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The SatLabs Group DVB-RCS MIB

Abstract

This document describes the MIB module for the Digital Video Broadcasting Return Channel via Satellite system (DVB-RCS), as defined by the SatLabs Group. It defines a set of MIB objects to characterize the behavior and performance of network-layer entities deploying DVB-RCS.

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1. Introduction

The SatLabs Group [SATLABS] is an international non-profit EEIG (European Economic Interest Grouping) committed to large-scale adoption and deployment of the Digital Video Broadcasting Return Channel via Satellite (DVB-RCS) standard [ETSI-RCS]. SatLabs members are service providers, satellite operators, system integrators, terminal manufacturers, and technology providers with an interest in DVB-RCS.

Since its creation in 2001, the main goal of the SatLabs Group has been to achieve interoperability between DVB-RCS terminals and systems. Therefore, the Group has defined the SatLabs Qualification Program, which provides an independent certification process for DVB-RCS terminals based on System Recommendations defined by SatLabs. To enhance product interoperability, beyond the physical-layer and MAC-layer mechanisms defined in the DVB-RCS standard, SatLabs has expanded its Recommendations in the field of DVB-RCS terminal management [SATLABS]. As part of this effort, SatLabs has specified a common Simple Network Management Protocol (SNMP) Management Information Base (MIB) for DVB-RCS terminals, which is defined in this document.

A DVB-RCS terminal is denoted as a Return Channel Satellite Terminal (RCST) in the remainder of this document. This consists of an Indoor Unit (IDU) and an Outdoor Unit (ODU) connected through an Inter-Facility Link (IFL), usually a coaxial L-band interface. On the user side, the IDU is connected to the user network through a Local Area Network (LAN) interface (usually Ethernet). On the network side, the ODU is connected via a satellite link (the air interface).

The SatLabs Group DVB-RCS MIB is implemented in the IDU of an RCST. RCST management can be performed either through the LAN interface (local management) or through the air interface (remote management from the Network Control Center, NCC). RCST and NCC elements are shown on Figure 1.

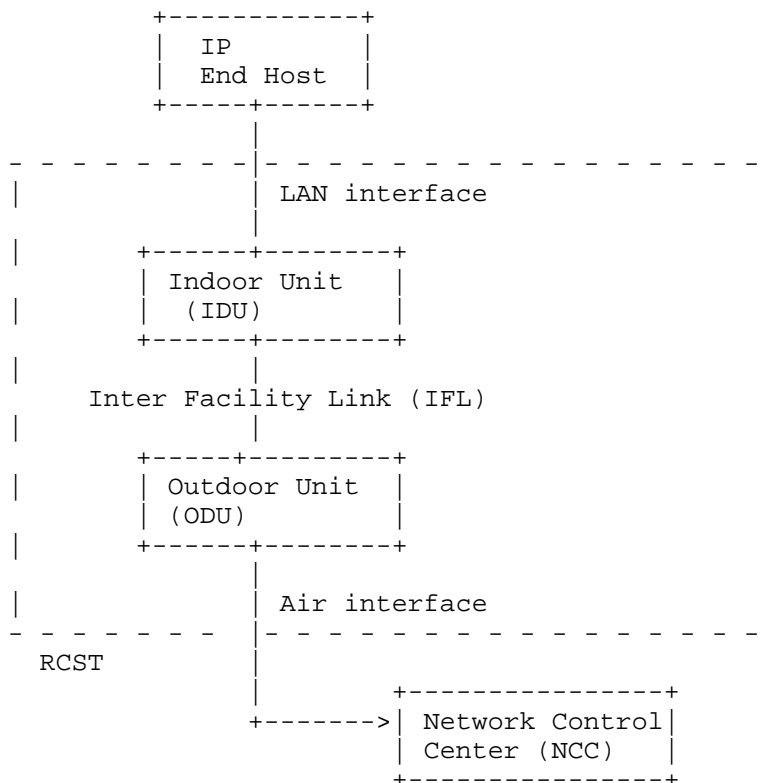


Figure 1: RCST Architecture

2. Conventions Used in This Document

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

For a detailed overview of the documents that describe the current Internet-Standard Management Framework, please refer to section 7 of RFC 3410 [RFC3410].

Managed objects are accessed via a virtual information store, termed the Management Information Base or MIB. MIB objects are generally accessed through the Simple Network Management Protocol (SNMP). Objects in the MIB are defined using the mechanisms defined in the Structure of Management Information (SMI). This memo specifies a MIB module that is compliant to the SMIV2, which is described in STD 58, RFC 2578 [RFC2578], STD 58, RFC 2579 [RFC2579] and STD 58, RFC 2580 [RFC2580].

The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "MAY", and "OPTIONAL" in this document are to be interpreted as described in BCP 14, RFC 2119 [RFC2119].

2.1. Abbreviations

AAL5	ATM Adaptation Layer Type 5
ACM	Adaptive Coding and Modulation
ATM	Asynchronous Transfer Mode
AVBDC	Absolute Volume-Based Dynamic Capacity
BER	Bit Error Rate
BUC	Block Up-Converter
CCM	Constant Coding and Modulation
CNR	Carrier to Noise Ratio
CRA	Continuous Rate Assignment
CSC	Common Signaling Channel
CW	Continuous Wave (carrier frequency)
dBi	decibel (isotropic)
dBm	decibel (with respect to 1 mW)
DC	Direct Current
DSCP	Diffserv Code Point
DVB	Digital Video Broadcasting
EIRP	Equivalent Isotropic Radiated Power
ETSI	European Telecommunications Standards Institute
FEC	Forward Error Correction
FTP	File Transfer Protocol
GS	Generic Stream

GSE	Generic Stream Encapsulation
IDU	Indoor Unit
IFL	Inter-Facility Link
LNB	Low Noise Block
LO	Local Oscillator
MAC	Medium Access Control
MIB	Management Information Base
MPEG	Motion Pictures Expert Group
MPE	Multi-Protocol Encapsulation
NCC	Network Control Centre
OAM	Operations and Management
ODU	Outdoor Unit
PHB	Per-Hop Behavior
PEP	Performance Enhancing Proxy
PID	Packet Identifier (MPEG, used as Elementary Stream Identifier)
QoS	Quality of Service
RBDC	Rate-Based Dynamic Capacity
RC	Request Class
RCS	Return Channel via Satellite
RCST	Return Channel via Satellite Terminal (DVB-RCS Terminal)
Rx	Receive
SDU	Service Data Unit
SSPA	Solid State Power Amplifier
TDM	Time-Division Multiplex

TDMA	Time-Division Multiple Access
TFTP	Trivial File Transfer Protocol
TS	Transport Stream (as defined by MPEG)
Tx	Transmit
VBDC	Volume-Based Dynamic Capacity
VCI	Virtual Channel Identifier (ATM)
VPI	Virtual Path Identifier (ATM)
Vpp	Volts peak-to-peak

2.2. Glossary

The terms in this document are derived either from DVB-RCS standard specifications [ETSI-RCS] or from SatLabs System Recommendations [SATLABS].

2.2.1. Star DVB-RCS Network

This denotes a hub-and-spoke configuration where all communications pass through a central hub, which usually also includes the NCC. Peer-to-peer communication between RCSTs is possible through a double satellite hop (this traffic has to pass through the hub).

2.2.2. Mesh DVB-RCS Network

This denotes a mesh configuration that supports peer-to-peer communications in a single satellite hop directly between RCSTs.

2.2.3. Transparent DVB-RCS Network

This denotes a network using transparent satellite transponders. Star or mesh network configurations can be supported. In the case of a mesh configuration, RCSTs need to incorporate a TDMA receiver in addition to the TDM receiver.

2.2.4. Regenerative DVB-RCS Network

This denotes a network that uses regenerative satellite transponders, i.e. includes some On-Board Processing functionality, which allows demodulation and decoding of the uplink TDMA signals and re-multiplex of the traffic into TDM signals on the downlink. Star or mesh network configurations can be supported.

2.2.5. DVB-RCS MAC Layer

The DVB-RCS MAC layer represents the air interface of an RCST, as specified in [ETSI-RCS]. The interface is bi-directional and supports IP traffic over hub-spoke (star) and mesh satellite network topologies.

2.2.6. DVB-RCS TDM

The DVB-RCS TDM corresponds to the forward link of a DVB-RCS transparent system or the downlink of a DVB-RCS regenerative system. It is based on either the DVB-S or DVB-S2 standard, specified in [ETSI-DVBS] and [ETSI-DVBS2] respectively. In the DVB-RCS context, this interface is uni- or bi-directional, as it may also be used for a return channel dedicated to a single terminal.

2.2.7. DVB-RCS TDMA

The DVB-RCS TDMA corresponds to the return or mesh link of an RCS transparent system or the uplink of an RCS regenerative system. It is specified in [ETSI-RCS].

In the context of star transparent and mesh regenerative DVB-RCS systems, this interface is uni-directional.

In the context of mesh transparent DVB-RCS systems, this interface is bi-directional.

2.2.8. IDU

This is the indoor part of the RCST (including at least the power supply, and usually also the modem and networking functions).

2.2.9. ODU

This is the outdoor part of the RCST (including at least the aerial, and usually also the LNB and BUC).

2.2.10. RCST

This is the Satellite Terminal, installed on the customer premises. It is composed of the IDU and ODU.

2.2.11. NCC

The NCC provides Control and Monitoring Functions. It generates control and timing signals for the operation of the DVB-RCS Network.

2.2.12. Configuration File

The configuration file is an XML-formatted file, storing configuration parameters for the RCST and their values.

2.2.13. Log File

The log file is stored at the RCST. This is used to log particular events that occur on the RCST side.

2.2.14. Installation Log File

The installation log file is stored at the RCST. This logs particular events that occur on the RCST side and are related to RCST installation phase.

2.2.15. Antenna Alignment

This is the process to align the RCST antenna, part of the ODU, in order to enable bi-directional communication (uplink, downlink) with the satellite network.

2.2.16. CW Frequency

The CW frequency is the frequency of a Continuous Wave signal. It is a narrowband carrier transmitted for the duration of measurements during the installation of an RCST.

2.2.17. Request Class

A Request Class (RC) is a representation of a Per-Hop Behavior (PHB) at the MAC layer. It defines a behavior of the MAC layer for a given aggregation of traffic. This behavior includes a combination of Capacity Categories associated to the RC and a priority with respect to the other RCs supported by an RCST.

2.2.18. Channel ID

Each Request Class is identified by a unique Channel_ID in the communication between the RCST and the NCC.

2.2.19. ATM Profile

The ATM profile is one of the two profiles for traffic burst format on a DVB-RCS TDMA. It is based on one or more concatenated ATM cells, each of length 53 bytes, plus an optional prefix.

2.2.20. MPEG Profile

The MPEG profile is one of the two profiles for traffic burst format on the DVB-RCS TDMA. It is based on a number of concatenated MPEG2-TS packets, each of length 188 bytes.

2.2.21. PID Pool

For the MPEG profile, several RCs may be mapped within a pool of several PIDs to allow cross-RC Section Packing [ETSI-DAT]. Section Packing can be used on all PIDs and higher priority traffic can always preempt lower priority streams. This reduces the need for padding.

2.2.22. Capacity Categories

The TDMA timeslot allocation process for the DVB-RCS uplink supports several Capacity Categories.

The Capacity Categories CRA, RBDC, and A/VBDC, when authorized for an RC, have to be configured from the NCC. Their configuration parameters are used to inform the RCST of the configuration of each category at the NCC side and thus help in Capacity Requests computation.

The categories are treated independently for each RC. A SatLabs optional feature is defined that allows their configuration at the RCST level in addition to configuration per RC. This feature is denoted RCST_PARA.

2.2.22.1. Continuous Rate Assignment (CRA)

CRA is a rate capacity that is provided in full in a continuous manner to the RCST while required.

2.2.22.2. Rate-Based Dynamic Capacity (RBDC)

RBDC is a rate capacity that is requested dynamically by an RCST. RBDC is provided in response to explicit requests from the RCST to the NCC, such requests being absolute (i.e., corresponding to the full rate currently being requested). Each request overrides all previous RBDC requests from the same RCST and is subject to a maximum rate limit.

2.2.22.3. Volume-Based Dynamic Capacity (VBDC)

VBDC is a volume capacity that is requested dynamically by an RCST. VBDC is provided in response to explicit requests from the RCST to the NCC, such requests being cumulative (i.e., each request adds to all previous requests from the same RCST).

2.2.22.4. Absolute Volume-Based Dynamic Capacity (AVBDC)

AVBDC is a volume capacity that is requested dynamically by an RCST. This capacity is provided in response to explicit requests from the RCST to the NCC, such requests being absolute (i.e., this request replaces the previous ones from the same RCST).

The combination of AVBDC and VBDC is seen as a single Capacity Category, denoted A/VBDC.

2.2.22.5. Population ID

This defines a group of RCSTs within a network.

2.2.23. Start Transponder

This is the satellite transponder on which the communication is initiated from an RCST point of view when in the installation mode. The parameters corresponding to this transponder (satellite orbital position, frequency, etc.) are stored at the RCST as power-up configuration data.

2.2.24. DVB-S

DVB-S is the Digital Video Broadcast over Satellite [ETSI-DVBS]. It is a framework and set of associated standards published by ETSI for the transmission of video, audio, and data, using the ISO MPEG-2 standard [ISO-MPEG], over satellite links.

2.2.25. DVB-S2 and CCM/VCM/ACM

DVB-S2 is the Second Generation of the Digital Video Broadcast for Satellite applications standard [ETSI-DVBS2]. It is a framework and set of associated standards published by ETSI for the transmission of video, audio, and data.

BBFRAME: The main framing unit of the DVB-S2 protocol stack.

CCM: In CCM transmission mode, the forward link uses a constant set of transmission parameters (FEC coding rate and modulation scheme) for all receivers.

VCM: In VCM transmission mode, the forward link uses transmission parameters that are variable on a BBFRAME-by-BBFRAME but fixed on a Receiver basis, according to fixed link and propagation conditions for each Receiver.

ACM: In ACM transmission mode, the forward link uses transmission parameters that are dynamically adjusted on a BBFRAME-by-BBFRAME and Receiver-per-Receiver basis, according to actual link and propagation conditions. In order to implement ACM, feedback from each Receiver has to be provided by DVB-RCS return channel.

2.2.26. Interactive Network

This is another name for a DVB-RCS-based satellite network.

3. MIB Module Overview

This MIB module provides a set of objects required for the management of a SatLabs-compliant RCST. The specification is derived from the parameters and protocols described in [SATLABS].

The MIB module in this document uses the following OBJECT IDENTIFIER values, as already assigned by IANA under the smi-numbers registry [IANA]:

Descriptor	OBJECT IDENTIFIER value
dvbRcsMib	{ mib-2 transmission 239 }

Table 1: Object Identifiers for the MIB

These values have been assigned for this MIB under the 'mib-2.transmission' subtree.

3.1. Textual Conventions

This MIB module defines new textual conventions for RCST indications of SatLabs-defined capabilities, including profiles, options, and optional features.

DvbRcsSystemSatLabsProfileMap represents the SatLabs profiles supported as defined in [SATLABS].

DvbRcsSystemSatLabsOptionMap represents the SatLabs options supported as defined in [SATLABS]. These are options that are used for the certification of SatLabs terminals. They represent important

functionality, with impact on interoperability, and their support is advertised with the RCST certification level.

DvbRcsSystemSatLabsFeatureMap represents the SatLabs optional features supported as defined in [SATLABS]. These represent minor features, not necessary for interoperability. They are not used for the certification of SatLabs terminals.

3.2. Structure of the MIB

This MIB module is structured into two top-level groups:

- o The dvbRcsMibObjects group includes all the managed objects of the DVB-RCS MIB.
- o The dvbRcsConformance group includes the compliance statements for DVB-RCS terminals that are compliant with [SATLABS]. The managed objects are grouped into formal object groups (i.e., units of conformance) according to their relation to specific SatLabs options or features. The conformance statements (MODULE-COMPLIANCE specification) are described within the dvbRcsRcstCompliances group, while the units of conformance are described within the dvbRcsRcstGroups group.

The dvbRcsMibObjects group is further structured into three groups: dvbRcsRcst, dvbRcsFwdLink, and dvbRcsRtnLink.

The dvbRcsRcst group covers management related to the RCST equipment. It is structured into six groups:

- o dvbRcsRcstSystem
- o dvbRcsRcstNetwork
- o dvbRcsRcstInstall
- o dvbRcsRcstQos
- o dvbRcsRcstControl
- o dvbRcsRcstState

The dvbRcsFwdLink group covers management information related to the RCST forward link. It is structured into two groups:

- o dvbRcsFwdConfig
- o dvbRcsFwdStatus

The dvbRcsRtnLink group covers management information related to the RCST return link. It is structured into two groups:

- o dvbRcsRtnConfig
- o dvbRcsRtnStatus

Tables within each of these groups cover different functions like return link traffic management (packet classes, Request Classes, PID pools) and forward link configuration and status.

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.

3.3. Relationship to the Interfaces MIB Module

This section clarifies the relationship of this MIB module to the Interfaces MIB [RFC2863]. Several areas of correlation are addressed in the following. The implementer is referred to the Interfaces MIB document in order to understand the general intent of these areas.

IANA has assigned three ifType labels for DVB-RCS. Each RCST MUST support at least the three following interfaces:

- o dvbRcsMacLayer (239), -- DVB-RCS MAC Layer

DVB-RCS MAC Layer represents the complete air interface of an RCST, as specified in [ETSI-RCS]. This interface supports star and mesh networks and is bi-directional. Only star networks are considered by the present MIB module.

- o dvbTdm (240), -- DVB Satellite TDM

DVB-RCS physical link based on Time-Division Multiplexing. It corresponds to the forward link of an RCS transparent system or the downlink of an RCS regenerative system. It is based on either the DVB-S or DVB-S2 standard, specified in [ETSI-DVBS] and [ETSI-DVBS2] respectively. Only transparent systems are considered by the present MIB module.

In the DVB-RCS context, this interface is uni- or bi-directional.

In the present MIB module, only a uni-directional (i.e., forward link, or downstream) dvbTdm interface is considered.

- o dvbRcsTdma (241), -- DVB-RCS TDMA

DVB-RCS physical link based on Time-Division Multiple Access. It corresponds to the return or mesh link of an RCS transparent system or the uplink of an RCS regenerative system. It is based on the DVB-RCS standard specified in [ETSI-RCS].

In the context of star transparent and mesh regenerative DVB-RCS systems, this interface is uni-directional.

