

Internet Draft
Expires October 2004
[draft-ietf-bridge-bridgemib-smiv2-06.txt](#)
Obsoletes: [1493](#)

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April 2004

Definitions of Managed Objects for Bridges

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Abstract

This memo defines a portion of the Management Information Base (MIB) for use with network management protocols in TCP/IP based internets. In particular it defines objects for managing MAC bridges based on the IEEE 802.1D-1998 standard between Local Area Network (LAN) segments. Provisions are made for support of transparent bridging. Provisions are also made so that these objects apply to bridges connected by subnetworks other than LAN segments.

The MIB presented in this memo is a direct translation of the BRIDGE MIB defined in [[RFC1493](#)], to the SMIV2 syntax required for current IETF MIB standards. This memo obsoletes [RFC 1493](#).

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1. The SNMP Management Framework

The SNMP Management Framework presently consists of five major components:

- o An overall architecture, described in [RFC 2571](#) [[RFC2571](#)].
- o Mechanisms for describing and naming objects and events for the purpose of management. The first version of this Structure of Management Information (SMI) is called SMIV1 and described in STD 16, [RFC 1155](#) [[RFC1155](#)], STD 16, [RFC 1212](#) [[RFC1212](#)] and [RFC 1215](#) [[RFC1215](#)]. The second version, called SMIV2, is described in STD 58, [RFC 2578](#) [[RFC2578](#)], STD 58, [RFC 2579](#) [[RFC2579](#)] and STD 58, [RFC 2580](#) [[RFC2580](#)].
- o Message protocols for transferring management information. The first version of the SNMP message protocol is called SNMPv1 and described in STD 15, [RFC 1157](#) [[RFC1157](#)]. A second version of the SNMP message protocol, which is not an Internet standards track protocol, is called SNMPv2c and described in [RFC 1901](#) [[RFC1901](#)] and [RFC 1906](#) [[RFC1906](#)]. The third version of the message protocol is called SNMPv3 and described in [RFC 1906](#) [[RFC1906](#)], [RFC 2572](#) [[RFC2572](#)] and [RFC 2574](#) [[RFC2574](#)].
- o Protocol operations for accessing management information. The first set of protocol operations and associated PDU formats is described in STD 15, [RFC 1157](#) [[RFC1157](#)]. A second set of protocol operations and associated PDU formats is described in [RFC 1905](#) [[RFC1905](#)].
- o A set of fundamental applications described in [RFC 2573](#)

[[RFC2573](#)] and the view-based access control mechanism described in [RFC 2575](#) [[RFC2575](#)].

A more detailed introduction to the current SNMP Management Framework

can be found in [RFC 2570](#) [[RFC2570](#)].

Managed objects are accessed via a virtual information store, termed the Management Information Base or MIB. Objects in the MIB are defined using the mechanisms defined in the SMI.

This memo specifies a MIB module that is compliant to the SMIV2. A MIB conforming to the SMIV1 can be produced through the appropriate translations. The resulting translated MIB must be semantically equivalent, except where objects or events are omitted because no translation is possible (use of Counter64). Some machine readable information in SMIV2 will be converted into textual descriptions in SMIV1 during the translation process. However, this loss of machine readable information is not considered to change the semantics of the MIB.

2. Overview

A common device present in many networks is the Bridge. This device is used to connect Local Area Network segments below the network layer.

There are two major modes defined for this bridging; transparent and source route. The transparent method of bridging is defined in the IEEE 802.1D specification [[IEEE8021D](#)]. This memo defines those objects needed for the management of a bridging entity operating in the transparent mode, as well as some objects applicable to all types of bridges.

To be consistent with IAB directives and good engineering practice, an explicit attempt was made to keep this MIB as simple as possible. This was accomplished by applying the following criteria to objects proposed for inclusion:

- (1) Start with a small set of essential objects and add only as further objects are needed.
- (2) Require objects be essential for either fault or configuration management.
- (3) Consider evidence of current use and/or utility.
- (4) Limit the total of objects.
- (5) Exclude objects which are simply derivable from others in this or other MIBs.
- (6) Avoid causing critical sections to be heavily instrumented. The guideline that was followed is one counter per critical section per layer.

2.1. Structure of MIB

Objects in this MIB are arranged into groups. Each group is

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organized as a set of related objects. The overall structure and assignment of objects to their groups is shown below. Where appropriate the corresponding IEEE 802.1D [[IEEE8021D](#)] management object name is also included.

Bridge MIB Name	IEEE 802.1D Name
dot1dBridge	
dot1dBase	
BridgeAddress	Bridge.BridgeAddress
NumPorts	Bridge.NumberOfPorts
Type	
PortTable	
Port	BridgePort.PortNumber
IfIndex	
Circuit	
DelayExceededDiscards	.DiscardTransitDelay
MtuExceededDiscards	.DiscardOnError
dot1dStp	
ProtocolSpecification	
Priority	SpanningTreeProtocol
	.BridgePriority
TimeSinceTopologyChange	.TimeSinceTopologyChange
TopChanges	.TopologyChangeCount
DesignatedRoot	.DesignatedRoot
RootCost	.RootCost
RootPort	.RootPort
MaxAge	.MaxAge
HelloTime	.HelloTime
HoldTime	.HoldTime
ForwardDelay	.ForwardDelay
BridgeMaxAge	.BridgeMaxAge
BridgeHelloTime	.BridgeHelloTime
BridgeForwardDelay	.BridgeForwardDelay
PortTable	
Port	SpanningTreeProtocolPort
	.PortNumber
Priority	.PortPriority
State	.SpanningTreeState
Enable	
PathCost	.PortPathCost
DesignatedRoot	.DesignatedRoot
DesignatedCost	.DesignatedCost
DesignatedBridge	.DesignatedBridge
DesignatedPort	.DesignatedPort
ForwardTransitions	
dot1dTp	
LearnedEntryDiscards	BridgeFilter.DatabaseSize
	.NumDynamic, NumStatic

AgingTime
FdbTable
Address
Port
Status

BridgeFilter.AgingTime

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PortTable	
Port	
MaxInfo	
InFrames	BridgePort.FramesReceived
OutFrames	.ForwardOutbound
InDiscards	.DiscardInbound
dot1dStatic	
StaticTable	
Address	
ReceivePort	
AllowedToGoTo	
Status	

The following IEEE 802.1D management objects have not been included in the Bridge MIB for the indicated reasons.

