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 event notification management of DOCSIS compliant Cable Modems and Cable Modem Termination Systems. This MIB is defined as an
extension to the DOCSIS Cable Device MIB.

This memo specifies a MIB module in a manner that is compliant to the SMIv2. The set of objects is consistent with the SNMP framework and existing SNMP standards.

This memo is a product of the IPCDN working group within the Internet Engineering Task Force. Comments are solicited and should be addressed to the working group’s mailing list at ipcdn@ietf.org and/or the author.

Table of Contents

1. The Internet-Standard Management Framework ............... 3
2. Glossary ........................................... 3
   2.1 BPI - Baseline Privacy Interface .................. 3
   2.2 BPI - Baseline Privacy Plus Interface ............... 3
   2.3 CATV ........................................ 3
   2.4 CM - Cable Modem ................................. 3
   2.5 CMTS - Cable Modem Termination System .............. 3
   2.6 DOCSIS ......................................... 4
   2.7 Downstream ..................................... 4
   2.8 Head-end ...................................... 4
   2.9 MAC Packet .................................... 4
   2.10 RF ............................................ 4
   2.11 SID .......................................... 4
   2.12 TLV .......................................... 4
   2.13 Upstream ..................................... 5
3. Overview ........................................... 5
   3.1 Structure of the MIB ............................... 5
4. Definitions ......................................... 6
5. Contributors ....................................... 37
6. Acknowledgments ..................................... 37
7. Security Consideration ................................ 37
8. IANA Considerations ................................ 38
9. References ......................................... 38
   9.1 Normative References ............................. 38
   9.2 Informative References ............................ 38
7. Security Consideration ................................ 37
8. IANA Considerations ................................ 38
9. References ......................................... 38
   9.1 Normative References ............................. 38
   9.2 Informative References ............................ 38
Authors’ Addresses .................................... 40
Intellectual Property and Copyright Statements ............. 41
1. The Internet-Standard Management Framework

For a detailed overview of the documents that describe the current Internet-Standard Management Framework, please refer to section 7 of RFC 3410 [16].

Managed objects are accessed via a virtual information store, termed the Management Information Base or MIB. MIB objects are generally accessed through the Simple Network Management Protocol (SNMP). Objects in the MIB are defined using the mechanisms defined in the Structure of Management Information (SMI). This memo specifies a MIB module that is compliant to the SMIv2, which is described in STD 58, RFC 2578 [2], STD 58, RFC 2579 [3] and STD 58, RFC 2580 [4].

2. Glossary

The terms in this document are derived either from normal cable system usage, or from the documents associated with the Data Over Cable Service Interface Specification (DOCSIS) process.

2.1 BPI - Baseline Privacy Interface

A mechanism for providing data privacy over the HFC network in DOCSIS 1.0 systems[8].

2.2 BPI - Baseline Privacy Plus Interface

A mechanism that extend the Baseline Privacy Interface with the addition of CM authentication over the HFC network in DOCSIS1.1/2.0 system and beyond [9].

2.3 CATV

Originally "Community Antenna Television", now used to refer to any cable or hybrid fiber and cable system used to deliver video signals to a community.

2.4 CM - Cable Modem

A CM acts as a "slave" station in a DOCSIS compliant cable data system.

2.5 CMTS - Cable Modem Termination System

A generic term covering a cable bridge or cable router in a head-end. A CMTS acts as the master station in a DOCSIS compliant cable data system. It is the only station that transmits downstream, and it controls the scheduling of upstream transmissions by its associated
2.6 DOCSIS

DOCSIS stands for "Data-Over-Cable Service Interface Specifications" and refers to the ITU-T J.112 Annex B standard for cable modem systems [13] commonly known as DOCSIS 1.0. The DOCSIS 1.1 specification is an extension of DOCSIS 1.0, with new features to support quality of service, fragmentation, and requirements for European cable plants [14].

DOCSIS 2.0 [15] builds upon DOCSIS 1.1, and provides all of the features and functionality that DOCSIS 1.1 provides. In addition, it provides some significant enhancements in upstream capacity over DOCSIS 1.1, such as 30.72 Mbps maximum upstream channel capacity, Synchronous-Code Division Multiple Access (CDMA) operation, increased robustness to upstream noise and channel impairments, Enhanced Reed-Solomon error correction and, Trellis Coded Modulation.

2.7 Downstream

The direction from the CMTS to the CM.

2.8 Head-end

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

2.9 MAC Packet

A term referring to DOCSIS Protocol Data Unit (PDU).

2.10 RF

A term referring to Radio Frequency.

2.11 SID

A term referring to DOCSIS Service ID. The SID identifies a particular upstream bandwidth allocation and class-of-service management for DOCSIS, and identifies a particular bidirectional security association for BPI.

2.12 TLV

TLV stands for Type/Length/Value. TLV is an encoding method consisting of three fields. The first field indicates the type of element, the second field indicates the length of the element, and
the third field contains the element’s value.

2.13 Upstream

The direction from the CM to the CMTS.

3. Overview

High Speed Internet Service offering in cable industry has become extremely successful. DOCSIS devices are being deployed at a rate of multiple thousands per day. Although operators are enjoying successful deployment, they are also facing a challenge to properly manage deployed devices. Operators are using Simple Network Management Protocol, a set of Management Information Base (MIB) required by DOCSIS, and SNMP Notifications to manage deployed DOCSIS devices. The usage of SNMP Notification for event reporting is becoming more popular as an effective and efficient method for network monitoring.

Unfortunately, only a minimal set of SNMP Notifications is currently available. This notification MIB in conjunction with [11] and [12] provide a minimum set of standard DOCSIS Notifications that DOCSIS devices SHOULD support to enable successful management of DOCSIS devices and network.

This document defines a set of objects required for the event notification management of DOCSIS compliant Cable Modems (CMs) and Cable Modem Termination Systems (CMTSs). The MIB module is derived from the DOCSIS [11] and [12].

The Appendix H of [11] defines all DOCSIS 1.1 required events and the Appendix D of [12] does that for DOCSIS 2.0. The notifications specified in this document are used to notify these events via SNMP.

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 RFC 2119 [1].

3.1 Structure of the MIB

This DOCS-IETF-CABLE-DEVICE-NOTIFICATION-MIB was designed to extend the RFC2669 [5] notification module.

Two groups of SNMP notification objects are defined in this document. One group defines notifications for cable modem events, and the other group defines notifications for cable modem termination system events.
DOCSIS defines numerous events and each event is assigned to a functional category. This MIB defines a notification object for each functional category. The varbinding list of each notification includes information about the event that occurred on the device.

4. Definitions

The MIB module defined here IMPORTs from SNMPv2-SMI[2], SNMPv2-CONF[3], DOCS-CABLE-DEVICE-MIB [5], DOCS-IF-MIB [6], and IF-MIB [7].

