

**Technical Report
TR-016**

**CMIP Specification
for
ADSL Network Element
Management**

January 1999

ABSTRACT:

This document specifies the CMIP based management framework to be used for the management of ADSL Network Elements. This framework is based on the general management criteria for ADSL Network Elements as defined in ADSL Forum TR-005.

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1 INTRODUCTION

This document specifies a CMIP based management framework to be used for the management of ADSL Network Elements. This framework is based on the general management criteria for ADSL Network Elements defined in ADSL Forum Technical Report TR-005, as well as other relevant standards from ITU-T, Bellcore, and ANSI, as listed in the References section.

2 Management Framework

The general framework for management of ADSL Network Elements is specified in ADSL Forum Technical Report TR-005^[1]. This document uses the ADSL Forum System Reference Model specified in TR-005 (Figure 1).

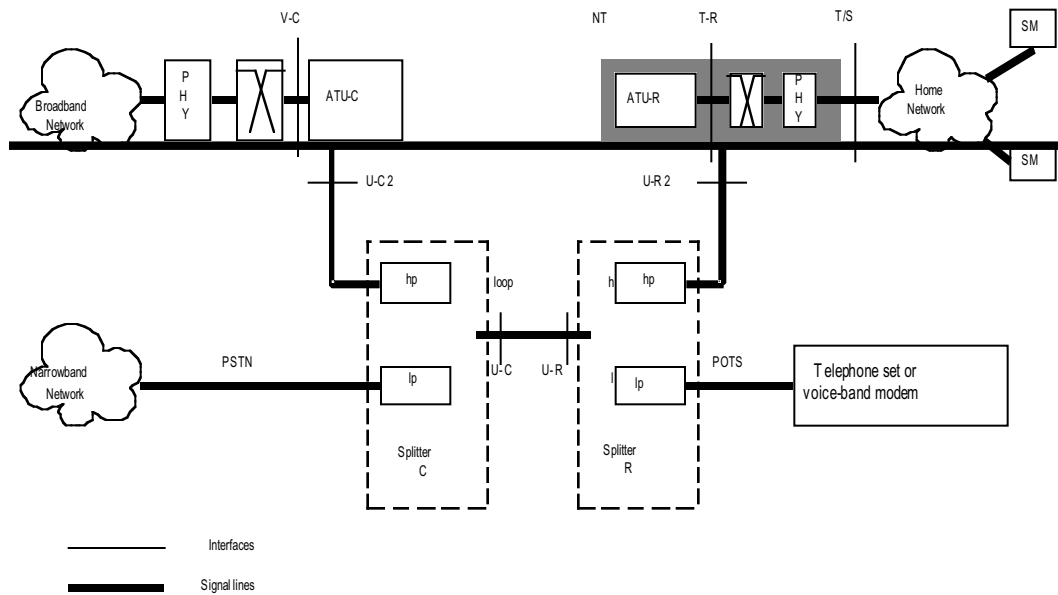


Figure 1 : ADSL Forum System Reference Model

This specification only deals with management of the following elements as per the above reference model:

- ADSL parameters in ATU-C (ADSL Termination Unit – Central)
- ADSL parameters in ATU-R (ADSL Termination Unit – Remote)
- ADSL Line (Physical transport medium between ATU-C & ATU-R)
- ADSL Channels (Transport channels defined over the ADSL Line.)

As outlined in TR-005, management of ADSL parameters in ATU-R is controlled by the ATU-C based on procedures specified in ANSI T1.413 specification.

3 Management Information Model

This section specifies the CMIP management information model to be used for the management of ADSL entities described in the Management Framework section. The management information model consists of GDMO (Guidelines for the Definition of Managed Objects) templates, ASN.1 (Abstract Syntax Notation One) syntax, and CMISE (Common Management Information Service Element) services and protocol.

The model makes use of a number of pre-existing object definitions from various standards bodies including ITU-T, ANSI, and Bellcore. Following standard object definitions are referenced:

For general Network Element and Equipment management

- ITU-T M.3100 : managedElementR1
- ITU-T M.3100 : equipmentR1
- ITU-T M.3100 : equipmentHolder
- ITU-T M.3100 : circuitPack
- Bellcore GR-1114 : multiPortCircuitPack

For Configuration Management

- ITU-T X.721 : objectCreationRecord
- ITU-T X.721 : objectDeletionRecord
- ITU-T X.721 : stateChangeRecord

For Fault/Performance Management

- ITU-T Q.822 : thresholdData
- ITU-T X.721 : alarmRecord
- ITU-T X.721 : log

Following sub-sections define new objects specifically needed for ADSL management. Figure-2 shows the containment tree diagram, while figures 3 and 4 show the inheritance relationships for the objects defined in this document.

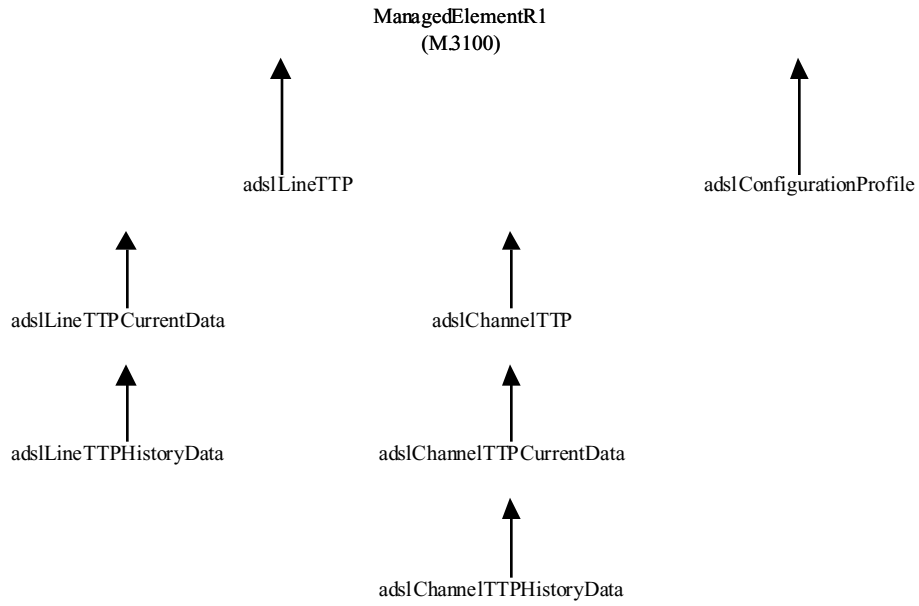


Figure 2 : Containment Tree Diagram

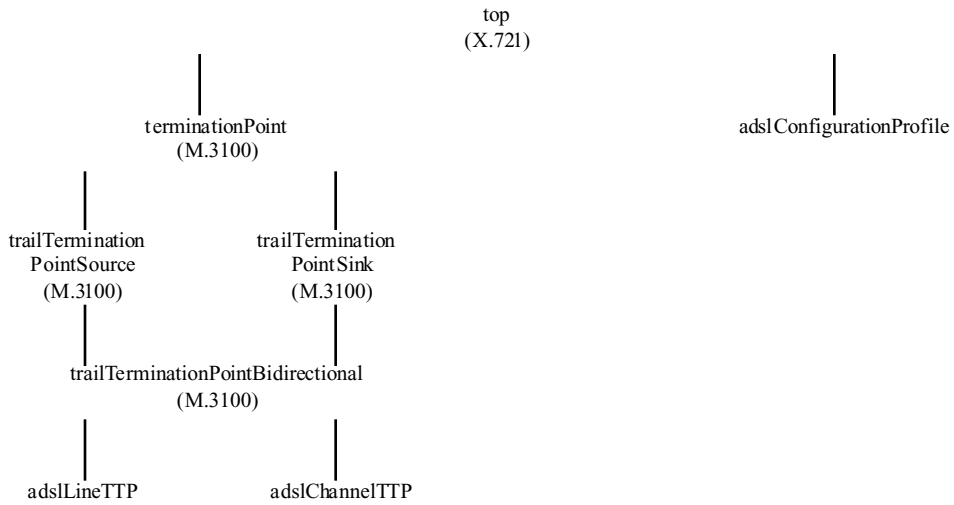


Figure 3 : Inheritance Tree Diagram (1 of 2)

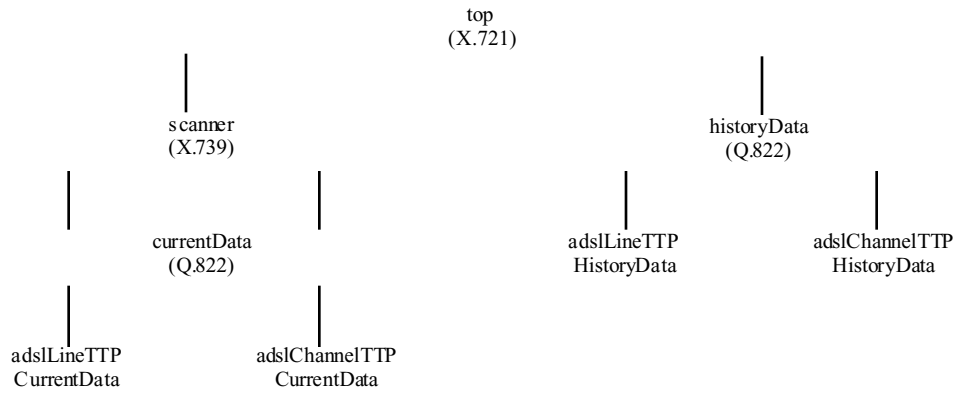


Figure 4 : Inheritance Tree Diagram (2 of 2)

3.1 Managed Object Definitions

3.1.1 adslChannelTTP

adslChannelTTP MANAGED OBJECT CLASS

DERIVED FROM

"Rec. M.3100 : 1992":trailTerminationPointBidirectional;

CHARACTERIZED BY

"Rec.721 | ISO/IEC 10165-2": administrativeStatePackage,

"Rec. M3100": createDeleteNotificationsPackage,

"Rec. M3100": attributeValueChangeNotificationsPackage,

adslChannelTTPPkg PACKAGE

BEHAVIOUR adslChannelTTPbeh;

ATTRIBUTES

adslChannelTTPId GET,

channelType GET

SET-BY-CREATE,

currentChannelRate GET,

previousChannelRate GET;;;

CONDITIONAL PACKAGES

interleaveDelayPkg

PRESENT IF "The channelType is Interleaved",

currentCrcBLPkg

PRESENT IF "The channelType is Fast or Interleaved",

rateAdaptationNotificationPkg

PRESENT IF "The channelType is Fast or Interleaved, and Run-time rate adaptation is supported";

REGISTERED AS { adslfNMObjectClass 1 };

adslChannelTTPbeh BEHAVIOUR

DEFINED AS

"adslChannelTTP object is used to model channel terminations on ATU-C and ATU-R. It represent both connection and trail termination aspects. One instance of this managed object class is created for each supported channel.