IEEE 802.1D Object	Disposition
Bridge.BridgeName	Same as sysDescr (MIB II)
Bridge.BridgeUpTime	Same as sysUpTime (MIB II)
Bridge.PortAddresses	Same as ifPhysAddress (MIB II)
BridgePort.PortName	Same as ifDescr (MIB II)
BridgePort.PortType	Same as ifType (MIB II)
BridgePort.RoutingType	Derivable from the implemented groups
SpanningTreeProtocol	
.BridgeIdentifier	Combination of dot1dStpPriority and dot1dBaseBridgeAddress
.TopologyChange	Since this is transitory, it is not considered useful.
SpanningTreeProtocolPort	
.Uptime	Same as ifLastChange (MIB II)
.PortIdentifier	Combination of dot1dStpPort and dot1dStpPortPriority
.TopologyChangeAcknowledged	Since this is transitory, it is not considered useful.
.DiscardLackOfBuffers	Redundant
Transmission Priority	These objects are not required as per the PICS Proforma and not considered useful.
.TransmissionPriorityName	
.OutboundUserPriority	
.OutboundAccessPriority	

[2.1.1.](#) The dot1dBase Group

This mandatory group contains the objects which are applicable to all types of bridges.

[2.1.2.](#) The dot1dStp Group

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This group contains the objects that denote the bridge's state with respect to the Spanning Tree Protocol. If a node does not implement the Spanning Tree Protocol, this group will not be implemented.

2.1.3. The dot1dSr Group

This group contains the objects that describe the entity's state with respect to source route bridging. If source routing is not supported this group will not be implemented. This group is applicable to source route only, and SRT bridges. This group will be described in a separate document applicable only to source route bridging.

2.1.4. The dot1dTp Group

This group contains objects that describe the entity's state with respect to transparent bridging. If transparent bridging is not supported this group will not be implemented. This group is applicable to transparent only and SRT bridges.

2.1.5. The dot1dStatic Group

This group contains objects that describe the entity's state with respect to destination-address filtering. If destination-address filtering is not supported this group will not be implemented. This group is applicable to any type of bridge which performs destination-address filtering.

2.2. Relationship to Other MIBs

As described above, some IEEE 802.1D management objects have not been included in this MIB because they overlap with objects in other MIBs applicable to a bridge implementing this MIB. In particular, it is assumed that a bridge implementing this MIB will also implement (at least) the 'system' group and the 'interfaces' group defined in MIB-II [[RFC1213](#)].

2.2.1. Relationship to the 'system' group

In MIB-II [[RFC1907](#)], the 'system' group is defined as being mandatory for all systems such that each managed entity contains one instance of each object in the 'system' group. Thus, those objects apply to the entity as a whole irrespective of whether the entity's sole functionality is bridging, or whether bridging is only a subset of the entity's functionality.

2.2.2. Relationship to the 'interfaces' group

In the Interfaces Group MIB [[RFC2863](#)], the 'interfaces' group is

defined as being mandatory for all systems and contains information on an entity's interfaces, where each interface is thought of as being attached to a `subnetwork'. (Note that this term is not to be confused with `subnet' which refers to an addressing partitioning

scheme used in the Internet suite of protocols.) The term 'segment' is used in this memo to refer to such a subnetwork, whether it be an Ethernet segment, a 'ring', a WAN link, or even an X.25 virtual circuit.

Implicit in this Bridge MIB is the notion of ports on a bridge. Each of these ports is associated with one interface of the 'interfaces' group, and in most situations, each port is associated with a different interface. However, there are situations in which multiple ports are associated with the same interface. An example of such a situation would be several ports each corresponding one-to-one with several X.25 virtual circuits but all on the same interface.

Each port is uniquely identified by a port number. A port number has no mandatory relationship to an interface number, but in the simple case a port number will have the same value as the corresponding interface's interface number. Port numbers are in the range (1..dot1dBaseNumPorts).

Some entities perform other functionality as well as bridging through the sending and receiving of data on their interfaces. In such situations, only a subset of the data sent/received on an interface is within the domain of the entity's bridging functionality. This subset is considered to be delineated according to a set of protocols, with some protocols being bridged, and other protocols not being bridged. For example, in an entity which exclusively performed bridging, all protocols would be considered as being bridged, whereas in an entity which performed IP routing on IP datagrams and only bridged other protocols, only the non-IP data would be considered as being bridged.

Thus, this Bridge MIB (and in particular, its counters) are applicable only to that subset of the data on an entity's interfaces which is sent/received for a protocol being bridged. All such data is sent/received via the ports of the bridge.

2.3. Textual Conventions

The datatypes, MacAddress, BridgeId and Timeout, are used as textual conventions in this document. Objects defined using these conventions are always encoded by means of the rules that define their primitive type. Hence, no changes to the SMI or the SNMP are necessary to accommodate these textual conventions which are adopted merely for the convenience of readers.

3. Definitions

BRIDGE-MIB DEFINITIONS ::= BEGIN

```
-- -----  
-- MIB for IEEE 802.1D devices  
-- -----  
IMPORTS
```

```
MODULE-IDENTITY, OBJECT-TYPE, NOTIFICATION-TYPE,  
Counter32, Integer32, TimeTicks, mib-2  
    FROM SNMPv2-SMI  
TEXTUAL-CONVENTION, MacAddress  
    FROM SNMPv2-TC  
MODULE-COMPLIANCE, OBJECT-GROUP, NOTIFICATION-GROUP  
    FROM SNMPv2-CONF  
InterfaceIndex FROM IF-MIB  
;
```

bridgeMIB MODULE-IDENTITY

```
LAST-UPDATED "200307240000Z"  
ORGANIZATION "IETF Bridge MIB Working Group"  
CONTACT-INFO  
    "Email: Bridge-mib@ietf.org
```

```
        K.C. Norseth  
        L-3 Communications  
        Tel: +1 801-594-2809  
        Email: kenyon.c.norseth@L-3com.com  
        Postal: 640 N. 2200 West.  
        Salt Lake City, Utah 84116-0850
```

```
        Les Bell  
        3Com Europe Limited  
        Phone: +44 1442 438025  
        Email: Les_Bell@3Com.com  
        Postal: 3Com Centre, Boundary Way  
        Hemel Hempstead  
        Herts. HP2 7YU  
        UK
```

```
        Send comments to <bridge-mib@ietf.org>"
```

DESCRIPTION

```
"The Bridge MIB module for managing devices that support  
IEEE 802.1D."
```

```
Copyright (C) The Internet Society (2003). This version of  
this MIB module is part of RFC xxxx; see the RFC itself for  
full legal notices."
```

```
REVISION      "200307240000Z"
```

DESCRIPTION

```
"Translation of RFC 1493 to SMIV2."
```

```
REVISION      "199307310000Z"
```

DESCRIPTION

```
"RFC 1493: SMIV1 version."
```

```
::= { dot1dBridge 8 }
```

dot1dNotification OBJECT IDENTIFIER ::= { dot1dBridge 0 }

-- -----
-- Textual Conventions
-- -----

-- All representations of MAC addresses in this MIB Module use,
-- as a textual convention (i.e. this convention does not affect
-- their encoding), the data type MacAddress, defined in
-- SNMPv2-TC.

