



1. The SNMP Management Framework

The SNMP Management Framework presently consists of five major components:

- An overall architecture, described in RFC 2571 [1].
- 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 [2], STD 16, RFC 1212 [3] and RFC 1215 [4]. The second version, called SMIv2, is described in STD 58, RFC 2578 [5], STD 58, RFC 2579 [6] and STD 58, RFC 2580 [7].
- Message protocols for transferring management information. The first version of the SNMP message protocol is called SNMPv1 and described in RFC 1157 [8]. A second version of the SNMP message protocol, which is not an Internet standards track protocol, is called SNMPv2c and described in RFC 1901 [9] and RFC 1906 [10]. The third version of the message protocol is called SNMPv3 and described in RFC 1906 [10], RFC 2572 [11] and RFC 2574 [12].
- Protocol operations for accessing management information. The first set of protocol operations and associated PDU formats is described in STD 15, RFC 1157 [8]. A second set of protocol operations and associated PDU formats is described in RFC 1905[13].
- A set of fundamental applications described in RFC 2573 [14] and the view-based access control mechanism described in RFC 2575[15].

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

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 process.

2.1. 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.

2.2. Channel

A specific frequency allocation with an RF medium, specified by channel width in Hertz (cycles per second) and by center frequency. Within the US Cable Systems, upstream channels are generally allocated from the 5-42MHz range while downstream channels are generally allocated from the 50-750MHz range depending on the capabilities of the given system. The typical broadcast channel width in the US is 6MHz. Upstream channel widths for DOCSIS vary.

2.3. CM Cable Modem.

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



2.4. 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 CMs.

2.5. Codeword

See [16]. A characteristic of the Forward Error Correction scheme used above the RF media layer.

2.6. Data Packet

The payload portion of the MAC Packet.

2.7. dBmV

Decibel relative to one milli-volt. A measure of RF power.

2.8. DOCSIS

"Data Over Cable Interface Specification". A term referring to the ITU-T J.112 Annex B standard for cable modem systems [20].

2.9. Downstream

The direction from the head-end towards the subscriber.

2.10. Head-end

The origination point in most cable systems of the subscriber video signals.



2.11. MAC Packet

A DOCSIS PDU.

2.12. MCNS

"Multimedia Cable Network System". Generally replaced in usage by DOCSIS.

2.13. Mini-slot

See [16]. In general, an interval of time which is allocated by the CMTS to a given CM for that CM to transmit in an upstream direction.

2.14. QPSK Quadrature Phase Shift Keying.

A particular modulation scheme on an RF medium. See [19].

2.15. QAM Quadrature Amplitude Modulation.

A particular modulation scheme on on RF medium. Usually expressed with a number indicating the size of the modulation constellation (e.g. 16 QAM). See [19], or any other book on digital communications over RF for a complete explanation of this.

2.16. RF

Radio Frequency.

2.17. Symbol-times

See [16]. A characteristic of the RF modulation scheme.



2.18. Upstream

The direction from the subscriber towards the head-end.

3. Overview

This MIB provides a set of objects required for the management of MCNS/DOCSIS compliant Cable Modem (CM) and Cable Modem Termination System (CMTS) RF interfaces. The specification is derived in part from the parameters and protocols described in DOCSIS Radio Frequency Interface Specification [16].

3.1. Structure of the MIB

This MIB is structured as three groups:

- Management information pertinent to both Cable Modems (CM) and Cable Modem Termination Systems (CMTS) (docslfBaseObjects).
- Management information pertinent to Cable Modems only (docslfCmObjects).
- Management information pertinent to Cable Modem Termination Systems only (docslfCmtsObjects).

Tables within each of these groups group objects functionally - e.g. Quality of Service, Channel characteristics, MAC layer management, etc. Rows created automatically (e.g. by the device according to the hardware configuration) may and generally will have a mixture of configuration and status objects within them. Rows that are meant to be created by the management station are generally restricted to configuration (read-create) objects.



3.1.1. docslfBaseObjects

docslfDownstreamChannelTable - This table describes the active downstream channels for a CMTS and the received downstream channel for a CM.

docslfUpstreamChannelTable - This table describes the active upstream channels for a CMTS and the current upstream transmission channel for a CM.

docslfQosProfileTable - This table describes the valid Quality of Service service profiles for the cable data system.

docslfSignalQualityTable - This table is used to monitor RF signal quality characteristics of received signals.

3.1.2. docslfCmObjects

docslfCmMacTable - This table is used to monitor the DOCSIS MAC interface and can be considered an extension to the ifEntry.

docslfCmServiceTable - This table describes the upstream service queues available at this CM. There is a comparable table at the CMTS, docslfCmtsServiceEntry, which describes the service queues from the point of view of the CMTS.

3.1.3. docslfCmtsObjects

docslfCmtsStatusTable - This table provides a set of aggregated counters which roll-up values and events that occur on the underlying sub-interfaces.

docslfCmtsCmStatusTable - This table is used to hold information about known (e.g. registered) cable modems on the system serviced by this CMTS.

docslfCmtsServiceEntry - This table provides access to the information related to upstream service queues.



docsIfCmtsModulationTable - This table allows control over the modulation profiles for RF channels associated with this CMTS.

docsIfCmtsMacToCmTable - This table allows fast access into the docsIfCmtsCmTable via a MAC address (of the CM) interface.

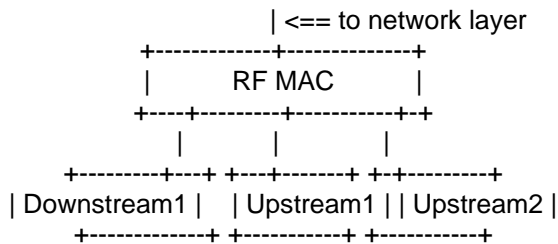
3.2. Relationship to the Interfaces MIB

This section clarifies the relationship of this MIB to the Interfaces MIB [17]. Several areas of correlation are addressed in the following subsections. The implementor is referred to the Interfaces MIB document in order to understand the general intent of these areas.

3.2.1. Layering Model

An instance of ifEntry exists for each RF Downstream interface, for each RF Upstream interface, and for each RF MAC layer. The ifStackTable [17] MUST be implemented to identify relationships among sub-interfaces.

The following example illustrates a MAC interface with one downstream and two upstream channels.



As can be seen from this example, the RF MAC interface is layered on top of the downstream and upstream interfaces.

In this example, the assignment of index values could be as follows:



ifIndex	ifType	Description
1	docsCableMaclayer(127)	CATV MAC Layer
2	docsCableDownstream(128)	CATV Downstream interface
3	docsCableUpstream(129)	CATV Upstream interface
4	docsCableUpstream(129)	CATV Upstream interface

The corresponding ifStack entries would then be:

IfStackHigherLayer	ifStackLowerLayer
0	1
1	2
1	3
1	4
2	0
3	0
4	0

The same interface model can also be used in Telephony or Telco Return systems. A pure Telco Return system (Cable Modem as well as Cable Modem Termination System) would not have upstream, but only downstream cable channels. Systems supporting both Telco Return and cable upstream channels can use the above model without modification.

Telco Return Upstream channel(s) are handled by the appropriate MIBs, such as PPP or Modem MIBs.

3.2.2. Virtual Circuits

This medium does not support virtual circuits and this area is not applicable to this MIB.

3.2.3. ifTestTable



The ifTestTable is not supported by this MIB.

3.2.4. ifRcvAddressTable

The ifRcvAddressTable is not supported by this MIB.

3.2.5. ifEntry

This section documents only the differences from the requirements specified in the Interfaces MIB. See that MIB for columns omitted from the descriptions below.

3.2.5.1. ifEntry for Downstream interfaces

The ifEntry for Downstream interfaces supports the ifGeneralInformationGroup and the ifPacketGroup of the Interfaces MIB. This is an output only interface at the CMTS and all input status counters - ifIn* - will return zero. This is an input only interface at the CM and all output status counters - ifOut* - will return zero.

3.2.5.1.1. ifEntry for Downstream interfaces in Cable Modem Termination Systems

ifTable	Comments
===== ifIndex	===== Each RF Cable Downstream interface is represented by an ifEntry.
ifType	The IANA value of docsCableDownstream(128).
ifSpeed	Return the speed of this downstream channel. The returned value the raw bandwidth in bits/s of this interface. This is the symbol rate multiplied with the number of bits per symbol.
ifPhysAddress	Return an empty string.



ifAdminStatus	The administrative status of this interface.
ifOperStatus	The current operational status of this interface.
ifMtu	The size of the largest frame which can be sent on this interface, specified in octets. The value includes the length of the MAC header.
ifInOctets	Return zero.
ifInUcastPkts	Return zero.
ifInMulticastPkts	Return zero.
ifInBroadcastPkts	Return zero.
ifInDiscards	Return zero.
ifInErrors	Return zero.
ifInUnknownProtos	Return zero.
ifOutOctets	The total number of octets transmitted on this interface. This includes MAC packets as well as data packets, and includes the length of the MAC header.
ifOutUcastPkts	The number of Unicast packets transmitted on this interface. This includes MAC packets as well as data packets.
ifOutMulticastPkts	Return the number of Multicast packets transmitted on this interface. This includes MAC packets as well as data packets.



ifOutBroadcastPkts	Return the number of broadcast packets transmitted on this interface. This includes MAC packets as well as data packets.
ifOutDiscards	The total number of outbound packets which were discarded. Possible reasons are: buffer shortage.
ifOutErrors	The number of packets which could not be transmitted due to errors.
ifPromiscuousMode	Return false.

3.2.5.1.2. ifEntry for Downstream interfaces in Cable Modems

ifTable	Comments
=====	=====
ifIndex	Each RF Cable Downstream interface is represented by an ifEntry.
ifType	The IANA value of docsCableDownstream(128).
ifSpeed	Return the speed of this downstream channel. The returned value the raw bandwidth in bits/s of this interface. This is the symbol rate multiplied with the number of bits per symbol.
ifPhysAddress	Return an empty string.
ifAdminStatus	The administrative status of this interface.
ifOperStatus	The current operational status of this interface.



ifMtu	The size of the largest frame which can be received from this interface, specified in octets. The value includes the length of the MAC header.
ifInOctets	The total number of octets received on this interface. This includes data packets as well as MAC layer packets, and includes the length of the MAC header.
ifInUcastPkts	The number of Unicast packets received on this interface. This includes data packets as well as MAC layer packets.
ifInMulticastPkts	Return the number of Multicast packets received on this interface. This includes data packets as well as MAC layer packets.
ifInBroadcastPkts	Return the number of Broadcast packets received on this interface. This includes data packets as well as MAC layer packets.
ifInDiscards	The total number of received packets which have been discarded. The possible reasons are: buffer shortage.
ifInErrors	The number of inbound packets that contained errors preventing them from being deliverable to higher layers. Possible reasons are: MAC FCS error.
ifInUnknownProtos	The number of frames with an unknown packet type. These are MAC frames with an unknown packet type.
ifOutOctets	Return zero.



ifOutUcastPkts	Return zero.
IfOutMulticastPkts	Return zero.
IfOutBroadcastPkts	Return zero.
ifOutDiscards	Return zero.
ifOutErrors	Return zero.
ifPromiscuousMode	Refer to the Interfaces MIB.

3.2.5.2. ifEntry for Upstream interfaces

The ifEntry for Upstream interfaces supports the ifGeneralInformationGroup and the ifPacketGroup of the Interfaces MIB. This is an input only interface at the CMTS and all output status counters - ifOut* - will return zero. This is an output only interface at the CM and all input status counters - ifIn* - will return zero.