For a given adslLineTTP object instance the total of current channel rates of the contained adslChannelTTP instances cannot exceed its line rate. The inherited supportedByObjectList attribute points to the associated equipment unit(s). ";

3.1.2 adslChannelTTPCurrentData

adslChannelTTPCurrentData MANAGED OBJECT CLASS

DERIVED FROM

"Rec. Q.822": currentData;

CHARACTERIZED BY

"Rec. M3100": createDeleteNotificationsPackage,

"Rec. M3100": attributeValueChangeNotificationsPackage,

"Rec. Q822": thresholdPkg,

adslChannelTTPCurrentDataPkg PACKAGE

BEHAVIOUR adslChannelTTPCurrentDataBeh;;;

CONDITIONAL PACKAGES

adslChannelRvcBlocksPkg PRESENT IF

"an instance supports it",

adslChannelTxBlocksPkg PRESENT IF

"an instance supports it",

adslChannelCorrectedBlocksPkg PRESENT IF

"an instance supports it",

adslChannelUncorrectedBlocksPkg PRESENT IF

"an instance supports it";

REGISTERED AS { adslfNMObjectClass 2 };

adslChannelTTPCurrentDataBeh BEHAVIOUR

DEFINED AS

"adslChannelTTPCurrentData object is used to monitor performance monitoring aspects of an ADSL channel. Instances of this managed object class shall model 1 Day counters";

3.1.3 adslChannelTTPHistoryData

adslChannelTTPHistoryData MANAGED OBJECT CLASS

DERIVED FROM

"Rec. Q.822": historyData;

CHARACTERIZED BY

"Rec. X.721": objectDeleteNotificationPkg,

"Rec. Q.822": historyDataSuspectIntervalFlagPkg,

adslChannelTTPHistoryDataPkg PACKAGE

BEHAVIOUR adslChannelTTPHistoryDataBeh;;;

CONDITIONAL PACKAGES

```

adslChannelRvcBlocksRecordPkg PRESENT IF
    "an instance supports it",
adslChannelTxBlocksRecordPkg PRESENT IF
    "an instance supports it",
adslChannelCorrectedBlocksRecordPkg PRESENT IF
    "an instance supports it",
adslChannelUncorrectedBlocksRecordPkg PRESENT IF
    "an instance supports it";

```

```
REGISTERED AS { adslfNMObjectClass 3 };
```

```

adslChannelTTPHistoryDataBeh BEHAVIOUR
    DEFINED AS
        "adslChannelTTPHistoryData object is used to keep previous
        performance monitoring counters of an ADSL channel.";

```

3.1.4 adslConfigurationProfile

```

adslConfigurationProfile MANAGED OBJECT CLASS
    DERIVED FROM
        "Rec. X721": top;
    CHARACTERIZED BY
        "Rec. M3100": createDeleteNotificationsPackage,
        "Rec. M3100": attributeValueChangeNotificationsPackage,

```

```

adslConfigurationProfilePkg PACKAGE
    BEHAVIOUR adslConfigurationProfileBeh;

```

```

ATTRIBUTES
adslConfigurationProfileId          GET,
rateModeAtuC                        GET
targetSnrMarginAtuC                 SET-BY-CREATE,
                                     GET
maxSnrMarginAtuC                    SET-BY-CREATE,
                                     GET
minSnrMarginAtuC                    SET-BY-CREATE,
                                     GET
rateModeAtuR                        GET
targetSnrMarginAtuR                 SET-BY-CREATE,
                                     GET
maxSnrMarginAtuR                    SET-BY-CREATE,
                                     GET

```

```

minSnrMarginAtuR          SET-BY-CREATE,
                           GET
                           SET-BY-CREATE;;;

```

CONDITIONAL PACKAGES

```

rateAdaptivePkg
PRESENT IF "Rate adaptive ADSL mode is available",
fastPkg
PRESENT IF "Fast channel mode is supported",
interleavedPkg
PRESENT IF "Interleaved channel mode is supported",
rateChangeRatioPkg
PRESENT IF "Rate adaptive ADSL mode is available , and, both Fast
and Interleaved channels are supported at the same time";

```

```

REGISTERED AS { adslfNMObjectClass 4 };

```

adslConfigurationProfileBeh BEHAVIOUR

DEFINED AS

“adslConfigurationProfile managed object class contains a list of parameters to be used in configuring an ADSL Modem.

The instances of this object class is pointed to by adslLineTTP object instances representing ATU-C side of an ADSL Line. However, this object class defines the attributes pertaining to both the ATU-C, as well as the related ATU-R. Note that the ATU-C configures the ATU-R.

The fastPkg and interleavedPkg control the configuration of channels to be supported. If fastPkg is present, fast channel is configured. If interleavedPkg is present, the interleaved channel is configured. If both fastPkg and interleavedPkg are present, both channels are configured.”;

3.1.5 adslLineTTP

adslLineTTP MANAGED OBJECT CLASS

DERIVED FROM

```
"Rec. M.3100 : 1992":trailTerminationPointBidirectional;
```

CHARACTERIZED BY

```

"Rec.721 | ISO/IEC 10165-2": administrativeStatePackage,
"Rec. M3100": createDeleteNotificationsPackage,
"Rec. M3100": attributeValueChangeNotificationsPackage,
"Rec. M3100": stateChangeNotificationsPackage,
initFailurePkg,

```

adslLineTTPkg PACKAGE

BEHAVIOUR adslLineTTPBeh;

ATTRIBUTES

adslLineTTPId	GET SET-BY-CREATE,
lineCoding	GET,
currentSnrMargin	GET,
currentAttenuation	GET,
currentOutputPower	GET,
currentAttainableRate	GET,
currentLineRate	GET,
previousLineRate	GET,
supportedChannelTypes	GET,
adslAvailabilityStatus	GET,
supportedOperationalModes	GET,
currentOperationalMode	GET;;;

CONDITIONAL PACKAGES

adslConfigurationProfilePointerPkg PRESENT IF

"The object instance represents the ATU-C side of the ADSL line",

allowedOperationalModesPkg PRESENT IF

"The object instance represents the ATU-C side of the ADSL line";

REGISTERED AS { adslfNMObjectClass 5 };

adslLineTTPBeh BEHAVIOUR

DEFINED AS

"adslLineTTP object is used to model a Physical ADSL line termination.

The inherited supportedByObjectList attribute points to the associated equipment unit(s).

The inherited downstreamConnectivityPointer of an adslLineTTP instance representing the ATU-C side of the ADSL line, points to the related adslLineTTP instance representing the ATU-R side of the ADSL line.

The inherited upstreamConnectivityPointer of an adslLineTTP instance representing the ATU-R side of the ADSL line, points to the related adslLineTTP instance representing the ATU-C side of the ADSL line.

The configurationProfilePointer attribute, which is only present for the instances of adslLineTTP object representing the ATU-C side of the ADSL line, points to the object class instance representing physical line configuration information for both ATU-C and ATU-R.

The adslAvailabilityStatus attribute further qualifies the inherited operationState attribute. Valid conditions that may be included in this set-valued attribute, for an instance representing the ATU-C side of an ADSL Line are: LOF, LOS, LPR, LOL, lossOfSigQuality, dataInitFailure, configInitFailure, protocolInitFailure, and noPeerPresent. For an instance representing ATU-R side of an ADSL Line the valid values are: LOF, LOS, LPR, and lossOfSigQuality. An empty set indicates 'No Defect'.