-- Similarly, all representations of Bridge-Id in this MIB
-- Module use, as a textual convention (i.e. this convention
-- does not affect their encoding), the data type:

BridgeId ::= TEXTUAL-CONVENTION

STATUS current

DESCRIPTION

"The Bridge-Identifier as used in the Spanning Tree
Protocol to uniquely identify a bridge. Its first two
octets (in network byte order) contain a priority value
and its last 6 octets contain the MAC address used to
refer to a bridge in a unique fashion (typically, the
numerically smallest MAC address of all ports on the
bridge)."

SYNTAX OCTET STRING (SIZE (8))

-- Several objects in this MIB module represent values of timers
-- used by the Spanning Tree Protocol. In this MIB, these
-- timers have values in units of hundredths of a second (i.e.
-- 1/100 secs).
-- These timers, when stored in a Spanning Tree Protocol's BPDU,
-- are in units of 1/256 seconds. Note, however, that
-- 802.1D-1998 specifies a settable granularity of no more
-- than 1 second for these timers. To avoid ambiguity, a data
-- type is defined here as a textual convention and all
-- representation of these timers in this MIB module are defined
-- using this data type. An algorithm is also defined for
-- converting between the different units, to ensure a timer's
-- value is not distorted by multiple conversions.
-- The data type is:

Timeout ::= TEXTUAL-CONVENTION

STATUS current

DESCRIPTION

"A STP timer in units of 1/100 seconds.
To convert a Timeout value into a value in units of
1/256 seconds, the following algorithm should be used:

$$b = \text{floor}((n * 256) / 100)$$

where:

floor = quotient [ignore remainder]
n is the value in 1/100 second units

b is the value in $1/256$ second units

To convert the value from $1/256$ second units back to $1/100$ seconds, the following algorithm should be used:

$$n = \text{ceiling}((b * 100) / 256)$$

where:

ceiling = quotient [if remainder is 0], or
 quotient + 1 [if remainder is non-zero]

n is the value in 1/100 second units

b is the value in 1/256 second units

Note: it is important that the arithmetic operations are
done in the order specified (i.e., multiply first,
divide second)."

SYNTAX Integer32

```
-- -----
dot1dBridge       OBJECT IDENTIFIER ::= { mib-2 17 }

-- -----
-- groups in the Bridge MIB
-- -----

dot1dBase         OBJECT IDENTIFIER ::= { dot1dBridge 1 }
dot1dStp          OBJECT IDENTIFIER ::= { dot1dBridge 2 }

dot1dSr           OBJECT IDENTIFIER ::= { dot1dBridge 3 }
-- separately documented

dot1dTp           OBJECT IDENTIFIER ::= { dot1dBridge 4 }
dot1dStatic       OBJECT IDENTIFIER ::= { dot1dBridge 5 }

-- Groups defined in the Bridge Mib Extensions:
--     pBridgeMIB MODULE-IDENTITY ::= { dot1dBridge 6 }
--     qBridgeMIB MODULE-IDENTITY ::= { dot1dBridge 7 }

-- The MODULE-IDENTITY for this MIB has been defined above as:
--     bridgeMIB MODULE-IDENTITY ::= { dot1dBridge 8 }

-- The MODULE-IDENTITY for the Source Routing MIB has been
-- defined in that MIB as:
--     srMIB MODULE-IDENTITY ::= { dot1dBridge 9 }

-- Groups defined in the Source Routing MIB:
--     dot1dPortPair OBJECT IDENTIFIER ::= { dot1dBridge 10 }

dot1dConformance       OBJECT IDENTIFIER ::= { bridgeMIB 1 }

-- -----
-- the dot1dBase group
-- -----
-- Implementation of the dot1dBase group is mandatory for all
```

-- bridges.

-- -----

dot1dBaseBridgeAddress OBJECT-TYPE

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SYNTAX MacAddress

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The MAC address used by this bridge when it must be referred to in a unique fashion. It is recommended that this be the numerically smallest MAC address of all ports that belong to this bridge. However it is only required to be unique. When concatenated with dot1dStpPriority a unique BridgeIdentifier is formed which is used in the Spanning Tree Protocol."

REFERENCE

"IEEE 802.1D-1998: clauses 14.4.1.1.3 and 7.12.5"

::= { dot1dBase 1 }

dot1dBaseNumPorts OBJECT-TYPE

SYNTAX Integer32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The number of ports controlled by this bridging entity."

REFERENCE

"IEEE 802.1D-1998: clause 14.4.1.1.3"

::= { dot1dBase 2 }

dot1dBaseType OBJECT-TYPE

SYNTAX INTEGER {
 unknown(1),
 transparentOnly(2),
 sourcerouteOnly(3),
 srt(4)
 }

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Indicates what type of bridging this bridge can perform. If a bridge is actually performing a certain type of bridging this will be indicated by entries in the port table for the given type."

::= { dot1dBase 3 }

-- -----
-- The Generic Bridge Port Table
-- -----

dot1dBasePortTable OBJECT-TYPE

SYNTAX SEQUENCE OF Dot1dBasePortEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"A table that contains generic information about every port that is associated with this bridge. Transparent, source-route, and srt ports are included."

::= { dot1dBase 4 }

dot1dBasePortEntry OBJECT-TYPE

SYNTAX Dot1dBasePortEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"A list of information for each port of the bridge."

REFERENCE

"IEEE 802.1D-1998: clause 14.4.2, 14.6.1"

INDEX { dot1dBasePort }

::= { dot1dBasePortTable 1 }

Dot1dBasePortEntry ::=

SEQUENCE {

dot1dBasePort

Integer32,

dot1dBasePortIfIndex

InterfaceIndex,

dot1dBasePortCircuit

OBJECT IDENTIFIER,

dot1dBasePortDelayExceededDiscards

Counter32,

dot1dBasePortMtuExceededDiscards

Counter32

}

dot1dBasePort OBJECT-TYPE

SYNTAX Integer32 (1..65535)

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The port number of the port for which this entry
contains bridge management information."

::= { dot1dBasePortEntry 1 }

dot1dBasePortIfIndex OBJECT-TYPE

SYNTAX InterfaceIndex

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The value of the instance of the ifIndex object,
defined in IF-MIB, for the interface corresponding
to this port."

::= { dot1dBasePortEntry 2 }

dot1dBasePortCircuit OBJECT-TYPE

SYNTAX OBJECT IDENTIFIER

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"For a port which (potentially) has the same value of dot1dBasePortIfIndex as another port on the same bridge, this object contains the name of an object instance unique to this port. For example, in the case where

multiple ports correspond one- to-one with multiple X.25 virtual circuits, this value might identify an (e.g., the first) object instance associated with the X.25 virtual circuit corresponding to this port.

