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DVB Cable Network Interface Unit MIB for EuroModem compliant Cable Modems

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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 defines a basic set of managed objects for SNMP-based management of EuroModem v1.0 compliant Cable Network Interface Units.

This memo specifies a MIB module in a manner that is compliant to the SNMP SMIV2[RFC2578][[RFC2579](#)][RFC2580]. The set of objects is consistent with the SNMP framework and existing SNMP standards.

This memo is a product of the DVB/DAVIC interoperability consortium which has been adopted as a work item of the IPCDN WG. Comments are solicited and should be addressed to the author.

1. The SNMP Management Framework

The SNMP Management Framework presently consists of five major

components:

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- o An overall architecture, described in [RFC 2571](#) [[RFC2571](#)].
- o 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](#)].
- o 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](#)], [RFC 2572](#) [[RFC2572](#)] and [RFC 2574](#) [[RFC2574](#)].
- o 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](#)].
- o 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. Glossary

2.1. CATV

Originally "Community Antenna Television", now used to refer to any

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cable or hybrid fiber and cable system used to deliver video signals to a community.

2.2. DAVIC

Digital Audiovisual Council. International council for internetworking audio and video systems.

2.3. Downstream

The direction from the head-end towards the subscriber.

2.4. DVB

Digital Video Broadcasting. The DVB projects produce open and interoperable global standards for digital audio and video distribution.

2.5. EuroModem.

EuroModem. A specification for an interoperable European Cable Modem [[EUROM](#)].

2.6. Head-end

The origination point in most cable systems of the subscriber video signals. Generally also the location of the INA equipment.

2.7. INA

Interactive Network Adapter. This can act as a bridge or router in the cable head-end. It is responsible for controlling the bandwidth available to each NIU.

2.8. NIU

Network Interface Unit. The unit is located at the subscriber premises and provides interactive services via the cable network. The NIU is under the control of the INA, but may request additional bandwidth/connections when required. The NIU can act as a bridge or

router.

2.9. RF

Radio Frequency.

2.10. Upstream

The direction from the subscriber towards the head-end.

3. Overview

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This MIB provides a set of objects required for the management of EuroModem v1.0 compliant NIUs. The MIB specification is derived from the EuroModem v1.0 specification [[EUROM](#)].

EuroModem NIUs are currently IPv4 only devices and may implement either SNMPv1 or SNMPv3. This MIB is intended for NIUs that implement SNNMPv3 and IPv4, however all IP addresses have been represented as described in [[RFC2851](#)] to aid future migration to IPv6.

The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "MAY", and "OPTIONAL" in this document are to be interpreted as described in [[RFC2119](#)].

3.1. Structure of the MIB

This MIB is structured into nine groups:

- o The dvbNiuSystem group extends the MIB-II 'system' group with objects needed for cable device system management.
- o The dvbNiuSoftware group provides objects necessary for managing software images and upgrades via download. See 3.2.1
- o The dvbNiuDhcp group configures DHCP/BOOTP functionality provided by the NIU. This group is optional. See 3.2.2
- o The dvbNiuEvent group provides control and logging for event reporting. See 3.2.3
- o The dvbNiuIpFilter group configures filters at the IP layer. The IP filter table is also used to provide support for anti spoofing, NAT, NAPT and TOS mapping. This group is optional. See 3.3

- o The dvbNiuNat group provides basic configuration for the NIU NAT capability. This group is optional.
- o The dvbNiuNapt group provides basic configuration for the NIU NAPT capability. This group is optional.
- o The dvbNiuEthFilter group configures filters at the link layer. This is primarily intended for use when the NIU is performing Ethernet MAC bridging. This group is optional. See 3.3
- o The dvbNiuCpe group provides control over which IP addresses may be used by customer premises equipment (e.g. PCs) serviced by a given NIU. This provides anti-spoofing control at the point of origin for a large cable modem system. This group is optional. See 3.3

3.2. Management requirements

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3.2.1. Software Management

The NIU may download and store multiple software images. The method for performing the download and using the image is as follows:

- o set dvbNiuSwServer to the address of the TFTP server for software upgrades.
- o set dvbNiuSwFilename to the filename including path of the image to download to the NIU.
- o set dvbNiuDownloadSlot to the image slot on the NIU in which to place the downloaded image. By default this will be set to the next free slot or the first slot designated as 'backup'.
- o set dvbNiuSwAdminStatus to 'initUpgrd'.

The status of the software download is obtained by reading dvbNiuSwAdminStatus. If the NIU was unable to successfully perform the download, the status returned will reflect the cause. Upon successful download the operator must configure dvbNiuSwVerTable if they wish to use the image as the boot or backup version. Note only one image may be marked as bootable.

3.2.2. IP Address Assignment

IP addresses may be assigned to NIU interfaces using static and

dynamic assignments. Objects are provided by the MIB to support both methods. `dvbNiuStaticIpTable` provides objects to assign static IP addresses to NIU interfaces, where each interface may have multiple IP addresses. An IP address assignment in the table MUST NOT be removed from the table if the destination address of the SNMP packet removing it is using that IP address.

`dvbNiuDhcpTable` provides objects for managing dynamically assigned IP addresses via DHCP and BOOTP. DHCP/BOOTP requests may be for NIU interfaces and relayed requests from the subscriber. If an NIU interface does not have dynamic IP address allocation enabled then the IP address of the interface MUST be specified in `dvbNiuStaticIpTable`.

Note: The `dvbNiuStaticIpTable` should be used with care. Where possible `dvbNiuDhcpTable` SHOULD be used in preference. When an interface has both a static IP address assigned and dynamic addresses assignment enabled, the assigned dynamic address overrides all assignments for that interface in the `dvbNiuStaticIpTable` table.

3.2.3. Events and Traps

This MIB provides control facilities for reporting events through traps and non-volatile logging. If events are reported through

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traps, the specified conventions must be followed. Other means of event reporting are outside the scope of this document.

Vendors SHOULD provide time-of-day clocks in NIUs to provide useful time stamping of events. Where possible this SHOULD be synchronised with a central time source, this will aid fault finding when multiple equipment logs are being investigated.

When `dvbNiuEventPolicy` is set to `clearNow(4)`, the first entry in the log MUST be the date and time the log was cleared and the source IP address of the SNMP SET request which caused the log to be cleared.

For each vendor-specific event that is reportable via TRAP, the vendor must create an enterprise-specific trap definition. Trap definitions MUST include the event reason encoded as `SnmpAdminString` and should be defined as:

```
trapName NOTIFICATION-TYPE
    OBJECTS {
        ifIndex,
        eventReason,
        other useful objects
```

```

}
STATUS      current
DESCRIPTION
    "trap description"
::= Object Id

```

Note that ifIndex is only included if the event or trap is interface related.

An example (fake) vendor defined trap might be:

```

xyzVendorRsUncorrHighMark NOTIFICATION-TYPE
    OBJECTS {
        eventReason,
        xyzRsUncorrCount
    }
    STATUS      current
    DESCRIPTION
        "Sent by a NIU when a configurable number of reed
        solomon uncorrectable errors occur during the sampling
        period (5 minutes). Used to warn a management station
        of potential degradation of the HFC."
    ::= { xyzTraps 23 }

```

In this example eventReason is a SnmpAdminString providing a human readable error message and xyzRsUncorrCount is a Integer32 which indicates the number of reed solomon uncorrectable errors during the epoch.

3.2.4. Trap Throttling

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The NIU MUST provide support for trap message throttling as described below. The network operator can employ message rate throttling or trap limiting by manipulating the appropriate MIB variables.

3.2.4.1. Trap rate throttling

Network operators may employ either of two rate control methods. In the first method, the device ceases to send traps when the rate exceeds the specified maximum message rate. It resumes sending traps only if reactivated by a network management station request.

In the second method, the device resumes sending traps when the rate falls below the specified maximum message rate.

The network operator configures the specified maximum message rate

by setting the measurement interval (in seconds), and the maximum number of traps to be transmitted within the measurement interval. The operator can query the operational throttling state (to determine whether traps are enabled or blocked by throttling) of the device, as well as query and set the administrative throttling state (to manage the rate control method) of the device.

3.2.4.2. Limiting the trap rate

Network operators may wish to limit the number of traps sent by a device over a specified time period. The device ceases to send traps when the number of traps exceeds the specified threshold. It resumes sending traps only when the measurement interval has passed.

The network operator defines the maximum number of traps he is willing to handle and sets the measurement interval to a large number (in hundredths of a second). For this case, the administrative throttling state is set to stop at threshold which is the maximum number of traps.

See "Techniques for Managing Asynchronously Generated Alerts" [[RFC1224](#)] for further information.

3.3. Protocol Filters

The NIU MIB provides objects for both Ethernet and IP protocol filters. The Ethernet protocol filter entries can be used to limit NIU forwarding to a restricted set of network-layer protocols (such as IP, IPX, NetBIOS, and Appletalk).

The IP protocol filter entries can be used to restrict upstream or downstream traffic based on source and destination IP addresses, transport-layer protocols (such as TCP, UDP, and ICMP), and source and destination TCP/UDP port numbers.

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In general, a NIU applies filters (or more properly, classifiers) in an order appropriate to the layering model. Specifically, the Ethernet layer filters are applied first, then the IP layer inbound filter and finally the IP layer outbound

```
*****
* Ethernet Filter *
*****
```

```

      v
*****
* IP Anti-Spoofing *
*****
      |
      v
*****
* IP Filter In *
*****
      |
      v
*****
* IP Filter Out *
*****

```

3.3.1. Ethernet EtherType/SNAP/LLC Filters dvbNiuEthernetFilterTable

The Ethernet (level-2) filters are contained in the dvbNiuEthernetFilterTable and are applied to level-2 frames entering the cable modem from either the DVB MAC interface or from one of the CPE (Ethernet or other Ethernet like) interfaces. These filters are used to prohibit the processing and forwarding of certain types of level-2 traffic that may be disruptive to the network. The filters, as currently specified, can be set to cause the NIU to either drop frames which match at least one filter, or to process a frame which matches at least filter. Some examples of possible configurations would be to only permit IP (and ARP) traffic, or to drop NETBUEI traffic.

3.3.2 IP Anti-Spoofing Filters - dvbNiuCpeTable

IP Anti-spoofing filters are applied to packets entering the NIU from one of the CPE interfaces and are intended to prevent a subscriber from stealing or mis-using IP addresses that were not assigned to the subscriber. If the filters are active (enabled), the source address of the IP packet must match at least one IP address/range in this table or it is discarded without further processing.

The table can be automatically populated where the first N different IP addresses seen from the CPE side of the NIU are used to

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automatically populate the table. The anti-spoofing filters are specified in the dvbNiuCpeTable and the policy for automatically creating filters in that table is controlled by dvbDevCpeEnroll and

dvbNiuCpeMax as well as the network management agent.

3.3.3. IP Filtering - dvbNiuIpFilterTable

The IP Filtering table acts as a classifier table. Each row in the table describes a template against which IP packets are compared. The template includes source and destination addresses (and their associated masks), upper level protocol (e.g. TCP, UDP), source and destination port ranges, TOS and TOS mask. A row also contains interface and traffic direction match values which have to be considered in combination. All columns of a particular row must match the appropriate fields in the packet, and must match the interface and direction items for the packet to result in a match to the packet.

When classifying a packet, the table is scanned beginning with the lowest number filter. If the agent finds a match, it performs the specified action. If the matched filter has the continue bit set, the agent continues the scan possibly matching additional filters and performing the specified actions. This allows the agent to take one set of actions for the 24.0.16/255.255.255.0 group and one set of actions for telnet packets to/from 24.0.16.30 and these sets of actions may not be mutually exclusive.

Once a packet is matched, one of five actions happen based on the setting of dvbNiuFilterAction in the row. The actions are:

- o Discarded. The packet is dropped, and no further processing is required.
- o Accept. The packet is accepted and processing of the packet continues.
- o NAT. The packet is to be accepted and have NAT applied. Processing of the packet continues using its new IP address.
- o NAPT. The packet is to be accepted and have NAT applied. Processing of the packet continues using its new IP address and port number.
- o TosMap. Invokes the action of rewriting the TOS bits in the IP header based up the entry in dvbNiuIpTOSMapTable identified by dvbNiuIpFilterActionPtr.

