Network Working Group
Request for Comments: 3440
Category: Standards Track

F. Ly
Pedestal Networks
G. Bathrick
Nokia

December 2002

Definitions of Extension Managed Objects for Asymmetric Digital Subscriber Lines

Status of this Memo

Copyright Notice

Abstract

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 additional managed objects used for managing Asymmetric Digital Subscriber Line (ADSL) interfaces not covered by the ADSL Line MIB (RFC 2662).

Table of Contents

1. The Internet-Standard Management Framework

For a detailed overview of the documents that describe the current Internet-Standard Management Framework, please refer to section 7 of RFC 3410 [RFC3410].

Managed objects are accessed via a virtual information store, termed the Management Information Base or MIB. MIB objects are generally accessed through the Simple Network Management Protocol (SNMP). Objects in the MIB are defined using the mechanisms defined in the Structure of Management Information (SMI). This memo specifies a MIB module that is compliant to the SMIv2, which is described in STD 58, RFC 2578 [RFC2578], STD 58, RFC 2579 [RFC2579] and STD 58, RFC 2580 [RFC2580].

2. Introduction

The purpose of this memo is to define a supplemental set of managed objects that is not covered by the ADSL Line MIB as defined in [RFC2662]. This memo addresses the additional objects defined in ITU G.997.1 [ITU G.997.1].

3. Relationship of ADSL Line Extension MIB with standard MIBs

This section outlines the relationship of the ADSL Line Extension MIB with other MIBs described in RFCs and in their various degrees of standardization. In regards to these relationships, the ADSL Line Extension MIB follows conventions as used by the ADSL Line MIB with one exception. The value of the RFC 2863 object, ifOperstatus, SHALL be down(2) when the ADSL line interface is in power state L3, as defined in ITU G.992.1 [ITU G.992.1], which means no power. Its value shall be up(1) if the ADSL line interface is in power state L0 (power on) [ITU G.992.1] or L1 (reduced power). Power Status L2 [ITU G.992.1] is not applicable.

4. Conventions used in the MIB

4.1 Structure

The MIB is organized to follow the same structure of the ADSL Line MIB [RFC2662].

4.2 Additional Managed Objects

Objects specific to the management of ADSL G.Lite as defined in ITU G.992.2 [ITU G.992.2] are:

- ADSL Transceiver Unit - Central Office End (ATU-C) Transmission System and Line Mode
- Power Management
- Counters for Fast Retrains and Failed Fast Retrains
- Counters for Severe Error Second-line and Unavailable Second
- Alternative profile configuration for the Dual line mode interface

Besides the management of G.Lite, another object has been added in order to manage the ADSL line profile. The object is the line mode configuration.

4.2.1 ATU-C ADSL Transmission System Parameters and Line Mode

The adslLineConfigTable needs to be extended to cover control of the ATU-C ADSL Transmission system. Three objects are defined to monitor and configure the transmission mode as well as the actual line mode:

- Capability
- Configuration
- Actual Status

Transmission modes can further determine the line mode of the ADSL interface. For example, if g9921PotsNonOverlapped(2) is the actual value of the ADSL interface, the interface is operating in Full rate ADSL. If the interface is set to g9922PotsOverlapped(9), the interface is operating in G.Lite mode.

The transmission mode and the corresponding line mode are defined as:

Transmission mode	Line Mode
Regional Std. (ANSI T1.413) [ANSI T1.413]	Full
Regional Std. (ETSI DTS/TM06006) [ETSI DTS/TM06006]	Full
G.992.1 [ITU G992.1] POTS non-overlapped	Full
G.992.1 POTS overlapped	Full
G.992.1 Integrated Services Digital Network (ISDN) non-overlapped	Full
G.992.1 ISDN overlapped	Full
G.992.1 TCM-ISDN non-overlapped	Full
G.992.1 TCM-ISDN overlapped	Full
G.992.2 POTS non-overlapped	G.Lite
G.992.2 POTS overlapped	G.Lite
G.992.2 with TCM-ISDN non-overlapped	G.Lite
G.992.2 with TCM-ISDN overlapped	G.Lite
G.992.1 TCM-ISDN symmetric	Full

Table 1: Transmission Mode and Line Mode

In case more than one bit is configured for an ADSL interface and both Full and G.Lite modes are selected, the interface is said to be configured in the dual mode. Only one bit can be set in the Actual object that reflects the actual mode of transmission as well as the line mode.

4.2.2 Power Management

There are three possible power states for each managed ADSL interface operating in the G.Lite mode. L0 is power on, L1 is power on but reduced and L3 is power off. Power state cannot be configured by an operator but it can be viewed via the ifOperStatus object for the managed ADSL interface. The value of the object ifOperStatus is set to down(2) if the ADSL interface is in power state L3 and is set to up(1) if the ADSL line interface is in power state L0 or L1.

An ADSL line power state, if the interface is operating in the G.Lite mode, can also be monitored by the adslLineGlitePowerState object defined in the ADSL Line Extension table. The value of the object enumerates the three power states attainable by the managed interface.

4.2.3 Fast Retrain Parameters

Section 7.4.15 [ITU G.997.1] specifies fast retrain parameters. Fast retrain parameters include two counters: fast retrain count and failed fast retrain count. These two counters have been added to all performance tables.

4.2.4 Counters for Severely Errored Second-line and Unavailable Seconds-line

ITU G.997.1 sections 6.2.1.1.7 and 6.2.1.1.9 specify two counters that are not covered by the ADSL Line MIB [RFC2662]. These two counters (severely errored seconds-line and unavailable seconds-line) are added to all the performance tables.

Unavailable seconds counts the cumulative number of seconds in which the interface was unavailable during the measured period. This counter does not include the seconds in which unavailability was caused solely by fast retrains and failed fast retrains. Fast retrains and failed fast retrains are considered to be part of the normal network operation and thus are not counted as unavailable errors.

4.2.5 Counters, Interval Buckets and Thresholds

For physical-level events, there are counters, current 15-minute and one (up to 96) 15-minute history bucket(s) of "interval-counters", as well as current and previous 1-day interval-counters. Threshold notification can be configured for each physical-layer current 15-minute bucket.

There is no requirement for an agent to ensure fixed relationship between the start of a fifteen minute and any wall clock; however some implementations may align the fifteen-minute intervals with quarter hours. Likewise, an implementation may choose to align one day intervals with start of a day.

Separate tables are provided for the 96 interval-counters. They are indexed by {ifIndex, AdslAtu*IntervalNumber}.

Counters are not reset when an ATU-C or ATU-R is reinitialized, only when the agent is reset or reinitialized (or under specific request outside the scope of this MIB).

The 15-minute event counters are of the type PerfCurrentCount and PerfIntervalCount. The 1-day event counters are of the type AdslPerfCurrDayCount and AdslPerfPrevDayCount. Both 15-minute and 1-day time elapsed counters are of the type AdslPerfTimeElapsed.

4.2.6 Alternative profile configuration for the dual line mode interface

The object, adslLineConfProfileDualLite, is used only when the interface (the ADSL line and, if applicable, channel) is configured as dual mode, that is, the object adslLineTransAtucConfig is configured with one or more full-rate modes and one or more G.Lite modes.

The object adslLineConfProfile defined in ADSL-MIB [RFC2662] is used as the primary full-rate profile. The newly added object in this MIB module, adslLineConfProfileDualLite, is used to describe and configure the G.Lite profile. Note that if one or more full-rate modes are configured, or only G.Lite modes are configured, only the original full-rate profile is needed. The dual-mode profile object is only needed when both full-rate and G.Lite profiles are needed. In this case, it will be set to the value of adslLineConfProfile when 'dynamic' profiles are implemented.

