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IEEE 802.5 MIB using SMIV2

Status of this Memo

This document specifies an Internet standards track protocol for the Internet community, and requests discussion and suggestions for improvements. Please refer to the current edition of the "Internet Official Protocol Standards" (STD 1) for the standardization state and status of this protocol. Distribution of this memo is unlimited.

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1. Introduction

This memo defines a portion of the Management Information Base (MIB) for use with network management protocols in the Internet community. In particular, it describes managed objects used for managing subnetworks which use the IEEE 802.5 Token Ring technology described in 802.5 Token Ring Access Method and Physical Layer Specifications, IEEE Standard 802.5-1989 [7]. This memo is a replacement for RFC 1231.

2. The SNMPv2 Network Management Framework

The SNMPv2 Network Management Framework consists of four major components. They are:

- o RFC 1442 [1] which defines the SMI, the mechanisms used for describing and naming objects for the purpose of management.
- o STD 17, RFC 1213 [2] defines MIB-II, the core set of managed objects for the Internet suite of protocols.
- o RFC 1445 [3] which defines the administrative and other architectural aspects of the framework.
- o RFC 1448 [4] which defines the protocol used for network access to managed objects.

The Framework permits new objects to be defined for the purpose of experimentation and evaluation.

2.1. Object Definitions

Managed objects are accessed via a virtual information store, termed the Management Information Base or MIB. Objects in the MIB are defined using the subset of Abstract Syntax Notation One (ASN.1) defined in the SMI. In particular, each object type is named by an OBJECT IDENTIFIER, an administratively assigned name. The object type together with an object instance serves to uniquely identify a specific instantiation of the object. For human convenience, we often use a textual string, termed the descriptor, to refer to the object type.

3. Overview

This memo defines three tables: the 802.5 Interface Table, which contains state and parameter information which is specific to 802.5 interfaces, the 802.5 Statistics Table, which contains 802.5 interface statistics, and the 802.5 Timer Table, which contains the values of 802.5-defined timers. A managed system will have one entry in the 802.5 Interface Table and one entry in the 802.5 Statistics Table for each of its 802.5 interfaces. The 802.5 Timer Table is obsolete, but its definition has been retained in this memo for backward compatibility.

This memo also defines OBJECT IDENTIFIERS, some to identify interface tests for use with the ifTestTable [6], and some to identify Token Ring interface Chip Sets.

3.1. MAC Addresses

All representations of MAC addresses in this MIB Module use the MacAddress textual convention [5] for which the address is in the "canonical" order defined by IEEE 802.1a, i.e., as if it were transmitted least significant bit first, even though 802.5 requires MAC addresses to be transmitted most significant bit first.

16-bit addresses, if needed, are represented by setting their upper 4 octets to all zeros, i.e., AAFF would be represented as 00000000AAFF.

3.2. Relationship to RFC 1213

When this MIB module is used in conjunction with the "old" (i.e., pre-RFC 1573) interfaces group, the relationship between an 802.5 interface and an interface in the context of the RFC 1213 is one-to-one. That is, the value of an ifIndex object instance for an 802.5 interface can be directly used to identify corresponding instances of the objects defined in this memo.

3.3. Relationship to RFC 1573

RFC 1573, the Interface MIB Evolution, requires that any MIB module which is an adjunct of the Interface MIB, clarify specific areas within the Interface MIB. These areas were intentionally left vague in RFC 1573 to avoid over constraining the MIB module, thereby precluding management of certain media-types.

Section 3.3 of RFC 1573 enumerates several areas which a media-specific MIB module must clarify. Each of these areas is addressed in a following subsection. The implementor is referred to RFC 1573 in order to understand the general intent of these areas.

3.3.1. Layering Model

For the typical usage of this IEEE 802.5 MIB module, there will be no sub-layers "above" or "below" the 802.5 interface. However, this MIB module does not preclude such layering.

3.3.2. Virtual Circuits

802.5 does not support virtual circuits.

3.3.3. ifTestTable

This MIB module defines two tests for 802.5 interfaces: Insertion and Loopback. Implementation of these tests is not required.