If dvbNiuIpFilterContinue is set to true, scanning of the table continues (unless the packet was discarded) and additional matches may result.

4. Definitions

```
DVB-CABLE-NIU-MIB DEFINITIONS ::= BEGIN
```

```
IMPORTS
```

```
MODULE-IDENTITY,
OBJECT-TYPE,
Counter32,
Integer32,
Unsigned32,
experimental
    FROM SNMPv2-SMI
InetAddress,
InetAddressType
    FROM INET-ADDRESS-MIB
RowStatus,
DateAndTime,
TruthValue,
TEXTUAL-CONVENTION
    FROM SNMPv2-TC
SnmpAdminString
    FROM SNMP-FRAMEWORK-MIB
OBJECT-GROUP,
MODULE-COMPLIANCE
    FROM SNMPv2-CONF
InterfaceIndexOrZero,
InterfaceIndex,
ifIndex
    FROM IF-MIB;
```

dvbDevice OBJECT IDENTIFIER ::= { experimental 110 }

dvbNiu MODULE-IDENTITY

```
LAST-UPDATED      "0102030000Z"
ORGANIZATION      "IETF IPCDN Working Group
                  DVB/DAVIC Interoperability Consortium Technical
                  Working Group"
CONTACT-INFO
    "              Andrew Valentine
    Postal: Engineering Design Centre
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```

```

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```

IETF IPCDN Working Group

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DESCRIPTION "The MIB modules for NIUs that
conform to the EuroModem specification. This
MIB assumes the NIU implements MIB-II [RFC 1213](#)"

REVISION "0102030000Z"
DESCRIPTION "Description for dvbNiuStaticIpStatus updated.
Description for dvbNiuCpeStatus updated."

REVISION "0101150000Z"
DESCRIPTION "ORGANIZATION and CONTACT-INFO updated.
dvbNiuCpeIpMax recommended default is now -1,
this is based on experience from another MIB
with a similar table."

REVISION "0011010000Z"
DESCRIPTION "New dvbNiuMulticast object. NAT descriptions
updated. New and simpler to implement
Anti-spoofing table dvbNiuCpe,
and IP filter table modified to support this."

REVISION "0005150000Z"
DESCRIPTION "All objects of type IpAddress now consist of
two objects (See [RFC2851](#)). Descriptions for
DHCP related objects have been fixed. Indices
for some the tables have been modified to
improve use."

REVISION "0003050000Z"
DESCRIPTION "dvbNiuNmAccessTable has been removed as this
MIB is intended for SNMPv3"

REVISION "9912030000Z"
DESCRIPTION "All references to modem/Cdm have been replaced
with NIU. Fixed group references in the
compliance section. Removed DEFVAL clause from
scalar objects. Corrected description of
dvbNiuEventTable. dvbNiuDhcpTable has been
modified to support backup DHCP servers."

dvbNiuEuroloader object has been added to enable or disable the EuroLoader.
dvbNiuOperStatus now only reflects the NIU status, MAC status has been moved to the interface MIB."

REVISION "9910010000Z"
DESCRIPTION "The mib has been modified to incorporate the comments made by the WGT during the 27/28 Sep 1999 meeting. The most significant changes were to the DHCP group and to the

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management of traps. Also some groups are now optional."

REVISION "9907071500Z"
DESCRIPTION "The initial version of the MIB"
::= {dvbDevice 1}

-- Sub divided dvbNiu into MIB objects and conformance

dvbNiuMIBobjects OBJECT IDENTIFIER ::= {dvbNiu 1}
dvbNiuMIBConform OBJECT IDENTIFIER ::= {dvbNiu 2}

-- Define groups under dvbNiuMIBobjects

dvbNiuSystem OBJECT IDENTIFIER ::= {dvbNiuMIBobjects 1}
dvbNiuSoftware OBJECT IDENTIFIER ::= {dvbNiuMIBobjects 2}
dvbNiuDhcp OBJECT IDENTIFIER ::= {dvbNiuMIBobjects 3}
dvbNiuEvent OBJECT IDENTIFIER ::= {dvbNiuMIBobjects 4}
dvbNiuIpFilter OBJECT IDENTIFIER ::= {dvbNiuMIBobjects 5}
dvbNiuNat OBJECT IDENTIFIER ::= {dvbNiuMIBobjects 6}
dvbNiuNapt OBJECT IDENTIFIER ::= {dvbNiuMIBobjects 7}
dvbNiuEthFilter OBJECT IDENTIFIER ::= {dvbNiuMIBobjects 8}
dvbNiuCpe OBJECT IDENTIFIER ::= {dvbNiuMIBobjects 9}

--Define identifiers under dvbNiuMIBConform

dvbNiuCompliances OBJECT IDENTIFIER ::= {dvbNiuMIBConform 1}
dvbNiuGroups OBJECT IDENTIFIER ::= {dvbNiuMIBConform 2}

-- Definition of textual conventions

DvbEventPriority ::= TEXTUAL-CONVENTION

STATUS current

DESCRIPTION

"This represents possible event priorities. These are

```

        ordered from most (emergency) critical to least
        (debug)critical."
SYNTAX      INTEGER {
                emergency(1),
                alert(2),
                critical(3),
                error(4),
                warning(5),
                notice(6),
                information(7),
                debug(8)
            }

-- Definition of MIB objects

-- =====
-- =   NIU System Group                               =
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-- =====

dvbNiuMibVersion OBJECT-TYPE
    SYNTAX      SnmpAdminString
    MAX-ACCESS   read-only
    STATUS       current
    DESCRIPTION
        "The MIB version number."
    -- DEFVAL { '1.0' }
    ::= { dvbNiuSystem 1}

dvbNiuSerialNum OBJECT-TYPE
    SYNTAX      SnmpAdminString
    MAX-ACCESS   read-only
    STATUS       current
    DESCRIPTION
        "This is the serial number of the equipment. It should
        identify the manufacturer, model and revsion of the
        equipment"
    ::= { dvbNiuSystem 2 }

dvbNiuResetNow OBJECT-TYPE
    SYNTAX      INTEGER {
                resetNow(1),
                ready(2)
            }
    MAX-ACCESS   read-write
    STATUS       current
    DESCRIPTION

```

```

        "When this object is set to resetNow it will cause a
        hardware reset followed by sign on. When read this object
        returns ready."
 ::= { dvbNiuSystem 3 }

```

```

dvbNiuResetCounts OBJECT-TYPE
    SYNTAX      Counter32
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "This counts the number of system resets since last power
        on."
 ::= { dvbNiuSystem 4}

```

```

dvbNiuDateAndTime OBJECT-TYPE
    SYNTAX      DateAndTime
    MAX-ACCESS  read-write
    STATUS      current
    DESCRIPTION
        "The date and time. See RFC1903"
 ::= { dvbNiuSystem 5}

```

```

dvbNiuOperStatus OBJECT-TYPE
    SYNTAX      INTEGER {

```

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```

        provisioning(1),
        running(2),
        stopped(3),
        failed(4),
        other(5)
    }
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "The operational status of the NIU.
        provisioning - The NIU is currently provisioning.
        running - The NIU has at least one operating connection.
        stopped - The NIU has no operating connection.
        failed - The NIU has experienced a failure which prevents
        further operation.
        other - used for any case that is not explicitly
        identified"
 ::= { dvbNiuSystem 6 }

```

```

dvbNiuModemtype OBJECT-TYPE
    SYNTAX      INTEGER {
        classA(1),

```

```

        classB(2),
        other(3)
    }
    MAX-ACCESS read-only
    STATUS current
    DESCRIPTION
        "The EuroModem class to which the NIU belongs as specified
        in ECCA EuroModem Specification version 1.0"
    ::= { dvbNiuSystem 7 }

```

-- Static IP address assignment table

```

dvbNiuStaticIpTable OBJECT-TYPE
    SYNTAX      SEQUENCE OF DvbNiuStaticIpEntry
    MAX-ACCESS not-accessible
    STATUS      current
    DESCRIPTION
        "This table is used to assign static IP addresses to NIU
        interfaces. It needs to be used with care! DHCP/BOOTP
        assigned addresses override entries in this table.
        The table is related to ifTable in the IF-MIB."
    ::= { dvbNiuSystem 8 }

```

```

dvbNiuStaticIpEntry OBJECT-TYPE
    SYNTAX      DvbNiuStaticIpEntry
    MAX-ACCESS not-accessible
    STATUS      current
    DESCRIPTION
        "A row can only be created if there is a corresponding row
        in ifTable. The IP address to be assigned must be unique
        within the NIU for the address type. The interface is

```

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```

        identified by ifIndex.
        For the HFC interface which is identified by 3 interfaces,
        the dvbRccMacLayer I/F shall be used to identify it.
        Rows are created/delete using dvbNiuStaticIpStatus."
    INDEX { ifIndex, dvbNiuStaticIpAddrType, dvbNiuStaticIpAddr }
    ::= { dvbNiuStaticIpTable 1 }

```

```

DvbNiuStaticIpEntry ::= SEQUENCE {
    dvbNiuStaticIpAddrType InetAddressType,
    dvbNiuStaticIpAddr      InetAddress,
    dvbNiuStaticIpMaskType  InetAddressType,
    dvbNiuStaticIpMask      InetAddress,
    dvbNiuStaticIpStatus    RowStatus
}

```

```

dvbNiuStaticIpAddrType OBJECT-TYPE
    SYNTAX      InetAddressType
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "The type of IP address assigned to the interface."
 ::= { dvbNiuStaticIpEntry 1 }

```

```

dvbNiuStaticIpAddr OBJECT-TYPE
    SYNTAX      InetAddress (SIZE (1..64))
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "The IP address assigned to the interface."
 ::= { dvbNiuStaticIpEntry 2 }

```

```

dvbNiuStaticIpMaskType OBJECT-TYPE
    SYNTAX      InetAddressType
    MAX-ACCESS  read-create
    STATUS      current
    DESCRIPTION
        "The type of IP address expressed by the mask."
 ::= { dvbNiuStaticIpEntry 3 }

```

```

dvbNiuStaticIpMask OBJECT-TYPE
    SYNTAX      InetAddress
    MAX-ACCESS  read-create
    STATUS      current
    DESCRIPTION
        "The IP subnet mask for the interface."
 ::= { dvbNiuStaticIpEntry 4 }

```

```

dvbNiuStaticIpStatus OBJECT-TYPE
    SYNTAX      RowStatus
    MAX-ACCESS  read-create
    STATUS      current
    DESCRIPTION
        "This controls and reflects the status of the row."

