listed are RFCs describing the Internet standards that Cisco Systems follows with regard to its MIB format and the SNMP protocol.

- RFC 1155, *Structure and Identification of Management Information for TCP/IP-based Internets*, May 1990

  Describes the common structures and identification scheme for the definition of management information for use with TCP/IP-based Internets. Formal descriptions of the structure are given using Abstract Syntax Notation One (ASN.1).

- RFC 1156, *Management Information Base for Network Management of TCP/IP-based Internets,* May 1990

  Describes the initial version of the standard Internet Management Information Base, MIB I. MIB I is superseded by MIB II, as described in RFC 1213.

- RFC 1157, *A Simple Network Management Protocol (SNMP)*, May 1990

  Describes the SNMP architecture and supported operations.

- RFC 1212, *Concise MIB Definitions*, March 1991

Describes the format for producing concise, yet descriptive, MIB modules.

- RFC 1213, *Management Information Base for Network Management of TCP/IP-based Internets: MIB-II*, March 1991

  Describes the Internet standard MIB II for use with network management protocols in TCP/IP-based internets.

  RFC 1213 obsoletes RFC 1158.

- RFC 1215, *A Convention for Defining Traps for use with the SNMP*, March 1991

  Describes the SNMP standardized traps and provides a means for defining enterprise-specific traps.

- RFC 1231, *IEEE 802.5 Token Ring MIB*, May 1991

  Describes the managed objects used for managing subnetworks that use the IEEE 802.5 Token Ring technology.

  Cisco implements the mandatory tables (Interface table and Statistics table), but not the optional table (Timer table) of this MIB.

  RFC 1239 contains information that updates RFC 1231.

- RFC 1243, *AppleTalk MIB*, July 1991

  Describes the managed objects for AppleTalk that use the SNMP protocol.

  Cisco Systems provides support for the AppleTalk Resolution Protocol (ARP), AppleTalk Port Group, AppleTalk Datagram Delivery Protocol (DDP), AppleTalk Routing Table Maintenance Protocol (RTMP), AppleTalk Zone Information Protocol (ZIP), AppleTalk Name Binding Protocol (NBP), and AppleTalk Echo Group

- RFC 1253, Open Shortest Path First (OSPF) MIB, August 1991

  The OSPF MIB defines an IP routing protocol that provides management information related OSPF and is supported by Cisco routers.

- RFC 1285, *FDDI Management Information Base*, January 1992

Describes the managed objects for Fiber Distributed Data Interface (FDDI) devices that are accessible via the Simple Network Management Protocol (SNMP).

Cisco Systems supports only some of the variables in the Station Management (SMT) and Media Access Control (MAC) groups of this MIB. Refer to the Cisco publication *FDDI MIB Variables in 9.0 Product Update Bulletin No. 181*. RFC 1285 corresponds to the ANSI FDDI SMT 6.2 draft standard

- RFC 1512, *FDDI Management Information Base,* September 1993

  RFC 1512 updates, but does not obsolete, RFC 1285.The changes from RFC 1285, based on changes from ANSI SMT 6.2 to SMT 7.3, were so numerous that the objects in this MIB module are located on a different branch of the MIB tree. No assumptions should be made about compatibility with RFC 1285.

- RFC 1398, *Ethernet-like Interface Types,* January 1993

  Specifies an IAB (Internet Activities Board) standards track protocol for the Internet community and defines objects for managing Ethernet-like objects.

- RFC 1442, *Structure of Management Information for version 2 of the Simple Network Management Protocol (SNMPv2),* April 1993

  This document outlines the subset of OSI's Abstract Syntax Notation One (ASN.1) used to define the Management Information Base (MIB) for version 2 of the Simple Network Management Protocol (SNMPv2).

- RFC 1443, *Textual Conventions for version 2 of the Simple Network Management Protocol (SNMPv2),* April 1993

  This document defines the initial set of extensions (textual conventions) to the basic types defined in the SMI (RFC1442) which are available to all MIB modules.

- RFC 1447 SNMPv2 Party MIB, April 1993

  Describes the managed objects which correspond to the properties associated with SNMPv2 parties, SNMPv2 contexts, and access control policies, as defined by the SNMPv2 Administrative Model.

Cisco supports the MIB variables as required by the Conformance clauses specified in these MIBs.

- RFC 1450 SNMPv2 MIB, April 1993

  Describes the managed objects that cause the behavior of an SNMPv2 implementation.

  Cisco supports the MIB variables as required by the Conformance clauses specified in these MIBs.

- RFC 1493, *Definitions of Managed Objects for Bridges*, July 1993

  RFC 1493 obsoletes half of RFC 1286.

- RFC 1516, *Standard Repeater MIB*, September 1993

  Defines a portion of the Management Information Base (MIB) for use with network management protocols in the Internet community. In particular, this RFC defines objects for managing IEEE 802.3 10-megabits per second (mbps) baseband repeaters, sometimes referred to as hubs.

- RFC 1525, *Definitions of Managed Objects for Source Routing Bridges*, September 1993

  RFC 1525 obsoletes half of RFC 1286.

  Cisco supports all of the groups described in this MIB, including the following groups: dotldBase, dotldSr, dot1dStp, and dotIdTp.

- RFC 1406, *Definitions of Managed Objects for DS1 and E1 Interface Types*, January 1993

  RFC 1406 obsoletes RFC 1232.

- RFC 1315, *Management Information Base for Frame Relay DTEs*, April 1992

  Cisco supports the following tables in this MIB:

  — Data Link Connection Management Interface

  — Circuit

  — Frame Relay Globals

  — Data Link Connection Management Interface Related Traps

  The Error Table is not supported in this MIB.

- RFC 1381, *SNMP MIB Extension for X.25 LAPB*, November 1992

  Cisco supports the following tables in this MIB:

  — LAPB Admn (read-only)

  — LAPB Operating Parameters

  — LAPB Flow

  The LAPB XID table is not supported in this MIB.

- RFC 1382, *SNMP MIB Extension for the X.25 Packet Layer*, November 1992

  The X.25 packet layer MIB is available under the ifType node rfc887-x25 (5) registered under the MIB-II transmission Object Identifier. This condition applies to all X.25 interfaces, including any DDN-X.25 encapsulation interfaces. Cisco supports the following tables in this MIB:

  — X.25 Administration (read-only)

  — X.25 Operational

  — X.25 Statistics

  — X.25 Channel (read-only)

  — X.25 Circuits Information (read-only)

  — X.25 Traps (both must be configured)

  The following tables are not supported in this MIB:

  — X.25 Cleared Circuit Table

  — X.25 Call Parameter Table

- RFC 1269, *Management Information Base for Border Gateway Protocol (BGP)*, October 1991

  Provides some support for RFC 1269 and replacement draft IETF-BGP-MIBC4-OS.Txt. Cisco supports the following tables in this MIB:

  — BGP Version

  — BGP LocalAs

  — BGP Identifier

— BGP PeerTable

- RFC 1659, *Definitions of Managed Objects for RS-232-like Hardware Devices using SMIv2*, July 1994

  The RS-232-like Hardware Device MIB applies to interface ports that might logically support the Interface MIB, a Transmission MIB, or the Character MIB. The most common example is an RS-232 port with modem signals.

  The RS-232-like Hardware Device MIB is mandatory for all systems that have such a hardware port supporting services managed through some other MIB.

  The MIB includes many similar types of hardware, and as a result contains objects not applicable to all of those hardware types. The compliance definitions have a general group for all implementations, and separate groups for the different types of ports, such as asynchronous and synchronous.

  The RS-232-like Hardware Port MIB includes RS-232, RS-422, RS-423, V.35, and serial physical links (other asynchronous or synchronous) with a similar set of control signals.

  The MIB contains objects that relate to physical layer connections. Such connections may provide hardware signals (other than for basic data transfer), such as RNG and DCD. Hardware ports also have such attributes as speed and bits per character.

To obtain copies of RFCs, use the **ftp nic.ddn.mil** command. Log in as **anonymous** and enter your e-mail name when prompted for the password. Enter the **cd rfc** command to change to the correct directory. Use the **get rfc-index.txt** command to retrieve a list of all available RFCs. To obtain a copy of any specific RFC, enter **get rfcnnnn.txt**, where *nnnn* is the RFC number.

## Related Cisco Publications

For detailed information on configuration and troubleshooting commands, refer to the following Cisco publications:

- *Router Products Configuration Guide*
- *Router Products Command Reference*

- *Access and Communication Servers Configuration Guide*
- *Access and Communication Servers Command Reference*

Users of the CiscoWorks router management software can refer to the *CiscoWorks User Guide* for information on CiscoWorks router management software features and its use of MIB variables for the purposes of graphing and analyzing network performance, ensuring configuration consistency, troubleshooting, and more.

## Suggested Reading

Following are suggested reading materials:


- Leinwand, A. and K. Fang. *Network Management: A Practical Perspective*. Reading, Massachusetts: Addison-Wesley Publishing Company, Inc.; 1993.
- Rose, M. T. *The Simple Book: An Introduction to Management of TCP/IP-based Internets*. Englewood Cliffs, New Jersey: Prentice-Hall; 1991.
- Rose, M. T. *The Simple Book: An Introduction to Internet Management*, 2nd edition. Englewood Cliffs, New Jersey: Prentice-Hall; 1993.
- Rose, M. T. and Keith McCloghrie. *How to Manage Your Network Using SNMP, The Network Management Practicum*. Englewood Cliffs, New Jersey: Prentice-Hall; 1995.
- Stallings, W. *SNMP, SNMPv2, and CMIP: The Practical Guide to Network Management Standards*. Reading, Massachusetts: Addison-Wesley Publishing Company, Inc.; 1993.


## Object Identifier Numbers for Variables

The figures in this section provide a visual overview of the Cisco MIB variables along with the object identifier numbers for each MIB variable. The MIB variables are arranged alphabetically within each figure (in the same order in which they appear in the sections of this guide).