In the context of mesh transparent DVB-RCS systems, this interface is bi-directional.

Only star transparent systems are considered by the present MIB module (i.e., return link, or upstream).

The protocol stack (as reflected in ifStackTable) will be as follows:

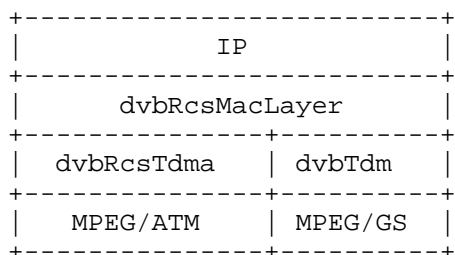


Figure 2: RCST Protocol Stack

An additional Ethernet interface is used on the LAN side of the RCST (see Figure 1).

An instance of ifEntry exists for each dvbTdm interface, for each dvbRcsTdma (normally only one), and for each dvbRcsMac layer (normally only one).

The interface counters relate to:

- o dvbRcsMacLayer: DVB-RCS two-way MAC interface that counts aggregate Multi-Protocol Encapsulation (MPE) frames, Generic Stream Encapsulation (GSE) encapsulated PDUs (equals IP packets), and ATM Adaptation Layer 5 (AAL5) frames.

MPE is specified in [ETSI-DAT] and is transported over MPEG, which is specified in [ISO-MPEG]. MPEG is transported over GS or TS (Transport Stream) carriers. The TS carrier is specified in [ETSI-DVBS] for DVB-S and [ETSI-DVBS2] for DVB-S2.

GSE is specified in [ETSI-GSE] and is transported over the GS (Generic Stream) carrier, which is specified in [ETSI-DVBS2].

ATM is specified in [ITU-ATM].

AAL5 is specified in [ITU-AAL5].

- o dvbTdm: The DVB-RCS TDM interface that counts MPEG TS packets at stream level, if the TS format is used. If the Generic Stream (GS) format is used, it counts GSE packets.
- o dvbRcsTdma: The DVB-RCS TDMA interface that counts aggregate ATM and MPEG TS packets.

The ifStackTable [RFC2863] MUST be implemented to identify the relationships among sub-interfaces.

The following example is a DVB-RCS star network with DVB-S and DVB-RCS. As illustrated on Figure 3, it shows a DVB-RCS MAC interface with one downstream and one upstream interface. In this network, ATM encapsulation is used in the DVB-RCS uplink. Two ATM Logical Ports are shown. DVB-S2 or DVB-S can be used in the downlink.

ifType 214 'mpegTransport' can also be used for counting TS packets and bytes for sub-interfaces of dvbRcsTdma or dvbTdm, e.g., per PID-oriented or per TS-oriented, as desired and applicable.

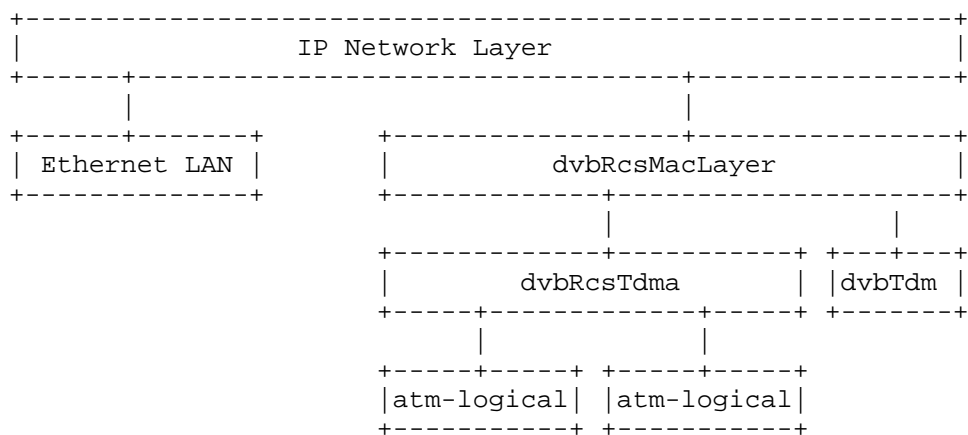


Figure 3: Example Stacking

As can be seen from this example, the dvbRcsMacLayer interface is layered on top of the downstream and upstream interfaces, and the upstream interface is layered on top of upstream ATM logical links.

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

ifIndex	ifType	Description
2	dvbRcsMacLayer (239)	DVB-RCS MAC Layer
3	dvbRcsTdma (241)	DVB-RCS TDMA Upstream
4	dvbTdm(240)	DVB-RCS TDM Downstream
5	atm-logical(80)	ATM Logical Port
6	atm-logical(80)	ATM Logical Port

The corresponding ifStack entries would then be:

IfStackHigherLayer	ifStackLowerLayer
0	1
0	2
1	0
2	3
2	4
3	5
3	6
4	0
5	0
6	0

Table 2: Example ifStack Entries

3.4. MIB Groups Description

3.4.1. dvbRcsRcstSystem

The MIB objects in this group gather some basic information that would allow anyone to trace the history -- the life -- of the RCST, as well as to get a complete description of its constitution on the component point of view, including the SatLabs options/features support statement. Many of the parameters will be defined at installation.

This group contains description parameters related to the RCST type (ODU type) and location. These parameters are believed to stay unchanged once it has been defined during installation. Modification of hardware equipment, maintenance operations, and geographical relocation may require an update of those MIB objects. Note that the `dvbRcsRcstSystem.dvbRcsSystemLocation` object gives the location of

the ODU antenna, which is needed for network operation, while the `system.sysLocation` (MIB-II SNMP OID) provides the location of the IDU unit, which cannot be used for the same purpose.

The RCST must provide either Read-Write access to `dvbRcsSystemOdu` parameters or, alternatively, provide the list of supported devices through the `dvbRcsRcstOduListGroup` (see conformance section). This group of parameters, defined in the `dvbRcsRcstSystem` group, allows the selection by the RCST installer of the actual ODU type. In such a case, the installer must set `dvbRcsOduTxType`, `dvbRcsOduRxType`, and `dvbRcsOduAntennaType` according to the selected BUC, LNB, and antenna respectively.

3.4.2. `dvbRcsRcstNetwork`

This group contains all the MIB objects related to network parameters.

In this subgroup, two objects have been defined in order to differentiate between control and user traffic and associate them with a physical interface. Both `dvbRcsRcstNetwork.dvbRcsNetworkLanIpAddress` (Traffic) and `dvbRcsRcstNetwork.dvbRcsNetworkOamInetAddress` (OAM) provide the value of the IP address of, respectively, the user traffic and the control and management traffic.

3.4.3. `dvbRcsRcstInstall`

This group contains all the information related to the RCST installation and commissioning. Many parameters are believed to stay unchanged once it has been defined during installation. Modification of hardware equipment, maintenance operations, and geographical relocation may require an update of those MIB objects.

3.4.4. `dvbRcsRcstQos`

This group contains objects to configure the Quality of Service (QoS) of the RCST by the NCC.

The `dvbRcsPktClass` table defines the packet classification for IP layer 3 classifications. Each `dvbRcsPktClass` entry is mapped to a `dvbRcsPhbEntry` in the `dvbRcsPhbMappingTable`.

The `dvbRcsPhbMappingTable` makes the relation between a packet classification entry, a Per-Hop Behavior (PHB) identifier, and a Request Class entry.

The dvbRcsRequestClassTable defines all the layer 2 DVB-RCS QoS parameters.

3.4.5. dvbRcsRcstControl

This MIB group contains objects a network manager can use to invoke actions and tests supported by the RCST agent and to retrieve the action/test results.

3.4.6. dvbRcsRcstState

This MIB group describes the fault state, software versions, and configuration file versions of the RCST.

3.4.7. dvbRcsFwdLink (dvbRcsFwdConfig and dvbRcsFwdStatus groups)

This MIB group contains parameters that enable access to data about the forward link.

Configuration information is kept in the dvbRcsFwdLink.dvbRcsFwdConfig subgroup. Status information is kept into the dvbRcsFwdLink.dvbRcsFwdStatus subgroup.

The information in dvbRcsFwdLink.dvbRcsFwdConfig.dvbRcsFwdStartTable is used for the first time the RCST tries to acquire the forward link. All these object values are aligned with the Satellite Delivery System Descriptor in the Network Information Table (NIT) table [ETSI-SI].

The objects in the dvbRcsFwdLink.dvbRcsFwdConfig.dvbRcsFwdStatusTable are aligned with the satellite forward path descriptor from the RCS Map Table (RMT) [ETSI-RCS] and with the Physical Layer (PL) Header [ETSI-DVBS2], which specifies the MODCOD (modulation and FEC rate) and the Type (frame length short or long and the presence/absence of pilots).

3.4.8. dvbRcsRtnLink (dvbRcsRtnConfig and dvbRcsRtnStatus groups)

This MIB group contains parameters that enable access to data about the return link.

Configuration information is kept in the dvbRcsRtnLink.dvbRcsRtnConfig subgroup. Status information is kept into the dvbRcsRtnLink.dvbRcsRtnStatus subgroup.

The RCST is only able to deal with one return link at a time. Hence, there is no need to define a table to collect the different SNMP objects, as it is done for the forward.

4. Definitions

```
DVB-RCS-MIB DEFINITIONS ::= BEGIN
```

```
IMPORTS
```

```
    MODULE-IDENTITY,
    OBJECT-TYPE,
    Integer32,
    Unsigned32,
    transmission
        FROM SNMPv2-SMI                -- [RFC2578]
    TEXTUAL-CONVENTION,
    RowStatus
        FROM SNMPv2-TC                -- [RFC2579]
    OBJECT-GROUP,
    MODULE-COMPLIANCE
        FROM SNMPv2-CONF              -- [RFC2580]
    SnmpAdminString
        FROM SNMP-FRAMEWORK-MIB       -- [RFC3411]
    InetAddressType,
    InetAddress,
    InetAddressPrefixLength,
    InetPortNumber
        FROM INET-ADDRESS-MIB         -- [RFC4001]
    Uri
        FROM URI-TC-MIB               -- [RFC5017]
    Dscp,
    DscpOrAny
        FROM DIFFSERV-DSCP-TC         -- [RFC3289]
    ;
```

```
dvbRcsMib MODULE-IDENTITY
```

```
    LAST-UPDATED "201002161200Z"
    ORGANIZATION "The SatLabs Group"
    CONTACT-INFO
        "The SatLabs Group
        Web:      www.satlabs.org
        E-mail:   info@satlabs.org"
```

```
DESCRIPTION
```

```
    "DVB-RCS MIB subtree.
```

```

    This MIB module applies to equipment that is a Return
    Channel Satellite Terminal (RCST), defined in the Digital
    Video Broadcasting Return Channel via Satellite system
    (DVB-RCS) standard (ETSI EN 301 790 Digital Video
    Broadcasting (DVB); Interaction Channel for Satellite
    Distribution Systems, European Telecommunications
    Standards Institute (ETSI)).
```

It defines a set of MIB objects to characterize the behavior and performance of network-layer entities implementing DVB-RCS.

This MIB module is intended to be used by DVB-RCS equipment following the SatLabs System Recommendations, defined by the SatLabs Group and available at www.satlabs.org.

Note that, if not stated otherwise in the object DESCRIPTION clause, all writable objects are persistent.

Copyright (C) The IETF Trust (2010). This version of this MIB module is part of RFC 5728; see the RFC itself for full legal notices."

REVISION "200907201200Z"

DESCRIPTION

"Revision of this MIB module, following MIB doctor review and adjustments based on the MIB authoring guidelines from the IETF."

::= { transmission 239 }

-- Textual Conventions

DvbRcsSatLabsProfileMap ::= TEXTUAL-CONVENTION

STATUS current

DESCRIPTION

"This textual convention enumerates the declaration of the SatLabs-defined terminal profiles. The mapping to the profiles is to be understood as described here. (0) refers to the most significant bit.

dvbs(0) -> DVBS profile (DVB-S support)

dvbs2ccm(1) -> DVB-S2 CCM profile (CCM support)

dvbs2acm(2) -> DVB-S2 ACM profile (CCM, VCM and ACM support)"

REFERENCE

"SatLabs System Recommendations, available at www.satlabs.org."

SYNTAX BITS

{
dvbs(0),
dvbs2ccm(1),
dvbs2acm(2),
spare1(3),
spare2(4),
spare3(5),
spare4(6),
spare5(7),

```
    spare6(8),
    spare7(9),
    spare8(10),
    spare9(11),
    spare10(12),
    spare11(13),
    spare12(14),
    spare13(15),
    spare14(16),
    spare15(17),
    spare16(18),
    spare17(19),
    spare18(20),
    spare19(21),
    spare20(22),
    spare21(23),
    spare22(24),
    spare23(25),
    spare24(26),
    spare25(27),
    spare26(28),
    spare27(29),
    spare28(30),
    spare29(31)
}
```

DvbRcsSatLabsOptionMap ::= TEXTUAL-CONVENTION

STATUS current

DESCRIPTION

"This textual convention enumerates the declaration of the SatLabs-defined options. A value of 1 indicates that the respective option is supported. The mapping to the options is to be understood as described here. (0) refers to the most significant bit.

```
mpegTrf(0) -> MPEG_TRF
coarseSync(1) -> COARSE_SYNC
wideHop(2) -> WIDE_HOPP
fastHop(3) -> FAST_HOPP
dynamicMfTdma(4) -> Dynamic_MF_TDMA
contentionSync(5) -> CONTENTION_SYNC
qpskLow(6) -> QPSKLOW
mod16Apsk(7) -> 16APSK
mod32Apsk(8) -> 32APSK
normalFec(9) -> NORMALFEC
multiTs(10) -> MULTITS
gsTs(11) -> GSTS
enhQoS(12) -> ENHQOS
```

```
pep(13) -> PEP
http(14) -> HTTP
ftp(15) -> FTP
dns(16) -> DNS
chIdStrict(17) -> CHID_STRICT
nlid(18) -> NLID
snmpMisc(19) -> SNMPMISC
```

The support of specific options mandates the support of specific objects and access levels."

REFERENCE

"SatLabs System Recommendations, available at www.satlabs.org."

```
SYNTAX BITS {
    mpegTrf(0),
    coarseSync(1),
    wideHop(2),
    fastHop(3),
    dynamicMfTdma(4),
    contentionSync(5),
    qpskLow(6),
    mod16Apsk(7),
    mod32Apsk(8),
    normalFec(9),
    multiTs(10),
    gsTs(11),
    enhQoS(12),
    pep(13),
    http(14),
    ftp(15),
    dns(16),
    chIdStrict(17),
    nlid(18),
    snmpMisc(19),
    spare1(20),
    spare2(21),
    spare3(22),
    spare4(23),
    spare5(24),
    spare6(25),
    spare7(26),
    spare8(27),
    spare9(28),
    spare10(29),
    spare11(30),
    spare12(31)
}
```


DvbRcsSatLabsFeatureMap ::= TEXTUAL-CONVENTION

STATUS current

DESCRIPTION

"This textual convention enumerates the declaration of the SatLabs-specified compatibility and configuration features. A value of 1 indicates that the respective feature is supported. The mapping to the features is to be understood as described here. (0) refers to the most significant bit.

rcstPara(0) -> RCST_PARA feature
installLog(1) -> INSTALL_LOG feature
enhClassifier(2) -> ENHCLASSIFIER feature
routeId(3) -> ROUTE_ID feature
oduList(4) -> ODULIST feature
extNetwork(5) -> EXTNETWORK feature
extControl(6) -> EXTCONTROL feature
extConfig(7) -> EXTCONFIG feature
extStatus(8) -> EXTSTATUS feature
mpaf(9) -> MPAF feature

The support of specific features mandates the support of specific objects and access levels."

REFERENCE

"SatLabs System Recommendations, available at www.satlabs.org."

SYNTAX BITS {
 rcstPara(0),
 installLog(1),
 enhClassifier(2),
 routeId(3),
 oduList(4),
 extNetwork(5),
 extControl(6),
 extConfig(7),
 extStatus(8),
 mpaf(9),
 spare1(10),
 spare2(11),
 spare3(12),
 spare4(13),
 spare5(14),
 spare6(15),
 spare7(16),
 spare8(17),
 spare9(18),
 spare10(19),
 spare11(20),

```

    spare12(21),
    spare13(22),
    spare14(23),
    spare15(24),
    spare16(25),
    spare17(26),
    spare18(27),
    spare19(28),
    spare20(29),
    spare21(30),
    spare22(31)
}

```

```

-----
-- object type definitions
-----
dvbRcsMibObjects      OBJECT IDENTIFIER ::= {dvbRcsMib 1}
dvbRcsConformance    OBJECT IDENTIFIER ::= {dvbRcsMib 2}

dvbRcsRcst            OBJECT IDENTIFIER ::= {dvbRcsMibObjects 1}
dvbRcsFwdLink         OBJECT IDENTIFIER ::= {dvbRcsMibObjects 2}
dvbRcsRtnLink         OBJECT IDENTIFIER ::= {dvbRcsMibObjects 3}

dvbRcsRcstSystem      OBJECT IDENTIFIER ::= {dvbRcsRcst 1}
dvbRcsRcstNetwork     OBJECT IDENTIFIER ::= {dvbRcsRcst 2}
dvbRcsRcstInstall     OBJECT IDENTIFIER ::= {dvbRcsRcst 3}
dvbRcsRcstQos         OBJECT IDENTIFIER ::= {dvbRcsRcst 4}
dvbRcsRcstControl     OBJECT IDENTIFIER ::= {dvbRcsRcst 5}
dvbRcsRcstState       OBJECT IDENTIFIER ::= {dvbRcsRcst 6}

dvbRcsFwdConfig       OBJECT IDENTIFIER ::= {dvbRcsFwdLink 1}
dvbRcsFwdStatus       OBJECT IDENTIFIER ::= {dvbRcsFwdLink 2}

dvbRcsRtnConfig       OBJECT IDENTIFIER ::= {dvbRcsRtnLink 1}
dvbRcsRtnStatus       OBJECT IDENTIFIER ::= {dvbRcsRtnLink 2}

-----
-- dvbRcsRcstSystem sub-tree object types
-----
dvbRcsSystemMibRevision OBJECT-TYPE
    SYNTAX      SnmpAdminString
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "This object allows the SNMP agent to report the
         implemented MIB module revision.
         The supported REVISION of this module is reported."
    ::= {dvbRcsRcstSystem 1}

```

```

=====
-- Options declared according to the textual conventions
=====
dvbRcsSystemSatLabsProfilesDeclaration OBJECT-TYPE
    SYNTAX      DvbRcsSatLabsProfileMap
    MAX-ACCESS   read-only
    STATUS       current
    DESCRIPTION
        "Indicates the SatLabs profiles supported, as defined in
         the SatLabs System Recommendations."
    ::= {dvbRcsRcstSystem 2}

dvbRcsSystemSatLabsOptionsDeclaration OBJECT-TYPE
    SYNTAX      DvbRcsSatLabsOptionMap
    MAX-ACCESS   read-only
    STATUS       current
    DESCRIPTION
        "Indicates the SatLabs options supported, as defined in
         the SatLabs System Recommendations."
    ::= {dvbRcsRcstSystem 3}

dvbRcsSystemSatLabsFeaturesDeclaration OBJECT-TYPE
    SYNTAX      DvbRcsSatLabsFeatureMap
    MAX-ACCESS   read-only
    STATUS       current
    DESCRIPTION
        "Indicates the optional compatibility features and minor
         options supported, as defined in the SatLabs System
         Recommendations."
    ::= {dvbRcsRcstSystem 4}

dvbRcsSystemLocation OBJECT-TYPE
    SYNTAX      SnmpAdminString
    MAX-ACCESS   read-write
    STATUS       current
    DESCRIPTION
        "Physical location of the ODU antenna expressed as
         longitude, latitude, and altitude. The string
         shall have 31 characters in the following format:
         <xxxx.xxx>,<a>,<yyyyy.yyy>,<b>,<zzzz.z>,M
         where x, y and z represents digits,
         a=N or S,
         b=E or W,
         Reading the digits from left to right:
         'x' 7 latitude digits;
         x digits 1-2 contain the degrees,
         x digits 3-7 contain the minutes in decimal;
         'y' 8 longitude digits;

```

y digits 1-3 contain the degrees,
 y digits 4-8 contain the minutes in decimal;
 'z' 5 altitude digits;
 meters above sea level in decimal;
 '.' is the decimal point;
 ',' is the field separator;
 'M' is the indicator for altitude meters.

