C H A P T E R **3**

MIB Specifications

This chapter describes the Management Information Base (MIB) on the Cisco 4451-X Integrated Services Router (ISR). It includes the following sections:

- Cisco 4451-X ISR MIBs, page 3-1
- Cisco 4451-X ISR MIB Categories, page 3-1

Cisco 4451-X ISR MIBs

Each MIB description lists relevant constraints about the MIB's implementation on the Cisco 4451-X Integrated Services Router platform. Any objects not listed in a table are implemented as defined in the MIB. For detailed MIB descriptions, see the standard MIB.

Note Your Cisco 4451-X ISR may or may not fully support all the MIBs included in a Cisco IOS software release. Certain MIBs might work but they have not been tested on the router. In addition, some MIBs are deprecated, but cannot be removed from the software. When a MIB is included in the software image, it does not necessarily mean that it is supported on a Cisco 4451-X ISR platform.

For more information about the MIBs that are included in this releases, see the "Downloading and Compiling MIBs" section on page 2-1.

Cisco 4451-X ISR MIB Categories

The subsequent tables list the following categories of MIBs in the Cisco 4451-X ISR Image on the Cisco 4451-X ISR:

- Supported and verified MIBs (tested forCisco 4451-X ISR)—The MIBs exist in the image, the code is implemented, and Cisco has verified that all the supported objects work properly (Table 3-1).
- Supported and unverified MIBs (not tested Cisco 4451-X ISR)—The MIBs exist in the image, the code is implemented, but Cisco has not verified if it is working properly (Table 3-2).
- Unsupported MIBs (no level of support or testing on the Cisco 4451-X ISR)—The MIBs may be posted on Cisco.com, but are not present in the image and cannot be queried (Table 3-3).

The MIB version string indicates the date and time that it was most recently modified. The format is YYMMDDHHMMZ or YYYYMMDDHHMMZ, where:

- YY is the last two digits of the year (only years between 1900 and1999).

- YYYY is all four digits of the year (any year).
- MM is the month (01 through 12).
- DD is the day of the month (01 through 31).
- HH is hours (00 through 23).
- MM is minutes (00 through 59).
- Z (the ASCII character Z), denotes Coordinated Universal Time (UTC, formerly Greenwich Mean Time [GMT]). This data type stores the date and time fields YEAR, MONTH, DAY, HOUR, MINUTE, SECOND, TIMEZONE_HOUR, and TIMEZONE_MINUTE.

> **Note** For example, 9502192015Z and 199502192015Z represent 8:15 GMT on 19 February 1995. Years after 1999 use the four-digit format. Years 1900-1999 may use the two-digit or four-digit format.

> **Note** In the following tables you might see the term *Unknown*. This term refers to the MIB that does not have a recorded time stamp indicating the latest modification.

Supported and Verified MIBs

Table 3-1 lists the MIBs that are *supported* and *verified* in the following Cisco IOS release. The table lists the MIBs, corresponding notification name, and applicable MIB versions.

Table 3-1   Supported and Verified Cisco 4451-X ISR MIBs in the Cisco 4451-X ISR Image

MIB	Notification Name	Revision ID
BGP4-MIB (RFC 1657)	bgpEstablished bgpBackwardTransition	9405050000Z
CISCO-AAA-SERVER-MIB	casServerStateChange	200001200000Z
CISCO-AAA-SESSION-MIB		200603210000Z
CISCO-ATM-EXT-MIB		200301060000Z
CISCO-BGP4-MIB	cbgpFsmStateChange cbgpBackwardTransition cbgpPrefixThresholdExceeded cbgpPrefixThresholdClear cbgpPeer2EstablishedNotification cbgpPeer2BackwardTransNotification cbgpPeer2FsmStateChange cbgpPeer2BackwardTransition cbgpPeer2PrefixThresholdExceeded cbgpPeer2PrefixThresholdClear	200302240000Z
CISCO-BULK-FILE-MIB	cbfDefineFileCompletion	200108220000Z

Table 3-1   Supported and Verified Cisco 4451-X ISR MIBs in the Cisco 4451-X ISR Image

MIB	Notification Name	Revision ID
CISCO-CBP-TARGET-MIB	–	200605240000Z
CISCO-CDP-MIB	–	200503210000Z
CISCO-CEF-MIB	cefResourceFailure cefPeerStateChange cefPeerFIBStateChange cefInconsistencyDetection	200601300000Z
CISCO-CLASS-BASED-QOS-MIB	–	200901260000Z
CISCO-CONFIG-COPY-MIB	ccCopyCompletion	200403170000Z
CISCO-CONFIG-MAN-MIB	ciscoConfigManEvent ccmCLIRunningConfigChanged ccmCTIDRolledOver	200608220000Z
CISCO-CONTEXT-MAPPING-MIB	–	200503170000Z
CISCO-DATA-COLLECTION-MIB	cdcVFileCollectionError cdcFileXferComplete	200210300530Z
CISCO-EMBEDDED-EVENT-MGR-MIB	cEventMgrServerEvent cEventMgrPolicyEvent	200304160000Z
CISCO-ENHANCED-MEMPOOL-MIB	cempMemBufferNotify	200302240000Z[1]
CISCO-ENTITY-ALARM-MIB	ceAlarmAsserted ceAlarmCleared	9907062150Z
CISCO-ENTITY-EXT-MIB	–	200811240000Z
CISCO-ENTITY-FRU-CONTROL-MIB	cefcModuleStatusChange cefcPowerStatusChange cefcFRUInserted cefcFRURemoved cefcUnrecognizedFRU cefcFanTrayStatusChange	201112220000Z
CISCO-ENTITY-SENSOR-MIB	entSensorThresholdNotification	200601010000Z
CISCO-ENTITY-VENDORTYPE-OID-MIB	–	200505050930Z
CISCO-ETHERLIKE-EXT-MIB	–	201006040000Z
CISCO-EVC-MIB	cevcEvcCreationNotification cevcEvcDeletionNotification cevcEvcStatusChangedNotification	200805010000Z

Table 3-1   Supported and Verified Cisco 4451-X ISR MIBs in the Cisco 4451-X ISR Image

MIB	Notification Name	Revision ID
CISCO-FLASH-MIB	ciscoFlashCopyCompletionTrap	200403180000Z
	ciscoFlashPartitioningCompletionTrap	
	ciscoFlashMiscOpCompletionTrap	
	ciscoFlashDeviceChangeTrap	
	ciscoFlashDeviceInsertedNotif	
	ciscoFlashDeviceRemovedNotif	
	ciscoFlashDeviceInsertedNotifRev1	
	ciscoFlashDeviceRemovedNotifRev1	
CISCO-FTP-CLIENT-MIB	–	9710091700Z
CISCO-HSRP-EXT-MIB	–	9808030000Z
CISCO-HSRP-MIB	cHsrpStateChange	9808030000Z
CISCO-IETF-FRR-MIB	cmplsFrrProtected	200211051200Z
CISCO-IETF-ISIS-MIB	ciiDatabaseOverload	200508161200Z
	ciiManualAddressDrops	
	ciiCorruptedLSPDetected	
	ciiAttemptToExceedMaxSequence	
	ciiIDLenMismatch	
	ciiMaxAreaAddressesMismatch	
	ciiOwnLSPPurge	
	ciiSequenceNumberSkip	
	ciiAuthenticationTypeFailure	
	ciiAuthenticationFailure	
	ciiVersionSkew	
	ciiAreaM	
CISCO-IETF-PPVPN-MPLS-VPN-MIB	cMplsNumVrfRouteMaxThreshCleared	200304171200Z
CISCO-IETF-PW-ENET-MIB	–	200209221200Z
CISCO-IETF-PW-MIB	cpwVcDown	200403171200Z
	cpwVcUp	
CISCO-IETF-PW-MPLS-MIB	–	200302261200Z
CISCO-IF-EXTENSION-MIB	–	200311140000Z
CISCO-IGMP-FILTER-MIB	–	200111080000Z
CISCO-IMAGE-MIB	–	9508150000Z
CISCO-IMAGE-LICENSE-MGMT-MIB	cilmBootImageLevelChanged	200710160000Z
CISCO-IP-LOCAL-POOL-MIB	ciscoIpLocalPoolInUseAddrNoti	200304032000Z

Table 3-1   Supported and Verified Cisco 4451-X ISR MIBs in the Cisco 4451-X ISR Image

MIB	Notification Name	Revision ID
CISCO-IPMROUTE-MIB	ciscoIpMRouteMissingHeartBeats	200503070000Z
CISCO-IPSEC-FLOW-MONITOR-MIB	cikeTunnelStart cikeTunnelStop cikeSysFailure cikeCertCrlFailure cikeProtocolFailure cikeNoSa cipSecTunnelStart cipSecTunnelStop cipSecSysFailure cipSecSetUpFailure cipSecEarlyTunTerm cipSecProtocolFailure cipSecNoSa	200010131800Z
CISCO-IPSEC-MIB	cipsIsakmpPolicyAdded cipsIsakmpPolicyDeleted cipsCryptomapAdded cipsCryptomapDeleted cipsCryptomapSetAttached cipsCryptomapSetDetached cipsTooManySAs	200008071139Z
CISCO-IPSEC-POLICY-MAP-MIB	–	200008171257Z
CISCO-IP-URPF-MIB	cipUrpfIfDropRateNotify	200411120000Z

Table 3-1   Supported and Verified Cisco 4451-X ISR MIBs in the Cisco 4451-X ISR Image

MIB	Notification Name	Revision ID
CISCO-LICENSE-MGMT-MIB	clmgmtLicenseExpired	201104190000Z
	clmgmtLicenseExpiryWarning	
	clmgmtLicenseUsageCountExceeded	
	clmgmtLicenseUsageCountAboutToExceed	
	clmgmtLicenseInstalled	
	clmgmtLicenseCleared	
	clmgmtLicenseRevoked	
	clmgmtLicenseEULAAccepted	
	clmgmtLicenseNotEnforced	
	clmgmtLicenseSubscriptionExpiryWarning	
	clmgmtLicenseSubscriptionExtExpiryWarning	
	clmgmtLicenseSubscriptionExpired	
	clmgmtLicenseEvalRTUTransitionWarning	
	clmgmtLicenseEvalRTUTransition	
CISCO-MVPN-MIB	ciscoMvpnMvrfChange	200402231200Z
CISCO-NETFLOW-MIB	–	200604200000Z
CISCO-OSPF-MIB (draft-ietf-ospf-mib-update-05)	–	200307180000Z
CISCO-OSPF-TRAP-MIB (draft-ietf-ospf-mib-update-05)	cospfIfConfigError	200307180000Z
	cospfVirtIfConfigError	
	cospfTxRetransmit	
	cospfVirtIfTxRetransmit	
	cospfOriginateLsa	
	cospfMaxAgeLsa	
	cospfNssaTranslatorStatusChange	
	cospfShamLinkStateChange	
	cospfShamLinksStateChange	
	cospfShamLinkNbrStateChange	
	cospfShamLinkConfigError	
	cospfShamLinkAuthFailure	
	cospfShamLinkRxBadPacket	
	cospfShamLinkTxRetransmit	

Table 3-1   Supported and Verified Cisco 4451-X ISR MIBs in the Cisco 4451-X ISR Image

MIB	Notification Name	Revision ID
CISCO-PIM-MIB	ciscoPimInterfaceUp ciscoPimInterfaceDown ciscoPimRPMappingChange ciscoPimInvalidRegister ciscoPimInvalidJoinPrune	200011020000Z
CISCO-PING-MIB	ciscoPingCompletion	200108280000Z
CISCO-PPPOE-MIB	cPppoeSystemSessionThresholdTrap cPppoeVcSessionThresholdTrap	200102200000Z
CISCO-PROCESS-MIB	cpmCPURisingThreshold cpmCPUFallingThreshold	201005060000Z
CISCO-PRODUCTS-MIB	–	200505051930Z
CISCO-QINQ-VLAN-MIB	–	200411290000Z
CISCO-RTTMON-MIB	rttMonConnectionChangeNotification rttMonTimeoutNotification rttMonThresholdNotification rttMonVerifyErrorNotification rttMonNotification rttMonLpdDiscoveryNotification rttMonLpdGrpStatusNotification	200701260000Z
CISCO-SYSLOG-MIB	clogMessageGenerated	9508070000Z
CISCO-UNIFIED-FIREWALL-MIB	–	200509220000Z
CISCO-VLAN-IFTABLE-RELATIONSHIP-MIB	–	9904010530Z
CISCO-VPDN-MGMT-MIB	cvpdnNotifSession cvpdnTrapDeadcacheEvent	200601200000Z
CISCO-VOICE-DIAL-CONTROL-MIB	cvdcFallbackNotification	200905070000Z
DS1-MIB (RFC 2495)	dsx1LineStatusChange	9808011830Z
DS3-MIB (RFC 2496)	dsx3LineStatusChange	9808012130Z
ENTITY-MIB (RFC 4133)	entConfigChange	200508100000Z
ENTITY-SENSOR-MIB (RFC 3433)	–	200212160000Z
ENTITY-STATE-MIB	entStateOperEnabled entStateOperDisabled	200511220000Z
ETHER-WIS (RFC 3637)	–	200309190000Z
ETHERLIKE-MIB (RFC 3635)	–	200309190000Z

Table 3-1   Supported and Verified Cisco 4451-X ISR MIBs in the Cisco 4451-X ISR Image

MIB	Notification Name	Revision ID
EVENT-MIB (RFC 2981)	mteTriggerFired mteTriggerRising mteTriggerFalling mteTriggerFailure mteEventSetFailure	200010160000Z
IF-MIB (RFC 2863)	linkDown linkUp	9611031355Z
IGMP-STD-MIB (RFC 2933)	–	200009280000Z
IP-FORWARD-MIB (RFC 4292)	–	200602010000Z
IP-MIB (RFC 4293)	–	200602020000Z
IPMROUTE-STD-MIB (RFC 2932)	–	200009220000Z
MPLS-L3VPN-STD-MIB (RFC 4382)	mplsL3VpnVrfUp mplsL3VpnVrfDown mplsL3VpnVrfRouteMidThreshExceeded mplsL3VpnVrfNumVrfRouteMaxThreshExceeded mplsL3VpnNumVrfSecIllglLblThrshExcd mplsL3VpnNumVrfRouteMaxThreshCleared	200601230000Z
MPLS-LDP-GENERIC-STD-MIB (RFC 3815)	–	200406030000Z
MPLS-LDP-STD-MIB (RFC 3815)	mplsLdpInitSessionThresholdExceeded mplsLdpPathVectorLimitMismatch mplsLdpSessionUp mplsLdpSessionDown	200406030000Z
MPLS-LSR-STD-MIB (RFC 3813)	mplsXCUp mplsXCDown	200406030000Z
MPLS-TE-MIB	mplsTunnelUp mplsTunnelDown mplsTunnelRerouted	200011211200Z
MPLS-VPN-MIB	mplsVrfIfUp mplsVrfIfDown mplsNumVrfRouteMidThreshExceeded mplsNumVrfRouteMaxThreshExceeded mplsNumVrfSecIllegalLabelThreshExceeded	200110151200Z
MSDP-MIB	msdpEstablished msdpBackwardTransition	9912160000Z

Table 3-1   Supported and Verified Cisco 4451-X ISR MIBs in the Cisco 4451-X ISR Image

MIB	Notification Name	Revision ID
NHRP-MIB	–	9908260000Z
NOTIFICATION-LOG-MIB (RFC 3014)	–	200011270000Z
OLD-CISCO-SYS-MIB	–	
OSPF-MIB (RFC 1850)	–	9501201225Z
OSPF-TRAP-MIB (RFC 1850)	ospfIfStateChange	9501201225Z
	ospfVirtIfStateChange	
	ospfNbrStateChange	
	ospfVirtNbrStateChange	
	ospfIfConfigError	
	ospfVirtIfConfigError	
	ospfIfAuthFailure	
	ospfVirtIfAuthFailure	
	ospfIfRxBadPacket	
	ospfVirtIfRxBadPacket	
	ospfTxRetransmit	
	ospfVirtIfTxRetransmit	
	ospfOriginate	
PIM-MIB (RFC 2934)	pimNeighborLoss	200009280000Z
RFC1213-MIB	–	UNKNOWN
RFC2982	–	UNKNOWN
RMON-MIB (RFC 1757)	–	9606111939Z
RSVP-MIB	newFlow	9808251820Z
	lostFlow	
SNMP-COMMUNITY-MIB (RFC 2576)	–	UNKNOWN
SNMP-FRAMEWORK-MIB (RFC 2571)	–	9901190000Z
SNMP-MPD-MIB (RFC 2572)	–	9905041636Z
SNMP-NOTIFICATION-MIB (RFC 2573)	–	9808040000Z
SNMP-PROXY-MIB (RFC 2573)	–	9808040000Z
SNMP-TARGET-MIB (RFC 2573)	–	9808040000Z

Table 3-1   Supported and Verified Cisco 4451-X ISR MIBs in the Cisco 4451-X ISR Image

MIB	Notification Name	Revision ID
SNMPv2-MIB (RFC 1907)	coldStart warmStart linkDown linkUp authenticationFailure egpNeighborLoss	9511090000Z
SNMP-VIEW-BASED-ACM-MIB (RFC 2575)	–	99012000000Z
SONET-MIB (RFC 2558)	–	9810190000Z
TCP-MIB (RFC 4022)	–	200502180000Z
TUNNEL-MIB (RFC 4087)	–	200505160000Z
UDP-MIB (RFC 4113)	–	200505200000Z

1. For Release 02.03.02, the version for CISCO-ENHANCED-MEMPOOL-MIB is 200812050000Z.

Supported and Unverified MIBs

Table 3-2 lists the MIBs, notification name, and versions in the routers image that are *supported* and *unverified* in the following Cisco IOS release.

Table 3-2   Supported and Unverified MIBs in your router Image

MIB	Notification Name	Revision ID
CISCO-DIAL-CONTROL-MIB	–	200505260000Z
CISCO-DYNAMIC-TEMPLATE-MIB	–	200709060000Z
CISCO-EIGRP-MIB	–	200411160000Z
CISCO-ENTITY-PERFORMANCE-MIB	–	201205150000Z
CISCO-FRAME-RELAY-MIB	–	200010130000Z
CISCO-IETF-BFD-MIB	ciscoBfdSessUp ciscoBfdSessDown	201104160000Z
CISCO-IP-TAP-MIB	–	200403110000Z
CISCO-LAG-MIB		
CISCO-NBAR-PROTOCOL-DISCOVERY-MIB	–	200208160000Z
CISCO-NTP-MIB	–	200307070000Z
CISCO-RADIUS-EXT-MIB		201005250000Z
CISCO-RTTMON-IP-EXT-MIB	–	200608020000Z
CISCO-SESS-BORDER-CTRLR-CALL-STATS-MIB	–	200808270000Z

Table 3-2   Supported and Unverified MIBs in your router Image (continued)

MIB	Notification Name	Revision ID
CISCO-SESS-BORDER-CTRLR-EVENT-MIB	csbAlarmSubsystem csbAlarmSeverity csbAlarmID csbAlarmTime csbSBCServiceName csbDynamicBlackListSubFamily csbDynamicBlackListVpnId csbDynamicBlackListAddressType csbDynamicBlackListAddress csbDynamicBlackListTransportType csbDynamicBlackListPortNumber csbDynamicBlackListSrcBlocked csbAlarmDescription	200808270000Z
CISCO-SESS-BORDER-CTRLR-STATS-MIB	–	201009150000Z
CISCO-SUBSCRIBER-SESSION-MIB	csubJobFinishedNotify	200709060000Z
CISCO-SIP-UA-MIB	–	200402190000Z
CISCO-TAP2-MIB	ciscoTap2MIBActive ciscoTap2MediationTimedOut ciscoTap2MediationDebug ciscoTap2StreamDebug ciscoTap2Switchover	200611270000Z
CISCO-UBE-MIB	–	201011290000Z
CISCO-USER-CONNECTION-TAP-MIB	–	200708090000Z
CISCO-VOICE-COMMON-DIAL-CONTROL-MIB	–	200903180000Z
CISCO-VOIP-TAP-MIB	–	200910010000Z
DIAL-CONTROL-MIB (RFC 2128)	dialCtlPeerCallInformation dialCtlPeerCallSetup	9609231544Z
EXPRESSION-MIB	–	9802251700Z
FRAME-RELAY-DTE-MIB (RFC1315-MIB)	–	9511170836Z
HC-ALARM-MIB	–	200212160000Z
SNMP-USM-MIB (RFC 2574)	–	99012000000Z

Unsupported MIBs

Table 3-3 lists the MIBs, notification name, and versions in the Cisco 4451-X Integrated Services Router image that are *unsupported* in the following Cisco IOS release.

