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Amendment 1

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SERIES G: TRANSMISSION SYSTEMS AND MEDIA,
DIGITAL SYSTEMS AND NETWORKS

Digital sections and digital line system – Optical line
systems for local and access networks

ONT management and control interface
specification for B-PON

**Amendment 1: Omnibus improvements
for OMCI**

ITU-T Recommendation G.983.2 (2005) – Amendment 1



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ITU-T Recommendation G.983.2

ONT management and control interface specification for B-PON

Amendment 1

Omnibus improvements for OMCI

Summary

This amendment includes assorted improvements and corrections for the ONT management and control interface Recommendation, ITU-T Rec. G.983.2 (2005). The major topics include:

- Voice over Internet Protocol (VoIP) management;
- ONT equipment management;
- ONT power shedding;
- ONT remote debug;
- Test command extensions;
- Video ANI enhancements;
- Protocol Implementation Conformance Statement.

In addition to these items, there are several minor corrections of editorial errors in the Recommendation.

Source

Amendment 1 to ITU-T Recommendation G.983.2 (2005) was approved on 29 March 2006 by ITU-T Study Group 15 (2005-2008) under the ITU-T Recommendation A.8 procedure.

Keywords

B-PON, G-PON, management, optical.

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ITU-T Recommendation G.983.2

ONT management and control interface specification for B-PON

Amendment 1

Omnibus improvements for OMCI

1 Introduction

1.1 Purpose and Scope

This amendment is intended to outline the requirements and recommended implementation of the OMCC management for a variety of new features supported in ONTs, including Voice over IP (VoIP) service, equipment management, power shedding, remote debug, extended test commands, and video ANI enhancements. The primary focus of this amendment is the definition of new standard OMCC managed entity objects and attributes, and expected behaviour of those objects.

2 Modifications and additions to ITU-T Rec. G.983.2 (2005)

2.1 Modifications to clause 3

Add the following new abbreviations alphabetically to clause 3:

AID	Access Identifier
ASCII	American Standard Code for Information Interchange
ASCII string	A sequence of ASCII encoded characters, terminated by the NULL character (0x00)
CID	Customer/Caller Identification
DHCP	Dynamic Host Configuration Protocol
LOS	Loss of Signal
RTCP	RTP Control Protocol
RTP	Real-Time Transport Protocol
SIP	Session Initiation Protocol
TCP	Transmission Control Protocol
TLS	Transport Layer Security
TOS	Type of Service
UDP	User Datagram Protocol
VoIP	Voice over IP

2.2 New clause 4.4

Add the following new clause 4.4:

4.4 Voice over IP management

While OMCI is always used to manage PON service and ONT equipment, VoIP service may optionally be managed by means external to OMCI. This allows operators more flexibility in choosing how to manage their overall VoIP service regardless of the access technology involved. VoIP service on an ONT may be managed via one of two paths:

- 1) OMCI Path – OMCI has full view and control of all VoIP service attributes.
- 2) IP Path – OMCI is only used to configure attributes that allow non-OMCI based control of VoIP service attributes.

Specifically, if the OMCI path is used to manage VoIP service, all of the managed entities defined here may be read and/or written.

If the IP path is used to manage SIP VoIP service, only the following MEs may be read and/or written:

- IP Host Config Data;
- IP Host Monitoring Data;
- VoIP Config Data;
- PPTP POTS UNI;
- Call Control PM History Data;
- RTP Monitoring Data;
- SIP Call Initiation Performance Monitoring History Data;
- SIP Agent Monitoring Data;
- SIP Config Portal;
- VoIP Line Status.

If the IP path is used to manage H.248 VoIP service, only the following MEs may be read and/or written:

- IP Host Config Data;
- IP Host Monitoring Data;
- VoIP Config Data;
- PPTP POTS UNI;
- Call Control PM History Data;
- RTP Monitoring Data;
- MGC Monitoring Data;
- H.248 Config Portal;
- VoIP Line Status.

2.3 Modifications to clause 5.2

Modify items b and c, and add new items to the list of MEs as follows:

- b) Cardholder (formerly "Subscriber Line Cardholder");
- c) Circuit pack (formerly "Subscriber Line Card");
- o) Equipment extension package;
- p) Physical Path Termination Point Video ANI;
- q) Physical Path Termination Point Video UNI;
- r) Physical Path Termination Point ISDN UNI;
- s) VoIP Config Data;
- t) SIP Agent Config Data.

2.4 Modifications to clause 5.3

Add the following new items to the list of MEs in this clause:

- z4) IP Host PM History Data;
- z5) SIP Agent Monitoring Data;
- z6) SIP Call Initiation PM History Data;
- z7) RTP Monitoring Data;
- z8) Call Control PM History Data;
- z9) MGC Monitoring Data.

2.5 Modifications to clause 6.1

Modify the following lines in Table 1 to read as follows:

Managed entity	Required/ Optional	Description	Defined in Section
PON IF Line Card	Deprecated	Used for the PON line card plug-in, only used if PON interface is implemented on a plug-in unit. This managed entity is deprecated in favour of the generalized circuit pack ME.	7.1.6
PON IF Line Cardholder	Deprecated	Used for the PON line card plug-in slot, only used if PON interface is implemented on a plug-in unit. This managed entity is deprecated in favour of the generalized cardholder ME.	7.1.5
Software image	R	Used for the software image of the ONT or its components that contain independently manageable software.	7.1.7
Circuit pack (formerly "Subscriber Line card")	CR (Note)	Used for a plug-in circuit pack module. Can also represent a virtual circuit pack to distinguish types of ports in an integrated ONT.	7.1.4
Cardholder (formerly "Subscriber Line Cardholder")	CR (Note)	Used for a circuit pack plug-in slot. Can also represent a virtual cardholder to distinguish types of ports in an integrated ONT.	7.1.3

Add the following new entries to Table 1 and change the Note at the end of the table as follows:

Managed Entity	Required/ Optional	Description	Defined in Section
IP Host Config Data	CR	Used to define the internet protocol service that may be used with a MAC Bridge Port. Member of IPHostData group.	7.3.98
IP Host PM History Data	O	Used to hold PM counters and alarms for the IP Host. Member of IPHostData group.	7.3.99
TCP/UDP Config Data	CR	Used for the TCP or UDP configuration for a TCP/UDP service. Member of IPHostData group.	7.3.100
Network Address	CR	Used to bind a network address (URI, IP Address) to its associated security method. Member of IPHostData group.	7.3.116
VoIP Config Data	CR	Used to discover VoIP signalling protocols supported and select a VoIP signalling to use. Also used to select a VoIP configuration method. Member of VoIPData group.	7.3.101
VoIP Voice CTP	CR	Used for VoIP voice channel termination point. Member of VoIPData group.	7.3.110
Call Control PM History Data	O	Used for call control performance monitoring history. Member of VoIPData group.	7.3.111
VoIP Line Status	O	Used for VoIP line status that relates to a POTS port. Member of VoIPData group.	7.3.114
VoIP Media Profile	CR	Used to define codec and other media selection criteria. Member of VoIPData group.	7.3.107
RTP Profile Data	CR	Used for RTP configuration for VoIP service.	7.3.108
RTP Monitoring Data	O	Used to hold the last completed 15-minute interval PM data for RTP. Member of VoIPData group.	7.3.109
Network Dial Plan Table	O	Used to support network defined dial plans. Member of VoIPData group.	7.3.112
VoIP Application Service Profile	O	Used for VoIP calling feature services. Member of VoIPData group.	7.3.113
VoIP Feature Access Codes	O	Used to define feature access codes for a POTS port. Member of VoIPData group.	7.3.115
Authentication Security Method	O	Used for the user id/password configuration to associate a session used between the client and destination server.	7.3.117

Managed Entity	Required/ Optional	Description	Defined in Section
SIP Config Portal	CR	Used to view SIP configuration when the IP path is being used to manage SIP. Member of SIPrelatedData group.	7.3.102
SIP Agent Config Data	CR	Used to define a VoIP SIP agent configuration. Member of SIPrelatedData group.	7.3.103
SIP Agent Monitoring Data	O	Used for statistics for the VoIP SIP agent. Member of SIPrelatedData group.	7.3.104
SIP Call Initiation Performance Monitoring History Data	O	Used for statistics for the VoIP SIP agent. Member of SIPrelatedData group.	7.3.105
SIP User Data	CR	Used for user (subscriber) specific SIP data. Member of SIPrelatedData group.	7.3.106
MGC Config Portal	CR	Used to view H.248 configuration when the IP path is being used to manage H.248. Member of H248relatedData group.	7.3.119
MGC Config Data	CR	Used for the configuration data associated with a MGC client. Member of H248relatedData group.	7.3.120
MGC Monitoring Data	O	Used for the runtime attributes and statistics associated with the active MGC client. Member of H248relatedData group.	7.3.121
LargeString	CR	Used to hold a character string larger than 25 bytes and up to 375 bytes. Member of H248relatedData group.	7.3.118
ONT Power Shedding	CR	Used to control the power shedding service.	7.1.12
ONT Remote Debug	CR	Used to allow remote debugging of an ONT.	7.1.13
Equipment protection profile	CR	Defines equipment protection groups	7.1.9
Equipment extension package	O	Used for additional attributes that may be associated with an ONT, ONU or cardholder.	7.1.10
Port mapping package	O	Used to map heterogeneous ports to an equipment entity.	7.1.11
NOTE – The preferred solution is that the circuit pack and cardholder managed entities should always be modelled, regardless of whether or not the ONT has integrated interfaces; however, for reasons of backward compatibility, these managed entities remain as "CR".			

2.6 Modifications to clause 6.2

Replace Figure 14 with the following:

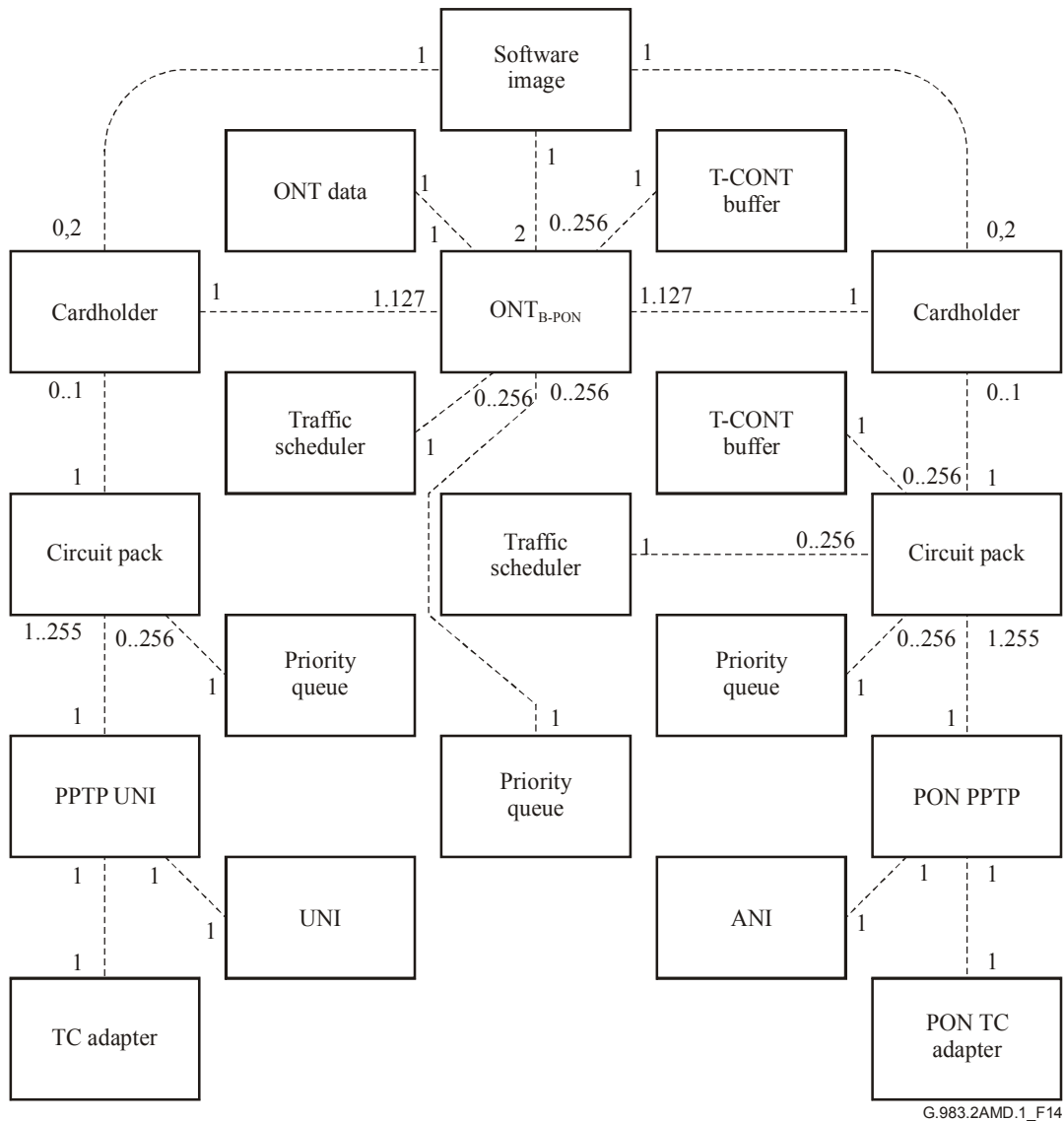


Figure 14/G.983.2 – Managed entity relationship diagram for non-integrated interfaces

In the first paragraph after Figure 14, replace "Subscriber Line Cards" with "circuit packs".

Add the following to the end of clause 6.2 after Figure 31:

The host IP service managed entity relationship diagram is shown in Figure 31-a. Note that this is only a partial diagram to simplify the service from the LAN side of the bridge.