When 'static' profiles are implemented, however, similar to the case of the object, adslLineConfProfileName [RFC2662], this object's value will need to algorithmically represent the line. In this case, the value of the line's ifIndex plus a value indicating the line mode type (e.g., G.Lite, Full-rate) will be used. Therefore, the profile's name is a string of the concatenation of the ifIndex and one of the following values: Full or Lite. This string will be fixed-length (i.e., 14) with leading zero(s). For example, the profile name for ifIndex that equals '15' and is a full rate line will be '0000000015Full'.

5. Conformance and Compliance

See the conformance and compliance statements within the information module.

6. Definitions

```
ADSL-LINE-EXT-MIB DEFINITIONS ::= BEGIN

   IMPORTS
      Counter32,
      Integer32,
      NOTIFICATION-TYPE,
      MODULE-IDENTITY,
      OBJECT-TYPE                         FROM SNMPv2-SMI
      MODULE-COMPLIANCE, OBJECT-GROUP,
      NOTIFICATION-GROUP                  FROM SNMPv2-CONF
      TEXTUAL-CONVENTION                  FROM SNMPv2-TC
      PerfCurrentCount,
```

```
      PerfIntervalCount                 FROM PerfHist-TC-MIB
      AdslPerfCurrDayCount,
      AdslPerfPrevDayCount              FROM ADSL-TC-MIB
      SnmpAdminString                   FROM SNMP-FRAMEWORK-MIB
      adslLineAlarmConfProfileEntry,
      adslLineConfProfileEntry,
      adslAturIntervalEntry,
      adslAturPerfDataEntry,
      adslAtucIntervalEntry,
      adslAtucPerfDataEntry,
      adslLineEntry,
      adslMIB                           FROM ADSL-LINE-MIB
      ;

   adslExtMIB MODULE-IDENTITY

   LAST-UPDATED "200212100000Z"  -- 10 Dec 2002

   ORGANIZATION "IETF ADSL MIB Working Group"

   CONTACT-INFO
         "
          Faye Ly
          Pedestal Networks
          6503 Dumbarton Circle,
          Fremont, CA 94555
          Tel: +1 510-578-0158
          Fax: +1 510-744-5152
          E-Mail: faye@pedestalnetworks.com

          Gregory Bathrick
          Nokia Networks
          2235 Mercury Way,
          Fax: +1 707-535-7300
          E-Mail: greg.bathrick@nokia.com

          General Discussion:adslmib@ietf.org
          To Subscribe: https://www1.ietf.org/mailman/listinfo/adslmib
          Archive: https://www1.ietf.org/mailman/listinfo/adslmib
          "
   DESCRIPTION
           "Copyright (C) The Internet Society (2002). This version of
           this MIB module is part of RFC 3440; see the RFC itself for
           full legal notices.

           This MIB Module is a supplement to the ADSL-LINE-MIB
           [RFC2662]."
```

```
   REVISION     "200212100000Z"  -- 10 dec 2002
   DESCRIPTION  "Initial Version, published as RFC 3440. This MIB
                 module supplements the ADSL-LINE-MIB [RFC2662]."
          ::= { adslMIB 3 }

       adslExtMibObjects  OBJECT IDENTIFIER ::= { adslExtMIB 1 }

       AdslTransmissionModeType ::= TEXTUAL-CONVENTION
           STATUS       current
           DESCRIPTION
               "A set of ADSL line transmission modes, with one bit
                per mode.  The notes (F) and (L) denote Full-Rate
                and G.Lite respectively:
                  Bit 00 : Regional Std. (ANSI T1.413) (F)
                  Bit 01 : Regional Std. (ETSI DTS/TM06006) (F)
                  Bit 02 : G.992.1 POTS non-overlapped (F)
                  Bit 03 : G.992.1 POTS overlapped (F)
                  Bit 04 : G.992.1 ISDN non-overlapped (F)
                  Bit 05 : G.992.1 ISDN overlapped (F)
                  Bit 06 : G.992.1 TCM-ISDN non-overlapped (F)
                  Bit 07 : G.992.1 TCM-ISDN overlapped (F)
                  Bit 08 : G.992.2 POTS non-overlapped (L)
                  Bit 09 : G.992.2 POTS overlapped (L)
                  Bit 10 : G.992.2 with TCM-ISDN non-overlapped (L)
                  Bit 11 : G.992.2 with TCM-ISDN overlapped (L)
                  Bit 12 : G.992.1 TCM-ISDN symmetric (F)
               "
           SYNTAX      BITS {
               ansit1413(0),
               etsi(1),
               q9921PotsNonOverlapped(2),
               q9921PotsOverlapped(3),
               q9921IsdnNonOverlapped(4),
               q9921isdnOverlapped(5),
               q9921tcmIsdnNonOverlapped(6),
               q9921tcmIsdnOverlapped(7),
               q9922potsNonOverlapeed(8),
               q9922potsOverlapped(9),
               q9922tcmIsdnNonOverlapped(10),
               q9922tcmIsdnOverlapped(11),
               q9921tcmIsdnSymmetric(12)
           }

         adslLineExtTable   OBJECT-TYPE
             SYNTAX          SEQUENCE OF AdslLineExtEntry
             MAX-ACCESS      not-accessible
             STATUS          current
             DESCRIPTION
```

```
            "This table is an extension of RFC 2662.  It
             contains ADSL line configuration and
             monitoring information. This includes the ADSL
             line's capabilities and actual ADSL transmission
             system."
        ::= { adslExtMibObjects 17 }

        adslLineExtEntry   OBJECT-TYPE
            SYNTAX          AdslLineExtEntry
            MAX-ACCESS      not-accessible
            STATUS          current
            DESCRIPTION
                "An entry extends the adslLineEntry defined in
                 [RFC2662].  Each entry corresponds to an ADSL
                 line."
            AUGMENTS { adslLineEntry }
        ::= { adslLineExtTable 1 }

        AdslLineExtEntry ::=
            SEQUENCE {
            adslLineTransAtucCap        AdslTransmissionModeType,
            adslLineTransAtucConfig     AdslTransmissionModeType,
            adslLineTransAtucActual     AdslTransmissionModeType,
            adslLineGlitePowerState     INTEGER,
            adslLineConfProfileDualLite SnmpAdminString
            }

        adslLineTransAtucCap OBJECT-TYPE
            SYNTAX      AdslTransmissionModeType
            MAX-ACCESS  read-only
            STATUS      current
            DESCRIPTION
                "The transmission modes, represented by a
                 bitmask that the ATU-C is capable of
                 supporting.  The modes available are limited
                 by the design of the equipment."
            REFERENCE "Section 7.3.2 ITU G.997.1"
        ::= { adslLineExtEntry 1 }

        adslLineTransAtucConfig OBJECT-TYPE
            SYNTAX      AdslTransmissionModeType
            MAX-ACCESS  read-write
            STATUS      current

            DESCRIPTION
                "The transmission modes, represented by a bitmask,
                 currently enabled by the ATU-C.  The manager can
                 only set those modes that are supported by the
```

```
            ATU-C.  An ATU-C's supported modes are provided by
            AdslLineTransAtucCap."
        REFERENCE "Section 7.3.2 ITU G.997.1"
    ::= { adslLineExtEntry 2 }

    adslLineTransAtucActual OBJECT-TYPE
        SYNTAX      AdslTransmissionModeType
        MAX-ACCESS  read-only
        STATUS      current
        DESCRIPTION
            "The actual transmission mode of the ATU-C.
            During ADSL line initialization, the ADSL
            Transceiver Unit - Remote terminal end (ATU-R)
            will determine the mode used for the link.
            This value will be limited a single transmission
            mode that is a subset of those modes enabled
            by the ATU-C and denoted by
            adslLineTransAtucConfig. After an initialization
            has occurred, its mode is saved as the 'Current'
            mode and is persistence should the link go
            down. This object returns 0 (i.e. BITS with no
            mode bit set) if the mode is not known."
        REFERENCE "Section 7.3.2 ITU G.997.1 "
    ::= { adslLineExtEntry 3 }

    adslLineGlitePowerState OBJECT-TYPE