**Figure 5 Local Variables: Flash File Table and Flash Group**

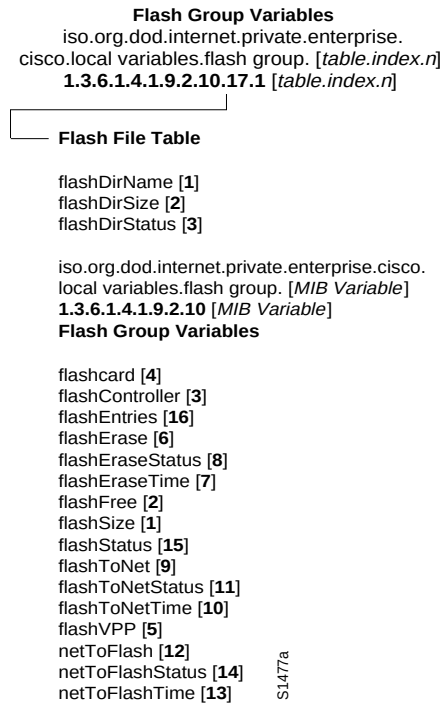



**Figure 6 FSIP Group Variables**

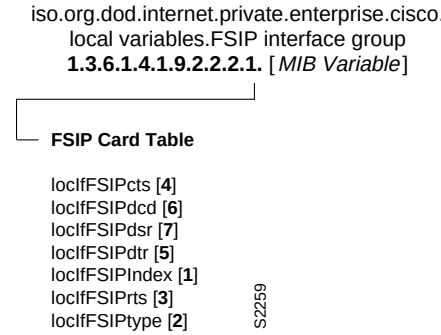


**Figure 7 Local Variables: Interface Group Table**

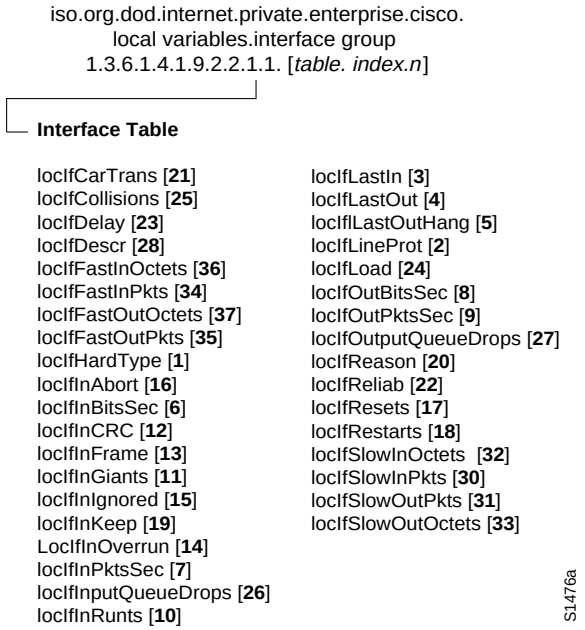


**Figure 8 Local Variables: Interface Group—ARP, AppleTalk, Apollo, Bridging, CLNS, DECnet, HP Probe, IP, LNM, and MOP**

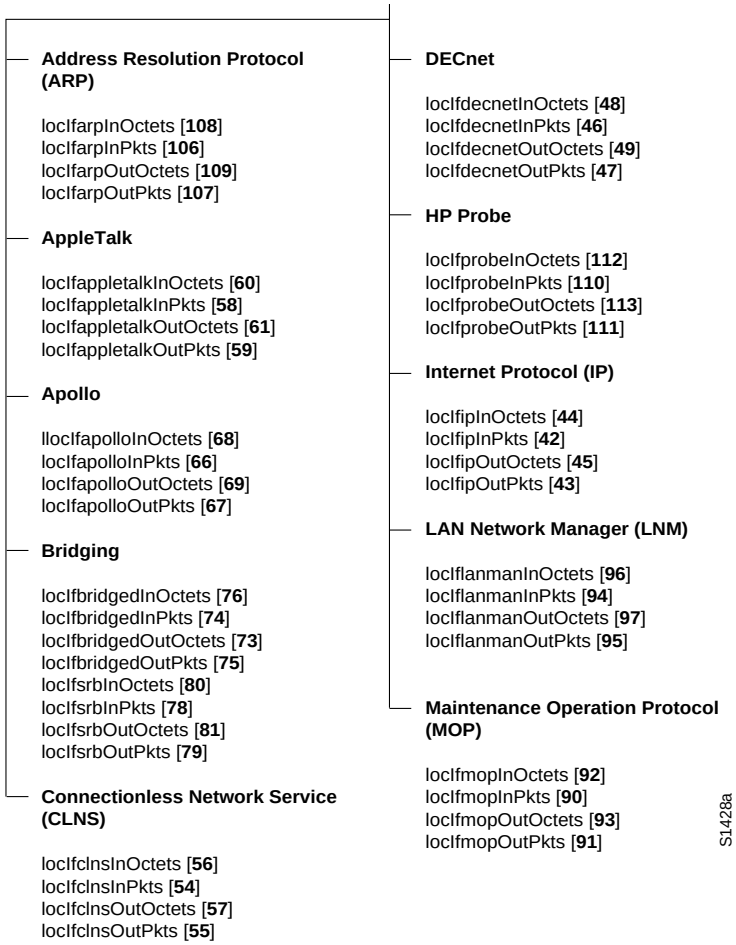


**Figure 9 Local Variables: Interface Group—Novell, Other Protocols, STUN, Spanning Tree**

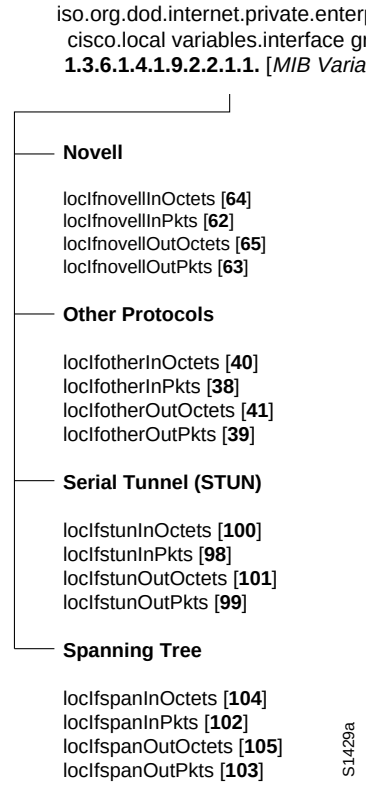



**Figure 10 Local Variables: Interface Group—VINES**

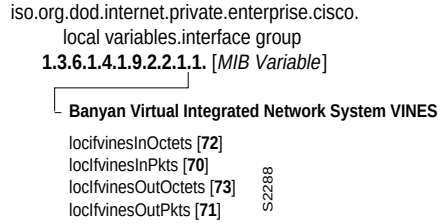


**Figure 11 Local Variables: Interface Group—XNS**

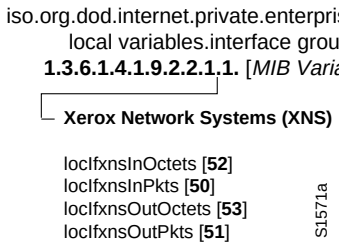



**Figure 12 Local Variables: Internet Protocol (IP) Group**

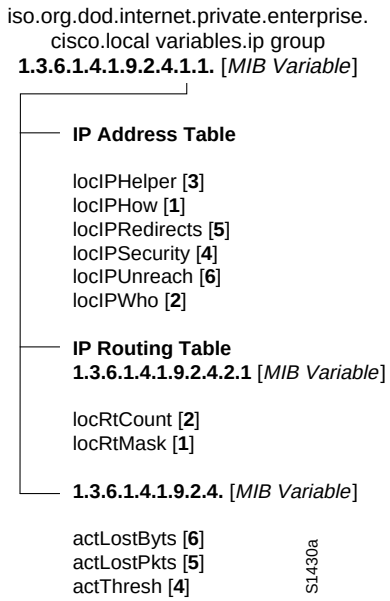


**Figure 13 Local Variables: IP Accounting Table**

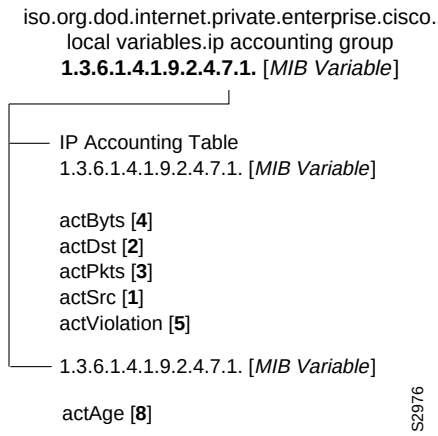



**Figure 14 Local Variables: IP Checkpoint Accounting Table**

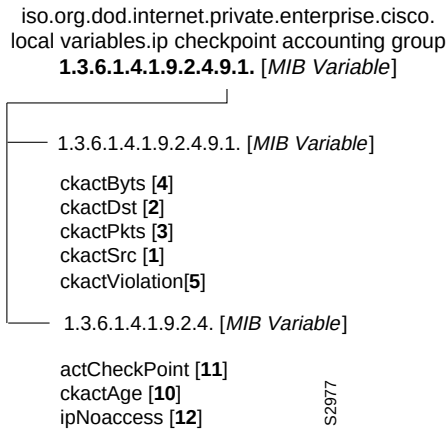


**Figure 15 Local Variables: System Group—Buffers**

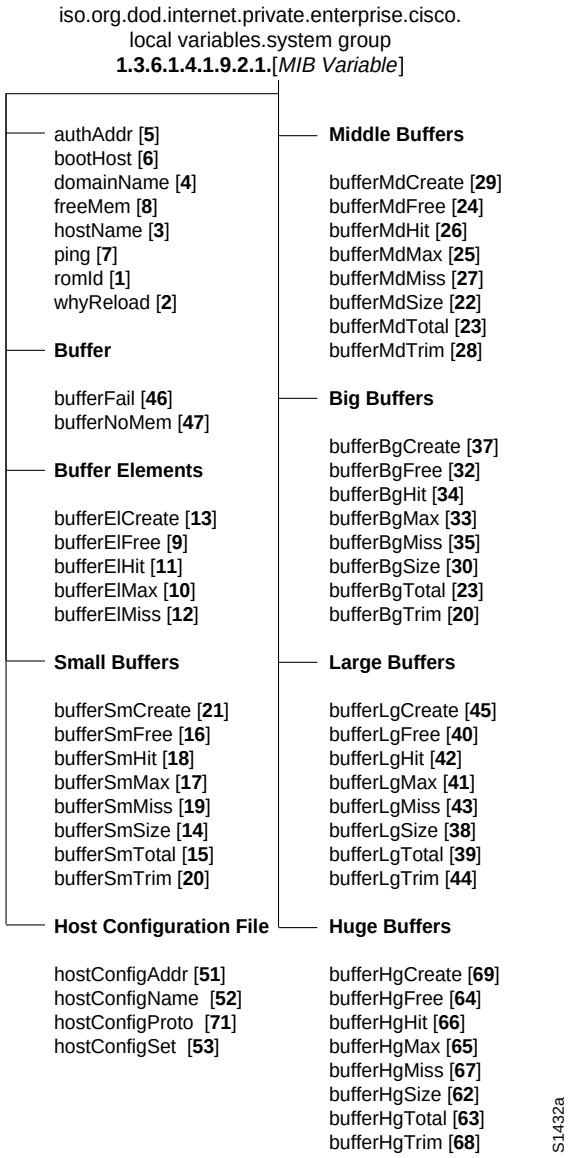


**Figure 16 Local Variables: System Group—CPU Utilization and Environmental Monitor Card**

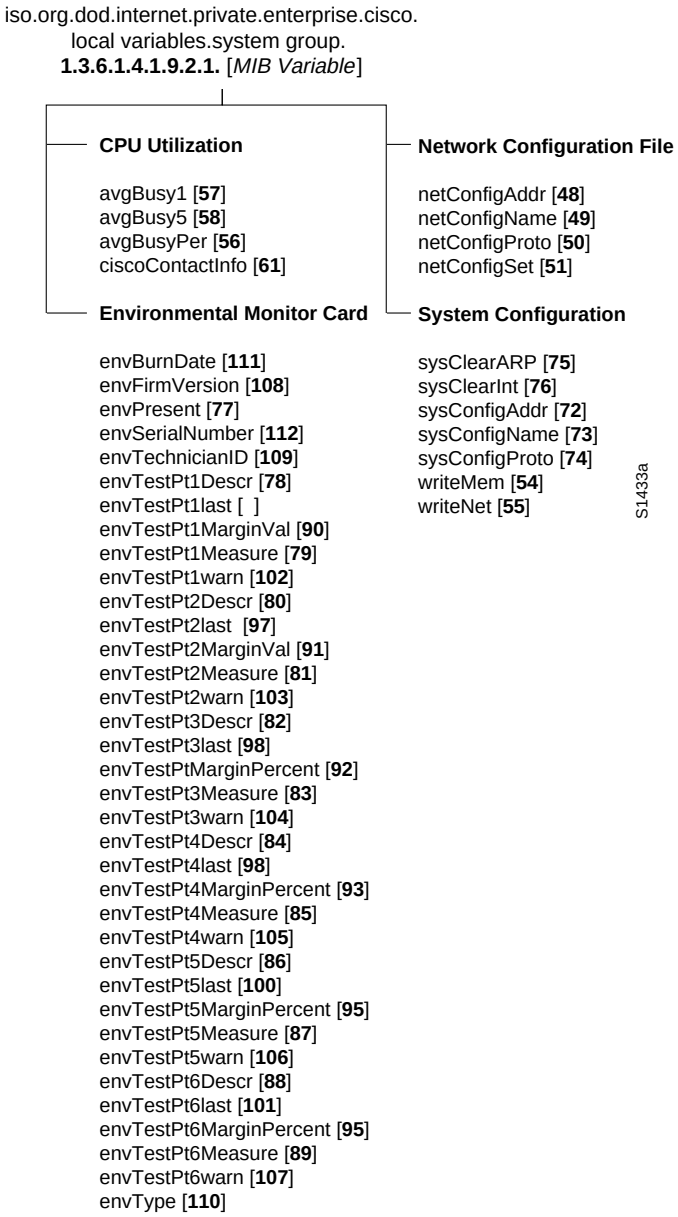


**Figure 17 Local Variables: Terminal Services Group**

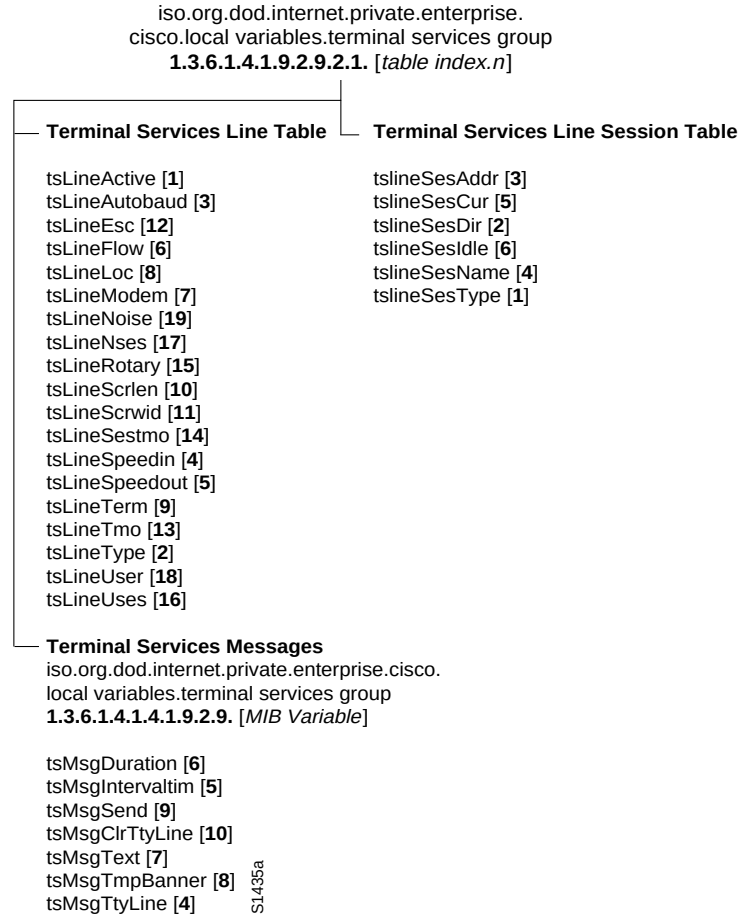


**Figure 18 Local Variables: Transmission Control Protocol (TCP) Connection Table**

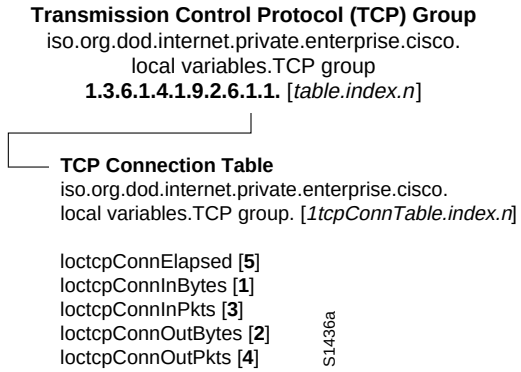



**Figure 19 ciscoMgmt Variables: Cisco Transmission Control Protocol (TCP) Connection Table**

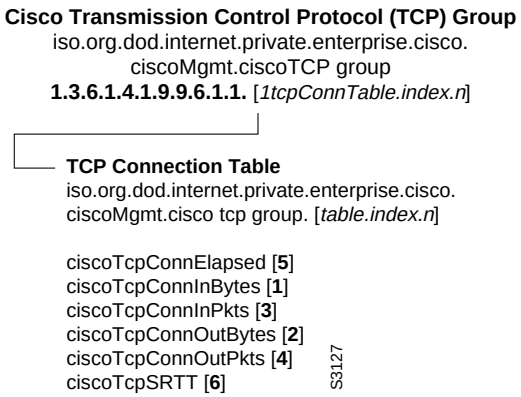


**Figure 20 Temporary Variables: AppleTalk and Chassis**

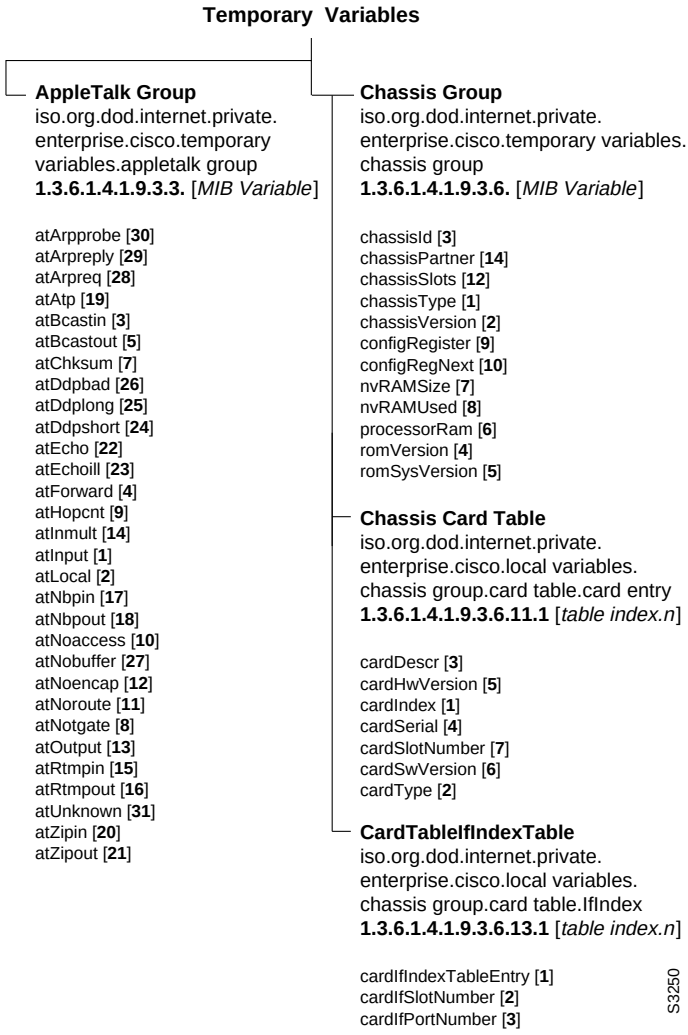


**Figure 21 Temporary Variables: DECnet**

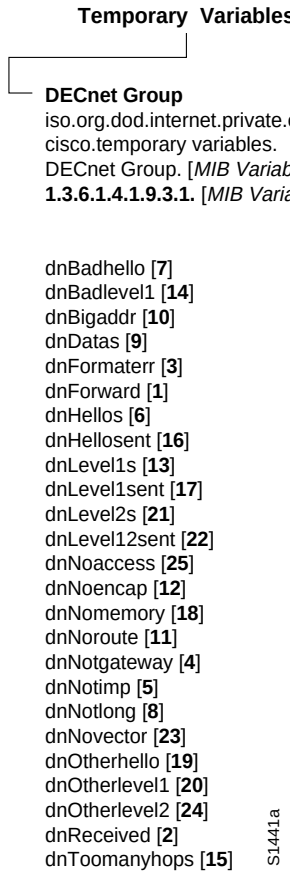


**Figure 22 Temporary Variables: DECnet Tables**

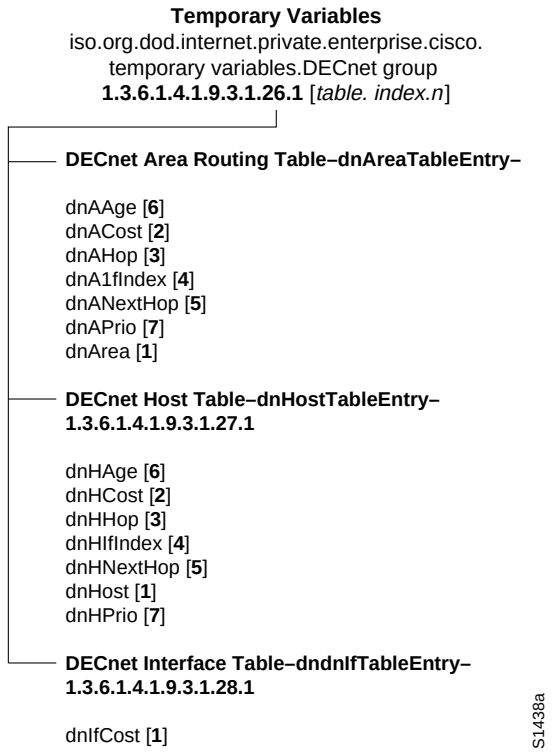


**Figure 23 Temporary Variables: Novell and Xerox Network Systems (XNS)**

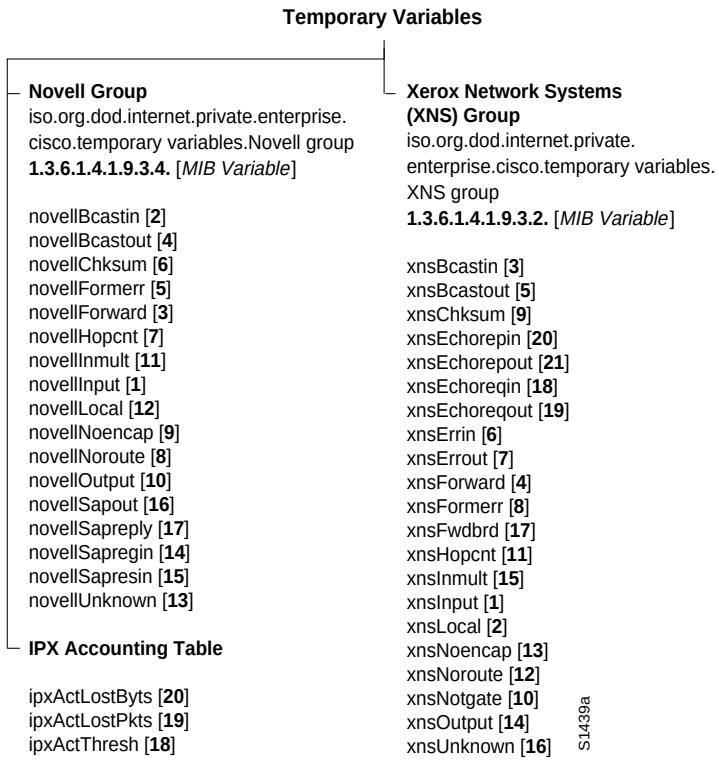


**Figure 24 Temporary Variables: IPX Accounting Table I**

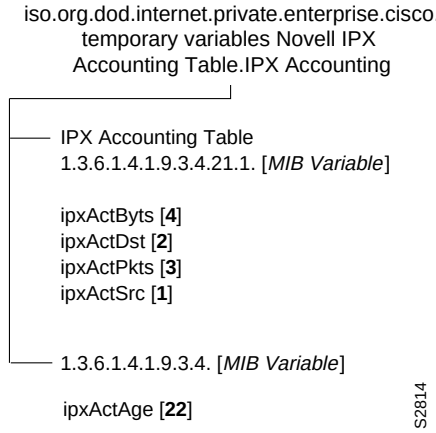



**Figure 25 Temporary Variables: IPX Checkpoint Accounting Table**

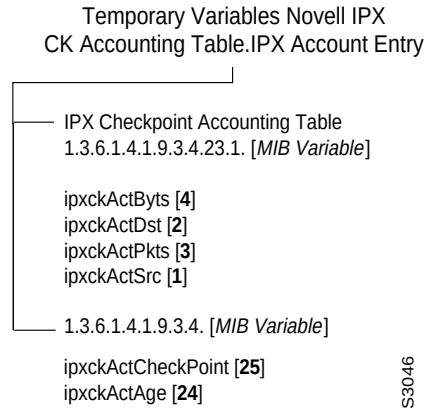


**Figure 26 Temporary Variables: Virtual Integrated Network System (VINES) I**

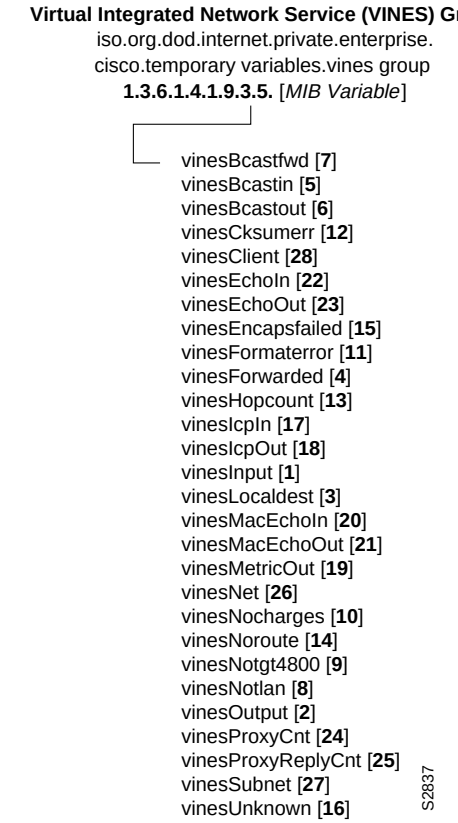


**Figure 27 Temporary Variables: (VINES) II**

**Figure 28 Novell MIB Variables: IPX Tables**

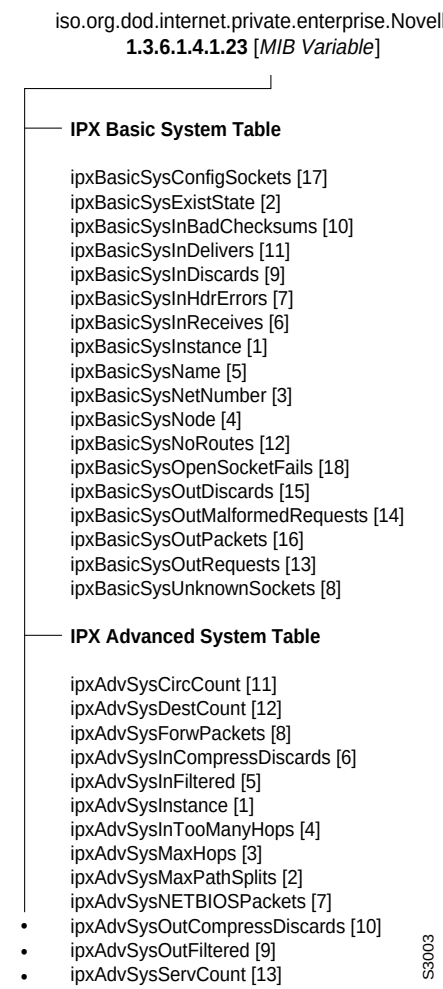


**Figure 29 Novell MIB: IPX Circuit Table**

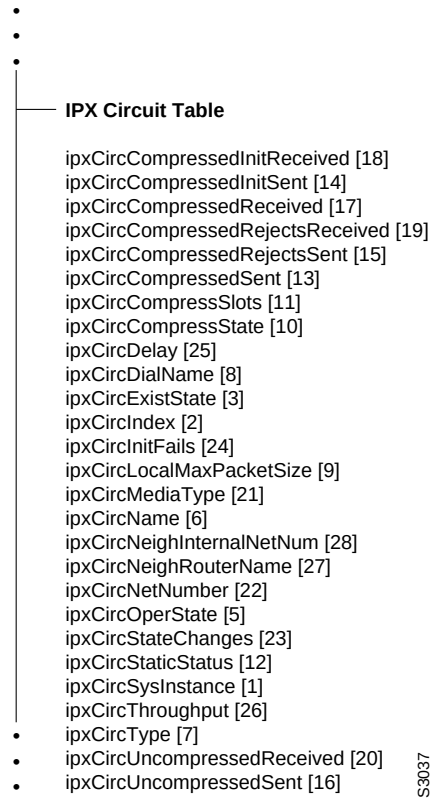


**Figure 30 Novell MIB: IPX Destination, Static Routes, and Services Tables**

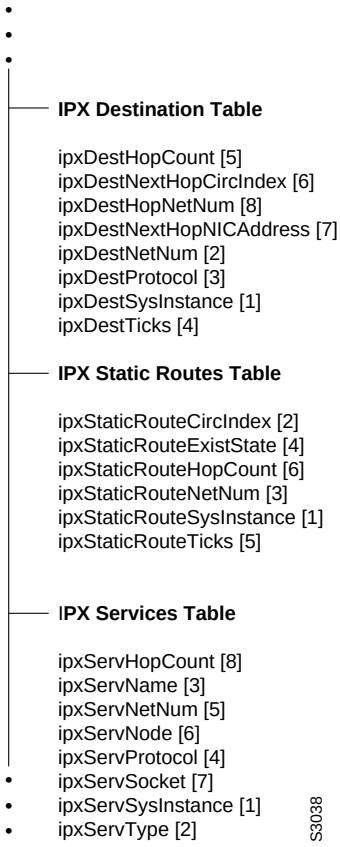


**Figure 31 Novell MIB: IPX Destination Services, Static Services, RIP System, SAP System Tables**

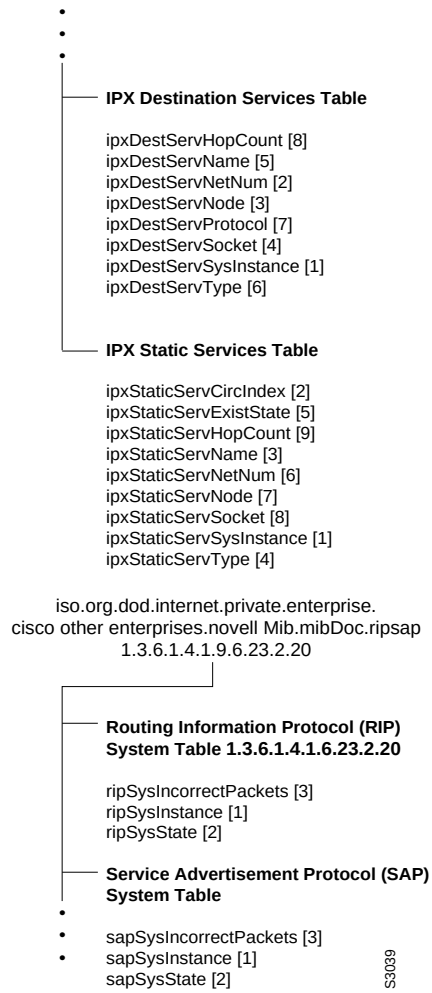


**Figure 32 Novell MIB: RIP and SAP Circuit Tables**

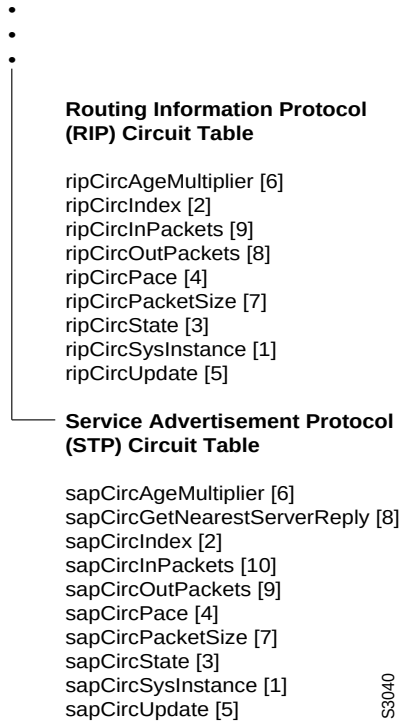


**Figure 33 ciscoMgmt: CIP Card Table**

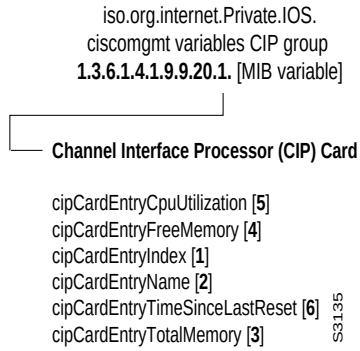


**Figure 34 ciscoMgmt: Channel Interface Processor Card Daughter Board and SubChannel Tables**

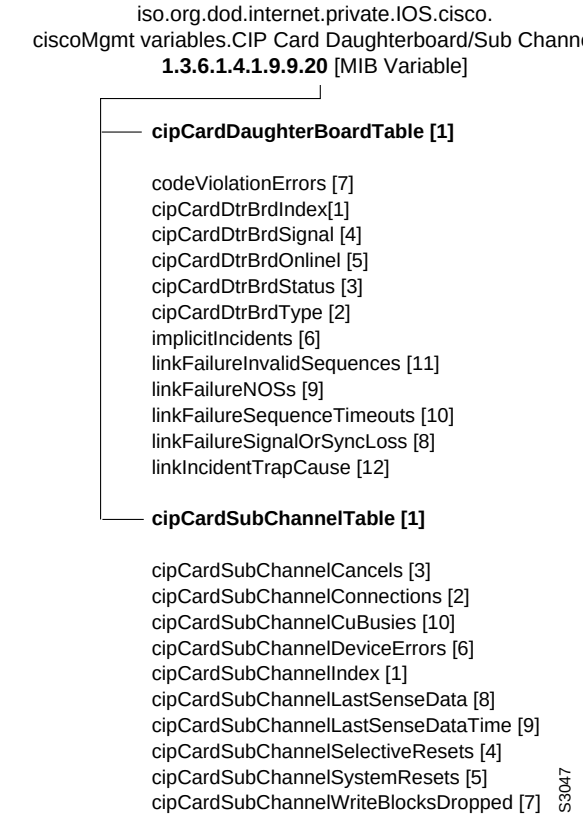


**Figure 35 ciscoMgmt: Channel Interface Processor Group CardClaw**

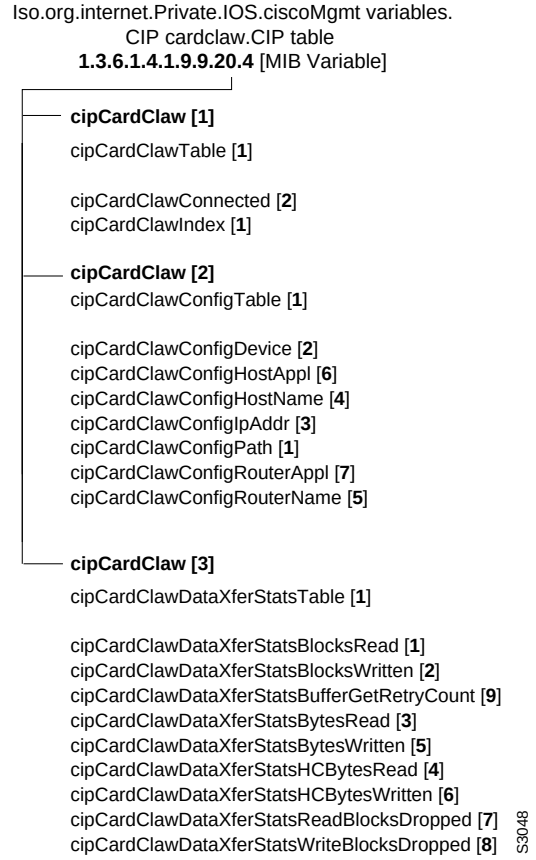


**Figure 36 ciscoMgmt DownStream Physical Unit (DSPU) I**

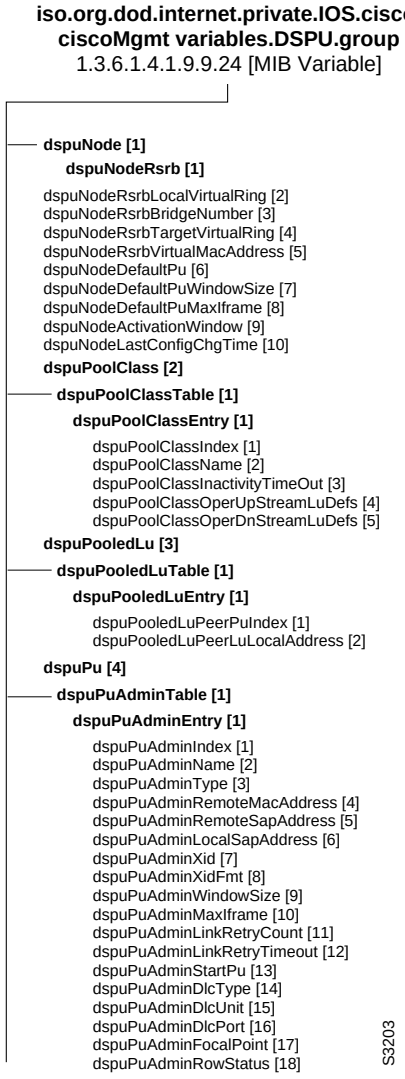


**Figure 37 ciscoMgmt DownStream Physical Unit (DSPU) II**

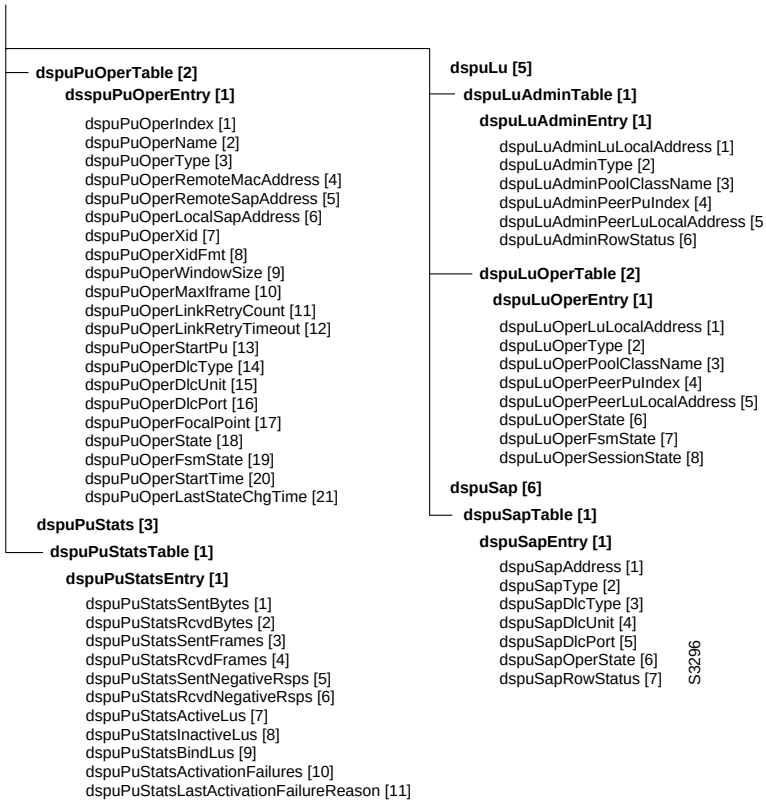


**Figure 38 ciscoMgmt: Ping group**

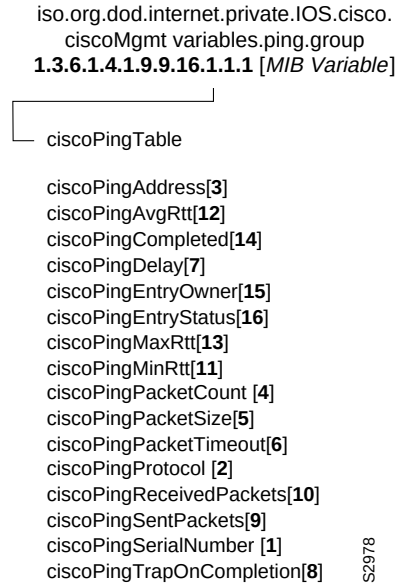


**Figure 39 ciscoMgmt: Environmental Monitor**

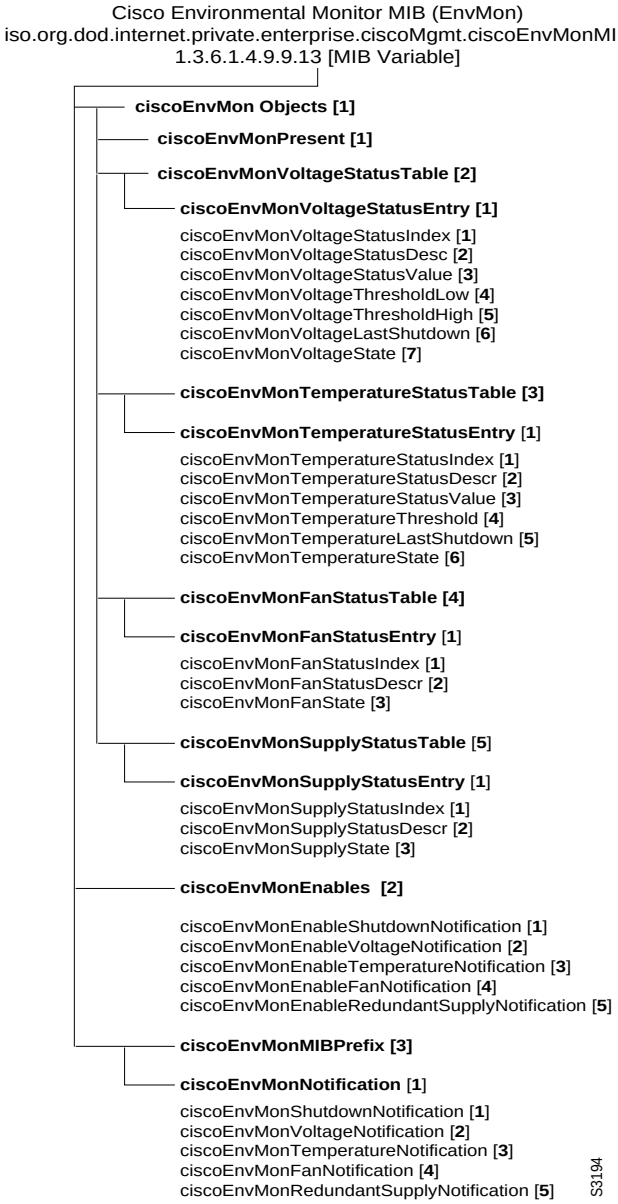


**Figure 40 ciscoMgmt Cisco Flash MIB**

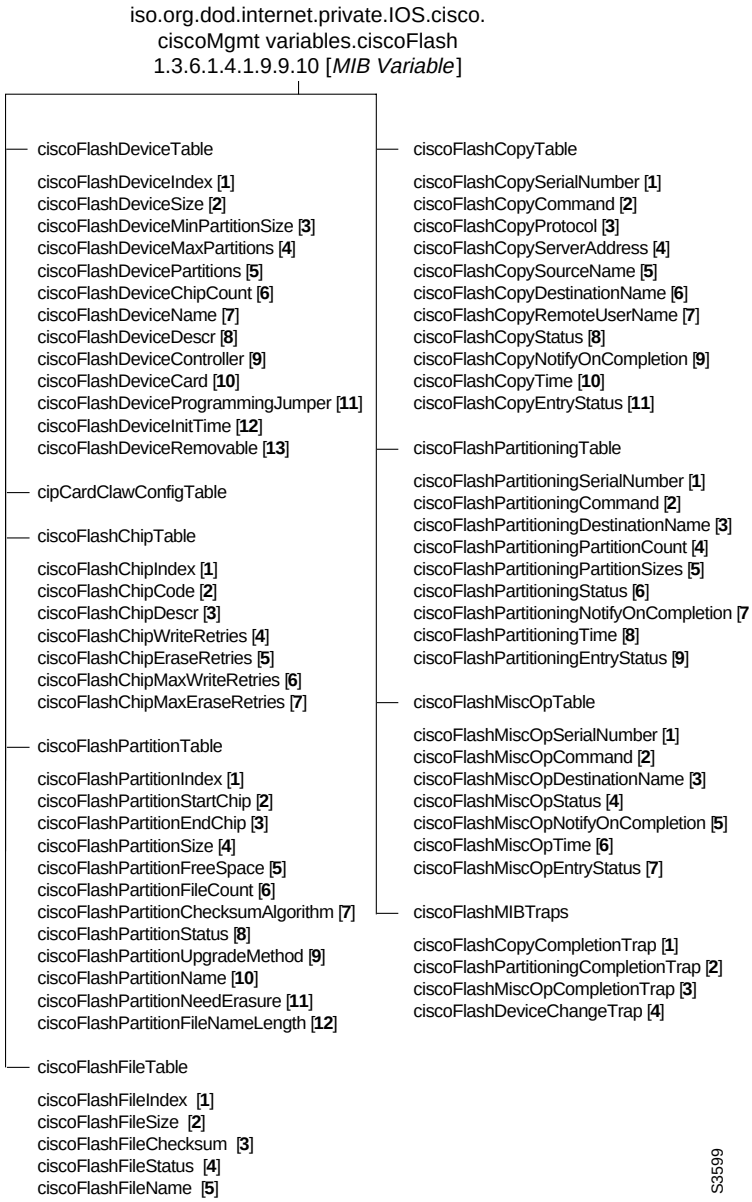


**Figure 41 CiscoMgmt Cisco ISDN MIB**

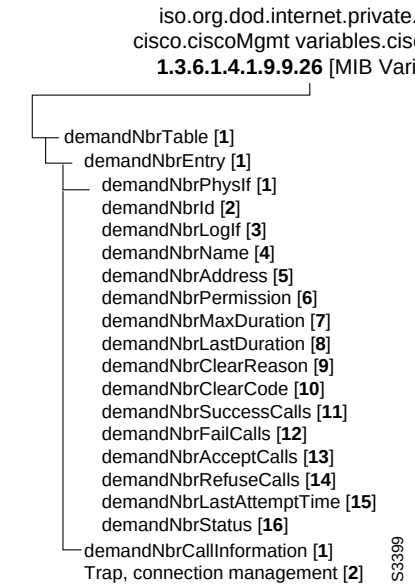



**Figure 42 ciscoMgmt Cisco Repeater (ciscoRptr) MIB**

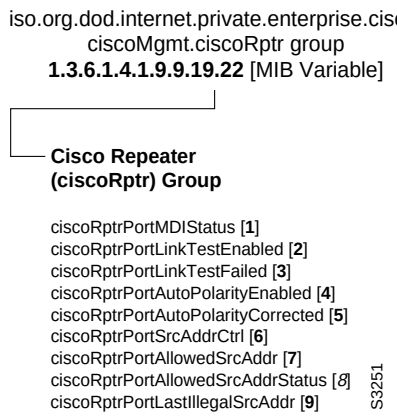


**Figure 43 ciscoMgmt Qualified Logical Link Control (QLLC) Tables**

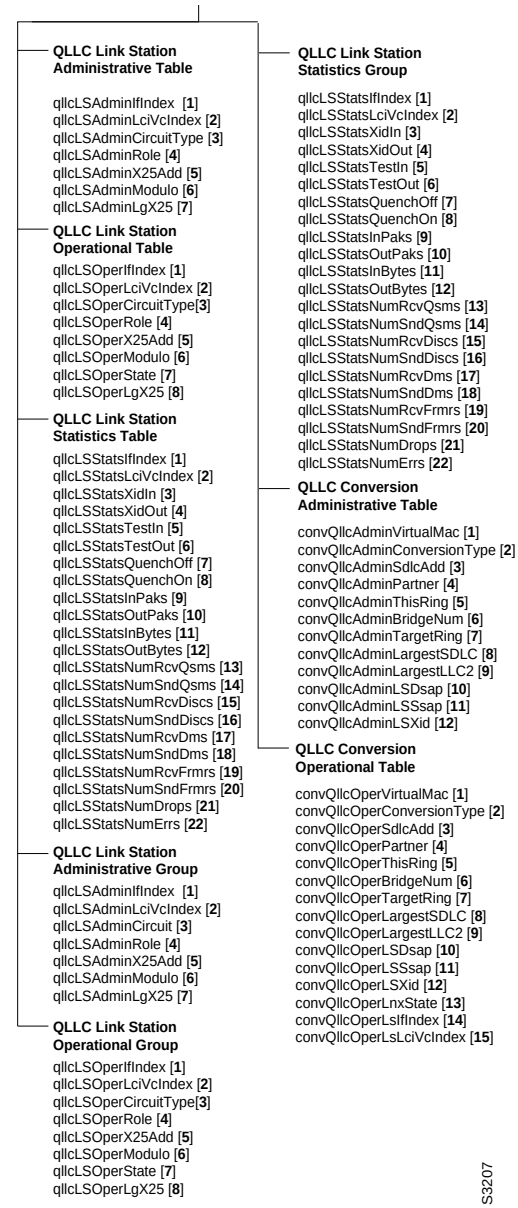


**Figure 44 ciscoMgmt ciscoDiscovery Protocol**

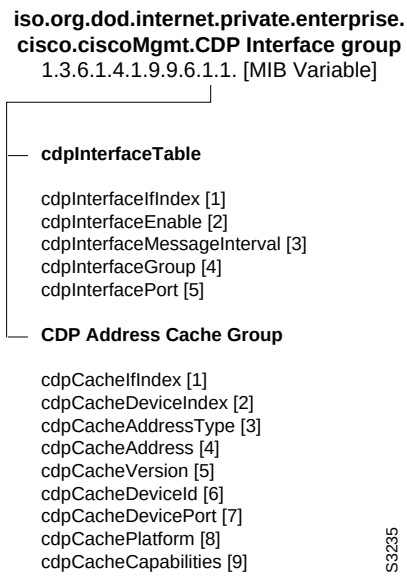


**Figure 45 ciscoMgmt ciscoSnapshot MIB**

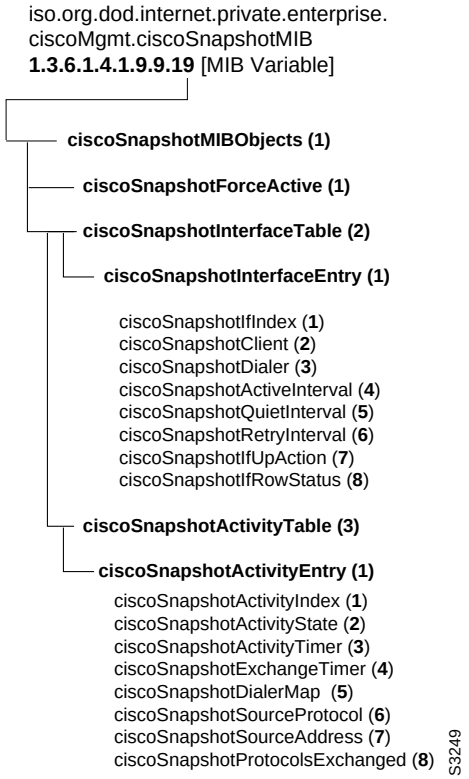


**Figure 46 ciscoMgmt ciscoVINES MIB I**

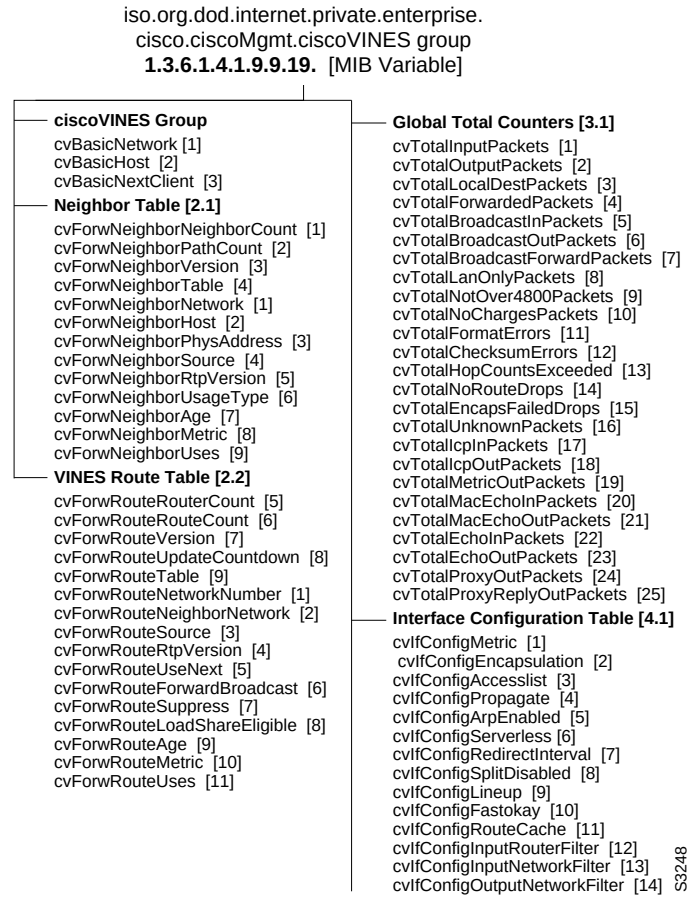
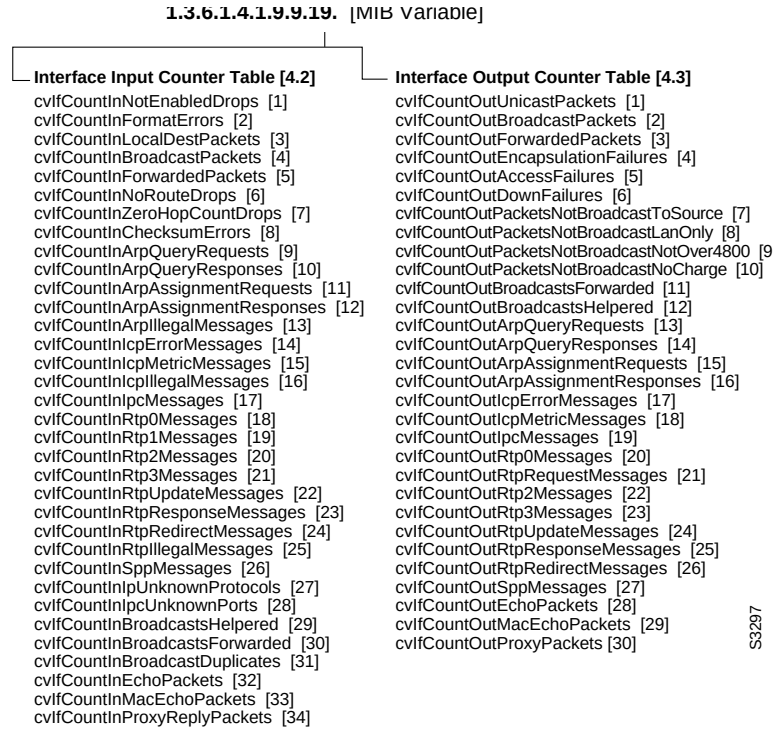


**Figure 47 ciscoMgmt: ciscoVINES MIB II**



## Local Variables

This section describes the MIB variables within the Cisco product line. Certain groups of variables might or might not be present, depending upon the software options and configuration in the managed device.

- Flash
  - Flash File Table
- Interfaces
  - Interface Table
  - Across All Interfaces
  - Address Resolution Protocol (ARP)
  - AppleTalk
  - Apollo
  - Bridging
  - Connectionless Network Service (CLNS)
  - DECnet
  - Fast Serial Interface Processor (FSIP)
  - HP Probe
  - Internet Protocol (IP)
  - LAN Network Manager (LNM)
  - Maintenance Operation Protocol (MOP)
  - Novell
  - Other Protocols
  - Serial Tunnel (STUN)
  - Spanning Tree
  - Banyan Virtual Integrated Network Service (VINES)
  - Xerox Network Systems (XNS)
- Internet Protocol (IP)
  - IP Address Table

- IP Routing Table

- System
  - Basic
  - Buffer
  - CPU Utilization
  - Environmental Monitor Card
  - Host Configuration File
  - Network Configuration File
  - System Configuration
- Terminal Services
  - Terminal Services Line Table
  - Terminal Services Line Session Table
  - Terminal Services Messages
- Transmission Control Protocol (TCP)

  This has been deprecated and replaced with a version in the ciscoMgmt group.
  - TCP Connection Table

## Flash Group

The Flash memory card is an add-in card of Flash EPROM (erasable programmable read-only memory) storage onto which system software images can be stored, booted, and rewritten.

### Flash File Table

The local Flash File table, *lflashFileDirTable*, contains information on a per file basis and includes the following three variables: *flashDirName*, *flashDirSize*, and *flashDirStatus.* The index to this table is *flashEntries*, or the number of Flash files. If the device has *n* number of Flash files, the table will contain *n* number of rows.

For example, in Table 3, the *flash1* file has a directory size of 50 octets, and its status is valid, represented by the integer 1.

**Table 3 Flash File Table**

| flashEntries | flashDirName | flashDirSize | flashDirStatus |
|---|---|---|---|
| 1 | flash1 | 50 | 1 |
| 2 | flash2 | 100 | 1 |
| 3 | flash3 | 200 | 2 |

**flashDirName**

Provides the name associated with a Flash directory entry.

Syntax: Display string

Access: Read-only

**flashDirSize**

Provides the size (in octets) of a Flash directory entry.

Syntax: Integer

Access: Read-only

**flashDirStatus**

Indicates the status of the Flash directory entry.

Syntax: Integer (1 = valid, 2 = deleted)

Access: Read-only

**End of Table**

**flashcard**

Provides the type of card connected to the Flash card installed in the router. For example, the type of card connected to the Flash card could be either CSC-MS or CSC-MC+.

Syntax: Display string

Access: Read-only

**flashController**

Provides the type of Flash controller (either CCTL or CCTL2) installed in the router.

Syntax: Display string

Access: Read-only

**flashEntries**

Provides the number of directory entries, or files, that exist in the Flash memory directory.

Syntax: Integer

Access: Read-only

**flashErase**

Sets a request to erase Flash memory, freeing up all available memory space. All of the Flash memory is erased out. Individual files cannot be erased from Flash memory.

Syntax: Integer

Access: Write-only

**flashEraseStatus**

Indicates the status of current or last erasing of Flash memory.

Syntax: Integer

Access: Read-only

**flashEraseTime**

Indicates the value of sysUpTime the last time the Flash memory was erased.

Syntax: Timeticks

Access: Read-only

**flashFree**

Provides the amount of available Flash memory in octets.

Syntax: Integer

Access: Read-only

**flashSize**

Provides the amount of total Flash memory in octets.

Syntax: Integer

Access: Read-only

**flashStatus**

Indicates the status of the availability of Flash memory.

Syntax: Integer

Access: Read-only

**flashToNet**

Requests to write the Flash memory to a Trivial File Transfer Protocol (TFTP) server. The value (display string) is the name of the Flash file being sent, or written, to the server. The instance ID is the IP address of the TFTP host.

This copy of the system image can serve as a backup copy and can also be used to verify that the copy in the Flash memory is the same as the original file.

The Flash memory card can be used as a TFTP file server for other routers on the network. This feature allows you to boot a remote router with an image that resides in the Flash server memory.

Syntax: Display string

Access: Write-only

**flashToNetStatus**

Indicates the status of the current or last flash to net transfer.

Syntax: Integer

Access: Read-only

**flashToNetTime**

Indicates the value of sysUpTime the last time a file was copied from the Flash memory in the router to the TFTP host.

Syntax: Timeticks

Access: Read-only

**flashVPP**

Provides the status of the VPP DIP jumper on the Flash memory card. Files can be written to the Flash memory card only if the VPP DIP jumper is turned on.

Syntax: Integer (1 = VPP enabled/Flash write enabled, 2 = VPP disabled/Flash write disabled)

Access: Read-only

**netToFlash**

Copies a software image from Trivial File Transfer Protocol (TFTP) server to the Flash memory on the router. The value (display string) is the name of the file being sent, or written, to the Flash memory. The instance ID is the IP address of the TFTP host.

The TFTP image copied to the Flash memory must be at least System Software Release 9.0 or later. If earlier system software is copied into the Flash memory, the host processor card will not recognize the CSC-MC+ card upon the next reboot.

If free Flash memory space is unavailable, or if the Flash memory has never been written to, the erase routine is required before new files can be copied.

Syntax: Display string

Access: Write-only

**netToFlashStatus**

Indicates the status of the current or next-to-last flash transfer.

Syntax: Integer

Access: Read-only

**netToFlashTime**

Indicates the value of sysUpTime the last time a file was copied from a Trivial File Transfer Protocol (TFTP) server to the Flash memory on the router.

Syntax: Timeticks

Access: Read-only

## Fast Serial Interface Processor (FSIP) Group

The local FSIP Card table, *lfsipTable*, contains information about FSIP cards used by the Cisco 7000 and includes the following six variables that provide information about the processor: *locIfFSIPtype*, *locIfFSIPrts*, *locIfFSIPcts*, *locIfFSIPdtr*, *locIfFSIPdcd*, and *locIfFSIPdsr*. The index to this table is *locIfSIPIndex*, which indicates the interface index of the card corresponding to its *IfIndex*.

**Table 4 FSIP Card Table**

| locIfFSIPIndex | locIfFSIPtype | locIfFSIPrts | locIfFSIPcts | and so on |
|---|---|---|---|---|
| 1 | DCE | 1 | 2 | |
| 2 | DTE | 1 | 3 | |
| and so on | | | | |

**locIfFSIPcts**

Indicates whether the CTS (clear to send) signal is up or down.

Syntax: Integer (1 = not available, 1 = up, 2 = down)

Access: Read-only

**locIfFSIPdcd**

Indicates whether the DCD (data carrier detect) signal is up or down.

Syntax: Integer (1 = not available, 2 = up, 3 = down)

Access: Read-only

**locIfFSIPdsr**

Indicates whether the DSR (data set ready) signal is up or down.

Syntax: Integer (1 = not available, 2 = up, 3 = down)

Access: Read-only

**locIfFSIPdtr**

Indicates whether the DTR (data terminal ready) signal is up or down.

Syntax: Integer (1 = not available, 2 = up, 3 = down)

Access: Read-only

**locIfFSIPIndex**

Indicates the index interface port of the corresponding *ifIndex.* (RFC 1213)

Syntax: Integer

Access: Read-only

**locIfFSIPrts**

Indicates whether the RTS (request to send) signal is up or down.

Syntax: Integer (1 = not available, 2 = up, 3 = down)

Access: Read-only

**locIfFSIPtype**

Indicates whether the FSIP line uses DCE (data communications equipment) or DTE (data terminal equipment).

Syntax: Integer (1 = not available, 2 = DTE, 3 = DCE)

Access: Read-only

## Interface Group

The following variables apply to interfaces attached to Cisco devices. These variables can be used to monitor the performance of the network in terms of the number of packets dropped, time allocations for input and output packets, and so on. These variables also can be used for fault management. For example, variable values indicate which interfaces are dropping packets or have had to be restarted several times.

### Interface Table

The Interface table, *lifTable*, contains all of the variables in the Interface group. The index to the table is *ifIndex*, which indicates the number of the interface. If the device has *n* number of interfaces, the Interface table will contain *n* rows.

In the Interface table shown in Table 5, the first column indicates the number of interfaces on the device. Each of the variables in the interface table occupies one column; for example, *locIfHardType* is shown in a column, followed by *locIfLineProt* in the next column, and so on.

**Table 5 Interface Table**

| Interface Numer | locIfHardType | locIfLineProt | and so on |
|---|---|---|---|
| 1 | Ethernet | 1 | |
| 2 | TokenRing | 0 | |
| 3 | FDDI | 1 | |
| and so on | | | |

### Across All Interfaces

This section contains basic interface variables that apply to all interfaces and are not protocol-specific.

**locIfCarTrans**

Provides the number of times the serial interface received the Carrier Detect (CD) signal. If the carrier detect line is changing state often, it might indicate modem or line problems.

Syntax: Integer

Access: Read-only

**locIfCollisions**

Provides the number of output collisions detected on this interface.

Syntax: Integer

Access: Read-only

**locIfDelay**

Provides the media-dependent delay in transferring a packet to another interface on the media. The delay is indicated in microseconds. Used by Interior Gateway Routing Protocol (IGRP).

Syntax: Integer

Access: Read-only

**locIfDescr**

Provides a description of the interface (such as Ethernet, serial, and so on) that corresponds to the user-configurable interface description commands

Syntax: Display string

Access: Read-write

**locIfFastInOctets**

Provides the octet count for inbound traffic routed with fast and autonomous switching.

Syntax: Counter

Access: Read-only

**locIfFastInPkts**

Provides the packet count for inbound traffic routed with fast and autonomous switching.

Syntax: Counter

Access: Read-only

**locIfFastOutOctets**

Provides the octet count for outbound traffic routed with fast and autonomous switching.

Syntax: Counter

Access: Read-only

**locIfFastOutPkts**

Provides the packet count for outbound traffic routed with fast and autonomous switching.

Syntax: Counter

Access: Read-only

**locIfHardType**

Provides the type of interface (such as Ethernet, serial, FDDI, and so on).

Syntax: Display string

Access: Read-only

**locIfInAbort**

Provides the number of input packets that were aborted. Aborted input packets usually indicate a clocking problem between the serial interface and the data-link equipment.

Syntax: Integer

Access: Read-only

**locIfInBitsSec**

Provides a weighted 5-minute exponentially decaying average of interface input bits per second.

Syntax: Integer

Access: Read-only

**locIfInCRC**

Provides the number of input packets that had cyclic redundancy checksum (CRC) errors. The CRC generated by the originating station or far-end device does not match the checksum calculated from the data received. On a serial link, CRCs usually indicate noise, gain hits, or other transmission problems on the data link.

Syntax: Integer

Access: Read-only

**locIfInFrame**

Provides the number of input packets that were received incorrectly with framing errors. On a serial line, this is usually the result of noise or other transmission problems.

Syntax: Integer

Access: Read-only

**locIfInGiants**

Provides the number of input packets that were discarded because they exceeded the maximum packet size allowed by the physical media.

Syntax: Integer

Access: Read-only

**locIfInIgnored**

Provides the number of input packets that were ignored by this interface because the interface hardware ran low on internal buffers. Broadcast storms and bursts of noise can cause the ignored count to be increased.

Syntax: Integer

Access: Read-only

**locIfInKeep**

Indicates whether keepalives are enabled on this interface.

Syntax: Integer (1 = enabled, 2 = disabled)

Access: Read-only

**locIfInOverrun**

Provides the number of times the serial receiver hardware was unable to send data to a hardware buffer because the input rate exceeded the ability of the receiver to handle the data.

Syntax: Integer

Access: Read-only

**locIfInPktsSec**

Provides a weighted 5-minute exponentially decaying average of input packets.

Syntax: Integer

Access: Read-only

**locIfInputQueueDrops**

Provides the number of packets dropped because the input queue was full.

Syntax: Integer

Access: Read-only

**locIfInRunts**

Provides the number of input packets that were discarded because they were smaller than the minimum packet size allowed by the physical media.

Syntax: Integer

Access: Read-only

**locIfLastIn**

Provides the elapsed time in milliseconds since the last line protocol input packet was successfully received by an interface. Useful for knowing when a dead interface failed.

Syntax: Integer

Access: Read-only

**locIfLastOut**

Provides the elapsed time in milliseconds since the last line protocol output packet was successfully transmitted by an interface. Useful for knowing when a dead interface failed.

Syntax: Integer

Access: Read-only

**locIfLastOutHang**

Provides the elapsed time in milliseconds since the last line protocol output packet could not be successfully transmitted.

*OR*

*Provides the elapsed time (in milliseconds) since the interface was last reset because of a transmission that took too long.*

Syntax: Integer

Access: Read-only

**locIfLineProt**

Indicates whether the interface is up or down.

Syntax: Integer (1 = up, 2 = down)

Access: Read-only

**locIfLoad**

Provides the loading factor of the interface. The load on the interface is calculated as an exponential average over 5 minutes and expressed as a fraction of 255 (255/255 is completely saturated). Used by Interior Gateway Routing Protocol (IGRP).

Syntax: Integer

Access: Read-only

**locIfOutBitsSec**

Provides a weighted 5-minute exponentially decaying average of interface output bits per second for the specific protocol.

Syntax: Integer

Access: Read-only

**locIfOutPktsSec**

Provides a weighted 5-minute exponentially decaying average of interface output packets per second for the specific protocol.

Syntax: Integer

Access: Read-only

**locIfOutputQueueDrops**

Provides the number of packets dropped because the output queue was full.

Syntax: Integer

Access: Read-only

**locIfReason**

Provides the reason for the most recent status change of the interface.

Syntax: Display string

Access: Read-only

**locIfReliab**

Provides the level of reliability for the interface. The reliability of the interface is calculated as an exponential average over 5 minutes and expressed as a fraction of 255 (255/255 is 100 percent). Used by Interior Gateway Routing Protocol (IGRP).

Syntax: Integer

Access: Read-only

**locIfResets**

Provides the number of times the interface was reset internally. An interface can be reset if packets queued for transmission were not sent within several seconds. On a serial line, this can be caused by a malfunctioning modem that is not supplying the transmit clock signal or by a cable problem. If the system notices that the carrier detect line of a serial interface is up, but the line protocol is down, it periodically resets the interface in an effort to restart it. Interface resets also can occur when an interface is looped back or shut down.

Syntax: Integer

Access: Read-only

**locIfRestarts**

Provides the number of times the interface needed to be completely restarted because of errors.

Syntax: Integer

Access: Read-only

**locIfSlowInOctets**

Provides the octet count for inbound traffic routed with process switching.

Syntax: Counter

Access: Read-only

**locIfSlowInPkts**

Provides the packet count for inbound traffic routed with process switching.

Syntax: Counter

Access: Read-only

**locIfSlowOutPkts**

Provides the packet count for outbound traffic routed with process switching.

Syntax: Counter

Access: Read-only

**locIfSlowOutOctets**

Provides the octet count for outbound traffic routed with process switching.

Syntax: Counter

Access: Read-only

**End of Table**

## Address Resolution Protocol (ARP)

The following variables in the Interface group apply to interfaces running the Address Resolution Protocol (ARP). ARP provides dynamic addressing between 32-bit IP addresses and Ethernet addresses. For detailed information on ARP, refer to the *Router Products Configuration and Reference* publication.

**locIfarpInOctets**

Provides the ARP input octet count.

Syntax: Counter

Access: Read-only

**locIfarpInPkts**

Provides the ARP input packet count. It indicates the number of ARP Reply packets received by this router on this interface from other hosts.

Syntax: Counter

Access: Read-only

**locIfarpOutOctets**

Provides the ARP output octet count.

Syntax: Counter

Access: Read-only

**locIfarpOutPkts**

Provides the ARP output packet count. It indicates the number of ARP Request packets sent by this router on this interface to other hosts on the network.

Syntax: Counter

Access: Read-only

## AppleTalk

The following variables in the Interface group apply to interfaces running AppleTalk:

**locIfappletalkInOctets**

Provides the AppleTalk protocol input octet count.

Syntax: Counter

Access: Read-only

**locIfappletalkInPkts**

Provides the AppleTalk protocol input packet count.

Syntax: Counter

Access: Read-only

**locIfappletalkOutOctets**

Provides the AppleTalk protocol output octet count.

Syntax: Counter

Access: Read-only

**locIfappletalkOutPkts**

Provides the AppleTalk protocol output packet count.

Syntax: Counter

Access: Read-only

## Apollo

The following variables in the Interface group apply to interfaces running Apollo:

**locIfapolloInOctets**

Provides the Apollo protocol input octet count.

Syntax: Counter

Access: Read-only

**locIfapolloInPkts**

Provides the Apollo protocol input packet count.

Syntax: Counter

Access: Read-only

**locIfapolloOutOctets**

Provides the Apollo protocol output octet count.

Syntax: Counter

Access: Read-only

**locIfapolloOutPkts**

Provides the Apollo protocol output packet count.

Syntax: Counter

Access: Read-only

## Bridging

The following variables in the Interface group apply to interfaces running bridging protocols:

**locIfbridgedInOctets**

Provides the bridged protocol input octet count.

Syntax: Counter

Access: Read-only

**locIfbridgedInPkts**

Provides the bridged protocol input packet count.

Syntax: Counter

Access: Read-only

**locIfbridgedOutOctets**

Provides the bridged protocol output octet count.

Syntax: Counter

Access: Read-only

**locIfbridgedOutPkts**

Provides the bridged protocol output packet count.

Syntax: Counter

Access: Read-only

**locIfsrbInOctets**

Provides the Source-Route Bridging (SRB) protocol input octet count.

Syntax: Counter

Access: Read-only

**locIfsrbInPkts**

Provides the SRB protocol input packet count.

Syntax: Counter

Access: Read-only

**locIfsrbOutOctets**

Provides the SRB protocol output octet count.

Syntax: Counter

Access: Read-only

**locIfsrbOutPkts**

Provides the SRB protocol output packet count.

Syntax: Counter

Access: Read-only

## Connectionless Network Service (CLNS)

The following variables in the Interface group apply to interfaces running Connectionless Network Service (CLNS):

**locIfclnsInOctets**

Provides the CLNS protocol input byte count.

Syntax: Counter

Access: Read-only

**locIfclnsInPkts**

Provides the CLNS protocol input packet count.

Syntax: Counter

Access: Read-only

**locIfclnsOutOctets**

Provides the CLNS protocol output byte count.

Syntax: Counter

Access: Read-only

**locIfclnsOutPkts**

Provides the CLNS protocol output packet count.

Syntax: Counter

Access: Read-only

## DECnet

The following variables in the Interface group apply to interfaces running DECnet:

**locIfdecnetInOctets**

Provides the DECnet protocol input octet count.

Syntax: Counter

Access: Read-only

**locIfdecnetInPkts**

Provides the DECnet protocol input packet count.

Syntax: Counter

Access: Read-only

**locIfdecnetOutOctets**

Provides the DECnet protocol output octet count.

Syntax: Counter

Access: Read-only

**locIfdecnetOutPkts**

Provides the DECnet protocol output packet count.

Syntax: Counter

Access: Read-only

## HP Probe

The following variables in the Interface group apply to interfaces running HP Probe, an address resolution protocol developed by Hewlett-Packard:

**locIfprobeInOctets**

Provides the HP Probe protocol input octet count.

Syntax: Counter

Access: Read-only

**locIfprobeInPkts**

Provides the HP Probe protocol input packet count.

Syntax: Counter

Access: Read-only

**locIfprobeOutOctets**

Provides the HP Probe protocol output octet count.

Syntax: Counter

Access: Read-only

**locIfprobeOutPkts**

Provides the HP Probe protocol output packet count.

Syntax: Counter

Access: Read-only

## Internet Protocol (IP)

The following variables in the Interface group apply to interfaces running the Internet Protocol (IP):

**locIfipInOctets**

Provides the IP input octet count.

Syntax: Counter

Access: Read-only

**locIfipInPkts**

Provides the IP input packet count.

Syntax: Counter

Access: Read-only

**locIfipOutOctets**

Provides the IP output octet count.

Syntax: Counter

Access: Read-only

**locIfipOutPkts**

Provides the IP output packet count.

Syntax: Counter

Access: Read-only

## LAN Network Manager (LNM)

The following variables in the Interface group apply to interfaces running the LAN Network Manager (LNM) protocol. This protocol manages source-route bridging (SRB) networks.

**locIflanmanInOctets**

Provides the LAN Network Manager protocol input octet count.

Syntax: Counter

Access: Read-only

**locIflanmanInPkts**

Provides the LAN Network Manager protocol input packet count.

Syntax: Counter

Access: Read-only

**locIflanmanOutOctets**

Provides the LAN Network Manager protocol output octet count.

Syntax: Counter

Access: Read-only

**locIflanmanOutPkts**

Provides the LAN Network Manager protocol output packet count.

Syntax: Counter

Access: Read-only

## Maintenance Operation Protocol (MOP)

The following variables in the Interface group apply to interfaces running the Maintenance Operation Protocol (MOP):

**locIfmopInOctets**

Provides the MOP input octet count.

Syntax: Counter

Access: Read-only

**locIfmopInPkts**

Provides the MOP input packet count.

Syntax: Counter

Access: Read-only

**locIfmopOutOctets**

Provides the MOP output octet count.

Syntax: Counter

Access: Read-only

**locIfmopOutPkts**

Provides the MOP output packet count.

Syntax: Counter

Access: Read-only

## Novell

The following variables in the Interface group apply to interfaces running Novell:

**locIfnovellInOctets**

Provides the Novell protocol input octet count.

Syntax: Counter

Access: Read-only

**locIfnovellInPkts**

Provides the Novell protocol input packet count.

Syntax: Counter

Access: Read-only

**locIfnovellOutOctets**

Provides the Novell protocol output octet count.

Syntax: Counter

Access: Read-only

**locIfnovellOutPkts**

Provides the Novell protocol output packet count.

Syntax: Counter

Access: Read-only

## Other Protocols

The following variables in the Interface group record the number of input and output packets and octets for interfaces running protocols other than those listed in the Interface group:

**locIfotherInOctets**

Provides the input octet count for protocols other than those listed in the Interface group.

Syntax: Counter

Access: Read-only

**locIfotherInPkts**

Provides the input packet count for protocols other than those listed in the Interface group.

Syntax: Counter

Access: Read-only

**locIfotherOutOctets**

Provides the output octet count for protocols other than those listed in the Interface group.

Syntax: Counter

Access: Read-only

**locIfotherOutPkts**

Provides the output packet count for protocols other than those listed in the Interface group.

Syntax: Counter

Access: Read-only

## Serial Tunnel (STUN)

The following variables in the Interface group apply to interfaces using the Serial Tunnel (STUN) protocol. STUN allows devices that use Synchronous Data Link Control (SDLC) or High-Level Data Link Control (HDLC) to be connected through one or more Cisco routers across different network topologies.

**locIfstunInOctets**

Provides the STUN protocol input octet count.

Syntax: Counter

Access: Read-only

**locIfstunInPkts**

Provides the STUN protocol input packet count.

Syntax: Counter

Access: Read-only

**locIfstunOutOctets**

Provides the STUN protocol output octet count.

Syntax: Counter

Access: Read-only

**locIfstunOutPkts**

Provides the STUN protocol output packet count.

Syntax: Counter

Access: Read-only

## Spanning Tree

The following variables in the Interface group apply to interfaces running the Spanning Tree protocol. Used in bridging, spanning trees provide root and designated bridges to notify all other bridges in the network when an address change has occurred, thereby eliminating loops.

**locIfspanInOctets**

Provides the spanning-tree input octet packet count.

Syntax: Counter

Access: Read-only

**locIfspanInPkts**

Provides the spanning-tree input protocol packet count.

Syntax: Counter

Access: Read-only

**locIfspanOutOctets**

Provides the spanning-tree output octet packet count.

Syntax: Counter

Access: Read-only

**locIfspanOutPkts**

Provides the spanning-tree output protocol packet count.

Syntax: Counter

Access: Read-only

## Banyan Virtual Integrated Network Service (VINES)

The following variables in the Interface group apply to interfaces running the Banyan Virtual Integrated Network Service (VINES) protocol. This proprietary protocol is derived from the Xerox Network Systems (XNS) protocol. The VINES variables provide the number of input and output packets and octets on a per interface basis.

**locIfvinesInOctets**

Provides the VINES protocol input octet count.

Syntax: Counter

Access: Read-only

**locIfvinesInPkts**

Provides the VINES protocol input packet count.

Syntax: Counter

Access: Read-only

**locIfvinesOutOctets**

Provides the VINES protocol output octet count.

Syntax: Counter

Access: Read-only

**locIfvinesOutPkts**

Provides the VINES protocol output packet count.

Syntax: Counter

Access: Read-only

## Xerox Network Systems (XNS)

The following variables in the Interface group apply to interfaces running Xerox Network Systems (XNS).

**locIfxnsInOctets**

Provides the XNS protocol input octet count.

Syntax: Counter

Access: Read-only

**locIfxnsInPkts**

Provides the XNS input packet count.

Syntax: Counter

Access: Read-only

**locIfxnsOutOctets**

Provides the XNS protocol output octet count.

Syntax: Counter

Access: Read-only

**locIfxnsOutPkts**

Provides the XNS protocol output packet count.

Syntax: Counter

Access: Read-only

## Internet Protocol (IP) Group

The Internet Protocol (IP) group provides variables pertaining to the IP, such as the determination of how an interface obtained its IP address, who supplied the address, and Internet Control Message Protocol (ICMP) messages about IP packet processing.

### IP Address Table

The Cisco IP Address table, *lipAddrTable,* contains the following six variable entries, or rows: *locIPHelper, locIPHow, locIPRedirects, locIPSecurity, locIPUnreach,* and *locIPWho.* The index to this table is the IP address of the device, or *ipAdEntAddr.* If a device has *n* number of IP addresses, there will be *n* rows in the table.

For simplification, Table 6 shows only the *locIpHow* and *locIPWho* variables. The *locIPHow* variable value shows that the device at 131.108.201.245 obtained its address through nonvolatile memory. The *locIPWho* variable value indicates the device was assigned its current address by the device at 131.101.200.248.

**Table 6 IP Address**

| IP Address | locIPHow | locIPWho | and so on |
|---|---|---|---|
| 131.108.201.245 | nonvolatile | 131.101.200.248 | |
| 142.111.202.244 | nonvolatile | 131.56.70.249 | |
| and so on | | | |

#### locIPHelper

Provides the IP address for broadcast forwarding support. Provides the destination broadcast or IP address that the router should use when forwarding User Datagram Protocol (UDP) broadcast datagrams, including BootP, received on the interface.

Syntax: IpAddress

Access: Read-only

**locIPHow**

Describes how this interface obtained its IP address. Typically, the address is determined by nonvolatile memory.

Syntax: Display string

Access: Read-only

**locIPRedirects**

Indicates whether Internet Control Message Protocol (ICMP) redirects will be sent. A router sends an ICMP Redirect message to the originator of any datagram that it is forced to resend through the same interface on which it was received. It does so because the originating host presumably could have sent that datagram to the ultimate destination without involving the router at all. ICMP Redirect messages are sent only if the router is configured with the **ip redirects** command.

Syntax: Integer (1 = sent, 2 = not sent)

Access: Read-only

**locIPSecurity**

Indicates whether IP security is enabled on the interface. For details on IP security levels, see RFC 1108, *U.S. Department of Defense Security Options for the Internet Protocol*.

Syntax: Integer (0 = false, 1 = true)

Access: Read-only

**locIPUnreach**

Indicates whether Internet Control Message Protocol (ICMP) packets indicating unreachable addresses will be sent for a specific route.

If this variable is set, and the router receives a datagram that it cannot deliver to its ultimate datagram (because it knows of no route to the destination address), it replies to the originator of that datagram with an ICMP Host Unreachable message.

Syntax: Integer (0 = false, 1 = true)

Access: Read-only

**locIPWho**

Provides the IP address of the device from which this interface received its IP address. If the interface does not use an IP address from another device, a value of 0.0.0.0 displays.

Syntax: IpAddress

Access: Read-only

**End of Table**

## IP Routing Table

The local IP routing table, *lipRoutingTable*, contains two variables: *locRtCount* and *locRtMask*. The index for this table is the destination address of the IP route, or *ipRouteDest.* If there are *n* number of routes available to a device, there will be *n* rows in the IP routing table.

In Table 7, for the route with the destination IP address of 131.104.111.1, the routing table network mask is 255.255.255.0. The number of parallel routes within the routing table is 3, and the route was used in a forwarding operation two times.

**Table 7 IP Routing Table**

| ipRouteDest | locRtMask | locRtCount |
|---|---|---|
| 131.104.111.1 | 255.255.255.0 | 3 |
| 133.45.244.245 | 255.255.255.0 | 1 |

**locRtCount**

Provides the number of parallel routes within the IP Routing table.

Syntax: Integer

Access: Read-only

**locRtMask**

Provides the IP Routing table network mask. For example, 255.255.255.0.

Syntax: IpAddress

Access: Read-only

**End of Table**

**actLostByts**

Provides the total number of bytes of lost IP packets as a result of accounting failure.

Syntax: Integer

Access: Read-only

**actLostPkts**

Provides the number of IP packets that were lost due to memory limitations and accounting failure.

Syntax: Integer

Access: Read-only

**actThresh**

Provides the threshold of IP accounting records in use before IP traffic will be discarded.

Syntax: Integer

Access: Read-only

## IP Accounting Group

Cisco routers maintain two accounting databases: an active database and a checkpoint database. The router takes a snapshot of the running, or active database, and copies it into the checkpoint database. For detailed information on active and checkpoint databases, refer to the *Router Products Configuration and Reference* and *Router Products Command Reference* publications.

This group provides access to the active database that is created and maintained if IP accounting is enabled on a router. The active database contains information about the number of bytes and packets switched through a system on a source and destination IP address basis. Only transit IP traffic is measured and only on an outbound basis; traffic generated by the router or terminating in the router is not included in the accounting statistics. Internetwork statistics obtained through these variables can be analyzed to improve network performance.

### IP Accounting Table

The local IP accounting table, *lipAccountingTable*, includes four related variables: *actByts*, *actDst*, *actPkts*, and *actSrc*. The index for this table is *actSrc* and *actDst*. For example, in the first row in Table 8, the source host address is 131.24.35.248, and the destination host address is 138.32.28.245. Fifty IP packets and 400 bytes of data have been sent between the source and destination address.

**Table 8 Local IP Accounting Table**

| actByts | actDst | actPkts | actSrc |
|---|---|---|---|
| 400 | 138.32.28.245 | 50 | 131.24.35.248 |
| 1259 | 128.52.33.101 | 110 | 128.52.33.96 |

**actByts**

Provides the total number of bytes in IP packets from the source to destination host.

Syntax: Integer

Access: Read-only

**actDst**

Provides the IP destination address for the host traffic matrix.

Syntax: Ip Address

Access: Read-only

**actPkts**

Provides the number of IP packets sent from the source to destination host.

Syntax: Integer

Access: Read-only

**actSrc**

Provides the IP address for the host traffic matrix.

Syntax: IpAddress

Access: Read-only

**actViolation**

Specifies the access list number violated by packets from this source to this destination. A zero value indicates that no access list was violated.

Syntax: Integer

Access: Read-only

**End of Table**

**actAge**

Provides the age of the accounting data in the current data matrix of the active database.

Syntax: Timeticks

Access: Read-only

## IP Checkpoint Accounting Group

The Cisco router maintains two accounting databases: an active database and a checkpoint database. For detailed information on active and checkpoint databases, refer to the *Router Products Configuration and Reference* publication.

The running, or active database, is copied into the checkpoint database. If the checkpoint database already has data obtained previously from the active database, the router appends the latest copy of the active database to the existing data in the checkpoint database. The checkpoint database stores data retrieved from the active database until actCheckPoint is set or you delete the contents of this database by using the **clear ip accounting [checkpoint]** command.

A network management system (NMS) can use checkpoint MIB variables to analyze stable data in the checkpoint database.

### IP Checkpoint Accounting Table

The local IP Checkpoint Accounting table, *lipCkAccountingTable*, includes four related variables: *ckactByts*, *ckactDst*, *ckactPkts*, and *ckactSrc*. The index for this table is *ckacSrc* and *ckactDst*. For example, in Table 9, the source host address is 131.24.35.248. The destination host address is 138.32.28.245. Fifty IP packets and 400 bytes of data have been sent between the source and destination address.

**Table 9 IP Checkpoint Accounting**

| ckactByts | ckactDst | ckactPkts | ckacSrc |
|---|---|---|---|
| 400 | 138.32.28.245 | 50 | 131.24.35.248 |
| 480 | 124.45.222.246 | 60 | 123.34.216.244 |

**ckactByts**

Provides the total number of bytes in IP packets from source to destination in the checkpoint matrix.

Syntax: Integer

Access: Read-only

**ckactDst**

Provides the IP destination address of the host receiving the IP packets. The address is listed in the checkpoint traffic matrix.

Syntax: IpAddress

Access: Read-only

**ckactPkts**

Provides the number of IP packets sent from the source to the destination address in the checkpoint matrix.

Syntax: Integer

Access: Read-only

**ckactSrc**

Provides the IP source address of the host sending the IP packets. The address is listed in the checkpoint traffic matrix.

Syntax: IP address

Access: Read-only

**ckactViolation**

Provides the access list number violated by packets from source to destination in the checkpoint matrix.

Syntax: Integer

Access: Read-only

**End of Table**

**actCheckPoint**

Activates a checkpoint database. This variable must be read and then set to the same value that was read. The value read and then set will be incremented after a successful set request.

For detailed information on active and checkpoint databases, refer to the *Router Products Command Reference* and *Router Products Configuration and Reference* publications.

Syntax: Integer

Access: Read-write

**ckactAge**

Provides information on how long ago the data was first stored in the checkpoint matrix.

Syntax: Timeticks

Access: Read-only

**ipNoaccess**

Provides the total number of packets dropped due to access control failure.

Syntax: Counter

Access: Read-only

## IPX Accounting

The IPX Accounting table allows a related set of IPX accounting variables to be applied across several devices or interfaces.

**ipxactLostByts**

Provides the total bytes of lost IPX packets.

Syntax: Counter

Access: Read-only

**ipxactLostPkts**

Provides the lost IPX packets due to memory limitations.

Syntax: Counter

Access: Read-only

**ipxactThresh**

Provides the threshold of IPX accounting records in use before IPX traffic will be unaccounted.

Syntax: Integer

Access: Read-only

## Local IPX Accounting Table

The local IPX accounting table (see Table 10), *lipxAccountingTable*, provides access to the Cisco IPX accounting support. The Local IPX Accounting Table (see Table 11) includes the following variables: *ipxActSrc*, *ipxActDst*, *ipxActPkts*, and *ipxActByts*.

**Table 10 Local IPX Accounting Table**

| ipxActByts | ipxActDst | ipxActPkts | ipxActSrc |
|---|---|---|---|
| 10,000 | 1.000.0230.0110 | 40 | BADDAD.0110.0220.0333 |

**ipxActByts**

Provides the total number of bytes in IPX packets from source to destination.

Syntax: Counter

Access: Read-only

**ipxActDst**

Provides the IPX Destination address for host traffic matrix.

Syntax: Octet String

Access: Read-only

**ipxActPkts**

Provides the number of IPX packets sent from source to destination.

Syntax: Counter

Access: Read-only

**ipxActSrc**

Provides the IPX source address for host traffic matrix.

Syntax: Octet String

Access: Read-only

**End of Table**

**ipxActAge**

Provides the age of the data in the current IPX data matrix.

Syntax: TimeTicks

Access: Read-only

## Local IPX Checkpoint Accounting Table

The Local IPX Checkpoint Accounting table, *ipxCkAccountingTable*, includes four related variables: *ipxckActByts*, *ipxckActDst*, *ipxckActPkts*, and *ipxckActSrc*. The index for this table is ckActSrc and ckActDst.

**Table 11 IPX Checkpoint Accounting**

| ipxckActBytes | ipxckActDst | ipxckActPkts | ipxckActSrc |
|---|---|---|---|
| 10,000 | 1.000.0230.0110 | 40 | BADDAD.0110.0220.0333 |

### ipxckActDst

Provides the IPX destination address for host in checkpoint traffic matrix.

Syntax: Octet String

Access: Read-only

### ipxckActPkts

Provides the number of IPX packets sent from source to destination in checkpoint matrix.

Syntax: Counter

Access: Read-only

### ipxckActSrc

Provides the IPX source address for host in checkpoint traffic matrix.

Syntax: Octet String

Access: Read-only

**End of Table**

**ipxckActAge**

Provides the age of data in the IPX checkpoint matrix.

Syntax: TimeTicks

Access: Read-only

**ipxckActCheckPoint**

Provides a checkpoint to the IPX accounting database. This MIB variable must be read and then set with the same value for the checkpoint to succeed. The value read and then set will be incremented after a successful set request

Syntax: Integer

Access: Read-write

## CiscoMgmt Group

This section describes the group of MIB variables managed by Cisco Systems.

## ciscoVINES Group

The MIB module in this section describes the management of VINES routing information in Cisco devices.