DOCS-IETF-CABLE-DEVICE-NOTIFICATION-MIB DEFINITIONS ::= BEGIN

IMPORTS
    MODULE-IDENTITY,
    OBJECT-TYPE,
    NOTIFICATION-TYPE,
    mib-2
    FROM SNMPv2-SMI -- RFC 2578
    MODULE-COMPLIANCE,
    OBJECT-GROUP,
    NOTIFICATION-GROUP
    FROM SNMPv2-CONF -- RFC 2580

docsDevEvLevel,
docsDevEvId,
docsDevEvText,
docsDevSwFilename,
docsDevSwServer,
docsDevServerDhcp,
docsDevServerTime
    FROM DOCS-CABLE-DEVICE-MIB -- RFC 2669

docsIfCmCmtsAddress,
docsIfCmCmtsCmStatusMacAddress,
docsIfDocsisBaseCapability,
docsIfCmStatusDocsisOperMode,
docsIfCmStatusModulationType,
docsIfCmtsCmStatusDocsisRegMode,
docsIfCmtsCmStatusModulationType
    FROM DOCS-IF-MIB -- draft-ietf-ipcdn-docs-rfmibv2-10

    -- RFC ED.: replace 'draft-ietf-ipcdn-docs-rfmibv2-10' with assigned
    -- RFC number and remove this note.

    ifPhysAddress
    FROM IF-MIB; -- RFC 2863
The Event Notification MIB is an extension of the CABLE DEVICE MIB. It defines various notification objects for both cable modem and cable modem termination systems. Two groups of SNMP notification objects are defined. One group is for notifying cable modem events and one group for notifying cable modem termination system events.

DOCSIS defines numerous events and each event is assigned to a functional category. This MIB defines a notification object for each functional category. The varbinding list of each notification includes information about the event that occurred on the device.

Copyright (C) The Internet Society (2005). This version of this MIB module is part of RFC yyyy; see the RFC itself for full legal notices.
docsDevNotifControl OBJECT IDENTIFIER ::= { docsDevNotifMIB 1}
docsDevCmNotifs OBJECT IDENTIFIER ::= { docsDevNotifMIB 2 0 }
docsDevCmCmtsNotifs OBJECT IDENTIFIER ::= { docsDevNotifMIB 3 0 }

docsDevNotifControl OBJECT-TYPE
SYNTAX BITS {
    cmInitTLVUnknownNotif( 0),
    cmDynServReqFailNotif( 1),
    cmDynServRspFailNotif( 2),
    cmDynServAckFailNotif( 3),
    cmBpiInitNotif( 4),
    cmBPKMNotif( 5),
    cmDynamicSANotif( 6),
    cmDHCPFailNotif( 7),
    cmSwUpgradeInitNotif( 8),
    cmSwUpgradeFailNotif( 9),
    cmSwUpgradeSuccessNotif( 10),
    cmSwUpgradeCVCNotif( 11),
    cmTODFailNotif( 12),
    cmDCCRspFailNotif( 13),
    cmDCCReqFailNotif( 14),
    cmDCCAckFailNotif( 15)
}
MAX-ACCESS read-write

STATUS current
DESCRIPTION
"The object is used to enable specific CM notifications. For example, if the first bit is set, then
docsDevCmInitTLVUnknownNotif is enabled. If it is not set, the notification is disabled. If the device is rebooted, the value of this object should revert to the default value.

```
DEFVAL { {} }
::= { docsDevNotifControl 1 }
```

```
docsDevCmInitTLVUnknownNotif NOTIFICATION-TYPE
OBJECTS {
    docsDevEvLevel,
    docsDevEvId,
    docsDevEvText,
    ifPhysAddress,
    docsIfCmCmtsAddress,
    docsIfDocsisBaseCapability,
    docsIfCmStatusDocsisOperMode,
}
```
docsIfCmStatusModulationType
)
STATUS current
DESCRIPTION
"Notification to indicate that an unknown TLV was encountered during the TLV parsing process.

This notification sends additional information about the event by including the following objects in it’s varbinding list:
- docsDevEvLevel: the priority level associated with the event.
- docsDevEvId: the unique identifier of the event that occurred.
- docsDevEvText: a textual description of the event.
- ifPhysAddress: the MAC address of the cable interface of this cable modem.
- docsIfCmCmtsAddress: the MAC address of the CMTS to which the CM is connected to (if there is a cable card/ interface in the CMTS, then it is actually the MAC address of the cable interface which connected to).
- docsIfDocsisBaseCapability: the highest version of the DOCSIS specification (1.0, 1.1, 2.0) that the device is capable of supporting.
- docsIfCmStatusDocsisOperMode: the QOS level (1.0, 1.1) that the CM is operating in.
- docsIfCmStatusModulationType: the upstream modulation methodology used by the CM.

::= { docsDevCmNotifs 1 }

docsDevCmDynServReqFailNotif NOTIFICATION-TYPE OBJECTS {
   docsDevEvLevel,
   docsDevEvId,
   docsDevEvText,
   ifPhysAddress,
   docsIfCmCmtsAddress,
   docsIfDocsisBaseCapability,
   docsIfCmStatusDocsisOperMode,
   docsIfCmStatusModulationType
}
STATUS current
DESCRIPTION
"A notification to report the failure of a dynamic service request during the dynamic services process.

Ahmad & Nakanishi Expires July 8, 2005 [Page 10]
This notification sends additional information about the event by including the following objects in its varbinding list.
- docsDevEvLevel: the priority level associated with the event.
- docsDevEvId: the unique identifier of the event that occurred.
- docsDevEvText: a textual description of the event.
- ifPhysAddress: the MAC address of the cable interface of this cable modem.
- docsIfCmCmtsAddress: the MAC address of the CMTS to which the CM is connected to (if there is a cable card/ interface in the CMTS, then it is actually the MAC address of the cable interface which connected to.
- docsIfDocsisBaseCapability: the highest version of the DOCSIS specification (1.0, 1.1, 2.0) that the device is capable of supporting.
- docsIfCmStatusDocsisOperMode: the QOS level (1.0, 1.1) that the CM is operating in.
- docsIfCmStatusModulationType the upstream modulation methodology used by the CM (the CM).

::= { docsDevCmNotifs 2 }

docsDevCmDynServRspFailNotif NOTIFICATION-TYPE
  OBJECTS {
    docsDevEvLevel,
    docsDevEvId,
    docsDevEvText,
    ifPhysAddress,
    docsIfCmCmtsAddress,
    docsIfDocsisBaseCapability,
    docsIfCmStatusDocsisOperMode,
    docsIfCmStatusModulationType
  }

STATUS current

DESCRIPTION

"A notification to report the failure of a dynamic service response during the dynamic services process.

This notification sends additional information about the event by including the following objects in its varbinding list.
- docsDevEvLevel: the priority level associated with the
event.
- docsDevEvId: the unique identifier of the event that occurred.
- docsDevEvText: a textual description of the event.
- ifPhysAddress: the MAC address of the cable interface of this cable modem.
- docsIfCmCmtsAddress: the MAC address of the CMTS to which the CM is connected to (if there is a cable card/ interface in the CMTS, then it is actually the MAC address of the cable interface which connected to.
- docsIfDocsisBaseCapability: the highest version of the DOCSIS specification (1.0, 1.1, 2.0) that the device is capable of supporting.
- docsIfCmStatusDocsisOperMode: the QOS level (1.0, 1.1) that the CM is operating in.
- docsIfCmStatusModulationType the upstream modulation methodology used by the CM the CM).