3.3.4. ifRcvAddressTable

The ifRcvAddressTable is defined to contain all MAC addresses, unicast, multicast (group) and broadcast, for which an interface will receive packets. For 802.5 interfaces, its use includes functional addresses. The format of the address, contained in ifRcvAddressAddress, is the same as for ifPhysAddress.

For functional addresses on a particular 802.5 interface, only one ifRcvAddressTable entry is required. That entry is the one for the address which has the functional address bit ANDed with the bit mask of all functional addresses for which the interface will accept frames.

3.3.5. ifPhysAddress

For an 802.5 interface, ifPhysAddress contains the interface's IEEE MAC address, stored as an octet string of length 6, in IEEE 802.1a "canonical" order, i.e., the Group Bit is positioned as the low-order bit (0x01) of the first octet.

3.3.6. ifType

The objects defined in this memo apply to each interface for which the ifType has the value:

iso88025-tokenRing(9)

4. Definitions

TOKENRING-MIB DEFINITIONS ::= BEGIN

IMPORTS

MODULE-IDENTITY, OBJECT-TYPE, OBJECT-IDENTITY,	
Counter32, Integer32	FROM SNMPv2-SMI
transmission	FROM RFC1213-MIB
MacAddress, TimeStamp	FROM SNMPv2-TC
MODULE-COMPLIANCE, OBJECT-GROUP	FROM SNMPv2-CONF;

dot5 MODULE-IDENTITY

LAST-UPDATED "9410231150Z"
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DESCRIPTION

"The MIB module for IEEE Token Ring entities."

::= { transmission 9 }

-- The 802.5 Interface Table

-- This table contains state and parameter information which
 -- is specific to 802.5 interfaces. It is mandatory that
 -- systems having 802.5 interfaces implement this table in
 -- addition to the ifTable (see RFCs 1213 and 1573).

dot5Table OBJECT-TYPE
 SYNTAX SEQUENCE OF Dot5Entry
 MAX-ACCESS not-accessible
 STATUS current

DESCRIPTION

"This table contains Token Ring interface
 parameters and state variables, one entry
 per 802.5 interface."

::= { dot5 1 }

dot5Entry OBJECT-TYPE
 SYNTAX Dot5Entry
 MAX-ACCESS not-accessible
 STATUS current

DESCRIPTION

"A list of Token Ring status and parameter
 values for an 802.5 interface."

INDEX { dot5IfIndex }

::= { dot5Table 1 }

```
Dot5Entry ::= SEQUENCE {
    dot5IfIndex          Integer32,
    dot5Commands         INTEGER,
    dot5RingStatus      INTEGER,
    dot5RingState       INTEGER,
    dot5RingOpenStatus  INTEGER,
    dot5RingSpeed       INTEGER,
    dot5UpStream        MacAddress,
    dot5ActMonParticipate INTEGER,
    dot5Functional       MacAddress,
    dot5LastBeaconSent  TimeStamp
}
```

```

dot5IfIndex      OBJECT-TYPE
  SYNTAX         Integer32
  MAX-ACCESS     read-only
  STATUS         current
  DESCRIPTION
    "The value of this object identifies the
    802.5 interface for which this entry
    contains management information.  The
    value of this object for a particular
    interface has the same value as the
    ifIndex object, defined in MIB-II for
    the same interface."
  ::= { dot5Entry 1 }

dot5Commands     OBJECT-TYPE
  SYNTAX         INTEGER {
                    noop(1),
                    open(2),
                    reset(3),
                    close(4)
                  }
  MAX-ACCESS     read-write
  STATUS         current
  DESCRIPTION
    "When this object is set to the value of
    open(2), the station should go into the
    open state.  The progress and success of
    the open is given by the values of the
    objects dot5RingState and
    dot5RingOpenStatus.
    When this object is set to the value
    of reset(3), then the station should do
    a reset.  On a reset, all MIB counters
    should retain their values, if possible.
    Other side affects are dependent on the
    hardware chip set.
    When this object is set to the value
    of close(4), the station should go into
    the stopped state by removing itself
    from the ring.
    Setting this object to a value of
    noop(1) has no effect.
    When read, this object always has a
    value of noop(1).
    The open(2) and close(4) values
    correspond to the up(1) and down(2) values
    of MIB-II's ifAdminStatus and ifOperStatus,
    i.e., the setting of ifAdminStatus and