For a port which has a unique value of dot1dBasePortIfIndex, this object can have the value { 0 0 }."

::= { dot1dBasePortEntry 3 }

dot1dBasePortDelayExceededDiscards OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The number of frames discarded by this port due to excessive transit delay through the bridge. It is incremented by both transparent and source route bridges."

REFERENCE

"IEEE 802.1D-1998: clause 14.6.1.1.3"

::= { dot1dBasePortEntry 4 }

dot1dBasePortMtuExceededDiscards OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The number of frames discarded by this port due to an excessive size. It is incremented by both transparent and source route bridges."

REFERENCE

"IEEE 802.1D-1998: clause 14.6.1.1.3"

::= { dot1dBasePortEntry 5 }

-- -----
-- the dot1dStp group
-- -----
-- Implementation of the dot1dStp group is optional. It is
-- implemented by those bridges that support the Spanning Tree
-- Protocol.
-- -----

dot1dStpProtocolSpecification OBJECT-TYPE

SYNTAX INTEGER {
 unknown(1),
 decLb100(2),
 ieee8021d(3)
}

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"An indication of what version of the Spanning Tree
Protocol is being run. The value 'decLb100(2)'

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indicates the DEC LANbridge 100 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."

::= { dot1dStp 1 }

dot1dStpPriority OBJECT-TYPE

SYNTAX Integer32 (0..65535)

MAX-ACCESS read-write

STATUS current

DESCRIPTION

"The value of the write-able portion of the Bridge ID, i.e., the first two octets of the (8 octet long) Bridge ID. The other (last) 6 octets of the Bridge ID are given by the value of dot1dBaseBridgeAddress.

On bridges supporting IEEE 802.1t or IEEE 802.1w, permissible values are 0-61440, in steps of 4096."

REFERENCE

"IEEE 802.1D-1998 clause 8.10.2, Table 8-4,
IEEE 802.1t clause 8.10.2, Table 8-4, clause 14.3."

::= { dot1dStp 2 }

dot1dStpTimeSinceTopologyChange OBJECT-TYPE

SYNTAX TimeTicks

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The time (in hundredths of a second) since the last time a topology change was detected by the bridge entity.

For RSTP, this reports the time since the tcWhile timer for any port on this Bridge was non-zero."

REFERENCE

"IEEE 802.1D-1998 clause 14.8.1.1.,
IEEE 802.1w clause 14.8.1.1."

::= { dot1dStp 3 }

dot1dStpTopChanges OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The total number of topology changes detected by this bridge since the management entity was last reset or initialized."

REFERENCE

"IEEE 802.1D-1998 clause 14.8.1.1."

::= { dot1dStp 4 }

dot1dStpDesignatedRoot OBJECT-TYPE

SYNTAX BridgeId

MAX-ACCESS read-only

STATUS current

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DESCRIPTION

"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."

REFERENCE

"IEEE 802.1D-1998: clause 8.5.3.1"

::= { dot1dStp 5 }

dot1dStpRootCost OBJECT-TYPE

SYNTAX Integer32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The cost of the path to the root as seen from this bridge."

REFERENCE

"IEEE 802.1D-1998: clause 8.5.3.2"

::= { dot1dStp 6 }

dot1dStpRootPort OBJECT-TYPE

SYNTAX Integer32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The port number of the port which offers the lowest cost path from this bridge to the root bridge."

REFERENCE

"IEEE 802.1D-1998: clause 8.5.3.3"

::= { dot1dStp 7 }

dot1dStpMaxAge OBJECT-TYPE

SYNTAX Timeout

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"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."

REFERENCE

"IEEE 802.1D-1998: clause 8.5.3.4"

::= { dot1dStp 8 }

dot1dStpHelloTime OBJECT-TYPE

SYNTAX Timeout

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"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."

REFERENCE

"IEEE 802.1D-1998: clause 8.5.3.5"
 ::= { dot1dStp 9 }

dot1dStpHoldTime OBJECT-TYPE

SYNTAX Integer32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"This time value 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."

REFERENCE

"IEEE 802.1D-1998: clause 8.5.3.14"
 ::= { dot1dStp 10 }

dot1dStpForwardDelay OBJECT-TYPE

SYNTAX Timeout

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"This time value, 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, when a topology change has been detected and is underway, to age all dynamic entries in the Forwarding Database. [Note that 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/when this bridge were to become the root.]"

REFERENCE

"IEEE 802.1D-1998: clause 8.5.3.6"
 ::= { dot1dStp 11 }

dot1dStpBridgeMaxAge OBJECT-TYPE

SYNTAX Timeout (600..4000)

MAX-ACCESS read-write

STATUS current

DESCRIPTION

"The value that all bridges use for MaxAge when this bridge is acting as the root. Note that 802.1D-1998 specifies that the range for this parameter is related to the value of dot1dStpBridgeHelloTime. The

granularity of this timer is specified by 802.1D-1998 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."

REFERENCE

"IEEE 802.1D-1998: clause 8.5.3.8"
 ::= { dot1dStp 12 }

dot1dStpBridgeHelloTime OBJECT-TYPE

SYNTAX Timeout (100..1000)

MAX-ACCESS read-write

STATUS current

DESCRIPTION

"The value that all bridges use for HelloTime when this bridge is acting as the root. The granularity of this timer is specified by 802.1D-1998 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."

REFERENCE

"IEEE 802.1D-1998: clause 8.5.3.9"
 ::= { dot1dStp 13 }

dot1dStpBridgeForwardDelay OBJECT-TYPE

SYNTAX Timeout (400..3000)

MAX-ACCESS read-write

STATUS current

DESCRIPTION

"The value that all bridges use for ForwardDelay when this bridge is acting as the root. Note that 802.1D-1998 specifies that the range for this parameter is related to the value of dot1dStpBridgeMaxAge. The granularity of this timer is specified by 802.1D-1998 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."

REFERENCE

"IEEE 802.1D-1998: clause 8.5.3.10"
 ::= { dot1dStp 14 }

-- -----
-- The Spanning Tree Port Table
-- -----

dot1dStpPortTable OBJECT-TYPE

SYNTAX SEQUENCE OF Dot1dStpPortEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"A table that contains port-specific information for the Spanning Tree Protocol."

