

PacketCable™ HD Voice

HDV Provisioning Specification

PKT-SP-HDV-PROV-I04-130411

ISSUED

Notice

This PacketCable™ specification is the result of a cooperative effort undertaken at the direction of Cable Television Laboratories, Inc. for the benefit of the cable industry and its customers. This document may contain references to other documents not owned or controlled by CableLabs®. Use and understanding of this document may require access to such other documents. Designing, manufacturing, distributing, using, selling, or servicing products, or providing services, based on this document may require intellectual property licenses from third parties for technology referenced in this document.

Neither CableLabs nor any member company is responsible to any party for any liability of any nature whatsoever resulting from or arising out of use or reliance upon this document, or any document referenced herein. This document is furnished on an "AS IS" basis and neither CableLabs nor its members provides any representation or warranty, express or implied, regarding the accuracy, completeness, noninfringement, or fitness for a particular purpose of this document, or any document referenced herein.

© Cable Television Laboratories, Inc., 2009 - 2013

DISCLAIMER

This document is published by Cable Television Laboratories, Inc. ("CableLabs®").

CableLabs reserves the right to revise this document for any reason including, but not limited to, changes in laws, regulations, or standards promulgated by various agencies; technological advances; or changes in equipment design, manufacturing techniques, or operating procedures described, or referred to, herein. CableLabs makes no representation or warranty, express or implied, with respect to the completeness, accuracy, or utility of the document or any information or opinion contained in the report. Any use or reliance on the information or opinion is at the risk of the user, and CableLabs shall not be liable for any damage or injury incurred by any person arising out of the completeness, accuracy, or utility of any information or opinion contained in the document.

This document is not to be construed to suggest that any affiliated company modify or change any of its products or procedures, nor does this document represent a commitment by CableLabs or any cable member to purchase any product whether or not it meets the described characteristics. Nothing contained herein shall be construed to confer any license or right to any intellectual property, whether or not the use of any information herein necessarily utilizes such intellectual property. This document is not to be construed as an endorsement of any product or company or as the adoption or promulgation of any guidelines, standards, or recommendations.

Document Status Sheet

Document Control Number:	PKT-SP-HDV-PROV-I04-130411			
Document Title:	HDV Provisioning Specification			
Revision History:	I01 - Released 2/26/09 as DECT-PROV I02 - Released 9/17/09 I03 - Released 8/23/12 as HDV-PROV I04 - Released 4/11/13			
Date:	April 11, 2013			
Status:	Work in Progress	Draft	Issued	Closed
Distribution Restrictions:	Author Only	CL Member	CL Member/ Vendor	Public

Key to Document Status Codes

Work in Progress	An incomplete document, designed to guide discussion and generate feedback that may include several alternative requirements for consideration.
Draft	A document in specification format considered largely complete, but lacking review by Members and vendors. Drafts are susceptible to substantial change during the review process.
Issued	A stable document, which has undergone rigorous member and vendor review and is suitable for product design and development, cross-vendor interoperability, and for certification testing.
Closed	A static document, reviewed, tested, validated, and closed to further engineering change requests to the specification through CableLabs.

Trademarks

CableLabs® is a registered trademark of Cable Television Laboratories, Inc. Other CableLabs marks are listed at <http://www.cablelabs.com/certqual/trademarks>. All other marks are the property of their respective owners.

DECT™ is a trademark of ETSI. DECT CAT-iq™ is a trademark of the DECT Forum.