        SYNTAX      INTEGER {
                    none(1),
                    l0(2),          -- L0 Power on
                    l1(3),          -- L1 Power on but reduced
                    l3(4)           -- L3 Power off
                    }
        MAX-ACCESS  read-only
        STATUS      current
        DESCRIPTION
            "The value of this object specifies the power
            state of this interface.  L0 is power on, L1 is
            power on but reduced and L3 is power off.  Power
            state cannot be configured by an operator but it
            can be viewed via the ifOperStatus object for the
            managed ADSL interface.  The value of the object
            ifOperStatus is set to down(2) if the ADSL
            interface is in power state L3 and is set to up(1)
            if the ADSL line interface is in power state L0 or
            L1. If the object adslLineTransAtucActual is set to
            a G.992.2 (G.Lite)-type transmission mode, the
            value of this object will be one of the valid power
            states: L0(2), L1(3), or L3(4).  Otherwise, its
```

```
                value will be none(1)."
        ::= { adslLineExtEntry 4 }

        adslLineConfProfileDualLite OBJECT-TYPE
            SYNTAX SnmpAdminString
            MAX-ACCESS  read-write
            STATUS current
            DESCRIPTION
                "This object extends the definition an ADSL line and
                 associated channels (when applicable) for cases
                 when it is configured in dual mode, and operating
                 in a G.Lite-type mode as denoted by
                 adslLineTransAtucActual.  Dual mode exists when the
                 object, adslLineTransAtucConfig, is configured with
                 one or more full-rate modes and one or more G.Lite
                 modes simultaneously.

                 When 'dynamic' profiles are implemented, the value
                 of object is equal to the index of the applicable
                 row in the ADSL Line Configuration Profile Table,
                 AdslLineConfProfileTable defined in ADSL-MIB
                 [RFC2662].

                 In the case when dual-mode has not been enabled,
                 the value of the object will be equal to the value
                 of the object adslLineConfProfile [RFC2662].

                 When 'static' profiles are implemented, in much
                 like the case of the object,
                 adslLineConfProfileName [RFC2662], this object's
                 value will need to algorithmically represent the
                 characteristics of the line.  In this case, the
                 value of the line's ifIndex plus a value indicating
                 the line mode type (e.g., G.Lite, Full-rate) will
                 be used. Therefore, the profile's name is a string
                 concatenating the ifIndex and one of the follow
                 values: Full or Lite. This string will be
                 fixed-length (i.e., 14) with leading zero(s).  For
                 example, the profile name for ifIndex that equals
                 '15' and is a full rate line, it will be
                 '0000000015Full'."
            REFERENCE "Section 5.4 Profiles, RFC 2662"
        ::= { adslLineExtEntry 5 }

        adslAtucPerfDataExtTable   OBJECT-TYPE

            SYNTAX          SEQUENCE OF AdslAtucPerfDataExtEntry
            MAX-ACCESS      not-accessible
```

```
        STATUS          current
        DESCRIPTION
            "This table extends adslAtucPerfDataTable [RFC2662]
             with additional ADSL physical line counter
             information such as unavailable seconds-line and
             severely errored seconds-line."
    ::= { adslExtMibObjects 18 }

    adslAtucPerfDataExtEntry   OBJECT-TYPE
        SYNTAX          AdslAtucPerfDataExtEntry
        MAX-ACCESS      not-accessible
        STATUS          current
        DESCRIPTION
            "An entry extends the adslAtucPerfDataEntry defined
             in [RFC2662].  Each entry corresponds to an ADSL
             line."
    AUGMENTS { adslAtucPerfDataEntry }
    ::= { adslAtucPerfDataExtTable 1 }

    AdslAtucPerfDataExtEntry ::=
        SEQUENCE {
        adslAtucPerfStatFastR            Counter32,
        adslAtucPerfStatFailedFastR      Counter32,
        adslAtucPerfStatSesL             Counter32,
        adslAtucPerfStatUasL             Counter32,
        adslAtucPerfCurr15MinFastR       PerfCurrentCount,
        adslAtucPerfCurr15MinFailedFastR PerfCurrentCount,
        adslAtucPerfCurr15MinSesL        PerfCurrentCount,
        adslAtucPerfCurr15MinUasL        PerfCurrentCount,
        adslAtucPerfCurr1DayFastR        AdslPerfCurrDayCount,
        adslAtucPerfCurr1DayFailedFastR  AdslPerfCurrDayCount,
        adslAtucPerfCurr1DaySesL         AdslPerfCurrDayCount,
        adslAtucPerfCurr1DayUasL         AdslPerfCurrDayCount,
        adslAtucPerfPrev1DayFastR        AdslPerfPrevDayCount,
        adslAtucPerfPrev1DayFailedFastR  AdslPerfPrevDayCount,
        adslAtucPerfPrev1DaySesL         AdslPerfPrevDayCount,
        adslAtucPerfPrev1DayUasL         AdslPerfPrevDayCount
    }

    adslAtucPerfStatFastR OBJECT-TYPE
        SYNTAX      Counter32
        UNITS       "line retrains"
        MAX-ACCESS  read-only
        STATUS      current
        DESCRIPTION
            "The value of this object reports the count of
             the number of fast line bs since last
             agent reset."
```

```
        REFERENCE "ITU G.997.1 Section 7.4.15.1 "
    ::= { adslAtucPerfDataExtEntry 1 }

    adslAtucPerfStatFailedFastR OBJECT-TYPE
        SYNTAX      Counter32
        UNITS       "line retrains"
        MAX-ACCESS  read-only
        STATUS      current
        DESCRIPTION
            "The value of this object reports the count of
             the number of failed fast line retrains since
             last agent reset."
        REFERENCE "ITU G.997.1 Section 7.4.15.2 "
    ::= { adslAtucPerfDataExtEntry 2 }

    adslAtucPerfStatSesL OBJECT-TYPE
        SYNTAX      Counter32
        UNITS       "seconds"
        MAX-ACCESS  read-only
        STATUS      current
        DESCRIPTION
            "The value of this object reports the count of
             the number of severely errored seconds-line since
             last agent reset."
        REFERENCE "ITU G.997.1 Section 7.2.1.1.7 "
    ::= { adslAtucPerfDataExtEntry 3 }

    adslAtucPerfStatUasL OBJECT-TYPE
        SYNTAX      Counter32
        UNITS       "seconds"
        MAX-ACCESS  read-only
        STATUS      current
        DESCRIPTION
            "The value of this object reports the count of
             the number of unavailable seconds-line since
             last agent reset."
        REFERENCE "ITU G.997.1 Section 7.2.1.1.9 "
    ::= { adslAtucPerfDataExtEntry 4 }

    adslAtucPerfCurr15MinFastR OBJECT-TYPE
        SYNTAX      PerfCurrentCount
        UNITS       "seconds"
        MAX-ACCESS  read-only
        STATUS      current
        DESCRIPTION
            "For the current 15-minute interval,
             adslAtucPerfCurr15MinFastR reports the current
             number of seconds during which there have been
```

```
             fast retrains."
        REFERENCE "ITU G.997.1 Section 7.4.15.1 "
    ::= { adslAtucPerfDataExtEntry 5 }

    adslAtucPerfCurr15MinFailedFastR   OBJECT-TYPE
        SYNTAX      PerfCurrentCount
        UNITS       "seconds"
        MAX-ACCESS  read-only
        STATUS      current
        DESCRIPTION
            "For the current 15-minute interval,
             adslAtucPerfCurr15MinFailedFastR reports the
             current number of seconds during which there
             have been failed fast retrains."
        REFERENCE "ITU G.997.1 Section 7.4.15.2 "