Table 3-3   Unsupported MIBs in your router Image

MIB	Notification Name	Revision ID
ATM-MIB		9406072245Z
ATM-ACCOUNTING-INFORMATION-MIB	–	9711050000Z
ATM-FORUM-ADDR-REG-MIB	–	9606200322Z
ATM-FORUM-MIB	–	9606200322Z
ATM-SOFT-PVC-MIB	atmSoftPvcCallFailuresTrap	9703010000Z
ATM-TRACE- MIB	–	UNKNOWN
CISCO-802-TAP-MIB	–	200607100000Z
CISCO-ATM2-MIB	–	9803040000Z
CISCO-ATM-CONN-MIB	–	200108060000Z
CISCO-ATM-PVCTRAP-EXTN-MIB	catmIntfPvcUpTrap catmIntfPvcOAMFailureTrap catmIntfPvcSegCCOAMFailureTrap catmIntfPvcEndCCOAMFailureTrap catmIntfPvcAISRDIOAMFailureTrap catmIntfPvcAnyOAMFailureTrap catmIntfPvcOAMRecoverTrap catmIntfPvcSegCCOAMRecoverTrap catmIntfPvcEndCCOAMRecoverTrap catmIntfPvcAISRDIOAMRecoverTrap catmIntfPvcAnyOAMRecoverTrap catmIntfPvcUp2Trap catmIntfPvcDownTrap catmIntfPvcSegAISRDIFailureTrap catmIntfPvcEndAISRDIFailureTrap catmIntfPvcSegAISRDIRecoverTrap catmIntfPvcEndAISRDIRecoverTrap	200303240000Z
CISCO-ATM-QOS-MIB	–	200206100000Z
CISCO-ATM-RM-MIB	–	200101290000Z
CISCO-ATM-TRAFFIC-MIB	–	9705290000Z
CISCO-AAL5-MIB		200309220000Z

Table 3-3   Unsupported MIBs in your router Image (continued)

MIB	Notification Name	Revision ID
CISCO-CALL-APPLICATION-MIB	–	9909220000Z
CISCO-ENHANCED-IMAGE-MIB	–	200501060000Z
CISCO-ENTITY-ASSET-MIB	–	200207231600Z
CISCO-ENTITY-QFP-MIB	–	201205150000Z
CISCO-IETF-ATM2-PVCTRAP-MIB	atmIntfPvcFailuresTrap	9802030000Z
CISCO-IETF-NAT-MIB	–	200103010000Z
CISCO-IETF-PW-ATM-MIB	–	200504191200Z
CISCO-IETF-PW-FR-MIB	–	200312160000Z
CISCO-IETF-PW-TDM-MIB	–	200607210000Z
CISCO-LAG-MIB	–	200212130000Z
CISCO-RF-MIB	ciscoRFSwactNotif ciscoRFProgressionNotif ciscoRFIssuStateNotifRev1	200803180000Z
CISCO-SLB-EXT-MIB	cslbxFtStateChange	200302111000Z
CISCO-SLB-MIB	ciscoSlbVirtualStateChange ciscoSlbRealStateChange	200203180000Z
CISCO-SONET-MIB	ciscoSonetSectionStatusChange ciscoSonetLineStatusChange ciscoSonetPathStatusChange	200205220000Z
CISCO-TAP-MIB	cTapMIBActive, cTapMediationTimedOut cTapMediationDebug cTapStreamIpDebug	200401090000Z
CISCO-VLAN-MEMBERSHIP-MIB	vmVmpsChange	200404070000Z
CISCO-VOICE-ANALOG-IF-MIB	–	200510030000Z
CISCO-VOICE-IF-MIB	–	9803060000Z
ETHER-WIS (RFC 3637)		200309190000Z
IEEE8023-LAG-MIB	–	200006270000Z
OLD-CISCO-CHASSIS-MIB	–	UNKNOWN

ATM-ACCOUNTING-INFORMATION-MIB

The ATM-ACCOUNTING-INFORMATION-MIB contains objects to manage accounting information applicable to ATM connections.

> **Note** This MIB is not supported on Cisco 4451-X ISR.

ATM-FORUM-ADDR-REG-MIB

The ATM-FORUM-ADDR-REG-MIB contains objects to manage information, such as ATM user-network interface (UNI) addresses and ports. This MIB also contains ATM address registration administration information.

> **Note** This MIB is not supported on Cisco 4451-X ISR

ATM-FORUM-MIB

The ATM-FORUM-MIB contains ATM object definitions and object identifiers (OIDs).

> **Note** This MIB is not supported on Cisco 4451-X ISR.

ATM-MIB

The ATM-MIB (RFC 1695) contains the ATM and ATM adaptation layer 5 (AAL5) objects to manage logical and physical entities. It also provides the functionality to manage the relationship between logical and physical entities, such as ATM interfaces, virtual links, cross connects, and AAL5 entities and connections.

> **Note** This MIB is not supported on Cisco 4451-X ISR.

ATM-SOFT-PVC-MIB

The ATM-SOFT-PVC-MIB contains ATM Forum definitions of managed objects for ATM Soft Permanent Virtual Circuits.

> **Note** This MIB is not supported on Cisco 4451-X ISR.

ATM-TRACE- MIB

The ATM-TRACE-MIB is a MIB module for ATM path and connection trace.

> **Note** This MIB is not supported on Cisco 4451-X ISR.

BGP4-MIB (RFC 1657)

The BGP4-MIB (RFC 1657) provides access to the implementation information for the Border Gateway Protocol (BGP). The MIB provides:

- BGP configuration information
- Information about BGP peers and messages exchanged within
- Information about the advertised networks

CISCO-802-TAP-MIB

The CISCO-802-TAP-MIB contains object to manage Cisco intercept feature for 802 streams (IEEE 802 intercept, layer 2. This MIB is used along with CISCO-TAP2-MIB to intercept 802 traffic.

CISCO-AAA-SERVER-MIB

The CISCO-AAA-SERVER-MIB contains objects to manage information such as authentication, authorization, and accounting (AAA) servers within the router and external to the router. This MIB provides:

- Configuration information for AAA servers, including identities of external AAA servers
- Statistics for AAA functions
- Status (state) information for AAA servers

MIB Constraints

The configuration objects in the MIB are read-only. To configure AAA servers, use the CLI commands **aaa new-model**, **aaa authentication ppp**, **aaa authorization**, **aaa accounting**, and **radius-server host**. Table 3-4 lists the constraints that the router places on the objects in the CISCO-AAA-SERVER-MIB.

Table 3-4   CISCO-AAA-SERVER-MIB Constraints

MIB Object	Notes
casConfigTable	
• casAddress	Read only.
• casAuthenPort	Read only. The default value is 1645.
• casAcctPort	Read only. The default value is1646.
• casKey	Read only. The value is shown as " " (null string) for security reasons.
• casConfigRowStatus	Read only.
casStatisTable	

Table 3-4   *CISCO-AAA-SERVER-MIB Constraints (continued)*

MIB Object	Notes
• casAuthorTable • casAuthorRequest • casAuthorRequestTimeouts • casAuthorUnexpectedResponses • casAuthorServerErrorResponses • casAuthorIncorrectResponses • casAuthorResponseTime • casAuthorTransactionSuccesses • casAuthorTransactionFailures	For RADIUS servers, the value of these attributes is always 0. Only TACACS+ servers can have nonzero values. **Note** RADIUS servers do not make authorization requests.

CISCO-AAA-SESSION-MIB

The CISCO-AAA-SESSION-MIB contains information about accounting sessions based on authentication, authorization, and accounting (AAA) protocols.

CISCO-AAL5-MIB

The CISCO-AAL5-MIB contains objects to manage performance statistics for adaptation layer 5 (AAL5) virtual channel connections (VCCs). This MIB also contains information such as packets and octets that are received and transmitted on the VCC, which is missing from cAal5VccTable in RFC 1695.

CISCO-ATM-EXT-MIB

The CISCO-ATM-EXT-MIB contains extensions to the Cisco ATM that are used to manage ATM entities. This MIB provides additional AAL5 performance statistics for a virtual channel connection (VCC) on an ATM interface.

Note   This MIB is not supported on Cisco 4451-X ISR.

CISCO-ATM-PVCTRAP-EXTN-MIB

The CISCO-ATM-PVCTRAP-EXTN-MIB contains objects to extend the functionality for the ATM-MIB. This MIB provides additional notifications and traps for permanent virtual circuits (PVCs) on your router. The CISCO-ATM-PVCTRAP-EXTN-MIB is supplemented by CISCO-IETF-ATM2-PVCTRAP-MIB.

CISCO-ATM-QOS-MIB

The CISCO-ATM-QOS-MIB contains objects to manage the following ATM QoS information:

- Traffic shaping on a per-VC basis
- Traffic shaping on a per-VP basis
- Per-VC queuing/buffering.

Note   This MIB is not supported on theCisco 4451-X ISR.

CISCO-ATM2-MIB

The CISCO-ATM2-MIB contains objects to supplement ATM-MIB.

Note   The CISCO-ATM2-MIB is not supported for any routers.

CISCO-ATM-CONN-MIB

The CISCO-ATM-CONN-MIB contains objects to extend the VPL/VCL table defined in RFC1695 for ATM switch connection management.

Note   The CISCO-ATM-CONN-MIB is not supported for any routers.

CISCO-ATM-RM-MIB

The CISCO-ATM-RM-MIB contains object to provide resource management functionality. This MIB complements standard ATM MIBs for Cisco devices.

Note   This CISCO-ATM-RM-MIB is not supported in this release.

CISCO-ATM-TRAFFIC-MIB

The CISCO-ATM-TRAFFIC-MIB contains objects that provide extension to traffic OIDs and variables defined in RFC1695.

Note   The CISCO-ATM-TRAFFIC-MIB is not supported in this release.

CISCO-BGP4-MIB

The CISCO-BGP4-MIB provides access to information related to the implementation of the Border Gateway Protocol (BGP). The MIB provides:

- BGP configuration information
- Information about BGP peers and messages exchanged with them
- Information about advertised networks

Beginning with Cisco IOS Release 15.2(1)S, CISCO-BGP4-MIB supports IPv6 addresses in addition to IPv4 addresses. To support IPv6-based peers, four new tables are added in the CISCO-BGP4-MIB:

- cbgpPeer2Table
- cbgpPeer2CapsTable

- cbgpPeer2AddrFamilyTable
- cbgpPeer2AddrFamilyPrefixTable

Note   These four tables have flexible indexing to support both the IPv4 and IPv6 peers.

MIB Tables

Table 3-5 lists the tables in the CISCO-BGP4-MIB.

Table 3-5   *CISCO-BGP4-MIB Tables*

MIB Table	Description
cbgpRouteTable	Contains information about the routes to the destination networks from all the BGP4 peers.
cbgpPeerTable	Contains information about the connections with the BGP peers, one entry for each BGP peer.
cbgpPeerCapsTable	Contains information about the capabilities supported by a peer. The capabilities of a peer are received while establishing the BGP connection.
cbgpPeerAddrFamilyTable	Contains information related to the address families supported by a peer.
cbgpPeerAddrFamilyPrefixTable	Contains prefix-related information for the address families supported by a peer.
cbgpPeer2Table	Contains information about the connection with the BGP peers, one entry for each BGP peer. This table supports IPv4 and IPv6 peers.
cbgpPeer2CapsTable	Contains information about the capabilities supported by a BGP peer. The capabilities of a peer are received while establishing the BGP connection. This table supports IPv4 and IPv6 peers.
cbgpPeer2AddrFamilyTable	Contains information related to the address families supported by a BGP peer. This table supports IPv4 and IPv6 peers.
cbgpPeer2AddrFamilyPrefixTable	Contains prefix-related information for the address families supported by a peer. This table supports IPv4 and IPv6 peers.

CISCO-BGP-POLICY-ACCOUNTING-MIB

The CISCO-BGP-POLICY-ACCOUNTING-MIB contains BGP policy-based accounting information (such as ingress traffic on an interface), which can be used for billing purposes. The MIB provides support for BGP Policy Accounting, which enables you to classify IP traffic into different classes and to maintain statistics for each traffic class.

The MIB contains counts of the number of bytes and packets of each traffic type on each input interface. This information can be used to charge customers according to the route that their traffic travels.

CISCO-BULK-FILE-MIB

The CISCO-BULK-FILE-MIB contains objects to create and delete files of SNMP data for bulk-file transfer.

MIB Constraints

Table 3-6 lists the constraints that the Cisco 4451-X ISR places on the objects in the CISCO-BULK-FILE-MIB.

Table 3-6   CISCO-BULK-FILE-MIB Constraints

MIB Object	Notes
cbfDefineFileTable	
• cbfDefinedFileStorage	Only *ephemeral* type of file storage is supported.
	Note The ephemeral bulk file created can be moved to a remote FTP server using CISCO-FTP-CLIENT-MIB.
• cbfDefinedFileFormat	Only *bulkBinary* and *bulkASCII* file formats are supported.

Notes: The cbfDefineFileTable has objects that are required for defining a bulk file and for controlling its creation. The cbfDefineObjectTable has information regarding the contents (SNMP data) that go into the bulk file.

When an entry in the cbfDefineFileTable and its corresponding entries in the cbfDefineObjectTable are active, then cbfDefineFileNow can then be set to create. This causes a bulkFile to be created as defined in cbfDefineFileTable and it will also create an entry in the cbfStatusFileTable.

CISCO-CALL-APPLICATION-MIB

The CISCO-CALL-APPLICATION-MIB manages the call applications on a network device. A call application is a software module that processes data, voice, video, and fax calls.

Note   This MIB is not supported on the Cisco 4451-X ISR

CISCO-CBP-TARGET-MIB

The CISCO-CBP-TARGET-MIB (common class-based policy) contains objects that provide a mapping of targets to which class-based features, such as QoS are applied. These features can be enabled in a feature-specific manner or through the Class-based Policy Language (CPL).

The CISCO-CBP-TARGET-MIB abstracts the knowledge of the specific types of targets from the class-based policy feature-specific MIB definitions.

MIB Constraints

The configuration objects in the MIB are read-only. To configure AAA servers, use the CLI commands **aaa new-model**, **aaa authentication ppp**, **aaa authorization**, **aaa accounting**, and **radius-server host**. Table 3-7 lists the constraints that the Cisco 4451-X ISR places on the objects in the CISCO-CBP-TARGET-MIB.

Table 3-7   CISCO-CBP-TARGET-MIB Constraints

MIB Object	Notes
CbpTargetTable	
• ccbptTargetType	Values are:
	• genIf(1)
	• atmPvc(2)
	• frDlci(3)
	• controlPlane(4)
• ccbptTargetDir	Values are:
	• input(2)
	• output(3)
• ccbptPolicyType	Value is always ciscoCbQos(1) to indicate mapping to CLASS-BASED-QOS-MIB.
• ccbptPolicyId	Contains the cbQosPolicyIndex value for this service-policy.
• ccbptTargetStorageType	Value is always volatile(2).
• ccbptTargetStatus	Value is always volatile(1).
• ccbptPolicyMap	Contains the OID for a cbQosPolicyMapName instance.
• ccbptPolicyInstance	Contains the OID for a cbQosIfType instance.

CISCO-CDP-MIB

The CISCO-CDP-MIB contains objects to manage the Cisco Discovery Protocol (CDP) on the router.

MIB Constraints

Table 3-8 lists the constraints that the Cisco 4451-X ISR places on the objects in the CISCO-CDP-MIB.

Table 3-8   CISCO-CDP-MIB Constraints

MIB Object	Notes
cdpCtAddressTable	Not supported.
cdpGlobalLastChange	Not supported.
cdpGlobalDeviceIdFormatCpb	Not supported.

Table 3-8   CISCO-CDP-MIB Constraints (continued)

MIB Object	Notes
cdpGlobalDeviceIdFormat	Not supported.
cdpInterfaceExtTable	Not Implemented.

CISCO-CEF-MIB

The CISCO-CEF-MIB contains objects that manage Cisco Express Forwarding (CEF) technology. CEF is the key data plane forwarding path for Layer 3 IP switching technology. The CISCO-CEF-MIB monitors CEF operational data and provides notification when encountering errors in CEF, through SNMP.

MIB Constraints

Table 3-9 lists the constraints that the Cisco 4451-X ISR places on the objects in the CISCO-CEF-MIB.

Table 3-9   CISCO-CEF-MIB Constraints

MIB Object	Notes
cefCfgAdminState	Read only. This object is enabled by default.
cefCCCount	Read only.
cefCCPeriod	Read only.
cefCCEnabled	Read only.

Note   Cisco Express Forwarding (CEF) is a high-speed switching mechanism that a router uses to forward packets from the inbound to the outbound interface.

CISCO-CLASS-BASED-QOS-MIB

The CISCO-CLASS-BASED-QOS-MIB provides only read access to quality of service (QoS) configuration information and statistics for Cisco platforms that support the modular Quality of Service command-line interface (modular QoS CLI).

To understand how to navigate the CISCO-CLASS-BASED-QOS-MIB tables, it is important to understand the relationship among different QoS objects. QoS objects consists of:

- Match Statement—The specific match criteria to identify packets for classification purposes.

- Class Map—A user-defined traffic class that contains one or more match statements used to classify packets into different categories.

- Feature Action—AQoS feature. Features include police, traffic shaping, queueing, random detect, and packet marking. After the traffic has been classified, apply actions to each traffic class.

- Policy Map—A user-defined policy that associates a QoS feature action to the user-defined class map.

- Service Policy—A policy map that has been attached to an interface.

The MIB uses the following indices to identify QoS features and distinguish among instances of those features:

- cbQosObjectsIndex—Identifies each QoS feature on the router.
- cbQoSConfigIndex—Identifies a type of QoS configuration. This index is shared by QoS objects that have identical configuration.
- cbQosPolicyIndex—Uniquely identifies a service policy.

QoS MIB information is stored in:

- Configuration instances—includes all class maps, policy maps, match statements, and feature action configuration parameters. Might have multiple identical instances. Multiple instances of the same QoS feature share a single configuration object, which is identified by cbQosConfigIndex.

- Runtime Statistics instances—Includes summary counts and rates by traffic class before and after any configured QoS policies are enforced. In addition, detailed feature-specific statistics are available for select Policy Map features. Each has a unique run-time instance. Multiple instances of a QoS feature have a separate statistics object. Run-time instances of QoS objects are each assigned a unique identifier (cbQosObjectsIndex) to distinguish among multiple objects with matching configuration.

MIB Constraints

Table 3-10 lists the constraints that the Cisco 4451-X ISR places on the objects in the CISCO-CLASS-BASED-QOS-MIB.

Table 3-10   CISCO-CLASS-BASED-QOS-MIB Constraints

MIB Object	Notes
cbQosATMPVCPolicyTable	Not implemented.
cbQosFrameRelayPolicyTable	Not implemented.
cbQosInterfacePolicyTable	Not implemented.
cbQosIPHCCfgTable	Not implemented.
cbQosPoliceColorStatsTable	Not implemented.
cbQosPoliceCfgConformColor	Not implemented.
cbQosPoliceCfgExceedColor	Not implemented.
cbQosQueueingCfgTable - cbQosQueueingCfgDynamicQNumber	Not implemented.
cbQosREDCfgTable - cbQosREDCfgECNEnabled	Not implemented.
cbQosTableMapCfgTable	Not implemented.
cbQosTableMapSetCfgTable	Not implemented.
cbQosQueueingClassCfgTable	Not implemented.
cbQosMeasureIPSLACfgTable	Not implemented.
cbQosQueueingCfgPriorityLevel	Not implemented.

Table 3-10   CISCO-CLASS-BASED-QOS-MIB Constraints

MIB Object	Notes
cbQosREDClassCfgMaxThresholdUnit	Not implemented.
cbQosREDClassCfgMinThresholdUnit	Not implemented.
cbQosTSCfgRate64	Not implemented.
cbQosREDECNMarkPktOverflow	Not implemented.
cbQosREDECNMarkPkt	Not implemented.
cbQosREDECNMarkPkt64	Not implemented.
cbQosREDECNMarkByteOverflow	Not implemented.
cbQosREDECNMarkByte	Not implemented.
cbQosREDECNMarkByte64	Not implemented.
cbQosREDMeanQSizeUnits	Not implemented.
cbQosREDMeanQSize	Not implemented.
cbQosQueueingCfgPrioBurstSize	Not supported.
cbQosQueueingCfgIndividualQSize	Not supported.
cbQosQueueingCfgDynamicQNumber	Not supported.
cbQosQueueingMaxQDepth	Not supported.
cbQosREDECNMarkPktOverflow	Not supported.
cbQosREDECNMarkPkt	Not supported.
cbQosREDECNMarkPkt64	Not supported.
cbQosREDECNMarkByteOverflow	Not supported.
cbQosREDECNMarkByte	Not supported.
cbQosREDECNMarkByte64	Not supported.
cbQosSetCfgL2CosInnerValue	Not supported.
cbQosSetDscpTunnelPkt64	Not supported.
cbQosSetPrecedenceTunnelPkt64	Not supported.
cbQosPoliceCfgConformAction	This object is deprecated. Refer to equivalent object in cbQosPoliceActionCfgTable.
cbQosPoliceCfgConformSetValue	This object is deprecated. Refer to equivalent object in cbQosPoliceActionCfgTable.
cbQosPoliceCfgExceedAction	This object is deprecated. Refer to equivalent object in cbQosPoliceActionCfgTable.
cbQosPoliceCfgExceedSetValue	This object is deprecated. Refer to equivalent object in cbQosPoliceActionCfgTable.
cbQosPoliceCfgViolateAction	This object is deprecated. Refer to equivalent object in cbQosPoliceActionCfgTable.