3.2.5.2.1. ifEntry for Upstream interfaces in Cable Modem Termination Systems

ifTable	Comments
=====	=====
ifIndex	Each RF Cable Upstream interface is represented by an ifEntry.
ifType	The IANA value of docsCableUpstream(129).
ifSpeed	Return the speed of this upstream channel. The returned value is the raw bandwidth in bits/s of this interface, regarding the highest speed modulation profile that is defined. This is the symbol rate multiplied



with the number of bits per symbol for this modulation profile.

ifPhysAddress	Return an empty string.
ifAdminStatus	The administrative status of this interface.
ifOperStatus	The current operational status of this interface.
ifMtu	The size of the largest frame which can be received on this interface, specified in octets. The value includes the length of the MAC header.
ifInOctets	The total number of octets received on this interface. This includes data packets as well as MAC layer packets, and includes the length of the MAC header.
ifInUcastPkts	The number of Unicast packets received on this interface. This includes data packets as well as MAC layer packets.
ifInMulticastPkts	Return the number of Multicast packets received on this interface. This includes data packets as well as MAC layer packets.
ifInBroadcastPkts	Return the number of Broadcast packets received on this interface. This includes data packets as well as MAC layer packets.



ifInDiscards	The total number of received packets which have been discarded. The possible reasons are: buffer shortage.
ifInErrors	The number of inbound packets that contained errors preventing them from being deliverable to higher layers. Possible reasons are: MAC FCS error.
ifInUnknownProtos	The number of frames with an unknown packet type. This are MAC frames with an unknown packet type.
ifOutOctets	Return zero.
ifOutUcastPkts	Return zero.
ifOutMulticastPkts	Return zero.
ifOutBroadcastPkts	Return zero.
ifOutDiscards	Return zero.
ifOutErrors	Return zero.

3.2.5.2.2. ifEntry for Upstream interfaces in Cable Modems

ifTable	Comments
=====	=====
ifIndex	Each RF Cable Upstream interface is represented by an ifEntry.
ifType	The IANA value of docsCableUpstream(129).
ifSpeed	Return the speed of this upstream channel. The returned value is the raw bandwidth in bits/s of this



interface, regarding the highest speed modulation profile that is defined. This is the symbol rate multiplied with the number of bits per symbol for this modulation profile.

ifPhysAddress	Return an empty string.
ifAdminStatus	The administrative status of this interface.
ifOperStatus	The current operational status of this interface.
ifMtu	The size of the largest frame which can be transmitted on this interface, specified in octets. The value includes the length of the MAC header.
ifInOctets	Return zero.
ifInUcastPkts	Return zero.
ifInMulticastPkts	Return zero.
ifInBroadcastPkts	Return zero.
ifInDiscards	Return zero.
ifInErrors	Return zero.
ifInUnknownProtos	Return zero.
ifOutOctets	The total number of octets transmitted on this interface. This includes MAC packets as well as data packets, and includes the length of the MAC header.



ifOutUcastPkts	The number of Unicast packets transmitted on this interface. This includes MAC packets as well as data packets.
ifOutMulticastPkts	Return the number of Multicast packets transmitted on this interface. This includes MAC packets as well as data packets.
ifOutBroadcastPkts	Return the number of broadcast packets transmitted on this interface. This includes MAC packets as well as data packets.
ifOutDiscards	The total number of outbound packets which were discarded. Possible reasons are: buffer shortage.
ifOutErrors	The number of packets which could not be transmitted due to errors.
ifPromiscuousMode	Return false.

3.2.5.3. ifEntry for the MAC Layer

The ifEntry for the MAC Layer supports the ifGeneralInformationGroup and the ifPacketGroup of the Interfaces MIB. This interface provides an aggregate view of status for the lower level Downstream and Upstream interfaces.

ifTable	Comments
===== ifIndex	===== Each RF Cable MAC layer entity is represented by an ifEntry.



ifType	The IANA value of docsCableMaclayer(127).
ifSpeed	Return zero.
ifPhysAddress	Return the physical address of this interface.
ifAdminStatus	The administrative status of this interface.
ifOperStatus	The current operational status of the MAC layer interface.
ifHighSpeed	Return zero.
ifMtu	Return 1500.
ifInOctets	The total number of data octets received on this interface, targeted for upper protocol layers.
ifInUcastPkts	The number of Unicast packets received on this interface, targeted for upper protocol layers.
ifInMulticastPkts	Return the number of Multicast packets received on this interface, targeted for upper protocol layers.
ifInBroadcastPkts	Return the number of Broadcast packets received on this interface, targeted for upper protocol layers.
ifInDiscards	The total number of received packets which have been discarded. The possible reasons are: buffer shortage.



ifInErrors	The number of inbound packets that contained errors preventing them from being deliverable to higher layers. Possible reasons are: data packet FCS error, invalid MAC header.
ifInUnknownProtos	The number of frames with an unknown packet type. This is the number of data packets targeted for upper protocol layers with an unknown packet type.
ifOutOctets	The total number of octets, received from upper protocol layers and transmitted on this interface.
ifOutUcastPkts	The number of Unicast packets, received from upper protocol layers and transmitted on this interface.
ifOutMulticastPkts	Return the number of Multicast packets received from upper protocol layers and transmitted on this interface.
ifOutBroadcastPkts	Return the number of broadcast packets received from upper protocol layers and transmitted on this interface.
ifOutDiscards	The total number of outbound packets which were discarded. Possible reasons are: buffer shortage.
ifOutErrors	The number of packets which could not be transmitted due to errors.
ifPromiscuousMode	Refer to the Interfaces MIB.



4. Definitions

DOCS-IF-MIB DEFINITIONS ::= BEGIN

IMPORTS

MODULE-IDENTITY,

OBJECT-TYPE,

-- do not import BITS,

Unsigned32,

Integer32,

Counter32,

TimeTicks,

IpAddress,

transmission

FROM SNMPv2-SMI

TEXTUAL-CONVENTION,

MacAddress,

RowStatus,

TruthValue,

TimeInterval,

TimeStamp

FROM SNMPv2-TC

OBJECT-GROUP,

MODULE-COMPLIANCE

FROM SNMPv2-CONF

ifIndex, InterfaceIndexOrZero

FROM IF-MIB;

docsIfMib MODULE-IDENTITY

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DESCRIPTION

"This is the MIB Module for MCNS/DOCSIS compliant Radio Frequency (RF) interfaces in Cable Modems (CM) and Cable Modem Termination Systems (CMTS)."

REVISION "9908190000Z"

DESCRIPTION

"Initial Version, published as RFC 2670.
Modified by Mike StJohns to fix problems identified by the first pass of the MIB doctor. Of special note, docslfRangingResp and docslfCmtsInsertionInterval were obsoleted and replaced by other objects with the same functionality, but more appropriate SYNTAX."

::= { transmission 127 }

-- Textual Conventions

TenthdBmV ::= TEXTUAL-CONVENTION

DISPLAY-HINT "d-1"
STATUS current

DESCRIPTION

"This data type represents power levels that are normally expressed in dBmV. Units are in tenths of a dBmV; for example, 5.1 dBmV will be represented as 51."

SYNTAX Integer32

TenthdB ::= TEXTUAL-CONVENTION

DISPLAY-HINT "d-1"



STATUS current

DESCRIPTION

"This data type represents power levels that are normally expressed in dB.

Units are in tenths of a dB; for example, 5.1 dB will be represented as 51."

SYNTAX Integer32

docslfMibObjects OBJECT IDENTIFIER ::= { docslfMib 1 }

docslfBaseObjects OBJECT IDENTIFIER ::= { docslfMibObjects 1 }

docslfCmObjects OBJECT IDENTIFIER ::= { docslfMibObjects 2 }

docslfCmtsObjects OBJECT IDENTIFIER ::= { docslfMibObjects 3 }

--

-- BASE GROUP

--

--

-- The following table is implemented on both the Cable Modem (CM) and the Cable

-- Modem Termination System (CMTS).

--

docslfDownstreamChannelTable OBJECT-TYPE

SYNTAX SEQUENCE OF DocslfDownstreamChannelEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"This table describes the attributes of downstream channels (frequency bands)."

REFERENCE

"DOCSIS Radio Frequency Interface Specification, Table 4-12 and Table 4-13."

::= { docslfBaseObjects 1 }

**docsIfDownstreamChannelEntry OBJECT-TYPE**

SYNTAX DocslfDownstreamChannelEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"An entry provides a list of attributes for a single Downstream channel. An entry in this table exists for each ifEntry with an ifType of docsCableDownstream(128)."

INDEX { ifIndex }

::= { docsIfDownstreamChannelTable 1 }

DocslfDownstreamChannelEntry ::= SEQUENCE {

docsIfDownChannelId Integer32,

docsIfDownChannelFrequency Integer32,

docsIfDownChannelWidth Integer32,

docsIfDownChannelModulation INTEGER,

docsIfDownChannelInterleave INTEGER,

docsIfDownChannelPower TenthdBmV

}

docsIfDownChannelId OBJECT-TYPE

SYNTAX Integer32 (0..255)

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The Cable Modem Termination System (CMTS) identification of the downstream channel within this particular MAC interface. If the interface is down, the object returns the most current value. If the downstream channel ID is unknown, this object returns a value of 0."

::= { docsIfDownstreamChannelEntry 1 }

docsIfDownChannelFrequency OBJECT-TYPE

SYNTAX Integer32 (0..1000000000)



UNITS "hertz"
MAX-ACCESS read-write
STATUS current

DESCRIPTION

"The center of the downstream frequency associated with this channel. This object will return the current tuner frequency. If a CMTS provides IF output, this object will return 0, unless this CMTS is in control of the final downstream RF frequency. See the associated compliance object for a description of valid frequencies that may be written to this object."

REFERENCE

"DOCSIS Radio Frequency Interface Specification, Section 4.3.3."

::= { docslfDownstreamChannelEntry 2 }

docslfDownChannelWidth OBJECT-TYPE

SYNTAX Integer32 (0..16000000)
UNITS "hertz"
MAX-ACCESS read-write
STATUS current

DESCRIPTION

"The bandwidth of this downstream channel. Most implementations are expected to support a channel width of 6 MHz (North America) and/or 8 MHz (Europe). See the associated compliance object for a description of the valid channel widths for this object."

REFERENCE

"DOCSIS Radio Frequency Interface Specification, Table 4-12 and Table 4-13."

::= { docslfDownstreamChannelEntry 3 }

docslfDownChannelModulation OBJECT-TYPE

SYNTAX INTEGER {
unknown(1),
other(2),
qam64(3),



latency .48/.33 msec
taps32Increment4(5): protection 24/16 usec,
latency .98/.68 msec
taps64Increment2(6): protection 47/33 usec,
latency 2/1.4 msec
taps128Increment1(7): protection 95/66 usec,
latency 4/2.8 msec

If the interface is down, this object either returns the configured value (CMTS), the most current value (CM), or the value of unknown(1).

The value of other(2) is returned if the interleave is known but not defined in the above list.

See the associated conformance object for write conditions and limitations. See the reference for the FEC configuration described by the setting of this object."

REFERENCE

"DOCSIS Radio Frequency Interface Specification, Section 4.3.2."

::= { docsIfDownstreamChannelEntry 5 }

docsIfDownChannelPower OBJECT-TYPE

SYNTAX TenthdBmV

UNITS "dBmV"

MAX-ACCESS read-write

STATUS current

DESCRIPTION

"At the CMTS, the operational transmit power. At the CM, the received power level. May be set to zero at the CM if power level measurement is not supported. If the interface is down, this object either returns the configured value (CMTS), the most current value (CM) or the value of 0. See the associated conformance object for write conditions and limitations. See the reference for recommended and required power levels."