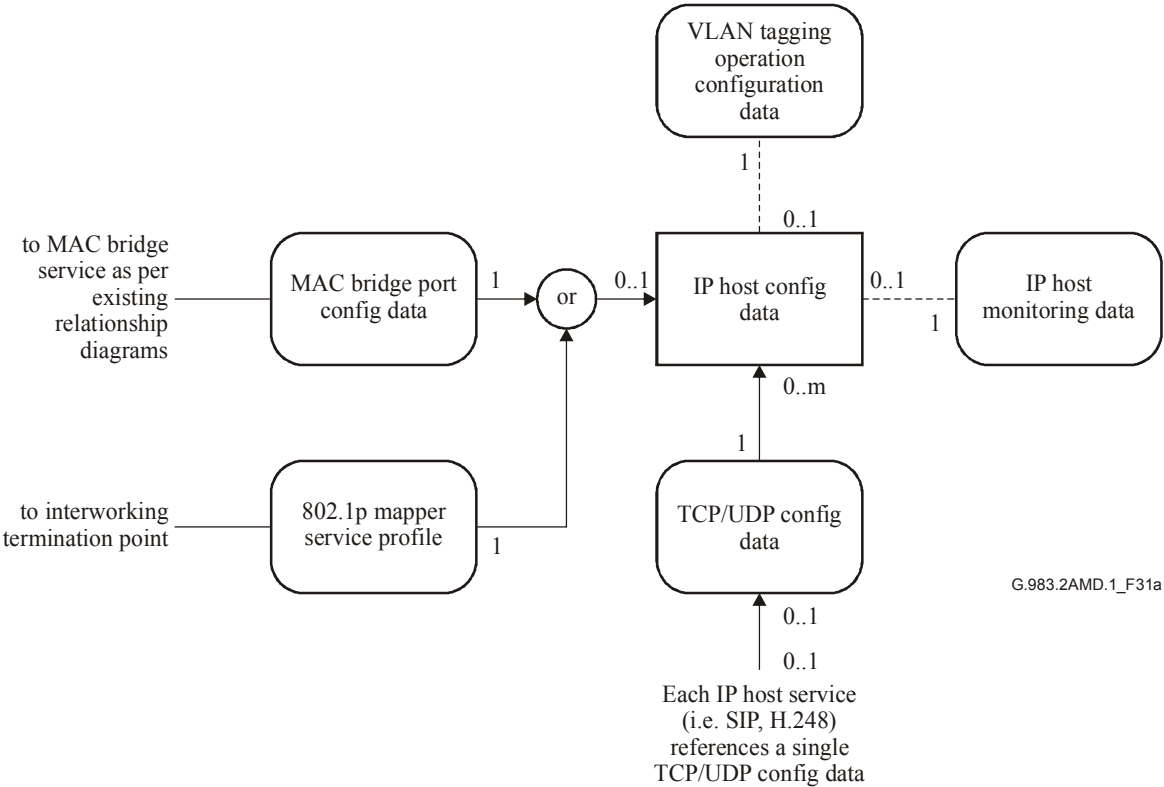


Figure 31-a/G.983.2 – Managed entity relationship diagram, IP host services

The host Network Address managed entity relationship diagram is shown in Figure 31-b.

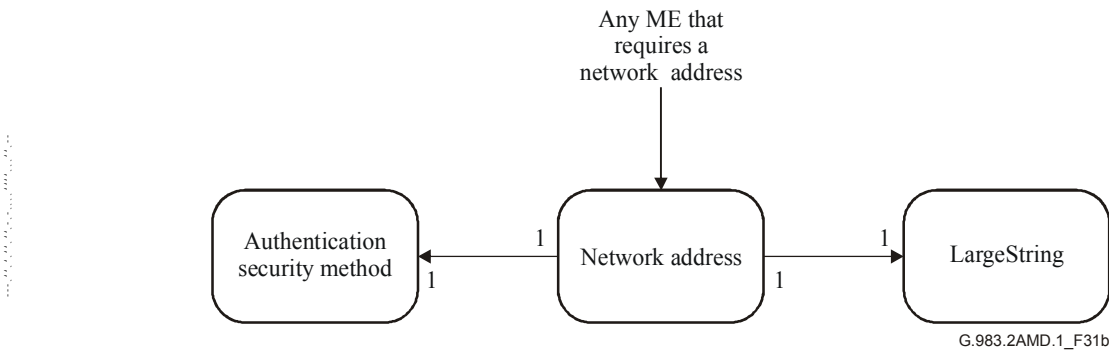
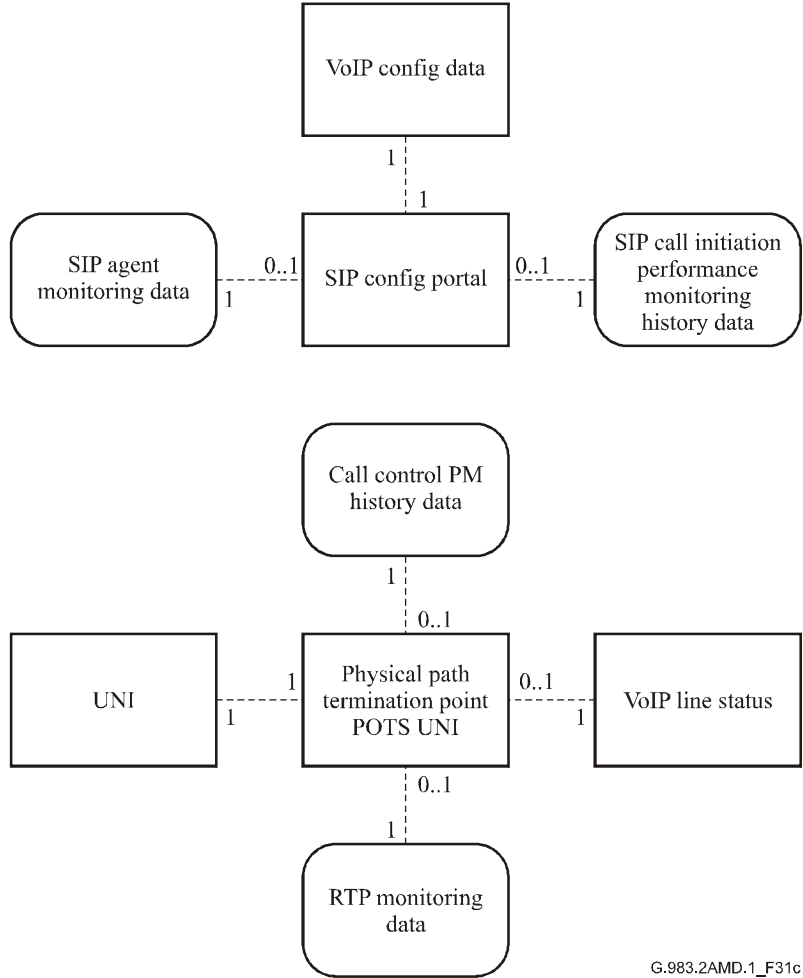


Figure 31-b/G.983.2 – Managed entity relationship diagram, network address

The following managed entity relationship diagrams show how managed entities are associated when the IP path is used to manage VoIP service on an ONT.

The VoIP managed entity relationship diagram in Figure 31-c shows how managed entities are associated when the IP path is used to manage SIP VoIP service on an ONT.

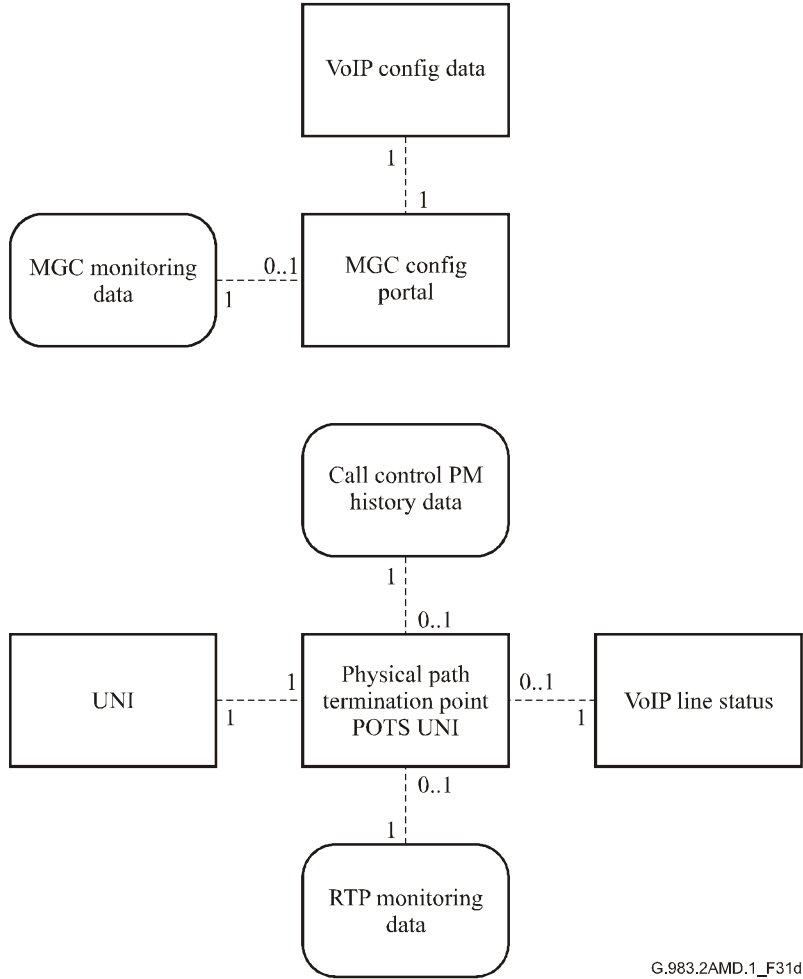


G.983.2AMD.1_F31c

NOTE 1 – Any ME that requires a large character string can reference a large string ME.
NOTE 2 – Any ME that requires a network address can reference a network address ME.

Figure 31-c/G.983.2 – Managed entity relationship diagram, IP path SIP VoIP management

The VoIP managed entity relationship diagram in Figure 31-d shows how managed entities are associated when the IP path is used to manage H.248 VoIP service on an ONT.



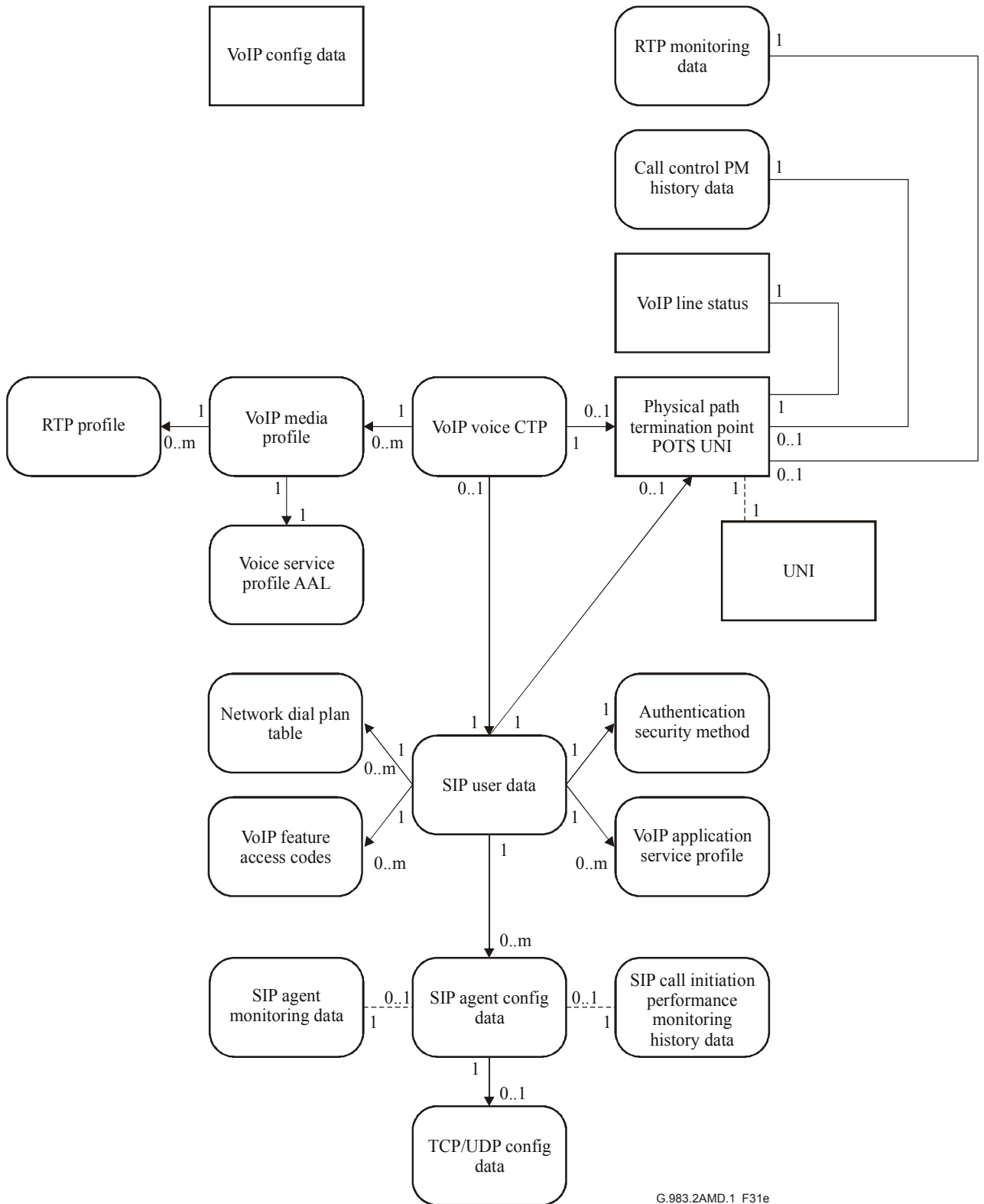
G.983.2AMD.1_F31d

NOTE 1 – Any ME that requires a large character string can reference a large string ME.
NOTE 2 – Any ME that requires a network address can reference a network address ME.

