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IEEE 802.4 Token Bus MIB

Status of this Memo

This memo defines a MIB for the IEEE 802.4 Token Bus for use with the SNMP protocol. This memo is a product of the Transmission Working Group of the Internet Engineering Task Force (IETF). This RFC specifies an IAB standards track protocol for the Internet community, and requests discussion and suggestions for improvements. Please refer to the current edition of the "IAB Official Protocol Standards" for the standardization state and status of this protocol. Distribution of this memo is unlimited.

Table of Contents

1. Abstract

This memo defines an experimental portion of the Management Information Base (MIB) for use with network management protocols in TCP/IP-based internets. In particular, this memo defines managed objects used for managing subnetworks which use the IEEE 802.4 Token Bus technology described in 802.4 Token-Passing Bus Access Method and Physical Layer Specifications, IEEE Standard 802.4.

2. The Network Management Framework

The Internet-standard Network Management Framework consists of three components. They are:

RFC 1155 which defines the SMI, the mechanisms used for describing and naming objects for the purpose of management. RFC 1212 defines a more concise description mechanism, which is wholly consistent with the SMI.

RFC 1156 which defines MIB-I, the core set of managed objects for the Internet suite of protocols. RFC 1213, defines MIB-II, an evolution of MIB-I based on implementation experience and new operational requirements.

RFC 1157 which defines the SNMP, the protocol used for network access to managed objects.

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

3. Objects

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) [7] defined in the SMI. In particular, each object has a name, a syntax, and an encoding. The name is an object identifier, an administratively assigned name, which specifies an object type. 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 OBJECT DESCRIPTOR, to also refer to the object type.

The syntax of an object type defines the abstract data structure corresponding to that object type. The ASN.1 language is used for this purpose. However, the SMI [3] purposely restricts the ASN.1 constructs which may be used. These restrictions are explicitly made for simplicity.

The encoding of an object type is simply how that object type is represented using the object type's syntax. Implicitly tied to the notion of an object type's syntax and encoding is how the object type is represented when being transmitted on the network.

The SMI specifies the use of the basic encoding rules of ASN.1 [8], subject to the additional requirements imposed by the SNMP.

3.1. Format of Definitions

Section 5 contains contains the specification of all object types contained in this MIB module. The object types are defined using the conventions defined in the SMI, as amended by the extensions specified in [9,10].

4. Overview

This memo defines three tables:

- the 802.4 Operational Table containing state and operational parameter information which is specific to 802.4 interfaces;

- the 802.4 Initialization Table containing the parameter information used by an 802.4 interface as the values to be assigned to its operational parameters upon initialization; and

- the 802.4 Statistics Table containing 802.4 interface statistics.

A managed system will have one entry in each of these tables for each of its 802.4 interfaces.

This memo also defines OBJECT IDENTIFIERs, some to identify 802.4 tests, for use with the ifExtnsTestTable defined in [11], and some to identify Token Bus interface Chip Sets, for use with the ifExtnsChipSet object defined in [11].

4.1. Scope of Definitions

All objects defined in this memo are registered in a single subtree within the experimental namespace [3], and are for use with every interface which conforms to the IEEE 802.4 Token Bus Access Method [10]. At present, this applies to interfaces for which the ifType variable in the Internet-standard MIB [4,6] has the value:

```
iso88024-tokenBus(8)
```

For these interfaces, the value of the ifSpecific variable in the MIB-II [6] has the OBJECT IDENTIFIER value:

```
dot4    OBJECT IDENTIFIER ::= { experimental 7 }
```

as defined below.

4.2. Textual Conventions

Two new datatypes, MacAddress and OctetTime, are introduced as textual conventions in this document. These textual conventions have NO effect on either the syntax nor the semantics of any managed object. 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 and writers in pursuit of the elusive goal of a concise and unambiguous specification.