::= { docsDevCmNotifs 3}
docsDevCmDynServAckFailNotif NOTIFICATION-TYPE
OBJECTS {
  docsDevEvLevel,
  docsDevEvId,
  docsDevEvText,
  ifPhysAddress,
  docsIfCmCmtsAddress,
  docsIfDocsisBaseCapability,
  docsIfCmStatusDocsisOperMode,
  docsIfCmStatusModulationType
}
STATUS current
DESCRIPTION
"A notification to report the failure of a dynamic service acknowledgement during the dynamic services process.

This notification sends additional information about the event by including the following objects in it’s varbinding list.
- docsDevEvLevel: the priority level associated with the event.
- docsDevEvId: the unique identifier of the event that occurred.
- docsDevEvText: a textual description of the event.
- ifPhysAddress: the MAC address of the cable interface of this cable modem.
- docsIfCmCmtsAddress: the MAC address of the CMTS
to which the CM is connected to(if there is a cable
    card/ interface in the CMTS, then it is actually the
    MAC address of the cable interface which connected to.
- docsIfDocsisBaseCapability: the highest
    version of the DOCSIS specification(1.0, 1.1, 2.0)
    that the device is capable of supporting.
- docsIfCmStatusDocsisOperMode: the QOS level (1.0, 1.1)
    that the CM is operating in.
- docsIfCmStatusModulationType the upstream modulation
    methodology used by the CM the CM).

 ::= { docsDevCmNotifs 4}

docsDevCmBpiInitNotif NOTIFICATION-TYPE
OBJECTS {
    docsDevEvLevel,  
    docsDevEvId,  
    docsDevEvText,  
    ifPhysAddress,  
    docsIfCmCmtsAddress,  
    docsIfDocsisBaseCapability,  
    docsIfCmStatusDocsisOperMode,  
    docsIfCmStatusModulationType
}
STATUS current
DESCRIPTION
"A notification to report the failure of a BPI
initialization attempt during the registration process.

This notification sends additional information about
the event by including the following objects in it’s
varbinding list.
- docsDevEvLevel: the priority level associated with the
  event.
- docsDevEvId: the unique identifier of the event that
  occurred.
- docsDevEvText: a textual description of the event.
- ifPhysAddress: the MAC address of the cable
  interface of this cable modem.
- docsIfCmCmtsAddress: the MAC address of the CMTS
to which the CM is connected to(if there is a cable
card/ interface in the CMTS, then it is actually the
MAC address of the cable interface which connected to.
- docsIfDocsisBaseCapability: the highest
  version of the DOCSIS specification(1.0, 1.1, 2.0)
  that the device is capable of supporting.
- docsIfCmStatusDocsisOperMode: the QOS level (1.0, 1.1)
that the CM is operating in.
- docsIfCmStatusModulationType the upstream modulation methodology used by the CM (the CM).

::= { docsDevCmNotifs 5 }

docsDevCmBPKMNotif NOTIFICATION-TYPE
OBJECTS {
  docsDevEvLevel,
  docsDevEvId,
  docsDevEvText,
  ifPhysAddress,
  docsIfCmCmtsAddress,
  docsIfDocsisBaseCapability,
  docsIfCmStatusDocsisOperMode,
  docsIfCmStatusModulationType
}

STATUS current
DESCRIPTION
"A notification to report the failure of a Baseline Privacy Key Management (BPKM) operation.

This notification sends additional information about the event by including the following objects in it’s varbinding list.
- docsDevEvLevel: the priority level associated with the event.
- docsDevEvId: the unique identifier of the event that occurred.
- docsDevEvText: a textual description of the event.
- ifPhysAddress: the MAC address of the cable interface of this cable modem.
- docsIfCmCmtsAddress: the MAC address of the CMTS to which the CM is connected (if there is a cable card/ interface in the CMTS, then it is actually the MAC address of the cable interface which connected to.
- docsIfDocsisBaseCapability: the highest version of the DOCSIS specification (1.0, 1.1, 2.0) that the device is capable of supporting.
- docsIfCmStatusDocsisOperMode: the QOS level (1.0, 1.1) that the CM is operating in.
- docsIfCmStatusModulationType the upstream modulation methodology used by the CM (the CM).

::= { docsDevCmNotifs 6 }
docsDevCmDynamicSANotif NOTIFICATION-TYPE
OBJECTS {
    docsDevEvLevel,
    docsDevEvId,
    docsDevEvText,
    ifPhysAddress,
    docsIfCmCmtsAddress,
    docsIfDocsisBaseCapability,
    docsIfCmStatusDocsisOperMode,
    docsIfCmStatusModulationType
}
STATUS current
DESCRIPTION
"A notification to report the failure of a dynamic security association operation.

This notification sends additional information about the event by including the following objects in it’s varbinding list.
- docsDevEvLevel: the priority level associated with the event.
- docsDevEvId: the unique identifier of the event that occurred.
- docsDevEvText: a textual description of the event.
- ifPhysAddress: the MAC address of the cable interface of this cable modem.
- docsIfCmCmtsAddress: the MAC address of the CMTS to which the CM is connected to (if there is a cable card/ interface in the CMTS, then it is actually the MAC address of the cable interface which connected to.
- docsIfDocsisBaseCapability: the highest version of the DOCSIS specification (1.0, 1.1, 2.0) that the device is capable of supporting.
- docsIfCmStatusDocsisOperMode: the QOS level (1.0, 1.1) that the CM is operating in.
- docsIfCmStatusModulationType: the upstream modulation methodology used by the CM the CM).
"
::= { docsDevCmNotifs 7 }

docsDevCmDHCPFailNotif NOTIFICATION-TYPE
OBJECTS {
    docsDevEvLevel,
    docsDevEvId,
    docsDevEvText,
    ifPhysAddress,
    docsIfCmCmtsAddress,
A notification to report the failure of a DHCP operation. This notification sends additional information about the event by including the following objects in its varbinding list.
- `docsDevEvLevel`: the priority level associated with the event.
- `docsDevEvId`: the unique identifier of the event that occurred.
- `docsDevEvText`: a textual description of the event.
- `ifPhysAddress`: the MAC address of the cable interface of this cable modem.
- `docsIfCmCmtsAddress`: the MAC address of the CMTS to which the CM is connected to (if there is a cable card/interface in the CMTS, then it is actually the MAC address of the cable interface which connected to).
- `docsDevServerDhcp`: the IP address of the DHCP server.
- `docsIfDocsisBaseCapability`: the highest version of the DOCSIS specification (1.0, 1.1, 2.0) that the device is capable of supporting.
- `docsIfCmStatusDocsisOperMode`: the QOS level (1.0, 1.1) that the CM is operating in.
- `docsIfCmStatusModulationType`: the upstream modulation methodology used by the CM (the CM).

```
::= { docsDevCmNotifs 8 }
```
A notification to indicate that a software upgrade has been initiated on the device.

This notification sends additional information about the event by including the following objects in it’s varbinding list:
- docsDevEvLevel: the priority level associated with the event.
- docsDevEvId: the unique identifier of the event that occurred.
- docsDevEvText: a textual description of the event.
- ifPhysAddress: the MAC address of the cable interface of this cable modem.
- docsIfCmCmtsAddress: the MAC address of the CMTS to which the CM is connected to (if there is a cable card/ interface in the CMTS, then it is actually the MAC address of the cable interface which connected to.
- docsIfDocsisBaseCapability: the highest version of the DOCSIS specification (1.0, 1.1, 2.0) that the device is capable of supporting.
- docsIfCmStatusDocsisOperMode: the QOS level (1.0, 1.1) that the CM is operating in.
- docsIfCmStatusModulationType: the upstream modulation methodology used by the CM (the CM).