Table 3-10 *CISCO-CLASS-BASED-QOS-MIB Constraints*

MIB Object	Notes
cbQosPoliceCfgViolateSetValue	This object is deprecated. Refer to equivalent object in cbQosPoliceActionCfgTable.
cbQosPoliceCfgRate cbQosPoliceCfgBurstSize cbQosPoliceCfgExtBurstSize	These objects will have zero value when cir (committed information rate) is configured as percent for policing configuration.

CISCO-CONFIG-COPY-MIB

The CISCO-CONFIG-COPY-MIB contains objects to copy configuration files on the router. For example, the MIB enables the SNMP agent to copy:

- Configuration files to and from the network

- The running configuration to the startup configuration and startup to running

- The startup or running configuration files to and from a local Cisco IOS file system

CISCO-CONFIG-MAN-MIB

The CISCO-CONFIG-MAN-MIB contains objects to track and save changes to the router configuration. The MIB represents a model of the configuration data that exists elsewhere in the router and in peripheral devices. Its main purpose is to report changes to the running configuration through the SNMP notification ciscoConfigManEvent.

CISCO-CONTEXT-MAPPING-MIB

The CISCO-CONTEXT-MAPPING-MIB provides mapping tables that contain the information that a single SNMP agent sometimes needs to support multiple instances of the same MIB. In such cases, network management applications need to know the specific data/identifier values in each context. This is accomplished through the use of multiple SNMP contexts.

CISCO-DATA-COLLECTION-MIB

The CISCO-DATA-COLLECTION-MIB retrieves data periodically when the data displays as a set of discontinuous rows spread across multiple tables. This MIB facilitates data retrieval of tabular objects. This MIB can be used for performance and accounting purposes, where several row instances of a set of objects are polled over a period of time.

The MIB provides the user a way to specify which objects and which instances are required. In addition the MIB provides two ways in which this data can be retrieved.

MIB Constraints

Table 3-11 lists the constraints that the Cisco 4451-X ISR places on the objects in the CISCO-DATA-COLLECTION-MIB. Any MIB object not listed in this table is implemented as defined in the MIB.

Table 3-11   CISCO-DATA-COLLECTION-MIB Constraints

MIB Object	Notes
cdcVFileMgmtTable	Not implemented.
cdcDGTable	Not implemented.
cdcDGBaseObjectTable	Not implemented.
cdcDGInstanceTable	Not implemented.

CISCO-DIAL-CONTROL-MIB

The CISCO-DIAL-CONTROL-MIB module is an extension of RFC 2128, and defines the callHistoryTable that stores information pertaining to earlier calls.

CISCO-DYNAMIC-TEMPLATE-MIB

The CISCO-DYNAMIC-TEMPLATE-MIB contains objects that describe the dynamic templates. A dynamic template is a set of configuration attributes that a system can dynamically apply to a target.

MIB Tables

Table 3-12 lists the tables in the CISCO-DYNAMIC-TEMPLATE-MIB.

Table 3-12   CISCO-DYNAMIC-TEMPLATE-MIB Tables

MIB Table	Description
cdtTemplateTable	Lists the dynamic templates maintained by the system, including those that are locally configured on the system, and those that are pushed to the system by external policy servers.
cdtTemplateTargetTable	Lists the targets associated with one or more dynamic templates.
cdtTemplateAssociationTable	Lists the templates associated with each target.
cdtTemplateUsageTable	Contains a list of targets that use each dynamic template.
cdtTemplateCommonTable	Contains attributes that relate to all the dynamic templates.
cdtIfTemplateTable	Contains attributes that relate to the interface configuration.
cdtPppTemplateTable	Contains attributes that relate to PPP connection configuration.
cdtPppPeerIpAddrPoolTable	Contains a prioritized list of named pools for each PPP template.
cdtEthernetTemplateTable	Contains attributes pertaining to the dynamic interfaces initiated on ethernet virtual interfaces or automatically created VLANs.
cdtSrvTemplateTable	Contains attributes pertaining to a service.

MIB Constraints

Table 3-13 lists the constraints that the Cisco 4451-X ISR places on the objects in the CISCO-DYNAMIC-TEMPLATE-MIB. Any MIB object not listed in this table is implemented as defined in the MIB.

Table 3-13   CISCO-DYNAMIC-TEMPLATE-MIB Constraints

MIB Object	Notes
cdtTemplateTable	
• cdtTemplateName	Read only.
• cdtTemplateUsageCount	Read only.
• cdtTemplateStatus	Read only.
• cdtTemplateStorage	Not implemented.
• cdtTemplateType	Not implemented.
• cdtTemplateSrc	Not implemented.
cdtTemplateAssociationTable	
• cdtTemplateAssociationName	Read only.
cdtTemplateUsageTable	
• cdtTemplateUsageTargetType	Read only.
• cdtTemplateUsageTargetId	Read only.
cdtTemplateTargetTable	Not implemented.

Table 3-13   CISCO-DYNAMIC-TEMPLATE-MIB Constraints (continued)

MIB Object	Notes
cdtTemplateCommonTable	Not implemented.
cdtIfTemplateTable	Not implemented.
cdtPppTemplateTable	Not implemented.
cdtPppPeerIpAddrPoolTable	Not implemented.
cdtEthernetTemplateTable	Not implemented.
cdtSrvTemplateTable	Not implemented.

CISCO-EIGRP-MIB

The CISCO-EIGRP-MIB contains objects to manage Enhanced Interior Gateway Protocol (EIGRP). EIGRP is a Cisco proprietary distance vector routing protocol, based on the Diffusing Update Algorithm (DUAL). DUAL defines the method to identify loop-free paths through a network.

CISCO-EMBEDDED-EVENT-MGR-MIB

The CISCO-EMBEDDED-EVENT-MGR-MIB provides descriptions and stores events generated by the Cisco Embedded Event Manager. The Cisco Embedded Event Manager detects hardware and software faults and other events such as OIR for the system.

CISCO-ENHANCED-IMAGE-MIB

The CISCO-ENHANCED-IMAGE-MIB provides information about events running on the system. The MIB modular operating systems.

CISCO-ENHANCED-MEMPOOL-MIB

The CISCO-ENHANCED-MEMPOOL-MIB contains objects to monitor memory pools on all of the physical entities on a managed system. It represents the different types of memory pools that may be present in a managed device. Memory use information is provided to users at three different intervals of time: 1 minute, 5 minutes, and 10 minutes. Memory pools can be categorized into two groups, predefined pools and dynamic pools. The following pool types are currently predefined:

- 1:Processor memory
- 2:I/O memory
- 3:PCI memory
- 4:Fast memory
- 5:Multibus memory
- Other memory

Dynamic pools have a pool type value greater than any of the predefined types listed above. Only the processor pool is required to be supported by all devices. Support for other pool types is dependent on the device being managed.

MIB Constraints

The CISCO-ENHANCED-MEMPOOL-MIB is supported only in the Active RP module. Table 3-14 lists the constraints that the Cisco 4451-X ISR place on the objects in the CISCO-ENHANCED-MEMPOOL-MIB.

Table 3-14   CISCO-ENHANCED-MEMPOOL-MIB Constraints

MIB Object	Notes
cempMemBufferPoolTable	
• cempMemBufferSize	Read only.
• cempMemBufferMin	Read only.
• cempMemBufferMax	Read only.
• cempMemBufferPermanent	Read only.
• cempMemBufferTransient	Read only.
cempMemPoolTable	
• cempMemPoolUsedLowWaterMark	Not Implemented.
• cempMemPoolAllocHit	Not Implemented.
• cempMemPoolAllocMiss	Not Implemented.
• cempMemPoolFreeHit	Not Implemented.
• cempMemPoolFreeMiss	Not Implemented.
• cempMemPoolHCShared	Not Implemented.
• cempMemPoolHCUsedLowWaterMark	Not Implemented.
• cempMemPoolShared	Not Implemented.
• cempMemPoolSharedOvrflw	Not Implemented.
• cempMemPoolUsedLowWaterMarkOvrflw	Not Implemented.
cempMemBufferPoolTable	
• cempMemBufferFreeHit	Not Implemented.
• cempMemBufferFreeMiss	Not Implemented.

CISCO-ETHRLIKE-EXT-MIB

The CISCO-ETHERLIKE-EXT-MIB defines generic objects for the Ethernet-like network interfaces.

MIB Constraints

Table 3-35 lists the constraint that the Cisco 4451-X ISR place on the objects in the
CISCO-ETHERLIKE-EXT-MIB.

Table 3-15   CISCO-ETHERLIKE-EXT-MIB Constraint

MIB Object	Notes
ceeDot3PauseExtTable	Not Supported.

CISCO-ENTITY-ALARM-MIB

The CISCO-ENTITY-ALARM-MIB enables the Cisco 4451-X ISR to monitor the alarms generated by
system components, such as chassis, slots, modules, power supplies, fans, and ports.

CISCO-ENTITY-ALARM-MIB supports these modules:

- NIM-8CE1T1-PRI
- SM-1T3/E3
- NIM-SSD
- UCS-E160DP-M1/K9

All the other interface types are not supported for this release.

For more information on this MIB, refer Using MIBs

MIB Constraints

Table 3-16 lists the constraints that the Cisco 4451-X ISR place on the objects in the
CISCO-ENTITY-ALARM-MIB.

Table 3-16   CISCO-ENTITY-ALARM-MIB Constraints

MIB Object	Notes
ceAlarmTable	
• ceAlarmFilterProfile	Not implemented.
• ceAlarmFilterProfileIndexNext	Not implemented.
ceAlarmFilterProfileTable	Not implemented.
ceAlarmDescrTable	
• ceAlarmDescrSeverity	Read only.

The ENTITY-MIB table, entPhysicalTable, identifies the physical system components in the router. The
following list describes the table objects that describe the alarms for the CISCO-ENTITY-ALARM-MIB:

- Physical entity—The component in the Cisco 4451-X ISR that generates the alarm.

- ceAlarmDescrVendorType—The object specifies an identifier (typically an enterprise-specific OID) that uniquely identifies the vendor type of those physical entities to which this alarm description applies.

- Alarm severity—Each alarm type defined by a vendor type and employed by the system is assigned an associated severity:

  – Critical—Indicates a severe, service-affecting condition has occurred and that immediate corrective action is imperative, regardless of the time of day or day of the week. For example, online insertion and removal or loss of signal failure when a physical port link is down.

  – Major—Used for hardware or software conditions. Indicates a serious disruption of service or the malfunctioning or failure of important hardware. Requires immediate attention and response of a technician to restore or maintain system stability. The urgency is less than in critical situations because of a lesser effect on service or system performance.

  – Minor—Used for troubles that do not have a serious effect on service to customers or for alarms in hardware that are not essential to the operation of the system.

  – Info—Notification about a condition that could lead to an impending problem or notification of an event that improves operation.

  The syntax values are critical(1), major(2), minor(3), and info(4).

- Alarm description text—Specifies a readable message describing the alarm.

- Alarm type—Identifies the type of alarm that is generated. An arbitrary integer value (0 through 255) that uniquely identifies an event relative to a physical entity in the Cisco 4451-X ISR.

Table 3-17 lists the alarm descriptions and severity levels for the Cisco 4451-X ISR SFP Container.

Table 3-17   Alarms Supported for Cisco 4451-X ISR SFP Container

Physical Entity	ceAlarmDescrVendorType	ceAlarmDescr Severity	ceAlarmDescrText	Scenario
SFP container	cevContainerSFP	critical	Transceiver missing	When the interface is *not* using RJ-45 and is in link down state.
SFP container	cevContainerSFP	info	Transceiver missing	When the interface is configured to use RJ-45 (only applicable to SPA-2X1GE) or is in admin down state.

Table 3-18 lists the alarm descriptions and severity levels for the Cisco 4451-X ISR modules.

Table 3-18   Alarms Supported for the Cisco 4451-X ISR Modules

Physical Entity	ceAlarmDescrVendorType	ceAlarmDescr Severity	ceAlarmDescrText
Modules	cevModuleISR44008CE1T1PRI	major	Unknown state
	cevModuleISRSM1T3E3	major	Boot state
	cevModuleISR4400NIMSSD	major	Disabled
		critical	Failed
		major	Stopped

Table 3-19 lists the alarm descriptions and severity levels for the Cisco 4451-X ISR sensors.

Table 3-19   Alarms Supported for Cisco 4451-X ISR Sensors

Physical Entity	ceAlarmDescrVendorType	ceAlarmDescr Severity	ceAlarmDescrText
Sensor	cevSensor	critical	Faulty sensor.
		critical	Reading above normal (Shutdown).
		critical	Reading above normal.
		major	Reading above normal.
		minor	Reading above normal.
		critical	Reading below normal (Shutdown).
		critical	Reading below normal.
		major	Reading below normal.
		minor	Reading below normal.

Note   These alarms are not supported for the module and XCVR sensors. You can use CISCO-ENTITY-SENSOR-MIB to monitor the alarms listed in the Table 3-19.

Table 3-20 lists the alarm descriptions and severity levels for the Cisco 4451-X ISR Network Interface Module (NIM) subslot containers.

Table 3-20   Alarms Supported for Cisco 4451-X ISR Container

Physical Entity	ceAlarmDescrVendorType	ceAlarmDescr Severity	ceAlarmDescrText
NIM Subslot	cevContainerISR4400NIMSlot	critical	Active card removed OIR alarm.
		critical	Card stopped responding.

Table 3-21 lists the alarm descriptions and severity levels for the Cisco 4451-X ISR USB ports.

Table 3-21   Alarms Supported for the Cisco 4451-X ISR USB Ports

Physical Entity	ceAlarmDescrVendorType	ceAlarmDescr Severity	ceAlarmDescrText
USB port	cevPortUSB	critical	Active card removed OIR alarm.
		critical	Card stopped responding.

Table 3-22 lists the alarm descriptions and severity levels for the Cisco 4451-X ISR hard disk containers.

Table 3-22   Alarms Supported for the Cisco 4451-X ISR Hard Disk Container

Physical Entity	ceAlarmDescrVendorType	ceAlarmDescrSeverity	ceAlarmDescrText
hard disk container	cevContainerHardDiskSlot	major	Hard disk missing.

Table 3-23 lists the alarm descriptions and severity levels for the Cisco 4451-X ISR power supply bay.

Table 3-23   Alarms Supported for CCisco 4451-X ISR Power Supply Bay

Physical Entity	ceAlarmDescrVendorType	ceAlarmDescr Severity	ceAlarmDescrText
Power Supply Bay	cevContainerPowerSupply ISR4400 Bay	critical	Power supply/Fan module missing.

Table 3-24 lists the alarm descriptions and severity levels for the Cisco 4451-X ISR RP.

Table 3-24   Alarms Supported for Cisco 4451-X ISR RP Module

Physical Entity	ceAlarmDescrVendorType	ceAlarmDescr Severity	ceAlarmDescrText
RP Module	cevModuleISR4451RP	major	Unknown state.
		major	Boot state.
		major	Disabled.
		critical	Incompatible
		critical	CPLD incompatible
		critical	Active RP CPLD incompatible
		critical	Failed.
		critical	Cutover.
		major	Secondary failure.
		major	Secondary removed.
		major	Secondary not synchronized.
		critical	No working ESP.
		major	Hard disk Missing

Table 3-25 lists the alarm descriptions and severity levels for the Cisco 4451-X ISR Unknown RP Module.

Table 3-25   *Alarms Supported for Cisco 4451-X ISR Unknown RP Modules*

Physical Entity	ceAlarmDescrVendorType	ceAlarmDescr Severity	ceAlarmDescrText
RP Module	cevPowerSupplyISR4400 Unknown	major	Unknown state.
		major	Boot state.
		major	Disabled.
		critical	Failed.
		critical	Stopped.

Table 3-26 lists the alarm descriptions and severity levels for the Cisco 4451-X ISR Power Supply Module.

Table 3-26   *Alarms Supported for Cisco 4451-X ISR Power Supply Module*

Physical Entity	ceAlarmDescrVendorType	ceAlarmDescr Severity	ceAlarmDescrText
Power Supply Modules	cevPowerSupplyISR4400 PWR450	critical	Power Supply Failure.
		critical	All Fans Failed.
		critical	Multiple Fan Failures.
		major	Fan 0 Failure.
		major	Fan 1 Failure.
		major	Fan 2 Failure.

Table 3-27 lists the alarm descriptions and severity levels for the Cisco 4451-X ISR modules.

Table 3-27   Alarms Supported for Cisco 4451-X ISR Module

Physical Entity	ceAlarmDescrVendorType	ceAlarmDescr Severity	ceAlarmDescrText
Module	cevModuleISR4451FP	major	Unknown state.
		major	Boot State.
		major	Disabled.
		critical	Incompatible
		critical	CPLD incompatible
		critical	Active RP CPLD incompatible
		critical	Failed.
		major	Stopped.

CISCO-ENTITY-ASSET-MIB

The CISCO-ENTITY-ASSET-MIB provides asset tracking information (ceAssetTable) for the physical components in the ENTITY-MIB (RFC 4133) entPhysicalTable.

The ceAssetTable contains an entry (ceAssetEntry) for each physical component on the router. Each entry provides information about the component. The component information includes:

- Orderable part number
- Serial number
- Hardware revision
- Manufacturing assembly number
- Manufacturing revision.

Most physical components are programmed with a standard Cisco-generic ID PROM value that specifies asset information for the component. If possible, the MIB accesses the component's ID PROM information.

Note   The ENTITY-MIB (RFC 4133) contains all the objects defined under the CISCO-ENTITY-ASSET-MIB. Thus, you can use the ENTIITY-MIB (RFC 4133) instead of the CISCO-ENTITY-ASSET-MIB.

CISCO-ENTITY-EXT-MIB

The CISCO-ENTITY-EXT-MIB contains extensions for the processor modules listed in the ENTITY-MIB entPhysicalTable. A processor module is any physical entity that has a CPU, RAM, and NVRAM, and can load a boot image and save a configuration. The extensions in this MIB provide information such as RAM and NVRAM sizes, configuration register settings, and bootload image name for each processor module.

MIB Constraints

Table 3-28 lists the constraints that the Cisco 4451-X ISR places on the objects in the CISCO-ENTITY-EXT-MIB.

Table 3-28   CISCO-ENTITY-EXT-MIB Constraints

MIB Object	Notes
ceExtConfigRegNext	Read only.
ceExtSysBootImageList	Read only.

CISCO-ENTITY-FRU-CONTROL-MIB

The CISCO-ENTITY-FRU-CONTROL-MIB contains objects to configure and monitor the status of the field-replaceable units (FRUs) on the Cisco 4451-X ISR listed in the ENTITY-MIB entPhysicalTable. A FRU is a hardware component (such as a line card and module, fan, or power supply) that can be replaced on site.

Note   When RP switchover is caused by the zone failure (when both power supplies in the zone fail) in the active RP. No notification is sent for the modules in the failure zone. The zone failure can be identified by the status of the power supply. P0 and P1 are in one zone, and P2 and P3 are in the other zone.

MIB Constraints

Table 3-29 lists the constraints that your router places on the objects in the CISCO-ENTITY-FRU-CONTROL-MIB.

Table 3-29   CISCO-ENTITY-FRU-CONTROL-MIB Constraints

MIB Object	Notes
cefcModuleTable	
• cefcModuleAdminStatus	Read only.
• cefcModuleOperStatus	The following values are supported: • unknown(1) • ok(2) • boot(5) • failed(7) • dormant(12) • outOfServiceAdmin(13) • disabled (3)
• cefcModuleLastClearConfigTime	Not implemented.
• cefcModuleStateChangeReasonDescr	Not implemented.

Table 3-29   *CISCO-ENTITY-FRU-CONTROL-MIB Constraints (continued)*

MIB Object	Notes
cefcFRUPowerSupplyGroupTable	Not implemented.
cefcFRUPowerSupplyValueTable	Not implemented.
cefcFRUPowerStatusTable	
• cefcFRUPowerAdminStatus	always on(1)
• cefcFRUPowerOperStatus	The following values are supported:
	• always on(2)
	• failed(8)
	• onButFanFail(9)
cefcFanTrayStatusTable	
• cefFanTrayOperStatus	always up(2)
cefcIntelliModuleTable	Not implemented.
cefcPhysicalTable	Not implemented.
cefcModuleUpTime	Always zero for Hard disk.