Contents

1	SCOPE.....	1
1.1	Introduction and Purpose.....	1
1.2	Document Overview.....	1
1.3	Requirements.....	1
2	REFERENCES	2
2.1	Normative References.....	2
2.2	Informative References.....	2
2.3	Reference Acquisition.....	3
3	TERMS AND DEFINITIONS	4
4	ABBREVIATIONS AND ACRONYMS.....	6
5	TECHNICAL OVERVIEW	7
5.1	HD Voice PacketCable Client Provisioning Framework.....	7
5.2	HD Voice Provisioning Requirements Overview	7
5.3	HD Voice Provisioning Object Model Components.....	7
5.4	DHCP- and SNMP-based Provisioning & Management Interface	8
5.5	OMA DM based Provisioning & Management Framework	9
6	HD VOICE MANAGEMENT MODEL	10
6.1	HD Voice PacketCable Service Delivery Model.....	10
6.2	PacketCable HD Voice (HDV) Client Abstraction Model	10
6.2.1	<i>Terminating Devices.....</i>	<i>11</i>
6.2.2	<i>Media Ports and Media Delivery Interface</i>	<i>11</i>
6.2.3	<i>Network Delivery Interface.....</i>	<i>12</i>
6.2.4	<i>Relationships between MDI and NSL</i>	<i>12</i>
6.2.5	<i>PacketCable HDV client.....</i>	<i>14</i>
6.3	General Description of the Data Model	14
6.3.1	<i>Media Delivery Interface (MDI) Data Model.....</i>	<i>14</i>
6.3.2	<i>Network Logical Interface Data Model</i>	<i>14</i>
6.3.3	<i>Network Service Lines (NSL) Data Model.....</i>	<i>14</i>
6.4	PacketCable HDV Client Requirements.....	14
6.4.1	<i>PacketCable Client DECT Capabilities.....</i>	<i>14</i>
6.4.2	<i>Network Logical Interface Configuration and Provisioning Requirements.....</i>	<i>15</i>
6.4.3	<i>MDI Configuration and Provisioning Requirements.....</i>	<i>15</i>
6.4.4	<i>Configuration Requirements for HDV Clients with Single-line Support</i>	<i>16</i>
6.4.5	<i>Configuration Requirements for HDV Clients with Multi-line Support.....</i>	<i>17</i>
6.4.6	<i>Configuration Requirements for the Inbound and Outgoing Service Requests</i>	<i>18</i>
6.4.7	<i>List Access Service Support.....</i>	<i>18</i>
6.4.8	<i>Provisioning and Configuration Error Status Reporting.....</i>	<i>19</i>
6.5	HD Voice Clients Requirements for DHCP- and SNMP-based Provisioning.....	20
6.5.1	<i>HD Voice E-MTA SNMP Requirements.....</i>	<i>20</i>
6.5.2	<i>HD Voice E-DVA SNMP Requirements.....</i>	<i>20</i>
6.6	HD Voice Clients Requirements for OMA DM-based Provisioning.....	20
6.6.1	<i>HD Voice OMA DM Requirements.....</i>	<i>21</i>
ANNEX A	HDV CLIENT CAPABILITIES.....	22
A.1	HDV Client Number of Lines.....	22
A.2	DECT Port Interface Index	22
A.3	Number of PPs.....	22
ANNEX B	HD VOICE MANAGEMENT REQUIREMENTS.....	23

B.1	DECT Object Model Overview	23
B.2	DECT Object Model Definitions	23
B.2.1	DECT Object Model Data Types	23
B.2.2	DECT Object Model Class Diagram	25
B.2.3	DECT Object Model Description	26
B.2.4	DECT-SIP Object Model Class Diagram	38
B.2.5	DECT-SIP Object Model Description	38
B.3	DECT SNMP MIB MODULES	40
B.3.1	DECT SNMP MIB MODULE	40
B.3.2	ENDDECT-NCS SNMP MIB MODULE	64
B.3.3	DECT-SIP SNMP MIB MODULE	64
B.4	DECT OMA Management Objects (MO)	67
B.4.1	DECT High Level MO	67
B.4.2	DECT Nodes	68
B.4.3	DECT OMA Device Description Framework (DDF)	76
B.5	DECT-SIP OMA Management Objects (MO)	110
B.5.1	DECT-SIP High Level MO	110
B.5.2	DECT-SIP Nodes	110
B.5.3	DECT-SIP OMA Device Description Framework (DDF)	111
ANNEX C	PACKETCABLE HDV CLIENT OBJECT MODEL	116
C.1	MDI Object Model Overview	116
C.2	MDI Object Model Definitions	116
C.2.1	MDI Object Model Data Types	116
C.2.2	MDI Object Model Class Diagram	116
C.2.3	MDI Object Model Description	116
C.3	MDI SNMP MIB MODULES	119
C.3.1	MDI SNMP MIB MODULE	119
C.3.2	MDI High Level MO	124
C.3.3	MDI Nodes	124
C.4	MDI OMA Device Description Framework (DDF)	125
APPENDIX I	EXAMPLES OF NETWORK SERVICE LINE CONFIGURATION	131
I.1	HDV client Single-line Provisioning	131
I.1.1	MDI and NSL Provisioning	132
I.1.2	Signaling Provisioning	133
I.2	HDV client Multi-line Provisioning	133
I.2.1	MDI and NSL Provisioning	134
I.2.2	Signaling Provisioning	135
APPENDIX II	ACKNOWLEDGEMENTS	137
APPENDIX III	REVISION HISTORY	138