::= { docsDevCmNotifs 9 }

docsDevCmSwUpgradeFailNotif NOTIFICATION-TYPE OBJECTS {
    docsDevEvLevel,
    docsDevEvId,
    docsDevEvText,
    ifPhysAddress,
    docsIfCmCmtsAddress,
    docsDevSwFilename,
    docsDevSwServer,
    docsIfDocsisBaseCapability,
    docsIfCmStatusDocsisOperMode,
    docsIfCmStatusModulationType
}

STATUS current
DESCRIPTION
"A notification to report the failure of a software upgrade attempt."
This notification sends additional information about the event by including the following objects in its varbinding list:
- docsDevEvLevel: the priority level associated with the event.
- docsDevEvId: the unique identifier of the event that occurred.
- docsDevEvText: a textual description of the event.
- ifPhysAddress: the MAC address of the cable interface of this cable modem.
- docsIfCmCmtsAddress: the MAC address of the CMTS to which the CM is connected to (if there is a cable card/ interface in the CMTS, then it is actually the MAC address of the cable interface which connected to.
- docsDevSwFilename: the software image file name
- docsDevSwServer: the IP address of the server that the image is retrieved from.
- docsIfDocsisBaseCapability: the highest version of the DOCSIS specification (1.0, 1.1, 2.0) that the device is capable of supporting.
- docsIfCmStatusDocsisOperMode: the QOS level (1.0, 1.1) that the CM is operating in.
- docsIfCmStatusModulationType the upstream modulation methodology used by the CM the CM).

::= { docsDevCmNotifs 10 }

docsDevCmSwUpgradeSuccessNotif NOTIFICATION-TYPE
OBJECTS {
  docsDevEvLevel,
  docsDevEvId,
  docsDevEvText,
  ifPhysAddress,
  docsIfCmCmtsAddress,
  docsDevSwFilename,
  docsDevSwServer,
  docsIfDocsisBaseCapability,
  docsIfCmStatusDocsisOperMode,
  docsIfCmStatusModulationType
}

STATUS current
DESCRIPTION
"A notification to report the software upgrade success status.

This notification sends additional information about the event by including the following objects in it’s
varbinding list.
- docsDevEvLevel: the priority level associated with the event.
- docsDevEvId: the unique identifier of the event that occurred.
- docsDevEvText: a textual description of the event.
- ifPhysAddress: the MAC address of the cable interface of this cable modem.
- docsIfCmCmtsAddress: the MAC address of the CMTS to which the CM is connected to (if there is a cable card/interface in the CMTS, then it is actually the MAC address of the cable interface which connected to.
- docsDevSwFilename: the software image file name
- docsDevSwServer: the IP address of the server that the image is retrieved from.
- docsIfDocsisBaseCapability: the highest version of the DOCSIS specification (1.0, 1.1, 2.0) that the device is capable of supporting.
- docsIfCmStatusDocsisOperMode: the QOS level (1.0, 1.1) that the CM is operating in.
- docsIfCmStatusModulationType: the upstream modulation methodology used by the CM (the CM).

::= { docsDevCmNotifs 11 }

docsDevCmSwUpgradeCVCFailNotif NOTIFICATION-TYPE
OBJECTS {
    docsDevEvLevel,
    docsDevEvId,
    docsDevEvText,
    ifPhysAddress,
    docsIfCmCmtsAddress,
    docsIfDocsisBaseCapability,
    docsIfCmStatusDocsisOperMode,
    docsIfCmStatusModulationType
}
STATUS current
DESCRIPTION
"A notification to report that the verification of the code file has failed during a secure software upgrade attempt.

This notification sends additional information about the event by including the following objects in its varbinding list.
- docsDevEvLevel: the priority level associated with the
event.
- docsDevEvId: the unique identifier of the event that occurred.
- docsDevEvText: a textual description of the event.
- ifPhysAddress: the MAC address of the cable interface of this cable modem.
- docsIfCmCmtsAddress: the MAC address of the CMTS to which the CM is connected to (if there is a cable card/ interface in the CMTS, then it is actually the MAC address of the cable interface which connected to).
- docsIfDcosisBaseCapability: the highest version of the DOCSIS specification (1.0, 1.1, 2.0) that the device is capable of supporting.
- docsIfCmStatusDcosisOperMode: the QOS level (1.0, 1.1) that the CM is operating in.
- docsIfCmStatusModulationType the upstream modulation methodology used by the CM (the CM).

::= { docsDevCmNotifs 12 }

docsDevCmTODFailNotif NOTIFICATION-TYPE

OBJECTS {
  docsDevEvLevel,
  docsDevEvId,
  docsDevEvText,
  ifPhysAddress,
  docsIfCmCmtsAddress,
  docsDevServerTime,
  docsIfDcosisBaseCapability,
  docsIfCmStatusDcosisOperMode,
  docsIfCmStatusModulationType
}

STATUS current

DESCRIPTION
"A notification to report a failure of a time of day operation.

This notification sends additional information about the event by including the following objects in its varbinding list.
- docsDevEvLevel: the priority level associated with the event.
- docsDevEvId: the unique identifier of the event that occurred.
- docsDevEvText: a textual description of the event.
- ifPhysAddress: the MAC address of the cable interface of this cable modem.
- docsIfCmCmtsAddress: the MAC address of the CMTS
to which the CM is connected to (if there is a cable
card/ interface in the CMTS, then it is actually the
MAC address of the cable interface which connected to.
- docsDevServerTime: the IP address of the time server.
- docsIfDocsisBaseCapability: the highest
  version of the DOCSIS specification (1.0, 1.1, 2.0)
  that the device is capable of supporting.
- docsIfCmStatusDocsisOperMode: the QOS level (1.0, 1.1)
  that the CM is operating in.
- docsIfCmStatusModulationType the upstream modulation
  methodology used by the CM the CM).

::= { docsDevCmNotifs 13 }

docsDevCmDCCReqFailNotif NOTIFICATION-TYPE
OBJECTS {
  docsDevEvLevel,
  docsDevEvId,
  docsDevEvText,
  ifPhysAddress,
  docsIfCmCmtsAddress,
  docsIfDocsisBaseCapability,
  docsIfCmStatusDocsisOperMode,
  docsIfCmStatusModulationType
}

STATUS current
DESCRIPTION " A notification to report a failure of a dynamic channel
change request during the dynamic channel change process
on the CM.

This notification sends additional information about
the event by including the following objects in it’s
varbinding list.
- docsDevEvLevel: the priority level associated with the
event.
- docsDevEvId: the unique identifier of the event that
  occurred.
- docsDevEvText: a textual description of the event.
- ifPhysAddress: the MAC address of the cable
  interface of this cable modem.
- docsIfCmCmtsAddress: the MAC address of the CMTS
to which the CM is connected to (if there is a cable
  card/ interface in the CMTS, then it is actually the
  MAC address of the cable interface which connected to.
- docsIfDocsisBaseCapability: the highest
  version of the DOCSIS specification (1.0, 1.1, 2.0)
that the device is capable of supporting.
- docsIfCmStatus Docsis Oper Mode: the QOS level (1.0, 1.1) that the CM is operating in.
- docsIfCmStatus Modulation Type: the upstream modulation methodology used by the CM.