```

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```

    Rows can be created by using both createAndGo and
    createAndWait. Rows can be modified/deleted ONLY if the
    SNMP set request destination IP address is NOT assigned by
    the row being modified/deleted. The only exception to this
    rule is if DHCP has been enabled for the same interface."
 ::= { dvbNiuStaticIpEntry 5 }

```

```
-- Removed and functionality replaced by RFC2573
-- dvbNiuNmAccessTable OBJECT-TYPE
--     SYNTAX          SEQUENCE OF DvbNiuNmAccessEntry
--     MAX-ACCESS      not-accessible
--     STATUS          current
--     DESCRIPTION
--         "This table controls access to SNMP objects by network
--         management stations. If the table is empty, access
--         to SNMP objects is unrestricted. This table exists only
--         on SNMPv1 or v2c agents and does not exist on SNMPv3
--         agents. See the conformance section for details.
--         Specifically, for v3 agents, the appropriate MIBs and
--         security models apply in lieu of this table.
--         An empty table will ONLY allow network management access
--         from the HFC network, any IP address is accepted.
--         Simultaneous write access to this MIB is not recommended"
--     ::= { dvbNiuSystem 9 }
```

```
dvbNiuConfigSet OBJECT-TYPE
    SYNTAX          INTEGER {
                        storeConfig(1),
                        readConfig(2),
                        setFactory(3),
                        local(4),
                        localUnsaved(5),
                        localSaved(6),
                        factoryDefault(7)
                    }
    MAX-ACCESS      read-write
    STATUS          current
    DESCRIPTION
        "This object is used to manage the configuration of the
        NIU. The following can be used to set the object.

        storeConfig - stores the current configuration to non
                      volatile storage. This action changes
                      configuration status to localSaved
        readConfig  - retrieves the configuration held in non
                      volatile storage. This action changes
                      configuration status to local
        setFactory  - sets the current configuration to factory
                      default. This excludes static assigned IP
                      addresses. This action changes configuration
                      status to factoryDefault"
```

When the object is read it reports the configuration being used.

- local - the configuration is unchanged since being retrieved from non volatile storage. When changed it becomes localUnsaved
- localUnsaved - the configuration has changed and requires storing. When stored it becomes localSaved
- localSaved - the current configuration has been saved since being retrieved from non volatile storage
- factoryDefault - the current configuration is the factory default and requires saving. Once saved it becomes localSaved. If modified it becomes localUnsaved"

```
::= { dvbNiuSystem 10 }
```

dvbNiuEuroloader OBJECT-TYPE

```
SYNTAX      INTEGER {  
                enabled(1),  
                disabled(2)  
            }
```

```
MAX-ACCESS  read-only
```

```
STATUS      current
```

```
DESCRIPTION
```

```
"Enables and disables the EuroLoader."
```

```
::= { dvbNiuSystem 11 }
```

dvbNiuImplSet OBJECT-TYPE

```
SYNTAX      BITS {  
                dhcp(0),  
                ipFilters(1),  
                ethFilters(2),  
                addrTransNat(3),  
                addrTransNapt(4),  
                cpeIpControl(5)  
            }
```

```
MAX-ACCESS  read-only
```

```
STATUS      current
```

```
DESCRIPTION
```

```
"This object when read identifies which optional groups have  
been implemented. Implemented groups have their bit set.
```

```
The bits represent the following:
```

- dhcp - dvbNiuDhcp group
- ipFilters - dvbNiuIpFilter group
- ethFilters - dvbNiuEthFileter group
- addrTransNat - dvbNiuNat group
- addrTransNapt - dvbNiuNapt group
- cpeIpControl - dvbNiuCpe group"

```
::= { dvbNiuSystem 12 }
```

```
dvbNiuMulticast OBJECT-TYPE
    SYNTAX      INTEGER {
                    disabled(1),
                    downstreamOnly(2),
                    upstreamOnly(3),
                    enabled(4)
                }
    MAX-ACCESS   read-write
    STATUS       current
    DESCRIPTION
        "This object is used to restrict the level of multicast
        support provided by the NIU.
        disabled - No IGMP or multicast packets are forwarded
                  through the NIU in either direction.
        downstreamOnly - Only multicast packets in the downstream
                          direction will be forwarded for the group to
                          which the subscriber has membership. IGMP
                          messages are allowed to manage group
                          membership for downstream groups only. Any
                          upstream multicast packets are discarded.
        upstreamOnly - Only multicast packets in the upstream
                        direction will be forwarded by the NIU. IGMP
                        messages are allowed to manage group
                        membership for upstream groups only.
        enabled - Multicast forwarding in the downstream and
                  upstream direction is allowed. IGMP
                  messages are allowed to manage group
                  membership for both upstream and downstream
                  multicast groups."
 ::= { dvbNiuSystem 13 }

-- =====
-- =  Software Group                                     =
-- =====

-- Software version table

dvbNiuSwVerTable OBJECT-TYPE
    SYNTAX      SEQUENCE OF DvbNiuSwVerEntry
    MAX-ACCESS   not-accessible
    STATUS       current
    DESCRIPTION
        "This table is used to check the versions of software stored
        in the NIU. It is also used to configure which/when
```

versions of software is executed."
 ::= { dvbNiuSoftware 1 }

dvbNiuSwVerEntry OBJECT-TYPE
SYNTAX DvbNiuSwVerEntry
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION

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"There will be a row for every storage slot within the
NIU. A slot is a location where a full software image
can be stored. Slot 0, is reserved for RAM."
INDEX { dvbNiuSwSlot }
 ::= { dvbNiuSwVerTable 1 }

DvbNiuSwVerEntry ::= SEQUENCE {
dvbNiuSwSlot Integer32,
dvbNiuSwVersion SnmpAdminString,
dvbNiuSwState INTEGER,
dvbNiuSwAction INTEGER,
dvbNiuSwDateTime DateAndTime
}

dvbNiuSwSlot OBJECT-TYPE
SYNTAX Integer32 (1..100)
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION
"The slot number the software image is held in. Slot 0 is
reserved for RAM, it is used to identify an image directly
loaded into RAM e.g. for debug purposes. The slots should
be consecutively numbered starting from 1."
 ::= { dvbNiuSwVerEntry 1 }

dvbNiuSwVersion OBJECT-TYPE
SYNTAX SnmpAdminString
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"The version of the software located in the slot. This is
a manufacturer dependant string."
 ::= { dvbNiuSwVerEntry 2 }

dvbNiuSwState OBJECT-TYPE
SYNTAX INTEGER {
executing(1),

```

        failed(2),
        none(3)
    }
MAX-ACCESS read-only
STATUS current
DESCRIPTION
    "The execution state of the software in the slot. If the
    s/w is currently executing the state will be executing(1).
    If the s/w tried to execute but failed it will be
    failed(2). If the s/w is not in use then it will be
    none(3)."
```

::= { dvbNiuSwVerEntry 3 }

```

dvbNiuSwAction OBJECT-TYPE
    SYNTAX      INTEGER {
```

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```

        boot(1),
        backup(2),
        none(3),
        emptySlot(4)
    }
MAX-ACCESS read-write
STATUS current
DESCRIPTION
    "When the NIU is initialising, this identifies which s/w
    image should be used.
```

boot - identifies that this s/w should be used at
initialisation. There must be one s/w version
with this action and there must be only one.

backup - is used to identify a s/w version to use in
the event that the boot version fails.
Multiple s/w versions may have this action.
In this case they will be tried in slot order.

none - is used to identify a s/w version that is not
used at initialisation.

emptySlot - identifies the slot as containing no s/w.
If this is applied to a slot that currently
contains a s/w image the image will be
erased and not identified in the slot."

::= { dvbNiuSwVerEntry 4 }

```

dvbNiuSwDateTime OBJECT-TYPE
    SYNTAX      DateAndTime
MAX-ACCESS read-only
STATUS current
DESCRIPTION
```

```
        "The date and time the image was downloaded to the slot."
 ::= { dvbNiuSwVerEntry 5 }
```

```
-- End of software version table
```

```
dvbNiuSwServerAddrType OBJECT-TYPE
```

```
    SYNTAX      InetAddressType
```

```
    MAX-ACCESS  read-write
```

```
    STATUS      current
```

```
    DESCRIPTION
```

```
        "The type of address used for the TFTP server."
```

```
 ::= { dvbNiuSoftware 2 }
```

```
dvbNiuSwServer OBJECT-TYPE
```

```
    SYNTAX      InetAddress
```

```
    MAX-ACCESS  read-write
```

```
    STATUS      current
```

```
    DESCRIPTION
```

```
        "This is the IP address of the TFTP server used for s/w
         updates"
```

```
 ::= { dvbNiuSoftware 3 }
```

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```
dvbNiuSwFilename OBJECT-TYPE
```

```
    SYNTAX      OCTET STRING (SIZE(0..500))
```

```
    MAX-ACCESS  read-write
```

```
    STATUS      current
```

```
    DESCRIPTION
```

```
        "This is the filename including the path for the software
         image that is to be downloaded."
```

```
 ::= { dvbNiuSoftware 4 }
```

```
dvbNiuSwDownloadSlot OBJECT-TYPE
```

```
    SYNTAX      Integer32 (0..100)
```

```
    MAX-ACCESS  read-write
```

```
    STATUS      current
```

```
    DESCRIPTION
```

```
        "This identifies the image slot which the software is to be
         downloaded into. The operator can manually select the slot
         to download into. Slot 0 is a special case which is used to
         identify a direct to RAM download, which should only be
         used for diagnostic purposes. By default this object will
         point to the first empty slot. If there are no empty slots
         it will point to the first backup image."
```

```
 ::= { dvbNiuSoftware 5 }
```

```
dvbNiuSwAdminStatus OBJECT-TYPE
```

```

SYNTAX      INTEGER {
                initUpgrd(1),
                contactingTFTPServer(2),
                downloadInProgress(3),
                failureTFTP(4),
                badImage(5),
                badHardware(6),
                downloadSuccessful(7),
                idle(8)
            }

```

MAX-ACCESS read-write

STATUS current

DESCRIPTION

"This will administer the software upgrade and provide status of its progress.

InitiateUpgrade	- This is the only admin selectable value and initiates the upgrade
ContactingTFTPServer	- The TFTP server is being contacted
DownloadInProgress	- The image is currently being downloaded to the Niu
TFTPFailure	- There was a failure at the TFTP layer while downloading
BadImage	- The downloaded software image failed an integrity check
BadHardware	- The downloaded software image is not suitable for the H/W platform
DownloadSuccessful	- The downloaded software image has been successful

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Idle	- No attempt to download software has been made since the last reset"
------	---

```
 ::= { dvbNiuSoftware 6 }
```

```

-- =====
-- =  DHCP Group                                     =
-- =====

```

dvbNiuDhcpTable OBJECT-TYPE

SYNTAX SEQUENCE OF DvbNiuDhcpEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"This table is used to manage the DHCP/BOOTP functionality on a per interface basis. All DHCP/BOOTP requests will be via the HFC interface."

```
 ::= { dvbNiuDhcp 1 }
```

```

dvbNiuDhcpEntry OBJECT-TYPE
    SYNTAX      DvbNiuDhcpEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "There will be a row for every interface within the
        equipment.
        For the HFC interface which is identified by 3 interfaces,
        the dvbRccMacLayer I/F shall be used to identify it.
        For an interface it is possible to specify the DHCP/BOOTP
        server to be used to obtain an IP address for the interface
        and any DHCP/BOOTP requests received on that interface that
        require relaying. Backup DHCP/BOOTP servers can be
        specified for each interface."
    INDEX { ifIndex, dvbNiuDhcpIndex }
    ::= { dvbNiuDhcpTable 1 }

```

```

DvbNiuDhcpEntry ::= SEQUENCE {
    dvbNiuDhcpIndex      Unsigned32,
    dvbNiuDhcpServerAddrType  InetAddressType,
    dvbNiuDhcpServer      InetAddress,
    dvbNiuDhcpRelay        INTEGER,
    dvbNiuDhcpReqIf        INTEGER,
    dvbNiuDhcpSerType      INTEGER,
    dvbNiuDhcpState        INTEGER,
    dvbNiuDhcpStatus       RowStatus
}

```

```

dvbNiuDhcpIndex OBJECT-TYPE
    SYNTAX      Unsigned32
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "Index used to order the application of backup
        entries."

```

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```

::= { dvbNiuDhcpEntry 1 }

```

```

dvbNiuDhcpServerAddrType OBJECT-TYPE
    SYNTAX      InetAddressType
    MAX-ACCESS  read-create
    STATUS      current
    DESCRIPTION
        "The type of IP address for the DHCP server."
    ::= { dvbNiuDhcpEntry 2 }

```

dvbNiuDhcpServer OBJECT-TYPE

SYNTAX InetAddress

MAX-ACCESS read-create

STATUS current

DESCRIPTION

"The IP address of the DHCP / BOOTP server to be used for
DHCP/BOOTP requests for the / received by the interface.
This server MUST be accessible through the HFC interface.
The broadcast IP address must be used when the IP address
is to be unspecified or the interface is the HFC
interface."

::= { dvbNiuDhcpEntry 3 }

dvbNiuDhcpRelay OBJECT-TYPE

SYNTAX INTEGER {
enabled(1),
disabled(2)
}

MAX-ACCESS read-create

STATUS current

DESCRIPTION

"This is used to select whether the NIU will relay
DHCP/BootP requests received from this interface to the HFC
interface. This option is ignored for the HFC interface.
enabled - relay DHCP/BootP as per RFCs 951,1542, 2131
disabled - discard DHCP/BootP"

DEFVAL { disabled }

::= { dvbNiuDhcpEntry 4 }

dvbNiuDhcpReqIf OBJECT-TYPE

SYNTAX INTEGER {
enabled(1),
disabled(2)
}

MAX-ACCESS read-create

STATUS current

DESCRIPTION

"This is used to select whether the NIU will request an IP
address by DHCP/BootP for this interface via the HFC
interface. If this is disabled then there must be an entry
in the static IP table for this interface.
enabled - request address by DHCP/BootP

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disabled - Use static IP address assignment"

-- DEFVAL { enabled } for the HFC interface

::= { dvbNiuDhcpEntry 5 }

dvbNiuDhcpSerType OBJECT-TYPE

SYNTAX INTEGER {
primary(1),
backup(2)
}

MAX-ACCESS read-create

STATUS current

DESCRIPTION

"This is used to identify whether the specified server for the interface is the primary server or backup. In the event that the primary server does not respond, the backup server is used. There can be only one primary server for an interface, but multiple backup servers. The backup servers use the values dvbNiuDhcpRelay and dvbNiuDhcpReqIf specified for the primary server for the interface, if a primary server is present otherwise the values are as defined for the backup server row. The order in which backup servers are tried is implied by the value of dvbNiuDhcpIndex, lowest first. This field is not applicable for the HFC interface."