Figures

Figure 1 - HD Voice Provisioning Model	8
Figure 2 - HD Voice Embedded Device's Reference Model	9
Figure 3 - PacketCable HDV Client Abstraction Model (general case)	11
Figure 4 - PacketCable HDV Client Abstraction Single-line support	13
Figure 5 - PacketCable HDV Client Abstraction Model for PacketCable 1.5 E-MTAs	13
Figure 6 - DECT Object Model Class Diagram.....	25
Figure 7 - List Access Service Object Model Class Diagram.....	34
Figure 8 - DECT Air Interface Object Model Class Diagram	36
Figure 9 - DECT-SIP Object Model Diagram	38
Figure 10 - DECT High Level OMA Management	67
Figure 11 - Node FP of DECT OMA Management.....	68
Figure 12 - Node HDVoiceProfile of DECT OMA Management	69
Figure 13 - Node Codec of DECT OMA Management	69
Figure 14 - Node DTMF of DECT OMA Management	69
Figure 15 - Node BargeIn of DECT OMA Management	70
Figure 16 - Node ServiceStatus of DECT OMA Management.....	70
Figure 17 - Node AnalogAlarmCfg of DECT OMA Management	70
Figure 18 - Node PP of DECT OMA Management.....	71
Figure 19 - Node PPCapabilities of DECT OMA Management.....	72
Figure 20 - Node ListAccess of DECT OMA Management.....	73
Figure 21 - Node InternalNamesList of DECT OMA Management.....	73
Figure 22 - Node LineSettingsList of DECT OMA Management.....	74
Figure 23 - Node Status of DECT OMA Management	75
Figure 24 - Node Performance of DECT OMA Management.....	76
Figure 25 - DECT-SIP High Level OMA Management	110
Figure 26 - Node CFVDis of DECT OMA Management.....	110
Figure 27 - Node CSFDis of DECT OMA Management.....	111
Figure 28 - Node DNDDis of DECT OMA Management	111
Figure 29 - MDI Object Model Diagram.....	116
Figure 30 - MDI High Level OMA Management.....	124
Figure 31 - Node Mdi of MDI OMA Management	124
Figure 32 - Node Nsl of MDI OMA Management	125
Figure 33 - Single-line Service Configuration.....	131
Figure 34 - Multi-line Service Configuration	133

Tables

Table 1 - Mdi Object Configuration based on Media Port Types.....	16
Table 2 - DECT List Access Service and Line Configuration Object Relationships.....	17
Table 3 - HD Voice Data Requirements for SNMP-based Provisioning.....	20
Table 4 - OMA DM HD Voice Provisioning Data Requirements	21
Table 5 - Data Type Definitions	23
Table 6 - FP Object.....	26
Table 7 - PP Object.....	28
Table 8 - PPCapability Object	29
Table 9 - HDVoiceProfile Object	31
Table 10 - Codec Object.....	32
Table 11 - DTMF Object	32
Table 12 - BargeIn Object	32
Table 13 - Service Status Object	33
Table 14 - AnalogAlarmCfg Object	33
Table 15 - List Access Object.....	34
Table 16 - InternalNamesListObject.....	34
Table 17 - LineSettingsList Object.....	35
Table 18 - Performance Object.....	37
Table 19 - Status Object	38
Table 20 - CFVFDIs Object.....	39
Table 21 - SCFDis Object.....	39
Table 22 - DNDIs Object.....	39
Table 23 - Data Type Definitions	116
Table 24 - Mdi Object	117
Table 25 - Nsl Object.....	117
Table 26 - Endpoint Representation in the Interface Table	131
Table 27 - Mdi Object Provisioning of POTS	132
Table 28 - Mdi Object Provisioning of DECT Handsets by the Operator	132
Table 29 - Nsl Object Configuration	132
Table 30 - Nsl Object Configuration, DECT Handsets Assigned by User	133
Table 31 - Multi-line Example NCS Endpoint configuration.....	133
Table 32 - Multi-line Example User Configuration for RST	133
Table 33 - Media Ports and Phone Lines Configuration.....	134
Table 34 - Mdi Object Provisioning of POTS	134
Table 35 - Mdi Object Provisioning of DECT Handsets by the Operator	134
Table 36 - Mdi Object Provisioning of DECT Handsets by the User.....	135
Table 37 - Nsl Object Configured by Operator	135
Table 38 - Nsl Object Configuration, DECT Handsets Assigned by User	135
Table 39 - Multi-line Example NCS Endpoint configuration.....	135
Table 40 - Multi-line Example User Configuration for RST	136