```

```

        dot5Commands affects the values of both
        dot5Commands and ifOperStatus."
 ::= { dot5Entry 2 }

dot5RingStatus OBJECT-TYPE
    SYNTAX      INTEGER (0..262143)
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "The current interface status which can
        be used to diagnose fluctuating problems
        that can occur on token rings, after a
        station has successfully been added to
        the ring.

        Before an open is completed, this
        object has the value for the 'no status'
        condition.  The dot5RingState and
        dot5RingOpenStatus objects provide for
        debugging problems when the station
        can not even enter the ring.

        The object's value is a sum of
        values, one for each currently applicable
        condition.  The following values are
        defined for various conditions:

                0 = No Problems detected
                32 = Ring Recovery
                64 = Single Station
                256 = Remove Received
                512 = reserved
                1024 = Auto-Removal Error
                2048 = Lobe Wire Fault
                4096 = Transmit Beacon
                8192 = Soft Error
                16384 = Hard Error
                32768 = Signal Loss
                131072 = no status, open not completed."
 ::= { dot5Entry 3 }

dot5RingState OBJECT-TYPE
    SYNTAX      INTEGER {
        opened(1),
        closed(2),
        opening(3),
        closing(4),
        openFailure(5),
        ringFailure(6)
    }

```

```
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
    "The current interface state with respect
    to entering or leaving the ring."
 ::= { dot5Entry 4 }

dot5RingOpenStatus  OBJECT-TYPE
SYNTAX             INTEGER {
                    noOpen(1),          -- no open attempted
                    badParam(2),
                    lobeFailed(3),
                    signalLoss(4),
                    insertionTimeout(5),
                    ringFailed(6),
                    beaconing(7),
                    duplicateMAC(8),
                    requestFailed(9),
                    removeReceived(10),
                    open(11)           -- last open successful
                    }
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
    "This object indicates the success, or the
    reason for failure, of the station's most
    recent attempt to enter the ring."
 ::= { dot5Entry 5 }

dot5RingSpeed  OBJECT-TYPE
SYNTAX         INTEGER {
                unknown(1),
                oneMegabit(2),
                fourMegabit(3),
                sixteenMegabit(4)
                }
MAX-ACCESS    read-write
STATUS        current
DESCRIPTION
    "The ring-speed at the next insertion into
    the ring. Note that this may or may not be
    different to the current ring-speed which is
    given by MIB-II's ifSpeed. For interfaces
    which do not support changing ring-speed,
    dot5RingSpeed can only be set to its current
    value. When dot5RingSpeed has the value
    unknown(1), the ring's actual ring-speed is
    to be used."
```

```
 ::= { dot5Entry 6 }

dot5UpStream OBJECT-TYPE
    SYNTAX      MacAddress
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "The MAC-address of the up stream neighbor
         station in the ring."
 ::= { dot5Entry 7 }

dot5ActMonParticipate OBJECT-TYPE
    SYNTAX      INTEGER {
                    true(1),
                    false(2)
                }
    MAX-ACCESS  read-write
    STATUS      current
    DESCRIPTION
        "If this object has a value of true(1) then
         this interface will participate in the
         active monitor selection process.  If the
         value is false(2) then it will not.
         Setting this object does not take effect
         until the next Active Monitor election, and
         might not take effect until the next time
         the interface is opened."
 ::= { dot5Entry 8 }

dot5Functional OBJECT-TYPE
    SYNTAX      MacAddress
    MAX-ACCESS  read-write
    STATUS      current
    DESCRIPTION
        "The bit mask of all Token Ring functional
         addresses for which this interface will
         accept frames."
 ::= { dot5Entry 9 }

dot5LastBeaconSent OBJECT-TYPE
    SYNTAX      TimeStamp
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "The value of MIB-II's sysUpTime object at which
         the local system last transmitted a Beacon frame
         on this interface."
 ::= { dot5Entry 10 }
```