CISCO-ENTITY-PERFORMANCE-MIB

The CISCO-ENTITY-PERFORMANCE-MIB defines objects to monitor the performance of the Crypto ASIC module of the Extended Service Platform (ESP). Performance monitoring includes utilization of resources and I/O rate for packets and bytes.

MIB Constraints

Table 3-30 lists the constraints that the Cisco 4451-X ISR places on the objects in the CISCO-ENTITY-PERFORMANCE-MIB. These constraints are applicable only for the Crypto ASIC module.

Table 3-30   *CISCO-ENTITY-PERFORMANCE-MIB Constraints*

MIB Object	Notes
cepEntityTable	Not supported.
cepConfigTable	Read only.
• CiscoEntPerfType	These MIB object values are supported:
	• utilization(1)
	• packetInputRate(5) – Mapped to Decrypt Packet Rate (DPR.)
	• packetOutputRate(6) – Mapped to Encrypt Packet Rate (EPR).

Table 3-30   CISCO-ENTITY-PERFORMANCE-MIB Constraints (continued)

MIB Object	Notes
• cepConfigRisingThreshold	Read only.
• cepConfigFallingThreshold	Read only.
• cepConfigThresholdNotifEnabled	Read only.
cepEntityIntervalTable	Supports performance monitoring every 15 minutes.
cepIntervalStatsTable	Supports interval value, fifteenMinutes (3).
cepPerfThreshFallingEvent	Not supported.
cepPerfThreshRisingEvent	Not supported.
cepThresholdNotifEnabled	Read only.

CISCO-ENTITY-QFP-MIB

The CISCO-ENTITY-QFP-MIB defines objects to manage Quantum Flow Processors (QFP) listed as entPhysicalClass attribute in the entPhysicalTable of ENTITY-MIB. The Quantum Flow Processors (QFP) technology control functions such as packet forwarding via fully integrated and programmable networking chipsets. This MIB module contains objects to monitor various QFP statistics such as system state, processor utilization, and memory.

The processor utilization statistics comprise these attributes:

- Input—Communication channel where packets arrive on the QFP.
- Output—Communication channel where packets exit the QFP.
- Priority—Indicates that the processing priority for the packet is high.
- Non-Priority—Indicates that the processing priority for the packet is low.
- Processing Load—Indicates the percentage of time spent forwarding packets.

Note   QFP entities from an inactive or standby FP are not monitored.

MIB Tables

Table 3-31 lists the tables in CISCO-ENTITY-QFP-MIB.

Table 3-31   CISCO-ENTITY-QFP-MIB Tables

MIB Table	Description
ceqfpSystemTable	Contains the QFP system information for each QFP physical entity. A separate row is created for each QFP physical entity when a physical entity supporting the QFP system information is detected. If a physical entity supporting the QFP system information is removed, the corresponding row is deleted from the table.
ceqfpUtilizationTable	Contains the utilization statistics for each QFP physical entity. A separate row is created for each QFP physical entity when a physical entity supporting the QFP system information is detected. If a physical entity supporting the QFP system information is removed or the utilization statistics are not received for a specific interval, the corresponding row is deleted from the table. The interval to wait before deleting an entry from this table depends on the supporting device.
ceqfpMemoryResourceTable[1]	Contains the memory resources statistics for each QFP physical entity. A separate row is created for each QFP physical entity when a physical entity supporting the QFP system information is detected. If a physical entity supporting the QFP system information is removed or the memory resource statistics are not received for a specific interval, the corresponding row is deleted from the table.
ciscoEntityQfpSystemGroup	Contains objects related to QFP system information.
ciscoEntityQfpUtilizationGroup	Contains objects related to QFP utilization information.
ciscoEntityQfpMemoryResourceGroup	Contains objects related to QFP memory resource information.
ciscoEntityQfpNotifGroup	Contains QFP notification such as memory resource crossing threshold.
ciscoEntityQfpMemoryResNotifGroup	Contains the QFP memory resource notification control object.

1. The physical DRAM memory resource is logically divided into DRAM and IRAM in the CLI, but the ceqfpMemoryResourceTable table would show the aggregate of DRAM and IRAM data. The IRAM memory is secondary and is used when DRAM memory is exhausted. The notification is generated whenever the threshold is greater or less than the aggregated value.

MIB Constraints

Table 3-32 lists the constraints that the Cisco 4451-X ISR places on the objects in the
CISCO-ENTITY-QFP-MIB.

Table 3-32   CISCO-ENTITY-QFP-MIB Constraints

MIB Object	Notes
ciscoEntityQfpMemoryResourceGroup	
• ceqfpMemoryResRisingThreshold	Read only.
• ceqfpMemoryResFallingThrehold	Read only.

CISCO-ENTITY-SENSOR-MIB

The CISCO-ENTITY-SENSOR-MIB contains objects that support the monitoring of sensors. The MIB
is applicable to sensors present in various modules. This MIB allows you to monitor sensor values and
thresholds on sensors that are discovered by the ENTITY-MIB. The sensor support is provided for the
following hardware

- Power Supply
- Fan
- RP
- Transceivers
- PVDM4-MB-240
- SM-1T3/E3

Note   For Cisco Services Modules, Network Interface Modules, and Fans, entSensorThresholdTable is not
supported

MIB Constraints

Table 3-33 lists the constraints that the Cisco 4451-X ISR places on the
CISCO-ENTITY-SENSOR-MIB.

Table 3-33   CISCO-ENTITY-SENSOR-MIB Constraints

MIB Object	Notes
entSensorValueTable	
• entSensorMeasuredEntity	Implemented for all sensors except for SPA and transceiver sensors.
entSensorThresholdTable	
• entSensorThresholdRelation	Read only.

Table 3-33   CISCO-ENTITY-SENSOR-MIB Constraints

MIB Object	Notes
• entSensorThresholdSeverity	Read only.
• entSensorThresholdValue	Read only.

MIB Usage Values for Cisco Transceivers

The table in this section lists each type of sensor's value represented in the entSensorValueTable and the entSensorThresholdTable.

Table 3-34 lists CISCO-ENTITY-SENSOR-MIB sensor objects and their usage values for the Cisco 4451-X Integrated Services Router transceivers in the entSensorValueTable.

Table 3-34   CISCO-ENTITY-SENSOR-MIB Usage Values in the entSensorValueTable for Cisco Transceivers

MIB Sensor Object	Notes
Module Temperature Sensor	
• entSensorType	celsius(8)
• entSensorScale	units(9)
• entSensorPrecision	3
• entSensorStatus	ok(1)
• entSensorValue	Reports most recent measurement seen by the sensor.
• entSensorValueTimeStamp	Value indicates the age of the value reported by entSensorValue object.
• entSensorValueUpdateRate	Value indicates the rate that the agent updates entSensorValue in seconds (for example, 60 seconds).
Tx Supply Voltage Sensor	
• entSensorType	voltsDC(4)
• entSensorScale	milli(8)
• entSensorPrecision	1
• entSensorStatus	ok(1)
• entSensorValue	Reports most recent measurement seen by the sensor.
• entSensorValueTimeStamp	Value indicates the age of the value reported by entSensorValue object.
• entSensorValueUpdateRate	Value indicates the rate that the agent updates entSensorValue in seconds (for example, 60 seconds).
Tx Laser Current Sensor	
• entSensorType	amperes(5)
• entSensorScale	milli(8)
• entSensorPrecision	0

Table 3-34   CISCO-ENTITY-SENSOR-MIB Usage Values in the entSensorValueTable for Cisco Transceivers (continued)

MIB Sensor Object	Notes
• entSensorStatus	ok(1)
• entSensorValue	Reports most recent measurement seen by the sensor.
• entSensorValueTimeStamp	Value indicates the age of the value reported by entSensorValue object.
• entSensorValueUpdateRate	Value indicates the rate that the agent updates entSensorValue in seconds (for example, 60 seconds).
Transmit Power Sensor (Optical Tx)	
Receive Power Sensor (Optical Rx)	
• entSensorType	dBm(14)
• entSensorScale	units(9)
• entSensorPrecision	0
• entSensorStatus	ok(1)
• entSensorValue	Reports most recent measurement seen by the sensor.
• entSensorValueTimeStamp	Value indicates the age of the value reported by entSensorValue object.
• entSensorValueUpdateRate	Value indicates the rate that the agent updates entSensorValue in seconds (for example, 60 seconds).

CISCO-ENTITY-VENDORTYPE-OID-MIB

The CISCO-ENTITY-VENDORTYPE-OID-MIB defines the object identifiers (OIDs) assigned to various Cisco 4451-X ISR components. The OIDs in this MIB are used by the entPhysicalTable of the ENTITY-MIB as values for the entPhysicalVendorType field in the entPhysicalTable. Each OID uniquely identifies a type of physical entity:

- Chassis
- NGWIC-8CE1T1-PRI
- SM-1T3/E3
- NIM-SSD
- ICS-E160DP-M1/K9

CISCO-ETHERLIKE-EXT-MIB

The CISCO-ETHERLIKE-EXT-MIB defines generic objects for the Ethernet-like network interfaces.

MIB Constraints

Table 3-35 lists the constraint that your router places on the objects in the CISCO-ETHERLIKE-EXT-MIB.

Table 3-35   CISCO-ETHERLIKE-EXT-MIB Constraint

MIB Object	Notes
ceeDot3PauseExtTable	Not Supported.

CISCO-EVC-MIB

The CISCO-EVC-MIB defines the managed objects and notifications describing Ethernet Virtual Connections (EVCs).

MIB Constraints

Table 3-36 lists the constraints that your router places on the objects in the CISCO-EVC-MIB.

Table 3-36   CISCO-EVC-MIB Constraint

MIB Object	Notes
cevcEvcUniTable	Not supported.
cevcEvcActiveUnis	Not supported.
ciscoEvcStatusChangedNotification	Not supported.
• cevcEvcOperStatus	Returns unknown as value.

CISCO-FLASH-MIB

The CISCO-FLASH-MIB contains objects to manage flash cards and flash-card operations.

MIB Constraints

Table 3-37 lists the constraints that your router places on the objects in the CISCO-FLASH-MIB.

Table 3-37   CISCO-FLASH-MIB Constraints

MIB Object	Notes
ciscoFlashDeviceTable	
• ciscoFlashDeviceInitTime	Not Implemented.
• ciscoFlashPhyEntIndex	Not Implemented.
ciscoFlashPartitionTable	
• ciscoFlashPartitionFileCount	Not Implemented.
• ciscoFlashPartitionChecksumAlgorithm	Not Implemented.
• ciscoFlashPartitionUpgradeMethod	Not Implemented.
• ciscoFlashPartitionNeedErasure	Not Implemented.
• ciscoFlashPartitionFileNameLength	Not Implemented.
ciscoFlashFileTable	
• ciscoFlashFileChecksum	Not Implemented.
• ciscoFlashFileType	Values not supported: config(2) image(3) crashinfo(5)

Note   The index of files stored in USB changes frequently since the files are mounted and unmounted after regular intervals.

Note   When both primary and secondary RPs are up and running, entities for standby usb flash and Flash disk are not populated for CISCO-FLASH-MIB. Compact Flash is not supported in ASR series Routers. So, it wont be modelled in CISCO-FLASH-MIB.

Note   Once the file is copied successfully via tftp, it takes at least 50 seconds to reflect the correct file size in ciscoFlashFileSize object.

CISCO-FRAME-RELAY-MIB

The CISCO-FRAME-RELAY-MIB contains Frame Relay information that is specific to Cisco products or that is missing from RFC 1315.

MIB Constraints

Table 3-38 lists the constraints that the Cisco 4451-X ISR place on the objects in the CISCO-FRAME-RELAY-MIB. Objects that are not listed in the table are implemented as defined in the MIB.

Note   Frame Relay Switched Virtual Circuits (SVCs) are not currently supported on your router.

Table 3-38   CISCO-FRAME-RELAY-MIB Constraints

MIB Object	Notes
cfrCircuitTable	
• cfrCircuitType	Supported value is pvc(1).
cfrExtCircuitTable	
• cfrExtCircuitMinThroughputOut	Supported for QoS. Otherwise value is 0.
• cfrExtCircuitMinThroughputIn	Supported for QoS. Otherwise value is 0.
• cfrExtCircuitShapeByteLimit	Supported for QoS. Otherwise value is 0.
• cfrExtCircuithapeInterval	Supported for QoS. Otherwise value is 0.
• cfrExtCircuitShapeByteIncrement	Supported for QoS. Otherwise value is 0.
• cfrExtCircuitShapeActive	Supported for QoS. Otherwise value is 0.
• cfrExtCircuitShapeAdapting	Supported for QoS. Otherwise value is 0.
cfrMapTable	

Table 3-38   CISCO-FRAME-RELAY-MIB Constraints (continued)

MIB Object	Notes
• cfrMapType	Values are: • static(1) • dynamic(2)
cfrSvcTable	Not implemented.

CISCO-FTP-CLIENT-MIB

The CISCO-FTP-CLIENT-MIB contains objects to invoke File Transfer Protocol (FTP) operations for network management. This MIB has no known constraints and all objects are implemented as defined in the MIB.

CISCO-HSRP-EXT-MIB

The CISCO-HSRP-EXT-MIB provides an extension to the CISCO-HSRP-MIB which defines the Cisco Hot Standby Router Protocol (HSRP), which is defined in RFC 2281. The extensions cover assigning of secondary IP addresses and modifying an HSRP group's priority.

CISCO-HSRP-MIB

The CISCO-HSRP-MIB contains objects to configure and manage the Cisco Hot Standby Router Protocol (HSRP), which is defined in RFC 2281.

CISCO-IETF-ATM2-PVCTRAP-MIB

The CISCO-IETF-ATM2-PVCTRAP-MIB contains objects that supplement the ATM-MIB. This MIB implements the Virtual Channel Link (VCL) section of the IETF document "draft-ietf-atommib-atm2-11.txt," Section 9 ATM Related Trap Support.

Note This MIB is currently not supported for broadband configurations.

CISCO-IETF-BFD-MIB

The CISCO-IETF-BFD-MIB contains managed object definitions for the Bidirectional Forwarding Detection (BFD) Protocol. BFD is a protocol that detects faults in the bidirectional path between two forwarding engines, including interfaces, data links, and to the extent possible, the forwarding engines themselves, with potentially very low latency. It operates independently of media, data protocols, and routing protocols.

Note The CISCO-IETF-BFD-MIB is based on the draft-ietf-bfd-mib-07.txt internet draft.

Following is the support information on the Virtual Routing and Forwarding (VRF) context for the MIB:

- The CISCO-IETF-BFD-MIB supports IPv4 and IPv6 in the non-VRF context.
- The CISCO-IETF-BFD-MIB supports IPv4 in the VRF context, and does not support IPv6 in the VRF context.

CISCO-IETF-FRR-MIB

The CISCO-IETF-FRR-MIB contains managed object definitions for MPLS Fast Reroute (FRR).

CISCO-IETF-ISIS-MIB

The CISCO-IETF-ISIS-MIB introduces network management support for the IS-IS routing protocol through the use of IS-IS MIB table entries, MIB objects, and MIB trap notification objects. A new CLI is added to enable SNMP notifications for the objects. Notifications are provided for errors and other significant event information for the IS-IS network.

CISCO-IETF-NAT-MIB

The CISCO-IETF-NAT-MIB contains objects for Network Address Translation (NAT) operations on the router, as defined in RFC 3022. The MIB included objects containing NAT configuration, NAT bindings, and run-time statistics.

The MODULE-IDENTITY for the CISCO-IETF-NAT-MIB is ciscoIetfNatMIB, and its top-level OID is 1.3.6.1.4.1.9.10.77 (iso.org.dod.internet.private.enterprises.cisco.ciscoExperiment.ciscoIetfNatMIB).

MIB Constraints

Table 3-39 lists the CISCO-IETF-NAT-MIB constraints.

Table 3-39   CISCO-IETF-NAT-MIB Constraints

MIB Object	Notes
cnatAddrBindTable	Not supported for static binds.
• cnatAddrBindCurrentIdleTime	Not supported.
cnatConfTable	Not Implemented.
cnatConfStaticAddrMapTable	Not Implemented.
cnatConfDynAddrMapTable	Not Implemented.
cnatInterfaceTable	
• cnatInterfaceRealm	Read only.
• cnatInterfaceStorageType	Read only.
• cnatInterfaceStatus	Read only.
cnatAddrBindTable	
• cnatAddrBindDirection	Read only.
• cnatAddrBindConfName	Not Implemented.
• cnatAddrBindSessionCount	Not Implemented.
• cnatAddrBindId	Not Implemented.
cnatAddrPortBindTable	
• cnatAddrPortBindDirection	Not Implemented.
• cnatAddrPortBindConfName	Not Implemented.
• cnatAddrPortBindSessionCount	Not Implemented.
cnatSessionTable	Not Implemented.
cnatAddrMapStatsTable	Not Implemented.
cnatInterfaceStatsTable	Not Implemented.

CISCO-IETF-PPVPN-MPLS-VPN-MIB

The CISCO-IETF-PPVPN-MPLS-VPN-MIB is an extension of the MPLS-VPN-MIB. It contains a new notification, mplsNumVrfRouteMaxThreshCleared, which was added with MPLS-VPN-MIB-DRAFT-05.

CISCO-IETF-PW-ATM-MIB

The CISCO-IETF-PW-ATM-MIB contains managed object definitions for Pseudo Wire (PW) emulation of ATM over Packet Switched Networks (PSN).

MIB Constraints

Table 3-40 lists the constraints that your router places on the objects in the CISCO-IETF-PW-ATM-MIB.

Table 3-40   CISCO-IETF-PW-ATM-MIB Constraints

MIB Object	Notes
CpwVcAtmPerfEntry	
• cpwAtmCellsReceived	Not supported, returns zero.
• cpwAtmCellsSent	Not supported, returns zero.
• cpwAtmCellsRejected	Not supported, returns zero.
• cpwAtmCellsTagged	Not supported, returns zero.
• cpwAtmHCCellsReceived	Not supported, returns zero.
• cpwAtmHCCellsRejected	Not supported, returns zero.
• cpwAtmHCCellsTagged	Not supported, returns zero.
• cpwAtmAvgCellsPacked	Not supported, returns zero.

CISCO-IETF-PW-ENET-MIB

The CISCO-IETF-PW-ENET-MIB contains objects that describe the model for managing Ethernet point-to-point pseudo wire services over a Packet Switched Network (PSN).

MIB Constraints

Table 3-41 lists the constraints that your router places on the objects in the
CISCO-IETF-PW-ENET-MIB.

Table 3-41   CISCO-IETF-PW-ENET-MIB Constraints

MIB Object	Notes
cpwVcEnetMplsPriMappingTable	Not supported.
cpwVcEnetStatsTable	Not supported.

CISCO-IETF-PW-FR-MIB

The CISCO-IETF-PW-FR-MIB contains the network management objects defined for FRoPW services
over a PSN.

CISCO-IETF-PW-MIB

The CISCO-IETF-PW-MIB contains managed object definitions for PW operation.
.

MIB Constraints

Table 3-42 lists the constraints that your router places on the objects in the CISCO-IETF-PW-MIB.

Table 3-42   CISCO-IETF-PW-MIB Constraints

MIB Object	Notes
cpwVcTable	
• CpwVcEntry	Not-accessible.
• cpwVcIndex	Not-accessible.
• cpwVcType	Read only.
• cpwVcOwner	Read only.
• cpwVcPsnType	Read only.
• cpwVcSetUpPriority	Not implemented.
• cpwVcHoldingPriority	Not implemented.
• cpwVcInboundMode	Read only.
• cpwVcPeerAddrType	Read only.
• cpwVcPeerAddr	Read only.
• cpwVcID	Read only.
• cpwVcLocalGroupID	Read only.

Table 3-42 **CISCO-IETF-PW-MIB Constraints**

MIB Object	Notes
• cpwVcControlWord	Read only.
• cpwVcLocalIfMtu	Read only.
• cpwVcLocalIfString	Read only.
• cpwVcRemoteControlWord	Read only.
• cpwVcOutboundVcLabel	Read only.
• cpwVcInboundVcLabel	Read only.
• cpwVcName	Read only.
• cpwVcDescr	Read only.
• cpwVcAdminStatus	Read only.
• cpwVcTimeElapsed	Not implemented.
• cpwVcRowStatus	Read only.
• cpwVcStorageType	Read only.
cpwVcPerfCurrentTable	
• cpwVcPerfCurrentEntry	Not implemented.
• cpwVcPerfCurrentInHCPackets	Not implemented.
• cpwVcPerfCurrentInHCBytes	Not implemented.
• cpwVcPerfCurrentOutHCBytes	Not implemented.
• cpwVcPerfCurrentOutHCPackets	Not implemented.
cpwVcPerfIntervalTable	
• cpwVcPerfIntervalEntry	Not implemented.
• cpwVcPerfIntervalNumber	Not implemented.
• cpwVcPerfIntervalValidData	Not implemented.
• cpwVcPerfIntervalInHCPackets	Not implemented.
• cpwVcPerfIntervalInHCBytes	Not implemented.
• cpwVcPerfIntervalOutHCPackets	Not implemented.
• cpwVcPerfIntervalOutHCBytes	Not implemented.
cpwVcNotifRate	Not implemented.