The lineCodeSpecificProfilePointer attribute is included for future expansion of the model with vendor or line code specific information”;

3.1.6 adslLineTTPCurrentData

adslLineTTPCurrentData MANAGED OBJECT CLASS

DERIVED FROM

"Rec. Q.822": currentData;

CHARACTERIZED BY

"Rec. M3100": createDeleteNotificationsPackage,

"Rec. M3100": attributeValueChangeNotificationsPackage,

"Rec. Q822": thresholdPkg,

adslLineTTPCurrentDataPkg PACKAGE

BEHAVIOUR adslLineTTPCurrentDataBeh;;;

CONDITIONAL PACKAGES

adslLofsPkg PRESENT IF

"an instance supports it",

adslLolsPkg PRESENT IF

"an instance supports it",

adslLossPkg PRESENT IF

"an instance supports it",

adslLprsPkg PRESENT IF

"an instance supports it",

adslEssPkg PRESENT IF

"an instance supports it",

adslSessPkg PRESENT IF

"an instance supports it",

adslUassPkg PRESENT IF

"an instance supports it",

adslFastRetrainPkg PRESENT IF
"an instance supports it";

REGISTERED AS { adslfNMObjectClass 6 };

adslLineTTPCurrentDataBeh BEHAVIOUR
DEFINED AS
"adslLineTTPCurrentData object is used to monitor performance
monitoring aspects of an ADSL physical line. Instances of this managed
object class shall model 15 Min and 1 Day counters";

3.1.7 adslLineTTPHistoryData

adslLineTTPHistoryData MANAGED OBJECT CLASS
DERIVED FROM
"Recommendation Q.822": historyData;
CHARACTERIZED BY
"Rec. X.721": objectDeleteNotificationPkg,
"Rec. Q.822": historyDataSuspectIntervalFlagPkg,

adslLineTTPHistoryDataPkg PACKAGE
BEHAVIOUR adslLineTTPHistoryDataBeh;;;

CONDITIONAL PACKAGES
adslLofsRecordPkg PRESENT IF
"an instance supports it",
adslLolsRecordPkg PRESENT IF
"an instance supports it",
adslLossRecordPkg PRESENT IF
"an instance supports it",
adslLprsRecordPkg PRESENT IF
"an instance supports it",
adslEssRecordPkg PRESENT IF
"an instance supports it",
adslSessRecordPkg PRESENT IF
"an instance supports it",
adslUassRecordPkg PRESENT IF
"an instance supports it",
adslFastRetrainRecordPkg PRESENT IF
"an instance supports it";

REGISTERED AS { adslfNMObjectClass 7 };

adslLineTTPHistoryDataBeh BEHAVIOUR

DEFINED AS

“adslLineTTPHistoryData object is used to keep previous performance counters of an ADSL physical line.”;

3.2 Conditional Packages

3.2.1 adslChannelCorrectedBlocksPkg

```
adslChannelCorrectedBlocksPkg    PACKAGE
  ATTRIBUTES
    adslChannelCorrectedBlocks
      REPLACE-WITH-DEFAULT
      DEFAULT VALUE AdslfMIBMod.integerZero
      GET;
REGISTERED AS { adslfNMPackage 1 };
```

3.2.2 adslChannelCorrectedBlocksRecordPkg

```
adslChannelCorrectedBlocksRecordPkg PACKAGE
  ATTRIBUTES
    adslChannelCorrectedBlocks
      GET;
REGISTERED AS { adslfNMPackage 2 };
```

3.2.3 adslChannelRcvBlocksPkg

```
adslChannelRcvBlocksPkg PACKAGE
  ATTRIBUTES
    adslChannelRcvBlocks
      REPLACE-WITH-DEFAULT
      DEFAULT VALUE AdslfMIBMod.integerZero
      GET;
REGISTERED AS { adslfNMPackage 3 };
```

3.2.4 adslChannelRcvBlocksRecordPkg

```
adslChannelRcvBlocksRecordPkg PACKAGE
  ATTRIBUTES
    adslChannelRcvBlocks
      GET;
REGISTERED AS { adslfNMPackage 4 };
```

3.2.5 adslChannelTxBlocksPkg

```
adslChannelTxBlocksPkg PACKAGE
  ATTRIBUTES
    adslChannelTxBlocks
      REPLACE-WITH-DEFAULT
      DEFAULT VALUE AdslfMIBMod.integerZero
      GET;
REGISTERED AS { adslfNMPackage 5 };
```

3.2.6 adslChannelTxBlocksRecordPkg

```
adslChannelTxBlocksRecordPkg PACKAGE
  ATTRIBUTES
    adslChannelTxBlocks
      GET;
REGISTERED AS { adslfNMPackage 6 };
```

3.2.7 adslChannelUncorrectedBlocksPkg

```
adslChannelUncorrectedBlocksPkg PACKAGE
  ATTRIBUTES
    adslChannelUncorrectedBlocks
      REPLACE-WITH-DEFAULT
      DEFAULT VALUE AdslfMIBMod.integerZero
      GET;
REGISTERED AS { adslfNMPackage 7 };
```

3.2.8 adslChannelUncorrectedBlocksRecordPkg

```
adslChannelUncorrectedBlocksRecordPkg PACKAGE
  ATTRIBUTES
    adslChannelUncorrectedBlocks
      GET;
REGISTERED AS { adslfNMPackage 8};
```

3.2.9 adslConfigurationProfilePointerPkg

```
adslConfigurationProfilePointerPkg PACKAGE
  ATTRIBUTES
    adslConfigurationProfilePointer
      GET-REPLACE,
    lineCodeSpecificProfilePointer
      GET-REPLACE;
REGISTERED AS { adslfNMPackage 9 };
```

3.2.10 adslEssPkg

```
adslEssPkg PACKAGE
  ATTRIBUTES
    adslEss
      REPLACE-WITH-DEFAULT
      DEFAULT VALUE AdslfMIBMod.integerZero
      GET;
REGISTERED AS { adslfNMPackage 10 };
```

3.2.11 adslEssRecordPkg

```
adslEssRecordPkg PACKAGE
  ATTRIBUTES
    adslEss
      GET;
REGISTERED AS { adslfNMPackage 11 };
```

3.2.12 adslFastRetrainPkg

```
adslFastRetrainPkg PACKAGE
  ATTRIBUTES
    adslNumFastRetrains
      REPLACE-WITH-DEFAULT
      DEFAULT VALUE AdslfMIBMod.integerZero
      GET,
    adslFailedFastRetrains
      REPLACE-WITH-DEFAULT
      DEFAULT VALUE AdslfMIBMod.integerZero
      GET;
```

REGISTERED AS { adslfNMPackage 12 };

3.2.13 adslFastRetrainRecordPkg

adslFastRetrainRecordPkg PACKAGE
ATTRIBUTES
 adslNumFastRetrains
 GET,
 adslFailedFastRetrains
 GET;
REGISTERED AS { adslfNMPackage 13 };

3.2.14 adslLofsPkg

adslLofsPkg PACKAGE
ATTRIBUTES
 adslLofs
 REPLACE-WITH-DEFAULT
 DEFAULT VALUE AdslfMIBMod.integerZero
 GET;
REGISTERED AS { adslfNMPackage 14 };

3.2.15 adslLofsRecordPkg

adslLofsRecordPkg PACKAGE
ATTRIBUTES
 adslLofs
 GET;
REGISTERED AS { adslfNMPackage 15 };

3.2.16 adslLolsPkg

adslLolsPkg PACKAGE
ATTRIBUTES
 adslLols
 REPLACE-WITH-DEFAULT
 DEFAULT VALUE AdslfMIBMod.integerZero
 GET;
REGISTERED AS { adslfNMPackage 16 };

3.2.17 adslLolsRecordPkg

```
adslLolsRecordPkg    PACKAGE
  ATTRIBUTES
    adslLols
      GET;
REGISTERED AS { adslfNMPackage 17 };
```

3.2.18 adslLossPkg

```
adslLossPkg          PACKAGE
  ATTRIBUTES
    adslLoss
      REPLACE-WITH-DEFAULT
      DEFAULT VALUE AdslfMIBMod.integerZero
      GET;
REGISTERED AS { adslfNMPackage 18 };
```

3.2.19 adslLossRecordPkg

```
adslLossRecordPkg   PACKAGE
  ATTRIBUTES
    adslLoss
      GET;
REGISTERED AS { adslfNMPackage 19 };
```

3.2.20 adslLprsPkg

```
adslLprsPkg         PACKAGE
  ATTRIBUTES
    adslLprs
      REPLACE-WITH-DEFAULT
      DEFAULT VALUE AdslfMIBMod.integerZero
      GET;
REGISTERED AS { adslfNMPackage 20 };
```

3.2.21 adslLprsRecordPkg

```
adslLprsRecordPkg PACKAGE
  ATTRIBUTES
    adslLprs
      GET;
REGISTERED AS { adslfNMPackage 21 };
```

3.2.22 adslSessPkg

```
adslSessPkg PACKAGE
  ATTRIBUTES
    adslSess
      REPLACE-WITH-DEFAULT
      DEFAULT VALUE AdslfMIBMod.integerZero
      GET;
REGISTERED AS { adslfNMPackage 22 };
```

3.2.23 adslSessRecordPkg

```
adslSessRecordPkg PACKAGE
  ATTRIBUTES
    adslSess
      GET;
REGISTERED AS { adslfNMPackage 23 };
```

3.2.24 adslUassPkg

```
adslUassPkg PACKAGE
  ATTRIBUTES
    adslUass
      REPLACE-WITH-DEFAULT
      DEFAULT VALUE AdslfMIBMod.integerZero
      GET;
REGISTERED AS { adslfNMPackage 24 };
```

3.2.25 adslUassRecordPkg

```
adslUassRecordPkg PACKAGE
  ATTRIBUTES
    adslUass
      GET;
REGISTERED AS { adslfNMPackage 25 };
```

3.2.26 allowedOperationalModesPkg

```
allowedOperationalModesPkg PACKAGE
  ATTRIBUTES
    adslAllowedOperationalModes
      GET-REPLACE
      ADD-REMOVE;
REGISTERED AS { adslfNMPackage 26 };
```

3.2.27 currentCrcBLPkg

```
currentCrcBLPkg PACKAGE
  ATTRIBUTES
    currentCrcBL
      GET;
REGISTERED AS { adslfNMPackage 27 };
```

3.2.28 fastPkg

```
fastPkg PACKAGE
  ATTRIBUTES
    fastMinTxRateAtuC
      GET
      SET-BY-CREATE,
    fastMaxTxRateAtuC
      GET
      SET-BY-CREATE,
    fastMinTxRateAtuR
      GET
      SET-BY-CREATE,
    fastMaxTxRateAtuR
      GET
```

```
    SET-BY-CREATE;  
REGISTERED AS { adslfNMPackage 28 };
```

3.2.29 initFailurePkg

```
initFailurePkg PACKAGE  
  ATTRIBUTES  
    initFailedNotificationSwitch  
      GET-REPLACE;  
  NOTIFICATIONS  
    initFailedNotification;  
REGISTERED AS { adslfNMPackage 29 };
```