This page is left blank intentionally.

1 SCOPE

1.1 Introduction and Purpose

PacketCable specifications [HDV], [HDV-NCS], and [HDV-SIP] specify requirements for PacketCable clients that support the PacketCable High Definition (HD) Voice features. This document specifies the use of the PacketCable Provisioning Framework to configure and manage PacketCable HD Voice capable clients. The PacketCable specifications leverage Digital Enhanced Cordless Telephone (DECT™) and Wideband Analog interface technologies to support HD Voice.

1.2 Document Overview

The document is structured as follows:

- Section 2 - References
- Section 3 - Terms and Definitions
- Section 4 - Abbreviations
- Section 5 - Informative section describing the HD Voice provisioning requirements
- Section 6 - Normative section providing HD Voice provisioning requirements
- Annex A - HD Voice Object models and Management Interfaces definitions
- Annex B - PacketCable Client Endpoint Object Model
- Appendix I - Examples of Telephony Service Delivery Endpoint Associations

1.3 Requirements

Throughout this document, the words that are used to define the significance of particular requirements are capitalized. These words are:

"MUST"	This word means that the item is an absolute requirement of this specification.
"MUST NOT"	This phrase means that the item is an absolute prohibition of this specification.
"SHOULD"	This word means that there may exist valid reasons in particular circumstances to ignore this item, but the full implications should be understood and the case carefully weighed before choosing a different course.
"SHOULD NOT"	This phrase means that there may exist valid reasons in particular circumstances when the listed behavior is acceptable or even useful, but the full implications should be understood and the case carefully weighed before implementing any behavior described with this label.
"MAY"	This word means that this item is truly optional. One vendor may choose to include the item because a particular marketplace requires it or because it enhances the product, for example; another vendor may omit the same item.

2 REFERENCES

2.1 Normative References

In order to claim compliance with this specification, it is necessary to conform to the following standards and other works as indicated, in addition to the other requirements of this specification. Notwithstanding, intellectual property rights may be required to use or implement such normative references.

[EUE-DATA]	PacketCable E-UE Provisioning Data Model Specification, PKT-SP-EUE-DATA-I08-121030, October 30, 2012, Cable Television Laboratories, Inc.
[RST-EUE-PROV]	PacketCable RST-E-UE Provisioning Specification, PKT-SP-RST-EUE-PROV-I08-121030, October 30, 2012, Cable Television Laboratories, Inc.
[RST-UE-PROV]	PacketCable RST UE Provisioning Specification, PKT-SP-RST-UE-PROV-I02-100527, May 27, 2010, Cable Television Laboratories, Inc.
[UE-DATA]	PacketCable 2.0 UE Provisioning Data Model, PKT-SP-UE-DATA-I02-100527, May 27, 2010, Cable Television Laboratories, Inc.
[EN 300 175-3]	ETSI EN 300 175-3, Digital Enhanced Cordless Telecommunications (DECT); Common Interface (CI); Part 3: Medium Access Control (MAC) layer, V2.2.0, June 2008.
[EN 300 175-5]	ETSI EN 300 175-5, Digital Enhanced Cordless Telecommunications (DECT); Common Interface (CI); Part 5: Network (NWK) layer, V2.2.0, June 2008.
[EN 300 175-6]	ETSI EN 300 175-6, Digital Enhanced Cordless Telecommunications (DECT); Common Interface (CI); Part 6: Identities and addressing, V2.2.0, June 2008.
[TS 102 527-1]	ETSI TS 102 527-1, Digital Enhanced Cordless Telecommunications (DECT); New Generation DECT; Part 1: Wideband speech, V1.2. June 2008.
[TS 102 527-2]	ETSI TS 102 527-2 V1.1.1, Digital Enhanced Cordless Telecommunications (DECT); New Generation DECT; Part 2: Support of transparent IP packet data, V1.1.1, June 2007.
[TS 102 527-3]	ETSI TS 102 527-3, Digital Enhanced Cordless Telecommunications (DECT); New Generation DECT; Part 3: Extended wideband speech services, V1.1.1, June 2008.