4.3. Optional Objects

A few objects are defined in this memo with "optional" status for the purpose of allowing experimentation to determine whether they are useful or not. If sufficient consensus is reached in the Internet community to result in a subsequent revision of this memo being placed in the Internet-standard MIB, then these optional objects will either be removed or become mandatory.

5. Definitions

```
        RFC1230-MIB DEFINITIONS ::= BEGIN

        --                IEEE 802.4 Token Bus MIB

        IMPORTS
                experimental
                        FROM RFC1155-SMI
                OBJECT-TYPE
                        FROM RFC-1212;

        --  This MIB Module uses the extended OBJECT-TYPE macro as
        --  defined in [9].



        dot4    OBJECT IDENTIFIER ::= { experimental 7 }

        -- 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 ::= OCTET STRING (SIZE (6))    -- a 6 octet
                                                  -- address in the
                                                  -- "canonical" order
```

```
                                                -- defined by IEEE
                                                -- 802.1a.
        -- 16-bit addresses, if needed, are represented by setting
        -- their upper 4 octets to all 0's, i.e., AAFF would be
        -- represented as 00000000AAFF.


        -- This specification follows the 802.4 convention of
        -- specifying time intervals, which are dependent on the
        -- bandwidth of the media, in units of octet time.  One
        -- octet time is the time taken to transmit eight bits.
        -- Representation of such time intervals in this MIB Module
        -- use, as a textual convention (i.e., this convention does
        -- not affect their encoding), the data type:

        OctetTime  ::= INTEGER        -- the value of a time
                                      -- interval in units of octet
                                      -- time.


        -- The 802.4 Operational Table

        -- This table contains state and parameter information which
        -- is specific to 802.4 interfaces.  It is mandatory that
        -- systems having 802.4 interfaces implement this table in
        -- addition to the generic interfaces table [4,6] and its
        -- generic extensions [11].

        dot4Table  OBJECT-TYPE
                   SYNTAX  SEQUENCE OF Dot4Entry
                   ACCESS  not-accessible
                   STATUS  mandatory
                   DESCRIPTION
                           "This table contains Token Bus interface
                           parameters and state variables, one entry
                           per 802.5 interface."

                   ::= { dot4 1 }

        dot4Entry  OBJECT-TYPE
                   SYNTAX  Dot4Entry
                   ACCESS  not-accessible
                   STATUS  mandatory
                   DESCRIPTION
                           "A list of Token Bus status and operational
                           parameter values for an 802.4 interface."
                   INDEX   { dot4IfIndex }
                   ::= { dot4Table 1 }
```

```
        Dot4Entry  ::= SEQUENCE {
                            dot4IfIndex
                                INTEGER,
                            dot4Options
                                INTEGER,
                            dot4State
                                INTEGER,
                            dot4Commands
                                INTEGER,
                            dot4MacAddrLen
                                INTEGER,
                            dot4NextStation
                                MacAddress,
                            dot4PreviousStation
                                MacAddress,
                            dot4SlotTime
                                OctetTime,
                            dot4LastTokenRotTime
                                OctetTime,
                            dot4HiPriTokenHoldTime
                                OctetTime,
                            dot4TargetRotTimeClass4
                                OctetTime,
                            dot4TargetRotTimeClass2
                                OctetTime,
                            dot4TargetRotTimeClass0
                                OctetTime,
                            dot4TargetRotTimeRingMaint
                                OctetTime,
                            dot4RingMaintTimerInitValue
                                OctetTime,
                            dot4MaxInterSolicitCount
                                INTEGER (16..255),
                            dot4MaxRetries
                                INTEGER (0..7),
                            dot4MinPostSilencePreambLen
                                INTEGER,
                            dot4StandardRevision
                                INTEGER
                        }

        dot4IfIndex  OBJECT-TYPE
                    SYNTAX  INTEGER
                    ACCESS  read-only
                    STATUS  mandatory