    ::= { adslAtucPerfDataExtEntry 6 }

    adslAtucPerfCurr15MinSesL OBJECT-TYPE
        SYNTAX      PerfCurrentCount
        UNITS       "seconds"
        MAX-ACCESS  read-only
        STATUS      current
        DESCRIPTION
            "For the current 15-minute interval,
             adslAtucPerfCurr15MinSesL reports the current
             number of seconds during which there have been
             severely errored seconds-line."
        REFERENCE "ITU G.997.1 Section 7.2.1.1.7 "
    ::= { adslAtucPerfDataExtEntry 7 }

    adslAtucPerfCurr15MinUasL   OBJECT-TYPE
        SYNTAX      PerfCurrentCount
        UNITS       "seconds"
        MAX-ACCESS  read-only
        STATUS      current
        DESCRIPTION
            "For the current 15-minute interval,
             adslAtucPerfCurr15MinUasL reports the current
             number of seconds during which there have been
             unavailable seconds-line."
        REFERENCE "ITU G.997.1 Section 7.2.1.1.9 "
    ::= { adslAtucPerfDataExtEntry 8 }

    adslAtucPerfCurr1DayFastR    OBJECT-TYPE
        SYNTAX      AdslPerfCurrDayCount
        UNITS       "seconds"
        MAX-ACCESS  read-only
        STATUS      current
```

```
            DESCRIPTION
                "For the current day as measured by
                 adslAtucPerfCurr1DayTimeElapsed [RFC2662],
                 adslAtucPerfCurr1DayFastR reports the number
                 of seconds during which there have been
                 fast retrains."
            REFERENCE "ITU G.997.1 Section 7.4.15.1 "
        ::= { adslAtucPerfDataExtEntry 9 }

        adslAtucPerfCurr1DayFailedFastR    OBJECT-TYPE
            SYNTAX      AdslPerfCurrDayCount
            UNITS       "seconds"
            MAX-ACCESS  read-only
            STATUS      current
            DESCRIPTION
                "For the current day as measured by
                 adslAtucPerfCurr1DayTimeElapsed [RFC2662],
                 adslAtucPerfCurr1DayFailedFastR reports the
                 number of seconds during which there have been
                 failed fast retrains."
            REFERENCE "ITU G.997.1 Section 7.4.15.2 "
        ::= { adslAtucPerfDataExtEntry 10 }

        adslAtucPerfCurr1DaySesL    OBJECT-TYPE
            SYNTAX      AdslPerfCurrDayCount
            UNITS       "seconds"
            MAX-ACCESS  read-only
            STATUS      current
            DESCRIPTION
                "For the current day as measured by
                 adslAtucPerfCurr1DayTimeElapsed [RFC2662],
                 adslAtucPerfCurr1DaySesL reports the
                 number of seconds during which there have been
                 severely errored seconds-line."
            REFERENCE "ITU G.997.1 Section 7.2.1.1.7 "
        ::= { adslAtucPerfDataExtEntry 11 }

        adslAtucPerfCurr1DayUasL    OBJECT-TYPE
            SYNTAX      AdslPerfCurrDayCount
            UNITS       "seconds"
            MAX-ACCESS  read-only
            STATUS      current
            DESCRIPTION
                "For the current day as measured by
                 adslAtucPerfCurr1DayTimeElapsed [RFC2662],
                 adslAtucPerfCurr1DayUasL reports the
                 number of seconds during which there have been
                 unavailable seconds-line."
```

```
            REFERENCE "ITU G.997.1 Section 7.2.1.1.9 "
        ::= { adslAtucPerfDataExtEntry 12 }

        adslAtucPerfPrev1DayFastR     OBJECT-TYPE
            SYNTAX      AdslPerfPrevDayCount
            UNITS       "seconds"
            MAX-ACCESS  read-only
            STATUS      current
            DESCRIPTION
                "For the previous day, adslAtucPerfPrev1DayFastR
                 reports the number of seconds during which there
                 were fast retrains."
            REFERENCE "ITU G.997.1 Section 7.4.15.1 "
        ::= { adslAtucPerfDataExtEntry 13 }

        adslAtucPerfPrev1DayFailedFastR OBJECT-TYPE
            SYNTAX      AdslPerfPrevDayCount
            UNITS       "seconds"
            MAX-ACCESS  read-only
            STATUS      current
            DESCRIPTION
                "For the previous day,
                 adslAtucPerfPrev1DayFailedFastR reports the number
                 of seconds during which there were failed fast
                 retrains."
            REFERENCE "ITU G.997.1 Section 7.4.15.2 "
        ::= { adslAtucPerfDataExtEntry 14 }

        adslAtucPerfPrev1DaySesL     OBJECT-TYPE
            SYNTAX      AdslPerfPrevDayCount
            UNITS       "seconds"
            MAX-ACCESS  read-only
            STATUS      current
            DESCRIPTION
                "For the previous day, adslAtucPerfPrev1DaySesL
                 reports the number of seconds during which there
                 were severely errored seconds-line."
            REFERENCE "ITU G.997.1 Section 7.2.1.1.7 "
        ::= { adslAtucPerfDataExtEntry 15 }

        adslAtucPerfPrev1DayUasL OBJECT-TYPE
            SYNTAX      AdslPerfPrevDayCount
            UNITS       "seconds"
            MAX-ACCESS  read-only
            STATUS      current
            DESCRIPTION
                "For the previous day, adslAtucPerfPrev1DayUasL
                 reports the number of seconds during which there
```

```
            were unavailable seconds-line."
        REFERENCE "ITU G.997.1 Section 7.2.1.1.9 "
    ::= { adslAtucPerfDataExtEntry 16 }

    adslAtucIntervalExtTable   OBJECT-TYPE
        SYNTAX          SEQUENCE OF AdslAtucIntervalExtEntry
        MAX-ACCESS      not-accessible
        STATUS          current
        DESCRIPTION
            "This table provides one row for each ATU-C
             performance data collection interval for
             ADSL physical interfaces whose
             IfEntries' ifType is equal to adsl(94)."
    ::= { adslExtMibObjects 19 }

    adslAtucIntervalExtEntry   OBJECT-TYPE
        SYNTAX          AdslAtucIntervalExtEntry
        MAX-ACCESS      not-accessible
        STATUS          current
        DESCRIPTION     "An entry in the
                         adslAtucIntervalExtTable."
        AUGMENTS        { adslAtucIntervalEntry }
    ::= { adslAtucIntervalExtTable 1 }

    AdslAtucIntervalExtEntry ::=
        SEQUENCE {
        adslAtucIntervalFastR           PerfIntervalCount,
        adslAtucIntervalFailedFastR     PerfIntervalCount,
        adslAtucIntervalSesL            PerfIntervalCount,
        adslAtucIntervalUasL            PerfIntervalCount
        }

    adslAtucIntervalFastR OBJECT-TYPE
        SYNTAX      PerfIntervalCount
        UNITS       "seconds"
        MAX-ACCESS  read-only
        STATUS      current
        DESCRIPTION
            "For the current interval, adslAtucIntervalFastR
             reports the current number of seconds during which
             there have been fast retrains."
    ::= { adslAtucIntervalExtEntry 1 }

    adslAtucIntervalFailedFastR OBJECT-TYPE
        SYNTAX      PerfIntervalCount
        UNITS       "seconds"
        MAX-ACCESS  read-only
        STATUS      current
```

```
            DESCRIPTION
                "For the each interval, adslAtucIntervalFailedFastR
                 reports the number of seconds during which
                 there have been failed fast retrains."
        ::= { adslAtucIntervalExtEntry 2 }

        adslAtucIntervalSesL OBJECT-TYPE
            SYNTAX      PerfIntervalCount
            UNITS       "seconds"
            MAX-ACCESS  read-only
            STATUS      current
            DESCRIPTION
                "For the each interval, adslAtucIntervalSesL
                 reports the number of seconds during which
                 there have been severely errored seconds-line."
        ::= { adslAtucIntervalExtEntry 3 }

        adslAtucIntervalUasL OBJECT-TYPE
            SYNTAX      PerfIntervalCount
