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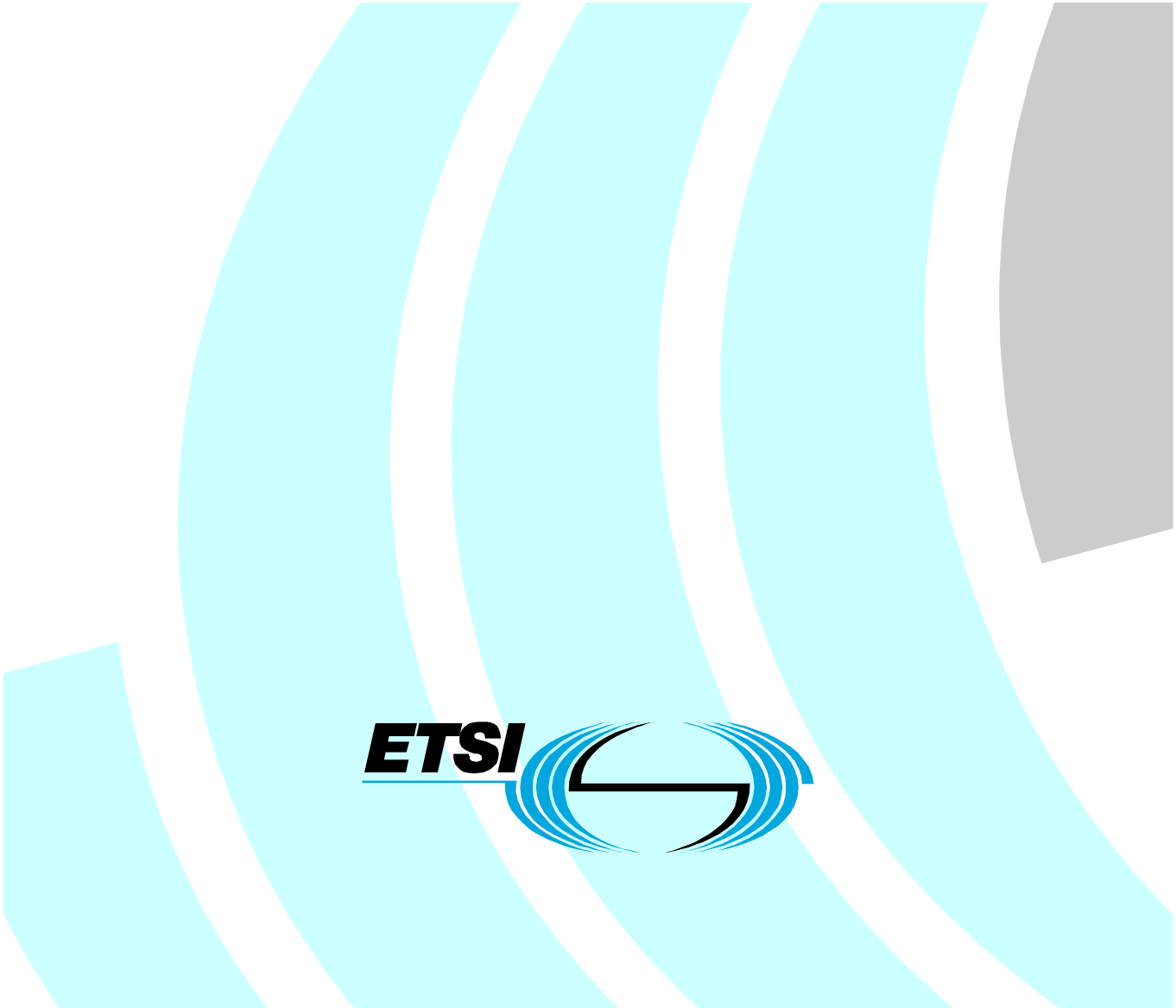
Technical Specification

Satellite Earth Stations and Systems (SES);
Broadband Satellite Multimedia (BSM);
Regenerative Satellite Mesh - B (RSM-B);
DVB-S/DVB-RCS family for regenerative satellites;
Part 4: Specific Management Information Base



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Foreword

This Technical Specification (TS) has been produced by ETSI Technical Committee Satellite Earth Stations and Systems (SES).

The present document is part 4 of a multi-part deliverable covering the Broadband Satellite Multimedia (BSM) Regenerative Satellite Mesh - B (RSM-B); DVB-S/DVB-RCS family for regenerative satellites, as identified below:

Part 1: "System overview";

Part 2: "Satellite Link Control layer";

Part 3: "Connection control protocol";

Part 4: "Specific Management Information Base".

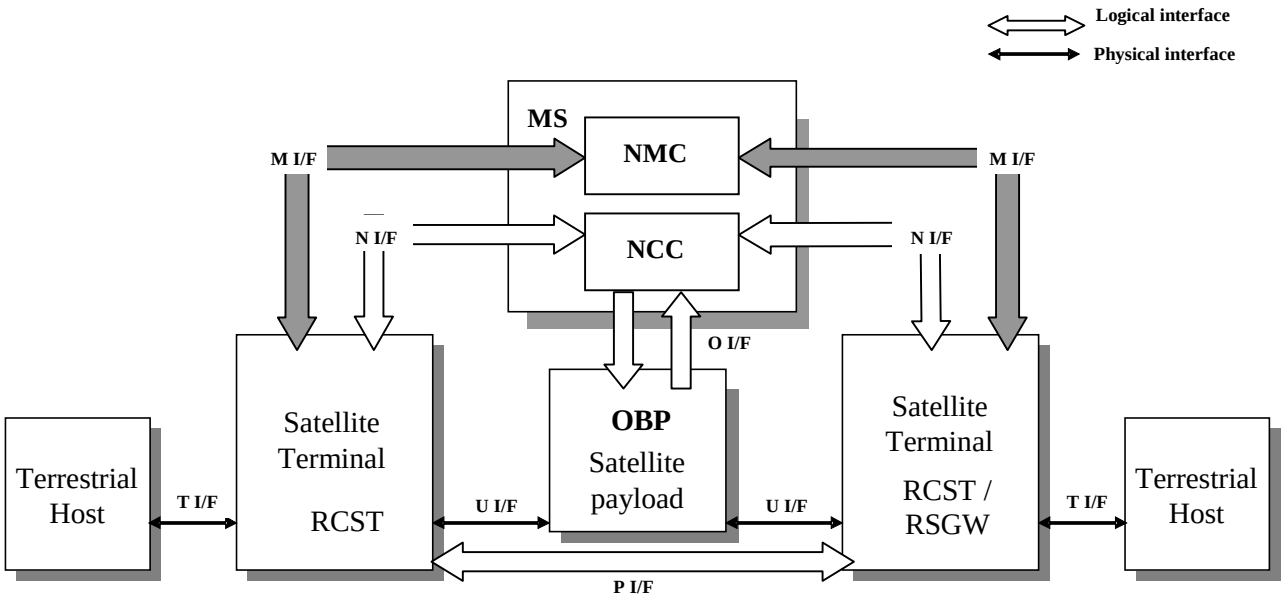
Introduction

The present document includes a RSM-B MIB as defined in clause 6.1.2 and annex A. This MIB defines RSM-B private objects using Object Identifiers (OIDs) that are defined under the Alcatel group iso(1).org(3).dod(6).internet(1).private(4).enterprises(1).alcatel(637).space(56) of private enterprises. In line with ETSI policy, Alcatel have formally transferred the control of this OID branch "iso(1).org(3).dod(6).internet(1).private(4).enterprises(1).alcatel(637).space(56).spdProduct(4).spdDvbRcstExtensionMib(40).1" and all subbranches to ETSI.

1 Scope

The present document defines the requirements for the management interface between the Network Management Center (NMC) Sub-System and the Return Channel Satellite Terminal (RCST) within SES BSM Regenerative Satellite Mesh - B (RSM-B) for a DVB-RCS network with Type A terminals.

The aim of the present document is to define the specific Management Information Base (MIB) that all RSM-B RCSTs within SES BSM Regenerative Satellite Mesh - B (RSM-B) shall support in addition to DVB-RCS guidelines MIB.



NOTE: See Part 1 (clause 4.1.5) for interfaces definition.

Figure 1: Network architecture

2 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication and/or edition number or version number) or non-specific.
- For a specific reference, subsequent revisions do not apply.
- For a non-specific reference, the latest version applies.

Referenced documents which are not found to be publicly available in the expected location might be found at http://docbox.etsi.org/Reference.

NOTE: While any hyperlinks included in this clause were valid at the time of publication ETSI cannot guarantee their long term validity.

[1] ETSI EN 301 790: "Digital Video Broadcasting (DVB); Interaction channel for satellite distribution systems".

[2] IETF RFC 1907: "Structure of Management Information Base for Version 2 (SMIv2)".

[3] IETF RFC 2096: "IP Forwarding Table MIB".

[4] IETF RFC 2579: "Textual Conventions for SMIv2".

3 Definitions and abbreviations

3.1 Definitions

For the purposes of the present document, the following terms and definitions apply:

Digital Video Broadcasting Return Channel by Satellite (DVB-RCS): protocol for an interaction (or return) channel in satellite links

Digital Video Broadcasting via Satellite (DVB-S): protocol for broadcasting TV signals and by extension data over satellite

management plane: plane which provides two types of functions, namely layer management and plane management functions

Management Station (MS): controls and manages the RSM-B network and is composed of three elements:

- the Network Control Center (NCC);
- the Network Management Center (NMC);
- the satellite terminal of the MS (NCC_RCST), which supports the modulation and demodulation functions to access to the satellite.

Network Control Center (NCC): RSM-B network element which controls the Interactive Network, serves user satellite access requests and manages the OBP configuration

Network Management Center (NMC): RSM-B network element composed in charge of element management functions and for the network and service provisioning and management

On Board Processor (OBP): digital processor on-board the satellite that allows MPEG packets from up-link to down-link beams in a flexible way

Return Channel Satellite Terminal (RCST): low cost and high performance RSM-B network element installed in the user premises that provides interfaces with final users and allows its users access to users of others RCSTs or to external users of terrestrial networks through the RSGW, or to services delivered by the Service Provider attached to the RSGW

GateWay Return Channel Satellite Terminal (GW_RCST): RSM-B RCST installed inside an RSGW with enhanced properties in routing, IP multicast, connection control and management

Regenerative Satellite GateWay (RSGW): RSM-B network element that provides the interface between RSM-B network and external users of terrestrial networks such as PSTN or ISDN and with external Service Providers

NOTE: A RSGW is composed by a Gateway and one or several GW_RCST. A Gateway includes all the network elements that will assure the interface with terrestrial networks (e.g. IP router, Voice gateway, Video gateway, Gatekeeper).

