CHAPTER 4

RFC-1493: Bridge MIB Objects

The Catalyst 2000 supports the following RFC-1493 groups:

- Generic bridge information: dot1dBase group and dot1dBasePort table.
- Spanning-tree bridge information: dot1dStp group and dot1dStpPort table.
- Transparent bridge information: dot1dTpFdb table, dot1dTp group, dot1dTpPort table, dot1dStatic table.

The Catalyst 2000 also supports the newRoot trap and the topologyChange trap.

The dot1dBase Group

dot1dBaseBridgeAddress (MacAddress)

This read-only MIB object is the MAC address used by this bridge when it must be referred to in a unique fashion. This MAC address must be unique. When concatenated with dot1dStpPriority a unique BridgeIdentifier is formed which is used in the Spanning-Tree Protocol.

dot1dBaseNumPorts (integer)

This read-only MIB object displays the number of ports controlled by this bridge.

Valid Values: 2
7

dot1dBaseType (integer)

This read-only MIB object indicates the type of bridging this bridge can perform. If a bridge is actually performing a certain type of bridging, it will be indicated by entries in the port table for the given type.

Valid Values: transparent-only (2)

The dot1dBasePort Table

This MIB table contains generic information about every port that is associated with this bridge.

dot1dBasePort (integer)

This read-only MIB object displays the port number of the port for which this entry contains bridge management information.

Valid Values: 1 to 27

dot1dBasePortIfIndex (integer)

This read-only MIB object displays the value of the instance of the ifIndex object, defined in MIB-II, for the interface corresponding to this port.

dot1dBasePortCircuit (object identifier)

For a port which (potentially) has the same value of dot1dBasePortIfIndex as another port on the same bridge, this read-only MIB object contains the name of an object instance unique to this port. Each Catalyst 2000 port has a unique value of dot1dBasePortIfIndex, this object has the value { 0 0 }.

dot1dBasePortDelayExceededDiscards (counter)

This read-only MIB object returns the number of frames discarded by this port due to excessive transit delay through the bridge.

dot1dBasePortMtuExceededDiscards (counter)

This read-only MIB object returns the number of frames discarded by this port due to an excessive size.

The dot1dStp Group

dot1dStpProtocolSpecification (integer)

This read-only MIB object displays what version of the Spanning-Tree Protocol is being run. The value decLb100(2) indicates the DEC LANbridge100 Spanning-Tree protocol. IEEE 802.1d implementations will return ieee8021d (3). If future versions of the IEEE Spanning-Tree Protocol are released that are incompatible with the current version, a new value will be defined.

Valid Values: ieee8021d (3)

dot1dStpPriority (integer)

This read-write MIB object contains the write-able portion of the bridge ID, that is, the first two octets of the 8-octet bridge ID. The other 6 octets of the Bridge ID are given by the value of dot1dBaseBridgeAddress.

Valid Values: 0 to 65535

Default Value: 32768

dot1dStpTimeSinceTopologyChange (timeticks)

This read-only MIB object displays the time, measured in hundredths of a second, since the last time a topology change was detected by the bridge entity.

dot1dStpTopChanges (counter)

This read-only MIB object returns the total number of topology changes detected by this bridge since the management entity was last reset or initialized.

dot1dStpDesignatedRoot (BridgeID)

This read-only MIB object displays the bridge identifier of the root of the spanning tree as determined by the Spanning-Tree Protocol as executed by this node. This value is used as the Root Identifier parameter in all Configuration Bridge PDUs originated by this node.

dot1dStpRootCost (integer)

This read-only MIB object displays the cost of the path to the root as seen from this bridge.

dot1dStpRootPort (integer)

This read-only MIB object displays the port number of the port which offers the lowest cost path from this bridge to the root bridge.

dot1dStpMaxAge (timeout)

This read-only MIB object displays the maximum age of Spanning-Tree Protocol information learned from the network on any port before it is discarded, in units of hundredths of a second. This is the actual value that this bridge is currently using.

dot1dStpHelloTime (timeout)

This read-only MIB object displays the amount of time between the transmission of Configuration bridge PDUs by this node on any port when it is the root of the spanning tree or trying to become so, in units of hundredths of a second. This is the actual value that this bridge is currently using.

dot1dStpHoldTime (integer)

This read-only MIB object displays the time value that determines the interval length during which no more than two Configuration bridge PDUs shall be transmitted by this node, in units of hundredths of a second.

dot1dStpForwardDelay (timeout)

This read-only MIB object displays the time value that, measured in units of hundredths of a second, controls how fast a port changes its spanning state when moving towards the Forwarding state. The value determines how long the port stays in each of the Listening and Learning states, which precede the Forwarding state. This value is also used to age all dynamic entries in the Forwarding Database when a topology change has been detected and is underway.