2.2 Informative References

This specification uses the following informative references:

[ARCH-TR]	PacketCable Architecture Framework Technical Report, PKT-TR-ARCH-FRM-V06-090528, May 28, 2009, Cable Television Laboratories, Inc.
[CANN]	CableLabs Assigned Names and Numbers Specification, CL-SP-CANN-I09-130404, April 4, 2013, Cable television Laboratories, Inc.
[HDV]	PacketCable High Definition Voice Specification, PKT-SP-HDV-I04-120823, August 23, 2012, Cable Television Laboratories, Inc.
[HDV-NCS]	PacketCable NCS Specification, PKT-SP- HDV-NCS-I04-120823, August 23, 2012, Cable Television Laboratories, Inc.
[HDV-SIP]	PacketCable HDV SIP Specification, PKT-SP-HDV-SIP-I03-120823, August 23, 2012, Cable Television Laboratories, Inc.
[E-DVA]	PacketCable Residential SIP Telephony E-DVA Specification, PKT-SP-RST-E-DVA-I10-121030, October 30, 2012, Cable Television Laboratories, Inc.

[EUE-PROV]	PacketCable E-UE Provisioning Framework Specification, PKT-SP-EUE-PROV-I07-110825, August 25, 2011, Cable Television Laboratories, Inc.
[ISO/IEC 19501]	ISO/IEC 19501:2005 Information technology - Open Distributed Processing - Unified Modeling Language (UML) Version 1.4.2.
[NCS]	PacketCable Network-Based Call Signaling Protocol, PKT-SP-NCS1.5-I04-120412, April 12, 2012, Cable Television Laboratories, Inc.
[MIBS1.5]	PacketCable 1.5, MIBs Framework Specification, PKT-SP-MIBS1.5-I03-090624, June 24, 2009, Cable Television Laboratories, Inc.
[OMA-DM]	Enabler Release Definition for Device Management version 1.2, OMA-ERELD-DM-V1_2-20070209-A, February 9, 2007, Open Mobile Alliance.
[PROV1.5]	PacketCable 1.5, MTA Device Provisioning, PKT-SP-PROV1.5-I04-090624, June 24, 2009, Cable Television Laboratories, Inc.
[RFC 2863]	IETF RFC 2863, The Interfaces Group MIB, June 2000.
[RFC 2578]	IETF RFC 2578/STD0058, Structure of Management Information Version 2 (SMIv2), April 1999.
[RSTF]	PacketCable Residential SIP Telephony Feature Specification, PKT-SP-RSTF-I10-130411, April 11, 2013, Cable Television Laboratories, Inc.
[UE-PROV]	PacketCable 2.0 UE Framework Provisioning, PKT-SP-UE-PROV-I02-100527, May 27, 2010, Cable Television Laboratories, Inc.
[eDOCSIS]	Data-Over-Cable Service Interface Specifications - eDOCSIS™ Specification, CM-SP-eDOCSIS-I25-130404, April 4, 2013, Cable Television Laboratories, Inc.