REFERENCE

"DOCSIS Radio Frequency Interface Specification, Table 4-12 and Table 4-13."



```
::= { docslfDownstreamChannelEntry 6 }
```

```
--
```

```
-- The following table is implemented on both the CM and the CMTS.
```

```
-- For the CM, only attached channels appear in the table. For the CM, this table is
```

```
-- read only as well.
```

```
--
```

```
docslfUpstreamChannelTable OBJECT-TYPE
```

```
SYNTAX SEQUENCE OF DocslfUpstreamChannelEntry
```

```
MAX-ACCESS not-accessible
```

```
STATUS current
```

```
DESCRIPTION
```

```
"This table describes the attributes of attached upstream channels (frequency  
bands)."
```

```
::= { docslfBaseObjects 2 }
```

```
docslfUpstreamChannelEntry OBJECT-TYPE
```

```
SYNTAX DocslfUpstreamChannelEntry
```

```
MAX-ACCESS not-accessible
```

```
STATUS current
```

```
DESCRIPTION
```

```
"List of attributes for a single upstream channel. An entry in this table exists  
for each ifEntry with an ifType of docsCableUpstream(129)."
```

```
INDEX { ifIndex }
```

```
::= { docslfUpstreamChannelTable 1 }
```

```
DocslfUpstreamChannelEntry ::= SEQUENCE {
```

```
    docslfUpChannelId Integer32,
```

```
    docslfUpChannelFrequency Integer32,
```

```
    docslfUpChannelWidth Integer32,
```

```
    docslfUpChannelModulationProfile Unsigned32,
```

```
    docslfUpChannelSlotSize Unsigned32,
```



```
docsIfUpChannelTxTimingOffset      Unsigned32,  
docsIfUpChannelRangingBackoffStart Integer32,  
docsIfUpChannelRangingBackoffEnd  Integer32,  
docsIfUpChannelTxBackoffStart      Integer32,  
docsIfUpChannelTxBackoffEnd        Integer32  
}
```

docsIfUpChannelId OBJECT-TYPE

SYNTAX Integer32 (0..255)

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The CMTS identification of the upstream channel."

::= { docsIfUpstreamChannelEntry 1 }

docsIfUpChannelFrequency OBJECT-TYPE

SYNTAX Integer32 (0..1000000000)

UNITS "hertz"

MAX-ACCESS read-write

STATUS current

DESCRIPTION

"The center of the frequency band associated with this upstream channel.

This object returns 0 if the frequency is undefined or unknown. Minimum permitted upstream frequency is 5,000,000 Hz for current technology. See the associated conformance object for write conditions and limitations."

REFERENCE

"DOCSIS Radio Frequency Interface Specification, Table 2-2."

::= { docsIfUpstreamChannelEntry 2 }

docsIfUpChannelWidth OBJECT-TYPE

SYNTAX Integer32 (0..20000000)

UNITS "hertz"

MAX-ACCESS read-write



STATUS current

DESCRIPTION

"The bandwidth of this upstream channel. This object returns 0 if the channel width is undefined or unknown. Minimum permitted channel width is 200,000 Hz currently. See the associated conformance object for write conditions and limitations."

REFERENCE

"DOCSIS Radio Frequency Interface Specification, Table 4-3."

::= { docslfUpstreamChannelEntry 3 }

docslfUpChannelModulationProfile OBJECT-TYPE

SYNTAX Unsigned32

MAX-ACCESS read-write

STATUS current

DESCRIPTION

"An entry identical to the docslfModIndex in the docslfCmtsModulationTable that describes this channel. This channel is further instantiated there by a grouping of interval usage codes which together fully describe the channel modulation. This object returns 0 if the docslfCmtsModulationTable entry does not exist or docslfCmtsModulationTable is empty. See the associated conformance object for write conditions and limitations."

::= { docslfUpstreamChannelEntry 4 }

docslfUpChannelSlotSize OBJECT-TYPE

SYNTAX Unsigned32

MAX-ACCESS read-write

STATUS current

DESCRIPTION

"The number of 6.25 microsecond ticks in each upstream mini-slot. Returns zero if the value is undefined or unknown. See the associated conformance object for write conditions and limitations."

REFERENCE



"DOCSIS Radio Frequency Interface Specification, Section 6.1.2.4."

::= { docslfUpstreamChannelEntry 5 }

docslfUpChannelTxTimingOffset OBJECT-TYPE

SYNTAX Unsigned32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"A measure of the current round trip time at the CM or the maximum round trip time seen by the CMTS. Used for timing of CM upstream transmissions to ensure synchronized arrivals at the CMTS. Units are in terms of (6.25 microseconds/64)."

REFERENCE

"DOCSIS Radio Frequency Interface Specification, Section 6.5."

::= { docslfUpstreamChannelEntry 6 }

docslfUpChannelRangingBackoffStart OBJECT-TYPE

SYNTAX Integer32 (0..16)

MAX-ACCESS read-write

STATUS current

DESCRIPTION

"The initial random backoff window to use when retrying Ranging Requests. Expressed as a power of 2. A value of 16 at the CMTS indicates that a proprietary adaptive retry mechanism is to be used. See the associated conformance object for write conditions and limitations."

REFERENCE

"DOCSIS Radio Frequency Interface Specification, Section 6.4.4."

::= { docslfUpstreamChannelEntry 7 }

docslfUpChannelRangingBackoffEnd OBJECT-TYPE

SYNTAX Integer32 (0..16)

MAX-ACCESS read-write

STATUS current

**DESCRIPTION**

"The final random backoff window to use when retrying Ranging Requests. Expressed as a power of 2. A value of 16 at the CMTS indicates that a proprietary adaptive retry mechanism is to be used. See the associated conformance object for write conditions and limitations."

REFERENCE

"DOCSIS Radio Frequency Interface Specification, Section 6.4.4."

::= { docslfUpstreamChannelEntry 8 }

docslfUpChannelTxBackoffStart OBJECT-TYPE

SYNTAX Integer32 (0..16)

MAX-ACCESS read-write

STATUS current

DESCRIPTION

"The initial random backoff window to use when retrying transmissions. Expressed as a power of 2. A value of 16 at the CMTS indicates that a proprietary adaptive retry mechanism is to be used. See the associated conformance object for write conditions and limitations."

REFERENCE

"DOCSIS Radio Frequency Interface Specification, Section 6.4.4."

::= { docslfUpstreamChannelEntry 9 }

docslfUpChannelTxBackoffEnd OBJECT-TYPE

SYNTAX Integer32 (0..16)

MAX-ACCESS read-write

STATUS current

DESCRIPTION

"The final random backoff window to use when retrying transmissions. Expressed as a power of 2. A value of 16 at the CMTS indicates that a proprietary adaptive retry mechanism is to be used. See the associated conformance object for write conditions and limitations."

REFERENCE



"DOCSIS Radio Frequency Interface Specification, Section 6.4.4."

::= { docslfUpstreamChannelEntry 10 }

-- The following table describes the attributes of each class of-- service. The entries
-- in this table are referenced from the-- docslfServiceEntries. They exist as a
-- separate table in order to-- reduce redundant information in docslfServiceTable.
-- This table is implemented at both the CM and the CMTS.
-- The CM need only maintain entries for the classes of service referenced by its
-- docslfServiceTable.
--

docslfQosProfileTable OBJECT-TYPE

SYNTAX SEQUENCE OF DocslfQosProfileEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"Describes the attributes for each class of service."

::= { docslfBaseObjects 3 }

docslfQosProfileEntry OBJECT-TYPE

SYNTAX DocslfQosProfileEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"Describes the attributes for a single class of service."

If implemented as read-create in the Cable Modem Termination System, creation of entries in this table is controlled by the value of docslfCmtsQosProfilePermissions.

If implemented as read-only, entries are created based on information in REG-REQ MAC messages received from Cable Modems (Cable Modem



Termination System implementation), or based on information extracted from the TFTP option file (Cable Modem implementation). In the Cable Modem Termination system, read-only entries are removed if no longer referenced by docslfCmtsServiceTable.

An entry in this table must not be removed while it is referenced by an entry in docslfCmServiceTable (Cable Modem) or docslfCmtsServiceTable (Cable Modem Termination System).

An entry in this table should not be changeable while it is referenced by an entry in docslfCmtsServiceTable.

If this table is created automatically, there should only be a single entry for each Class of Service. Multiple entries with the same Class of Service parameters are not recommended."

```
INDEX { docslfQosProfIndex }
```

```
::= { docslfQosProfileTable 1 }
```

```
DocslfQosProfileEntry ::= SEQUENCE {  
    docslfQosProfIndex          Integer32,  
    docslfQosProfPriority       Integer32,  
    docslfQosProfMaxUpBandwidth Integer32,  
    docslfQosProfGuarUpBandwidth Integer32,  
    docslfQosProfMaxDownBandwidth Integer32,  
    docslfQosProfMaxTxBurst    Integer32,  
    docslfQosProfBaselinePrivacy TruthValue,  
    docslfQosProfStatus        RowStatus  
}
```

```
docslfQosProfIndex OBJECT-TYPE
```

```
SYNTAX Integer32 (1..16383)
```

```
MAX-ACCESS not-accessible
```

```
STATUS current
```

**DESCRIPTION**

"The index value which uniquely identifies an entry in the docslfQosProfileTable."

::= { docslfQosProfileEntry 1 }

docslfQosProfPriority OBJECT-TYPE

SYNTAX Integer32 (0..7)

MAX-ACCESS read-create

STATUS current

DESCRIPTION

"A relative priority assigned to this service when allocating bandwidth. Zero indicates lowest priority; and seven indicates highest priority. Interpretation of priority is device-specific. MUST NOT be changed while this row is active."

DEFVAL { 0 }

::= { docslfQosProfileEntry 2 }

docslfQosProfMaxUpBandwidth OBJECT-TYPE

SYNTAX Integer32 (0..100000000)

MAX-ACCESS read-create

STATUS current

DESCRIPTION

"The maximum upstream bandwidth, in bits per second, allowed for a service with this service class. Zero if there is no restriction of upstream bandwidth. MUST NOT be changed while this row is active."

DEFVAL { 0 }

::= { docslfQosProfileEntry 3 }

docslfQosProfGuarUpBandwidth OBJECT-TYPE

SYNTAX Integer32 (0..100000000)

MAX-ACCESS read-create

STATUS current

DESCRIPTION



"Minimum guaranteed upstream bandwidth, in bits per second, allowed for a service with this service class. MUST NOT be changed while this row is active."

DEFVAL { 0 }

::= { docslfQosProfileEntry 4 }

docslfQosProfMaxDownBandwidth OBJECT-TYPE

SYNTAX Integer32 (0..100000000)

MAX-ACCESS read-create

STATUS current

DESCRIPTION

"The maximum downstream bandwidth, in bits per second, allowed for a service with this service class. Zero if there is no restriction of downstream bandwidth. MUST NOT be changed while this row is active."

DEFVAL { 0 }

::= { docslfQosProfileEntry 5 }

docslfQosProfMaxTxBurst OBJECT-TYPE

SYNTAX Integer32 (0..255)

MAX-ACCESS read-create

STATUS current

DESCRIPTION

"The maximum number of mini-slots that may be requested for a single upstream transmission. A value of zero means there is no limit. MUST NOT be changed while this row is active."

DEFVAL { 0 }

::= { docslfQosProfileEntry 6 }

docslfQosProfBaselinePrivacy OBJECT-TYPE

SYNTAX TruthValue

MAX-ACCESS read-create

STATUS current

DESCRIPTION



"Indicates whether Baseline Privacy is enabled for this service class.
MUST NOT be changed while this row is active."