DEFVAL { primary }

::= { dvbNiuDhcpEntry 6 }

dvbNiuDhcpState OBJECT-TYPE

SYNTAX INTEGER {
idle(1),
waitingForDHCPoffer(2),
waitingForDHCPack(3),
assigned(4)
}

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"This is the status for DHCP for this interface.
idle - No DHCP request has been made
waitingForDHCPoffer - Waiting for DHCP offer
waitingForDHCPack - Waiting for DHCP ack
assigned - IP address for I/F assigned by DHCP."

::= { dvbNiuDhcpEntry 7 }

dvbNiuDhcpStatus OBJECT-TYPE

SYNTAX RowStatus

MAX-ACCESS read-create

STATUS current

DESCRIPTION

"Controls and reflects the status of rows in this table. Rows in this table may be created by either the create-and-go or create-and-wait paradigms. There is no restriction on changing values in a row of this table while

```
        the row is active."
 ::= { dvbNiuDhcpEntry 8 }

-- =====
-- =   Event Group                               =
-- =====

dvbNiuEventPolicy OBJECT-TYPE
    SYNTAX      INTEGER {
                    wrap(1),
                    stop(2),
                    oneHour(3),
                    clearNow(4)
                }
    MAX-ACCESS   read-write
    STATUS       current
    DESCRIPTION
        "This defines event log policy.
         wrap      When full the log wraps
         stop      Stop event logging when full
         oneHour   Clear the log at the start of every hour
         clearNow  Clears the event log. Previous policy is
                    restored.

         At initial startup this object has the default value of
         wrap(1)."
```

```
 ::= { dvbNiuEvent 1 }

-- Event control table

dvbNiuEventControlTable OBJECT-TYPE
    SYNTAX      SEQUENCE OF DvbNiuEventControlEntry
    MAX-ACCESS   not-accessible
    STATUS       current
    DESCRIPTION
        "This table defines the action to be taken for the defined
         event priorities. A row will exist for each priority:
         Emergency, Alert, Critical, Error, Warning, Notice,
         Information and Debug. A bit field is used to identify the
         action to be taken for the event priority. Actions can be:
         place the event in the event table; issue an SNMP Trap"
```

```
 ::= { dvbNiuEvent 2 }

dvbNiuEventControlEntry OBJECT-TYPE
    SYNTAX      DvbNiuEventControlEntry
    MAX-ACCESS   not-accessible
```

```

STATUS      current
DESCRIPTION
    "There is a row per event and are recorded in chronological
    order."
INDEX { dvbNiuEventCtrlPriority }
::= { dvbNiuEventControlTable 1 }

```

```

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```

```

DvbNiuEventControlEntry ::= SEQUENCE {
    dvbNiuEventControlPriority    DvbEventPriority,
    dvbNiuEventControlAction     BITS
}

```

dvbNiuEventControlPriority OBJECT-TYPE

```

SYNTAX      DvbEventPriority
MAX-ACCESS  not-accessible
STATUS      current
DESCRIPTION

```

"The priority level that is controlled by this entry. These are ordered from most (emergency) to least (debug) critical. Each event with a NIU has a particular priority level associated with it (as defined by the vendor). During normal operation no event more critical than notice(6) should be generated. Events between warning and emergency should be generated at appropriate levels of problems (e.g. emergency when the box is about to crash)."

```

::= { dvbNiuEventControlEntry 1 }

```

dvbNiuEventControlAction OBJECT-TYPE

```

SYNTAX      BITS {
    local(0),
    trap(1)
}

```

```

MAX-ACCESS  read-write
STATUS      current
DESCRIPTION

```

"This defines the actions to perform when an event happens of this priority. local causes the event to be written to the local event log. trap causes a trap to be issued."

```

::= { dvbNiuEventControlEntry 2 }

```

-- Currently no traps are defined, these need to be added.

-- End of Event control table

dvbNiuEventTableMaxSize OBJECT-TYPE

```

SYNTAX      Integer32 (1..2147483647)
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
    "The maximum number of entries the event log may hold"
::= { dvbNiuEvent 3 }

```

```
-- Event table
```

```

dvbNiuEventTable OBJECT-TYPE
    SYNTAX      SEQUENCE OF DvbNiuEventEntry
    MAX-ACCESS  not-accessible
    STATUS      current

```

```

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```

```

DESCRIPTION
    "Contains a log of network and device events that may be of
    interest in fault isolation and trouble shooting."
::= { dvbNiuEvent 4 }

```

```

dvbNiuEventEntry OBJECT-TYPE
    SYNTAX      DvbNiuEventEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "Entries are created when an event occurs.
        dvbNiuEventPolicy can be used to clear the table in
        addition individual events can be deleted."
    INDEX { dvbNiuEventIndex }
::= { dvbNiuEventTable 1 }

```

```

DvbNiuEventEntry ::= SEQUENCE {
    dvbNiuEventIndex      Unsigned32,
    dvbNiuEventType       DvbEventPriority,
    dvbNiuEventDateTime   DateAndTime,
    dvbNiuEventDescription SnmpAdminString,
    dvbNiuEventCode       SnmpAdminString,
    dvbNiuEventStatus     RowStatus
}

```

```

dvbNiuEventIndex OBJECT-TYPE
    SYNTAX      Unsigned32
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "This provides relative ordering of the objects in the event
        log. This object will always increase except when
        (a) the log is reset via dvbNiuEventPolicy,

```

(b) the device reboots and does not implement non-volatile storage for this log, or (c) it reaches the value 2^{31} . The next entry for all the above cases is 1."

::= { dvbNiuEventEntry 1 }

dvbNiuEventType OBJECT-TYPE

SYNTAX DvbEventPriority

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"This is the priority of the event."

::= { dvbNiuEventEntry 2 }

dvbNiuEventDateTime OBJECT-TYPE

SYNTAX DateAndTime

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"This is the date and time the event occurred."

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::= { dvbNiuEventEntry 3 }

dvbNiuEventDescription OBJECT-TYPE

SYNTAX SnmpAdminString

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"This is a vendor specific textual description of the event."

::= { dvbNiuEventEntry 4 }

dvbNiuEventCode OBJECT-TYPE

SYNTAX SnmpAdminString

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"This is the event code which uniquely identifies the event.

The event codes should be in the form tppxxxxx where:-

t - identifies who allocated the event identifier; d =
dvb, v = vendor

pp - identifies the priority; em = emergency, al = alert,
cr = critical, er = error, wa = warning, no = notice,
in = information, de = debug

xxxxxxx - the event identifier which is 5 characters."

::= { dvbNiuEventEntry 5 }

```

dvbNiuEventStatus OBJECT-TYPE
    SYNTAX      RowStatus
    MAX-ACCESS  read-write
    STATUS      current
    DESCRIPTION
        "This is used to delete individual events. The only valid
        management operation is destroy, which causes the event to
        be deleted. When read this object should always return
        active."
 ::= { dvbNiuEventEntry 6 }

```

-- End of Event table

-- These apply to traps sent to all

```

dvbNiuEvThrottleAdminStatus OBJECT-TYPE
    SYNTAX      INTEGER {
                        unconstrained(1),
                        maintainBelowThreshold(2),
                        stopAtThreshold(3),
                        inhibited(4)
                    }
    MAX-ACCESS  read-write
    STATUS      current
    DESCRIPTION
        "Controls the transmission of traps with respect to the
        trap pacing threshold.

```

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unconstrained(1) causes traps to be transmitted without regard to the threshold settings.

maintainBelowThreshold(2) causes trap transmission to be suppressed if the number of traps would otherwise exceed the threshold.

stopAtThreshold(3) causes trap transmission to cease at the threshold, and not resume until directed to do so. See also [RFC 1224](#).

inhibited(4) causes all trap transmission messages to be suppressed.

Writing to this object resets the thresholding state.

At initial startup, this object has a default value of unconstrained(1).

All the network managers with the trap capability as per [RFC2573](#) will be treated as a single entity with regard to Trap management. This is done to simplify implementation

```
        within the NIU."
 ::= { dvbNiuEvent 5 }
```

dvbNiuEvThrottleInhibited OBJECT-TYPE

SYNTAX TruthValue

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"If true(1), trap is currently inhibited due to thresholds and/or the current setting of dvbNiuEvThrottleAdminStatus. In addition, this is set to true(1) if transmission is inhibited due to no trap (dvbNiuNmAccessEntry) destinations having been set."

```
 ::= { dvbNiuEvent 6 }
```

dvbNiuEvThrottleThreshold OBJECT-TYPE

SYNTAX Unsigned32

MAX-ACCESS read-write

STATUS current

DESCRIPTION

"Number of trap events per DvbNiuEvThrottleInterval to be transmitted before throttling."

At initial startup, this object returns 0."

```
 ::= { dvbNiuEvent 7 }
```

dvbNiuEvThrottleInterval OBJECT-TYPE

SYNTAX Integer32 (1..2147483647)

UNITS "seconds"

MAX-ACCESS read-write

STATUS current

DESCRIPTION

"The interval over which the trap threshold applies. At initial startup, this object has a value of 1."

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```
 ::= { dvbNiuEvent 8 }
```

```
-- =====
-- = IP Filter Group =
-- =====
```

dvbNiuIpFilterEnable OBJECT-TYPE

SYNTAX INTEGER {

enabled(1),

countHits(3),

disabled(4)

```

    }
MAX-ACCESS read-write
STATUS current
DESCRIPTION
    "This controls the IP filter table.
        enable - Enables the IP filter table.
        countHits - This option is used to debug the filter
                    table. It allows packets to be checked
                    against the filter table and increments
                    dvbNiuIpFilterMatches for a matching
                    filter, but ALL PACKETS ARE ALLOWED
                    THROUGH.
        disabled - Disables IP filtering, all packets are
                    allowed through.