3.2.30 interleavedPkg

```
interleavedPkg PACKAGE  
  ATTRIBUTES  
    interleavedMinTxRateAtuC  
      GET  
      SET-BY-CREATE,  
    interleavedMaxTxRateAtuC  
      GET  
      SET-BY-CREATE,  
    maxInterleaveDelayAtuC  
      GET  
      SET-BY-CREATE,  
  
    interleavedMinTxRateAtuR  
      GET  
      SET-BY-CREATE,  
    interleavedMaxTxRateAtuR  
      GET  
      SET-BY-CREATE,  
    maxInterleaveDelayAtuR  
      GET  
      SET-BY-CREATE;  
  
REGISTERED AS { adslfNMPackage 30 };
```

3.2.31 interleaveDelayPkg

```

interleaveDelayPkg PACKAGE
  ATTRIBUTES
    interleaveDelay
      GET;
REGISTERED AS { adslfNMPackage 31 };

```

3.2.32 rateAdaptationNotificationPkg

```

rateAdaptationNotificationPkg PACKAGE
  ATTRIBUTES
    upThreshold
      GET-REPLACE,
    downThreshold
      GET-REPLACE;
  NOTIFICATIONS
    rateChangeNotification;
REGISTERED AS { adslfNMPackage 32 };

```

3.2.33 rateAdaptivePkg

```

rateAdaptivePkg PACKAGE
  ATTRIBUTES
    downShiftSnrMarginAtuC
      GET
      SET-BY-CREATE,
    upShiftSnrMarginAtuC
      GET
      SET-BY-CREATE,
    minDownShiftTimeAtuC
      GET
      SET-BY-CREATE,
    minUpShiftTimeAtuC
      GET
      SET-BY-CREATE,
    downShiftSnrMarginAtuR
      GET
      SET-BY-CREATE,
    upShiftSnrMarginAtuR
      GET

```

```
        SET-BY-CREATE,  
        minDownShiftTimeAtuR  
        GET  
        SET-BY-CREATE,  
        minUpShiftTimeAtuR  
        GET  
        SET-BY-CREATE;  
REGISTERED AS { adslfNMPackage 33 };
```

3.2.34 rateChangeRatioPkg

```
rateChangeRatioPkg PACKAGE  
  ATTRIBUTES  
    rateChangeRatioAtuC  
    GET  
    SET-BY-CREATE,  
    rateChangeRatioAtuR  
    GET  
    SET-BY-CREATE;  
REGISTERED AS { adslfNMPackage 34 };
```

3.3 Attributes

3.3.1 adslAvailabilityStatus

adslAvailabilityStatus ATTRIBUTE
WITH ATTRIBUTE SYNTAX AdslfMIBMod.AdslAvailabilityStatus ;
MATCHES FOR EQUALITY, SET-COMPARISON,
SET-INTERSECTION;
BEHAVIOUR adslAvailabilityStatusBeh;
REGISTERED AS { adslfNMAAttribute 1 };

adslAvailabilityStatusBeh BEHAVIOUR
DEFINED AS
“This set-valued attribute further qualifies a defect indicated by the
operationState of the the object instance. An empty set indicate the
absence of any defect condition.”;

3.3.2 adslChannelCorrectedBlocks

adslChannelCorrectedBlocks ATTRIBUTE
DERIVED FROM "Rec. X.721 | ISO/IEC 10165-2":counter;
BEHAVIOUR adslChannelCorrectedBlocksBeh;
REGISTERED AS { adslfNMAAttribute 2 };

adslChannelCorrectedBeh BEHAVIOUR
DEFINED AS
“This attribute indicates the count of all blocks received with an error and
corrected.”;

3.3.3 adslChannelCTPId

adslChannelCTPId ATTRIBUTE
WITH ATTRIBUTE SYNTAX AdslfMIBMod.NameType;
MATCHES FOR EQUALITY;
BEHAVIOUR adslChannelCTPIdBeh;
REGISTERED AS { adslfNMAAttribute 3 };

adslChannelCTPIdBeh BEHAVIOUR
DEFINED AS
“This attribute is the object instance identifier for the adslChannelCTP.”;

3.3.4 adslChannelRcvBlocks

adslChannelRcvBlocks ATTRIBUTE
DERIVED FROM "Rec. X.721 | ISO/IEC 10165-2":counter;
BEHAVIOUR adslChannelRcvBlocksBeh;
REGISTERED AS { adslfNMAAttribute 4 };

adslChannelRcvBlocksBeh BEHAVIOUR
DEFINED AS
"This attribute indicates the count of all received encoded blocks.";

3.3.5 adslChannelTxBlocks

adslChannelTxBlocks ATTRIBUTE
DERIVED FROM "Rec. X.721 | ISO/IEC 10165-2":counter;
BEHAVIOUR adslChannelTxBlocksBeh;
REGISTERED AS { adslfNMAAttribute 5 };

adslChannelTxBlocksBeh BEHAVIOUR
DEFINED AS
"This attribute indicates the count of all transmitted encoded blocks.";

3.3.6 adslChannelUncorrectedBlocks

adslChannelUncorrectedBlocks ATTRIBUTE
DERIVED FROM "Rec. X.721 | ISO/IEC 10165-2":counter;
BEHAVIOUR adslChannelUncorrectedBlocksBeh;
REGISTERED AS { adslfNMAAttribute 6 };

adslChannelUncorrectedBeh BEHAVIOUR
DEFINED AS
"This attribute indicates the count of all blocks received with uncorrectable errors.";

3.3.7 adslConfigurationProfileId

adslConfigurationProfileId ATTRIBUTE
WITH ATTRIBUTE SYNTAX AdslfMIBMod.NameType;
MATCHES FOR EQUALITY;
BEHAVIOUR adslConfigurationProfileIdBeh;
REGISTERED AS { adslfNMAAttribute 7 };

adslConfigurationProfileIdBeh BEHAVIOUR

DEFINED AS

“This attribute is the object instance identifier for the
adslConfigurationProfile.”;

3.3.8 adslConfigurationProfilePointer

adslConfigurationProfilePointer ATTRIBUTE

WITH ATTRIBUTE SYNTAX AdslfMIBMod.ObjectInstance;

MATCHES FOR EQUALITY;

BEHAVIOUR adslConfigurationProfilePointerBeh;

REGISTERED AS { adslfNMAttribute 8 };

adslConfigurationProfilePointerBeh BEHAVIOUR

DEFINED AS

“This attribute is a pointer to the applicable ADSL Configuration Profile.”;

3.3.9 adslEss

adslEss ATTRIBUTE

DERIVED FROM "Rec. X.721 | ISO/IEC 10165-2":counter;

BEHAVIOUR adslEssBeh;

REGISTERED AS { adslfNMAttribute 9 };

adslEssBeh BEHAVIOUR

DEFINED AS

“This attribute indicates the count of errored seconds (one ore more crc,
one or more los or sef defects).”;

3.3.10 adslFailedFastRetrains

adslFailedFastRetrains ATTRIBUTE

DERIVED FROM "Rec. X.721 | ISO/IEC 10165-2":counter;

BEHAVIOUR adslFailedFastRetrainsBeh;

REGISTERED AS { adslfNMAttribute 10 };

adslFailedFastRetrainsBeh BEHAVIOUR

DEFINED AS

“This attribute indicates the count of failed fast-retrain attempts.”;

3.3.11 adslLineTTPId

adslLineTTPId ATTRIBUTE
WITH ATTRIBUTE SYNTAX AdslfMIBMod.NameType;
MATCHES FOR EQUALITY;
BEHAVIOUR adslLineTTPIdBeh;
REGISTERED AS { adslfNMAAttribute 11 };

adslLineTTPIdBeh BEHAVIOUR
DEFINED AS
"This attribute is the object instance identifier for the adslLineTTP.“;

3.3.12 adslLofs

adslLofs ATTRIBUTE
DERIVED FROM "Rec. X.721 | ISO/IEC 10165-2":counter;
BEHAVIOUR adslLofsBeh;
REGISTERED AS { adslfNMAAttribute 12 };

adslLofsBeh BEHAVIOUR
DEFINED AS
"This attribute indicates the count of seconds where there was a Loss of Frame.“;

3.3.13 adslLols

adslLols ATTRIBUTE
DERIVED FROM "Rec. X.721 | ISO/IEC 10165-2":counter;
BEHAVIOUR adslLolsBeh;
REGISTERED AS { adslfNMAAttribute 13 };

adslLolsBeh BEHAVIOUR
DEFINED AS
"This attribute indicates the count of seconds where there was a Loss of Link.“;

3.3.14 adslLoss

adslLoss ATTRIBUTE
DERIVED FROM "Rec. X.721 | ISO/IEC 10165-2":counter;
BEHAVIOUR adslLossBeh;

REGISTERED AS { adslfNMAtribute 14 };

adslLossBeh BEHAVIOUR

DEFINED AS

“This attribute indicates the count of seconds where there was a Loss of Signal.”;

3.3.15 adslLprs

adslLprs ATTRIBUTE

DERIVED FROM "Rec. X.721 | ISO/IEC 10165-2":counter;

BEHAVIOUR adslLprsBeh;

REGISTERED AS { adslfNMAtribute 15 };

adslLprsBeh BEHAVIOUR

DEFINED AS

“This attribute indicates the count of seconds where there was a Loss of Power.”;

3.3.16 adslNumFastRetrains

adslNumFastRetrains ATTRIBUTE

DERIVED FROM "Rec. X.721 | ISO/IEC 10165-2":counter;

BEHAVIOUR adslNumFastRetrainsBeh;

REGISTERED AS { adslfNMAtribute 16 };

adslNumFastRetrainsBeh BEHAVIOUR

DEFINED AS

“This attribute indicates the count of modem fast-retrain attempts.”;

3.3.17 adslSess

adslSess ATTRIBUTE

DERIVED FROM "Rec. X.721 | ISO/IEC 10165-2":counter;

BEHAVIOUR adslSessBeh;

REGISTERED AS { adslfNMAtribute 17 };

adslSessBeh BEHAVIOUR

DEFINED AS

“This attribute indicates the count of Severely Errored Seconds (SES).”;