**Figure 31-d/G.983.2 – Managed entity relationship diagram,
IP path H.248 VoIP management**

The following managed entity relationship diagrams show how managed entities are associated when the OMCI path is used to manage VoIP service on an ONT.

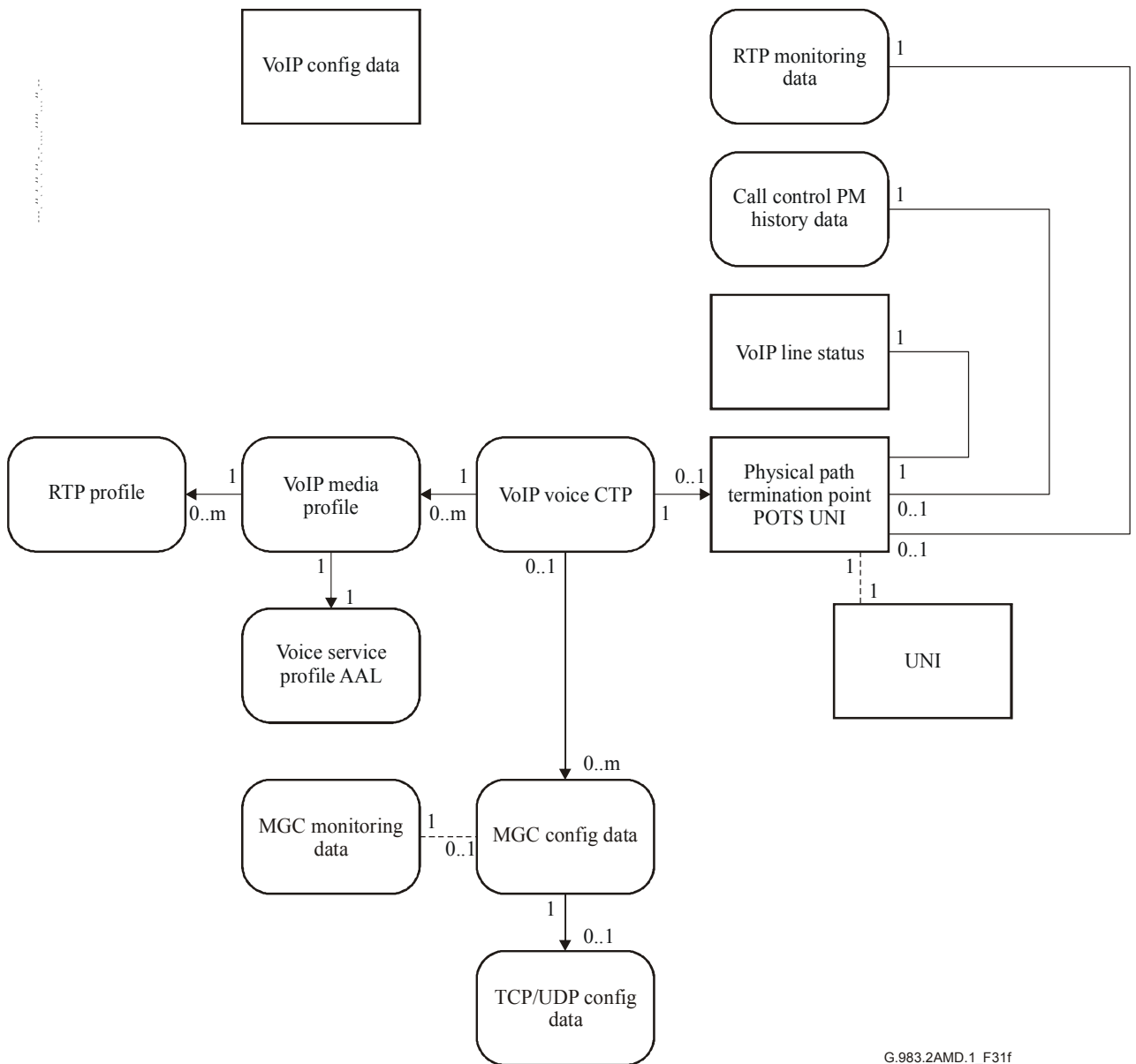
The VoIP managed entity relationship diagram in Figure 31-e shows how managed entities are associated for a SIP-based VoIP service



NOTE 1 – Any ME that requires a large character string can reference a large string ME.
 NOTE 2 – Any ME that requires a network address can reference a network address ME.

Figure 31-e/G.983.2 – Managed entity relationship diagram, Voice over IP service in an ONT

The VoIP managed entity relationship diagram in Figure 31-f shows how managed entities are associated for a H.248 based VoIP service.



G.983.2AMD.1_F31f

NOTE 1 – Any ME that requires a large character string can reference a large string ME.
 NOTE 2 – Any ME that requires a network address can reference a network address ME.

Figure 31-f/G.983.2 – Managed entity relationship diagram, Voice over IP service using H.248

2.7 Modification to clause 7.1 ONT equipment management

Add the following text under clause 7.1:

An ONT may be physically implemented as a single module or as a shelf containing plug-in field-replaceable units (the latter construction is likely to be called an ONU, but this Recommendation uses ONT generically to refer to both). The ONT automatically instantiates cardholder MEs for each of its slots. A slot can then be populated with a circuit pack. For backward compatibility, a PON IF line card ME can also be installed in a PON IF line cardholder.

2.8 Modifications to clause 7.1.1 ONT_{B-PON}

Change all instances of "PON interface line card" to "Circuit Pack".

Modify the "Test" action as follows:

Test: Test the ONT. The test action can be used either to perform equipment diagnostics or to make measurements of parameters such as received optical power, video output level, battery voltage, etc. Extensions to the test and test response messages are defined for these purposes; refer to Appendix II.

2.9 Modifications to clause 7.1.2 ONT Data

Change "Subscriber Line Cardholder" to "Cardholder".

Change "PON interface line card" to "Circuit Pack".

2.10 Modifications to clause 7.1.3 Subscriber Line Cardholder

Change heading to read "Cardholder (formerly Subscriber Line Cardholder)".

Replace the text up to Table 3 with the following:

NOTE 1 – This ME was previously called a subscriber line cardholder. It has been generalized to represent any form of cardholder, regardless of function.

This managed entity represents an equipment slot of the ONT. One or more of these entities are contained in the ONT. Each cardholder can contain 0 or 1 circuit pack.

An instance of this managed entity shall exist for each slot. Instances of this managed entity are created automatically by the ONT after ONT initialization. After the creation of this managed entity, the associated attributes are updated according to the data within the ONT itself.

One or more instances of this managed entity may also be contained in integrated ONTs. They then represent virtual cardholders.

There is potential for conflict in the semantics of the expected plug-in unit type, the expected port count and the expected equipment ID, both when the slot is not populated and when a new circuit pack is inserted. The expected plug-in unit type and the plug-in type mismatch alarm are mandatory, although *plug-and-play/unknown* may be used as a way to minimize their significance. It is recommended that an ONT deny the provisioning of inconsistent combinations of expected equipment attributes.

Relationships

An instance of the cardholder ME may contain an instance of the circuit pack managed entity, or for backward compatibility, the PON IF line card managed entity.

Attributes

Managed Entity id: This attribute provides a unique number for each instance of this managed entity. The first byte of this two-byte identifier is set to:

- 0x00 if the ONT contains pluggable equipment modules.
- 0x01 if the ONT is a single integrated equipment.

The second byte of this identifier is the slot number. In integrated ONTs, this byte can be used as a virtual slot or set to 0 to indicate a universal pseudo-slot.

Slot numbering schemes differ among vendors. It is only required that slot numbers be unique across the entire ONT. Up to 254 equipment slots are supported in the range 1..254 (Note 2). The value 0 is reserved to indicate a universal pseudo-slot. The value 255 is also reserved. (R) (mandatory) (2 bytes).

NOTE 2 – Some ADSL managed entities use the two MSBs of the slot address for other purposes. An ONT that supports these services may have slot limitations or restrictions.

Actual Plug-in unit Type: This attribute is equal to the type of the circuit pack in the cardholder or equal to 0 if the cardholder is empty. This attribute is then redundant with the "Type" attribute of the circuit pack managed entity. Circuit pack types are defined in Table 3. (R) (mandatory) (1 byte)

Expected Plug-in unit Type: This attribute identifies which type of plug-in unit is provisioned for the slot. For type coding, see Table 3. The value 0 (no circuit pack) means that the cardholder is not provisioned to contain a circuit pack. The value 0xFF (255) means that the cardholder is configured for plug-and-play. Upon autonomous instantiation, this attribute is set to 0. For integrated interfaces, this attribute may be used to represent the type of interface. (R, W) (mandatory) (1 byte)

Expected port count: This attribute permits the OLT to specify the number of ports it expects in a circuit pack. Prior to provisioning by the OLT, the ONU shall initialize this attribute to 0. (R, W) (optional) (1 byte)

Expected equipment ID: This attribute may be used to identify the specific type of expected circuit pack. This attribute applies only to ONTs that do not have integrated interfaces. In North America, this may be used for the expected equipment CLEI code. Upon autonomous instantiation, this attribute comprises all spaces. (R, W) (optional) (20 bytes)

Actual equipment ID: This attribute may be used to identify the specific type of circuit pack, once it is installed. This attribute applies only to ONTs that do not have integrated interfaces. In North America, this may be used for the equipment CLEI code. When the slot is empty or the equipment ID is not known, this attribute should be set to all spaces. (R) (optional) (20 bytes)

Protection profile pointer: This attribute selects an equipment protection profile that may be associated with the cardholder. Its value is the least significant byte of the managed entity ID of the equipment protection profile with which it is associated, or 0 if equipment protection is not selected. (R, W) (optional) (1 byte)

Invoke protection switch: The OLT may use this attribute to control equipment protection switching. Code points have the following meaning when set by the OLT:

- 0x00 Release protection switch
- 0x01 Operate protection switch, protect cardholder unspecified
- 0x02 Operate protection switch, use first protect cardholder
- 0x03 Operate protection switch, use second protect cardholder

The ONT should deny attempts to switch to an unequipped, defective or already active protect cardholder.

Upon get from the OLT, this attribute should return the current value of the actual protection configuration. Code points are as defined above, except that 0x01 will never be returned.

When circuit packs that support a PON IF function are switched, the response should be returned on the same PON that received the command. However, the OLT should also be prepared to accept a response on the redundant PON. (R, W) (optional) (1 byte)

Actions

Get: Get one or more attributes.

Set: Set one or more attributes.

Notifications

Attribute Value Change: This notification is used to report autonomous changes of the Actual Plug-in unit type or actual equipment ID. The attribute value change notification shall identify the attribute changed and its new value. The AVCs for this managed entity are listed in Table 4a. For ONTs with integrated interfaces, AVCs are not supported.

NOTE 3 – In the AVC tables, the numbering follows that of the Attribute mask coding found in Table II.1. Accordingly, each AVC table has a maximum of 16 entries. If an existing attribute does not emit AVCs, then "N/A" (not applicable) is listed in the AVC column. "Reserved" is used for numbers that do not correspond to an existing attribute.

Alarm: This notification is used to notify the management system that there is something wrong with the provisioned plug-in unit. Both ONT and OLT should know the alarm list (see Table 4b) used by this entity. If no circuit pack is configured or if the cardholder is configured for plug-and-play with no expected equipment ID, no alarms are raised. If the plugInLIMMissingAlarm is active, none of the mismatch alarms shall be declared. No alarms are defined for ONTs with integrated interfaces.

Add the following entries to Table 3:

Coding	Contents	Description
43	Common equipment	Circuit packs such as removable power supply modules or ONU controllers
44	Combined video UNI and PON interface	Circuit pack that combines both functions
45	Mixed services equipment	Circuit pack with several types of ANI and/or UNI. Suggested for use with the port mapping package managed entity.
46	Reserved	Reserved for future standardization
47-242	Reserved	
243..249	Future PON interfaces	Reserved for future standardization

Replace Table 4a and Table 4b with the following:

Table 4a/G.983.2 – AVC list for cardholder

Number	Attribute value change	Description
1	ActualType	Actual type of circuit pack in cardholder
2..4	N/A	
5	ActualEquipmentId	Actual equipment ID of circuit pack in cardholder
6, 7	N/A	
8-16	Reserved	