DEFVAL { false }

::= { docslfQosProfileEntry 7 }

docslfQosProfStatus OBJECT-TYPE

SYNTAX RowStatus

MAX-ACCESS read-create

STATUS current

DESCRIPTION

"This object is used to create or delete rows in this table. This object MUST NOT be changed from active while the row is referenced by any entry in either docslfCmServiceTable (on the CM), or the docslfCmtsServiceTable (on the CMTS)."

::= { docslfQosProfileEntry 8 }

docslfSignalQualityTable OBJECT-TYPE

SYNTAX SEQUENCE OF DocslfSignalQualityEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"At the CM, describes the PHY signal quality of downstream channels. At the CMTS, describes the PHY signal quality of upstream channels. At the CMTS, this table may exclude contention intervals."

::= { docslfBaseObjects 4 }

docslfSignalQualityEntry OBJECT-TYPE

SYNTAX DocslfSignalQualityEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION



"At the CM, describes the PHY characteristics of a downstream channel. At the CMTS, describes the PHY signal quality of an upstream channel. An entry in this table exists for each ifEntry with an ifType of docsCableUpstream(129) for Cable Modem Termination Systems and docsCableDownstream(128) for Cable Modems."

```
INDEX { ifIndex }  
 ::= { docsIfSignalQualityTable 1 }
```

```
docsIfSignalQualityEntry ::= SEQUENCE {  
    docsIfSigQIncludesContention    TruthValue,  
    docsIfSigQUnerroreds           Counter32,  
    docsIfSigQCorrecteds           Counter32,  
    docsIfSigQUncorrectables       Counter32,  
    docsIfSigQSignalNoise          TenthdB,  
    docsIfSigQMicroreflections     Integer32,  
    docsIfSigQEqualizationData     OCTET STRING  
}
```

docsIfSigQIncludesContention OBJECT-TYPE

SYNTAX TruthValue

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"true(1) if this CMTS includes contention intervals in the counters in this table.

Always false(2) for CMs."

REFERENCE

"DOCSIS Radio Frequency Interface specification, Section 6.4.4"

```
::= { docsIfSignalQualityEntry 1 }
```

docsIfSigQUnerroreds OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

**DESCRIPTION**

"Codewords received on this channel without error. This includes all codewords, whether or not they were part of frames destined for this device."

REFERENCE

"DOCSIS Radio Frequency Interface specification, Section 4.2.3 and 4.3.6"

::= { docslfSignalQualityEntry 2 }

docslfSigQCorrecteds OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Codewords received on this channel with correctable errors. This includes all codewords, whether or not they were part of frames destined for this device."

REFERENCE

"DOCSIS Radio Frequency Interface specification, Section 4.2.3 and 4.3.6"

::= { docslfSignalQualityEntry 3 }

docslfSigQUncorrectables OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Codewords received on this channel with uncorrectable errors. This includes all codewords, whether or not they were part of frames destined for this device."

REFERENCE

"DOCSIS Radio Frequency Interface specification, Section 4.2.3 and 4.3.6"

::= { docslfSignalQualityEntry 4 }

docslfSigQSignalNoise OBJECT-TYPE

SYNTAX TenthdB

UNITS "dB"



MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Signal/Noise ratio as perceived for this channel. At the CM, describes the Signal/Noise of the downstream channel. At the CMTS, describes the average Signal/Noise of the upstream channel."

REFERENCE

"DOCSIS Radio Frequency Interface specification, Table 2-1 and 2-2"

::= { docslfSignalQualityEntry 5 }

docslfSigQMicroreflections OBJECT-TYPE

SYNTAX Integer32 (0..255)

UNITS "dBc"

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Total microreflections including in-channel response as perceived on this interface, measured in dBc below the signal level. This object is not assumed to return an absolutely accurate value, but should give a rough indication of microreflections received on this interface. It is up to the implementor to provide information as accurate as possible."

REFERENCE

"DOCSIS Radio Frequency Interface specification, Table 2-1 and 2-2"

::= { docslfSignalQualityEntry 6 }

docslfSigQEqualizationData OBJECT-TYPE

SYNTAX OCTET STRING

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"At the CM, returns the equalization data for the downstream channel. At the CMTS, returns the average equalization data for the upstream channel."



Returns an empty string if the value is unknown or if there is no equalization data available or defined."

REFERENCE

"DOCSIS Radio Frequency Interface Specification, Figure 6-23."

::= { docslfSignalQualityEntry 7 }

--

-- CABLE MODEM GROUP

--

-- #####

--

-- The CM MAC Table

--

docslfCmMacTable OBJECT-TYPE

SYNTAX SEQUENCE OF DocslfCmMacEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"Describes the attributes of each CM MAC interface, extending the information available from ifEntry."

::= { docslfCmObjects 1 }

docslfCmMacEntry OBJECT-TYPE

SYNTAX DocslfCmMacEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"An entry containing objects describing attributes of each MAC entry, extending the information in ifEntry. An entry in this table exists for each ifEntry with an ifType of docsCableMaclayer(127)."



```
INDEX { ifIndex }  
 ::= { docslfCmMacTable 1 }
```

```
DocslfCmMacEntry ::= SEQUENCE {  
    docslfCmCmtsAddress      MacAddress,  
    docslfCmCapabilities    BITS,  
    docslfCmRangingRespTimeout TimeTicks,  
    docslfCmRangingTimeout  TimeInterval  
}
```

docslfCmCmtsAddress OBJECT-TYPE

```
SYNTAX      MacAddress  
MAX-ACCESS  read-only  
STATUS      current
```

DESCRIPTION

"Identifies the CMTS that is believed to control this MAC domain. At the CM, this will be the source address from SYNC, MAP, and other MAC-layer messages. If the CMTS is unknown, returns 00-00-00-00-00-00."

```
::= { docslfCmMacEntry 1 }
```

docslfCmCapabilities OBJECT-TYPE

```
SYNTAX      BITS {  
    atmCells(0),  
    concatenation(1)  
}
```

```
MAX-ACCESS  read-only  
STATUS      current
```

DESCRIPTION

"Identifies the capabilities of the MAC implementation at this interface. Note that packet transmission is always supported. Therefore, there is no specific bit required to explicitly indicate this capability."

```
::= { docslfCmMacEntry 2 }
```



-- This object has been obsoleted and replaced by docslfCmRangingTimeout to
-- correct the typing to TimeInterval. New implementations of the MIB should use
-- docslfCmRangingTimeout instead.

docslfCmRangingRespTimeout OBJECT-TYPE

SYNTAX TimeTicks

MAX-ACCESS read-write

STATUS obsolete

DESCRIPTION

"Waiting time for a Ranging Response packet."

REFERENCE

"DOCSIS Radio Frequency Interface specification, Figure 7-6 and 7-7, timer
T3."

DEFVAL { 20 }

::= { docslfCmMacEntry 3 }

docslfCmRangingTimeout OBJECT-TYPE

SYNTAX TimeInterval

MAX-ACCESS read-write

STATUS current

DESCRIPTION

"Waiting time for a Ranging Response packet."

REFERENCE

"DOCSIS Radio Frequency Interface specification, Figure 7-6 and 7-7, timer
T3."

DEFVAL { 20 }

::= { docslfCmMacEntry 4 }

--
-- CM status table.
-- This table is implemented only at the CM.
--

**docsIfCmStatusTable OBJECT-TYPE**

SYNTAX SEQUENCE OF DocsIfCmStatusEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"This table maintains a number of status objects and counters for Cable Modems."

::= { docsIfCmObjects 2 }

docsIfCmStatusEntry OBJECT-TYPE

SYNTAX DocsIfCmStatusEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"A set of status objects and counters for a single MAC layer instance in a Cable Modem. An entry in this table exists for each ifEntry with an ifType of docsCableMaclayer(127)."

INDEX { ifIndex }

::= { docsIfCmStatusTable 1 }

DocsIfCmStatusEntry ::= SEQUENCE {

docsIfCmStatusValue	INTEGER,
docsIfCmStatusCode	OCTET STRING,
docsIfCmStatusTxPower	TenthdBmV,
docsIfCmStatusResets	Counter32,
docsIfCmStatusLostSyncs	Counter32,
docsIfCmStatusInvalidMaps	Counter32,
docsIfCmStatusInvalidUcdfs	Counter32,
-- docsIfCmStatusInvalidRangingResp	Counter32,
docsIfCmStatusInvalidRangingResponses	Counter32,
-- docsIfCmStatusInvalidRegistrationResp	Counter32,
docsIfCmStatusInvalidRegistrationResponses	Counter32,



```
docsIfCmStatusT1Timeouts Counter32,  
docsIfCmStatusT2Timeouts Counter32,  
docsIfCmStatusT3Timeouts Counter32,  
docsIfCmStatusT4Timeouts Counter32,  
docsIfCmStatusRangingAborted Counter32  
}
```

docsIfCmStatusValue OBJECT-TYPE

```
SYNTAX INTEGER {  
    other(1),  
    notReady(2),  
    notSynchronized(3),  
    phySynchronized(4),  
    usParametersAcquired(5),  
    rangingComplete(6),  
    ipComplete(7),  
    todEstablished(8),  
    securityEstablished(9),  
    paramTransferComplete(10),  
    registrationComplete(11),  
    operational(12),  
    accessDenied(13)  
}
```

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Current Cable Modem connectivity state, as specified in the RF Interface Specification."

REFERENCE

"DOCSIS Radio Frequency Interface Specification, Chapter 7.2."

::= { docsIfCmStatusEntry 1 }

docsIfCmStatusCode OBJECT-TYPE



SYNTAX OCTET STRING

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Status code for this Cable Modem as defined in the RF Interface Specification. The status code consists of a single character indicating error groups, followed by a two- or three-digit number indicating the status condition."

REFERENCE

"DOCSIS Radio Frequency Interface Specification, Cable Modem status codes."

::= { docslfCmStatusEntry 2 }

docslfCmStatusTxPower OBJECT-TYPE

SYNTAX TenthdBmV

UNITS "dBmV"

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The operational transmit power for the attached upstream channel."

REFERENCE

"DOCSIS Radio Frequency Interface specification, Section 4.2.8."

::= { docslfCmStatusEntry 3 }

docslfCmStatusResets OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Number of times the CM reset or initialized this interface."

::= { docslfCmStatusEntry 4 }

docslfCmStatusLostSyncs OBJECT-TYPE

SYNTAX Counter32



MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Number of times the CM lost synchronization with the downstream channel."

REFERENCE

"DOCSIS Radio Frequency Interface specification, Section 6.5."

::= { docslfCmStatusEntry 5 }

docslfCmStatusInvalidMaps OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Number of times the CM received invalid MAP messages."

REFERENCE

"DOCSIS Radio Frequency Interface specification, Section 6.3.2.3 and 6.4.2."

::= { docslfCmStatusEntry 6 }

docslfCmStatusInvalidUcds OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Number of times the CM received invalid UCD messages."

REFERENCE

"DOCSIS Radio Frequency Interface specification, Section 6.3.2.2."

::= { docslfCmStatusEntry 7 }

-- docslfCmStatusInvalidRangingResp replaced for Counter32

-- naming requirements

docslfCmStatusInvalidRangingResponses OBJECT-TYPE

SYNTAX Counter32



MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Number of times the CM received invalid ranging response messages."

::= { docslfCmStatusEntry 8 }

-- docslfCmStatusInvalidRegistrationResp replaced for Counter32 naming

-- requirements docslfCmStatusInvalidRegistrationResponses OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Number of times the CM received invalid registration response messages."

