Definitions of Managed Objects for Bridges

Status of this Memo

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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-1990 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.

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
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                   BridgeFilter.AgingTime
        FdbTable
           Address
           Port
           Status
        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

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

bridgeMIB MODULE-IDENTITY
    LAST-UPDATED "200106260000Z"
    ORGANIZATION "IETF Bridge MIB Working Group"
    CONTACT-INFO
        "Email: Bridge-mib@ietf.org"
    DESCRIPTION
        "The Bridge MIB module for managing devices that support
        IEEE 802.1D."
    REVISION     "200106260000Z"
    DESCRIPTION
         "Draft 0: initial translation of RFC 1493 to SMIv2."
    REVISION     "199307310000Z"
    DESCRIPTION
        "RFC 1493: SMIv1 version."
     ::= { dot1dBridge 8 }

-- ------------------------------------------------------------ --
-- 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 hundreths 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-1990 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 = 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 = 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
    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-1990: Sections 6.4.1.1.3 and 3.12.5"
     ::= { 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-1990: Section 6.4.1.1.3"
     ::= { 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-1990: Section 6.4.2, 6.6.1"
        INDEX  { dot1dBasePort }
        ::= { dot1dBasePortTable 1 }

    Dot1dBasePortEntry ::=
        SEQUENCE {
            dot1dBasePort
                Integer32,
            dot1dBasePortIfIndex
                Integer32,
            dot1dBasePortCircuit
                OBJECT IDENTIFIER,
            dot1dBasePortDelayExceededDiscards
                Counter32,
            dot1dBasePortMtuExceededDiscards
                Counter32
        }

    dot1dBasePort OBJECT-TYPE
        SYNTAX       Integer32 (1..65535)
        MAX-ACCESS  not-accessible
        STATUS       current
        DESCRIPTION
            "The port number of the port for which this entry
            contains bridge management information."
        ::= { dot1dBasePortEntry 1 }

    dot1dBasePortIfIndex OBJECT-TYPE
        SYNTAX       Integer32
        MAX-ACCESS  read-only
        STATUS       current
        DESCRIPTION
            "The value of the instance of the ifIndex object,
            defined in MIB-II, 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-1990: Section 6.6.1.1.3"
          ::= { 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-1990: Section 6.6.1.1.3"
          ::= { 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)'
           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."
       REFERENCE
           "IEEE 802.1D-1990: Section 4.5.3.7"
       ::= { 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."
       REFERENCE
           "IEEE 802.1D-1990: Section 6.8.1.1.3"
       ::= { 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-1990: Section 6.8.1.1.3"
        ::= { dot1dStp 4 }

    dot1dStpDesignatedRoot OBJECT-TYPE
        SYNTAX        BridgeId
        MAX-ACCESS  read-only
        STATUS        current
        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-1990: Section 4.5.3.1"
        ::= { 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-1990: Section 4.5.3.2"
        ::= { 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-1990: Section 4.5.3.3"
        ::= { 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-1990: Section 4.5.3.4"

```
     ::= { 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-1990: Section 4.5.3.5"
    ::= { 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-1990: Section 4.5.3.14"
    ::= { 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-1990: Section 4.5.3.6"
    ::= { 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-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."
    REFERENCE
        "IEEE 802.1D-1990: Section 4.5.3.8"
    ::= { 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- 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."
    REFERENCE
        "IEEE 802.1D-1990: Section 4.5.3.9"
    ::= { 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-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."
    REFERENCE
        "IEEE 802.1D-1990: Section 4.5.3.10"
    ::= { 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
                 Integer32,
             dot1dStpPortDesignatedRoot
                 BridgeId,
             dot1dStpPortDesignatedCost
                 Integer32,
             dot1dStpPortDesignatedBridge
                 BridgeId,
             dot1dStpPortDesignatedPort
                 OCTET STRING,
             dot1dStpPortForwardTransitions
                 Counter32
         }

     dot1dStpPort OBJECT-TYPE
         SYNTAX   Integer32 (1..65535)
         MAX-ACCESS not-accessible

