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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.

Status of This Memo

This document is not an Internet Standards Track specification; it is published for informational purposes.

This document is a product of the Internet Engineering Task Force (IETF). It represents the consensus of the IETF community. It has received public review and has been approved for publication by the Internet Engineering Steering Group (IESG). Not all documents approved by the IESG are a candidate for any level of Internet Standard; see Section 2 of RFC 5741.

Information about the current status of this document, any errata, and how to provide feedback on it may be obtained at http://www.rfc-editor.org/info/rfc5728.

Table of Contents

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.

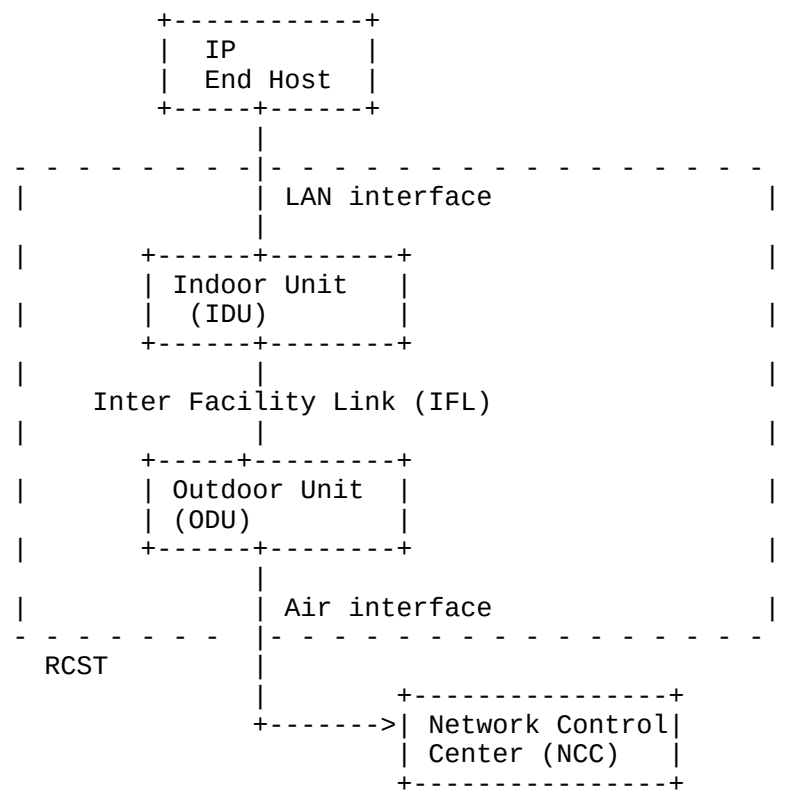

Figure 1: RCST Architecture

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:

- The dvbRcsMibObjects group includes all the managed objects of the DVB-RCS MIB.

- 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:

- dvbRcsRcstSystem

- dvbRcsRcstNetwork

- dvbRcsRcstInstall

- dvbRcsRcstQos

- dvbRcsRcstControl

- dvbRcsRcstState

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

- dvbRcsFwdConfig

- dvbRcsFwdStatus

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

- dvbRcsRtnConfig
- 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:

- 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.

- 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:

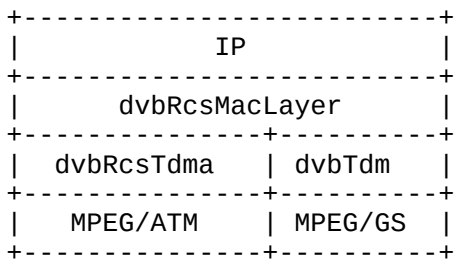

Figure 2: RCST Protocol Stack

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].

- 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.

- 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.

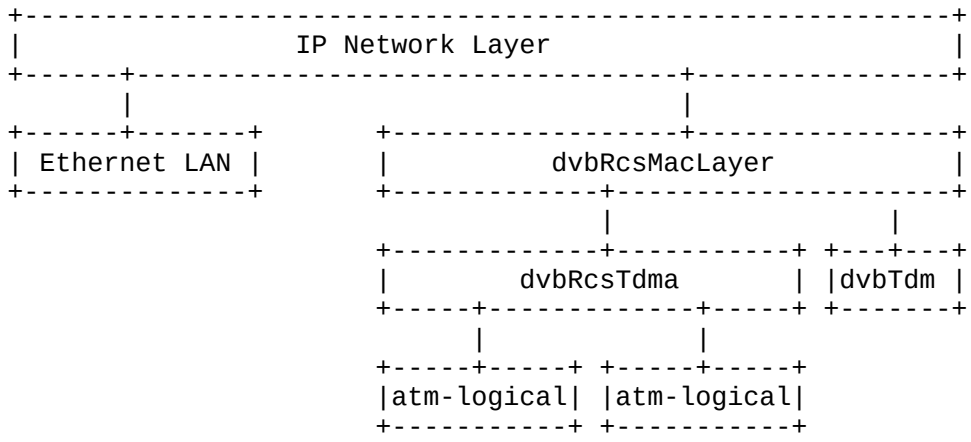

Figure 3: Example Stacking

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 re-location 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 re-location 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:

- 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.

- 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.

- 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.

- Setting dvbRcsNetworkLogFileUploadUrl to a wrong address may potentially impact debugging/troubleshooting efforts.

- 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:

- The dvbRcsNetworkNccMgtInetAddress object may provide sufficient information for attackers to spoof management stations that have management access to the device.

- The dvbRcsRcstCurrentSoftwareVersion object may provide hints as to the software vulnerabilities of the RCST.

- 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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