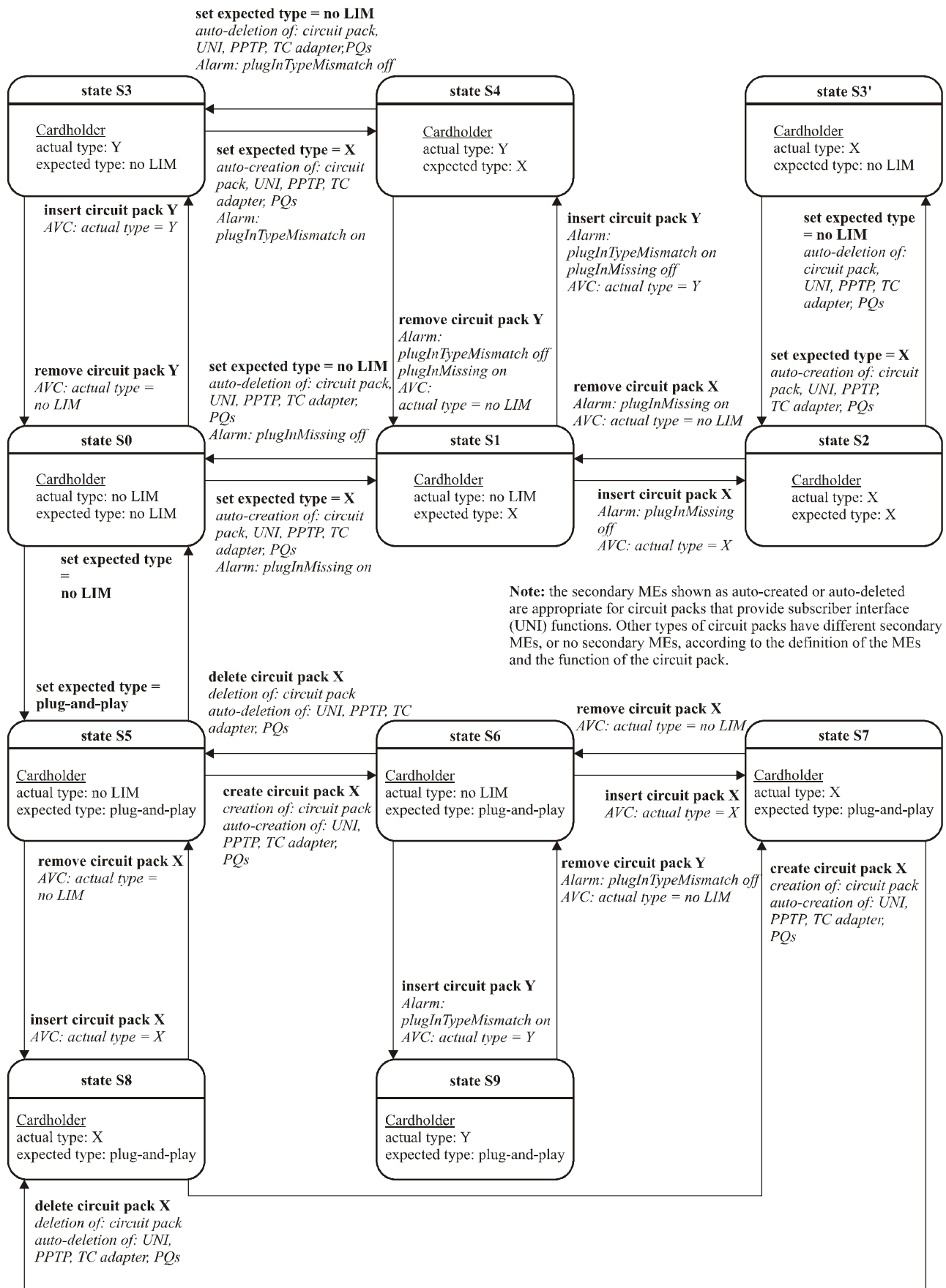
Table 4b/G.983.2 – Alarm list for cardholder

Number	Alarm	Description
0	PlugInLimMissingAlarm	Configured Plug-in circuit pack is not present
1	PlugInTypeMismatchAlarm	Inserted Plug-in circuit pack is wrong type
2	ImproperCardRemoval	Circuit pack has been removed without being deprovisioned. (This is a redundant alarm that helps the OLT distinguish between transitions from state S2 to state S1 and transitions from state S4 to state S1. This alarm is sent only when a transition occurs from state S2 to state S1. See Figure 32 for state diagrams.)
3	PlugInEqptIdMismatchAlarm	Inserted plug-in circuit pack has wrong equipment ID
4	ProtectionSwitch	An autonomous equipment protection switch has occurred. This notification is reported by the protected cardholder.
5-223	Reserved	
224-239	Vendor-specific alarms	Not to be standardized

Replace the text preceding Figure 32 (and that which follows after Table 4b) to read as follows:

Figure 32 shows a state diagram of the various behaviours of inserting/removing a particular circuit pack into/from a cardholder that is provisioned to a specific type or to plug-and-play.

Replace Figure 32 with the following:



G.983.2AMD.1_F2.10

2.11 Modification to clause 7.1.4 Subscriber line card

Change the heading to read "Circuit pack":

Revise the beginning of the clause, up to the "Notifications" subheading to read as follows:

NOTE 1 – This managed entity was previously known as a subscriber line card. It has been generalized in a backward-compatible way to model any plug-in equipment module.

This managed entity represents a circuit pack that is equipped in an ONT slot. For ONTs with integrated interfaces, this managed entity may be used to distinguish available types of interfaces. (The port mapping package is another way.)

An instance of this managed entity shall be automatically created by the ONT when the OLT provisions the cardholder to expect a circuit pack (i.e., when the OLT sets the expected plug-in unit type or equipment ID of the cardholder to a circuit pack type) (see 7.1.3). An instance of this managed entity shall also be created by the ONT when a circuit pack is installed in a cardholder whose expected plug-in unit type is equal to 0xFF (255, plug-and-play), and whose equipment ID is not provisioned. Finally, when the cardholder is provisioned for plug and play, an instance of this managed entity can be created at the request of the OLT. For ONTs with integrated interfaces, the ONT shall automatically create an instance of this managed entity for each instance of the virtual cardholder managed entity.

An instance of this managed entity shall be deleted by the ONT when the OLT de-provisions the circuit pack (i.e., when the OLT sets the expected plug-in unit type or equipment ID of the cardholder to no LIM). An instance of this managed entity shall also be deleted by the ONT on request of the OLT if the attribute "Expected Plug-in Unit Type" of the corresponding cardholder is equal to 0xFF, plug-and-play, and the expected equipment ID is blank (a string of all spaces). For ONTs with integrated interfaces, an instance of this managed entity cannot be deleted by an OLT request.

NOTE 2 – Creation and deletion by the OLT is retained for backward compatibility.

Relationships

An instance of this managed entity is contained by an instance of the cardholder managed entity.

Attributes

Managed Entity id: This attribute provides a unique number for each instance of this managed entity. The number is the same as the instance number of the cardholder managed entity instance containing this circuit pack instance. (R, Set-by-create (if applicable)) (mandatory) (2 bytes)

Type: This attribute identifies the circuit pack type. This attribute is a code as defined in Table 3. The value 0xFF (255) means unknown or undefined, i.e., the inserted circuit pack is not recognized by the ONT or is not mapped to an entry in Table 3. In the latter case, the equipment ID attribute may contain inventory information. Upon autonomous instantiation, this attribute is set to 0 or to the type of the circuit pack that is physically present. (R, Set-by-create (if applicable)) (mandatory) (1 byte)

Number of ports: This attribute gives the quantity of access ports on the circuit pack. If the port mapping package is supported for this circuit pack, this attribute should be set to the total number of ports of all types. (R) (optional) (1 byte)

Serial Number: The serial number is unique for each circuit pack. Note that the serial number may contain the vendor id and/or version number. For ONTs with integrated interfaces on the UNI side, this value is identical to the value of the serial number attribute of the ONT_{B-PON} managed entity. Upon instantiation, this attribute consists of all spaces. (R) (mandatory) (8 bytes)

Version: This attribute identifies the version of the circuit pack as defined by the vendor. A value of 0 shall be used when version information is not available or applicable to the ONT being represented. For ONTs with integrated interfaces on the UNI side, this value is identical to the value of the version attribute of the ONT_{B-PON} managed entity. Upon autonomous instantiation, this attribute consists of all spaces. (R) (mandatory) (14 bytes)

Vendor id: This attribute identifies the vendor of the circuit pack. For ONTs with integrated interfaces, this value is identical to the value of the vendor id attribute of the ONT_{B-PON} managed entity. Upon instantiation, this attribute consists of all spaces. (R) (optional) (4 bytes)

Administrative State: This attribute is used to "unlock" (value 0) and "lock" (value 1) the functions performed by the circuit pack. When the administrative state is set to "lock," all user traffic to and from this circuit pack is blocked and alarms for this circuit pack and all associated managed entities are no longer generated. Selection of a default value for this attribute is outside the scope of this Recommendation as it is normally handled through supplier-operator negotiations. (R, W, Set-by-create (if applicable)) (mandatory) (1 byte)

Operational State: This attribute indicates whether or not the managed entity is capable of performing its task. Valid values are enabled (0x00), disabled (0x01), and unknown (0x02). Upon instantiation, this attribute is set to (0x02). (R) (optional) (1 byte)

BridgedorIPInd: This attribute indicates whether the Ethernet interface is bridged or derived from an IP router function (Bridged: 0x00; IP router: 0x01; 0x02 Bridged and IP Router). 0x02 means that both bridged and IP router functions are supported by the circuit pack. Upon autonomous instantiation, the value 0x00 is used. (R, W) (optional, only applicable for circuit packs with Ethernet interfaces) (1 byte)

Equipment id: This attribute may be used to identify the vendor's specific type of circuit pack. In North America, this may be used for the CLEI code. Upon instantiation, this attribute comprises all spaces or the equipment ID of the circuit pack that is physically present. (R) (optional) (20 bytes)

CardConfiguration: This attribute is used to select the appropriate configuration on configurable line cards (e.g., T1/E1). Table 3 specifies 3 configurable card types: A45/34 (code 9), C-DS1/E1 (code 16), and C-DS1/E1/J1 (code 17). Values are indicated below for the allowed card types and configurations.

Card Type	Configuration	Value
A45/34	ATM 44.736 Mbit/s	0x00
	ATM 34.368 Mbit/s	0x01
C-DS1/E1	DS1	0x00
	E1	0x01
C-DS1/E1/J1	DS1	0x00
	E1	0x01
	J1	0x02

Upon autonomous instantiation, the value 0x00 is used. (R, W, Set-by-create (if applicable)) (mandatory for configurable line cards) (1 byte)

Total T-CONT buffer number: This attribute provides the total number of T-CONT buffers that are associated with the circuit pack. Upon autonomous instantiation, the value 0 is used. (R) (mandatory for circuit packs that provide a traffic scheduler function) (1 byte)

Total Priority Queue number: This attribute provides the total number of priority queues that are associated with the circuit pack. Upon autonomous instantiation, the value 0 is used. (R) (mandatory for circuit packs that provide a traffic scheduler function) (1 byte)

Total Traffic Scheduler number: This attribute provides the total number of traffic schedulers that are associated with the circuit pack. The ONT supports NULL function, HOL (Head Of the Line) scheduling and WRR (Weighted Round Robin) from the priority control and guarantee of minimum rate control points of view, respectively. If the circuit pack has no traffic scheduler, this attribute should be 0x00. Upon autonomous instantiation, the value 0 is used. (R) (mandatory for circuit packs that provide a traffic scheduler function) (1 byte)

Power Shed Override: This attribute allows ports to be excluded from the power shed control. Order of the bit mask uses port 1 as the MSB, and a bit value of one is used to mark the port as overriding the shed timer. Note for hardware that cannot shed power per port, this attribute is used as a slot override instead of a per port override, with any non-zero value indicating slot overriding power shedding. (R, W) (optional) (4 bytes)

Actions

Create: Create an instance of this managed entity (optional, only when plug-and-play is supported).

Delete: Delete an instance of this managed entity (optional, only when plug-and-play is supported).

Get: Get one or more attributes.

Set: Set one or more attributes.

Reboot: Reboot the circuit pack.

Test: Test the circuit pack (this action is optional). The test action can be used either to perform equipment diagnostics or to make measurements of parameters such as received optical power, video output level, battery voltage, etc. Extensions to the test and test response messages are defined for these purposes; refer to Appendix II.

Change "Subscriber line card" to "Circuit pack" in the captions to Tables 5a and 5b.

2.12 Modifications to clause 7.1.5 PON IF line cardholder

Add the following text to the beginning of the clause:

This attribute is deprecated in favour of the general purpose cardholder ME, defined in 7.1.3.

2.13 Modifications to clause 7.1.6 PON IF line card

Add the following text to the beginning of the clause:

This managed entity is deprecated in favour of the general purpose circuit pack managed entity, defined in 7.1.4.

2.14 Modifications to clause 7.1.7 Software image

Modify the text up to the "Actions" sub-heading in this clause to read as follows:

This managed entity represents a program stored in the ONT.

Two instances of this managed entity shall be automatically created by the ONT after the creation of each managed entity that contains independently manageable software. The software image managed entity is used to report to the management system the software currently installed in non-volatile memory. After the creation of the instances of this managed entity, the associated attributes are updated according to the data within the ONT and its circuit packs.

Some pluggable equipments may contain no software. Others may contain software that is intrinsically bound to the ONT's own software image. No software image ME need exist for such equipments, though it may be convenient for the ONT to create them to support software version audit from the OLT. In this case, the dependent MEs would support only the *get* action.

A slot may contain various equipments over its lifetime, and if software image MEs exist, they must automatically be created and deleted by the ONT as the equipage changes.

When controller packs are duplicated, each can be expected to contain two software image MEs, managed through reference to the individual controller packs themselves. When this occurs, the ONT should not have a global pair of software image MEs (instance 0), since an action (download, activate, commit) directed to instance 0 would be ambiguous.

Relationships

Two instances of the software image managed entity are contained in an instance of an ONT or equipment managed entity whose software is independently managed.