                    DESCRIPTION
                            "The value of this object identifies the
```

```
                        802.4 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 [4,6], for the
                        same interface."
                ::= { dot4Entry 1 }

        dot4Options OBJECT-TYPE
                SYNTAX  INTEGER
                ACCESS  read-only
                STATUS  mandatory
                DESCRIPTION
                        "The optional parts of the 802.4
                        specification which are in use by this
                        station.  The options of the 802.4
                        specification are represented by the
                        following values:
                              1 - Priority
                              2 - Request-With-Response
                        The value of this object is given by the
                        sum of the above representations for
                        those options in use on this interface.
                        The value zero indicates that no options
                        are in use."
                ::= { dot4Entry 2 }

        dot4State OBJECT-TYPE
                SYNTAX  INTEGER {
                            other(1),
                            offline(2),
                            outOfRing(3),
                            enteringRing(4),
                            inRing(5)
                        }
                ACCESS  read-only
                STATUS  mandatory
                DESCRIPTION
                        "The current state of the 802.4
                        interface.  The value of other(1) is
                        used if the state is unknown
                        (e.g., due to an error condition)."
                ::=   { dot4Entry 3 }

        dot4Commands OBJECT-TYPE
                SYNTAX  INTEGER {
                            no-op(1),
                            enterRing(2),
```

```
                            exitRing(3),
                            reset(4),
                            initialize(5)
                        }
                ACCESS  read-write
                STATUS  mandatory
                DESCRIPTION
                        "Setting this object causes the station
                        to change the state of the interface as
                        indicated by the specified value.  An
                        initialize(5) command causes the
                        interfaceto load its operational
                        parameters from its initialization
                        parameters; the value of
                        dot4InitInRingDesired determines
                        whether the station tries to enter the
                        logical ring immediately.
                            Note that the 802.4 specification
                        suggests a station remain Offline after a
                        'remote Network Management' reset(4),
                        until a 'local Network Management'
                        initialize(5) is performed.
                            Setting this object to a value of
                        no-op(1) has no effect.  When read,
                        this object always has the value no-op(1)."
                ::=  { dot4Entry 4 }

        dot4MacAddrLen OBJECT-TYPE
                SYNTAX  INTEGER {
                            sixteenBit(1),
                            forty-eightBit(2)
                        }
                ACCESS  read-only
                STATUS  mandatory
                DESCRIPTION
                        "This object indicates the size of MAC
                        addresses interpreted by this station."
                ::= { dot4Entry 5 }

        dot4NextStation OBJECT-TYPE
                SYNTAX  MacAddress
                ACCESS  read-only
                STATUS  mandatory
                DESCRIPTION
                        "The MAC address of this station's
                        successor in the logical ring."
                ::= { dot4Entry 6 }
```

```
        dot4PreviousStation OBJECT-TYPE
                    SYNTAX  MacAddress
                    ACCESS  read-only
                    STATUS  mandatory
                    DESCRIPTION
                            "The source MAC address of the last token
                            addressed to this station."
                    ::= { dot4Entry 7 }

        dot4SlotTime OBJECT-TYPE
                    SYNTAX  OctetTime
                    ACCESS  read-only
                    STATUS  mandatory
                    DESCRIPTION
                            "The maximum time any station need wait
                            for an immediate MAC-level response from
                            another station.
                            This value must the same in all stations on
                            the 802.4 network."
                    ::= { dot4Entry 8 }

        dot4LastTokenRotTime OBJECT-TYPE
                    SYNTAX  OctetTime
                    ACCESS  read-only