**cvBasicNetwork**

Specifies the VINES network number of this router.

Syntax: VinesNetworkNumber

Max-Access: Read-only

**cvBasicHost**

Specifies the VINES host (subnetwork) number of this router.

Syntax: VinesHostNumber

Max-Access: Read-only

**cvBasicNextClient**

Specifies the next VINES client host (subnetwork) number to be assigned by this router.

Syntax: VinesHostNumber

Max-Access: Read-only

## Neighbor Table

The Cisco VINES Neighbor Table contains the objects listed in this section.

**cvForwNeighborNeighborCount**

Specifies the number of neighbors in the neighbor table, cvForwNeighborTable.

Syntax: Gauge32

Max-Access: Read-only

**cvForwNeighborPathCount**

Specifies the number of paths in the neighbor table, cvForwNeighborTable.

Syntax: Gauge32

Max-Access: Read-only

**cvForwNeighborVersion**

Specifies the version number of the neighbor table, cvForwNeighborTable, which is incremented each time a route or path is added or deleted.

Syntax: Integer32

Max-Access: Read-only

**cvForwNeighborTable**

Specifies a table of information about neighbors of this router.

Syntax: SEQUENCE OF CvForwNeighborEntry

Max-Access: Not-accessible

**cvForwNeighborNetwork**

Specifies the network part of the neighbor's VINES internet address.

Syntax: VinesNetworkNumber

Max-Access: Not-accessible

**cvForwNeighborHost**

Specifies the host part of the neighbor’s VINES internet address.

Syntax: VinesHostNumber

Max-Access: Not-accessible

**cvForwNeighborPhysAddress**

Specifies the neighbor’s physical address on the network interface as indicated by this entry’s ifIndex and interpreted according to ifType at ifIndex in ifTable.

Syntax: PhysAddress

Max-Access: Not-accessible

**cvForwNeighborSource**

Specifies the source of this entry.

Syntax: Integer 1 = unrecognized, 2 = self, 3= rtpRedirect, 4 = rtpUpdate, 5 = manualRoute, 6 = igrp, 7 = test, 8 = manualNeighbor

Max-Access: Read-only

**cvForwNeighborRtpVersion**

Specifies the version of RTP through which the entry was learned.

Syntax: Integer32 (0–255)

Max-Access: Read-only

**cvForwNeighborUsageType**

Specifies the way in which this path will be used to forward a message.

Syntax: Integer 1 = next, 2 = roundRobin, 3 = backup

Max-Access: Read-only

**cvForwNeighborAge**

Specifies the age of the entry, in seconds. The value –1 indicates not applicable for RTP Version 0 neighbors on WAN interfaces when the interface is configured for delta-only updates.

Syntax: Integer32 (–1–65535)

Max-Access: Read-only

**cvForwNeighborMetric**

Specifies the expected one-way delay to send a message to this neighbor

Syntax: VinesMetric

Max-Access: Read-only

**cvForwNeighborUses**

Specifies the number of times the path has been used to forward a message for all cvForwNeighborSource values except “manualRoute.” For a “manualRoute,” the cvForwNeighborUses variable specifies the number of static routes that use this neighbor as its first hop.

Syntax: Counter32

Max-Access: Read-only

**End of Table**

## VINES Route Table

The VINES Route table contains the objects specified in this section.

**cvForwRouteRouterCount**

Specifies the number of routers (servers) in the route table, cvForwRouteTable.

Syntax: Gauge32

Max-Access: Read-only

**cvForwRouteRouteCount**

Specifies the number of routes in the route table, cvForwRouteTable.

Syntax: Gauge32

Max-Access: Read-only

**cvForwRouteVersion**

Specifies the version number of the route table, cvForwRouteTable, incremented each time a route or server (router) is added or deleted.

Syntax: Integer32

Max-Access: Read-only

**cvForwRouteUpdateCountdown**

Specifies the number of seconds until the next routing update.

Syntax: Gauge32

Max-Access: Read-only

**cvForwRouteTable**

Specifies a table of information about routes from this router to other VINES networks.

Syntax: SEQUENCE OF CvForwRouteEntry

Max-Access: Not-accessible

**cvForwRouteNetworkNumber**

Specifies the remote network's VINES network number.

Syntax: VinesNetworkNumber

Max-Access: Not-accessible

**cvForwRouteNeighborNetwork**

Specifies the network part of the VINES internetwork address of the neighbor that is the next hop to the remote network. Because the neighbor is a router by definition, its host number is 1.

Syntax: VinesNetworkNumber

Max-Access: Not-accessible

**cvForwRouteSource**

Specifies the source of this entry.

Syntax: Integer 1 = unrecognized, 2 = self, 3 = rtpRedirect, 4 = rtpUpdate, 5 = manualRoute, 6 = igrp, 7 = test

Max-Access: Read-only

**cvForwRouteRtpVersion**

Specifies the version of RTP through which the entry was learned.

Syntax: Integer32 (0–255)

Max-Access: Read-only

**cvForwRouteUseNext**

Specifies whether this route is the one to use next to get to the remote network.

Syntax: TruthValue

Max-Access: Read-only

**cvForwRouteForwardBroadcast**

Specifies whether this route will be used to forward a broadcast from a serverless network.

Syntax: TruthValue

Max-Access: Read-only

**cvForwRouteSuppress**

Specifies whether this route is temporarily being suppressed as normal operation before eventually advertising it.

Syntax: TruthValue

Max-Access: Read-only

**cvForwRouteLoadShareEligible**

Specifies whether this route is eligible for load sharing because its metric is equal to the best metric for the same neighbor.

Syntax: TruthValue

Max-Access: Read-only

**cvForwRouteAge**

Specifies the age of the entry, in seconds. The value –1 indicates not applicable for RTP Version 0 neighbors on WAN interfaces when the interface is configured for delta-only updates.

Syntax: Integer32 (–1–65535)

Max-Access: Read-only

**cvForwRouteMetric**

Specifies the expected one-way delay, in milliseconds to send a message on this route.

Syntax: VinesMetric

Max-Access: Read-only

**cvForwRouteUses**

Specifies the number of times the route has been used to forward a message.

Syntax: Counter32

Max-Access: Read-only

## Global Total Counters

The global total counters used by the Cisco VINES MIB contains objects listed in this section.

**cvTotalInputPackets**

Specifies the total count of number of VINES input packets.

Syntax: Counter32

Max-Access: Read-only

**cvTotalOutputPackets**

Specifies the total count of number of VINES output packets.

Syntax: Counter32

Max-Access: Read-only

**cvTotalLocalDestPackets**

Specifies the total count of VINES input packets for this host.

Syntax: Counter32

Max-Access: Read-only

**cvTotalForwardedPackets**

Specifies the total count of number of VINES packets forwarded.

Syntax: Counter32

Max-Access: Read-only

**cvTotalBroadcastInPackets**

Specifies the total count of number of VINES input broadcast packets.

Syntax: Counter32

Max-Access: Read-only

**cvTotalBroadcastOutPackets**

Specifies the total count of number of VINES output broadcast packets.

Syntax: Counter32

Max-Access: Read-only

**cvTotalBroadcastForwardPackets**

Specifies the total count of number of VINES broadcast packets forwarded.

Syntax: Counter32

Max-Access: Read-only

**cvTotalLanOnlyPackets**

Specifies the total count of number of VINES broadcast packets not forwarded to all interfaces because the LAN ONLY bit was set.

Syntax: Counter32

Max-Access: Read-only

**cvTotalNotOver4800Packets**

Specifies the total count of number of VINES broadcast packets not forwarded to all interfaces because the OVER 4800 BPS bit was set.

Syntax: Counter32

Max-Access: Read-only

**cvTotalNoChargesPackets**

Specifies the total count of number of VINES broadcast packets not forwarded to all interfaces because the NO CHARGES only bit was set.

Syntax: Counter32

Max-Access: Read-only

**cvTotalFormatErrors**

Specifies the total count of VINES input packets with header errors.

Syntax: Counter32

Max-Access: Read-only

**cvTotalChecksumErrors**

Specifies the total count of VINES input packets with checksum errors.

Syntax: Counter32

Max-Access: Read-only

**cvTotalHopCountsExceeded**

Specifies the total count of VINES input packets that have exceeded the maximum hop count.

Syntax: Counter32

Max-Access: Read-only

**cvTotalNoRouteDrops**

Specifies the total count of VINES packets dropped due to no route.

Syntax: Counter32

Max-Access: Read-only

**cvTotalEncapsFailedDrops**

Specifies the total count of VINES packets dropped due to output encapsulation failed.

Syntax: Counter32

Max-Access: Read-only

**cvTotalUnknownPackets**

Specifies the total count of unknown VINES input packets.

Syntax: Counter32

Max-Access: Read-only

**cvTotalIcpInPackets**

Specifies the total count of VINES ICP packets received.

Syntax: Counter32

Max-Access: Read-only

**cvTotalIcpOutPackets**

Specifies the total count of VINES ICP packets generated.

Syntax: Counter32

Max-Access: Read-only

**cvTotalMetricOutPackets**

Specifies the total count of VINES ICP Metric Notification packets generated.

Syntax: Counter32

Max-Access: Read-only

**cvTotalMacEchoInPackets**

Specifies the total count of VINES MAC level Echo packets received.

Syntax: Counter32

Max-Access: Read-only

**cvTotalMacEchoOutPackets**

Specifies the total count of VINES MAC level Echo packets generated.

Syntax: Counter32

Max-Access: Read-only

**cvTotalEchoInPackets**

Specifies the total count of VINES Echo packets received.

Syntax: Counter32

Max-Access: Read-only

**cvTotalEchoOutPackets**

Specifies the total count of VINES Echo packets generated.

Syntax: Counter32

Max-Access: Read-only

**cvTotalProxyOutPackets**

Specifies the total count of proxy packets sent.

Syntax: Counter32

Max-Access: Read-only

**cvTotalProxyReplyOutPackets**

Specifies the total count of responses to proxy packets.

Syntax: Counter32

Max-Access: Read-only

## Interface Configuration Table

The Interface Configuration Table (cvInterface) contains the objects listed in this section.

**cvIfConfigMetric**

Specifies the VINES protocol metric value.

Syntax: VinesMetric

Max-Access: Read-only

**cvIfConfigEncapsulation**

Specifies the VINES protocol default encapsulation

Syntax: Integer 1 = arpa, 2 = tokenRing, 3 = snap

Max-Access: Read-only

**cvIfConfigAccesslist**

Specifies the VINES protocol outgoing access list number.

Syntax: Integer32

Max-Access: Read-only

**cvIfConfigPropagate**

Specifies the VINES protocol propagation control.

Syntax: Integer 1 = never, 2 = always, 3 = dynamic

Max-Access: Read-only

**cvIfConfigArpEnabled**

Specifies the VINES protocol arp replies enabled.

Syntax: Integer 1 = never, 2 = always, 3 = dynamic

Max-Access: Read-only

**cvIfConfigServerless**

Specifies that VINES protocol serverless support is enabled.

Syntax: Integer 1 = never, 2 = dynamic, 3 = always, 4 = alwaysBroadcast

Max-Access: Read-only

**cvIfConfigRedirectInterval**

Specifies the VINES protocol redirect interval in milliseconds.

Syntax: Integer32

Max-Access: Read-only

**cvIfConfigSplitDisabled**

Specifies that the VINES protocol split horizon is disabled.

Syntax: TruthValue

Max-Access: Read-only

**cvIfConfigLineup**

Specifies whether the VINES protocol line is up or down.

Syntax: TruthValue

Max-Access: Read-only

**cvIfConfigFastokay**

Specifies whether the VINES protocol fast switching is supported.

Syntax: TruthValue

Max-Access: Read-only

**cvIfConfigRouteCache**

Specifies whether the VINES protocol fast switching was requested.

Syntax: TruthValue

Max-Access: Read-only

**cvIfConfigInputRouterFilter**

Specifies the VINES protocol filter on received routing information source address.

Syntax: Integer32

Max-Access: Read-only

**cvIfConfigInputNetworkFilter**

Specifies the VINES protocol filter on received routing information content.

Syntax: Integer32

Max-Access: Read-only

**cvIfConfigOutputNetworkFilter**

Specifies the VINES protocol filter on transmitted routing information content.

Syntax: Integer32

Max-Access: Read-only

**End of Table**

## Interface Input Counter Table

The Interface Input Counter Table (cvIfCountInTable) contains the objects listed in this section.

**cvIfCountInNotEnabledDrops**

Specifies the VINES protocol count of input packets that were discarded because the interface was not configured.

Syntax: Counter32

Max-Access: Read-only

**cvIfCountInFormatErrors**

Specifies the VINES protocol count of input packets with format errors.

Syntax: Counter32

Max-Access: Read-only

**cvIfCountInLocalDestPackets**

Specifies the VINES protocol count of input packets destined for this router.

Syntax: Counter32

Max-Access: Read-only

**cvIfCountInBroadcastPackets**

Specifies the VINES protocol input broadcast count.

Syntax: Counter32

Max-Access: Read-only

**cvIfCountInForwardedPackets**

Specifies the VINES protocol count of input packets forwarded to another interface.

Syntax: Counter32

Max-Access: Read-only

**cvIfCountInNoRouteDrops**

Specifies the VINES protocol count of input packets that were dropped because there was no route to the destination.

Syntax: Counter32

Max-Access: Read-only

**cvIfCountInZeroHopCountDrops**

Specifies the VINES protocol count of input packets that were dropped due to a zero hop count.

Syntax: Counter32

Max-Access: Read-only

**cvIfCountInChecksumErrors**

Specifies the VINES protocol count of input packets with checksum errors.

Syntax: Counter32

Max-Access: Read-only

**cvIfCountInArpQueryRequests**

Specifies the VINES protocol count of input ARP Query Request messages.

Syntax: Counter32

Max-Access: Read-only

**cvIfCountInArpQueryResponses**

Specifies the VINES protocol count of input ARP Query Response messages.

Syntax: Counter32

Max-Access: Read-only

**cvIfCountInArpAssignmentRequests**

Specifies the VINES protocol count of input ARP Assignment Request messages.

Syntax: Counter32

Max-Access: Read-only

**cvIfCountInArpAssignmentResponses**

Specifies the VINES protocol count of input ARP Assignment Response messages.

Syntax: Counter32

Max-Access: Read-only

**cvIfCountInArpIllegalMessages**

Specifies the VINES protocol count of input illegal ARP messages.

Syntax: Counter32

Max-Access: Read-only

**cvIfCountInIcpErrorMessages**

Specifies the VINES protocol count of input ICP error messages.

Syntax: Counter32

Max-Access: Read-only

**cvIfCountInIcpMetricMessages**

Specifies the VINES protocol count of input ICP metric messages.

Syntax: Counter32

Max-Access: Read-only

**cvIfCountInIcpIllegalMessages**

Specifies the VINES protocol count of input illegal ICP messages.

Syntax: Counter32

Max-Access: Read-only

**cvIfCountInIpcMessages**

Specifies the VINES protocol count of input IPC messages.

Syntax: Counter32

Max-Access: Read-only

**cvIfCountInRtp0Messages**

Specifies the VINES protocol count of input RTP type 0 messages.

Syntax: Counter32

Max-Access: Read-only

**cvIfCountInRtp1Messages**

Specifies the VINES protocol count of input RTP Request messages.

Syntax: Counter32

Max-Access: Read-only

**cvIfCountInRtp2Messages**

Specifies the VINES protocol count of input RTP type 2 messages.

Syntax: Counter32

Max-Access: Read-only

**cvIfCountInRtp3Messages**

Specifies the VINES protocol count of input RTP type 3 messages.

Syntax: Counter32

Max-Access: Read-only

**cvIfCountInRtpUpdateMessages**

Specifies the VINES protocol count of input RTP Update messages.

Syntax: Counter32

Max-Access: Read-only

**cvIfCountInRtpResponseMessages**

Specifies the VINES protocol count of input RTP Response messages.

Syntax: Counter32

Max-Access: Read-only

**cvIfCountInRtpRedirectMessages**

Specifies the VINES protocol count of input RTP Redirect messages.

Syntax: Counter32

Max-Access: Read-only

**cvIfCountInRtpIllegalMessages**

Specifies the VINES protocol count of input illegal RTP messages.

Syntax: Counter32

Max-Access: Read-only

**cvIfCountInSppMessages**

Specifies the VINES protocol count of input SPP messages.

Syntax: Counter32

Max-Access: Read-only

**cvIfCountInIpUnknownProtocols**

Specifies the VINES protocol count of input packets of unknown VINES protocols.

Syntax: Counter32

Max-Access: Read-only

**cvIfCountInIpcUnknownPorts**

Specifies the VINES protocol count of input packets of unknown VINES IPC ports.

Syntax: Counter32

Max-Access: Read-only

**cvIfCountInBroadcastsHelpered**

Specifies the VINES protocol count of input packets helpered to another server.

Syntax: Counter32

Max-Access: Read-only

**cvIfCountInBroadcastsForwarded**

Specifies the VINES protocol input broadcast forwarded to other interface(s).

Syntax: Counter32

Max-Access: Read-only

**cvIfCountInBroadcastDuplicates**

Specifies the VINES protocol input duplicate broadcast count.

Syntax: Counter32

Max-Access: Read-only

**cvIfCountInEchoPackets**

Specifies the VINES protocol count of input IPC echo messages.

Syntax: Counter32

Max-Access: Read-only

**cvIfCountInMacEchoPackets**

Specifies the VINES protocol count of input MAC layer echo frames.

Syntax: Counter32

Max-Access: Read-only

**cvIfCountInProxyReplyPackets**

Specifies the VINES protocol count of responses to proxy packets.

Syntax: Counter32

Max-Access: Read-only

**End of Table**

## Interface Output Counter Table

The VINES interface output counter table (cvIfCountOutTable) contains the objects in this section.

**cvIfCountOutUnicastPackets**

Specifies the VINES protocol unicast packets generated.

Syntax: Counter32

Max-Access: Read-only

**cvIfCountOutBroadcastPackets**

Specifies the VINES protocol broadcast packets generated.

Syntax: Counter32

Max-Access: Read-only

**cvIfCountOutForwardedPackets**

Specifies the VINES protocol count of forwarded packets.

Syntax: Counter32

Max-Access: Read-only

**cvIfCountOutEncapsulationFailures**

Specifies the VINES protocol output encapsulation failures.

Syntax: Counter32

Max-Access: Read-only

**cvIfCountOutAccessFailures**

Specifies the VINES protocol output access list failures.

Syntax: Counter32

Max-Access: Read-only

**cvIfCountOutDownFailures**

Specifies the VINES protocol output interface down count.

Syntax: Counter32

Max-Access: Read-only

**cvIfCountOutPacketsNotBroadcastToSource**

Specifies the VINES protocol output broadcast not sent because interface leads back to the source.

Syntax: Counter32

Max-Access: Read-only

**cvIfCountOutPacketsNotBroadcastLanOnly**

Specifies the VINES protocol output broadcast not sent due to Lan Only class.

Syntax: Counter32

Max-Access: Read-only

**cvIfCountOutPacketsNotBroadcastNotOver4800**

Specifies the VINES protocol output broadcast not sent due to High Speed class.

Syntax: Counter32

Max-Access: Read-only

**cvIfCountOutPacketsNotBroadcastNoCharge**

Specifies the VINES protocol output broadcast not sent due to No Charges class.

Syntax: Counter32

Max-Access: Read-only

**cvIfCountOutBroadcastsForwarded**

Specifies the VINES protocol output broadcast forwarded from another interface.

Syntax: Counter32

Max-Access: Read-only

**cvIfCountOutBroadcastsHelpered**

Specifies the VINES protocol output broadcast helpered to a VINES server.

Syntax: Counter32

Max-Access: Read-only

**cvIfCountOutArpQueryRequests**

Specifies the VINES protocol count of output ARP Query Request messages.

Syntax: Counter32

Max-Access: Read-only

**cvIfCountOutArpQueryResponses**

Specifies the VINES protocol count of output ARP Query Response messages.

Syntax: Counter32

Max-Access: Read-only

**cvIfCountOutArpAssignmentRequests**

Specifies the VINES protocol count of output ARP Assignment Request messages.

Syntax: Counter32

Max-Access: Read-only

**cvIfCountOutArpAssignmentResponses**

Specifies the VINES protocol count of input ARP Assignment Response messages.

Syntax: Counter32

Max-Access: Read-only

**cvIfCountOutIcpErrorMessages**

Specifies the VINES protocol count of output IPC Error messages.

Syntax: Counter32

Max-Access: Read-only

**cvIfCountOutIcpMetricMessages**

Specifies the VINES protocol count of output IPC metric messages.

Syntax: Counter32

Max-Access: Read-only

**cvIfCountOutIpcMessages**

Specifies the VINES protocol count of output ICP messages.

Syntax: Counter32

Max-Access: Read-only

**cvIfCountOutRtp0Messages**

Specifies the VINES protocol count of output RTP type 0 messages.

Syntax: Counter32

Max-Access: Read-only

**cvIfCountOutRtpRequestMessages**

Specifies the VINES protocol count of output RTP Request messages.

Syntax: Counter32

Max-Access: Read-only

**cvIfCountOutRtp2Messages**

Specifies the VINES protocol count of output RTP type 2 messages.

Syntax: Counter32

Max-Access: Read-only

**cvIfCountOutRtp3Messages**

Specifies the VINES protocol count of output RTP type 3 messages.

Syntax: Counter32

Max-Access: Read-only

**cvIfCountOutRtpUpdateMessages**

Specifies the VINES protocol count of output RTP Update messages.

Syntax: Counter32

Max-Access: Read-only

**cvIfCountOutRtpResponseMessages**

Specifies the VINES protocol count of output RTP Response messages.

Syntax: Counter32

Max-Access: Read-only

**cvIfCountOutRtpRedirectMessages**

Specifies the VINES protocol count of output RTP Redirect messages.

Syntax: Counter32

Max-Access: Read-only

**cvIfCountOutSppMessages**

Specifies the VINES protocol count of output SPP messages.

Syntax: Counter32

Max-Access: Read-only

**cvIfCountOutEchoPackets**

Specifies the VINES protocol count of output IPC echo messages.

Syntax: Counter32

Max-Access: Read-only

**cvIfCountOutMacEchoPackets**

Specifies the VINES protocol count of output IPCMAC layer echo frames.

Syntax: Counter32

Max-Access: Read-only

**cvIfCountOutProxyPackets**

Specifies the VINES protocol count of proxy packets sent.

Syntax: Counter32

Max-Access: Read-only

## ciscoDiscovery Protocol Group

The MIB module in this section describes the management of the Cisco Discovery Protocol in Cisco devices.

## cdpInterfaceTable

The (conceptual) table containing the status of CDP on the device's interfaces.

Syntax: SEQUENCE OF CdpInterfaceEntry

Max-Access: Not-accessible

### cdpInterfaceEntry

Specifies an entry (conceptual row) in the cdpInterfaceTable containing the status of CDP on an interface.

Syntax: CdpInterfaceEntry

Max-Access: Not-accessible

### cdpInterfaceIfIndex

Specifies the ifIndex value of the local interface. For 802.3 Repeaters on which the repeater ports do not have ifIndex values assigned, this value is a unique value for the port, and greater than any ifIndex value supported by the repeater; in this case, the specific port is indicated by corresponding values of cdpInterfaceGroup and cdpInterfacePort, where these values correspond to the group number and port number values of RFC 1516.

Syntax: Integer32

Max-Access: Not-accessible

### cdpInterfaceEnable

Provides an indication of whether the Cisco Discovery Protocol is currently running on this interface.

Syntax: TruthValue

Max-Access: Read-write

**cdpInterfaceMessageInterval**

Specifies the interval at which CDP messages are to be generated on this interface. The default value is 60 seconds.

Syntax: Integer (10–300). Units are in seconds.

Max-Access: Read-write

**cdpInterfaceGroup**

This object is only relevant to interfaces that are repeater ports on 802.3 repeaters. In this situation, it indicates the RFC1516 group number of the repeater port which corresponds to this interface.

Syntax: Integer32

Max-Access: Read-only

**cdpInterfacePort**

This object is only relevant to interfaces that are repeater ports on 802.3 repeaters. In this situation, it indicates the RFC1516 port number of the repeater port that corresponds to this interface.

Syntax: Integer32

Max-Access: Read-only

**End of Table**

## cdpCacheTable

Specifies the (conceptual) table containing the cached information obtained by means of receiving CDP messages.

Syntax: SEQUENCE OF CdpCacheEntry

Max-Access: Not-accessible

**cdpCacheEntry**

Specifies an entry (conceptual row) in the cdpCacheTable containing the information received by means of CDP on one interface from one device.

Syntax: CdpCacheEntry

Max-Access: Not-accessible

**cdpCacheIfIndex**

Normally specifies the ifIndex value of the local interface. For 802.3 Repeaters for which the repeater ports do not have ifIndex values assigned, this value is a unique value for the port, and greater than any ifIndex value supported by the repeater; the specific port number, in this case, is given by the corresponding value of cdpInterfacePort.

Syntax: Integer32

Max-Access: Not-accessible

**cdpCacheDeviceIndex**

Specifies a unique value for each device from which CDP messages are being received.

Syntax: Integer32

Max-Access: Not-accessible

**cdpCacheAddressType**

Provides an indication of the type of address contained in the corresponding instance of cdpCacheAddress.

Syntax: CiscoNetworkProtocol

Max-Access: Read-only

**cdpCacheAddress**

Specifies the (first) network-layer address of the device's SNMP-agent as reported in the most recent CDP message. For example, if the the corresponding instance of cacheAddressType had the value ip(1), then this object would be an IP-address.

Syntax: CiscoNetworkAddress

Max-Access: Read-only

**cdpCacheVersion**

Specifies the Version string as reported in the most recent CDP message. The zero-length string indicates no Version field (TLV) was reported in the most recent CDP message.

Syntax: DisplayString

Max-Access: Read-only

**cdpCacheDeviceId**

Specifies the Device-ID string as reported in the most recent CDP message. The zero-length string indicates no Device-ID field (TLV) was reported in the most recent CDP message.

Syntax: DisplayString

Max-Access: Read-only

**cdpCacheDevicePort**

Specifies the Port-ID string as reported in the most recent CDP message. This will typically be the value of the ifName object (for example, Ethernet0). The zero-length string indicates no Port-ID field (TLV) was reported in the most recent CDP message.

Syntax: DisplayString

Max-Access: Read-only

**cdpCachePlatform**

Specifies the device's hardware platform as reported in the most recent CDP message. The zero-length string indicates that no Platform field (TLV) was reported in the most recent CDP message.

Syntax: DisplayString

Max-Access: Read-only

**cdpCacheCapabilities**

Specifies the device's functional capabilities as reported in the most recent CDP message. For latest set of specific values, see the latest version of the CDP specification. The zero-length string indicates no Capabilities field (TLV) was reported in the most recent CDP message.

Syntax: OCTET STRING (SIZE (0–4))

Max-Access: Read-only

## CiscoIntegrated Services Digital Network (ISDN) MIBGroup

Describes the status of the ISDN Interfaces on Cisco devices.The ISDN hardware interface Basic Rate Interface (BRI) or Primary Rate Interface (PRI) will be represeted by the D channel. This will have an ifType value of basicISDN(20) or primaryISDN(21). For related information, refer to RFC 1213.

Each B channel will also be represented in an an entry in the ifTable. The B channels will have an ifType value of other(1). This model will be used while defining objects and tables for management.

The ISDN MIB will allow sub-layers. For example, the data transfer over a B channel may take place with PPP encapsulation. While the ISDN MIB will describe the B channel, a media specific MIB for PPP can be used on a layered basis. This will be as per RFC 1573. The isdn call information will be stored in the neighbor table

## demandNbrTable

Specifies the list of neighbors from which the router will accept calls or to which it will place them.

Syntax: SEQUENCE OF DemandNbrEntry

Max-Access: Not-accessible

### demandNbrEntry

Specifies a single Neighbor. This entry is effectively permanent, and contains information describing the neighbor, his permissions, his last call attempt, and his cumulative effects.

Syntax: DemandNbrEntry

Max-Access: Not-accessible

### demandNbrPhysIf

Specifies the ifIndex value of the physical interface the neighbor will be called on. On an ISDN interface, this is the ifIndex value of the D channel.

Syntax: Integer32 (1—2147483647)

Max-Access: Not-accessible

### demandNbrId

Specifies an arbitrary sequence number associated with the neighbor.

Syntax: Integer32

Max-Access: Not-accessible

**demandNbrLogIf**

Specifies the ifIndex value of virtual interface associated with the neighbor.This interface maintains a queue of messages holding for the neighbor awaiting call completion, and all statistics.

Syntax: Integer32 (1..2147483647)

Max-Access: Read-create

**demandNbrName**

Specifies the ASCII name of the neighbor.

Syntax: DisplayString

Max-Access: Read-create

**demandNbrAddress**

Specifies the Call Address at which the neighbor should be called.Consider this address as the set of characters following 'ATDT 'or the 'phone number' included in a D channel call request.

Syntax: DisplayString

Max-Access: Read-create

**demandNbrPermission**

Specifies the applicable permissions.

Syntax: Integer 1 = iCanCallHim, 2 = heCanCallMe, 3 = weCanCallEachOther

Max-Access: Read-create

**demandNbrMaxDuration**

Maximum call duration in seconds. Zero means 'unlimited'.

Syntax: Integer32 (1..2147483647)

Max-Access: Read-create

**demandNbrLastDuration**

Specifies the duration of last call in seconds.

Syntax: Integer32 (1—2147483647)

Max-Access: Read-only

**demandNbrClearReason**

Specifies the ASCII reason that the last call terminated.

Syntax: DisplayString

Max-Access: Read-only

**demandNbrClearCode**

Specifies the encoded reason for the last call tear down.

Syntax: OCTET STRING

Max-Access: Read-only

**demandNbrSuccessCalls**

Specifies the number of completed calls to neighbor since system reset.

Syntax: Counter32

Max-Access: Read-only

**demandNbrFailCalls**

Specifies the number of call attempts that have failed.

Syntax: Counter32

Max-Access: Read-only

**demandNbrAcceptCalls**

Specifies the number of calls accepted from the neighbor.

Syntax: Counter32

Max-Access: Read-only

**demandNbrRefuseCalls**

Specifies the number of calls from neighbor that we have refused.

Syntax: Counter32

Max-Access: Read-only

**demandNbrLastAttemptTime**

Specifies the sysUpTime of last call attempt.

Syntax: TimeStamp

Max-Access: Read-only

**demandNbrStatus**

Enables a new vendor to manage the device using SNMP...

Syntax: RowStatus

Max-Access: Read-create

**End of Table**

## Trap related to connection management

This section lists the trap associated with the ciscoISDN MIB group.

**demandNbrCallInformation**

This trap/inform is sent to the manager whenever a successful call clears, or a failed call attempt is determined to have ultimately failed. In the event that call retry is active, then this is after all retry attempts have failed. However, only one such trap is sent in between successful callattempts; subsequent call attempts result in no trap.

## Qualified Logical Link Control (QLLC) MIB Group

The QLLC MIB includes a managed entity or LS (link station). The managed entity includes objects needed to configure and monitor the logical connections.

**Note** Although some objects are specified with a Max-Access of read-write, IOS Release 10.3 singularly implements read-only access.

### QLLC Link Station Administrative Table (qllcLSAdminTable)

This table contains objects that can be changed for each qllc entry. Changing one of these parameters will take effect in the operating LS immediately. Each qllc connection will have an entry in this table.

Syntax: SEQUENCE OF QllcLSAdminEntry

Access: Not-accessible

**qllcLSAdminIfIndex**

Specifies the interface index value for the qllc connection.

Syntax: IfIndexType

Max-Access: Read-write

**qllcLSAdminLciVcIndex**

Specifies the virtual circuit number for the logical channel identifier or PVC number depending on the type of circuit on this interface.

Syntax: IfIndexType

Max-Access: Read-write

**qllcLSAdminCircuitType**

Specifies the circuit type on this interface.

Syntax: Integer 1 = switchedVC, 2 = permanentVC

Max-Access: Read-write

**qllcLSAdminRole**

Specifies the role that the QLLC link station shall assume.

Syntax: Integer 1 = primary, 2 = secondary, 3 = peerToPeer

Max-Access: Read-write

**qllcLSAdminX25Add**

Specifies the X.25 address associated with the qllc connection.

Syntax: X121Address

Max-Access: Read-write

**qllcLSAdminModulo**

Specifies the modulus for QLLC link station. It determines the size of the rotating ACK window and can take values of 8 and 128.

Syntax: Integer 1 = modulo8, 2 = modulo128

Max-Access: Read-write

**qllcLSAdminLgX25**

Specifies the largest QLLC packet allowed to go out on the QLLC/X.25 side.

Syntax: Integer32

Max-Access: Read-write

## QLLC Link Station Operational Table (qllcLSOperTable)

Specifies an entry for each qllc connection.

**qllcLSOperIfIndex**

Specifies the interface index value for the qllc connection.

Syntax: IfIndexType

Max-Access: Read-only

**qllcLSOperLciVcIndex**

Specifies the virtual circuit number for the logical channel identifier on this interface.

Syntax: IfIndexType

Max-Access: Read-only

**qllcLSOperCircuitType**

Specifies the circuit type on this interface.

Syntax: Integer 1 = switchedVC, 2 = permanentVC

Max-Access: Read-only

**qllcLSOperRole**

Specifies the role of the QLLC link station.

Syntax: Integer 1 = primary, 2 = secondary, 3 = peerToPeer

Max-Access: Read-only

**qllcLSOperX25Add**

Specifies the remote X.25 address associated with the qllc connection.

Syntax: X121Address

Max-Access: Read-only

**qllcLSOperModulo**

The modulus for QLLC link station. It determines the size of the rotating ACK window and can take values of 8 and 128.

Syntax: Integer 1 = modulo8, 2 = modulo128

Max-Access: Read-only

**qllcLSOperState**

Specifies the state of a particular QLLC connection. Inop, closed, opening, closing, recovery, and opened are states defined in the IBM document SC30-3409-1, *The X.25 1984/1988 DTE/DCE and DTE/DTE Interface Architecture Reference.*

Syntax: Integer 1 = lsStateInop, 2 = lsStateClosed, 3 = lsStateOpening, 4 = lsStateClosing, 5 = lsStateRecovery, 6 = lsStateOpened

Max-Access: Read-only

**qllcLSOperLgX25**

Specifies the largest QLLC packet allowed to go out on the QLLC/X.25 side.

Syntax: Integer32

Max-Access: Read-only

## QLLC Link Station Statistics Table (qllcLSStatsTable)

The qllcLSStatsTable defines link station statistics kept for each qllc connection.

**qllcLSStatsEntry**

Specifies the link station statistics.

Syntax: QllcLSStatsEntry

Max-Access: Not-accessible

**qllcLSStatsIfIndex**

Specifies the interface index value for the qllc connection.

Syntax: IfIndexType

Max-Access: Read-only

**qllcLSStatsLciVcIndex**

Specifies the virtual circuit number for the logical channel identifier on this interface.

Syntax: IfIndexType

Max-Access: Read-only

**qllcLSStatsXidIn**

Specifies the number of XIDs received from the LS on this VC.

Syntax: Counter32

Max-Access: Read-only

**qllcLSStatsXidOut**

Specifies the number of XIDs sent to the LS on this VC.

Syntax: Counter32

Max-Access: Read-only

**qllcLSStatsTestIn**

Specifies the number of TEST packets received from the LS on this VC.

Syntax: Counter32

Max-Access: Read-only

**qllcLSStatsTestOut**

Specifies the number of TEST packets sent to the LS from this VC.

Syntax: Counter32

Max-Access: Read-only

**qllcLSStatsQuenchOff**

Specifies the number of times the connection quenched off for this connection.

Syntax: Counter32

Max-Access: Read-only

**qllcLSStatsQuenchOn**

Specifies the number of times the connection quenched on for this connection.

Syntax: Counter32

Max-Access: Read-only

**qllcLSStatsInPaks**

Specifies the total number of information packets received on this interface.

Syntax: Counter32

Max-Access: Read-only

**qllcLSStatsOutPaks**

Specifies the total number of information packets sent on this interface.

Syntax: Counter32

Max-Access: Read-only

**qllcLSStatsInBytes**

Specifies the total number of bytes in the information packets received on this connection.

Syntax: Counter32

Max-Access: Read-only

**qllcLSStatsOutBytes**

Specifies the total number of bytes in the information packets sent on this connection.

Syntax: Counter32

Max-Access: Read-only

**qllcLSStatsNumRcvQsms**

Specifies the number of QSMs received on this connection.

Syntax: Counter32

Max-Access: Read-only

**qllcLSStatsNumSndQsms**

Specifies the number of QSMs sent on this connection.

Syntax: Counter32

Max-Access: Read-only

**qllcLSStatsNumRcvDiscs**

Specifies the number of DISCs received on this connection.

Syntax: Counter32

Max-Access: Read-only

**qllcLSStatsNumSndDiscs**

Specifies the number of DISCs sent on this connection.

Syntax: Counter32

Max-Access: Read-only

**qllcLSStatsNumRcvDms**

Specifies the number of DMs received on this connection.

Syntax: Counter32

Max-Access: Read-only

**qllcLSStatsNumSndDms**

Specifies the number of DMs sent on this connection.

Syntax: Counter32

Max-Access: Read-only

**qllcLSStatsNumRcvFrmrs**

Specifies the number of FRMRs received on this connection.

Syntax: Counter32

Max-Access: Read-only

**qllcLSStatsNumSndFrmrs**

Specifies the number of FRMRs sent on this connection.

Syntax: Counter32

Max-Access: Read-only

**qllcLSStatsNumDrops**

Specifies the number of packets dropped due to buffer allocation or other internal problems.

Syntax: Counter32

Max-Access: Read-only

**qllcLSStatsNumErrs**

Specifies the number of HDLC protocol errors detected.

Syntax: Counter32

Max-Access: Read-only

## QLLC Link Station Admin Group (qllcLSAdminGroup)

This group specifies a collection of objects providing configuration capability.

### qllcLSAdminIfIndex

Specifies the interface index value for the qllc connection.

Syntax: IfIndexType

Max-Access: Read-write

### qllcLSAdminLciVcIndex

Specifies the virtual circuit number for the logical channel identifier or PVC number depending on the type of circuit on this interface.

Syntax: IfIndexType

Max-Access: Read-write

### qllcLSAdminRole

Specifies the role that the QLLC link station shall assume.

Syntax: Integer 1 = primary, 2 = secondary, 3 = peerToPeer

Max-Access: Read-write

### qllcLSAdminCircuitType

Specifies the circuit type on this interface.

Syntax: Integer 1 = switchedVC, 2 = permanentVC

Max-Access: Read-write

**qllcLSAdminX25Add**

Specifies the X.25 address associated with the qllc connection.

Syntax: X121Address

Max-Access: Read-write

**qllcLSAdminModulo**

Specifies the modulus for QLLC link station. It determines the size of the rotating ACK window and can take values of 8 and 128.

Syntax: Integer 1 = modulo8, 2 = modulo128

Max-Access: Read-write

**qllcLSAdminLgX25**

Specifies the largest QLLC packet allowed to go out on the QLLC/X.25 side.

Syntax: Integer32

Max-Access: Read-write

## QLLC Link Station Operational Group (qllcLSOperGroup)

This group specifies a collection of objects providing operational control capability.

**qllcLSOperIfIndex**

Specifies the interface index value for the qllc connection.

Syntax: IfIndexType

Max-Access: Read-only

**qllcLSOperLciVcIndex**

Specifies the virtual circuit number for the logical channel identifier on this interface.

Syntax: IfIndexType

Max-Access: Read-only

**qllcLSOperCircuitType**

Specifies the circuit type on this interface.

Syntax: Integer 1 = switchedVC, 2 = permanentVC

Max-Access: Read-only

**qllcLSOperRole**

Specifies the role of the QLLC link station.

Syntax: Integer 1 = primary, 2 = secondary, 3 = peerToPeer

Max-Access: Read-only

**qllcLSOperX25Add**

Specifies the remote X.25 address associated with the qllc connection.

Syntax: X121Address

Max-Access: Read-only

**qllcLSOperModulo**

The modulus for QLLC link station. It determines the size of the rotating ACK window and can take values of 8 and 128.

Syntax: Integer 1 = modulo8, 2 = modulo128

Max-Access: Read-only

**qllcLSOperState**

Specifies the state of a particular QLLC connection. Inop, closed, opening, closing, recovery, and opened are states defined in the IBM document SC30-3409-1, *The X.25 1984/1988 DTE/DCE and DTE/DTE Interface Architecture Reference.*

Syntax: Integer 1 = lsStateInop, 2 = lsStateClosed, 3 = lsStateOpening, 4 = lsStateClosing, 5 = lsStateRecovery, 6 = lsStateOpened

Max-Access: Read-only

**qllcLSOperLgX25**

Specifies the largest QLLC packet allowed to go out on the QLLC/X.25 side.

Syntax: Integer32

Max-Access: Read-only

## QLLC Link Station Statistics Group (qllcLSStatsGroup)

This group specifies a collection of objects providing statistics.

**qllcLSStatsEntry**

Specifies the link station statistics.

Syntax: QllcLSStatsEntry

Max-Access: Not-accessible

**qllcLSStatsIfIndex**

Specifies the interface index value for the qllc connection.

Syntax: IfIndexType

Max-Access: Read-only

**qllcLSStatsLciVcIndex**

Specifies the virtual circuit number for the logical channel identifier on this interface.

Syntax: IfIndexType

Max-Access: Read-only

**qllcLSStatsXidIn**

Specifies the number of XIDs received from the LS on this VC.

Syntax: Counter32

Max-Access: Read-only

**qllcLSStatsXidOut**

Specifies the number of XIDs sent to the LS on this VC.

Syntax: Counter32

Max-Access: Read-only

**qllcLSStatsTestIn**

Specifies the number of TEST packets received from the LS on this VC.

Syntax: Counter32

Max-Access: Read-only

**qllcLSStatsTestOut**

Specifies the number of TEST packets sent to the LS from this VC.

Syntax: Counter32

Max-Access: Read-only

**qllcLSStatsQuenchOff**

Specifies the number of times the connection quenched off for this connection.

Syntax: Counter32

Max-Access: Read-only

**qllcLSStatsQuenchOn**

Specifies the number of times the connection quenched on for this connection.

Syntax: Counter32

Max-Access: Read-only

**qllcLSStatsInPaks**

Specifies the total number of information packets received on this interface.

Syntax: Counter32

Max-Access: Read-only

**qllcLSStatsOutPaks**

Specifies the total number of information packets sent on this interface.

Syntax: Counter32

Max-Access: Read-only

**qllcLSStatsInBytes**

Specifies the total number of bytes in the information packets received on this connection.

Syntax: Counter32

Max-Access: Read-only

**qllcLSStatsOutBytes**

Specifies the total number of bytes in the information packets sent on this connection.

Syntax: Counter32

Max-Access: Read-only

**qllcLSStatsNumRcvQsms**

Specifies the number of QSMs received on this connection.

Syntax: Counter32

Max-Access: Read-only

**qllcLSStatsNumSndQsms**

Specifies the number of QSMs sent on this connection.

Syntax: Counter32

Max-Access: Read-only

**qllcLSStatsNumRcvDiscs**

Specifies the number of DISCs received on this connection.

Syntax: Counter32

Max-Access: Read-only

**qllcLSStatsNumSndDiscs**

Specifies the number of DISCs sent on this connection.

Syntax: Counter32

Max-Access: Read-only

**qllcLSStatsNumRcvDms**

Specifies the number of DMs received on this connection.

Syntax: Counter32

Max-Access: Read-only

**qllcLSStatsNumSndDms**

Specifies the number of DMs sent on this connection.

Syntax: Counter32

Max-Access: Read-only

**qllcLSStatsNumRcvFrmrs**

Specifies the number of FRMRs received on this connection.

Syntax: Counter32

Max-Access: Read-only

**qllcLSStatsNumSndFrmrs**

Specifies the number of FRMRs sent on this connection.

Syntax: Counter32

Max-Access: Read-only

**qllcLSStatsNumDrops**

Specifies the number of packets dropped due to buffer allocation or other internal problems.

Syntax: Counter32

Max-Access: Read-only

**qllcLSStatsNumErrs**

Specifies the number of HDLC protocol errors detected.

Syntax: Counter32

Max-Access: Read-only

## CONV(ersion) MIB

The Qualified Logical Link Control (QLLC) conversion provides data link layer support for SNA communication. The CONV(ersion) MIB includes a managed entity (link station). The managed entity includes objects to configure and monitor the logical connections. Managed objects fall in one of the following categories:

- Administration—Objects used for configuration and controlling the initial operation of link station.
- Operation—Objects used for monitoring and controlling the link station during operation.

  This section is closely coupled with the qllcmib document and provides general conversion information that can be extended to support RSRB/SDLLC as well, but currently addresses only the QLLC aspects of the conversion module.

The permissions allowed on these objects are as follows:

- Administrative/Configuration type (read-write)
- Operational (read)

## CISCO-SNADLC-CONV-MIB

This is the MIB module for objects used to manage QLLC-to-SDLC and QLLC-to-LLC2 conversion.

## QLLC Conversion Administrative Table (convQllcAdminTable)

This table contains objects that can be changed for each qllc entry. Changing one of these parameters will take effect in the operating LS immediately. Each qllc connection will have an entry in this table.

Syntax: SEQUENCE OF ConvQllcAdminEntry

Max-Access: Not-accessible

### convQllcAdminEntry

Specifies configured parameter values for a specific qllc connection.

Syntax: ConvQllcAdminEntry

Max-Access: Not-accessible

### convQllcAdminVirtualMac

Specifies the virtual address assigned to the qllc connection. It is in the form of 802.3, 802.5 MAC address.

Syntax: MacAddress

Max-Access: Read-write

### convQllcAdminConversionType

Specifies the conversion that is being used. The conversion is from QLLC to one of unknown-conversion is not one of sdlc (QLLC to SDLC), llc (QLLC to LLC), or localAck (QLLC to local acknowledgment.)

Syntax: Integer 1 = unknown, 2 = sdlc, 3 = llc, 4 = localAck

Max-Access: Read-write

**convQllcAdminSdlcAdd**

Specifies the SDLC address associated with the qllc connection.

Syntax: Integer (0–255)

Max-Access: Read-write

**convQllcAdminPartner**

Specifies the X.25 connection partner of the other DLC (SDLC or LLC2). It is in the form of 802.3, 802.5 MAC address.

Syntax: MacAddress

Max-Access: Read-write

**convQllcAdminThisRing**

Specifies that the Virtual ring number QLLC end-stations are on. It is used for LLC<->QLLC only.

Syntax: Integer32

Max-Access: Read-write

**convQllcAdminBridgeNum**

Specifies the Bridge number QLLC end-stations are on. It is used for LLC<->QLLC only.

Syntax: Integer32

Max-Access: Read-write

**convQllcAdminTargetRing**

Specifies the ring number LLC end-stations are on. It is used for LLC <->QLLC only.

Syntax: Integer32

Max-Access: Read-write

**convQllcAdminLargestSDLC**

Specifies the largest QLLC packet allowed to go out on the SDLC side.

Syntax: Integer32

Max-Access: Read-write

**convQllcAdminLargestLLC2**

Specifies the largest QLLC packet allowed to go out on the LLC2 side.

Syntax: Integer32

Max-Access: Read-write

**convQllcAdminLSDsap**

Specifies the LS destination sap address.

Syntax: Integer32

Max-Access: Read-write

**convQllcAdminLSSsap**

Specifies the LS source sap address.

Syntax: Integer32

Max-Access: Read-write

**convQllcAdminLSXid**

Specifies the qllc XID that is being used for the particular connection.

Syntax: OCTET STRING (SIZE ( 0 | 4 ))

Max-Access: Read-write

## QLLC Conversion Operational Table (convQllcOperTable)

This table contains objects for each qllc connection.

Syntax: SEQUENCE OF ConvQllcOperEntry

Max-Access: Not-accessible

### convQllcOperEntry

Specifies the operational values for a specific qllc connection.

Syntax: ConvQllcOperEntry

Max-Access: Not-accessible

### convQllcOperVirtualMac

Specifies the virtual address assigned to the qllc connection. It is in the form of 802.3, 802.5 MAC address.

Syntax: MacAddress

Max-Access: Read-only

### convQllcOperConversionType

Specifies the conversion that is being used. The conversion is from QLLC to one of unknown; conversion is not one of the following sdlc-QLLC to SDLC llc-QLLC to LLC localAck-QLLC to local acknowledgment

Syntax: Integer 1 = unknown, 2 = sdlc, 3 = llc, 4 = localAck

Max-Access: Read-only

### convQllcOperSdlcAdd

Specifies the SDLC address associated with the qllc connection.

Syntax: Integer (0–255)

Max-Access: Read-only

**convQllcOperPartner**

Specifies the X.25 connection partner of the other DLC (SDLC or LLC2). It is in the form of 802.3, 802.5 MAC address.

Syntax: MacAddress

Max-Access: Read-only

**convQllcOperThisRing**

The Virtual ring number QLLC end-stations are on. It is used for LLC <-> QLLC only.

Syntax: Integer32

Max-Access: Read-only

**convQllcOperBridgeNum**

The Bridge number QLLC end-stations are on. It is used for LLC <->QLLC only.

Syntax: Integer32

Max-Access: Read-only

**convQllcOperTargetRing**

Specifies the ring number LLC end-stations are on. It is used for LLC <->QLLC only.

Syntax: Integer32

Max-Access: Read-only

**convQllcOperLargestSDLC**

Specifies the largest QLLC packet allowed to go out on the SDLC side.

Syntax: Integer32

Max-Access: Read-only

**convQllcOperLargestLLC2**

Specifies the largest QLLC packet allowed to go out on the LLC2 side.

Syntax: Integer32

Max-Access: Read-only

**convQllcOperLSDsap**

Specifies the LS destination sap address.

Syntax: Integer32

Max-Access: Read-only

**convQllcOperLSSsap**

Specifies the LS source sap address.

Syntax: Integer32

Max-Access: Read-only

**convQllcOperLSXid**

Specifies the qllc XID that is being used for the particular connection.

Syntax: OCTET STRING (SIZE ( 0 | 4 ))

Max-Access: Read-only

**convQllcOperLnxState**

Specifies the LNX state. Cisco uses similar states for both LNX and SNX.

Syntax: Integer 1 = lnxDisconnect, 2 = lnxDwQllc, 3 = lnxAwQllcPri, 4 = lnxAwNetQllcSec, 5 = lnxNetContactPending, 6 = lnxDwNet, 7 = lnxAwNet, 8 = lnxAwQllcSec, 9 = lnxAwConnect

Max-Access: Read-only

**convQllcOperLsIfIndex**

This object and convQllcOperLsLciVcIndex defines the corresponding row in the qllcLSOperTable in the cisco-qllc01-mib. The corresponding row is that for which this object and convQllcOperLsLciVcIndex match qllcLSOperIfIndex and qllcLSOperLciVcIndex in table qllcLSOperTable in cisco-qllc01-mib respectively.

Syntax: IfIndexType

Max-Access: Read-only

**convQllcOperLsLciVcIndex**

This object and convQllcOperLsLciVcIndex defines the corresponding row in the qllcLSOperTable in the cisco-qllc01-mib. The corresponding row is that for which this object and convQllcOperLsLciVcIndex match qllcLSOperIfIndex and qllcLSOperLciVcIndex in table qllcLSOperTable in cisco-qllc01-mib respectively.

Syntax: IfIndexType

Max-Access: Read-only

## Snapshot Routing MIB Group

This is the MIB module for objects used to manage the Cisco Snapshot Routing MIB.