This format is a modified subset of the NMEA 0183
 (National Marine Electronics Association, Interface
 Standard) format for Global Positioning System Fix
 Data.

This location and the satellite position are used to
 calculate the RCST-satellite path delay.

Note: The system.sysLocation object of MIB-II provides
 physical location of the IDU unit."

::= {dvbRcsRcstSystem 5}

dvbRcsSystemOduAntennaSize OBJECT-TYPE

SYNTAX	Unsigned32
UNITS	"cm"
MAX-ACCESS	read-write
STATUS	current
DESCRIPTION	

"Diameter of the antenna."

::= {dvbRcsRcstSystem 6}

dvbRcsSystemOduAntennaGain OBJECT-TYPE

SYNTAX	Unsigned32
UNITS	"x0.1 dBi"
MAX-ACCESS	read-write
STATUS	current
DESCRIPTION	

"Antenna peak gain of the ODU."

::= {dvbRcsRcstSystem 7}

dvbRcsSystemOduSspa OBJECT-TYPE

SYNTAX	Unsigned32
UNITS	"x0.1 W"
MAX-ACCESS	read-write
STATUS	current
DESCRIPTION	

"Power level of the Solid State Power Amplifier
 installed in the ODU."

::= {dvbRcsRcstSystem 8}

dvbRcsSystemOduTxType OBJECT-TYPE

SYNTAX	SnmpAdminString
MAX-ACCESS	read-write

```

    STATUS          current
    DESCRIPTION
        "Type of transmitter installed in the ODU."
 ::= { dvbRcsRcstSystem 9 }

dvbRcsSystemOduRxType OBJECT-TYPE
    SYNTAX          SnmpAdminString
    MAX-ACCESS      read-write
    STATUS          current
    DESCRIPTION
        "Type of LNB installed in the ODU, with
         information such as vendor type, output type (single,
         twin, quad,...), etc."
 ::= { dvbRcsRcstSystem 10 }

dvbRcsSystemOduRxBand OBJECT-TYPE
    SYNTAX          INTEGER {
                        oduHighRxBand (0),
                        oduLowRxBand  (1)
                      }
    MAX-ACCESS      read-write
    STATUS          current
    DESCRIPTION
        "LNB High Band / Low Band selector. High Band corresponds
         to the emission of an 18-26 kHz tone with 0.4-0.8 Vpp in
         the Rx IFL cable:
         (0)      - High Band
         (1)      - Low Band"
 ::= { dvbRcsRcstSystem 11 }

dvbRcsSystemOduRxLO OBJECT-TYPE
    SYNTAX          Unsigned32
    UNITS           "x100 Hz"
    MAX-ACCESS      read-write
    STATUS          current
    DESCRIPTION
        "Frequency of LNB Local Oscillator (in 100 Hz)"
 ::= { dvbRcsRcstSystem 12 }

dvbRcsSystemOduTxLO OBJECT-TYPE
    SYNTAX          Unsigned32
    UNITS           "x100 Hz"
    MAX-ACCESS      read-write
    STATUS          current
    DESCRIPTION
        "Frequency of Block Up-Converter Local Oscillator
         (in 100 Hz)."
 ::= { dvbRcsRcstSystem 13 }

```

dvbRcsSystemIduPep OBJECT IDENTIFIER ::= {dvbRcsRcstSystem 14}

dvbRcsTcpPep OBJECT-TYPE

```
SYNTAX          INTEGER{
                    disabled (0),
                    enabled (1)
                }
MAX-ACCESS      read-write
STATUS          current
DESCRIPTION
    "Status and control of embedded TCP PEP.
     0 - disabled or not implemented
     1 - enabled"
```

::={dvbRcsSystemIduPep 1}

dvbRcsHttpPep OBJECT-TYPE

```
SYNTAX          INTEGER{
                    disabled (0),
                    enabled (1)
                }
MAX-ACCESS      read-write
STATUS          current
DESCRIPTION
    "Status and control of embedded HTTP PEP.
     0 - disabled or not implemented
     1 - enabled"
```

::={dvbRcsSystemIduPep 2}

```
-----
-- ODU structural entities
-----
```

dvbRcsOduTx OBJECT IDENTIFIER ::= {dvbRcsRcstSystem 15}

dvbRcsOduRx OBJECT IDENTIFIER ::= {dvbRcsRcstSystem 16}

dvbRcsOduAntenna OBJECT IDENTIFIER ::= {dvbRcsRcstSystem 17}

```
-----
-- ODU BUC
-----
```

dvbRcsOduTxTypeTable OBJECT-TYPE

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

"This table contains the identification of each well-known BUC type supported by the IDU and provides its associated index."

```

 ::= { dvbRcsOduTx 1 }

dvbRcsOduTxTypeEntry OBJECT-TYPE
    SYNTAX      DvbRcsOduTxTypeEntry
    MAX-ACCESS   not-accessible
    STATUS       current
    DESCRIPTION
        "An entry in the BUC type table."
    INDEX       { dvbRcsOduTxTypeIndex }
 ::= { dvbRcsOduTxTypeTable 1 }

DvbRcsOduTxTypeEntry ::= SEQUENCE {
    dvbRcsOduTxTypeIndex      Unsigned32,
    dvbRcsOduTxTypeDescription SnmpAdminString
}

dvbRcsOduTxTypeIndex OBJECT-TYPE
    SYNTAX      Unsigned32 (1..32)
    MAX-ACCESS   not-accessible
    STATUS       current
    DESCRIPTION
        "Index for the BUC type."
 ::= { dvbRcsOduTxTypeEntry 1 }

dvbRcsOduTxTypeDescription OBJECT-TYPE
    SYNTAX      SnmpAdminString
    MAX-ACCESS   read-only
    STATUS       current
    DESCRIPTION
        "Text-based identification of a BUC type."
 ::= { dvbRcsOduTxTypeEntry 2 }

dvbRcsOduTxType OBJECT-TYPE
    SYNTAX      Unsigned32
    MAX-ACCESS   read-write
    STATUS       current
    DESCRIPTION
        "Index of the selected BUC type."
 ::= { dvbRcsOduTx 2 }

-----
-- ODU LNB
-----

dvbRcsOduRxTypeTable OBJECT-TYPE
    SYNTAX      SEQUENCE OF DvbRcsOduRxTypeEntry
    MAX-ACCESS   not-accessible
    STATUS       current

```

DESCRIPTION

"This table contains the identification of each well-known LNB type supported by the IDU and provides its associated index."

::={dvbRcsOduRx 1}

dvbRcsOduRxTypeEntry OBJECT-TYPE

SYNTAX DvbRcsOduRxTypeEntry
MAX-ACCESS not-accessible
STATUS current

DESCRIPTION

"An entry in the LNB type table."

INDEX { dvbRcsOduRxTypeIndex }

::={dvbRcsOduRxTypeTable 1}

DvbRcsOduRxTypeEntry ::= SEQUENCE {

dvbRcsOduRxTypeIndex	Unsigned32,
dvbRcsOduRxTypeDescription	SnmpAdminString
}	

dvbRcsOduRxTypeIndex OBJECT-TYPE

SYNTAX Unsigned32 (1..32)
MAX-ACCESS not-accessible
STATUS current

DESCRIPTION

"Index for the LNB type."

::={dvbRcsOduRxTypeEntry 1}

dvbRcsOduRxTypeDescription OBJECT-TYPE

SYNTAX SnmpAdminString
MAX-ACCESS read-only
STATUS current

DESCRIPTION

"Text-based identification of an LNB type."

::={dvbRcsOduRxTypeEntry 2}

dvbRcsOduRxType OBJECT-TYPE

SYNTAX Unsigned32
MAX-ACCESS read-write
STATUS current

DESCRIPTION

"Index of the selected LNB type."

::={dvbRcsOduRx 2}


```

=====
-- ODU Antenna
=====

dvbRcsOduAntennaTypeTable OBJECT-TYPE
    SYNTAX      SEQUENCE OF DvbRcsOduAntennaTypeEntry
    MAX-ACCESS   not-accessible
    STATUS       current
    DESCRIPTION
        "This table contains the identification of each well-
        known antenna type supported by the IDU and provides
        its associated index."
    ::= { dvbRcsOduAntenna 1 }

dvbRcsOduAntennaTypeEntry OBJECT-TYPE
    SYNTAX      DvbRcsOduAntennaTypeEntry
    MAX-ACCESS   not-accessible
    STATUS       current
    DESCRIPTION
        "An entry in the antenna type table."
    INDEX       { dvbRcsOduAntennaTypeIndex }
    ::= { dvbRcsOduAntennaTypeTable 1 }

DvbRcsOduAntennaTypeEntry ::= SEQUENCE {
    dvbRcsOduAntennaTypeIndex      Unsigned32,
    dvbRcsOduAntennaTypeDescription SnmpAdminString
}

dvbRcsOduAntennaTypeIndex OBJECT-TYPE
    SYNTAX      Unsigned32 (1..32)
    MAX-ACCESS   not-accessible
    STATUS       current
    DESCRIPTION
        "Index for the antenna type."
    ::= { dvbRcsOduAntennaTypeEntry 1 }

dvbRcsOduAntennaTypeDescription OBJECT-TYPE
    SYNTAX      SnmpAdminString
    MAX-ACCESS   read-only
    STATUS       current
    DESCRIPTION
        "Text-based identification of an antenna type."
    ::= { dvbRcsOduAntennaTypeEntry 2 }

dvbRcsOduAntennaType OBJECT-TYPE
    SYNTAX      Unsigned32
    MAX-ACCESS   read-write
    STATUS       current

```

```

DESCRIPTION
    "Index of the selected antenna type."
 ::= {dvbRcsOduAntenna 2}

=====
-- dvbRcsRcstNetwork sub-tree object types
=====

dvbRcsNetworkOamInetAddressType OBJECT-TYPE
    SYNTAX      InetAddressType
    MAX-ACCESS   read-write
    STATUS       current
    DESCRIPTION
        "The type of Internet address of
         dvbRcsNetworkOamInetAddress.
         If the terminal OAM Internet address is unassigned or
         unknown, then the value of this object is unknown(0)."
```

```

 ::= {dvbRcsRcstNetwork 1}

dvbRcsNetworkOamInetAddress OBJECT-TYPE
    SYNTAX      InetAddress
    MAX-ACCESS   read-write
    STATUS       current
    DESCRIPTION
        "OAM IP Address of the RCST. This object is used with
         both IP and interfaces MIB-II subgroups. It uniquely
         determines the interface through which OAM traffic
         passes.
         The OAM IP address may be statically or dynamically
         assigned. It is system dependent whether the OAM IP
         address and the Traffic IP address are the same address.
         If the terminal has no OAM Internet address assigned or if
         this Internet address is unknown, the value of this
         object is the zero-length OCTET STRING.
         The InetAddressType is given by the
         dvbRcsNetworkOamInetAddressType object."
```

```

 ::= {dvbRcsRcstNetwork 2}

dvbRcsNetworkOamInetAddressPrefixLength OBJECT-TYPE
    SYNTAX      InetAddressPrefixLength
    MAX-ACCESS   read-write
    STATUS       current
    DESCRIPTION
        "Prefix length for the OAM IP Address. If this address
         prefix is unknown or does not apply, the value is zero."
```

```

 ::= {dvbRcsRcstNetwork 3}

dvbRcsNetworkOamInetAddressAssign OBJECT-TYPE
```

```

SYNTAX          INTEGER {
                    oamInetAddressStatic    (1),
                    oamInetAddressDynamic   (2)
                }
MAX-ACCESS      read-write
STATUS          current
DESCRIPTION
    "Identifies whether the OAM IP address is statically
    (1) or dynamically (2) assigned."
 ::= { dvbRcsRcstNetwork 4}

dvbRcsNetworkLanInetAddressType OBJECT-TYPE
    SYNTAX      InetAddressType
    MAX-ACCESS  read-write
    STATUS      current
    DESCRIPTION
        "The type of Internet address of dvbRcsNetworkLanInetAddress.
        If the terminal Internet address on the LAN interface is
        unassigned or unknown, then the value of this object is
        unknown(0)."
```

```

 ::= { dvbRcsRcstNetwork 5}

dvbRcsNetworkLanInetAddress OBJECT-TYPE
    SYNTAX      InetAddress
    MAX-ACCESS  read-write
    STATUS      current
    DESCRIPTION
        "IP address of the LAN interface of the terminal. If the
        terminal has no Internet address assigned on the LAN
        interface or if this Internet address is unknown, the
        value of this object is the zero-length OCTET STRING.
        The InetAddressType is given by the
        dvbRcsNetworkLanInetAddressType object."
```

```

 ::= { dvbRcsRcstNetwork 6}

dvbRcsNetworkLanInetAddressPrefixLength OBJECT-TYPE
    SYNTAX      InetAddressPrefixLength
    MAX-ACCESS  read-write
    STATUS      current
    DESCRIPTION
        "Prefix length for the LAN IP Address of the terminal.
        If this address prefix is unknown or does not apply, the
        value is zero."
```

```

 ::= { dvbRcsRcstNetwork 7}

dvbRcsNetworkAirInterfaceDefaultGatewayInetAddressType
OBJECT-TYPE
    SYNTAX      InetAddressType
```

```

MAX-ACCESS    read-write
STATUS        current
DESCRIPTION
    "The type of Internet address of
    dvbRcsNetworkAirInterfaceDefaultGatewayInetAddress.
    If the default gateway Internet address is unassigned or
    unknown, then the value of this object is unknown(0)."
```

::= {dvbRcsRcstNetwork 8}

```

dvbRcsNetworkAirInterfaceDefaultGatewayInetAddress OBJECT-TYPE
    SYNTAX      InetAddress
    MAX-ACCESS  read-write
    STATUS      current
    DESCRIPTION
        "IP address of the default gateway for the air
        interface.  If the terminal has no default gateway
        assigned on the air interface or if this Internet address
        is unknown, the value of this object is the zero-length
        OCTET STRING.
        The InetAddressType is given by the
        dvbRcsNetworkAirInterfaceDefaultGatewayInetAddressType
        object."
```

::= {dvbRcsRcstNetwork 9}

```

dvbRcsNetworkAirInterfaceDefaultGatewayInetAddressPrefixLength
OBJECT-TYPE
    SYNTAX      InetAddressPrefixLength
    MAX-ACCESS  read-write
    STATUS      current
    DESCRIPTION
        "Prefix length for the IP address of the default gateway
        for the air interface.
        If this address prefix is unknown or does not apply, the
        value is zero."
```

::= {dvbRcsRcstNetwork 10}

```

dvbRcsNetworkDnsServers OBJECT IDENTIFIER ::= {dvbRcsRcstNetwork
11}
```

```

dvbRcsPrimaryDnsServerInetAddressType OBJECT-TYPE
    SYNTAX      InetAddressType
    MAX-ACCESS  read-write
    STATUS      current
    DESCRIPTION
        "The type of Internet address of
        dvbRcsPrimaryDnsServerInetAddress.  If the primary DNS
        server Internet address is unassigned or unknown, then
        the value of this object is unknown(0)."
```

```
::= { dvbRcsNetworkDnsServers 1}
```

dvbRcsPrimaryDnsServerInetAddress OBJECT-TYPE

SYNTAX InetAddress

MAX-ACCESS read-write

STATUS current

DESCRIPTION

"IP address of the primary DNS server in the NCC. If the terminal has no primary DNS server assigned or if this Internet address is unknown, the value of this object is the zero-length OCTET STRING.

The InetAddressType is given by the dvbRcsPrimaryDnsServerInetAddressType object."

```
::= { dvbRcsNetworkDnsServers 2}
```

dvbRcsPrimaryDnsServerInetAddressPrefixLength OBJECT-TYPE

SYNTAX InetAddressPrefixLength

MAX-ACCESS read-write

STATUS current

DESCRIPTION

"Prefix length for the IP address of the primary DNS server in the NCC.

If this address prefix is unknown or does not apply, the value is zero."

```
::= { dvbRcsNetworkDnsServers 3}
```

dvbRcsSecondaryDnsServerInetAddressType OBJECT-TYPE

SYNTAX InetAddressType

MAX-ACCESS read-write

STATUS current

DESCRIPTION

"The type of Internet address of dvbRcsSecondaryDnsServerInetAddress. If the secondary DNS server Internet address is unassigned or unknown, then the value of this object is unknown(0)."

```
::= { dvbRcsNetworkDnsServers 4}
```

dvbRcsSecondaryDnsServerInetAddress OBJECT-TYPE

SYNTAX InetAddress

MAX-ACCESS read-write

STATUS current

DESCRIPTION

"IP address of the secondary DNS server in the NCC. If the terminal has no secondary DNS server assigned or if this Internet address is unknown, the value of this object is the zero-length OCTET STRING.