::= { dot1dStp 15 }

dot1dStpPortEntry OBJECT-TYPE

SYNTAX Dot1dStpPortEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"A list of information maintained by every port about
the Spanning Tree Protocol state for that port."

```
INDEX    { dot1dStpPort }  
::= { dot1dStpPortTable 1 }
```

```
Dot1dStpPortEntry ::=  
  SEQUENCE {  
    dot1dStpPort  
      Integer32,  
    dot1dStpPortPriority  
      Integer32,  
    dot1dStpPortState  
      INTEGER,  
    dot1dStpPortEnable  
      INTEGER,  
    dot1dStpPortPathCost  
      INTEGER,  
    dot1dStpPortDesignatedRoot  
      BridgeId,  
    dot1dStpPortDesignatedCost  
      Integer32,  
    dot1dStpPortDesignatedBridge  
      BridgeId,  
    dot1dStpPortDesignatedPort  
      OCTET STRING,  
    dot1dStpPortForwardTransitions  
      Counter32,  
    dot1dStpPortPathCost32  
      Integer32  
  }
```

```
dot1dStpPort OBJECT-TYPE  
  SYNTAX      Integer32 (1..65535)  
  MAX-ACCESS  read-only  
  STATUS      current  
  DESCRIPTION  
    "The port number of the port for which this entry  
    contains Spanning Tree Protocol management information."  
  REFERENCE  
    "IEEE 802.1D-1998: clause 14.8.2.1.2"  
  ::= { dot1dStpPortEntry 1 }
```

```
dot1dStpPortPriority OBJECT-TYPE  
  SYNTAX Integer32 (0.. 255)  
  MAX-ACCESS read-write  
  STATUS      current  
  DESCRIPTION  
    "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."
```

On bridges supporting IEEE 802.1t or IEEE 802.1w,
permissible values are 0-240, in steps of 16."

REFERENCE

"IEEE 802.1D-1998 clause 8.10.2, Table 8-4,
IEEE 802.1t clause 8.10.2, Table 8-4, clause 14.3."

```
::= { dot1dStpPortEntry 2 }
```

dot1dStpPortState OBJECT-TYPE

```
SYNTAX      INTEGER {
                disabled(1),
                blocking(2),
                listening(3),
                learning(4),
                forwarding(5),
                broken(6)
            }
```

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"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. If the bridge has detected a port that is malfunctioning it will place that port into the broken(6) state. For ports which are disabled (see dot1dStpPortEnable), this object will have a value of disabled(1)."

REFERENCE

"IEEE 802.1D-1998: clause 8.5.5.2"

```
::= { dot1dStpPortEntry 3 }
```

dot1dStpPortEnable OBJECT-TYPE

```
SYNTAX      INTEGER {
                enabled(1),
                disabled(2)
            }
```

MAX-ACCESS read-write

STATUS current

DESCRIPTION

"The enabled/disabled status of the port."

REFERENCE

"IEEE 802.1D-1998: clause 8.5.5.2"

```
::= { dot1dStpPortEntry 4 }
```

dot1dStpPortPathCost OBJECT-TYPE

```
SYNTAX      INTEGER (1..65535)
```

MAX-ACCESS read-write

STATUS deprecated

DESCRIPTION

"The contribution of this port to the path cost of paths towards the spanning tree root which include this port. 802.1D-1998 recommends that the default value of this parameter be in inverse proportion to the speed of the attached LAN."

New implementations should use dot1dStpPortPathCost32"

REFERENCE

"IEEE 802.1D-1998: clause 8.5.5.3"

::= { dot1dStpPortEntry 5 }

dot1dStpPortDesignatedRoot OBJECT-TYPE

SYNTAX BridgeId

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"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."

REFERENCE

"IEEE 802.1D-1998: clause 8.5.5.4"

::= { dot1dStpPortEntry 6 }

dot1dStpPortDesignatedCost OBJECT-TYPE

SYNTAX Integer32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"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."

REFERENCE

"IEEE 802.1D-1998: clause 8.5.5.5"

::= { dot1dStpPortEntry 7 }

dot1dStpPortDesignatedBridge OBJECT-TYPE

SYNTAX BridgeId

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The Bridge Identifier of the bridge which this port considers to be the Designated Bridge for this port's segment."

REFERENCE

"IEEE 802.1D-1998: clause 8.5.5.6"

::= { dot1dStpPortEntry 8 }

dot1dStpPortDesignatedPort OBJECT-TYPE

SYNTAX OCTET STRING (SIZE (2))

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The Port Identifier of the port on the Designated Bridge for this port's segment."

REFERENCE

"IEEE 802.1D-1998: clause 8.5.5.7"

::= { dot1dStpPortEntry 9 }

dot1dStpPortForwardTransitions OBJECT-TYPE

SYNTAX Counter32
MAX-ACCESS read-only
STATUS current
DESCRIPTION

"The number of times this port has transitioned

from the Learning state to the Forwarding state."
::= { dot1dStpPortEntry 10 }

dot1dStpPortPathCost32 OBJECT-TYPE

SYNTAX Integer32 (1..200000000)

MAX-ACCESS read-write

STATUS current

DESCRIPTION

"The contribution of this port to the path cost of paths towards the spanning tree root which include this port. 802.1D-1998 recommends that the default value of this parameter be in inverse proportion to the speed of the attached LAN.

Replacement for deprecated object dot1dStpPortPathCost."
REFERENCE

"IEEE 802.1t clause 8.10.2, Table 8-5."

::= { dot1dStpPortEntry 11 }

-- -----
-- the dot1dTp group
-- -----
-- Implementation of the dot1dTp group is optional. It is
-- implemented by those bridges that support the transparent
-- bridging mode. A transparent or SRT bridge will implement
-- this group.
-- -----

dot1dTpLearnedEntryDiscards OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The total number of Forwarding Database entries, which have been or would have been learnt, but have been discarded due to a lack of space to store them in the Forwarding Database. If this counter is increasing, it indicates that the Forwarding Database is regularly becoming full (a condition which has unpleasant performance effects on the subnetwork). If this counter has a significant value but is not presently increasing, it indicates that the problem has been occurring but is not persistent."

REFERENCE

"IEEE 802.1D-1998: clause 14.7.1.1.3"

::= { dot1dTp 1 }

dot1dTpAgingTime OBJECT-TYPE

SYNTAX Integer32 (10..1000000)

MAX-ACCESS read-write

STATUS current

DESCRIPTION

"The timeout period in seconds for aging out
dynamically learned forwarding information.

802.1D-1998 recommends a default of 300 seconds."

REFERENCE

"IEEE 802.1D-1998: clause 14.7.1.1.3"

::= { dot1dTp 2 }

-- -----
-- The Forwarding Database for Transparent Bridges
-- -----

dot1dTpFdbTable OBJECT-TYPE

SYNTAX SEQUENCE OF Dot1dTpFdbEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"A table that contains information about unicast entries for which the bridge has forwarding and/or filtering information. This information is used by the transparent bridging function in determining how to propagate a received frame."

::= { dot1dTp 3 }

dot1dTpFdbEntry OBJECT-TYPE

SYNTAX Dot1dTpFdbEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"Information about a specific unicast MAC address for which the bridge has some forwarding and/or filtering information."