**ciscoSnapshotForceActive**

Forces the snapshot state to active for all entries of the ciscoSnapshotActivityTable whose ciscoSnapshotIfIndex value is specified as parameter. The interface must have been previously configured for snapshot routing, and be a client interface. Retrieval of this object will return the value of the of the interface that was last forced into the active state, or 0 if no interfaces have been forced into the active state since the router was reset.

Syntax: Integer32

Max-Access: Read-write

## ciscoSnapshotInterfaceTable

The ciscoSnapshotInterfaceTable defines a list of pre-interface Snapshot Routing entries.

### ciscoSnapshotInterfaceEntry

Specifies a pre-interface Snapshot Routing entry. A management station acting to create an entry should create the associated instance of the row status object. The management station should also modify, either in the same or in successive PDUs, the values for the other objects if the defaults are not appropriate. Once the appropriate instance of all the configuration objects have been created, either by an explicit SNMP set request or by default, the row status should be set to active to initiate the request.

**Note** This entire procedure can be initiated by means of a single set request which specifies a row status of createAndGo. In order to prevent inactive (notReady, or notInService) entries from clogging the table, entries will be aged out, but an entry will never be deleted within 5 minutes of creation.

Syntax: CiscoSnapshotInterfaceEntry

Max-Access: Not-accessible

### ciscoSnapshotIfIndex

Specifies the interface to which this entry pertains.

Syntax: InterfaceIndex

Max-Access: Not-accessible

**ciscoSnapshotClient**

When set to true, this router is the client snapshot router on the interface. When false, this router is the server snapshot router on the interface.

Syntax: TruthValue

Max-Access: Read-create

**ciscoSnapshotDialer**

Indicates whether snapshot routing on this interface uses Dial-on-Demand routing.

Syntax: TruthValue

Max-Access: Read-create

**ciscoSnapshotActiveInterval**

Specifies the amount of time in minutes during which routes may be exchanged between the client and server routers.

Syntax: Integer32 (5–1000)

Max-Access: Read-create

**ciscoSnapshotQuietInterval**

Specifies the amount of time in minutes during which routes are retained and frozen between active periods. An instance of this object may only be present if the value of the associated ciscoSnapshotClient object is true.

Syntax: Integer32 (8–100000)

Max-Access: Read-create

**ciscoSnapshotRetryInterval**

Specifies the amount of time in minutes to wait and retry a route exchange in the event that an active period elapses with no routes being exchanged. For example, if an interface is down (or a DDR phone

number is busy, or a DDR interface is unavailable) during the active interval, instead of waiting for the amount of time specified by ciscoSnapshotQuietTime to elapse before an attempt is made to exchange routing updates again, the attempt is made after the amount of time specified by this object has elapsed. This value is calculated automatically based on the ciscoSnapshotActiveInterval. An instance of this object may only be present if the value of the associated ciscoSnapshotClient object is true.

Syntax: Integer32

Max-Access: Read-only

**ciscoSnapshotIfUpAction**

Specifies the action that takes place when the interface associated with this entry transitions to the "up" state while snapshot routing on the interface is in quiet mode.

A value of goActive will cause the immediate transition to the active state.

A value of noAction will cause no such transition. Instead, the transition to the active state will occur normally when the current quiet period has expired.

Going active immediately incurs extra routing protocol overhead, but allows a fresh set of routing updates be exchanged each time the line is brought up. This is useful in a Dial-on-Demand routing environment.

An instance of this object may only be present if the value of the associated ciscoSnapshotClient object is true.

Syntax: Integer 1 = goActive, 2 = noAction

Max-Access: Read-create

**ciscoSnapshotRowStatus**

Specifies the status of this table entry. Once the entry status is set to active, the snapshot routing process will be enabled for this interface.

Syntax: RowStatus

Max-Access: Read-create

## ciscoSnapshotActivityTable

Specifies a list of snapshot routing activity entries.

Syntax: SEQUENCE OF CiscoSnapshotActivityEntry

Max-Access: Not-accessible

**ciscoSnapshotActivityEntry**

Specifies a snapshot routing activity entry. Entries in this table are added for active row entries in the ciscoSnapshotInterfaceTable. If a row entry in the ciscoSnapshotInterfaceTable is set to notInService, or deleted, associated entries in this table will be deleted.

Syntax: CiscoSnapshotActivityEntry

Max-Access: Not-accessible

**ciscoSnapshotActivityIndex**

Specifies an index value that uniquely identifies a Snapshot Activity Entry on a given interface.

Syntax: Integer32

Max-Access: Not-accessible

**ciscoSnapshotActivityState**

Specifies the current state of snapshot routing for this entry. active means that routing information may be exchanged. quiet, only present on a client snapshot interface, means that routes are frozen, and that no routing information may be exchanged until the active state is reentered.

serverPostActive, only present on a server snapshot interface, means that the active period has expired, but routing information will still be accepted from (but not sent to) the associated client router. transitionToQuiet, and transitionToActive, only present on a client, are temporary states entered after the active state, wherein any down to up transition of the interface will cause a move to the quiet or active state, respectively. limbo is a temporary state for activity blocks that are in the process of being created or destroyed.

Syntax: Integer 1 = active, 2 = quiet, 3 = serverPostActive, 4 = transitionToQuiet, 5 = transitionToActive, 6 = limbo

Max-Access: Read-only

**ciscoSnapshotActivityTimer**

Specifies the time in minutes remaining in the current state.

Syntax: Integer32

Max-Access: Read-only

**ciscoSnapshotExchangeTimer**

Specifies the time in minutes during the last active state, in which protocol exchanges occurred. The minimum time required to allow updates to be exchanged for a “successful update cycle” is the greater of 3 minutes, or 1/2 the active time. If the ciscoSnapshotExchangeTimer is less than this, the quiet state will use the retry interval to determine when next to go active.

An instance of this object will only be present when the associated value of ciscoSnapshotClient is true for this interface.

Syntax: Integer32

Max-Access: Read-only

**ciscoSnapshotDialerMap**

Specifies the index of the dialer map entry associated with this snapshot activity record. A value of 0 indicates that no dialer map is associated with this entry. An instance of this object will only be present when the associated value of ciscoSnapshotClient is true.

Syntax: Integer32

Max-Access: Read-only

**ciscoSnapshotSourceProtocol**

Specifies the protocol of the host that initiated the snapshot routing activity associated with this record. An instance of this object will only be present when the associated value of ciscoSnapshotClient is false.

Syntax: CiscoNetworkProtocol

Max-Access: Read-only

**ciscoSnapshotSourceAddress**

Specifies the address of the host that initiated the snapshot routing activity associated with this record.An instance of this object will only be present when the associated value of ciscoSnapshotClient is false.

Syntax: CiscoNetworkAddress

Max-Access: Read-only

**ciscoSnapshotProtocolsExchanged**

Specifies an array of bits that indicates whether or not routing information has been exchanged for all protocols. The most significant bit of the first octet represents the protocol associated with CiscoNetworkProtocol value of 0; the least significant bit of the first octet represents the protocol associated with CiscoNetworkProtocol value of 7; the most significant bit of the second octet represents the protocol associated with the CiscoNetworkProtocol value of 8; and so forth.

Routing information for a given protocol has been exchanged if the associated bit is set.An instance of this object will only be present when the associated value of ciscoSnapshotClient is true.

Syntax: OCTET STRING

Max-Access: Read-only

## Channel Interface Processor (CIP) Group

The CIP Group specifies the MIB module for objects used to manage the cisco channel interface processor card.

### cipCardTable

The cipCardTable contains a list of values for the CIP card that can be obtained on a per cip-card basis and include the following variables: *cipCardEntryIndex, cipCardEntryName, cipCardEntryTotalMemory, cipCardEntryFreeMemory, cipCardEntryCpuUtilization,* and *cipCardEntryTimeSinceLastReset*. This table extends CardTable in the cisco.mib.

Syntax: Sequence of CipCardEntry

Max-Access: Not-accessible

#### cipCardEntryName

Specifies the configured name for the CIP.

Syntax: DisplayString

Max-Access: Read-only

#### cipCardEntryTotalMemory

Specifies total memory on the card in kilobytes.

Syntax: UInteger32

Max-Access: Read-only

**cipCardEntryFreeMemory**

Specifies the total free memory on the card, that is the amount of memory in kilobytes not in use.

Syntax: UInteger32

Max-Access: Read-only

**cipCardEntryCpuUtilization**

Specifies the average percentage of time, over the last minute, that this processor was not idle.

Syntax: Integer (0–100)

Max-Access: Read-only

**cipCardEntryTimeSinceLastReset**

Specifies the number of seconds the CIP has been running.

Syntax: Counter32

Max-Access: Read-only

**End of Table**

## cipCardDaughterBoardTable

This table contains a list of objects pertaining to the daughter board on the CIP card.

**cipCardDtrBrdIndex**

Specifies which daughter board is being referenced for a particular CIP card.

Syntax: UInteger32

Max-Access: Read-only

**cipCardDtrBrdType**

Indicates the channel path interface type.

Syntax: Integer

Max-Access: Read-only

**cipCardDtrBrdStatus**

Specifies that the microcode for the daughter board has been successfully loaded and is executing.

Syntax: TruthValue

Max-Access: Read-only

**cipCardDtrBrdSignal**

For ESCON, specifies that the LED has been seen, and synchronization has been established. ESCON is the fiber-optic connection from the IBM mainframe to the peripheral. This is layer 1 of the channel. Older technology (still in use) is called BUS and TAB and consists of two bulky copper cables. For Parallel Channel Adapter (PCA), specifies that the operational out has been sensed.

Syntax: TruthValue

Max-Access: Read-only

**cipCardDtrBrdOnline**

For ESCON, specifies that a path has been established with at least one channel. For PCA, specifies that the PCA is online to the channel. It will respond to at least one device address.

Syntax: TruthValue

Max-Access: Read-only

**implicitIncidents**

Counts the number of times the ESCON Processor recovers from an internal error.

Syntax: Counter32

Max-Access: Read-only

**codeViolationErrors**

Specifies the number of recognized code-violation errors. A trap is issued when this number exceeds the bit error rate threshold for ESCON. The bit error rate threshold is set at 15 error burst within a 5-minute period. An error burst is the time period of 1.5 seconds + or – 0.05 seconds during which one or more code violations errors occur.

Syntax: Counter32

Max-Access: Read-only

**linkFailureSignalOrSyncLoss**

Specifies the number of link failures recognized as a result of a loss of signal or loss of synchronization that persisted longer than the link interval duration. The link interval duration is 1 second with a tolerance of +1.5 seconds and –0 seconds.

Syntax: Counter32

Max-Access: Read-only

**linkFailureNOSs**

Specifies the number of link failures recognized as a result of the not-operational sequence (NOS).

Syntax: Counter32

Max-Access: Read-only

**linkFailureSequenceTimeouts**

Specifies the number of link failures recognized as a result of a connection recovery timeout or response timeout occurring while in transmit OLS state.

Syntax: Counter32

Max-Access: Read-only

**linkFailureInvalidSequences**

Specifies the number of link failures recognized as a result of an invalid sequence for Link-Level-Facility State. Either a UD or UDR sequence was recognized while in wait-for-offline-sequence state.

Syntax: Counter32

Max-Access: Read-only

**linkIncidentTrapCause**

Indicates the condition which caused the last SNMP trap.

Syntax: Integer
1 = reason other than what is defined in conditions 2–7.
2 = indicates that the daughter board status has changed.
3 = indicates that a condition, that might cause the recognition of a link incident in the attached node, has occurred.
4 = indicates that the code violation error rate exceeded the threshold. 5 = indicates a loss of signal or loss of synchronization that persisted longer than the link interval duration.
6 = indicates the recognition of not-operational sequence, usually due to the operator taking the channel offline.
7 = indicates a connection recovery timeout or response timeout occurring while in transmit OLS state.
8 = indicates a UD or UDR sequence was recognized while in wait-for-offline-sequence state.

Max-Access: Read-only

## cipCard SubChannel Table

This table contains a list of objects pertaining to subchannel connections referenced by the CIP card or its daughter board.

### cipCardSubChannelIndex

Indicates which subchannel is being referenced for a particular daughter board on a CIP card.

Syntax: UInteger32

Max-Access: Read-only

### cipCardSubChannelConnections

Indicates the number of times a device was connected to the subchannel. For some devices, this correlates with the number of start subchannels.

Syntax: Counter32

Max-Access: Read-only

### cipCardSubChannelCancels

Specifies the number of halt subchannels.

Syntax: Counter32

Max-Access: Read-only

### cipCardSubChannelSelectiveResets

Specifies the number of selective resets.

Syntax: Counter32

Max-Access: Read-only

**cipCardSubChannelSystemResets**

Specifies the number of system resets.

Syntax: Counter32

Max-Access: Read-only

**cipCardSubChannelDeviceErrors**

Specifies the number of device level errors.

Syntax: Counter32

Max-Access: Read-only

**cipCardSubChannelWriteBlocksDropped**

Specifies the number of times a block was received by the channel and a router buffer was not available so the block was discarded.

Syntax: Counter32

Max-Access: Read-only

**cipCardSubChannelLastSenseData**

Specifies the last sense data sent to the channel by this device.

Syntax: OCTET STRING (SIZE (2))

Access: Read-only

**cipCardSubChannelLastSenseDataTime**

Specifies the time when the last sense data was sent to the channel by this device.

Syntax: TimeStamp

Max-Access: Read-only

**cipCardSubChannelCuBusies**

Specifies the number of control unit busies sent to the channel when this device was requested.

Syntax: Counter32

Max-Access: Read-only

**End of Table**

## cipCardClawTable

This table contains status and other information not covered in the following tables for the Common Link Access to Workstation (CLAW) protocol.

Syntax: Sequence of CipCardClawEntry

Max-Access: Not-accessible

**cipCardClawIndex**

Specifies which CLAW link is being referenced for a particular subchannel on a daughter board on a CIP card.

Syntax: UInteger32

Max-Access: Read-only

**cipCardClawConnected**

Specifies the CLAW connection status.

Syntax: TruthValue

Max-Access: Read-only

**cipCardClawConfigTable**

Contains configuration information for the Common Link Access to Workstation (CLAW) protocol.

Syntax: Sequence of CipCardClawConfigEntry

Max-Access: Not-accessible

**cipCardClawConfigEntry**

Specifies a list of CLAW configuration values.

Syntax: CipCardClawConfigEntry

Max-Access: Not-accessible

**cipCardClawConfigPath**

Specifies the Hex path identifier for the switch port containing the fiber from the channel on the host to which this task connects. This is a concatenation of the switch port number, the channel logical address, and the control unit logical address. For a directly connected channel, the switch port number is usually 01.

Syntax: OCTET STRING (SIZE (2))

Max-Access: Read-write

**cipCardClawConfigDevice**

Specifies Device address for the device the host will use to communicate with this task.

Syntax: OCTET STRING (SIZE(2))

Max-Access: Read-write

**cipCardClawConfigIpAddr**

Specifies the IP address of the host application for this task.

Syntax: IpAddress

Max-Access: Read-write

**cipCardClawConfigHostName**

Specifies the CLAW host name for this CLAW device.

Syntax: DisplayString

Max-Access: Read-write

**cipCardClawConfigRouterName**

Specifies the CLAW router name for this CLAW device.

Syntax: DisplayString

Max-Access: Read-write

**cipCardClawConfigHostAppl**

Specifies the CLAW host application name for this CLAW connection.

Syntax: DisplayString

Max-Access: Read-write

**cipCardClawConfigRouterAppl**

Specifies the CLAW router application name for this CLAW connection.

Syntax: DisplayString

Max-Access: Read-write

**cipCardClawDataXferStatsTable**

Specifies a list of objects pertaining to data transfer statistics per CLAW Logical Link.

Syntax: Sequence of CipCardClawDataXferStatsEntry

Max-Access: Not-accessible

**cipCardClawDataXferStatsEntry**

Specifies a list of daughter board statistics.

Syntax: CipCardClawDataXferStatsEntry

Max-Access: Not-accessible

**cipCardClawDataXferStatsBlocksRead**

Specifies the number of read data transfer channel command words (CCWs) from the channel perspective.

Syntax: Counter32

Max-Access: Read-only

**cipCardClawDataXferStatsBlocksWritten**

Specifies the number of successful write data transfer CCWs from the channel perspective.

Syntax: Counter32

Max-Access: Read-only

**cipCardClawDataXferStatsBytesRead**

Specifies the number of bytes successfully read from the channel perspective.

Syntax: Counter32

Max-Access: Read-only

**clawDataXferStatsBytesWritten**

Specifies the number of bytes successfully written from the channel perspective.

Syntax: Counter32

Max-Access: Read-only

**cipCardClawDataXferStatsHCBytesRead**

Specifies the number of bytes successfully read from the channel perspective. The HC (High Capacity) objects are the 64-bit equivalent of their 32-bit counterparts modeled after RFC 1573.

Syntax: Counter64

Max-Access: Read-only

**cipCardClawDataXferStatsHCBytesWritten**

Specifies the number of bytes successfully written from the channel perspective. The HC (High Capacity) objects are the 64-bit equivalent of their 32-bit counterparts modeled after RFC 1573.

Syntax: Counter64

Max-Access: Read-only

**cipCardClawDataXferStatsReadBlocksDropped**

Specifies the number of bytes written.

Syntax: Counter32

Max-Access: Read-only

**cipCardClawDataXferStatsWriteBlocksDropped**

Specifies the number of read blocks dropped.

Syntax: Counter32

Max-Access: Read-only

**cipCardClawDataXferStatsBufferGetRetryCount**

Specifies the number of times a buffer was requested and none was available.

Syntax: Counter32

Max-Access: Read-only

## Cisco Transmission Control Protocol (ciscoTCP) Group

The variables described in this section provide the necessary information for the definition and management of ciscoTCP objects. The ciscoTCP variables succeed the TCP variables found in the Local Variables subtree.

### ciscoTcpConnTable

The ciscoTcpConnTable augments the tcpConnTable defined in RFC 1213. The ciscoTcpConnTable contains TCP connection-specific information.

**ciscoTcpConnInBytes**

Specifies the number of bytes input on this TCP connection.

Syntax: Counter32

Max-Access: Read-only

**ciscoTcpConnOutBytes**

Specifies the number of bytes output on this TCP connection.

Syntax: Counter32

Max-Access: Read-only

**ciscoTcpConnInPkts**

Specifies the number of packets input on this TCP connection.

Syntax: Counter32

Max-Access: Read-only

**ciscoTcpConnOutPkts**

Specifies the number of packets output on this TCP connection.

Syntax: Counter32

Max-Access: Read-only

**ciscoTcpConnElapsed**

Specifies the amount of time this TCP connection has been established.

Syntax: TimeTicks

Max-Access: Read-only

**ciscoTcpConnSRTT**

Specifies a “smoothed” round-trip time, in milliseconds, for this TCP connection.

Syntax: Integer32

Max-Access: Read-only

**End of Table**

## ciscoTcpMIBGroup

This group specifies a collection of objects providing TCP connection monitoring.

**ciscoTcpConnInBytes**

Specifies the number of bytes input on this TCP connection.

Syntax: Counter32

Max-Access: Read-only

**ciscoTcpConnOutBytes**

Specifies the number of bytes output on this TCP connection.

Syntax: Counter32

Max-Access: Read-only

**ciscoTcpConnInPkts**

Specifies the number of packets input on this TCP connection.

Syntax: Counter32

Max-Access: Read-only

**ciscoTcpConnOutPkts**

Specifies the number of packets output on this TCP connection.

Syntax: Counter32

Max-Access: Read-only

**ciscoTcpConnElapsed**

Specifies the Amount of time in milliseconds that this TCP connection has been established.

Syntax: TimeTicks

Max-Access: Read-only

**ciscoTcpConnSRTT**

Specifies a “smoothed” round-trip time in milliseconds for this TCP connection.

Syntax: Integer32

Max-Access: Read-only

## Cisco DownStream Physical Unit (DSPU) Group

The variables described in this section provide the necessary information for the definition and management of DSPU objects.

**dspuNodeRsrb**

Specifies whether the RSRB feature is enabled for the DSPU node.

Syntax: TruthValue

Max-Access: Read-only

**dspuNodeRsrbLocalVirtualRing**

Specifies local virtual ring number used by DSPU node. LocalVirtualRing is zero if RSRB is not enabled.

Syntax: Integer (0–4096)

Max-Access: Read-only

**dspuNodeRsrbBridgeNumber**

Specifies the bridge number connecting the DSPU LocalVirtualRing with the RSRB TargetVirtualRing. Currently, the only valid bridge number supported is 1. The bridge number must be 1 if RSRB is enabled. The bridge number is zero if RSRB is not enabled.

Syntax: Integer (0–15)

Max-Access: Read-only

**dspuNodeRsrbTargetVirtualRing**

Specifies the target virtual ring number used for RSRB. TargetVirtualRing is zero if RSRB not enabled.

Syntax: Integer (0–4096)

Max-Access: Read-only

**dspuNodeRsrbVirtualMacAddress**

Specifies the virtual MAC address of the DSPU node. VirtualMacAddress is zero if RSRB is not enabled

Syntax: MacAddress

Max-Access: Read-only

**dspuNodeDefaultPu**

Specifies if the Default-PU feature is enabled for the DSPU node. The default value is disabled (2).

Syntax: TruthValue

Max-Access: Read-only

**dspuNodeDefaultPuWindowSize**

Specifies the send/receive window size to be used across the link between the default-PU and a remote PU.

Syntax: Integer (1–127)

Max-Access: Read-only

**dspuNodeDefaultPuMaxIframe**

Specifies the maximum size of an I-frame that can be transmitted/received across the link between the default-PU and a remote PU.

Syntax: Integer (64–18432)

Max-Access: Read-only

**dspuNodeActivationWindow**

Specifies the value of the activation pacing window. The pacing window is used by the DSPU node to limit the number of activation RUs sent for a given SAP before waiting for responses from the remote.

Syntax: Integer (1–65535)

Max-Access: Read-only

**dspuNodeLastConfigChgTime**

Specifies the last change to DSPU configuration parameters. LastConfigChgTime reflects any change in DSPU configuration.

Syntax: TimeStamp

Max-Access: Read-only

## dspuPoolClassTable

Specifies a table listing defined pool classes for the DSPU node. A pool class is defined at the DSPU node as a pool of upstream LUs that can be shared among downstream PUs.

Each entry in the table represents a separate pool class definition.

Syntax: SEQUENCE OF DspuPoolClassEntry

Max-Access: Not-accessible

**dspuPoolClassEntry**

Each entry represents a defined pool class.

Syntax: DspuPoolClassEntry

Max-Access: Not-accessible

**dspuPoolClassIndex**

Specifies the index of pool class entry defined in the dpsuPoolClassTable.

Syntax: Integer32

Max-Access: Not-accessible

**dspuPoolClassName**

Specifies the name identifier of the pool class.

Syntax: DisplayString (SIZE(0–10))

Max-Access: Read-only

**dspuPoolClassInactivityTimeout**

Specifies the value (in minutes) of the inactivity timeout that will be applied to active LU sessions assigned from the pool class. The inactivity timeout feature for pooled LUs is disabled if the Inactivity Timeout value is zero.

Syntax: Integer (0–255)

Max-Access: Read-only

**dspuPoolClassOperUpStreamLuDefs**

Specifies the number of upstream LUs defined in the pool class.

Syntax: Integer32

Max-Access: Read-only

**dspuPoolClassOperDnStreamLuDefs**

Specifies the number of downstream LUs defined in the pool class.

Syntax: Integer32

Max-Access: Read-only

**End of Table**

## dspuPooledLuTable

Table listing all LUs defined in a specified pool class.

The entries in the table provide information such that the downstream LUs in the pool can be correlated with the upstream LUs to which they might be assigned and vice versa.

If all upstream LUs have been assigned, downstream LUs might be waiting for assignment.

If there are no downstream LUs waiting for assignment, upstream LUs might be unassigned.

Syntax: SEQUENCE OF DspuPooledLuEntry

Max-Access: Not-accessible

**dspuPooledLuEntry**

Each entry represents an LU that is defined as a member of the specified pool class.

Syntax: DspuPooledLuEntry

Max-Access: Not-accessible

**dspuPooledLuPeerPuIndex**

Specifies the index (dspuPuOperIndex) of the peer PU that owns the peer LU. The PeerPuIndex is zero if the peer LU has not been assigned.

Syntax: Integer32

Max-Access: Read-only

**dspuPooledLuPeerLuLocalAddress**

Specifies the NAU address (dspuLuOperLuLocalAddress) of the peer LU. The PeerLuLocalAddress is zero if peer LU has not been assigned.

Syntax: Integer (0–254)

Max-Access: Read-only

**End of Table**

## dspuPuAdminTable

Table listing all defined upstream/downstream PUs that are owned by the DSPU node.

**Note** The dspuPuAdminTable does not include default downstream PUs that might be dynamically created.

Syntax: SEQUENCE OF DspuPuAdminEntry

Max-Access: Not-accessible

**dspuPuAdminEntry**

Each entry represents a defined upstream/downstream PU.

Syntax: DspuPuAdminEntry

Max-Access: Not-accessible

**dspuPuAdminIndex**

Specifies the index of a PU in the dspuPuAdminTable.

Syntax: Integer32

Max-Access: Not-accessible

**dspuPuAdminName**

Specifies the name of the upstream/downstream PU.

Syntax: DisplayString (SIZE(0–8))

Max-Access: Read-only

**dspuPuAdminType**

Specifies PU type as either upstream or downstream.

Syntax: Integer 1 = upstreamPu, 2 = dnstreamPu

Max-Access: Read-only

**dspuPuAdminRemoteMacAddress**

Specifies the MAC address of the remote PU.

Syntax: MacAddress

Max-Access: Read-only

**dspuPuAdminRemoteSapAddress**

Specifies the SAP address of the remote PU.

Syntax: Integer (1–254)

Max-Access: Read-only

**dspuPuAdminLocalSapAddress**

Specifies the SAP address of the local PU. The default value of the local SAP address is 8.

Syntax: Integer (1–254)

Max-Access: Read-only

**dspuPuAdminXid**

For upstream PUs, specifies the XID that will be sent to the remote PU. For downstream PUs, specifies the XID that must be received from the remote PU.

Syntax: Integer32

Max-Access: Read-only

**dspuPuAdminXidFmt**

Specifies the type of XID format used during activation of the link between this dspuNode and the remote PU.

Syntax: Integer 1 = formatUnknown, 2 = format0, 3 = format3

Max-Access: Read-only

**dspuPuAdminWindowSize**

Specifies the send/receive window size to be used across the link between this dspuNode and the remote PU.

Syntax: Integer (1–127)

Max-Access: Read-only

**dspuPuAdminMaxIframe**

Specifies the maximum size of an I-frame that can be transmitted/received across the link between this dspuNode and the remote PU.

Syntax: Integer (64–18432)

Max-Access: Read-only

**dspuPuAdminLinkRetryCount**

Specifies the number of times that the DSPU node will attempt to activate the link between the dspuNode and the remote PU.

Syntax: Integer (0–255)

Max-Access: Read-only

**dspuPuAdminLinkRetryTimeout**

Specifies the value (in seconds) for the delay between link activation attempts between the dspuNode and the remote PU.

Syntax: Integer (1–600)

Max-Access: Read-only

**dspuPuAdminStartPu**

Specifies whether the dspuNode should attempt link activation with the remote PU.

Syntax: TruthValue

Max-Access: Read-only

**dspuPuAdminDlcType**

Specifies the DLC type used by the dspuNode for link activation with the remote PU.

Syntax: Integer 1 = undefined, 2 = sdlc, 5 = Ethernet, 6 = tokenRing, 8 = rsrb, 9 = Framerelay, 10 = FDDI

Max-Access: Read-only

**dspuPuAdminDlcUnit**

Specifies the DLC unit used by the dspuNode for link activation with the remote PU.

Syntax: Integer (0–255)

Max-Access: Read-only

**dspuPuAdminDlcPort**

Specifies the DLC port used by the dspuNode for link activation with the remote PU.

Syntax: Integer (0–255)

Max-Access: Read-only

**dspuPuAdminFocalPoint**

Specifies whether the PU serves as a focal point for alert notification forwarding. Only an upstream PU can be defined as a focal point. Downstream PUs can never be defined as a focal point. The DSPU node can define only one upstream PU as a focal point PU.

Syntax: TruthValue

Max-Access: Read-only

**dspuPuAdminRowStatus**

Specifies the status of a row entry in the dspuPuAdminTable.

Syntax: RowStatus

Max-Access: Read-only

**End of Table**

## dspuPuOperTable

Table listing all active upstream/downstream PUs that are owned by the DSPU node (including default PUs).

**Note** In addition to the explicitly defined PUs from the dspuPuAdminTable, the dspuPuOperTable also includes default downstream PUs that may be dynamically created.

Syntax: SEQUENCE OF DspuPuOperEntry

Max-Access: Not-accessible

**dspuPuOperEntry**

Each entry represents an active upstream/downstream PU.

Syntax: DspuPuOperEntry

Max-Access: Not-accessible

**dspuPuOperIndex**

Specifies the index of a PU entry in the dspuPUOperTable.

Syntax: Integer32

Max-Access: Read-only

**dspuPuOperName**

Specifies the name of the PU.

Syntax: DisplayString (SIZE(0–8))

Max-Access: Read-only

**dspuPuOperType**

Specifies the PU type as either upstream or downstream.

Syntax: Integer 1 = upstreamPu, 2 = dnstreamPu

Max-Access: Read-only

**dspuPuOperRemoteMacAddress**

Specifies the MAC address of the remote PU.

Syntax: MacAddress

Max-Access: Read-only

**dspuPuOperRemoteSapAddress**

Specifies the SAP address of the remote PU.

Syntax: Integer (0–254)

Max-Access: Read-only

**dspuPuOperLocalSapAddress**

Specifies the SAP address of the local PU used by the dspuNode.

Syntax: Integer (1–254)

Max-Access: Read-only

**dspuPuOperXid**

For upstream PUs, specifies the XID that was sent to the remote PU. For downstream PUs, specifies the XID that was received from the remote PU.

Syntax: Integer32

Max-Access: Read-only

**dspuPuOperXidFmt**

Specifies the type of XID format used during activation of the link between this dspuNode and the remote PU.

Syntax: Integer 1 = formatUnknown, 2 = format0, 3 = format3

Max-Access: Read-only

**dspuPuOperWindowSize**

Specifies the send/receive window size used across the link between this dspuNode and the remote PU.

Syntax: Integer (1–127)

Max-Access: Read-only

**dspuPuOperMaxIframe**

Specifies the maximum size of an I-frame that can be transmitted/received across the link between this dspuNode and the remote PU.

Syntax: Integer (64–18432)

Max-Access: Read-only

**dspuPuOperLinkRetryCount**

Specifies the number of times that the DSPU node will attempt to activate the link between the dspuNode and the remote PU.

Syntax: Integer (0–255)

Max-Access: Read-only

**dspuPuOperLinkRetryTimeout**

Specifies the value (in seconds) for the delay between link activation attempts between the dspuNode and the remote PU.

Syntax: Integer (1–600)

Max-Access: Read-only

**dspuPuOperStartPu**

Specifies whether the dspuNode should attempt link activation with the remote PU.

Syntax: TruthValue

Max-Access: Read-only

**dspuPuOperDlcType**

Specifies the DLC type used by the dspuNode for link activation with the remote PU.

Syntax: Integer 1 = undefined, 2 = sdlc, 5 = Ethernet, 6 = tokenRing, 8 = rsrb, 9 = Framerelay, 10 = FDDI

Max-Access: Read-only

**dspuPuOperDlcUnit**

Specifies the DLC unit used by the dspuNode for link activation with the remote PU.

Syntax: Integer (0–255)

Max-Access: Read-only

**dspuPuOperDlcPort**

Specifies the DLC port used by the dspuNode for link activation with the remote PU.

Syntax: Integer (0–255)

Max-Access: Read-only

**dspuPuOperFocalPoint**

Specifies if the PU serves as a focal point for alert notification forwarding. Only an upstream PU can be defined as a focal point. Downstream PUs can never be defined as a focal point. The DSPU node may define only one upstream PU as a focal point PU.

Syntax: TruthValue

Max-Access: Read-only

**dspuPuOperState**

Specifies the operational state of the PU as either active or inactive.

Syntax: Integer 1 = active, 2 = inactive

Max-Access: Read-only

**dspuPuOperFsmState**

Specifies the current FSM state of the PU. The defined FSM state values are defined as follows:

- linkReset

  Link is in reset state—not connected

- linkPendConnOut

  Pending ConnectOut to establish link

- linkPendConnIn

  Pending ConnectIn to establish link

- linkPendXid

  Pending XID negotiation on the link

- linkXidNeg

  XID negotiation proceeding on link

- linkConnOut

  ConnectOut link activation

- linkConnIn

  ConnectIn link activation

- linkConnected

  Link connected, PU inactive

- puPendAct

  Link connected, PU pending activation

- puActive

  Link connected, PU active

- puBusy

  Link connected, PU busy

- puPendInact

  Link connected, PU pending deactivation

- linkPendDisc

  Pending disconnect of link

- linkPendClose

  Pending close of link station

Syntax: Integer 1 = linkReset, 2 = linkPendConnOut, 3 = linkPendConnIn, 4 = linkPendXid, 5 = linkXidNeg, 6 = linkConnOut, 7 = linkConnIn, 8 = linkConnected, 9 = puPendAct, 10 = puActive 11 = puBusy, 12 = puPendInact, 13 = linkPendDisc, 14 = linkPendClose

Max-Access: Read-only

**dspuPuOperStartTime**

Specifies the timestamp of PU activation (when ACTPU +rsp received).

Syntax: TimeStamp

Max-Access: Read-only

**dspuPuOperLastStateChgTime**

Specifies the TimeStamp of the last PU state change between active and inactive

Syntax: TimeStamp

Max-Access: Read-only

**End of Table**

## dspuPuStatsTable

Table listing the statistics recorded for each PU.

Syntax: SEQUENCE OF DspuPuStatsEntry

Max-Access: Not-accessible

**dspuPuStatsEntry**

Each entry represents an active upstream/downstream PU and has a corresponding entry in the dspuOperPuTable.

Syntax: DspuPuStatsEntry

Max-Access: Not-accessible

**dspuPuStatsSentBytes**

Specifies the number of bytes sent by this PU.

Syntax: Counter32

Access: Read-only

**dspuPuStatsRcvdBytes**

Specifies the number of bytes received by this PU.

Syntax: Counter32

Max-Access: Read-only

**dspuPuStatsSentFrames**

Specifies the number of frames sent by this PU.

Syntax: Counter32

Max-Access: Read-only

**dspuPuStatsRcvdFrames**

Specifies the number of frames received by this PU.

Syntax: Counter32

Max-Access: Read-only

**dspuPuStatsSentNegativeRsps**

Specifies the number of negative responses sent by this PU.

Syntax: Counter32

Max-Access: Read-only

**dspuPuStatsRcvdNegativeRsps**

Specifies the number of negative responses received by this PU.

Syntax: Counter32

Max-Access: Read-only

**dspuPuStatsActiveLus**

Specifies the number of active LUs on this PU (LU becomes active when ACTLU +rsp received).

Syntax: Counter32

Max-Access: Read-only

**dspuPuStatsInactiveLus**

Specifies the number of inactive LUs on this PU (LU is inactive until ACTLU rq or ACLTU +rsp received).

Syntax: Counter32

Max-Access: Read-only

**dspuPuStatsBindLus**

Specifies the number of LUs on this PU which are active-in-session (LU is active-in-session when BIND rq received).

Syntax: Counter32

Max-Access: Read-only

**dspuPuStatsActivationFailures**

Specifies the number of activation failures for this PU.

Syntax: Counter32

Max-Access: Read-only

**dspuPuStatsLastActivationFailureReason**

Specifies the reason for last activation failure of this PU

Syntax: Integer 1 = noError (no PU activation failure has been detected), 2 = otherError (undefined error detected during PU activation), 3 = internalError (internal resources error detected during PU activation), 4 = configuration error (PU could not be activated), 5 = puNegativeResponse (Negative ACTPU response received from remote PU), 6 = puAlreadyActive (PU is already active)

Max-Access: Read-only

**End of Table**

### dspuLuAdminTable

Table listing all LUs owned by the PU.

**Note** The dspuLuAdminTable does not include LUs owned by default downstream PUs that can be dynamically created.

Syntax: SEQUENCE OF DspuLuAdminEntry

Max-Access: Not-accessible

#### dspuLuAdminEntry

Each entry represents a defined LU owned by the PU.

Syntax: DspuLuAdminEntry

Max-Access: Not-accessible

#### dspuLuAdminLuLocalAddress

Specifies the NAU address of the local LU.

Syntax: Integer (1–254)

Max-Access: Not-accessible

#### dspuLuAdminType

Specifies whether the LU is pooled or dedicated.

Syntax: Integer 1 = pooled, 2 = dedicated

Max-Access: Read-only

**dspuLuAdminPoolClassName**

Specifies the pool class to which the LU is defined as a member. The dspuLuAdminPoolClassName is valid for pooled LUs only.

Syntax: DisplayString (SIZE(0–10))

Max-Access: Read-only

**dspuLuAdminPeerPuIndex**

For downstream LUs, the PeerPuIndex identifies the upstream PU that owns the upstream LU to which this downstream LU is assigned.

For upstream LUs, the PeerPuIndex identifies the downstream PU that owns the downstream LU to which this upstream LU is assigned.

The PeerPuIndex is valid for dedicated LUs only; otherwise, the PeerPuIndex is zero.

Syntax: Integer32

Max-Access: Read-only

**dspuLuAdminPeerLuLocalAddress**

For downstream LUs, the PeerLuLocalAddress identifies the NAU address of the upstream LU to which this downstream LU is assigned. For upstream LUs, the PeerLuLocalAddress identifies the NAU address of the downstream LU to which this upstream LU is assigned. The dspuLuAdminPeerLuLocalAddress is valid for dedicated LUs only; otherwise, the PeerLuLocalAddress is zero.

Syntax: Integer (1–254)

Max-Access: Read-only

**dspuLuAdminRowStatus**

Specifies the status of a row entry in the dspuLuAdminTable.

Syntax: RowStatus

Max-Access: Read-only

**End of Table**

## dspuLuOperTable

Table listing all LUs owned by the PU.

**Note** In addition to the LUs owned by explicitly defined PUs from the dsuPuAdminTable, the dspuLuOperTable also includes LUs owned by default downstream PUs that may be dynamically created.

Syntax: SEQUENCE OF DspuLuOperEntry

Max-Access: Not-accessible

### dspuLuOperEntry

Each entry represents a defined LU owned by the PU.

Syntax: DspuLuOperEntry

Max-Access: Not-accessible

### dspuLuOperLuLocalAddress

Specifies the NAU address of the local LU.

Syntax: Integer (1–254)

Max-Access: Read-only

### dspuLuOperType

Specifies whether the LU is pooled or dedicated.

Syntax: Integer 1 = pooled, 2 = dedicated

Max-Access: Read-only

**dspuLuOperPoolClassName**

Specifies the pool class of which the LU is a member. The dspuLuOperPoolClassName is valid for pooled LUs only.

Syntax: DisplayString (SIZE(0–10))

Max-Access: Read-only

**dspuLuOperPeerPuIndex**

For downstream LUs, the PeerPuIndex identifies the upstream PU that owns the upstream LU to which this downstream LU is assigned.

For upstream LUs, the PeerPuIndex identifies the downstream PU that owns the downstream LU to which this upstream LU is assigned.

If the PeerPuIndex is zero, the LU is a pooled LU and has not been assigned a peer LU from the pool.

Syntax: Integer32

Max-Access: Read-only

**dspuLuOperPeerLuLocalAddress**

For downstream LUs, the PeerLuLocalAddress identifies the NAU address of the upstream LU to which this downstream LU is assigned.

For upstream LUs, the PeerLuLocalAddress identifies the NAU address of the downstream LU to which this upstream LU is assigned. If the PeerLuLocalAddress is zero, the LU is a pooled LU and has not been assigned a peer LU from the pool.

Syntax: Integer (1–254)

Max-Access: Read-only

**dspuLuOperState**

Specifies the operational state of the LU as either active or inactive.

Syntax: Integer 1 = active, 2 = inactive

Max-Access: Read-only

**dspuLuOperFsmState**

Specifies the current FSM state of the LU as follows:

- reset

  neither dnLu nor upLu active
- dnLuStarted

  dnLu active, upLu inactive
- upLuActive

  upLu active, dnLu inactive
- dnLuPendAct

  dnLu pending activation, upLu active-unavailable
- dnLuActUnav

  dnLu active-unavailable, upLu active-available
- upLuPendAvail

  upLu pending-available
- bothAvail

  both upLu and dnLu active-available
- dnLuPendInact

  dnLu pending inactive
- upLuPendInact

  upLu pending inactive
- luInactivityTimeout

  inactivity Timeout on LU-to-LU session
- dnInactivityPendInact

dnLu pending inactive from inactivity timeout

Syntax: Integer 1 = reset, 2 = dnLuStarted, 3 = upLuActive, 4 = dnLuPendAct, 5 = dnLuActUnav, 6 = upLuPendAvail, 7 = bothAvail, 8 = dnLuPendInact, 9 = upLuPendInact, 10 = luInactivityTimeout, 11 = dnInactivityPendInact

Max-Access: Read-only

**dspuLuOperSessionState**

Specifies the operational state of the LU session as either bound or unbound.

Syntax: Integer1 = bound, 2 = unbound

Max-Access: Read-only

**End of Table**

## dspuSapTable

Table listing the SAPs that are enabled for the DSPU node.

Syntax: SEQUENCE of DspuSapEntry

Max-Access: Not-accessible

**dspuSapEntry**

Each entry represents an enabled SAP for the DSPU node.

Syntax: DspuSapEntry

Max-Access: Not-accessible

**dspuSapAddress**

Specifies the SAP address of the local SAP.

Syntax: Integer (1–254)

Max-Access: Not-accessible

**dspuSapType**

Specifies the local SAP type as either an upstreamSap or a downstreamSap.

Syntax: Integer 1 = upstreamSap, 2 = dnstreamSap

Max-Access: Read-only

**dspuSapDlcType**

Specifies the DLC type of the adapter that owns the local SAP.

Syntax: Integer 1 = undefined, 2 = sdlc, 5 = Ethernet, 6 = tokenring, 8 = rsrb, 9 = Framerelay, 10 = FDDI

Max-Access: Read-only

**dspuSapDlcUnit**

Specifies the DLC unit of the adapter that owns the local SAP.

Syntax: Integer (0–255)

Max-Access: Read-only

**dspuSapDlcPort**

Specifies the DLC port of the adapter that owns the local SAP.

Syntax: Integer (0–255)

Max-Access: Read-only

**dspuSapOperState**

Specifies the operational state of the local SAP as follows:

- sapClosed
- sapOpening
- sapOpened

- sapClosed

Syntax: Integer 1 = sapClosed, 2 = sapOpening, 3 = sapOpened, 4 = sapClosed

Max-Access: Read-only

**dspuSapRowStatus**

Specifies the status of a row entry in the dspuSapTable.

Syntax: RowStatus

Max-Access: Read-only

**End of Table**

## Cisco Flash Group

The variables described in this section apply to the Cisco Flash MIB definitions.

**ciscoFlashDevicesSupported**

Specifies the number of Flash devices supported by the system. If the system does not support any Flash devices, this MIB will not be loaded on that system. The value of this object will therefore be at least 1.

Syntax: Integer32 (1–32)

Max-Access: Read-only

### ciscoFlashDeviceTable

Specifies the Table of Flash device properties for each initialized Flash device. Each Flash device installed in a system is detected, sized, and initialized when the system image boots up. For removable Flash devices, the device properties will be dynamically deleted and recreated as the device is removed and inserted. In this case, the newly inserted device may not be the same as the one that was removed earlier.

**Note** If you are using a Cisco 1003 and the flash card is removed, only the ciscoFlashDevice Table is accessible.

The ciscoFlashDeviceInitTime object is available for a management station to determine the time at which a device was initialized, and thereby detect the change of a removable device. A removable device that has not been installed will also have an entry in this table. This is to let a management station know about a removable device that has been removed.

Since a removed device obviously cannot be sized and initialized, the table entry for such a device will have ciscoFlashDeviceSize, ciscoFlashDeviceMinPartitionSize, ciscoFlashDeviceMaxPartitions, ciscoFlashDevicePartitions, and ciscoFlashDeviceChipCount equal to zero. ciscoFlashDeviceRemovable will be true to indicate it is removable.

Syntax: SEQUENCE OF CiscoFlashDeviceEntry

Max-Access: Not-accessible

**ciscoFlashDeviceEntry**

Specifies an entry in the table of flash device properties for each initialized flash device. Each entry can be randomly accessed by using ciscoFlashDeviceIndex as an index into the table. Note that removable devices will have an entry in the table even when they have been removed. However, a non-removable device that has not been installed will not have an entry in the table.

Syntax: CiscoFlashDeviceEntry

Max-Access: Not-accessible

**ciscoFlashDeviceIndex**

Specifies the Flash device sequence number to index within the table of initialized flash devices. The lowest value should be 1. The highest should be less than or equal to the value of the ciscoFlashDevicesSupported object.

Syntax: Integer32 (1–32)

Max-Access: Not-accessible

**ciscoFlashDeviceSize**

Specifies the total size in bytes of the Flash device. For a removable device, the size will be zero if the device has been removed.

Syntax: Integer32

Max-Access: Read-only

**ciscoFlashDeviceMinPartitionSize**

Specifies that this object will give the minimum partition size supported for this device. For systems that execute code directly out of Flash, the minimum partition size needs to be the bank size. (Bank size is equal to the size of a chip multiplied by the width of the device. In most cases, the device width is 4 bytes, and so the bank size would be four times the size of a chip). This has to be so because all programming commands affect the operation of an entire chip (in the case of Cisco chips, an entire bank is affected because all operations are done on the entire width of the device) even though the actual command may be localized to a small portion of each chip. So when executing code out of Flash, one needs to be able to write and erase some portion of Flash without affecting the code execution.

For systems that execute code out of DRAM or ROM, it is possible to partition Flash with a finer granularity (for example, at erase sector boundaries) if the system code supports such granularity.

This object will let a management entity know the minimum partition size as defined by the system. If the system does not support partitioning, the value in bytes will be equal to the device size in ciscoFlashDeviceSize. The maximum number of partitions that can be

configured will be equal to the minumum number of ciscoFlashDeviceMaxPartitions and the quotient that is derivd when ciscoFlashDeviceSize is divided by ciscoFlashDeviceMinPartitionSize.

Syntax: Integer32

Max-Access: Read-only

**ciscoFlashDeviceMaxPartitions**

Specifies the maximum number of partitions supported by the system for this Flash device. The default is 1, which actually means that partitioning is not supported. Note that this value will be defined by system limitations, not by the flash device itself (for example, the system may impose a limit of 2 partitions even though the device may be large enough to be partitioned into 4 based on the smallest partition unit supported). On systems that execute code out of Flash, partitioning is a way of creating multiple file systems in the Flash device so that writing into or erasing of one file system can be done while executing code residing in another file system. For systems executing code out of DRAM, partitioning gives a way of sub-dividing a large Flash device for easier management of files.

Syntax: Integer32 (1–8)

Max-Access: Read-only

**ciscoFlashDevicePartitions**

Specifies the Flash device partitions that are actually present. The number of partitions cannot exceed the minimum number of ciscoFlashDeviceMaxPartitions and the quotient that is derived when ciscoFlashDeviceSize is divided by ciscoFlashDeviceMinPartitionSize.

The number of partitions will be equal to at least 1 when the partition spans the entire device (actually no partitioning). A partition in turn will contain one or more minimum partition units where a minimum partition unit is defined by ciscoFlashDeviceMinPartitionSize.

Syntax: Integer32

Max-Access: Read-only

**ciscoFlashDeviceChipCount**

Specifies the total number of chips within the Flash device. The purpose of this object is to provide a management station with information on how much chip information to expect. In addition, this object can help double check the chip index against an upper limit when randomly retrieving chip information for a partition.

Syntax: Integer32 (1–64)

Max-Access: Read-only

**ciscoFlashDeviceName**

Specifies the name of the Flash device . This name is used to refer to the device within the system. Flash operations get directed to a device based on this name. The system has a concept of a default device. This device would be the primary or most used in case of multiple devices. The system directs an operation to the default device whenever a device name is not specified. The device name is therefore mandatory except when the operation is being done on the default device, or, the system supports only a single Flash device. The device name will always be available for a removable device, even when the device has been removed.

Syntax: DisplayString (SIZE (0–16) )

Max-Access: Read-only

**ciscoFlashDeviceDescr**

Description of a Flash device. The description is meant to explain what the Flash device and its purpose is. Current values are:

- System flash, for the primary Flash used to store full system images.
- Boot flash, for the secondary Flash used to store bootstrap images.

The ciscoFlashDeviceDescr, ciscoFlashDeviceController (if applicable), and ciscoFlashDeviceCard objects are expected to collectively give all information about a Flash device.

The device description will always be available for a removable device, even when the device has been removed.

Syntax: DisplayString (SIZE (0–64))

Max-Access: Read-only

**ciscoFlashDeviceController**

Specifies the flash device controller (in other words, the card that actually controls Flash read/write/erase. This object is relevant for AGS+ systems where Flash may be controlled by the MC+, STR or the Environmental Monitor cards—cards that may not actually contain the Flash chips.

For systems that have removable PCMCIA flash cards that are controlled by a PCMCIA controller chip, this object may contain a description of that controller chip.

Where irrelevant (in other words, when flash is a direct memory mapped device accessed directly by the main processor), this object will have an empty (NULL) string.

Syntax: DisplayString (SIZE (0–64))

Max-Access: Read-only

**ciscoFlashDeviceCard**

Specifies an instance of a card entry in the cardTable. The card entry will give details about the card on which the Flash device is actually located. For most systems, this is usually the main processor board. On AGS+ systems, Flash is located on a separate multibus card such as the MC. This object will therefore be used to essentially index into cardTable to retrieve details about the card such as cardDescr, cardSlotNumber, and so forth.

Syntax: InstancePointer

Max-Access: Read-only

**ciscoFlashDeviceProgrammingJumper**

Specifies the state of a jumper (if present and can be determined) that controls the programming voltage called Vpp to the Flash device. Vpp is required for programming (erasing and writing) Flash. For certain older technology chips, it is also required for identifying the chips (which in turn is required to identify which programming algorithms to use; different chips require different algorithms and commands).

The purpose of the jumper, on systems where it is available, is to write protect a Flash device. On most of the newer remote access routers, this jumper is unavailable since users are not expected to visit remote sites just to install and remove the jumpers when upgrading software in the Flash device. The unknown(3) value will be returned for such systems and can be interpreted to mean that a programming jumper is not present or not required on those systems.

On systems where the programming jumper state can be read back by means of a hardware register, the installed(1) or notInstalled(2) value will be returned.

This object is expected to be used in conjunction with the ciscoFlashPartitionStatus object whenever that object has the readOnly(1) value. In such a case, this object will indicate whether the programming jumper is a possible reason for the readOnly state.

Syntax: Integer 1 = installed, 2 = notInstalled, 3 = unknown

Max-Access: Read-only

**ciscoFlashDeviceInitTime**

Specifies the system time at which the device was initialized. For fixed devices, this will be the system time at boot up. For removable devices, it will be the time at which the device was inserted, which may be boot up time, or a later time (if device was inserted later). If a device (fixed or removable) was repartitioned, it will be the time of repartitioning.