3.3.18 adslUass

adslUass ATTRIBUTE
DERIVED FROM "Rec. X.721 | ISO/IEC 10165-2":counter;
BEHAVIOUR adslUassBeh;
REGISTERED AS { adslfNMAAttribute 18 };

adslUassBeh BEHAVIOUR
DEFINED AS
"This attribute indicates the count of Unavailable Seconds (UAS).";

3.3.19 allowedOperationalModes

allowedOperationalModes ATTRIBUTE
WITH ATTRIBUTE SYNTAX AdslfMIBMod.AdslOperationalModes;
MATCHES FOR EQUALITY, SET-COMPARISON,
SET-INTERSECTION;
BEHAVIOUR allowedOperationalModesBeh;
REGISTERED AS { adslfNMAAttribute 19 };

allowedOperationalModesBeh BEHAVIOUR
DEFINED AS
"This set-valued attribute configures the modem Operational Modes that should be allowed by the ATU-C. The allowed Modes should be a subset of the Modes supported by the ATU-C (as per the supportedOperationalModes attribute).";

3.3.20 channelType

channelType ATTRIBUTE
WITH ATTRIBUTE SYNTAX AdslfMIBMod.AdslChannelType;
MATCHES FOR EQUALITY;
BEHAVIOUR channelTypeBeh;
REGISTERED AS { adslfNMAAttribute 20 };

channelTypeBeh BEHAVIOUR
DEFINED AS
"This attribute indicates the channel type (Fast, Interleaved, other).";

3.3.21 currentAttainableRate

currentAttainableRate ATTRIBUTE
DERIVED FROM "Rec. X.721 | ISO/IEC 10165-2":gauge;
BEHAVIOUR currentAttainableRateBeh;
REGISTERED AS { adslfNMAAttribute 21 };

currentAttainableRateBeh BEHAVIOUR
DEFINED AS
"This attribute indicates the current maximum attainable transmit rate for the ATU in kbps. This value is greater than or equal to the current line rate.";

3.3.22 currentAttenuation

currentAttenuation ATTRIBUTE
DERIVED FROM "Rec. X.721 | ISO/IEC 10165-2":gauge;
BEHAVIOUR currentAttenuationBeh;
REGISTERED AS { adslfNMAAttribute 22 };

currentAttenuationBeh BEHAVIOUR
DEFINED AS
"This attribute indicates the measured difference in the total power transmitted by peer ATU and the total power received by this ATU in 1/10th of a dB.";

3.3.23 currentChannelRate

currentChannelRate ATTRIBUTE
DERIVED FROM "Rec. X.721 | ISO/IEC 10165-2":gauge;
BEHAVIOUR currentChannelRateBeh;
REGISTERED AS { adslfNMAAttribute 23 };

currentChannelRateBeh BEHAVIOUR
DEFINED AS
"This attribute indicates the current transmit rate in kbps for the associated ADSL channel.";

3.3.24 currentCrcBL

currentCrcBL ATTRIBUTE
DERIVED FROM "Rec. X.721 | ISO/IEC 10165-2":gauge;

BEHAVIOUR currentCrcBLBeh;
REGISTERED AS { adslfNMAAttribute 24 };

currentCrcBLBeh BEHAVIOUR
DEFINED AS
“This attribute represents the current length of the channel data-block
on which the CRC is calculated in bytes.”;

3.3.25 currentLineRate

currentLineRate ATTRIBUTE
DERIVED FROM "Rec. X.721 | ISO/IEC 10165-2":gauge;
BEHAVIOUR currentLineRateBeh;
REGISTERED AS { adslfNMAAttribute 25 };

currentLineRateBeh BEHAVIOUR
DEFINED AS
“This attribute represents the current data rate for the ADSL line in
kbps. “;

3.3.26 currentOperationalMode

currentOperationalMode ATTRIBUTE
WITH ATTRIBUTE SYNTAX AdslfMIBMod.AdsIOperationalMode;
MATCHES FOR EQUALITY;
BEHAVIOUR currentOperationalModeBeh;
REGISTERED AS { adslfNMAAttribute 26 };

currentOperationalModeBeh BEHAVIOUR
DEFINED AS
“This attribute represents the currently selected modem
Operational Mode.”;

3.3.27 currentOutputPower

currentOutputPower ATTRIBUTE
DERIVED FROM "Rec. X.721 | ISO/IEC 10165-2":gauge;
BEHAVIOUR currentOutputPowerBeh;
REGISTERED AS { adslfNMAAttribute 27 };

currentOutputPowerBeh BEHAVIOUR
DEFINED AS

“This attribute indicates the measured total output power transmitted by the associated ATU in 1/10th dBm.”;

3.3.28 currentSnrMargin

currentSnrMargin ATTRIBUTE
 DERIVED FROM "Rec. X.721 | ISO/IEC 10165-2":gauge;
 BEHAVIOUR currentSnrMarginBeh;
 REGISTERED AS { adslfNMAtribute 28 };

currentSnrMarginBeh BEHAVIOUR
 DEFINED AS
 “This attribute indicates the current noise margin for the received signal on the associated ATU in 1/10th of a dB.”;

3.3.29 downShiftSnrMarginAtuC

downShiftSnrMarginAtuC ATTRIBUTE
 WITH ATTRIBUTE SYNTAX AdslfMIBMod.Integer;
 MATCHES FOR EQUALITY, ORDERING;
 BEHAVIOUR downShiftSnrMarginAtuCBeh;
 REGISTERED AS { adslfNMAtribute 29 };

downShiftSnrMarginAtuCBeh BEHAVIOUR
 DEFINED AS
 “This attribute indicates the signal/noise margin for rate downshift, in the case of a rate-adaptive ATU-C in 1/10th of a dB.”;

3.3.30 downShiftSnrMarginAtuR

downShiftSnrMarginAtuR ATTRIBUTE
 WITH ATTRIBUTE SYNTAX AdslfMIBMod.Integer;
 MATCHES FOR EQUALITY, ORDERING;
 BEHAVIOUR downShiftSnrMarginAtuRBeh;
 REGISTERED AS { adslfNMAtribute 30 };

downShiftSnrMarginAtuRBeh BEHAVIOUR
 DEFINED AS
 “This attribute indicates the signal/noise margin for rate downshift, in the case of a rate-adaptive ATU-R in 1/10th of a dB.”;

3.3.31 downThreshold

downThreshold ATTRIBUTE
WITH ATTRIBUTE SYNTAX AdslfMIBMod.Integer;
MATCHES FOR EQUALITY, ORDERING;
BEHAVIOUR downThresholdBeh;
REGISTERED AS { adslfNMAttribute 31 };

downThresholdBeh BEHAVIOUR
DEFINED AS
“This attribute indicates the amount of decrement in the channel rate from the last time a rate-change notification was issued that will cause another rateChangeNotification to be sent . It is in kbps.”;

3.3.32 fastMaxTxRateAtuC

fastMaxTxRateAtuC ATTRIBUTE
WITH ATTRIBUTE SYNTAX AdslfMIBMod.Integer;
MATCHES FOR EQUALITY, ORDERING;
BEHAVIOUR fastMaxTxRateAtuCBeh;
REGISTERED AS { adslfNMAttribute 32 };

fastMaxTxRateAtuCBeh BEHAVIOUR
DEFINED AS
“This attribute configures the maximum transmit rate allowed for the fast channel for the associated ATU-C in kbps.”;

3.3.33 fastMaxTxRateAtuR

fastMaxTxRateAtuR ATTRIBUTE
WITH ATTRIBUTE SYNTAX AdslfMIBMod.Integer;
MATCHES FOR EQUALITY, ORDERING;
BEHAVIOUR fastMaxTxRateAtuRBeh;
REGISTERED AS { adslfNMAttribute 33 };

fastMaxTxRateAtuRBeh BEHAVIOUR
DEFINED AS
“This attribute configures the maximum transmit rate allowed for the fast channel for the associated ATU-R in kbps.”;

3.3.34 fastMinTxRateAtuC

fastMinTxRateAtuC ATTRIBUTE
WITH ATTRIBUTE SYNTAX AdslfMIBMod.Integer;
MATCHES FOR EQUALITY, ORDERING;
BEHAVIOUR fastMinTxRateAtuCBeh;
REGISTERED AS { adslfNMAttribute 34 };

fastMinTxRateAtuCBeh BEHAVIOUR
DEFINED AS
“This attribute configures the minimum transmit rate acceptable for
the fast channel in the associated ATU-C in kbps.”;

3.3.35 fastMinTxRateAtuR

fastMinTxRateAtuR ATTRIBUTE
WITH ATTRIBUTE SYNTAX AdslfMIBMod.Integer;
MATCHES FOR EQUALITY, ORDERING;
BEHAVIOUR fastMinTxRateAtuRBeh;
REGISTERED AS { adslfNMAttribute 35 };

fastMinTxRateAtuRBeh BEHAVIOUR
DEFINED AS
“This attribute configures the minimum transmit rate acceptable for the
fast channel in the associated ATU-R in kbps.”;

3.3.36 initFailedNotificationSwitch

initFailedNotificationSwitch ATTRIBUTE
WITH ATTRIBUTE SYNTAX AdslfMIBMod.Boolean;
MATCHES FOR EQUALITY;
BEHAVIOUR initFailedNotificationSwitchBeh;
REGISTERED AS { adslfNMAttribute 36 };

initFailedNotificationSwitchBeh BEHAVIOUR
DEFINED AS
“This attribute is used to enable (TRUE) / disable (FALSE) the
initFailedNotifications”;

3.3.37 interleavedDelay

interleavedDelay ATTRIBUTE
DERIVED FROM "Rec. X.721 | ISO/IEC 10165-2":gauge;
BEHAVIOUR interleavedDelayBeh;
REGISTERED AS { adslfNMAttribute 37 };

interleavedDelayBeh BEHAVIOUR
DEFINED AS
"This attribute indicates the current interleaved delay on the associated interleaved channel in milli-seconds.";