Attributes

Managed Entity id: This attribute provides a unique number for each instance of this managed entity. The number consists of a two-byte field. The first field (MSB) identifies the ME instance (ONT (value 0x00) or circuit pack slot (value 0x01-0xFF)) containing the associated software image ME. The second field (LSB) distinguishes between the two (redundant) software image ME instances (values 0x00 and 0x01). (R) (mandatory) (2 bytes)

Version: This attribute identifies the version of the software. Upon autonomous instantiation, this attribute consists of all spaces. (R) (mandatory) (14 bytes)

Is committed: This attribute indicates whether the associated software image is "committed" (value 0x01) or "uncommitted" (value 0x00). By definition, the "committed" software image will be loaded and executed upon a reboot of the ONT and/or associated circuit pack. During normal operation, one software image will always be "committed" while the other is "uncommitted". Under no circumstances are both software images allowed to be "committed" at the same time. On the other hand, both software images are only allowed to be non-committed at the same time if both are invalid. Upon autonomous instantiation, this attribute of instance 0 shall be initialized to "committed" and this attribute of instance 1 shall be initialized to "uncommitted". (R) (mandatory) (1 byte)

Is active: This attribute indicates whether the associated software image is "active" (value 0x01) or "inactive" (value 0x00). By definition, the active software image is one that is currently loaded and executing in the ONT (or associated circuit pack). Under normal operation, one software image will always be "active" while the other is "inactive". Under no circumstances are both software images allowed to be "active" at the same time. On the other hand, both software images are only allowed to be inactive at the same time if both are invalid. Upon autonomous instantiation, this attribute of instance 0 shall be initialized to "active" and this attribute of instance 1 shall be initialized to "inactive". (R) (mandatory) (1 byte)

Is valid: This attribute indicates whether the associated software image is "valid" (value 0x01) or "invalid" (value 0x00). By definition, a software image is "valid" if it has been verified to be an executable code image. The verification mechanism is not subject to standardization; however, at a minimum, it must include a data integrity (CRC) check of the entire code image. Upon autonomous instantiation, the associated code image is verified and this attribute is set according to the result of this verification. (R) (mandatory) (1 byte)

2.15 Add new clauses 7.1.9, 7.1.10, 7.1.11, 7.1.12 and 7.1.13

Add the following new clauses:

7.1.9 Equipment protection profile

This managed entity supports equipment protection. There can be as many as two protection slots protecting as many as eight working slots. Each of the working and protect cardholder managed entities should refer to the equipment protection profile that defines its protection group. Instances of this managed entity are created and deleted by the OLT.

An ONT should deny pre-provisioning that would create impossible protection groupings. In the same way, the ONT should deny creation or addition to protection groups that cannot be supported by the current equipage. An inconsistent card type alarm is defined, for example, to cover the case of a plug-and-play circuit pack installed in a protection group that cannot support it.

Relationships

An instance of this object points to the working and protect cardholders, that in turn point back to this managed entity.

Attributes

Managed Entity id: This attribute provides a unique number for each instance of this managed entity. The first byte is 0. The second byte is assigned by the OLT at creation, and must be unique and non-zero. (R, Set-by-create) (mandatory) (2 bytes)

Protect slot 1, Protect slot 2: This list of attributes describes the protecting cardholder entities in an equipment protection group. There can be one or two protecting entities.

- 0 Undefined entry. This value is appropriate as a place-holder if there are fewer than two protecting entities in the protection group.
- 1..254 Slot number of the protecting circuit pack.

(R, W, Set-by-create) (at least one entry mandatory) (1 byte × 2 entries)

Working slot 1, Working slot 2, Working slot 3, Working slot 4, Working slot 5, Working slot 6, Working slot 7, Working slot 8: This list of attributes describes the working cardholder entities in an equipment protection group. There can be up to eight working entities.

- 0 Undefined entry. This value is appropriate as a place-holder if there are fewer than eight working entities in the protection group.
- 1..254 Slot number of the working circuit pack.

(R, W, Set-by-create) (at least one entry mandatory) (1 byte × 8 entries)

Protect status 1, Protect status 2: This list of attributes indicates whether each protection cardholder is currently protecting some other cardholder, and if so, which one.

- 0 Not protecting any other cardholder.
- 1..254 Slot number of the cardholder currently being protected by this ME.

(R) (mandatory) (1 byte × 2 entries)

Revertive Ind: This attribute specifies whether equipment protection is revertive. The default value 0 indicates revertive switching; any other value indicates non-revertive switching. (R, W, Set-by-create) (optional) (1 byte)

Wait to restore time: This attribute specifies the time, in minutes, during which a working equipment must be free of error before a revertive switch occurs. It defaults to 0. (R, W, Set-by-create) (optional) (1 byte)

Actions

Get: Get one or more attributes.

Set: Set one or more attributes.

Create: Create an instance of this managed entity.

Delete: Delete an instance of this managed entity.

Notifications

Alarm: This notification indicates an incompatibility in the proposed protection group. When possible, the ONT should deny provisioning attempts that would create incompatibilities, but, for example in the case of plug-and-play, it may not be possible to forestall the inconsistency.

Table 5c/G.983.2 – Alarm list for equipment protection profile

Number	Alarm	Description
0	inconsistentCardType	The expected or actual circuit pack type in a slot is incapable of participating in the equipment protection group, either because it is not subject to equipment protection or because its type or equipment ID differs from that previously defined for the other cardholders of the group.
1-223	Reserved	
224-239	Vendor-specific alarms	Not to be standardized

7.1.10 Equipment extension package

This managed entity supports optional extensions to circuit pack managed entities.

Relationships

An equipment extension package may be contained by an ONT_{B-PON}, ONU_{B-PON} or cardholder.

Attributes

Managed entity id: This attribute provides a unique number for each instance of this managed entity. The assigned number is the same as that of the ONT_{B-PON}, ONU_{B-PON} or cardholder with which this instance is associated. (R) (mandatory) (2 bytes)

Environmental sense: This attribute permits an ONT to support external sense points, for example physical security detectors at an enclosure. Each pair of bits is defined as follows:

- 00 (default) sense point disabled
- 01 report contact closure
- 10 report contact open
- 11 sense point disabled

If the byte is represented in binary as 0B hhgg ffee ddcc bbaa, bits hh correspond to sense point 1, while bits aa correspond to sense point 8. (R) (optional) (2 bytes)

NOTE – Some specific sense point applications are already specifically defined on the ONT/ONU managed entity. It is the vendor's choice how to configure and report sense points that appear both generically and specifically.

Contact closure output: This attribute permits an ONT to support external contact closure points, for example sump pump or air conditioner activation at an ONT enclosure. A contact point is said to be released when it is not energized. Whether this corresponds to an open or a closed external circuit depends on the ONT's wiring options. Upon ONT initialization, all contact points should go to the released state.

If the byte is represented in binary as 0B hhgg ffee ddcc bbaa, bits hh correspond to contact output point 1, while bits aa correspond to contact output point 8.

On write, the bits of this attribute have the following meaning:

- 0x no change to contact output point state
- 10 release contact output point
- 11 operate contact output point

On read, the left bit in each pair should be set to 0 at the ONT and ignored at the OLT. The right bit indicates a released output point with 0 and an operated point with 1. (R, W) (optional) (2 bytes)

Actions

Get: Get one or more attributes.

Set: Set one or more attributes.

Notifications

Alarm: This notification is used to notify the managed system when a failure has been detected or cleared. Both ONT and OLT should know the alarm list used by this entity. The alarm list for this entity is given in Table 5d.

Table 5d/G.983.2 – Alarm list for equipment extension package

Number	Event	Description
	Alarm	
1	Sense point 1	Environmental sense point 1 active
2	Sense point 2	Environmental sense point 2 active
3	Sense point 3	Environmental sense point 3 active
4	Sense point 4	Environmental sense point 4 active
5	Sense point 5	Environmental sense point 5 active
6	Sense point 6	Environmental sense point 6 active
7	Sense point 7	Environmental sense point 7 active
8	Sense point 8	Environmental sense point 8 active
9-223	Reserved	
224-239	Vendor-specific alarms	Not to be standardized

7.1.11 Port mapping package

This managed entity provides a way to map a heterogeneous set of physical path termination points (ports) to a parent equipment, which may be a cardholder or the ONT_{B-PON} itself. It is useful, for example, if a single plug-in circuit pack contains a PON ANI as port 1, a video UNI as port 2, and a craft UNI as port 3. It also provides an option for an integrated ONT to represent its ports without the use of virtual cardholders and virtual circuit packs.

If the port mapping package is supported for the ONT as a whole, it is automatically created by the ONU when the MIB is created. If the port mapping package is supported for plug-in circuit packs, it is automatically created and destroyed by the ONT when the corresponding circuit pack is installed or preprovisioned in a cardholder.

The port list attributes specify ports 1-128 sequentially. The port list contains a sequence of ME code types, as defined in Table 21. The code types define what kind of PPTP or ANI corresponds to the specific port number. If gaps in the PPTP numbering are desired, zero entries can be included within the list. For example, for a circuit pack with 4 POTS ports, 2 VDSL ports, and 1 video port, the attributes could be coded:

MaxPorts: 7

PortList1:53, 53, 53, 53, 117, 117, 82, 0,0,0,0,0,0,0,0

PortList2-8:All zero

Relationships

A port mapping package may be contained by an ONT_{B-PON}, ONU_{B-PON} or a cardholder.

Attributes

Managed entity id: This attribute provides a unique number for each instance of this managed entity. The assigned number is the same as that of the ONT_{B-PON}, ONU_{B-PON} or cardholder with which this instance is associated. (R) (mandatory) (2 bytes)

Max ports: This attribute indicates the largest port number contained in the port list attributes. Ports are numbered from 1 to this maximum, possibly with embedded 0 entries, but no port may exist beyond the maximum. (R) (mandatory) (1 byte)

Port list 1, Port list 2, Port list 3, Port list 4, Port list 5, Port list 6, Port list 7, Port list 8: Each of these attributes is a list of 16 ports, in increasing port number sequence.

Each list entry is one byte containing the managed entity identifier of the UNI or ANI corresponding to the port number. Managed entity identifiers are defined in Table 21. Placeholders for unused port numbers are indicated with the value 0. (R) (at least one entry mandatory) (16 bytes per attribute)

Actions

Get: Get one or more attributes.

Notifications

None

7.1.12 ONT power shedding

This managed entity is contained in the ONT managed entity and is used to model the ONT equipment power shedding parameters. This object contains timer values used for the shedding of UNI services when the ONT transitions into a battery operation mode from an AC powered mode. Attributes are used to define shedding classes and may span multiple LIM types. This feature works in conjunction with the power shed override attribute in the Circuit Pack ME, which controls the power shedding of priority ports.

An instance of this managed entity is automatically created by the ONT after initialization if power shedding is supported on an ONT.

The following table outlines the binding of shedding class and UNI PPTP. Note that in the case of hybrid LIM types, multiple shedding classes may impact the port if the hardware is capable of a partial hardware shed.

Shedding Class	PPTP Type	Coding	Contents
ATM	ATM PPTP	1	A1.5
		2	A2
		3	A6.3
		4	A6.3U
		5	A8
		6	A25
		7	A34
		8	A45
		9	A45/34
		10	A150SMF SDH
		11	A150MMF SDH
		12	A150UTP SDH
CES	CES PPTP	13	C1.5 (DS1)
		14	C2.0 (E1)
		15	C6.3 (J2)
		16	C-DS1/E1
		17	C-DS1/E1/J1
		18	C6.3U (J2)
		19	C192k
ATM	ATM PPTP	20	C44.7 (DS3)
		21	C34.3 (E3)
Data	Ethernet PPTP	22	10Base-T
		23	100Base-T
		24	10/100Base-T
Frame	Unspecified	25	Token Ring
	Unspecified	26	FDDI
	Unspecified	27	FR
CES	CES PPTP	28	C1.5 (J1)
Sonet	ATM	29	A150SMF SONET
		30	A150MMF SONET
		31	A150UTP SONET
Voice	POTS PPTP	32	POTS
	ISDN PPTP	33	ISDN-BRI
Data	Ethernet PPTP	34	Gigabit Ethernet
Dsl	ADSL PPTP	35	ADSL
	Unspecified	36	SHDSL
	VDSL PPTP	37	VDSL
Video overlay	Video UNI	38	Video Service
N/A	LCT PPTP	39	LCT

Shedding Class	PPTP Type	Coding	Contents
Data	802.11 PPTP	40	802.11
Voice (Dsl may also apply)	ADSL + POTS	41	ADSL / POTS
	VDSL + POTS	42	VDSL / POTS
N/A	PON PPTP	250	PON1244155
		251	PON1244622
		252	PON622symm
		253	PON155
		254	PON622
Video overlay	Video ANI PPTP		
Video Return	Video RPD		
Data	MOCA PPTP		

Relationships

One instance of this managed entity is contained in the instance of the ONT managed entity.

Attributes

Managed Entity id: This attribute provides a unique number for each instance of this managed entity. There is only one instance and it has the number 0x0000. (R) (mandatory) (2 bytes)

Restore Power Timer Reset Interval: Specifies the time delay required before resetting shedding timers to zero after a full power restore, defined in seconds. Upon autonomous instantiation, this attribute is set to 0x00. (R, W) (mandatory) (2 bytes)

Data shedding class Interval: Attribute is defined in seconds, with zero defined as no-powershed, and one defined as immediate power shed. Upon autonomous instantiation, this attribute is set to 0x00. (R, W) (mandatory) (2 bytes)

Voice shedding class Interval: Attribute is defined in seconds, with zero defined as no-powershed, and one defined as immediate power shed. Note that this only applies to Voice services that are terminated on the ONT, and does not apply to voice services that may reside in the customer premises served by a Data type port. Upon autonomous instantiation, this attribute is set to 0x00. (R, W) (mandatory) (2 bytes)

Video Overlay shedding class Interval: Attribute is defined in seconds, with zero defined as no-powershed, and one defined as immediate power shed. Upon autonomous instantiation, this attribute is set to 0x00. (R, W) (mandatory) (2 bytes)

Video Return shedding class Interval: Attribute is defined in seconds, with zero defined as no-powershed, and one defined as immediate power shed. Upon autonomous instantiation, this attribute is set to 0x00. (R, W) (mandatory) (2 bytes)

DSL shedding class Interval: Attribute is defined in seconds, with zero defined as no-powershed, and one defined as immediate power shed. Upon autonomous instantiation, this attribute is set to 0x00. (R, W) (mandatory) (2 bytes)

ATM shedding class Interval: Attribute is defined in seconds, with zero defined as no-powershed, and one defined as immediate power shed. Upon autonomous instantiation, this attribute is set to 0x00. (R, W) (mandatory) (2 bytes)

CES shedding class Interval: Attribute is defined in seconds, with zero defined as no-powershed, and one defined as immediate power shed. Upon autonomous instantiation, this attribute is set to 0x00. (R, W) (mandatory) (2 bytes)

Frame shedding class Interval: Attribute is defined in seconds, with zero defined as no-powershed, and one defined as immediate power shed. Upon autonomous instantiation, this attribute is set to 0x00. (R, W) (mandatory) (2 bytes)

SONET shedding class Interval: Attribute is defined in seconds, with zero defined as no-powershed, and one defined as immediate power shed. Upon autonomous instantiation, this attribute is set to 0x00. (R, W) (mandatory) (2 bytes)

Actions

Get: Get one or more attributes.