CISCO-IETF-PW-MPLS-MIB

The CISCO-IETF-PW-MPLS-MIB contains objects that complement the CISCO-IETF-PW-MIB for PW operation over MPLS.

MIB Constraints

Table 3-43 lists the constraints that your router places on the objects in the CISCO-IETF-PW-MPLS-MIB.

Table 3-43   CISCO-IETF-PW-MPLS-MIB Constraints

MIB Object	Notes
cpwVcMplsOutboundIndexNext	Not supported.
cpwVcMplsInboundIndexNext	Not supported.

CISCO-IETF-PW-TDM-MIB

The CISCO-IETF-PW-TDM-MIB contains managed object definitions for encapsulating TDM (T1,E1, T3, E3, NxDS0) as pseudo-wires over packet-switching networks (PSN).

CISCO-IF-EXTENSION-MIB

The CISCO-IF-EXTENSION-MIB contains objects that provide additional interface-related information that is not available in the IF-MIB (RFC 2863).

MIB Constraints

Table 3-44 lists constraints that your router places on the object in CISCO-IF-EXTENSION-MIB

Table 3-44   CISCO-IF-EXTENSION-MIB Constraints

MIB Object	Notes
cieIInterfaceTable	
• cieIfDhcpMode	Not implemented.
• cieIfMtu	Not implemented.
• cieIfContextName	Not implemented.
• cieIfKeepAliveEnabled	Not supported for ATM interfaces.
cieSystemMtu	Not implemented.
cieIfUtilTable	Not supported for Cisco Services Module interfaces.
cieIfDot1dBaseMappingTable	Not implemented.

Table 3-44   *CISCO-IF-EXTENSION-MIB Constraints (continued)*

MIB Object	Notes
cieIfDot1qCustomEtherTypeTable	Not implemented.
cieIfNameMappingTable	Not implemented.

Notes

Some objects defined in cieIfPacketStatsTable and cieIfInterfaceTable are applicable to physical interfaces
only. As a result, this table may be sparse for non-physical interfaces.

ATM interfaces do not support the cieIfKeepAliveEnabled object.

CISCO-IGMP-FILTER-MIB

The CISCO_IGMP-FILTER-MIB provides a mechanism for users to configure the system to intercept
Internet Group Management Protocol (IGMP) joins for IP Multicast groups identified in this MIB and
only allow certain ports to join certain multicast groups.

CISCO-IMAGE-MIB

The CISCO-IMAGE-MIB contains objects that identify the capabilities and characteristics of the Cisco
IOS image.

CISCO-IMAGE-LICENSE-MGMT-MIB

The CISCO-IMAGE-LICENSE-MGMT-MIB contains objects to control the management level of the
IOS image on a device. Cisco licensing mechanism provides flexibility to run a device at different image
levels. This mechanism is referred to as image-level licensing. Image-level licensing leverages the
universal image-based licensing solution. A universal image containing all levels of a software package
is loaded on to the device. During startup, the device determines the highest level of license and loads
the corresponding software features or subsystems.

CISCO-IP-LOCAL-POOL-MIB

The CISCO-IP-LOCAL-POOL-MIB contains objects that provide a network manager with information
related to the local IP address pools. This MIB provides configuration and statistics reflecting the
allocation of local IP pools. Each entry provides information about a particular local IP pool, including
the number of free and used addresses.

The SNMP agent does not have to be configured in any special way for CISCO-IP-LOCAL-POOL-MIB
objects to be available to the network management system. You can configure the SNMP agent to send
the ciscoIpLocalPoolInUseAddrNoti notification to a particular host using the **snmp-server host**
ip-address community-name **iplocalpool** command.

The ciscoIpLocalPoolInUseAddrNoti notification is enabled:

- Through SNMP by using the cIpLocalPoolNotificationsEnable object
- Using the **snmp-server enable traps ip local pool** CLI configuration

CISCO-IPMROUTE-MIB

The CISCO-IPMROUTE-MIB contains objects to manage IP multicast routing on the router.

CISCO-IPSEC-FLOW-MONITOR-MIB

The CISCO-IPSEC-FLOW-MONITOR-MIB allows monitoring of the structures in IPsec-based virtual private networks.

CISCO-IPSEC-MIB

The CISCO-IPSEC-MIB models the Cisco implementation-specific attributes of a Cisco entity that implements IPsec.

CISCO-IPSEC-POLICY-MAP-MIB

The CISCO-IPSEC-POLICY-MAP-MIB contains objects that supplement the proposed IETF standards for IPsec VPNs. In particular, this MIB maps dynamically instantiated IPsec protocol structures (such as tunnels and security associations) to the policy entities that created them (such as policy definitions, crypto maps, and transforms).

The MODULE-IDENTITY for the CISCO-IPSEC-POLICY-MAP-MIB is ciscoIpSecPolMapMIB, and its top-level OID is 1.3.6.1.4.1.9.9.172 (iso.org.dod.internet.private.enterprises.cisco.ciscoMgmt.ciscoIpSecPolMapMIB).

MIB Constraints

This MIB is supported only in Cisco IOS software images that support DES encryption (-k8- or -k9-).

CISCO-IP-TAP-MIB

The CISCO-IP-TAP-MIB manages Cisco intercept feature for IP. This MIB is used along with CISCO-TAP2-MIB to intercept IP traffic.

CISCO-IP-URPF-MIB

The CISCO-IP-URPF-MIBcontains objects that allow users to specify a Unicast Reverse Path Forwarding (URPF) drop-rate threshold on interfaces of a managed device, which when exceeded, a SNMP notification is sent. It includes objects specifying global (to a managed device as a whole) and per-interface drop counts and drop rates, and also generates traps based on the drop rate exceeding a configurable per-interface threshold.

MIB Constraints

Table 3-45 lists the constraints that your router places on the CISCO-IP-URPF-MIB.

Table 3-45   *CISCO-IP-URPF-MIB Constraints*

MIB Object	Notes
cipUrpfIfMonTable	Entries in this tables are present when URPF is enabled on an interface. They are not available when the interface is removed or if RPF is disabled on the interface.
cipUrpfIfConfTable	Entries in this tables are present when URPF is enabled on an interface. They are not available when the interface is removed or if RPF is disabled on the interface.

CISCO-LAG-MIB

The CISCO-LAG-MIB contains objects to manage link aggregation (LAG) on the router, as defined by IEEE Standard 802.3ad. The MIB contains link aggregation information that supplements to IEEE8023-LAG-MIB or is specific to Cisco products.

CISCO-LICENSE-MGMT-MIB

The CISCO-LICENSE-MGMT-MIB contains objects to manage the licenses on a system. The licensing mechanism provides flexibility to enforce licensing for various features in the system. These are the different kinds of licenses:

- NODE LOCKED LICENSE
- NON-NODE LOCKED LICENSE
- METERED LICENSE
- EVALUATION LICENSE
- RIGHT TO USE (RTU) LICENSE
- EXTENSION LICENSE
- GRACE PERIOD LICENSE
- COUNTED LICENSE
- UNCOUNTED LICENSE
- IMAGE LEVEL LICENSING
- FEATURE LEVEL LICENSING

CISCO-MVPN-MIB

The CISCO-MVPN-MIB contains managed object definitions for the Cisco implementation of multicast in VPNs defined by the Internet draft, draft-rosen-vpn-mcast-05.txt.

The Multicast VPN MIB feature introduces the capability for Simple Network Management Protocol (SNMP) monitoring of a Multicast VPN (MVPN). Using the MVPN MIB, network administrators can access MVRF information from PE routers. This information can be accessed for VPN traffic across multiple CE sites in real time. SNMP operations can be performed to monitor the MVRFs on the PE routers, using the get and set commands. These commands are entered on the Network management system (NMS) workstation for which the SNMP has been implemented. The NMS workstations is also known as the SNMP manager.

Note   Currently only IPv4 is supported.

Note   For all MIB objects with "read-create" access privileges, currently only "read-only" access is supported.

For more information on this MIB, please access the following link:
https://www.cisco.com/en/US/docs/ios/12_0s/feature/guide/mcvpnmib.html

CISCO-NBAR-PROTOCOL-DISCOVERY-MIB

The CISCO-NBAR-PROTOCOL-DISCOVERY-MIB provides SNMP support for Network-Based Application Recognition (NBAR), including enabling and disabling protocol discovery on a per-interface basis, and configuring the traps that are generated when certain events occur. You can also display the current NBAR configuration and run-time statistics.

Note The MODULE-IDENTITY for the CISCO-NBAR-PROTOCOL-DISCOVERY-MIB is ciscoNbarProtocolDiscoveryMIB, and its top-level OID is 1.3.6.1.4.1.9.9.244 (iso.org.dod.internet.private.enterprises.cisco.ciscoMgmt.ciscoNbarProtocolDiscoveryMIB).

Note The cnpdTopNConfigTable and cnpdTopNStatsTable tables do not have details for the protocol "unknown".

CISCO-NETFLOW-MIB

The CISCO-NETFLOW-MIB provides a simple and easy method to get NetFlow cache information, the current NetFlow configuration, and statistics.

MIB Constraints

Table 3-46 lists the constraints that your router places on the objects in the CISCO-NETFLOW-MIB.

Table 3-46   CISCO-NETFLOW-MIB Constraints

MIB Object	Notes
cnfClCacheEnable	The following values are not supported: • destinationOnly(6) • sourceDestination(7) • fullFlow(8) • expBgpPrefix(23)

CISCO-NTP-MIB

The CISCO-NTP-MIB contains objects to monitor a Network Time Protocol (NTP) server. NTP is used to synchronize timekeeping among a set of distributed time servers and clients. Primary time servers, which are synchronized to national time standards, are connected to widely accessible resources such as backbone gateways. These primary servers send timekeeping information to other time servers, and perform clock checking to eliminate timekeeping errors due to equipment or propagation failures.

MIB Constraints

Table 3-47 lists the constraints that the Cisco 4451-X ISR place on the objects in the CISCO-NTP-MIB.

Table 3-47   CISCO-NTP-MIB Constraints

MIB Object	Notes
cntpSysLeap	Read only.
cntpSysStratum	Read only.

CISCO-OSPF-MIB

The CISCO-OSPF-MIB contains objects for managing OSPF implementation. Most of the MIB definitions are based on the IETF draft draft-ietf-ospf-mib-update-05.txt and include support for OSPF Sham link. The CISCO-OSPF-MIB is an extension to the OSPF-MIB defined in RFC 1850.

CISCO-OSPF-TRAP-MIB

The CISCO-OSPF-TRAP-MIB contains new and modified notification objects and events, which are defined in the latest version for OSPF-MIB IETF draft draftietf-ospf-mib-update-05.txt in addition to support for OSPF Sham link.

CISCO-PIM-MIB

The CISCO-PIM-MIB defines Cisco-specific objects and variables for managing Protocol Independent Multicast (PIM) on the router. These MIB definitions are an extension of those in RFC 2934, which is the IETF PIM MIB.

CISCO-PING-MIB

The CISCO-PING-MIB contains objects to manage ping requests on the router.

CISCO-POWER-ETHERNET-EXT-MIB

The CISCO-POWER-ETHERNET-EXT-MIB extends the POWER-ETHERNET-MIB (RFC3621) to add objects which provide additional management information about Power Sourcing Equipment (PSE) that is not available in the POWER-ETHERNET-MIB.

Table 3-48 lists the constraints that your router place on the objects in the CISCO-POWER-ETHERNET-EXT-MIB.

Table 3-48   CISCO-POWER-ETHERNET-EXT-MIB Constraints

MIB Object	Constraints
cpeExtPsePortDiscoverMode	Read only.
cpeExtPsePortDeviceDetected	Read only.
cpeExtPsePortIeeePd	Read only.
cpeExtPsePortAdditionalStatus	Read only.
cpeExtPsePortPwrMax	Read only.
cpeExtPsePortPwrAllocated	Read only.
cpeExtPsePortPwrAvailable	Read only.
cpeExtPsePortPwrConsumption	Read only.
cpeExtPsePortMaxPwrDrawn	Read only.
cpeExtPsePortEntPhyIndex	Read only.
cpeExtPsePortPolicingCapable	Read only.
cpeExtMainPseEntPhyIndex	Read only.
cpeExtMainPseDescr	Read only.
cpeExtMainPsePwrMonitorCapable	Read only.
cpeExtPdStatsTotalDevices	Read only.
cpeExtPdStatsDeviceCount	Read only.

CISCO-PPPOE-MIB

The CISCO-PPPOE-MIB contains objects to manage Point-to-Point Protocol over Ethernet (PPPoE) sessions. These objects represent PPPoE sessions at the system and virtual channel (VC) level.

MIB Constraints

Table 3-49 lists the constraints that your router places on the objects in the CISCO-PPPOE-MIB.

Table 3-49   CISCO-PPPOE-MIB Constraints

MIB Object	Notes
cPppoeSystemMaxAllowedSessions	Read only.
cPppoeSystemThresholdSessions	Read only.
cPppoeVcCfgTable	
• cPppoeVcEnable	Read only.
cPppoeVcSessionsTable	
• cPppoeVcMaxAllowedSessions	Read only.
• cPppoeVcExceededSessionErrors	Read only.

CISCO-PROCESS-MIB

The CISCO-PROCESS-MIB displays memory and CPU usage on the router and describes active system processes. CPU utilization presents a status of how busy the system is. The numbers are a ratio of the current idle time over the longest idle time. (This information should be used as an estimate only)

MIB Constraints

Table 3-50 lists the constraints that your router places on the objects in the CISCO-PROCESS-MIB.

Table 3-50   CISCO-PROCESS-MIB Constraints

MIB Object	Notes
cpmProcessTable	
• cpmProcExtPriority	Read only.
cpmCPURisingThreshold	Not Supported
cpmCPUFallingThreshold	Not Supported

CISCO-PROCESS-MIB Usage

The cpmCPUTotal5sec, cpmCPUTotal1min, and cpmCPUTotal5min objects have been deprecated and replaced by cpmCPUTotal5secRev, cpmCPUTotal1minRev, and cpmCPUTotal5minRev, respectively.

Note   When an object is deprecated, it does not mean that an object instance may not be returned. For these deprecated objects, object instances are returned. However, their returned values must be ignored. The values returned by the new objects must be used.

> **Note** The CPU utilization objects such as cpmCPUTotal5sec, cpmCPUTotal1min, and cpmCPUTotal5min are calculated for all the processes used by CPU except under idle condition.

Table 3-51 lists the support matrix for the CISCO-PROCESS-MIB cpmCPUTotalTable object.

Table 3-51   Support-Matrix for cpmCPUTotalTable

cpmCPUTotalTable Objects	RP CPU
cpmCPULoadAvg1min	Yes
cpmCPULoadAvg5min	Yes
cpmCPULoadAvg15min	Yes
cpmCPUMemoryCommitted	Yes
cpmCPUTotalPhysicalIndex	Yes
cpmCPUTotal5sec	Yes
cpmCPUTotal1min	Yes
cpmCPUTotal5min	Yes
cpmCPUTotal5secRev	Yes
cpmCPUTotal1minRev	Yes
cpmCPUTotal5minRev	Yes
cpmCPUMonInterval	No
cpmCPUTotalMonIntervalValue	No
cpmCPUInterruptMonIntervalValue	No
cpmCPUMemoryUsed	Yes
cpmCPUMemoryFree	Yes
cpmCPUMemoryKernelReserved	No
cpmCPUMemoryLowest	Yes

Table 3-52 lists the support matrix for the CISCO-PROCESS-MIB cpmProcessTable and cpmProcessExtRevTable objects for RP CPU.

Table 3-52   ***Support Matrix for the cpmProcessTable and the cpmProcessRevExtTable for RP CPU***

cpmProcessTable and cpmProcessRevExtTable Objects	IOSD Process [Process Name: ppc_linux_iosd-]	Other Process [Process Name: Cmand, hman, imand]
cpmProcessName	Yes	Yes
cpmProcessuSecs	No	No
cpmProcessTimeCreated	Yes	Yes
cpmProcessAverageUSecs	Yes	Yes
cpmProcExtMemAllocatedRev	Yes	Yes
cpmProcExtMemFreedRev	No	No
cpmProcExtInvokedRev	No	No
cpmProcExtRuntimeRev	No	No
cpmProcExtUtil5SecRev	No	No
cpmProcExtUtil1MinRev	No	No
cpmProcExtUtil5MinRev	No	No
cpmProcExtPriorityRev	Yes	Yes
cpmProcessType	No	No
cpmProcessRespawn	No	No
cpmProcessRespawnCount	No	No
cpmProcessRespawnAfterLastPatch	No	No
cpmProcessMemoryCore	No	No
cpmProcessLastRestartUser	No	No
cpmProcessTextSegmentSize	No	No
cpmProcessDataSegmentSize	No	No
cpmProcessStackSize	No	No
cpmProcessDynamicMemorySize	No	No

Table 3-53 lists the support matrix for the CISCO-PROCESS-MIB cpmVirtualProcessTable object.

Table 3-53   ***Support Matrix for the cpmVirtualProcessTable***

cpmVirtualProcessTable Objects	Process running under Active RP IOSD Process
cpmVirtualProcessName	Yes
cpmVirtualProcessUtil5Sec	Yes
cpmVirtualProcessUtil1Min	Yes

Table 3-53   Support Matrix for the cpmVirtualProcessTable (continued)

cpmVirtualProcessTable Objects	Process running under Active RP IOSD Process
cpmVirtualProcessUtil5Min	Yes
cpmVirtualProcessMemAllocated	Yes
cpmVirtualProcessMemFreed	Yes
cpmVirtualProcessInvokeCount	Yes
cpmVirtualProcessRuntime	Yes

CISCO-PRODUCTS-MIB

The CISCO-PRODUCTS-MIB lists the object identifiers (OIDs) assigned to the Cisco hardware platforms.

CISCO-QINQ-VLAN-MIB

The CISCO-QINQ-VLAN-MIB describes configuration and monitoring capabilities relating to 802.1QinQ interfaces.

MIB Constraints

Table 3-54 lists the constraints that your router places on the objects in the CISCO-QINQ-VLAN-MIB.

Table 3-54   CISCO-QINQ-VLAN-MIB Constraints

MIB Object	Notes
cqvTerminationTable	
• cqvTerminationPeEncap	Implemented as Read only.
• cqvTerminationRowStatus	Implemented as Read only.
cqvTranslationTable	Not supported.

CISCO-RADIUS-EXT-MIB

The CISCO-RADIUS-EXT-MIB contains MIB objects used for managing the RADIUS authentication and accounting statistics.

CISCO-RF-MIB

The CISCO-RF-MIB provides configuration control and status information for the redundancy framework subsystem. The redundancy framework subsystem provides a mechanism for logical redundancy of the software functionality and is designed to support 1:1 redundancy for the processor cards.

CISCO-RTTMON-IP-EXT-MIB

The CISCO-RTTMON-IP-EXT-MIB provides extensions for the tables in CISCO-RTTMON-MIB to support IP layer extensions, specifically IPv6 addresses and other information related to IPv6 standards.

CISCO-RTTMON-MIB

The CISCO-RTTMON-MIB contains objects to monitor network performance. The MIB provides information about the response times of network resources and applications. Each conceptual round-trip time (RTT) control row in the MIB represents a single probe, which is used to determine an entity's response time. The probe defines an RTT operation to perform (for example, an FTP or HTTP get request), and the results indicate whether the operation succeeded or failed, and how long it took to complete.

If you plan to schedule an RTT operation, see Table 3-55 for information about rttMonScheduleAdminRttStartTime in the rttMonScheduleAdminTable.

Note   An rttMonCtrlOperConnectionLostOccurred trap is generated when an RTT connection cannot be established to the destination router because the router responder application is not running. However, the trap is not generated if the physical connection to the router is lost.

MIB Constraints

Table 3-55 lists the constraints that the Cisco 4451-X ISR place on the objects in the CISCO-RTTMON-MIB.

Table 3-55   CISCO-RTTMON-MIB Constraints

MIB Object	Notes
RttMonProtocol	The following values are not supported: • snaRUEcho • snaLU0EchoAppl
rttMonApplAuthTable	Not supported.
rttMonCtrlAdminTable	

Table 3-55   CISCO-RTTMON-MIB Constraints (continued)

MIB Object	Notes
• rttMonCtrlAdminRttType	Supported values are: • echo(1) • pathEcho(2) • udpEcho(5) • tcpConnect(6) • http(7) • dns(8) • jitter(9) • ftp(12) All other values not supported.
rttMonEchoAdminTable • rttMonEchoAdminProtocol	 Supported values: • ipIcmpEcho(2) • ipUdpEchoAppl(3) • ipTcpConn(24) • httpAppl(25) • dnsAppl(26) • jitterAppl(27) • ftpAppl(30) All other values not supported.
rttMonScheduleAdminTable • rttMonScheduleAdminRttStartTime	 Before setting this object to a date/time value, make sure the ESR clock was set through the CLI **clock set** command. Otherwise, the scheduled RTT operation does not run.
rttMonHistoryCollectionTable	HTTP and Jitter types are not supported.