The InetAddressType is given by the dvbRcsSecondaryDnsServerInetAddressType object."

```
::= {dvbRcsNetworkDnsServers 5}
```

```
dvbRcsSecondaryDnsServerInetAddressPrefixLength OBJECT-TYPE
```

```
SYNTAX      InetAddressPrefixLength
```

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

```
STATUS      current
```

```
DESCRIPTION
```

```
    "Prefix length for the IP address of the secondary DNS  
    server in the NCC.
```

```
    If this address prefix is unknown or does not apply, the  
    value is zero."
```

```
::= { dvbRcsNetworkDnsServers 6}
```

```
dvbRcsNetworkNccMgtInetAddressType OBJECT-TYPE
```

```
SYNTAX      InetAddressType
```

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

```
STATUS      current
```

```
DESCRIPTION
```

```
    "The type of Internet address of  
    dvbRcsNetworkNccMgtInetAddress. If the management server  
    Internet address is unassigned or unknown, then the  
    value of this object is unknown(0)."
```

```
::= {dvbRcsRcstNetwork 12}
```

```
dvbRcsNetworkNccMgtInetAddress OBJECT-TYPE
```

```
SYNTAX      InetAddress
```

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

```
STATUS      current
```

```
DESCRIPTION
```

```
    "IP address of the management server in the NCC. If  
    the terminal has no management server assigned or if this  
    Internet address is unknown, the value of this object is  
    the zero-length OCTET STRING.
```

```
    The InetAddressType is given by the  
    dvbRcsNetworkNccMgtInetAddressType object."
```

```
::= {dvbRcsRcstNetwork 13}
```

```
dvbRcsNetworkNccMgtInetAddressPrefixLength OBJECT-TYPE
```

```
SYNTAX      InetAddressPrefixLength
```

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

```
STATUS      current
```

```
DESCRIPTION
```

```
    "Prefix length for the IP address of the management  
    server in the NCC.
```

```
    If this address prefix is unknown or does not apply, the  
    value is zero."
```

```
::= { dvbRcsRcstNetwork 14}
```

dvbRcsNetworkConfigFileDownloadUrl OBJECT-TYPE
SYNTAX Uri (SIZE(0..65535))
MAX-ACCESS read-write
STATUS current
DESCRIPTION
"Full path name for the configuration file download.
It includes the protocol type (TFTP or FTP) and the
associated server IP address or hostname. Hostname can
only be used if DNS is supported by the RCST.
The format of this parameter follows RFC 3986."
::= {dvbRcsRcstNetwork 15}

dvbRcsNetworkInstallLogFileDownloadUrl OBJECT-TYPE
SYNTAX Uri (SIZE(0..65535))
MAX-ACCESS read-write
STATUS current
DESCRIPTION
"Full path of the installation log file to download.
It includes the protocol type (TFTP or FTP) and the
associated server IP address or hostname. Hostname can
only be used if DNS is supported by the RCST. The
installation log file can be created on the installer's
computer and downloaded to the RCST.
The format of this parameter follows RFC 3986."
::= {dvbRcsRcstNetwork 16}

dvbRcsNetworkConfigFileUploadUrl OBJECT-TYPE
SYNTAX Uri(SIZE(0..65535))
MAX-ACCESS read-write
STATUS current
DESCRIPTION
"Full path name for the configuration file upload.
It includes the protocol type (TFTP or FTP) and the
associated server IP address or hostname. Hostname can
only be used if DNS is supported by the RCST.
The format of this parameter follows RFC 3986."
::= {dvbRcsRcstNetwork 17}

```

dvbRcsNetworkLogFileUploadUrl OBJECT-TYPE
    SYNTAX          Uri(SIZE(0..65535))
    MAX-ACCESS      read-write
    STATUS          current
    DESCRIPTION
        "Full path of the event log file.  It includes the
        protocol type (TFTP or FTP) and the associated server IP
        address or hostname.  Hostname can only be used if DNS is
        supported by the RCST.
        The format of this parameter follows RFC 3986."
 ::= {dvbRcsRcstNetwork 18}

```

```

dvbRcsNetworkInstallLogFileUploadUrl OBJECT-TYPE
    SYNTAX          Uri(SIZE(0..65535))
    MAX-ACCESS      read-write
    STATUS          current
    DESCRIPTION
        "Full path of the installation log file.  It includes the
        protocol type (TFTP or FTP) and the associated server
        IP address or hostname.  Hostname can only be used if DNS
        is supported by the RCST.  The installation log file can
        be retrieved from the RCST by the NCC or by the
        installer via the LAN.
        The format of this parameter follows RFC 3986."
 ::= {dvbRcsRcstNetwork 19}

```

```

-----
--      dvbRcsRcstInstall sub-tree object types
-----
dvbRcsInstallAntennaAlignmentState OBJECT-TYPE
    SYNTAX          INTEGER {
                        antennaAlignmentStart    (1),
                        antennaAlignmentDeny     (2),
                        antennaAlignmentContinue (3),
                        antennaAlignmentStop      (4),
                        antennaAlignmentSuccess   (5),
                        antennaAlignmentFail      (6)
                    }
    MAX-ACCESS      read-write
    STATUS          current

```


DESCRIPTION

"Indicates the alignment state of the antenna:

- (1)-Start;
- (2)-Deny;
- (3)-Continue;
- (4)-Stop;
- (5)-Success;
- (6)-Fail"

::= {dvbRcsRcstInstall 1}

dvbRcsInstallCwFrequency OBJECT-TYPE

SYNTAX Unsigned32

UNITS "x100 Hz"

MAX-ACCESS read-write

STATUS current

DESCRIPTION

"Frequency of the transmitted Continuous Wave carrier (in 100 Hz).

Minimum required precision is 1 kHz."

::= {dvbRcsRcstInstall 2}

dvbRcsInstallCwMaxDuration OBJECT-TYPE

SYNTAX Unsigned32

UNITS "seconds"

MAX-ACCESS read-write

STATUS current

DESCRIPTION

"Time after which the Continuous Wave carrier must be put down (in seconds)."

::= {dvbRcsRcstInstall 3}

dvbRcsInstallCwPower OBJECT-TYPE

SYNTAX Integer32

UNITS "x0.1 dBm"

MAX-ACCESS read-write

STATUS current

DESCRIPTION

"IDU TX output level when the IDU is configured to send CW. The resolution is 0.1 dBm and the accuracy is +/- 1 dBm. Reconfiguration is applied immediately to a CW."

::= {dvbRcsRcstInstall 4}

```
dvbRcsInstallCoPolReading OBJECT-TYPE
    SYNTAX      Unsigned32
    UNITS       "x0.1 dB"
    MAX-ACCESS   read-write
    STATUS      current
    DESCRIPTION
        "Co-polarization measured value during installation
        procedure (in 0.1 dB)."
```

```
::= {dvbRcsRcstInstall 5}
```

```
dvbRcsInstallXPolReading OBJECT-TYPE
    SYNTAX      Unsigned32
    UNITS       "x0.1 dB"
    MAX-ACCESS   read-write
    STATUS      current
    DESCRIPTION
        "Cross-polarization measured value during installation
        procedure (in 0.1 dB)."
```

```
::= {dvbRcsRcstInstall 6}
```

```
dvbRcsInstallCoPolTarget OBJECT-TYPE
    SYNTAX      Unsigned32
    UNITS       "x0.1 dB"
    MAX-ACCESS   read-write
    STATUS      current
    DESCRIPTION
        "Co-polarization target value during installation
        procedure (in 0.1 dB)."
```

```
::= {dvbRcsRcstInstall 7}
```

```
dvbRcsInstallXPolTarget OBJECT-TYPE
    SYNTAX      Unsigned32
    UNITS       "x0.1 dB"
    MAX-ACCESS   read-write
    STATUS      current
    DESCRIPTION
        "Cross-polarization target value during installation
        procedure (in 0.1 dB)."
```

```
::= {dvbRcsRcstInstall 8}
```

```
dvbRcsInstallStandByDuration OBJECT-TYPE
    SYNTAX      Unsigned32
    UNITS       "seconds"
    MAX-ACCESS   read-write
    STATUS      current
    DESCRIPTION
        "Time to wait in stand-by mode (in seconds)."
```

```
::= {dvbRcsRcstInstall 9}
```

```

dvbRcsInstallTargetEsN0 OBJECT-TYPE
    SYNTAX      Unsigned32(0..315)
    UNITS       "x0.1 dB"
    MAX-ACCESS   read-write
    STATUS      current
    DESCRIPTION
        "This value describes the wanted Es/N0 value that
        enables operation of the return link with the required
        error performance. The values shall be given in tenth of
        dB and the initial value shall be equal to 7 dB. The
        range shall be from 0 dB to 31.5 dB, with a precision
        of 0.1 dB."
    DEFVAL      { 70 }
 ::= { dvbRcsRcstInstall 10}

-----
-- dvbRcsRcstQos sub-tree object types
-----
dvbRcsPktClassTable OBJECT-TYPE
    SYNTAX      SEQUENCE OF DvbRcsPktClassEntry
    MAX-ACCESS   not-accessible
    STATUS      current
    DESCRIPTION
        "This table describes the packet classification used in
        the DVB-RCS terminal. The number of entries is specified
        by dvbRcsPktClassIndex. "
 ::= {dvbRcsRcstQos 1}

dvbRcsPktClassEntry OBJECT-TYPE
    SYNTAX      DvbRcsPktClassEntry
    MAX-ACCESS   not-accessible
    STATUS      current
    DESCRIPTION
        "An entry in the packet classification table. One object
        type of each entry may have a value in the active range
        (a non-default value). The other object types are then
        assumed to be set to 'inactive'. The entry with the lowest
        index value takes precedence when classifying a packet."
    INDEX      { dvbRcsPktClassIndex }
 ::= { dvbRcsPktClassTable 1}

DvbRcsPktClassEntry ::= SEQUENCE {
    dvbRcsPktClassIndex      Unsigned32,
    dvbRcsPktClassDscpLow    Dscp,
    dvbRcsPktClassDscpHigh   Dscp,
    dvbRcsPktClassDscpMarkValue DscpOrAny,
    dvbRcsPktClassIpProtocol Unsigned32,
    dvbRcsPktClassSrcInetAddressType InetAddressType,

```

```

        dvbRcsPktClassSrcInetAddress      InetAddress,
        dvbRcsPktClassSrcInetAddressPrefixLength
                                         InetAddressPrefixLength,
        dvbRcsPktClassDstInetAddressType  InetAddressType,
        dvbRcsPktClassDstInetAddress      InetAddress,
        dvbRcsPktClassDstInetAddressPrefixLength
                                         InetAddressPrefixLength,
        dvbRcsPktClassSrcPortLow          InetPortNumber,
        dvbRcsPktClassSrcPortHigh         InetPortNumber,
        dvbRcsPktClassDstPortLow          InetPortNumber,
        dvbRcsPktClassDstPortHigh         InetPortNumber,
        dvbRcsPktClassVlanUserPri         Integer32,
        dvbRcsPktClassPhbAssociation      Unsigned32,
        dvbRcsPktClassRowStatus           RowStatus
    }

```

dvbRcsPktClassIndex OBJECT-TYPE

SYNTAX Unsigned32 (1..64)

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"Index automatically incremented by one at row creation."

::={dvbRcsPktClassEntry 1}

dvbRcsPktClassDscpLow OBJECT-TYPE

SYNTAX Dscp

MAX-ACCESS read-create

STATUS current

DESCRIPTION

"This object specifies the low value of a range of Diffserv Code Point (DSCP) values to which a packet is compared."

DEFVAL { 0 }

::={dvbRcsPktClassEntry 2}

dvbRcsPktClassDscpHigh OBJECT-TYPE

SYNTAX Dscp

MAX-ACCESS read-create

STATUS current

DESCRIPTION

"This object specifies the high value of a range of Diffserv Code Point (DSCP) values to which a packet is compared."

DEFVAL { 63 }

::={dvbRcsPktClassEntry 3}

dvbRcsPktClassDscpMarkValue OBJECT-TYPE

```
SYNTAX          DscpOrAny
MAX-ACCESS      read-create
STATUS          current
DESCRIPTION
    "This object is the Diffserv Code Point (DSCP) value
    used to mark the packet; -1 indicates no DSCP marking.
    Possible DSCP marks values are (0..63)"
DEFVAL { -1 }
::={dvbRcsPktClassEntry 4}

dvbRcsPktClassIpProtocol OBJECT-TYPE
    SYNTAX          Unsigned32 (0..255)
    MAX-ACCESS      read-create
    STATUS          current
    DESCRIPTION
        "This object specifies the IP protocol to which a
        packet is compared. A value of 255 means match all."
    DEFVAL { 255 }
    ::= {dvbRcsPktClassEntry 5}

dvbRcsPktClassSrcInetAddressType OBJECT-TYPE
    SYNTAX          InetAddressType
    MAX-ACCESS      read-create
    STATUS          current
    DESCRIPTION
        "The type of Internet address of
        dvbRcsPktClassSrcInetAddress. If the packet class source
        Internet address is unassigned or unknown, then the
        value of this object is unknown(0)."
    ::= { dvbRcsPktClassEntry 6}

dvbRcsPktClassSrcInetAddress OBJECT-TYPE
    SYNTAX          InetAddress
    MAX-ACCESS      read-create
    STATUS          current
    DESCRIPTION
        "This object specifies the IP source address to which a
        packet is compared. If the packet class has no source
        Internet address assigned or if this Internet address is
        unknown, the value of this object is the zero-length
        OCTET STRING.
        The InetAddressType is given by the
        dvbRcsPktClassSrcInetAddressType object."
    ::= {dvbRcsPktClassEntry 7}

dvbRcsPktClassSrcInetAddressPrefixLength OBJECT-TYPE
    SYNTAX          InetAddressPrefixLength
```

```
MAX-ACCESS      read-create
STATUS          current
DESCRIPTION
    "Prefix length of the IP source address that will be
    matched for this packet class.  A value of zero indicates
    that the selectivity is inactive."
DEFVAL { 0 }
::={dvbRcsPktClassEntry 8}

dvbRcsPktClassDstInetAddressType OBJECT-TYPE
SYNTAX          InetAddressType
MAX-ACCESS      read-create
STATUS          current
DESCRIPTION
    "The type of Internet address of
    dvbRcsPktClassDstInetAddress.  If the packet class
    destination Internet address is unassigned or unknown,
    then the value of this object is unknown(0)."
```

```
::= { dvbRcsPktClassEntry 9}

dvbRcsPktClassDstInetAddress OBJECT-TYPE
SYNTAX          InetAddress
MAX-ACCESS      read-create
STATUS          current
DESCRIPTION
    "This object specifies the IP destination address to
    which a packet is compared.  If the packet class has no
    destination Internet address assigned or if this Internet
    address is unknown, the value of this object is the
    zero-length OCTET STRING.
    The InetAddressType is given by the
    dvbRcsPktClassDstInetAddressType object."
```

```
::={dvbRcsPktClassEntry 10}

dvbRcsPktClassDstInetAddressPrefixLength OBJECT-TYPE
SYNTAX          InetAddressPrefixLength
MAX-ACCESS      read-create
STATUS          current
DESCRIPTION
    "Prefix length of the IP source address that will be
    matched for this packet class.  A value of zero indicates
    that the selectivity is inactive."
DEFVAL { 0 }
::={dvbRcsPktClassEntry 11}
```

```
dvbRcsPktClassSrcPortLow OBJECT-TYPE
    SYNTAX          InetPortNumber
    MAX-ACCESS      read-create
    STATUS          current
    DESCRIPTION
        "This object specifies the low range of the source
        port to which a packet is compared.  A value of 0
        indicates that the selectivity is inactive."
    DEFVAL { 0 }
 ::= {dvbRcsPktClassEntry 12}

dvbRcsPktClassSrcPortHigh OBJECT-TYPE
    SYNTAX          InetPortNumber
    MAX-ACCESS      read-create
    STATUS          current
    DESCRIPTION
        "This object specifies the high range of the source port
        to which a packet is compared.  A value of 0 indicates
        that the selectivity is inactive."
    DEFVAL { 65535 }
 ::= {dvbRcsPktClassEntry 13}

dvbRcsPktClassDstPortLow OBJECT-TYPE
    SYNTAX          InetPortNumber
    MAX-ACCESS      read-create
    STATUS          current
    DESCRIPTION
        "This object specifies the low range of the destination
        port to which a packet is compared.  A value of 0
        indicates that the selectivity is inactive."
    DEFVAL { 0 }
 ::= {dvbRcsPktClassEntry 14}

dvbRcsPktClassDstPortHigh OBJECT-TYPE
    SYNTAX          InetPortNumber
    MAX-ACCESS      read-create
    STATUS          current
    DESCRIPTION
        "This object specifies the high range of the destination
        port to which a packet is compared.  A value of 0
        indicates that the selectivity is inactive."
    DEFVAL { 65535 }
 ::= {dvbRcsPktClassEntry 15}

dvbRcsPktClassVlanUserPri OBJECT-TYPE
    SYNTAX          Integer32 (-1..7)
    MAX-ACCESS      read-create
    STATUS          current
```

```

DESCRIPTION
    "This object specifies the VLAN User Priority to which a
    packet is compared.  A value of -1 indicates that the
    selectivity is inactive."
    DEFVAL { -1 }
::={dvbRcsPktClassEntry 16}

dvbRcsPktClassPhbAssociation OBJECT-TYPE
    SYNTAX      Unsigned32 (0..65535)
    MAX-ACCESS   read-create
    STATUS       current
    DESCRIPTION
        "Associate the filter entry to a specific PHB (refer to
        dvbRcsPhbIdentifier)."
```

```

::={dvbRcsPktClassEntry 17}

dvbRcsPktClassRowStatus OBJECT-TYPE
    SYNTAX      RowStatus
    MAX-ACCESS   read-create
    STATUS       current
    DESCRIPTION
        "The status of this conceptual row.  All writable objects
        in this row may be modified at any time."
```

```

::={dvbRcsPktClassEntry 18}

-----
-- dvbRcsPhbMappingTable
-----
dvbRcsPhbMappingTable OBJECT-TYPE
    SYNTAX      SEQUENCE OF DvbRcsPhbMappingEntry
    MAX-ACCESS   not-accessible
    STATUS       current
    DESCRIPTION
        "This table is a list of Per-Hop Behavior (PHB) MIB
        entries.
        It describes the PHB mapping to the Request Class."
```

```

::={dvbRcsRcstQos 2}

dvbRcsPhbMappingEntry OBJECT-TYPE
    SYNTAX      DvbRcsPhbMappingEntry
    MAX-ACCESS   not-accessible
    STATUS       current
    DESCRIPTION
        "An entry in the PHB mapping table."
    INDEX       {dvbRcsPhbIdentifier}
::= {dvbRcsPhbMappingTable 1}

DvbRcsPhbMappingEntry ::= SEQUENCE {
```



```

        dvbRcsPhbIdentifier          Unsigned32,
        dvbRcsPhbName
                                SnmpAdminString,
        dvbRcsPhbRequestClassAssociation Unsigned32,
        dvbRcsPhbMappingRowStatus    RowStatus
    }

```

dvbRcsPhbIdentifier OBJECT-TYPE

SYNTAX Unsigned32 (0..65535)

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"Identification of the Per-Hop Behavior (PHB). It follows the unsigned 16-bit binary encoding as specified in RFC 3140. The value 0 designates the Default PHB."