::= { docsDev CmNotifs 14 }

docs Dev Cm DCCRspFailNotif NOTIFICATION-TYPE
OBJECTS {
  docsDevEv Level,
  docsDevEv Id,
  docsDevEv Text,
  if Phys Address,
  docsIfCmCmts Address,
  docsIfDocsis Base Capability,
  docsIfCmStatus Docsis Oper Mode,
  docsIfCmStatus Modulation Type
}

STATUS current

DESCRIPTION
"A notification to report the failure of a dynamic channel change response during the dynamic channel change process on the CM.

This notification sends additional information about the event by including the following objects in it’s varbinding list.
- docsDevEv Level: the priority level associated with the event.
- docsDevEv Id: the unique identifier of the event that occurred.
- docsDevEv Text: a textual description of the event.
- if Phys Address: the MAC address of the cable interface of this cable modem.
- docsIfCmCmts Address: the MAC address of the CMTS to which the CM is connected to if there is a cable card/ interface in the CMTS, then it is actually the MAC address of the cable interface which connected to.
- docsIfDocsis Base Capability: the highest version of the DOCSIS specification (1.0, 1.1, 2.0) that the device is capable of supporting.
- docsIfCmStatus Docsis Oper Mode: the QOS level (1.0, 1.1) that the CM is operating in.
- docsIfCmStatus Modulation Type: the upstream modulation methodology used by the CM."
docsDevCmDCCAckFailNotif NOTIFICATION-TYPE

OBJECTS {
  docsDevEvLevel,
  docsDevEvId,
  docsDevEvText,
  ifPhysAddress,
  docsIfCmCmtsAddress,
  docsIfDocsisBaseCapability,
  docsIfCmStatusDocsisOperMode,
  docsIfCmStatusModulationType
}

STATUS current

DESCRIPTION
"A notification to report the failure of a dynamic channel change acknowledgement during the dynamic channel change process on the CM.

This notification sends additional information about the event by including the following objects in it’s varbinding list.
- docsDevEvLevel: the priority level associated with the event.
- docsDevEvId: the unique identifier of the event that occurred.
- docsDevEvText: a textual description of the event.
- ifPhysAddress: the MAC address of the cable interface of this cable modem.
- docsIfCmCmtsAddress: the MAC address of the CMTS to which the CM is connected to (if there is a cable card/ interface in the CMTS, then it is actually the MAC address of the cable interface which connected to.
- docsIfDocsisBaseCapability: the highest version of the DOCSIS specification (1.0, 1.1, 2.0) that the device is capable of supporting.
- docsIfCmStatusDocsisOperMode: the QOS level (1.0, 1.1) that the CM is operating in.
- docsIfCmtsCmStatusModulationType the upstream modulation methodology used by the CM the CM).

"
OBJECTS {
    docsDevEvLevel,
    docsDevEvId,
    docsDevEvText,
    docsIfCmtsCmStatusMacAddress,
    ifPhysAddress,
    docsIfCmtsCmStatusDocsisRegMode,
    docsIfDocsisBaseCapability,
    docsIfCmtsCmStatusModulationType
}

STATUS current

DESCRIPTION
"A notification to report the failure of a registration request from a CM during the CM initialization process and detected on the CMTS.

This notification sends additional information about the event by including the following objects in it’s varbinding list.
- docsDevEvLevel: the priority level associated with the event.
- docsDevEvId: the unique identifier of the event that occurred.
- docsDevEvText: a textual description of the event.
- docsIfCmtsCmStatusMacAddress: the MAC address of the CM for which this notification is associated with.
- ifPhysAddress: the MAC address of the CMTS (if there is a cable card/ interface in the CMTS, then it is actually the MAC address of the cable interface which connected to the CM) cable interface connected to the CM.
- docsIfCmtsCmStatusDocsisRegMode: the QOS level (1.0, 1.1) that the reporting CM is operating in.
- docsIfDocsisBaseCapability: the highest version of the DOCSIS specification(1.0, 1.1, 2.0) that the device is capable of supporting.
- docsIfCmtsCmStatusModulationType the upstream modulation methodology used by the CM.
"

::= { docsDevCmtsNotifs 1 }

docsDevCmtsInitRegRspFailNotif NOTIFICATION-TYPE
OBJECTS {
    docsDevEvLevel,
    docsDevEvId,
    docsDevEvText,
    docsIfCmtsCmStatusMacAddress,
ifPhysAddress,
docsIfCmtsCmStatusDocsisRegMode,
docsIfDocsisBaseCapability,
docsIfCmtsCmStatusModulationType
}

STATUS current
DESCRIPTION
"A notification to report the failure of a registration
response during the CM initialization
process and detected by the CMTS.

This notification sends additional information about
the event by including the following objects in it’s
varbinding list.
- docsDevEvLevel: the priority level associated with the
  event.
- docsDevEvId: the unique identifier of the event that
  occurred.
- docsDevEvText: a textual description of the event.
- docsIfCmtsCmStatusMacAddress: the MAC address of the CM
  for which this notification is associated with.
- ifPhysAddress: the MAC address of the CMTS
  (if there is a cable card/ interface in the CMTS,
  then it is actually the MAC address of the cable
  interface which connected to the CM) cable interface
  connected to the CM.
- docsIfCmtsCmStatusDocsisRegMode: the QOS level (1.0, 1.1)
  that the reporting CM is operating in.
- docsIfDocsisBaseCapability: the highest
  version of the DOCSIS specification(1.0, 1.1, 2.0)
  that the device is capable of supporting.
- docsIfCmtsCmStatusModulationType the upstream
  modulation methodology used by the CM.
"

::= { docsDevCmtsNotifs 2 }

docsDevCmtsInitRegAckFailNotif NOTIFICATION-TYPE
OBJECTS {
docsDevEvLevel,
docsDevEvId,
docsDevEvText,
docsIfCmtsCmStatusMacAddress,
ifPhysAddress,
docsIfCmtsCmStatusDocsisRegMode,
docsIfDocsisBaseCapability,
docsIfCmtsCmStatusModulationType
}
STATUS current
DESCRIPTION
"A notification to report the failure of a registration acknowledgement from the CM during the CM initialization process and detected by the CMTS.