3.3.38 interleavedMaxTxRateAtuC

interleavedMaxTxRateAtuC ATTRIBUTE
WITH ATTRIBUTE SYNTAX AdslfMIBMod.Integer;
MATCHES FOR EQUALITY, ORDERING;
BEHAVIOUR interleavedMaxTxRateAtuCBeh;
REGISTERED AS { adslfNMAttribute 38 };

interleavedMaxTxRateAtuCBeh BEHAVIOUR
DEFINED AS
"This attribute configures the maximum transmit rate allowed on the interleaved channel for the associated ATU-C in kbps.";

3.3.39 interleavedMaxTxRateAtuR

interleavedMaxTxRateAtuR ATTRIBUTE
WITH ATTRIBUTE SYNTAX AdslfMIBMod.Integer;
MATCHES FOR EQUALITY, ORDERING;
BEHAVIOUR interleavedMaxTxRateAtuRBeh;
REGISTERED AS { adslfNMAttribute 39 };

interleavedMaxTxRateAtuRBeh BEHAVIOUR
DEFINED AS
"This attribute configures the maximum transmit rate on the interleaved channel for the associated ATU-R in kbps.";

3.3.40 interleavedMinTxRateAtuC

interleavedMinTxRateAtuC ATTRIBUTE
WITH ATTRIBUTE SYNTAX AdslfMIBMod.Integer;
MATCHES FOR EQUALITY, ORDERING;
BEHAVIOUR interleavedMinTxRateAtuCBeh;
REGISTERED AS { adslfNMAtribute 40 };

interleavedMinTxRateAtuCBeh BEHAVIOUR
DEFINED AS
“This attribute configures the minimum transmit rate acceptable on the interleaved channel for the associated ATU-C in kbps.”;

3.3.41 interleavedMinTxRateAtuR

interleavedMinTxRateAtuR ATTRIBUTE
WITH ATTRIBUTE SYNTAX AdslfMIBMod.Integer;
MATCHES FOR EQUALITY, ORDERING;
BEHAVIOUR interleavedMinTxRateAtuRBeh;
REGISTERED AS { adslfNMAtribute 41 };

interleavedMinTxRateAtuRBeh BEHAVIOUR
DEFINED AS
“This attribute configures the minimum transmit rate acceptable on the interleaved channel for the associated ATU-R in kbps.”;

3.3.42 lineCodeSpecificProfilePointer

lineCodeSpecificProfilePointer ATTRIBUTE
WITH ATTRIBUTE SYNTAX AdslfMIBModule.PointerOrNull;
MATCHES FOR EQUALITY ;
BEHAVIOUR lineCodeSpecificProfilePointerBeh;
REGISTERED AS { adslfNMAtribute 42 };

lineCodeSpecificProfilePointerBeh BEHAVIOUR
DEFINED AS
“This attribute is a pointer to an optional line-code / vendor specific Configuration Profile. If the value is NULL, no profile is specified.”;

3.3.43 lineCoding

lineCoding ATTRIBUTE

WITH ATTRIBUTE SYNTAX AdslfMIBMod.AdslLineCoding;
MATCHES FOR EQUALITY;
BEHAVIOUR lineCodingBeh;
REGISTERED AS { adslfNMAttribute 43 };

lineCodingBeh BEHAVIOUR

DEFINED AS

“This attribute indicates the supported line coding for the ADSL Line (DMT, CAP, QAM, other).“;

3.3.44 maxInterleaveDelayAtuC

maxInterleaveDelayAtuC ATTRIBUTE

WITH ATTRIBUTE SYNTAX AdslfMIBMod.Integer;
MATCHES FOR EQUALITY, ORDERING;
BEHAVIOUR maxInterleaveDelayAtuCBeh;
REGISTERED AS { adslfNMAttribute 44 };

maxInterleaveDelayAtuCBeh BEHAVIOUR

DEFINED AS

“This attribute configures the maximum Interleave delay acceptable for the interleaved channel on the associated ATU-C in milli-seconds.“;

3.3.45 maxInterleaveDelayAtuR

maxInterleaveDelayAtuR ATTRIBUTE

WITH ATTRIBUTE SYNTAX AdslfMIBMod.Integer;
MATCHES FOR EQUALITY, ORDERING;
BEHAVIOUR maxInterleaveDelayAtuRBeh;
REGISTERED AS { adslfNMAttribute 45 };

maxInterleaveDelayAtuRBeh BEHAVIOUR

DEFINED AS

“This attribute configures the maximum acceptable Interleave delay for the interleaved channel on the associated ATU-R in milli-seconds.“;

3.3.46 maxSnrMarginAtuC

maxSnrMarginAtuC ATTRIBUTE
WITH ATTRIBUTE SYNTAX AdslfMIBMod.Integer;
MATCHES FOR EQUALITY, ORDERING;
BEHAVIOUR maxSnrMarginAtuCBeh;
REGISTERED AS { adslfNMAtribute 46 };

maxSnrMarginAtuCBeh BEHAVIOUR
DEFINED AS
“This attribute configures the maximum signal/noise margin the ATU-C should try to maintain before increasing the data-rate. The units are 1/10th of a dB”;

3.3.47 maxSnrMarginAtuR

maxSnrMarginAtuR ATTRIBUTE
WITH ATTRIBUTE SYNTAX AdslfMIBMod.Integer;
MATCHES FOR EQUALITY, ORDERING;
BEHAVIOUR maxSnrMarginAtuRBeh;
REGISTERED AS { adslfNMAtribute 47 };

maxSnrMarginAtuRBeh BEHAVIOUR
DEFINED AS
“This attribute configures the maximum signal/noise margin the ATU-R should attempt to maintain before increasing the data-rate. The units are 1/10th of a dB.”;

3.3.48 minDownShiftTimeAtuC

minDownShiftTimeAtuC ATTRIBUTE
WITH ATTRIBUTE SYNTAX AdslfMIBMod.Integer;
MATCHES FOR EQUALITY, ORDERING;
BEHAVIOUR minDownShiftTimeAtuCBeh;
REGISTERED AS { adslfNMAtribute 48 };

minDownShiftTimeAtuCBeh BEHAVIOUR
DEFINED AS
“This attribute configures the minimum time for which the noise margin should be below the downShiftSnrMargin before the ATU-C should attempt a rate downshift. Only applicable to rate-adaptive modems. The unit is seconds.”;

3.3.49 minDownShiftTimeAtuR

minDownShiftTimeAtuR ATTRIBUTE
WITH ATTRIBUTE SYNTAX AdslfMIBMod.Integer;
MATCHES FOR EQUALITY, ORDERING;
BEHAVIOUR minDownShiftTimeAtuRBeh;
REGISTERED AS { adslfNMAttribute 49 };

minDownShiftTimeAtuRBeh BEHAVIOUR
DEFINED AS
“This attribute configures the minimum time for which current margin should be below the downShiftSnrMargin before the ATU-R should attempt a rate downshift. Only applicable to rate-adaptive modems. The unit is seconds.”;

3.3.50 minSnrMarginAtuC

minSnrMarginAtuC ATTRIBUTE
WITH ATTRIBUTE SYNTAX AdslfMIBMod.Integer;
MATCHES FOR EQUALITY, ORDERING;
BEHAVIOUR minSnrMarginAtuCBeh;
REGISTERED AS { adslfNMAttribute 50 };

minSnrMarginAtuCBeh BEHAVIOUR
DEFINED AS
“This attribute configures the minimum acceptable signal/noise margin in 1/10th of a dB for the associated ATU-C.”;

3.3.51 minSnrMarginAtuR

minSnrMarginAtuR ATTRIBUTE
WITH ATTRIBUTE SYNTAX AdslfMIBMod.Integer;
MATCHES FOR EQUALITY, ORDERING;
BEHAVIOUR minSnrMarginAtuRBeh;
REGISTERED AS { adslfNMAttribute 51 };

minSnrMarginAtuRBeh BEHAVIOUR
DEFINED AS
“This attribute indicates the minimum acceptable signal/noise margin in 1/10th of a dB for the associated ATU-R.”;

3.3.52 minUpShiftTimeAtuC

minUpShiftTimeAtuC ATTRIBUTE
WITH ATTRIBUTE SYNTAX AdslfMIBMod.Integer;
MATCHES FOR EQUALITY, ORDERING;
BEHAVIOUR minUpShiftTimeAtuCBeh;
REGISTERED AS { adslfNMAttribute 52 };

minUpShiftTimeAtuCBeh BEHAVIOUR
DEFINED AS
“This attribute indicates the minimum time that the noise margin for the associated ATU-C should remain above the upShiftSnrMargin, before it should attempt a rate upshift. Only applicable to rate adaptive modems. Units are seconds“;

3.3.53 minUpShiftTimeAtuR

minUpShiftTimeAtuR ATTRIBUTE
WITH ATTRIBUTE SYNTAX AdslfMIBMod.Integer;
MATCHES FOR EQUALITY, ORDERING;
BEHAVIOUR minUpShiftTimeAtuRBeh;
REGISTERED AS { adslfNMAttribute 53 };

minUpShiftTimeAtuRBeh BEHAVIOUR
DEFINED AS
“This attribute indicates the minimum time that the noise margin for the associated ATU-C should remain above the upShiftSnrMargin, before it should attempt a rate upshift. Only applicable to rate adaptive modems. Units are seconds“;

3.3.54 previousChannelRate

previousChannelRate ATTRIBUTE
DERIVED FROM "Rec. X.721 | ISO/IEC 10165-2":gauge;
BEHAVIOUR previousChannelRateBeh;
REGISTERED AS { adslfNMAttribute 54 };

previousChannelRateBeh BEHAVIOUR
DEFINED AS
“This attribute indicates the previous rate of the associated ADSL channel in kbps for a rate-adaptive ATU following rate-change.“;