2.3 Reference Acquisition

Cable Television Laboratories, Inc., 858 Coal Creek Circle, Louisville, CO 80027;
Phone +1-303-661-9100; Fax +1-303-661-9199; <http://www.cablelabs.com>

International Organization for Standardization (ISO), 1, rue de Varembe, Case postale 56, CH-1211 Geneva 20, Switzerland; Phone +41 22 749 01 11; Fax +41 22 733 34 30; <http://www.iso.org>

Internet Engineering Task Force (IETF) Secretariat, 46000 Center Oak Plaza, Sterling, VA 20166; Phone +1-571-434-3500, Fax +1-571-434-3535; <http://www.ietf.org>

Open Mobile Alliance (OMA), OMA Office, 4275 Executive Square, Suite 240, La Jolla, CA 92037; Fax +1-858-623-0743; <http://www.openmobilealliance.com>

International Telecommunications Union, (ITU), Place des Nations, CH-1211, Geneva 20, Switzerland; Phone +41-22-730-51-11; Fax +41-22-733-7256.

3 TERMS AND DEFINITIONS

This specification uses the following terms:

Client	The terms client and PacketCable client are used interchangeably in this specification.
Configuration	Configuration is the process of defining and propagating data to network elements for providing services.
Data Model	An abstract model that describes representation of data in a system.
Description Framework	A specification for how to describe the management syntax and semantics for a particular device type.
DTMF Event	A DTMF Event is the detection of a DTMF digit.
Endpoint	The term endpoint used in this specification refers to a control signaling endpoint such as an NCS endpoint or a SIP client.
eUE	The logical PacketCable UE component of an E-UE, complies with eSAFE and PacketCable requirements.
E-UE	Embedded User Equipment. A single physical device embedded with an eDOCSIS-compliant DOCSIS Cable Modem and a PacketCable eUE.
FP	The Fixed Part is a portion of the cordless telephone base station defined in ETSI DECT specifications.
Management	Management refers to the protocols, methodologies and interfaces that enable oversight services in a Service Provider Network.
Management Information Base	The description of the data items used by the Network Management for management and configuration of the PacketCable compliant E-UE. Such description is done based on the formal meta-language SMI defined by the corresponding IETF standards.
Management object	A management object (MO) is a subtree of the OMA DM management tree, which is intended to be a (possibly singleton) collection of nodes that are related in some way. For example, the ./DevInfo nodes form a management object. A simple management object may consist of one single node.
Management server	A network-based entity that issues OMA DM commands to devices and correctly interprets responses sent from the devices.
Node	A node is a single element in a management tree. There can be two kinds of nodes in a management tree: interior nodes and leaf nodes. The Format property of a node provides information about whether a node is a leaf or an interior node.
Off-hook Status for the client	Off-hook status at the client is when either the FP is in off-hook status, or the analog line is in off-hook status.
Off-hook Status for the FP	Off-hook status at the FP is when at least one PP is involved in a network call. Note that DECT internal calls do not affect the off-hook status of the FP.
On-hook Status for the client	On hook status at the client is when the FP status is on-hook and the analog line is on-hook or in analog intrusion denial state.
On-hook Status for the FP	On-hook status at the FP is when no PP is involved in a network call. Note that DECT internal calls do not effect the on-hook status of the FP.

PacketCable client	The PacketCable client is a PacketCable network signaling termination within the customer's CPE. Examples include the NCS endpoint within the PacketCable 1.5 E-MTA and the PacketCable 2.0 User Equipment.
Permanent node	A node is permanent if the DDF property Scope is set to Permanent. If a node is not permanent, it is dynamic. A permanent node can never be deleted.
PP	The Portable Part is a portion of the cordless telephone handset defined in ETSI DECT specifications.
Provisioning	Provisioning refers to the processes involved in the initialization of user attributes and resources to provide services to a User. This involves protocols, methodologies, and interfaces to network elements such as: Order Entry and Workflow Systems that carry out business processes, Operational Support Elements that handle network resources, Application Servers that offer services and Use Equipment that offer services.
Request for Comments	Technical policy documents approved by the IETF, which are available on the World Wide Web at http://www.ietf.org
Wideband Audio	The audio technology used in telephony to improve voice quality by extending the frequency range of audio signals transmitted over telephone lines to 50Hz-7kHz from the traditional 300Hz-3400Hz.
Wideband Analog Interface	The physical telephony interface that has the capability to support Wideband Audio, in addition to traditional narrowband POTS audio.