This notification sends additional information about the event by including the following objects in it’s varbinding list.
- docsDevEvLevel: the priority level associated with the event.
- docsDevEvId: the unique identifier of the event that occurred.
- docsDevEvText: a textual description of the event.
- docsIfCmtsCmStatusMacAddress: the MAC address of the CM for which this notification is associated with.
- ifPhysAddress: the MAC address of the CMTS (if there is a cable card/ interface in the CMTS, then it is actually the MAC address of the cable interface which connected to the CM) cable interface connected to the CM.
- docsIfCmtsCmStatusDcosisRegMode: the QOS level (1.0, 1.1) that the reporting CM is operating in.
- docsIfDcosisBaseCapability: the highest version of the DOCSIS specification(1.0, 1.1, 2.0) that the device is capable of supporting.
- docsIfCmtsCmStatusModulationType the upstream modulation methodology used by the CM.
"
::= { docsDevCmtsNotifs 3 }

docsDevCmtsDynServReqFailNotif NOTIFICATION-TYPE
OBJECTS {
  docsDevEvLevel,
  docsDevEvId,
  docsDevEvText,
  docsIfCmtsCmStatusMacAddress,
  ifPhysAddress,
  docsIfCmtsCmStatusDcosisRegMode,
  docsIfDcosisBaseCapability,
  docsIfCmtsCmStatusModulationType
}
STATUS current
DESCRIPTION
"A notification to report the failure of a dynamic service request during the dynamic services process and detected by the CMTS.
This notification sends additional information about
the event by including the following objects in it’s
varbinding list.
- docsDevEvLevel: the priority level associated with the
  event.
- docsDevEvId: the unique identifier of the event that
  occurred.
- docsDevEvText: a textual description of the event.
- docsIfCmtsCmStatusMacAddress: the MAC address of the CM
  for which this notification is associated with.
- ifPhysAddress: the MAC address of the CMTS
  (if there is a cable card/ interface in the CMTS,
  then it is actually the MAC address of the cable
  interface which connected to the CM) cable interface
  connected to the CM.
- docsIfCmtsCmStatusDcosisRegMode: the QOS level (1.0, 1.1)
  that the reporting CM is operating in.
- docsIfDocsisBaseCapability: the highest
  version of the DOCSIS specification(1.0, 1.1, 2.0)
  that the device is capable of supporting.
- docsIfCmtsCmStatusModulationType the upstream
  modulation methodology used by the CM.

::= { docsDevCmtsNotifs 4 }
- docsDevEvId: the unique identifier of the event that occurred.
- docsDevEvText: a textual description of the event.
- docsIfCmtsCmStatusMacAddress: the MAC address of the CM for which this notification is associated with.
- ifPhysAddress: the MAC address of the CMTS (if there is a cable card/ interface in the CMTS, then it is actually the MAC address of the cable interface which connected to the CM) cable interface connected to the CM.
- docsIfCmtsCmStatusDocsisRegMode: the QOS level (1.0, 1.1) that the reporting CM is operating in.
- docsIfDocsisBaseCapability: the highest version of the DOCSIS specification (1.0, 1.1, 2.0) that the device is capable of supporting.
- docsIfCmtsCmStatusModulationType: the upstream modulation methodology used by the CM.

::= { docsDevCmtsNotifs 5 }

docsDevCmtsDynServAckFailNotif NOTIFICATION-TYPE
OBJECTS {
  docsDevEvLevel, docsDevEvId, docsDevEvText,
  docsIfCmtsCmStatusMacAddress, ifPhysAddress,
  docsIfCmtsCmStatusDocsisRegMode, docsIfDocsisBaseCapability,
  docsIfCmtsCmStatusModulationType
}
STATUS current
DESCRIPTION
"A notification to report the failure of a dynamic service acknowledgement during the dynamic services process and detected by the CMTS.

This notification sends additional information about the event by including the following objects in it’s varbinding list.
- docsDevEvLevel: the priority level associated with the event.
- docsDevEvId: the unique identifier of the event that occurred.
- docsDevEvText: a textual description of the event.
- docsIfCmtsCmStatusMacAddress: the MAC address of the CM for which this notification is associated with."
- ifPhysAddress: the MAC address of the CMTS 
  (if there is a cable card/ interface in the CMTS, 
  then it is actually the MAC address of the cable 
  interface which connected to the CM) cable interface 
  connected to the CM.
- docsIfCmtsCmStatusDocsisRegMode: the QOS level (1.0, 1.1) 
  that the reporting CM is operating in.
- docsIfDocsisBaseCapability: the highest 
  version of the DOCSIS specification(1.0, 1.1, 2.0) 
  that the device is capable of supporting.
- docsIfCmtsCmStatusModulationType the upstream 
  modulation methodology used by the CM.

::= { docsDevCmtsNotifs 6 }

docsDevCmtsBpiInitNotif NOTIFICATION-TYPE 
OBJECTS {
  docsDevEvLevel, 
  docsDevEvId, 
  docsDevEvText, 
  docsIfCmtsCmStatusMacAddress, 
  ifPhysAddress, 
  docsIfCmtsCmStatusDocsisRegMode, 
  docsIfDocsisBaseCapability, 
  docsIfCmtsCmStatusModulationType
}
STATUS current
DESCRIPTION
"A notification to report the failure of a BPI 
initialization attempt during the CM registration process 
and detected by the CMTS.

This notification sends additional information about 
the event by including the following objects in it’s 
varbinding list.
- docsDevEvLevel: the priority level associated with the 
event.
- docsDevEvId: the unique identifier of the event that 
ocurred.
- docsDevEvText: a textual description of the event.
- docsIfCmtsCmStatusMacAddress: the MAC address of the CM 
for which this notification is associated with.
- ifPhysAddress: the MAC address of the CMTS 
(if there is a cable card/ interface in the CMTS, 
then it is actually the MAC address of the cable 
interface which connected to the CM) cable interface
connected to the CM.
- docsIfCmtsCmStatusDocsisRegMode: the QOS level (1.0, 1.1) that the reporting CM is operating in.
- docsIfDocsisBaseCapability: the highest version of the DOCSIS specification(1.0, 1.1, 2.0) that the device is capable of supporting.
- docsIfCmtsCmStatusModulationType the upstream modulation methodology used by the CM.

::= { docsDevCmtsNotifs 7 }

docsDevCmtsBPKMNotif NOTIFICATION-TYPE
OBJECTS {
  docsDevEvLevel,
  docsDevEvId,
  docsDevEvText,
  docsIfCmtsCmStatusMacAddress,
  ifPhysAddress,
  docsIfCmtsCmStatusDocsisRegMode,
  docsIfDocsisBaseCapability,
  docsIfCmtsCmStatusModulationType
}
STATUS current
DESCRIPTION
"A notification to report the failure of a BPKM operation which is detected by the CMTS.

This notification sends additional information about the event by including the following objects in it’s varbinding list.
- docsDevEvLevel: the priority level associated with the event.
- docsDevEvId: the unique identifier of the event that occurred.
- docsDevEvText: a textual description of the event.
- docsIfCmtsCmStatusMacAddress: the MAC address of the CM for which this notification is associated with.
- ifPhysAddress: the MAC address of the CMTS (if there is a cable card/ interface in the CMTS, then it is actually the MAC address of the cable interface which connected to the CM) cable interface connected to the CM.
- docsIfCmtsCmStatusDocsisRegMode: the QOS level (1.0, 1.1) that the reporting CM is operating in.
- docsIfDocsisBaseCapability: the highest version of the DOCSIS specification(1.0, 1.1, 2.0) that the device is capable of supporting.
docsCmtsDynamicSANotif NOTIFICATION-TYPE
OBJECTS {
    docsDevEvLevel,
    docsDevEvId,
    docsDevEvText,
    docsIfCmtsCmStatusMacAddress,
    ifPhysAddress,
    docsIfCmtsCmStatusDocsisRegMode,
    docsIfDocsisBaseCapability,
    docsIfCmtsCmStatusModulationType
}
STATUS current
DESCRIPTION
"A notification to report the failure of a dynamic security association operation which is detected by the CMTS.

This notification sends additional information about the event by including the following objects in its varbinding list.