The purpose of this object is to help a management station determine if a removable device has been changed. The application should retrieve this object prior to any operation and compare with the previously retrieved value. Note that this time will not be real time but a running time

maintained by the system. This running time starts from zero when the system boots up. For a removable device that has been removed, this value will be zero.

Syntax: TimeStamp

Max-Access: Read-only

**ciscoFlashDeviceRemovable**

Specifies whether the Flash device is removable. Generally, only PCMCIA Flash cards will be treated as removable. Socketed Flash chips and Flash SIMM modules will not be treated as removable. Simply put, only those Flash devices that can be inserted or removed without opening the hardware casing will be considered removable. Further, removable Flash devices are expected to have the necessary hardware support including 1) on-line removal and insertion and 2) interrupt generation on removal or insertion.

Syntax: TruthValue

Max-Access: Read-only

**End of Table**

## ciscoFlashChipTable

Specifies the table of Flash device chip properties for each initialized Flash device. This table is intended primarily to support error diagnosis.

Syntax: SEQUENCE OF CiscoFlashChipEntry

Max-Access: Not-accessible

**Note** If you remove the flash card, the ciscoFlashChipTable is not accessible.

**ciscoFlashChipEntry**

Specifies an entry in the table of chip information for each flash device initialized in the system. An entry is indexed by two objects: 1) the device index and 2) the chip index within that device.

Syntax: CiscoFlashChipEntry

Max-Access: Not-accessible

**ciscoFlashChipIndex**

Specifies the chip sequence number within selected flash device. Used to index within chip info table. Value starts from 1 and should not be greater than ciscoFlashDeviceChipCount for that device.

When retrieving chip information for chips within a partition, the sequence number should lie between ciscoFlashPartitionStartChip & ciscoFlashPartitionEndChip (both inclusive).

Syntax: Integer32 (1–64)

Max-Access: Not-accessible

**ciscoFlashChipCode**

Specifies the manufacturer and device code for a chip. The lower byte will contain the device code.The upper byte will contain the manufacturer code. If a chip code is unknown because it could not be queried out of the chip, the value of this object will be 00:00.

Syntax: FlashChipCode

Max-Access: Read-only

**ciscoFlashChipDescr**

Specifies the flash chip name corresponding to the chip code. The name will contain the manufacturer and the chip type. It will be of the form Intel 27F008SA.

In the case where a chip code is unknown, this object will be an empty (NULL) string. In the case where the chip code is known but the chip is not supported by the system, this object will be an empty (NULL) string.

A management station is therefore expected to use the chip code and the chip description in conjunction to provide additional information whenever the ciscoFlashPartitionStatus object has the readOnly(1) value.

Syntax: DisplayString (SIZE (0–32))

Max-Access: Read-only

**ciscoFlashChipWriteRetries**

Specifies a cumulative count (since last system boot up or initialization) of the number of write retries that were done in the chip. If no writes have been done to Flash, the count will be zero. Typically, a maximum of 25 retries are done on a single location before flagging a write error. A management station is expected to get this object for each chip in a partition after a write failure in that partition. To keep a track of retries for a given write operation, the management station would have to retrieve the values for the concerned chips before and after any write operation.

Syntax: Counter32

Max-Access: Read-only

**ciscoFlashChipEraseRetries**

Specifies a cumulative count (since last system boot up or initialization) of the number of erase retries that were done in the chip. Typically, a maximum of 2000 retries are done in a single erase zone (which may be a full chip or a portion, depending on the chip technology) before flagging an erase error.

A management station is expected to get this object for each chip in a partition after an erase failure in that partition. To keep a track of retries for a given erase operation, the management station would have to retrieve the values for the concerned chips before and after any erase operation.

**Note** Erase may be done through an independent command, or through a copy-to-flash command.

Syntax: Counter32

Max-Access: Read-only

**ciscoFlashChipMaxWriteRetries**

Specifies the maximum number of write retries done at any single location before declaring a write failure.

Syntax: Integer32

Max-Access: Read-only

**ciscoFlashChipMaxEraseRetries**

Specifies the maximum number of erase retries done within an erase sector before declaring an erase failure.

Syntax: Integer32

Max-Access: Read-only

**End of Table**

## Flash Partition level information

A flash partition is a logical sub-division of a flash device and may or may not be equal to the entire device itself. When there is no explicit partitioning done, a single partition is assumed to exist, spanning the entire device.

**Note** If you remove the flash card, the flash partition level information is not accessible.

Partitioning has the following restrictions:

- a partition must always start and end at the boundary of a system defined minimum unit. Therefore a device must have atleast two such minimum units in order to be partitioned.
- existing files and file systems on a device always override any partitioning commands when it comes to partitioning a Flash device. In other words, the existance or configuration of partitions in a Flash device is always first determined by the location of existing files in the device.
- partitioning of a device cannot be changed if it can cause loss of existing files in a partition. Those files have to be explicitly erased (by erasing the partition containing them).

## ciscoFlashPartitionTable

Specifies the Table of flash device partition properties for each initialized flash partition. Whenever there is no explicit partitioning done, a single partition spanning the entire device will be assumed to exist. There will therefore always be atleast one partition on a device.

Syntax: SEQUENCE OF CiscoFlashPartitionEntry

Max-Access: Not-accessible

### ciscoFlashPartitionEntry

Specifies an entry in the table of flash partition properties for each initialized flash partition. Each entry will be indexed by a device number and a partition number within the device.

Syntax: CiscoFlashPartitionEntry

Max-Access: Not-accessible

**ciscoFlashPartitionIndex**

Specifies the flash partition sequence number used to index within table of initialized flash partitions.

Syntax: Integer32 (1–8)

Max-Access: Not-accessible

**ciscoFlashPartitionStartChip**

Specifies the chip sequence number of first chip in partition. Used as an index into the chip table.

Syntax: Integer32 (1—64)

Max-Access: Read-only

**ciscoFlashPartitionEndChip**

Specifies the chip sequence number of last chip in partition. Used as an index into the chip table.

Syntax: Integer32 (1—64)

Max-Access: Read-only

**ciscoFlashPartitionSize**

Specifies in bytes the flash partition size. It should be an integral multiple of ciscoFlashDeviceMinPartitionSize. If there is a single partition, this size will be equal to ciscoFlashDeviceSize.

Syntax: Integer32

Max-Access: Read-only

**ciscoFlashPartitionFreeSpace**

Specifies in bytes the free space within a Flash partition.

**Note** The actual size of a file in Flash includes a small overhead that represents the file system's file header.

Certain file systems may also have a partition or device header overhead to be considered when computing the free space. Free space will be computed as total partition size less size of all existing files (valid/invalid/deleted files and including file header of each file), less size of any partition header, less size of header of next file to be copied in. In short, this object will give the size of the largest file that can be copied in. The management entity will not be expected to know or use any overheads such as file and partition header lengths, since such overheads may vary from file system to file system.

Deleted files in Flash do not free up space. A partition has to be erased in order to reclaim the space occupied by files. (The irspFileSystem file system provides an alternate method, through the squeeze command, of reclaiming free space occupied by deleted files. Support for this file system may however not be available on all systems).

Syntax: Gauge32

Max-Access: Read-only

**ciscoFlashPartitionFileCount**

Specifies the count of all files in a flash partition. Both good and bad (deleted or invalid checksum) files will be included in this count.

Syntax: Integer32

Max-Access: Read-only

**ciscoFlashPartitionChecksumAlgorithm**

Specifies the checksum algorithm identifier for checksum method used by the file system. Normally, this would be fixed for a particular file system. When a file system writes a file to Flash, it checksums the data written. The checksum then serves as a way to validate the data read back whenever the file is opened for reading.

Since there is no way, when using TFTP, to guarantee that a network download has been error free (since UDP checksums may not have been enabled), this object together with the ciscoFlashFileChecksum object provides a method for any management station to regenerate the checksum of the original file on the server and compare checksums to ensure that the file download to Flash was error free.

simpleChecksum represents a simple 1s complement addition of short word values. Other algorithm values will be added as necessary.

Syntax: Integer, 1=simpleChecksum

Max-Access: Read-only

**ciscoFlashPartitionStatus**

Specifies that flash partition status can be one of the following:

- readOnly, if the device is not programmable either because chips could not be recognized or an erroneous mismatch of chips was detected. Chip recognition may fail either because the chips are not supported by the system, or because the Vpp voltage required to identify chips has been disabled via the programming jumper.

  The ciscoFlashDeviceProgrammingJumper, ciscoFlashChipCode, and ciscoFlashChipDescr objects can be examined to get more details on the cause of this status

- runFromFlash (RFF), if current image is running from this partition.The ciscoFlashPartitionUpgradeMethod object will then indicate whether the Flash Load Helper can be used to write a file to this partition or not.

- readWrite, if partition is programmable.

Syntax: Integer 1 = ReadOnly, 2 = runFromFlash, 3 = readWrite

Max-Access: Read-only

**ciscoFlashPartitionUpgradeMethod**

Specifies the flash partition upgrade method, In other words, specifies the method by which new files can be downloaded into the partition.

FLH stands for Flash Load Helper, a feature provided on run-from-Flash systems for upgrading Flash. This feature uses the bootstrap code in ROMs to help in automatic download.

This object should be retrieved if the partition status is runFromFlash(2). If the partition status is readOnly(1), the upgrade method would depend on the reason for the readOnly status. For example, it may simply be a matter of installing the programming jumper, or it may require execution of a version of software that supports the Flash chips.

**Table 12 Partition Status**

| Partition Status | Meaning |
|---|---|
| unknown | The current system image does not know how Flash can be programmed. A possible method would be to reload the ROM image and perform the upgrade manually. |
| rxbootFLH | The Flash Load Helper is available to download files to Flash. A copy-to-flash command can be used and this system image will automatically reload the Rxboot image in ROM and direct it to carry out the download request. |
| direct | Will be done directly by this image. |

Syntax: Integer 1 = unknown, 2 = rxbootFLH, 3 = direct

Max-Access: Read-only

**ciscoFlashPartitionName**

Specifies the flash partition name used to refer to a partition by the system. This can be any alpha-numeric character string of the form AAAAAAAAnn, where A represents an optional alpha character and n a numeric character.

Any numeric characters must always form the trailing part of the string. The system will strip off the alpha characters and use the numeric portion to map to a partition index.

Flash operations get directed to a device partition based on this name. The system has a concept of a default partition. This would be the first partition in the device. The system directs an operation to the default partition whenever a partition name is not specified. The partition name is therefore mandatory except when the operation is being done on the default partition, or the device has just one partition (is not partitioned).

Syntax: DisplayString (SIZE (0–16))

Max-Access: Read-only

**ciscoFlashPartitionNeedErasure**

This object indicates whether a partition requires erasure before any write operations can be done in it.

A management station should therefore retrieve this object prior to attempting any write operation. A partition requires erasure after it becomes full free space left is less than or equal to the (filesystem file header size).

A partition also requires erasure if the system does not find the existance of any file system when it boots up.

The partition may be erased explicitly through the erase(5) command, or by using the copyToFlashWithErase(1) command. If a copyToFlashWithoutErase(2) command is issued when this object has the TRUE value, the command will fail.

Syntax: TruthValue

Max-Access: Read-only

**ciscoFlashPartitionFileNameLength**

Maximum file name length supported by the file system. Max file name length will depend on the file system implemented. Today, all file systems support a max length of 48 bytes. But the irsp file system may support a larger length. A management entity must use this object when prompting a user for, or deriving the Flash file name length.

Syntax: Integer32 (1–256)

Max-Access: Read-only

**End of Table**

## ciscoFlashFileTable

Specifies the table of information for files in a Flash partition.

Syntax: SEQUENCE OF CiscoFlashFileEntry

Max-Access: Not-accessible

### ciscoFlashFileEntry

Specifies an entry in the table of Flash file properties for each initialized Flash partition. Each entry represents a file and gives details about the file. An entry is indexed using the device number, partition number within the device, and file number within the partition.

Syntax: CiscoFlashFileEntry

Max-Access: Not-accessible

### ciscoFlashFileIndex

Specifies the Flash file sequence number used to index within a Flash partition directory table.

Syntax: Integer32 (1–32)

Max-Access: Not-accessible

### ciscoFlashFileSize

Specifies the size of the file in bytes. Note that this size does not include the size of the filesystem file header. File size will always be non-zero.

Syntax: Integer32

Max-Access: Read-only

**ciscoFlashFileChecksum**

Specifies a File checksum stored in the file header. This checksum is computed and stored when the file is written into Flash. It serves to validate the data written into Flash. Whereas the system will generate and store the checksum internally in hexadecimal form, this object will provide the checksum in a string form. The checksum will be available for all valid and invalid-checksum files.

Syntax: ChecksumString

Max-Access: Read-only

**ciscoFlashFileStatus**

Specifies the status of a file. A file could be explicitly deleted if the file system supports such a user command facility. Alternately, an existing good file would be automatically deleted if another good file with the same name were copied in. Note that deleted files continue to occupy prime Flash real estate.

A file is marked as having an invalid checksum if any checksum mismatch was detected while writing or reading the file. Incomplete files (files truncated either because of lack of free space, or a network download failure) are also written with a bad checksum and marked as invalid.

Syntax: Integer, 1 = deleted, 2 = invalidChecksum, 3 = valid

Max-Access: Read-only

**ciscoFlashFileName**

Specifies the Flash file name as specified by the user copying in the file. The name should not include the colon (:) character as it is a special separator character used to delineate the device name, partition name, and the file name.

Syntax: DisplayString (SIZE (1–255))

Max-Access: Read-only

**End of Table**

## Flash operations

Flash operations are used for copying to or from flash partitioning, and miscellaneous functions such as erasing, file verification.

## ciscoFlashCopyTable

Specifies a table of Flash copy operation entries. Each entry represents a Flash copy operation (to or from Flash) that has been initiated.

Syntax: SEQUENCE OF CiscoFlashCopyEntry

Max-Access: Not-accessible

### ciscoFlashCopyEntry

Specifies a Flash copy operation entry. Each entry consists of a command, a source, and optional parameters such as protocol to be used, a destination, a server address, and so forth.

A management station wishing to create an entry should first generate a pseudo-random serial number to be used as the index to this sparse table. The station should then create the associated instance of the row status object. It must also, either in the same or in successive PDUs, create the associated instance of the command and parameter objects. It should also modify the default values for any of the parameter objects if the defaults are not appropriate.

Once the appropriate instances of all the command objects have been created, either by an explicit SNMP set request or by default, the row status should be set to active to initiate the operation. Note that this entire procedure may be initiated by means of a single set request which specifies a row status of createAndGo as well as specifies valid values for the non-defaulted parameter objects.

Once an operation has been activated, it cannot be stopped. Once the operation completes, the management station should retrieve the value of the status object (and time if desired), and delete the entry. In order to prevent old entries from clogging the table, entries will be aged out, but an entry will never be deleted within 5 minutes of completing.

Syntax: CiscoFlashCopyEntry

Max-Access: Not-accessible

**ciscoFlashCopySerialNumber**

Specifies a unique entry in the table. A management station wishing to initiate a copy operation should use a pseudo-random value for this object when creating or modifying an instance of a ciscoFlashCopyEntry.

Syntax: Integer32

Max-Access: Not-accessible

**ciscoFlashCopyCommand**

Specifies the copy command to be executed. Mandatory. Note that it is possible for a system to support multiple file systems (different file systems on different Flash devices, or different file systems on different partitions within a device). Each such file system may support only a subset of these commands. If a command is unsupported, the invalidOperation(3) error will be reported in the operation status.

**Table 13 Copy Commands**

| Command | Remarks |
|---|---|
| copyToFlashWithErase | Copy a file to flash; erase flash before copy. Use the TFTP or rcp protocol |
| copyToFlashWithoutErase | Copy a file to flash; do not erase. Note that this command will fail if the PartitionNeedErasure object specifies that the partition being copied to needs erasure. Use the TFTP or rcp protocol. |
| copyFromFlash | Copy a file from flash using the TFTP, rcp or lex protocol. Note that the lex protocol can only be used to copy to a lex device. |
| copyFromFlhLog | Copy contents of FLH log to server using TFTP protocol. Command table parameters include *copyToFlashWithErase*, CopyProtocol, CopyServerAddress, CopySourceName, CopyDestinationName (optional), CopyRemoteUserName (optional), CopyNotifyOnCompletion (optional), *copyToFlashWithoutErase*, CopyProtocol, CopyServerAddress, CopySourceName, CopyDestinationName (optional), CopyRemoteUserName (optional), CopyNotifyOnCompletion (optional), *copyFromFlash*, CopyProtocol, CopySourceName, CopyDestinationName (optional), CopyRemoteUserName (optional), CopyNotifyOnCompletion (optional), *copyFromFlhLog*, CopyProtocol, CopyServerAddress, CopyDestinationName, CopyNotifyOnCompletion (optional) |

Syntax: Integer 1 = copyToFlashWithErase,

```
copy {tftp|rcp} flash
```

2 = copyToFlashWithoutErase,

```
copy {tftp|rcp} flash
```

3 = copyFromFlash,

```
copy flash {tftp|rcp|lex}
```

4 = copyFromFlhLog

```
copy flhlog tftp
```
Max-Access: Read-create

**ciscoFlashCopyProtocol**

Specifies the protocol to be used for any copy. Optional. Will default to tftp if not specified. Since feature support depends on a software release, version number within the release, platform, and maybe the image type (subset type), a management station would be expected to somehow determine the protocol support for a command.

Syntax: Integer 1 = tftp, 2 = rcp , 3 = lex

Max-Access: Read-create

**ciscoFlashCopyServerAddress**

Specifies the server address to be used for any copy. Optional. Will default to 'FFFFFFFF'H (or 255.255.255.255).

Syntax: IpAddress

Max-Access: Read-create

**ciscoFlashCopySourceName**

Specifies the source file name, either in Flash or on a server, depending on the type of copy command. Mandatory. For a copy from Flash, File name must be of the form

```
[device>:][<partition>:]<file>
```
where <device> is a value obtained from FlashDeviceName, <partition> is obtained from FlashPartitionName and <file> is the name of a file in Flash.

A management station could derive its own partition name as per the description for the ciscoFlashPartitionName object. If <device> is not specified, the default Flash device will be assumed.

If <partition> is not specified, the default partition will be assumed. If a device is not partitioned into 2 or more partitions, this value may be left out.

For a copy to Flash, the file name will be as per the file naming conventions and path to the file on the server.

Syntax: DisplayString (SIZE (1–255))

Max-Access: Read-create

**ciscoFlashCopyDestinationName**

Specifies the destination file name. For a copy to Flash,the file name must be of the form

```
{device>:][<partition>:]<file>
```

where <device> is a value obtained from FlashDeviceName, <partition> is obtained from FlashPartitionName and <file> is any character string that does not have embedded colon characters. A management station could derive its own partition name as per the description for the ciscoFlashPartitionName object.

If <device> is not specified, the default Flash device will be assumed. If <partition> is not specified, the default partition will be assumed. If a device is not partitioned into 2 or more partitions, this value may be left out. If <file> is not specified, it will default to <file> specified in ciscoFlashCopySourceName.

For a copy from Flash by means of tftp or rcp, the file name will be as per the file naming conventions and destination sub-directory on the server. If not specified, <file> from the source file name will be used.

For a copy from Flash by means of lex, this string will consist of numeric characters specifying the interface on the lex box that will receive the source flash image.

Syntax: DisplayString (SIZE (0–255))

Access: Read-create

**ciscoFlashCopyRemoteUserName**

Specifies the remote user name for copy by means of the rcp protocol. Optional. This object will be ignored for protocols other than rcp. If specified, it will override the remote user-name configured through the

**rcmd remote-username <username>** configuration command. The remote user-name is sent as the server user-name in an rcp command request sent by the system to a remote rcp server.

Syntax: DisplayString (SIZE (1–255))

Max-Access: Read-create

**Note** In IOS 10.3 and later, this command is known as **iprcmd remote-username <username>**.

**ciscoFlashCopyStatus**

Specifies the status of the specified copy operation, as defined in the following table.

**Table 14 Status Messages of Copy Operations**

| Status Message | Meaning |
|---|---|
| copyInProgress | specified operation is active |
| copyOperationSuccess | specified operation is supported and completed successfully |
| copyInvalidOperation | command invalid or command-protocol-device combination unsupported |
| copyInvalidProtool | invalid protocol specified |
| copyInvalidSourceName | invalid source file name specified For the copy from flash to lex operation, this error code will be returned when the source file is not a valid lex image. |
| copyInvalidDestName | invalid target name (file or partition or device name) specified For the copy from flash to lex operation, this error code will be returned when no lex devices are connected to the router or when an invalid lex interface number has been specified in the destination string. |
| copyInvalidServerAddress | invalid server address specified |
| copyDeviceBusy | specified device is in use and locked by another process |
| copyDeviceOpenError | invalid device name |
| copyDeviceError | device read, write or erase error |
| copyDeviceNotProgrammable | device is read-only but a write or erase operation was specified |
| copyDeviceFull | device is filled to capacity |
| copyFileOpenError | invalid file name; file not found in partition |
| copyFileTransferError | file transfer was unsuccessfull; network failure |
| copyFileChecksumError | file checksum in Flash failed |
| copyNoMemory | system running low on memory |
| copyUnknownFailure | failure unknown |

Syntax: Integer 1 = copyInProgress, 2 = copyOperationSuccess, 3 = copyInvalidOperation, 4 = copyInvalidProtocol, 5 = copyInvalidSourceName, 6 = copyInvalidDestName,7 = copyInvalidServerAddress, 8 = copyDeviceBusy, 9 = copyDeviceOpenError, 10 = copyDeviceError, 11 = copyDeviceNotProgrammable, 12 = copyDeviceFull, 13 = copyFileOpenError, 14 = copyFileTransferError, 15 = copyFileChecksumError, 16 = copyNoMemory, 17 = copyUnknownFailure

Max-Access: Read-only

**ciscoFlashCopyNotifyOnCompletion**

Specifies whether or not a notification should be generated on the completion of the copy operation. If specified, ciscoFlashCopyCompletionTrap will be generated. It is the responsibility of the management entity to ensure that the SNMP administrative model is configured in such a way as to allow the notification to be delivered.

Syntax: TruthValue

Max-Access: Read-create

**ciscoFlashCopyTime**

Specifies the time taken for the copy operation. This object will be like a stopwatch, starting when the operation starts, stopping when the operation completes. If a management entity keeps a database of completion times for various operations, it can then use the stopwatch capability to display percentage completion time.

Syntax: TimeTicks

Max-Access: Read-only

**ciscoFlashCopyEntryStatus**

Specifies the status of this table entry.

Syntax: RowStatus

Max-Access: Read-create

**End of Table**

## ciscoFlashPartitioningTable

Specifies atable of Flash partitioning operation entries. Each entry represents a Flash partitioning operation that has been initiated.

Syntax: SEQUENCE OF CiscoFlashPartitioningEntry

Max-Access: Not-accessible

**ciscoFlashPartitioningEntry**

Specifies a Flash partitioning operation entry. Each entry consists of the command, the target device, the partition count, and optionally the partition sizes.

A management station wishing to create an entry should first generate a pseudo-random serial number to be used as the index to this sparse table. The station should then create the associated instance of the row status object. It must also, either in the same or in successive PDUs, create the associated instance of the command and parameter objects. It should also modify the default values for any of the parameter objects if the defaults are not appropriate.

Once the appropriate instances of all the command objects have been created, either by an explicit SNMP set request or by default, the row status should be set to active to initiate the operation. Note that this entire procedure may be initiated via a single set request which specifies a row status of createAndGo as well as specifies valid values for the non-defaulted parameter objects.

Once an operation has been activated, it cannot be stopped. Once the operation completes, the management station should retrieve the value of the status object (and time if desired), and delete the entry. In order to prevent old entries from clogging the table, entries will be aged out, but an entry will never be deleted within 5 minutes of completing.

Syntax: CiscoFlashPartitioningEntry

Max-Access: Not-accessible

**ciscoFlashPartitioningSerialNumber**

Specifies the object which identifies a unique entry in the partitioning operations table. A management station wishing to initiate a partitioning operation should use a pseudo-random value for this object when creating or modifying an instance of a ciscoFlashPartitioningEntry.

Syntax: Integer32

Max-Access: Not-accessible

**ciscoFlashPartitioningCommand**

Specifies the partitioning command to be executed. Mandatory. If the command is unsupported, the partitioningInvalidOperation error will be reported in the operation status.

Syntax: Integer 1 = partition

Max-Access: Read-create

**Table 15 Partitioning Command**

| Command | Remarks | Parameters |
|---|---|---|
| partition | Partition a Flash device. All the prerequisites for partitioning must be met for this command to succeed. | PartitioningDestinationName, PartitioningPartitionCount, PartitioningPartitionSizes (optional), PartitioningNotifyOnCompletion (optional) |

**ciscoFlashPartitioningDestinationName**

Specifies the destination device name. This name will be the value obtained from FlashDeviceName. If the name is not specified, the default Flash device will be assumed.

Syntax: DisplayString (SIZE (0–255))

Max-Access: Read-create

**ciscoFlashPartitioningPartitionCount**

Specifies the number of partitions to be created. Its value cannot exceed the value of ciscoFlashDeviceMaxPartitions.

To undo partitioning (revert to a single partition), this object must have the value 1.

Syntax: Integer32

Max-Access: Read-create

**ciscoFlashPartitioningPartitionSizes**

Specifies the size of each partition to be created. The size of each partition will be in units of ciscoFlashDeviceMinPartitionSize. The value of this object will be in the form:

```
<part1>:<part2>...:<partn>
```

If partition sizes are not specified, the system will calculate default sizes based on the partition count, the minimum partition size, and the device size. Partition size need not be specified when undoing partitioning (partition count is 1). If partition sizes are specified, the number of sizes specified must exactly match the partition count. If not, the partitioning command will be rejected with the invalidPartitionSizes error.

Syntax: DisplayString

Max-Access: Read-create

**ciscoFlashPartitioningStatus**

Specifies the status of the specified partitioning operation.

**Table 16 Partitioning Operations**

| Operation | Meaning |
|---|---|
| partitioningInProgress | The specified operation is active |
| partitioningOperationSuccess | The specified operation has completed successfully |
| partitioningInvalidOperation | command invalid or command-protocol-device combination unsupported |
| partitioningInvalidDestName | invalid target name (file or partition or device name) specified |
| partitioningInvalidPartitionCount | invalid partition count specified for the partitioning command |
| partitioningInvalidPartitionSizes | invalid partition size, or invalid count of partition sizes |
| partitioningDeviceBusy | The specified device is in use and locked by another process |
| partitioningDeviceOpenError | invalid device name |
| partitioningDeviceEror | device read, write or erase error |
| partitioningNoMemoy | system running low on memory |
| partitioningUnknownFailure | failure unknown |

Syntax: Integer 1 = partitioningInProgress, 2 = partitioningOperationSuccess, 3 = partitioningInvalidOperation, 4 = partitioningInvalidDestName, 5 = partitioningInvalidPartitionCount, 6 = partitioningInvalidPartitionSizes, 7 = partitioningDeviceBusy, 8 = partitioningDeviceOpenError , 9 = partitioningDeviceError,10 = partitioningNoMemory, 11 = partitioningUnknownFailure

Max-Access: Read-only

**ciscoFlashPartitioningNotifyOnCompletion**

Specifies whether or not a notification should be generated on the completion of the partitioning operation. If specified, ciscoFlashPartitioningCompletionTrap will be generated. It is the responsibility of the management entity to ensure that the SNMP administrative model is configured in such a way as to allow the notification to be delivered.

Syntax: TruthValue

Max-Access: Read-create

**ciscoFlashPartitioningTime**

Specifies the time taken for the operation. This object will be like a stopwatch, starting when the operation starts, stopping when the operation completes. If a management entity keeps a database of completion times for various operations, it can then use the stopwatch capability to display percentage completion time.

Syntax: TimeTicks

Max-Access: Read-only

**ciscoFlashPartitioningEntryStatus**

Specifies the status of this table entry.

Syntax: RowStatus

Max-Access: Read-create

**End of Table**

## ciscoFlashMiscOpTable

Specifies a table of miscellaneous Flash operation entries. Each entry represents a Flash operation that has been initiated.

Syntax: SEQUENCE OF CiscoFlashMiscOpEntry

Max-Access: Not-accessible

**ciscoFlashMiscOpEntry**

Specifies a Flash operation entry. Each entry consists of a command, a target, and any optional parameters.

A management station wishing to create an entry should first generate a pseudo-random serial number to be used as the index to this sparse table. The station should then create the associated instance of the row status object. It must also, either in the same or in successive PDUs, create the associated instance of the command and parameter objects. It should also modify the default values for any of the parameter objects if the defaults are not appropriate.

Once the appropriate instances of all the command objects have been created, either by an explicit SNMP set request or by default, the row status should be set to active to initiate the operation. Note that this entire procedure may be initiated via a single set request which specifies a row status of createAndGo as well as specifies valid values for the non-defaulted parameter objects.

Once an operation has been activated, it cannot be stopped.

Once the operation completes, the management station should retrieve the value of the status object (and time if desired), and delete the entry. In order to prevent old entries from clogging the table, entries will be aged out, but an entry will never be deleted within 5 minutes of completing.

Syntax: CiscoFlashMiscOpEntry

Max-Access: Not-accessible

**ciscoFlashMiscOpSerialNumber**

Specifies a unique entry in the table. A management station wishing to initiate a flash operation should use a pseudo-random value for this object when creating or modifying an instance of a ciscoFlashMiscOpEntry.

Syntax: Integer32

Max-Access: Not-accessible

**ciscoFlashMiscOpCommand**

Specifies the command to be executed. Mandatory. Note that it is possible for a system to support multiple file systems (different file systems on different Flash devices, or different file systems on different partitions within a device). Each such file system may support only a subset of these commands. If a command is unsupported, the miscOpInvalidOperation(3) error will be reported in the operation status.

**Table 17 Miscellaneous Operation Commands**

| Command | Remarks |
|---|---|
| erase | Erase flash |
| verify | Verify flash file checksum |
| delete | Delete a file. |
| undelete | Revive a deleted file. Note that there are limits on the number of times a file can be deleted and undeleted. When this limit is exceeded, the system will return the appropriate error. |
| squeeze | Recover space occupied by deleted files. This command preserves the good files, erases out the file system, then restores the preserved good files. |

Syntax: Integer 1 = erase, 2 = verify, 3 = delete, 4 = undelete, 5 = squeeze

Max-Access: Read-create

**Table 18 Flash Command Parameters**

| Command | Parameters |
|---|---|
| erase | MiscOpDestinationName, MiscOpNotifyOnCompletion (optional) |
| verify | MiscOpDestinationName, MiscOpNotifyOnCompletion (optional) |

| Command | Parameters |
|---|---|
| delete | MiscOpDestinationName,<br>MiscOpNotifyOnCompletion (optional) |
| undelete | MiscOpDestinationName,<br>MiscOpNotifyOnCompletion (optional) |
| squeeze | MiscOpDestinationName,<br>MiscOpNotifyOnCompletion (optional) |

**ciscoFlashMiscOpDestinationName**

Syntax: DisplayString (SIZE (0–255))

Max-Access: Read-create

Specifies the destination file, or partition name. The file name must be of the following form:

```
[device>:][<partition>:]<file>
```

where <device> is a value obtained from FlashDeviceName, <partition> is obtained from FlashPartitionName and <file> is the name of a file in Flash. While leading and/or trailing whitespaces are acceptable, no whitespaces are allowed within the path itself.

A management station could derive its own partition name as per the description for the ciscoFlashPartitionName object. If <device> is not specified, the default Flash device will be assumed.

If <partition> is not specified, the default partition will be assumed. If a device is not partitioned into 2 or more partitions, this value may be left out.

For an operation on a partition, such as the erase command, this object would specify the partition name in the form:

[device>:][<partition>:]

**ciscoFlashMiscOpStatus**

Specifies the status of the given operation.

Syntax: Integer

1 = miscOpInProgress, 2 = miscOpOperationSuccess, 3 = miscOpInvalidOperation, 4 = miscOpInvalidDestName, 5 = miscOpDeviceBusy, 6 = miscOpDeviceOpenError, 7 = miscOpDeviceError, 8 = miscOpDeviceNotProgrammable, 9 = miscOpFileOpenError, 10 = miscOpFileDeleteFailure, 11 = miscOpFileUndeleteFailure, 12 = miscOpFileChecksumError, 13 = miscOpNoMemory, 14 = miscOpUnknownFailure

Max-Access: Read-only

**Table 19 Miscellaneous Flash Operations**

| Operation | Meaning |
|---|---|
| miscOpInProgress | specified operation is active |
| miscOpOperationSuccess | specified operation has completed successfully |
| miscOpInvalidOperation | command invalid or command-protocol-device combination unsupported |
| miscOpInvalidDestName | invalid target name (file or partition or device name) specified |
| miscOpDeviceBusy | specified device is in use and locked by another process |
| miscOpDeviceOpenError | invalid device name |
| miscOpDeviceError | device read, write or erase error |
| miscOpDeviceNotProgrammable | device is read-only but a write or erase operation was specified |
| miscOpFileOpenError | invalid file name; file not found in partition |
| miscOpFileDeleteFailure | file could not be deleted; delete count exceeded |
| miscOpFileUndeleteFailure | file could not be undeleted; undelete count exceeded |

| Operation | Meaning |
|---|---|
| miscOpFileChecksumError | file has a bad checksum |
| miscOpNoMemory | system running low on memory |
| miscOpUnknownFailure | failure unknown |

**ciscoFlashMiscOpNotifyOnCompletion**

Specifies whether a notification should be generated on the completion of an operation. If specified, ciscoFlashMiscOpCompletionTrap will be generated. It is the responsibility of the management entity to ensure that the SNMP administrative model is configured in such a way as to allow the notification to be delivered.

Syntax: TruthValue

Max-Access: Read-create

**ciscoFlashMiscOpTime**

Specifies the time taken for the operation. This object will be like a stopwatch, starting when the operation starts, stopping when the operation completes. If a management entity keeps a database of completion times for various operations, it can then use the stopwatch capability to display percentage completion time.

Syntax: TimeTicks

Max-Access: Read-only

**ciscoFlashMiscOpEntryStatus**

Specifies the status of this table entry.

Syntax: RowStatus

Max-Access: Read-create

**End of Table**

### ciscoFlashMIBTraps

The following notifications are supported with the ciscoFlash MIB:

#### ciscoFlashCopyCompletionTrap

A ciscoFlashCopyCompletionTrap is sent at the completion of a flash copy operation if such a trap was requested when the operation was initiated.

#### ciscoFlashPartitioningCompletionTrap

A ciscoFlashPartitioningCompletionTrap is sent at the completion of a partitioning operation if such a trap was requested when the operation was initiated.

#### ciscoFlashMiscOpCompletionTrap

A ciscoFlashMiscOpCompletionTrap is sent at the completion of a miscellaneous flash operation (enumerated in ciscoFlashMiscOpCommand) if such a trap was requested when the operation was initiated.

#### ciscoFlashDeviceChangeTrap

A ciscoFlashDeviceChangeTrap is sent whenever a removable Flash device is inserted or removed.

## Cisco Ping Group

The variables described in this section apply to the Cisco Ping MIB definitions.

## ciscoPingTable

Provides a table of ping request entries. The ping group consists of a single table, the ciscoPingTable, and includes the ciscoPing entries described in this subsection.

Syntax: Sequence of CiscoPingEntry

Max-Access: Not-accessible

### ciscoPingAddress

The address of the device to be pinged. An instance of this object cannot be created until the associated instance of ciscoPingProtocol is created. Once an instance of this object is created, its value cannot be changed.

Syntax: CiscoNetworkAddress

Max-Access: Read-Write

### ciscoPingEntry

Provides a ping request entry. A management station choosing to create an entry should first generate a pseudo-random serial number to be used as the index to this sparse table. The station should then create the associated instance of the row status and row owner objects. It must also, either in the same or in successive protocol data units (PDUs), create the associated instance of the protocol and address objects. It should also modify the default values for the other configuration objects if the defaults are not appropriate.

Once the appropriate instance of all the configuration objects has been created, either by an explicit SNMP set request or by default, the row status should be set to active to initiate the request. Note that this entire procedure can be initiated by means of a single set request which specifies a row status of *createAndGo* as well as specifies values for the non-defaulted configuration objects.

Once the ping sequence has been activated, it cannot be stopped; it will run until the configured number of packets have been sent.

Once the sequence completes, the management station should retrieve the values of the status objects of interest, and should then delete the entry. In order to prevent old entries from clogging the table, entries will be aged out, but an entry will never be deleted within 5 minutes of completing.

Syntax: CiscoPingEntry

Max-Access: Not-accessible

**ciscoPingProtocol**

Specifies the protocol stack over which the ping packet is being sent. For IOS Release 10.2, Cisco supports the SNMP ping over IP, IPX, AppleTalk, CLNS, DECnet, and VINES.

Syntax: Cisco Network Protocol

Max-Access: Read-Create

**ciscoPingSerialNumber**

Specifies a unique entry in the ciscoPingTable. A management station choosing to initiate a ping operation should use a pseudo-random value for this object when creating or modifying an instance of a ciscoPingEntry. The RowStatus semantics of the ciscoPingEntryStatus object will prevent access conflicts.

Syntax: Integer32

Max-Access: Not-accessible

**ciscoPingPacketCount**

Specifies the number of ping packets to send to the target in this sequence.

Syntax: Integer32

Max-Access: Read-create

**ciscoPingPacketSize**

Specifies the size of ping packets to send to the target in this sequence. The lower and upper boundaries of this object are protocol-dependent. An instance of this object cannot be modified unless the associated instance of ciscoPingProtocol has been created (so as to allow protocol-specific range checking on the new value).

Syntax: Integer32

Max-Access: Read-create

**ciscoPingPacketTimeout**

Specifies the amount of time to wait for a response to a transmitted packet before declaring the packet dropped.

Syntax: Integer32

Max-Access: Read-create

**ciscoPingDelay**

Specifies the minimum amount of time to wait before sending the next packet in a sequence after receiving a response or declaring a timeout for a previous packet. The actual delay may be greater due to internal task scheduling.

Syntax: Integer32

Max-Access: Read-create

**ciscoPingTrapOnCompletion**

Specifies whether a ciscoPingCompletion trap should be issued on completion of the sequence of pings. If such a trap is sought, it is the responsibility of the management entity to ensure that the SNMP administrative model is configured in such a way as to allow the trap to be delivered.

Syntax: TruthValue

Max-Access: Read-create

**ciscoPingSentPackets**

Specifies the number of ping packets that have been sent to the target in this sequence.

Syntax: Counter32

Max-Access: Read-only

**ciscoPingReceivedPackets**

Specifies the number of ping packets that have been received from the target in this sequence.

Syntax: Counter32

Max-Access: Read-only

**ciscoPingMinRtt**

Specifies the minimum round trip time of all the packets sent in this sequence. This object will not be created until the first ping response in a sequence is received.

Syntax: Integer

Max-Access: Read-only

**ciscoPingAvgRtt**

The average round trip time of all the packets sent in this sequence. This object will not be created until the first ping response in a sequence is received.

Syntax: Integer

Max-Access: Read-only

**ciscoPingMaxRtt**

The maximum round trip time of all the packets sent in this sequence. This object will not be created until the first ping response in a sequence is received.

Syntax: Integer

Max-Access: Read-only

**ciscoPingCompleted**

Specifies a setting of true when all the packets in this sequence have been answered or have timed out.

Syntax: TruthValue

Max-Access: Read-only

**ciscoPingEntryOwner**

Specifies the entity that configured this device.

Syntax: OwnerString

Max-Access: Read-create

**ciscoPingEntryStatus**

Specifies the status of this table entry. Once the entry status is set to active, the associate entry cannot be modified until the sequence is completed (in other words, ciscoPingCompleted is true).

Syntax: RowStatus

Max-Access: Read-create

## Cisco Repeater (ciscoRptr) Group

The Cisco Repeater Group specifies proprietary MIB extensions to RFC 1516. These extensions support the standard-repeater (hub), including the Cisco 2516, features such as link-test, auto-polarity, source-address control, and the MDI/MDI-X switch status.

**ciscoRptrPortMDIStatus**

Specifies the port's MDI/MDI-X switching status. The crossover(2) status indicates the port is configured to be in MDI-X mode (crossover function is enabled to allow for connection to a chained hub). The normal(1) status indicates the port is configured to be standard MDI as defined by the 10BaseT Standard. The notSwitchable(3) status indicates the port is not switchable between MDI and MDI-X mode.

Syntax: Integer 1 = normal, 2 = crossover, 3 = notSwitchable

Max-Access: Read-only

**ciscoRptrPortLinkTestEnabled**

Specifies whether or not Link Integrity Test Function is enabled for the port as specified by the 10BaseT Standard. When the link test function is enabled, the absence of the Link Test pulses and receive data on the port will cause the port to go into a Link Fail state. In this state, the data transmission, data reception and collision detection functions are disabled until valid data or 4 consecutive Link Test pulses appear on RXD+/- pair of the port. With the Link Integrity Test Function disabled, the data driver, receiver and collision detection remain enabled irrespective of the presence or absence of data or Link Test pulses on the port.

Syntax: TruthValue

Max-Access: Read-write

**ciscoRptrPortLinkTestFailed**

Specifies the status of the Link Test function for the port. Set to false indicates valid data or 4 consecutive Link Test pulses have been detected on the port. Set to true indicates the failure of the Link Test function for the port. In the Link Test Fail state, data transmission, data reception and collision detection functions are disabled until valid data or 4 consecutive Link Test pulses appear on the RXD+/- pair of the port.

Syntax: TruthValue

Max-Access: Read-only

**ciscoRptrPortAutoPolarityEnabled**

Specifies whether or not the Automatic Receiver Polarity Reversal is enabled for the port. This feature provides the ability to invert the polarity of the signals appearing at the RXD+/- pair of the port prior to re-transmission if the polarity of the received signal is reversed (such as in the case of wiring error).

Syntax: TruthValue

Max-Access: Read-write

**ciscoRptrPortAutoPolarityCorrected**

Specifies the status of the Automatic Receiver Polarity Reversal for the port. Set to true indicates the polarity of the port has been detected as reversed and is corrected. Set to false indicates the polarity for the port as having correct polarity.

Syntax: TruthValue

Max-Access: Read-only

**ciscoRptrPortSrcAddrCtrl**

Specifies whether or not the Source Address Control feature is enabled for the port. This feature provides the ability to control which device's specific MAC address is allowed access to the network. If the management entity specified an address via ciscoRptrPortAllowedSrcAddr, only the device with the configured MAC address is allowed access to the network. If the management entity does not specified an address, the allowed source address is learned from the last source address if valid; otherwise, the allowed source address is learned from the MAC address of the first valid packet detected on the port. When another MAC address other than the allowed source address is detected on the port, the port is partitioned.

**Note** Configuring Source Address Control feature on the port which is used for management can cause the management entity to lose access to the agent if the management's source address does not match the allowed source address.

Syntax: TruthValue

Max-Access: Read-write

**ciscoRptrPortAllowedSrcAddr**

For write access, this object specifies the allowed source address that is to be configured for source address control feature for the port. For read access, if no allowed source address was specifically specified by the manager, the agent shall return the learned address to control. Otherwise, the specified allowed source address is returned if configured by management entity.

Syntax: OCTET STRING (SIZE(0 | 6))

Max-Access: Read-write

**ciscoRptrPortAllowedSrcAddrStatus**

Specifies the status of ciscoRptrPortAllowedSrcAddr for the port. allowedSrcAddrConfig(1) status indicates that the allowed source address was explicitly configured by management entity. The allowedSrcAddrLearn(2) status indicates that the allowed source address was learned for the port. The allowedSrcAddrUndefined(3) status indicates that currently there is no restriction on the source address for the port.

Syntax: Integer 1 = allowedSrcAddrConfig, 2 = allowedSrcAddrLearn, 3 = allowedSrcAddrUndefined

Max-Access: Read-only

**ciscoRptrPortLastIllegalSrcAddr**

Specifies the last illegal source address which caused this port to be partitioned. If the port is never partitioned due to Source Address Control, the agent shall return a string of length zero.

Syntax: OCTET STRING (SIZE(0 | 6))

Max-Access: Read-only

## System Group

The variables described in this section are system-wide and apply to all Cisco Systems products.

## Basic

The following variables pertain to basic information such as system software description and version number, host and domain names, and number of bytes of free memory in the managed device:

**authAddr**

Provides the IP address of the device causing the last SNMP authorization failure. The device did not use a configured community string or tried a SET with a read-only community string.

Syntax: IP address

Access: Read-only

**bootHost**

Provides the IP address of the host that supplied the software currently running on the managed device.

Syntax: IP address

Access: Read-only

**domainName**

Provides the domain portion of the domain name of the host.

Syntax: Display string

Access: Read-only

**freeMem**

Provides the number of bytes of free memory available in the managed device.

Syntax: Integer

Access: Read-only

**hostName**

Represents the name of the host in printable ASCII characters.

Syntax: Display string

Access: Read-only

**romId**

Contains a printable octet string that contains the system bootstrap description and version identification.

Syntax: Display string

Access: Read-only

**whyReload**

Contains a printable octet string that contains the reason why the system was last restarted.

Syntax: Display string

Access: Read-only

## Buffer

The following variables are used to monitor the amount and type of buffer space available within a managed device. *Buffers* are blocks of memory used to hold network packets. There are five types of buffers based on size: *small*, *middle*, *big*, *large*, and *huge*. There are several pools of different-sized buffers. These pools grow and shrink based upon demand. Some buffers are temporary and are created and destroyed as warranted. Others are permanently allocated.

### bufferFail

Contains the total number of allocation requests that have failed due to lack of any free buffers.

Syntax: Integer

Access: Read-only

### bufferNoMem

Counts the number of failures caused by insufficient memory to create a new buffer.

Syntax: Integer

Access: Read-only

## Buffer Elements

Buffer elements are blocks of memory used in internal operating system queues.

### bufferElCreate

Contains the number of new buffer elements created for the managed device.

Syntax: Integer

Access: Read-only

**bufferElFree**

Contains the number of buffer elements that are not currently allocated and are available for use in the managed device.

Syntax: Integer

Access: Read-only

**bufferElHit**

Contains the number of successful attempts to allocate a buffer element when needed.

Syntax: Integer

Access: Read-only

**bufferElMax**

Contains the maximum number of buffer elements the managed device can have.

Syntax: Integer

Access: Read-only

**bufferElMiss**

Contains the number of allocation attempts that failed because there were no buffer elements available.

Syntax: Integer

Access: Read-only

## Small Buffers

Small buffer sizes are configurable.

**bufferSmCreate**

Contains the number of small buffers created in the managed device.

Syntax: Integer

Access: Read-only

**bufferSmFree**

Contains the number of small buffers that are currently available to the managed device.

Syntax: Integer

Access: Read-only

**bufferSmHit**

Contains the number of successful attempts to allocate a small buffer when needed.

Syntax: Integer

Access: Read-only

**bufferSmMax**

Contains the maximum number of small buffers that can be allocated to the managed device.

Syntax: Integer

Access: Read-only

**bufferSmMiss**

Contains the number of allocation attempts that failed because there were no small buffers available.

Syntax: Integer

Access: Read-only

**bufferSmSize**

Provides the size (in bytes) of small buffers.

Syntax: Integer

Access: Read-only

**bufferSmTotal**

Provides the total number of small buffers allocated to the managed device.

Syntax: Integer

Access: Read-only

**bufferSmTrim**

Contains the small buffers that have been destroyed in the managed device.

Syntax: Integer

Access: Read-only

## Middle Buffers

Middle buffer sizes are configurable.

**bufferMdCreate**

Contains the number of middle buffers created in the managed device.

Syntax: Integer

Access: Read-only

**bufferMdFree**

Contains the number of middle buffers that are currently available to the managed device.

Syntax: Integer

Access: Read-only

**bufferMdHit**

Contains the number of successful attempts to allocate a middle buffer when needed.

Syntax: Integer

Access: Read-only

**bufferMdMax**

Contains the maximum number of middle buffers that can be allocated to the managed device.

Syntax: Integer

Access: Read-only

**bufferMdMiss**

Contains the number of allocation attempts that failed because there were no middle buffers available.

Syntax: Integer

Access: Read-only

**bufferMdSize**

Provides the size (in bytes) of middle buffers.

Syntax: Integer

Access: Read-only

**bufferMdTotal**

Provides the total number of middle buffers allocated to the managed device.

Syntax: Integer

Access: Read-only

**bufferMdTrim**

Contains the middle buffers that have been destroyed in the managed device.

Syntax: Integer

Access: Read-only

## Big Buffers

Big buffer sizes are configurable.

**bufferBgCreate**

Contains the number of big buffers created in the managed device.

Syntax: Integer

Access: Read-only

**bufferBgFree**

Contains the number of big buffers that are currently available to the managed device.

Syntax: Integer

Access: Read-only

**bufferBgHit**

Contains the number of successful attempts to allocate a big buffer when needed.

Syntax: Integer

Access: Read-only

**bufferBgMax**

Contains the maximum number of big buffers that can be allocated to the managed device.

Syntax: Integer

Access: Read-only

**bufferBgMiss**

Contains the number of allocation attempts that failed because there were no big buffers available.

Syntax: Integer

Access: Read-only

**bufferBgSize**

Provides the size (in bytes) of big buffers.

Syntax: Integer

Access: Read-only

**bufferBgTotal**

Provides the total number of big buffers allocated to the managed device.

Syntax: Integer

Access: Read-only

**bufferBgTrim**

Contains the big buffers that have been destroyed in the managed device.

Syntax: Integer

Access: Read-only

## Large Buffers

Large buffer sizes are configurable.

**bufferLgCreate**

Contains the number of large buffers created in the managed device.

Syntax: Integer

Access: Read-only

**bufferLgFree**

Contains the number of large buffers that are currently available to the managed device.

Syntax: Integer

Access: Read-only

**bufferLgHit**

Contains the number of successful attempts to allocate a large buffer when needed.

Syntax: Integer

Access: Read-only

**bufferLgMax**

Contains the maximum number of large buffers that can be allocated to the managed device.

Syntax: Integer

Access: Read-only

**bufferLgMiss**

Contains the number of allocation attempts that failed because there were no large buffers available.

Syntax: Integer

Access: Read-only

**bufferLgSize**

Provides the size (in bytes) of large buffers.

Syntax: Integer

Access: Read-only

**bufferLgTotal**

Provides the total number of large buffers allocated to the managed device.

Syntax: Integer

Access: Read-only

**bufferLgTrim**

Contains the large buffers that have been destroyed in the managed device.

Syntax: Integer

Access: Read-only

## Huge Buffers

Huge buffer sizes are configurable.

### bufferHgCreate

Contains the number of huge buffers created in the managed device.

Syntax: Integer

Access: Read-only

### bufferHgFree

Contains the number of huge buffers that are currently available to the managed device.

Syntax: Integer

Access: Read-only

### bufferHgHit

Contains the number of successful attempts to allocate a huge buffer when needed.

Syntax: Integer

Access: Read-only

### bufferHgMax

Contains the maximum number of huge buffers that can be allocated to the managed device.

Syntax: Integer

Access: Read-only

**bufferHgMiss**

Contains the number of allocation attempts that failed because there were no huge buffers available.

Syntax: Integer

Access: Read-only

**bufferHgSize**

Provides the size (in bytes) of huge buffers.

Syntax: Integer

Access: Read-only

**bufferHgTotal**

Provides the total number of huge buffers allocated to the managed device.

Syntax: Integer

Access: Read-only

**bufferHgTrim**

Contains the huge buffers that have been destroyed in the managed device.