CISCO-SLB-EXT-MIB

The CISCO-SLB-EXT-MIB contains extensions to the Cisco server load-balancing (SLB) MIB (CISCO-SLB-MIB). Server load balancing enables the router to balance the processing of packets and connections from a number of other devices, such as real servers, firewalls, or caches. An SLB device determines how to handle incoming frames and connections according to the contents of the incoming data and various configuration options.

CISCO-SLB-MIB

The CISCO-SLB-MIB contains objects to manage server load-balancing (SLB) managers, such as those provided by the Cisco IOS SLB product. The MIB includes objects for the manager-side implementation of the Dynamic Feedback Protocol (DFP), which is used to obtain information about servers.

CISCO-SESS-BORDER-CTRLR-CALL-STATS-MIB

The CISCO-SESSION-BORDER-CONTROLLER-CALL-STATS-MIB defines the statistics information for Session Border Controller application. The statistic information is of two types:

- Call statistics
- Media statistics

CISCO-SESS-BORDER-CTRLR-EVENT-MIB

The CISCO-SESS-BORDER-CTRLR-EVENT-MIB defines the SNMP notifications, events, and alarms generated by Session Border Controller application, and sends these notifications to SNMP manager application. The various notification, events, and alarms generated by a SBC application can be:

- Change in the state of a configured SBC service.
- Change in the connection state with an adjacency or a radius server or H.248 controller attached to SBC, CPU or memory congestion, due to a large number of ongoing SIP/H.248 calls.
- Violation in the call policies configured for the current ongoing SIP/H.248 calls, when SBC application receives media (RTP/RTCP) packets from an unknown IP address or port.

CISCO-SESS-BORDER-CTRLR-STATS-MIB

The CISCO-SESS-BORDER-CTRLR-STATS-MIB contains objects to manage the statistics information for the Session Border Controller application. The statistics information is categorized into these types:

- RADIUS Messages Statistics—Represents the statistics of various RADIUS messages for the RADIUS servers with which the client (SBC) shares a secret.
- RF Billing Statistics—Represents the RF billing statistics information, which is used to monitor the messages sent per realm over the IMS Rx interface by the RF billing manager(SBC).

MIB Tables

Table 3-56 lists the tables in CISCO-SESS-BORDER-CTRLR-STATS-MIB.

Table 3-56   CISCO-SESS-BORDER-CTRLR-STATS-MIB Tables

MIB Table	Description
csbRadiusStatsTable	Maintains the RADIUS messages for the RADIUS servers.
csbRfBillRealmStatsTable	Maintains the RF billing statistics information.

Table 3-56   CISCO-SESS-BORDER-CTRLR-STATS-MIB Tables

MIB Table	Description
csbSIPMthdCurrentStatsTable	Contains the total number of SIP request and responses for each SIP method on a given adjacency for a specific interval.
csbSIPMthdHistoryStatsTable	Contains the historical count of SIP requests and responses for each SIP method on a SIP adjacency for the different intervals defined by the csbSIPMthdHistoryStatsInterval object.
csbSIPMthdRCCurrentStatsTable	Contains the SIP method request and response code statistics corresponding to the method and response code combination on a given adjacency for a specific interval.
csbSIPMthdRCHistoryStatsTable	Contains the historical data for the SIP method request and response code statistics corresponding to the method and response code on a given adjacency for a specific interval.

CISCO-SIP-UA-MIB

The CISCO-SIP-UA-MIB manages the Session Initiation Protocol (SIP) User Agents (UA). SIP is an application-layer signalling protocol for creating, modifying, and terminating multimedia sessions with one or more participants. A UA is an application that contains both a User Agent Client (UAC) and a User Agent Server (UAS). A UAC is an application that initiates a SIP request. A UAS is an application that contacts the corresponding user when a SIP request is received and returns a response on behalf of the user.

CISCO-SNMP-TARGET-EXT-MIB

The CISCO-SNMP-TARGET-EXT-MIB is an extension of the SNMP-TARGET-MIB specified in RFC2273.

CISCO-SONET-MIB

The CISCO-SONET-MIB contains objects to describe SONET/SDH interfaces on the router. This MIB is an extension to the standard SONET-MIB (RFC 2558). The CISCO-SONET-MIB has objects that provide additional SONET-related information not found in the SONET-MIB.

Note CISCO-SONET-MIB supports SONET traps that are seen when the linestatus, sectionstatus, pathstatus changes, and Notifications are enabled.

CISCO-SUBSCRIBER-SESSION-MIB

The CISCO-SUBSCRIBER-SESSION-MIB contains objects that describe the subscriber sessions terminated by a Remote Access Service (RAS).

MIB Tables

Table 3-57 lists the tables in CISCO-SUBSCRIBER-SESSION-MIB.

Table 3-57   CISCO-SUBSCRIBER-SESSION-MIB Tables

MIB Table	Description
csubSessionTable	Describes a list of subscriber sessions currently maintained by the system.
csubSessionByTypeTable	Sorts the subscriber sessions first by corresponding subscriber session type, and then by the ifIndex assigned to the corresponding subscriber session.
csubAggStatsTable	Contains sets of aggregated statistics pertaining to subscriber sessions, where each set has a unique scope of aggregation.
csubAggStatsIntTable	Contains aggregated subscriber session performance data collected for every 15-minute measurement intervals.
csubJobTable	Contains the subscriber session jobs submitted by the element management system (EMS) and network management system (NMS).
csubJobMatchParamsTable	Contains subscriber session job parameters that describe the match criteria.
csubJobQueryParamsTable	Contains subscriber session job parameters that describe the query parameters.
csubJobQueueTable	Lists the subscriber session jobs pending in the subscriber session job queue.
csubJobReportTable	Contains the reports corresponding to subscriber session jobs that have *query* as the csubJobType, and *finished* as the csubJobState.

MIB Constraints

Table 3-58 lists the constraints that the Cisco 4451-X ISR place on the objects in the CISCO-SUBSCRIBER-SESSION-MIB. Any MIB object that is not listed in this table is implemented as defined in the MIB.

Table 3-58   CISCO-SUBSCRIBER-SESSION-MIB Constraints

MIB Object	Notes
csubSessionByTypeTable	Not implemented.
csubAggStatsIntTable	Not implemented.
csubJobQueueTable	Not implemented.
csubSessionTable	
• csubSessionType	Read only. The pppSubscriber(3), pppoeSubscriber(4), ipInterfaceSubscriber(7), ipPktSubscriber(8), and ipDhcpv4Subscriber(9) types are supported.
• csubSessionAuthenticated	Read only.

Table 3-58   CISCO-SUBSCRIBER-SESSION-MIB Constraints (continued)

MIB Object	Notes
• csubSessionCreationTime	Read only.
• csubSessionAvailableIdentities	Read only.
• csubSessionSubscriberLabel	Read only.
• csubSessionMacAddress	Read only.
• csubSessionNativeVrf	Read only.
• csubSessionNativeIpAddrType	Read only.
• csubSessionNativeIpAddr	Read only.
• csubSessionNativeIpMask	Read only.
• csubSessionDomainVrf	Read only.
• csubSessionPbhk	Read only.
• csubSessionRemoteId	Read only.
• csubSessionCircuitId	Read only.
• csubSessionNasPort	Read only.
• csubSessionDomain	Read only.
• csubSessionUsername	Read only.
• csubSessionAcctSessionId	Read only.
• csubSessionProtocol	Read only. The IP(3) and PPP(5) values are supported.
• csubSessionLocationIdentifier	Read only.
• csubSessionServiceIdentifier	Read only.
• csubSessionLastChanged	Read only.
• csubSessionNativeIpAddrType2	Read only.
• csubSessionNativeIpAddr2	Read only.
• csubSessionNativeIpMask2	Read only.
• csubSessionIpAddrAssignment	Not implemented.
• csubSessionRedundancyMode	Not implemented.
• csubSessionDerivedCfg	Not implemented.
• csubSessionDnis	Not implemented.
• csubSessionMedia	Not implemented.
• csubSessionMlpNegotiated	Not implemented.
• csubSessionServiceName	Not implemented.
• csubSessionDhcpClass	Not implemented.
• csubSessionTunnelName	Not implemented.
csubAggStatsTable	Currently the scope of aggregation is limited to providing the statistics at the RAS level.
• csubAggStatsPendingSessions	Read only.
• csubAggStatsUpSessions	Read only.

Table 3-58 *CISCO-SUBSCRIBER-SESSION-MIB Constraints (continued)*

MIB Object	Notes
• csubAggStatsAuthSessions	Read only.
• csubAggStatsUnAuthSessions	Read only.
• csubAggStatsLightWeightSessions	Read only.
• csubAggStatsHighUpSessions	Read only.
• csubAggStatsAvgSessionUptime	Read only.
• csubAggStatsAvgSessionRPM	Read only.
• csubAggStatsAvgSessionRPH	Read only.
• csubAggStatsTotalFailedSessions	Read only.
• csubAggStatsTotalUpSessions	Read only.
• csubAggStatsTotalLightWeightSessions	Read only.
• csubAggStatsTotalFlowsUp	Read only.
• csubAggStatsCurrFlowsUp	Read only.
• csubAggStatsRedSessions	Not implemented.
• csubAggStatsThrottleEngagements	Not implemented.
• csubAggStatsTotalCreatedSessions	Not implemented.
• csubAggStatsTotalAuthSessions	Not implemented.
• csubAggStatsTotalDiscSessions	Not implemented.
• csubAggStatsDayCreatedSessions	Not implemented.
• csubAggStatsDayFailedSessions	Not implemented.
• csubAggStatsDayUpSessions	Not implemented.
• csubAggStatsDayAuthSessions	Not implemented.
• csubAggStatsDayDiscSessions	Not implemented.
• csubAggStatsCurrTimeElapsed	Not implemented.
• csubAggStatsCurrValidIntervals	Not implemented.
• csubAggStatsCurrInvalidIntervals	Not implemented.
• csubAggStatsCurrCreatedSessions	Not implemented.
• csubAggStatsCurrFailedSessions	Not implemented.
• csubAggStatsCurrUpSessions	Not implemented.
• csubAggStatsCurrAuthSessions	Not implemented.
• csubAggStatsCurrDiscSessions	Not implemented.
csubJobTable	
• csubJobId	Read only.
• csubJobStatus	The values, Not-In-Service and Not-Ready, are not supported.
• csubJobStorage	Read only.
• csubJobType	Read only.

Table 3-58 **CISCO-SUBSCRIBER-SESSION-MIB Constraints (continued)**

MIB Object	Notes
• csubJobControl	If the job is executing, the *abort* action is ignored.
• csubJobState	Read only.
• csubJobStartedTime	The sysuptime at the time of job start is measured in timeticks.
• csubJobFinishedTime	The sysuptime at the time of job start is measured in timeticks.
• csubJobFinishedReason	The value *insufficientResources* is returned if a job query is started without sufficient job match parameters.
csubJobMatchParamsTable	
• csubJobMatchParamsEntry	Read only.
• csubJobMatchIdentities	Read only.
• csubJobMatchSubscriberLabel	Read only.
• csubJobMatchMacAddress	Read only.
• csubJobMatchNativeVrf	Read only.
• csubJobMatchNativeIpAddrType	The job search based on IPv6 is not supported.
• csubJobMatchNativeIpAddr	Read only.
• csubJobMatchPbhk	Read only.
• csubJobMatchOtherParams	Not implemented.
• csubJobMatchDomainVrf	Not implemented.
• csubJobMatchRemoteId	Not implemented.
• csubJobMatchCircuitId	Not implemented.
• csubJobMatchNasPort	Not implemented.
• csubJobMatchUsername	Not implemented.
• csubJobMatchAccountingSid	Not implemented.
• csubJobMatchDomain	Not implemented.
• csubJobMatchDnis	Not implemented.
• csubJobMatchMedia	Not implemented.
• csubJobMatchMlpNegotiated	Not implemented.
• csubJobMatchProtocol	Not implemented.
• csubJobMatchServiceName	Not implemented.
• csubJobMatchDhcpClass	Not implemented.
• csubJobMatchTunnelName	Not implemented.
• csubJobMatchDanglingDuration	Not implemented.
csubJobQueryParamsTable	

Table 3-58 ***CISCO-SUBSCRIBER-SESSION-MIB Constraints (continued)***

MIB Object	Notes
• csubJobQueryResultingReportSize	• When the EMS or NMS sets the *jobcontrol* value to *release*, the job and the csubJobQueryResultingReportSize object become invalid. • The csubJobQueryParamsTable is created only when the jobfinished value becomes *normal*.
csubJobReportTable	
• csubJobReportId	Read only.
• csubJobReportSession	Read only.
csubJobFinishedNotifyEnable	Read-write.
csubJobIndexedAttributes	The supported indexed attributes are: • Subscriber Label • Mac Address • IP Address (IPv4 only) • Native VRF • Port-bundle Host Key (PBHK)

CISCO-SYSLOG-MIB

The CISCO-SYSLOG-MIB contains all system log messages generated by the Cisco IOS software. The MIB provides a way to access these syslog messages through SNMP. All Cisco IOS syslog messages contain the message name and its severity, message text, the name of the entity generating the message, and an optional time stamp. The MIB also contains a history of syslog messages and counts related to syslog messages.

Note   You can configure the Cisco 4451-X ISR to send syslog messages to a syslog server.

Note   The MIB does not keep track of messages generated from debug commands entered through the command-line interface (CLI).

CISCO-UNIFIED-FIREWALL-MIB

The CISCO-UNIFIED-FIREWALL-MIB contains status and performance statistics for Cisco firewall implementation. The Cisco 4451-X ISR platform only supports the statistics for the zone base firewall.

Note   Begining with Cisco IOS Release 3.6, the CISCO-UNIFIED-FIREWALL-MIB is supported on IPv6 networks.

MIB Tables

Table 3-58 lists the tables in CISCO-UNIFIED-FIREWALL-MIB.

CISCO-UNIFIED-FIREWALL-MIB Tables

MIB Table	Description
cufwConnSummaryTable	Contains information about the connection activity on the firewall for each layer3 and layer 4 protocols. Each entry in the table lists the connection summary of a distinct network protocol.
cufwAppConnSummaryTable	Contains firewall connections information for Layer 7 protocols. Each entry in the table lists the connection summary corresponding to a distinct application protocol.
cufwPolicyConnSummaryTable	Contains firewall connections information for layer3 and layer 4 protocols for each applied policy. Each entry in the table lists the connection summary of a distinct network protocol, configured on the specified target policy on the firewall.
cufwPolicyAppConnSummaryTable	Contains firewall connections information for Layer 7 protocols for each applied policy. Each entry in the table lists the connection summary of a distinct application protocol, configured on the specified target policy on the firewall.
cufwInspectionTable	Contains objects to identify whether or not an application protocol is configured for inspection. It also contains attributes to identify whether or not the specified protocol is currently being verified.
cufwUrlfServerTable	Lists the URL filtering servers configured on the managed devices and corresponding performance statistics.

MIB Constraints

Table 3-59 lists the constraints that your router places on CISCO-UNIFIED-FIREWALL-MIB.

Table 3-59   CISCO-UNIFIED-FIREWALL-MIB Constraints

MIB Object	Notes
cufwInspectionTable	Not supported.
cufwUrlfServerTable	Not supported.
cuFwConnectionGlobalsTable	
• cufwConnGlobalNumSetupsAborted	Not supported, default value set to zero.
• cufwConnGlobalNumPolicyDeclined	Not supported, default value set to zero.
• cufwConnGlobalNumResDeclined	Not supported, default value set to zero.
• cufwConnGlobalNumExpired	Not supported, default value set to zero.
• cufwConnGlobalNumAborted	Not supported, default value set to zero.
• cufwConnGlobalNumEmbryonic	Not supported, default value set to zero.
• cufwConnGlobalNumRemoteAccess	Not supported, default value set to zero.

Table 3-59   CISCO-UNIFIED-FIREWALL-MIB Constraints (continued)

MIB Object	Notes
• cufwConnGlobalConnSetupRate1	The number of sessions created in the last minute.
• cufwConnGlobalConnSetupRate5	The number of sessions created in the last five minutes.
cufwConnSummaryTable	
• cufwConnNumSetupsAborted	Not supported, default value set to zero.
• cufwConnNumPolicyDeclined	Not supported, default value set to zero.
• cufwConnNumResDeclined	Not supported, default value set to zero.
• cufwConnNumAborted	Not supported, default value set to zero.
• cufwConnSetupRate1	The number of sessions created in the last minute.
• cufwConnSetupRate5	The number of sessions created in the last five minutes.
cufwAppConnSummaryTable	
• cufwAppConnNumSetupsAborted	Not supported, default value set to zero.
• cufwAppConnNumPolicyDeclined	Not supported, default value set to zero.
• cufwAppConnNumPolicyDeclined	Not supported, default value set to zero.
• cufwAppConnNumAborted	Not supported, default value set to zero.
• cufwAppConnSetupRate1	The number of sessions created in the last minute.
• cufwAppConnSetupRate5	The number of sessions created in the last five minutes.
cufwPolicyConnSummaryTable	
• cufwPolConnNumSetupsAborted	Not supported, default value set to zero.
• cufwPolConnNumPolicyDeclined	Not supported, default value set to zero.
• cufwPolConnNumResDeclined	Not supported, default value set to zero.
• cufwPolConnNumAborted	Not supported, default value set to zero.
cufwPolicyAppConnSummaryTable	
• cufwPolAppConnNumSetupsAborted	Not supported, default value set to zero.
• cufwPolAppConnNumPolicyDeclined	Not supported, default value set to zero.
• cufwPolAppConnNumResDeclined	Not supported, default value set to zero.
• cufwPolAppConnNumAborted	Not supported, default value set to zero.

CISCO-TAP2-MIB

The CISCO-TAP2-MIB manages Cisco intercept feature. This MIB replaces CISCO-TAP-MIB. This MIB defines a generic stream table that contains fields common to all intercept types. Specific intercept filters are defined in the following extension MIBs:

- CISCO-IP-TAP-MIB for IP intercepts
- CISCO-802-TAP-MIB for IEEE 802 intercepts

• CISCO-USER-CONNECTION-TAP-MIB for RADIUS-based user connection intercepts.

MIB Constraints

Table 3-60 lists the constraints that your router places on CISCO-TAP2-MIB.

Table 3-60   CISCO-TAP2-MIB Constraints

MIB Object	Notes
cTap2MediationRtcpPort	Not supported.
cTap2MediationRetransmitType	Not supported.
cTap2MediationTransport	Only udp(1) is supported.

CISCO-TAP-MIB

The CISCO-TAP-MIB contains objects to manage Cisco intercept feature.

CISCO-UBE-MIB

The CISCO-UBE-MIB contains objects to manage the Cisco Unified Border Element (CUBE), which is a Cisco IOS Session Border Controller (SBC) that interconnects independent voice over IP (VoIP) and video over IP networks for data, voice, and video transport.

CISCO-USER-CONNECTION-TAP-MIB

The CISCO-USER-CONNECTION-TAP-MIB is a filter MIB that provides the functionality to manage the Cisco intercept feature for user connections. This MIB is used along with the CISCO-TAP2-MIB to intercept and filter user traffic. To create a user connection intercept, an entry named cuctTapStreamEntry is created in the CISCO-USER-CONNECTION-TAP-MIB. This entry contains the filtering information.

CISCO-VLAN-IFTABLE-RELATIONSHIP-MIB

The CISCO-VLAN-IFTABLE-RELATIONSHIP-MIB contains VLAN-ID and ifIndex information for each routed virtual LAN (VLAN) interface on the router. A routed VLAN interface is the router interface or subinterface to which you attach the IP address used by the router on the VLAN. The MIB maps each VLAN-ID to an ifIndex, which you can use to access the ipRouteTable to obtain the routing configuration for the routed VLAN interface.

CISCO-VLAN-MEMBERSHIP-MIB

The CISCO-VLAN-MEMBERSHIP-MIB provides management functions for the VLAN membership within the framework of Cisco VLAN Architecture, Version 2.0. The MIB provides information on VLAN Membership Policy Servers used by a device and VLAN membership assignments of non-trunk bridge ports of the device.

Note This MIB is not supported on Cisco 4451-X ISR.

CISCO-VPDN-MGMT-MIB

The CISCO-VPDN-MGMT-MIB provides operational information about the Virtual Private Dialup Network (VPDN) feature on the router. You can use the MIB to monitor VPDN tunnel information on the router, but you cannot use the MIB to configure VPDN.

