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Definitions of Extension Managed Objects for Asymmetric Digital Subscriber Lines

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Status of this Memo

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Abstract

This memo defines a portion of the Management Information Base (MIB) for use with network management protocols in 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 [RFC2662].

1. The SNMP Network Management Framework

The SNMP Management Framework presently consists of five major components:

- An overall architecture, described in RFC 2571 [RFC2571].

- Mechanisms for describing and naming objects and events for the purpose of management. The first version of this Structure of Management Information (SMI) is called SMIv1 and described in STD 16, RFC 1155 [RFC1155], STD 16, RFC 1212 [RFC1212] and RFC 1215 [RFC1215]. The second version, called SMIv2, is described in STD 58, RFC 2578 [RFC2578], STD 58, RFC 2579 [RFC2579] and STD 58, RFC 2580 [RFC2580].

- Message protocols for transferring management information. The first version of the SNMP message protocol is called SNMPv1 and described in STD 15, RFC 1157[RFC1157]. A second version of the SNMP message protocol, which is not an Internet standards track protocol, is called SNMPv2c and described in RFC 1901 [RFC1901] and RFC 1906 [RFC1906]. The third version of the message protocol is called SNMPv3 and described in RFC 1906 [RFC1906], RFC2572 [RFC2572] and RFC 2574 [RFC2574].

- Protocol operations for accessing management information. The first set of protocol operations and associated PDU formats is described in STD 15, RFC 1157 [RFC1157]. A second set of protocol operations and associated PDU formats is described in RFC 1905 [RFC1905].

- A set of fundamental applications described in RFC 2573 [RFC2573] and the view-based access control mechanism described in RFC 2575 [RFC2575].

A more detailed introduction to the current SNMP Management Framework can be found in RFC 2570 [RFC2570].

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

This memo specifies a MIB module that is compliant to the SMIv2. A MIB conforming to the SMIv1 can be produced through the appropriate translations. The resulting translated MIB must be semantically equivalent, except where objects or events are omitted because no translation is possible (use of Counter64). Some machine-readable information in SMIv2 will be converted into textual descriptions in SMIv1 during the translation process. However, this loss of machine readable information is not considered to change the semantics of the MIB.

2. Introduction

The purpose of this memo is to define a supplemental set of managed objects that is not covered by 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 ADSL Line Extension MIB with other MIBs described in RFCs and in their various degrees of standardization. In regards to these relationship, the ADSL Line Extension MIB follows conventions as used by the ADSL Line MIB with one exception. The value of the RFC2863 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 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 type PerfCurrentCount and PerfIntervalCount. The 1-day event counters are of type AdslPerfCurrDayCount and AdslPerfPrevDayCount. Both 15-minute and 1-day time elapsed counters are of 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 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'.

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 "200204231200Z"

      ORGANIZATION "IETF ADSL MIB Working Group"

      CONTACT-INFO
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```

```
            IETF ADSL MIB Working Group
            <XDSLMIB@LISTSERV.ECIRALEIGH.COM>
            "
        DESCRIPTION
            "This MIB Module is a supplement to the ADSL-LINE-MIB
            [RFC2662]."
        REVISION     "200204231200Z"
        DESCRIPTION  "Initial Version, published as RFC xxxx. 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. Normative References

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[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.

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11. 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 modification of notification thresholds such as Signal-to-Noise Ratio (SNR) margins.

2) There are a number of managed objects in this MIB that may be considered to contain sensitive information. In particular, the certain objects may be considered sensitive in many environments, since it would allow an intruder to obtain information about which vendor's equipment is in use on the network. Therefore, it may be important in some environments to control read access to these objects and possibly to even encrypt the values of these object when sending them over the network via SNMP. Not all versions of SNMP provide features for such a secure environment.

SNMPv1 by itself is such an insecure environment. Even if the network itself is secure (for example by using IPSec), even then, there is no control as to who on the secure network is allowed to access and GET (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 RFC 2574 [21] and the View-based Access Control Model RFC 2575 [23] 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 those objects only 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 RFC2662.

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 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 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.

12. Intellectual Property Notice

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14. Full Copyright Statement

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