Syntax: Integer

Access: Read-only

## CPU Utilization

The following variables provide statistics on the CPU utilization of a device:

**avgBusy1**

Provides a cumulative average of the CPU usage percentage over a 1-minute period. This variable, called by the scheduler every 5 seconds, computes the busy time in the last 5-second period, and the 5-minute, exponentially decayed busy time. The following equation shows the average sampling time:

average = ((average–interval) * exp (-t/C)) + interval

where t is 5 seconds and C is 1 minute, exp(–5/60) == .920 ~= 942/1024

Syntax: Integer

Access: Read-only

**avgBusy5**

Provides a cumulative average of the CPU usage percentage over a 5-minute period. This variable, called by the scheduler every 5 seconds, computes the busy time in the last 5-second period, and the 5-minute, exponentially decayed busy time. The following equation shows the average sampling time:

average = ((average-interval) * exp (-t/C)) + interval

where t is 5 seconds and C is five minutes, exp(–5/60*5)) == .983 ~= 1007/1024

Syntax: Integer

Access: Read-only

**avgBusyPer**

Provides the percentage of CPU usage over the first 5-second period in the scheduler. The scheduler determines which process or task takes priority over another and triggers them accordingly.

Syntax: Integer

Access: Read-only

**ciscoContactInfo**

Provides the Cisco name and address for reference purposes. This MIB variable applies only to router products that were purchased from Cisco.

Syntax: Display string

Access: Read-only

## Environmental Monitor Card and Environmental Monitoring

The environmental monitor card is provided only with the Cisco AGS+ router. This card checks input air temperature and air flow through the system card cage and card cage backplane power supplies. It also provides nonvolatile and system bus memory for the system. The Cisco 7000 and Cisco 7010 have built-in environmental monitoring functionality, and so does not use the card. The Cisco 7000 and Cisco 7010 routers provide environmental monitoring, reporting, and if necessary, system shutdown.

The following MIB module describes the status of the Environmental Monitor on those devices which support one:

**ciscoEnvMonPresent**

Specifies the type of environmental monitor located in the chassis. An oldAgs environmental monitor card is identical to an ags environmental card except that it is not capable of supplying data, and hence no instance of the remaining objects in this MIB will be returned in response to an SNMP query. Note that only a firmware upgrade is required to convert an oldAgs into an ags card.

Syntax: Integer, 1 = oldAgs, 2 = ags, 3 = c7000

Max-Access: Read-only

### ciscoEnvMonVoltageStatusTable

Specifies the table of voltage status maintained by the environmental monitor.

Syntax: SEQUENCE OF CiscoEnvMonVoltageStatusEntry

Max-Access: Not-accessible

#### ciscoEnvMonVoltageStatusEntry

An entry in the voltage status table, representing the status of the associated testpoint maintained by the environmental monitor.

Syntax: CiscoEnvMonVoltageStatusEntry

Max-Access: Not-accessible

#### ciscoEnvMonVoltageStatusIndex

Specifies a unique index for the testpoint being instrumented. This index is for SNMP purposes only and has no intrinsic meaning.

Syntax: Integer32

Max-Access: Not-accessible

#### ciscoEnvMonVoltageStatusDesc

Provides a textual description of the testpoint being instrumented. This description is a short textual label, suitable as a human-sensible identification for the rest of the information in the entry.

Syntax: DisplayString

Max-Access: Read-only

**ciscoEnvMonVoltageStatusValue**

Specifies the current measurement in millivolts of the testpoint being instrumented.

Syntax: CiscoSignedGauge

Max-Access: Read-only

**ciscoEnvMonVoltageThresholdLow**

Specifies the lowest value in millivolts that the associated instance of the object ciscoEnvMonVoltageStatusValue can obtain before an emergency shutdown of the managed device is initiated.

Syntax: Integer32

Max-Access: Read-only

**ciscoEnvMonVoltageThresholdHigh**

The highest value in millivolts that the associated instance of the object ciscoEnvMonVoltageStatusValue can obtain before an emergency shutdown of the managed device is initiated.

Syntax: Integer32

Max-Access: Read-only

**ciscoEnvMonVoltageLastShutdown**

The value in millivolts of the associated instance of the object ciscoEnvMonVoltageStatusValue at the time an emergency shutdown of the managed device was last initiated. This value is stored in nonvolatile RAM and hence is able to survive the shutdown.

Syntax: Integer32

Max-Access: Read-only

**ciscoEnvMonVoltageState**

Specifies the current state of the testpoint being instrumented.

Syntax: CiscoEnvMonState

Max-Access: Read-only

**End of Table**

## ciscoEnvMonTemperatureStatusTable

Specifies the table of ambient temperature status maintained by the environmental monitor.

Syntax: SEQUENCE OF CiscoEnvMonTemperatureStatusEntry

Max-Access: Not-accessible

**ciscoEnvMonTemperatureStatusEntry**

An entry in the ambient temperature status table, representing the status of the associated testpoint maintained by the environmental monitor.

Syntax: CiscoEnvMonTemperatureStatusEntry

Max-Access: Not-accessible

**ciscoEnvMonTemperatureStatusIndex**

Specifies the unique index for the testpoint being instrumented. This index is for SNMP purposes only and has no intrinsic meaning.

Syntax: Integer32

Max-Access: Not-accessible

**ciscoEnvMonTemperatureStatusDescr**

Specifies the textual description of the testpoint being instrumented. This description is a short textual label, suitable as a human-sensible identification for the rest of the information in the entry.

Syntax: DisplayString

Max-Access: Read-only

**ciscoEnvMonTemperatureStatusValue**

Specifies the current measurement in degrees Celsius of the testpoint being instrumented.

Syntax: Gauge32

Max-Access: Read-only

**ciscoEnvMonTemperatureThreshold**

Specifies the highest value in degrees Celsius that the associated instance of the object ciscoEnvMonTemperatureStatusValue can obtain before an emergency shutdown of the managed device is initiated.

Syntax: Integer32

Max-Access: Read-only

**ciscoEnvMonTemperatureLastShutdown**

Specifies the value in degrees Celsius of the associated instance of the object ciscoEnvMonTemperatureStatusValue at the time an emergency shutdown of the managed device was last initiated. This value is stored in nonvolatile RAM and hence is able to survive the shutdown.

Syntax: Integer32

Max-Access: Read-only

**ciscoEnvMonTemperatureState**

Specifies the current state of the testpoint being instrumented.

Syntax: CiscoEnvMonState

Max-Access: Read-only

**End of Table**

## ciscoEnvMonFanStatusTable

Provides the fan status maintained by the environmental monitor.

Syntax: SEQUENCE OF CiscoEnvMonFanStatusEntry

Max-Access: Not-accessible

**ciscoEnvMonFanStatusEntry**

Specifies an entry in the fan status table, representing the status of the associated fan maintained by the environmental monitor.

Syntax: CiscoEnvMonFanStatusEntry

Max-Access: Not-accessible

**ciscoEnvMonFanStatusIndex**

Specifies a unique index for the fan being instrumented. This index is for SNMP purposes only and has no intrinsic meaning.

Syntax: Integer32

Max-Access: Not-accessible

**ciscoEnvMonFanStatusDescr**

Provides a textual description of the fan being instrumented. This description is a short textual label, suitable as a human-sensible identification for the rest of the information in the entry.

Syntax: DisplayString

Max-Access: Read-only

**ciscoEnvMonFanState**

Specifies the current state of the fan being instrumented.

Syntax: CiscoEnvMonState

Max-Access: Read-only

**End of Table**

## ciscoEnvMonSupplyStatusTable

Specifies the table of power supply status maintained by the environmental monitor card.

Syntax: SEQUENCE OF CiscoEnvMonSupplyStatusEntry

Max-Access: Not-accessible

**ciscoEnvMonSupplyStatusEntry**

Specifies an entry in the power supply status table, representing the status of the associated power supply maintained by the environmental monitor card.

Syntax: CiscoEnvMonSupplyStatusEntry

Max-Access: Not-accessible

**ciscoEnvMonSupplyStatusIndex**

Specifies a unique index for the power supply being instrumented. This index is for SNMP purposes only and has no intrinsic meaning.

Syntax: Integer32

Max-Access: Not-accessible

**ciscoEnvMonSupplyStatusDescr**

Provides a textual description of the power supply being instrumented. This description is a short textual label, suitable as a human-sensible identification for the rest of the information in the entry.

Syntax: DisplayString

Max-Access: Read-only

**ciscoEnvMonSupplyState**

Specifies the current state of the power supply being instrumented.

Syntax: CiscoEnvMonState

Max-Access: Read-only

## SNMPv2 Notifications Used in Cisco Environmental Monitoring

The following object identifiers are used to define SNMPv2 notifications that are backward compatible with SNMPv1 notifications, along with their associated notification enables:

**ciscoEnvMonShutdownNotification**

A ciscoEnvMonShutdownnotification is sent if the environmental monitor detects a testpoint reaching a critical state and is about to initiate a shutdown. This notification contains no objects so that it can be encoded and sent in the shortest amount of time possible. Even so, management applications should not rely on receiving such a notification because it might not be sent before the shutdown completes.

**ciscoEnvMonEnableShutdownNotification**

This variable indicates whether the system produces the ciscoEnvMonShutdownNotification.

Syntax: TruthValue

Max-Access: Read-write

**ciscoEnvMonEnableVoltageNotification**

Specifies whether the system produces the ciscoEnvMonVoltageNotification. A false value will prevent voltage notifications from being generated by this system

Syntax: TruthValue

Max-Access: Read-write

**ciscoEnvMonVoltageNotification**

A ciscoEnvMonVoltageNotification is sent if the voltage measured at a given testpoint is outside the normal range for the testpoint. (In other words, is at the warning, critical, or shutdown stage.) Because such a notification is usually generated before the shutdown state is reached, it can convey more data and has a better chance of being sent than does the ciscoEnvMonShutdownNotification. The ciscoEnvMonVoltage includes the following variable bindings (varBinds): ciscoEnvMonVoltageStatusDescr, ciscoEnvMonVoltageStatusValue, and ciscoEnvMonVoltageState. (The varBinds comprise the data of an SNMP v.1 protocol data unit (PDU). Each varBind associates a particular variable with its current value—with the exception of get and get-next requests, for which the value is ignored).

**ciscoEnvMonTemperatureNotification**

A ciscoEnvMonTemperatureNotification is sent if the temperature measured at a given testpoint is outside the normal range for the testpoint (in other words, the testpoint is at the warning, critical, or shutdown stage). Because such a notification is usually generated before the shutdown state is reached, it can convey more data and has a better

chance of being sent than does the ciscoEnvMonShutdownNotification. The ciscoEnvMonTemperatureNotification includes the following varBinds: ciscoEnvMonTemperatureStatusDescr, ciscoEnvMonTemperatureStatusValue, and ciscoEnvMonTemperatureState

**ciscoEnvMonEnableTemperatureNotification**

Specifies whether the system produces the ciscoEnvMonTemperatureNotification. A false value will prevent temperature notifications from being generated by this system.

Syntax: TruthValue

Max-Access: Read-write

**ciscoEnvMonFanNotification**

A ciscoEnvMonFanNotification is sent if any fan in the fan arrays fails. Because such a trap is usually generated before the shutdown state is reached, it can convey more data and has a better chance of being sent than does the ciscoEnvMonShutdownNotification. The ciscoEnvMonFanNotification includes the following varBinds: ciscoEnvMonFanStatusDescr, and ciscoEnvMonFanState

**ciscoEnvMonEnableFanNotification**

Specifies whether the system produces the ciscoEnvMonFanNotification. A false value will prevent fan notifications from being generated by this system.

Syntax: TruthValue

Max-Access: Read-write

**ciscoEnvMonRedundantSupplyNotification**

A ciscoEnvMonRedundantSupplyNotification is sent if the redundant power supply (where extant) fails. Because such a notification is usually generated before the shutdown state is reached, it can convey more data

and has a better chance of being sent than does the ciscoEnvMonShutdownNotification. The ciscoEnvMonRedundantSupplyNotification has the following varBinds included: ciscoEnvMonSupplyStatusDescr, and ciscoEnvMonSupplyState.

**ciscoEnvMonEnableRedundantSupplyNotification**

Specifies whether the system produces the ciscoEnvMonRedundantSupplyNotification. A false value will prevent redundant supply notifications from being generated by this system.

Syntax: TruthValue

Max-Access: Read-write

## Environmental Monitor Card

The variables in this section , from the Environmental Monitor Card group in IOS Release 10.2, have been deprecated and replaced with the former Environmental Monitor group, also found in the ciscoMgmt tree.

The environmental card is provided only with the Cisco AGS+ router. This card checks input air temperature and air flow through the system card cage and card cage bckplane power supplies. It also provides nonvolatile and system bus memory for the system. The Cisco 7000 has built-in environmental monitoring functionality, and so does not use the card. The Cisco 7000 router provides environmental monitoring , reporting, and if necessary, system shutdown.

All MIB variables in this group apply to the Cisco AGS+. A subset of those variables apply to the Cisco 7000. the following variables are used to poll and display power supply voltage and air temperature (in Celsius) in an AGS+ to help prevent system problems.

**envBurnDate**

Provides the date of the calibration of the environmental monitor card. (AGS+ only).

For example:

```
calibrated on 2-14-93.
```

Syntax: Display string

Access: Read-only

**envFirmVersion**

Provides the firmware level of the environmental monitor card. (AGS+ only).

For example:

```
Environmental controller firmware version 2.0
```

Syntax: Display string

Access: Read-only

**envPresent**

Indicates whether there is an environmental monitor card in a router.

Syntax: Integer (0 = no, 1 = yes, but unavailable to SNMP; 2 = yes and available to SNMP for AGS+ routers; 3 = yes and available to SNMP for Cisco 7000 routers)

Access: Read-only

**envSerialNumber**

Provides the serial number of the environmental monitor card. (AGS+ only)

Following is an example of a serial number:

```
00220846
```

Syntax: Display string

Access: Read-only

**envTechnicianID**

Provides the technician ID for the environmental monitor card. (AGS+ only)

Following is an example of a technician ID:

```
rma
```

Syntax: Display string

Access: Read-only

**envTestPt1Descr**

Test point 1 is the temperature of air entering the router. (AGS+ and Cisco 7000)

Syntax: Display string

Access: Read-only

**envTestPt1last**

Provides the temperature of air entering the AGS+ and the Cisco 7000 router when the last shutdown occurred. If the input air temperature exceeds 109°F (43°C) in an AGS+, an error is detected, and the CSC-ENVM card shuts down the power supply.

Syntax: Integer

Access: Read-only

**envTestPt1MarginVal**

Provides warning and fatal threshold values of the internal intake air for the AGS+ router and Cisco 7000.

Syntax: Integer

Access: Read-only

**envTestPt1Measure**

Provides the current temperature of air entering the router. (AGS+ and Cisco 7000)

Syntax: Display string

Access: Read-only

**envTestPt1warn**

Indicates whether the air temperature entering the router is at warning level. (AGS+ and Cisco 7000)

Syntax: Integer (1 = warning, 2 = no warning)

Access: Read-only

**envTestPt2Descr**

Provides the temperature of air leaving the router. (AGS+ and Cisco 7000)

Syntax: Display string

Access: Read-only

**envTestPt2last**

Provides the temperature of air leaving the router when the last shutdown occurred. (AGS+ and Cisco 7000)

Syntax: Integer

Access: Read-only

**envTestPt2MarginVal**

Provides the fatal threshold value for the exhaust air flow of the router. (AGS+ and Cisco 7000)

Syntax: Integer

Access: Read-only

**envTestPt2Measure**

Provides the temperature of the exhaust air flow of the router. (AGS+ and Cisco 7000)

Syntax: Integer

Access: Read-only

**envTestPt2warn**

Indicates whether the temperature of air flow leaving the router is at a warning level. (AGS+ and Cisco 7000)

Syntax: Integer (1 = warning, 2 = no warning)

Access: Read-only

**envTestPt3Descr**

Test point 3 is the +5-volt (V) line on the router.

Syntax: Display string

Access: Read-only

**envTestPt3last**

Provides the value of the +5V line when the last shutdown occurred. (AGS+ and Cisco 7000)

Syntax: Integer

Access: Read-only

**envTestPt3MarginPercent**

Provides the warning and fatal thresholds for the +5V line to the power supply on the AGS+ router. The warning threshold is ± 5 percent above or below +5V. The fatal threshold at which the router shuts down is ± 10 percent above or below +5V. (AGS+ only)

Syntax: Integer

Access: Read-only

**envTestPt3Measure**

Provides the current value for the +5V line to the power supply on the router. The value is expressed in millivolts. (AGS+ and Cisco 7000)

Syntax: Integer

Access: Read-only

**envTestPt3warn**

Indicates whether the +5V line to the power supply is at warning level. The warning threshold is ±5 percent above or below +5V. (AGS+ and Cisco 7000)

Syntax: Integer (1 = warning, 2 = no warning)

Access: Read-only

**envTestPt4Descr**

Test point 4 is the +12V line to the power supply of the router.

Syntax: Display string

Access: Read-only

**envTestPt4last**

Provides the value of the +12V line when the last shutdown occurred.

Syntax: Integer

Access: Read-only

**envTestPt4MarginPercent**

Provides the warning and fatal thresholds for the +12V line to the power supply on the AGS+ router. The warning threshold is ± 10 percent above or below +12V. The fatal threshold at which the router shuts down is ± 15 percent above or below +12V. (AGS+ only)

Syntax: Integer

Access: Read-only

**envTestPt4Measure**

Provides the current value (in millivolts) of the +12V line to the power supply of the router.

Syntax: Integer

Access: Read-only

**envTestPt4warn**

Indicates whether the +12V line to the power supply is at warning level. The warning threshold is ± 10 percent above or below +12V.

Syntax: Integer (1 = warning, 2 = no warning)

Access: Read-only

**envTestPt5Descr**

Test point 5 is the –12V line to the power supply of the router.

Syntax: Display string

Access: Read-only

**envTestPt5last**

Provides the value of the –12V line when the last shutdown occurred.

Syntax: Integer

Access: Read-only

**envTestPt5MarginPercent**

Provides the warning and fatal thresholds for the –12V line to the power supply on the router. The warning threshold is ± 10 percent above or below –12V. The fatal threshold at which the router shuts down is ± 15 percent above or below –12V. (AGS+ only)

Syntax: Integer

Access: Read-only

**envTestPt5Measure**

Provides the current value (in millivolts) of the –12V line to the power supply of the router.

Syntax: Integer

Access: Read-only

**envTestPt5warn**

Indicates whether the –12V line to the power supply on the router is at the warning level. The warning threshold is ± 10 percent above or below –12V. (AGS+ only)

Syntax: Integer (1 = warning, 2 = no warning)

Access: Read-only

**envTestPt6Descr**

Test point 6 is the –5V line to the power supply of the AGS+ router and +24V line to the power supply of the Cisco 7000 router.

Syntax: Display string

Access: Read-only

**envTestPt6last**

Provides the value of the –5V line to the power supply of the AGS+ router and +24V line to the power supply of the Cisco 7000 router when the last shutdown occurred.

Syntax: Integer

Access: Read-only

**envTestPt6MarginPercent**

Provides the warning and fatal thresholds for the –12V line to the power supply on the AGS+ router. The warning threshold is ± 5 percent above or below –5V. The fatal threshold at which the router shuts down is ± 10 percent above or below –5V. (AGS+ only)

Syntax: Integer

Access: Read-only

**envTestPt6Measure**

Provides the current value (in millivolts) of the –5V line to the power supply of the AGS+ router and +24V line to the power supply of the Cisco 7000 router.

Syntax: Integer

Access: Read-only

For the Cisco 7000, this variable indicates whether the +P24V line to the power supply is at the warning level.

Syntax: Integer (1 = warning, 2 = no warning)

Access: Read-only

**envTestPt6warn**

Indicates whether the –5V line to the power supply of the AGS+ router or +24V line to the power supply of the Cisco 7000 router is at the warning level. The warning threshold is ± 10 percent above or below –5V (AGS+ router) or +24V (Cisco 7000 router).

Syntax: Integer (1 = warning, 2 = no warning)

Access: Read-only

**envType**

Provides the type of environmental card (for example, CSC-ENVM).

Syntax: Display string

Access: Read-only

## Host Configuration File

The following variables are used to monitor and set host configuration file information:

**hostConfigAddr**

Provides the address of the host that provided the host configuration file for the managed device. The *host configuration file* contains commands that apply to one network server in particular.

Syntax: IpAddress

Access: Read-only

**hostConfigName**

Provides the name of the last host configuration file used by the device.

Syntax: Display string

Access: Read-only

**hostConfigProto**

Provides the protocol that supplied the host configuration file.

Syntax: Integer (1 = IP, 2 = MOP, 3 = not applicable)

Access: Read-only

**hostConfigSet**

Allows the network management system (NMS) to load a new host configuration file via Trivial File Transfer Protocol (TFTP) onto the managed device and indicate the name of this configuration file. The instance ID is the IP address of the TFTP host. The display string indicates the name of the configuration file.

Syntax: Display string

Access: Write-only

## Network Configuration File

The following variables are used to monitor and remotely set network configuration file information for the device:

**netConfigAddr**

Provides the address of the host that supplied the network configuration file for the managed device. The *network configuration file* contains commands that apply to all network servers and terminal services on a network.

Syntax: IpAddress

Access: Read-only

**netConfigName**

Provides the name of the network configuration file that resides on the managed device.

Syntax: Display string

Access: Read-only

**netConfigProto**

Provides the protocol that supplied the network configuration file.

Syntax: Integer

Access: Read-only

**netConfigSet**

Loads a new network configuration file via Trivial File Transfer Protocol (TFTP) onto the managed device and indicates the name of this configuration file. The instance ID is the IP address of the TFTP host. The display string indicates the name of the configuration file.

Syntax: Display string

Access: Write-only

## System Configuration

The following variables are used to monitor and set system-wide parameters:

**sysClearARP**

Performs a clearing of the entire Address Resolution Protocol (ARP) cache and Internet Protocol (IP) route cache. The ARP provides dynamic mapping between IP addresses and Ethernet addresses. The ARP Cache table, which keeps a record of these mappings, can be cleared for maintenance purposes.

The IP route cache controls the use of a high-speed switching cache for IP routing. The route cache is enabled by default and allows outgoing packets to be load balanced on a per-destination basis. The *sysClearARP* variable helps clear the IP route cache for maintenance purposes.

Syntax: Integer

Access: Write-only

**sysClearInt**

Clears an interface that is given *IfIndex* as a value. To clear an interface, take the *ifIndex* for the interface (for example, a value of 4) and set the *sysClearInt* variable to the *ifIndex* value of 4.

Syntax: Integer

Access: Write-only

**sysConfigAddr**

Provides the address of the host that supplied the system boot image for the managed device. New versions of software can be downloaded over the network with boot image files. The new file takes effect the next time the managed device is reloaded.

Syntax: IpAddress

Access: Read-only

**sysConfigName**

Provides the name of the system boot image file. New versions of software can be downloaded over the network with boot image files. The new file takes effect the next time the managed device is reloaded.

Syntax: Display string

Access: Read-only

**sysConfigProto**

Provides the protocol type that supplied the system boot image.

Syntax: Integer

Access: Read-only

**writeMem**

Writes the current (running) router configuration into nonvolatile memory where it can be stored and retained even if the router is reloaded. Write configuration memory if 1. Erase configuration memory if 0.

Syntax: Integer

Access: Write-only

**writeNet**

Sends a copy of the current configuration via Trivial File Transfer Protocol (TFTP) to a remote host. When it is stored on the host, the configuration file can be edited and retrieved by other network entities.

Syntax: Display string

Access: Write-only

## Terminal Services Group

Following are variables that can be applied to terminal services. This group of variables contains terminal service information on a per-line basis, such as line status, line type, line speed, type of flow control, and type of modem.

**tsLine**

Provides the number of physical lines on the device.

Syntax: Integer

Access: Read-only

**tsClrTtyLine**

Specifies the tty line to clear. Read returns the last line cleared. A value of –1 indicates that no lines have been cleared.

Syntax: Integer

Access: Read-write

## Terminal Services Line Table

The local terminal services line table, *ltsLineTable*, contains all of the variables described in this section. The index to this table is the number of the terminal services line. If there are *n* number of terminal lines associated with the device, there will be *n* rows in the table.

**Table 20 Terminal Services Line**

| Line Number | tsLineActive | tsLineAutobaud | and so on |
|---|---|---|---|
| 1 | Contains all of the variables described in this section. | | |
| 2 | | | |
| and so on | | | |

**tsLineActive**

Indicates whether this line is active.

Syntax: Integer (1 = active, 2 = not active)

Access: Read-only

**tsLineAutobaud**

Indicates whether the line is set to autobaud detection so that it can adapt to the rate at which data is being sent to it.

Syntax: Integer (1 = autobaud, 2 = not autobaud)

Access: Read-only

**tsLineEsc**

Indicates what is used to represent the escape (Esc) character. The escape character allows a user to break out of active sessions.

Syntax: Display string

Access: Read-only

**tsLineFlow**

Indicates the type of flow control the line is using. The flow can be controlled from software or hardware. Input indicates that the flow control is coming from the device to the terminal service. Output indicates flow control is provided by the terminal service.

The possible integer values follow:

1 = unknown
2 = none
3 = software-input
4 = software-output
5 = software-both
6 = hardware-input
7 = hardware-output
8 = hardware-both

Syntax: Integer

Access: Read-only

**tsLineLoc**

Describes the physical location of the line. The integer values 1–3 represent commands that can be defined by the user.

Syntax: Display string

Access: Read-only

**tsLineModem**

Describes the type of modem control the line is using.

The possible integer values follow:

1 = unknown
2 = none
3 = call-in
4 = call-out
5 = cts-required
6 = ri-is-cd
7 = modem inout

Descriptions of the integer values follow:

*Call-in* indicates dial-in modems that use the status of Data Terminal Ready (DTR) to determine whether to answer an incoming call.

*Call-out* indicates modems that raise data terminal ready (DTR) to see if Clear To Send (CTS) becomes high as an indication that the host has noticed its signal.

*Cts-required* indicates the form of modem control that requires CTS to be high throughout the use of the line.

*ri-is-cd* is used for lines with high-speed modems. The modem answers the call if DTR is high, uses its Carrier Detect (CD) signal to reflect the carrier presence, and has its CD signal wired to the ring input of the terminal service.

*modem inout* is used to configure a line for both incoming and outgoing calls. The command enables a line to be used for both incoming and outgoing calls on dial-in/dial-out modems.

Syntax: Integer

Access: Read-only

**tsLineNoise**

Provides the number of garbage characters received while the line is inactive.

Syntax: Integer

Access: Read-only

**tsLineNses**

Indicates the number of current sessions on the line.

Syntax: Integer

Access: Read-only

**tsLineRotary**

Specifies the number of the rotary group to which the line belongs. If the first line in a rotary group is busy, a connection can be made to the next free line.

Syntax: Integer

Access: Read-only

**tsLineScrlen**

Provides the length (in lines) of the screen of the terminal attached to the line.

Syntax: Integer

Access: Read-only

**tsLineScrwid**

Provides the width (in characters) of the screen of the terminal attached to the line.

Syntax: Integer

Access: Read-only

**tsLineSestmo**

Specifies the interval (in seconds) for closing the connection when there is no input or output traffic during a session.

Syntax: Integer

Access: Read-only

**tsLineSpeedin**

Indicates the input speed at which the line is running.

Syntax: Integer

Access: Read-only

**tsLineSpeedout**

Indicates the output speed at which the line is running.

Syntax: Integer

Access: Read-only

**tsLineTerm**

Describes the terminal type of the line.

Syntax: Display string

Access: Read-only

**tsLineTmo**

Specifies the interval (in seconds) for closing the connection when there is no input or output traffic on the line.

Syntax: Integer

Access: Read-only

**tsLineType**

Describes the terminal line type.

The possible integer values follow:

1 = unknown
2 = console
3 = terminal

4 = line-printer
5 = virtual-terminal
6 = auxiliary

Syntax: Integer

Access: Read-only

**tsLineUser**

Provides the Terminal Access Controller Access System (TACACS) username and indicates whether TACACS is enabled on this line. TACACS servers provide security for accessing terminals remotely.

Syntax: Display string

Access: Read-only

**tsLineUses**

Indicates the number of times a connection has been made to or from this line.

Syntax: Integer

Access: Read-only

**End of Table**

## Terminal Services Line Session Table

The Terminal Services Line Session table, *ltsLineSessionTable*, contains six variables: *tslineSesAddr, tslineSesCur, tslineSesDir, tslineSesIdle, tslineSesName,* and *tslineSesType.*

For simplification, Table 21 shows values for three of the variables contained in the Terminal Services Line Session table. The index to the table is the session number and line number. Line 1 in the first session illustrates a Telnet connection. The session was started by the terminal. The remote host for this session is located at the IP address of 131.38.141.244.

**Table 21 Terminal Services Line Session**

| Session no. Line no. | tslineSesAddr | tslineSesDir | tslineSesType |
|---|---|---|---|
| 1, 1 | 131.38.141.244 | 3 | 5 |
| 2, 4 | 138.121.128.243 | 2 | 3 |

**tslineSesAddr**

Provides the address of the remote host for this session.

Syntax: Network address

Access: Read-only

**tslineSesCur**

Indicates whether this session is currently active.

Syntax: Integer (1 = active, 2 = not active)

Access: Read-only

**tslineSesDir**

Indicates whether this session was started by another device (incoming) or by the terminal (outgoing).

The possible integer values follow:

1 = unknown
2 = incoming
3 = outgoing

Syntax: Integer

Access: Read-only

**tslineSesIdle**

Indicates the amount of time (in seconds) that this session has been idle.

Syntax: Integer

Access: Read-only

**tslineSesName**

Provides the name of the remote host for this session.

Syntax: Display string

Access: Read-only

**tslineSesType**

Describes the type of session that is currently active.

The possible integer values follow:

1 = unknown
2 = X.3 Packet Assembler/Disassembler (PAD)
3 = stream (enables a raw TCP [Transmission Control Protocol] stream with no Telnet-control sequences)
4 = rlogin (for making remote connection to a host—part of TCP/IP)
5 = telnet (for making remote connection to a host—UNIX protocol)
6 = Transmission Control Protocol (TCP)
7 = local-area transport (LAT)
8 = Maintenance Operation Protocol (MOP)
9 = Serial Line Internet Protocol (SLIP)
10 = XRemote (provides support for X Windows over a serial line)

Syntax: Integer

Access: Read-only

**End of Table**

## Terminal Services Messages

The following variables pertain to the parameters of terminal services messages:

### tsMsgDuration

Sets the length of time (in milliseconds) allocated to reissue a message. The minimum nonzero setting is 10000.0. A setting of 0 will not repeat the message.

Syntax: Integer

Access: Read-write

### tsMsgIntervaltim

Sets the interval (in milliseconds) that occurs between reissues of the same message. The minimum (nonzero) setting for this interval is 10,000 milliseconds. If set to 0, the intervals will become more frequent as the message duration gets close to expiring. For example, 2 hours, 1 hour, 30 minutes, 5 minutes, and 1 minute.

Syntax: Integer

Access: Read-write

### tsMsgSend

Determines what action to take after the message has been sent.

The possible integer values follow:

1 = nothing
2 = reload
3 = message done
4 = abort

Syntax: Integer

Access: Read-write

**tsMsgText**

Sets the text of the message. Up to 256 characters can be included in the message.

Syntax: Display string

Access: Read-write

**tsMsgTmpBanner**

Determines whether to use the message text as a temporary banner.

Syntax: Integer (1 = no, 2 = yes, in addition to the regular banner)

Access: Read-write

**tsMsgTtyLine**

Selects the TTY line to which you want the message sent. Setting this variable to –1 will send the message to all TTY lines.

Syntax: Integer

Access: Read-write

## Transmission Control Protocol (TCP) Group

The following variables, from the TCP group in IOS Release 10.2, have been deprecated and replaced with the ciscoTCP group, found in the ciscoMgmt tree.

These variables can be applied to Cisco products running the Transmission Control Protocol (TCP). These variables provide statistics on the number of input and output bytes and packets for TCP connections.

### TCP Connection Table

The TCP connection table, *ltcpConnTable*, contains five variables: *loctcpConnElapsed, loctcpConnInBytes*, *loctcpConnInPkts*, *loctcpConnOutBytes*, and *loctcpConnOutPkts.*

The index to this table includes the local host address and port number and the remote host address and port number for each TCP connection that is active for the device. These values are represented by *tcpConnLocalAddress*, *tcpConnLocalPort*, *tcpConnRemAddress*, and *tcpConRemPort*.

For *n* number of TCP connections, there are *n* rows in the table. The value *n* can change at any time if another TCP connection opens or if an existing TCP connection closes.

In Table 22, TCP A represents the first TCP connection in the table. The TCP A connection shows 100 input bytes, 100 output bytes, 85 input packets, and 85 output packets for the connection. The connection has been established for 60 seconds, or 6000 timeticks.

**Table 22 TCP Connection Table**

| ltcpConnTable | Elapsed | InBytes | InPkts | OutBytes | OutPkts |
|---|---|---|---|---|---|
| TCP A | 6000 | 100 | 85 | 100 | 85 |
| TCP B | 4500 | 200 | 90 | 130 | 100 |
| TCP C | 9000 | 300 | 100 | 250 | 95 |

### loctcpConnElapsed

Provides the length of time that the TCP connection has been established.

Syntax: Timeticks

Access: Read-only

### loctcpConnInBytes

Provides the number of input bytes for the TCP connection.

Syntax: Counter

Access: Read-only

**loctcpConnInPkts**

Provides the number of input packets for the TCP connection.

Syntax: Counter

Access: Read-only

**loctcpConnOutBytes**

Provides the number of output bytes for the TCP connection.

Syntax: Counter

Access: Read-only

**loctcpConnOutPkts**

Provides the number of output packets for the TCP connection.

Syntax: Counter

Access: Read-only

**End of Table**

## Temporary Variables

This section is equivalent to the experimental space defined by the Structure of Management Information (SMI). It contains variables that are useful to have, but are beyond the ability of Cisco to control and maintain. Support for these variables can change with each Cisco Systems software release.

**Note** Unlike the compilable mib files, this quick reference guide organizes variable groups and variables within groups alphabetically so that you can quickly look up descriptions of MIB variables.

The temporary variables section includes the following groups of variables:

- AppleTalk
- Chassis
  - Chassis Card Table
  - Chassis Interface Table
  - CardTableIfIndex Table
- DECnet
  - DECnet Area Routing Table
  - DECnet Host Table
  - DECnet Interface Table
- Novell
- Virtual Integrated Network Service (VINES)

The variables in this group have been deprecated and replaced with the ciscoVINES (cv) group, found in the ciscoMgmt tree:

  - Banyan Vines Interface Table
- Xerox Network Systems (XNS)

## AppleTalk Group

Variables in this group can be used with all Cisco products running the AppleTalk protocol. These variables provide such information as total number of input and output packets, number of packets with errors, and number of packets with Address Resolution Protocol (ARP) requests and replies.

### atArpprobe

Indicates the total number of input ARP probe packets.

Syntax: Integer

Access: Read-only

**atArpreply**

Indicates the total number of AppleTalk ARP reply packets output.

Syntax: Integer

Access: Read-only

**atArpreq**

Indicates the total number of input AppleTalk ARP request packets.

Syntax: Integer

Access: Read-only

**atAtp**

Indicates the total number of AppleTalk ATP packets received.

Syntax: Integer

Access: Read-only

**atBcastin**

Indicates the total number of AppleTalk input broadcast packets.

Syntax: Integer

Access: Read-only

**atBcastout**

Indicates the total number of AppleTalk output broadcast packets.

Syntax: Integer

Access: Read-only

**atChksum**

Indicates the total number of AppleTalk input packets with checksum errors.

Syntax: Integer

Access: Read-only

**atDdpbad**

Indicates the total number of illegal-sized AppleTalk Datagram Delivery Protocol (DDP) packets received.

Syntax: Integer

Access: Read-only

**atDdplong**

Indicates the total number of long DDP packets received.

Syntax: Integer

Access: Read-only

**atDdpshort**

Indicates the total number of short DDP packets received.

Syntax: Integer

Access: Read-only

**atEcho**

Indicates the total number of AppleTalk echo packets received.

Syntax: Integer

Access: Read-only

**atEchoill**

Indicates the total number of illegal AppleTalk echo packets received.

Syntax: Integer

Access: Read-only

**atForward**

Indicates the total number of AppleTalk packets forwarded.

Syntax: Integer

Access: Read-only

**atHopcnt**

Indicates the total number of AppleTalk input packets that have exceeded the maximum hop count.

Syntax: Integer

Access: Read-only

**atInmult**

Indicates the total number of AppleTalk input packets with multicast addresses.

Syntax: Integer

Access: Read-only

**atInput**

Indicates the total number of input AppleTalk packets.

Syntax: Integer

Access: Read-only

**atLocal**

Indicates the total number of AppleTalk input packets for this host.

Syntax: Integer

Access: Read-only

**atNbpin**

Indicates the total number of AppleTalk Name Binding Protocol (NBP) packets received.

Syntax: Integer

Access: Read-only

**atNbpout**

Indicates the total number of NBP packets sent.

Syntax: Integer

Access: Read-only

**atNoaccess**

Indicates the total number of AppleTalk packets dropped due to access control.

Syntax: Integer

Access: Read-only

**atNobuffer**

Indicates the total number of AppleTalk packets lost due to no memory.

Syntax: Integer

Access: Read-only

**atNoencap**

Indicates the total number of AppleTalk packets that were dropped because they could not be encapsulated.

Syntax: Integer

Access: Read-only

**atNoroute**

Indicates the total number of number of AppleTalk packets dropped because the router did not know where to forward them.

Syntax: Integer

Access: Read-only

**atNotgate**

Indicates the total number of AppleTalk input packets received while AppleTalk routing was not enabled.

Syntax: Integer

Access: Read-only

**atOutput**

Indicates the total number of AppleTalk output packets.

Syntax: Integer

Access: Read-only

**atRtmpin**

Indicates the total number of AppleTalk Routing Table Maintenance Protocol (RTMP) packets received.

Syntax: Integer

Access: Read-only

**atRtmpout**

Indicates the total number of RTMP packets sent.

Syntax: Integer

Access: Read-only

**atUnknown**

Indicates the total number of unknown AppleTalk input packets.

Syntax: Integer

Access: Read-only

**atZipin**

Indicates the total number of AppleTalk Zone Information Protocol (ZIP) packets received.

Syntax: Integer

Access: Read-only

**atZipout**

Indicates the total number of ZIP packets sent.

Syntax: Integer

Access: Read-only

## Chassis Group

Variables in this group apply to the Cisco chassis and provide information about the hardware within the chassis such as the system software version of the read-only memory (ROM) and the type of chassis (Cisco 2000, Cisco 3000, and so on).

The Chassis Card table, *cardTableEntry,* contains information on a per-chassis basis and includes the following variables: *cardDescr, cardHwVersion, cardIndex, cardSerial, cardSlotNumber, cardSwVersion,* and *cardType*. The index to this table is *cardIndex*. If the device has *n* number of cards, the table will contain *n* number of rows.

**chassisId**

Provides the unique ID number for the chassis. This number contains the value of the CPU serial number or ID number (if available); otherwise, it will be empty. This number also can be set with *snmp-server chassis-id*. An example of a value for a CPU serial number is 00160917.

Syntax: Display string

Access: Read-write

**chassisPartner**

Specifies whether this chassis is a variant partner of a product.

Syntax: Integer (1 = cisco, 2 = synoptics, 3 = chipcom, 4 = cabletron, 5 = dec, 6 = ncr, 7 = usrobotics)

Access: Read-only

**chassisSlots**

Provides the number of slots in this chassis, or –1 if no slots exist or the number of slots cannot be determined.

Syntax: Integer

Access: read-only

**chassisType**

Indicates the type of chassis for the product. For example, c4000 indicates a Cisco 4000 router.

The following are integer values for this variable:

1 = Unknown

2 = Multibus (for example, CGS or ASM)

3 = AGS+

4 = IGS

5 = Cisco 2000

6 = Cisco 3000

7 = Cisco 4000

8 = Cisco 7000

9 = Communication server 500

10 = Cisco 7010

11 = Cisco 2500

12 = Cisco 4500

Syntax: Integer

Access: Read-only

**chassisVersion**

Provides the chassis hardware revision level, or an empty string if the information is unavailable. Examples of the types of chassis versions are D or AO.

Syntax: Display string

Access: Read-only

**configRegister**

Indicates the value of the configuration register.

Syntax: Integer

Access: Read-only

**configRegNext**

Indicates the value of the configuration register at next reload.

Syntax: Integer

Access: Read-only

**nvRAMSize**

Provides the nonvolatile configuration memory in bytes.

Syntax: Integer

Access: Read-only

**nvRAMUsed**

Provides the number of bytes of nonvolatile configuration memory in use.

Syntax: Integer

Access: Read-only

**processorRam**

Provides the bytes of RAM available to the CPU of the device.

Syntax: Integer

Access: Read-only

**romVersion**

Provides the ROM system software version, or an empty string if unavailable. Following is an example of the type of information provided by the *romVersion* variable:

```
System Bootstrap, Version 4.5(3), SOFTWARE [fc1]
Copyright (c) 1986-1992 by cisco Systems
```

Syntax: Display string

Access: Read-only

**romSysVersion**

Provides the software version of the system software in ROM, or an empty string if the information is unavailable. Following is an example of the type of information provided by the *romSysVersion* variable:

```
GS Software (GS3), Version 10.2(3127) [jdoe 106]
Copyright (c) 1986-1993 by cisco Systems, Inc.
Compiled Thu 08-Apr-93 09:55
```

Syntax: Display string

Access: Read-only

## Chassis Interface Card Table

The Chassis Interface Card Table, *cardTabl*e, contains the *cardTableEntry* variable. The Cisco Card table, *cardTableEntry*, contains seven entries, or rows: *cardDescr, cardHwVersion*, *cardIndex*, *cardSerial*, *cardSwVersion*, *cardSlotNumber*, and *cardType*. The index to this table is *cardIndex*. If there are *n* number of cards associated with the device, there will be *n* rows in the table.

For example, in Table 23, there are 4 rows.

**Table 23 Chassis Card Table**

| cardType | cardDescr | cardHwVersion | cardSerial | and so on |
|---|---|---|---|---|
| 70 | MCI interface | 1.1 | 0 | |
| 70 | MCI interface | 1.1 | 0 | |
| 5 | 25 MHz 68040 | | 0 | |
| 24 | Environmental Monitor | 4 | 00196849 | |
| and so on | | | | |

**cardDescr**

Provides a description of the card used by the router. Examples of the descriptions are *MEC Ethernet* for an MEC board, *25MHz 68040* for the CSC/4, and *CTR Token Ring* for a CTR board.

Syntax: Display string

Access: Read-only

**cardHwVersion**

Provides the hardware revision level of this card, or an empty string if unavailable.

Syntax: Display string

Access: Read-only

**cardIndex**

Provides index into card table (not physical chassis slot number).

Syntax: Integer

Access: Read-only

**cardSerial**

Provides the serial number of this card, or zero if unavailable.

Syntax: Integer

Access: Read-only

**cardSlotNumber**

Provides the chassis slot number. A value of –1 is provided if it is not applicable or cannot be determined.

Syntax: Integer

Access: Read-only

**cardSwVersion**

Provides the version of the firmware or microcode installed on this card, or an empty string if unavailable. For example, *1.8* indicates MCI microcode 1.8, and *3.0 MADGE 1.01/4.02, TI 000000* indicates CSC-R16M.

Syntax: Display string

Access: Read-only

**cardType**

Provides information that identifies the functional type of card.

The possible integer values follow:

1 = unknown

2 = csc1

3 = csc2

4 = csc3

5 = csc4

6 = rp

20 = csc-m

21 = csc-mt

22 = csc-mc

23 = csc-mcplus

24 = csc-envm

40 = csc-16

41 = csc-p

50 = csc-a

51 = csc-e1

52 = csc-e2

53 = csc-y

54 = csc-s

55 = csc-t

56 = sci4s

57 = sci2s2t

58 = sci4t

59 = mci1t

60 = mci2t

61 = mci1s

62 = mci1s1t

63 = mci2s

64 = mci1e

65 = mci1e1t

66 = mci1e2t

67 = mci1e1s

68 = mci1e1s1t

69 = mci1e2s

70 = mci2e

71 = mci2e1t

72 = mci2e2t

73 = mci2e1s

74 = mci2e1s1t

75 = mci2e2s

80 = csc-r

81 = csc-r16

82 = csc-r16m

83 = csc-1r

84 = csc-2r

100 = csc-cctl1

101 = csc-cctl2

110 = csc-mec2

111 = csc-mec4

112 = csc-mec6

113 = csc-fci

114 = csc-fcit

115 = csc-hsci

116 = csc-ctr

150 = sp

151 = eip

152 = fip

153 = hip

154 = sip

155 = trip

156 = fsip

157 = aip

158 = mip

159 = ssp

200 = npm-4000-fddi-sas

201 = npm-4000-fddi-das

202 = npm-4000-1e

203 = npm-4000-1r

204 = npm-4000-2s

206 = npm-4000-2e

210 = npm-4000-4b

211 = npm-4000-8b

Syntax: Integer

Access: Read-only

**chassisSlots**

Provides the number of slots in this chassis. A value of –1 is provided if the number is not applicable or cannot be determined.

Syntax: Integer

Access: Read-only

**Chassis cardTableIfIndex Table**

The cardTableIfIndex Table, introduced in IOS Release 10.3, provides logical mapping between a device interface and a card's presence in the chassis. The variables in this table support only the Cisco 4000, Cisco 4500, Cisco7000, and Cisco 7010. By implementing the new MIB table in supported configurations, you can discover statistics about the card. The cardTableIfIndex table can provide significant solutions for CiscoWorks and CiscoView users.

**cardIfIndex**

Matches RFC1213 ifTable IfIndex.

Syntax: Integer

Access: Read-only

**cardIfSlotNumber**

Specifies the Chassis slot number, or –1 if neither is applicable nor determinable.

Syntax: Integer

Access: Read-only

**cardIfPortNumber**

Specifies the Chassis port number, unique per port on a given card if available.

Syntax: Integer

Access: Read-only

## DECnet Group

This section describes the Cisco MIB variables pertaining to monitoring and managing a device running the DECnet protocol. These variables gather information, such as hop count, host name, total packets received and sent, and number of packets with header errors.

**Note** The terms *Level 1* and *Level 2* are used often with these variables. Level 1 routers can communicate with end nodes and with other Level 1 routers in an area. Level 2 routers can communicate with Level 1 routers in the same area and with Level 2 routers in different areas. The term *hellos* is also used. Hosts acknowledge the addresses of other hosts by listening to host hello messages. Hosts learn about nearby routers by listening to router hello messages.

**dnBadhello**

Provides the total number of received bad hello messages.

Syntax: Integer

Access: Read-only

**dnBadlevel1**

Provides the total number of bad Level 1 routing packets that have been received.

Syntax: Integer

Access: Read-only

**dnBigaddr**

Provides the total number of addresses that are too large.

Syntax: Integer

Access: Read-only

**dnDatas**

Provides the total number of received data packets.

Syntax: Integer

Access: Read-only

**dnFormaterr**

Provides the total number of DECnet packets received with header errors.

Syntax: Integer

Access: Read-only

**dnForward**

Provides the total number of DECnet packets forwarded.

Syntax: Integer

Access: Read-only

**dnHellos**

Provides the total number of hello messages received.

Syntax: Integer

Access: Read-only

**dnHellosent**

Provides the total number of output hello messages.

Syntax: Integer

Access: Read-only

**dnLevel1s**

Provides the total number of Level 1 routing packets received.

Syntax: Integer

Access: Read-only

**dnLevel1sent**

Provides the total number of Level 1 routing packets sent.

Syntax: Integer

Access: Read-only

**dnLevel2s**

Provides the total number of Level 2 routing packets received.

Syntax: Integer

Access: Read-only

**dnLevel2sent**

Provides the total number of Level 2 routing packets sent.

Syntax: Integer

Access: Read-only

**dnNoaccess**

Provides the total number of packets dropped due to access control failure.

Syntax: Integer

Access: Read-only

**dnNoencap**

Provides the total number of packets that were dropped because they could not be encapsulated.

Syntax: Integer

Access: Read-only

**dnNomemory**

Provides the total number of transactions denied due to lack of memory.

Syntax: Integer

Access: Read-only

**dnNoroute**

Provides the total number of packets that were dropped because the router did not know where to forward them.

Syntax: Integer

Access: Read-only

**dnNotgateway**

Provides the total number of packets that were received while not routing DECnet.

Syntax: Integer

Access: Read-only

**dnNotimp**

Provides the total number of unknown control packets received.

Syntax: Integer

Access: Read-only

**dnNotlong**

Provides the total number of received packets not in the long DECnet format. This number should always be zero.

Syntax: Integer

Access: Read-only

**dnNovector**

Provides the total number of missing routing vectors. Occurs when a packet is received for which there is no entry in the Routing table.

Syntax: Integer

Access: Read-only

**dnOtherhello**

Provides the total number of hello messages received from another area by a Level 1 router.

Syntax: Integer

Access: Read-only

**dnOtherlevel1**

Provides the total number of Level 1 routing packets received from another area.

Syntax: Integer

Access: Read-only

**dnOtherlevel2**

Provides the total number of Level 2 routing packets received from another area.

Syntax: Integer

Access: Read-only

**dnReceived**

Provides the number of total DECnet packets received.

Syntax: Integer

Access: Read-only

**dnToomanyhops**

Provides the total number of packets received that exceeded the maximum hop count set for this device and have been discarded.

Syntax: Integer

Access: Read-only

## DECnet Area Routing Table

The DECnet Area Routing table, *dnAreaTable,* includes seven variables: *dnAAge, dnACost, dnAHop, dnAIfIndex, dnANextHop, dnAPrio,* and *dnArea.* The index for this table is the DECnet area, or *dnArea.* If there are *n* number of areas for the device, there will be *n* rows in the table.

For example, in Table 24, the DECnet area is 44; the cost is 3; and the maximum number of hops allowed is 2. The interface used to get to area 44 is number 1; the address for the next hop is 46.5; the Routing table was updated 30 seconds ago; and the next hop area is prioritized as 1.

**Table 24 DECnet Area Routing**

| dn Area | dnACost | dnAHop | dnA IfIndex | dnA Next Hop | dnAAge | dnA Prio |
|---|---|---|---|---|---|---|
| 44 | 3 | 2 | 1 | 46.5 | 30 | 1 |
| 24 | 60 | 4 | 2 | 24.7 | 12 | 2 |
| 6 | 17 | 2 | 3 | 6.4 | 60 | 3 |

### dnAAge

Provides the age (in seconds) of an area route. When a route is used or has been verified as functional, its age is reset to 0. If a route is not used, its age will gradually grow. Eventually, routes with large ages are cleared out.

Syntax: Integer

Access: Read-only

### dnACost

Provides the cost of the router area. The cost value can be an integer from 1 through 63. The cost signifies routing preference. The lower the cost, the better the path.

Syntax: Integer

Access: Read-only

### dnAHop

Provides the maximum number of hops for a route to a distant area that the router will accept.

Syntax: Integer

Access: Read-only

**dnAIfIndex**

Provides the instance ID of the interface providing the next hop address to the area. A zero denotes self. The DECnet table is indexed by *dnArea*. For example, *dnAIfIndex.5* is the *ifIndex* for the next hop to *DECnet area 5*; *dnAifIndex 7* is the *ifIndex* for the next hop to DECnet area 7; and so on.

If *dnAIfIndex.5* is set to the value of 4, to get to the next hop for DECnet area 5, the router sends the packet via the interface that has an *ifIndex* of 4.