- docsDevEvLevel: the priority level associated with the event.
- docsDevEvId: the unique identifier of the event that occurred.
- docsDevEvText: a textual description of the event.
- docsIfCmtsCmStatusMacAddress: the MAC address of the CM for which this notification is associated with.
- ifPhysAddress: the MAC address of the CMTS (if there is a cable card/ interface in the CMTS, then it is actually the MAC address of the cable interface which connected to the CM) cable interface connected to the CM.
- docsIfCmtsCmStatusDocsisRegMode: the QOS level (1.0, 1.1) that the reporting CM is operating in.
- docsIfDocsisBaseCapability: the highest version of the DOCSIS specification(1.0, 1.1, 2.0) that the device is capable of supporting.
- docsIfCmtsCmStatusModulationType the upstream modulation methodology used by the CM.
"

::= { docsDevCmtsNotifs 9 }
docsDevCmtsDCCReqFailNotif NOTIFICATION-TYPE
OBJECTS {
    docsDevEvLevel,
    docsDevEvId,
    docsDevEvText,
    docsIfCmtsCmStatusMacAddress,
    ifPhysAddress,
    docsIfCmtsCmStatusDocsisRegMode,
    docsIfDocsisBaseCapability,
    docsIfCmtsCmStatusModulationType
}
STATUS current
DESCRIPTION

"A notification to report the failure of a dynamic channel change request during the dynamic channel change process and is detected by the CMTS.

This notification sends additional information about the event by including the following objects in its varbinding list.
- docsDevEvLevel: the priority level associated with the event.
- docsDevEvId: the unique identifier of the event that occurred.
- docsDevEvText: a textual description of the event.
- docsIfCmtsCmStatusMacAddress: the MAC address of the CM for which this notification is associated with.
- ifPhysAddress: the MAC address of the CMTS (if there is a cable card/ interface in the CMTS, then it is actually the MAC address of the cable interface which connected to the CM) cable interface connected to the CM.
- docsIfCmtsCmStatusDocsisRegMode: the QOS level (1.0, 1.1) that the reporting CM is operating in.
- docsIfDocsisBaseCapability: the highest version of the DOCSIS specification(1.0, 1.1, 2.0) that the device is capable of supporting.
- docsIfCmtsCmStatusModulationType the upstream modulation methodology used by the CM.
"
::= { docsDevCmtsNotifs 10 }

docsDevCmtsDCCRspFailNotif NOTIFICATION-TYPE
OBJECTS {
    docsDevEvLevel,
A notification to report the failure of a dynamic channel change response during the dynamic channel change process and is detected by the CMTS.

This notification sends additional information about the event by including the following objects in it’s varbinding list.
- docsDevEvLevel: the priority level associated with the event.
- docsDevEvId: the unique identifier of the event that occurred.
- docsDevEvText: a textual description of the event.
- docsIfCmtsCmStatusMacAddress: the MAC address of the CM for which this notification is associated with.
- ifPhysAddress: the MAC address of the CMTS (if there is a cable card/ interface in the CMTS, then it is actually the MAC address of the cable interface which connected to the CM) cable interface connected to the CM.
- docsIfCmtsCmStatusDocsisRegMode: the QOS level (1.0, 1.1) that the reporting CM is operating in.
- docsIfDocsisBaseCapability: the highest version of the DOCSIS specification (1.0, 1.1, 2.0) that the device is capable of supporting.
- docsIfCmtsCmStatusModulationType: the upstream modulation methodology used by the CM.

::= { docsDevCmtsNotifs 11 }
ifPhysAddress,
docsIfCmtsCmStatusDocsisRegMode,
docsIfDocsisBaseCapability,
docsIfCmtsCmStatusModulationType
)
STATUS current
DESCRIPTION
"A notification to report the failure of a dynamic channel change acknowledgement during the dynamic channel change process and is detected by the CMTS.

This notification sends additional information about the event by including the following objects in it's varbinding list.
- docsDevEvLevel: the priority level associated with the event.
- docsDevEvId: the unique identifier of the event that occurred.
- docsDevEvText: a textual description of the event.
- docsIfCmtsCmStatusMacAddress: the MAC address of the CM for which this notification is associated with.
- ifPhysAddress: the MAC address of the CMTS (if there is a cable card/ interface in the CMTS, then it is actually the MAC address of the cable interface which connected to the CM) cable interface connected to the CM.
- docsIfCmtsCmStatusDocsisRegMode: the QOS level (1.0, 1.1) that the reporting CM is operating in.
- docsIfDocsisBaseCapability: the highest version of the DOCSIS specification(1.0, 1.1, 2.0) that the device is capable of supporting.
- docsIfCmtsCmStatusModulationType: the upstream modulation methodology used by the CM.
"
::= { docsDevCmtsNotifs 12}

--
--Conformance definitions
--

docsDevNotifConformance OBJECT IDENTIFIER ::= { docsDevNotifMIB 4 }
docsDevNotifGroups OBJECT IDENTIFIER ::= { docsDevNotifConformance 1 }
docsDevNotifCompliances OBJECT IDENTIFIER ::= { docsDevNotifConformance 2 }
docsDevCmNotifCompliance MODULE-COMPLIANCE
STATUS current
DESCRIPTION
"The compliance statement for CM Notifications and Control"

MODULE --docsDevNotif
--mandatory groups

GROUP docsDevCmNotifControlGroup
DESCRIPTION
"Mandatory in CM."

GROUP docsDevCmNotificationGroup
DESCRIPTION
"Mandatory in CM."

::= { docsDevNotifCompliances 1 }

docsDevCmNotifControlGroup OBJECT-GROUP
OBJECTS {
  docsDevCmNotifControl
}
STATUS current
DESCRIPTION
"CM must support docsDevCmNotifControl."
::= { docsDevNotifGroups 1 }

docsDevCmNotificationGroup NOTIFICATION-GROUP
NOTIFICATIONS {
  docsDevCmInitTLVUnknownNotif,
  docsDevCmDynServReqFailNotif,
  docsDevCmDynServRspFailNotif,
  docsDevCmDynServAckFailNotif,
  docsDevCmBpiInitNotif,
  docsDevCmBPKMNotif,
  docsDevCmDynamicSANotif,
  docsDevCmDHCPFailNotif,
  docsDevCmSwUpgradeInitNotif,
  docsDevCmSwUpgradeFailNotif,
  docsDevCmSwUpgradeSuccessNotif,
  docsDevCmSwUpgradeCVCFailNotif,
  docsDevCmTODFailNotif,
  docsDevCmDCCReqFailNotif,
  docsDevCmDCCRspFailNotif,
  docsDevCmDCCAckFailNotif
}
STATUS current
DESCRIPTION
"A collection of CM notifications providing device status"
and control.

::= { docsDevNotifGroups 2 }

docsDevCmtsNotifCompliance MODULE-COMPLIANCE
STATUS current
DESCRIPTION
   "The compliance statement for DOCSIS CM and
   CMTS."
MODULE --docsDevNotif
   --mandatory groups

   GROUP docsDevCmtsNotifControlGroup
   DESCRIPTION
   "Mandatory in CMTS."

   GROUP docsDevCmtsNotificationGroup
   DESCRIPTION
   "Mandatory in CMTS."