Set: Set one or more attributes.

Notifications

None.

7.1.13 ONT remote debug

This managed entity is used to send debug commands to the ONT and receive data contents back for processing on the OLT. This allows for the remote debugging of an ONT that may not be accessible by any other means. The command format may have two modes, one being text and the other free format. If the format is defined as text, then both the command and reply will be defined in standard ASCII string format. If using free format, the contents and format of both the command and reply are vendor specific. Note that the use of the free format makes interoperability difficult.

An instance of this managed entity is automatically created by the ONT after initialization if remote debugging is supported on an ONT.

Relationships

One instance of this managed entity is contained in the instance of the ONT managed entity.

Attributes

Managed Entity id: This attribute provides a unique number for each instance of this managed entity. There is only one instance and it has the number 0x0000. (R) (mandatory) (2 bytes)

Command Format: This attribute defines the format of the command request and reply attributes. Value 0x0 defines the ASCII string format, with value 0x1 used to specify free format. Upon autonomous instantiation, this attribute is set to 0x00. (R) (mandatory) (1 byte)

Command: This attribute is used to send a command to the ONT. The format of the command is defined by the command format. If the format is of ASCII string, the command should be null terminated unless the string size is equal to the attribute size. The action of setting this attribute should trigger the ONT to discard any previously command reply information, and execute the current debugging command. (W) (mandatory) (25 bytes)

Reply: Attribute is used to pass reply information back to the OLT. The contents are defined by the command format attribute. Note that the Get-next sequence must be used with this attribute since the size is assumed to be unspecified. On an action of Get, the size of the reply is returned with a size of 4 bytes (as per the Get-Next usage). If the size of the reply is unknown at the time of the Get, the value 0xFFFF will be returned. The OLT will then attempt to issue Get-next requests until the ONT is exhausted of data, whereupon the ONT will reply with a Command sequence number out of range response. The OLT will then terminate the Get-next process. Upon autonomous instantiation, this attribute is set to 0x00. (R) (mandatory) (N*1 bytes)

Actions

Get: Get one or more attributes. Latch a snapshot (i.e., copy) of the current reply attribute and respond with the size of data (4 bytes) that should be obtained using the Get next command.

Get-Next: Get the latch attribute values of the managed entity within the current snapshot.

Set: Set one or more attributes.

Notifications

None.

2.16 Modification to clause 7.2.1 PON physical path termination point

Modify clause 7.2.1 to read as follows:

7.2.1 PON physical path termination point

An instance of this managed entity represents a point in the ONT where a PON Physical Path terminates and physical path level functions (e.g., path overhead functions) are performed.

An instance of this managed entity is automatically created by the ONT after initialization. However, this instance will not be reported during a MIB upload.

Relationships

One or more instances of this managed entity are contained in an instance of the ONT or Circuit pack managed entities.

Attributes

Managed Entity id: This attribute provides a unique number for each instance of this managed entity. This 2-byte number is directly associated with the physical position of the PON IF. The first byte is the slot id (defined in 7.1.3). The second byte is the port id. It is preferred but not mandatory that the numbering of the port ID should be structured such that 0x01 is used for the leftmost/lowest port on a PON IF Line Card, 0x02 is used for the next right/upper port, and so forth. (R) (mandatory) (2 bytes)

Actions

None.

Notifications

None.

2.17 Modification to clause 7.2.2 ANI

Replace the "Relationships" clause as follows:

Relationships

One or more instances of this managed entity shall be contained in the ONT_{B-PON} or in an instance of a circuit pack managed entity that supports ANI functions.

2.18 Modification to clause 7.2.4 T-CONT buffer

Modify the description of the ME ID attribute to read as follows:

Managed Entity id: This attribute provides a unique number for each instance of this managed entity. This 2-byte number is associated with the physical capability that realizes the T-CONT buffer. The first byte is the slot id of the circuit pack with which this T-CONT buffer is associated. If the ONT has T-CONT buffers that are not associated with a circuit pack, the first

byte of this attribute is 0xFF. The second byte is the T-CONT id that is numbered by the ONT itself. The T-CONT id is numbered in ascending order with the range of 0x00 to 0xFF in each circuit pack or ONT core. (R) (mandatory) (2 bytes)

2.19 Modification to subclauses within clause 7.3

In any managed entity that contains an "ARC" attribute, add a corresponding entry to the AVC list for that ME to describe the AVC that would be sent when the ARC timer expires and the AVC attribute is reset.

At the beginning of each subclause (i.e., clauses 7.3.1, 7.3.2, 7.3.3, 7.3.4 and 7.3.5), in the creation conditions for any ME that refers to "Subscriber line card" should be modified to refer to "Circuit pack or Port mapping package", and the reference to "card type" should be changed to refer to support of the service in question. For example, in 7.3.1, the initial text reads:

This managed entity represents the point at an ATM UNI in the ONT where physical paths terminate and physical path level functions (e.g., path overhead functions) are performed.

An instance of this managed entity shall be automatically created/deleted by the ONT upon the creation/deletion of a Subscriber Line Card of ATM type.

Relationships

One or more instances of this managed entity shall be contained in an instance of a Subscriber Line Card managed entity classified as ATM type.

Should be changed to read:

This managed entity represents the point at an ATM UNI in the ONT where physical paths terminate and physical path level functions (e.g., path overhead functions) are performed.

The ONT shall automatically create/delete an instance of this managed entity for each port that supports ATM services upon the creation/deletion of a circuit pack or port mapping package managed entity.

Relationships

Instances of this managed entity shall be contained in the ONT_{B-PON} or in instances of the circuit pack managed entity that support ATM services.

Replace all instances of "PON interface line card" with "Circuit Pack".

Replace all instances of "Subscriber line card" with "Circuit Pack".

Replace all instances of "Subscriber line Cardholder" with "Cardholder".

In any managed entity that is a physical path termination point, the description of the "Managed Entity ID" attribute should be changed as follows:

Managed Entity ID: This attribute provides a unique number for each instance of this managed entity. This 2-byte number is directly associated with the physical position of the UNI. The first byte is the slot ID (defined in 7.1.3). The second byte is the port ID with a value range from 0x01 to 0xFF (1 to 255). It is preferred but not mandatory that the numbering of the port ID should be structured such that 0x01 is used for the leftmost/lowest port on a subscriber line card, 0x02 is used for the next right/upper port, and so forth. (R) (mandatory) (2 bytes)

2.20 Modifications to clause 7.3.26 Physical path termination point POTS UNI

Add the following attribute descriptions to the PPTP POTS UNI ME:

Operational State: This attribute indicates whether or not this managed entity is capable of performing its task. The operational state reflects the perceived ability to receive or to generate a valid signal. Valid values are enabled (0x00) and disabled (0x01). (R) (optional) (1 byte)

Hook State: This attribute indicates the state of the subscriber line: 0x00 = on hook, 0x01 = off hook (R) (Optional) (1 byte)

2.21 Modifications to clause 7.3.29 MAC bridge service profile

Add the following attribute:

Unknown MAC address discard: This Boolean attribute indicates the treatment of MAC frames with unknown destination addresses. The value TRUE means that frames with unknown destination addresses will be discarded. The value FALSE means that such frames will be forwarded to all allowed ports. (R, W, Set-by-create) (mandatory) (1 byte)

2.22 Modifications to clause 7.3.31 MAC bridge port configuration data

Append the following text to the attribute descriptions indicated:

TPTType: The value is set to 0x04 if this bridge port is associated with an IP Host Service. The value 0x05 is reserved for future standardization

TPPointer: If the TPTType = 0x04, the value of this attribute is the same as that of the associated IP Host Config Data ME

Append the following new attribute to the list:

PortMACAddress: This attribute indicates the Physical MAC address used by the Port as defined by the TPPointer when the TPTType is set to LAN. (R) (optional) (6 bytes)

2.23 Modifications to clause 7.3.49 VLAN tagging operation configuration data

Replace the following attribute descriptions as follows:

Managed Entity id: This attribute provides a unique number for each instance of this managed entity. The assigned number is the same as the id of the Physical Path Termination Point Ethernet UNI or IP Host Config Data ME with which this VLAN Tagging Operation Configuration Data instance is associated. (R, Set-by-create) (mandatory) (2 bytes)

Upstream VLAN Tagging Operation Mode: This attribute selects how upstream VLAN tagging is sent. Valid values are:

0x00 (upstream frame is sent "as is", regardless of whether or not the received frame is tagged).

0x01 (The upstream frame is sent as tagged whether or not the received frame is tagged. TCI, consisting of VID, CFI and user priority, is attached or overwritten by using the Upstream VLAN Tag TCI Value.).

0x02 (The upstream frame is sent as tagged whether or not the received frame is tagged. If the received frame is tagged, a second tag (Q-n-Q) is added to the frame. If the received frame is not tagged, a tag is attached to the frame. TCI, consisting of VID, CFI and user priority, is attached or added by using the Upstream VLAN Tag TCI Value.).

(R, W, Set-by-create) (mandatory) (1 byte)

2.24 Modifications to clause 7.3.51 MAC bridge port filter preassign table

Add the following to the Actions table:

Get: Get one or more attributes.

2.25 Modifications to clause 7.3.53 Physical path termination point video ANI

Replace the following attribute description as follows:

PilotFrequency: This attribute indicates the frequency of the pilot channel receiver. The unit of this attribute is Hz.

If SignalCapability = 0, 1, 6, or 7, this attribute is undefined;

If SignalCapability = 2 or 3, this attribute is functionally read only;

If SignalCapability = 4 or 5, this attribute is read-write.

(R, W) (optional) (4 bytes)

Add the following attributes:

Video Lower Optical Threshold: This attribute indicates the optical level the ONT uses to declare the Video-OOR Low alarm. When the optical level of the received 1550 nm signal drops below the Video Lower Optical Threshold, the Video-OOR Low alarm is declared. Valid values are –12 dBm to +6 dBm in 0.1 dB increments, represented as a 2's complement integer. (value –120 to +60, 0x00 = 0 dBm, 0x88 = –12.0 dBm, etc.) Upon autonomous instantiation, the value 0xA1 (–9.5 dBm) is used. (R,W) (optional) (1 byte)

Video Upper Optical Threshold: This attribute indicates the optical level the ONT uses to declare the Video-OOR High alarm. When the optical level of the received 1550 nm signal rises above the Video Upper Optical Threshold, the Video-OOR High alarm is declared. Valid values are –12 dB to +6 dBm in 0.1 dBm increments, represented as a 2's complement integer (value –120 to +60, 0x00 = 0 dBm, 0x88 = –12.0 dBm, etc.) Upon autonomous instantiation, the value 0x19 (+2.5 dBm) is used. (R,W) (optional) (1 byte)

Modify the alarm list Table 15p as follows:

Table 15p/G.983.2 – Alarms list for physical path termination point video ANI

Number	Event	Description
0	Video-LOS	No signal at the video ANI
1	Video-OOR Low	Signal strength below lower optical threshold (Optional)
2	Video-OOR High	Signal strength above upper optical threshold (Optional)
3-223	Reserved	
224-239	Vendor-specific alarms	Not to be standardized

2.26 Modifications to clause 7.3.62 802.11 PHY FHSS DSSS IR tables

Under the "Actions" subheading, delete the "Create" and "Delete" actions.

2.27 Modifications to clauses 7.3.73-7.3.76 and 7.3.94

The clauses in question describe the following MEs:

- ADSL subcarrier masking downstream profile;
- ADSL subcarrier masking upstream profile;
- ADSL downstream PSD mask profile;
- ADSL downstream RFI bands profile;
- Video return path statistics.

In each of these clauses, under the "Actions" sub-heading, add the "Create" and "Delete" actions, as shown below:

Create: Create an instance of this managed entity.

Delete: Delete an instance of this managed entity.

2.28 Modifications to clause 7.3.95 802.1p mapper service profile

Make the following change to the existing description for VoIP support:

PPTP UNI Pointer: An instance identifier of the PPTP UNI or IP Host Service that is associated with this 802.1p Priority Queue Mapper. If the mapper is used for Bridging-mapping, then this attribute is set to 0xFFFF. If TPTYPE is not supported, or TPTYPE is set to 0x01, this attribute contains the ME ID of the associated PPTP Ethernet UNI ME. If TPTYPE is set to 0x02, this attribute contains the ME ID of the IP Host Config Data ME. (R,W) (mandatory) (2 bytes)

Remove "Set-by-create" from the description of the "DSCP to P-Bit Mapping" attribute.

Add the following new attribute:

TPTYPE: This attribute identifies the type of termination point associated with the mapper. The value is set to 0x0 if the mapper is used for Bridging-mapping. The value is set to 0x01 if the mapper is directly associated with a PPTP Ethernet UNI. The value is set to 0x02 if the mapper is directly associated with an IP Host Service. The value 0x03 is reserved for future standardization. (R,W) (optional) (1 byte)

2.29 New subclauses to clause 7.3

Add the following new subclauses to clause 7.3:

7.3.98 IP host config data

The IP host config data contains the configuration for IP-based services that are offered on the ONT. This entity is conditionally required for ONTs that offer IP services from the ONT itself, and its presence allows additional features to be supported with the ONT.

Instances of this managed entity are automatically created by the ONT after initialization if IP Host services are available.

Relationships

One instance of this managed entity is contained in the instance of the ONT managed entity.