            UNITS       "seconds"
            MAX-ACCESS  read-only
            STATUS      current
            DESCRIPTION
                "For the each interval, adslAtucIntervalUasL
                 reports the number of seconds during which
                 there have been unavailable seconds-line."
        ::= { adslAtucIntervalExtEntry 4 }

        adslAturPerfDataExtTable   OBJECT-TYPE
            SYNTAX          SEQUENCE OF AdslAturPerfDataExtEntry
            MAX-ACCESS      not-accessible
            STATUS          current
            DESCRIPTION
                "This table contains ADSL physical line counters
                 not defined in the adslAturPerfDataTable
                 from the ADSL-LINE-MIB [RFC2662]."
        ::= { adslExtMibObjects 20 }

        adslAturPerfDataExtEntry   OBJECT-TYPE
            SYNTAX          AdslAturPerfDataExtEntry
            MAX-ACCESS      not-accessible
            STATUS          current
            DESCRIPTION
                "An entry extends the adslAturPerfDataEntry defined
                 in [RFC2662].  Each entry corresponds to an ADSL
                 line."
            AUGMENTS { adslAturPerfDataEntry }
        ::= { adslAturPerfDataExtTable 1 }
```

```
AdslAturPerfDataExtEntry ::=
    SEQUENCE {
    adslAturPerfStatSesL             Counter32,
    adslAturPerfStatUasL             Counter32,
    adslAturPerfCurr15MinSesL        PerfCurrentCount,
    adslAturPerfCurr15MinUasL        PerfCurrentCount,
    adslAturPerfCurr1DaySesL         AdslPerfCurrDayCount,
    adslAturPerfCurr1DayUasL         AdslPerfCurrDayCount,
    adslAturPerfPrev1DaySesL         AdslPerfPrevDayCount,
    adslAturPerfPrev1DayUasL         AdslPerfPrevDayCount
}

adslAturPerfStatSesL OBJECT-TYPE
    SYNTAX      Counter32
    UNITS       "seconds"
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "The value of this object reports the count of
         severely errored second-line since the last agent
         reset."
    REFERENCE "ITU G.997.1 Section 7.2.1.1.7 "
::= { adslAturPerfDataExtEntry 1 }

adslAturPerfStatUasL OBJECT-TYPE
    SYNTAX      Counter32
    UNITS       "seconds"
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "The value of this object reports the count of
         unavailable seconds-line since the last agent
         reset."
    REFERENCE "ITU G.997.1 Section 7.2.1.2.9 "
::= { adslAturPerfDataExtEntry 2 }

adslAturPerfCurr15MinSesL OBJECT-TYPE
    SYNTAX      PerfCurrentCount
    UNITS       "seconds"
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "For the current 15-minute interval,
         adslAturPerfCurr15MinSesL reports the current
         number of seconds during which there have been
         severely errored seconds-line."

    REFERENCE "ITU G.997.1 Section 7.2.1.2.7 "
```

```
        ::= { adslAturPerfDataExtEntry 3 }

        adslAturPerfCurr15MinUasL   OBJECT-TYPE
            SYNTAX      PerfCurrentCount
            UNITS       "seconds"
            MAX-ACCESS  read-only
            STATUS      current
            DESCRIPTION
                "For the current 15-minute interval,
                 adslAturPerfCurr15MinUasL reports the current
                 number of seconds during which there have been
                 available seconds-line."
            REFERENCE "ITU G.997.1 Section 7.2.1.2.9 "
        ::= { adslAturPerfDataExtEntry 4 }

        adslAturPerfCurr1DaySesL    OBJECT-TYPE
            SYNTAX      AdslPerfCurrDayCount
            UNITS       "seconds"
            MAX-ACCESS  read-only
            STATUS      current
            DESCRIPTION
                "For the current day as measured by
                 adslAturPerfCurr1DayTimeElapsed [RFC2662],
                 adslAturPerfCurr1DaySesL reports the
                 number of seconds during which there have been
                 severely errored seconds-line."
            REFERENCE "ITU G.997.1 Section 7.2.1.2.7 "
        ::= { adslAturPerfDataExtEntry 5 }

        adslAturPerfCurr1DayUasL    OBJECT-TYPE
            SYNTAX      AdslPerfCurrDayCount
            UNITS       "seconds"
            MAX-ACCESS  read-only
            STATUS      current
            DESCRIPTION
                "For the current day as measured by
                 adslAturPerfCurr1DayTimeElapsed [RFC2662],
                 adslAturPerfCurr1DayUasL reports the
                 number of seconds during which there have been
                 unavailable seconds-line."
            REFERENCE "ITU G.997.1 Section 7.2.1.2.9 "
        ::= { adslAturPerfDataExtEntry 6 }

        adslAturPerfPrev1DaySesL     OBJECT-TYPE
            SYNTAX      AdslPerfPrevDayCount
            UNITS       "seconds"
            MAX-ACCESS  read-only
            STATUS      current
```

```
        DESCRIPTION
            "For the previous day, adslAturPerfPrev1DaySesL
             reports the number of seconds during which there
             were severely errored seconds-line."
        REFERENCE "ITU G.997.1 Section 7.2.1.2.7 "
    ::= { adslAturPerfDataExtEntry 7 }

    adslAturPerfPrev1DayUasL OBJECT-TYPE
        SYNTAX      AdslPerfPrevDayCount
        UNITS       "seconds"
        MAX-ACCESS  read-only
        STATUS      current
        DESCRIPTION
            "For the previous day, adslAturPerfPrev1DayUasL
             reports the number of seconds during which there
             were severely errored seconds-line."
        REFERENCE "ITU G.997.1 Section 7.2.1.2.9 "
    ::= { adslAturPerfDataExtEntry 8 }

    adslAturIntervalExtTable   OBJECT-TYPE
        SYNTAX          SEQUENCE OF AdslAturIntervalExtEntry
        MAX-ACCESS      not-accessible
        STATUS          current
        DESCRIPTION
            "This table provides one row for each ATU-R
             performance data collection interval for
             ADSL physical interfaces whose
             IfEntries' ifType is equal to adsl(94)."
    ::= { adslExtMibObjects 21 }

    adslAturIntervalExtEntry   OBJECT-TYPE
        SYNTAX          AdslAturIntervalExtEntry
        MAX-ACCESS      not-accessible
        STATUS          current
        DESCRIPTION     "An entry in the
                         adslAturIntervalExtTable."
        AUGMENTS        { adslAturIntervalEntry }
    ::= { adslAturIntervalExtTable 1 }

    AdslAturIntervalExtEntry ::=
        SEQUENCE {
        adslAturIntervalSesL            PerfIntervalCount,
        adslAturIntervalUasL            PerfIntervalCount
        }

    adslAturIntervalSesL OBJECT-TYPE
        SYNTAX      PerfIntervalCount
        UNITS       "seconds"
```

```
        MAX-ACCESS  read-only
        STATUS      current
        DESCRIPTION
            "For the each interval, adslAturIntervalSesL
             reports the number of seconds during which
             there have been severely errored seconds-line."
    ::= { adslAturIntervalExtEntry 1 }

    adslAturIntervalUasL OBJECT-TYPE
        SYNTAX      PerfIntervalCount
        UNITS       "seconds"
        MAX-ACCESS  read-only
        STATUS      current
        DESCRIPTION
            "For the each interval, adslAturIntervalUasL
             reports the number of seconds during which
             there have been unavailable seconds-line."
    ::= { adslAturIntervalExtEntry 2 }

    adslConfProfileExtTable   OBJECT-TYPE
        SYNTAX          SEQUENCE OF AdslConfProfileExtEntry
        MAX-ACCESS      not-accessible
        STATUS          current
        DESCRIPTION
            "The adslConfProfileExtTable extends the ADSL line
             profile configuration information in the
             adslLineConfProfileTable from the ADSL-LINE-MIB
             [RFC2662] by adding the ability to configure the
             ADSL physical line mode."
    ::= { adslExtMibObjects 22 }

    adslConfProfileExtEntry   OBJECT-TYPE
