

Common Components

This chapter describes the level of support that Cisco ANA provides for components common to all network elements, as follows:

- [Information Model Objects \(IMOs\)](#), page 37-1
- [Service Alarms](#), page 37-10

Information Model Objects (IMOs)

This section describes the following IMOs:

- [Bridging Entity \(IBridge\)](#)
- [Bridging Entry \(IBridgeEntry\)](#)
- [Forwarding Component Container \(IFWComponentContainer\)](#)
- [Operating System \(IOperatingSystem\)](#)
- [Modular Operating System \(IModularOS\)](#)
- [Operating System Package \(IOSPackage\)](#)
- [Entity Information \(IEntityInfo\)](#)
- [Rollback Point \(IRollbackPoint\)](#)
- [Flash Device \(IFlashDevice\)](#)
- [Logical File \(ILogicalFile\)](#)
- [Physical Layer \(IPhysicalLayer\)](#)
- [Traffic Descriptor Container \(ITrafficDescriptorContainer\)](#)
- [Tunnel Container \(ITunnelContainer\)](#)
- [Virtual Cross Connection \(IVcCrossConnect\)](#)
- [VC Encapsulation \(IVcBasedEncapsulation\)](#)
- [VC Multiplexer \(EncapMux\)](#)

Bridging Entity

The [Bridging Entity](#) object describes the IEEE 802-based protocol- independent forwarding component of an IEEE 802 bridge or switch. It is bound by its Logical Sons attribute to all the data link layer objects (such as [Ethernet Interface](#)) among which this Bridging Entity is bridging or switching IEEE 802-based data link frames.

Table 37-1 *Bridging Entity (IBridge)*

Attribute Name	Attribute Description	Scheme	Polling Interval
Bridge Table	Array of Bridging Entries	Any	Configuration
Type	Bridge type (<i>Null, Automatic, Regular, Bridge Route</i>)	Any	Configuration
MAC Address	Bridge internal MAC address used either for running Spanning Tree Protocol (STP) or for bridge network management	Any	Configuration
IP Interface	OID of the IP interface used mainly for routing traffic from that bridge	Any	Configuration
Name	Bridging entity name	Any	Configuration
Logical Sons	Array of all IEEE 802-based data link interfaces among which this Bridging Entity is bridging or switching IEEE 802-based data link frames	Any	Configuration
VLAN Type	The type of VLAN	Any	Configuration

Bridging Entry

The [Bridging Entry](#) object describes a domain-wide bridge table entry within a [Bridging Entity](#).

Table 37-2 *Bridging Entry (IBridgeEntry)*

Attribute Name	Attribute Description	Scheme	Polling Interval
Destination MAC Address	Destination station MAC address	Any	Configuration
Outgoing Interface	Underlying outgoing interface (Cisco Ethernet Channels , Ethernet Interfaces , Virtual LAN Interfaces or Virtual LAN Multiplexers)	Any	Configuration

Forwarding Component Container

The [Forwarding Component Container](#) object aggregates a single type of Forwarding Component, such as a [Routing Entry](#), [Bridging Entity](#) or [Virtual Connection Switching Entity](#).

Table 37-3 *Forwarding Component Container (IFWComponentContainer)*

Attribute Name	Attribute Description	Scheme	Polling Interval
Forwarding Components	Array of a single type of forwarding component	Any	Configuration
Type	Forwarding component (<i>Null, Routing Entities, Bridges, VRFs, LSEs, VC Switching Entities, L2TP Peers, MPBGPs, IMA Groups</i>)	Any	Configuration

Operating System

This object relates to the IOS version running on the device.

Table 37-4 *Operating System (IOperatingSystem)*

Attribute Name	Attribute Description	Scheme	Polling Interval
OS Version	String defining the operating system and its version.	Product	Configuration
Rom Version	Information on the system bootstrap software and its version.	Product	Configuration
Boot Software	Information on the system image software and its version.	Product	Configuration
Boot Reason	A free-text string indicating how the operating system was last booted, either as a result of normal startup or of system error.	Product	Configuration
Boot Ldr Software	Information on device BOOTLDR software.	Product	Configuration
IsK9Sec	Indicates whether the operating system has the cryptographic feature enabled.	Product	Configuration
Ram Size	The device processor RAM size in KB.	Product	Configuration

Modular Operating System

This object relates to the IOS-XR version running on the XR device.