3.2 Abbreviations

For the purposes of the present document, the abbreviations given in EN 301 790 [1] and the following apply:

BER	Bit Error Rate
BSM	Broadband Satellite Multimedia
C2P	Connection Control Protocol
CLI	Command Line Interface
CRA	Constant Rate Assignment
CW	Continuous Wave
DiffServ	Internet Differentiated Services
DSCP	DiffServ Code Point

DVB	Digital Video Broadcasting
DVB-RCS	Digital Video Broadcast-Return Channel Satellite
DVB-S	Digital Video Broadcast by Satellite
EIRP	Equivalent Isotropic Radiated Power
ETSI	European Telecommunications Standards Institute
FCAPS	Fault, Configuration, Accounting, Performance and Security.
GPS	Global Positioning System
GRD	Guaranteed Rate & Delay
IDU	Indoor Unit
IETF	Internet Engineering Task Force
IGMP	Internet Group Management Protocol
IP	Internet Protocol
IPSec	IP Security
ISDN	Integrated Services Digital Network
Kbps	Kilo bits per second
LAN	Local Area Network
M&C	Management and Control
Mbps	Mega bits per second
MIB	Management Information Base
MMT	Multicast Map Table
MPE	Multi Protocol Encapsulation
MSB	Most Significant Bit
NAT	Network Address Translation
NAPT	Network Address Port Translation
NCC	Network Control Center
NMC	Network Management Center
NSM	Network and Service Manager
OBP	On Board Processor
ODU	Out-Door Unit
OID	Object Identifier
PDR	Peak Data Rate
PID	Program Identifier
PSTN	Public Switched Telephone Network
QoS	Quality of Service
RBDC	Rate Based Dynamic Capacity
RCST	Return Channel Satellite Terminal
RSGW	Regenerative Satellite GateWay
RSM	Regenerative Satellite Mesh
SDR	Sustainable Data Rate
SMIv2	Structure of Management Information version 2
SNMP	Simple Network Management Protocol
SSPA	Solid State Power Amplifier
TCP	Transmission Control Protocol
TDM	Time-Division Multiplex
TDMA	Time Division Multiple Access
TIM	Terminal Information Message
TRF	Traffic
TS	Transport Stream
TTL	Time To Live
UDP	User Datagram Protocol
UI	User Interface
VBR	Variable Bit Rate
VSN	Virtual Satellite Network

4 Protocols stack overview

The management interface between the NMC and the RCST within RSM-B will allow:

- RCSTs MIB support.
- Management of RCSTs including:
  - RCST configuration parameters, provisioning, managing status and commands (logoff, lock, unlock) by the NMC.
  - Faults (RCST related alarms generated by the NMC).
  - Performances (RCSTs related counters).

A private MIB in the RCST stores the configuration parameter values in variables. The NMC will use SNMP Version 2C commands to obtain the current configuration parameter values from the RCST MIB. An SNMP agent in the RCST responds to commands from an SNMP client in the NMC.

The RCST should support local management and remote management.

The local management plane refers to the protocol stack applied to the management data through the user Ethernet interface.

The remote management protocol stack in RCST applied to remote management data is shown in figure 2:

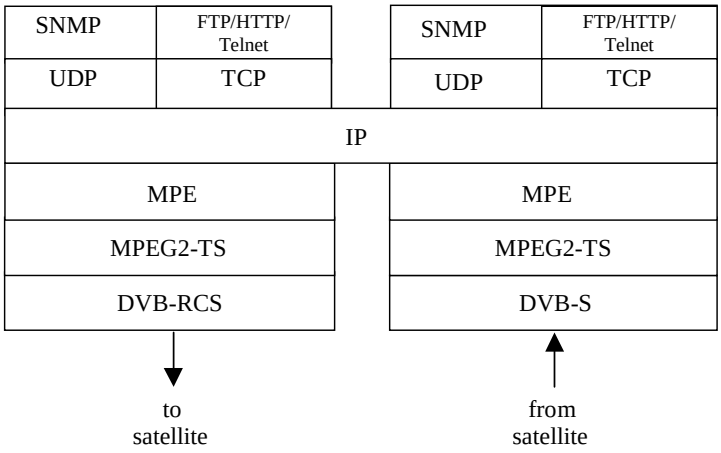


Figure 2: RCST management control protocol stack

5 Access policy

According to SNMPv2c, when an SNMP request arrives, the validity of the packet's source IP address and community name combination should be checked. This community name together with the object ID(s) in the SNMP request determine the access right to the information being requested.

6 Network Manager - RCST interface

6.1 SNMP MIBs groups

For RSM-B full functionality implementation at least three different MIB groups objects should be considered:

- dvb subtree, 2696, DVB_RCS guidelines parameters;
- MIB-II standard groups;
- Alcatel private group for dvbRcstMib specific parameters for RSM-B project.

6.1.1 DVB-RCS MIB

The subtree rcs for DVB-RCS systems has number 2. The private enterprise RCST MIB is located under rcst with the name rcstMib and number 1. The RCST DVB MIB consist of five groups: rcstSystem, rcstConfig, rcstLife, rcstActions and rcstCallCntl.

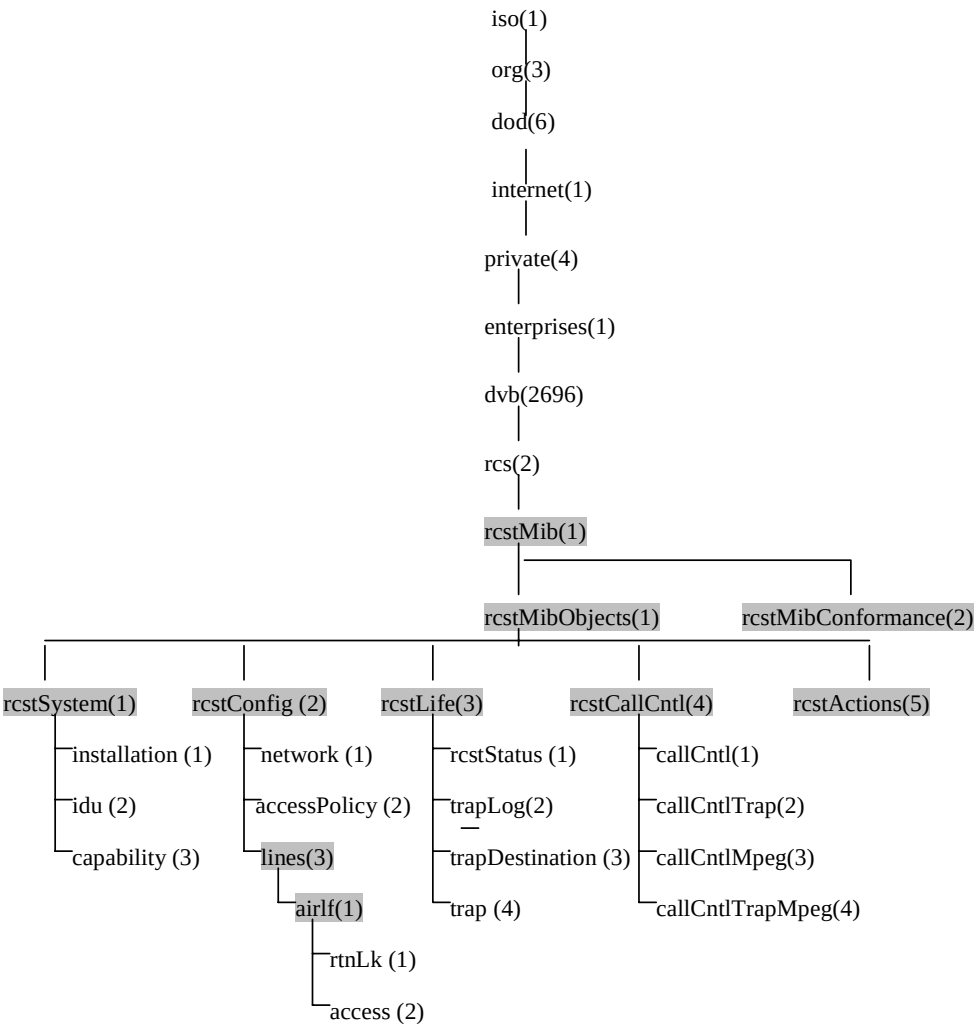


Figure 3: DVB-RCS MIB OID tree

The detailed definition of the DVB-RCS MIB objects is provided in annex F of TR 101 790.

6.1.2 RSM-B MIB

For RSM-B private objects, a group dvbRcstMibExtension is defined under the Alcatel group of private enterprises.

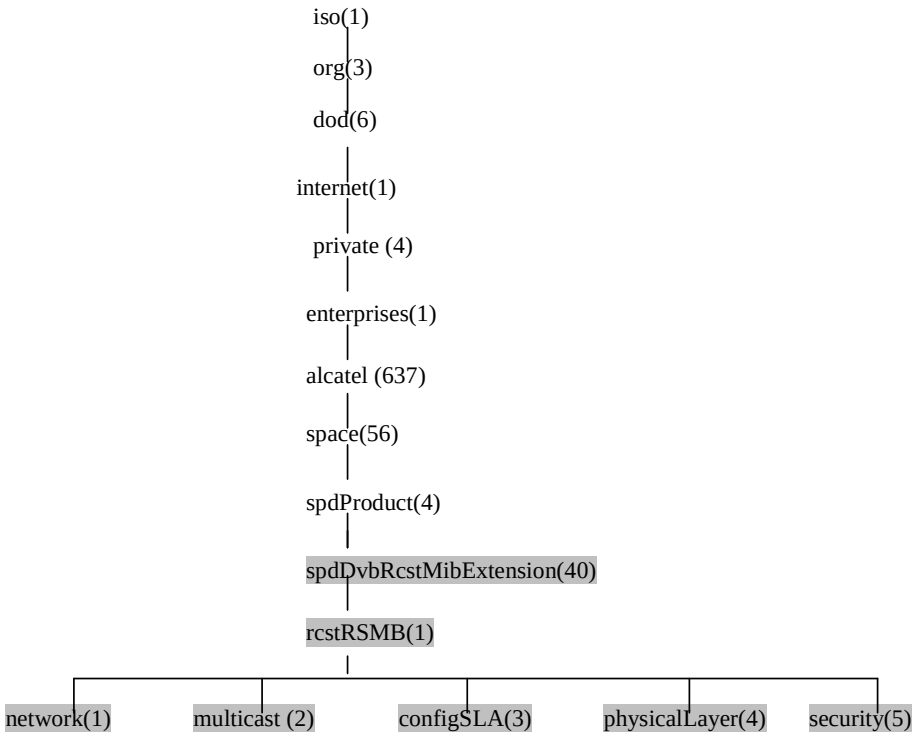


Figure 4: RSM-B RCST MIB

RCST characteristics are defined during its installation, other are defined in order to get access to the system and finally several are dynamically changing and adapted during the session.

The detailed definition of the RSM-B specific MIB objects is provided in annex A.

6.1.3 Generic MIBs

The RCST shall support the following standard MIBs SNMPv2-MIB defined in RFC 1907 [2].

The following MIB-II Groups are applicable to the management of the RCST and shall be supported by the RCST:

- system Group;
- interfaces Group;
- ip Group;
- icmp Group
- tcp Group;
- udp Group;
- snmp Group.

The group ipRouteTable within ip group is obsolete. It should be replaced by **ipForward.ipCidrRouteTable (RFC 2096 [3]).**

RCSTs agents are developed and owned by each manufacturer. Therefore they should provide sysObjectId, parameter from system Group that gives a vendor's authoritative identification of the network management subsystem contained in the entity. This value is allocated within the SMI enterprises subtree (1.3.6.1.4.1) and provides an easy and unambiguous means for determining what kind of box is being managed.

As mentioned in previous section it is required to support MIB-II groups: system, interfaces, ip, tcp, udp, icmp and snmp. All MIB objects follow the definitions and usage already considered within TR 101 202.