        SYNTAX          AdslConfProfileExtEntry
        MAX-ACCESS      not-accessible
        STATUS          current
        DESCRIPTION
            "An entry extends the adslLineConfProfileEntry
             defined in [RFC2662].  Each entry corresponds to an
             ADSL line profile."
        AUGMENTS { adslLineConfProfileEntry }
    ::= { adslConfProfileExtTable 1 }

    AdslConfProfileExtEntry ::=
        SEQUENCE {
            adslConfProfileLineType  INTEGER
        }

    adslConfProfileLineType OBJECT-TYPE
```

```
            SYNTAX      INTEGER {
                noChannel (1),         -- no channels exist
                fastOnly (2),          -- only fast channel exists
                interleavedOnly (3),   -- only interleaved channel
                                       -- exist
                fastOrInterleaved (4),-- either fast or interleaved
                                       -- channels can exist, but
                                       -- only one at any time
                fastAndInterleaved (5)-- both the fast channel and
                                       -- the interleaved channel
                                       -- exist
                }
            MAX-ACCESS  read-create
            STATUS      current
            DESCRIPTION
                "This object is used to configure the ADSL physical
                 line mode.  It has following valid values:

                 noChannel(1), when no channels exist.
                 fastOnly(2), when only fast channel exists.
                 interleavedOnly(3), when only interleaved channel
                     exist.
                 fastOrInterleaved(4), when either fast or
                     interleaved channels can exist, but only one
                     at any time.
                 fastAndInterleaved(5), when both the fast channel
                     and the interleaved channel exist.

                 In the case when no value has been set, the default
                 Value is noChannel(1).
                 "
            DEFVAL { fastOnly }
        ::= { adslConfProfileExtEntry 1 }

        adslAlarmConfProfileExtTable   OBJECT-TYPE
            SYNTAX          SEQUENCE OF AdslAlarmConfProfileExtEntry
            MAX-ACCESS      not-accessible
            STATUS          current
            DESCRIPTION
                "This table extends the
                 adslLineAlarmConfProfileTable and provides
                 threshold parameters for all the counters defined
                 in this MIB module."
        ::= { adslExtMibObjects 23 }

        adslAlarmConfProfileExtEntry   OBJECT-TYPE
            SYNTAX          AdslAlarmConfProfileExtEntry
            MAX-ACCESS      not-accessible
```

```
        STATUS          current
        DESCRIPTION
            "An entry extends the adslLineAlarmConfProfileTable
             defined in [RFC2662].  Each entry corresponds to
             an ADSL alarm profile."
        AUGMENTS { adslLineAlarmConfProfileEntry }
    ::= { adslAlarmConfProfileExtTable 1 }

    AdslAlarmConfProfileExtEntry ::=
        SEQUENCE {
        adslAtucThreshold15MinFailedFastR     Integer32,
        adslAtucThreshold15MinSesL            Integer32,
        adslAtucThreshold15MinUasL            Integer32,
        adslAturThreshold15MinSesL            Integer32,
        adslAturThreshold15MinUasL            Integer32
    }

    adslAtucThreshold15MinFailedFastR   OBJECT-TYPE
        SYNTAX      Integer32(0..900)
        UNITS       "seconds"
        MAX-ACCESS  read-create
        STATUS      current
        DESCRIPTION
            "The first time the value of the corresponding
             instance of adslAtucPerfCurr15MinFailedFastR
             reaches or exceeds this value within a given
             15-minute performance data collection period,
             an adslAtucFailedFastRThreshTrap  notification
             will be generated. The value '0' will disable
             the notification. The default value of this
             object is '0'."
        DEFVAL { 0 }
    ::= { adslAlarmConfProfileExtEntry 1 }

    adslAtucThreshold15MinSesL OBJECT-TYPE
        SYNTAX      Integer32(0..900)
        UNITS       "seconds"
        MAX-ACCESS  read-create
        STATUS      current
        DESCRIPTION
            "The first time the value of the corresponding
             instance of adslAtucPerf15MinSesL reaches or
             exceeds this value within a given 15-minute
             performance data collection period, an
             adslAtucSesLThreshTrap notification will be
             generated. The value '0' will disable the
             notification.  The default value of this
             object is '0'."
```

```
            DEFVAL { 0 }

        ::= { adslAlarmConfProfileExtEntry 2 }

        adslAtucThreshold15MinUasL OBJECT-TYPE
            SYNTAX      Integer32(0..900)
            UNITS       "seconds"
            MAX-ACCESS  read-create
            STATUS      current
            DESCRIPTION
                "The first time the value of the corresponding
                 instance of adslAtucPerf15MinUasL reaches or
                 exceeds this value within a given 15-minute
                 performance data collection period, an
                 adslAtucUasLThreshTrap notification will be
                 generated. The value '0' will disable the
                 notification.  The default value of this
                 object is '0'."
            DEFVAL { 0 }
        ::= { adslAlarmConfProfileExtEntry 3 }

        adslAturThreshold15MinSesL OBJECT-TYPE
            SYNTAX      Integer32(0..900)
            UNITS       "seconds"
            MAX-ACCESS  read-create
            STATUS      current
            DESCRIPTION
                "The first time the value of the corresponding
                 instance of adslAturPerf15MinSesL reaches or
                 exceeds this value within a given 15-minute
                 performance data collection period, an
                 adslAturSesLThreshTrap notification will be
                 generated. The value '0' will disable the
                 notification.  The default value of this
                 object is '0'."
            DEFVAL { 0 }
        ::= { adslAlarmConfProfileExtEntry 4 }

        adslAturThreshold15MinUasL OBJECT-TYPE
            SYNTAX      Integer32(0..900)
            UNITS       "seconds"
            MAX-ACCESS  read-create
            STATUS      current
            DESCRIPTION
                "The first time the value of the corresponding
                 instance of adslAturPerf15MinUasL reaches or
                 exceeds this value within a given 15-minute
                 performance data collection period, an
```

```
                adslAturUasLThreshTrap notification will be
                generated. The value '0' will disable the
                notification.  The default value of this
                object is '0'."
            DEFVAL { 0 }

        ::= { adslAlarmConfProfileExtEntry 5 }

  --   definitions

   adslExtTraps OBJECT IDENTIFIER ::= { adslExtMibObjects 24 }

   adslExtAtucTraps OBJECT IDENTIFIER ::= { adslExtTraps 1 }

   adslExtAtucTrapsPrefix OBJECT IDENTIFIER ::= { adslExtAtucTraps 0 }

        adslAtucFailedFastRThreshTrap      NOTIFICATION-TYPE
            OBJECTS { adslAtucPerfCurr15MinFailedFastR }
            STATUS  current
            DESCRIPTION
                "Failed Fast Retrains 15-minute threshold reached."
        ::= { adslExtAtucTrapsPrefix 1 }

        adslAtucSesLThreshTrap      NOTIFICATION-TYPE
            OBJECTS { adslAtucPerfCurr15MinSesL }
            STATUS  current
            DESCRIPTION
                "Severely errored seconds-line 15-minute threshold
                 reached."