INDEX { dot1dTpFdbAddress }

::= { dot1dTpFdbTable 1 }

Dot1dTpFdbEntry ::=

SEQUENCE {

dot1dTpFdbAddress

MacAddress,

dot1dTpFdbPort

Integer32,

dot1dTpFdbStatus

INTEGER

}

dot1dTpFdbAddress OBJECT-TYPE

SYNTAX MacAddress

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"A unicast MAC address for which the bridge has forwarding and/or filtering information."

REFERENCE

"IEEE 802.1D-1998: clause 7.9.1, 7.9.2"
 ::= { dot1dTpFdbEntry 1 }

dot1dTpFdbPort OBJECT-TYPE

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SYNTAX Integer32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"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 (e.g. in the dot1dStaticTable). Implementors are encouraged to assign the port value to this object whenever it is learned even for addresses for which the corresponding value of dot1dTpFdbStatus is not learned(3)."

::= { dot1dTpFdbEntry 2 }

dot1dTpFdbStatus OBJECT-TYPE

SYNTAX INTEGER {
 other(1),
 invalid(2),
 learned(3),
 self(4),
 mgmt(5)
}

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The status of this entry. The meanings of the values are:

other(1) - none of the following. This would include the case where some other MIB object (not the corresponding instance of dot1dTpFdbPort, nor an entry in the dot1dStaticTable) is being used to determine if and how frames addressed to the value of the corresponding instance of dot1dTpFdbAddress are being forwarded.

invalid(2) - this entry is not longer valid (e.g., it was learned but has since aged-out), but has not yet been flushed from the table.

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."
::= { dot1dTpFdbEntry 3 }

```
-- -----  
-- Port Table for Transparent Bridges  
-- -----
```

dot1dTpPortTable OBJECT-TYPE

SYNTAX SEQUENCE OF Dot1dTpPortEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"A table that contains information about every port that
is associated with this transparent bridge."

::= { dot1dTp 4 }

dot1dTpPortEntry OBJECT-TYPE

SYNTAX Dot1dTpPortEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"A list of information for each port of a transparent
bridge."

INDEX { dot1dTpPort }

::= { dot1dTpPortTable 1 }

Dot1dTpPortEntry ::=

SEQUENCE {

dot1dTpPort

Integer32,

dot1dTpPortMaxInfo

Integer32,

dot1dTpPortInFrames

Counter32,

dot1dTpPortOutFrames

Counter32,

dot1dTpPortInDiscards

Counter32

}

dot1dTpPort OBJECT-TYPE

SYNTAX Integer32 (1..65535)

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The port number of the port for which this entry
contains Transparent bridging management information."

::= { dot1dTpPortEntry 1 }

```
-- It would be nice if we could use ifMtu as the size of the  
-- largest INFO field, but we can't because ifMtu is defined  
-- to be the size that the (inter-)network layer can use which
```

-- can differ from the MAC layer (especially if several layers
-- of encapsulation are used).

dot1dTpPortMaxInfo OBJECT-TYPE
SYNTAX Integer32

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MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The maximum size of the INFO (non-MAC) field that
this port will receive or transmit."

::= { dot1dTpPortEntry 2 }

dot1dTpPortInFrames OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The number of frames that have been received by this
port from its segment. Note that a frame received on the
interface corresponding to this port is only counted by
this object if and only if it is for a protocol being
processed by the local bridging function, including
bridge management frames."

REFERENCE

"IEEE 802.1D-1998: clause 14.6.1.1.3"

::= { dot1dTpPortEntry 3 }

dot1dTpPortOutFrames OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The number of frames that have been transmitted by this
port to its segment. Note that a frame transmitted on
the interface corresponding to this port is only counted
by this object if and only if it is for a protocol being
processed by the local bridging function, including
bridge management frames."

REFERENCE

"IEEE 802.1D-1998: clause 14.6.1.1.3"

::= { dot1dTpPortEntry 4 }

dot1dTpPortInDiscards OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Count of valid frames received which were discarded
(i.e., filtered) by the Forwarding Process."

REFERENCE

"IEEE 802.1D-1998: clause 14.6.1.1.3"

::= { dot1dTpPortEntry 5 }

-- The Static (Destination-Address Filtering) Database

-- -----

-- Implementation of this group is optional.

-- -----

dot1dStaticTable OBJECT-TYPE

SYNTAX SEQUENCE OF Dot1dStaticEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"A table containing 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. The value of zero in this table as the port number from which frames with a specific destination address are received, is used to specify all ports for which there is no specific entry in this table for that particular destination address. Entries are valid for unicast and for group/broadcast addresses."

REFERENCE

"IEEE 802.1D-1998: clause 14.7.2"

::= { dot1dStatic 1 }

dot1dStaticEntry OBJECT-TYPE

SYNTAX Dot1dStaticEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"Filtering information configured into the bridge by (local or network) management specifying the set of ports to which frames received from a specific port and containing a specific destination address are allowed to be forwarded."

REFERENCE

"IEEE 802.1D-1998: clause 14.7.2"

INDEX { dot1dStaticAddress, dot1dStaticReceivePort }

::= { dot1dStaticTable 1 }

Dot1dStaticEntry ::=

SEQUENCE {

dot1dStaticAddress MacAddress,
dot1dStaticReceivePort Integer32,
dot1dStaticAllowedToGoTo OCTET STRING,
dot1dStaticStatus INTEGER

}

dot1dStaticAddress OBJECT-TYPE

SYNTAX MacAddress

MAX-ACCESS read-create

STATUS current

DESCRIPTION

"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."

REFERENCE

"IEEE 802.1D-1998: clause 7.9.1, 7.9.2"

```
::= { dot1dStaticEntry 1 }
```

dot1dStaticReceivePort OBJECT-TYPE

SYNTAX Integer32 (0..65535)

MAX-ACCESS read-create

STATUS current

DESCRIPTION

"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."

```
::= { dot1dStaticEntry 2 }
```

dot1dStaticAllowedToGoTo OBJECT-TYPE

SYNTAX OCTET STRING (SIZE (0..512))

MAX-ACCESS read-create

STATUS current

DESCRIPTION

"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, etc. 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'. (Note that the setting of the bit corresponding to the port from which a frame is received is irrelevant.) The default value of this object is a string of ones of appropriate length.

This exceeds the minimum required SNMP packet size supported. This is sufficient to allow the maximum 4096 ports now supported."

```
::= { dot1dStaticEntry 3 }
```

dot1dStaticStatus OBJECT-TYPE

SYNTAX INTEGER {
 other(1),
 invalid(2),
 permanent(3),
 deleteOnReset(4),
 deleteOnTimeout(5)

```
}  
MAX-ACCESS read-create  
STATUS current  
DESCRIPTION
```

"This object indicates the status of this entry."