                    STATUS  mandatory
                    DESCRIPTION
                            "The observed token rotation time for the
                            last token rotation, timed from token
                            arrival to token arrival.  A value of
                            zero indicates that the token is not
                            rotating."
                    ::= { dot4Entry 9 }

        dot4HiPriTokenHoldTime OBJECT-TYPE
                    SYNTAX  OctetTime
                    ACCESS  read-only
                    STATUS  mandatory
                    DESCRIPTION
                            "The maximum duration for which a station
                            can hold the token to transmit frames of
                            access class 6 (if the priority option is
                            implemented), or of any access class (if
                            the priority option is not implemented)."
                    ::= { dot4Entry 10 }

        dot4TargetRotTimeClass4 OBJECT-TYPE
                    SYNTAX  OctetTime
                    ACCESS  read-only
```

```
                    STATUS  mandatory
                    DESCRIPTION
                            "If the priority scheme is being used,
                            this value specifies a limit on how long
                            a station can transmit frames at access
                            class 4.  The limit is measured from the
                            time the station is able to start
                            transmitting frames at this access class
                            on one rotation, to the time it must stop
                            transmitting frames at this access class
                            on the next rotation.  If the priority
                            scheme is not being used, this object has
                            the value 0."
                    ::= { dot4Entry 11 }

            dot4TargetRotTimeClass2 OBJECT-TYPE
                    SYNTAX  OctetTime
                    ACCESS  read-only
                    STATUS  mandatory
                    DESCRIPTION
                            "If the priority scheme is being used,
                            this value specifies a limit on how long
                            a station can transmit frames at access
                            class 2.  The limit is measured from the
                            time the station is able to start
                            transmitting frames at this access
                            class on one rotation, to the time it
                            must stop transmitting frames at this
                            access class on the next rotation.  If
                            the priority scheme is not being used,
                            this object has the value 0."
                    ::= { dot4Entry 12 }

            dot4TargetRotTimeClass0 OBJECT-TYPE
                    SYNTAX  OctetTime
                    ACCESS  read-only
                    STATUS  mandatory
                    DESCRIPTION
                            "If the priority scheme is being used,
                            this value specifies a limit on how long
                            a station can transmit frames at access
                            class 0.  The limit is measured from the
                            time the station is able to start
                            transmitting frames at this access
                            class on one rotation, to the time it
                            must stop transmitting frames at this
                            access class on the next rotation.  If
                            the priority scheme is not being used,
```

```
                        this object has the value 0."
                ::= { dot4Entry 13 }

        dot4TargetRotTimeRingMaint OBJECT-TYPE
                SYNTAX  OctetTime
                ACCESS  read-only
                STATUS  mandatory
                DESCRIPTION
                        "A value used to limit the duration of a
                        token rotation.  If the duration of a
                        token rotation exceeds this value, the
                        station will not open the response window
                        to solicit for a new successor."
                ::= { dot4Entry 14 }

        dot4RingMaintTimerInitValue OBJECT-TYPE
                SYNTAX  OctetTime
                ACCESS  read-only
                STATUS  mandatory
                DESCRIPTION
                        "The value to which the
                        dot4TargetRotTimeRingMaint is set, each
                        time the station enters the ring.
                        A large value will cause the station to
                        solicit successors immediately upon entry
                        to the ring; a value of zero will cause
                        the station to defer this solicitation
                        for at least one token rotation."
                ::= { dot4Entry 15 }