-- The 802.5 Statistics Table

-- This table contains statistics and error counter which are
 -- specific to 802.5 interfaces. It is mandatory that systems
 -- having 802.5 interfaces implement this table.

```
dot5StatsTable OBJECT-TYPE
  SYNTAX      SEQUENCE OF Dot5StatsEntry
  MAX-ACCESS  not-accessible
  STATUS      current
  DESCRIPTION
    "A table containing Token Ring statistics,
     one entry per 802.5 interface.
     All the statistics are defined using
     the syntax Counter32 as 32-bit wrap around
     counters. Thus, if an interface's
     hardware maintains these statistics in
     16-bit counters, then the agent must read
     the hardware's counters frequently enough
     to prevent loss of significance, in order
     to maintain 32-bit counters in software."
 ::= { dot5 2 }
```

```
dot5StatsEntry OBJECT-TYPE
  SYNTAX      Dot5StatsEntry
  MAX-ACCESS  not-accessible
  STATUS      current
  DESCRIPTION
    "An entry contains the 802.5 statistics
     for a particular interface."
  INDEX       { dot5StatsIfIndex }
 ::= { dot5StatsTable 1 }
```

```
Dot5StatsEntry ::= SEQUENCE {
  dot5StatsIfIndex      Integer32,
  dot5StatsLineErrors   Counter32,
  dot5StatsBurstErrors  Counter32,
  dot5StatsACErrors     Counter32,
  dot5StatsAbortTransErrors Counter32,
  dot5StatsInternalErrors Counter32,
  dot5StatsLostFrameErrors Counter32,
  dot5StatsReceiveCongestions Counter32,
  dot5StatsFrameCopiedErrors Counter32,
  dot5StatsTokenErrors  Counter32,
  dot5StatsSoftErrors   Counter32,
  dot5StatsHardErrors   Counter32,
  dot5StatsSignalLoss   Counter32,
```

```
dot5StatsTransmitBeacons      Counter32,
dot5StatsRecoveryys          Counter32,
dot5StatsLobeWires           Counter32,
dot5StatsRemoves             Counter32,
dot5StatsSingles             Counter32,
dot5StatsFreqErrors          Counter32
}

dot5StatsIfIndex OBJECT-TYPE
    SYNTAX      Integer32
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "The value of this object identifies the
        802.5 interface for which this entry
        contains management information. The
        value of this object for a particular
        interface has the same value as MIB-II's
        ifIndex object for the same interface."
    ::= { dot5StatsEntry 1 }

dot5StatsLineErrors OBJECT-TYPE
    SYNTAX      Counter32
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "This counter is incremented when a frame
        or token is copied or repeated by a
        station, the E bit is zero in the frame
        or token and one of the following
        conditions exists: 1) there is a
        non-data bit (J or K bit) between the SD
        and the ED of the frame or token, or
        2) there is an FCS error in the frame."
    ::= { dot5StatsEntry 2 }

dot5StatsBurstErrors OBJECT-TYPE
    SYNTAX      Counter32
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "This counter is incremented when a station
        detects the absence of transitions for five
        half-bit timers (burst-five error)."
    ::= { dot5StatsEntry 3 }
```

```
dot5StatsACErrors OBJECT-TYPE
    SYNTAX      Counter32
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "This counter is incremented when a station
        receives an AMP or SMP frame in which A is
        equal to C is equal to 0, and then receives
        another SMP frame with A is equal to C is
        equal to 0 without first receiving an AMP
        frame. It denotes a station that cannot set
        the AC bits properly."
    ::= { dot5StatsEntry 4 }

dot5StatsAbortTransErrors OBJECT-TYPE
    SYNTAX      Counter32
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "This counter is incremented when a station
        transmits an abort delimiter while
        transmitting."
    ::= { dot5StatsEntry 5 }

dot5StatsInternalErrors OBJECT-TYPE
    SYNTAX      Counter32
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "This counter is incremented when a station
        recognizes an internal error."
    ::= { dot5StatsEntry 6 }

dot5StatsLostFrameErrors OBJECT-TYPE
    SYNTAX      Counter32
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "This counter is incremented when a station
        is transmitting and its TRR timer expires.
        This condition denotes a condition where a
        transmitting station in strip mode does not
        receive the trailer of the frame before the
        TRR timer goes off."
    ::= { dot5StatsEntry 7 }
```

```
dot5StatsReceiveCongestions OBJECT-TYPE
    SYNTAX      Counter32
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "This counter is incremented when a station
        recognizes a frame addressed to its
        specific address, but has no available
        buffer space indicating that the station
        is congested."
    ::= { dot5StatsEntry 8 }

dot5StatsFrameCopiedErrors OBJECT-TYPE
    SYNTAX      Counter32