Note

The Scheme for this IMO is Product except for CRS devices for which the scheme is IpCore.

Table 37-5 *Modular Operating System (IModularOS)*

Attribute Name	Attribute Description	Scheme	Polling Interval
OS Version	String defining the operating system and its version.	Product	Configuration
Rom Version	Information on the system bootstrap software and its version.	Product	Configuration
Boot Software	Information on the system image software and its version.	Product	Configuration
Boot Reason	A free-text string indicating how the operating system was last booted, either as a result of normal startup or of system error.	Product	Configuration
Boot Ldr Software	Information on device BOOTLDR software.	Product	Configuration
IsK9Sec	Indicates whether the operating system has the cryptographic feature enabled.	Product	Configuration
Ram Size	The device processor RAM size in KB.	Product	Configuration
OS Packages	The instances of OSPackage that are contained in this instance of ModularOS.	Product	Configuration
Rollback Points	The instances of RollbackPoint that are contained in this instance of ModularOS.	Product	Configuration
SDR ID	Identifier of the SDR.	Product	Configuration
SDR Name	Name of the SDR.	Product	Configuration
SDR MAC Address	MAC address associated with the SDR.	Product	Configuration

Table 37-5 *Modular Operating System (IModularOS) (continued)*

Attribute Name	Attribute Description	Scheme	Polling Interval
IsOwner	Specifies whether the instance is an owner SDR.	Product	Configuration
ConfiguredSDRMacs	MAC address configured on the device.	Product	Configuration

Operating System Package

This object provides XR package information about the instance of OS package contained in the IModularOS object.



Note

The Scheme for this IMO is Product except for CRS devices for which the scheme is IpCore.

Table 37-6 *Operating System Package (IOSPackage)*

Attribute Name	Attribute Description	Scheme	Polling Interval
Package Info	A string defining the package and its version.	Product	Configuration
Release	A string that identifies the software release for this element.	Product	Configuration
Build Info	A string that identifies the software build for this element of the modular OS.	Product	Configuration
Supported For Card Types	A multi-valued enumeration for designation of card types supported by this element of the modular OS.	Product	Configuration
Package Description	Detailed description for this package.	Product	Configuration
Composite Name	Stores information about the package's installed location (EntityInfo)	Product	Configuration

Entity Information

This object stores information on package status on the module.



Note

The Scheme for this IMO is Product except for CRS devices for which the scheme is IpCore.

Table 37-7 *Entity Information (IEntityInfo)*

Attribute Name	Attribute Description	Scheme	Polling Interval
Entity XID	A string representing the entity to which this package belongs.	Product	Configuration
Is Active	Status of this package on the module.	Product	Configuration
Module Name	String representing the module name	Product	Configuration

Rollback Point

This object represents XR install manager rollback point information.


Note

The Scheme for this IMO is Product except for CRS devices for which the scheme is IpCore.

Table 37-8 *Rollback Point (IRollbackPoint)*

Attribute Name	Attribute Description	Scheme	Polling Interval
Is Current	Set to "true" for the current device configuration scoped by this instance of RollbackPoint.	Product	Configuration
Rollback Point ID	A means to map the configuration to the identification of the rollback point of the operating system.	Product	Configuration
User ID	Identification of the user who installed and activated the new package.	Product	Configuration
Start Time	The date/time when the installation started.	Product	Configuration
Completion Time	The date/time when the installation was committed and became effective.	Product	Configuration
OS Packages	An array of packages, version, entity reference, and corresponding state belonging to this rollback instance.	Product	Configuration

Flash Device

This object provides information about the flash disk drives on the device.


Note

The Scheme for this IMO is Product except for CRS devices for which the scheme is IpCore.

Table 37-9 *Flash Device (IFlashDevice)*

Attribute Name	Attribute Description	Scheme	Polling Interval
Flash Partition	String name representation of the flash disk, for example, disk0, disk1, bootflash, etc.	Product	Configuration
Capacity	The total size of the flash, specified in bytes.	Product	Configuration
Available Space	Free space in the file system, specified in bytes.	Product	Configuration
Type of Memory	The type of memory, such as dynamic RAM (DRAM) or Flash.	Product	Configuration
Logical Files	Array of named collection of files or directories.	Product	Configuration

Logical File

This object provides information about the logical files on the flash disk.