VPDN enables the router to forward Point-to-Point Protocol (PPP) traffic between an Internet service provider (ISP) and a home gateway. The CISCO-VPDN-MGMT-MIB includes several tables that contain VPDN tunneling information:

- cvpdnSystemTable—Provides system-wide VPDN information.
- cvpdnTunnelAttrTable—Provides information about each active tunnel.
- cvpdnSessionAttrTable—Provides information about each active session within each tunnel.
- cvpdnUserToFailHistInfoTable—Provides information about the last failure that occurred for each tunnel user.
- cvpdnTemplateTable—Identifies each VPDN template and indicates the number of active sessions associated with the template. See Table 3-61 for information about template name restrictions and and their effect on SNMP.

MIB Constraints

The CISCO-VPDN-MGMT-MIB contains read-only information. In addition, the MIB objects in Table 3-61 have been deprecated. Although currently supported, their use is being phased out and we recommend that you use the replacement object instead.

Table 3-61   *CISCO-VPDN-MGMT-MIB Constraints*

MIB Object	Notes
cvpdnTunnelTotal	Replaced by cvpdnSystemTunnelTotal.
cvpdnSessionTotal	Replaced by cvpdnSystemSessionTotal.
cvpdnDeniedUsersTotal	Replaced by cvpdnSystemDeniedUsersTotal.
cvpdnTunnelTable	Replaced by cvpdnTunnelAttrTable.

Table 3-61   CISCO-VPDN-MGMT-MIB Constraints (continued)

MIB Object	Notes
cvpdnTunnelSessionTable	Replaced by cvpdnSessionAttrTable.
cvpdnTemplateTable	SNMP limits the size of VPDN template names to 128 characters. If any template name in the cvpdnTemplateTable exceeds this length, you cannot use an SNMP getmany request to retrieve any table entries. Instead, you must use individual getone requests to retrieve each template name (cvpdnTemplateName) that does not exceed 128 characters.

Note   CISCO-VPDN-MGMT-MIB does not support L2TPv3.

CISCO-VOICE-ANALOG-IF-MIB

The CISCO-VOICE-ANALOG-IF-MIB provides the standard configuration, timing parameters, telephony hook, and ring status information on the Cisco Analog Voice interface implementation. This MIB manages the following groups:

- Analog interface general group
- E&M (recEive and transMit) interface group
- FXO (Foreign Exchange Office) interface group
- FXS (Foreign Exchange Station) interface group

Note   This MIB is not supported on Cisco 4451-X ISR.

CISCO-VOICE-COMMON-DIAL-CONTROL-MIB

The CISCO-VOICE-COMMON-DIAL-CONTROL-MIB contains voice-related objects that are common across more than one network encapsulation, such as VoIP, Voice over ATM (VoATM), and Voice over Frame Relay (VoFR).

CISCO-VOICE-DIAL-CONTROL-MIB

The CISCO-VOICE-DIAL-CONTROL-MIB module enhances the IETF Dial Control MIB (RFC2128) by providing the management of voice telephony peers on both a circuit-switched telephony networks and IP data networks.

CISCO-VOICE-IF-MIB

The CISCO-VOICE-IF-MIB managerial the common voice-related parameters for both voice analog and Integrated Services Digital Network (ISDN) interfaces.

> **Note**   This MIB is not supported on Cisco 4451-X ISR.

CISCO-VOIP-TAP-MIB

The CISCO-VOIP-TAP-MIB module defines the objects to manage the Intercept feature for Voice over IP (VoIP). This MIB is used along with CISCO-TAP2-MIB to intercept the VoIP control and data traffic.

DIAL-CONTROL-MIB (RFC 2128)

The DIAL-CONTROL-MIB (RFC 2128) contains peer information for demand access.

DS1-MIB (RFC 2495)

The DS1-MIB(RFC-2495) contains a description of the DS1, E1, DS2, and E2 interface objects.

MIB Constraints

Table 3-62 describes the constraints that your router places on the objects in the DS1-MIB. For detailed definitions of the MIB objects, see the corresponding MIB.

Table 3-62   DS1-MIB Constraints

MIB Object	Notes
dsx1ConfigTable	
• dsx1LineStatusChangeTrapEnable	Read only. This MIB object cannot be set through SNMP. The **snmp-server enable traps ds1** command can be used to enable status change traps.
• dsx1Channelization	Read only.
• dsx1LineLength	Read only.
• dsx1LineType	Read only.
• dsx1LineCoding	Read only.
• dsx1SendCode	Read only.
• dsx1CircuitIdentifier	Read only.
• dsx1LoopbackConfig	Read only.

Table 3-62   DS1-MIB Constraints (continued)

MIB Object	Notes
• dsx1SignalMode	Read only or SPA-8XCHT1/E1 usage is always none(1).
• dsx1TransmitClockSource	Read only.
• dsx1Fdl	Read only.
• dsx1LoopbackStatus	SPA-8XCHT1/E1 usage: Payload loopbacks are not supported (dsx1NearEndPayloadLoopback, dsx1FarEndPayloadLoopback).
dsx1FracTable	Not implemented.
dsx1FarEndIntervalTable	Not implemented.

DS3-MIB (RFC 2496)

The DS3-MIB(RFC-2496) contains a description of the DS3 and E3 interface objects.

MIB Constraints

Table 3-63 lists the constraints that the Cisco 4451-X ISR places on the objects in the RFC1407-MIB. Objects that are not listed in the table are implemented as defined in the RFC 1407-MIB.

Table 3-63   DS3-MIB Constraints

MIB Object	Notes
dsx3ConfigTable	
• dsx3LineType	Supported values are:
	• T3 supports dsx3M23(2) and dsx3CbitParity(4).
	• E3 supports e3Framed(7) and e3Plcp(8).
• dsx3LineCoding	Read only. Supported values are:
	• T3 supports dsx3B3ZS(2).
	• E3 supports e3HDB3(3).
• dsx3SendCode	Read only. Supports only dsx3SendNoCode
• dsx3TransmitClockSource	Supported values are loopTiming(1) and localTiming(2).
• dsx3CircuitIdentifier	Read only.
• dsx3LoopbackConfig	Read only.
dsx3FarEndConfigTable	Not implemented.
dsx3FarEndCurrentTable	Not implemented.
dsx3FarEndIntervalTable	Not implemented.
dsx3FarEndTotalTable	Not implemented.

Table 3-63   DS3-MIB Constraints (continued)

MIB Object	Notes
dsx3FracTable	Not implemented.

Notes

All T3/ATM line cards only support read-only values on all variables.

Currently for the dsx3FracTable to operate, the DS1 layer must be implemented in the ifTable. In this release, this table is shown as not implemented because no rows are instantiated.

ENTITY-MIB (RFC 4133)

The ENTITY-MIB (RFC 4133) allows functional component discovery. It is used to represent physical and logical entities (components) in the router and manages those entities. The current software release supports the RFC 4133 version of this MIB.

The following are the conformance groups contained in the ENTITY-MIB:

- entityPhysical group—Describes the physical entities managed by a single agent.

- entityLogical group—Describes the logical entities managed by a single agent.

- entityMapping group—Describes the associations between the physical entities, logical entities, interfaces, and non-interface ports managed by a single agent.

- entityGeneral group—Describes general system attributes shared by potentially all types of entities managed by a single agent.

- entityNotifications group—Contains status indication notifications.

The following groups are added from RFC 4133:

- entityPhysical2 group—This group augments the entityPhysical group.

- entityLogical2 group—Describes the logical entities managed by a single agent, and replaces entityLogical group.

The MIB table entPhysicalTable identifies the physical entities in the router. The entPhysicalTable contains a single row for the Cisco 4451-X ISR chassis and a row for each entity in the chassis. A physical entity may contain other entities. For example:

```
entPhysicalDescr.7000 = Cisco ISR4451 Route Processor
entPhysicalContainedIn.7000 = 1
entPhysicalDescr.7001 = Temp: Inlet 1
entPhysicalContainedIn.7001 = 7000
entPhysicalDescr.7002 = Temp: Inlet 2
entPhysicalContainedIn.7002 = 7000
entPhysicalDescr.7003 = Temp: Outlet 1
entPhysicalContainedIn.7003 = 7000
entPhysicalDescr.7004 = Temp: Outlet 2
entPhysicalContainedIn.7004 = 7000
entPhysicalDescr.7005 = Temp: core-A
entPhysicalContainedIn.7005 = 7000
entPhysicalDescr.7006 = Temp: core-B
entPhysicalContainedIn.7006 = 7000
entPhysicalDescr.7007 = Temp: core-C
entPhysicalContainedIn.7007 = 7000
entPhysicalDescr.7008 = V: 12v
entPhysicalContainedIn.7008 = 7000
entPhysicalDescr.7009 = V: 5v
entPhysicalContainedIn.7009 = 7000
entPhysicalDescr.7010 = V: 3.3v
```

```
entPhysicalContainedIn.7010 = 7000
entPhysicalDescr.7011 = V: 3.0v
entPhysicalContainedIn.7011 = 7000
entPhysicalDescr.7012 = V: 2.5v
entPhysicalContainedIn.7012 = 7000
entPhysicalDescr.7013 = V: 1.05v
entPhysicalContainedIn.7013 = 7000
entPhysicalDescr.7014 = V: 1.8v
entPhysicalContainedIn.7014 = 7000
entPhysicalDescr.7015 = V: 1.2v
entPhysicalContainedIn.7015 = 7000
entPhysicalDescr.7016 = V: Vcore-C
entPhysicalContainedIn.7016 = 7000
entPhysicalDescr.7017 = V: 1.1v
entPhysicalContainedIn.7017 = 7000
entPhysicalDescr.7018 = V: 1.0v
entPhysicalContainedIn.7018 = 7000
entPhysicalDescr.7019 = V: 1.8v-A
entPhysicalContainedIn.7019 = 7000
entPhysicalDescr.7020 = V: 1.5v-A
entPhysicalContainedIn.7020 = 7000
entPhysicalDescr.7021 = V: 1.5v-C1
entPhysicalContainedIn.7021 = 7000
entPhysicalDescr.7022 = V: 1.5v-B
entPhysicalContainedIn.7022 = 7000
entPhysicalDescr.7023 = V: Vcore-A
entPhysicalContainedIn.7023 = 7000
entPhysicalDescr.7024 = V: 1.5v-C2
entPhysicalContainedIn.7024 = 7000
entPhysicalDescr.7025 = V: Vcore-B1
entPhysicalContainedIn.7025 = 7000
entPhysicalDescr.7026 = V: Vcore-B2
entPhysicalContainedIn.7026 = 7000
entPhysicalDescr.7027 = V: 0.75v-B
entPhysicalContainedIn.7027 = 7000
entPhysicalDescr.7028 = V: 0.75v-C
entPhysicalContainedIn.7028 = 7000
entPhysicalDescr.7029 = I: 12v
entPhysicalContainedIn.7029 = 7000
entPhysicalDescr.7030 = P: pwr
entPhysicalContainedIn.7030 = 7000
entPhysicalDescr.7035 = CPU 0 of module R0
entPhysicalContainedIn.7035 = 7000
entPhysicalDescr.7036 = USB Port
entPhysicalContainedIn.7036 = 7000
entPhysicalDescr.7038 = USB Port
entPhysicalContainedIn.7038 = 7000
```

For the Cisco 4451-X ISR, the entPhysicalParentRelPos are populated with the slot numbers (except for the RP, ESP, and PEM slot numbers) given in the external label. Table 3-64 lists the mapping between external label and entPhysicalParentRelPos.

Table 3-64   Mapping the External Label to the entPhysicalParentRelPos Value

Type	External Label	Value
SM/NIM Container	0 to 2	0 to 2 match the external label.
RP	R0	6 for R0.
FP	F0	8 for F0
Power Supply	0 and 1	9 for P0 and10 P1

Table 3-64   *Mapping the External Label to the entPhysicalParentRelPos Value (continued)*

Type	External Label	Value
CPU		Starts from 0.
QFP		Starts from 0.
Crypto ASIC Module of FP		Starts from 0.

Table 3-65 lists the values of the affected MIB table objects in the Cisco 4451-X ISR:

Table 3-65   *Affected MIB Objects in a Cisco 4451-X ISR*

Type	External Label	Value
entPhysicalContainedIn	RP Module	entPhysicalIndex of Chassis.
	ESP Module	entPhysicalIndex of Chassis.
	SM/NIM Controller	entPhysicalIndex of Chassis.
	SM Module x/y	entPhysicalIndex of NIM subslot/SM slot.
	Fan Assembly	Fan Tray Bay
entPhysicalIsFRU	RP Module	false(2)
	ESP Module	false(2)
	SM/NIM Controller	false(2)
	SM Module x/y	true(1)
	Fan Assembly	true(1)
entPhysicalParentRelPos	RP Module	6
	ESP Module	8
	SM/NIM Controller	from 0
	SM Module x/y	from 0
	Fan Assembly	0

Table 3-66 lists the fans supported on a Cisco 4451-X ISR.

0

Table 3-66   *Fans Supported on a Cisco 4451-X ISR*

Module	Number of Fans
Power Supply	1
Fan Tray/Fan Assembly	4

MIB Constraints

Table 3-67 lists the constraints that your router places on the objects in the ENTITY-MIB.

Table 3-67   ENTITY-MIB Constraints

MIB Object	Notes
entPhysicalSoftwareRev	Supported for RP, FP, SM/NIM Controller, SM and NIMs.
entPhysicalAssetId	Not supported
entPhysicalFirmwareRev	Not supported
entPhysicalHardwareRev	
entPhysicalSerialNum	Implemented as Readonly.
entPhysicalModelName	Not implemented for USB and Hard disk.
entPhysicalMfgName	Not implemented for USB and Hard disk.
entPhysicalUris	Implemented as Read only.
entPhysicalAlias	Not supported for transceiver modules, USB and Hard disk. Implemented only as read-write for the following entPhysicalClass entities: • Chassis • Powersupply • Module
entPhysicalMfgDate	Not implemented.

ENTITY-SENSOR-MIB (RFC 3433)

The ENTITY-SENSOR-MIB (RFC 3433) contains objects that manage physical sensors, which are represented in the Entity-MIB with entPhysicalEntry and an entPhysicalClass value of sensor(8). The ENTITY-SENSOR-MIB contains a single table called the entPhySensorTable.

Note   The sensor support is provided for the power supply, fan, RP, transceivers, PVDM4-MB-240, SM-1T3/E3, and SM-ES3X-24-P.

ENTITY-STATE-MIB

The ENTITY-STATE-MIB defines objects to extend the functionality provided by the ENTITY-MIB. This MIB supports the entities having these entPhysicalClass values:

• chassis

• container (Slot container, SPA container, PS bay, and Transceiver Container)

• module

• powerSupply

• fan

MIB Constraints

Table 3-68 lists the constraints that your router places on the objects in the ENTITY-STATE-MIB.

Table 3-68   ENTITY-STATE-MIB Constraints

MIB Object	Notes
entStateAlarm	Valid values are: • critical • major • minor • warning These values indicate the CISCO-ENTITY-ALARM-MIB alarm types.
entStateAdmin	Read only.

Note   Power supply and fan alarms are generated on either the Power Entry Module or Fan Tray module. Therefore no alarm is generated on the entStateAlarm associated with either the power supply or the fan.

ETHER-WIS (RFC 3637)

The ETHER-WIS (RFC 3637) MIB contains objects to manage application details for the Ethernet WAN Interface Sublayer (WIS).

Note   This MIB is not supported on Cisco 4451-X ISR.

MIB Constraints

Table 3-69 lists the constraints that your router places on the objects in the ETHER-WIS (RFC 3637) MIB.

Table 3-69   ETHER-WIS (RFC 3637) MIB Constraints

MIB Object	Note
etherWisDeviceTable	Not supported.
etherWisSectionCurrentTable	Not supported.
etherWisFarEndPathCurrentTable	Not supported.

Note   WAN-PHY is not fully compliant with the SONET/SDH optical and electrical specifications.

Note   SONET layer is not modelled for the Ethernet WIS port.

ETHERLIKE-MIB (RFC 3635)

The ETHERLIKE-MIB contains objects to manage Ethernet-like interfaces.

MIB Constraints

Table 3-70 lists the constraints that your router places on the objects in the ETHERLIKE-MIB. Any objects not listed in a table are implemented as defined in the MIB.

Table 3-70   *ETHERLIKE-MIB Constraints*

MIB Object	Notes
dot3CollTable	Not implemented.
dot3ControlTable	Not implemented.
dot3Control	Not implemented.
dot3PauseAdminMode	Read only.

EVENT-MIB (RFC 2981)

The EVENT-MIB (RFC 2981) contains objects to define event triggers and actions for network management purposes.

EXPRESSION-MIB

The EXPRESSION-MIB (RFC 2982) contains objects to define the expressions of MIB objects for network management purposes.

FRAME-RELAY-DTE-MIB (RFC1315-MIB)

The FRAME-RELAY-DTE-MIB (RFC1315-MIB) contains objects to manage a Frame Relay data terminal equipment (DTE) interface, which consists of a single physical connection to the network with many virtual connections to other destinations and neighbors. The MIB contains the objects used to manage:

- The Data Link Connection Management Interface (DLCMI)
- Virtual circuits on each Frame Relay interface
- Errors detected on Frame Relay interfaces

MIB Constraints

Table 3-71 lists the constraints that the router places on the objects in the RFC1315-MIB.

Table 3-71   FRAME-RELAY-DTE-MIB Constraints

MIB Object	Notes
frDlcmiTable	
• frDlcmiAddress	Always q922November90(3), which indicates a 10-bit DLCI.
• frDlcmiAddressLen	Always two-octets(2).
frCircuitTable	
• frCircuitCommittedBurst	Normally, the QoS configuration entered through the Modular QoS CLI (MQC) syntax does not appear in these frCircuitTable objects.
• frCircuitExcessBurst	However, when QoS is configured through the MQC and the following conditions are met, these frCircuitTable objects contain the QoS values as they are entered through the MQC:
• frCircuitThroughput	• The default class is configured on the policy-map only.
	• An output policy is attached to the Frame Relay (FR) Permanent Virtual Circuit (PVC).
	• The Cisco class-based-QoS (CBQ) enhancement only supports two MQC actions: police cir and shape.
	• If both police cir and shape actions exist, then the FR traffic-shaping QoS takes precedence before policing.
frCircuitState	
• frErrTable	Not supported.

HC-ALARM-MIB

The HC-ALARM-MIB defines Remote Monitoring MIB extensions for High Capacity Alarms.

MIB Tables

Table 3-71 lists the tables in HC-ALARM-MIB.

HC-ALARM-MIBTables

MIB Table	Description
hcAlarmTable	A list of entries for the configuration of high capacity alarms.

HC-RMON-MIB

The HC-RMON- MIB augments the original RMON MIB as specified in RFC 1757 and RFC 1513, and RMON2 MIB as specified in RFC 2021. It manages the remote monitoring device implementations.

IEEE8023-LAG-MIB

The IEEE 8023-LAG- MIB is the Link Aggregation module for managing IEEE Std 802.3ad.

IF-MIB (RFC 2863)

The IF-MIB (RFC 2863) describes the attributes of physical and logical interfaces (network interface sublayers). The router supports the ifGeneralGroup of MIB objects for all layers (ifIndex, ifDescr, ifType, ifSpeed, ifPhysAddress, ifAdminStatus, ifOperStatus, ifLastChange, ifName, ifLinkUpDownTrapEnable, ifHighSpeed, and ifConnectorPresent).

Note   This MIB is not supported on Cisco 4451-X ISR.

One of the most commonly used identifiers in SNMP-based network management applications is the Interface Index (ifIndex) value. IfIndex is a unique identifying number associated with a physical or logical interface.

- The IF-MIB supports the Circuit Emulation (CEM) only on the SPA-1CHOC3-CE-ATM. For each controller, only a single CEM interface is supported bacause it is being used for l1/l2 forwarding.

- Multiple sublayers are not supported for the SPA-1CHOC3-CE-ATM from SNMP. Hence, the layers corresponding to digital signal layer 1 (DS1), Synchronous Transport Signal (STS), and Virtual Tributary (VT) are not modeled for the CE interface.

MIB Constraints

Table 3-72 lists the constraints that your router places on the objects in the IF-MIB.

Table 3-72   IF-MIB Constraints

MIB Object	Notes
ifOutErrors	Not supported for ATM subinterfaces.
ifPromiscuousMode	Read only.
ifStackStatus	Read only.

IGMP-STD-MIB (RFC 2933)

The IGMP-STD-MIB(RFC 2933) manages Internet Group Management Protocol (IGMP).

IP-FORWARD-MIB (RFC 4292)

The IP-FORWARD-MIB (RFC 4292) contains objects to control the display of Classless Interdomain Routing (CIDR) multipath IP Routes.

MIB Constraints

Table 3-73 lists the constraints that your router places on the objects in the IP-FORWARD-MIB.

Table 3-73   IP-FORWARD-MIB Constraints

MIB Object	Notes
inetCidrRouteTable	Implemented for IPv6 only.

IP-MIB (RFC 4293)

The IP-MIB (RFC 4293) module contains objects for managing IP and Internet Control Message Protocol (ICMP) implementations, but excluding their management of IP routes.