Note This value is the one that this bridge is currently using, in contrast to dot1dStpBridgeForwardDelay which is the value that this bridge and all others would start using if and when this bridge were to become the root.

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dot1dStpBridgeMaxAge (timeout)

This read-write MIB object contains the value, measured in units of hundredths of a second, that all bridges use for MaxAge when this bridge is acting as the root.

Note The 802.1D-1990 specifies that the range for this parameter is related to the value of dot1dStpBridgeHelloTime. The granularity of this timer is specified by 802.1D-1990 to be 1 second. An agent may return a badValue error if a set is attempted to a value which is not a whole number of seconds.

Valid Values: 600 to 4000

Default Value: 2000

dot1dStpBridgeHelloTime (timeout)

This read-write MIB object contains the value, measured in units of hundredths of a second, that all bridges use for HelloTime when this bridge is acting as the root. The granularity of this timer is specified by 802.1D-1990 to be 1 second. An agent may return a badValue error if a set is attempted to a value which is not a whole number of seconds.

Valid Values: 100 to 1000

Default Value: 200

dot1dStpBridgeForwardDelay (timeout)

This read-write MIB object contains the value, measured in units of hundredths of a second, that all bridges use for ForwardDelay when this bridge is acting as the root.

Note 802.1D-1990 specifies that the range for this parameter is related to the value of dot1dStpBridgeMaxAge. The granularity of this timer is specified by 802.1D-1990 to be 1 second. An agent may return a badValue error if a set is attempted to a value which is not a whole number of seconds.

Valid Values: 400 to 3000

Default Value: 1500

The Spanning-Tree Port Table (dot1dStpPort)

dot1dStpPort (integer)

This read-only MIB object displays the port number of the port for which this entry contains Spanning Tree Protocol management information.

Valid Values: 1 to 27

dot1dStpPortPriority (integer)

This read-write MIB object contains the value of the priority field which is contained in the first (in network byte order) octet of the (2 octet long) Port ID. The other octet of the Port ID is given by the value of dot1dStpPort.

Valid Values: 0 to 255

Default Value: 128

dot1dStpPortState (integer)

This read-only MIB object displays the port's current state as defined by application of the Spanning-Tree Protocol. This state controls what action a port takes on reception of a frame. For ports which are disabled (see dot1dStpPortEnable), this object will have a value of disabled.

Valid Values:	disabled	(1)
	blocking	(2)
	listening	(3)
	learning	(4)
	forwarding	(5)
Default Value:	forwarding	(5)

dot1dStpPortEnable (integer)

This read-write MIB object enables or disables the port.

Valid Values: enabled (1)

disabled (2)

dot1dStpPortPathCost (integer)

This read-write MIB object contains the contribution of this port to the path cost of paths towards the spanning tree root which include this port.

Valid Values: 1 to 65535

Default Value: 802.1D-1990 recommends that the default Path Cost equal 1000/speed of attached LAN in Mbps.

dot1dStpPortDesignatedRoot (BridgeId)

This read-only MIB object displays the unique bridge identifier of the bridge recorded as the root in the configuration BPDUs transmitted by the designated bridge for the segment to which the port is attached.

dot1dStpPortDesignatedCost (integer)

This read-only MIB object displays the path cost of the Designated Port of the segment connected to this port. This value is compared to the Root Path Cost field in received bridge PDUs.

dot1dStpPortDesignatedBridge (BridgeId)

This read-only MIB object displays the bridge identifier of the bridge which this port considers to be the designated bridge for this port's segment.

dot1dStpPortDesignatedPort (octet string)

This read-only MIB object displays the port identifier of the port on the designated bridge for this port's segment.

dot1dStpPortForwardTransitions (counter)

This read-only MIB object returns the number of times this port has transitioned from the Learning state to the Forwarding state.