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "This counter is incremented when a station
        recognizes a frame addressed to its
        specific address and detects that the FS
        field A bits are set to 1 indicating a
        possible line hit or duplicate address."
    ::= { dot5StatsEntry 9 }

dot5StatsTokenErrors OBJECT-TYPE
    SYNTAX      Counter32
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "This counter is incremented when a station
        acting as the active monitor recognizes an
        error condition that needs a token
        transmitted."
    ::= { dot5StatsEntry 10 }

dot5StatsSoftErrors OBJECT-TYPE
    SYNTAX      Counter32
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "The number of Soft Errors the interface
        has detected. It directly corresponds to
        the number of Report Error MAC frames
        that this interface has transmitted.
        Soft Errors are those which are
        recoverable by the MAC layer protocols."
    ::= { dot5StatsEntry 11 }
```

```
dot5StatsHardErrors OBJECT-TYPE
    SYNTAX      Counter32
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "The number of times this interface has
        detected an immediately recoverable
        fatal error.  It denotes the number of
        times this interface is either
        transmitting or receiving beacon MAC
        frames."
    ::= { dot5StatsEntry 12 }

dot5StatsSignalLoss OBJECT-TYPE
    SYNTAX      Counter32
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "The number of times this interface has
        detected the loss of signal condition from
        the ring."
    ::= { dot5StatsEntry 13 }

dot5StatsTransmitBeacons OBJECT-TYPE
    SYNTAX      Counter32
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "The number of times this interface has
        transmitted a beacon frame."
    ::= { dot5StatsEntry 14 }

dot5StatsRecoverys OBJECT-TYPE
    SYNTAX      Counter32
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "The number of Claim Token MAC frames
        received or transmitted after the interface
        has received a Ring Purge MAC frame.  This
        counter signifies the number of times the
        ring has been purged and is being recovered
        back into a normal operating state."
    ::= { dot5StatsEntry 15 }

dot5StatsLobeWires OBJECT-TYPE
    SYNTAX      Counter32
    MAX-ACCESS  read-only
```

```
STATUS      current
DESCRIPTION
    "The number of times the interface has
    detected an open or short circuit in the
    lobe data path.  The adapter will be closed
    and dot5RingState will signify this
    condition."
 ::= { dot5StatsEntry 16 }

dot5StatsRemoves OBJECT-TYPE
SYNTAX      Counter32
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
    "The number of times the interface has
    received a Remove Ring Station MAC frame
    request.  When this frame is received
    the interface will enter the close state
    and dot5RingState will signify this
    condition."
 ::= { dot5StatsEntry 17 }

dot5StatsSingles OBJECT-TYPE
SYNTAX      Counter32
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
    "The number of times the interface has
    sensed that it is the only station on the
    ring.  This will happen if the interface
    is the first one up on a ring, or if
    there is a hardware problem."
 ::= { dot5StatsEntry 18 }

dot5StatsFreqErrors OBJECT-TYPE
SYNTAX      Counter32
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
    "The number of times the interface has
    detected that the frequency of the
    incoming signal differs from the expected
    frequency by more than that specified by
    the IEEE 802.5 standard."
 ::= { dot5StatsEntry 19 }
```

```
-- The Timer Table

-- This group contains the values of timers for 802.5
-- interfaces. This table is obsolete, but its definition
-- is retained here for backwards compatibility.
```

```
dot5TimerTable OBJECT-TYPE
    SYNTAX      SEQUENCE OF Dot5TimerEntry
    MAX-ACCESS  not-accessible
    STATUS      obsolete
    DESCRIPTION
        "This table contains Token Ring interface
        timer values, one entry per 802.5
        interface."
    ::= { dot5 5 }
```

```
dot5TimerEntry OBJECT-TYPE
    SYNTAX      Dot5TimerEntry
    MAX-ACCESS  not-accessible
    STATUS      obsolete
    DESCRIPTION
        "A list of Token Ring timer values for an
        802.5 interface."
    INDEX       { dot5TimerIfIndex }
    ::= { dot5TimerTable 1 }
```

```
Dot5TimerEntry ::= SEQUENCE {
    dot5TimerIfIndex      Integer32,
    dot5TimerReturnRepeat Integer32,
    dot5TimerHolding      Integer32,
    dot5TimerQueuePDU     Integer32,
    dot5TimerValidTransmit Integer32,
    dot5TimerNoToken      Integer32,
    dot5TimerActiveMon    Integer32,
    dot5TimerStandbyMon   Integer32,
    dot5TimerErrorReport  Integer32,