The default value is permanent(3).

other(1) - this entry is currently in use but the conditions under which it will remain so are different from each of the following values.

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.

deleteOnReset(4) - this entry is currently in use and will remain so until the next reset of the bridge.

deleteOnTimeout(5) - this entry is currently in use and will remain so until it is aged out."

::= { dot1dStaticEntry 4 }

```
-- -----  
-- Notifications for use by Bridges  
-- -----  
-- Notifications for the Spanning Tree Protocol  
-- -----
```

newRoot NOTIFICATION-TYPE

-- OBJECTS { }

STATUS current

DESCRIPTION

"The newRoot trap indicates that the sending agent has become the new root of the Spanning Tree; the trap is sent by a bridge soon after its election as the new root, e.g., upon expiration of the Topology Change Timer immediately subsequent to its election. Implementation of this trap is optional."

::= { dot1dNotification 1 }

topologyChange NOTIFICATION-TYPE

-- OBJECTS { }

STATUS current

DESCRIPTION

"A topologyChange trap is sent by a bridge when any of its configured ports transitions from the Learning state to the Forwarding state, or from the Forwarding state to the Blocking state. The trap is not sent if a newRoot trap is sent for the same transition. Implementation of this trap is optional."

::= { dot1dNotification 2 }

```
-- -----  
-- IEEE 802.1D MIB - Conformance Information  
-- -----
```

dot1dGroups OBJECT IDENTIFIER ::= { dot1dConformance 1 }
dot1dCompliances OBJECT IDENTIFIER ::= { dot1dConformance 2 }

-- -----


```
-- units of conformance
```

```
-- -----
```

```
-- -----
```

```
-- the dot1dBase group
```

```
-- -----
```

```
dot1dBaseBridgeGroup OBJECT-GROUP
```

```
    OBJECTS {
```

```
        dot1dBaseBridgeAddress,
```

```
        dot1dBaseNumPorts,
```

```
        dot1dBaseType
```

```
    }
```

```
    STATUS      current
```

```
    DESCRIPTION
```

```
        "Bridge level information for this device."
```

```
    ::= { dot1dGroups 1 }
```

```
dot1dBasePortGroup OBJECT-GROUP
```

```
    OBJECTS {
```

```
        dot1dBasePort,
```

```
        dot1dBasePortIfIndex,
```

```
        dot1dBasePortCircuit,
```

```
        dot1dBasePortDelayExceededDiscards,
```

```
        dot1dBasePortMtuExceededDiscards
```

```
    }
```

```
    STATUS      current
```

```
    DESCRIPTION
```

```
        "Information for each port on this device."
```

```
    ::= { dot1dGroups 2 }
```

```
-- -----
```

```
-- the dot1dStp group
```

```
-- -----
```

```
dot1dStpBridgeGroup OBJECT-GROUP
```

```
    OBJECTS {
```

```
        dot1dStpProtocolSpecification,
```

```
        dot1dStpPriority,
```

```
        dot1dStpTimeSinceTopologyChange,
```

```
        dot1dStpTopChanges,
```

```
        dot1dStpDesignatedRoot,
```

```
        dot1dStpRootCost,
```

```
        dot1dStpRootPort,
```

```
        dot1dStpMaxAge,
```

```
        dot1dStpHelloTime,
```

```
        dot1dStpHoldTime,
```

```
        dot1dStpForwardDelay,
```

```
        dot1dStpBridgeMaxAge,
```

```
dot1dStpBridgeHelloTime,  
dot1dStpBridgeForwardDelay  
}  
STATUS      current  
DESCRIPTION
```

```
    "Bridge level Spanning Tree data for this device."  
    ::= { dot1dGroups 3 }
```

```
dot1dStpPortGroup OBJECT-GROUP
```

```
    OBJECTS {  
        dot1dStpPort,  
        dot1dStpPortPriority,  
        dot1dStpPortState,  
        dot1dStpPortEnable,  
        dot1dStpPortPathCost,  
        dot1dStpPortDesignatedRoot,  
        dot1dStpPortDesignatedCost,  
        dot1dStpPortDesignatedBridge,  
        dot1dStpPortDesignatedPort,  
        dot1dStpPortForwardTransitions  
    }  
    STATUS      deprecated  
    DESCRIPTION  
        "Spanning Tree data for each port on this device."  
    ::= { dot1dGroups 4 }
```

```
dot1dStpPortGroup2 OBJECT-GROUP
```

```
    OBJECTS {  
        dot1dStpPort,  
        dot1dStpPortPriority,  
        dot1dStpPortState,  
        dot1dStpPortEnable,  
        dot1dStpPortDesignatedRoot,  
        dot1dStpPortDesignatedCost,  
        dot1dStpPortDesignatedBridge,  
        dot1dStpPortDesignatedPort,  
        dot1dStpPortForwardTransitions,  
        dot1dStpPortPathCost32  
    }  
    STATUS      current  
    DESCRIPTION  
        "Spanning Tree data for each port on this device."  
    ::= { dot1dGroups 5 }
```

```
-- -----  
-- the dot1dTp group  
-- -----
```

```
dot1dTpBridgeGroup OBJECT-GROUP
```

```
    OBJECTS {  
        dot1dTpLearnedEntryDiscards,  
        dot1dTpAgingTime  
    }  
    STATUS      current
```

DESCRIPTION

"Bridge level Transparent Bridging data."
::= { dot1dGroups 6 }

dot1dTpFdbGroup OBJECT-GROUP

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```
OBJECTS {
    dot1dTpFdbAddress,
    dot1dTpFdbPort,
    dot1dTpFdbStatus
}
STATUS      current
DESCRIPTION
    "Filtering Database information for the Bridge."
 ::= { dot1dGroups 7 }
```

dot1dTpGroup OBJECT-GROUP

```
OBJECTS {
    dot1dTpPort,
    dot1dTpPortMaxInfo,
    dot1dTpPortInFrames,
    dot1dTpPortOutFrames,
    dot1dTpPortInDiscards
}
STATUS      current
DESCRIPTION
    "Dynamic Filtering Database information for each port of
    the Bridge."
 ::= { dot1dGroups 8 }
```

```
-- -----
-- The Static (Destination-Address Filtering) Database
-- -----
```

dot1dStaticGroup OBJECT-GROUP

```
OBJECTS {
    dot1dStaticAddress,
    dot1dStaticReceivePort,
    dot1dStaticAllowedToGoTo,
    dot1dStaticStatus
}
STATUS      current
DESCRIPTION
    "Static Filtering Database information for each port of
    the Bridge."
 ::= { dot1dGroups 9 }
```

```
-- -----
-- The Trap Notification Group
-- -----
```

dot1dNotificationGroup NOTIFICATION-GROUP

```
NOTIFICATIONS {
    newRoot,
    topologyChange
```

```
}  
STATUS      current  
DESCRIPTION  
    "Group of objects describing notifications (traps)."  
 ::= { dot1dGroups 10 }
```

```
-- -----  
-- compliance statements  
-- -----  
  
bridgeCompliance MODULE-COMPLIANCE  
    STATUS      deprecated  
    DESCRIPTION  
        "The compliance statement for device support of bridging  
        services.  As per RFC1493"  
  
    MODULE  
        MANDATORY-GROUPS {  
            dot1dBaseBridgeGroup,  
            dot1dBasePortGroup  
        }  
  
    GROUP      dot1dStpBridgeGroup  
    DESCRIPTION  
        "Implementation of this group is mandatory for bridges  
        that support the Spanning Tree Protocol."  
  