        At initial startup this object has the default value of
        disabled(4)."
```

::= { dvbNiuIpFilter 1 }

dvbNiuIpFilterTable OBJECT-TYPE

```

SYNTAX SEQUENCE OF DvbNiuIpFilterEntry
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION
```

"An ordered list of filters or classifiers to apply to IP traffic. Filter application is ordered by the filter index, rather than by a best match algorithm (Note that this implies that the filter table may have gaps in the index values). Packets which have matched no filters will be discarded i.e. no hits on any filter.

Any IP packet can theoretically match multiple rows of this table. When considering a packet, the table is scanned in row index order (e.g. filter 10 is checked before filter 20). If the packet matches that filter (which means that it matches ALL criteria for that row), actions appropriate to dvbNiuIpFilterAction and dvbNiuIpFilterActionPtr are taken. If the packet was discarded processing is complete. If

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```

        dvbNiuIpFilterContinue is set to true, the filter
        comparison continues with the next row in the table
        looking for additional matches."
 ::= { dvbNiuIpFilter 2 }
```

dvbNiuIpFilterEntry OBJECT-TYPE

```

SYNTAX      DvbNiuIpFilterEntry
MAX-ACCESS  not-accessible
STATUS      current
DESCRIPTION
    "Describes a filter to apply to IP traffic received on a
    specified interface. All identity objects in this table
    (e.g. source and destination address/mask, protocol,
    source/dest port, TOS/mask, interface and direction) must
    match their respective fields in the packet for any given
    filter to match.

    To create an entry in this table, dvbNiuIpFilterIfIndex
    must be specified."
    INDEX { dvbNiuIpFilterIndex }
 ::= { dvbNiuIpFilterTable 1 }

DvbNiuIpFilterEntry ::= SEQUENCE {
    dvbNiuIpFilterIndex      Unsigned32,
    dvbNiuIpFilterStatus     RowStatus,
    dvbNiuIpFilterIfIndex    InterfaceIndexOrZero,
    dvbNiuIpFilterDirection  INTEGER,
    dvbNiuIpFilterTos        OCTET STRING,
    dvbNiuIpFilterTosMask    OCTET STRING,
    dvbNiuIpFilterSrcAddrType InetAddressType,
    dvbNiuIpFilterSrcAddr     InetAddress,
    dvbNiuIpFilterSrcMaskType InetAddressType,
    dvbNiuIpFilterSrcMask     InetAddress,
    dvbNiuIpFilterDstAddrType InetAddressType,
    dvbNiuIpFilterDstAddr     InetAddress,
    dvbNiuIpFilterDstMaskType InetAddressType,
    dvbNiuIpFilterDstMask     InetAddress,
    dvbNiuIpFilterProtocol    Integer32,
    dvbNiuIpFilterSrcPortLow  Integer32,
    dvbNiuIpFilterSrcPortHigh Integer32,
    dvbNiuIpFilterDstPortLow  Integer32,
    dvbNiuIpFilterDstPortHigh Integer32,
    dvbNiuIpFilterAction      INTEGER,
    dvbNiuIpFilterMatches     Counter32,
    dvbNiuIpFilterContinue    TruthValue,
    dvbNiuIpFilterActionPtr    Integer32
}

dvbNiuIpFilterIndex OBJECT-TYPE
    SYNTAX      Unsigned32
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION

```

```

        "Index used to order the application of filters.
        The filter with the lowest index is always applied
        first."
    ::= { dvbNiuIpFilterEntry 1 }

dvbNiuIpFilterStatus OBJECT-TYPE
    SYNTAX      RowStatus
    MAX-ACCESS   read-create
    STATUS       current
    DESCRIPTION
        "Controls and reflects the status of rows in this
        table. Specifying only this object (with the appropriate
        index) on a NIU is sufficient to create a filter row which
        matches all inbound packets on the Ethernet interface,
        and results in the packets being discarded. Creation of
        the rows may be done via either create-and-wait or
        create-and-go, but the filter is not applied until this
        object is set to (or changes to) active. There is no
        restriction in changing any object in a row while this
        object is set to active."
    ::= { dvbNiuIpFilterEntry 2 }

dvbNiuIpFilterIfIndex OBJECT-TYPE
    SYNTAX      InterfaceIndexOrZero
    MAX-ACCESS   read-create
    STATUS       current
    DESCRIPTION
        "The entry interface to which this filter applies. The
        value corresponds to ifIndex for either a CATV MAC or
        another network interface. If the value is zero, the
        filter applies to all interfaces. Default value in NIU
        is the index of the customer-side (e.g. ethernet)
        interface."
    ::= { dvbNiuIpFilterEntry 4 }

dvbNiuIpFilterDirection OBJECT-TYPE
    SYNTAX INTEGER {
        inbound(1),
        outbound(2),
        both(3)
    }
    MAX-ACCESS   read-create
    STATUS       current
    DESCRIPTION
        "Determines whether the filter is applied to inbound(1)
        traffic, outbound(2) traffic, or traffic in both(3)
        directions."
    DEFVAL { inbound }
    ::= { dvbNiuIpFilterEntry 5 }

```

dvbNiuIpFilterTos OBJECT-TYPE
SYNTAX OCTET STRING (SIZE (1))

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MAX-ACCESS read-create
STATUS current
DESCRIPTION
"This is the value to be matched to the packet's
TOS (Type of Service) value (after the TOS value
is AND'd with dvbNiuIpFilterTosMask). A value for this
object of 0 and a mask of 0 matches all TOS values."
DEFVAL { '00'h }
::= { dvbNiuIpFilterEntry 6 }

dvbNiuIpFilterTosMask OBJECT-TYPE
SYNTAX OCTET STRING (SIZE (1))
MAX-ACCESS read-create
STATUS current
DESCRIPTION
"The mask to be applied to the packet's TOS value before
matching."
DEFVAL { '00'h }
::= { dvbNiuIpFilterEntry 7 }

dvbNiuIpFilterSrcAddrType OBJECT-TYPE
SYNTAX InetAddressType
MAX-ACCESS read-create
STATUS current
DESCRIPTION
"The type of IP address for the source address."
::= { dvbNiuIpFilterEntry 8 }

dvbNiuIpFilterSrcAddr OBJECT-TYPE
SYNTAX InetAddress
MAX-ACCESS read-create
STATUS current
DESCRIPTION
"The source IP address, or portion thereof, that is to be
matched for this filter. The source address is first
masked (and'ed) against dvbNiuIpFilterSrcMask before being
compared to this value. A value of 0 for this object
and 0 for the mask matches all IP addresses."
::= { dvbNiuIpFilterEntry 9 }

dvbNiuIpFilterSrcMaskType OBJECT-TYPE
SYNTAX InetAddressType
MAX-ACCESS read-create

```

STATUS      current
DESCRIPTION
    "The type of IP address for the source address mask."
::= { dvbNiuIpFilterEntry 10 }

```

dvbNiuIpFilterSrcMask OBJECT-TYPE

```

SYNTAX      InetAddress
MAX-ACCESS  read-create
STATUS      current
DESCRIPTION

```

```

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```

```

    "A bit mask that is to be applied to the source address
    prior to matching. This mask is not necessarily the same
    as a subnet mask, but 1's bits must be leftmost and
    contiguous."
::= { dvbNiuIpFilterEntry 11 }

```

dvbNiuIpFilterDstAddrType OBJECT-TYPE

```

SYNTAX      InetAddressType
MAX-ACCESS  read-create
STATUS      current
DESCRIPTION

```

```

    "The type of IP address for the destination address."
::= { dvbNiuIpFilterEntry 12 }

```

dvbNiuIpFilterDstAddr OBJECT-TYPE

```

SYNTAX      InetAddress
MAX-ACCESS  read-create
STATUS      current
DESCRIPTION

```

```

    "The destination IP address, or portion thereof, that is
    to be matched for this filter. The destination address is
    first masked (and'ed) against dvbNiuIpFilterDstMask before
    being compared to this value. A value of 0 for this
    object and 0 for the mask matches all IP addresses."
::= { dvbNiuIpFilterEntry 13 }

```

dvbNiuIpFilterDstMaskType OBJECT-TYPE

```

SYNTAX      InetAddressType
MAX-ACCESS  read-create
STATUS      current
DESCRIPTION

```

```

    "The type of IP address for the destination address mask."
::= { dvbNiuIpFilterEntry 14 }

```

dvbNiuIpFilterDstMask OBJECT-TYPE

```

SYNTAX      InetAddress

```

```

MAX-ACCESS    read-create
STATUS        current
DESCRIPTION
    "A bit mask that is to be applied to the destination
    address prior to matching. This mask is not necessarily
    the same as a subnet mask, but 1's bits must be leftmost
    and contiguous."
::= { dvbNiuIpFilterEntry 15 }

dvbNiuIpFilterProtocol OBJECT-TYPE
    SYNTAX      Integer32 (0..256)
    MAX-ACCESS   read-create
    STATUS       current
    DESCRIPTION
        "The IP protocol value that is to be matched. For example:
        icmp is 1, tcp is 6, udp is 17. A value of 256 matches
        ANY protocol."

```

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```

DEFVAL { 256 }
::= { dvbNiuIpFilterEntry 16 }

dvbNiuIpFilterSrcPortLow OBJECT-TYPE
    SYNTAX      Integer32 (0..65535)
    MAX-ACCESS   read-create
    STATUS       current
    DESCRIPTION
        "If dvbNiuIpFilterProtocol is udp or tcp, this is the
        inclusive lower bound of the transport-layer source port
        range that is to be matched, otherwise it is ignored
        during matching."
    DEFVAL { 0 }
::= { dvbNiuIpFilterEntry 17 }

dvbNiuIpFilterSrcPortHigh OBJECT-TYPE
    SYNTAX      Integer32 (0..65535)
    MAX-ACCESS   read-create
    STATUS       current
    DESCRIPTION
        "If dvbNiuIpFilterProtocol is udp or tcp, this is the
        inclusive upper bound of the transport-layer source port
        range that is to be matched, otherwise it is ignored
        during matching."
    DEFVAL { 65535 }
::= { dvbNiuIpFilterEntry 18 }

dvbNiuIpFilterDstPortLow OBJECT-TYPE
    SYNTAX      Integer32 (0..65535)

```

```

MAX-ACCESS    read-create
STATUS        current
DESCRIPTION
    "If dvbNiuIpFilterProtocol is udp or tcp, this is the
    inclusive lower bound of the transport-layer destination
    port range that is to be matched, otherwise it is ignored
    during matching."
DEFVAL { 0 }
::= { dvbNiuIpFilterEntry 19 }

```

```

dvbNiuIpFilterDstPortHigh OBJECT-TYPE
    SYNTAX      Integer32 (0..65535)
    MAX-ACCESS  read-create
    STATUS      current
    DESCRIPTION
        "If dvbNiuIpFilterProtocol is udp or tcp, this is the
        inclusive upper bound of the transport-layer destination
        port range that is to be matched, otherwise it is ignored
        during matching."
    DEFVAL { 65535 }
    ::= { dvbNiuIpFilterEntry 20 }

```

```

dvbNiuIpFilterAction OBJECT-TYPE
    SYNTAX      INTEGER {

```

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```

        discard(1),
        accept(2),
        nat(3),
        napt(4),
        tosmap(5)
    }
MAX-ACCESS    read-create
STATUS        current
DESCRIPTION
    "This is the action to be performed if there is a match
    against this filter. Possible actions are:
    discard - Discard the packet.
    accept  - Accept the packet for further processing /
              forwarding.
    nat     - Perform network address translation on this
              packet.
              This is used to identify internal addresses that
              can be mapped to external addresses.
    napt    - Perform network port address translation on this
              packet. This is used to identify internal
              addresses that can be mapped to an external
              address/port.

```

```

        tosmap - Apply TOS to this packet."
    DEFVAL { discard }
    ::= { dvbNiuIpFilterEntry 21 }

dvbNiuIpFilterMatches OBJECT-TYPE
    SYNTAX      Counter32
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "Counts the number of times this filter was matched.
        This object is initialized to 0 at boot, or at row
        creation, and is reset only upon reboot."
    ::= { dvbNiuIpFilterEntry 22 }

dvbNiuIpFilterContinue OBJECT-TYPE
    SYNTAX      TruthValue
    MAX-ACCESS  read-create
    STATUS      current
    DESCRIPTION
        "If this value is set to true and dvbNiuIpFilterAction
        is not discard, continue scanning and applying
        matching filter actions."
    DEFVAL { false }
    ::= { dvbNiuIpFilterEntry 23 }

dvbNiuIpFilterActionPtr OBJECT-TYPE
    SYNTAX      Integer32 (0..2147483647)
    MAX-ACCESS  read-create
    STATUS      current
    DESCRIPTION
        "This object identifies the dvbNiuIpTosMapPolicyId

```

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```

        in dvbNiuIpTOSMapTable that is to be applied if
        dvbNiuIpFilterAction is set to tosmap.
        If no matching policy exists, treat as if
        dvbNiuIpFilterAction were set to accept (1).
        If this object is set to the value of 0, there is no
        matching policy, and dvbNiuIpTOSMapTable MUST NOT be
        consulted."
    DEFVAL { 0 }
    ::= { dvbNiuIpFilterEntry 24 }

-- End of IP filter table

-- TOS Map Table

dvbNiuIpTOSMapTable OBJECT-TYPE

```

SYNTAX SEQUENCE OF DvbNiuIpTOSMapEntry
 MAX-ACCESS not-accessible
 STATUS current
 DESCRIPTION
 "A Table which maps between a policy id
 (dvbNiuIpTosMapPolicyId) and a policy to be applied. This
 table applies only to the TOS within the IP header.
 Policy ID 0 is reserved."
 ::= { dvbNiuIpFilter 3 }

dvbNiuIpTOSMapEntry OBJECT-TYPE

SYNTAX DvbNiuIpTOSMapEntry
 MAX-ACCESS not-accessible
 STATUS current
 DESCRIPTION
 "Table used to describe Type of Service (TOS) bits
 processing.