::={dvbRcsPhbMappingEntry 1}

dvbRcsPhbName OBJECT-TYPE

SYNTAX SnmpAdminString

MAX-ACCESS read-create

STATUS current

DESCRIPTION

"The name of the Per-Hop Behavior (PHB)."

::={dvbRcsPhbMappingEntry 2}

dvbRcsPhbRequestClassAssociation OBJECT-TYPE

SYNTAX Unsigned32 (1..16)

MAX-ACCESS read-create

STATUS current

DESCRIPTION

"This object is an association of this Per-Hop Behavior (PHB) to a Request Class (by reference to a Request Class index)."

::={dvbRcsPhbMappingEntry 3}

dvbRcsPhbMappingRowStatus OBJECT-TYPE

SYNTAX RowStatus

MAX-ACCESS read-create

STATUS current

DESCRIPTION

"The status of this conceptual row. All writable objects in this row may be modified at any time."

DEFVAL { active }

::={dvbRcsPhbMappingEntry 4}

```

=====
--   dvbRcsRequestClassTable
=====
dvbRcsRequestClassTable OBJECT-TYPE
    SYNTAX          SEQUENCE OF DvbRcsRequestClassEntry
    MAX-ACCESS      not-accessible
    STATUS          current
    DESCRIPTION
        "This table is a list of Request Class entries.  This
        class describes the layer 2 QoS objects."
    ::= {dvbRcsRcstQos 3}

dvbRcsRequestClassEntry OBJECT-TYPE
    SYNTAX          DvbRcsRequestClassEntry
    MAX-ACCESS      not-accessible
    STATUS          current
    DESCRIPTION
        "An entry in the Request Class table."
    INDEX {dvbRcsRequestClassIndex}
    ::= {dvbRcsRequestClassTable 1}

DvbRcsRequestClassEntry ::= SEQUENCE {
    dvbRcsRequestClassIndex      Unsigned32,
    dvbRcsRequestClassName      SnmpAdminString,
    dvbRcsRequestClassChanId     Unsigned32,
    dvbRcsRequestClassVccVpi     Unsigned32,
    dvbRcsRequestClassVccVci     Unsigned32,
    dvbRcsRequestClassPidPoolReference Unsigned32,
    dvbRcsRequestClassCra        Unsigned32,
    dvbRcsRequestClassRbdcMax     Unsigned32,
    dvbRcsRequestClassRbdcTimeout Unsigned32,
    dvbRcsRequestClassVbdcMax     Unsigned32,
    dvbRcsRequestClassVbdcTimeout Unsigned32,
    dvbRcsRequestClassVbdcMaxBackLog Unsigned32,
    dvbRcsRequestClassRowStatus   RowStatus
}

dvbRcsRequestClassIndex OBJECT-TYPE
    SYNTAX          Unsigned32 (1..16)
    MAX-ACCESS      not-accessible
    STATUS          current
    DESCRIPTION
        "Index of the Request Class table.  A total of 16 entries
        are supported."
    ::= {dvbRcsRequestClassEntry 1}

dvbRcsRequestClassName OBJECT-TYPE

```

```
SYNTAX          SnmpAdminString
MAX-ACCESS       read-create
STATUS           current
DESCRIPTION
    "Name of the Request Class."
::={dvbRcsRequestClassEntry 2}

dvbRcsRequestClassChanId OBJECT-TYPE
    SYNTAX          Unsigned32 (0..15)
    MAX-ACCESS       read-create
    STATUS           current
    DESCRIPTION
        "Channel ID of the Request Class."
    ::= {dvbRcsRequestClassEntry 3}

dvbRcsRequestClassVccVpi OBJECT-TYPE
    SYNTAX          Unsigned32 (0..255)
    MAX-ACCESS       read-create
    STATUS           current
    DESCRIPTION
        "Defines the VPI used for the Request Class (ATM profile)."
    ::= {dvbRcsRequestClassEntry 4}

dvbRcsRequestClassVccVci OBJECT-TYPE
    SYNTAX          Unsigned32 (0..65535)
    MAX-ACCESS       read-create
    STATUS           current
    DESCRIPTION
        "Defines the VCI used for the Request Class (ATM profile)."
    ::= {dvbRcsRequestClassEntry 5}

dvbRcsRequestClassPidPoolReference OBJECT-TYPE
    SYNTAX          Unsigned32 (1..16)
    MAX-ACCESS       read-create
    STATUS           current
    DESCRIPTION
        "Reference to the Packet Identifier (PID) pool
        applicable for the Request Class."
    ::= {dvbRcsRequestClassEntry 6}

dvbRcsRequestClassCra OBJECT-TYPE
    SYNTAX          Unsigned32
    UNITS            "bit/s"
    MAX-ACCESS       read-create
    STATUS           current
    DESCRIPTION
        "Defines the Continuous Rate Assignment (CRA) level for the
        Request Class in bits per second (bit/s)."
```

```
::={dvbRcsRequestClassEntry 7}

dvbRcsRequestClassRbdcMax OBJECT-TYPE
    SYNTAX      Unsigned32
    UNITS       "x2 kbit/s"
    MAX-ACCESS   read-create
    STATUS      current
    DESCRIPTION
        "Maximum Rate-Based Dynamic Capacity (RBDC) that can be
         requested for the Request Class, in number of 2 kbit/s."
::={dvbRcsRequestClassEntry 8}

dvbRcsRequestClassRbdcTimeout OBJECT-TYPE
    SYNTAX      Unsigned32
    UNITS       "superframes"
    MAX-ACCESS   read-create
    STATUS      current
    DESCRIPTION
        "Persistence of the Rate-Based Dynamic Capacity (RBDC)
         request, expressed in superframes."
::={dvbRcsRequestClassEntry 9}

dvbRcsRequestClassVbdcMax OBJECT-TYPE
    SYNTAX      Unsigned32
    UNITS       "ATM cells/MPEG packets"
    MAX-ACCESS   read-create
    STATUS      current
    DESCRIPTION
        "Maximum Volume-Based Dynamic Capacity (VBDC) that can
         be allocated to the Request Class, in payload units (one
         ATM cell or one MPEG packet) per superframe."
::={dvbRcsRequestClassEntry 10}

dvbRcsRequestClassVbdcTimeout OBJECT-TYPE
    SYNTAX      Unsigned32
    UNITS       "superframes"
    MAX-ACCESS   read-create
    STATUS      current
    DESCRIPTION
        "Time after which the RCST considers that the pending
         requests are lost. The RCST may issue new requests for
         that traffic. Volume-Based Dynamic Capacity (VBDC)
         Timeout is expressed in superframes."
::={dvbRcsRequestClassEntry 11}

dvbRcsRequestClassVbdcMaxBackLog OBJECT-TYPE
    SYNTAX      Unsigned32
    UNITS       "bytes"
```

```

    MAX-ACCESS      read-create
    STATUS          current
    DESCRIPTION
        "Volume-Based Dynamic Capacity (VBDC) back log per
        Request Class (expressed in bytes)."
```

::={dvbRcsRequestClassEntry 12}

dvbRcsRequestClassRowStatus OBJECT-TYPE

```

    SYNTAX          RowStatus
    MAX-ACCESS      read-create
    STATUS          current
    DESCRIPTION
        "The status of this conceptual row.  It is not possible
        to change values in a row of this table while the row is
        active."
```

::={dvbRcsRequestClassEntry 13}

-- The table of PID pools

dvbRcsPidPoolTable OBJECT-TYPE

```

    SYNTAX          SEQUENCE OF DvbRcsPidPoolEntry
    MAX-ACCESS      not-accessible
    STATUS          current
    DESCRIPTION
        "This table contains the Packet IDentifier (PID) pools.
        For the MPEG profile, several Request Classes may be mapped
        within a pool of several PIDs to allow Section Packing
        across several Request Classes.
        A PID value may occur in more than one PID pool.  Each
        PID value can effectively occur only once in each pool."
```

::={dvbRcsRcstQos 4}

dvbRcsPidPoolEntry OBJECT-TYPE

```

    SYNTAX          DvbRcsPidPoolEntry
    MAX-ACCESS      not-accessible
    STATUS          current
    DESCRIPTION
        "An entry in the PID pool table."
```

INDEX { dvbRcsPidPoolIndex, dvbRcsPidIndex }

::= {dvbRcsPidPoolTable 1}

DvbRcsPidPoolEntry ::= SEQUENCE {

```

    dvbRcsPidPoolIndex      Unsigned32,
    dvbRcsPidIndex          Unsigned32,
    dvbRcsPidValue          Unsigned32,
    dvbRcsPidPoolRowStatus  RowStatus
```

}

dvbRcsPidPoolIndex OBJECT-TYPE

SYNTAX Unsigned32 (1..16)

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"Index of the PID pool in the PID pool table."

::={dvbRcsPidPoolEntry 1}

dvbRcsPidIndex OBJECT-TYPE

SYNTAX Unsigned32 (1..16)

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"Index of the PID entry within the PID pool."

::={dvbRcsPidPoolEntry 2}

dvbRcsPidValue OBJECT-TYPE

SYNTAX Unsigned32 (0..8191)

MAX-ACCESS read-create

STATUS current

DESCRIPTION

"Defines one of the PIDs to be used in a PID pool of dvbRcsPidPoolIndex.

A PID value may occur in more than one PID pool. Each

PID value can effectively occur only once in each pool."

::={dvbRcsPidPoolEntry 3}

dvbRcsPidPoolRowStatus OBJECT-TYPE

SYNTAX RowStatus

MAX-ACCESS read-create

STATUS current

DESCRIPTION

"The status of this conceptual row. All writable objects in this row may be modified at any time."

DEFVAL { active }

::={dvbRcsPidPoolEntry 4}

dvbRcsQosGlobalRbdcMax OBJECT-TYPE

SYNTAX Unsigned32

UNITS "x2 kbit/s"

MAX-ACCESS read-write

STATUS current

DESCRIPTION

"Global maximum RBDC that can be requested for the RCST, in number of 2 kbit/s."

::={dvbRcsRcstQos 5}

```

dvbRcsQosGlobalVbdcMax OBJECT-TYPE
    SYNTAX      Unsigned32
    UNITS       "ATM cells/MPEG packets"
    MAX-ACCESS   read-write
    STATUS      current
    DESCRIPTION
        "Global maximum VBDC that can be allocated to the RCST,
        in payload units (one ATM cell or one MPEG packet) per
        superframe."
    ::= {dvbRcsRcstQos 6}

```

```

dvbRcsQosGlobalVbdcMaxBackLog OBJECT-TYPE
    SYNTAX      Unsigned32
    UNITS       "bytes"
    MAX-ACCESS   read-write
    STATUS      current
    DESCRIPTION
        "Global VBDC back log at the RCST level (expressed in
        bytes). It is used only if the VBDC back log is not
        configured in the Request Class (expressed in bytes)."
    ::= {dvbRcsRcstQos 7}

```

```

dvbRcsQosChannelIdStrictDispatching OBJECT-TYPE
    SYNTAX      INTEGER {
                                notStrict (0),
                                strict    (1)
                            }
    MAX-ACCESS   read-write
    STATUS      current
    DESCRIPTION
        "Indicates whether the RCST will strictly follow RC
        association when signaled through Channel_ID in the
        TBTP:
            (0)- no strict association
            (1)- strict association"
    ::= {dvbRcsRcstQos 8}

```

```

-----
-- dvbRcsRcstControl sub-tree object types
-----

```

```

dvbRcsCtrlRebootCommand OBJECT-TYPE
    SYNTAX      INTEGER {
                                idle      (1),
                                normal    (2),
                                alternate  (3)
                            }
    MAX-ACCESS   read-write
    STATUS      current

```

DESCRIPTION

"This variable shall force the RCST to reboot:

- (1)- idle
- (2)- normal reboot (from current software load)
- (3)- reboot from alternate load (swap to alternate load before reboot)"

DEFVAL {idle}

::={dvbRcsRcstControl 1}

dvbRcsCtrlRcstTxDisable OBJECT-TYPE

SYNTAX INTEGER {
idle (1),
disable (2)
}

MAX-ACCESS read-write

STATUS current

DESCRIPTION

"This variable shall force the RCST to stop transmission (transmit disabled as defined in SatLabs System Recommendations):

- (1)- idle
- (2)- initiate Tx Disabled"

DEFVAL {idle}

::={dvbRcsRcstControl 2}

dvbRcsCtrlUserTrafficDisable OBJECT-TYPE

SYNTAX INTEGER {
idle (1),
disable (2)
}

MAX-ACCESS read-write

STATUS current

DESCRIPTION

"This variable shall disable user traffic (only RCST management traffic can be transmitted):

- (1)- idle
- (2)- disable user traffic"

DEFVAL {idle}

::={dvbRcsRcstControl 3}

dvbRcsCtrlCwEnable OBJECT-TYPE

SYNTAX INTEGER {
off (1),
on (2)
}

MAX-ACCESS read-write

STATUS current

DESCRIPTION

"This variable will force the RCST to start transmission of CW, if the RCST is first set to the installation state and is properly configured for CW transmission:

(1)- off

(2)- on"

DEFVAL {off}

::={dvbRcsRcstControl 4}

dvbRcsCtrlOduTxReferenceEnable OBJECT-TYPE

SYNTAX INTEGER {
off (1),
on (2)

}

MAX-ACCESS read-write

STATUS current

DESCRIPTION

"Enables activation and deactivation of the 10 MHz reference clock in the Tx IFL cable:

(1) off

(2) on"

DEFVAL {on}

::={dvbRcsRcstControl 5}

dvbRcsCtrlOduTxDCEnable OBJECT-TYPE

SYNTAX INTEGER {
off (1),
on (2)

}

MAX-ACCESS read-write

STATUS current

DESCRIPTION

"Enables activation and deactivation of DC in the Tx IFL cable:

(1) off

(2) on"

DEFVAL {on}

::={dvbRcsRcstControl 6}

dvbRcsCtrlOduRxDCEnable OBJECT-TYPE

SYNTAX INTEGER {
off (1),
on (2)

}

MAX-ACCESS read-write

STATUS current

DESCRIPTION

"Enables activation and deactivation of DC in the Rx IFL cable:

```

        (1) off
        (2) on"
    DEFVAL {on}
 ::= {dvbRcsRcstControl 7}

dvbRcsCtrlDownloadFileCommand OBJECT-TYPE
    SYNTAX          INTEGER {
                        idle          (1),
                        config        (2),
                        installationLog (3)
                    }
    MAX-ACCESS      read-write
    STATUS          current
    DESCRIPTION
        "This variable will initiate an RCST configuration file
        download process:
        (1) idle
        (2) download RCST configuration file from TFTP/FTP
            server
        (3) download RCST installation log file from TFTP/FTP
            server (INSTALL_LOG feature)"
    DEFVAL {idle}
 ::= {dvbRcsRcstControl 8}

dvbRcsCtrlUploadFileCommand OBJECT-TYPE
    SYNTAX          INTEGER {
                        idle          (1),
                        config        (2),
                        eventAlarm    (3),
                        installationLog (4)
                    }
    MAX-ACCESS      read-write
    STATUS          current
    DESCRIPTION
        "This variable will initiate an RCST upload process:
        (1) idle
        (2) upload RCST configuration file to TFTP/FTP server
        (3) upload RCST event/alarm log file to TFTP/FTP server
        (4) upload RCST installation log file to TFTP/FTP server
            (INSTALL_LOG feature)"
    DEFVAL {idle}
 ::= {dvbRcsRcstControl 9}

dvbRcsCtrlActivateConfigFileCommand OBJECT-TYPE
    SYNTAX          INTEGER {
                        idle          (1),
                        activate      (2)
                    }

```

```

MAX-ACCESS      read-write
STATUS          current
DESCRIPTION
    "Triggers the RCST to use the configuration file and
    update its parameters accordingly.  Some RCST
    implementations may require a reboot for the parameters
    to take effect (vendor specific).
    (1)  idle
    (2)  activate"
DEFVAL {idle}
::={dvbRcsRcstControl 10}

dvbRcsCtrlRcstLogonCommand OBJECT-TYPE
    SYNTAX      INTEGER {
                                idle      (1),
                                logon     (2)
                        }
    MAX-ACCESS      read-write
    STATUS          current
    DESCRIPTION
        "This variable will initiate an RCST logon:
        (1) idle
        (2) initiate RCST logon"
    DEFVAL {idle}
    ::= {dvbRcsRcstControl 11}

dvbRcsCtrlRcstLogoffCommand OBJECT-TYPE
    SYNTAX      INTEGER {
                                idle      (1),
                                logoff    (2)
                        }
    MAX-ACCESS      read-write
    STATUS          current
    DESCRIPTION
        "This variable will initiate an RCST logoff:
        (1) idle
        (2) initiate RCST logoff"
    DEFVAL {idle}
    ::= {dvbRcsRcstControl 12}

dvbRcsCtrlRcstRxReacquire OBJECT-TYPE
    SYNTAX      INTEGER {
                                idle      (1),
                                reacquireForwardLink (2)
                        }
    MAX-ACCESS      read-write
    STATUS          current
    DESCRIPTION