7 Blind commands

Blind commands are commands that can be sent to terminals that are only locked to the forward channel in order to recover them. These terminals have successfully perform a logon during installation, but have lost their return link due to different reasons, or could have never done a successful logon due to a wrong parameter configuration. These commands are classified as blind because the RCST should be capable of processing them even if not having performed a successful logon into the RSM-B network.

These Blind Commands will be fundamental in situations where bi-directional protocols cannot be used, as for example SNMP, Telnet, HTTP, etc.

The Blind Commands to be considered are:

- Restart.
- Alignment and power calibration: allowing re-calibrations of power without having to send an installer to remote places.
- IP configuration: allowing changes in IP management configuration, even with no IP connectivity or opened session.
- Save configuration (only if this operation is required in the terminal).
- Transmitter parameters configuration: helping to recover terminal which transmitter is not working properly.
- GPS position configuration: helping to recover terminals where the GPS position was wrongly configured.

The NMC will provide a form for each of the blind commands. The form adopted for these blind commands could either be:

- by direct SNMP command, but with no acknowledge sent by the terminal;
- by TIMu including the SNMP command within the NLID (Network Layer Information Descriptor).

Blind Commands are translated into MIB SET parameters commands. The parameters required to be able to support this functionality are given in the following sections.

7.1 Restart

The Restart/Reboot Blind command shall enable the operator to send a restart command to the RCST.

7.2 Alignment and power calibration

The alignment and power calibration blind command shall enable the operator to SET the following parameters to the RCST:

- Continuous Wave (CW) Transmission ON.
- Continuous Wave (CW) Transmission OFF.
- Continuous Wave (CW) Frequency.
- Continuous Wave (CW) Power.

7.3 IP configuration

The IP Configuration blind command for terminal manufacturers shall enable the operator to SET the following parameters to the RCST:

- NMC IP address.
- NMC IP subnet.
- RCST Management IP address.

7.4 Save configuration

The Save configuration blind command shall enable the operator to permanently store in the RCST non-volatile memory parameters modified through SNMP or CLI commands. This command is applicable only on those terminals where this kind of operation is required.

7.5 Transmitter parameters

The transmitter parameters configuration blind command shall enable the operator to set the transmission parameters used for the ODU configuration:

- Local oscillator frequency.
- BUC (Transmitter) type.
- Transmitter power, in terms of IDU power (DiSEqC support) or maximum ODU EIRP (with no DiSEqC support).
- Antenna size or antenna type.
- Antenna gain or ODU SSPA power.

7.6 GPS position configuration

The GPS position configuration blind command shall enable the operator to SET the GPS position of the terminal, either given in XYZ coordinates (geodesic reference ITRF96) or LatLongEl (WGS84) coordinates, depending on the terminal manufacturer. The physical position of the IDU is given in system.sysLocations of object MIB-II.

7.7 Summary

A summary of the Blind Commands MIB objects is given in table 1.

Table 1: Blind commands MIB objects summary

Blind command	MIB object	MIB group	OID description
restart/reboot	rcstActRebootCommand	DVB_RCS guidelines	
Continuous Wave (CW) Tx ON Continuous Wave (CW) Tx OFF Continuous Wave (CW) Frequency	cwTest	RSM-B	Frequency specified in multiple of 100 Hz for CW Test mode. When the frequency is set, a CW carrier is transmitted at that frequency. A frequency of 0 turn the CW off. Default frequency value is 0.
Continuous Wave (CW) Power	rcstConfigLinesAirIfRtnLkDefIfLevel	DVB_RCS guidelines	
IP configuration NMC IP address	networkipAddrNMC	RSM-B	

Blind command	MIB object	MIB group	OID description
IP configuration NMC IP subnet	networkipSubnetNMC	RSM-B	
IP configuration RCST Management IP address	networkipAddrRCSTMngt	RSM-B	
Transmitter power (ODU EIRP)	rcstConfigLinesAirIfRtnLkMaxEirp	DVB_RCS guidelines	
Antenna Size or antenna type	rcstSysInstallOduAntennaSize	DVB_RCS guidelines	
Antenna Gain or ODU SSPA	rcstSysInstallOduSSPA	DVB_RCS guidelines	
GPS position configuration	rcstSysInstallLocation	DVB_RCS guidelines	

Annex A (normative): RSM-B RCST MIB

A.1 MIB definitions

A.1.1 network group

Table A.1: rcstRSMB network

OID	Name	Syntax	Access	Description / Definition
1	**ipAddRCSTMngt**	IpAddress	$R_{NIA}W_{NI}$	Management IP address of the RCST, equivalent to satellite air I/F IP address. This object used with both ip and interfaces MIB-II subgroups determines uniquely the satellite interface. This is the interface used for NMC management functions. Note that the IP_add_RCST_MNGT may be statically or dynamically assigned.
2	**ipAddrNMC**	IpAddress	$R_{NIA}W_{NI}$	NMS IP address to be used for management purposes. Parameter assigned via TIMu NLID.
3	**ipSubnetNMC**	OCTET STRING (6)	$R_{NIA}W_{NI}$	Upon reception at UI of an IP packet with an IP address that matches the NMC_subnet, Address coding uses the 5 bytes CIDR format aa.bb.cc.dd./ee. First byte is padded. Parameter assigned via TIM u NLID.
4	**pidTxMngt**	Integer32	$R_{NIA}W_{NI}$	Control and management PID for transmission. Parameter assigned via TIMu NLID.
5	**pidRxMngt**	Integer32	$R_{NIA}W_{NI}$	Control and management PID for reception. Parameter assigned via TIMu NLID.
6	**macDestMngt**	MacAddress	$R_{NIA}W_{NI}$	MAC address used when sending management information towards NMC. Parameter assigned via TIMu NLID.
7	**craSig**	Capacity Values	$R_{NIA}W_{NI}$	CRA Assigned to channel_id 0 via TIMu NLID and used for RCST signalling with NCC. Only least significant byte is used: 1 bit bslbf encoded defines the Scaling Factor (value "1" represents a Scaling Factor of 16, values "0" represents a Scaling Factor of 1) and it is followed by 7 bits uimsbf encoded representing a multiple M of 4 Kbps; the resulting rate is given by the product of the Scaling Factor x M x 4 Kbps.
8	**rbdcMaxSig**	Capacity Values	$R_{NIA}W_{NI}$	Maximum RBDC assigned to channel_id 0 via TIMu NLID and used for RCST signalling with NCC. Only least significant byte used: 1 bit bslbf encoded defines the Scaling Factor (value "1" represents a Scaling Factor of 16, values "0" represents a Scaling Factor of 1) and its is followed by 7 bits uimsbf encoded representing a multiple M of 4 Kbps; the resulting rate is given by the product of the Scaling Factor × M × 4 Kbps.
9	**ipNAT**			NAT configuration
9.1	**ipNATenable**	Integer32	$R_{NIA}W_{NI}$	Enables or disables the Network Address Translator. 0 = disabled;1 = enabled

OID	Name	Syntax	Access	Description / Definition
9.2	**ipNATdynamic**	INTEGER		Determines NAT functionality type: 0 = static, 1 = dynamic - Static translation establishes a one-to-one mapping between local address and a global address; - Dynamic translation establishes a mapping between an inside local address and a pool of global addresses.
9.3	**ipNATdynamicTable**	Sequence	NA	The RCST supporting dynamic NAT shall be able to map a single global address to a single local address. Up to 5 global addresses may be configurable in the RCST and are defined within this pool.
9.3.1	**ipNATdynamicEntry**	Sequence of	NA	Sequence of{ IpNATdynamicIndex, IpNATdynamicAddr, IpNATdynamicAddrStatus}
9.3.1.1	**ipNATdynamicIndex**	Integer32	NA	Table index
9.3.1.2	**ipNATdynamicAddr**	IpAddress	$R_{NIA}W_{NI}$	Up to 5 global Ip addresses may be defined
9.3.1.3	**ipNATdynamicAddrStatus**	RowStatus	$R_{NIA}W_{NI}$	Status entry: active or not in service
10	**ipNAPT**			NAPT configuration
10.1	**ipNAPTenable**	Integer32	$R_{NIA}W_{NI}$	Enables or disables the Network Address Port Translator. 0 = disable;1 = enabled
10.2	**ipNAPTdynamic**	INTEGER	$R_{NIA}W_{NI}$	Determines NAPT functionality: 0 = static, 1 = dynamic
11	**ipNATtranslationsTable**	Sequence of ipNATtranslationEntry	NA	Table that reflects the active static/dynamic NAT / NAPT sessions in the RCST.
11.1	**ipNATtranslationsEntry**	Sequence	NA	Sequence of{ ipNATtranslationIndex, ipNATtranslationOutsideAddr, ipNATtranslationInsideAddr, ipNATtranslationOutsidePort} ipNATtranslationInsidePort]
11.1.1	**ipNATtranslationIndex**	INTEGER	NA	Table Index
11.1.2	**ipNATtranslationOutsideAddr**	IpAddress	$R_{NIA}W_{NI}$	Outside (global) IP address
11.1.3	**ipNATtranslationInsideAddr**	IpAddress	$R_{NIA}W_{NI}$	Inside (local) IP address (private)
11.1.4	**ipNATtranslationOutsidePort**	Integer32	$R_{NIA}W_{NI}$	Outside (global) port value
11.1.5	**ipNATtranslationInsidePort**	Integer32	$R_{NIA}W_{NI}$	Inside (local) port value
12	**ipNATstadisticsTable**	Sequence of ipNATstadisticsEntry	NA	Table that summarizes a groups of counters that reflect the status of NAT activity in the terminal.
12.1	**ipNATstadisticsEntry**	Sequence	NA	Sequence of{ ipNATstadisticsIndex, ipNATstadisticsTotalSessions, ipNATstadisticsActiveSessions, ipNATstadisticsFailedSessions, ipNATstadisticsPacketTranslations}
12.1.1	**ipNATstadisticsIndex**	INTEGER	NA	Table Index
12.1.2	**ipNATstadisticsTotalSessions**	Counter32	R_{NIA}	Total number of NAT sessions
12.1.3	**ipNATstadisticsActiveSessions**	Counter32	R_{NIA}	Number of active NAT sessions
12.1.4	**ipNATstadisticsFailedSessions**	Counter32	R_{NIA}	Number of Failed NAT sessions
12.1.5	**ipNATstadisticsPacketTranslations**	Counter32	R_{NIA}	Number of NAT packet translations done