 This table is an adjunct to the dvbNiuIpFilterTable.
 Entries in the latter table can point to specific rows
 in this (and other) tables and cause specific actions to
 be taken. This table permits the manipulation of the value
 of the Type of Service bits in the IP header of the matched
 packet as follows:
 Set the tosBits of the packet to
 (tosBits & dvbNiuIpTosMapAndMask) | dvbNiuIpTosMapOrMask

 This construct allows you to do a clear and set of all
 the TOS bits in a flexible manner."
 INDEX { dvbNiuIpTosMapIndex }
 ::= { dvbNiuIpTOSMapTable 1 }

DvbNiuIpTOSMapEntry ::= SEQUENCE {
 dvbNiuIpTosMapIndex Unsigned32,
 dvbNiuIpTosMapPolicyId Unsigned32,
 dvbNiuIpTosMapStatus RowStatus,
 dvbNiuIpTosMapAndMask OCTET STRING (SIZE (1)),
 dvbNiuIpTosMapOrMask OCTET STRING (SIZE (1))

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}

dvbNiuIpTosMapIndex OBJECT-TYPE

SYNTAX Unsigned32
 MAX-ACCESS not-accessible
 STATUS current
 DESCRIPTION
 "The unique index for this row. There are no ordering

```

        requirements for this table and any valid index may be
        specified."
 ::= { dvbNiuIpTOSMapEntry 1 }

dvbNiuIpTosMapPolicyId OBJECT-TYPE
    SYNTAX      Unsigned32
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "The unique index for this row.  There are no ordering
        requirements for this table and any valid index may be
        specified.  This index is used by dvbNiuIpFilterPolicyId as
        the pointer to the TOS mapping to be performed."
 ::= { dvbNiuIpTOSMapEntry 2 }

dvbNiuIpTosMapStatus OBJECT-TYPE
    SYNTAX      RowStatus
    MAX-ACCESS  read-create
    STATUS      current
    DESCRIPTION
        "The object used to create and delete entries in this
        table.  A row created by specifying just this object
        results in a row which specifies no change to the TOS
        bits.  A row may be created using either the create-and-go
        or create-and-wait paradigms.  There is no restriction on
        the ability to change values in this row while the row is
        active."
 ::= { dvbNiuIpTOSMapEntry 3 }

dvbNiuIpTosMapAndMask OBJECT-TYPE
    SYNTAX      OCTET STRING (SIZE (1))
    MAX-ACCESS  read-create
    STATUS      current
    DESCRIPTION
        "This value is bitwise AND'd with the matched packet's
        TOS bits."
    DEFVAL { 'ff'h }
 ::= { dvbNiuIpTOSMapEntry 4 }

dvbNiuIpTosMapOrMask OBJECT-TYPE
    SYNTAX      OCTET STRING (SIZE (1))
    MAX-ACCESS  read-create
    STATUS      current
    DESCRIPTION
        "After bitwise AND'ing with the above bits, the packet's

```

TOS bits are bitwise OR'd with these bits."

```

        DEFVAL { '00'h }
::= { dvbNiuIpTOSMapEntry 5 }

-- End of TOS Map table

-- =====
-- =   NAT Group                                     =
-- =====

-- NAT assignment table

dvbNiuNatTable OBJECT-TYPE
    SYNTAX      SEQUENCE OF DvbNiuNatEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "This table is used to list external IP addresses available
        for assignment to internal IP addresses. The filter table
        is used to identify internal addresses that require NAT
        before entering the external domain (upstream). In the
        downstream direction NAT (inverse of the NAT applied in the
        upstream) is applied before applying the IP filter table.
        NAT assignment algorithms are vendor dependant. When an
        external IP address is no longer assigned to an IP address,
        dvbNiuNatIntIp should be all 0's. If there are no free
        external addresses the packet requiring translation should
        be dropped.

        NAPT is not applicable to multicast packets."
::= { dvbNiuNat 1 }

dvbNiuNatEntry OBJECT-TYPE
    SYNTAX      DvbNiuNatEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "A row should be created for each external IP address
        available for translation. When an internal address is
        assigned to an external address, dvbNiuNatIntIp will
        contained the mapped internal address."
    INDEX { dvbNiuNatExtIpType, dvbNiuNatExtIp }
::= { dvbNiuNatTable 1 }

DvbNiuNatEntry ::= SEQUENCE {
    dvbNiuNatExtIpType InetAddressType,
    dvbNiuNatExtIp     InetAddress,
    dvbNiuNatIntIpType InetAddressType,
    dvbNiuNatIntIp     InetAddress,
    dvbNiuNatStatus    RowStatus
}

```

dvbNiuNatExtIpType OBJECT-TYPE

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SYNTAX InetAddressType

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"The type of the external IP address available for NAT assignment"

::= { dvbNiuNatEntry 1 }

dvbNiuNatExtIp OBJECT-TYPE

SYNTAX InetAddress (SIZE (1..64))

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"An external IP address available for NAT assignment"

::= { dvbNiuNatEntry 2 }

dvbNiuNatIntIpType OBJECT-TYPE

SYNTAX InetAddressType

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The type of the internal IP address assigned for NAT."

::= { dvbNiuNatEntry 3 }

dvbNiuNatIntIp OBJECT-TYPE

SYNTAX InetAddress

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The internal IP address assigned to the external IP address. If no address is assigned this will be all 0's."

::= { dvbNiuNatEntry 4 }

dvbNiuNatStatus OBJECT-TYPE

SYNTAX RowStatus

MAX-ACCESS read-create

STATUS current

DESCRIPTION

"This controls and reflects the status of the row. Rows can be created by using both createAndGo and createAndWait. Rows can be modified/deleted ONLY if the dvbNiuNatIntIp is all 0's. notInService can be applied to a row which currently has dvbNiuNatIntIp assigned, in this case when dvbNiuNatIntIp become free (all 0's) the associated dvbNiuNatExtIp cannot be used for further

```
        assignments."
::= { dvbNiuNatEntry 5 }

-- End of NAT table
```

```
-- =====
-- =   NAPT Group                                     =
```

```
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```

```
-- =====
```

```
dvbNiuNaptAddrType OBJECT-TYPE
    SYNTAX      InetAddressType
    MAX-ACCESS   read-write
    STATUS       current
    DESCRIPTION
        "The type of external IP address to be used for NAPT."
::= { dvbNiuNapt 1 }
```

```
dvbNiuNaptAddr OBJECT-TYPE
    SYNTAX      InetAddress
    MAX-ACCESS   read-write
    STATUS       current
    DESCRIPTION
        "The external IP address to be used for NAPT.
        The filter table is used to identify internal
        addresses that require NAPT before entering the
        external domain (upstream). In the downstream direction
        NAPT (inverse of the NAPT applied in the upstream) is
        applied before applying the IP filter table. NAPT
        assignment algorithms are vendor dependant. The value of
        all 0's specifies that NAPT is not available and the packet
        requiring it should be discarded. A value with all bits
        set to 1 specifies that NAPT will use the IP address
        assigned to the HFC interface.

        NAPT is not applicable to multicast packets.

        At initial startup this object has the default value of
        all 0's"
::= { dvbNiuNapt 2 }
```

```
-- NAPT assignment table
```

```
dvbNiuNaptTable OBJECT-TYPE
    SYNTAX      SEQUENCE OF DvbNiuNaptEntry
    MAX-ACCESS   not-accessible
    STATUS       current
```

DESCRIPTION

"This table lists the current internal/external port assignments. The NAPT assignment algorithms used for port assignments are vendor dependant."

::= { dvbNiuNapt 3 }

dvbNiuNaptEntry OBJECT-TYPE

SYNTAX DvbNiuNaptEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"A row should be created for each internal to external port mapping. Each row contains the internal and external ports used in the mapping, and the internal IP address of the

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host being mapped. When the assignment is no longer required the row should be deleted."

INDEX { dvbNiuNaptExtPort }

::= { dvbNiuNaptTable 1 }

DvbNiuNaptEntry ::= SEQUENCE {

dvbNiuNaptExtPort Integer32,

dvbNiuNaptIntPort Integer32,

dvbNiuNaptIntIpType InetAddressType,

dvbNiuNaptIntIp InetAddress

}

dvbNiuNaptExtPort OBJECT-TYPE

SYNTAX Integer32 (1..65535)

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"The external port assigned to the internal port/IP Address."

::= { dvbNiuNaptEntry 1 }

dvbNiuNaptIntPort OBJECT-TYPE

SYNTAX Integer32 (1..65535)

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The internal port that required mapping to the external port."

::= { dvbNiuNaptEntry 2 }

dvbNiuNaptIntIpType OBJECT-TYPE

SYNTAX InetAddressType

```

MAX-ACCESS    read-only
STATUS        current
DESCRIPTION
    "The internal IP address type."
::= { dvbNiuNaptEntry 3 }

dvbNiuNaptIntIp OBJECT-TYPE
    SYNTAX      InetAddress
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "The internal IP address of the host to which the port
         mapping is being applied."
    ::= { dvbNiuNaptEntry 4 }

-- End of NAPT table

-- =====
-- =   Ethernet Filters Group                               =
-- =====

```

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```

dvbNiuEthernetFilterEnable
OBJECT-TYPE
    SYNTAX      INTEGER {
                    enabled(1),
                    countHits(2),
                    disabled(3)
                }
    MAX-ACCESS  read-write
    STATUS      current
    DESCRIPTION
        "This controls the Ethernet filter table.
         enable      - Enables the Ethernet filter table.
         countHits   - This option is used to debug the filter
                       table. It allows frames to be checked
                       against the filter table and increments
                       dvbNiuEthernetFilterMatches for a matching
                       filter, but ALL frames ARE ALLOWED
                       THROUGH.
         disabled    - Disables Ethernet filtering, all frames
                       are allowed through.

         At initial startup this object has the default value of
         disabled(3)."
    ::= { dvdNiuEthFilter 1 }

```

dvbNiuEthernetFilterTable OBJECT-TYPE

SYNTAX SEQUENCE OF DvbNiuEthernetFilterEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"A list of filters to apply to Ethernet type frames to control the types of upper layer protocols that can be transported. The EtherType/LLC field is examined and the filter table is checked to see if there is a filter for the protocol. If no match is found the frame is discarded, otherwise the filter action is performed.

The filter table does not have to be ordered as there can be only one possible match."

::= { dvbNiuEthFilter 2 }

dvbNiuEthernetFilterEntry OBJECT-TYPE

SYNTAX DvbNiuEthernetFilterEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"Describes a filter to apply to Ethernet frame received on a specified interface. The dvbNiuEthernetFilterProtocol in this table must match its respective fields in the frame for any given filter to match."

INDEX { dvbNiuEthernetFilterIndex }

::= { dvbNiuEthernetFilterTable 1 }

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DvbNiuEthernetFilterEntry ::= SEQUENCE {

dvbNiuEthernetFilterIndex Unsigned32,

dvbNiuEthernetFilterStatus RowStatus,

dvbNiuEthernetFilterIfIndex InterfaceIndexOrZero,

dvbNiuEthernetFilterEtherType INTEGER,

dvbNiuEthernetFilterProtocol Integer32,

dvbNiuEthernetFilterAction INTEGER,

dvbNiuEthernetFilterMatches Counter32

}

dvbNiuEthernetFilterIndex OBJECT-TYPE

SYNTAX Unsigned32

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"The unique index for this row. There are no ordering requirements for this table and any valid index may be specified."

```
::= { dvbNiuEthernetFilterEntry 1 }
```

dvbNiuEthernetFilterStatus OBJECT-TYPE

```
SYNTAX      RowStatus
MAX-ACCESS  read-create
STATUS      current
DESCRIPTION
```

"Controls and reflects the status of rows in this table. Creation of the rows may be done via either create-and-wait or create-and-go, but the filter is not applied until this object is set to (or changes to) active. There is no restriction in changing any object in a row while this object is set to active."

```
::= { dvbNiuEthernetFilterEntry 2 }
```

dvbNiuEthernetFilterIfIndex OBJECT-TYPE

```
SYNTAX      InterfaceIndexOrZero
MAX-ACCESS  read-create
STATUS      current
DESCRIPTION
```

"The entry interface to which this filter applies. The value corresponds to ifIndex for either a CATV MAC or another network interface. If the value is zero, the filter applies to all interfaces. Default value in NIUs is the index of the customer-side (e.g. ethernet) interface."

```
::= { dvbNiuEthernetFilterEntry 3 }
```

dvbNiuEthernetFilterEtherType OBJECT-TYPE

```
SYNTAX      INTEGER {
                ethernet2(1),
                snap(2),
                llc(3)
            }
MAX-ACCESS  read-create
```

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```
STATUS      current
DESCRIPTION
```

"The format of the etherent frame. This can be Ethernet2, 802.2 SNAP or 802.2 LLC. This is used to correctly locate the field identifying the protocol being transported."