    GROUP      dot1dStpPortGroup  
    DESCRIPTION  
        "Implementation of this group is mandatory for bridges  
        that support the Spanning Tree Protocol."  
  
    GROUP      dot1dTpBridgeGroup  
    DESCRIPTION  
        "Implementation of this group is mandatory for bridges  
        that support the transparent bridging mode.  A  
        transparent or SRT bridge will implement this group."  
  
    GROUP      dot1dTpFdbGroup  
    DESCRIPTION  
        "Implementation of this group is mandatory for bridges  
        that support the transparent bridging mode.  A  
        transparent or SRT bridge will implement this group."  
  
    GROUP      dot1dTpGroup  
    DESCRIPTION  
        "Implementation of this group is mandatory for bridges  
        that support the transparent bridging mode.  A  
        transparent or SRT bridge will implement this group."  
  
    GROUP      dot1dStaticGroup  
    DESCRIPTION  
        "Implementation of this group is optional."  
  
    GROUP      dot1dNotificationGroup
```

DESCRIPTION

"Implementation of this group is optional."
::= { dot1dCompliances 1 }

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bridgeCompliance2 MODULE-COMPLIANCE

STATUS current

DESCRIPTION

"The compliance statement for device support of bridging services. This supports 32-bit Path Cost values and the more restricted bridge and port priorities, as per IEEE 802.1t."

MODULE

```
MANDATORY-GROUPS {  
    dot1dBaseBridgeGroup,  
    dot1dBasePortGroup  
}
```

GROUP dot1dStpBridgeGroup

DESCRIPTION

"Implementation of this group is mandatory for bridges that support the Spanning Tree Protocol."

OBJECT dot1dStpPriority

```
SYNTAX Integer32 (0|4096|8192|12288|16384|20480|24576  
                  |28672|32768|36864|40960|45056|49152  
                  |53248|57344|61440)
```

DESCRIPTION

"All possible values as per IEEE 802.1t."

GROUP dot1dStpPortGroup2

DESCRIPTION

"Implementation of this group is mandatory for bridges that support the Spanning Tree Protocol."

OBJECT dot1dStpPortPriority

```
SYNTAX Integer32 (0|16|32|48|64|80|96|112|128  
                  |144|160|176|192|208|224|240)
```

DESCRIPTION

"All possible values as per IEEE 802.1t."

GROUP dot1dTpBridgeGroup

DESCRIPTION

"Implementation of this group is mandatory for bridges that support the transparent bridging mode. A transparent or SRT bridge will implement this group."

GROUP dot1dTpFdbGroup

DESCRIPTION

"Implementation of this group is mandatory for bridges that support the transparent bridging mode. A transparent or SRT bridge will implement

this group."

GROUP dot1dTpGroup

DESCRIPTION

"Implementation of this group is mandatory for

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bridges that support the transparent bridging mode. A transparent or SRT bridge will implement this group."

GROUP dot1dStaticGroup

DESCRIPTION

"Implementation of this group is optional."

GROUP dot1dNotificationGroup

DESCRIPTION

"Implementation of this group is optional."

::= { dot1dCompliances 2 }

END

4. Security Considerations

There are a number of management objects defined in this MIB that have a MAX-ACCESS clause of read-write and/or read-create. Such objects may be considered sensitive or vulnerable in some network environments. The support for SET operations in a non-secure environment without proper protection can have a negative effect on network operations.

SNMPv1 by itself is not a secure environment. Even if the network itself is secure (for example by using IPSec), even then, there is no control as to who on the secure network is allowed to access and GET/SET (read/change/create/delete) the objects in this MIB.

It is recommended that the implementers consider the security features as provided by the SNMPv3 framework. Specifically, the use of the User-based Security Model [RFC 2574](#) [[RFC2574](#)] and the View-based Access Control Model [RFC 2575](#) [[RFC2575](#)] is recommended.

It is then a customer/user responsibility to ensure that the SNMP entity giving access to an instance of this MIB, is properly configured to give access to the objects only to those principals (users) that have legitimate rights to indeed GET or SET (change/create/delete) them.

5. Acknowledgments

The MIB presented in this memo is a direct translation of the BRIDGE MIB defined in [[RFC1493](#)], to the SMIV2 syntax required for current IETF MIB standards.

The original authors were E. Decker, P. Langille, A Rijsinghani and

K. McCloghrie. Further acknowledgement is given to the members of the original Bridge Working Group in [[RFC1493](#)].

This document was produced on behalf of the Bridge MIB Working Group

in the Operations and Management area of the Internet Engineering Task Force.

The authors wish to thank the members of the Bridge MIB Working Group, especially Mike MacFadden and Bert Visscher for their many comments and suggestions which improved this effort.

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8. Changes from [RFC 1493](#)

The following changes have been made from [RFC 1493](#).

- (1) Translated the MIB definition to use SMIV2.
- (2) Updated the SNMP Framework and references to comply with the current IETF guidelines.
- (3) Updated the Security section to comply with current IETF guidelines.

The following chnages have been made from
[draft-ietf-bridge-bridgemib-smiv2-00.txt](#)

- (1) Misc. description refernces to IEEE 802.1d documents

(2) dot1dNotificationGroup changed from dot1dTrapGroup

(3) Misc. additions to some descriptions

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The following changes have been made from
[draft-ietf-bridge-bridgemib-smiv2-01.txt](#)

- (1) corrections to objects that were made not-accessible in the
[draft-00](#) version that were read /read-write in [rfc 1493](#)
- (2) Misc. additions to some descriptions

The following changes have been made from
[draft-ietf-bridge-bridgemib-smiv2-02.txt](#)

- (1) Updated references of IEEE 802.1d draft from
1990 document to 1998 document.

The following changes have been made from
[draft-ietf-bridge-bridgemib-smiv2-03.txt](#)

- (1) Adapted the current conformance statement.

No changes have been made between version 4 and version 5
of this draft.

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