

# Interface MIB Implementation for ATM Subinterfaces

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This feature module describes the Interface MIB Implementation for ATM Subinterfaces feature. It includes information on the benefits of the new feature, supported platforms, related documents, and so forth.

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## Feature Overview

The Interface MIB Implementation for ATM Subinterfaces feature involves the implementation of the Interface MIB (RFC 2233) for ATM subinterfaces. Network managers are now able to query for the MIB variables on a per-subinterface basis. Because the implementation of this feature is in platform-independent code, this feature is supported on all Cisco ATM interfaces and port adapters where speeds are at or above OC-3.

## Benefits

Permits deployment of GSR line cards in service provider backbone networks.

## Related Documents

- RFC 1573/2233: *The Interface Group MIB Using SMiv2*
- RFC 1695: *Definitions of Managed Objects for ATM Management Version 8.0 Using SMiv2*

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## Supported Platforms

This feature is supported on all ATM interfaces on the following platforms:

- Cisco 3600
- Cisco 4500
- Cisco 4700
- Cisco 7200 series
- Cisco 7500 series
- Cisco 12000 series

Any platform with ATM port adapters and line cards where speeds are at or above OC-3.

## Supported Standards, MIBs, and RFCs

### Standards

None

### MIBs

Cisco's implementation of SNMP supports all MIB II variables (as described in RFC 1213) and SNMP traps (as described in RFC 1215).

Cisco provides its own private MIB extensions with every system. One of the set of MIB objects provided is the Cisco Chassis MIB that enables the SNMP manager to gather data on system card descriptions, serial numbers, hardware and software revision levels, and slot locations. Another set is the Entity MIB (RFC 2037), which describes the logical resources, physical resources, and logical-to-physical mappings of devices managed by a single SNMP agent. The Entity MIB also records the time of the last modification to any object in the Entity MIB and sends out a trap when any object is modified.

For descriptions of supported MIBs and how to use MIBs, see the Cisco MIB web site on CCO at <http://www.cisco.com/public/sw-center/netmgmt/cmtk/mibs.shtml>.

### RFCs

The following RFCs are supported:

- RFC 1213
- RFC 1215
- RFC 2037
- RFC 2233

Cisco no longer supports RFC 1447, "SNMPv2 Party MIB" (April 1993) or RFC 1450, "SNMPv2 MIB" (April 1993).

## Configuration Tasks

Before you enable this feature, you must configure SNMP support on your router. For information about configuring SNMP support, refer to the chapter “Monitoring the Router and Network” in the *Configuration Fundamentals Configuration Guide* for Cisco IOS Release 12.0.

For information about configuring IP routing protocols, refer to the section “IP Routing Protocols” in the *Network Protocols Configuration Guide, Part 1* for Cisco IOS Release 12.0.

## Configuration Examples

For information on SNMP configuration examples, refer to the chapter “Monitoring the Router and Network” in the *Configuration Fundamentals Configuration Guide* for Cisco IOS Release 12.0.

## Command Reference

This section documents the following command (with updates to the packets input and packets output field descriptions):

- **show interfaces atm**

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## show interfaces atm

Use the **show interfaces atm** privileged EXEC command to display information about the ATM interface.

Cisco 7500 Series with AIP; Cisco 7200 Series with ATM, ATM-CES, and Enhanced ATM Port Adapter;  
Cisco 2600 and 3600 Series with 1-Port ATM-25 Network Module

**show interfaces atm** [*slot/port*]

Cisco 7500 Series Routers with the ATM Port Adapter and Enhanced ATM Port Adapter

**show interfaces atm** [*slot/port-adapter/port*]

### Syntax Description

*slot/port*

(Optional) ATM slot number and port number. Use this format for the following platform configurations:

- The AIP on Cisco 7500 series routers.
- The ATM port adapter, ATM-CES port adapter, or enhanced ATM port adapter on Cisco 7200 series routers.
- The 1-port ATM-25 network module on Cisco 2600 and 3600 series routers.

*slot/port-adapter/port*

(Optional) ATM slot, port adapter, and port numbers. Use this format for the ATM port adapter or enhanced ATM port adapter on Cisco 2600 and 3600 series routers.

### Defaults

No default behavior or values.

### Command Modes

Privileged EXEC

## Command History

Release	Modification
10.0	This command was introduced.