3.3.55 previousLineRate

previousLineRate ATTRIBUTE
 DERIVED FROM "Rec. X.721 | ISO/IEC 10165-2":gauge;
 BEHAVIOUR previousLineRateBeh;
 REGISTERED AS { adslfNMAAttribute 55 };

previousLineRateBeh BEHAVIOUR
 DEFINED AS
 "This attribute indicates the previous rate of the ADSL line in kbps
 for the associated rate-adaptive ATU following rate-change.";

3.3.56 rateChangeRatioAtuC

rateChangeRatioAtuC ATTRIBUTE
 WITH ATTRIBUTE SYNTAX AdslfMIBMod.Integer;
 MATCHES FOR EQUALITY, ORDERING;
 BEHAVIOUR rateChangeRatioAtuCBeh;
 REGISTERED AS { adslfNMAAttribute 56 };

rateChangeRatioAtuCBeh BEHAVIOUR
 DEFINED AS
 "This attribute indicates the allocation ratio of excess transmit bandwidth
 between fast and interleaved channels, in the case where rate adaptive
 ADSL mode is available and both fast and interleaved channels are
 supported at the same time. The value is between 0..100 and is
 computed as follows:

$$\text{rateChangeRatio} = [\text{Fast} / (\text{Fast} + \text{Interleaved})] * 100.$$
"

3.3.57 rateChangeRatioAtuR

rateChangeRatioAtuR ATTRIBUTE
 WITH ATTRIBUTE SYNTAX AdslfMIBMod.Integer;
 MATCHES FOR EQUALITY, ORDERING;
 BEHAVIOUR rateChangeRatioAtuRBeh;
 REGISTERED AS { adslfNMAAttribute 57 };

rateChangeRatioAtuRBeh BEHAVIOUR
 DEFINED AS
 "This attribute indicates the allocation ratio of excess transmit bandwidth
 between fast and interleaved channels, in the case where rate adaptive

ADSL mode is available and both fast and interleaved channels are supported at the same time. The value is between 0..100 and is computed as follows:

$$\text{rateChangeRatio} = [\text{Fast} / (\text{Fast} + \text{Interleaved})] * 100.;$$

3.3.58 rateModeAtuC

rateModeAtuC ATTRIBUTE

WITH ATTRIBUTE SYNTAX AdslfMIBMod.AdslRateMode;

MATCHES FOR EQUALITY;

BEHAVIOUR rateModeAtuCBeh;

REGISTERED AS { adslfNMAttribute 58 };

rateModeAtuCBeh BEHAVIOUR

DEFINED AS

“This attribute indicates what type of rate adaptation mode is supported. (Fixed, Adapt-At-Start, Adapt-At-Runtime)”;

3.3.59 rateModeAtuR

rateModeAtuR ATTRIBUTE

WITH ATTRIBUTE SYNTAX AdslfMIBMod.AdslRateMode;

MATCHES FOR EQUALITY;

BEHAVIOUR rateModeAtuRBeh;

REGISTERED AS { adslfNMAttribute 59 };

rateModeAtuRBeh BEHAVIOUR

DEFINED AS

“This attribute indicates what type of rate adaptation mode is supported. (Fixed, Adapt-At-Start, Adapt-At-Runtime)”;

3.3.60 supportedChannelTypes

supportedChannelTypes ATTRIBUTE

WITH ATTRIBUTE SYNTAX AdslfMIBMod.AdslChannelOptions;

MATCHES FOR EQUALITY;

BEHAVIOUR supportedChannelTypesBeh;

REGISTERED AS { adslfNMAttribute 60 };

supportedChannelTypesBeh BEHAVIOUR

DEFINED AS

“This attribute indicates supported channel types over an ADSL Line. (noChanne, fastOnly, interleavedOnly, fastAndInterleaved, fastOrInterleaved)“;

3.3.61 supportedOperationalModes

supportedOperationalModes ATTRIBUTE
 WITH ATTRIBUTE SYNTAX AdslfMIBMod.AdslOperationalModes;
 MATCHES FOR EQUALITY, SET-COMPARISON,
 SET-INTERSECTION;
 BEHAVIOUR supportedOperationalModesBeh;
 REGISTERED AS { adslfNMAttribute 61 };

supportedOperationalModesBeh BEHAVIOUR
 DEFINED AS
 “This attribute indicates which ADSL Operational Modes are supported by the modem.“;

3.3.62 targetSnrMarginAtuC

targetSnrMarginAtuC ATTRIBUTE
 WITH ATTRIBUTE SYNTAX AdslfMIBMod.Integer;
 MATCHES FOR EQUALITY, ORDERING;
 BEHAVIOUR targetSnrMarginAtuCBeh;
 REGISTERED AS { adslfNMAttribute 62 };

targetSnrMarginAtuCBeh BEHAVIOUR
 DEFINED AS
 “This attribute indicates the signal/noise margin (in 1/10th of dB) the modem must achieve with a BER of 10-7 or better.“;

3.3.63 targetSnrMarginAtuR

targetSnrMarginAtuR ATTRIBUTE
 WITH ATTRIBUTE SYNTAX AdslfMIBMod.Integer;
 MATCHES FOR EQUALITY, ORDERING;
 BEHAVIOUR targetSnrMarginAtuRBeh;
 REGISTERED AS { adslfNMAttribute 63 };

targetSnrMarginAtuRBeh BEHAVIOUR
 DEFINED AS

"This attribute indicates the signal/noise margin (in 1/10th of dB) the modem must achieve with a BER of 10⁻⁷ or better.";

3.3.64 upShiftSnrMarginAtuC

upShiftSnrMarginAtuC ATTRIBUTE
WITH ATTRIBUTE SYNTAX AdslfMIBMod.Integer;
MATCHES FOR EQUALITY, ORDERING;
BEHAVIOUR upShiftSnrMarginAtuCBeh;
REGISTERED AS { adslfNMAAttribute 64 };

upShiftSnrMarginAtuCBeh BEHAVIOUR
DEFINED AS
"This attribute indicates the signal/noise margin for rate upshift, in the case of rate adaptive ADSL in 1/10th of a dB.";

3.3.65 upShiftSnrMarginAtuR

upShiftSnrMarginAtuR ATTRIBUTE
WITH ATTRIBUTE SYNTAX AdslfMIBMod.Integer;
MATCHES FOR EQUALITY, ORDERING;
BEHAVIOUR upShiftSnrMarginAtuRBeh;
REGISTERED AS { adslfNMAAttribute 65 };

upShiftSnrMarginAtuRBeh BEHAVIOUR
DEFINED AS
"This attribute indicates the signal/noise margin for rate upshift, in the case of rate adaptive ADSL in 1/10th of a dB.";

3.3.66 upThreshold

upThreshold ATTRIBUTE
WITH ATTRIBUTE SYNTAX AdslfMIBMod.Integer;
MATCHES FOR EQUALITY, ORDERING;
BEHAVIOUR upThresholdBeh;
REGISTERED AS { adslfNMAAttribute 66 };

upThresholdBeh BEHAVIOUR
DEFINED AS
"This attribute indicates the minimum amount by which the rate must increase since the last notification in order to issue a new rate change notification. It is specified in kbps.";

3.4 Name Bindings

3.4.1 adslChannelTTP-adslLineTTP

```

adslChannelTTP-adslLineTTP NAME BINDING
  SUBORDINATE OBJECT CLASS    adslChannelTTP;
  NAMED BY SUPERIOR OBJECT CLASS adslLineTTP;
  WITH ATTRIBUTE              adslChannelTTPId;
  CREATE
    WITH-REFERENCE-OBJECT,
    WITH-AUTOMATIC-INSTANCE-NAMING;
  DELETE
    DELETES-CONTAINED-OBJECTS ;
REGISTERED AS { adslfNMNameBinding 1 };

```

3.4.2 adslChannelTTPCurrentData-adslChannelTTP

```

adslChannelTTPCurrentData-adslChannelTTP NAME BINDING
  SUBORDINATE OBJECT CLASS    adslChannelTTPCurrentData;
  NAMED BY SUPERIOR OBJECT CLASS adslChannelTTP;
  WITH ATTRIBUTE              "Recommendation X.739":scannerId;
  CREATE
    WITH-REFERENCE-OBJECT,
    WITH-AUTOMATIC-INSTANCE-NAMING;
  DELETE
    DELETES-CONTAINED-OBJECTS ;
REGISTERED AS { adslfNMNameBinding 2 };

```

3.4.3 adslChannelTTPHistoryData-adslChannelTTPCurrentData

```

adslChannelTTPHistoryData-adslChannelTTPCurrentData NAME BINDING
  SUBORDINATE OBJECT CLASS    adslChannelTTPHistoryData;
  NAMED BY SUPERIOR OBJECT CLASS adslChannelTTPCurrentData;
  WITH ATTRIBUTE              "Recommendation Q.822":historyDataId;
REGISTERED AS { adslfNMNameBinding 3 };

```

3.4.4 adslConfigurationProfile-managedElementR1

```

adslConfigurationProfile-managedElementR1 NAME BINDING
  SUBORDINATE OBJECT CLASS    adslConfigurationProfile;
  NAMED BY SUPERIOR OBJECT CLASS managedElementR1;
  WITH ATTRIBUTE                adslConfigurationProfileId;
  CREATE
    WITH-REFERENCE-OBJECT,
    WITH-AUTOMATIC-INSTANCE-NAMING;
  DELETE
    DELETES-CONTAINED-OBJECTS ;
REGISTERED AS { adslfNMNameBinding 4 };