A.1.2 multicast group

Table A.2: rcstRSMB multicast

OID	Name	Syntax	Access	Description / Definition
1	**igmp**	Integer32	$R_{NIA}W_{NI}$	Value that determines basic igmp multicast functionality on RCST user interface. 0 = disabled: GW_RCST, that behaves transparent to IGMP messages 1 = enabled: User RCST, igmp Querier implemented on the User Interface
2	**igmpProxyFunctionality**	Integer32	$R_{NIA}W_{NI}$	Value that determines igmp multicast functionality on RCST satellite interface. 0 = disabled, User RCST mesh multicast functionality implemented (igmp Querier only on the User Interface) 1 = enabled, User RCST star multicast functionality implemented (igmp Querier on UI and igmp Host on Satellite interface)
3	**pidMMT**	Integer32	$R_{NIA}W_{NI}$	Pid used for MMT decoding
4	**ipMulticastPrefixTable**	Sequence of ipMulticastPrefixEntry	NA	Pool of meshed IP multicast addresses dedicated to a RCST. The RCST shall forward meshed multicast traffic to the satellite interface if these packets belong to the pool of meshed IP multicast addresses dedicated to this RCST. Address coding uses the 5 bytes CIDR format aa.bb.cc.dd./ee. First byte is padded.
4.1	**ipMulticastSubnetPrefixEntry**	Sequence	NA	Sequence of{ ipMulticastIndex, ipMulticastSubnetPrefix, ipMulticastPrefixStatus, ipMulticastPrefixInterface}
4.1.1	**ipMulticastIndex**	Integer32	NA	Table index for each entry
4.1.2	**ipMulticastSubnetPrefix**	OCTET STRING(6)	$R_{NIA}W_{NI}$	IP multicast subnet prefix values
4.1.3	**ipMulticastSubnetPrefixStatus**	RowStatus	$R_{NIA}W_{NI}$	Attribute used to manage the creation / deletion of an ip Multicast Prefix entry.
5	**ifMulticastTable**	Sequence of ifMulticastEntry	NA	Table that reflects the multicast parameters configured per interface (LAN or Satellite Interface).
5.1	**ifMulticastEntry**	Sequence	NA	Sequence of{ ifMulticastIndex, ifMulticastIgmpUnsolicitedInterval, ifMulticastIgmpQueryInterval, ifMulticastIgmpMaxResponseTime, ifMulticastEntryStatus}
5.1.1	**ifMulticastIndex**	Integer32	NA	Index value which identifies the interface to which this entry is applicable. The interface identified by a particular value of this index is the same interface as identified by the value fo ifIndex in MIB II: "1": User Interface (ethernet I/F); "2": Loopback; "3": Satellite Interface
5.1.2	**ifMulticastIgmpUnsolicitedInterval**	Integer32	$R_{NIA}W_{NI}$	Time between repetitions of a host's initial report of membership in a group (in seconds). Default value 10 sec.
5.1.3	**ifMulticastIgmpQueryInterval**	Integer32	$R_{NIA}W_{NI}$	Frequency at which IGMP Host – Query packets are transmitted on this interface (in seconds) Valid range [60 to 600]. Default value 125 sec.
5.1.4	**ifMulticastIgmpMaxResponseTime**	Integer32	$R_{NIA}W_{NI}$	Maximum query response time advertised in IGMPv2 queries on this interface (in seconds). Valid range [10 to 25]. Default value is 10.
5.1.5	**ifMulticastIgmpEntryStatus**	RowStatus	$R_{NIA}W_{NI}$	Value used to reflect the entry status of the table: not in service or active, having static snmp table implementation.

A.1.3 configSLA group

A.1.3.1 flowtypes

Table A.3: rcstRSMB configSLA flowTypes

OID	Name	Syntax	Access	Description / Definition
1	**flowTypetable**	Sequence of flowTypeEntry	NA	Table that defines the multifield classification per priority level and the C2P parameters associated. This table is expected to have a maximum of 20 entries, including a default entry. The default type of flow is recognised as being the last entry e.g. the 3rd one if there are only 3 entries, the 6th one if 6 entries are used) Default values: - Src IP address: 0.0.0.0 - Src IP Mask: all 0 - Dst IP address: 0.0.0.0 - Dst IP Mask: all 0 - DSCP Min: 0 - DSCP Max: 255 - Protocol: 255 - Protocol Mask: 0 - Src Port Min: 0 - Src Port Max: 255 - Dst Port Min: 0 - Dst Port Max: 255
1.1	**flowTypeEntry**	Sequence	NA	Sequence of { flowTypeIndex, flowTypeSrcIpAddr, flowTypeSrcIpAddrMask, flowTypeDstIpAddr, flowTypeDstIpAddrMask, flowTypeDSCPmin, flowTypeDSCPmax, flowTypeProtocol, flowTypeProtocolMask, flowTypeSrcPortMin, flowTypeSrPortMax, flowTypeDstPortMin, flowTypeDstPortMax, C2P_activityTimer, C2P_prio, C2P_SDR_rtn, C2P_PDR_rtn, C2P_SDR_fwd, C2P_PDR_fwd, C2P_UniBidir, flowTypeStatus}
1.1.1	**flowTypeIndex**	Integer32	NA	Index (0 to 5)
1.1.2	**flowTypeSrcIpAddr**	IpAddress	$R_{NIA}W_{NI}$	Flow type source IP address value.
1.1.3	**flowTypeSrcIpAddrMask**	IpAddress	$R_{NIA}W_{NI}$	Flow Type source IP address mask. A bit value of 0 indicates a 'don´t care' on the value when compared to incoming IP header field.
1.1.4	**flowTypeDstIpAddr**	IpAddress	$R_{NIA}W_{NI}$	Flow Type destination IP address value.
1.1.5	**flowTypeDstIpAddrMask**	IpAddress	$R_{NIA}W_{NI}$	Flow Type destination IP address mask. A bit value of 0 indicates a 'don´t care' on the value when compared to incoming IP header field.
1.1.6	**flowtypeDSCPmin**	Integer32	$R_{NIA}W_{NI}$	DSCP range min value. DSCP is a six-bit value, and can vary from xx000 000 to xx111 111 in terms of bits value.
1.1.7	**flowTypeDSCPmax**	Integer32	$R_{NIA}W_{NI}$	DSCP range max value DSCP is a six-bit value, and can vary from xx000 000 to xx111 111 in terms of bits value.
1.1.8	**flowTypeProtocol**	Integer32	$R_{NIA}W_{NI}$	Protocol type value.

OID	Name	Syntax	Access	Description / Definition
1.1.9	**flowTypeProtocolMask**	Integer32	$R_{NIA}W_{NI}$	Protocol type mask. A bit value of 0 indicates a 'don´t care' on the value when compared to incoming IP header field.
1.1.10	**flowTypeSrcPortMin**	Integer32	$R_{NIA}W_{NI}$	Source port range min value.
1.1.11	**flowTypeSrcPortMax**	Integer32	$R_{NIA}W_{NI}$	Source port range last value.
1.1.12	**flowTypeDstPortMin**	Integer32	$R_{NIA}W_{NI}$	Destination port range min value.
1.1.13	**flowtypeDstPortMax**	Integer32	$R_{NIA}W_{NI}$	Destination port range max value.
1.1.14	**c2pActivityTimer**	Integer32	$R_{NIA}W_{NI}$	Connection transmission activity timer value, applicable for transmission and reception. Value given in second, from 1 to 231 sec.
1.1.15	**c2pPrio**	INTEGER	$R_{NIA}W_{NI}$	Connection Control PRIO value: "0" LP; "1" HP; "2" HPj.
1.1.16	**c2pSdrRtn**	CapacityValues	$R_{NIA}W_{NI}$	Connection SDR for RCST transmission Only the least significant byte used: 1 bit bslbf encoded defines the Scaling Factor (value "1" represents a Scaling Factor of 16, values "0" represents a Scaling Factor of 1) and it is followed by 7 bits uimsbf encoded representing a multiple M of 4 Kbps; the resulting rate is given by the product of the Scaling Factor x M x 4 Kbps.
1.1.17	**c2pPdrRtn**	CapacityValues	$R_{NIA}W_{NI}$	Connection PDR for RCST transmission Only the least significant byte used: 1 bit bslbf encoded defines the Scaling Factor (value "1" represents a Scaling Factor of 16, values "0" represents a Scaling Factor of 1) and it is followed by 7 bits uimsbf encoded representing a multiple M of 4 Kbps; the resulting rate is given by the product of the Scaling Factor x M x 4 Kbps.
1.1.18	**c2pSdrFwd**	CapacityValues	$R_{NIA}W_{NI}$	Connection SDR for RCST reception Only the least significant byte used: 1 bit bslbf encoded defines the Scaling Factor (value "1" represents a Scaling Factor of 16, values "0" represents a Scaling Factor of 1) and it is followed by 7 bits uimsbf encoded representing a multiple M of 4 Kbps; the resulting rate is given by the product of the Scaling Factor × M × 4 Kbps.
1.1.19	**c2pPdrFwd**	CapacityValues	$R_{NIA}W_{NI}$	Connection PDR for RCST reception Only the least significant byte used: 1 bit bslbf encoded defines the Scaling Factor (value "1" represents a Scaling Factor of 16, values "0" represents a Scaling Factor of 1) and it is followed by 7 bits uimsbf encoded representing a multiple M of 4 Kbps; the resulting rate is given by the product of the Scaling Factor × M × 4 Kbps.
1.1.20	**c2pUniBiDir**	CapacityValues	$R_{NIA}W_{NI}$	The type of connection that this flow requires: "1", unidirectional or "2" bi-directional.
1.1.21	**flowTypeStatus**	CapacityValues	$R_{NIA}W_{NI}$	Attribute used to manage the creation / deletion of a Flow Type entry.
2	**c2pMaxNbrConnections**	Integer32	$R_{NIA}W_{NI}$	Maximum global number of connections that the RCST IDU may support.

A.1.3.2 modify

Table A.4: rcstRSMB configSLA modify

OID	Name	Syntax	Access	Description / Definition
1	**modifyHighWaterMark**	Integer32	$R_{NIA}W_{NI}$	High watermark relative to the guaranteed capacity authorised for the RCST. Capacity request activated by channel modify when MPEG packets, in terms of a certain number of bytes, in the buffer rises above this threshold in the HP queue. Units in hundreds of bytes.
2	**modifyLowWaterMark**	Integer32	$R_{NIA}W_{NI}$	Low watermark relative to the guaranteed capacity authorised for the RCST. Decreasing direction capacity request by channel modify activated when MPEG packets , in terms of a certain number of bytes, in the buffer are below this threshold in HP queue. Units in hundreds of bytes.
3	**modifyTime**	Integer32	$R_{NIA}W_{NI}$	Time allowed between two consecutive channel_modify messages, given in seconds.
4	**craMod**	Sequence of ipMulticastPrefixEntry	$R_{NIA}W_{NI}$	CRA quantity step requested by channel modify mechanism. Only the first byte used: 1 bit bslbf encoded defines the Scaling Factor (value "1" represents a Scaling Factor of 16, values "0" represents a Scaling Factor of 1) and it is followed by 7 bits uimsbf encoded representing a multiple M of 4 Kbps; the resulting rate is given by the product of the Scaling Factor × M × 4 Kbps.

A.1.4 physical layer group

Table A.5: rcstRSMB physicalLayer

OID	Name	Syntax	Access	Description / Definition
1	**powerLevelOffsetSYNCTRF**	Integer32	R_NW_N	PowerLevelOffset between SYNC and TRF. Value given in dBs.
2	**forwardLinkEbN0**	Integer32	R_N	Eb/N0 measured in the forward link. Performance parameter of the forward link. Value given in tenth of dB and a precision of 0,1 dB.
3	**cwTest**	Integer32	R_NW_N	Frequency specified in multiple of 100 Hz for CW Test mode. When the frequency is set, a CW carrier is transmitted at the frequency. A frequency of 0 turns the CW off. Default frequency value is 0.
4	**returnLinkEbN0**	Integer32	R_N	Eb/N0 measured in the return link. Performance parameter of the return link. Value given in tenth of dB and a precision of 0,1 dB.