    dot5TimerBeaconTransmit Integer32,
    dot5TimerBeaconReceive Integer32
}
```

```
dot5TimerIfIndex OBJECT-TYPE
    SYNTAX      Integer32
    MAX-ACCESS  read-only
    STATUS      obsolete
    DESCRIPTION
        "The value of this object identifies the
        802.5 interface for which this entry
        contains timer values. The value of
```

```

        this object for a particular interface
        has the same value as MIB-II's ifIndex
        object for the same interface."
 ::= { dot5TimerEntry 1 }

dot5TimerReturnRepeat OBJECT-TYPE
    SYNTAX      Integer32
    MAX-ACCESS  read-only
    STATUS      obsolete
    DESCRIPTION
        "The time-out value used to ensure the
        interface will return to Repeat State, in
        units of 100 micro-seconds. The value
        should be greater than the maximum ring
        latency."
 ::= { dot5TimerEntry 2 }

dot5TimerHolding OBJECT-TYPE
    SYNTAX      Integer32
    MAX-ACCESS  read-only
    STATUS      obsolete
    DESCRIPTION
        "Maximum period of time a station is
        permitted to transmit frames after capturing
        a token, in units of 100 micro-seconds."
 ::= { dot5TimerEntry 3 }

dot5TimerQueuePDU OBJECT-TYPE
    SYNTAX      Integer32
    MAX-ACCESS  read-only
    STATUS      obsolete
    DESCRIPTION
        "The time-out value for enqueueing of an SMP
        PDU after reception of an AMP or SMP
        frame in which the A and C bits were
        equal to 0, in units of 100
        micro-seconds."
 ::= { dot5TimerEntry 4 }

dot5TimerValidTransmit OBJECT-TYPE
    SYNTAX      Integer32
    MAX-ACCESS  read-only
    STATUS      obsolete
    DESCRIPTION
        "The time-out value used by the active
        monitor to detect the absence of valid
        transmissions, in units of 100
        micro-seconds."
```

```
 ::= { dot5TimerEntry 5 }

dot5TimerNoToken OBJECT-TYPE
    SYNTAX      Integer32
    MAX-ACCESS  read-only
    STATUS      obsolete
    DESCRIPTION
        "The time-out value used to recover from
        various-related error situations.
        If N is the maximum number of stations on
        the ring, the value of this timer is
        normally:
        dot5TimerReturnRepeat + N*dot5TimerHolding."
 ::= { dot5TimerEntry 6 }

dot5TimerActiveMon OBJECT-TYPE
    SYNTAX      Integer32
    MAX-ACCESS  read-only
    STATUS      obsolete
    DESCRIPTION
        "The time-out value used by the active
        monitor to stimulate the enqueueing of an
        AMP PDU for transmission, in units of
        100 micro-seconds."
 ::= { dot5TimerEntry 7 }

dot5TimerStandbyMon OBJECT-TYPE
    SYNTAX      Integer32
    MAX-ACCESS  read-only
    STATUS      obsolete
    DESCRIPTION
        "The time-out value used by the stand-by
        monitors to ensure that there is an active
        monitor on the ring and to detect a
        continuous stream of tokens, in units of
        100 micro-seconds."
 ::= { dot5TimerEntry 8 }

dot5TimerErrorReport OBJECT-TYPE
    SYNTAX      Integer32
    MAX-ACCESS  read-only
    STATUS      obsolete
    DESCRIPTION
        "The time-out value which determines how
        often a station shall send a Report Error
        MAC frame to report its error counters,
        in units of 100 micro-seconds."
 ::= { dot5TimerEntry 9 }
```

```
dot5TimerBeaconTransmit OBJECT-TYPE
    SYNTAX      Integer32
    MAX-ACCESS  read-only
    STATUS      obsolete
    DESCRIPTION
        "The time-out value which determines how
        long a station shall remain in the state
        of transmitting Beacon frames before
        entering the Bypass state, in units of
        100 micro-seconds."
    ::= { dot5TimerEntry 10 }

dot5TimerBeaconReceive OBJECT-TYPE
    SYNTAX      Integer32
    MAX-ACCESS  read-only
    STATUS      obsolete
    DESCRIPTION
        "The time-out value which determines how
        long a station shall receive Beacon
        frames from its downstream neighbor
        before entering the Bypass state, in
        units of 100 micro-seconds."
    ::= { dot5TimerEntry 11 }

--
--                               802.5 Interface Tests

dot5Tests OBJECT IDENTIFIER ::= { dot5 3 }

-- RFC 1573 defines the ifTestTable, through which a
-- network manager can instruct an agent to test an interface
-- for various faults. A test to be performed is identified
-- as an OBJECT IDENTIFIER.

-- The Insert Function test

dot5TestInsertFunc OBJECT-IDENTITY
    STATUS      current
    DESCRIPTION
        "Invoking this test causes the station to test the insert
        ring logic of the hardware if the station's lobe media
        cable is connected to a wiring concentrator. Note that
        this command inserts the station into the network, and
        thus, could cause problems if the station is connected
        to a operational network."
    ::= { dot5Tests 1 }
```