Note The Scheme for this IMO is Product except for CRS devices for which the scheme is IpCore.

Table 37-10 Logical File (*LogicalFile*)

Attribute Name	Attribute Description	Scheme	Polling Interval
Checksum	The checksum for the file, specified as a string.	Product	Configuration
File Size	The size of the file, specified in bytes.	Product	Configuration
Type of File	The type of this logical file, for example, directory.	Product	Configuration
Full Path Name	A string containing the full path name of the logical file.	Product	Configuration

Physical Layer

The [Bridging Entity](#) object is bound by its Containing Termination Points attribute to a [Port Connector](#) object. It is accessed by the data link layer bound by its Contained Connection Termination Points attribute.

The polling interval for each of the four “Thresholds” attributes is marked as Not Applicable (N/A) because it does not originate from the modeled NE. Instead, it is taken from the TCA system of the VNE.



Note The following attributes are configured in the registry and not retrieved from the device.

Table 37-11 Physical Layer (*PhysicalLayer*)

Attribute Name	Attribute Description	Scheme	Polling Interval
Media Type	Physical media type (<i>Null, Thin Coax, Thick Coax, Fiber Optic, Multi Mode Fiber Optic, Single Mode Fiber Optic, Short Single Mode Fiber Optic, Long Single Mode Fiber Optic, UTP, STP, FTP, EIA/TIA-232, EIA/TIA-449, V.35, X.21, EIA/TIA-530, EIA/TIA-530A, Generic Serial, EIA/TIA-612/613, Other</i>)	Any	Configuration
Clocking Source	Clocking source (<i>Unknown, Other, Network, Internal, Loop Timed, External, None, Line, Back Plane, Adaptive Timing</i>)	Any	Configuration
Maximum Speed	Maximum supported speed with units specification	Any	System
Is Internal Port	Indicates an internal port, such as between module and backplane (<i>True, False</i>)	Any	Configuration
Maximum and Minimum Discarded Thresholds	Maximum and minimum discarded input bandwidth thresholds	Any	N/A
Discarded Bandwidth	Current discarded input bandwidth	Any	Configuration
Maximum and Minimum Dropped Thresholds	Maximum and minimum dropped output bandwidth thresholds	Any	N/A
Dropped Bandwidth	Current dropped output bandwidth	Any	Configuration

Table 37-11 Physical Layer (IPhysicalLayer) (continued)

Attribute Name	Attribute Description	Scheme	Polling Interval
Maximum and Minimum Input Thresholds	Maximum and minimum utilized input bandwidth thresholds	Any	N/A
Input Bandwidth	Current utilized input bandwidth	Any	Configuration
Maximum and Minimum Output Thresholds	Maximum and minimum utilized output bandwidth thresholds	Any	N/A
Output Bandwidth	Current utilized output bandwidth	Any	Configuration
Discarded and Received Input Data Counters	Discarded and received input octets and packets counters	Any	Topology L1
Dropped and Forwarded Output Data Counters	Dropped and forwarded output octets and packets counters	Any	Topology L1
Administrative Status	Administrative status (<i>Unknown, Up, Down, Testing</i>)	Any	Status
Operational Status	Operational status (<i>Unknown, Up, Down, Testing, Dormant, Not Present</i>)	Any	Status
Operational Status Last Change	Date of last operational status change	Any	Configuration
IANA Type	Internet Assigned Numbers Authority (IANA) type of the sublayer	N/A	N/A
Containing Termination Points	Underlying termination points (connection or physical)	Any	N/A
Contained Connection Termination Points	Bound connection termination points	Any	N/A

Traffic Descriptor Container

The [Traffic Descriptor Container](#) object is basically a container of any table's entries. It aggregates a single type of Traffic Descriptor.