A.1.5 security group

Table A.6: rcstRSMB security

OID	Name	Syntax	Access	Description / Definition
1	**applicationLayer**	NA		Authentication / authorization parameters
1.1	**QKE**	OCTET STRING (20)	R_NW_N	160 bits octet string needed to perform QKE
2	**networkLayer**	NA		Security on network layer based on IPSec
2.1	**ipSecEnable**	INTEGER	R_NW_N	Value that determines IPSEC functionality: 0 = static; 1 = dynamic

A.2 Access rights

The write and read access rights of any SNMP object are defined/identified according to the different users/entities. In the RCST MIB definition within the present document, the following notations are used in the scope of the access rights:

Table A.7: SNMP access rights

Notations	Access Right
"W"	Write access
"R"	Read access
"C"	Create access
"NA"	Not Accessible
"A"	Local Administrator
"I"	Installer
"N"	NMC, Network Manager Center

The access rights to a particular SNMP object are defined cross-checking both the maximum level of access of that SNMP object and the access rights granted to the entity according to its community name.

Table A.8: Relationship between SNMPv2 MIB MAX-ACCESS value and protocol access mode

SNMPv2 Protocol Operation		
MAX-ACCESS Value	READ-ONLY	READ-WRITE
read-only	Available for get and trap operations	
read-write	for get and trap operations	Available for get, set, and trap operations
read-create	Available for get and trap operations	Available for get, set, create, and trap operations
accessible-for-notify	Available for trap operations	
not-accessible	Unavailable	

A.3 Access policy

The process that the RCST shall follow when receiving an SNMP set/get message is based on the following steps:

- Check that SNMP is enabled for the interface via which the request is received.
- Check in the rcstConfigAccessPolicyTable table if the SNMP request is coming from a valid IP subnet (note that the network mask can be set to 255.255.255.255 so that it maps to a unique IP address) and if this subnet is associated with the given community string.
- Check that the request type (GET/SET) match the permission assigned to the community (using the corresponding MIB view to the community name defined in the rcstConfigAccessPolMibViewTable).
- Request performed calling the correct low level SNMP request handler. Not the if MAX_ACCESS for the object is READ-ONLY there will be no SET function to call and the response will be an error message.

The process that shall be followed by the RCST when sending a trap is the following:

- RCST parses the rcstLifeTrapDest table based on the trap OID. A "Trap Destination Management Entity" is associated to each occurrence (in the rcstLifeTrapDestTable) of this trap OID.
- RCST parses the rcstConfigAccessPolicyTable based on the "Trap Destination Management Entities" ("Management Entity Name"). A rcstConfigAccessPolicyIpAddr is associated to each occurrence (in the rcstConfigAccessPolicyTable) of these "Trap Destination Management Entities" ("Management Entity Name").
- Traps are sent to these IP addresses.

Table A.9: rcstConfigAccessPolicyTable

RCSTConfigAccessPolicyIndex	RCSTConfigAccessPolicyIpAddr	RCSTConfigAccessPolicyCommunityName
1	Primary NMC IP address	NMC_Manager
2	Backup NMC IP address	NMC_Manager
3	Primary SMS IP address	SuperUser
4	Backup SMS IP address	Installer
5	RCST IP address	Public
6	Service Station IP Address	Service
7	Installer host IP address	Installer
8	Other IP address	Public

Table A 10: rcstConfigAccessPolMibViewTable

RCSTConfigAccessPolMibViewIndex	RCSTConfigAccessPolMibViewCommunityName	RCSTConfigAccessPolMibViewPrefix	RCSTConfigAccessPolMibViewAccessRight
1	NMC_Manager	RCSTSysInstall	read-only
2	SuperUser	RCSTSysInstall	read-only
3	Installer	RCSTSysInstall	read-write
4	Service	RCSTSysInstall	read-write
5	Public	RCSTSysInstall	not-accessible
6	NMC_Manager	RCSTSysIdu	read-write
7	SuperUser	RCSTSysIdu	read-only
8	Installer	RCSTSysIdu	read-write
9	Service	RCSTSysIdu	read-write
10	Public	RCSTSysIdu	not-accessible
11	NMC_Manager	RCSTConfigNetwork	read-write
12	SuperUser	RCSTConfigNetwork	read-only
13	Installer	RCSTConfigNetwork	read-write
14	Service	RCSTConfigNetwork	read-write
15	Public	RCSTConfigNetwork	not-accessible
16	NMC_Manager	RCSTAccessPol	read-write
17	SuperUser	RCSTAccessPol	read-only
18	Installer	RCSTAccessPol	read-write
19	Service	RCSTAccessPol	read-write
20	Public	RCSTAccessPol	not-accessible
21	NMC_Manager	RCSTConfigLinesAirIfRtnLk	read-write
22	SuperUser	RCSTConfigLinesAirIfRtnLk	not-accessible
23	Installer	RCSTConfigLinesAirIfRtnLk	read-write
24	Service	RCSTConfigLinesAirIfRtnLk	read-write
25	Public	RCSTConfigLinesAirIfRtnLk	not-accessible
26	NMC_Manager	RCSTConfigLinesAirIfAccess	read-write
27	SuperUser	RCSTConfigLinesAirIfAccess	read-only
28	Installer	RCSTConfigLinesAirIfAccess	read-write
29	Service	RCSTConfigLinesAirIfAccess	read-write
30	Public	RCSTConfigLinesAirIfAccess	not-accessible
31	NMC_Manager	RCSTLifeRCSTStatus	read-only
32	SuperUser	RCSTLifeRCSTStatus	read-only
33	Installer	RCSTLifeRCSTStatus	read-only
34	Service	RCSTLifeRCSTStatus	read-only
35	Public	RCSTLifeRCSTStatus	not-accessible
36	NMC_Manager	RCSTLifeTrapLog	read-only
37	SuperUser	RCSTLifeTrapLog	read-only
38	Installer	RCSTLifeTrapLog	read-only
39	Service	RCSTLifeTrapLog	read-only
40	Public	RCSTLifeTrapLog	not-accessible
41	ISP_SSP	RCSTLifeTrapLog	not-accessible
42	NMC_Manager	RCSTLifeTrapDest	read-write
43	SuperUser	RCSTLifeTrapDest	read-write
44	Installer	RCSTLifeTrapDest	read-write
45	Service	RCSTLifeTrapDest	read-write
46	Public	RCSTLifeTrapDest	not-accessible
47	ISP_SSP	RCSTLifeTrapDest	not-accessible
48	NMC_Manager	RCSTLifeTrap	not-accessible

RCSTConfigAccessPolMibViewIndex	RCSTConfigAccessPolMibViewCommunityName	RCSTConfigAccessPolMibViewPrefix	RCSTConfigAccessPolMibViewAccessRight
49	SuperUser	RCSTLifeTrap	not-accessible
50	Installer	RCSTLifeTrap	not-accessible
51	Service	RCSTLifeTrap	not-accessible
52	Public	RCSTLifeTrap	not-accessible
53	ISP_SSP	RCSTLifeTrap	not-accessible
54	NMC_Manager	RCSTAct	read-write
55	SuperUser	RCSTAct	read-write
56	Installer	RCSTAct	read-write
57	Service	RCSTAct	read-write
58	Public	RCSTAct	not-accessible
59	NMC_Manager	RCSTCallCntl	read-write
60	SuperUser	RCSTCallCntl	read-only
61	Installer	RCSTCallCntl	read-only
62	Service	RCSTCallCntl	read-only
63	Public	RCSTCallCntl	not-accessible
64	NMC_Manager	RCSTCallCntlTrap	not-accessible
65	SuperUser	RCSTCallCntlTrap	not-accessible
66	Installer	RCSTCallCntlTrap	not-accessible
67	Service	RCSTCallCntlTrap	not-accessible
68	Public	RCSTCallCntlTrap	not-accessible
69	NMC_Manager	RCSTCallCntlMpeg	read-write
70	SuperUser	RCSTCallCntlMpeg	read-only
71	Installer	RCSTCallCntlMpeg	read-only
72	Service	RCSTCallCntlMpeg	read-only
73	Public	RCSTCallCntlMpeg	not-accessible
74	NMC_Manager	RCSTCallCntlTrapMpeg	not-accessible
75	SuperUser	RCSTCallCntlTrapMpeg	not-accessible
76	Installer	RCSTCallCntlTrapMpeg	not-accessible
77	Service	RCSTCallCntlTrapMpeg	not-accessible
78	Public	RCSTCallCntlTrapMpeg	not-accessible
79	NMC_Manager	RCSTSysCapability	read-write
80	SuperUser	RCSTSysCapability	not-accessible
81	Installer	RCSTSysCapability	read-write
82	Service	RCSTSysCapability	read-write
83	Public	RCSTSysCapability	not-accessible
84	NMC_Manager	RCSTRsmBNetwork	read-write
85	SuperUser	RCSTRsmBNetwork	read-only
86	Installer	RCSTRsmBNetwork	read-write
87	Service	RCSTRsmBNetwork	not-accessible
88	Public	RCSTRsmBNetwork	not-accessible
89	NMC_Manager	RCSTRsmBMulticast	read-write
90	SuperUser	RCSTRsmBMulticast	read-only
91	Installer	RCSTRsmBMulticast	read-write
92	Service	RCSTRsmBMulticast	not-accessible
93	Public	RCSTRsmBMulticast	not-accessible
94	NMC_Manager	RCSTRsmBConfigSLA	read-write
95	SuperUser	RCSTRsmBConfigSLA	read-only
96	Installer	RCSTRsmBConfigSLA	read-write
97	Service	RCSTRsmBConfigSLA	not-accessible
98	Public	RCSTRsmBConfigSLA	not-accessible
99	NMC_Manager	RCSTRsmBPhysicalLayer	read-write
100	SuperUser	RCSTRsmBPhysicalLayer	read-only
101	Installer	RCSTRsmBPhysicalLayer	read-write
102	Service	RCSTRsmBPhysicalLayer	not-accessible
103	Public	RCSTRsmBPhysicalLayer	not-accessible

A.4 MIB syntax

SNMP Object Type	Description
Integer32	Represents integer-valued information -2^31 and +2^31 inclusive. Big Endian order shall be used in transmission in the protocol as required by SNMP ASN.1/BER
INTEGER	Used to represent integer-valued information as named-number enumeration. In this case, only those named-numbers so enumerated may be present as a value.
OCTET STRING	A string of 0 or more 8-bit bytes. Each byte has a value between 0 and 255. In the BER encoding used for this data type, a count of the number of bytes in the string precedes the string. These strings are not null-terminated strings.
PhysAddress	OCTET STRING specifying a media or physical address.
MacAddress	represents an 802 MAC address represented in the "canonical" order defined by IEEE 802.1[a], OCTET STRING (SIZE(6)).
Counter	A non-negative integer whose value increases monotonically from 0 to 2^32 – 1, and then wraps back to 0.
Gauge	A non-negative integer between 0 and 2^32 –1, whose value can increase or decrease, but latches at its maximum value. That is, if the value increments to 2^32 –1, it stays there until reset.
RowStatus	Type textual convention, mainly used to declare dynamic tables, to manage the creation and deletion of conceptual rows, used as the value of the SYNTAX clause for the status column of a conceptual row. See RFC 2579 [4].
TimeTicks	Non-negative integer which represents the time, modulo 2^32 (4 294 967 296 decimal), in hundredths of a second between two epochs.
TimeStamp	Textual convention based on the TimeTicks type. With a TimeStamp, the first reference epoch is defined as the time when sysUpTime (MIB-II system SNMP object) was zero, and the second reference epoch is defined as the current value of sysUpTime.
SEQUENCE	Similar to a programming structure with entries.
Sequence Of	An array with elements with one type.
CapacityValues	Type textual Convention used to define Capacity as stated in DVB-RCS guidelines for Connection Control Protocol capacity. The encoding is done as follows: 1 bit bslbf encoded (bit string, left bit first) defines the scaling factor (value 1 represents a scaling factor of 16, value 0 represents a Scaling factor of 1); it is followed by 7 bits uimsbf encoded (unsigned integer, most significant bit first) representing a multiple M of 4kbit/s; overall the resulting capacity is given by the product of the Scaling factor × M × 4kbps.