The dot1dTp Group

dot1dTpLearnedEntryDiscards (counter)

This read-only MIB object returns the total number of Forwarding Database entries, which have been or would have been learned, but have been discarded. If this counter is increasing, it indicates that the Forwarding Database is regularly becoming full (Catalyst 2000 switches flood packets with unknown destinations). If this counter has a significant value but is not presently increasing, it indicates that the problem has been occurring but is not persistent.

dot1dTpAgingTime (integer)

This read-write MIB object contains the timeout period in seconds for aging out dynamically learned forwarding information.

Valid Values: 10 to 1000000

Default Value: 802.1D-1990 recommends a default of 300 seconds.

Forwarding Database for Transparent Bridges (dot1dTpFdb Table)

This MIB object displays a table that contains information about unicast entries for which the bridge has forwarding and/or filtering information. This information is used by Catalyst 2000 switches to determine how to propagate a received frame.

dot1dTpFdbAddress (MacAddress)

This read-only MIB object displays a unicast MAC address for which the bridge has forwarding and/or filtering information.

dot1dTpFdbPort (integer)

This read-only MIB object displays either the value 0, or the port number of the port on which a frame having a source address equal to the value of the corresponding instance of dot1dTpFdbAddress has been seen. A value of 0 indicates that the port number has not been learned but that the bridge does have some forwarding/filtering information about this address (in the dot1dStaticTable).

dot1dTpFdbStatus (integer)

This read-only MIB object displays the status of this entry.

Valid Values: learned (3)

self (4)

mgmt (5)

The following are the meanings of the values:

- Learned (3): The value of the corresponding instance of dot1dTpFdbPort was learned, and is being used.
- Self (4): The value of the corresponding instance of dot1dTpFdbAddress represents one of the bridge's addresses. The corresponding instance of dot1dTpFdbPort indicates which of the bridge's ports has this address.
- Mgmt (5): The value of the corresponding instance of dot1dTpFdbAddress is also the value of an existing instance of dot1dStaticAddress.

Port Table for Transparent Bridges (dot1dTpPort Table)

dot1dTpPort (integer)

This read-only MIB object displays the port number of the port for which this entry contains transparent bridging management information.

Valid Values: 1 to 27

dot1dTpPortMaxInfo (integer)

This read-only MIB object displays the maximum size of the INFO (non-MAC) field that this port will receive or transmit.

Valid Value: 150
0

dot1dTpPortInFrames (counter)

This read-only MIB object returns the number of frames that have been received by this port from its segment.

dot1dTpPortOutFrames (counter)

This read-only MIB object returns the number of frames that have been transmitted by this port to its segment.

dot1dTpPortInDiscards (counter)

This read-only MIB object returns a count of valid frames received which were filtered by the forwarding process.

The Static Address Database (dot1dStatic Table)

This table contains filtering information configured into the bridge by (local or network) management specifying the set of ports to which frames received from specific ports and containing specific destination addresses are allowed to be forwarded. Entries are valid for unicast and for group/broadcast addresses.

dot1dStaticAddress (MacAddress)

This read-write MIB object contains the destination MAC address in a frame to which this entry's filtering information applies. This object can take the value of a unicast address, a group address or the broadcast address.

dot1dStaticReceivePort (integer)

This read-write MIB object contains either the value 0, or the port number of the port from which a frame must be received in order for this entry's filtering information to apply. A value of zero indicates that this entry applies on all ports of the bridge for which there is no other applicable entry.

dot1dStaticAllowedToGoTo (octet string)

This read-write MIB object contains the set of ports to which frames received from a specific port and destined for a specific MAC address, are allowed to be forwarded. Each octet within the value of this object specifies a set of eight ports, with the first octet specifying ports 1 through 8, the second octet specifying ports 9 through 16, and so on. Within each octet, the most significant bit represents the lowest numbered port, and the least significant bit represents the highest numbered port. Thus, each port of the bridge is represented by a single bit within the value of this object. If that bit has a value of 1 then that port is included in the set of ports; the port is not included if its bit has a value of 0.

dot1dStaticStatus (integer)

This read-write MIB object indicates the status of this entry.

Valid Values: invalid (2)

permanent (3)

- Invalid (2): Writing this value to the object removes the corresponding entry.
- Permanent (3): This entry is currently in use and will remain so after the next reset of the bridge.

Default Value: permanent (3)