Syntax: Integer

Access: Read-only

**dnANextHop**

Provides the DECnet address for the next hop.

Syntax: Octet string

Access: Read-only

**dnAPrio**

Provides the priority of the next hop router for an area route.

Syntax: Integer

Access: Read-only

**dnArea**

Indicates the DECnet area for the device.

Syntax: Integer

Access: Read-only

**End of Table**

## DECnet Host Table

The DECnet host table, *dnHostTable*, contains seven variables: *dnHAge*, *dnHCost*, *dnHHop*, *dnHIfIndex*, *dnHNextHop*, *dnHost*, and *dnHPrio*.

In Table 25, the first DECnet host address in the table is 44.5. Its cost is 3; the number of hops to the host is 4; and the interface number 1 provides the next hop to address 55.6. The route was updated 30 seconds ago, and the priority for the next hop is set to 4.

**Table 25 DECnet Host**

| dnHost | dnH Cost | dnH Hop | dnHIfIndex | dnH Next Hop | dnH Age | dnH Prio |
|---|---|---|---|---|---|---|
| 44.5 | 3 | 4 | 1 | 55.6 | 30 | 4 |
| 54.6 | 1 | 3 | 2 | 33.2 | 20 | 3 |
| 23.2 | 2 | 1 | 3 | 25.1 | 60 | 2 |

### dnHAge

Provides the age (in seconds) of the route to the host.When a route is used or has been verified as functional, its age is reset to 0. If a route is not used, the age of the route will gradually grow. Eventually, routes with large ages are cleared out.

Syntax: Integer

Access: Read-only

### dnHCost

Provides the cost of the path to this device.

Syntax: Integer

Access: Read-only

**dnHHop**

Provides the number of hops to this device.

Syntax: Integer

Access: Read-only

**dnHIfIndex**

Provides the index of the interface to the next hop address to the node. 0 denotes self.

Syntax: Integer

Access: Read-only

**dnHNextHop**

Provides the DECnet address of the next hop destination.

Syntax: Octet string

Access: Read-only

**dnHost**

Provides the DECnet node address.

Syntax: Integer

Access: Read-only

**dnHPrio**

Provides the priority of the next hop router for the node.

Syntax: Integer

Access: Read-only

**End of Table**

## DECnet Interface Table

The DECnet Interface table, *dnIfTabl*e, contains the *dnIfCost* variable. The index to this table is *ifIndex*, or the interface number. If there are *n* number of interfaces associated with the device, there will be *n* rows in the table.

For example, in Table 26, interface 1 has a cost of 20; interface 2 has a cost of 31; and so on.

**Table 26 DECnet Interface**

| Interface Number | dnIfCost |
|---|---|
| 1 | 20 |
| 2 | 31 |
| 3 | 12 |

**dnIfCost**

Indicates the cost of this interface.

Syntax: Integer

Access: Read-only

**End of Table**

## Novell Group

The variables in this group can be used with all Cisco products running the Novell protocol. These variables provide such information as total number of input and output packets, number of packets with errors, and number of packets with service access point (SAP) requests and replies.

**novellBcastin**

Indicates the total number of Novell input broadcast packets.

Syntax: Integer

Access: Read-only

**novellBcastout**

Indicates the total number of Novell output broadcast packets.

Syntax: Integer

Access: Read-only

**novellChksum**

Indicates the total number of Novell input packets with checksum errors.

Syntax: Integer

Access: Read-only

**novellFormerr**

Indicates the total number of Novell input packets with header errors.

Syntax: Integer

Access: Read-only

**novellForward**

Indicates the total number of Novell packets forwarded.

Syntax: Integer

Access: Read-only

**novellHopcnt**

Indicates the total number of Novell input packets that exceeded the maximum hop count.

Syntax: Integer

Access: Read-only

**novellInmult**

Indicates the total number of Novell input multicast packets.

Syntax: Integer

Access: Read-only

**novellInput**

Indicates the total number of Novell input packets.

Syntax: Integer

Access: Read-only

**novellLocal**

Indicates the total number of Novell input packets for this host.

Syntax: Integer

Access: Read-only

**novellNoencap**

Indicates the total number of Novell packets dropped due to output encapsulation failure.

Syntax: Integer

Access: Read-only

**novellNoroute**

Indicates the total number of Novell packets dropped because the router did not know where to forward them.

Syntax: Integer

Access: Read-only

**novellOutput**

Indicates the total number of Novell output packets.

Syntax: Integer

Access: Read-only

**novellSapout**

Indicates the total number of Novell service access point (SAP) request packets sent.

Syntax: Integer

Access: Read-only

**novellSapreply**

Indicates the total number of Novell SAP reply packets sent.

Syntax: Integer

Access: Read-only

**novellSapreqin**

Indicates the total number of Novell SAP request packets received.

Syntax: Integer

Access: Read-only

**novellSapresin**

Indicates the total number of Novell SAP response packets received.

Syntax: Integer

Access: Read-only

**novellUnknown**

Indicates the total number of unknown Novell input packets.

Syntax: Integer

Access: Read-only

## Virtual Integrated Network Service (VINES) Group

The variables in this section, from the VINES group in IOS 10.2, have been deprecated and replaced with the ciscoVINES (cv) group, found in the ciscoMgmt tree.

The variables in this group can be used with all Cisco products running the Banyan Virtual Integrated Network Service (VINES) protocol. This protocol is derived from the Xerox Network Systems (XNS) protocol. These variables provide information such as total number of input and output packets, number of packets with errors, and number of packets with Internet Control Protocol(ICP) requests and replies.

**vinesBcastfwd**

Indicates the total number of VINES broadcast packets forwarded.

Syntax: Integer

Access: Read-only

**vinesBcastin**

Indicates the total number of VINES input broadcast packets.

Syntax: Integer

Access: Read-only

**vinesBcastout**

Indicates the total number of VINES output broadcast packets.

Syntax: Integer

Access: Read-only

**vinesCksumerr**

Indicates the total number of VINES input packets with checksum errors.

Syntax: Integer

Access: Read-only

**vinesClient**

Indicates the next VINES subnetwork number that this router will assign to a client.

Syntax: Integer

Access: Read-only

**vinesEchoIn**

Indicates the total number of VINES echo packets received.

Syntax: Integer

Access: Read-only

**vinesEchoOut**

Indicates the total number of VINES echo packets generated.

Syntax: Integer

Access: Read-only

**vinesEncapsfailed**

Indicates the total number of VINES packets dropped because they could not be encapsulated.

Syntax: Integer

Access: Read-only

**vinesFormaterror**

Indicates the total number of VINES input packets with header errors.

Syntax: Integer

Access: Read-only

**vinesForwarded**

Indicates the total number of VINES packets forwarded.

Syntax: Integer

Access: Read-only

**vinesHopcount**

Indicates the total number of VINES input packets that have exceeded the maximum hop count.

Syntax: Integer

Access: Read-only

**vinesIcpIn**

Indicates the total number of VINES Internet Control Protocol (ICP) packets received.

Syntax: Integer

Access: Read-only

**vinesIcpOut**

Indicates the total number of VINES ICP packets generated.

Syntax: Integer

Access: Read-only

**vinesInput**

Indicates the total number of VINES input packets.

Syntax: Integer

Access: Read-only

**vinesLocalDest**

Indicates the total number of VINES input packets for this host.

Syntax: Integer

Access: Read-only

**vinesMacEchoIn**

Indicates the total number of VINES MAC level echo packets received.

Syntax: Integer

Access: Read-only

**vinesMacEchoOut**

Indicates the total number of VINES Media Access Control (MAC) level echo packets generated.

Syntax: Integer

Access: Read-only

**vinesMetricOut**

Indicates the total number of VINES ICP metric notification packets generated.

Syntax: Integer

Access: Read-only

**vinesNet**

Indicates the VINES network number of this router.

Syntax: Integer

Access: Read-only

**vinesNoCharges**

Indicates the total number of VINES broadcast packets not forwarded to all interfaces because the *no charges only* bit in the packet was set to *on*.

Syntax: Integer

Access: Read-only

**vinesNoRoute**

Indicates the total number of VINES packets dropped because the router did not know where to forward them.

Syntax: Integer

Access: Read-only

**vinesNotGt4800**

Indicates the total number of VINES broadcast packets not forwarded to all interfaces because the *over 4800 bps* bit in the packet was set to *on*.

Syntax: Integer

Access: Read-only

**vinesNotLan**

Indicates the total number of VINES broadcast packets not forwarded to all interfaces because the *lan only* bit in the packet was set to *on*.

Syntax: Integer

Access: Read-only

**vinesOutput**

Indicates the total number of VINES output packets.

Syntax: Integer

Access: Read-only

**vinesProxyCnt**

Indicates the total number of VINES packets that were sent to an actual Banyan server as a proxy for a client.

Syntax: Counter

Access: Read-only

**vinesProxyReplyCnt**

Indicates the total number of received VINES packets that were responses to proxy packets sent by the router.

Syntax: Counter

Access: Read-only

**vinesSubnet**

Indicates the VINES subnet number of this router.

Syntax: Integer

Access: Read-only

**vinesUnknown**

Indicates the total number of unknown VINES input packets.

Syntax: Integer

Access: Read-only

## Banyan VINES Interface Table

The Banyan VINES Interface table, *vinesIfTableEntry*, contains all the variables described in the Banyan VINES group. The index to the table is *ifIndex*. *ifIndex* indicates the number of the interface. If the device has *n* number of interfaces, the VINES Interface table will contain *n* rows.

In Table 27, the first column indicates the number of interfaces on the devices. Each of the variables in the VINES Interface table occupies one column; for example, *vinesIfMetri*c is shown in a column, followed by *vinesIfEnctype* in the next column, and so on.

**Table 27 Banyan VINES Interface Table**

| Interface Number | vinesIfMetric | vinesIfEnctype | and so on |
|---|---|---|---|
| 1 | 3 | 1 | |
| 2 | 5 | 3 | |
| and so on | | | |

**vinesIfAccesslist**

Provides the outgoing access list number for the VINES protocol.

Syntax: Integer

Access: Read-only

**vinesIfArpEnabled**

Indicates how the router responds to the VINES protocol ARP.

Syntax: Integer (0 = never respond to ARP packets, 1 = always respond to ARP packets, 2 = respond to ARP packets only if servers are not present on the network)

Access: Read-only

**vinesIfEnctype**

Indicates the type of data link encapsulation that will be used on broadcasts sent by the router.

Syntax: Integer (1 = ARPA, 3 = SNAP, 5 = HDLC, 12 = X.25, 13 = X.25, 25 = VINES TR, 27 = Frame Relay, 28 = SMDS, 30 = PPP)

Access: Read-only

**vinesIfFastOkay**

Indicates whether fast switching is supported for the VINES protocol.

Syntax: Integer (0 = fast switching not requested or not supported, 1 = fast switching requested and supported)

Access: Read-only

**vinesIfInputNetworkFilter**

Provides the access list number for filtering the content of received VINES routing information.

Syntax: Integer

Access: Read-only

**vinesIfInputRouterFilter**

Provides the access list number for filtering on the source of received VINES routing information.

Syntax: Integer

Access: Read-only

**vinesIfLineup**

Indicates whether the VINES protocol line is up or down.

Syntax: Integer (0 = down, 1 = up)

Access: Read-only

**vinesIfMetric**

Provides the metric value for the VINES protocol. Banyan servers use delay metrics to compute timeouts when communicating with other hosts. The metric value is either manually assigned to the interface by using the **vines metric** command or is automatically assigned by the system. This number is returned in the format defined in the VINES Protocol Definition.

Syntax: Integer

Access: Read-only

**vinesIfOutputNetworkFilter**

Provides the access list number for filtering the content of transmitted VINES routing information.

Syntax: Integer

Access: Read-only

**vinesIfPropagate**

Indicates whether the VINES protocol "propagate" is enabled.

Syntax: Integer (0 = never enabled, 1 = always enabled, 2 = enabled only if there are no local servers on any interface)

Access: Read-only

**vinesIfRedirectInterval**

Provides the redirect interval for the VINES protocol.

Syntax: Integer

Access: Read-only

**vinesIfRouteCache**

Indicates whether fast switching is supported for the VINES protocol.

Syntax: Integer

Access: Read-only

**vinesIfRxArp0Cnt**

Provides the number of input ARP query request messages for the VINES protocol. The four types of ARP messages following apply to *vinesIfRxArp0–vinesIfRxArp3*:

- Service request (type 0)—Query to find servers
- Service response (type 1)—Server indicating its presence
- Assignment request (type 2)—Client asking to be assigned a VINES IP address
- Assignment response (type 3)—Server assigning a VINES IP address to a client

Syntax: Counter

Access: Read-only

**vinesIfRxArp1Cnt**

Provides the number of input ARP query response messages for the VINES protocol.

Syntax: Counter

Access: Read-only

**vinesIfRxArp2Cnt**

Provides the number of input ARP assignment request messages for the VINES protocol.

Syntax: Counter

Access: Read-only

**vinesIfRxArp3Cnt**

Provides the number of input ARP assignment response messages for the VINES protocol.

Syntax: Counter

Access: Read-only

**vinesIfRxArpIllegalCnt**

Provides the number of input illegal ARP messages for the VINES protocol.

Syntax: Counter

Access: Read-only

**vinesIfRxBcastDuplicateCnt**

Provides the input duplicate broadcast count for the VINES protocol.

Syntax: Counter

Access: Read-only

**vinesIfRxBcastForwardedCnt**

Provides the VINES protocol number of input packets forwarded to another interface.

Syntax: Counter

Access: Read-only

**vinesIfRxBcastHelperedCnt**

Provides the VINES protocol number of input packets helpered to another server. Helpered packets are broadcasts received from a serverless network that should be thrown away according to the fields in the VINES IP header. Instead of being thrown away, they are resent on another interface, so that they will be received by a VINES server.

Syntax: Counter

Access: Read-only

**vinesIfRxBcastinCnt**

Provides the input broadcast count for the VINES protocol.

Syntax: Counter

Access: Read-only

**vinesIfRxChecksumErrorCnt**

Provides the number of input packets with checksum errors for the VINES protocol.

Syntax: Counter

Access: Read-only

**vinesIfRxEchoCnt**

Provides the number of input IPC echo messages for the VINES protocol.

Syntax: Counter

Access: Read-only

**vinesIfRxFormatErrorCnt**

Provides the number of input packets with format errors for the VINES protocol.

Syntax: Counter

Access: Read-only

**vinesIfRxForwardedCnt**

Provides the VINES protocol number of input packets forwarded to another interface.

Syntax: Counter

Access: Read-only

**vinesIfRxIcpErrorCnt**

Provides the number of input interprocess communications (ICP) error messages for the VINES protocol.

Syntax: Counter

Access: Read-only

**vinesIfRxIcpIllegalCnt**

Provides the number of input illegal ICP messages for the VINES protocol.

Syntax: Counter

Access: Read-only

**vinesIfRxIcpMetricCnt**

Provides the number of input ICP metric messages for the VINES protocol.

Syntax: Counter

Access: Read-only

**vinesIfRxIpcCnt**

Provides the number of input IPC messages for the VINES protocol.

Syntax: Counter

Access: Read-only

**vinesIfRxLocalDestCnt**

Provides the VINES protocol number of input packets destined for this router.

Syntax: Counter

Access: Read-only

**vinesIfRxMacEchoCnt**

Provides the number of input MAC layer echo frames for the VINES protocol.

Syntax: Counter

Access: Read-only

**vinesIfRxNoRouteCnt**

Provides the VINES protocol number of input packets that were dropped because there was no route to the destination.

Syntax: Counter

Access: Read-only

**vinesIfRxNotEnabledCnt**

Provides the VINES protocol number of input packets that were discarded because the interface was not configured.

Syntax: Counter

Access: Read-only

**vinesIfRxProxyReplyCnt**

Provides the VINES protocol number of responses to proxy packets.

Syntax: Counter

Access: Read-only

**vinesIfRxRtp0Cnt**

Provides the number of illegal input Routing Table Protocol (RTP) type 0 messages for the VINES protocol.

Syntax: Counter

Access: Read-only

**vinesIfRxRtp1Cnt**

Provides the number of input RTP type 1 (request for information) messages for the VINES protocol.

Syntax: Counter

Access: Read-only

**vinesIfRxRtp2Cnt**

Provides the number of illegal input RTP type 2 messages for the VINES protocol.

Syntax: Counter

Access: Read-only

**vinesIfRxRtp3Cnt**

Provides the number of illegal input RTP type 3 messages for the VINES protocol.

Syntax: Counter

Access: Read-only

**vinesIfRxRtp4Cnt**

Provides the number of input RTP type 4 update messages for the VINES protocol.

Syntax: Counter

Access: Read-only

**vinesIfRxRtp5Cnt**

Provides the number of input RTP type 5 response messages for the VINES protocol.

Syntax: Counter

Access: Read-only

**vinesIfRxRtp6Cnt**

Provides the number of input RTP type 6 redirect messages for the VINES protocol.

Syntax: Counter

Access: Read-only

**vinesIfRxRtpIllegalCnt**

Provides the number of all other illegal input RTP messages for the VINES protocol.

Syntax: Counter

Access: Read-only

**vinesIfRxIpUnknownCnt**

Provides the number of input messages from unknown VINES protocols.

Syntax: Counter

Access: Read-only

**vinesIfRxlpcUnknownCnt**

Provides the number of input messages from unknown VINES IPC ports.

Syntax: Counter

Access: Read-only

**vinesIfRxSppCnt**

Provides the number of input SPP messages for the VINES protocol.

Syntax: Counter

Access: Read-only

**vinesIfRxZeroHopCountCnt**

Provides VINES protocol number of input packets dropped due to a zero hop count.

Syntax: Counter

Access: Read-only

**vinesIfServerless**

Indicates whether the VINES protocol serverless support is enabled.

Syntax: Integer (0 = never enabled, 1 = enabled only if servers are not present on the network, 2 = always enabled, 3 = always enabled to flood broadcasts)

Access: Read-only

**vinesIfServerlessBcast**

Indicates whether VINES protocol serverless broadcasting support is enabled.

Syntax: Counter (0 = not enabled, 1 = enabled)

Access: Read-only

**vinesIfSplitDisabled**

Indicates whether the VINES protocol split horizon is enabled.

Syntax: Integer (0 = enabled, 1 = disabled)

Access: Read-only

**vinesIfTxArp0Cnt**

Provides the number of output ARP query request messages for the VINES protocol.

Syntax: Counter

Access: Read-only

**vinesIfTxArp1Cnt**

Provides the number of output ARP query response messages for the VINES protocol.

Syntax: Counter

Access: Read-only

**vinesIfTxArp2Cnt**

Provides the number of output ARP assignment request messages for the VINES protocol.

Syntax: Counter

Access: Read-only

**vinesIfTxArp3Cnt**

Provides the number of input ARP assignment response messages for the VINES protocol.

Syntax: Counter

Access: Read-only

**vinesIfTxBcastCnt**

Provides broadcast packets that were generated by the VINES protocol.

Syntax: Counter

Access: Read-only

**vinesIfTxBcastForwardedCnt**

Provides the VINES protocol output broadcast forwarded from another interface.

Syntax: Counter

Access: Read-only

**vinesIfTxBcastHelperedCnt**

Provides the VINES protocol output broadcast helpered to a Banyan server.

Syntax: Counter

Access: Read-only

**vinesIfTxEchoCnt**

Provides the number of output IPC echo messages for the VINES protocol.

Syntax: Counter

Access: Read-only

**vinesIfTxFailedAccessCnt**

Provides the number of packets to be output that failed on access list for the VINES protocol.

Syntax: Counter

Access: Read-only

**vinesIfTxFailedDownCnt**

Provides the number of VINES packets that could not be output because the interface was down.

Syntax: Counter

Access: Read-only

**vinesIfTxFailedEncapsCnt**

Provides VINES packets to be output that could not be encapsulated.

Syntax: Counter

Access: Read-only

**vinesIfTxForwardedCnt**

Provides the number of forwarded packets for the VINES protocol.

Syntax: Counter

Access: Read-only

**vinesIfTxIcpErrorCnt**

Provides the number of output IPC error messages for the VINES protocol.

Syntax: Counter

Access: Read-only

**vinesIfTxIcpMetricCnt**

Provides the number of output IPC metric messages for the VINES protocol.

Syntax: Counter

Access: Read-only

**vinesIfTxIpcCnt**

Provides the number of output ICP messages for the VINES protocol.

Syntax: Counter

Access: Read-only

**vinesIfTxMacEchoCnt**

Provides the number of output IPC MAC-layer echo frames for the VINES protocol.

Syntax: Counter

Access: Read-only

**vinesIfTxNotBcastNotgt4800Cnt**

Provides the VINES protocol output broadcast not sent due to high-speed class. This occurs if a received packet is marked to be sent only on network interfaces with a speed of 4800 bps or greater. The counter is incremented on interfaces with a speed of less than 4800 whenever this type of packet should have been transmitted.

Syntax: Counter

Access: Read-only

**vinesIfTxNotBcastNotLanCnt**

Provides the VINES protocol output broadcast not sent due to *LanOnly* class. This occurs if a received packet is marked to be sent only if the network interface type is *LanOnly.* The counter is incremented on interfaces other than type *LanOnly* whenever this type of packet should have been transmitted.

Syntax: Counter

Access: Read-only

**vinesIfTxNotBcastPpchargeCnt**

Provides VINES protocol output broadcast not sent due to *No Charges* class. This occurs if a received packet is marked to be sent only if the sender's transmission is free of charge. The counter is incremented on interfaces carrying per-packet charges whenever this type of packet should have been transmitted.

Syntax: Counter

Access: Read-only

**vinesIfTxNotBcastToSourceCnt**

Provides the VINES protocol output broadcast packets that were not sent due to the interface leading back to the source.

Syntax: Counter

Access: Read-only

**vinesIfTxProxyCnt**

Provides the number of proxy packets sent by the VINES protocol.

Syntax: Counter

Access: Read-only

**vinesIfTxRtp0Cnt**

Provides the number of illegal output RTP type 0 messages for the VINES protocol.

Syntax: Counter

Access: Read-only

**vinesIfTxRtp1Cnt**

Provides the number of output RTP type 1 (request messages) for the VINES protocol.

Syntax: Counter

Access: Read-only

**vinesIfTxRtp2Cnt**

Provides the number of illegal output RTP type 2 messages for the VINES protocol.

Syntax: Counter

Access: Read-only

**vinesIfTxRtp3Cnt**

Provides the number of illegal output RTP type 3 messages for the VINES protocol.

Syntax: Counter

Access: Read-only

**vinesIfTxRtp4Cnt**

Provides the number of output RTP type 4 (update messages) for the VINES protocol.

Syntax: Counter

Access: Read-only

**vinesIfTxRtp5Cnt**

Provides the number of output RTP type 5 (response messages) for the VINES protocol.

Syntax: Counter

Access: Read-only

**vinesIfTxRtp6Cnt**

Provides the number of output RTP type 6 (redirect messages) for the VINES protocol.

Syntax: Counter

Access: Read-only

**vinesIfTxSppCnt**

Provides the number of output SPP messages for the VINES protocol.

Syntax: Counter

Access: Read-only

**vinesIfTxUnicastCnt**

Provides the unicast packets that were generated for the VINES protocol.

Syntax: Counter

Access: Read-only

## Xerox Network Systems (XNS) Group

This group is present in all router-based products running the Xerox Network Systems (XNS) protocol. These variables provide such information as the number of packets forwarded, total number of input packets, and total number of packets transmitted with errors.

**xnsBcastin**

Indicates the total number of XNS input broadcast packets.

Syntax: Integer

Access: Read-only

**xnsBcastout**

Indicates the total number of XNS output broadcast packets.

Syntax: Integer

Access: Read-only

**xnsChksum**

Indicates the total number of XNS input packets with checksum errors.

Syntax: Integer

Syntax: Read-only

**xnsEchorepin**

Indicates the total number of XNS echo reply packets received.

Syntax: Integer

Access: Read-only

**xnsEchorepout**

Indicates the total number of XNS echo reply packets sent.

Syntax: Integer

Access: Read-only

**xnsEchoreqin**

Indicates the total number of XNS echo request packets received.

Syntax: Integer

Access: Read-only

**xnsEchoreqout**

Indicates the total number of XNS echo request packets sent.

Syntax: Integer

Access: Read-only

**xnsErrin**

Indicates the total number of XNS error input packets.

Syntax: Integer

Access: Read-only

**xnsErrout**

Indicates the total number of XNS error output packets.

Syntax: Integer

Access: Read-only

**xnsForward**

Indicates the total number of XNS packets forwarded.

Syntax: Integer

Access: Read-only

**xnsFormerr**

Indicates the total number of XNS input packets with header errors.

Syntax: Integer

Access: Read-only

**xnsFwdbrd**

Indicates the total number of XNS broadcast packets forwarded.

Syntax: Integer

Access: Read-only

**xnsHopcnt**

Indicates the total number of XNS input packets that exceeded the maximum hop count.

Syntax: Integer

Access: Read-only

**xnsInmult**

Indicates the total number of XNS input packets received with multicast addresses.

Syntax: Integer

Access: Read-only

**xnsInput**

Indicates the total number of input XNS packets.

Syntax: Integer

Access: Read-only

**xnsLocal**

Indicates the total number of XNS input packets for this host.

Syntax: Integer

Access: Read-only

**xnsNoencap**

Provides the total number of XNS packets dropped because they could not be encapsulated.

Syntax: Integer

Access: Read-only

**xnsNoroute**

Indicates the total number of XNS packets that were discarded because the router did not know where to forward them.

Syntax: Integer

Access: Read-only

**xnsNotgate**

Indicates the total number of XNS input packets received while XNS routing was not enabled.

Syntax: Integer

Access: Read-only

**xnsOutput**

Indicates the total number of XNS output packets.

Syntax: Integer

Access: Read-only

**xnsUnknown**

Indicates the total number of unknown XNS input packets.

Syntax: Integer

Access: Read-only

## Other-Vendor MIB Variables Supported by Cisco

This section documents the MIB variables of other vendors that are supported by Cisco.

## Novell Support

The Novell subtree contains the Novell MIB (IPX) group, the Novell Link State Protocol (NLSP), and the Routing Information Protocol/Service Advertisement Protocol (RIPSAP) group.

### IPX System Group

This group contains general information about all instances of IPX on one system. The IPX variables are located in the other Enterprises group.

### Basic System Table

This table contains one entry for each instance of IPX running on the system. It contains the management information that should be made available by all implementations of the IPX protocol.

**ipxBasicSysInstance**

Specifies the unique identifier of the instance of IPX to which this row corresponds. This value can be written only when creating a new entry in the table.

Syntax: Integer

Access: Read

**ipxBasicSysExistState**

Specifies the validity of this entry in the IPX system table. Setting this field to off indicates that this entry can be deleted from the system table at the IPX implementation's discretion.

Syntax: Integer 1 = off, 2 = on

Access: Read-write

**ipxBasicSysNetNumber**

Specifies the network number portion of the IPX address of this system.

Syntax: NetNumber

Access: Read-write

**ipxBasicSysNode**

Specifies the node number portion of the IPX address of this system.

Syntax: Octet String (size = 6)

Access: Read-write

**ipxBasicSysName**

Specifies the readable name for this system.

Syntax: Octet string (size (0–48))

Access: Read-write

**ipxBasicSysInReceives**

Specifies the total number of IPX packets received, including those received in error.

Syntax: Counter

Access: Read-only

**ipxBasicSysInHdrErrors**

Specifies the number of IPX packets discarded due to errors in their headers, including any IPX packet with a size less than the minimum of 30 bytes.

Syntax: Counter

Access: Read-only

**ipxBasicSysInUnknownSockets**

Specifies the number of IPX packets discarded because the destination socket was not open.

Syntax: Counter

Access: Read-only

**ipxBasicSysInDiscards**

Specifies the number of IPX packets received but discarded due to reasons other than those accounted for by ipxBasicSysInHdrErrors, ipxBasicSysInUnknownSockets, ipxAdvSysInDiscards, and ipxAdvSysInCompressDiscards.

Syntax: Counter

Access: Read-only

**ipxBasicSysInBadChecksums**

Specifies the number of IPX packets received with incorrect checksums.

Syntax: Counter

Access: Read-only

**ipxBasicSysInDelivers**

Specifies the total number of IPX packets delivered locally, including packets from local applications.

Syntax: Counter

Access: Read-only

**ipxBasicSysNoRoutes**

Specifies the number of times no route to a destination was found.

Syntax: Counter

Access: Read-only

**ipxBasicSysOutRequests**

Specifies the number of IPX packets supplied locally for transmission, not including any packets counted in ipxAdvForwPackets.

Syntax: Counter

Access: Read-only

**ipxBasicSysOutMalformedRequests**

Specifies the number of IPX packets supplied locally that contained errors in their structure.

Syntax: Counter

Access: Read-only

**ipxBasicSysOutDiscards**

Specifies the number of outgoing IPX packets discarded due to reasons other than those accounted for in ipxBasicSysOutMalformedRequests, ipxAdvSysOutFiltered, and ipxAdvSysOutCompressDiscards.

Syntax: Counter

Access: Read-only

**ipxBasicSysOutPackets**

Specifies the total number of IPX packets transmitted.

Syntax: Counter

Access: Read-only

**ipxBasicSysConfigSockets**

Specifies the configured maximum number of IPX sockets that can be open at one time.

Syntax: Integer

Access: Read-only

**ipxBasicSysOpenSocketFails**

Specifies the number of IPX socket open calls that failed.

Syntax: Counter

Access: Read-only

## Advanced System Table

This table contains one entry for each instance of IPX running on the system. It contains the advanced management information that might not be available from all implementations of the IPX protocol.

**ipxAdvSysInstance**

Specifies the unique identifier of the instance of IPX to which this row corresponds. This value can be written only when creating a new entry in the table.

Syntax: Integer

Access: Read-write

**ipxAdvSysMaxPathSplits**

Specifies the maximum number of paths with equal routing metric value that this instance of the IPX can split between when forwarding packets.

Syntax: Integer (1–32)

Access: Read-write

**ipxAdvSysMaxHops**

Specifies the maximum number of hops a packet may take.

Syntax: Integer

Access: Read-write

**ipxAdvSysInTooManyHops**

Specifies the number of IPX packets discarded due to exceeding the maximum hop count.

Syntax: Counter

Access: read-only

**ipxAdvSysInFiltered**

Specifies the number of incoming IPX packets discarded due to filtering.

Syntax: Counter

Access: Read-only

**ipxAdvSysInCompressDiscards**

Specifies the number of incoming IPX packets discarded due to decompression errors.

Syntax: Counter

Access: Read-only

**ipxAdvSysNETBIOSPackets**

Specifies the number of NETBIOS packets received.

Syntax: Counter

Access: Read-only

**ipxAdvSysForwPackets**

Specifies the number of IPX packets forwarded.

Syntax: Counter

Access: Read-only

**ipxAdvSysOutFiltered**

Specifies the number of outgoing IPX packets discarded due to filtering.

Syntax: Counter

Access: Read-only

**ipxAdvSysOutCompressDiscards**

Specifies the number of outgoing IPX packets discarded due to compression errors.

Syntax: Counter

Access: Read-only

**ipxAdvSysCircCount**

Specifies the number of circuits known to this instance of IPX.

Syntax: Integer

Access: Read-only

**ipxAdvSysDestCount**

Specifies the number of currently reachable destinations known to this instance of IPX.

Syntax: Integer

Access: Read-only

**ipxAdvSysServCount**

Specifies the number of services known to this instance of IPX.

Syntax: Integer

Access: Read-only

## IPX Circuit Group

This group contains information about all circuits used by IPX on the system.

## Circuit Table

The Circuit Table contains management information for each circuit known to this system.

**ipxCircSysInstance**

Specifies the unique identifier of the instance of IPX to which this entry corresponds. This value can be written only when creating a new entry in the table.

Syntax: Integer‘

Access: Read-write

**ipxCircIndex**

Specifies the identifier of this circuit, unique within the instance of IPX. This value can be written only when creating a new entry in the table.

Syntax: Integer

Access: Read-write

**ipxCircExistState**

Specifies the validity of this circuit entry. A circuit with this value set to off can be deleted from the table at the IPX implementation's discretion.

Syntax: Integer 1 = off, 2 = on

Access: Read-write

**ipxCircOperState**

Specifies the value of ifIndex for the interface used by this circuit. This value can be written only when creating a new entry in the table

Syntax: Integer 1 = down, 2 = up, 3 = sleeping

Access: Read-write

**ipxCircName**

Specifies the readable name for the circuit.

Syntax: Octet string (size (0–48)

Access: Read-write

**ipxCircType**

Specifies the type of the circuit.

Syntax: Integer 1 = other, 2 = broadcast, 3 = ptToPt, 4 = wanRIP, 5 = unnumberedRIP, 6 = dynamic, 7 = wanWS

Access: Read-write

**ipxCircDialName**

Specifies the symbolic name used to reference the dialing information used to create this circuit. This value can be written only when creating a new entry in the table.

Syntax: Octet string (size (0–48))

Access: Read-write

**ipxCircLocalMaxPacketSize**

Specifies the maximum size (including header), in bytes, that the system supports locally on this circuit.

Syntax: Integer

Access: Read-write

**ipxCircCompressState**

Specifies the compression state on this circuit. This value can be written only when creating a new entry in the table.

Syntax: Integer 1 = off, 2 = on

Access: Read-write

**ipxCircCompressSlots**

Specifies the number of compression slots available on this circuit. This value can be written only when creating a new entry in the table.

Syntax: Integer

Access: Read-write

**ipxCircStaticStatus**

Specifies whether the information about static routes and services reached via this circuit matches that saved in permanent storage (current).

Syntax: Integer 1 = unknown, 2 = current, 3 = changed, 4 = read, 5 = reading

Access: Read-write

**ipxCircCompressedSent**

Specifies the number of compressed packets sent.

Syntax: Counter

Access: Read-only

**ipxCircCompressedInitSent**

Specifies the number of compression initialization packets sent.

Syntax: Counter

Access: Read-only

**ipxCircCompressedRejectsSent**

The number of compressed packet rejected packets sent.

Syntax: Counter

Access: Read-only

**ipxCircUncompressedSent**

The number of packets sent without being compressed even though compression was turned on for this circuit.

Syntax: Counter

Access: Read-only

**ipxCircCompressedReceived**

The number of compressed packets received.

Syntax: Counter

Access: Read-only

**ipxCircCompressedInitReceived**

The number of compression initialization packets received.

Syntax: Counter

Access: Read-only

**ipxCircCompressedRejectsReceived**

The number of compressed packet rejected packets received.

Syntax: Counter

Access: Read-only

**ipxCircUncompressedReceived**

The number of packets received without having been compressed even though compression was turned on for this circuit.

Syntax: Counter

Access: Read-only

**ipxCircMediaType**

Specifies the media type used on this circuit

Syntax: Octet string (size = 2)

Access: Read-only

**ipxCircNetNumber**

Specifies the IPX network number of this circuit.

Syntax: NetNumber

Access: Read-only

**ipxCircStateChanges**

The number of times the circuit has changed state.

Syntax: Counter

Access: Read-only

**ipxCircInitFails**

Specifies the number of times that initialization of this circuit has failed.

Syntax: Counter

Access: Read-only

**ipxCircDelay**

Specifies the period of time, in milliseconds, that it takes to transmit 1 byte of data, excluding protocol headers, to a destination on the other end of the circuit, if the circuit is free of other traffic.

Syntax: Integer

Access: Read-only

**ipxCircThroughput**

Specifies the amount of data, in bits per second, that can flow through the circuit if there is no other traffic.

Syntax: Integer

Access: Read-only

**ipxCircNeighRouterName**

Specifies the name of the neighboring router on a WAN circuit.

Syntax: Octet string (size = 0–48)

Access: Read-only

**ipxCircNeighInternalNetNum**

Specifies the internal network number of the neighboring router on a WAN circuit.

Syntax: NetNumber

Access: Read-only

## IPX Forwarding Group

This group provides a representation of the forwarding database used by all instances of IPX on the system. This group contains generic routing information that must be provided by any IPX routing protocol.

## Destination Table

The Destination table contains information about all known destinations. The routing information shown in this table represents the path currently being used to reach the destination.

**ipxDestSysInstance**

Specifies the unique identifier of the instance of IPX to which this row corresponds.

Syntax: Integer

Access: Read-only

**ipxDestNetNum**

Specifies the IPX network number of the destination.

Syntax: NetNumber

Access: Read-only

**ipxDestProtocol**

Specifies the routing protocol from which knowledge of this destination was obtained.

Syntax: Integer 1 = other, 2 = local, 3 = rip, 4 = nlsp, 5 = static

Access: Read-only

**ipxDestTicks**

Specifies the delay in ticks to reach this destination.

Syntax: Integer

Access: Read-only

**ipxDestHopCount**

Specifies the number of hops necessary to reach the destination.

Syntax: Integer

Access: Read-only

**ipxDestNextHopCircIndex**

Specifies the unique identifier of the circuit used to reach the next hop.

Syntax: PhysAddress

Access: Read-only

**ipxDestNextHopNICAddress**

Specifies the NIC address of the next hop.

Syntax: PhysAddress

Access: Read-only

**ipxDestNextHopNetNum**

Specifies the IPX network number of the next hop.

Syntax: NetNumbr

Access: Read-only

## Static Routes Table

This table contains the information about all the static routes defined. There may be more than one static route to any given destination. Only the route currently being used will also be present in the Destination Table defined earlier.

**ipxStaticRouteSysInstance**

Specifies the unique identifier of the instance of IPX to which this row corresponds.

Syntax: Integer

Access: Read-write

**ipxStaticRouteCircIndex**

Specifies the unique identifier of the circuit used to reach the first hop in the static route.

Syntax: Integer

Access: Read-write

**ipxStaticRouteNetNum**

Specifies the IPX network number of the route's destination.

Syntax: NetNumber

Access: Read-write

**ipxStaticRouteExistState**

Specifies the validity of this static route. Entries with the value set to off can be deleted from the table at the implementation's discretion.

Syntax: Integer 1 = off, 2 = on

Access: Read-write

**ipxStaticRouteTicks**

Specifies the delay, in ticks, to reach the route's destination.

Syntax: Integer

Access: Read-write

**ipxStaticRouteHopCount**

Specifies the number of hops necessary to reach the destination.

Syntax: Integer

Access: Read-only

## IPX Services Group

This group contains management information about all known services.

## Services Table

This table contains the services information indexed by service name and type.

**ipxServSysInstance**

Specifies the unique identifier of the instance of IPX to which this entry corresponds.

Syntax: Integer

Access: Read-only

**ipxServType**

Specifies the service type

Syntax: Octet string (size = 2)

Access: Read-only

**ipxServName**

Specifies the service name.

Syntax: Octet string (size = 1–48)

Access: Read-only

**ipxServProtocol**

Specifies the protocol from which knowledge of this service was obtained.

Syntax: Integer 1 = other, 2 = local, 4 = nlsp, 5 = static, 6 = sap

Access: Read-only

**ipxServNetNum**

Specifies the IPX network number portion of the IPX address of the service.

Syntax: NetNumber

Access: Read-only

**ipxServNode**

Specifies the node portion of the IPX address of the service.

Syntax: Octet string (Size = 6)

Access: Read-only

**ipxServSocket**

Specifies the socket portion of the IPX address of the service.

Syntax: Octet string (Size = 2)

Access: Read-only

**ipxServHopCount**

Specifies the number of hops to the service.

Syntax: Integer

Access: Read-only

## Destination Services Table

This table contains the services information indexed by address, name, and type.

**ipxDestServSysInstance**

Specifies the unique identifier of the instance of IPX to which this entry corresponds.

Syntax: Integer

Access: Read-only

**ipxDestServNetNum**

Specifies the IPX network number portion of the IPX address of the service.

Syntax: NetNumber

Access: Read-only

**ipxDestServSocket**

Specifies the socket portion of the IPX address of the service.

Syntax: Octet string (Size = 2)

Access: Read-only

**ipxDestServName**

Specifies the name of the service

Syntax: Octet string (Size = 1–48)

Access: Read-only

**ipxDestServType**

Specifies the type of service

Syntax: Octet string (Size = 2)

Access: Read-only

**ipxDestServProtocol**

Specifies the protocol from which knowledge of this service was obtained.

Syntax: Integer 1 = other, 2 = local, 4 = nlsp, 5 = static, 6 = sap

Access: Read-only

**ipxDestServHopCount**

Identifies the number of hops to the service.

Syntax: Integer

Access: Read-only

## Static Services Table

This table contains information for all services reached via a static route.

**ipxStaticServSysInstance**

Specifies the unique identifier of the instance of IPX to which this entry corresponds.

Syntax: Integer

Access: Read-write

**ipxStaticServCircIndex**

Specifies the circuit used to reach this service.

Syntax: Integer

Access: Read-write

**ipxStaticServName**

Specifies the name of the service.

Syntax: Octet string (Size = 1–48)

Access: Read-write

**ipxStaticServType**

Specifies the type of service.

Syntax: Octet string (Size = 2)

Access: Read-write

**ipxStaticServExistState**

Specifies the validity of this static service. Entries with the value set to off may be deleted from the table at the implementation's discretion.

Syntax: Integer 1 = off, 2 = on

Access: Read-write

**ipxStaticServNetNum**

Specifies the IPX network number portion of the IPX address of the service.

Syntax: NetNumber

Access: Read-write

**ipxStaticServNode**

Specifies the node portion of the IPX address of the service.

Syntax: Octet string (Size = 6)

Access: Read-write

**ipxStaticServSocket**

Specifies the socket portion of the IPX address of the service.

Syntax: Octet String (Size = 2)

Access: Read-write

**ipxStaticServHopCount**

Specifies the number of hops to the service.

Syntax: Integer

Access: Read-write

## Novell Link State Protocol

The Novell Link State Protocol (NLSP) MIB defines the management information for the NLSP protocol running in an IPX environment. It provides information in addition to that contained in the IPX MIB itself. All tables in this MIB are linked to an instance of IPX by way of the system instance identifier as defined in the IPX MIB.

### NLSP System Group

This group contains global information about each instance of NLSP running on one system.

### NLSP System Table

This table contains an entry for each instance of NLSP running on the system.

#### nlspSysTable

The nlspSysTable describes the NLSP system table.

Syntax: SEQUENCE OF NLSPSysEntry

Access: Not-accessible

#### nlspSysEntry

Specifies that each entry corresponds to one instance of NLSP running on the system.

Syntax: NLSPSysEntry

Access: Not-accessible

**nlspSysInstance**

Specifies the unique identifier of the instance of NLSP to which this corresponds. This value links the instance of NLSP to an instance of IPX running on the system. (The value of nlspSysInstance should be the same as a value of ipxSysInstance.) This value can be written only when creating a new entry in the table.

Syntax: Integer

Access: Read-write

**nlspSysState**

Indicates the operational state of this instance of NLSP.

Syntax: Integer 1 = off, 2 = nlspLevel1Router

Access: Read-write

**nlspSysID**

Identifies the system ID for this instance of NLSP.

Syntax: SystemID

Access: Read-write

**nlspSysMinNonBcastLSPTransInt**

Specifies the minimum interval, in seconds, between transmission of LSPs on a nonbroadcast circuit.

Syntax: Integer (1–30)

Access: Read-write

**nlspSysMinBcastLSPTransInt**

Specifies the minimum interval, in seconds, between transmission of LSPs on a broadcast circuit.

Syntax: Integer (1–30)

Access: Read-write

**nlspSysMinLSPGenInt**

Specifies the minimum interval, in seconds, between the generation of the same LSP.

Syntax: Integer (1–30)

Access: Read-write

**nlspSysMaxLSPGenInt**

Specifies the maximum interval, in seconds, between the generation of the same LSP.

Syntax: Integer (1–50000)

Access: Read-write

**nlspSysMaxLSPAge**

Specifies the value, in seconds, placed in the lifetime field of LSPs generated by this instance of NLSP.

Syntax: Integer (1–50000)

Access: Read-write

**nlspSysBcastHelloInt**

Specifies the interval, in seconds, at which NLSP Hellos will be sent on a broadcast circuit, if this system is not the designated router.

Syntax: Integer (1–100)

Access: Read-write

**nlspSysNonBcastHelloInt**

Specifies the interval, in seconds, at which NLSP Hellos will be sent on a nonbroadcast circuit.

Syntax: Integer (1–100)

Access: Read-write

**nlspSysDRBcastHelloInt**

Specifies the interval, in seconds, at which the designated router sends NLSP Hellos on a broadcast circuit.

Syntax: Integer (1–100)

Access: Read-write

**nlspSysHoldTimeMultiplier**

Specifies the holding time multiplier used to specify the holding time for NLSP neighbor entries as a function of the NLSP Hello interval.

Syntax: Integer (2–20)

Access: Read-write

**nlspSysCompSNPInt**

Specifies the interval, in seconds, between generation of Complete Sequence Number Packets by a designated router on a broadcast circuit.

Syntax: Integer (1–600)

Access: Read-write

**nlspSysPartSNPInt**

Specifies the minimum interval, in seconds, between transmission of Partial Sequence Number Packets

Syntax: Integer (1–60)

Access: Read-write

**nlspSysWaitTime**

Specifies the number of seconds to delay in the waiting state before entering the on state.

Syntax: Integer (1–300)

Access: Read-write

**nlspSysOrigL1LSPBufSize**

Specifies the maximum size of Level 1 LSPs originated by this instance of NLSP.

Syntax: Integer (512–4096)

Access: Read-write

**nlspSysVersion**

Specifies the version number of this instance of NLSP.

Syntax: Integer

Access: Read-only

**nlspSysCorrLSPs**

Specifies the number of corrupt LSPs detected.

Syntax: Counter

Access: Read-only

**nlspSysL1Overloaded**

Indicates whether the NLSP Level 1 database is overloaded.

Syntax: Integer 1 = no, 2 = yes

Access: Read-only

**nlspSysL1DbaseOloads**

Specifies the number of times the NLSP Level 1 LSP database has become overloaded.

Syntax: Counter

Access: Read-only

**nlspSysMaxSeqNums**

Specifies the number of times the router attempted to exceed NLSP's maximum sequence number.

Syntax: Counter

Access: Read-only

**nlspSysSeqNumSkips**

Specifies the number of times a sequence number skip has occurred.

Syntax: Counter

Access: Read-only

**nlspSysTransmittedLSPs**

Specifies the number of LSPs transmitted by this system.

Syntax: Counter

Access: Read-only

**nlspSysReceivedLSPs**

Specifies the number of LSPs received by this system.

Syntax: Counter

Access: Read-only

**nlspSysOwnLSPPurges**

Specifies the number of times a zero-aged copy of the router's own LSP has been received from some other node.

Syntax: Counter

Access: Read-only

**nlspSysVersionErrors**

Specifies the number of times that a received NLSP packet was rejected because its version number was invalid.

Syntax: Counter

Access: Read-only

**nlspSysIncorrectPackets**

Specifies the number of times that an incorrectly formatted NLSP packet was received.

Syntax: Counter

Access: Read-only

**nlspSysNearestL2DefaultExists**

Indicates whether this instance of NLSP knows of an NLSP Level 2 router that currently can reach other areas using the default metric.

Syntax: Integer 1 = no, 2 = yes

Access: Read-only

**nlspSysNearestL2DefaultRouter**

Specifies the system ID of the nearest NLSP Level 2 router that currently can reach other areas using the default metric. The value is undefined if the value of nlspSysNearestL2DefaultExists is no.

Syntax: SystemID

Access: Read-only

**nlspSysResourceFailures**

Specifies the number of times this instance of the NLSP has been unable to obtain needed resources (memory and so forth).

Syntax: Counter

Access: Read-only

### System Area Address Table

The System Area Address table contains the area addresses configured for NLSP.

**nlspSysAreaSysInstance**

Specifies the unique identifier of the instance of NLSP and IPX (via ipxSysInstance) to which this row corresponds.

Syntax: Integer

Access: Read-write

**nlspSysAreaNet**

Specifies the network address portion of the area address.

Syntax: OCTET STRING (SIZE(4))

Access: Read-write

**nlspSysAreaMask**

Specifies the mask portion of the area address.

Syntax: OCTET STRING (SIZE(4))

Access: Read-write

### Actual Area Address Table

The Actual Area Address table contains the area addresses actually used by NLSP.

**nlspActAreaSysInstance**

Specifies the unique identifier of the instance of NLSP and IPX (via ipxSysInstance) to which this row corresponds.

Syntax: Integer

Access: Read-write

**nlspActAreaNet**

Specifies the network address portion of the area address.

Syntax: OCTET STRING (SIZE(4))

Access: Read-write

**nlspActAreaMask**

Specifies the mask portion of the area address.

Syntax: OCTET STRING (SIZE(4))

Access: Read-write

## Circuit Group

This group contains the NLSP information for each circuit known to this system.

**nlspCircSysInstance**

Specifies the unique identifier of the instance of NLSP and IPX (via ipxSysInstance) to which this entry corresponds. This value can be written only when creating a new entry in the table.

Syntax: Integer

Access: Read-write

**nlspCircIndex**

Specifies the identifier of this circuit, unique within the instance of NLSP. This value can be written only when creating a new entry in the table.

Syntax: Integer

Access: Read-write

**nlspCircState**

Indicates whether NLSP information can be sent/received over this circuit.

Syntax: Integer 1 = off, 2 = on

Access: Read-write

**nlspCircPace**

Specifies the maximum pace, in packets per second, at which NLSP packets can be sent on this circuit.

Syntax: Integer

Access: Read-write

**nlspCircHelloTimer**

Specifies the interval, in seconds, between NLSP Hello packets sent on this circuit.

Syntax: Integer (1–100)

Access: Read-write

**nlspCircL1DefaultCost**

Identifies the NLSP default cost of this circuit for Level 1 traffic.

Syntax: Integer (1–63)

Access: Read-write

**nlspCircL1DesRouterPriority**

Specifies the priority for becoming the NLSP LAN Level 1 Designated Router on a broadcast circuit.

Syntax: Integer (1–127)

Access: Read-write

**nlspCircL1CircID**

Specifies the NLSP ID for this circuit.

Syntax: OCTET STRING (SIZE(7))

Access: Read-only

**nlspCircL1DesRouter**

Specifies the system ID of the NLSP LAN Level 1 Designated Router on this circuit.

Syntax: SystemID

Access: Read-only

**nlspCircLANL1DesRouterChanges**

Specifies the number of times the NLSP LAN Level 1 Designated Router has changed on this circuit.

Syntax: Counter

Access: Read-only

**nlspCircNeighChanges**

Specifies the number of times an NLSP neighbor state change has occurred on this circuit.

Syntax: Counter

Access: Read-only

**nlspCircRejNeighbors**

Specifies the number of times that an NLSP neighbor has been rejected on this circuit.

Syntax: Counter

Access: Read-only

**nlspCircOutPackets**

Specifies the number of NLSP packets sent on this circuit.

Syntax: Counter

Access: Read-only

**nlspCircInPackets**

Specifies the number of NLSP packets received on this circuit.

Syntax: Counter

Access: Read-only

#### nlspCircActualMaxPacketSize

Specifies the actual maximum packet size (including header), in bytes, used on this circuit.

Syntax: Integer

Access: Read-only

#### nlspCircPSNPsSent

Specifies the number of PSNPs sent on this circuit.

Syntax: Counter

Access: Read-only

#### nlspCircPSNPsReceived

Specifies the number of PSNPs received on this circuit.

Syntax: Counter

Access: Read-only

## Forwarding Group

This group contains NLSP forwarding information in addition to that contained in the IPX forwarding group.

### Destination Table

The Destination table contains additional NLSP forwarding information about all destinations learned about via NLSP.