        dot4MaxInterSolicitCount OBJECT-TYPE
                SYNTAX  INTEGER (16..255)
                ACCESS  read-only
                STATUS  mandatory
                DESCRIPTION
                        "The maximum number of consecutive token
                        rotations without soliciting for a
                        successor.  If this count expires, the
                        station opens the response window to
                        solicit for a successor (providing the
                        duration of the current token rotation
                        has not exceeded
                        dot4TargetRotTimeRingMaint).  The least
                        significant two bits of the count are
                        determined randomly by the station on a
                        per-use basis."
                ::= { dot4Entry 16 }
```

```
        dot4MaxRetries OBJECT-TYPE
                    SYNTAX  INTEGER (0..7)
                    ACCESS  read-only
                    STATUS  mandatory
                    DESCRIPTION
                            "The maximum number of retries of a
                            Request-with-Response (RWR) frame.  If
                            the RWR option is not in use, this object
                            has the value 0."
                    ::= { dot4Entry 17 }

        dot4MinPostSilencePreambLen OBJECT-TYPE
                    SYNTAX  INTEGER
                    ACCESS  read-only
                    STATUS  mandatory
                    DESCRIPTION
                            "The minimum number of octets of preamble
                            on the first frame transmitted by this
                            station after a period of 'transmitted'
                            silence."
                    ::= { dot4Entry 18 }

        dot4StandardRevision OBJECT-TYPE
                    SYNTAX  INTEGER {
                                rev2(2)
                            }
                    ACCESS  read-only
                    STATUS  mandatory
                    DESCRIPTION
                            "The Revision number of the 802.4 standard
                            implemented by this station."
                    ::= { dot4Entry 19 }


        -- 802.4 Initialization Table

        -- This table contains the parameter information used by an
        -- 802.4 interface as the values to be assigned to its
        -- operational parameters upon initialization.  It is
        -- mandatory that systems having 802.4 interfaces implement
        -- this table.

        dot4InitTable  OBJECT-TYPE
                    SYNTAX  SEQUENCE OF Dot4InitEntry
                    ACCESS  not-accessible
                    STATUS  mandatory
                    DESCRIPTION
                            "This table contains Token Bus
```

```
                        initialization parameters, one entry per
                        802.4 interface."
                ::= { dot4 2 }

        dot4InitEntry  OBJECT-TYPE
                    SYNTAX  Dot4InitEntry
                    ACCESS  not-accessible
                    STATUS  mandatory
                    DESCRIPTION
                            "A list of Token Bus initialization
                            parameters for an 802.4 interface."
                    INDEX   { dot4InitIfIndex }
                    ::= { dot4InitTable 1 }

        Dot4InitEntry ::= SEQUENCE {
                              dot4InitIfIndex
                                  INTEGER,
                              dot4InitSlotTime
                                  OctetTime,
                              dot4InitMaxInterSolicitCount
                                  INTEGER (16..255),
                              dot4InitMaxRetries
                                  INTEGER (0..7),
                              dot4InitHiPriTokenHoldTime
                                  OctetTime,
                              dot4InitTargetRotTimeClass4
                                  OctetTime,
                              dot4InitTargetRotTimeClass2
                                  OctetTime,
                              dot4InitTargetRotTimeClass0
                                  OctetTime,
                              dot4InitTargetRotTimeRingMaint
                                  OctetTime,
                              dot4InitRingMaintTimerInitValue
                                  OctetTime,
                              dot4InitMinPostSilencePreambLen
                                  INTEGER,
                              dot4InitInRingDesired
                                  INTEGER
                            }

        dot4InitIfIndex  OBJECT-TYPE
                    SYNTAX  INTEGER
                    ACCESS  read-only
                    STATUS  mandatory
                    DESCRIPTION
                            "The value of this object identifies the
                            802.4 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 [4,6], for
                        the same interface."