Attributes

Managed Entity id: This attribute provides a unique number for each instance of this managed entity. The ONT creates as many instances as there are independent IP stacks on the ONT. (R) (mandatory) (2 bytes)

IP Options: This attribute is a bitfield that is used to enable or disable IP related options. A bit value of 1 enables the option and a bit value of 0 disables the option. The options are assigned as follows:

0x1 = Enable DHCP

0x2 = Respond to PINGs

0x4 = Respond to TraceRoute messages.

0x8-0x80 = Reserved for future use.

(R, W) (mandatory) (1 byte)

MAC Address: This attribute indicates the MAC address used by the IP Node (R) (mandatory) (6 bytes)

ONT Identifier: A unique ONT identifier string. This string, if set, is provided as part of the DHCP request to allow an alternative to MAC Address in retrieving the DHCP parameters of the specified ONT. The string may be up to 25 bytes long. If the string length is smaller than 25 bytes, it must be null terminated.

Default value is 25 null bytes. (R, W) (mandatory) (25 bytes)

IP Address: Address used for all IP services hosted by the ONT, and has a default value of 0x0 [not set]. If this value is set, it will override any values returned in DHCP. (R, W) (mandatory) (4 bytes)

Mask: Subnet mask for the IP services hosted by the ONT, and has a default value of 0x0 [not set]. If this value is set, it will override any values returned in DHCP. (R, W) (mandatory) (4 bytes)

Gateway: Default Gateway Address used for all IP services hosted by the ONT, and has a default value of 0x0 [not set]. If this value is set, it will override any values returned in DHCP. (R, W) (mandatory) (4 bytes)

Primary DNS: Address used for the Primary DNS server for the IP service, and has a default value of 0x0 [not set]. If this value is set, it will override any values returned in DHCP. (R, W) (mandatory) (4 bytes)

Secondary DNS: Address used for the Secondary DNS server for the IP service, and has a default value of 0x0 [not set]. If this value is set, it will override any values returned in DHCP. (R, W) (mandatory) (4 bytes)

Current Address: Current address for the IP service hosted by the ONT. This attribute is updated by the ONT if a new address is assigned by DHCP. (R) (optional) (4 bytes)

Current Mask: Current subnet mask for the IP service. This attribute is updated by the ONT if a new mask is assigned by DHCP. (R) (optional) (4 bytes)

Current Gateway: Current default Gateway Address for the IP service. This attribute is updated by the ONT if a new gateway is assigned by DHCP. (R) (optional) (4 bytes)

Current Primary DNS: Current address used for the Primary DNS server for the IP service. This attribute is updated by the ONT if a new address is assigned by DHCP. (R) (optional) (4 bytes)

Current Secondary DNS: Current address used for the Secondary DNS server for the IP service. This attribute is updated by the ONT if a new address is assigned by DHCP. (R) (optional) (4 bytes)

Domain Name: If domain name is indicated by DHCP, it is presented here. If domain name is not indicated, this attribute is set to an empty string.

The string may be up to 25 bytes long. If the string length is smaller than 25 bytes, it must be null terminated.

Default value is 25 null bytes. (R) (mandatory) (25 bytes)

Host Name: If host name is indicated by DHCP, it is presented here. If host name is not indicated, this attribute is set to an empty string.

The string may be up to 25 bytes long. If the string length is smaller than 25 bytes, it must be null terminated.

Default value is 25 null bytes. (R) (mandatory) (25 bytes)

Actions

Get: Get one or more attributes.

Set: Set one or more attributes.

Notifications

None.

7.3.99 IP host performance monitoring history data

This managed entity contains the last completed 15-minute interval performance monitoring data collected with regard to the IP Node. All the attribute counters are only updated at the end of each period. Instances of this managed entity may be created by the OLT in case an instance of the IP Host Config Data managed entity was created by the ONT. Instances of this managed entity are deleted by the OLT.

Relationships

One instance of this managed entity can exist for each instance of the IP Node managed entity that represents IP functions.

Attributes

Managed Entity Id: This attribute provides a unique number for each instance of this managed entity. The assigned number is the same as the Managed Entity Id of the corresponding IP Host Config Data ME. (R, Set-by-create) (mandatory) (2 bytes)

Interval End Time: This attribute identifies the most recently finished 15-minute interval. It is a cyclic counter (modulo 0x100 (256)) that is incremented each time a new interval is finished and the attribute counters are updated. The value of this attribute is 0x00 during the first 15-minute interval that starts with the reception of the "synchronize time" action. The value is 0x01 during the first period after this, and so on. If this managed entity is created after the reception of the "synchronize time" action, the value of this attribute is set equal to the number of the last completed interval. The actual counters of this managed entity start counting directly. The attribute counters are updated at the end of the interval. (R) (mandatory) (1 byte)

Threshold Data Id: This attribute provides a pointer to an instance of the Threshold Data managed entity that contains the threshold values for the performance monitoring data collected by this managed entity. The value 0xFFFF is interpreted as a Null pointer. (R, W, Set-by-create) (mandatory) (2 bytes)

ICMP Errors: This attribute represents a count of the number of ICMP errors received for any traffic sent by the IP Node. If the actual counter saturates, it remains on its maximum value. Default value is 0x00. (R) (mandatory) (4 bytes)

DNS Errors: This attribute represents a count of the number of DNS errors received for any traffic sent by the IP Node. If the actual counter saturates, it remains on its maximum value. Default value is 0x00. (R) (mandatory) (4 bytes)

Actions

Create: Creates an instance of this managed entity.

Delete: Deletes an instance of this managed entity.

Get: Gets one or more attributes.

Set: Sets one or more attributes.

Get current data: This action returns the current value of one or more actual counters associated with performance monitoring attributes and the value of the Interval End Time attribute representing the interval in which the request is made. The values in the specific counters are reset at the end of the interval. (NOTE – "Get" returns the statistical data stored in the attribute values; "Get current data" returns the real-time value of the actual counters associated with those attributes.) Support of this action is optional.

Notifications

Threshold Crossing Alert: This notification is used to notify the management system when a Threshold Crossing Alert (TCA) has been detected or cleared. The TCA change notification "on" will be sent at the crossing of the threshold by the actual counter; the TCA change notification "off" will be sent at the end of the 15-minute period since that is when the actual counters are reset to 0x00. The event list for this entity is given in Table 36c.

Table 36c/G.983.2 – Alarm list for IP host performance monitoring history data

Number	Event	Description	Threshold Data counter # (Note)
	Threshold Crossing Alert		
0	IPNPM-ICMP-ERROR	IP Node ICMP Error threshold crossing	1
1	IPNPM-DNS-ERROR	IP Node DNS Error threshold crossing	2
2-223	Reserved		
224-239	Vendor-specific alarms	Not to be standardized	
NOTE – This numbering is used with the associated Threshold Data _{B-PON} managed entity. Threshold Data counter 1 indicates the 1st thresholded counter, etc.			

7.3.100 TCP/UDP config data

The TCP/UDP Config Data contains the configuration for TCP- and UDP-based services that are offered from the IP Host. This entity is conditionally required for ONTs that offer TCP/UDP IP services from the ONT itself, and its presence allows additional features to be supported with the ONT.

NOTE – If a Non-OMCI interface is being used for management of an IP service, this ME is not required. The Non-OMCI interface supplies the data contained within this ME.

An instance of this managed entity is created/deleted on request of the OLT.

Relationships

One or more instances of this managed entity are contained in the instance of the IP Host Config Data managed entity.

Attributes

Managed Entity id: This attribute provides a unique number for each instance of this managed entity. It is recommended that the entity id be the same as the port number. (R, Set-by-create) (mandatory) (2 bytes)

Port Id: This attribute refers to the port number that offers the TCP/UDP service. (R, Set-by-create) (mandatory) (2 bytes)

Protocol: This attribute defines the protocol types available as defined by IANA. Default value is UDP (0x11) (R, Set-by-Create) (mandatory) (1 byte)

TOS/Diffserv Field: This attribute contains the value for the TOS/Diffserv field of the IPv4 header. The contents of this attribute may contain the Type of Service as per RFC 1349 or the Differentiated Services Code Point (DSCP). Valid values for DSCP are as defined by IANA. Default value is 0x0. (R, W, Set-By-create) (mandatory) (1 byte)

IP Host Pointer: This attribute refers to the IP Host Config Data ME associated with this TCP/UDP Data. This allows for the support of multiple IP addresses to be associated with an ONT. (R, Set-by-create) (mandatory) (2 bytes)

Actions

Get: Get one or more attributes.

Set: Set one or more attributes.

Create: Create the object.

Delete: Delete the object.

Notifications

None.

7.3.101 VoIP config data

The VoIP Configuration Data defines the configuration for VoIP in the ONT. The OLT uses this ME to discover the VoIP signalling protocols and configuration methods supported by this ONT. The OLT then uses this ME to select the desired signalling protocol and configuration method. The entity is conditionally required for ONTs that offer VoIP services.

An instance of this managed entity is automatically created by the ONT if VoIP services are supported.

Relationships

One instance of the managed entity is contained in an instance of the ONT.

Attributes

Managed Entity id: This attribute provides a unique number for each instance of this managed entity. There is only one instance of this entity and will have an instance of 0x0000. (R) (mandatory) (2 bytes)

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Available Signalling Protocols: This attribute defines, using a bitmap, the VoIP Signalling Protocols supported in the ONT. Valid bitmap values are:

0x00 = None, VoIP not supported

0x01 = SIP

0x02 = H.248

0x04 = MGCP

(R) (mandatory) (1 byte)

Signalling Protocol Used: This attribute identifies the type of VoIP signalling protocol used for ONT. Only one type of protocol is allowed. Valid values are:

0x00 = None

0x01 = SIP

0x02 = H.248

0x03 = MGCP

0xFF = Selected by Non-OMCI Management Interface

(R, W) (mandatory) (1 byte)

Available VoIP Configuration Methods: This attribute indicates, using a bitmap, the capabilities of the ONT with regard to VoIP service configuration:

0x0001 indicates that the ONT is capable of using OMCI to configure its VoIP services.

0x0002 indicates that the ONT is capable of working with configuration file retrieval to configure its VoIP services.

0x0004 indicates that the ONT is capable of working with TR-69 to configure its VoIP services.

0x0008 indicates that the ONT is capable of working with IETF sipping config framework to configure its VoIP services.

Bits 5-24 are reserved for future use.

Bits 25-32 are reserved for proprietary vendor configuration capability indications.

Default value is 0x0001. (R) (mandatory) (4 bytes)

VoIP Configuration Method Used: Indicates to the ONT, which method should be used to configure the VoIP Service of the ONT.

0x00 the ONT default – do not configure.

0x01 indicates use of OMCI for VoIP service configuration of the ONT.

0x02 indicates use of configuration file retrieval for VoIP service configuration of the ONT.

0x03 indicates use of TR-69 for VoIP service configuration of the ONT.

0x04 indicates use of IETF sipping config framework for VoIP service configuration of the ONT.

0x05-0xF0 are reserved for future use.

0xF1-0xFF are reserved for proprietary vendor configuration methods.

Default value is 0x00 (R, W) (mandatory) (1 byte)

VoIP Configuration Address Pointer: If this attribute is set to any value other than 0xFFFF, it points to a Network Address managed entity. In this case, the Network Address ME indicates the address of the server to contact using the method indicated in the VoIP Configuration Method

Used attribute of the VoIP Service ME.

If this attribute is set to 0xFFFF, an address is not defined by this attribute. However, the address may be defined by other methods such as deriving the address from the ONT Identifier attribute of the IP Host Config Data ME, and using a well-known URI schema.

Default value is 0xFFFF (R, W) (mandatory) (2 bytes)

VoIP Configuration State: Indicates the VoIP service status of the ONT VoIP Service:

Value of 0x00 indicates inactive – meaning that configuration was not retrieved for the VoIP Service.

Value of 0x01 indicates active – meaning that configuration was retrieved for the VoIP Service.

Value of 0x02 indicates initializing – meaning that configuration is now being retrieved for the VoIP Service.

Value of 0x03 indicates fault – meaning that configuration retrieval process has failed for the VoIP Service.

Values 0x04-0xFF are reserved.

Default value is 0x00 (R) (mandatory) (1 byte)

Retrieve Profile: This attribute provides a means by which the ONT may be notified that a new VoIP profile should be retrieved. The setting of this attribute informs the ONT that a new profile should be retrieved. The actual value being set is ignored, because it is the action of setting that is important. (W) (mandatory) (1 byte)

Profile Version: This attribute is a character string that provides a version identifier for the last retrieved profile. (R) (mandatory) (25 bytes)

Actions

Get: Get one or more attributes.

Set: Set one or more attributes.

Notifications

Attribute value change: This notification is used to report autonomous changes to the attributes of this managed entity. The attribute value change notification shall identify the attribute changed and its new value. The list of AVCs for this managed entity is given in Table 36d.

Table 36d/G.983.2 – AVCs for VoIP config data ME

Number	Attribute value change	Description
1-7	N/A	
8	Profile Version	Version of last retrieved profile
9-16	Reserved	

Alarm: This notification is used to notify the management system when an alarm has been detected or cleared. The OLT should know the alarm list used by this entity. The alarm list for this entity is given in Table 36e.