#### nlspDestTable

The Destination table contains information about all known destinations learned about via NLSP.

Syntax: SEQUENCE OF NLSPDestEntry

Access: Not-accessible

**nlspDestEntry**

Specifies that each entry corresponds to one destination.

Syntax: NLSPDestEntry

Access: Not-accessible

**nlspDestSysInstance**

Specifies the unique identifier of the instance of NLSP and IPX (via ipxSysInstance) to which this row corresponds.

Syntax: Integer

Access: Read-only

**nlspDestNetNum**

Specifies the IPX network number of the destination.

Syntax: NetNumber

Access: Read-only

**nlspDestID**

Specifies the destination NLSP ID (6-octet system ID plus 1-octet pseudo-node ID).

Syntax: NLSPID

Access: Read-only

**nlspDestEstDelay**

Specifies the estimated delay, in milliseconds, to reach the destination.

Syntax: Integer

Access: Read-only

**nlspDestEstThroughput**

Specifies the estimated throughput, in bits per second, to the destination.

Syntax: Integer

Access: Read-only

**nlspDestNextHopID**

Specifies the NLSP ID (6-octet system ID plus 1-octet pseudo-node ID) of the next hop.

Syntax: NLSPID

Access: Read-only

**nlspDestCost**

Specifies the total path default cost to reach this destination.

Syntax: Integer

Access: Read-only

## NLSP Neighbors Group

This group contains management information for each neighboring NLSP router known to the system.

**nlspNeighSysInstance**

Specifies the unique identifier of the instance of NLSP and IPX (via ipxSysInstance) to which this row corresponds.

Syntax: Integer

Access: Read-only

**nlspNeighCircIndex**

Specifies the identifier of the parent circuit of this neighbor within this instance of the NLSP and IPX.

Syntax: Integer

Access: Read-only

**nlspNeighIndex**

Specifies the identifier for this NLSP neighbor entry, unique within the parent circuit.

Syntax: Integer

Access: Read-only

**nlspNeighState**

Specifies the state of the connection to the neighboring NLSP router.

Syntax: Integer 1 = initializing, 2 = up, 3 = failed, 4 = down

Access: Read-only

**nlspNeighNICAddress**

Specifies the NIC Address of the neighboring NLSP router.

Syntax: PhysAddress

Access: Read-only

**nlspNeighSysType**

Specifies the type of the neighboring NLSP router.

Syntax: Integer = unknown, 2 = nlspLevel1 Router

Access: Read-only

**nlspNeighSysID**

Specifies the neighboring NLSP router's system ID.

Syntax: SystemID

Access: Read-only

**nlspNeighName**

Specifies the readable name for the neighboring NLSP router.

Syntax: OCTET STRING (SIZE(0–48))

Access: Read-only

**nlspNeighUsage**

Specifies the usage of the connection to the neighboring NLSP router.

Syntax: Integer 1 = undefined, 2 = level 1

Access: Read-only

**nlspNeighHoldTimer**

Specifies the initial holding time, in seconds, for this NLSP neighbor entry as specified in the NLSP Hello packet.

Syntax: Integer (1–65535)

Access: Read-only

**nlspNeighRemainingTime**

Specifies the remaining time to live, in seconds, for this NLSP neighbor entry.

Syntax: Integer

Access: Read-only

#### nlspNeighPriority

Specifies the priority of the neighboring NLSP router for becoming the LAN Level 1 Designated router if the value of nlspNeighSysType is nlspLevel1Router.

Syntax: Integer (1–127)

Access: Read-only

## Translation Group

The translation group contains tables providing mappings between network numbers, NLSP system IDs, and router names.

### NLSP ID Mapping Table

Maps NLSP system IDs to router names and IPX network numbers.

#### nlspIDMapTable

Maps NLSP system IDs to router names and IPX network numbers.

Syntax: SEQUENCE OF NLSPIDMapEntry

Access: Not-accessible

#### nlspIDMapEntry

Specifies that each entry maps one NLSP system ID to its corresponding router name and IPX network number.

Syntax: NLSPIDMapEntry

Access: Not-accessible

**nlspIDMapSysInstance**

The unique identifier of the instance of NLSP and IPX (via ipxSysInstance) to which this row corresponds.

Syntax: Integer

Access: Read-only

**nlspIDMapID**

The NLSP ID (6-octet system ID plus the pseudo-node ID).

Syntax: NLSPID

Access: Read-only

**nlspIDMapServerName**

The readable name corresponding to this NLSP ID.

Syntax: OCTET STRING (SIZE(0–48))

Access: Read-only

**nlspIDMapNetNum**

The IPX network number corresponding to this NLSP ID.

Syntax: NetNumber

Access: Read-only

### IPX Network Number Mapping Table

Maps IPX network numbers to router names and NLSP IDs.

**nlspNetMapTable**

Maps IPX network numbers to router names and NLSP IDs.

Syntax: SEQUENCE OF NLSPNetMapEntry

Access: Not-accessible

**nlspNetMapEntry**

Each entry maps one IPX network number to its corresponding router name and NLSP ID.

Syntax: NLSPNetMapEntry

Access: Not-accessible

**nlspNetMapSysInstance**

Specifies the unique identifier of the instance of NLSP and IPX (via ipxSysInstance) to which this row corresponds.

Syntax: Integer

Access: Read-only

**nlspNetMapNetNum**

Specifies the IPX network number.

Syntax: NetNumber

Access: Read-only

**nlspNetMapServerName**

Specifies the router name corresponding to the IPX network number.

Syntax: OCTET STRING (SIZE(0–48))

Access: Read-only

**nlspNetMapID**

Specifies the NLSP ID corresponding to the IPX network number.

Syntax: NLSPID

Access: Read-only

### Name Mapping Table

Maps router names to their corresponding IPX network number and NLSP ID.

#### nlspNameMapTable

Maps router names to the corresponding IPX network number and NLSP ID.

Syntax: SEQUENCE OF NLSPNameMapEntry

Access: Not-accessible

#### nlspNameMapEntry

Specifies that each entry maps one router name to its corresponding IPX network number and NLSP ID.

Syntax: NLSPNameMapEntry

Access: Not-accessible

#### nlspNameMapSysInstance

The unique identifier of the instance of NLSP and IPX (via ipxSysInstance) to which this row corresponds.

Syntax: Integer

Access: Read-only

#### nlspNameMapServerName

Specifies the readable name for this system.

Syntax: OCTET STRING (SIZE(0–48))

Access: Read-only

**nlspNameMapNetNum**

Specifies the IPX network number corresponding to the router name.

Syntax: NetNumber

Access: Read-only

**nlspNameMapID**

Specifies the NLSP ID corresponding to the router name. This value is undefined if the value of nlspSysState is off.

Syntax: NLSPID

Access: Read-only

## Graph Group

The Graph group provides a representation of the network topology. The group is optional.

### Node Table

Contains an entry for each node in the graph.

**nlspNodeTable**

Contains an entry for each node in the graph.

Syntax: SEQUENCE OF NLSPNodeEntry

Access: Not-accessible

**nlspNodeEntry**

Each entry corresponds to one graph node.

Syntax: NLSPNodeEntry

Access: Not-accessible

**InlspNodeSysInstance**

Specifies the unique identifier of the instance of NLSP and IPX (via ipxSysInstance) to which this row corresponds.

Syntax: Integer

Access: Read-only

**nlspNodeID**

Specifies the NLSP ID for this node.

Syntax: NLSPID

Access: Read-only

**nlspNodeNetNum**

Specifies the IPX network number of this node.

Syntax: NetNumber

Access: Read-only

**nlspNodeType**

Specifies the type of system the node represents.

Syntax: Integer 1 = unknown, 2 = nlspLevel1Router, 3 = nlspLevel2Router, 4 = router, 5 = network

Access: Read-only

**nlspNodeEstDelay**

Specifies the estimated delay, in milliseconds, to reach the destination represented by this node.

Syntax: Integer

Access: Read-only

**nlspNodeEstThroughput**

Specifies the estimated throughput, in bits per second, to the destination represented by this node.

Syntax: Integer

Access: Read-only

**nlspNodeMaxPacketSize**

Specifies the maximum packet size, in bytes, that can be sent to the destination represented by this node.

Syntax: Integer

Access: Read-only

**nlspNodeCost**

Specifies the cost to reach this node. The cost value can be a whole number from 0–1023. Lower bandwidth links usually have higher cost; whereas, faster links usually have lower cost. The cost of a single link is 0–63; the cost of a path is 0–1023.

Syntax: Integer

Access: Read-only

**nlspNodeOverload**

Indicates whether this node is overloaded.

Syntax: Integer 1 = no, 2 = yes

Access: Read-only

**nlspNodeReachable**

Indicates whether the destination represented by this node is reachable.

Syntax: Integer 1 = no, 2 = yes

Access: Read-only

### Link Table

Contains the entries for all of the links in the graph.

**nlspLinkSysInstance**

Specifies the unique identifier of the instance of NLSP and IPX (via ipxSysInstance) to which this row corresponds.

Syntax: Integer

Access: Read-only

**nlspLinkNLSPID**

Specifies the NLSP ID (6-byte system ID plus 1-octet pseudo-node ID) of the node to which this link belongs.

Syntax: NLSPID

Access: Read-only

**nlspLinkIndex**

Specifies the unique value identifying the link within the node.

Syntax: Integer

Access: Read-only

**nlspLinkNeighNLSPID**

Specifies the NLSP ID (6-byte system ID plus 1-octet pseudo-node ID) of the neighboring node.

Syntax: NLSPID

Access: Read-only

**nlspLinkFromNeighCost**

Specifies the cost to use this link to reach this node from the neighboring node.

Syntax: Integer

Access: Read-only

**nlspLinkMaxPacketSize**

Specifies the maximum size, in bytes, of a packet that can be sent over this link.

Syntax: Integer

Access: Read-only

**nlspLinkThroughput**

Specifies the link's maximum throughput, in bits per second.

Syntax: Integer

Access: Read-only

**nlspLinkDelay**

Specifies the delay, in milliseconds, on this link.

Syntax: Integer

Access: Read-only

**nlspLinkMediaType**

Specifies the media type of this link.

Syntax: OCTET STRING (SIZE(2))

Access: Read-only

**nlspLinkToNeighCost**

Specifies the cost to use this link to reach the neighbor from this node.

Syntax: Integer

Access: Read-only

### Path Table

Allows the path(s) that a packet can take to reach a destination to be reconstructed. The entries in this table represent those links that are one hop closer to the source and would be used for the minimum cost path(s) to reach the destination.

**nlspPathTable**

Specifies the path table.

Syntax: SEQUENCE OF NLSPPathEntry

Access: Not-accessible

**nlspPathEntry**

Each row in this table represents a link to a node that is one hop closer to the source and would be used for the minimum cost path(s) to reach the destination.

Syntax: NLSPPathEntry

Access: Not-accessible

**nlspPathSysInstance**

Specifies the unique identifier of the instance of NLSP and IPX (via ipxSysInstance) to which this row corresponds.

Syntax: Integer

Access: Read-only

**nlspPathDestNLSPID**

Specifies the NLSP ID (6-octet system ID plus 1-octet pseudo-node ID) of this destination.

Syntax: NLSPID

Access: Read-only

**nlspPathLinkIndex**

Specifies the unique value identifying this link within the destination node.

Syntax: Integer

Access: Read-only

### Graph XRoutes Table

This table contains information about all of the XRoutes provided by a node in the graph.

**nlspGraphXRouteTable**

Contains the information about the XRoutes associated with a node in the graph.

Syntax: SEQUENCE OF NLSPGraphXRouteEntry

Access: Not-accessible

**nlspGraphXRouteEntry**

Each entry in the table contains the information for one XRoute associated with the node.

Syntax: NLSPGraphXRouteEntry

Access: Not-accessible

**nlspGraphXRouteSysInstance**

Specifies the unique identifier of the instance of NLSP and IPX (via ipxSysInstance) to which this entry corresponds.

Syntax: Integer

Access: Read-only

**nlspGraphXRouteNLSPID**

Specifies the NLSP ID of the node.

Syntax: NLSPID

Access: Read-only

**nlspGraphXRouteNetNum**

Specifies the IPX network number of the XRoute destination.

Syntax: NetNumber

Access: Read-only

**nlspGraphXRouteCost**

Specifies the cost to reach the XRoute's destination.

Syntax: Integer

Access: Read-only

**nlspGraphXRouteHopCount**

Specifies the number of hops necessary to reach the XRoute's destination.

Syntax: Integer

Access: Read-only

### Graph Services Table

This table contains information about all of the services provided by a node in the graph.

#### nlspGraphServTable

This table contains the information about the services associated with a node in the graph.

Syntax: SEQUENCE OF NLSPGraphServEntry

Access: Not-accessible

#### nlspGraphServEntry

Each entry in the table contains the information for one service associated with the node.

Syntax: NLSPGraphServEntry

Access: Not-accessible

#### nlspGraphServSysInstance

Specifies the unique identifier of the instance of NLSP and IPX (via ipxSysInstance) to which this entry corresponds.

Syntax: Integer

Access: Read-only

#### nlspGraphServNLSPID

Specifies the NLSP ID of the node.

Syntax: NLSPID

Access: Read-only

**nlspGraphServName**

Specifies the service name.

Syntax: OCTET STRING (SIZE(1–48))

Access: Read-only

**nlspGraphServTypeValue**

Specifies the service type's hexadecimal value.

Syntax: OCTET STRING (SIZE(2))

Access: Read-only

**nlspGraphServType**

Specifies the service type.

Syntax: Integer 1 = unknown

Access: Read-only

**nlspGraphServNetNum**

The IPX network number portion of the IPX address of the service.

Syntax: NetNumber

Access: Read-only

**nlspGraphServNode**

Specifies the node portion of the IPX address of the service.

Syntax: OCTET STRING (SIZE(6))

Access: Read-only

**nlspGraphServSocket**

Specifies the socket portion of the IPX address of the service.

Syntax: OCTET STRING (SIZE(2))

Access: Read-only

## LSP Group

The LSP group provides a representation of NLSP's LSP database. This group is optional.

### LSP Header Table

The LSP header table contains summary information about each LSP in the database, as well as an OCTET STRING containing the entire LSP header.

**nlspLSPTable**

Specifies the LSP header table.

Syntax: SEQUENCE OF NLSPLSPEntry

Access: Not-accessible

**nlspLSPEntry**

Each entry corresponds to one LSP’s header.

Syntax: NLSPLSPEntry

Access: Not-accessible

**nlspLSPSysInstance**

Specifies the unique identifier for the instance of NLSP and IPX (via ipxSysInstance) to which this entry corresponds.

Syntax: Integer

Access: Read-only

**nlspLSPID**

Specifies the value that uniquely identifies this LSP.

Syntax: OCTET STRING (SIZE(8))

Access: Read-only

**nlspLSPLifetime**

Specifies the number of seconds prior to the expiration of the LSP.

Syntax: Integer (0–65535)

Access: Read-only

**nlspLSPSeqNum**

Specifies the sequence number of the LSP.

Syntax: Integer (0–255)

Access: Read-only

**nlspLSPChecksum**

Specifies the checksum value of the LSP.

Syntax: Integer (0–65535)

Access: Read-only

**nlspLSPRouterType**

Specifies the type of the router that sent the LSP.

Syntax: Integer 1 = unknown, 2 = nlspLevel1Router

Access: Read-only

**nlspLSPOverload**

Indicates whether the sending router's LSP database is overloaded.

Syntax: Integer 1 = no, 2 = yes

Access: Read-only

**nlspLSPHeader**

Specifies the complete LSP header.

Syntax: OCTET STRING (SIZE(27))

Access: Read-only

### LSP Options Table

The LSP options table is used to obtain each option contained in an LSP.

**nlspLSPOptTable**

Specifies the LSP Options table.

Syntax: SEQUENCE OF NLSPLSPOptEntry

Access: Not-accessible

**nlspLSPOptEntry**

Each entry corresponds to one option from an LSP.

Syntax: NLSPLSPOptEntry

Access: Not-accessible

**nlspLSPOptSysInstance**

Specifies the unique identifier of the instance of NLSP and IPX (via ipxSysInstance) to which this entry corresponds.

Syntax: Integer

Access: Read-only

**nlspLSPOptLSPID**

Specifies the value that uniquely identifies the LSP.

Syntax: OCTET STRING (SIZE(8))

Access: Read-only

**nlspLSPOptIndex**

Specifies the value that uniquely identifies this option within the LSP.

Syntax: Integer

Access: Read-only

**nlspLSPOptCode**

Specifies the code that identifies the type of the option.

Syntax: Integer (0–255)

Access: Read-only

**nlspLSPOptLength**

Indicates the length of the option's value field.

Syntax: Integer (0–255)

Access: Read-only

**nlspLSPOptValue**

Specifies the option’s value field.

Syntax: OCTET STRING (SIZE(0–255))

Access: Read-only

## RIPSAP Group

This MIB defines the management information for the RIP and SAP protocols running in an IPX environment. It provides information in addition to that contained in the IPX MIB itself. All tables in this MIB are linked to an instance of IPX via the system instance identifier as defined in the IPX MIB.

### System Group

This group contains global information about each instance of RIP/SAP running on one system.

### RIP System Table

This table contains an entry for each instance of RIP running on the system.

#### ripSysTable

Specifies the RIP system table.

Syntax: Sequence of RIPSysEntry

Access: Not-accessible

#### ripSysEntry

Specifies that each entry corresponds to one instance of RIP running on the system.

Syntax: RIPSysEntry

Access: Not-accessible

**ripSysInstance**

The unique identifier of the instance of RIP to which this row corresponds. This value links the instance of RIP to an instance of IPX running on the system (in other words, the value of ripSysInstance should be the same as a value of ipxSysInstance). This value can be written only when creating a new entry in the table.

Syntax: Integer

Access: Read-write

**ripSysState**

Indicates the operational state of this instance of RIP.

Syntax: Integer 1 = off, 2 = on

Access: Read-write

**ripSysIncorrectPackets**

Specifies the number of times that an incorrectly formatted RIP packet was received.

Syntax: Counter

Access: Read-only

## SAP System Table

This table contains an entry for each instance of SAP running on the system.

**sapSysTable**

Identifies the SAP system table.

Syntax: Sequence of SAPSysEntry

Access: Not-accessible

**sapSysEntry**

Specifies that each entry corresponds to one instance of SAP running on the system.

Syntax: SAPSysEntry

Access: Not-accessible

**sapSysInstance**

Specifies the unique identifier of the instance of SAP to which this row corresponds. This value links the instance of SAP to an instance of IPX running on the system (in other words, the value of SApSysInstance should be the same as a value of ipxSysInstance). This value can be written only when creating a new entry in the table.

Syntax: Integer

Access: Read-write

**sapSysState**

Indicates the operational state of this instance of SAP.

Syntax: Integer 1 = off, 2 = on

Access: Read-write

**sapSysIncorrectPackets**

Specifies the number of times that an incorrectly formatted SAP packet was received.

Syntax: Counter

Access: Read-only

## Circuit Group

This group contains RIP and SAP management information for each circuit known to this system.

## RIP Circuit Table

The RIP Circuit table contains an entry for the RIP information for each circuit known to the system.

### ripCircSysInstance

Specifies the unique identifier of the instance of RIP and IPX (by means of ipxSysInstance) to which this entry corresponds. This value can be written only when creating a new entry in the table.

Syntax: Integer

Access: Read-write

### ripCircIndex

Specifies the identifier of this circuit, unique within the instance of RIP. This value corresponds to the circuit identifier found in ipxCircIndex. This value can be written only when creating a new entry in the table.

Syntax: Integer

Access: Read-write

### ripCircState

Indicates whether RIP information may be sent/received over this circuit.

Syntax: Integer 1 = off, 2 = on, 3 = auto-on, 5 = auto-off

Access: Read-write

### ripCircPace

Specifies the maximum pace, in packets per second, at which RIP packets may be sent on this circuit.

Syntax: Integer

Access: Read-write

**ripCircUpdate**

Specifies the RIP periodic update interval, in seconds.

Syntax: Integer

Access: Read-write

**ripCircAgeMultiplier**

Specifies the holding multiplier for information received in RIP periodic updates.

Syntax: Integer

Access: Read-write

**ripCircPacketSize**

Specifies the RIP packet size used on this circuit.

Syntax: Integer

Access: Read-write

**ripCircOutPackets**

Specifies the number of RIP packets sent on this circuit.

Syntax: Counter

Access: Read-only

**ripCircInPackets**

Specifies the number of RIP packets received on this circuit.

Syntax: Counter

Access: Read-only

## SAP Circuit Table

The SAP Circuit table contains an entry for the SAP information for each circuit known to the system.

### sapCircTable

Identifies the SAP Circuit table.

Syntax: Sequence of SAPCircEntry

Access: not-accessible

### sapCircEntry

Specifies that each entry corresponds to one circuit known to the system.

Syntax: SAPCircEntry

Access: Not-accessible

### sapCircSysInstance

The unique identifier of the instance of SAP and IPX (by means of ipxSysInstance) to which this entry corresponds. This value may be written only when creating a new entry in the table.

Syntax: Integer

Access: Read-write

### sapCircIndex

Specifies the identifier of this circuit, unique within the instance of SAP. This value corresponds to the circuit identifier found in ipxCircIndex. This value may be written only when creating a new entry in the table.

Syntax: Integer

Access: Read-write

**sapCircState**

Indicates whether SAP information can be sent/received over this circuit.

Syntax: Integer 1 = off, 2 = on, 3 = auto-on, 4 = auto-off

Access: Read-write

**sapCircPace**

Specifies the maximum pace, in packets per second, at which SAP packets can be sent on this circuit.

Syntax: Integer

Access: Read-write

**sapCircUpdate**

Specifies the SAP periodic update interval, in seconds.

Syntax: Integer

Access: Read-write

**sapCircAgeMultiplier**

Specifies the holding multiplier for information received in SAP periodic updates.

Syntax: Integer

Access: Read-write

**sapCircPacketSize**

Specifies the SAP packet size used on this circuit.

Syntax: Integer

Access: Read-write

**sapCircGetNearestServerReply**

Indicates whether to respond to SAP to get the nearest server requests received on this circuit.

Syntax: Integer 1 = no, 2 = yes

Access: Read-write

**sapCircOutPackets**

Indicates the number of SAP packets sent on this circuit.

Syntax: Counter

Access: Read-only

**sapCircInPackets**

Specifies the number of SAP packets received on this circuit.

Syntax: Counter

Access: Read-only

## Public SNMP Traps Supported by Cisco

SNMP traps are set up on specific devices to obtain useful information such as the change in a device configuration or the absence of proper user authentication with a request. When the SNMP agent on the device detects a change, it immediately sends an SNMP trap to the NMS system.

Network managers must be wary of depending on traps for vital information. Because traps are sent as datagrams with no acknowledgement they can be lost in the network due to, for example, congestion or errors.

Cisco products, including the routers, access servers and communication servers, and protocol translators, support the SNMP traps specified in RFC 1213, *Management Information Base for Network Management of TCP/IP-based Internets: MIB-II*. The *warmStart* trap in MIB II is not supported by Cisco.

Following are the standard SNMP traps supported by Cisco:

**authenticationFailure**

This trap is sent to the NMS system if the SNMP agent detects that proper user authentication was not provided with a request. User authentication enhances the security of the devices by ensuring that only privileged users with valid community strings are allowed to access the system.

**coldStart**

The SNMP agent sends a *coldStart* trap when its device has reinitialized itself.

**egpNeighborloss**

An *egpNeighborLoss* trap indicates that an EGP (Exterior Gateway Protocol) neighbor is down. Neighboring routers are two routers that have interfaces to a common network and exchange routing information. An exterior router uses EGP to advertise its knowledge of routes to networks within its autonomous system. It sends these advertisements to the core routers, which then readvertise their collected routing information to the exterior router. A neighbor or peer router is any router with which the router communicates using EGP.

**linkDown**

A *linkDown* trap is sent by the SNMP agent to the NMS system if a link in a configuration of a device has been shutdown. For example, the link could be a serial line connecting two devices or an Ethernet link between two networks.

**linkUp**

A *linkUp* trap indicates the recognition of an SNMP agent that a link in a configuration of a device has become active.

## SNMP Traps Defined by Cisco

Following are the Cisco private SNMP traps that are implemented in Cisco products including the router, access server and communication server, and protocol translator.

**ipxTrapCircuitUp**

This trap signifies that the specified circuit has come up.

**ipxTrapCircuitDown**

This trap signifies that the specified circuit has gone down.

**ciscoPingCompletionTrap**

A ciscoPingCompleted trap is sent at the completion of a sequence of pings if such a trap was requested when the sequence was initiated.

**reload**

This trap is sent after a reload command is issued.

**tcpConnectionClose**

The *tty* trap indicates that a TCP connection, which existed previously for a tty session, has been terminated.

## Variables Supported in RFC 1285

The following variables in RFC 1285 are supported in Software Release 9.0 and later:

*snmpFddiSMTNumber*

*snmpFddiSMTIndex*

*snmpFddiSMTStationId*

*snmpFddiSMTOpVersionId*

*snmpFddiSMTHiVersionId*

*snmpFddiSMTLoVersionId*

*snmpFddiSMTCFState*

*snmpFddiMACNumber*

*snmpFddiMACSMTIndex*

*snmpFddiMACIndex*

*snmpFddiMACTReq*

*snmpFddiMACTNegj*

*snmpFddiMACTMax*

*snmpFddiMACTvxValue*

*snmpFddiMACMin*

*snmpFddiMACFrameCts*

*snmpFddiMACErrorCts*

*snmpFddiMACLostCts*

*snmpFddiMACChipSet*

## MIBs Supported by Cisco Software Releases

This section lists the Cisco private MIB variables that have been introduced after Software Release 8.0.

### Software Release 8.2

The following list describes the MIB variables introduced with Software Release 8.2:

*writeMem*

*writeNet*

*busyPer*

*avgBusy1*

*avgBusy5*

*idleCount*

*idleWired*

*locIfCarTrans*

*locIfReliab*

*locIfDelay*

*locIfLoad*

*locIfCollisions*

*tsLineNoise*

*dnAreaTable*

dnACost

dnAHop

dnAifIndex

dnANextHop

dnAAge

dnAPrio

*vinesInput*

*vinesOutput*

*vinesLocaldest*

*vinesForwarded*

*vinesBcastin*

*vinesBcastout*

*vinesBcastfwd*

*vinesNotlan*

*vinesNotgt4800*

*vinesNocharges*

*vinesFormaterror*

*vinesCksumerr*

*vinesHopcout*

*vinesNoroute*

*vinesEncapsfailed*

*vinesUnknown*

*vinesIcpIn*

*vinesIcpOut*

*vinesMetricOut*

*vinesMacEchoIn*

*vinesMacEchoOut*

*vinesEchoIn*

*vinesEchoOut*

## Software Release 8.3

The following list describes the MIB variables introduced with Software Release 8.3:

*bufferHgsize*

*bufferHgTotal*

*bufferHgFree*

*bufferHgMax*

*bufferHgHit*

*bufferHgMiss*

*bufferHgTrim*

*bufferHgCreate*

*locIfInputQueueDrops*

*locIfOutputQueueDrops*

*ipNoaccess*

*actCheckPoint*

*tsMsgTtyLine*

*tsMsgIntervaltim*

*tsMsgDuration*

*tsMsgTest*

*tsMsgTmpBanner*

*tsMsgSend*

*dnIfTable*

*dnIfCost*

## Software Release 9.0

*The following list provides the MIB variables introduced with Software Release 9.0:*

*netConfigProto*

*hostConfigProto*

*sysConfigAddr*

*sysConfigName*

*sysConfigProto*

*sysClearARP*

*sysClearInt*

*envPresent*

*envTestPt1Descr*

*envTestPt1Measure*

*envTestPt2Descr*

*envTestPt2Measure*

*envTestPt3Descr*

*envTestPt3Measure*

*envTestPt4Descr*

*envTestPt4Measure*

*envTestPt5Descr*

*envTestPt5Measure*

*envTestPt6Descr*

*envTestPt6Measure*

*locIfDescr*

*locIfPakmon*

### Software Release 9.1

The following list provides the MIB variables introduced with Software Release 9.1:

*envTestPt4MarginPercent*

*envTestPt5MarginPercent*

*envTestPt6MarginPercent*

*envTestPt1last*

*envTestPt2last*

*envTestPt3last*

*envTestPt4last*

*envTestPt5last*

*envTestPt6last*

*envTestPt1MarginVal*

*envTestPt2MarginVal*

*envTestPt3MarginVal*

*envTestPt4MarginVal*

*envTestPt5MarginVal*

*envTestPt6MarginVal*

*envTestPt1warn*

*envTestPt2warn*

*envTestPt3warn*

*envTestPt4warn*

*envTestPt5warn*

*envTestPt6warn*

*envFirmVersion*

*envTechnicianID*

*envType*

*envBurnDate*

*envSerialNumber*

*locIfSlowInPkts*

*locIfSlowOutPkts*

*locIfSlowInOctets*

*locIfSlowOutOctets*

*locIfFastInPkts*

*locIfFastOutPkts*

*locIfFastInOctets*

*locIfFastOutOctets*

*locIfotherInPkts*

*locIfotherOutPkts*

*locIfotherInOctets*

*locIfotherOutOctets*

*locIfipInPkts*

*locIfipOutPkts*

*locIfipInOctets*

*locIfipOutOctets*

*locIfdecnetInPkts*

*locIfdecnetOutPkts*

*locIfdecnetInOctets*

*locIfdecnetOutOctets*

*locIfxnsInPkts*

*locIfxnsOutPkts*

*locIfxnsInOctets*

*locIfxnsOutOctets*

*locIfclnsInPkts*

*locIfclnsOutPkts*

*locIfclnsInOctets*

*locIfclnsOutOctets*

*locIfappletalkInPkts*

*locIfappletalkOutPkts*

*locIfappletalkInOctets*

*locIfappletalkOutOctets*

*locIfnovellInPkts*

*locIfnovellOutPkts*

*locIfnovellInOctets*

*locIfnovellOutOctets*

*locIfapolloInPkts*

*locIfapolloOutPkts*

*locIfapolloInOctets*

*locIfapolloOutOctets*

*locIfvinesInPkts*

*locIfvinesOutPkts*

*locIfvinesInOctets*

*locIfvinesOutOctets*

*locIfbridgedInPkts*

*locIfbridgedOutPkts*

*locIfbridgedInOctets*

*locIfbridgedOutOctets*

*locIfsrbInPkts*

*locIfsrbOutPkts*

*locIfsrbInOctets*

*locIfsrbOutOctets*

*locIfchaosInPkts*

*locIfchaosOutPkts*

*locIfchaosInOctets*

*locIfchaosOutOctets*

*locIfpupInPkts*

*locIfpupOutPkts*

*locIfpupInOctets*

*locIfpupOutOctets*

*locIfmopInPkts*

*locIfmopOutPkts*

*locIfmopInOctets*

*locIfmopOutOctets*

*locIflanmanInPkts*

*locIflanmanOutPkts*

*locIflanmanInOctets*

*locIflanmanOutOctets*

*locIfstunInPkts*

*locIfstunOutPkts*

*locIfstunInOctets*

*locIfstunOutOctets*

*locIfspanInPkts*

*locIfspanOutPkts*

*locIfspanInOctets*

*locIfspanOutOctets*

*locIfarpInPkts*

*locIfarpOutPkts*

*locIfarpInOctets*

*locIfarpOutOctets*

*locIfprobeInPkts*

*locIfprobeOutPkts*

*locIfprobeInOctets*

*locIfprobeOutOctets*

*flashSize*

*flashFree*

*flashcontoller*

*flashcard*

*flashVPP*

*flashErase*

*flashEraseTime*

*flashEraseStatus*

*flashToNet*

*flashToNetTime*

*flashToNetStatus*

*netToFlash*

*netToFlashTime*

*netToFlashStatus*

*flashStatus*

*flashEntries*

*flashDirName*

*flashDirSize*

*flashDirStatus*

## Software Release 9.21

The following list identifies the MIB variables introduced with Software Release 9.21:

locIfDribbleInputs

vinesProxy

vinesProxyReply

vinesNet

vinesSubNet

vinesClient

vinesIfMetric

vinesIfEnctype

vinesIfAccesslist

vinesIfInputNetworkFilter

vinesIfInputRouterFilter

vinesIfOutputNetworkFilter

vinesIfPropagate

vinesIfArpEnabled

vinesIfServerless

vinesIfServerlessBcast

vinesIfRedirectInterval

vinesIfSplitDisabled

vinesIfLineup

vinesIfFastokay

vinesIfRouteCache

vinesIfIn

vinesIfOut

vinesIfInBytes

vinesIfOutBytes

vinesIfRxNotEnabled

vinesIfRxFormatError

vinesIfRxLocalDest

vinesIfRxBcastin

vinesIfRxForwarded

vinesIfRxNoRoute

vinesIfRxZeroHopCount

vinesIfRxChecksumError

vinesIfRxArp0

vinesIfRxArp1

vinesIfRxArp2

vinesIfRxArp3

vinesIfRxArpIllegal

vinesIfRxIcpError

vinesIfRxIcpMetric

vinesIfRxIcpIllegal

vinesIfRxIpc

vinesIfRxRtp0

vinesIfRxRtp1

vinesIfRxRtp2

vinesIfRxRtp3

vinesIfRxRtp4

vinesIfRxRtp5

vinesIfRxRtp6

vinesIfRxRtpIllegal

vinesIfRxSpp

vinesIfRxBcastHelpered

vinesIfRxBcastForwarded

vinesIfRxBcastDuplicate

vinesIfRxEcho

vinesIfRxMacEcho

vinesIfRxProxyReply

vinesIfTxUnicast

vinesIfTxBcast

vinesIfTxForwarded

vinesIfTxFailedEncaps

vinesIfTxFailedAccess

vinesIfTxFailedDown

vinesIfTxNotBcastToSource

vinesIfTxNotBcastNotlan

vinesIfTxNotBcastNotgt4800

vinesIfTxNotBcastPpcharge

vinesIfTxBcastForwarded

vinesIfTxBcastHelpered

vinesIfTxArp0

vinesIfTxArp1

vinesIfTxArp2

vinesIfTxArp3

vinesIfTxIcpError

vinesIfTxIcpMetric

vinesIfTxIpc

vinesIfTxRtp0

vinesIfTxRtp1

vinesIfTxRtp2

vinesIfTxRtp3

vinesIfTxRtp4

vinesIfTxRtp5

vinesIfTxRtp6

vinesIfTxSpp

vinesIfTxEcho

vinesIfTxMacEcho

vinesIfTxProxy

chassisType

chassisVersion

chassisId

romVersion

romSysVersion

processorRam

nvRAMSize

nvRAMUsed

configRegister

configRegNext

cardTable

cardTableEntry

cardIndex

cardType

cardDescr

cardSerial

cardHwVersion

cardSwVersion

cardSlotNumber

chassisSlots

### Internetwork Operating System (IOS) Release 10.0

The following list identifies the MIB variables introduced with IOS Release 10.0:

ipxThresh

ipxactLostPkts

ipxactLostByts

ipxactSrc

ipxactDst

ipxactPkts

ipxactByts

ipxactAge

ipxckactSrc

ipxckactDst

ipxckactPkts

ipckactByts

ipxckactAge

ipxactCheckPoint

vinesIfInputNetworkFilter

vinesIfInputRouterFilter

vinesIfOutputNetworkFilter

cardIfIndex

cardIfSlotNumber

cardIfPortNumber

### Internetwork Operating System (IOS) Release 10.2

The following list identifies the MIB variables introduced with IOS Release 10.2:

cipCardClawEntry

cipCardClawIndex

cipCardClawConnected

cipCardClawConfigTable

cipCardClawConfigEntry

cipCardClawConfigPath

cipCardClawConfigDevice

cipCardClawConfigIpAddr

cipCardClawConfigHostName

cipCardClawConfigRouterName

cipCardClawConfigHostAppl

cipCardClawConfigRouterAppl

cipCardClawDataXferStatsTable

cipCardClawDataXferStatsEntry

cipCardClawDataXferStatsBlocksRead

cipCardClawDataXferStatsBlocksWritten

cipCardClawDataXferStatsBytesRead

cipCardClawDataXferStatsBytesWritten

cipCardClawDataXferStatsHCBytesRead

cipCardClawDataXferStatsHCBytesWritten

cipCardClawDataXferStatsReadBlocksDropped

cipCardClawDataXferStatsWriteBlocksDropped

cipCardClawDataXferStatsBufferGetRetryCount

cipCardDtrBrdIndex

cipCardDtrBrdType

cipCardDtrBrdStatus

cipCardDtrBrdSignal

cipCardDtrBrdOnline

implicitIncidents

codeViolationErrors

linkFailureSignalOrSyncLoss

linkFailureNOSs

linkFailureSequenceTimeouts

linkFailureInvalidSequences

linkIncidentTrapCause

cipCardsubChannelIndex

cipCardsubChannelConnections

cipCardsubChannelCancels

cipCardsubChannelSelectiveResets

cipCardsubChannelSystemResets

cipCardsubChannelDeviceErrors

cipCardsubChannelWriteBlocksDropped

cipCardsubChannelLastSenseData

cipCardSubchannelLastSenseDataTime

cipCardSubChannelCuBusies

cipCardEntryIndex

cipCardEntryName

cipCardEntryTotalMemory

cipCardEntryFreeMemory

cipCardEntryCpuUtilization

cipCardEntryTimeSinceLastReset

ciscoFlash

ciscoPingAddress

ciscoPingTable

ciscoPingEntry

ciscoPingProtocol

ciscoPingSerialNumber

ciscoPingPacketCount

ciscoPingPacketSize

ciscoPingPacketTimeout

ciscoPingDelay

ciscoPingTrapOnCompletion

ciscoPingSentPackets

ciscoPingReceivedPackets

ciscoPingMinRtt

ciscoPingAvgRtt

ciscoPingMaxRtt

ciscoPingCompleted

ciscoPingEntryOwner

ciscoPingEntryStatus

ipxBasicSysInstance

ipxBasicSysExistState

ipxBasicSysNetNumber

ipxBasicSysNode

ipxBasicSysName

ipxBasicSysInReceives

ipxBasicSysInHdrErrors

ipxBasicSysInUnknownSockets

ipxBasicSysInDiscards

ipxBasicSysInBadChecksums

ipxBasicSysInDelivers

ipxBasicSysNoRoutes

ipxBasicSysOutRequests

ipxBasicSysOutMalformedRequests

ipxBasicSysOutDiscards

ipxBasicSysOutPackets

ipxBasicSysConfigSockets

ipxBasicSysOpenSocketFails

ipxAdvSysInstance

ipxAdvSysMaxPathSplits

ipxAdvSysMaxHops

ipxAdvSysInTooManyHops

ipxAdvSysInFiltered

ipxAdvSysInCompressDiscards

ipxAdvSysNETBIOSPackets

ipxAdvSysForwPackets

ipxAdvSysOutFiltered

ipxAdvSysOutCompressDiscards

ipxAdvSysCircCount

ipxAdvSysDestCount

ipxAdvSysServCount

ipxCircSysInstance

ipxCircIndex

ipxCircExistState

ipxCircOperState

ipxCircName

ipxCircType

ipxCircDialName

ipxCircLocalMaxPacketSize

ipxCircCompressState

ipxCircCompressSlots

ipxCircStaticStatus

ipxCircCompressedSent

ipxCircCompressedInitSent

ipxCircCompressedRejectsSent

ipxCircUncompressedSent

ipxCircCompressedReceived

ipxCircCompressedInitReceived

ipxCircCompressedRejectsReceived

ipxCircUncompressedReceived

ipxCircMediaType

ipxCircNetNumber

ipxCircStateChanges

ipxCircInitFails

ipxCircDelay

ipxCircThroughput

ipxCircNeighRouterName

ipxCircNeighInternalNetNum

ipxDestSysInstance

ipxDestNetNum

ipxDestProtocol

ipxDestTicks

ipxDestHopCount

ipxDestNextHopCircIndex

ipxDestNextHopNICAddress

ipxDestNextHopNetNum

ipxStaticRouteSysInstance

ipxStaticRouteCircIndex

ipxStaticRouteNetNum

ipxStaticRouteExistState

ipxStaticRouteTicks

ipxStaticRouteHopCount

ipxServSysInstance

ipxServType

ipxServName

ipxServProtocol

ipxServNetNum

ipxServNode

ipxServSocket

ipxServHopCount

ipxDestServSysInstance

ipxDestServNetNum

ipxDestServSocket

ipxDestServName

ipxDestServType

ipxDestServProtocol

ipxDestServHopCount

ipxStaticServSysInstance

ipxStaticServCircIndex

ipxStaticServName

ipxStaticServType

ipxStaticServExistState

ipxStaticServNetNum

ipxStaticServNode

ipxStaticServSocket

ipxStaticServHopCount

ripSysInstance

ripSysState

ripSysIncorrectPackets

sapSysInstance

sapSysState

sapSysIncorrectPackets

ripCircSysInstance

ripCircIndex

ripCircState

ripCircPace

ripCircUpdate

ripCircAgeMultiplier

ripCircPacketSize

ripCircOutPackets

ripCircInPackets

sapCircSysInstance

sapCircIndex

sapCircState

sapCircPace

sapCircUpdate

sapCircAgeMultiplier

sapCircPacketSize

sapCircGetNearestServerReply

sapCircOutPackets

sapCircInPackets

cardIfIndex

cardIfSlotNumber

cardIfPortNumber

#### Deprecated in IOS 10.2

The loctcp table has been replaced by the ciscoloctcp table.

#### Obsoleted in IOS 10.2

The IOS Release 10.1 ping object was replaced by the IOS 10.2 ciscoPing table.

The loctcp table has been replaced by the ciscoloctcp table.

### Internetwork Operating System (IOS) Release 10.3(2)

The following list identifies the MIB variables introduced with IOS Release 10.3(2):

ciscoRptrPortMDIStatus

ciscoRptrPortLinkTestEnabled

ciscoRptrPortLinkTestFailed

ciscoRptrPortAutoPolarityEnabled

ciscoRptrPortAutoPolarityCorrected

ciscoRptrPortSrcAddrCtrl

ciscoRptrPortAllowedSrcAddr

ciscoRptrPortAllowedSrcAddrStatus

ciscoRptrPortLastIllegalSrcAddr

### Internetwork Operating System (IOS) Release 10.3

The following list identifies the MIB variables introduced with IOS Release 10.3:

cardIfIndex

cardIfSlotNumber

cardIfPortNumber

ciscoEnvMonVoltageStatusIndex

ciscoEnvMonVoltageStatusDesc

ciscoEnvMonVoltageStatusValue

ciscoEnvMonVoltageThresholdLow

ciscoEnvMonVoltageThresholdHigh

ciscoEnvMonVoltageLastShutdown

ciscoEnvMonVoltageState

ciscoEnvMonTemperatureStatusEntry

ciscoEnvMonTemperatureStatusIndex

ciscoEnvMonTemperatureStatusDescr

ciscoEnvMonTemperatureStatusValue

ciscoEnvMonTemperatureThreshold

ciscoEnvMonTemperatureLastShutdown

ciscoEnvMonTemperatureState

ciscoEnvMonFanStatusIndex

ciscoEnvMonFanStatusDescr

ciscoEnvMonFanState

ciscoEnvMonSupplyStatusDescr

ciscoEnvMonSupplyState

ciscoEnvMonShutdownTrap

ciscoEnvMonEnableShutdownTrap

ciscoEnvMonVoltageTrap

ciscoEnvMonTemperatureTrap

ciscoEnvMonEnableTemperatureTrap

ciscoEnvMonRedundantSupplyTrap

ciscoEnvMonEnableRedundantSupplyTrap

dspuNodeRsrb

dspuNodeRsrbLocalVirtualRing

dspuNodeRsrbBridgeNumber

dspuNodeRsrbTargetVirtualRing

dspuNodeRsrbVirtualMacAddress

dspuNodeDefaultPu

dspuNodeDefaultPuWindowSize

dspuNodeDefaultPuMaxIframe

dspuNodeActivationWindow

dspuNodeLastConfigChgTime

dspuPoolClassEntry

dspuPoolClassIndex

dspuPoolClassName

dspuPoolClassInactivityTimeout

dspuPoolClassOperUpStreamLuDefs

dspuPoolClassOperDnStreamLuDefs

dspuPooledLuPeerLuLocalAddress

dspuPuAdminName

dspuPuAdminType

dspuPuAdminRemoteMacAddress

dspuPuAdminRemoteSapAddress

dspuPuAdminLocalSapAddress

dspuPuAdminXid

dspuPuAdminXidFmt

dspuPuAdminWindowSize

dspuPuAdminMaxIframe

dspuPuAdminLinkRetryCount

dspuPuAdminLinkRetryTimeout

dspuPuAdminStartPu

dspuPuAdminDlcType

dspuPuAdminDlcUnit

dspuPuAdminDlcPort

dspuPuAdminFocalPoint

dspuPuAdminRowStatus

dspuPuOperName

dspuPuOperType

dspuPuOperRemoteMacAddress

dspuPuOperRemoteSapAddress

dspuPuOperLocalSapAddress

dspuPuOperXid

dspuPuOperXidFmt

dspuPuOperWindowSize

dspuPuOperMaxIframe

dspuPuOperLinkRetryCount

dspuPuOperLinkRetryTimeout

dspuPuOperStartPu

dspuPuOperDlcType

dspuPuOperDlcUnit

dspuPuOperDlcPort

dspuPuOperFocalPoint

dspuPuOperState

dspuPuOperFsmState

dspuPuOperStartTime

dspuPuOperLastStateChgTime

dspuPuStatsSentBytes

dspuPuStatsRcvdBytes

dspuPuStatsSentFrames

dspuPuStatsRcvdFrames

dspuPuStatsSentNegativeRsps

dspuPuStatsRcvdNegativeRsps

dspuPuStatsActiveLus

dspuPuStatsInactiveLus

dspuPuStatsBindLus

dspuPuStatsActivationFailures

dspuPuStatsLastActivationFailureReason

dspuLuAdminLuLocalAddress

dspuLuAdminType

dspuLuAdminPoolClassName

dspuLuAdminPeerPuIndex

dspuLuAdminPeerLuLocalAddress

dspuLuAdminRowStatus

dspuLuOperEntry

dspuLuOperLuLocalAddress

dspuLuOperType

dspuLuOperPoolClassName

dspuLuOperPeerPuIndex

dspuLuOperPeerLuLocalAddress

dspuLuOperState

dspuLuOperFsmState

dspuLuOperSessionState

dspuSapAddress

dspuSapType

dspuSapDlcType

dspuSapDlcUnit

dspuSapDlcPort

dspuSapOperState

dspuSapRowStatus

cdpInterfaceEnable

cdpInterfaceMessageInterval

cdpInterfaceGroup

cdpInterfacePort

cdpCacheEntry

cdpCacheIfIndex

cdpCacheDeviceIndex

cdpCacheAddressType

cdpCacheAddress

cdpCacheVersion

cdpCacheDeviceId

cdpCacheDevicePort

cdpCachePlatform

cdpCacheCapabilities

qllcLSAdminLciVcIndex

qllcLSAdminCircuitType

qllcLSAdminRole

qllcLSAdminX25Add

qllcLSAdminModulo

qllcLSAdminLgX25

qllcLSOperCircuitType

qllcLSOperRole

qllcLSOperX25Add

qllcLSOperModulo

qllcLSOperState

qllcLSOperLgX25

qllcLSStatsLciVcIndex

qllcLSStatsXidIn

qllcLSStatsXidOut

qllcLSStatsTestIn

qllcLSStatsTestOut

qllcLSStatsQuenchOff

qllcLSStatsQuenchOn

qllcLSStatsInPaks

qllcLSStatsOutPaks

qllcLSStatsInBytes

qllcLSStatsOutBytes

qllcLSStatsNumRcvQsms

qllcLSStatsNumSndQsms

qllcLSStatsNumRcvDiscs

qllcLSStatsNumSndDiscs

qllcLSStatsNumRcvDms

qllcLSStatsNumSndDms

qllcLSStatsNumRcvFrmrs

qllcLSStatsNumSndFrmrs

qllcLSStatsNumDrops

qllcLSStatsNumErrs

cvBasicNetwork

cvBasicHost

cvBasicNextClient

cvForwNeighborNeighborCount

cvForwNeighborPathCount

cvForwNeighborVersion

cvForwNeighborTable

cvForwNeighborNetwork

cvForwNeighborHost

cvForwNeighborPhysAddress

cvForwNeighborSource

cvForwNeighborRtpVersion

cvForwNeighborUsageType

cvForwNeighborAge

cvForwNeighborMetric

cvForwNeighborUses

cvForwRouteRouterCount

cvForwRouteRouteCount

cvForwRouteVersion

cvForwRouteUpdateCountdown

cvForwRouteTable

cvForwRouteNetworkNumber

cvForwRouteNeighborNetwork

cvForwRouteSource

cvForwRouteRtpVersion

cvForwRouteUseNext

cvForwRouteForwardBroadcast

cvForwRouteSuppress

cvForwRouteLoadShareEligible

cvForwRouteAge

cvForwRouteMetric

cvForwRouteUses

cvTotalInputPackets

cvTotalOutputPackets

cvTotalLocalDestPackets

cvTotalForwardedPackets

cvTotalBroadcastInPackets

cvTotalBroadcastOutPackets

cvTotalBroadcastForwardPackets

cvTotalLanOnlyPackets

cvTotalNotOver4800Packets

cvTotalNoChargesPackets

cvTotalFormatErrors

cvTotalChecksumErrors

cvTotalHopCountsExceeded

cvTotalNoRouteDrops

cvTotalEncapsFailedDrops

cvTotalUnknownPackets

cvTotalIcpInPackets

cvTotalIcpOutPackets

cvTotalMetricOutPackets

cvTotalMacEchoInPackets

cvTotalMacEchoOutPackets

cvTotalEchoInPackets

cvTotalEchoOutPackets

cvTotalProxyOutPackets

cvTotalProxyReplyOutPackets

cvIfConfigMetric

cvIfConfigEncapsulation

cvIfConfigAccesslist

cvIfConfigPropagate

cvIfConfigArpEnabled

cvIfConfigServerless

cvIfConfigRedirectInterval

cvIfConfigSplitDisabled

cvIfConfigLineup

cvIfConfigFastokay

cvIfConfigRouteCache

cvIfConfigInputRouterFilter

cvIfConfigInputNetworkFilter

cvIfConfigOutputNetworkFilter

cvIfCountInNotEnabledDrops

cvIfCountInFormatErrors

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nlspLSPHeader

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#### Deprecated in IOS 10.3

The Environmental Monitor Card objects have been replaced by the IOS Release 10.3 by the Cisco Environmental Monitor MIB.

The Flash group objects found in Local Variables have been superceded by the ciscoFlash MIB found in ciscoMgmt.

#### Obsoleted in IOS 10.3

The loctcp table has been replaced by the ciscoloctcp table.

### Internetwork Operating System (IOS) Release 10.3(3)

The following list identifies the MIB variables introduced with IOS Release 10.3(3):

chassisPartner

ciscoRptrPortMDIStatus

ciscoRptrPortLinkTestEnabled

ciscoRptrPortLinkTestFailed

ciscoRptrPortAutoPolarityEnabled

ciscoRptrPortAutoPolarityCorrected

ciscoRptrPortSrcAddrCtrl

ciscoRptrPortAllowedSrcAddr

ciscoRptrPortAllowedSrcAddrStatus

ciscoRptrPortLastIllegalSrcAddr

demandNbrEntry

demandNbrPhysIf

demandNbrId

demandNbrLogIf

demandNbrName

demandNbrAddress

demandNbrPermission

demandNbrMaxDuration

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