```

3.4.5 adslLineTTP-managedElementR1

```

adslLineTTP-managedElementR1 NAME BINDING
  SUBORDINATE OBJECT CLASS    adslLineTTP;
  NAMED BY SUPERIOR OBJECT CLASS "Recommendation M.3100 :
1995":managedElementR1;
  WITH ATTRIBUTE                adslLineTTPId;
  CREATE
    WITH-REFERENCE-OBJECT,
    WITH-AUTOMATIC-INSTANCE-NAMING;
  DELETE
    DELETES-CONTAINED-OBJECTS ;
REGISTERED AS { adslfNMNameBinding 5 };

```

3.4.6 adslLineTTPCurrentData-adslLineTTP

```

adslLineTTPCurrentData-adslLineTTP NAME BINDING
  SUBORDINATE OBJECT CLASS    adslLineTTPCurrentData;
  NAMED BY SUPERIOR OBJECT CLASS adslLineTTP;
  WITH ATTRIBUTE                "Recommendation X.739":scannerId;
  CREATE
    WITH-REFERENCE-OBJECT,
    WITH-AUTOMATIC-INSTANCE-NAMING;
  DELETE
    DELETES-CONTAINED-OBJECTS;
REGISTERED AS { adslfNMNameBinding 6 };

```

3.4.7 adslLineTTPHistoryData-adslLineTTPCurrentData

adslLineTTPHistoryData-adslLineTTPCurrentData NAME BINDING
SUBORDINATE OBJECT CLASS adslLineTTPHistoryData;
NAMED BY SUPERIOR OBJECT CLASS adslLineTTPCurrentData;
WITH ATTRIBUTE "Recommendation Q.822":historyDataId;
REGISTERED AS { adslfNMNameBinding 7 };

3.5 Actions

*** None Defined At Present ***

3.6 Notifications

3.6.1 initFailedNotification

initFailedNotification NOTIFICATION

BEHAVIOUR initFailedNotificationBeh;

WITH INFORMATION SYNTAX AdslfMIBMod.AdslInitFailedInfo

AND ATTRIBUTE IDS

probableCause	probableCause,
notificationIdentifier	notificationIdentifier;

REGISTERED AS { adslfNMNotification 1 };

initFailedNotificationBeh BEHAVIOUR

DEFINED AS

“This notification is sent when the ATU-C cannot initialize the ATU-R, and the value of the initFailedNotificationSwitch attribute is TRUE (on). The probableCause attribute indicates reason for initialization failure.”;

3.6.2 rateChangeNotification

rateChangeNotification NOTIFICATION

BEHAVIOUR rateChangeNotificationBeh;

WITH INFORMATION SYNTAX AdslfMIBMod.AdslRateChangeInfo

AND ATTRIBUTE IDS

oldRate	oldRate,
newRate	newRate,
notificationIdentifier	notificationIdentifier;

REGISTERED AS { adslfNMNotification 2 };

rateChangeNotificationBeh BEHAVIOUR

DEFINED AS

“This notification is sent for Fast and Interleaved channels in the following cases:

- i) Rate increased since last notification by more than the 'upThreshold' value.
- ii) Rate decreased since last notification by more than the 'downThreshold' value.”;

3.7 Supporting Productions

```

AdslfMIBMod {1 3 6 1 4 1 adslForum(3561) adslForumNetworkManagement(1)
             adslfLineMIB(1) informationModel(0) asnlModule(2)
adslfMIBMod(0)}

```

```
DEFINITIONS IMPLICIT TAGS ::= BEGIN
```

```

-- exports everything
IMPORTS
    Boolean,
    NameType,
    PointerOrNull,
    ProblemCause
FROM ASN1DefinedTypesModule {ccitt recommendation m(13) gnm(3100)
                             informationModel(0) asnlModules(2)
                             asnlDefinedTypesModule(0) }

    DistinguishedName,
    RelativeDistinguishedName
FROM InformationFramework {joint-iso-ccitt ds(5) modules(1)
                           informationFramework(1)}

    EventTypeId,
    ObjectInstance
FROM CMIP-1 {joint-iso-ccitt ms(9) cmip(1) modules(0) protocol(3)}

    AdministrativeState,
    AttributeList,
    ProbableCause,
    SimpleNameType
FROM Attribute-ASN1Module {joint-iso-ccitt ms(9) smi(3) part2(2)
                           asnlModule(2) 1};

```

```

adslfNMInformationModel OBJECT IDENTIFIER ::= { 1 3 6 1 4 1
                                                adslForum(3561)
                                                adslForumNetworkManagement(1)
                                                adslfLineMIB(1)
                                                informationModel(0)}

```

```

adslfNMStandardSpecificExtension OBJECT IDENTIFIER ::=
                                   {adslfNMInformationModel 0}

```

```

adslfNMObjectClass                OBJECT IDENTIFIER ::=
                                   {adslfNMInformationModel 3}

```

```

adslfNMPackage                    OBJECT IDENTIFIER ::=
                                   {adslfNMInformationModel 4}

```

```

adslfNMAttribute                  OBJECT IDENTIFIER ::=
                                   {adslfNMInformationModel 5}

```

```

adslfNMNameBinding                OBJECT IDENTIFIER ::=
                                   {adslfNMInformationModel 6}

```

```

adslfNMAction                     OBJECT IDENTIFIER ::=

```

```

adslfNMNotification          OBJECT IDENTIFIER ::=
                                {adslfNMInformationModel 7}
                                {adslfNMInformationModel 8}

-- default value definitions
booleanFalseDefault Boolean ::= FALSE

booleanTrueDefault Boolean ::= TRUE

integerZero INTEGER ::= 0

-- Additional probableCause Definitions
adslfNMProbableCause OBJECT IDENTIFIER ::= {
                                adslfNMStandardSpecificExtension 0 }

lossOfPower          ProbableCause ::= globalValue :
                                {adslfNMProbableCause 1}
lossOfLink           ProbableCause ::= globalValue :
                                {adslfNMProbableCause 2}
lossOfSignalQuality ProbableCause ::= globalValue :
                                {adslfNMProbableCause 3}
dataInitFailure     ProbableCause ::= globalValue :
                                {adslfNMProbableCause 4}
configInitFailure   ProbableCause ::= globalValue :
                                {adslfNMProbableCause 5}
protocolInitFailure ProbableCause ::= globalValue :
                                {adslfNMProbableCause 6}
noPeerAtuPresent    ProbableCause ::= globalValue :
                                {adslfNMProbableCause 7}

-- Additional eventTypes Definitions
adslfNMEventTypes OBJECT IDENTIFIER ::= {
                                adslfNMStandardSpecificExtension 1 }

-- Supporting productions

AdslAvailabilityStatus ::= SET OF AdslLineFailureCondition

AdslChannelOptions ::= ENUMERATED {
    noChannels(0),
    fastOnly(1),
    interleavedOnly(2),
    fastOrInterleaved(3),
    fastAndInterleaved(4)
}

AdslChannelType ::= ENUMERATED {
    fast(0),
    interleaved(1)
}

AdslInitFailInfo ::= SEQUENCE {
    probableCause          ProbableCause,
    notificationIdentifier NotificationIdentifier OPTIONAL
}

```

```

AdslLineCoding ::= ENUMERATED {
    other(0),
    dmt(1),
    cap(2),
    qam(3)
}

AdslLineFailureCondition ::= ENUMERATED {
    lossOfFraming(0),
    lossOfSignal(1),
    lossOfPower(2),
    lossOfLink(3),
    lossOfSignalQuality(4),
    dataInitFailure(5),
    configInitFailure(6),
    protocolInitFailure(8),
    noPeerAtuPresent(9)
}

-- ADSL modem Operational Mode
AdslOperationalMode ::= ENUMERATED {
    ansi(0),                -- ANSI T1.413
    etsi(1),                -- ETSI DTS/TM06006
    potsNonOverlapped(2),  -- ITU G.992.1 POTS non-overlapped
    potsOverlapped(3),     -- ITU G.992.1 POTS overlapped
    isdnNonOverlapped(4),  -- ITU G.992.1 ISDN non-overlapped
    isdnOverlapped(5),     -- ITU G.992.1 ISDN overlapped
    isdnTcm(6),            -- ITU G.992.1 with TCM-ISDN
    potsNonOverlappedLite(7), -- ITU G.992.2 POTS non-overlapped
    potsOverlappedLite(8), -- ITU G.992.2 POTS overlapped
    isdnTcmLite(9)        -- ITU G.992.2 with TCM-ISDN
}

AdslOperationalModes ::= SET OF AdslOperationalMode

AdslRateChangeInfo ::= SEQUENCE {
    oldRate          Integer,
    newRate          Integer,
    notificationIdentifier NotificationIdentifier OPTIONAL
}

AdslRateMode ::= ENUMERATED {
    fixed(0),
    adaptAtStartup(1),
    adaptAtRuntime(2)
}

Integer ::= INTEGER

```

NotificationIdentifier ::= INTEGER

END

4 References

- [1] ADSL Forum Technical Report TR-005, "ADSL Network Element Management", March 1998.
- [2] ADSL Forum Contribution 98-010, "CMIP Model for ADSL Management", March 1998.
- [3] ADSL Forum Contribution 97-056, "GDMO Representation of the ADSL Function Model & Information Model", May 1997.
- [4] ITU-T Recommendation M.3100, "Generic Network Information Model", Version 2, March 1995.
- [5] ITU-T Recommendation Q.822, "Stage 1, State 2, and Stage 3 Description for the Q3 Interface Performance Management", April 1994.
- [6] ITU-T Recommendation X.721, "Information Technology - Open Systems Interconnection - Structure of Management Information - Part 2: Definition of Management Information", February 1992.
- [7] Bellcore TA-NWT-001114, Generic Requirements for Operations Interfaces Using OSI Tools: ATM/Broadband Network Management, Issue 2, October 1993.
- [8] ADSL Forum Contribution 98-196, "Aligning ADSL Line MIB with ANSI T1M1 and ITU-T G.997.1", November 1998.
- [9] ITU-T Draft Recommendation G.997.1, "Physical Layer Management for Digital Subscriber Line (DSL) Transceivers", October 1998.