::= { docsDevNotifCompliances 2 }

docsDevCmtsNotifControlGroup OBJECT-GROUP
   OBJECTS {
      docsDevCmtsNotifControl
   }
   STATUS current
   DESCRIPTION
      "CMTS must support docsDevCmtsNotifControl."
::= { docsDevNotifGroups 3 }

docsDevCmtsNotificationGroup NOTIFICATION-GROUP
   NOTIFICATIONS {
      docsDevCmtsInitRegReqFailNotif,
      docsDevCmtsInitRegRspFailNotif,
      docsDevCmtsInitRegAckFailNotif,
      docsDevCmtsDynServReqFailNotif,
      docsDevCmtsDynServRspFailNotif,
      docsDevCmtsDynServAckFailNotif,
      docsDevCmtsBpiInitNotif,
      docsDevCmtsBPKMNotif,
      docsDevCmtsDynamicSANotif,
      docsDevCmtsDCCReqFailNotif,
      docsDevCmtsDCCRspFailNotif,
      docsDevCmtsDCCAckFailNotif
5. Contributors

Thanks goes to the following people who have made significant contributions to this document: Junming Gao, Jean-Francois Mule, Dave Raftus, Pak Siripunkaw, and Rich Woundy.

6. Acknowledgments

This document was produced by the IPCDN Working Group. Thanks to Harrie Hazewinkel and Bert Wijnen for their thorough review and insightful comments on this document. Special thanks to Rich Woundy, who made several valuable suggestions to improve the notifications.

7. Security Consideration

There are two management objects defined in this MIB module with a MAX-ACCESS clause of read-write and/or read-create (docsDevCmNotifControl and docsDevCmtsNotifControl). 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.

Setting docsDevCmNotifControl or docsDevCmtsNotifControl may cause flooding of notifications, which can disrupt network service. Besides causing "flooding", changing the objects can also mean that notifications will not be emitted while one intended that to happen. Note that notifications are also under the control of the MIB modules defined in RFC 3413 [17].

This MIB defines a number of notification objects that send detailed information about the event that caused the generation of the notification. Information included in the notification message include: event priority, the event Id, the event message body, the CM DOCSIS capability, the CM DOCSIS QOS level, the CM DOCSIS upstream modulation type, the cable interface MAC address of the cable modem and, the cable card MAC address of the CMTS to which the modem is connected. The monitoring of these notification messages could be
used to gather information about the state of the network and devices (CM and CMTS) attached to the network.

SNMP versions prior to SNMPv3 did not include adequate security. 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 module.

It is RECOMMENDED that implementers consider the security features as provided by the SNMPv3 framework (see [RFC3410], section 8), including full support for the SNMPv3 cryptographic mechanisms (for authentication and privacy).

Further, deployment of SNMP versions prior to SNMPv3 is NOT RECOMMENDED. Instead, it is RECOMMENDED to deploy SNMPv3 and to enable cryptographic security. It is then a customer/operator responsibility to ensure that the SNMP entity giving access to an instance of this MIB module 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.

8. IANA Considerations

The MIB module defined in this document uses the following IANA-assigned OBJECT IDENTIFIER values recorded in the SMI Numbers registry:

<table>
<thead>
<tr>
<th>Descriptor</th>
<th>OBJECT IDENTIFIER value</th>
</tr>
</thead>
<tbody>
<tr>
<td>docsDevNotifMIB</td>
<td>{ mib-2 xxx }</td>
</tr>
</tbody>
</table>

-- Editor’s Note (to be removed prior to publication): the IANA is requested to assign a value for "xxx" under the ‘mib-2’ sub-tree and to record the assignment in the SMI Numbers registry. When the assignment has been made, the RFC Editor is asked to replace "xxx" (here and in the MIB module) with the assigned value and to remove this note.

9. References

9.1 Normative References

McCloghrie, K., Rose, M. and S. Waldbusser, "Structure of
Management Information Version 2 (SMIv2)", STD 58, RFC 2578,
April 1999.

McCloghrie, K., Rose, M. and S. Waldbusser, "Textual
Conventions for SMIv2", STD 58, RFC 2579, April 1999.

Statements for SMIv2", STD 58, RFC 2580, April 1999.

[5] St. Johns, M., "DOCSIS Cable Device MIB Cable Device Management
Information Base for DOCSIS compliant Cable Modems and Cable

Information Base for DOCSIS 2.0 compliant RF interfaces",
Internet Draft draft-ietf-ipcdn-docs-rfmibv2-10, April 2004
-- RFC ED.: replace this reference of
'draft-ietf-ipcdn-docs-rfmibv2-10' with actual RFC reference
and remove this note.

RFC 2863, June 2000.

[8] SCTE Data Standards Subcommittee, "Data-Over-Cable Service
Interface Specifications: DOCSIS 1.0 Baseline Privacy Interface
Specification SCTE 22-2", 2002,

SP-BPI+040407", April 2004,

[10] SCTE Data Standards Subcommittee, "Data-Over-Cable Service
Interface Specifications: DOCSIS 1.0 Operations Support System
Interface Specification Radio Frequency Interface SCTE 22-3",

[11] CableLabs, "Data-Over-Cable Service Interface Specifications:
Operations Support System Interface Specification
SP-OSSIv1.1-I07-030703", July 2003,

[12] CableLabs, "Data-Over-Cable Service Interface Specifications:
Operations Support System Interface Specification
SP-OSSIv2.0-I07-041210", December 2004,
9.2 Informative References


Authors’ Addresses

Azlina Ahmad  
Protego Networks, Inc.  
1064 Yosemite Drive  
Milpitas, CA 95035  
US  
Phone: 408 262 5220  
EMail: azlina@protegonetworks.com

Greg Nakanishi  
Motorola  
6450 Sequence Dr.  
San Diego, CA 92126  
US  
Phone: 858 404-2366  
EMail: gnakanishi@motorola.com
Intellectual Property Statement

The IETF takes no position regarding the validity or scope of any Intellectual Property Rights or other rights that might be claimed to pertain to the implementation or use of the technology described in this document or the extent to which any license under such rights might or might not be available; nor does it represent that it has made any independent effort to identify any such rights. Information on the procedures with respect to rights in RFC documents can be found in BCP 78 and BCP 79.

Copies of IPR disclosures made to the IETF Secretariat and any assurances of licenses to be made available, or the result of an attempt made to obtain a general license or permission for the use of such proprietary rights by implementers or users of this specification can be obtained from the IETF on-line IPR repository at http://www.ietf.org/ipr.

The IETF invites any interested party to bring to its attention any copyrights, patents or patent applications, or other proprietary rights that may cover technology that may be required to implement this standard. Please address the information to the IETF at ietf-ipr@ietf.org.

Disclaimer of Validity

This document and the information contained herein are provided on an "AS IS" basis and THE CONTRIBUTOR, THE ORGANIZATION HE/SHE REPRESENTS OR IS SPONSORED BY (IF ANY), THE INTERNET SOCIETY AND THE INTERNET ENGINEERING TASK FORCE DISCLAIM ALL WARRANTIES, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO ANY WARRANTY THAT THE USE OF THE INFORMATION HEREIN WILL NOT INFRINGE ANY RIGHTS OR ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.

Copyright Statement

Copyright (C) The Internet Society (2005). This document is subject to the rights, licenses and restrictions contained in BCP 78, and except as set forth therein, the authors retain all their rights.

Acknowledgment

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