```
::= { dvbNiuEthernetFilterEntry 4 }
```

dvbNiuEthernetFilterProtocol OBJECT-TYPE

```
SYNTAX      Integer32 (1..65535)
MAX-ACCESS  read-create
```

```

STATUS      current
DESCRIPTION
    "The protocol to filter on.  For Ethernet2 and 802.2 SNAP
    the value in the EtherType field is checked.  For 802.2 LLC
    the value in the SAP field is checked."
::= { dvbNiuEthernetFilterEntry 4 }

```

dvbNiuEthernetFilterAction OBJECT-TYPE

```

SYNTAX      INTEGER {
                accept(1),
                discard(2)
            }
MAX-ACCESS  read-create
STATUS      current
DESCRIPTION
    "The action to be taken when there is a filter match.  If
    it is accept, the frame will be forwarded otherwise
    the frame will be discarded."
::= { dvbNiuEthernetFilterEntry 5 }

```

dvbNiuEthernetFilterMatches OBJECT-TYPE

```

SYNTAX      Counter32
MAX-ACCESS  read-create
STATUS      current
DESCRIPTION
    "Counts the number of times this filter was matched.
    This object is initialized to 0 at boot, or at row
    creation, and is reset only upon reboot."
::= { dvbNiuEthernetFilterEntry 6 }

```

```

-- =====
-- =  CPE IP Management and anti spoofing group                      =
-- =====

```

-- This CPE section is taken from [RFC2669](#) and enhanced

dvbNiuCpeEnroll OBJECT-TYPE

```

SYNTAX      INTEGER {
                none(1),
                any(2),
            }

```

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```

MAX-ACCESS  read-write
STATUS      current
DESCRIPTION
    "This object controls the population of dvbNiuCpeTable.

```

If set to none, the filters must be set manually.
 If set to any, the NIU sniffs the packets originating from the Ethernet and enrolls up to dvbNiuCpeIpMax addresses based on the source IP addresses of those packets. At initial system startup, default value for this object is any(2)."

```
::= { dvbNiuCpe 1 }
```

dvbNiuCpeIpMax OBJECT-TYPE
 SYNTAX Integer32 (-1..2147483647)
 MAX-ACCESS read-write
 STATUS current
 DESCRIPTION
 "This object controls the maximum number of CPEs allowed to connect behind this device. If set to zero, any number of CPEs may connect up to the maximum permitted for the device or the maximum allowed for the subnet configured for the CPE (subscriber) interface, whichever is the smaller. If set to -1, no filtering is done on CPE source addresses, and no entries are made in the dvbNiuCpeTable.
 If an attempt is made to set this to a number greater than that permitted for the device/subnet, it is set to that maximum of the smallest value (device or subnet).
 At initial system startup, default value for this object is -1."

```
::= { dvbNiuCpe 2 }
```

dvbNiuCpeTable OBJECT-TYPE
 SYNTAX SEQUENCE OF DvbNiuCpeEntry
 MAX-ACCESS not-accessible
 STATUS current
 DESCRIPTION
 "This table lists the IP addresses seen (or permitted) as source addresses in packets originating from the customer interface on this device. In addition, this table can be provisioned with the specific addresses permitted for the CPEs via the normal row creation mechanisms."

```
::= { dvbNiuCpe 3 }
```

dvbNiuCpeEntry OBJECT-TYPE
 SYNTAX DvbNiuCpeEntry
 MAX-ACCESS not-accessible
 STATUS current
 DESCRIPTION
 "An entry in the dvbNiuCpeTable. There is one entry for each IP CPE seen or provisioned. If dvbNiuCpeIpMax is set to -1, this table is ignored, otherwise: Upon receipt of an IP packet from the customer interface of the CM, the source IP address is checked against this table. If

the address is in the table, packet processing continues.

If the address is not in the table, but dvbNiuCpeEnroll is set to any and the table size is less than dvbNiuCpeIpMax, the address is added to the table and packet processing continues. Otherwise, the packet is dropped.

The filtering actions specified by this table occur after any Ethernet filtering (dvbNiuEthernetFilterTable), but prior to any IP filtering (dvbNiuIpFilterTable)."

```
INDEX    { dvbNiuCpeAddrType, dvbNiuCpeIp }
 ::= { dvbNiuCpeTable 1 }
```

```
DvbNiuCpeEntry ::= SEQUENCE {
    dvbNiuCpeIpType      InetAddressType,
    dvbNiuCpeIp          InetAddress,
    dvbNiuCpeMaskType    InetAddressType,
    dvbNiuCpeMask        InetAddress,
    dvbNiuCpeSource      INTEGER,
    dvbNiuCpeStatus      RowStatus
}
```

```
dvbNiuCpeIpType OBJECT-TYPE
    SYNTAX      InetAddressType
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "The type of IP address used for the identified CPE."
 ::= { dvbNiuCpeEntry 1 }
```

```
dvbNiuCpeIp OBJECT-TYPE
    SYNTAX      InetAddress
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "The IP address to which this entry applies."
 ::= { dvbNiuCpeEntry 2 }
```

```
dvbNiuCpeMaskType OBJECT-TYPE
    SYNTAX      InetAddressType
    MAX-ACCESS  read-create
    STATUS      current
    DESCRIPTION
        "The type of IP address for the CPE address mask."
 ::= { dvbNiuCpeEntry 3 }
```

```
dvbNiuCpeMask OBJECT-TYPE
```

SYNTAX InetAddress
MAX-ACCESS read-create
STATUS current
DESCRIPTION

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"A bit mask that is to be applied to the CPE source IP address prior to matching. This mask is not necessarily the same as a subnet mask, but 1's bits must be leftmost and contiguous. When created automatically this will be all 1's. For manual entries, it can be used to represent a range (subnet) thus reducing the number of entries in the table."

::= { dvbNiuCpeEntry 4 }

dvbNiuCpeSource OBJECT-TYPE

SYNTAX INTEGER {
 other(1),
 manual(2),
 learned(3)
 }

MAX-ACCESS read-only
STATUS current

DESCRIPTION

"This object describes how this entry was created. If the value is manual(2), this row was created by a network management action (either configuration, or SNMP set). If set to learned(3), then it was found via looking at the source IP address of a received packet."

::= { dvbNiuCpeEntry 5 }

dvbNiuCpeStatus OBJECT-TYPE

SYNTAX RowStatus
MAX-ACCESS read-create
STATUS current
DESCRIPTION

"Controls and reflects the status of rows in this table. Creation of the rows may be done via either create-and-wait or create-and-go. There is no restriction in changing any object in a row while this object is set to active."

::= { dvbNiuCpeEntry 6 }

-- Conformance statements

dvbNiuCompliance MODULE-COMPLIANCE

STATUS current

DESCRIPTION

"The compliance statement for EuroModem NIUs which implement the DVB-CABLE-NIU-MIB MIB. An implementation only has to support IPv4 addresses to be compliant."

MODULE -- dvbNiu

MANDATORY-GROUPS { dvbNiuSystemGroup,
dvbNiuSoftwareGroup,

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dvbNiuEventGroup

}

GROUP dvbNiuDhcpGroup

DESCRIPTION

"The group is optional but should be implemented if DHCP/BOOTP is implemented."

GROUP dvbNiuIpFilterGroup

DESCRIPTION

"The group is optional but should be implemented if dvbNiuNatGroup or dvbNiuNaptGroup are implemented. The implementation of this group does not mandate the implementation of dvbNiuNatGroup or dvbNiuNaptGroup."

GROUP dvbNiuNatGroup

DESCRIPTION

"The group is optional but should be implemented if NAT is implemented."

GROUP dvbNiuNaptGroup

DESCRIPTION

"The group is optional but should be implemented if NAPT is implemented."

GROUP dvbNiuEthFilterGroup

DESCRIPTION

"The group is optional but should be implemented if Ethernet filtering is implemented. If the NIU supports bridging then it is strongly recommended this group is implemented."

GROUP dvbNiuCpeGroup

DESCRIPTION

"The group is optional but should be implemented to prevent spoofing type attacks and restrict the number of CPE devices attached to the NIU."

OBJECT dvbNiuStaticIpMaskType
SYNTAX InetAddressType { ipv4(1)}
DESCRIPTION
"An implementation is only required to support IPv4
addresses."

OBJECT dvbNiuStaticIpMask
SYNTAX InetAddress (SIZE(4))
DESCRIPTION
"An implementation is only required to support IPv4
addresses."

OBJECT dvbNiuSwServerAddrType
SYNTAX InetAddressType { ipv4(1)}
DESCRIPTION
"An implementation is only required to support IPv4

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addresses."

OBJECT dvbNiuSwServer
SYNTAX InetAddress (SIZE(4))
DESCRIPTION
"An implementation is only required to support IPv4
addresses."

OBJECT dvbNiuDhcpServerAddrType
SYNTAX InetAddressType { ipv4(1)}
DESCRIPTION
"An implementation is only required to support IPv4
addresses."

OBJECT dvbNiuDhcpServer
SYNTAX InetAddress (SIZE(4))
DESCRIPTION
"An implementation is only required to support IPv4
addresses. The broadcast address to be used for IPv4 is
255.255.255.255 and should be the default value."

OBJECT dvbNiuIpFilterDstAddrType
SYNTAX InetAddressType { ipv4(1)}
DESCRIPTION
"An implementation is only required to support IPv4
addresses."

OBJECT dvbNiuIpFilterDstAddr
SYNTAX InetAddress (SIZE(4))
DESCRIPTION
"An implementation is only required to support IPv4

addresses. The default value for this object for IPv4 is 0.0.0.0"

OBJECT dvbNiuIpFilterSrcAddrType

SYNTAX InetAddressType { ipv4(1)}

DESCRIPTION

"An implementation is only required to support IPv4 addresses."

OBJECT dvbNiuIpFilterSrcAddr

SYNTAX InetAddress (SIZE(4))

DESCRIPTION

"An implementation is only required to support IPv4 addresses. The default value for this object for IPv4 is 0.0.0.0"

OBJECT dvbNiuIpFilterDstMaskType

SYNTAX InetAddressType { ipv4(1)}

DESCRIPTION

"An implementation is only required to support IPv4 addresses."

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OBJECT dvbNiuIpFilterDstMask

SYNTAX InetAddress (SIZE(4))

DESCRIPTION

"An implementation is only required to support IPv4 addresses. The default value for this object for IPv4 is 0.0.0.0"

OBJECT dvbNiuIpFilterSrcMaskType

SYNTAX InetAddressType { ipv4(1)}

DESCRIPTION

"An implementation is only required to support IPv4 addresses."

OBJECT dvbNiuIpFilterSrcMask

SYNTAX InetAddress (SIZE(4))

DESCRIPTION

"An implementation is only required to support IPv4 addresses. The default value for this object for IPv4 is 0.0.0.0"

OBJECT dvbNiuNatIntIpType

SYNTAX InetAddressType { ipv4(1)}

DESCRIPTION

"An implementation is only required to support IPv4 addresses."

OBJECT dvbNiuNatIntIp
SYNTAX InetAddress (SIZE(4))
DESCRIPTION
"An implementation is only required to support IPv4 addresses."

OBJECT dvbNiuNaptAddrType
SYNTAX InetAddressType { ipv4(1)}
DESCRIPTION
"An implementation is only required to support IPv4 addresses."

OBJECT dvbNiuNaptAddr
SYNTAX InetAddress (SIZE(4))
DESCRIPTION
"An implementation is only required to support IPv4 addresses."

OBJECT dvbNiuNaptIntIpType
SYNTAX InetAddressType { ipv4(1)}
DESCRIPTION
"An implementation is only required to support IPv4 addresses."

OBJECT dvbNiuNaptIntIp
SYNTAX InetAddress (SIZE(4))
DESCRIPTION

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"An implementation is only required to support IPv4 addresses."