Table 37-12 Traffic Descriptor Container (ITrafficDescriptorContainer)

Attribute Name	Attribute Description	Scheme	Polling Interval
Traffic Descriptors	Array of a single type of traffic descriptor	Any	Configuration
Type	Descriptor type (<i>Null, ATM Traffic Profiles, ADSL Traffic Descriptors, SDSL Traffic Descriptors, IDSL Traffic Descriptors, SHDSL Traffic Descriptors, MPLS Properties, CAC Profiles, ATM Access Profiles, OSPF Networks, BGP Neighbor, Access Lists, Tunnel Traffic Descriptors, QoS Policies, QoS Classes, IS-IS Database, QoS WRED, ATM Traffic Shaping Profile, Frame Relay Traffic Profiles, Rate Limit, Filter, Policer, IP Pools, ISAKMP Policies, IPsec Maps, Process List, Installed Software, L2TP Peer Group, L2TP Domain Group, QoS Object Table, QoS Class Map, QoS Policy Map, QoS Match Statements Table, QoS Queueing Config Table, QoS Service Policy Table, ADSL 2 Traffic Descriptors, ADSL 2 Spectrum Descriptors</i>)	Any	Configuration

Tunnel Container

The [Tunnel Container](#) object aggregates instances of a single type of tunnel interface (either [MPLS TE Tunnel Interfaces](#) or [PTP Layer 2 MPLS Tunnel Interfaces](#)).

Table 37-13 *Tunnel Container (ITunnelContainer)*

Attribute Name	Attribute Description	Scheme	Polling Interval
Tunnel Edges	Array of either PTP Layer 2 MPLS Tunnel Interfaces or MPLS TE Tunnel Interfaces	Any	Configuration

Virtual Cross Connection

The [Virtual Cross Connection](#) object describes either a [Virtual Connection Switching Entity](#)-wide or an [ATM Interface](#)-specific Cross Connect table's entry.

Table 37-14 *Virtual Cross Connection (IVcCrossConnect)*

Attribute Name	Attribute Description	Scheme	Polling Interval
Ingress and Egress Virtual Connection	Ingress and egress virtual connections (ATM Virtual Connection or Frame Relay Virtual Connection)	Any	Configuration
Ingress and Egress Port	Ingress and egress ports (<i>Port Connectors</i>)	Any	Configuration

VC Multiplexer

The [VC Multiplexer](#) object is bound by its Containing Termination Points attribute to either an [ATM Interface](#) or a [Frame Relay Interface](#) object. It is accessed primarily by the data link layer [VC Encapsulations](#) bound by its Contained Connection Termination Points attribute.

Table 37-15 *VC Multiplexer (EncapMux)*

Attribute Name	Attribute Description	Scheme	Polling Interval
Virtual Connection Count	Bound virtual connection count	Any	Configuration
IANA Type	Internet Assigned Numbers Authority (IANA) type of the sublayer	N/A	N/A
Containing Termination Points	Underlying termination points (ATM Interface or Frame Relay Interface)	Any	N/A
Contained Connection Termination Points	Bound connection termination points (VC Encapsulations)	Any	N/A

VC Encapsulation

The data link layer [VC Encapsulation](#) object is bound by its Containing Termination Points attribute to an ATM or Frame Relay [VC Multiplexer](#) object. It is accessed primarily by a network layer object (such as an [IP Interface](#)), and also by the data link layer object (such as an [Ethernet Interface](#) or [PPP Encapsulation](#)) bound by its Contained Connection Termination Points attribute.

Table 37-16 VC Encapsulation (*IVcBasedEncapsulation*)

Attribute Name	Attribute Description	Scheme	Polling Interval
Virtual Connection	Virtual connection (ATM Virtual Connection or Frame Relay Virtual Connection)	Any	Configuration
Binding Information	Binding information (<i>User Name, ...</i>)	Any	Configuration
Binding Status	Binding status (<i>Not Bound, Bound</i>)	Any	Configuration
IANA Type	Internet Assigned Numbers Authority (IANA) type of the sublayer	N/A	N/A
Containing Termination Points	Underlying termination points (connection or physical)	Any	N/A
Contained Connection Termination Points	Bound connection termination points	Any	N/A

Service Alarms

The following alarms are supported for this technology:

- [Cloud Problem](#), page 41-22
- [Discard Packets](#), page 41-26
- [Dropped Packets](#), page 41-27
- [Link Down](#), page 41-43
- [Port Down](#), page 41-55
- [Rx Utilization](#), page 41-58
- [Tx Utilization](#), page 41-62