                ::= { dot4InitEntry 1 }

        dot4InitSlotTime OBJECT-TYPE
                SYNTAX  OctetTime
                ACCESS  read-write
                STATUS  mandatory
                DESCRIPTION
                        "The value assigned to the object
                        dot4SlotTime when the station is
                        initialized."
                ::= { dot4InitEntry 2 }

        dot4InitMaxInterSolicitCount OBJECT-TYPE
                SYNTAX  INTEGER (16..255)
                ACCESS  read-write
                STATUS  mandatory
                DESCRIPTION
                        "The value assigned to the object
                        dot4MaxInterSolicitCount when the station
                        is initialized."
                ::= { dot4InitEntry 3 }

        dot4InitMaxRetries OBJECT-TYPE
                SYNTAX  INTEGER (0..7)
                ACCESS  read-write
                STATUS  mandatory
                DESCRIPTION
                        "The value assigned to the object
                        dot4MaxRetries when the station is
                        initialized."
                ::= { dot4InitEntry 4 }

        dot4InitHiPriTokenHoldTime OBJECT-TYPE
                SYNTAX  OctetTime
                ACCESS  read-write
                STATUS  mandatory
                DESCRIPTION
                        "The value assigned to the object
                        dot4HiPriTokenHoldTime when the station
                        is initialized."
                ::= { dot4InitEntry 5 }
```

```
        dot4InitTargetRotTimeClass4 OBJECT-TYPE
                    SYNTAX  OctetTime
                    ACCESS  read-write
                    STATUS  mandatory
                    DESCRIPTION
                            "The value assigned to the object
                            dot4TargetRotTimeClass4 when the station
                            is initialized."
                    ::= { dot4InitEntry 6 }

        dot4InitTargetRotTimeClass2 OBJECT-TYPE
                    SYNTAX  OctetTime
                    ACCESS  read-write
                    STATUS  mandatory
                    DESCRIPTION
                            "The value assigned to the object
                            dot4TargetRotTimeClass2 when the station
                            is initialized."
                    ::= { dot4InitEntry 7 }

        dot4InitTargetRotTimeClass0 OBJECT-TYPE
                    SYNTAX  OctetTime
                    ACCESS  read-write
                    STATUS  mandatory
                    DESCRIPTION
                            "The value assigned to the object
                            dot4TargetRotTimeClass0 when the station
                            is initialized."
                    ::= { dot4InitEntry 8 }

        dot4InitTargetRotTimeRingMaint OBJECT-TYPE
                    SYNTAX  OctetTime
                    ACCESS  read-write
                    STATUS  mandatory
                    DESCRIPTION
                            "The value assigned to the object
                            dot4TargetRotTimeRingMaint when the station
                            is initialized."
                    ::= { dot4InitEntry 9 }

        dot4InitRingMaintTimerInitValue OBJECT-TYPE
                    SYNTAX  OctetTime
                    ACCESS  read-write
                    STATUS  mandatory
                    DESCRIPTION
                            "The value assigned to the object
                            dot4RingMaintTimerInitValue when the
                            station is initialized."
```

```
                ::= { dot4InitEntry 10 }

        dot4InitMinPostSilencePreambLen OBJECT-TYPE
                SYNTAX  INTEGER
                ACCESS  read-write
                STATUS  mandatory
                DESCRIPTION
                        "The value assigned to the object
                        dot4MinPostSilencePreambLen when the
                        station is initialized."
                ::= { dot4InitEntry 11 }

        dot4InitInRingDesired OBJECT-TYPE
                SYNTAX INTEGER {
                           inRing(1),
                           outOfRing(2)
                       }
                ACCESS  read-write
                STATUS  mandatory
                DESCRIPTION
                        "This object determines whether the
                        station will attempt to enter the logical
                        ring immediately after initialization."
                ::= { dot4InitEntry 12 }


        -- 802.4 Statistics Table

        -- This table contains Token Bus statistics, one entry per
        -- 802.4 interface.  It is mandatory that systems having
        -- 802.4 interfaces implement this table.

        dot4StatsTable  OBJECT-TYPE
                SYNTAX  SEQUENCE OF Dot4StatsEntry
                ACCESS  not-accessible
                STATUS  mandatory
                DESCRIPTION
                        "A table containing Token Bus statistics.
                        All the statistics are defined using the