A.5 NAT configuration

RCST would either support dynamic or static NAT/NAPT. Both types of NAT should be applied over all the active connections present in the RCST. Therefore NAT configuration should follow the same rules as the Type of Flow table. Any change done in the MIB will not become effective till a next reboot/restart of the terminal (and previously save the configuration if necessary).

Dynamic NAT works over all the connections initiated from the LAN and that are forwarded towards the DVB interface. The source address of the outgoing packets is replaced by the global NAT address defined in the NAT for global addresses even before the connection is established. The connection is requested with the translated IP address.

Static NAT will make possible to have bidirectional access to servers located behind the NAT, something that did not happen with dynamic NAT. This way the IP destination address of incoming packets is replaced by the local IP address, configured in the NAT static table. Also, whenever a packet is sent towards the satellite network, the source IP address of the outgoing packet is replaced by the global address configured in the table. The connection, as in the case of dynamic NAT, is established based on the translated IP addresses.

A.6 GPS configuration

GPS position configuration of the terminal ODU, may either be given in XYZ coordinates (geodesic reference ITRF96) or LatLongEI (WGS84) coordinates, depending on the terminal manufacturer.

A.6.1 XYZ coordinates

XYZ coordinates: Geodesic reference ITRF (IERS Terrestrial Reference Frame). The co-ordinatinates x, y and z are given in meters.

Floating notation notation shall be used with 6 digits after the decimal. E.g. "1,23481e+"6; –4,309632e+06; 4,510650e+06". The first parameter is the x co-ordinate, the second parameter is the y co-ordinate and the third parameter is the z co-ordinate.

A.6.2 LatLongEl coordinates

"LatLongEl" format: the latitude and longitude uses WGS84 format giving the following values:

- PosLatDeg: Latitude degrees.
- PosLatMin: Latitude minutes.
- PosLatMinFrac: Latitude minutes fraction.
- PosLatDir: Latitude direction.
- PosLongDeg: Longitude degrees.
- PosLongMin: Longitude minutes.
- PosLongMinFrac: Longitude minutes fraction.
- PosLongDir: Longitude direction.
- PosAlt: Altitude (in meters).

A.7 RSM-B ASN.1 format

```
RSMB-RCST-MIB DEFINITIONS ::= BEGIN


   IMPORTS
          IpAddress, Integer32,
       OBJECT-TYPE,MODULE-IDENTITY
          FROM SNMPv2-SMI
       RowStatus, MacAddress, TEXTUAL-CONVENTION
          FROM SNMPv2-TC;



--    rcstRSMB MODULE-IDENTITY
      network MODULE-IDENTITY
       LAST-UPDATED "0604181500z"
       ORGANIZATION "Alcatel Space"
```

```
       CONTACT-INFO
              "ALCATEL ESPACIO
               C/EINSTEIN, 7
               28760 - TRES CANTOS
               MADRID
               ESPANA "

       DESCRIPTION
              "RSM-B RCST MIB extension subtree."
       REVISION    "0604181500z"
       DESCRIPTION "Original Version.
                    This MIB definition includes the specific mib objects
           required for RSM-B RCST implementation."

       ::= { spdRcstRSMBMib 1 }

-================================================================================
       -- Definition of RSM-B RCS Terminal Generator MIB OID Tree
--================================================================================
   alcatel               OBJECT IDENTIFIER ::= { enterprises 637 }
   space                 OBJECT IDENTIFIER ::= { alcatel 56 }
   spdProduct            OBJECT IDENTIFIER ::= { space 4 }
   spdDvbRcstExtension   OBJECT IDENTIFIER ::= { spdProduct 40 }
   spdRcstRSMBMib              OBJECT IDENTIFIER ::= { spdDvbRcstExtension 1 }



--================================================================================
       -- Definition of RSMB RCS Terminal Generator MIB OID Tree
--================================================================================
--        network                  OBJECT IDENTIFIER ::= { spdRcstRSMBMib 1 }
        multicast               OBJECT IDENTIFIER ::= { spdRcstRSMBMib 2 }
        configSLA               OBJECT IDENTIFIER ::= { spdRcstRSMBMib 3 }
        physicalLayer           OBJECT IDENTIFIER ::= { spdRcstRSMBMib 4 }
       security                OBJECT IDENTIFIER ::= { spdRcstRSMBMib 5 }
        flowTypes       OBJECT IDENTIFIER ::= { configSLA 1}
        modify          OBJECT IDENTIFIER ::= { configSLA 2}

   applicationLayer OBJECT IDENTIFIER ::= { security 1}
   networkLayer     OBJECT IDENTIFIER ::= { security 2}
```

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

            -- Definition of Textual conventions

--============================================================================

        CapacityValues ::= TEXTUAL-CONVENTION

        STATUS       current

        DESCRIPTION

            "Capacity, as defined in the DVB-RCS connection control protocol (TR 101 790).

             Encoding: 1 bit bslbf encoded (bit string, left bit first) defines The Scaling Factor(value 1

             represents a Scaling Factor of 16, value 0 represents a Scaling Factor of 1) and it is followed by

             7 bits uimsbf encoded (unsigned integer, most significant bit first) representing a multiple M of

             4kbit/s; overall, the resulting capacity is given by the product of the Scaling Factor*M*4kbit/s."

        SYNTAX OCTET STRING (SIZE(1))


--============================================================================

       -- Definition of network MIB OID Tree

--============================================================================


        ipAddRCSTMngt   OBJECT-TYPE

        SYNTAX              IpAddress

        MAX-ACCESS          read-write

        STATUS              current

        DESCRIPTION

            "Management Ip address of the RCST.

       Object used with both ip and interfaces mib-2 subgroups:

            satellite interface IP address used by NMC for management functions."

          ::={network 1}

        ipAddNMC    OBJECT-TYPE

        SYNTAX              IpAddress

        MAX-ACCESS          read-write

        STATUS              current

        DESCRIPTION

            "NMS IP address to be used for management purposes."

          ::={network 2}

        ipSubnetNMC     OBJECT-TYPE

        SYNTAX              OCTET STRING(SIZE(6))

        MAX-ACCESS          read-write

        STATUS              current

        DESCRIPTION

            "Upon reception of UI of an IP packet which IP Address matches the NMC_subnet,

      address coding uses the 5 bytes CIDR format as aa.bb.cc.dd/ee.

      First byte is padded"

          ::={network 3}
```

```
pidTxMNGT   OBJECT-TYPE
SYNTAX              Integer32 (0..8191)
MAX-ACCESS          read-write
STATUS              current
DESCRIPTION
    "Control and management PID for transmission."
  ::={network 4}
pidRxMNGT   OBJECT-TYPE
SYNTAX              Integer32 (0..8191)
MAX-ACCESS          read-write
STATUS              current
DESCRIPTION
    "Control and management PID for reception."
  ::={network 5}

macDestMNGT     OBJECT-TYPE
SYNTAX              MacAddress
MAX-ACCESS          read-write
STATUS              current
DESCRIPTION
    "MAC address used when sending management information towards NMC"
  ::={network 6}

craSig      OBJECT-TYPE
SYNTAX              CapacityValues
MAX-ACCESS          read-write
STATUS              current
DESCRIPTION
    "CRA assigned to channel_id 0."
  ::={network 7}