OBJECT dvbNiuCpeIpType
SYNTAX InetAddressType { ipv4(1)}
DESCRIPTION
"An implementation is only required to support IPv4 addresses."

OBJECT dvbNiuCpeIp
SYNTAX InetAddress (SIZE(4))
DESCRIPTION
"An implementation is only required to support IPv4 addresses."

OBJECT dvbNiuCpeMaskType
SYNTAX InetAddressType { ipv4(1)}
DESCRIPTION
"An implementation is only required to support IPv4 addresses."

addresses."

OBJECT dvbNiuCpeMask

SYNTAX InetAddress (SIZE(4))

DESCRIPTION

"An implementation is only required to support IPv4 addresses."

::= { dvbNiuCompliances 1 }

dvbNiuSystemGroup OBJECT-GROUP

OBJECTS {
 dvbNiuConfigSet,
 dvbNiuMibVersion,
 dvbNiuSerialNum,
 dvbNiuResetNow,
 dvbNiuResetCounts,
 dvbNiuDateAndTime,
 dvbNiuOperStatus,
 dvbNiuModemtype,
 dvbNiuStaticIpMaskType,
 dvbNiuStaticIpMask,
 dvbNiuStaticIpStatus,
 dvbNiuEuroloader,
 dvbNiuImplSet,
 dvbNiuMulticast
}

STATUS current

DESCRIPTION

"A collection of objects providing basic system level control and instrumentation of the EuroModem."

::= { dvbNiuGroups 1 }

dvbNiuSoftwareGroup OBJECT-GROUP

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OBJECTS {
 dvbNiuSwVersion,
 dvbNiuSwState,
 dvbNiuSwAction,
 dvbNiuSwDateTime,
 dvbNiuSwServerAddrType,
 dvbNiuSwServer,
 dvbNiuSwFilename,
 dvbNiuSwDownloadSlot,
 dvbNiuSwAdminStatus
}

STATUS current

```

DESCRIPTION
    "A collection of objects providing control and
      instrumentation of the EuroModem's software."
::= { dvbNiuGroups 2 }

dvbNiuDhcpGroup OBJECT-GROUP
    OBJECTS      {
        dvbNiuDhcpServerAddrType,
        dvbNiuDhcpServer,
        dvbNiuDhcpRelay,
        dvbNiuDhcpReqIf,
        dvbNiuDhcpState,
        dvbNiuDhcpSerType,
        dvbNiuDhcpStatus
    }
    STATUS        current
    DESCRIPTION
        "A collection of objects providing control over the
          EuroModem's DHCP/Bootp functionality."
::= { dvbNiuGroups 3 }

```

```

dvbNiuEventGroup OBJECT-GROUP
    OBJECTS      {
        dvbNiuEventPolicy,
        dvbNiuEventControlTable,
        dvbNiuEventTableMaxSize,
        dvbNiuTrapRate,
        dvbNiuEventControlPriority,
        dvbNiuEventControlAction,
        dvbNiuEventType,
        dvbEventDateTime,
        dvbEventDescription,
        dvbEventCode,
        dvbEventStatus,
        dvbNiuEvThrottleAdminStatus,
        dvbNiuEvThrottleInhibited,
        dvbNiuEvThrottleThreshold,
        dvbNiuEvThrottleInterval
    }
    STATUS        current
    DESCRIPTION

```

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```

    "A collection of objects used to control and monitor
      EuroModem events."
::= { dvbNiuGroups 4 }

```

```

dvbNiuIpFilterGroup OBJECT-GROUP

```

```

OBJECTS      {
    dvbNiuIpFilterDstAddrType,
    dvbNiuIpFilterDstAddr,
    dvbNiuIpFilterDstMaskType,
    dvbNiuIpFilterDstMask,
    dvbNiuIpFilterStatus,
    dvbNiuIpFilterProtocol,
    dvbNiuIpFilterIfIndex,
    dvbNiuIpFilterSrcPortLow,
    dvbNiuIpFilterDirection,
    dvbNiuIpFilterSrcPortHigh,
    dvbNiuIpFilterTos,
    dvbNiuIpFilterDstPortLow,
    dvbNiuIpFilterTosMask,
    dvbNiuIpFilterDstPortHigh,
    dvbNiuIpFilterSrcAddrType,
    dvbNiuIpFilterSrcAddr,
    dvbNiuIpFilterAction,
    dvbNiuIpFilterMatches,
    dvbNiuIpFilterSrcMaskType,
    dvbNiuIpFilterSrcMask,
    dvbNiuIpFilterContinue,
    dvbNiuIpFilterEnable,
    dvbNiuIpTosMapIndex,
    dvbNiuIpTosMapStatus,
    dvbNiuIpTosMapAndMask,
    dvbNiuIpTosMapOrMask
}
STATUS      current
DESCRIPTION
    "A collection of objects providing a filtering capability
    at the IP layer."
::= { dvbNiuGroups 5 }

dvbNiuEthFilterGroup OBJECT-GROUP
OBJECTS      {
    dvbNiuEthernetFilterStatus,
    dvbNiuEthernetFilterIfIndex,
    dvbNiuEthernetFilterEtherType,
    dvbNiuEthernetFilterAction,
    dvbNiuEthernetFilterMatches,
    dvbNiuEthernetFilterEnable
}
STATUS      current
DESCRIPTION
    "A collection of objects providing a filtering capability
    at the Ethernet layer."
::= { dvbNiuGroups 6 }

```

```

dvbNiuNatGroup OBJECT-GROUP
    OBJECTS      {
        dvbNiuNatIntIpType,
        dvbNiuNatIntIp,
        dvbNiuNatStatus
    }
    STATUS       current
    DESCRIPTION
        "A collection of objects providing address translation at
        either the address level"
    ::= { dvbNiuGroups 7 }

dvbNiuNaptGroup OBJECT-GROUP
    OBJECTS      {
        dvbNiuNaptAddrType,
        dvbNiuNaptAddr,
        dvbNiuNaptIntPort,
        dvbNiuNaptIntIpType,
        dvbNiuNaptIntIp
    }
    STATUS       current
    DESCRIPTION
        "A collection of objects providing address translation at
        either the port level"
    ::= { dvbNiuGroups 8 }

dvbNiuCpeGroup OBJECT-GROUP
    OBJECTS      {
        dvbNiuCpeEnroll,
        dvbNiuCpeIpMax,
        dvbNiuCpeIpType,
        dvbNiuCpeIp,
        dvbNiuCpeMaskType,
        dvbNiuCpeMask,
        dvbNiuCpeSource,
        dvbNiuCpeStatus
    }
    STATUS       current
    DESCRIPTION
        "A collection of objects providing anti spoofing / CPE
        address management"
    ::= { dvbNiuGroups 9 }

END

```

5. Security Considerations

This MIB relates to a system which will provide metropolitan public

internet access. As such, improper manipulation of the objects represented by this MIB may result in denial of service to a large number of end-users. In addition, manipulation of dvbNiuEthernetFilterTable and dvbNiuIpFilterTable may allow an end-

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user to increase their service levels, spoof their IP addresses or affect other end-users in either a positive or negative manner.

There are a number of management objects defined in this MIB that have a MAX-ACCESS clause of read-write and/or read-create. Such objects may be considered sensitive or vulnerable in some network environments. The support for SET operations in a non-secure environment without proper protection can have a negative effect on network operations. In addition to those mentioned above:

- o dvbNiuStaticIpTable and dvbNiuDhcpTable can be manipulated to prevent IP addresses being assigned to the NIU after a reset, which results in a denial of service.
- o The NIU may have its software changed by the actions of the management system. An improper software load may result in substantial vulnerabilities and the loss of the ability of the management system to control the NIU.
- o Setting dvbDevEvThrottleAdminStatus = unconstrained(1) may cause flooding of traps, which can disrupt network service.

This MIB does not affect confidentiality of services on a cable system. The DVB/DAVIC Interoperability Consortium expects to produce a MIB for the security mechanism in the near future.

SNMPv1 by itself is not a secure 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/SET (read/change/create/delete) the objects in this MIB. It is recommended that the implementers consider the security features as provided by the SNMPv3 framework. Specifically, the use of the User-based Security Model [RFC 2574](#) [[RFC2574](#)] and the View-based Access Control Model [RFC 2575](#) [[RFC2575](#)] 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 the objects only to those principals (users) that have legitimate rights to indeed GET or SET (change/create/delete) them.

6. References

- [RFC2571] Harrington, D., Presuhn, R., and B. Wijnen,
"An Architecture for Describing SNMP Management
Frameworks", [RFC 2571](#), April 1999.
- [RFC1155] Rose, M., and K. McCloghrie,
"Structure and Identification of Management Information
for TCP/IP-based Internets", STD 16, [RFC 1155](#), May 1990.

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	DVB Cable Network Interface Unit MIB	February 2001

- [RFC1212] Rose, M., and K. McCloghrie,
"Concise MIB Definitions", STD 16, [RFC 1212](#), March 1991.
- [RFC1215] M. Rose,
"A Convention for Defining Traps for use with the SNMP",
[RFC 1215](#), March 1991.
- [RFC2578] McCloghrie, K., Perkins, D., Schoenwaelder, J., Case, J.,
Rose, M., and S. Waldbusser, "Structure of Management
Information Version 2 (SMIv2)", STD 58, [RFC 2578](#), April
1999.
- [RFC2579] McCloghrie, K., Perkins, D., Schoenwaelder, J., Case,
J., Rose, M., and S. Waldbusser, "Textual Conventions
for SMIv2", STD 58, [RFC 2579](#), April 1999.
- [RFC2580] McCloghrie, K., Perkins, D., Schoenwaelder, J., Case,
J., Rose, M., and S. Waldbusser, "Conformance Statements
for SMIv2", STD 58, [RFC 2580](#), April 1999.
- [RFC1157] Case, J., Fedor, M., Schoffstall, M., and J. Davin,
"Simple Network Management Protocol", STD 15, [RFC 1157](#),
May 1990.
- [RFC1901] Case, J., McCloghrie, K., Rose, M., and S. Waldbusser,
"Introduction to Community-based SNMPv2", [RFC 1901](#),
January 1996.
- [RFC1906] Case, J., McCloghrie, K., Rose, M., and S. Waldbusser,
"Transport Mappings for Version 2 of the Simple Network
Management Protocol (SNMPv2)", [RFC 1906](#), January 1996.
- [RFC2572] Case, J., Harrington D., Presuhn R., and B. Wijnen,
"Message Processing and Dispatching for the Simple
Network Management Protocol (SNMP)", [RFC 2572](#), April
1999.

- [RFC2574] Blumenthal, U., and B. Wijnen, "User-based Security Model (USM) for version 3 of the Simple Network Management Protocol (SNMPv3)", [RFC 2574](#), April 1999.
- [RFC1905] Case, J., McCloghrie, K., Rose, M., and S. Waldbusser, "Protocol Operations for Version 2 of the Simple Network Management Protocol (SNMPv2)", [RFC 1905](#), January 1996.
- [RFC2573] Levi, D., Meyer, P., and B. Stewart, "SNMPv3 Applications", [RFC 2573](#), April 1999.
- [RFC2575] Wijnen, B., Presuhn, R., and K. McCloghrie, "View-based Access Control Model (VACM) for the Simple Network Management Protocol (SNMP)", [RFC 2575](#), April 1999.
- [RFC2570] Case, J., Mundy, R., Partain, D., and B. Stewart,

Valentine	Expires August 2001	57
	DVB Cable Network Interface Unit MIB	February 2001

"Introduction to Version 3 of the Internet-standard Network Management Framework", [RFC 2570](#), April 1999.

- [RFC1224] Steinberg, L., "Techniques for Managing Asynchronously Generated Alerts", [RFC 1224](#), May 1991.
- [RFC2119] Bradner, S., "Key words for use in RFCs to Indicate Requirement Levels", [BCP 14](#), [RFC 2119](#), March 1997.
- [RFC2851] M. Daniele, B. Haberman, S. Routhier, J. Schoenwaelder, "Textual Conventions for Internet Network Addresses", June 2000
- [EUROM] ECCA, "Technical Specification of a European Cable Modem for digital bi-directional communications via cable networks", Version 1.0, 12th May 1999

7. Acknowledgments

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[RFC 2669](#) edited by Michael St Johns was used as the template for this document.

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