::= { docslfCmStatusEntry 9 }

docslfCmStatusT1Timeouts OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Number of times counter T1 expired in the CM."

REFERENCE

"DOCSIS Radio Frequency Interface specification, Figure 7-3."

::= { docslfCmStatusEntry 10 }

docslfCmStatusT2Timeouts OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Number of times counter T2 expired in the CM."

REFERENCE



"DOCSIS Radio Frequency Interface specification, Figure 7-6."
::= { docslfCmStatusEntry 11 }

docslfCmStatusT3Timeouts OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Number of times counter T3 expired in the CM."

REFERENCE

"DOCSIS Radio Frequency Interface specification, Figure 7-6 and 7-7."

::= { docslfCmStatusEntry 12 }

docslfCmStatusT4Timeouts OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Number of times counter T4 expired in the CM."

REFERENCE

"DOCSIS Radio Frequency Interface specification, Figure 7-7."

::= { docslfCmStatusEntry 13 }

docslfCmStatusRangingAbortedcs OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Number of times the ranging process was aborted by the CMTS."

::= { docslfCmStatusEntry 14 }

--

-- The Cable Modem Service Table



--

docsIfCmServiceTable OBJECT-TYPE

SYNTAX SEQUENCE OF DocsIfCmServiceEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"Describes the attributes of each upstream service queue on a CM."

::= { docsIfCmObjects 3 }

docsIfCmServiceEntry OBJECT-TYPE

SYNTAX DocsIfCmServiceEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"Describes the attributes of an upstream bandwidth service queue. An entry in this table exists for each Service ID. The primary index is an ifIndex with an ifType of docsCableMaclayer(127)."

INDEX { ifIndex, docsIfCmServiceId }

::= { docsIfCmServiceTable 1 }

DocsIfCmServiceEntry ::= SEQUENCE {

docsIfCmServiceId Integer32,

docsIfCmServiceQosProfile Integer32,

docsIfCmServiceTxSlotsImmed Counter32,

docsIfCmServiceTxSlotsDed Counter32,

docsIfCmServiceTxRetries Counter32,

-- docsIfCmServiceTxExceeded Counter32,

docsIfCmServiceTxExceededs Counter32,

docsIfCmServiceRqRetries Counter32,

-- docsIfCmServiceRqExceeded Counter32

docsIfCmServiceRqExceededs Counter32

}

**docsIfCmServiceId OBJECT-TYPE**

SYNTAX Integer32 (1..16383)

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"Identifies a service queue for upstream bandwidth. The attributes of this service queue are shared between theCM and the CMTS. The CMTS allocates upstream bandwidth to this service queue based on requests from the CM and on the class of service associated with this queue."

::= { docsIfCmServiceEntry 1 }

docsIfCmServiceQosProfile OBJECT-TYPE

SYNTAX Integer32 (0..16383)

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The index in docsIfQosProfileTable describing the quality of service attributes associated with this particular service. If no associated entry in docsIfQosProfileTable exists, this object returns a value of zero."

::= { docsIfCmServiceEntry 2 }

docsIfCmServiceTxSlotsImmed OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The number of upstream mini-slots which have been used to transmit data PDUs in immediate (contention) mode. This includes only those PDUs which are presumed to have arrived at the headend (i.e., those which were explicitly acknowledged.) It does not include retransmission attempts or mini-slots used by Requests."

REFERENCE



"DOCSIS Radio Frequency Interface specification, Section 6.4."
::= { docslfCmServiceEntry 3 }

docslfCmServiceTxSlotsDed OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The number of upstream mini-slots which have been used to transmit data PDUs in dedicated mode (i.e., as a result of a unicast Data Grant)."

REFERENCE

"DOCSIS Radio Frequency Interface specification, Section 6.4."
::= { docslfCmServiceEntry 4 }

docslfCmServiceTxRetries OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The number of attempts to transmit data PDUs containing requests for acknowledgment which did not result in acknowledgment."

REFERENCE

"DOCSIS Radio Frequency Interface specification, Section 6.4."
::= { docslfCmServiceEntry 5 }

-- docslfCmServiceTxExceeded renamed for Counter32 naming requirements

docslfCmServiceTxExceededs OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The number of data PDUs transmission failures due to excessive retries without acknowledgment."



REFERENCE

"DOCSIS Radio Frequency Interface specification, Section 6.4."

::= { docslfCmServiceEntry 6 }

docslfCmServiceRqRetries OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The number of attempts to transmit bandwidth requests which did not result in acknowledgment."

REFERENCE

"DOCSIS Radio Frequency Interface specification, Section 6.4."

::= { docslfCmServiceEntry 7 }

-- docslfCmServiceRqExceeded renamed for Counter 32 naming requirements

docslfCmServiceRqExceededs OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The number of requests for bandwidth which failed due to excessive retries without acknowledgment."

REFERENCE

"DOCSIS Radio Frequency Interface specification, Section 6.4."

::= { docslfCmServiceEntry 8 }

--

-- CMTS GROUP

--

--

-- The CMTS MAC Table



--

docsIfCmtsMacTable OBJECT-TYPE

SYNTAX SEQUENCE OF DocsIfCmtsMacEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"Describes the attributes of each CMTS MAC interface, extending the information available from ifEntry. Mandatory for all CMTS devices."

::= { docsIfCmtsObjects 1 }

docsIfCmtsMacEntry OBJECT-TYPE

SYNTAX DocsIfCmtsMacEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"An entry containing objects describing attributes of each MAC entry, extending the information in ifEntry. An entry in this table exists for each ifEntry with an ifType of docsCableMaclayer(127)."

INDEX { ifIndex }

::= { docsIfCmtsMacTable 1 }

DocsIfCmtsMacEntry ::= SEQUENCE {

docsIfCmtsCapabilities	BITS,
docsIfCmtsSyncInterval	Integer32,
docsIfCmtsUcdInterval	Integer32,
docsIfCmtsMaxServiceIds	Integer32,
docsIfCmtsInsertionInterval	TimeTicks, -- Obsolete
docsIfCmtsInvitedRangingAttempts	Integer32,
docsIfCmtsInsertInterval	TimeInterval

}**docsIfCmtsCapabilities OBJECT-TYPE**

SYNTAX BITS {



```
    atmCells(0),  
    concatenation(1)  
}
```

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Identifies the capabilities of the CMTS MAC implementation at this interface. Note that packet transmission is always supported. Therefore, there is no specific bit required to explicitly indicate this capability."

REFERENCE

"DOCSIS Radio Frequency Interface specification, Chapter 6."

::= { docslfCmtsMacEntry 1 }

docslfCmtsSyncInterval OBJECT-TYPE

SYNTAX Integer32 (1..200)

UNITS "Milliseconds"

MAX-ACCESS read-write

STATUS current

DESCRIPTION

"The interval between CMTS transmission of successive SYNC messages at this interface."

REFERENCE

"DOCSIS Radio Frequency Interface Specification, Section 6.5 and Appendix B."

::= { docslfCmtsMacEntry 2 }

docslfCmtsUcdInterval OBJECT-TYPE

SYNTAX Integer32 (1..2000)

UNITS "Milliseconds"

MAX-ACCESS read-write

STATUS current

DESCRIPTION



"The interval between CMTS transmission of successive Upstream Channel Descriptor messages for each upstream channel at this interface."

REFERENCE

"DOCSIS Radio Frequency Interface Specification, Section 6.5 and Appendix B."

::= { docslfCmtsMacEntry 3 }

docslfCmtsMaxServiceIds OBJECT-TYPE

SYNTAX Integer32 (1..16383)

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The maximum number of service IDs that may be simultaneously active."

::= { docslfCmtsMacEntry 4 }

-- This object has been obsoleted and replaced by docslfCmtsInsertInterval to fix a
-- SYNTAX typing problem. New implementations of this MIB should use that object
-- instead.

docslfCmtsInsertionInterval OBJECT-TYPE

SYNTAX TimeTicks

MAX-ACCESS read-write

STATUS obsolete

DESCRIPTION

"The amount of time to elapse between each broadcast station maintenance grant. Broadcast station maintenance grants are used to allow new cable modems to join the network. Zero indicates that a vendor-specific algorithm is used instead of a fixed time. Maximum amount of time permitted by the specification is 2 seconds."

REFERENCE

"DOCSIS Radio Frequency Interface Specification, Appendix B, Ranging Interval."



```
::= { docslfCmtsMacEntry 5 }
```

docslfCmtsInvitedRangingAttempts OBJECT-TYPE

SYNTAX Integer32 (0..1024)

MAX-ACCESS read-write

STATUS current

DESCRIPTION

"The maximum number of attempts to make on invitations for ranging requests. A value of zero means the system should attempt to range forever."

REFERENCE

"DOCSIS Radio Frequency Interface specification, Section 7.2.5 and Appendix B."

```
::= { docslfCmtsMacEntry 6 }
```

docslfCmtsInsertInterval OBJECT-TYPE

SYNTAX TimeInterval

MAX-ACCESS read-write

STATUS current

DESCRIPTION

"The amount of time to elapse between each broadcast station maintenance grant. Broadcast station maintenance grants are used to allow new cable modems to join the network. Zero indicates that a vendor-specific algorithm is used instead of a fixed time. Maximum amount of time permitted by the specification is 2 seconds."

REFERENCE

"DOCSIS Radio Frequency Interface Specification, Appendix B."

```
::= { docslfCmtsMacEntry 7 }
```

```
--
```

```
--
```

```
-- CMTS status table.
```

```
--
```


**docsIfCmtsStatusTable OBJECT-TYPE**

SYNTAX SEQUENCE OF DocsIfCmtsStatusEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"For the MAC layer, this group maintains a number of status objects and counters."

::= { docsIfCmtsObjects 2 }

docsIfCmtsStatusEntry OBJECT-TYPE

SYNTAX DocsIfCmtsStatusEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"Status entry for a single MAC layer. An entry in this table exists for each ifEntry with an ifType of docsCableMaclayer(127)."

INDEX { ifIndex }

::= { docsIfCmtsStatusTable 1 }

DocsIfCmtsStatusEntry ::= SEQUENCE {

docsIfCmtsStatusInvalidRangeReqs Counter32,

docsIfCmtsStatusRangingAborted Counter32,

docsIfCmtsStatusInvalidRegReqs Counter32,

docsIfCmtsStatusFailedRegReqs Counter32,

docsIfCmtsStatusInvalidDataReqs Counter32,

docsIfCmtsStatusT5Timeouts Counter32

}**docsIfCmtsStatusInvalidRangeReqs OBJECT-TYPE**

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

DESCRIPTION



"This object counts invalid RNG-REQ messages received on this interface."
::= { docslfCmtsStatusEntry 1 }

docslfCmtsStatusRangingAborted OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"This object counts ranging attempts that were explicitly aborted by the CMTS."

::= { docslfCmtsStatusEntry 2 }

docslfCmtsStatusInvalidRegReqs OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"This object counts invalid REG-REQ messages received on this interface."

::= { docslfCmtsStatusEntry 3 }

docslfCmtsStatusFailedRegReqs OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"This object counts failed registration attempts, i.e., authentication failures and class of service failures, on this interface."

::= { docslfCmtsStatusEntry 4 }

docslfCmtsStatusInvalidDataReqs OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

**DESCRIPTION**

"This object counts invalid data request messages received on this interface."

::= { docslfCmtsStatusEntry 5 }

docslfCmtsStatusT5Timeouts OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"This object counts the number of times counter T5 expired on this interface."

::= { docslfCmtsStatusEntry 6 }

--

-- CM status table (within CMTS).

-- This table is implemented only at the CMTS.