rbdcMaxSig      OBJECT-TYPE
SYNTAX              CapacityValues
MAX-ACCESS          read-write
STATUS              current
DESCRIPTION
    "Maximum RBDC assigned to channel_id 0."
  ::={network 8}
```

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

       -- Definition of NAT/NAPT MIB OID subTrees

--================================================================================

   ipNAT  OBJECT IDENTIFIER ::= { network 9 }

   ipNATenable  OBJECT-TYPE

   SYNTAX    INTEGER {

      enable (0),

      disable (1)

   }

   MAX-ACCESS    read-write

   STATUS    current

   DESCRIPTION      ""

          ::= { network ipNAT 1 }


   ipNATdynamic  OBJECT-TYPE

   SYNTAX    INTEGER { static (0),   dynamic (1)   }

   MAX-ACCESS    read-write

   STATUS    current

   DESCRIPTION      ""

          ::= { ipNAT 2}


   ipNATdynamicTable   OBJECT-TYPE

   SYNTAX SEQUENCE OF IpNATdynamicEntry

   MAX-ACCESS    not-accessible

   STATUS    current

   DESCRIPTION

      "RCST supporting dynamic NAT shall be able to map a single global address to a single local address.

      Up to 5 global addresses may be configured in the RCST and are defined in this pool"

          ::= { ipNAT 3}

   ipNATdynamicEntry  OBJECT-TYPE

   SYNTAX    IpNATdynamicEntry

   MAX-ACCESS    not-accessible

   STATUS    current

   DESCRIPTION

      "Sequence of global IP addresses to be used for dynamic NAT"

   INDEX { ipNATdynamicTableIndex }

          ::= { ipNATdynamicTable 1 }


   IpNATdynamicEntry ::= SEQUENCE {

      ipNATdynamicTableIndex     Integer32,

      ipNATdynamicTableAddr      IpAddress,

      ipNATdynamicTableAddrStatus    RowStatus
```

```
}
ipNATdynamicTableIndex  OBJECT-TYPE
SYNTAX    Integer32
MAX-ACCESS    not-accessible
STATUS    current
DESCRIPTION      ""
       ::= { ipNATdynamicEntry 1 }
ipNATdynamicTableAddr  OBJECT-TYPE
SYNTAX    IpAddress
MAX-ACCESS    read-write
STATUS    current
DESCRIPTION      ""
       ::= { ipNATdynamicEntry 2 }
ipNATdynamicTableAddrStatus  OBJECT-TYPE
SYNTAX    RowStatus
MAX-ACCESS    read-write
STATUS    current
DESCRIPTION      "Status entry: active or not in service"
       ::= { ipNATdynamicEntry 3 }
ipNAPT  OBJECT IDENTIFIER ::= { network 10 }
ipNAPTenable  OBJECT-TYPE
SYNTAX    INTEGER {     enable (0),   disable (1)   }
MAX-ACCESS    read-write
STATUS    current
DESCRIPTION
   ""
       ::= { ipNAPT 1 }
ipNAPTdynamic    OBJECT-TYPE
SYNTAX    INTEGER {     static (0),      dynamic (1)   }
MAX-ACCESS    read-write
STATUS    current
DESCRIPTION
   ""
       ::= { ipNAPT 2 }
ipNATtranslationsTable  OBJECT-TYPE
SYNTAX SEQUENCE OF IpNATtranslationsEntry
MAX-ACCESS    not-accessible
STATUS    current
DESCRIPTION
   "RCST supporting NAT/NAPT will give the status of NAT/NAPT sessions in this table"
       ::= { network 11 }
ipNATtranslationsEntry  OBJECT-TYPE
```

```
SYNTAX    IpNATtranslationsEntry
MAX-ACCESS    not-accessible
STATUS    current
DESCRIPTION
   "Table that reflects the active static/dynamic NAT/NAPT sessions in the RCST"
INDEX { ipNATtranslationsTableIndex }
       ::= { ipNATtranslationsTable 1 }
IpNATtranslationsEntry ::= SEQUENCE {
   ipNATtranslationsTableIndex       Integer32,
   ipNATtranslationsOutsideAddr      IpAddress,
   ipNATtranslationsInsideAddr       IpAddress,
   ipNATtranslationsOutsidePort      Integer32,
   ipNATtranslationsInsidePort       Integer32
}
ipNATtranslationsTableIndex  OBJECT-TYPE
SYNTAX    Integer32
MAX-ACCESS    not-accessible
STATUS    current
DESCRIPTION
   "Index of ipNATtranslationsTable"
       ::= { ipNATtranslationsEntry 1 }
ipNATtranslationsOutsideAddr  OBJECT-TYPE
SYNTAX    IpAddress
MAX-ACCESS    read-only
STATUS    current
DESCRIPTION
   "NAT outside (global) address value"
       ::= { ipNATtranslationsEntry 2 }
ipNATtranslationsInsideAddr  OBJECT-TYPE
SYNTAX    IpAddress
MAX-ACCESS    read-only
STATUS    current
DESCRIPTION
   "NAT inside (local) address value"
       ::= { ipNATtranslationsEntry 3 }
ipNATtranslationsOutsidePort  OBJECT-TYPE
SYNTAX    Integer32
MAX-ACCESS    read-only
STATUS    current
DESCRIPTION
   "NAPT Outside (global) port value"
       ::= { ipNATtranslationsEntry 4 }
```

```
    ipNATtranslationsInsidePort  OBJECT-TYPE
    SYNTAX    Integer32
    MAX-ACCESS    read-only
    STATUS    current
    DESCRIPTION
       "NAPT Inside (local) port value"
          ::= { ipNATtranslationsEntry 5 }
--================================================================================
        -- Definition of NAT/NAPT stadistics MIB OID Tree
--================================================================================
    ipNATstatisticsTable  OBJECT-TYPE
    SYNTAX SEQUENCE OF IpNATstatisticsEntry
    MAX-ACCESS    not-accessible
    STATUS    current
    DESCRIPTION
       "RCST supporting NAT/NAPT sessions statistics are giving in this table"
          ::= { network 12 }
    ipNATstatisticsEntry  OBJECT-TYPE
    SYNTAX    IpNATstatisticsEntry
    MAX-ACCESS    not-accessible
    STATUS    current
    DESCRIPTION
       "Entry of IpNATstatisticsTable"
    INDEX { ipNATstatisticsIndex }
    ::= { ipNATstatisticsTable 1 }
    IpNATstatisticsEntry ::= SEQUENCE {
       ipNATstatisticsIndex       Integer32,
       ipNATstatisticsTotalSessions     Counter32,
       ipNATstatisticsActiveSessions    Counter32,
       ipNATstatisticsFailedSessions    Counter32,
       ipNATstatisticsPacketTranslations    Counter32


    }
    ipNATstatisticsIndex  OBJECT-TYPE
    SYNTAX    Integer32
    MAX-ACCESS    not-accessible
    STATUS    current
    DESCRIPTION
       "Index of ipNATstatisticsTable"
          ::= { ipNATstatisticsEntry 1 }
    ipNATstatisticsTotalSessions  OBJECT-TYPE
    SYNTAX    Counter32
```

```
   MAX-ACCESS    read-only
   STATUS    current
   DESCRIPTION
      "Total number of NAT sessions"
         ::= { ipNATstatisticsEntry 2 }
   ipNATstatisticsActiveSessions  OBJECT-TYPE
   SYNTAX    Counter32
   MAX-ACCESS    read-only
   STATUS    current
   DESCRIPTION
      "Number of active NAT sessions"
         ::= { ipNATstatisticsEntry 3 }
   ipNATstatisticsFailedSessions  OBJECT-TYPE
   SYNTAX    Counter32
   MAX-ACCESS    read-only
   STATUS    current
   DESCRIPTION
      "Number of failed NAT sessions"
         ::= { ipNATstatisticsEntry 4 }
   ipNATstatisticsPacketTranslations  OBJECT-TYPE
   SYNTAX    Counter32
   MAX-ACCESS    read-only
   STATUS    current
   DESCRIPTION
      "Number of NAT packets translated"
         ::= { ipNATstatisticsEntry 5 }
--================================================================================
       -- Definition of multicast MIB OID Tree
--================================================================================
        igmp   OBJECT-TYPE
        SYNTAX              INTEGER{ disabled (0),
                    enabled (1) }
        MAX-ACCESS          read-write
        STATUS              current
        DESCRIPTION
            "'0' = disabled, GW-RCST, transparent to IGMP signaling
        '1' = enabled, User-RCST."
          ::={multicast 1}

        igmpProxyFunctionality   OBJECT-TYPE
        SYNTAX              INTEGER { disabled (0), enabled (1) }
        MAX-ACCESS          read-write
```

```
    STATUS              current
    DESCRIPTION
        "'0' = disabled, user RCST mesh multicast functionality implemented
     '1' = enabled, user RCST star multicast functionality implemented."
      ::={multicast 2}

    pidMMT   OBJECT-TYPE
    SYNTAX              Integer32 (0..8191)
    MAX-ACCESS          read-write
    STATUS              current
    DESCRIPTION
        "PID used for MMT decoding."
      ::={multicast 3}

    ipMulticastPrefixTable   OBJECT-TYPE
    SYNTAX              SEQUENCE OF IpMulticastPrefixEntry
    MAX-ACCESS          not-accessible
    STATUS              current
    DESCRIPTION
        "Pool of meshed IP multicast dedicated to an RCST."
      ::={multicast 4}

    ipMulticastPrefixEntry   OBJECT-TYPE
    SYNTAX              IpMulticastPrefixEntry
    MAX-ACCESS          not-accessible
    STATUS              current
    DESCRIPTION
        "Entry for ip multicast prefix table."
  INDEX {ipMulticastIndex }
   ::= {ipMulticastPrefixTable 1}

  IpMulticastPrefixEntry ::= SEQUENCE {
   ipMulticastIndex Integer32,
   ipMulticastSubnetPrefix OCTET STRING,
            ipMulticastPrefixStatus RowStatus
  }
ipMulticastIndex    OBJECT-TYPE
SYNTAX       Integer32 (0..4)
MAX-ACCESS   not-accessible
STATUS       current
DESCRIPTION
    "Table index"
```

```
        ::= {ipMulticastPrefixEntry 1}
    ipMulticastSubnetPrefix   OBJECT-TYPE
    SYNTAX                OCTET STRING (SIZE(6))
    MAX-ACCESS                 read-create
    STATUS                    current
    DESCRIPTION
         "IP multicast subnet prefix value.
          Address coding uses the 5 bytes CIDR format as aa.bb.cc.dd/ee.
         First byte is padded."
          ::={ipMulticastPrefixEntry 2}

   ipMulticastPrefixStatus OBJECT-TYPE
   SYNTAX    RowStatus
   MAX-ACCESS    read-create
   STATUS    current
   DESCRIPTION
      "Attribute used to manage the creation / deletion of a ip Multicast Prefix entry."
            ::= { ipMulticastPrefixEntry 3}

--================================================================================
       -- Definition of multicast & igmp parameters per RCST interface
--================================================================================
   ifmulticastTable  OBJECT-TYPE
   SYNTAX SEQUENCE OF IfmulticastEntry
   MAX-ACCESS    not-accessible
   STATUS    current
   DESCRIPTION
      "Table that reflects the multicast parameters configured per interface (LAN or Satellite interface)"
   ::= { multicast 5 }

   ifmulticastEntry  OBJECT-TYPE
   SYNTAX    IfmulticastEntry
   MAX-ACCESS    not-accessible
   STATUS    current
   DESCRIPTION
      ""
   INDEX { ifmulticastIndex }
   ::= { ifmulticastTable 1 }

   IfmulticastEntry ::= SEQUENCE {
      ifmulticastIndex    Integer32,
      ifmulticastIgmpUnsolicitedInterval   Integer32,
```

```
    ifmulticastIgmpQueryInterval      Integer32,
    ifmulticastIgmpMaxResponseTime    Integer32,
    ifmulticastEntrystatus        RowStatus
}
ifmulticastIndex  OBJECT-TYPE
SYNTAX    Integer32
MAX-ACCESS    not-accessible
STATUS    current
DESCRIPTION
    "Index of ifMulticastTable that identifies the interface on which the entry of multicast parameters
   are applicable.   The interface index correspond to the values given in ifIndex MIB II
    '1' User Interface; '2' LoopBack; '3' Satellite Interface"
        ::= { ifmulticastEntry 1 }

ifmulticastIgmpUnsolicitedInterval  OBJECT-TYPE
SYNTAX    Integer32
MAX-ACCESS    read-write
STATUS    current
DESCRIPTION
    "Time between repetitions of a host initial report of membership in a group (in seconds).
    Default value 10 sec."
        ::= { ifmulticastEntry 2 }
ifmulticastIgmpQueryInterval  OBJECT-TYPE
SYNTAX    Integer32(60..600)
MAX-ACCESS    read-write
STATUS    current
DESCRIPTION
    "Query interval in seconds. Valid range [60..600]. Default value is 125 sec."
        ::= { ifmulticastEntry 3 }
ifmulticastIgmpMaxResponseTime  OBJECT-TYPE
SYNTAX    Integer32(10..25)
MAX-ACCESS    read-write
STATUS    current
DESCRIPTION
    "Maximum query response time advertised in IGMPv2 queries on this interface (in seconds).
    Valid range [10..25]. Default value is 10 sec."
        ::= { ifmulticastEntry 4 }
ifmulticastEntrystatus  OBJECT-TYPE
SYNTAX    RowStatus
MAX-ACCESS    read-write
STATUS    current
DESCRIPTION
```

```
      "Value to reflect the entry status of the table: Not in service, active. "
         ::= { ifmulticastEntry 5 }

--================================================================================
       -- Definition of SLA config flow Type MIB OID Tree
--================================================================================
        flowTypeTable      OBJECT-TYPE
        SYNTAX              SEQUENCE OF FlowTypeEntry
        MAX-ACCESS          not-accessible
        STATUS              current
        DESCRIPTION
            "Table that associates IP flow mask values with a certain set of C2P params.
       It may contain up to 20 entries, including default.
            The default flow Type is recognized as being the last entry (e.g. the 3rd one,
            if there are 3 entries, the 6th one if there are 6 entries)."
          ::={flowTypes 1}
   flowTypeEntry    OBJECT-TYPE
   SYNTAX        FlowTypeEntry
   MAX-ACCESS    not-accessible
   STATUS        current
   DESCRIPTION
       "An Entry of flow type table."
   INDEX  {flowTypeIndex }
          ::={flowTypeTable 1}

   FlowTypeEntry ::= SEQUENCE {
      flowTypeIndex    Integer32,
      flowTypeSrcIpAddr   IpAddress,
      flowTypeSrcIpAddrMask   IpAddress,
      flowTypeDstIpAddr   IpAddress,
      flowTypeDstIpAddrMask   IpAddress,
      flowTypeDSCPMin     Integer32,
      flowTypeDSCPMax     Integer32,
      flowTypeProtocol Integer32,
      flowTypeProtocolMaskInteger32,
      flowTypeSrcPortMin  Integer32,
      flowTypeSrcPortMax  Integer32,
      flowTypeDstPortMin  Integer32,
      flowTypeDstPortMax  Integer32,
      c2pActivityTimer Integer32,
      c2pPrio          INTEGER,
      c2pSdrRtn    CapacityValues,
```

```
    c2pPdrRtn     CapacityValues,
    c2pSdrFwd     CapacityValues,
    c2pPdrFwd     CapacityValues,
    c2pUniBiDir      INTEGER,
    flowTypeStatus      RowStatus
}

flowTypeIndex OBJECT-TYPE
SYNTAX    Integer32 (0..5)
MAX-ACCESS    not-accessible
STATUS    current
DESCRIPTION
    "Flow type index"
          ::= { flowTypeEntry 1}

flowTypeSrcIpAddr   OBJECT-TYPE
SYNTAX    IpAddress
MAX-ACCESS    read-write
STATUS    current
DESCRIPTION
    "Flow type source IP address value"
          ::= { flowTypeEntry 2}

flowTypeSrcIpAddrMask   OBJECT-TYPE
SYNTAX    IpAddress
MAX-ACCESS    read-write
STATUS    current
DESCRIPTION
    "Flow type source 32 bits IP address mask.
    A bit value of 0 indicates a 'don't care' on the value
    when compared to incoming IP header field."
          ::= { flowTypeEntry 3}

flowTypeDstIpAddr   OBJECT-TYPE
SYNTAX    IpAddress
MAX-ACCESS    read-write
STATUS    current
DESCRIPTION
    "Flow type destination IP address value."
          ::= { flowTypeEntry 4}

flowTypeDstIpAddrMask   OBJECT-TYPE
```

```
SYNTAX    IpAddress
MAX-ACCESS    read-write
STATUS    current
DESCRIPTION
   "Flow type destination 32 bits IP address mask.
   A bit value of 0 indicates a 'don't care' on the value
   when compared to incoming IP header field."
          ::= { flowTypeEntry 5}

flowTypeDSCPMin  OBJECT-TYPE
SYNTAX    Integer32 (0..255)
MAX-ACCESS    read-write
STATUS    current
DESCRIPTION
   "Flow type DSCP min value. Only least significant byte is used."
          ::= { flowTypeEntry 6}

flowTypeDSCPMax  OBJECT-TYPE
SYNTAX    Integer32 (0..255)
MAX-ACCESS    read-write
STATUS    current
DESCRIPTION
   "Flow type DSCP max value. Only least significant byte is used."
          ::= { flowTypeEntry 7}

flowTypeProtocol OBJECT-TYPE
SYNTAX    Integer32 (0..255)
MAX-ACCESS    read-write
STATUS    current
DESCRIPTION
   "Flow type protocol value. Only least significant byte is used"
          ::= { flowTypeEntry 8}

flowTypeProtocolMask OBJECT-TYPE
SYNTAX    Integer32 (0..255)
MAX-ACCESS    read-write
STATUS    current
DESCRIPTION
   "Flow type protocol value mask.A bit value of 0
   indicates a 'don't care' on the value when compared
   to incoming IP header field.
   Only least significant byte is used."
```

```
          ::= { flowTypeEntry 9}

flowTypeSrcPortMin  OBJECT-TYPE
SYNTAX    Integer32 (0..65535)
MAX-ACCESS    read-write
STATUS    current
DESCRIPTION
   "Flow type source port min value. Only two least significant bytes are used."
          ::= { flowTypeEntry 10}

flowTypeSrcPortMax  OBJECT-TYPE
SYNTAX    Integer32 (0..65535)
MAX-ACCESS    read-write
STATUS    current
DESCRIPTION
   "Flow type source port max value. Only two least significant bytes are used."
          ::= { flowTypeEntry 11}

flowTypeDstPortMin  OBJECT-TYPE
SYNTAX    Integer32 (0..65535)
MAX-ACCESS    read-write
STATUS    current
DESCRIPTION
   "flow type destination port min value. Only two least significant bytes are used."
          ::= { flowTypeEntry 12}

flowTypeDstPortMax  OBJECT-TYPE
SYNTAX    Integer32 (0..65535)
MAX-ACCESS    read-write
STATUS    current
DESCRIPTION
   "flow type destination port max value. Only two least significant bytes are used."
          ::= { flowTypeEntry 13}

c2pActivityTimer OBJECT-TYPE
SYNTAX    Integer32 (0..2147483647)
MAX-ACCESS    read-write
STATUS    current
DESCRIPTION
   "Flow type C2P activity timer. A 0 value implies no timer applicable."
          ::= { flowTypeEntry 14}
c2pPrio   OBJECT-TYPE
```

```
SYNTAX    INTEGER { lp (0),   hp (1),   hpj (2)   }
MAX-ACCESS   read-write
STATUS    current
DESCRIPTION
   "Flow type C2P priority value. '0' corresponds to lp,
   '1' to hp, '2' to hp with jitter constraints."
          ::= { flowTypeEntry 15}
c2pSdrRtn OBJECT-TYPE
SYNTAX    CapacityValues
MAX-ACCESS   read-write
STATUS    current
DESCRIPTION
   "Flow type C2P SDR for RCST transmission, return channel."
          ::= { flowTypeEntry 16}
c2pPdrRtn OBJECT-TYPE
SYNTAX    CapacityValues
MAX-ACCESS   read-write
STATUS    current
DESCRIPTION
   "Flow type C2P PDR for RCST transmission, return channel."
          ::= { flowTypeEntry 17}
c2pSdrFwd OBJECT-TYPE
SYNTAX    CapacityValues
MAX-ACCESS   read-write
STATUS    current
DESCRIPTION
   "Flow type C2P SDR for RCST reception, forward channel."
          ::= { flowTypeEntry 18}
c2pPdrFwd OBJECT-TYPE
SYNTAX    CapacityValues
MAX-ACCESS   read-write
STATUS    current
DESCRIPTION
   "Flow type C2P PDR for RCST transmission, forward channel."
          ::= { flowTypeEntry 19}
c2pUniBiDir   OBJECT-TYPE
SYNTAX    INTEGER { unidirectional(1), bidirectional (2)  }
MAX-ACCESS   read-write
STATUS    current
DESCRIPTION
   "Flow type C2P type of connection: unidirectional or bidirectional."
          ::= { flowTypeEntry 20}
```

```
    flowTypeStatus   OBJECT-TYPE
    SYNTAX     RowStatus
    MAX-ACCESS    read-write
    STATUS     current
    DESCRIPTION
       "Attribute used to manage the creation / deletion of a Flow type entry."
             ::= { flowTypeEntry 21}
    c2pMaxNbrConnections OBJECT-TYPE
    SYNTAX     Integer32 (0..64)
    MAX-ACCESS read-write
    STATUS     current
    DESCRIPTION
       "Max global number of connection that the RCST is allowed to support."
           ::= { flowTypes 2}
--============================================================================
       -- Definition of SLA config channel modify MIB OID Tree
--============================================================================
        modifyHighWaterMark   OBJECT-TYPE
        SYNTAX              Integer32 (0..2147483647)
        MAX-ACCESS          read-write
        STATUS              current
        DESCRIPTION
           "Units given in 100 bytes."
          ::={modify 1}
        modifyLowWaterMark   OBJECT-TYPE
        SYNTAX              Integer32 (0..2147483647)
        MAX-ACCESS          read-write
        STATUS              current
        DESCRIPTION
           "Units given in 100 bytes."
          ::={modify 2}
        modifyTime   OBJECT-TYPE
        SYNTAX              Integer32 (0..2147483647)
        MAX-ACCESS          read-write
        STATUS              current
        DESCRIPTION
           "Time allowed between two consecutive channel_modify."
          ::={modify 3}
        craMod   OBJECT-TYPE
        SYNTAX              CapacityValues
        MAX-ACCESS          read-write
        STATUS              current
```

```
        DESCRIPTION
           "CRA quantity step requested by channel modify mechanism."
          ::={modify 4}

--================================================================================
       -- Definition of physicalLayer MIB OID Tree
--================================================================================
   powerLevelOffsetSYNCTRF OBJECT-TYPE
   SYNTAX    Integer32 (0..12)
   MAX-ACCESSread-write
   STATUS    current
   DESCRIPTION
      "Power level offset between SYNC and TRF bursts, in dB."
            ::= { physicalLayer 1}
   forwardLinkEbN0  OBJECT-TYPE
   SYNTAX    Integer32
   MAX-ACCESSread-write
   STATUS    current
   DESCRIPTION
      "Eb/N0 performance measurements on the forward link. Value given in tenth of dB and a precision of 0,1 dB."
            ::= { physicalLayer 2}
   cwTest OBJECT-TYPE
   SYNTAX    Integer32
   MAX-ACCESS read-write
   STATUS    current
   DESCRIPTION
      "Frequency specified in multiple of 100 Hz for CW Test Mode.
      When the frequency is set, a CW carrier is transmitted at that
      frequency. A frequency of 0 turn the CW off. Default frequency
      value is 0"
            ::= { physicalLayer 3}
   forwardLinkEbN0  OBJECT-TYPE
   SYNTAX    Integer32
   MAX-ACCESS read-write
   STATUS    current
   DESCRIPTION
      " Eb/N0 measured in the return link. Performance parameter of the return link.
        Value given in tenth of dB and a precision of 0,1 dB"
            ::= { physicalLayer 4}
```