        ::= { adslExtAtucTrapsPrefix 2 }

        adslAtucUasLThreshTrap      NOTIFICATION-TYPE
            OBJECTS { adslAtucPerfCurr15MinUasL }
            STATUS  current
            DESCRIPTION
                "Unavailable seconds-line 15-minute threshold
                 reached."
        ::= { adslExtAtucTrapsPrefix 3 }


   adslExtAturTraps OBJECT IDENTIFIER ::= { adslExtTraps 2 }

   adslExtAturTrapsPrefix OBJECT IDENTIFIER ::= { adslExtAturTraps 0 }

        adslAturSesLThreshTrap      NOTIFICATION-TYPE
            OBJECTS { adslAturPerfCurr15MinSesL }
            STATUS  current
            DESCRIPTION
```

```
                "Severely errored seconds-line 15-minute threshold
                 reached."
        ::= { adslExtAturTrapsPrefix 1 }

        adslAturUasLThreshTrap      NOTIFICATION-TYPE
            OBJECTS { adslAturPerfCurr15MinUasL }
            STATUS  current
            DESCRIPTION
                "Unavailable seconds-line 15-minute threshold
                 reached."
        ::= { adslExtAturTrapsPrefix 2 }


   -- conformance information

   adslExtConformance OBJECT IDENTIFIER ::= { adslExtMIB 2 }

   adslExtGroups OBJECT IDENTIFIER ::= { adslExtConformance 1 }
   adslExtCompliances OBJECT IDENTIFIER ::= { adslExtConformance 2 }

         -- ATU-C agent compliance statements

         adslExtLineMibAtucCompliance MODULE-COMPLIANCE
             STATUS  current
             DESCRIPTION
                 "The compliance statement for SNMP entities which
                  represent ADSL ATU-C interfaces."

             MODULE  -- this module
             MANDATORY-GROUPS
                {
                adslExtLineGroup,
                adslExtLineConfProfileControlGroup,
                adslExtLineAlarmConfProfileGroup
                }

             GROUP       adslExtAtucPhysPerfCounterGroup
             DESCRIPTION
                 "This group is optional.  Implementations which
                  require continuous ATU-C physical event counters
                  should implement this group."

             GROUP       adslExtAturPhysPerfCounterGroup
             DESCRIPTION
                 "This group is optional.  Implementations which
                  require continuous ATU-R physical event counters
                  should implement this group."
```

```
        GROUP   adslExtNotificationsGroup
        DESCRIPTION
      "This group is optional.  Implementations which
            support TCA (Threshold Crossing Alert) should
            implement this group."

        OBJECT      adslAtucThreshold15MinFailedFastR
        MIN-ACCESS  read-write
        DESCRIPTION
            "Read-write access is applicable only when
             static profiles as defined in ADSL Line MIB
             [RFC2662] are implemented."

        OBJECT      adslAtucThreshold15MinSesL
        MIN-ACCESS  read-write
        DESCRIPTION
            "Read-write access is applicable only when
             static profiles as defined in ADSL Line MIB
             [RFC2662] are implemented."

        OBJECT      adslAtucThreshold15MinUasL
        MIN-ACCESS  read-write
        DESCRIPTION
            "Read-write access is applicable only when
             static profiles as defined in ADSL Line MIB
             [RFC2662] are implemented."

        OBJECT      adslAturThreshold15MinSesL
        MIN-ACCESS  read-write
        DESCRIPTION
            "Read-write access is applicable only when
             static profiles as defined in ADSL Line MIB
             [RFC2662] are implemented."

        OBJECT      adslAturThreshold15MinUasL
        MIN-ACCESS  read-write
        DESCRIPTION
            "Read-write access is applicable only when
             static profiles as defined in ADSL Line MIB
             [RFC2662] are implemented."

        OBJECT      adslLineConfProfileDualLite
        MIN-ACCESS  read-only
        DESCRIPTION
            "Read-only access is applicable only when
             static profiles as defined in ADSL Line MIB
             [RFC2662] are implemented."
```

```
        ::= { adslExtCompliances 1 }

        -- units of conformance
        adslExtLineGroup    OBJECT-GROUP
            OBJECTS {
                adslLineConfProfileDualLite,
                adslLineTransAtucCap,
                adslLineTransAtucConfig,
                adslLineTransAtucActual,
                adslLineGlitePowerState
               }
            STATUS     current
            DESCRIPTION
                "A collection of objects providing extended
                configuration information about an ADSL Line."
        ::= { adslExtGroups 1 }

        adslExtAtucPhysPerfCounterGroup OBJECT-GROUP
            OBJECTS {
                adslAtucPerfStatFastR,
                adslAtucPerfStatFailedFastR,
                adslAtucPerfCurr15MinFastR,
                adslAtucPerfCurr15MinFailedFastR,
                adslAtucPerfCurr1DayFastR,
                adslAtucPerfCurr1DayFailedFastR,
                adslAtucPerfPrev1DayFastR,
                adslAtucPerfPrev1DayFailedFastR,
                adslAtucPerfStatSesL,
                adslAtucPerfStatUasL,
                adslAtucPerfCurr15MinSesL,
                adslAtucPerfCurr15MinUasL,
                adslAtucPerfCurr1DaySesL,
                adslAtucPerfCurr1DayUasL,
                adslAtucPerfPrev1DaySesL,
                adslAtucPerfPrev1DayUasL,
                adslAtucIntervalFastR,
                adslAtucIntervalFailedFastR,
                adslAtucIntervalSesL,
                adslAtucIntervalUasL
               }
            STATUS     current
            DESCRIPTION
                "A collection of objects providing raw performance
                counts on an ADSL Line (ATU-C end)."
        ::= { adslExtGroups 2 }

        adslExtAturPhysPerfCounterGroup OBJECT-GROUP
            OBJECTS {
```

```
                adslAturPerfStatSesL,
                adslAturPerfStatUasL,
                adslAturPerfCurr15MinSesL,
                adslAturPerfCurr15MinUasL,
                adslAturPerfCurr1DaySesL,
                adslAturPerfCurr1DayUasL,
                adslAturPerfPrev1DaySesL,
                adslAturPerfPrev1DayUasL,
                adslAturIntervalSesL, adslAturIntervalUasL
               }
            STATUS     current
            DESCRIPTION
                "A collection of objects providing raw performance
                counts on an ADSL Line (ATU-C end)."
        ::= { adslExtGroups 3 }

        adslExtLineConfProfileControlGroup OBJECT-GROUP
            OBJECTS {
                adslConfProfileLineType
               }
            STATUS     current
            DESCRIPTION
                "A collection of objects providing profile
                control for the ADSL system."
        ::= { adslExtGroups 4 }

        adslExtLineAlarmConfProfileGroup OBJECT-GROUP
            OBJECTS {
                   adslAtucThreshold15MinFailedFastR,
                   adslAtucThreshold15MinSesL,
                   adslAtucThreshold15MinUasL,
                   adslAturThreshold15MinSesL,
                   adslAturThreshold15MinUasL
               }
            STATUS     current
            DESCRIPTION
                "A collection of objects providing alarm profile
                control for the ADSL system."
        ::= { adslExtGroups 5 }

        adslExtNotificationsGroup NOTIFICATION-GROUP
            NOTIFICATIONS {
                adslAtucFailedFastRThreshTrap,
                adslAtucSesLThreshTrap,
                adslAtucUasLThreshTrap,
                adslAturSesLThreshTrap,
                adslAturUasLThreshTrap
            }
```

```
            STATUS       current
            DESCRIPTION
                "The collection of ADSL extension notifications."
           ::= { adslExtGroups 6 }

END
```