```
        STATUS      current
        DESCRIPTION
```

                "The port number of the port for which this entry
                contains Spanning Tree Protocol management information."
            REFERENCE
                "IEEE 802.1D-1990: Section 6.8.2.1.2"
            ::= { 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."
            REFERENCE
                "IEEE 802.1D-1990: Section 4.5.5.1"
            ::= { 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-1990: Section 4.5.5.2"
            ::= { 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-1990: Section 4.5.5.2"
     ::= { dot1dStpPortEntry 4 }

dot1dStpPortPathCost OBJECT-TYPE
    SYNTAX   Integer32 (1..65535)
    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-1990 recommends that the
        default value of this parameter be in inverse
        proportion to the speed of the attached LAN."
    REFERENCE
        "IEEE 802.1D-1990: Section 4.5.5.3"
    ::= { 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-1990: Section 4.5.5.4"
    ::= { 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-1990: Section 4.5.5.5"
    ::= { 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-1990: Section 4.5.5.6"
        ::= { 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-1990: Section 4.5.5.7"
        ::= { 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 }

    -- --- --
    -- 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-1990: Section 6.7.1.1.3"
        ::= { 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-1990 recommends a default of 300 seconds."
        REFERENCE
            "IEEE 802.1D-1990: Section 6.7.1.1.3"
        ::= { 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   not-accessible
        STATUS       current
        DESCRIPTION
            "A unicast MAC address for which the bridge has
            forwarding and/or filtering information."
        REFERENCE
            "IEEE 802.1D-1990: Section 3.9.1, 3.9.2"
        ::= { dot1dTpFdbEntry 1 }


    dot1dTpFdbPort OBJECT-TYPE
        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   not-accessible
        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
        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-1990: Section 6.6.1.1.3"
        ::= { 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-1990: Section 6.6.1.1.3"
    ::= { 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-1990: Section 6.6.1.1.3"
    ::= { 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-1990: Section 6.7.2"
    ::= { 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-1990: Section 6.7.2"
        INDEX   { dot1dStaticAddress, dot1dStaticReceivePort }
        ::= { dot1dStaticTable 1 }

    Dot1dStaticEntry ::=
        SEQUENCE {
            dot1dStaticAddress
                MacAddress,
            dot1dStaticReceivePort
                Integer32,
            dot1dStaticAllowedToGoTo
                OCTET STRING,
            dot1dStaticStatus
                INTEGER
        }

    dot1dStaticAddress OBJECT-TYPE
        SYNTAX      MacAddress
        MAX-ACCESS  not-accessible
        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-1990: Section 3.9.1, 3.9.2"
        ::= { dot1dStaticEntry 1 }

    dot1dStaticReceivePort OBJECT-TYPE
        SYNTAX      Integer32 (1..65535)
        MAX-ACCESS  not-accessible
        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
        MAX-ACCESS  read-write
        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."
        ::= { dot1dStaticEntry 3 }

    dot1dStaticStatus OBJECT-TYPE
        SYNTAX      INTEGER {
                    other(1),
                    invalid(2),
                    permanent(3),
                    deleteOnReset(4),
                    deleteOnTimeout(5)
                }
        MAX-ACCESS  read-write
        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 }
```

```
     -- ------------------------------------------------------------- --
     -- Traps for use by Bridges
     -- ------------------------------------------------------------- --
     -- Traps 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."
         ::= { dot1dBridge 0 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."
         ::= { dot1dBridge 0 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 {
            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 {
            dot1dStpPortPriority,
            dot1dStpPortState,
```

```
            dot1dStpPortEnable,
            dot1dStpPortPathCost,
```

```
            dot1dStpPortDesignatedRoot,
            dot1dStpPortDesignatedCost,
            dot1dStpPortDesignatedBridge,
            dot1dStpPortDesignatedPort,
            dot1dStpPortForwardTransitions
        }
        STATUS      current
        DESCRIPTION
            "Spanning Tree data for each port on this device."
        ::= { dot1dGroups 4 }

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

    dot1dTpBridgeGroup OBJECT-GROUP
        OBJECTS {
            dot1dTpLearnedEntryDiscards,
            dot1dTpAgingTime
        }
        STATUS      current
        DESCRIPTION
            "Bridge level Transparent Bridging data."
        ::= { dot1dGroups 5 }

    dot1dTpFdbGroup OBJECT-GROUP
        OBJECTS {
            dot1dTpFdbPort,
            dot1dTpFdbStatus
        }
        STATUS      current
        DESCRIPTION
            "Filtering Database information for the Bridge."
        ::= { dot1dGroups 6 }

    dot1dTpGroup OBJECT-GROUP
        OBJECTS {
            dot1dTpPortMaxInfo,
            dot1dTpPortInFrames,
            dot1dTpPortOutFrames,
            dot1dTpPortInDiscards
        }
        STATUS      current
        DESCRIPTION
            "Dynamic Filtering Database information for each port of
            the Bridge."
        ::= { dot1dGroups 7 }
```

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

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

     dot1dStaticGroup OBJECT-GROUP
         OBJECTS {
             dot1dStaticAllowedToGoTo,
             dot1dStaticStatus
         }
         STATUS      current
         DESCRIPTION
             "Static Filtering Database information for each port of
             the Bridge."
         ::= { dot1dGroups 8 }

     -- ------------------------------------------------------------ --
     -- The Trap Notfication Group
     -- ------------------------------------------------------------ --

     dot1dTrapGroup NOTIFICATION-GROUP
         NOTIFICATIONS {
             newRoot,
             topologyChange
         }
         STATUS      current
         DESCRIPTION
             "Group of objects describing notifications (traps)."
         ::= { dot1dGroups 9 }

     -- ------------------------------------------------------------ --
     -- compliance statements
     -- ------------------------------------------------------------ --

     bridgeCompliance MODULE-COMPLIANCE
         STATUS      current
         DESCRIPTION
             "The compliance statement for device support of bridging
             services."

         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."

            ::= { dot1dCompliances 1 }

    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.

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

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

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   for their many comments and suggestions which improved this effort.

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             1996.

7. 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.

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