-- The Full-Duplex Loop Back test

```
dot5TestFullDuplexLoopBack OBJECT-IDENTITY
  STATUS      current
  DESCRIPTION
    "Invoking this test on a 802.5 interface causes the
    interface to check the path from memory through the
    chip set's internal logic and back to memory, thus
    checking the proper functioning of the system's
    interface to the chip set."
 ::= { dot5Tests 2 }
```

-- 802.5 Hardware Chip Sets

-- RFC 1229 specified an object, ifExtnsChipSet, with the
-- syntax of OBJECT IDENTIFIER, to identify the hardware
-- chip set in use by an interface. RFC 1573 obsoletes
-- the use of ifExtnsChipSet. However, the following
-- definitions are retained for backwards compatibility.

```
dot5ChipSets OBJECT IDENTIFIER ::= { dot5 4 }
```

```
dot5ChipSetIBM16 OBJECT-IDENTITY
  STATUS      current
  DESCRIPTION
    "IBM's 16/4 Mbs chip set."
 ::= { dot5ChipSets 1 }
```

```
dot5ChipSetTItms380 OBJECT-IDENTITY
  STATUS      current
  DESCRIPTION
    "Texas Instruments' TMS 380 4Mbs chip-set"
 ::= { dot5ChipSets 2 }
```

```
dot5ChipSetTItms380c16 OBJECT-IDENTITY
  STATUS      current
  DESCRIPTION
    "Texas Instruments' TMS 380C16 16/4 Mbs chip-set"
 ::= { dot5ChipSets 3 }
```

```
-- conformance information

dot5Conformance OBJECT IDENTIFIER ::= { dot5 6 }

dot5Groups      OBJECT IDENTIFIER ::= { dot5Conformance 1 }
dot5Compliances OBJECT IDENTIFIER ::= { dot5Conformance 2 }

-- compliance statements

dot5Compliance MODULE-COMPLIANCE
  STATUS current
  DESCRIPTION
    "The compliance statement for SNMPv2 entities
    which implement the IEEE 802.5 MIB."

  MODULE -- this module
    MANDATORY-GROUPS { dot5StateGroup, dot5StatsGroup }

    OBJECT dot5ActMonParticipate
      MIN-ACCESS read-only
      DESCRIPTION
        "Write access is not required."

    OBJECT dot5Functional
      MIN-ACCESS read-only
      DESCRIPTION
        "Write access is not required."

  ::= { dot5Compliances 1 }

-- units of conformance

dot5StateGroup OBJECT-GROUP
  OBJECTS { dot5Commands, dot5RingStatus, dot5RingState,
            dot5RingOpenStatus, dot5RingSpeed, dot5UpStream,
            dot5ActMonParticipate, dot5Functional,
            dot5LastBeaconSent
          }
  STATUS current
  DESCRIPTION
    "A collection of objects providing state information
    and parameters for IEEE 802.5 interfaces."
  ::= { dot5Groups 1 }

dot5StatsGroup OBJECT-GROUP
  OBJECTS { dot5StatsLineErrors, dot5StatsBurstErrors,
```

```
dot5StatsACErrors, dot5StatsAbortTransErrors,
dot5StatsInternalErrors, dot5StatsLostFrameErrors,
dot5StatsReceiveCongestions,
dot5StatsFrameCopiedErrors, dot5StatsTokenErrors,
dot5StatsSoftErrors, dot5StatsHardErrors,
dot5StatsSignalLoss, dot5StatsTransmitBeacons,
dot5StatsRecoverys, dot5StatsLobeWires,
dot5StatsRemoves, dot5StatsSingles,
dot5StatsFreqErrors
    }
STATUS      current
DESCRIPTION
    "A collection of objects providing statistics for
    IEEE 802.5 interfaces."
 ::= { dot5Groups 2 }
```