-- It contains per CM status information available in the CMTS.

--

docslfCmtsCmStatusTable OBJECT-TYPE

SYNTAX SEQUENCE OF DocslfCmtsCmStatusEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"A set of objects in the CMTS, maintained for each Cable Modem connected to this CMTS."

::= { docslfCmtsObjects 3 }

docslfCmtsCmStatusEntry OBJECT-TYPE

SYNTAX DocslfCmtsCmStatusEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION



"Status information for a single Cable Modem. An entry in this table exists for each Cable Modem that is connected to the CMTS implementing this table."

INDEX { docslfCmtsCmStatusIndex }

::= { docslfCmtsCmStatusTable 1 }

```
DocslfCmtsCmStatusEntry ::= SEQUENCE {
    docslfCmtsCmStatusIndex          Integer32,
    docslfCmtsCmStatusMacAddress     MacAddress,
    docslfCmtsCmStatusIpAddress     IpAddress,
    docslfCmtsCmStatusDownChannelfIndex InterfaceIndexOrZero,
    docslfCmtsCmStatusUpChannelfIndex InterfaceIndexOrZero,
    docslfCmtsCmStatusRxPower        TenthdBmV,
    docslfCmtsCmStatusTimingOffset   Unsigned32,
    docslfCmtsCmStatusEqualizationData OCTET STRING,
    docslfCmtsCmStatusValue          INTEGER,
    docslfCmtsCmStatusUnerroreds     Counter32,
    docslfCmtsCmStatusCorrecteds     Counter32,
    docslfCmtsCmStatusUncorrectables Counter32,
    docslfCmtsCmStatusSignalNoise    TenthdB,
    docslfCmtsCmStatusMicroreflections Integer32
}
```

docslfCmtsCmStatusIndex OBJECT-TYPE

SYNTAX Integer32 (1..2147483647)

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"Index value to uniquely identify an entry in this table. For an individual Cable Modem, this index value should not change during CMTS uptime."

::= { docslfCmtsCmStatusEntry 1 }

docslfCmtsCmStatusMacAddress OBJECT-TYPE

SYNTAX MacAddress



MAX-ACCESS read-only

STATUS current

DESCRIPTION

"MAC address of this Cable Modem. If the Cable Modem has multiple MAC addresses, this is the MAC address associated with the Cable interface."

::= { docslfCmtsCmStatusEntry 2 }

docslfCmtsCmStatusIpAddress OBJECT-TYPE

SYNTAX IpAddress

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"IP address of this Cable Modem. If the Cable Modem has no IP address assigned, or the IP address is unknown, this object returns a value of 0.0.0.0. If the Cable Modem has multiple IP addresses, this object returns the IP address associated with the Cable interface."

::= { docslfCmtsCmStatusEntry 3 }

docslfCmtsCmStatusDownChannelIfIndex OBJECT-TYPE

SYNTAX InterfaceIndexOrZero

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"IfIndex of the downstream channel this CM is connected to. If the downstream channel is unknown, this object returns a value of zero."

::= { docslfCmtsCmStatusEntry 4 }

docslfCmtsCmStatusUpChannelIfIndex OBJECT-TYPE

SYNTAX InterfaceIndexOrZero

MAX-ACCESS read-only

STATUS current

DESCRIPTION



"IfIndex of the upstream channel this CM is connected to. If the upstream channel is unknown, this object returns a value of zero."

::= { docslfCmtsCmStatusEntry 5 }

docslfCmtsCmStatusRxPower OBJECT-TYPE

SYNTAX TenthdBmV

UNITS "dBmV"

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The receive power as perceived for upstream data from this Cable Modem.

If the receive power is unknown, this object returns a value of zero."

REFERENCE

"DOCSIS Radio Frequency Interface Specification, Table 4-13."

::= { docslfCmtsCmStatusEntry 6 }

docslfCmtsCmStatusTimingOffset OBJECT-TYPE

SYNTAX Unsigned32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"A measure of the current round trip time for this CM. Used for timing of CM upstream transmissions to ensure synchronized arrivals at the CMTS. Units are in terms of (6.25 microseconds/64). Returns zero if the value is unknown."

REFERENCE

"DOCSIS Radio Frequency Interface Specification, Section 6.5."

::= { docslfCmtsCmStatusEntry 7 }

docslfCmtsCmStatusEqualizationData OBJECT-TYPE

SYNTAX OCTET STRING

MAX-ACCESS read-only

STATUS current

**DESCRIPTION**

"Equalization data for this CM. Returns an empty string if the value is unknown or if there is no equalization data available or defined."

REFERENCE

"DOCSIS Radio Frequency Interface Specification, Figure 6-23."

::= { docsIfCmtsCmStatusEntry 8 }

docsIfCmtsCmStatusValue OBJECT-TYPE

SYNTAX INTEGER {

other(1),
ranging(2),
rangingAborted(3),
rangingComplete(4),
ipComplete(5),
registrationComplete(6),
accessDenied(7)

}

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Current Cable Modem connectivity state, as specified in the RF Interface Specification. Returned status information is the CM status as assumed by the CMTS, and indicates the following events:

other(1)

Any state other than below.

ranging(2)

The CMTS has received an Initial Ranging Request message from the CM, and the ranging process is not yet complete.

rangingAborted(3)

The CMTS has sent a Ranging Abort message to the CM.

rangingComplete(4)

The CMTS has sent a Ranging Complete message to the CM.

ipComplete(5)



The CMTS has received a DHCP reply message and forwarded it to the CM.

registrationComplete(6)

The CMTS has sent a Registration Response message to the CM.

accessDenied(7)

The CMTS has sent a Registration Aborted message to the CM.

The CMTS only needs to report states it is able to detect."

REFERENCE

"DOCSIS Radio Frequency Interface Specification, Chapter 7.2."

::= { docslfCmtsCmStatusEntry 9 }

docslfCmtsCmStatusUnerrored OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Codewords received without error from this Cable Modem."

REFERENCE

"DOCSIS Radio Frequency Interface specification, Section 4.2.3"

::= { docslfCmtsCmStatusEntry 10 }

docslfCmtsCmStatusCorrecteds OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Codewords received with correctable errors from this Cable Modem."

REFERENCE

"DOCSIS Radio Frequency Interface specification, Section 4.2.3"

::= { docslfCmtsCmStatusEntry 11 }

docslfCmtsCmStatusUncorrectables OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only



STATUS current

DESCRIPTION

"Codewords received with uncorrectable errors from this Cable Modem."

REFERENCE

"DOCSIS Radio Frequency Interface specification, Section 4.2.3"

::= { docsIfCmtsCmStatusEntry 12 }

docsIfCmtsCmStatusSignalNoise OBJECT-TYPE

SYNTAX TenthdB

UNITS "dB"

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Signal/Noise ratio as perceived for upstream data from this Cable Modem.

If the Signal/Noise is unknown, this object returns a value of zero."

::= { docsIfCmtsCmStatusEntry 13 }

docsIfCmtsCmStatusMicroreflections OBJECT-TYPE

SYNTAX Integer32 (0..255)

UNITS "dBc"

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Total microreflections including in-channel response as perceived on this interface, measured in dBc below the signal level. This object is not assumed to return an absolutely accurate value, but should give a rough indication of microreflections received on this interface. It is up to the implementor to provide information as accurate as possible."

REFERENCE

"DOCSIS Radio Frequency Interface specification, Table 2-1 and 2-2"

::= { docsIfCmtsCmStatusEntry 14 }



--
-- The CMTS Service Table.
--

docsIfCmtsServiceTable OBJECT-TYPE

SYNTAX SEQUENCE OF DocsIfCmtsServiceEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"Describes the attributes of upstream service queues in a Cable Modem Termination System."

::= { docsIfCmtsObjects 4 }

docsIfCmtsServiceEntry OBJECT-TYPE

SYNTAX DocsIfCmtsServiceEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"Describes the attributes of a single upstream bandwidth service queue.

Entries in this table exist for each ifEntry with an ifType of docsCableMaclayer(127), and for each service queue (Service ID) within this MAC layer.

Entries in this table are created with the creation of individual Service IDs by the MAC layer and removed when a Service ID is removed."

INDEX { ifIndex, docsIfCmtsServiceId }

::= { docsIfCmtsServiceTable 1 }

DocsIfCmtsServiceEntry ::= SEQUENCE {

docsIfCmtsServiceId Integer32,

docsIfCmtsServiceCmStatusIndex Integer32,

docsIfCmtsServiceAdminStatus INTEGER,

docsIfCmtsServiceQosProfile Integer32,



```
docsIfCmtsServiceCreateTime      TimeStamp,
docsIfCmtsServiceInOctets        Counter32,
docsIfCmtsServiceInPackets       Counter32
}
```

docsIfCmtsServiceId OBJECT-TYPE

SYNTAX Integer32 (1..16383)

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"Identifies a service queue for upstream bandwidth. The attributes of this service queue are shared between the Cable Modem and the Cable Modem Termination System.

The CMTS allocates upstream bandwidth to this service queue based on requests from the CM and on the class of service associated with this queue."

::= { docsIfCmtsServiceEntry 1 }

docsIfCmtsServiceCmStatusIndex OBJECT-TYPE

SYNTAX Integer32 (0..65535)

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Pointer to an entry in docsIfCmtsCmStatusTable identifying the Cable Modem using this Service Queue. If multiple Cable Modems are using this Service Queue, the value of this object is zero."

::= { docsIfCmtsServiceEntry 2 }

docsIfCmtsServiceAdminStatus OBJECT-TYPE

SYNTAX INTEGER {

enabled(1),

disabled(2),

destroyed(3) }

MAX-ACCESS read-write



STATUS current

DESCRIPTION

"Allows a service class for a particular modem to be suppressed, (re-) enabled, or deleted altogether."

::= { docslfCmtsServiceEntry 3 }

docslfCmtsServiceQosProfile OBJECT-TYPE

SYNTAX Integer32 (0..16383)

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The index in docslfQosProfileTable describing the quality of service attributes associated with this particular service. If no associated docslfQosProfileTable entry exists, this object returns a value of zero."

::= { docslfCmtsServiceEntry 4 }

docslfCmtsServiceCreateTime OBJECT-TYPE

-- SYNTAX TimeTicks

SYNTAX TimeStamp

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The value of sysUpTime when this entry was created."

::= { docslfCmtsServiceEntry 5 }

docslfCmtsServiceInOctets OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The cumulative number of Packet Data octets received on this Service ID.
The count does not include the size of the Cable MAC header"

::= { docslfCmtsServiceEntry 6 }

**docsIfCmtsServiceInPackets OBJECT-TYPE**

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The cumulative number of Packet Data packets received on this Service ID."

::= { docsIfCmtsServiceEntry 7 }

--

-- The following table provides upstream channel modulation profiles. Entries in this
-- table can be re-used by one or more upstream channels. An upstream channel
-- will have a modulation profile for each value of docsIfModIntervalUsageCode.

--

docsIfCmtsModulationTable OBJECT-TYPE

SYNTAX SEQUENCE OF DocsIfCmtsModulationEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"Describes a modulation profile associated with one or more upstream channels."

::= { docsIfCmtsObjects 5 }

docsIfCmtsModulationEntry OBJECT-TYPE

SYNTAX DocsIfCmtsModulationEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"Describes a modulation profile for an Interval Usage Code for one or more upstream channels. Entries in this table are created by the operator. Initial



default entries may be created at system initialization time. No individual objects have to be specified in order to create an entry in this table.

Note that some objects do not have DEFVALs, but do have calculated defaults and need not be specified during row creation.