MIB Constraints

Table 3-74 lists the constraints that your router places on the objects in the IP-MIB.

Table 3-74   IP-MIB Constraints

MIB Object	Notes
ipDefaultRouterTable	Implemented for IPv6 only.
ipIfStatsTableLastChange	Implemented for IPv6 only.

Table 3-74   IP-MIB Constraints (continued)

MIB Object	Notes
ipIfStatsTable	Implemented for IPv6 only.
ipSystemStatsTable	Implemented for IPv6 only
ipv4InterfaceTableLastChange	Not Implemented.
ipv4InterfaceTable	Not Implemented.
ipAddressPrefixTable	Implemented for IPv6 only.
ipAddressTable	Implemented for IPv6 only.
ipNetToPhysicalTable	Implemented for IPv6 only.
icmpStatsTable	Implemented for IPv6 only.
icmpMsgStatsTable	Implemented for IPv6 only.

IPMROUTE-STD-MIB (RFC 2932)

The IPMROUTE-STD-MIB (RFC 2932) contains objects to manage IP multicast routing, but independent of the specific multicast routing protocol in use.

MIB Constraints

Table 3-75 lists the constraints that your router places on the objects in the IPMROUTE-STD-MIB.

Table 3-75   IPMROUTE-STD-MIB Constraints

MIB Object	Notes
ipMRouteScopeNameTable	Not implemented.
ipMRouteEnable	Read only.
ipMRouteInterfaceTtl	Read only.
ipMRouteInterfaceRateLimit	Read only.

MPLS-L3VPN-STD-MIB (RFC 4382)

The MPLS-L3VPN-STD-MIB contains managed object definitions for the Layer-3 Multiprotocol Label Switching Virtual Private Networks. This MIB is based on RFC 4382 specification.

MPLS-LDP-GENERIC-STD-MIB (RFC 3815)

The MPLS-LDP-GENERIC-STD-MIB (RFC 3815) contains managed object definitions for configuring and monitoring the Multiprotocol Label Switching (MPLS), Label Distribution Protocol (LDP), utilizing ethernet as the Layer 2 media.

MPLS-LDP-STD-MIB (RFC 3815)

The MPLS-LDP-STD-MIB (RFC 3815) contains managed object definitions for the Multiprotocol Label Switching (MPLS) and Label Distribution Protocol (LDP) document.

MPLS-LSR-STD-MIB (RFC 3813)

The MPLS-LSR-STD-MIB (RFC 3031) contains managed object definitions for the Multiprotocol Label Switching (MPLS) router.

MPLS-TE-MIB

The MPLS-TE-MIB enables the Cisco 4451-X ISR to perform traffic engineering for MPLS tunnels. The MIB is based on Revision 05 of the IETF MPLS-TE-MIB.

Traffic engineering support for MPLS tunnels requires the following configuration:

- Setting up MPLS tunnels with appropriate configuration parameters.
- Configuring tunnel loose and strict source routed hops.

MIB Constraints

Table 3-75 lists the constraints that your router places on the objects in the MPLS-TE-MIB.

MPLS-TE-MIB Constraints

MIB Object	Notes
mplsTunnelIndexNext	Read only. Always 0.
mplsTunnelTable	
• mplsTunnelName	Read only.
• mplsTunnelDescr	Read only.
• mplsTunnelIsif	Read only.
• mplsTunnelXCPointer	Read only.
• mplsTunnelSignallingProto	Read only.
• mplsTunnelSetupPrio	Read only. Always 7.
• mplsTunnelHoldingPrio	Read only. Always 7.
• mplsTunnelSessionAttributes	Read only.
• mplsTunnelOwner	Read only.
• mplsTunnelLocalProtectInUse	Read only. Always false(2).
• mplsTunnelResourcePointer	Read only.
• mplsTunnelInstancePriority	Read only. Always 0.
• mplsTunnelHopTableIndex	Read only.

MPLS-TE-MIB Constraints (continued)

MIB Object	Notes
• mplsTunnelIncludeAnyAffinity	Read only. Always 0.
• mplsTunnelIncludeAllAffinity	Read only.
• mplsTunnelExcludeAllAffinity	Read only.
• mplsTunnelPathInUse	Read only.
• mplsTunnelRole	Read only.
• mplsTunnelTotalUpTime	Read only.
• mplsTunnelInstanceUpTime	Read only. Always 0.
• mplsTunnelAdminStatus	Read only.
• mplsTunnelRowStatus	Read only. Always readOnly(5).
• mplsTunnelStorageType	Read only. Volatile(2). Always active.
mplsTunnelHopListIndexNext	Read only. Always 0.
mplsTunnelHopTable	
• mplsTunnelHopAddrType	Read only. Always ipv4(1).
• mplsTunnelHopIpv4Addr	Read only.
• mplsTunnelHopIpv4PrefixLen	Read only. Always 32.
• mplsTunnelHopIpv6Addr	Read only. NULL.
• mplsTunnelHopIpv6PrefixLen	Read only. Always 0.
• mplsTunnelHopAsNumber	Read only.
• mplsTunnelHopLspId	Read only.
• mplsTunnelHopType	Read only. Always strict(1).
• mplsTunnelHopRowStatus	Read only. Always active(1).
• mplsTunnelHopStorageType	Read only. Value is readOnly(5).
mplsTunnelResourceIndexNext	Read only. Always 0.
mplsTunnelResourceTable	
• mplsTunnelResourceMaxRate	Read only.
• mplsTunnelResourceMeanRate	Read only.
• mplsTunnelResourceMaxBurstSize	Read only.
• mplsTunnelResourceRowStatus	Read only. Always active(1).

MPLS-TE-MIB Constraints (continued)

MIB Object	Notes
• mplsTunnelResourceStorageType	Read only. Value is readOnly(5).

Notes:

The mplsTunnelTable allows new MPLS tunnels to be created between an MPLS LSR and a remote endpoint and existing tunnels to be reconfigured or removed. The Cisco 4451-X ISR support point-to-point tunnel segments, although multipoint-to-point and point-to-multipoint connections are supported by an LSR acting as a cross-connect. Each MPLS tunnel can have one out-segment originating at an LSR and one in-segment terminating at that LSR. The mplsTunnelTable is enhanced by the mplsTunnelPerfTable that provides several counters to measure the performance of the MPLS tunnels.

The mplsTunnelResourceTable indicates the resources required for a tunnel. Multiple tunnels can share the same resources by pointing to the same entry in this table. Tunnels that do not share resources must point to separate entries in this table.

The mplsTunnelHopTable indicates strict or loose hops for an MPLS tunnel defined in mplsTunnelTable when you establish the hop using signaling. Multiple tunnels share the same hops by pointing to the same entry in this table. Each row also has a secondary index, mplsTunnelHopIndex, corresponding to the next hop of this tunnel. The scalar mplsTunnelMaxHops indicates the maximum number of hops that you can specify on each tunnel supported by this LSR. The mplsTunnelARHopTable indicates the actual hops crossed by a tunnel as reported by the MPLS signaling protocol after the tunnel is set up.

There are three notifications in this MIB. The notifications mplsTunnelUp and mplsTunnelDown indicate that the value of mplsTunnelOperStatus has transitioned to up(1) or down(2). The notification mplsTunnelRerouted is generated when a tunnel is rerouted or re-optimized.

MPLS-TE-STD-MIB

The MPLS-TE-STD-MIB contains managed object definitions for Multiprotocol Label Switching Traffic Engineering (MPLS-TE).

MPLS-VPN-MIB

The MPLS-VPN-MIB:

- Describes managed objects for modeling a Multiprotocol Label Switching/Border Gateway Protocol virtual private network
- Configures and monitors routes and route targets for each VRF instance on a router
- Facilitates provisioning VPN Routing and Forwarding (VRF) instances on MPLS interfaces
- Measures the performance of MPLS/BGP VPNs

The MIB is based on Revision 05 of the IETF MPLS-VPN-MIB.

MIB Constraints

Table 3-76 lists the constraints that your router places on the objects in the MPLS-VPN-MIB.

Table 3-76   MPLS-VPN-MIB Constraints

MIB Object	Notes
mplsNumVrfSecViolationThreshExceeded	Not implemented.
mplsVpnVrfSecTable	
• mplsVpnVrfSecIllegalLabelViolations	Read only. Always 0.
• mplsVpnVrfSecIllegalLabelRcvThresh	Read only. Always 0.
mplsVpnVrfTable	
• mplsVpnVrfConfRowStatus	Read only.
• mplsVpnVrfConfStorageType	Read only. Volatile(2).
• mplsVpnVrfConfMidRouteThreshold	Read only.
• mplsVpnVrfConfHighRouteThreshold	Read only.
• mplsVpnVrfConfMaxRoutes	Read only.
• mplsVpnVrfConfMaxPossibleRoutes	Read only. Always 0.
• mplsVpnVrfDescription	Read only.
• mplsVpnInterfaceVpnClassification	Read only.
mplsVpnInterfaceConfTable	
• mplsVpnInterfaceConfStorageType	Read only. Volatile(2).
• mplsVpnInterfaceConfRowStatus	Read only. Values: active(1), notInService(2).
• mplsVpnInterfaceLabelEdgeType	Read only. providerEdge(1).
mplsVpnVrfRouteTargetTable	
• mplsVpnVrfRouteTargetRowStatus	Read only. Values: active(1), notInService(2).
mplsVpnVrfBgpNbrAddrTable	
• mplsVpnVrfBgpNbrRowStatus	Read only. Values: active(1), notInService(2).
• mplsVpnVrfBgpNbrRole	Read only. providerEdge(1).
• mplsVpnVrfBgpNbrType	Read only.
• mplsVpnVrfBgpNbrAddr	Read only.
• mplsVpnVrfBgpNbrStorageType	Read only. Volatile(2).
mplsVpnVrfRouteTable	
• mplsVpnVrfRouteInfo	Read only. Value nullOID.
• mplsVpnVrfRouteTarget	Read only. Determines the route distinguisher for this target.
• mplsVpnVrfRouteTargetDescr	Description of the route target. Currently this object is not supported in this Cisco IOS release. Therefore, the object is the same as mplsVpnVrfRouteTarget.
• mplsVpnVrfRouteDistinguisher	Read only.
• mplsVpnVrfRouteNextHopAS	Read only. Always 0.

Table 3-76   MPLS-VPN-MIB Constraints (continued)

MIB Object	Notes
• mplsVpnVrfRouteRowStatus	Read only. This object normally reads active(1), but may read notInService(2), if a VRF was recently deleted.
• mplsVpnVrfRouteStorageType	Read only. Volatile(2).
• mplsVpnVrfRouteDestAddrType	Read only.
• mplsVpnVrfRouteMaskAddrType	Read only.
• mplsVpnVrfRouteTos	Read only. Always 0.
• mplsVpnVrfRouteNextHop	Read only.
• mplsVpnVrfRouteNextHopAddrType	Read only.
• mplsVpnVrfRouteifIndex	Read only.
• mplsVpnVrfRouteType	Read only.
• mplsVpnVrfRouteProto	Read only.
mplsVpnVrfBgpNbrPrefixTable	Not implemented.

Notes:

The mplsVpnVrfConfTable represents all the MPLS/BGP VPNs configured. The NMS configures an entry in this table for each MPLS/BGP VPN configured to run in this MPLS domain. The mplsVPNInterfaceConfTable extends the interface MIB to provide specific MPLS/BGP VPN information on MPLS/BGP VPN-enabled interfaces. The mplsVPNPerfTable enhances the mplsVpnVrfConfTable to provide performance information.

The mplsVpnVrfRouteTable and the mplsVpnRouteTargetTable facilitate the configuration and monitoring of routes and route targets, respectively, for each VRF instance.

MSDP-MIB

The MSDP-MIB contains objects to monitor the Multicast Source Discovery Protocol (MSDP). The MIB can be used with SNMPv3 to remotely monitor MSDP speakers.

For more information about this MIB, see its feature module description at the following URL:

http://www.cisco.com/en/US/docs/ios/12_1t/12_1t5/feature/guide/dt5msdp.html

NHRP-MIB

The Cisco NHRP MIB feature introduces support for the NHRP MIB, which helps to manage and monitor the Next Hop Resolution Protocol (NHRP) through the Simple Network Management Protocol (SNMP). Statistics can be collected and monitored through standards-based SNMP techniques (get operations) to query objects defined in the NHRP MIB. The NHRP MIB is VRF-aware and supports VRF-aware queries.

For more information about this MIB, refer:

http://www.cisco.com/en/US/docs/ios/sec_secure_connectivity/configuration/guide/sec_dmvpn_nhrp_mib.html

MIB Constraints

Table 3-77 lists the constraints that your router places on the objects in the NHRP-MIB.

Table 3-77   NHRP-MIB Constraints

MIB Object	Notes
nhrpClientNbmaSubaddr	Not implemented.
nhrpClientNhsNbmaSubaddr	Not implemented.
nhrpServerNbmaSubaddr	Not implemented.
nhrpServerNhcNbmaSubaddr	Not implemented.
nhrpCachePreference	Not implemented.
nhrpClientDefaultMtu	Not implemented.
nhrpCacheNegotiatedMtu	Not implemented.
nhrpPurgePrefixLength	Not implemented.
nhrpCacheNbmaSubaddr	Not supported.
nhrpCacheType	
• atmarp(7)	Not supported.
• scsp(8)	Not supported.

NOTIFICATION-LOG-MIB (RFC 3014)

The NOTIFICATION-LOG-MIB contains objects for logging SNMP notifications; that is, traps and informs types of notifications.

OLD-CISCO-CHASSIS-MIB

The OLD-CISCO-CHASSIS-MIB describes chassis objects in a device running an old implementation of the Cisco IOS operating system. The chassis objects are now described in the ENTITY-MIB, and OLD-CISCO-CHASSIS-MIB is not supported for the Cisco 4451-X ISR

OLD-CISCO-SYS-MIB

The OLD-CISCO-SYS-MIB defines objects to manage the system bootstrap description and the corresponding version identification.

Note   Currently, only the whyReload object is supported in this MIB.

OSPF-MIB (RFC 1850)

The OSPF-MIB (RFC 1850) contains objects that describe the OSPF Version 2 Protocol. The RFC1253-MIB corresponds to the OSPF-MIB (Open Shortest Path First [OSPF] protocol).

OSPF-TRAP-MIB (RFC 1850)

The OSPF-TRAP-MIB (RFC 1850) contains objects that describe traps for the OSPF Version 2 Protocol.

PIM-MIB (RFC 2934)

The PIM-MIB (RFC 2934) contains objects to configure and manage Protocol Independent Multicast (PIM) on the router. The MIB is extracted from RFC 2934.

MIB Constraints

Table 3-78 lists the constraints that your router place on the objects in the PIM-MIB.

Table 3-78   PIM-MIB Constraints

MIB Object	Notes
pimIpMRouteTable	Not implemented.
pimIpMRouteNextHopTable	Not implemented.
pimInterfaceTable	
• pimInterfaceMode	Read only.
• pimInterfaceHelloInterval	Read only.
• pimInterfaceStatus	Read only.
• pimInterfaceJoinPruneInterval	Read only.
• pimInterfaceCBSRPreference	Read only.
pimJoinPruneInterval	Read only.
pimCandidateRPTable	
• pimCandidateRPAdressd	Read only.
• pimCandidateRPRowStatus	Read only.
pimComponentTable	
• pimComponentCRPHoldTime	Read only.
• pimComponentStatus	Read only.

POWER-ETHERNET-MIB

The POWER-ETHERNET-MIB manages Power Source Equipment (PSE) working according to the IEEE 802.af Powered Ethernet (DTE Power via MDI) standard.

Table 3-48 lists the constraints that your router place on the objects in the POWER-ETHERNET-MIB.

POWER-ETHERNET-MIB Constraints

MIB Object	Constraints
pethMainPowerUsageOnNotification	Not implemented.
pethMainPowerUsageOffNotification	Not implemented.
pethPsePortPowerClassifications	Read Only.

RFC1213-MIB

The RFC1213-MIB defines the second version of the Management Information Base (MIB-II) for use with network-management protocols in TCP-based internets. This RFC1213-MIB includes the following groups:

- system
- interfaces
- at
- ip
- icmp
- tcp
- udp
- igmp
- transmission
- snmp

Note   For more information, refer to the latest RFCs specified in the RFC-1213-MIB.

RFC2982

The RFC2982-MIB defines expressions of MIB objects for management purposes.

RMON-MIB (RFC 1757)

The RMON-MIB (RFC 1757) contains objects to remotely monitor devices in the network.

MIB Constraints

Only alarm and event groups are supported in Cisco ISR 4400 Series Routers.

RSVP-MIB

The RSVP-MIB contains objects to manage the Resource Reservation Protocol (RSVP).

MIB Constraints

Table 3-79 lists the constraints that your router places on the objects in the RSVP-MIB.

Table 3-79   RSVP-MIB Constraints

MIB Object	Notes
rsvpIfRefreshBlockadeMultiple	Read only.
rsvpIfRefreshMultiple	Read only.
rsvpIfTTL	Read only.
rsvpIfRefreshInterval	Read only.
rsvpIfRouteDelay	Read only.
rsvpIfUdpRequired	Read only.

SNMP-COMMUNITY-MIB (RFC 2576)

The SNMP-COMMUNITY-MIB (RFC 2576) contains objects that help support coexistence among SNMPv1, SNMPv2c, and SNMPv3.

SNMP-FRAMEWORK-MIB (RFC 2571)

The SNMP-FRAMEWORK-MIB (RFC 2571) contains objects that describe the SNMP management architecture. There are no constraints on this MIB.

SNMP-MPD-MIB (RFC 2572)

The SNMP-MPD-MIB (RFC 2572) contains objects for Message Processing and Dispatching (MPD).

SNMP-NOTIFICATION-MIB (RFC 2573)

The SNMP-NOTIFICATION-MIB (RFC 2573) contains managed objects for SNMPv3 notifications. The MIB also defines a set of filters that limit the number of notifications generated by a particular entity (snmpNotifyFilterProfileTable and snmpNotifyFilterTable).

Objects in the snmpNotifyTable are used to select entities in the SNMP-TARGET-MIB snmpTargetAddrTable and specify the types of SNMP notifications those entities are to receive.

SNMP-PROXY-MIB (RFC 2573)

The SNMP-PROXY-MIB (RFC 2573) contains managed objects to remotely configure the parameters used by an SNMP entity for proxy forwarding operations. The MIB contains a single table, snmpProxyTable, which defines the translations to use to forward messages between management targets.

SNMP-TARGET-MIB (RFC 2573)

The SNMP-TARGET-MIB (RFC 2573) contains objects to remotely configure the parameters used by an entity to generate SNMP notifications. The MIB defines the addresses of entities to send SNMP notifications to, and contains a list of tag values that are used to filter the notifications sent to these entities (see the SNMP-NOTIFICATION-MIB).

SNMP-USM-MIB (RFC 2574)

The SNMP-USM-MIB (RFC 2574) contains objects that describe the SNMP user-based security model.

SNMPv2-MIB (RFC 1907)

The SNMPv2-MIB (RFC 1907) contains objects to manage SNMPv2 entities. The SNMPv2-MIB contains the following mandatory object groups:

- SNMP group—Collection of objects providing basic instrumentation and control of an SNMP entity.
- System group—Collection of objects common to all managed systems.
- snmpSetGroup—Collection of objects that allow several cooperating SNMPv2 entities, all acting in a manager role, to coordinate their use of the SNMPv2 set operation.
- snmpBasicNotificationsGroup—The two notifications are coldStart and authenticationFailure, which an SNMPv2 entity is required to implement.

SNMP-VIEW-BASED-ACM-MIB (RFC 2575)

The SNMP-VIEW-BASED-ACM-MIB (RFC 2575) contains objects that describe the view-based access control model for SNMP.

Note   To access the SNMP-VIEW-BASED-ACM-MIB, you must create an SNMPv3 user with access to a view that includes all of the information from the Internet subtree. For example:

```
Router(config)# snmp-server view abcview internet included
Router(config)# snmp-server group abcgroup v3 noauth read abcview write abcview notify
abcview
Router(config)# snmp-server user abcuser abcgroup v3
```

SONET-MIB (RFC 2558)

The SONET-MIB (RFC 2558) provides both the configuration and performance monitoring objects for the SONET interfaces.

TCP-MIB (RFC 4022)

The TCP-MIB (RFC 4022) contains objects to manage the Transmission Control Protocol (TCP) implementations on the router.

TUNNEL-MIB (RFC 4087)

The TUNNEL-MIB contains objects to manage IP Tunnels independent of the encapsulation scheme in use.

UDP-MIB (RFC 4113)

The UDP-MIB (RFC4113) contains objects to manage the User Datagram Protocol (UDP) on the router. There are no constraints.

VRRP-MIB

The VRRP-MIB contains objects to manage Virtual Router Redundancy Protocol (VRRP) routers