END

5. Acknowledgements

The changes from RFC 1231 are the result of discussions on the IETF's snmp mailing-list and in the Interfaces MIB Working Group.

6. References

- [1] Case, J., McCloghrie, K., Rose, M., and S. Waldbusser, "Structure of Management Information for version 2 of the Simple Network Management Protocol (SNMPv2)", RFC 1442, SNMP Research, Inc., Hughes LAN Systems, Dover Beach Consulting, Inc., Carnegie Mellon University, April 1993.
- [2] McCloghrie, K., and M. Rose, Editors, "Management Information Base for Network Management of TCP/IP-based internets: MIB-II", STD 17, RFC 1213, Hughes LAN Systems, Performance Systems International, March 1991.
- [3] Galvin, J., and K. McCloghrie, "Administrative Model for version 2 of the Simple Network Management Protocol (SNMPv2)", RFC 1445, Trusted Information Systems, Hughes LAN Systems, April 1993.
- [4] Case, J., McCloghrie, K., Rose, M., and S. Waldbusser, "Protocol Operations for version 2 of the Simple Network Management Protocol (SNMPv2)", RFC 1448, SNMP Research, Inc., Hughes LAN Systems, Dover Beach Consulting, Inc., Carnegie Mellon University, April 1993.
- [5] Case, J., McCloghrie, K., Rose, M., and S. Waldbusser, "Textual Conventions for version 2 of the Simple Network Management Protocol (SNMPv2)", RFC 1443, SNMP Research, Inc., Hughes LAN Systems, Dover Beach Consulting, Inc., Carnegie Mellon University, April 1993.
- [6] McCloghrie, K., and F. Kastenholz, "Evolution of the Interfaces Group of MIB-II", RFC 1573, Hughes LAN Systems, FTP Software, Jan 1994
- [7] Institute of Electrical and Electronic Engineers, "Token Ring Access Method and Physical Layer Specifications", IEEE Standard 802.5-1989, 1989.

APPENDIX A - Changes from RFC 1231

This memo has the following differences from RFC 1231:

- (1) This memo is formatted using the SNMPv2 SMI.
- (2) The relationship of the "open" and "close" states of dot5Commands to the value of ifAdminStatus has been clarified. In particular, the setting of one affects the value of the other.
- (3) The relationship dot5RingSpeed and ifSpeed has been clarified. In particular, ifSpeed indicates the current ring-speed; dot5RingSpeed indicates the ring-speed at the next insertion into the ring. If the interface doesn't support changing ring-speed, then dot5RingSpeed can only be set to its current value. When dot5RingSpeed has the value 'unknown(1)', the ring-speed is to be set to the ring's actual ring-speed.
- (4) Write-access to dot5ActMonParticipate is not required, and a change to the value of dot5ActMonParticipate does not take effect until the next Active Monitor election.
- (5) Write-access to dot5Functional is not required.
- (6) A new object, dot5LastBeaconSent has been defined to contain the timestamp of the last beacon frame sent.
- (7) The dot5TimerTable has been designated as obsolete.
- (8) Text has been added describing the applicability of RFC 1573 [6] to 802.5 interfaces.
- (9) Other minor editorial changes.

Security Considerations

Security issues are not discussed in this memo.

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