Table 36e/G.983.2 – Alarm list for VoIP config data

Number	Alarm	Description
0	VCD-CONFIGSERVER-NAME	Failed to resolve the configuration server name
1	VCD-CONFIGSERVER-REACH	Cannot reach configuration server (The port cannot be reached, ICMP errors)
2	VCD-CONFIGSERVER-CONNECT	Cannot connect to configuration server (due to bad credentials or other fault after the port responded)
3	VCD-CONFIGSERVER-VALIDATE	Cannot validate configuration server
4	VCD-CONFIGSERVER-AUTH	Cannot authenticate configuration session (e.g., missing credentials)
5	VCD-CONFIGSERVER-TIMEOUT	Timeout waiting for response from configuration server
6	VCD-CONFIGSERVER-FAIL	Failure response received from configuration server
7	VCD-CONFIGFILE-ERROR	Configuration file received has an error
8	VCD-SUBSCRIPTION-NAME	Failed to resolve the subscription server name
9	VCD-SUBSCRIPTION-REACH	Cannot reach subscription server (The port cannot be reached, ICMP errors)
10	VCD-SUBSCRIPTION-CONNECT	Cannot connect to subscription server (due to bad credentials or other fault after the port responded)
11	VCD-SUBSCRIPTION-VALIDATE	Cannot validate subscription server
12	VCD-SUBSCRIPTION-AUTH	Cannot authenticate subscription session (e.g., missing credentials)
13	VCD-SUBSCRIPTION-TIMEOUT	Timeout waiting for response from subscription server
14	VCD-SUBSCRIPTION-FAIL	Failure response received from subscription server
15	VCD-REBOOT-REQUEST	A Non-OMCI management interface has requested a reboot of the ONT. NOTE – This alarm is used only to indicate the request and not indicate that a reboot has actually taken place.
16-223	Reserved	
224-239	Vendor-specific alarms	Not to be standardized

7.3.102 SIP config portal

The SIP Config Portal managed entity is conditionally required for ONTs that support SIP VoIP service and Non-OMCI configuration of that service. The SIP Config Portal ME is used to retrieve VoIP configuration information in textual form when SIP VoIP service is configured by a Non-OMCI mechanism (i.e., TR-069, Sipping Framework, etc.) but is monitored via OMCI.

The format of the text retrieved from this ME is vendor specific and is not required to be understood by the OLT or EMS.

An instance of this managed entity is created by the ONT when SIP VoIP signalling and a Non-OMCI configuration method is selected in the VoIP Config Data ME.

Relationships

One instance of this managed entity is related to the VoIP Config Data ME.

Attributes

Managed Entity ID: This attribute provides a unique number for each instance of this managed entity. The assigned number is the same as the associated VoIP Config Data ME. (R) (mandatory) (2 bytes)

Configuration Text: This attribute is used to pass a textual representation of the VoIP configuration back to the OLT. The contents are vendor specific. Note that the GET-NEXT sequence must be used with this attribute since the size is assumed to be unspecified. On an action of Get, the size of the reply is returned with a size of 4 bytes (as per the Get-Next usage). Upon autonomous instantiation, this attribute is set to 0x00. (R) (mandatory) (x bytes)

Actions

Get: Get one or more attributes. Latch a snapshot of the current Configuration Text attribute and respond with the size of the data (4 bytes) that should be obtained using the Get-Next command.

Get-Next: Get the latched attribute values of the managed entity within the current snapshot.

Notifications

Attribute value change: This notification is used to report autonomous changes to the attributes of this managed entity. The attribute value change notification shall identify the attribute changed. The list of AVCs for this managed entity is given in Table 36f.

Table 36f/G.983.2 – AVCs for SIP config portal ME

Number	Attribute value change	Description
1	Configuration Text	Used to indicate that a change has been made to the VoIP configuration from a Non-OMCI interface.
2-16	Reserved	

7.3.103 SIP agent config data

The SIP Agent Config Data defines the configuration attributes necessary to establish communication for signalling between a SIP User Agent and SIP Server. This entity is conditionally required for ONTs that offer SIP for VoIP services.

NOTE – If a Non-OMCI interface is being used for management of SIP for VoIP, this ME is not required. In this case, the Non-OMCI interface supplies the data contained within this ME but the data may be read via the SIP Config Portal ME.

An instance of this managed entity is created/deleted by request of the OLT.

Relationships

One instance of this managed entity is related to a TCP/UDP Config Data object. This managed entity may be referenced by one or more SIP User Data managed entities.

Attributes

Managed Entity id: This attribute provides a unique number for each instance of this managed entity. (R, Set-by-create) (mandatory) (2 bytes)

Proxy Server Address Pointer: This attribute provides a pointer to a LargeString ME that contains the name (IP address or URI) of the SIP Proxy Server for SIP signalling messages. (R, W, Set-by-create) (mandatory) (2 bytes)

Outbound Proxy Address Pointer: This attribute provides a pointer to a LargeString ME that contains the name (IP address or URI) of the SIP outbound Proxy Server for SIP signalling messages. (R, W, Set-by-create) (mandatory) (2 bytes)

Primary SIP DNS: This attribute defines the Primary SIP DNS IP Address. If this value is zero, the Primary SIP DNS should not be used. Default value is 0. (R, W, Set-by-create) (mandatory) (4 bytes)

Secondary SIP DNS: This attribute defines the Secondary SIP DNS IP Address. If this value is zero, the Secondary SIP DNS should not be used. Default value is 0. (R, W, Set-by-create) (mandatory) (4 bytes)

UDP/TCP pointer: This attribute associates the SIP Agent with the TCP/UDP service to be used for communication with the SIP Server. Default value is 0xFFFF. (R, W) (mandatory) (2 bytes)

SIP Reg Exp Time: This attribute defines the SIP Registration Expiration Time in seconds. If this value is zero, the SIP Agent will not add an expiration time to the registration requests, and will not perform re-registration. The default value used at Create shall be 3600 seconds. (R, W) (mandatory) (4 bytes)

SIP ReReg Head Start Time: This attribute provides the time in seconds prior to timeout that the SIP Agent should start the re-registration process. The default value used at Create shall be 360 seconds. (R, W) (mandatory) (4 bytes)

Host Part URI: This attribute provides a pointer to a LargeString ME that contains the host or domain part of the SIP Address of Record for users connected to this ONT. A 0xFFFF indicates the current address in the IP Host Config ME is used. Default value is 0xFFFF. (R, W, Set-by-create) (mandatory) (2 bytes)

SIP Status: This attribute is used to show the current status of the SIP Agent. Values are as follows: 0: ok/initial, 1: Connected, 2: Failed-ICMP Error, 3: Failed-Malformed-response, 4: Failed-Inadequate Info Response, 5: Failed-Timeout. (R) (mandatory) (1 byte)

SIP Registrar: This attribute provides a pointer to a Network Address ME that contains the name (IP address or resolved name) of the SIP Registrar Server for SIP signalling messages. Examples: "10.10.10.10" and "proxy.voip.net". Default value is 0xFFFF. (R, W, Set-by-create) (mandatory) (2 bytes)

Softswitch: This attribute identifies the SIP Gateway softswitch vendor. The format is four ASCII coded alphabetic characters [A-Z] as defined in ANSI T1.220. All NULL characters indicates no particular vendor. (R,W, Set-by-create) (mandatory) (4 byte)

Actions

Create: Create the object.

Delete: Delete the object.

Get: Get one or more attributes.

Set: Set one or more attributes.

Notifications

Attribute value change: This notification is used to report autonomous changes of attributes of this managed entity. The notification shall identify the attribute and its new value. The list of AVCs for this managed entity is given in Table 36g.

Alarm: This notification is used to notify the management system when an alarm has been detected or cleared. The OLT should know the alarm list used by this entity. The alarm list for this entity is given in Table 36h.

Table 36g/G.983.2 – AVCs for SIP agent config data

Number	Attribute value change	Description
1-8	N/A	
9	SIP Status	Status code of the SIP Agent
10, 11	N/A	
12-16	Reserved	

Table 36h/G.983.2 – Alarm list for SIP agent config data

Number	Alarm	Description
0	SIPUA-REGISTER-NAME	Failed to resolve the registration server name.
1	SIPUA-REGISTER-REACH	Cannot reach registration server (The port cannot be reached, ICMP errors)
2	SIPUA-REGISTER-CONNECT	Cannot connect to registration server (due to bad credentials or other fault after the port responded)
3	SIPUA-REGISTER-VALIDATE	Cannot validate registration server
4	SIPUA-REGISTER-AUTH	Cannot authenticate registration session (e.g., missing credentials)
5	SIPUA-REGISTER-TIMEOUT	Timeout waiting for response from registration server
6	SIPUA-REGISTER-FAIL	Failure response received from registration server
7-223	Reserved	
224-239	Vendor-specific alarms	Not to be standardized

7.3.104 SIP agent monitoring data

The SIP Agent Monitoring Data contains statistical information for the associated VoIP SIP Agent. This entity is optional for ONTs that offer SIP VoIP services.

An instance of this managed entity is created/deleted by the OLT if SIP Agent Monitoring is required.

Relationships

One instance of this managed entity is related to a SIP Agent Config Data object.

Attributes

Managed Entity id: This attribute provides a unique number for each instance of this managed entity. The assigned number is the same as the Managed Entity Id of the corresponding SIP Agent Config Data. If a Non-OMCI configuration method is being used for VoIP, the assigned number is the same as the ME Id of the SIP Config Portal ME. (R, Set-by-create) (mandatory) (2 bytes)

Interval End Time: This attribute identifies the most recently finished 15-minute interval. It is a cyclic counter (modulo 0x100 (256)) that is incremented each time a new interval is finished and the attribute counters are updated. The value of this attribute is 0x00 during the first 15-minute interval that starts with the reception of the "synchronize time" action. The value is 0x01 during the first period after this, and so on. If this managed entity is created after the reception of the "synchronize time" action, the value of this attribute is set equal to the number of the last

completed interval. The actual counters of this managed entity start counting directly. The attribute counters are updated at the end of the interval. (R) (mandatory) (1 byte)

Threshold Data id: This attribute provides a pointer to an instance of the Threshold Data_{B-PON} managed entity that contains the threshold values for the performance monitoring data collected by this managed entity. (R, W, Set-by-create) (mandatory) (2 bytes)

Transactions: This attribute represents a count of the number of new transactions that were initiated during this interval. If the counter saturates, it remains on its maximum value. (R) (optional) (4 bytes)

Rx Invite Reqs: This attribute defines the Received Invite messages (including retransmission). (R) (optional) (4 bytes)

Rx Invite Retrans: This attribute defines the Received Invite Retransmission messages. (R) (optional) (4 bytes)

Rx NonInvite Reqs: This attribute defines the Received Non-Invite messages (including retransmission). (R) (optional) (4 bytes)

Rx NonInvite Retrans: This attribute defines the Received Non-Invite Retransmission messages. (R) (optional) (4 bytes)

Rx Response: This attribute defines the total Responses received. (R) (optional) (4 bytes)

Rx Response Retransmissions: This attribute defines the total Responses Retransmissions received. (R) (optional) (4 bytes)

Tx Invite Reqs: This attribute defines the Transmitted Invite messages (including retransmission). (R) (optional) (4 bytes)

Tx Invite Retrans: This attribute defines the Transmitted Invite Retransmission messages. (R) (optional) (4 bytes)

Tx NonInvite Reqs: This attribute defines the Transmitted Non-Invite messages (including retransmission). (R) (optional) (4 bytes)

Tx NonInvite Retrans: This attribute defines the Transmitted Non-Invite Retransmission messages. (R) (optional) (4 bytes)

Tx Response: This attribute defines the total Responses sent. (R) (optional) (4 bytes)

Tx Response Retransmissions: This attribute defines the total Responses Retransmissions sent. (R) (optional) (4 bytes)

Actions

Create: Create the monitoring entity.

Delete: Delete the monitoring entity.

Get: Get one or more history attributes.

Set: Set one or more attributes.

Get current data: This action returns the current value of one or more actual counters associated with performance monitoring attributes and the value of the Interval End Time attribute representing the interval in which the request is made. The values in the specific counters are reset at the end of the interval. (NOTE – "Get" returns the statistical data stored in the attribute values; "Get current data" returns the real-time value of the actual counters associated with those attributes.) Support of this action is optional.

Notifications

Threshold Crossing Alert: This notification is used to notify the management system when a Threshold Crossing Alert (TCA) has been detected or cleared. The TCA change notification "on" will be sent at the crossing of the threshold by the actual counter; the TCA change notification "off" will be sent at the end of the 15-minute period, since that is when the actual counters are reset to 0x00. The event list for this entity is given in Table 36i.

Table 36i/G.983.2 – Alarm list for SIP agent monitoring data

Number	Event	Description	Threshold data counter # (Note)
	Threshold Crossing Alert		
0	SIPAMD-RX-INVITE-REQ	Receive Invite Request threshold crossing	1
1	SIPAMD-RX-INVITE-REQ-RET	Receive Invite Request Retransmission threshold crossing	2
2	SIPAMD-RX-NONINVITE-REQ	Receive Non-Invite Request threshold crossing	3
3	SIPAMD-RX-NONINVITE-REQ-RET	Receive Non-Invite Request Retransmission threshold crossing	4
4	SIPAMD-RX-RES	Receive Response threshold crossing	5
5	SIPAMD-RX-RES-RET	Receive Response Retransmission threshold crossing	6
6-223	Reserved		
224-239	Vendor-specific alarms	Not to be standardized	
NOTE – This numbering is used with the associated Threshold Data _{B-PON} managed entity. Threshold Data counter 1 indicates the 1st thresholded counter, etc.			

7.3.105 SIP call initiation performance monitoring history data

This managed entity contains the last completed 15-minute interval performance monitoring data collected with regard to SIP Call Initiations of the VoIP SIP Agent. All the attribute counters are only updated at the end of each period. Instances of this managed entity may be created by the OLT. Instances of this managed entity are deleted by the OLT.

Relationships

One instance of this managed entity can exist for each instance of the SIP Agent Config Data managed entity that represents Call Control channel functions. Alternately, one instance of this ME can exist for each instance of the SIP Config Portal ME.

Attributes

Managed Entity Id: This attribute provides a unique number for each instance of this managed entity. The assigned number is the same as the Managed Entity Id of the corresponding SIP Agent Config Data. If a Non-OMCI configuration method is being used for VoIP, the assigned number is the same as the ME Id of the SIP Config Portal ME. (R, Set-by-create) (mandatory) (2 bytes)