## Examples

The following is sample output from the **show interfaces atm** command:

```
Router# show interfaces atm 4/0
```

```
ATM4/0 is up, line protocol is up
Hardware is cxBus ATM
Internet address is 131.108.97.165, subnet mask is 255.255.255.0
MTU 4470 bytes, BW 100000 Kbit, DLY 100 usec, rely 255/255, load 1/255
ATM E164 Auto Conversion Interface
Encapsulation ATM, loopback not set, keepalive set (10 sec)
Encapsulation(s): AAL5, PVC mode
256 TX buffers, 256 RX buffers, 1024 Maximum VCs, 1 Current VCs
Signalling vc = 1, vpi = 0, vci = 5
ATM NSAP address: BC.CDEF.01.234567.890A.BCDE.F012.3456.7890.1234.13
Last input 0:00:05, output 0:00:05, output hang never
Last clearing of "show interface" counters never
Output queue 0/40, 0 drops; input queue 0/75, 0 drops
Five minute input rate 0 bits/sec, 0 packets/sec
Five minute output rate 0 bits/sec, 0 packets/sec
 144 packets input, 3148 bytes, 0 no buffer
  Received 0 broadcasts, 0 runts, 0 giants
  0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
 154 packets output, 4228 bytes, 0 underruns
  0 output errors, 0 collisions, 1 interface resets, 0 restarts
```

The following is sample output from the **show interfaces atm** command for the ATM port adapter on a Cisco 7500 series router:

```
Router# show interfaces atm 0/0/0
```

```
ATM0/0/0 is up, line protocol is up
Hardware is cyBus ATM
Internet address is 1.1.1.1/24
MTU 4470 bytes, sub MTU 4470, BW 156250 Kbit, DLY 80 usec, rely 255/255, load 1/255
Encapsulation ATM, loopback not set, keepalive set (10 sec)
Encapsulation(s): AAL5, PVC mode
256 TX buffers, 256 RX buffers,
2048 maximum active VCs, 1024 VCs per VP, 1 current VCCs
VC idle disconnect time: 300 seconds
Last input never, output 00:00:05, output hang never
Last clearing of "show interface" counters never
Queueing strategy: fifo
Output queue 0/40, 0 drops; input queue 0/75, 0 drops
5 minute input rate 0 bits/sec, 1 packets/sec
5 minute output rate 0 bits/sec, 1 packets/sec
  5 packets input, 560 bytes, 0 no buffer
  Received 0 broadcasts, 0 runts, 0 giants
  0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
  5 packets output, 560 bytes, 0 underruns
  0 output errors, 0 collisions, 0 interface resets
  0 output buffer failures, 0 output buffers swapped out
```

Table 1 describes the fields shown in both the displays.

**Table 1 show interfaces atm Field Descriptions**

Field	Description
ATM... is {up   down} is administratively down	Indicates whether the interface hardware is currently active (whether carrier detect is present) and if it has been taken down by an administrator.
line protocol is {up   down   administratively down}	Indicates whether the software processes that handle the line protocol think the line is usable (that is, whether keepalives are successful).
Hardware is	Hardware type.
Internet address is	Internet address and subnet mask.
MTU	Maximum Transmission Unit of the interface.
sub MTU	Maximum Transmission Unit of the subinterface.
BW	Bandwidth of the interface in kilobits per second.
DLY	Delay of the interface in microseconds.
rely	Reliability of the interface as a fraction of 255 (255/255 is 100% reliability), calculated as an exponential average over 5 minutes.
load	Load on the interface as a fraction of 255 (255/255 is completely saturated), calculated as an exponential average over 5 minutes. The calculation uses the value from the <b>bandwidth</b> interface configuration command.
ATM E164 Auto Conversion Interface	Indicates that ATM E164 auto conversion is enabled. When this field is not present, ATM E164 auto conversion is disabled.
Encapsulation	Encapsulation method assigned to interface.
loopback	Indicates whether the interface is configured for loopback testing.
keepalive	Indicates whether keepalives are set or not.
Encapsulation(s)	Type of encapsulation used on the interface (for example, AAL5, and either PVC or SVC mode).
TX buffers	Number of buffers configured with the <b>atm txbuff</b> command.
RX buffers	Number of buffers configured with the <b>atm rxbuff</b> command.
Maximum active VCs	Maximum number of virtual circuits.
VCs per VP	Number of virtual circuits per virtual path (the default is 1024).
Current VCs	Number of virtual circuit connections currently open.
VC idle disconnect time	Number of seconds the SVC must be idle before the SVC is disconnected.
Signalling vc	Number of the signaling PVC.
vpi	Virtual path identifier number.
vci	Virtual channel identifier number.
ATM NSAP address	NSAP address of the ATM interface.
Last input	Number of hours, minutes, and seconds since the last packet was successfully received by an interface. Useful for knowing when a dead interface failed.
Last output	Number of hours, minutes, and seconds since the last packet was successfully transmitted by an interface.