There is no restriction on the changing of values in this table while their associated rows are active."

```
INDEX { docsIfCmtsModIndex, docsIfCmtsModIntervalUsageCode }  
::= { docsIfCmtsModulationTable 1 }
```

```
DocsIfCmtsModulationEntry ::= SEQUENCE {  
    docsIfCmtsModIndex          Integer32,  
    docsIfCmtsModIntervalUsageCode  INTEGER,  
    docsIfCmtsModControl        RowStatus,  
    docsIfCmtsModType           INTEGER,  
    docsIfCmtsModPreambleLen    Integer32,  
    docsIfCmtsModDifferentialEncoding TruthValue,  
    docsIfCmtsModFECErrorCorrection Integer32,  
    docsIfCmtsModFECCodeWordLength Integer32,  
    docsIfCmtsModScramblerSeed  Integer32,  
    docsIfCmtsModMaxBurstSize   Integer32,  
    docsIfCmtsModGuardTimeSize  Unsigned32,  
    docsIfCmtsModLastCodeWordShortened TruthValue,  
    docsIfCmtsModScrambler      TruthValue  
}
```

docsIfCmtsModIndex OBJECT-TYPE

SYNTAX Integer32 (1..2147483647)

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"An index into the Channel Modulation table representing a group of Interval Usage Codes, all associated with the same channel."



::= { docslfCmtsModulationEntry 1 }

docslfCmtsModIntervalUsageCode OBJECT-TYPE

SYNTAX INTEGER {

request(1),
requestData(2),
initialRanging(3),
periodicRanging(4),
shortData(5),
longData(6)

}

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"An index into the Channel Modulation table which, when grouped with other Interval Usage Codes, fully instantiate all modulation sets for a given upstream channel."

REFERENCE

"DOCSIS Radio Frequency Interface specification, Table 6-16."

::= { docslfCmtsModulationEntry 2 }

docslfCmtsModControl OBJECT-TYPE

SYNTAX RowStatus

MAX-ACCESS read-create

STATUS current

DESCRIPTION

"Controls and reflects the status of rows in this table."

::= { docslfCmtsModulationEntry 3 }

docslfCmtsModType OBJECT-TYPE

SYNTAX INTEGER {

other(1),
qpsk(2),



qam16(3)

}

MAX-ACCESS read-create

STATUS current

DESCRIPTION

"The modulation type used on this channel. Returns other(1) if the modulation type is neither qpsk or qam16. See the reference for the modulation profiles implied by qpsk or qam16. See the conformance object for write conditions and limitations."

REFERENCE

"DOCSIS Radio Frequency Interface specification, Section 4.2.2."

DEFVAL { qpsk }

::= { docslfCmtsModulationEntry 4 }

docslfCmtsModPreambleLen OBJECT-TYPE

SYNTAX Integer32 (0..1024)

MAX-ACCESS read-create

STATUS current

DESCRIPTION

"The preamble length for this modulation profile in bits. Default value is the minimum needed by the implementation the CMTS for the given modulation profile."

REFERENCE

"DOCSIS Radio Frequency Interface specification, Section 4.2.5."

::= { docslfCmtsModulationEntry 5 }

docslfCmtsModDifferentialEncoding OBJECT-TYPE

SYNTAX TruthValue

MAX-ACCESS read-create

STATUS current

DESCRIPTION

"Specifies whether or not differential encoding is used on this channel."

DEFVAL { false }



::= { docslfCmtsModulationEntry 6 }

docslfCmtsModFECErrorCorrection OBJECT-TYPE

SYNTAX Integer32 (0..10)

MAX-ACCESS read-create

STATUS current

DESCRIPTION

"The number of correctable errored bytes (t) used in forward error correction code. The value of 0 indicates no correction is employed. The number of check bytes appended will be twice this value."

REFERENCE

"DOCSIS Radio Frequency Interface specification, Section 4.2.3."

DEFVAL { 0 }

::= { docslfCmtsModulationEntry 7 }

docslfCmtsModFECCodewordLength OBJECT-TYPE

SYNTAX Integer32 (1..255)

MAX-ACCESS read-create

STATUS current

DESCRIPTION

"The number of data bytes (k) in the forward error correction codeword.

This object is not used if docslfCmtsModFECErrorCorrection is zero."

REFERENCE

"DOCSIS Radio Frequency Interface specification, Section 4.2.3."

DEFVAL { 32 }

::= { docslfCmtsModulationEntry 8 }

docslfCmtsModScramblerSeed OBJECT-TYPE

SYNTAX Integer32 (0..32767)

MAX-ACCESS read-create

STATUS current

DESCRIPTION

"The 15 bit seed value for the scrambler polynomial."



REFERENCE

"DOCSIS Radio Frequency Interface specification, Section 4.2.4."

DEFVAL { 0 }

::= { docslfCmtsModulationEntry 9 }

docslfCmtsModMaxBurstSize OBJECT-TYPE

SYNTAX Integer32 (0..255)

MAX-ACCESS read-create

STATUS current

DESCRIPTION

"The maximum number of mini-slots that can be transmitted during this channel's burst time. Returns zero if the burst length is bounded by the allocation MAP rather than this profile. Default value is 0 except for shortData, where it is 8."

::= { docslfCmtsModulationEntry 10 }

docslfCmtsModGuardTimeSize OBJECT-TYPE

SYNTAX Unsigned32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The number of symbol-times which must follow the end of this channel's burst. Default value is the minimum time needed by the implementation for this modulation profile."

REFERENCE

"DOCSIS Radio Frequency Interface specification, Section 4.2.7."

::= { docslfCmtsModulationEntry 11 }

docslfCmtsModLastCodewordShortened OBJECT-TYPE

SYNTAX TruthValue

MAX-ACCESS read-create

STATUS current

DESCRIPTION



"Indicates if the last FEC codeword is truncated."

REFERENCE

"DOCSIS Radio Frequency Interface specification, Section 4.2.10."

DEFVAL { true }

::= { docsIfCmtsModulationEntry 12 }

docsIfCmtsModScrambler OBJECT-TYPE

SYNTAX TruthValue

MAX-ACCESS read-create

STATUS current

DESCRIPTION

"Indicates if the scrambler is employed."

REFERENCE

"DOCSIS Radio Frequency Interface specification, Section 4.2.4."

DEFVAL { false }

::= { docsIfCmtsModulationEntry 13 }

docsIfCmtsQosProfilePermissions OBJECT-TYPE

SYNTAX BITS {
 createByManagement(0),
 updateByManagement(1),
 createByModems(2)
}

MAX-ACCESS read-write

STATUS current

DESCRIPTION

"This object specifies permitted methods of creating entries in docsIfQosProfileTable.

CreateByManagement(0) is set if entries can be created using SNMP. UpdateByManagement(1) is set if updating entries using SNMP is permitted. CreateByModems(2) is set if entries can be created based on information in REG-REQ MAC messages received from Cable Modems. Information in this



object is only applicable if docslfQosProfileTable is implemented as read-create.

Otherwise, this object is implemented as read-only and returns CreateByModems(2).

Either CreateByManagement(0) or CreateByModems(1) must be set when writing to this object."

::= { docslfCmtsObjects 6 }

docslfCmtsMacToCmTable OBJECT-TYPE

SYNTAX SEQUENCE OF DocslfCmtsMacToCmEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"This is a table to provide a quick access index into the docslfCmtsCmStatusTable. There is exactly one row in this table for each row in the docslfCmtsCmStatusTable. In general, the management station should use this table only to get a pointer into the docslfCmtsCmStatusTable (which corresponds to the CM's RF interface MAC address), and should not iterate (e.g. GetNext through) this table."

::= { docslfCmtsObjects 7 }

docslfCmtsMacToCmEntry OBJECT-TYPE

SYNTAX DocslfCmtsMacToCmEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"A row in the docslfCmtsMacToCmTable. An entry in this table exists for each Cable Modem that is connected to the CMTS implementing this table."

INDEX { docslfCmtsCmMac }

::= { docslfCmtsMacToCmTable 1 }

DocslfCmtsMacToCmEntry ::= SEQUENCE {

docslfCmtsCmMac MacAddress,

docslfCmtsCmPtr Integer32



}

docsIfCmtsCmMac OBJECT-TYPE

SYNTAX MacAddress
MAX-ACCESS not-accessible
STATUS current

DESCRIPTION

"The RF side MAC address for the referenced CM. (E.g. the interface on the CM that has docsCableMacLayer(127) as its ifType."

::= { docsIfCmtsMacToCmEntry 1 }

docsIfCmtsCmPtr OBJECT-TYPE

SYNTAX Integer32 (1..2147483647)
MAX-ACCESS read-only
STATUS current

DESCRIPTION

"An row index into docsIfCmtsCmStatusTable. When queried with the correct instance value (e.g. a CM's MAC address), returns the index in docsIfCmtsCmStatusTable which represents that CM."

::= { docsIfCmtsMacToCmEntry 2 }

--

-- notification group is for future extension.

--

docsIfNotification OBJECT IDENTIFIER ::= { docsIfMib 2 }
docsIfConformance OBJECT IDENTIFIER ::= { docsIfMib 3 }
docsIfCompliances OBJECT IDENTIFIER ::= { docsIfConformance 1 }
docsIfGroups OBJECT IDENTIFIER ::= { docsIfConformance 2 }

-- compliance statements

docsIfBasicCompliance MODULE-COMPLIANCE

STATUS current

DESCRIPTION



"The compliance statement for devices that implement MCNS/DOCSIS compliant Radio Frequency Interfaces."

MODULE -- docslfMib

-- unconditionally mandatory groups

```
MANDATORY-GROUPS {  
    docslfBasicGroup  
}
```

-- conditionally mandatory group

GROUP docslfCmGroup

DESCRIPTION

"This group is implemented only in Cable Modems, not in Cable Modem Termination Systems."

-- conditionally mandatory group

GROUP docslfCmtsGroup

DESCRIPTION

"This group is implemented only in Cable Modem Termination Systems, not in Cable Modems."

OBJECT docslfDownChannelFrequency

WRITE-SYNTAX Integer32 (54000000..860000000)

MIN-ACCESS read-only

DESCRIPTION

"Read-write in Cable Modem Termination Systems; read-only in Cable Modems. The values above are appropriate for a cable plant using a Sub-Split channel plan. If DOCSIS is extended to cover other types of channel plans (and frequency allocations) this object will be modified accordingly."

OBJECT docslfDownChannelWidth



WRITE-SYNTAX Integer32 (6000000)

MIN-ACCESS read-only

DESCRIPTION

"It is conformant to implement this object as read-only. In Cable Modems, this object is always implemented as read-only. The above value is appropriate for cable plants running under NTSC (National Television Standards Committee) standards. If DOCSIS is extended to work with other standard (e.g. European standards), this object will be modified accordingly."

OBJECT docslfDownChannelModulation

WRITE-SYNTAX INTEGER {
 qam64 (3),
 qam256 (4)
}

MIN-ACCESS read-only

DESCRIPTION

"Read-write in Cable Modem Termination Systems; read-only in Cable Modems."

OBJECT docslfDownChannelInterleave

WRITE-SYNTAX INTEGER {
 taps8Increment16(3),
 taps16Increment8(4),
 taps32Increment4(5),
 taps64Increment2(6),
 taps128Increment1(7)
}

MIN-ACCESS read-only

DESCRIPTION

"Read-write in Cable Modem Termination Systems; read-only in Cable Modems."

OBJECT docslfDownChannelPower



MIN-ACCESS read-only

DESCRIPTION

"Read-write in Cable Modem Termination Systems; read-only in Cable Modems."