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

       -- Definition of security MIB OID Tree

--================================================================================

   nonceNMC  OBJECT-TYPE

   SYNTAX    OCTET STRING(SIZE(28))

   MAX-ACCESSread-write

   STATUS    current

   DESCRIPTION

      "176 bits of NMC nonce, needed to crate

      the Hash value to be sent by the RCST in the QKE response"

            ::= { applicationLayer 1}

   qke    OBJECT-TYPE

   SYNTAX    OCTET STRING(SIZE(28))

   MAX-ACCESSread-write

   STATUS    current

   DESCRIPTION

      "176 bits of QKE response needed to perform RCST authentication"

            ::= { applicationLayer 2}

   ipSecEnable   OBJECT-TYPE

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

   MAX-ACCESSread-write

   STATUS    current

   DESCRIPTION

      "Value that determines IPSEC functionality

      0 = static, 1 = dynamic"

            ::= { networkLayer 1}

END
```

Annex B (informative): Bibliography

- ETSI TS 102 429-1: "Satellite Earth Stations and Systems (SES); Broadband Satellite Multimedia (BSM); Regenerative Satellite Mesh - B (RSM-B); DVB-S/DVB-RCS family for regenerative satellites; Part 1: System overview".
- ETSI TS 102 429-2: "Satellite Earth Stations and Systems (SES); Broadband Satellite Multimedia (BSM); Regenerative Satellite Mesh - B (RSM-B); DVB-S/DVB-RCS family for regenerative satellites; Part 2: Satellite Link Control layer".
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- ETSI TR 101 790: "Digital Video Broadcasting (DVB); Interaction channel for satellite distribution systems; Guidelines for the use of EN 301 790".
- ETSI TR 101 202: "Digital Video Broadcasting (DVB); Implementation guidelines for data broadcasting".
- IETF RFC 1905: "Protocol Operations for Version 2 of the Simple Network Management Protocol (SNMP v2)".

History

Document history		
V1.1.1	October 2006	Publication