**Table 1** show interfaces atm Field Descriptions (continued)

Field	Description
output hang	Number of hours, minutes, and seconds (or never) since the interface was last reset because of a transmission that took too long. When the number of hours in any of the “last” fields exceeds 24 hours, the number of days and hours is printed. If that field overflows, asterisks are printed.
Last clearing	The time at which the counters that measure cumulative statistics (such as number of bytes transmitted and received) shown in this report were last reset to zero. Note that variables that might affect routing (for example, load and reliability) are not cleared when the counters are cleared.  *** indicates the elapsed time is too large to be displayed. 0:00:00 indicates the counters were cleared more than $2^{31}$ ms (and less than $2^{32}$ ms) ago.
Queueing strategy	First-in, first-out queueing strategy (other queueing strategies you might see are priority-list, custom-list, and weighted fair).
Output queue, drops input queue, drops	Number of packets in output and input queues. Each number is followed by a slash, the maximum size of the queue, and the number of packets dropped due to a full queue.
5 minute input rate, 5 minute output rate	Average number of bits and packets transmitted per second in the last 5 minutes.
packets input	Total number of error-free packets received by the system.
bytes	Total number of bytes, including data and MAC encapsulation, in the error free packets received by the system.
no buffer	Number of received packets discarded because there was no buffer space in the main system. Compare with ignored count. Broadcast storms on Ethernets and bursts of noise on serial lines are often responsible for no input buffer events.
Received broadcasts	Total number of broadcast or multicast packets received by the interface.
runts	Number of packets that are discarded because they are smaller than the medium’s minimum packet size.
giants	Number of packets that are discarded because they exceed the medium’s maximum packet size.
input errors	Total number of no buffer, runts, giants, CRCs, frame, overrun, ignored, and abort counts. Other input-related errors can also increment the count, so that this sum may not balance with the other counts.
CRC	Cyclic redundancy checksum generated by the originating LAN station or far end device does not match the checksum calculated from the data received. On a LAN, this usually indicates noise or transmission problems on the LAN interface or the LAN bus itself. A high number of CRC’s is usually the result of collisions or a station transmitting bad data. On a serial link, CRC’s usually indicate noise, gain hits or other transmission problems on the data link.
frame	Number of packets received incorrectly having a CRC error and a noninteger number of octets.
overrun	Number of times the serial receiver hardware was unable to hand received data to a hardware buffer because the input rate exceeded the receiver’s ability to handle the data.

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**Table 1**                    **show interfaces atm Field Descriptions (continued)**

Field	Description
ignored	Number of received packets ignored by the interface because the interface hardware ran low on internal buffers. These buffers are different than the system buffers mentioned previously in the buffer description. Broadcast storms and bursts of noise can cause the ignored count to be incremented.
abort	Illegal sequence of one bits the interface. This usually indicates a clocking problem between the interface and the data link equipment.
packets input	Total number of error-free packets transmitted by the system.
bytes	Total number of bytes, including data and MAC encapsulation, transmitted by the system.
underruns	Number of times that the transmitter has been running faster than the router can handle. This may never be reported on some interfaces.
output errors	Sum of all errors that prevented the final transmission of datagrams out of the interface being examined. Note that this may not balance with the sum of the enumerated output errors, as some datagrams may have more than one error, and others may have errors that do not fall into any of the specifically tabulated categories.
collisions	This feature is not applicable for ATM interfaces.
interface resets	Number of times an interface has been completely reset. This can happen 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 can also occur when an interface is looped back or shut down.
output buffer failures	Number of times that a packet was not output from the output hold queue because of a shortage of MEMD shared memory.
output buffers swapped out	Number of packets stored in main memory when the output queue is full; swapping buffers to main memory prevents packets from being dropped when output is congested. The number is high when traffic is bursty.
restarts	Number of times the controller was restarted because of errors.

## Glossary

**ATM**—Asynchronous Transfer Mode

**AIP**—ATM Interface Processor

**ATS**—Automated Test Scripts

**AToM MIB**—RFC 1695 (Also called the ATM MIB)

**MIB**—Management Information BASE

**NMS**—Network Management System

**PVC**—Permanent Virtual Circuit

**PVCL**—Permanent Virtual Channel Link

**PVPL**—Permanent Virtual Path Link

**SNMP**—Simple Network Management Protocol

**SONET OC-3**—Synchronous Optical Network, Optical Carrier - 3 Specification