7. Acknowledgments

This document is a product of the ADSL MIB Working Group.

8. References

8.1 Normative References

[ANSI T1.413] American National Standards Institute, ANSI T1.413, Issue 2, "Standards Project for Interfaces Relating to Carrier to Customer Connection of ADSL Equipment", 1998.

[ETSI DTS/TM06006] European Telecommunications Standards Institute "ADSL European Specific Requirements", November 2000.

[ITU G.992.1] ITU-T Telecommunication Standardization Sector, "Asymmetric digital subscriber line (ADSL) transceivers", June 1999.

[ITU G.992.2] ITU-T Telecommunication Standardization Sector, "Splitterless asymmetric digital subscriber line (ADSL) transceivers", June 1999.

[ITU G.997.1] ITU-T Telecommunication Standardization Sector, "Physical Layer Management of Digital Subscriber Transceivers", June 1999.

[RFC2026] Bradner S., "The Internet Standards Process - Revision 3", BCP 9, RFC 2026, October 1996.

[RFC2028] Hovey R. and S. Bradner, "The Organizations Involved in the IETF Standards Process", BCP 11, RFC 2028, October 1996.

[RFC2493] Tesink, K., "Textual Conventions for MIB Modules Using Performance History Based on 15 Minute Intervals" RFC 2493, January 1999.

[RFC2578] McCloghrie, K., Perkins, D., Schoenwaelder, J., Case, J., Rose, M. and S. Waldbusser, "Structure of Management Information Version 2 (SMIv2)", STD 58, RFC 2578, April 1999.

[RFC2579] McCloghrie, K., Perkins, D., Schoenwaelder, J., Case, J., Rose, M. and S. Waldbusser, "Textual Conventions for SMIv2", STD 58, RFC 2579, April 1999.

[RFC2580] McCloghrie, K., Perkins, D., Schoenwaelder, J., Case, J., Rose, M. and S. Waldbusser, "Conformance Statements for SMIv2", STD 58, RFC 2580, April 1999.

[RFC2662] Bathrick, G. and F. Ly, "Definitions of Managed Objects for the ADSL Lines", RFC 2662, May 1999.

[RFC2863] McCloghrie, K. and F. Kastenholz, "The Interfaces Group MIB", RFC 2863, June 2000.

[RFC3414] Blumenthal, U. and B. Wijnen, "User-based Security Model (USM) for version 3 of the Simple Network Management Protocol (SNMPv3)", STD 62, RFC 3414, December 2002.

[RFC3415] Wijnen, B., Presuhn, R. and K. McCloghrie, "View-based Access Control Model (VACM) for the Simple Network Management Protocol (SNMP)", STD 62, RFC 3415, December 2002.

8.2 Informative References

[RFC3410] Case, J., Mundy, R., Partain, D. and B. Stewart, "Introduction and Applicability Statements for Internet-Standard Management Framework", RFC 3410, December 2002.

9. Security Considerations

The following security matters should be considered when implementing this MIB.

1) Blocking unauthorized access to the ADSL MIB via the element management system is outside the scope of this document. It should be noted that access to the MIB permits the unauthorized entity to modify the profiles (section 6.4) such that both subscriber service and network operations can be interfered with.

Subscriber service can be altered by modifying any of a number of service characteristics such as rate partitioning and maximum transmission rates. Network operations can be impacted by modifying notification thresholds such as Signal-to-Noise Ratio (SNR) margins.

2) SNMPv1 by itself is such an insecure environment. Even if the network itself is secure (for example by using IPSec), there is no control over who on the secure network is allowed to access and GET (read) the objects in this MIB. It is recommended that the implementors consider the security features as provided by the SNMPv3 framework. Specifically, the use of the User-based Security Model STD 62, RFC 3414 [RFC3414] and the View-based Access Control Model STD 62, RFC 3415 [RFC3415] 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 only those objects, and to those principals (users) that have legitimate rights to access them.

3) The profile mechanism presented in this document requires specific attention. The implementor of this MIB has a choice of implementing either 'static' or 'dynamic' profiles. This decision must be consistent with the implementation of RFC 2662.

   In the case of 'static' profiles, the elements of the profile are read-write, as opposed to read-create when 'dynamic' profiles are implemented:

   - adslConfProfileLineType,
   - adslAtucThreshold15MinFailedFastR,
   - adslAtucThreshold15MinSesL,
   - adslAtucThreshold15MinUasL,
   - adslAturThreshold15MinSesL, and
   - adslAturThreshold15MinUasL.

   This decision also impacts the mechanics of the index, adslLineConfProfileDualLite. When 'static' profiles are implemented, its value is algorithmically set by the system and its value is based on the ifIndex. Hence it is not guaranteed across system reboots. Similar to the handling of adslLineConfProfile [RFC2662], the implementor of this MIB must ensure that the profile object values associated with these indices are maintained across system reboots.

In the case of dynamic profiles, this object is set by the SNMP manager. The implementor of this MIB may want to provide a view of the profile on a customer-by-customer standpoint, but should be cautious of the dynamic nature of these objects.

4) ADSL layer connectivity from the ATU-R will permit the subscriber to manipulate both the ADSL link directly and the ADSL overhead control channel(AOC)/embedded operations channel (EOC) for their own loop. For example, unchecked or unfiltered fluctuations initiated by the subscriber could generate sufficient notifications to potentially overwhelm either the management interface to the network or the element manager. Other attacks affecting the ATU-R portions of the MIB may also be possible.

10. Intellectual Property Notice

11. Authors' Addresses

Faye Ly
Pedestal Networks
6503 Dumbarton Circle,
Fremont, CA 94555

Phone: +1 510-578-0158
Fax: +1 510-744-5152
EMail: faye@pedestalnetworks.com

Gregory Bathrick
Nokia Networks
2235 Mercury Way,
Santa Rosa, CA 95405

Phone: +1 707-362-1125
Fax: +1 707-535-7300
EMail: greg.bathrick@nokia.com

12. Full Copyright Statement

Acknowledgement

Funding for the RFC Editor function is currently provided by the Internet Society.