```

```

        "This variable will force the RCST to acquire the
        forward link and start receiving:
            (1) idle
            (2) reacquire forward link"
        DEFVAL {idle}
 ::= {dvbRcsRcstControl 13}

-----
-- dvbRcsRcstState sub-tree object types
-----
dvbRcsRcstMode OBJECT-TYPE
    SYNTAX          INTEGER {
                        installation (0),
                        operational  (1)
                    }
    MAX-ACCESS      read-write
    STATUS          current
    DESCRIPTION
        "Identifies the current mode of the RCST and allows the RCST
        to return to the installation mode when needed.  Values for
        the RCST mode are:
            Installation (0)
            Operational (1)"
 ::= {dvbRcsRcstState 1}

dvbRcsRcstFaultStatus OBJECT-TYPE
    SYNTAX          INTEGER {
                        nofault (0),
                        fault   (1)
                    }
    MAX-ACCESS      read-only
    STATUS          current
    DESCRIPTION
        "Provides the fault status of the terminal.  The fault
        status management is vendor specific.  Values for the
        fault status are:
            no fault (0)
            fault (1)"
 ::= {dvbRcsRcstState 2}

dvbRcsRcstFwdLinkStatus OBJECT-TYPE
    SYNTAX          INTEGER {
                        notAcquired (0),
                        acquired    (1)
                    }
    MAX-ACCESS      read-only
    STATUS          current
    DESCRIPTION

```

```

        "Provides the status of the RCST forward link.  Values
        for the forward link status are:
            Not acquired (0)
            Acquired (1)"
 ::= {dvbRcsRcstState 3}

dvbRcsRcstRtnLinkStatus OBJECT-TYPE
    SYNTAX          INTEGER {
                        loggedOff (0),
                        loggedOn  (1)
                    }
    MAX-ACCESS      read-only
    STATUS          current
    DESCRIPTION
        "Provides the status of the RCST return link.  Values for
        the return link status are:
            Logged-off (0)
            Logged-on (1)"
 ::= {dvbRcsRcstState 4}

dvbRcsRcstLogUpdated OBJECT-TYPE
    SYNTAX          INTEGER {
                        noUpdate          (0),
                        logfileUpdated    (1)
                    }
    MAX-ACCESS      read-only
    STATUS          current
    DESCRIPTION
        "Indicates the existence of an updated event log file:
            No update (0)
            Event Log file updated (1)
        The RCST should remove the 'Event Log file updated'
        indication as the log file is fetched by the NCC."
 ::= {dvbRcsRcstState 5}

dvbRcsRcstCurrentSoftwareVersion OBJECT-TYPE
    SYNTAX          SnmpAdminString
    MAX-ACCESS      read-only
    STATUS          current
    DESCRIPTION
        "Current RCST software version."
 ::= {dvbRcsRcstState 6}

dvbRcsRcstAlternateSoftwareVersion OBJECT-TYPE
    SYNTAX          SnmpAdminString
    MAX-ACCESS      read-only
    STATUS          current
    DESCRIPTION

```

"Alternate (backup/new) RCST software version."
 ::= {dvbRcsRcstState 7}

dvbRcsRcstActivatedConfigFileVersion OBJECT-TYPE

SYNTAX SnmpAdminString
 MAX-ACCESS read-only
 STATUS current
 DESCRIPTION

"Version of the most recently activated configuration file.

The version is vendor specific."

::= {dvbRcsRcstState 8}

dvbRcsRcstDownloadedConfigFileVersion OBJECT-TYPE

SYNTAX SnmpAdminString
 MAX-ACCESS read-only
 STATUS current
 DESCRIPTION

"Version of the most recently downloaded configuration file.

Version is vendor specific. If the value is different from dvbRcsRcstActivatedConfigFileVersion, it is pending for activation."

::= {dvbRcsRcstState 9}

 -- dvbRcsFwdConfig sub-tree object types

dvbRcsFwdStartTable OBJECT-TYPE

SYNTAX SEQUENCE OF DvbRcsFwdStartEntry
 MAX-ACCESS not-accessible
 STATUS current
 DESCRIPTION

"Lists forward link attachment points (e.g., different for installation and operation).

The table describes the forward link parameters used for the start-up stream with the NCC."

::= {dvbRcsFwdConfig 1}

dvbRcsFwdStartEntry OBJECT-TYPE

SYNTAX DvbRcsFwdStartEntry
 MAX-ACCESS not-accessible
 STATUS current
 DESCRIPTION

"An entry in the Forward Link Start Configuration table."

INDEX {dvbRcsFwdStartIndex}

::= {dvbRcsFwdStartTable 1}

```

DvbRcsFwdStartEntry ::= SEQUENCE {
    dvbRcsFwdStartIndex      Unsigned32,
    dvbRcsFwdStartPopId     Integer32,
    dvbRcsFwdStartFrequency Unsigned32,
    dvbRcsFwdStartPolar     INTEGER,
    dvbRcsFwdStartFormat    INTEGER,
    dvbRcsFwdStartRolloff   INTEGER,
    dvbRcsFwdStartSymbolRate Unsigned32,
    dvbRcsFwdStartInnerFec  INTEGER,
    dvbRcsFwdStartRowStatus RowStatus
}

dvbRcsFwdStartIndex OBJECT-TYPE
    SYNTAX      Unsigned32 (1..8)
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "Index of the Forward Link StartConfig table."
    ::= {dvbRcsFwdStartEntry 1}

dvbRcsFwdStartPopId OBJECT-TYPE
    SYNTAX      Integer32 (-1..65535)
    MAX-ACCESS  read-create
    STATUS      current
    DESCRIPTION
        "Population identifier associated with the start-up
        forward link:
        -1: any (auto)
        0-65535: specific StartPopId
        If 'any' is set, the RCST will assume membership of any
        announced population ID and will commence with logon in
        accordance with this assumption."
    ::= {dvbRcsFwdStartEntry 2}

dvbRcsFwdStartFrequency OBJECT-TYPE
    SYNTAX      Unsigned32
    UNITS       "x100 kHz"
    MAX-ACCESS  read-create
    STATUS      current
    DESCRIPTION
        "Frequency of the start transponder carrying a
        Network Information Table to which any RCST shall
        trigger to acquire forward link. Its value shall be
        given in multiples of 100 kHz."
    ::= {dvbRcsFwdStartEntry 3}

dvbRcsFwdStartPolar OBJECT-TYPE
    SYNTAX      INTEGER {

```

```

        linearHorizontal (0),
        linearVertical   (1),
        circularLeft     (2),
        circularRight    (3)
    }
    MAX-ACCESS      read-create
    STATUS          current
    DESCRIPTION
        "2-bit field giving the polarization of the start
        transponder carrying a Network Information Table to
        which any RCST shall trigger to acquire forward link:
        00: linear and horizontal
        01: linear and vertical
        10: circular left
        11: circular right"
 ::= {dvbRcsFwdStartEntry 4}

dvbRcsFwdStartFormat OBJECT-TYPE
    SYNTAX          INTEGER {
        auto          (-1),
        dvbs           (0),
        dvbs2ccm      (1),
        dvbs2acm      (2)
    }
    MAX-ACCESS      read-create
    STATUS          current
    DESCRIPTION
        "Specifies the transmission format standard applied for
        the startup stream. The start transport stream carries a
        Network Information Table that the RCST uses for
        acquiring the forward link signaling. Supported values
        are:
        -1: unspecified (automatic format acquisition is
            assumed)
        0: DVB-S (support of this value is mandatory if
            DVB-S support is claimed)
        1: DVB-S2 with CCM (support of this value is
            mandatory if DVB-S2 CCM support is claimed)
        2: DVB-S2 with VCM or ACM (support of this value is
            mandatory if DVB-S2 ACM support is claimed)
        This allows the RCST to discriminate between CCM and
        VCM/ACM when selecting the forward link.
        The support of automatic format selection is optional.
        One or several of the other format selections must be
        supported, according to the claimed SatLabs profile
        support."
 ::= {dvbRcsFwdStartEntry 5}

```


dvbRcsFwdStartRolloff OBJECT-TYPE

```

SYNTAX      INTEGER {
                                autoRolloff      (0),
                                rolloff020      (1),
                                rolloff025      (2),
                                rolloff035      (3)
                        }

```

```

MAX-ACCESS   read-create

```

```

STATUS       current

```

DESCRIPTION

"Specifies the receive filter roll-off applied on the start transponder. The start transponder carries a Network Information Table that the RCST uses for acquiring the forward link signaling.

Supported values are:

0: any (auto)

1: 0.20

2: 0.25

3: 0.35"

```

::={dvbRcsFwdStartEntry 6}

```

dvbRcsFwdStartSymbolRate OBJECT-TYPE

```

SYNTAX      Unsigned32

```

```

UNITS       "x100 symbols/s"

```

```

MAX-ACCESS   read-create

```

```

STATUS       current

```

DESCRIPTION

"Specifies the symbol rate on the start transponder carrying a Network Information Table to which any RCST shall trigger to acquire forward link. Its value shall be given in multiples of 100 symbols/s."

```

::={dvbRcsFwdStartEntry 7}

```

dvbRcsFwdStartInnerFec OBJECT-TYPE

```

SYNTAX      INTEGER {
                                autoFec      (-1),
                                fecRate12    (0),
                                fecRate23    (1),
                                fecRate34    (2),
                                fecRate56    (3),
                                fecRate78    (4),
                                fecRate89    (5),
                                fecRate35    (6),
                                fecRate45    (7),
                                fecRate910   (8),
                                fecRate25    (9),
                                fecRate13    (10),
                                fecRate14    (11),

```

```

                                noInnerCode (12)
    }
    MAX-ACCESS      read-create
    STATUS          current
    DESCRIPTION
        "Specifies the inner Forward Error Correction used on
        the start transponder carrying a Network Information
        Table to which any RCST shall trigger to acquire forward
        link.
        Supported values are:
            autoFec      (-1),
            fecRate1/2   (0),
            fecRate2/3   (1),
            fecRate3/4   (2),
            fecRate5/6   (3),
            fecRate7/8   (4),
            fecRate8/9   (5),
            fecRate3/5   (6),
            fecRate4/5   (7),
            fecRate9/10  (8),
            fecRate2/5   (9),
            fecRate1/3   (10),
            fecRate1/4   (11),
            noInnerCode  (12)

    The support of autoFec is optional."
 ::= {dvbRcsFwdStartEntry 8}

dvbRcsFwdStartRowStatus OBJECT-TYPE
    SYNTAX          RowStatus
    MAX-ACCESS      read-create
    STATUS          current
    DESCRIPTION
        "The status of this conceptual row. It is not possible
        to change values in a row of this table while the row is
        active."
 ::= {dvbRcsFwdStartEntry 9}

-----
-- dvbRcsFwdStatus sub-tree object types
-----
dvbRcsFwdStatusPopId OBJECT-TYPE
    SYNTAX          Unsigned32 (0..65535)
    MAX-ACCESS      read-only
    STATUS          current
    DESCRIPTION
        "Population identifier applied at log-on:
         0-65535: specific StartPopId
        If the RCST was allowed to logon with any population,
```

the RCST will report the base number of the announced population ID indicated by the RCS Map Table linkage descriptor used at logon."

::={dvbRcsFwdStatus 1}

dvbRcsFwdStatusTable OBJECT-TYPE

SYNTAX SEQUENCE OF DvbRcsFwdStatusEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"This table describes the current status of Forward Link interfaces."

::={dvbRcsFwdStatus 2}

dvbRcsFwdStatusEntry OBJECT-TYPE

SYNTAX DvbRcsFwdStatusEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"An entry in the forward link status table. Each entry is associated with a physical interface."

An RCST shall support at least one entry."

INDEX { dvbRcsFwdStatusIndex }

::= {dvbRcsFwdStatusTable 1}

DvbRcsFwdStatusEntry ::= SEQUENCE {

dvbRcsFwdStatusIndex Unsigned32,

dvbRcsFwdStatusIfReference Unsigned32,

dvbRcsFwdStatusNetId Unsigned32,

dvbRcsFwdStatusNetName

SnmpAdminString,

dvbRcsFwdStatusFormat INTEGER,

dvbRcsFwdStatusFrequency Unsigned32,

dvbRcsFwdStatusPolar INTEGER,

dvbRcsFwdStatusInnerFec INTEGER,

dvbRcsFwdStatusSymbolRate Unsigned32,

dvbRcsFwdStatusRolloff INTEGER,

dvbRcsFwdStatusModulation INTEGER,

dvbRcsFwdStatusFecFrame INTEGER,

dvbRcsFwdStatusPilot INTEGER,

dvbRcsFwdStatusBer Integer32,

dvbRcsFwdStatusCnr Integer32,

dvbRcsFwdStatusRxPower Integer32

}

dvbRcsFwdStatusIndex OBJECT-TYPE

SYNTAX Unsigned32 (1..8)

MAX-ACCESS not-accessible

```

        STATUS                current
        DESCRIPTION
            "Index of the forward link status table."
 ::= {dvbRcsFwdStatusEntry 1}

dvbRcsFwdStatusIfReference OBJECT-TYPE
    SYNTAX                Unsigned32 (1..8)
    MAX-ACCESS            read-only
    STATUS                current
    DESCRIPTION
        "Cross reference to the interface table."
 ::= {dvbRcsFwdStatusEntry 2}

dvbRcsFwdStatusNetId OBJECT-TYPE
    SYNTAX                Unsigned32
    MAX-ACCESS            read-only
    STATUS                current
    DESCRIPTION
        "Interactive network identifier of the forward
        link (from the RCS Map Table)."
 ::= {dvbRcsFwdStatusEntry 3}

dvbRcsFwdStatusNetName OBJECT-TYPE
    SYNTAX                SnmpAdminString
    MAX-ACCESS            read-only
    STATUS                current
    DESCRIPTION
        "The name of the interactive network of the forward
        link (from the RCS Map Table)."
 ::= {dvbRcsFwdStatusEntry 4}

dvbRcsFwdStatusFormat OBJECT-TYPE
    SYNTAX                INTEGER {
                                dvbs                (0),
                                dvbs2ccm            (1),
                                dvbs2acm            (2),
                                reservedFormat      (3)
                                }
    MAX-ACCESS            read-only
    STATUS                current
    DESCRIPTION
        "Specifies the transmission format applied on the
        forward link. Supported values are (from RCS Map Table):
        0: DVB-S
        1: DVB-S2 using CCM
        2: DVB-S2 using VCM or ACM
        3: reserved"
 ::= {dvbRcsFwdStatusEntry 5}

```

dvbRcsFwdStatusFrequency OBJECT-TYPE

SYNTAX Unsigned32

UNITS "x100 kHz"

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"An estimate of the frequency of the forward link. Its value shall be given in multiples of 100 kHz."

::={dvbRcsFwdStatusEntry 6}

dvbRcsFwdStatusPolar OBJECT-TYPE

SYNTAX INTEGER {
 linearHorizontal (0),
 linearVertical (1),
 circularLeft (2),
 circularRight (3)

}

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"2-bit field giving the polarization of the forward link
 Supported values are (from RCS Map Table):

00: linear and horizontal

01: linear and vertical

10: circular left

11: circular right"

::={dvbRcsFwdStatusEntry 7}

dvbRcsFwdStatusInnerFec OBJECT-TYPE

SYNTAX INTEGER {
 unknown (-1),
 fecRate12 (0),
 fecRate23 (1),
 fecRate34 (2),
 fecRate56 (3),
 fecRate78 (4),
 fecRate89 (5),
 fecRate35 (6),
 fecRate45 (7),
 fecRate910 (8),
 fecRate25 (9),
 fecRate13 (10),
 fecRate14 (11),
 noInnerCode (12)

}

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Specifies the inner Forward Error Correction used on the forward link for transmission to the RCST.

Supported values are:

```

        unknown      (-1),
        fecRate1/2    (0),
        fecRate2/3    (1),
        fecRate3/4    (2),
        fecRate5/6    (3),
        fecRate7/8    (4),
        fecRate8/9    (5),
        fecRate3/5    (6),
        fecRate4/5    (7),
        fecRate9/10   (8),
        fecRate2/5    (9),
        fecRate1/3    (10),
        fecRate1/4    (11),
        noInnerCode   (12)

```

The RCST will report a value that has been used for transmission to the RCST within the most recent 60 seconds. If this is not relevant, the RCST will report 'unknown'."

```
::={dvbRcsFwdStatusEntry 8}
```

dvbRcsFwdStatusSymbolRate OBJECT-TYPE

```

SYNTAX      Unsigned32
UNITS       "x100 symbols/s"
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION

```

"An estimate of the symbol rate of the forward link.

Its value shall be given in multiples of 100 symbols/s."

```
::={dvbRcsFwdStatusEntry 9}
```

dvbRcsFwdStatusRolloff OBJECT-TYPE

```

SYNTAX      INTEGER {
        undefRolloff      (0),
        rolloff020        (1),
        rolloff025        (2),
        rolloff035        (3)
}

```

```

MAX-ACCESS  read-only
STATUS      current

```

DESCRIPTION

"An estimate of the roll-off applied on the forward link.

Supported values are:

```

0: undefined
1: 0.20

```

```

        2: 0.25
        3: 0.35"
 ::= {dvbRcsFwdStatusEntry 10}

```

dvbRcsFwdStatusModulation OBJECT-TYPE

```

SYNTAX          INTEGER {
                                unknown      (0),
                                mBPSK       (1),
                                mQPSK       (2),
                                m8PSK       (3),
                                m16APSK     (4),
                                m32APSK     (5)

```

```

}

```

```

MAX-ACCESS      read-only

```

```

STATUS          current

```

DESCRIPTION

"Indicates the modulation on the forward link used for transmission to the RCST. Supported values are:

```

    0: unknown
    1: BPSK
    2: QPSK
    3: 8PSK
    4: 16APSK
    5: 32APSK

```

The RCST will report a value that has been used for transmission to the RCST within the most recent 60 seconds.

If this is not relevant, the RCST will report 'unknown'."

```

 ::= {dvbRcsFwdStatusEntry 11}

```

dvbRcsFwdStatusFecFrame OBJECT-TYPE

```

SYNTAX          INTEGER {
                                unknown      (0),
                                shortframe   (1),
                                longframe    (2)

```

```

}

```

```

MAX-ACCESS      read-only

```

```

STATUS          current

```

DESCRIPTION

"Indicates the frame length used on the forward link for transmission to the RCST.