                        syntax Counter as 32 bit wrap around
                        counters.  Thus, if an interface's
                        hardware chip set 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
                        a 32-bit counter in software."
                ::= { dot4 3 }
```

```
          dot4StatsEntry  OBJECT-TYPE
                     SYNTAX  Dot4StatsEntry
                     ACCESS  not-accessible
                     STATUS  mandatory
                     DESCRIPTION
                             "An entry containing the 802.4 statistics
                             for a particular interface."
                     INDEX   { dot4StatsIfIndex }
                     ::= { dot4StatsTable 1 }

          Dot4StatsEntry ::= SEQUENCE {
                               dot4StatsIfIndex
                                  INTEGER,
                               dot4StatsTokenPasses
                                  Counter,
                               dot4StatsTokenHeards
                                  Counter,
                               dot4StatsNoSuccessors
                                  Counter,
                               dot4StatsWhoFollows
                                  Counter,
                               dot4StatsTokenPassFails
                                  Counter,
                               dot4StatsNonSilences
                                  Counter,
                               dot4StatsFcsErrors
                                  Counter,
                               dot4StatsEbitErrors
                                  Counter,
                               dot4StatsFrameFrags
                                  Counter,
                               dot4StatsFrameTooLongs
                                  Counter,
                               dot4StatsOverRuns
                                  Counter,
                               dot4StatsDupAddresses
                                  Counter
                             }

          dot4StatsIfIndex  OBJECT-TYPE
                     SYNTAX  INTEGER
                     ACCESS  read-only
                     STATUS  mandatory
                     DESCRIPTION
                             "The value of this object identifies the
                             802.4 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 [4,6], for the
                        same interface."
                ::= { dot4StatsEntry 1 }

        dot4StatsTokenPasses OBJECT-TYPE
                SYNTAX  Counter
                ACCESS  read-only
                STATUS  optional
                DESCRIPTION
                        "The number of times this station has
                        passed the token."
                ::= { dot4StatsEntry 2 }

        dot4StatsTokenHeards OBJECT-TYPE
                SYNTAX  Counter
                ACCESS  read-only
                STATUS  optional
                DESCRIPTION
                        "The number of tokens heard by this
                        station."
                ::= { dot4StatsEntry 3 }

        dot4StatsNoSuccessors OBJECT-TYPE
                SYNTAX  Counter
                ACCESS  read-only
                STATUS  mandatory
                DESCRIPTION
                        "The number of times the station could
                        not find a successor while believing
                        itself not the only station in the ring.
                        This can signify a faulty transmitter
                        condition in this station."
                ::= { dot4StatsEntry 4 }

        dot4StatsWhoFollows OBJECT-TYPE
                SYNTAX  Counter
                ACCESS  read-only
                STATUS  mandatory
                DESCRIPTION
                        "The number of times the station has had
                        to look for a new next station."
                ::= { dot4StatsEntry 5 }

        dot4StatsTokenPassFails OBJECT-TYPE
                SYNTAX  Counter
                ACCESS  read-only
                STATUS  mandatory
```

```
                DESCRIPTION
                        "The number of times the station failed in
                        passing the token to the next station."
                ::= { dot4StatsEntry 6 }

        dot4StatsNonSilences OBJECT-TYPE
                SYNTAX  Counter
                ACCESS  read-only
                STATUS  mandatory
                DESCRIPTION
                        "The number of occurrences of non-silence
                        followed by silence in which a start
                        delimiter was not detected."
                ::= { dot4StatsEntry 7 }

        dot4StatsFcsErrors OBJECT-TYPE
                SYNTAX  Counter
                ACCESS  read-only
                STATUS  mandatory
                DESCRIPTION
                        "The number of frames received with an
                        incorrect FCS and the E-bit reset."
                ::= { dot4StatsEntry 8 }

        dot4StatsEbitErrors OBJECT-TYPE
                SYNTAX  Counter