OBJECT docslfUpChannelFrequency

WRITE-SYNTAX Integer32 (5000000..42000000)

MIN-ACCESS read-only

DESCRIPTION

"Read-write in Cable Modem Termination Systems; read-only in Cable Modems. The values above are appropriate for a cable plant using a Sub-Split channel plan. If DOCSIS is extended to cover other types of channel plans (and frequency allocations) this object will be modified accordingly."

OBJECT docslfUpChannelWidth

WRITE-SYNTAX Integer32 (200000..3200000)

MIN-ACCESS read-only

DESCRIPTION

"Read-write in Cable Modem Termination Systems; read-only in Cable Modems. The above value is appropriate for cable plants running under NTSC (National Television Standards Committee) standards. If DOCSIS is extended to work with other standard (e.g. European standards), this object will be modified accordingly."

OBJECT docslfUpChannelModulationProfile

MIN-ACCESS read-only

DESCRIPTION

"Read-write in Cable Modem Termination Systems; read-only in Cable Modems."

OBJECT docslfUpChannelSlotSize

MIN-ACCESS read-only



DESCRIPTION

"This object is always read-only in Cable Modems. It is compliant to implement this object as read-only in Cable Modem Termination Systems."

OBJECT docsIfUpChannelRangingBackoffStart

MIN-ACCESS read-only

DESCRIPTION

"Read-write in Cable Modem Termination Systems; read-only in Cable Modems."

OBJECT docsIfUpChannelRangingBackoffEnd

MIN-ACCESS read-only

DESCRIPTION

"Read-write in Cable Modem Termination Systems; read-only in Cable Modems."

OBJECT docsIfUpChannelTxBackoffStart

MIN-ACCESS read-only

DESCRIPTION

"Read-write in Cable Modem Termination Systems; read-only in Cable Modems."

OBJECT docsIfUpChannelTxBackoffEnd

MIN-ACCESS read-only

DESCRIPTION

"Read-write in Cable Modem Termination Systems; read-only in Cable Modems."

OBJECT docsIfQosProfPriority

MIN-ACCESS read-only

DESCRIPTION

"This object is always read-only in Cable Modems. it is compliant to implement this object as read-only in Cable Modem Termination Systems."



OBJECT docslfQosProfMaxUpBandwidth

MIN-ACCESS read-only

DESCRIPTION

"This object is always read-only in Cable Modems. It is compliant to implement this object as read-only in Cable Modem Termination Systems."

OBJECT docslfQosProfGuarUpBandwidth

MIN-ACCESS read-only

DESCRIPTION

"This object is always read-only in Cable Modems. It is compliant to implement this object as read-only in Cable Modem Termination Systems."

OBJECT docslfQosProfMaxDownBandwidth

MIN-ACCESS read-only

DESCRIPTION

"This object is always read-only in Cable Modems. It is compliant to implement this object as read-only in Cable Modem Termination Systems."

OBJECT docslfQosProfMaxTxBurst

MIN-ACCESS read-only

DESCRIPTION

"This object is always read-only in Cable Modems. It is compliant to implement this object as read-only in Cable Modem Termination Systems."

OBJECT docslfQosProfBaselinePrivacy

MIN-ACCESS read-only

DESCRIPTION

"This object is always read-only in Cable Modems. It is compliant to implement this object as read-only in Cable Modem Termination Systems."

OBJECT docslfQosProfStatus

MIN-ACCESS read-only



DESCRIPTION

"This object is always read-only in Cable Modems. It is compliant to implement this object as read-only in Cable Modem Termination Systems."

OBJECT docslfCmtsServiceAdminStatus

MIN-ACCESS read-only

DESCRIPTION

"It is compliant to implement this object as read-only."

OBJECT docslfCmtsSyncInterval

MIN-ACCESS read-only

DESCRIPTION

"It is compliant to implement this object as read-only."

OBJECT docslfCmtsUcdInterval

MIN-ACCESS read-only

DESCRIPTION

"It is compliant to implement this object as read-only."

OBJECT docslfCmtsInsertInterval

MIN-ACCESS read-only

DESCRIPTION

"It is compliant to implement this object as read-only."

OBJECT docslfCmtsInvitedRangingAttempts

MIN-ACCESS read-only

DESCRIPTION

"It is compliant to implement this object as read-only."

OBJECT docslfCmtsQosProfilePermissions

MIN-ACCESS read-only

DESCRIPTION

"It is compliant to implement this object as read-only."



OBJECT docslfCmtsModType

```
WRITE-SYNTAX INTEGER {  
    qpsk (2),  
    qam16 (3)  
}
```

DESCRIPTION

"Management station may only set 16QAM or QPSK modulation, but others might be possible based on device configuration."

```
::= { docslfCompliances 1 }
```

docslfBasicGroup OBJECT-GROUP

```
OBJECTS {  
    docslfDownChannelId,  
    docslfDownChannelFrequency,  
    docslfDownChannelWidth,  
    docslfDownChannelModulation,  
    docslfDownChannelInterleave,  
    docslfDownChannelPower,  
    docslfUpChannelId,  
    docslfUpChannelFrequency,  
    docslfUpChannelWidth,  
    docslfUpChannelModulationProfile,  
    docslfUpChannelSlotSize,  
    docslfUpChannelTxTimingOffset,  
    docslfUpChannelRangingBackoffStart,  
    docslfUpChannelRangingBackoffEnd,  
    docslfUpChannelTxBackoffStart,  
    docslfUpChannelTxBackoffEnd,  
    docslfQosProfPriority,  
    docslfQosProfMaxUpBandwidth,  
    docslfQosProfGuarUpBandwidth,  
    docslfQosProfMaxDownBandwidth,
```



```
docslfQosProfMaxTxBurst,  
docslfQosProfBaselinePrivacy,  
docslfQosProfStatus,  
docslfSigQIncludesContention,  
docslfSigQUnerroreds,  
docslfSigQCorrecteds,  
docslfSigQUncorrectables,  
docslfSigQSignalNoise,  
docslfSigQMicroreflections,  
docslfSigQEqualizationData
```

```
}
```

```
STATUS    current
```

```
DESCRIPTION
```

```
"Group of objects implemented in both Cable Modems and Cable Modem  
Termination Systems."
```

```
::= { docslfGroups 1 }
```

```
-- The following table was modified to correct naming conventions for Counter32  
-- variables.
```

```
docslfCmGroup OBJECT-GROUP
```

```
OBJECTS {
```

```
    docslfCmCmtsAddress,
```

```
    docslfCmCapabilities,
```

```
--    docslfCmRangingRespTimeout,
```

```
    docslfCmRangingTimeout,
```

```
    docslfCmStatusValue,
```

```
    docslfCmStatusCode,
```

```
    docslfCmStatusTxPower,
```

```
    docslfCmStatusResets,
```

```
    docslfCmStatusLostSyncs,
```

```
    docslfCmStatusInvalidMaps,
```

```
    docslfCmStatusInvalidUcds,
```

```
--    docslfCmStatusInvalidRangingResp,
```



```
docslfCmStatusInvalidRangingResponses,
-- docslfCmStatusInvalidRegistrationResp,
docslfCmStatusInvalidRegistrationResponses,
docslfCmStatusT1Timeouts,
docslfCmStatusT2Timeouts,
docslfCmStatusT3Timeouts,
docslfCmStatusT4Timeouts,
docslfCmStatusRangingAborted,
docslfCmServiceQosProfile,
docslfCmServiceTxSlotsImmed,
docslfCmServiceTxSlotsDed,
docslfCmServiceTxRetries,
-- docslfCmServiceTxExceeded,
docslfCmServiceTxExceededs,
docslfCmServiceRqRetries,
-- docslfCmServiceRqExceeded
docslfCmServiceRqExceededs
}
STATUS current
DESCRIPTION
"Group of objects implemented in Cable Modems."
::= { docslfGroups 2 }
```

docslfCmtsGroup OBJECT-GROUP

```
OBJECTS {
docslfCmtsCapabilities,
docslfCmtsSyncInterval,
docslfCmtsUcdInterval,
docslfCmtsMaxServiceIds,
-- docslfCmtsInsertionInterval,
docslfCmtsInvitedRangingAttempts,
docslfCmtsInsertInterval,
docslfCmtsStatusInvalidRangeReqs,
```



docsIfCmtsStatusRangingAborted,
docsIfCmtsStatusInvalidRegReqs,
docsIfCmtsStatusFailedRegReqs,
docsIfCmtsStatusInvalidDataReqs,
docsIfCmtsStatusT5Timeouts,
docsIfCmtsCmStatusMacAddress,
docsIfCmtsCmStatusIpAddress,
docsIfCmtsCmStatusDownChannelIfIndex,
docsIfCmtsCmStatusUpChannelIfIndex,
docsIfCmtsCmStatusRxPower,
docsIfCmtsCmStatusTimingOffset,
docsIfCmtsCmStatusEqualizationData,
docsIfCmtsCmStatusValue,
docsIfCmtsCmStatusUnerrored,
docsIfCmtsCmStatusCorrected,
docsIfCmtsCmStatusUncorrectable,
docsIfCmtsCmStatusSignalNoise,
docsIfCmtsCmStatusMicroreflections,
docsIfCmtsServiceCmStatusIndex,
docsIfCmtsServiceAdminStatus,
docsIfCmtsServiceQosProfile,
docsIfCmtsServiceCreateTime,
docsIfCmtsServiceInOctets,
docsIfCmtsServiceInPackets,
docsIfCmtsModType,
docsIfCmtsModControl,
docsIfCmtsModPreambleLen,
docsIfCmtsModDifferentialEncoding,
docsIfCmtsModFECErrorCorrection,
docsIfCmtsModFECCodeWordLength,
docsIfCmtsModScramblerSeed,
docsIfCmtsModMaxBurstSize,
docsIfCmtsModGuardTimeSize,



```
    docslfCmtsModLastCodewordShortened,  
    docslfCmtsModScrambler,  
    docslfCmtsQosProfilePermissions,  
    docslfCmtsCmPtr  
  }  
  STATUS    current  
  DESCRIPTION  
    "Group of objects implemented in Cable Modem Termination Systems."  
  ::= { docslfGroups 3 }
```

docslfObsoleteGroup OBJECT-GROUP

```
  OBJECTS {  
    docslfCmRangingRespTimeout,  
    docslfCmtsInsertionInterval  
  }  
  STATUS    obsolete  
  DESCRIPTION  
    "Group of objects obsoleted."  
  ::= { docslfGroups 4 }
```

END

5. Acknowledgments

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7. 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 the `docslfCmServiceQosProfile`, `docslfCmtsServerQosProfile`, and the elements of `docslfQosProfileTable` may allow an end-user to improve their service response or decrease other subscriber service response.

This MIB does not affect confidentiality, authentication or authorization of services on a cable modem system. For authentication and authorization, please see the related document "Cable Device Management Information Base for DOCSIS compliant Cable Modems and Cable Modem Termination Systems" [18]. For confidentiality, the working group expects to issue a MIB which describes the management of the DOCSIS Baseline Privacy mechanism.

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@Home Network
August 1999

Radio Frequency (RF) Interface Management Information Base
for MCNS/DOCSIS compliant RF interfaces

Status of this Memo

This document specifies an Internet standards track protocol for the Internet community, and requests discussion and suggestions for improvements. Please refer to the current edition of the "Internet Official Protocol Standards" (STD 1) for the standardization state and status of this protocol. Distribution of this memo is unlimited.

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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 MCNS/DOCSIS compliant Radio Frequency (RF) interfaces.

This memo specifies a MIB module in a manner that is compliant to the SNMP SMIv2 [5][6][7]. The set of objects are 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@terayon.com and/or the author.

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