Supported values are:

```

    0: Unknown
    1: Short frame
    2: Normal frame

```

The RCST will report a value that has been used for transmission to the RCST within the most recent 60

```

        seconds.
        If this is not relevant, the RCST will report
        'unknown'."
 ::= {dvbRcsFwdStatusEntry 12}

dvbRcsFwdStatusPilot OBJECT-TYPE
    SYNTAX          INTEGER {
                        unknown      (0),
                        pilotNotused (1),
                        pilotUsed    (2)
                      }
    MAX-ACCESS      read-only
    STATUS          current
    DESCRIPTION
        "Indicates whether pilots are used on the forward link
        for transmission to the RCST.
        Supported values are:
            0: Unknown
            1: Pilots are not used
            2: Pilots are used
        The RCST will report a value that has been used for
        transmission to the RCST within the most recent 60
        seconds.
        If this is not relevant, the RCST will report
        'unknown'."
 ::= {dvbRcsFwdStatusEntry 13}

dvbRcsFwdStatusBer OBJECT-TYPE
    SYNTAX          Integer32
    UNITS           "exponent of 10"
    MAX-ACCESS      read-only
    STATUS          current
    DESCRIPTION
        "Provides the RCST BER on the Forward Link in log10
        units."
 ::= {dvbRcsFwdStatusEntry 14}

dvbRcsFwdStatusCnr OBJECT-TYPE
    SYNTAX          Integer32
    UNITS           "0.1 dB"
    MAX-ACCESS      read-only
    STATUS          current
    DESCRIPTION
        "Provides the RCST CNR on the Forward Link in 0.1 dB
        units."
 ::= {dvbRcsFwdStatusEntry 15}

dvbRcsFwdStatusRxPower OBJECT-TYPE

```



```

SYNTAX          Integer32
UNITS           "0.1 dBm"
MAX-ACCESS      read-only
STATUS          current
DESCRIPTION
    "Provides the power level of the forward link as
    received at the IDU, in 0.1 dBm units."
DEFVAL { -500 }
::={dvbRcsFwdStatusEntry 16}

=====
--  dvbRcsRtnConfig sub-tree object types
=====
dvbRcsRtnConfigMaxEirp OBJECT-TYPE
    SYNTAX          Integer32
    UNITS           "x0.1 dBm"
    MAX-ACCESS      read-write
    STATUS          current
    DESCRIPTION
        "Max Equivalent Isotropic Radiated Power (EIRP) of the RCST,
        given in resolution of 0.1 dBm and applied when the IDU
        can, itself, set the necessary IDU TX output level, e.g.,
        when using a BUC that has a power level detector and that
        provides sufficient feedback to the IDU."
    ::= {dvbRcsRtnConfig 1}

dvbRcsRtnConfigDefIfLevel OBJECT-TYPE
    SYNTAX          Integer32
    UNITS           "x0.1 dBm"
    MAX-ACCESS      read-write
    STATUS          current
    DESCRIPTION
        "IDU TX output level applied in case the
        dvbRcsRtnConfigMaxEirp cannot be used. The resolution
        is 0.1 dBm and the accuracy is +/- 1 dBm."
    ::= {dvbRcsRtnConfig 2}

=====
--  dvbRcsRtnStatus sub-tree object types
=====
dvbRcsRtnStatusEbN0 OBJECT-TYPE
    SYNTAX          Integer32
    UNITS           "x0.1 dB"
    MAX-ACCESS      read-only
    STATUS          current
    DESCRIPTION
        "The EbN0 value reported for the return link, referenced
        to the regular SYNC burst transmission, in 0.1 dB"

```

```

        units."
 ::= {dvbRcsRtnStatus 1}

dvbRcsRtnStatusSFDuration OBJECT-TYPE
    SYNTAX      Unsigned32 (250..7500)
    UNITS        "0.1 ms"
    MAX-ACCESS   read-only
    STATUS       current
    DESCRIPTION
        "The duration of the currently applied return link
        superframe structure, in tenths of milliseconds."
 ::= {dvbRcsRtnStatus 2}

dvbRcsRtnStatusPayloadUnit OBJECT-TYPE
    SYNTAX      INTEGER {
                                unitATM      (0),
                                unitMPEG     (1)
                            }
    MAX-ACCESS   read-only
    STATUS       current
    DESCRIPTION
        "Indicates if the payload unit used for the return link
        is ATM or MPEG."
 ::= {dvbRcsRtnStatus 3}

-----
--      conformance information
-----
dvbRcsRcstGroups          OBJECT IDENTIFIER ::=
{dvbRcsConformance 1}
dvbRcsRcstCompliances     OBJECT IDENTIFIER ::=
{dvbRcsConformance 2}

-----
--      conformance statements
-----
dvbRcsRcstCompliance1 MODULE-COMPLIANCE
    STATUS       current
    DESCRIPTION
        "The compliance statement for DVB-RCS terminals that
        are compliant with SatLabs System Recommendations.
        Compliance is linked to the support by the terminal of
        the options or features defined in the SatLabs System
        Recommendations.
        The supported options and features of a terminal are
        declared in objects
        dvbRcsSystemSatLabsOptionsDeclaration
        and dvbRcsSystemSatLabsFeaturesDeclaration

```

respectively."

MODULE -- this module

MANDATORY-GROUPS {dvbRcsRcstSystemGroup,
dvbRcsRcstNetworkGroup, dvbRcsRcstInstallGroup,
dvbRcsRcstQosGroup, dvbRcsRcstControlGroup,
dvbRcsRcstStateGroup, dvbRcsFwdConfigGroup,
dvbRcsFwdStatusGroup, dvbRcsRtnConfigGroup,
dvbRcsRtnStatusGroup}

GROUP dvbRcsRcstExtNetworkGroup

DESCRIPTION

"This group is mandatory for an RCST that supports extended networking management functionality. Such RCST is qualified as supporting the EXTNETWORK feature, as defined in the SatLabs System Recommendations."

GROUP dvbRcsRcstDnsGroup

DESCRIPTION

"This group is mandatory for an RCST that supports the DNS protocol. Such RCST is qualified as supporting the DNS option, as defined in the SatLabs System Recommendations."

GROUP dvbRcsRcstExtInstallGroup

DESCRIPTION

"This group is mandatory for an RCST that supports the installation log file. Such RCST is qualified as supporting the INSTALL_LOG feature, as defined in the SatLabs System Recommendations."

GROUP dvbRcsRcstEnhancedClassifierGroup

DESCRIPTION

"This group is mandatory for an RCST that supports the enhanced classifier feature. Such RCST is qualified as supporting the ENHCLASSIFIER feature, as defined in the SatLabs System Recommendations."

GROUP dvbRcsRcstMpegQosGroup

DESCRIPTION

"This group is mandatory for an RCST that supports MPEG traffic bursts. Such RCST is qualified as supporting the MPEG_TRF option, as defined in the SatLabs System Recommendations."

GROUP dvbRcsRcstGlobalQosGroup

DESCRIPTION

"This group is mandatory for an RCST that supports global

RCST QoS configuration data. Such RCST is qualified as supporting the RCST_PARA feature, as defined in the SatLabs System Recommendations."

GROUP dvbRcsRcstStrictQosGroup

DESCRIPTION

"This group is mandatory for an RCST that supports strict channel ID dispatching. Such RCST is qualified as supporting the CHID_STRICT option, as defined in the SatLabs System Recommendations."

GROUP dvbRcsRcstExtControlGroup

DESCRIPTION

"This group is mandatory for an RCST that supports extended control management functionality. Such RCST is qualified as supporting the EXTCONTROL feature, as defined in the SatLabs System Recommendations."

GROUP dvbRcsRtnExtConfigGroup

DESCRIPTION

"This group is mandatory for an RCST that supports extended return link configuration management functionality. Such RCST is qualified as supporting the EXTCONFIG feature, as defined in the SatLabs System Recommendations."

GROUP dvbRcsRtnExtStatusGroup

DESCRIPTION

"This group is mandatory for an RCST that supports extended return link status report functionality. Such RCST is qualified as supporting the EXTSTATUS feature, as defined in the SatLabs System Recommendations."

GROUP dvbRcsRcstOduListGroup

DESCRIPTION

"This group is mandatory for an RCST that supports the ODU structural entities defined under dvbRcsOduTx, dvbRcsOduRx, and dvbRcsOduAntenna. Such RCST is qualified as supporting the ODULIST feature, as defined in the SatLabs System Recommendations."

OBJECT dvbRcsSystemOduAntennaSize

MIN-ACCESS read-only

DESCRIPTION

"Write access must be supported if dvbRcsRcstOduListGroup is not supported."

OBJECT dvbRcsSystemOduAntennaGain

MIN-ACCESS read-only

DESCRIPTION

"Write access must be supported if dvbRcsRcstOduListGroup is not supported."

OBJECT dvbRcsSystemOduSspa

MIN-ACCESS read-only

DESCRIPTION

"Write access must be supported if dvbRcsRcstOduListGroup is not supported."

OBJECT dvbRcsSystemOduTxType

MIN-ACCESS read-only

DESCRIPTION

"Write access must be supported if dvbRcsRcstOduListGroup is not supported."

OBJECT dvbRcsSystemOduRxType

MIN-ACCESS read-only

DESCRIPTION

"Write access must be supported if dvbRcsRcstOduListGroup is not supported."

OBJECT dvbRcsSystemOduRxBand

MIN-ACCESS read-only

DESCRIPTION

"Write access must be supported if dvbRcsRcstOduListGroup is not supported."

OBJECT dvbRcsSystemOduRxLO

MIN-ACCESS read-only

DESCRIPTION

"Write access must be supported if dvbRcsRcstOduListGroup is not supported."

OBJECT dvbRcsSystemOduTxLO

MIN-ACCESS read-only

DESCRIPTION

"Write access must be supported if dvbRcsRcstOduListGroup is not supported."

OBJECT dvbRcsNetworkOamInetAddressType

SYNTAX InetAddressType { ipv4(1) }

DESCRIPTION

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

OBJECT dvbRcsNetworkOamInetAddress

SYNTAX InetAddress (SIZE(4))

DESCRIPTION

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

OBJECT dvbRcsNetworkLanInetAddressType

SYNTAX InetAddressType { ipv4(1) }

DESCRIPTION

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

OBJECT dvbRcsNetworkLanInetAddress

SYNTAX InetAddress (SIZE(4))

DESCRIPTION

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

OBJECT dvbRcsNetworkAirInterfaceDefaultGatewayInetAddressType

SYNTAX InetAddressType { ipv4(1) }

DESCRIPTION

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

OBJECT dvbRcsNetworkAirInterfaceDefaultGatewayInetAddress

SYNTAX InetAddress (SIZE(4))

DESCRIPTION

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

OBJECT dvbRcsPrimaryDnsServerInetAddressType

SYNTAX InetAddressType { ipv4(1) }

DESCRIPTION

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

OBJECT dvbRcsPrimaryDnsServerInetAddress

SYNTAX InetAddress (SIZE(4))

DESCRIPTION

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

OBJECT dvbRcsSecondaryDnsServerInetAddressType

SYNTAX InetAddressType { ipv4(1) }

DESCRIPTION

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

OBJECT dvbRcsSecondaryDnsServerInetAddress

SYNTAX InetAddress (SIZE(4))

DESCRIPTION

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

OBJECT dvbRcsNetworkNccMgtInetAddressType

SYNTAX InetAddressType { ipv4(1) }

DESCRIPTION

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

OBJECT dvbRcsNetworkNccMgtInetAddress

SYNTAX InetAddress (SIZE(4))

DESCRIPTION

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

OBJECT dvbRcsPktClassDscpLow

MIN-ACCESS read-only

DESCRIPTION

"Create access only required if the RCST supports the enhanced classifier feature. Such RCST is qualified as supporting the ENHCLASSIFIER feature, as defined in the SatLabs System Recommendations."

OBJECT dvbRcsPktClassDscpHigh

MIN-ACCESS read-only

DESCRIPTION

"Create access only required if the RCST supports the enhanced classifier feature. Such RCST is qualified as supporting the ENHCLASSIFIER feature, as defined in the SatLabs System Recommendations."

OBJECT dvbRcsPktClassDscpMarkValue

MIN-ACCESS read-only

DESCRIPTION

"Create access only required if the RCST supports the enhanced classifier feature. Such RCST is qualified as supporting the ENHCLASSIFIER feature, as defined in the SatLabs System Recommendations."

OBJECT dvbRcsPktClassSrcInetAddressType

SYNTAX InetAddressType { ipv4(1) }

DESCRIPTION

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

OBJECT dvbRcsPktClassSrcInetAddress

SYNTAX InetAddress (SIZE(4))

DESCRIPTION

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

OBJECT dvbRcsPktClassDstInetAddressType

SYNTAX InetAddressType { ipv4(1) }

DESCRIPTION

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

OBJECT dvbRcsPktClassDstInetAddress

SYNTAX InetAddress (SIZE(4))

DESCRIPTION

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

OBJECT dvbRcsPhbName

MIN-ACCESS read-only

DESCRIPTION

"Create access only required if the RCST supports extended management support. Such RCST is qualified as supporting the SNMPMISC option, as defined in the SatLabs System Recommendations."

OBJECT dvbRcsPhbRequestClassAssociation

MIN-ACCESS read-only

DESCRIPTION

"Create access only required if the RCST supports extended management support. Such RCST is qualified as supporting the SNMPMISC option, as defined in the SatLabs System Recommendations."

OBJECT dvbRcsPhbMappingRowStatus

MIN-ACCESS read-only

DESCRIPTION

"Create access only required if the RCST supports extended management support. Such RCST is qualified as supporting the SNMPMISC option, as defined in the SatLabs System Recommendations."

OBJECT dvbRcsRequestClassName

MIN-ACCESS read-only

DESCRIPTION

"Create access only required if the RCST supports extended management support. Such RCST is qualified as supporting the SNMPMISC option, as defined in the SatLabs System Recommendations."

OBJECT dvbRcsRequestClassChanId
MIN-ACCESS read-only
DESCRIPTION
"Create access only required if the RCST supports extended management support. Such RCST is qualified as supporting the SNMPMISC option, as defined in the SatLabs System Recommendations."

OBJECT dvbRcsRequestClassVccVpi
MIN-ACCESS read-only
DESCRIPTION
"Create access only required if the RCST supports extended management support. Such RCST is qualified as supporting the SNMPMISC option, as defined in the SatLabs System Recommendations."

OBJECT dvbRcsRequestClassVccVci
MIN-ACCESS read-only
DESCRIPTION
"Create access only required if the RCST supports extended management support. Such RCST is qualified as supporting the SNMPMISC option, as defined in the SatLabs System Recommendations."

OBJECT dvbRcsRequestClassPidPoolReference
MIN-ACCESS not-accessible
DESCRIPTION
"Read-only access required if the RCST supports MPEG traffic bursts, according to the MPEG_TRF option, as defined in the SatLabs System Recommendations. Create access only required if the RCST also supports extended management support, according to the SNMPMISC option, as defined in the SatLabs System Recommendations."

OBJECT dvbRcsRequestClassCra
MIN-ACCESS read-only
DESCRIPTION
"Create access only required if the RCST supports extended management support, according to the SNMPMISC option, as defined in the SatLabs System Recommendations."

OBJECT dvbRcsRequestClassRbdcMax
MIN-ACCESS read-only
DESCRIPTION
"Create access only required if the RCST supports extended management support, according to the SNMPMISC option, as defined in the SatLabs System Recommendations."

OBJECT dvbRcsRequestClassRbdcTimeout
MIN-ACCESS read-only
DESCRIPTION
 "Create access only required if the RCST supports extended management support, according to the SNMPMISC option, as defined in the SatLabs System Recommendations."

OBJECT dvbRcsRequestClassVbdcMax
MIN-ACCESS read-only
DESCRIPTION
 "Create access only required if the RCST supports extended management support, according to the SNMPMISC option, as defined in the SatLabs System Recommendations."

OBJECT dvbRcsRequestClassVbdcTimeout
MIN-ACCESS read-only
DESCRIPTION
 "Create access only required if the RCST supports extended management support, according to the SNMPMISC option, as defined in the SatLabs System Recommendations."

OBJECT dvbRcsRequestClassVbdcMaxBackLog
MIN-ACCESS read-only
DESCRIPTION
 "Create access only required if the RCST supports extended management support, according to the SNMPMISC option, as defined in the SatLabs System Recommendations."

OBJECT dvbRcsRequestClassRowStatus
MIN-ACCESS read-only
DESCRIPTION
 "Create access only required if the RCST supports extended management support, according to the SNMPMISC option, as defined in the SatLabs System Recommendations."

OBJECT dvbRcsPidValue
MIN-ACCESS not-accessible
DESCRIPTION
 "Read-only access required if the RCST supports MPEG traffic bursts, according to the MPEG_TRF option, as defined in the SatLabs System Recommendations. Create access only required if the RCST also supports extended management support, according to the SNMPMISC option, as defined in the SatLabs System Recommendations."