                ACCESS  read-only
                STATUS  mandatory
                DESCRIPTION
                        "The number of frames the station
                        received with the E-bit set in the
                        end delimiter."
                ::= { dot4StatsEntry 9 }

        dot4StatsFrameFrags OBJECT-TYPE
                SYNTAX  Counter
                ACCESS  read-only
                STATUS  mandatory
                DESCRIPTION
                        "The number of occurrences of receiving a
                        start delimiter followed by another start
                        delimiter, an invalid symbol sequence or
                        silence, without an intervening end
                        delimiter."
                ::= { dot4StatsEntry 10 }

        dot4StatsFrameTooLongs OBJECT-TYPE
                SYNTAX  Counter
```

```
                ACCESS  read-only
                STATUS  mandatory
                DESCRIPTION
                        "The number of frames that were received
                        that were larger than the media's MTU."
                ::= { dot4StatsEntry 11 }

        dot4StatsOverRuns OBJECT-TYPE
                SYNTAX  Counter
                ACCESS  read-only
                STATUS  mandatory
                DESCRIPTION
                        "The number of times a FIFO overrun was
                        detected in the station."
                ::= { dot4StatsEntry 12 }

        dot4StatsDupAddresses OBJECT-TYPE
                SYNTAX  Counter
                ACCESS  read-only
                STATUS  mandatory
                DESCRIPTION
                        "The number of times this station
                        detected another station using the same
                        MAC address."
                ::= { dot4StatsEntry 13 }


        --                      802.4 Interface Tests

        dot4Tests         OBJECT IDENTIFIER ::= { dot4 5 }

        -- The extensions to the interfaces table proposed in [11]
        -- define a table object, ifExtnsTestTable, through which a
        -- network manager can instruct an agent to test an interface
        -- for various faults.  A test to be performed is identified
        -- (as the value of ifExtnsTestType) via an OBJECT IDENTIFIER.

        -- When a test fails, the object ifExtnsTestCode, defined in
        -- [11], may contain a media-specific error-code.  For 802.4
        -- interfaces, the following is defined as the value of
        -- ifExtnsTestCode when a test fails because the modem could
        -- not be initialized:

        dot4Errors OBJECT IDENTIFIER ::= { dot4 4 }
        dot4ModemInitFailed OBJECT IDENTIFIER ::= { dot4Errors 1 }

        -- The Full-Duplex Loop Back Test is a common test, defined
        -- in [11] as:
```

```
--
--    testFullDuplexLoopBack
--
-- Invoking this test on a 802.4 interface causes the
-- interface to check the path from memory through the chip
-- set's serial interface back to memory, thus checking the
-- proper functioning of the transmit and receive machines
-- of the token bus hardware.
-- This test may only be invoked when the interface is
-- the Offline state.

-- The FIFO Path test is defined by:

testFifoPath   OBJECT IDENTIFIER ::= { dot4Tests 1 }

-- Invoking this test causes the interface to check the path
-- from memory to the chip set's FIFO and back to memory.
-- This test checks the hosts interface to the token bus
-- hardware.  This test may only be invoked when the
-- interface is the Offline state.

-- The External Loopback test is defined by:

testExternalLoopback OBJECT IDENTIFIER ::= { dot4Tests 2 }

-- Invoking this test causes the interface to check the path
-- from memory through the chip set and out onto the network
-- for external (e.g., at the head-end) loopback through the
-- chip set to memory. This test checks the host's interface
-- to the 802.4 network.  This test is liable to cause
-- serious disruption if invoked on an operational network.



--                 802.4 Hardware Chip Sets

dot4ChipSets       OBJECT IDENTIFIER ::= { dot4 6 }

-- The extensions to the interfaces table proposed in [11]
-- define an object, ifExtnsChipSet, with the syntax of
-- OBJECT IDENTIFIER, to identify the hardware chip set in
-- use by an interface.  That definition specifies just
-- one applicable object identifier:
--
--    unknownChipSet
--
-- for use as the value of ifExtnsChipSet when the specific
-- chip set is unknown.
```

```
--
-- This MIB defines the following for use as values of
-- ifExtnsChipSet:
-- for use as values of ifExtnsChipSet

   -- Motorola 68824 Token Bus Controller
chipSetMc68824  OBJECT IDENTIFIER ::= { dot4ChipSets 1 }

END
```

6. Acknowledgements

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Marshall T. Rose, Performance Systems International, Inc.

7. References

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8. Security Considerations

Security issues are not discussed in this memo.

9. Authors' Addresses

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