OBJECT dvbRcsPidPoolRowStatus
MIN-ACCESS not-accessible
DESCRIPTION

"Read-only access required if the RCST supports MPEG traffic bursts, according to the MPEG_TRF option, as defined in the SatLabs System Recommendations. Create access only required if the RCST also supports extended management support, according to the SNMPMISC option, as defined in the SatLabs System Recommendations."

```
::= {dvbRcsRcstCompliances 1}
```

```
=====
--      units of conformance
=====
```

```
=====
--      object groups for RCST system
=====
```

```
dvbRcsRcstSystemGroup OBJECT-GROUP
    OBJECTS {
        dvbRcsSystemMibRevision,
        dvbRcsSystemSatLabsProfilesDeclaration,
        dvbRcsSystemSatLabsOptionsDeclaration,
        dvbRcsSystemSatLabsFeaturesDeclaration,
        dvbRcsSystemLocation,
        dvbRcsSystemOduAntennaSize,
        dvbRcsSystemOduAntennaGain,
        dvbRcsSystemOduSspa,
        dvbRcsSystemOduTxType,
        dvbRcsSystemOduRxType,
        dvbRcsSystemOduRxBand,
        dvbRcsSystemOduRxLO,
        dvbRcsSystemOduTxLO,
        dvbRcsTcpPep,
        dvbRcsHttpPep
    }
    STATUS      current
    DESCRIPTION
        "A collection of objects providing information
        applicable for basic device management support."
::= {dvbRcsRcstGroups 1}
```

```
=====
--      object groups for RCST networking
=====
```

```
dvbRcsRcstNetworkGroup OBJECT-GROUP
    OBJECTS {
        dvbRcsNetworkOamInetAddressType,
        dvbRcsNetworkOamInetAddress,
        dvbRcsNetworkOamInetAddressPrefixLength,
```

```
        dvbRcsNetworkLanInetAddressType,
        dvbRcsNetworkLanInetAddress,
        dvbRcsNetworkLanInetAddressPrefixLength,
        dvbRcsNetworkConfigFileDownloadUrl,
        dvbRcsNetworkConfigFileUploadUrl,
        dvbRcsNetworkLogFileUploadUrl
    }
    STATUS      current
    DESCRIPTION
        "A collection of objects providing basic networking
        management support."
 ::= {dvbRcsRcstGroups 2}

dvbRcsRcstExtNetworkGroup OBJECT-GROUP
    OBJECTS {
        dvbRcsNetworkOamInetAddressAssign,
        dvbRcsNetworkAirInterfaceDefaultGatewayInetAddressType,
        dvbRcsNetworkAirInterfaceDefaultGatewayInetAddress,
        dvbRcsNetworkAirInterfaceDefaultGatewayInetAddressPrefixLength,
        dvbRcsNetworkNccMgtInetAddressType,
        dvbRcsNetworkNccMgtInetAddress,
        dvbRcsNetworkNccMgtInetAddressPrefixLength
    }
    STATUS      current
    DESCRIPTION
        "A collection of objects providing extended networking
        management support."
 ::= {dvbRcsRcstGroups 3}

dvbRcsRcstDnsGroup OBJECT-GROUP
    OBJECTS {
        dvbRcsPrimaryDnsServerInetAddressType,
        dvbRcsPrimaryDnsServerInetAddress,
        dvbRcsPrimaryDnsServerInetAddressPrefixLength,
        dvbRcsSecondaryDnsServerInetAddressType,
        dvbRcsSecondaryDnsServerInetAddress,
        dvbRcsSecondaryDnsServerInetAddressPrefixLength
    }
    STATUS      current
    DESCRIPTION
        "A collection of objects providing DNS management
        support."
 ::= {dvbRcsRcstGroups 4}
```

```

=====
--      object groups for RCST installation
=====

```

```

dvbRcsRcstInstallGroup OBJECT-GROUP
  OBJECTS {
    dvbRcsInstallAntennaAlignmentState,
    dvbRcsInstallCwFrequency,
    dvbRcsInstallCwMaxDuration,
    dvbRcsInstallCwPower,
    dvbRcsInstallCoPolReading,
    dvbRcsInstallXPolReading,
    dvbRcsInstallCoPolTarget,
    dvbRcsInstallXPolTarget,
    dvbRcsInstallStandByDuration,
    dvbRcsInstallTargetEsN0
  }
  STATUS      current
  DESCRIPTION
    "A collection of objects providing information
    applicable for basic installation support."
 ::= { dvbRcsRcstGroups 5 }

```

```

dvbRcsRcstExtInstallGroup OBJECT-GROUP
  OBJECTS {
    dvbRcsNetworkInstallLogFileDownloadUrl,
    dvbRcsNetworkInstallLogFileUploadUrl
  }
  STATUS      current
  DESCRIPTION
    "A collection of objects providing extended device
    installation support."
 ::= { dvbRcsRcstGroups 6 }

```

```

=====
--      object groups for QoS
=====

```

```

dvbRcsRcstQosGroup OBJECT-GROUP
  OBJECTS {
    dvbRcsPktClassDscpLow,
    dvbRcsPktClassDscpHigh,
    dvbRcsPktClassDscpMarkValue,
    dvbRcsPktClassPhbAssociation,
    dvbRcsPktClassRowStatus,
    dvbRcsPhbName,
    dvbRcsPhbRequestClassAssociation,
    dvbRcsPhbMappingRowStatus,

```

```
    dvbRcsRequestClassName,
    dvbRcsRequestClassChanId,
    dvbRcsRequestClassVccVpi,
    dvbRcsRequestClassVccVci,
    dvbRcsRequestClassCra,
    dvbRcsRequestClassRbdcMax,
    dvbRcsRequestClassRbdcTimeout,
    dvbRcsRequestClassVbdcMax,
    dvbRcsRequestClassVbdcTimeout,
    dvbRcsRequestClassVbdcMaxBackLog,
    dvbRcsRequestClassRowStatus
  }
STATUS      current
DESCRIPTION
  "A collection of objects providing basic access to QoS
  configuration data."
::= {dvbRcsRcstGroups 7}

dvbRcsRcstEnhancedClassifierGroup OBJECT-GROUP
  OBJECTS {
    dvbRcsPktClassIpProtocol,
    dvbRcsPktClassSrcInetAddressType,
    dvbRcsPktClassSrcInetAddress,
    dvbRcsPktClassSrcInetAddressPrefixLength,
    dvbRcsPktClassDstInetAddressType,
    dvbRcsPktClassDstInetAddress,
    dvbRcsPktClassDstInetAddressPrefixLength,
    dvbRcsPktClassSrcPortLow,
    dvbRcsPktClassSrcPortHigh,
    dvbRcsPktClassDstPortLow,
    dvbRcsPktClassDstPortHigh,
    dvbRcsPktClassVlanUserPri
  }
STATUS      current
DESCRIPTION
  "A collection of objects providing support for
  management of the enhanced classifier."
::= {dvbRcsRcstGroups 8}

dvbRcsRcstMpegQosGroup OBJECT-GROUP
  OBJECTS {
    dvbRcsRequestClassPidPoolReference,
    dvbRcsPidValue,
    dvbRcsPidPoolRowStatus
  }
STATUS      current
DESCRIPTION
  "A collection of objects providing access to
```

```

        MPEG-related link QoS configuration data."

 ::= {dvbRcsRcstGroups 9}

dvbRcsRcstGlobalQosGroup OBJECT-GROUP
    OBJECTS {
        dvbRcsQosGlobalRbdcMax,
        dvbRcsQosGlobalVbdcMax,
        dvbRcsQosGlobalVbdcMaxBackLog
    }
    STATUS      current
    DESCRIPTION
        "A collection of objects providing access to global RCST
        QoS configuration data."
 ::= {dvbRcsRcstGroups 10}

dvbRcsRcstStrictQosGroup OBJECT-GROUP
    OBJECTS {
        dvbRcsQosChannelIdStrictDispatching
    }
    STATUS      current
    DESCRIPTION
        "A collection of objects allowing management of strict
        channel ID dispatching."
 ::= {dvbRcsRcstGroups 11}

=====
--      object groups for RCST control
=====
dvbRcsRcstControlGroup OBJECT-GROUP
    OBJECTS {
        dvbRcsCtrlRebootCommand,
        dvbRcsCtrlUserTrafficDisable,
        dvbRcsCtrlCwEnable,
        dvbRcsCtrlDownloadFileCommand,
        dvbRcsCtrlUploadFileCommand,
        dvbRcsCtrlActivateConfigFileCommand,
        dvbRcsCtrlRcstRxReacquire
    }
    STATUS      current
    DESCRIPTION
        "A collection of objects allowing basic RCST control."
 ::= {dvbRcsRcstGroups 12}

dvbRcsRcstExtControlGroup OBJECT-GROUP
    OBJECTS {
        dvbRcsCtrlRcstTxDisable,
        dvbRcsCtrlOduTxReferenceEnable,

```

```

        dvbRcsCtrlOduTxDCEnable,
        dvbRcsCtrlOduRxDCEnable,
        dvbRcsCtrlRcstLogonCommand,
        dvbRcsCtrlRcstLogoffCommand
    }
    STATUS      current
    DESCRIPTION
        "A collection of objects allowing extended RCST
        control."
 ::= { dvbRcsRcstGroups 13}

=====
--      object groups for RCST state
=====

dvbRcsRcstStateGroup OBJECT-GROUP
    OBJECTS {
        dvbRcsRcstMode,
        dvbRcsRcstFaultStatus,
        dvbRcsRcstFwdLinkStatus,
        dvbRcsRcstLogUpdated,
        dvbRcsRcstCurrentSoftwareVersion,
        dvbRcsRcstAlternateSoftwareVersion,
        dvbRcsRcstActivatedConfigFileVersion,
        dvbRcsRcstDownloadedConfigFileVersion
    }
    STATUS      current
    DESCRIPTION
        "A collection of objects allowing access to RCST state."
 ::= { dvbRcsRcstGroups 14}

=====
--      object groups for forward link
=====

dvbRcsFwdConfigGroup OBJECT-GROUP
    OBJECTS {
        dvbRcsFwdStartPopId,
        dvbRcsFwdStartFrequency,
        dvbRcsFwdStartPolar,
        dvbRcsFwdStartFormat,
        dvbRcsFwdStartRolloff,
        dvbRcsFwdStartSymbolRate,
        dvbRcsFwdStartInnerFec,
        dvbRcsFwdStartRowStatus
    }
    STATUS      current
    DESCRIPTION

```



```

        "A collection of objects providing basic start forward
        link configuration support."
 ::= { dvbRcsRcstGroups 15}

```

```

dvbRcsFwdStatusGroup OBJECT-GROUP

```

```

    OBJECTS {
        dvbRcsFwdStatusPopId,
        dvbRcsFwdStatusIfReference,
        dvbRcsFwdStatusNetId,
        dvbRcsFwdStatusNetName,
        dvbRcsFwdStatusFormat,
        dvbRcsFwdStatusFrequency,
        dvbRcsFwdStatusPolar,
        dvbRcsFwdStatusInnerFec,
        dvbRcsFwdStatusSymbolRate,
        dvbRcsFwdStatusRolloff,
        dvbRcsFwdStatusModulation,
        dvbRcsFwdStatusFecFrame,
        dvbRcsFwdStatusPilot,
        dvbRcsFwdStatusBer,
        dvbRcsFwdStatusCnr,
        dvbRcsFwdStatusRxPower
    }

```

```

    STATUS      current

```

```

    DESCRIPTION

```

```

        "A collection of objects providing forward link status."
 ::= { dvbRcsRcstGroups 16}

```

```

-----
--      object groups for return link
-----

```

```

dvbRcsRtnConfigGroup OBJECT-GROUP

```

```

    OBJECTS {
        dvbRcsRtnConfigDefIfLevel
    }

```

```

    STATUS      current

```

```

    DESCRIPTION

```

```

        "A collection of objects providing basic return link
        configuration support."
 ::= { dvbRcsRcstGroups 17}

```

```

dvbRcsRtnExtConfigGroup OBJECT-GROUP

```

```

    OBJECTS {
        dvbRcsRtnConfigMaxEirp
    }

```

```

    STATUS      current

```

```

    DESCRIPTION

```

```

        "A collection of objects providing extended return link

```

```
        configuration support."
 ::= {dvbRcsRcstGroups 18}

dvbRcsRtnStatusGroup OBJECT-GROUP
  OBJECTS {
    dvbRcsRtnStatusPayloadUnit
  }
  STATUS      current
  DESCRIPTION
    "A collection of objects allowing access to return link
    status."
 ::= {dvbRcsRcstGroups 19}

dvbRcsRtnExtStatusGroup OBJECT-GROUP
  OBJECTS {
    dvbRcsRcstRtnLinkStatus,
    dvbRcsRtnStatusEbN0,
    dvbRcsRtnStatusSFDuration
  }
  STATUS      current
  DESCRIPTION
    "A collection of objects allowing access to extended
    return link status."
 ::= {dvbRcsRcstGroups 20}

dvbRcsRcstOduListGroup OBJECT-GROUP
  OBJECTS {
    dvbRcsOduTxTypeDescription,
    dvbRcsOduTxType,
    dvbRcsOduRxTypeDescription,
    dvbRcsOduRxType,
    dvbRcsOduAntennaTypeDescription,
    dvbRcsOduAntennaType
  }
  STATUS      current
  DESCRIPTION
    "A collection of objects supporting flexible
    selection of ODU devices."
 ::= {dvbRcsRcstGroups 21}

END
```

5. Security Considerations

This MIB module relates to a system that allows end users to access a private network or public Internet access. As such, improper manipulation of the MIB objects represented by this MIB module may result in denial of service to a large number of end users.

There are a number of management objects defined in this MIB module with a MAX-ACCESS clause of read-write and/or read- create. Such objects may be considered sensitive or vulnerable in some network environments. The support for SET operations in a non-secure environment without proper protection can have a negative effect on network operations. These are the tables and objects and their sensitivity/vulnerability:

- o The use of the dvbRcsNetworkNccMgtInetAddress object to specify management stations is considered only limited protection and does not protect against attacks that spoof the management station's IP address. The use of stronger mechanisms, such as SNMPv3 security, should be considered, where possible.
- o The dvbRcsSystemOdu objects, dvbRcsCtrlCwEnable, dvbRcsRtnConfigMaxEirp, dvbRcsRtnConfigDefIfLevel objects, and dvbRcsRcstInstall sub-tree can, if improperly or maliciously used, lead to unwanted emissions or emission levels on the satellite uplink, thereby resulting in potential degradation of the RCS service or other services using the frequency band being used.
- o The RCST may have its configuration file changed by the actions of the management system using a combination of the following objects: dvbRcsNetworkInstallLogFileDownloadUrl, dvbRcsCtrlDownloadFileCommand, dvbRcsCtrlActivateConfigFileCommand, or dvbRcsCtrlRebootCommand. An improper configuration file download may result in substantial vulnerabilities and the loss of the ability of the management system to control the satellite terminal.
- o Setting dvbRcsNetworkLogFileUploadUrl to a wrong address may potentially impact debugging/troubleshooting efforts.
- o Setting objects in dvbRcsPktClassTable could cause significant changes to default traffic filtering on an RCST.

Some of the readable objects in this MIB module (i.e., objects with a MAX-ACCESS other than not-accessible) may be considered sensitive or vulnerable in some network environments. It is thus important to control even GET and/or NOTIFY access to these objects and possibly to even encrypt the values of these objects when sending them over

the network via SNMP. These are the tables and objects and their sensitivity/vulnerability:

- o The dvbRcsNetworkNccMgtInetAddress object may provide sufficient information for attackers to spoof management stations that have management access to the device.
- o The dvbRcsRcstCurrentSoftwareVersion object may provide hints as to the software vulnerabilities of the RCST.
- o The object dvbRcsNetworkOamInetAddress and the table dvbRcsPktClassTable may provide clues for attacking the RCST and other subscriber devices.

SNMP versions prior to SNMPv3 did not include adequate security. Even if the network itself is secure (for example by using IPsec), even then, there is no control as to who on the secure network is allowed to access and GET/SET (read/change/create/delete) the objects in this MIB module.

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

Further, deployment of SNMP versions prior to SNMPv3 is NOT RECOMMENDED. Instead, it is RECOMMENDED to deploy SNMPv3 and to enable cryptographic security. It is then a customer/operator responsibility to ensure that the SNMP entity giving access to an instance of this MIB module, is properly configured to give access to the objects only to those principals (users) that have legitimate rights to indeed GET or SET (change/create/delete) them.

6. IANA Considerations

The transmission and ifType numbers described in Section 3 have already been assigned under the smi-numbers registry.

7. Acknowledgments

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8. References

8.1. Normative References

- [IANA] Internet Assigned Numbers Authority, "Internet Assigned Numbers Authority", June 2008, <<http://www.iana.org>>.
- [RFC2119] Bradner, S., "Key words for use in RFCs to Indicate Requirement Levels", BCP 14, RFC 2119, March 1997.
- [RFC2578] McCloghrie, K., Perkins, D., and J. Schoenwaelder, "Structure of Management Information Version 2 (SMIv2)", STD 58, RFC 2578, April 1999.
- [RFC2579] McCloghrie, K., Perkins, D., and J. Schoenwaelder, "Textual Conventions for SMIv2", STD 58, RFC 2579, April 1999.
- [RFC2580] McCloghrie, K., Perkins, D., and J. Schoenwaelder, "Conformance Statements for SMIv2", STD 58, RFC 2580, April 1999.
- [RFC2863] McCloghrie, K. and F. Kastenholz, "The Interfaces Group MIB", RFC 2863, June 2000.
- [RFC3289] Baker, F., Chan, K., and A. Smith, "Management Information Base for the Differentiated Services Architecture", RFC 3289, May 2002.
- [RFC3411] Harrington, D., Presuhn, R., and B. Wijnen, "An Architecture for Describing Simple Network Management Protocol (SNMP) Management Frameworks", STD 62, RFC 3411, December 2002.
- [RFC4001] Daniele, M., Haberman, B., Routhier, S., and J. Schoenwaelder, "Textual Conventions for Internet Network Addresses", RFC 4001, February 2005.
- [RFC5017] McWalter, D., Ed., "MIB Textual Conventions for Uniform Resource Identifiers (URIs)", RFC 5017, September 2007.

8.2. Informative References

- [ISO-MPEG] ISO/IEC DIS 13818-1:2000, "Information Technology; Generic Coding of Moving Pictures and Associated Audio Information Systems", International Organization for Standardization (ISO).
- [ITU-ATM] ITU-T Recommendation I.432 (all parts): "B-ISDN user-network interface - Physical layer specification".
- [ITU-AAL5] ITU-T Recommendation I.363-5 (1996): "B-ISDN ATM Adaptation Layer specification: Type 5 AAL".
- [ETSI-DAT] ETSI EN 301 192, "Digital Video Broadcasting (DVB); DVB Specifications for Data Broadcasting", European Telecommunications Standards Institute (ETSI).
- [ETSI-DVBS] ETSI EN 301 421, "Digital Video Broadcasting (DVB); Modulation and Coding for DBS satellite systems at 11/12 GHz", European Telecommunications Standards Institute (ETSI).
- [ETSI-DVBS2] ETSI EN 302 307, "Digital Video Broadcasting (DVB); Second generation framing structure, channel coding and modulation systems for Broadcasting, Interactive Services, News Gathering and other broadband satellite applications", European Telecommunications Standards Institute (ETSI).
- [ETSI-GSE] ETSI TS 102 606, "Digital Video Broadcasting (DVB); Generic Stream Encapsulation (GSE) Protocol", European Telecommunications Standards Institute (ETSI).
- [ETSI-RCS] ETSI 301 790, "Digital Video Broadcasting (DVB); Interaction Channel for Satellite Distribution Systems", European Telecommunications Standards Institute (ETSI).
- [ETSI-SI] ETSI EN 300 468, "Digital Video Broadcasting (DVB); Specification for Service Information (SI) in DVB Systems", European Telecommunications Standards Institute (ETSI).
- [RFC3410] Case, J., Mundy, R., Partain, D., and B. Stewart, "Introduction and Applicability Statements for Internet-Standard Management Framework", RFC 3410, December 2002.
- [SATLABS] SatLabs System Recommendations,
<<http://www.satlabs.org>>.

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