4 ABBREVIATIONS AND ACRONYMS

This specification uses the following abbreviations:

DDF	Device Description Framework
DECT	Digital Enhanced Cordless Telephone
DOCSIS®	Data-Over-Cable Service Interface Specifications
DVA	Digital Voice Adapter
E-DVA	Embedded DVA
FP	Fix Part
IMS	IP Multimedia Subsystem
MIB	Management Information Base
MO	Managed Objects
MTA	Multimedia Terminal Adapter
E-MTA	Embedded MTA
OMA	Open Mobile Alliance
OMA DM	OMA Device Management
POTS	Plain Old Telephony Service
PP	Portable Part
RFC	Request for Comments
RFI	Radio Frequency Interface
RST	Residential SIP Telephony
SIP	Session Initiation Protocol
S-EDVA	Standalone DVA
SMI	Structure of Management Information
SNMP	Simple Network Management Protocol
UML	Unified Modeling Language

5 TECHNICAL OVERVIEW

PacketCable is a CableLabs specification effort designed to support the convergence of voice, video, data, and mobility technologies. The PacketCable architecture describes a set of functional groups and logical entities, as well as a set of interfaces that support the information flows exchanged between entities. For more information about PacketCable, please refer to the PacketCable Architecture Framework Technical Report [ARCH-TR].

As part of these efforts, PacketCable specifies applications built upon the PacketCable architecture. One such application is extensions to support HD Voice application. This document describes the configuration and management requirements of the PacketCable HD Voice application for PacketCable 1.5 E-MTAs and PacketCable 2.0 User Equipment (UE). For details on the PacketCable HD Voice application architecture, see [HDV].

5.1 HD Voice PacketCable Client Provisioning Framework

The PacketCable client provisioning framework supports the management and configuration of embedded devices (e.g., E-MTA and E-DVA) and standalone devices (e.g., S-DVA). Embedded device provisioning requirements are specified in [PROV1.5] and [EUE-PROV], for PacketCable 1.5 and PacketCable 2.0, respectively. These specifications specify the use of SNMP [RFC 2578] for the provisioning and management of Embedded PacketCable clients. The UE Provisioning Framework ([UE-PROV]) specifies the use of OMA DM for provisioning and management, based on the OMA DM specifications ([OMA-DM]).

For the purpose of this specification, the HD Voice application provisioning requirements are based on PacketCable Provisioning frameworks. In addition, this specification presents a management protocol agnostic object model, to keep in extensible for future enhancements and for potential use with management protocols other than that specified in this document. See the [UE-DATA] specification for more information on the modeling methodology used in this specification.

5.2 HD Voice Provisioning Requirements Overview

The PacketCable HD Voice provisioning requirements are defined in three different specifications.

[HDV] specifies the High Definition voice service for PacketCable through the use of a Digital Enhanced Cordless Telephone (DECT) base station integrated with a PacketCable client or Wideband Analog Interface integrated with a PacketCable client. The provisioning requirements specified in this document and related to [HDV] apply to both PacketCable 1.5 and 2.0 clients.

[HDV-NCS] places requirements on PacketCable1.5 clients that interface with either the FP for DECT or the Wideband Analog Interface and NCS interoperability. The provisioning requirements for the [HDV-NCS] specifications are applicable to PacketCable 1.5 E-MTAs.

[HDV-SIP] places requirements on the PacketCable 2.0 client that interface with either the FP for DECT or the Wideband Analog and SIP interoperability. The provisioning requirements for the [HDV-SIP] specification apply to devices that support the PacketCable Residential SIP Telephony [RSTF] and PacketCable Embedded DVA [E-DVA] specifications.

One of the essential requirements for the PacketCable HD Voice Provisioning is the ability to support the Multi-Line configuration and management model, so that the association between the handsets (e.g., POTS, DECT) and the service delivery lines (e.g., subscriber's telephone numbers) can be configured and managed by the network and the end-user (subscriber).

5.3 HD Voice Provisioning Object Model Components

Figure 1 represents the data model for the data element definitions in this document. Please refer to [UE-DATA] for details on the usage of UML models and subsequent derivation of management elements (e.g., SNMP MIB modules, and OMA DM MOs). The DECT Object Model specifies all the HD Voice Provisioning data elements (DECT, DECT-NCS, DECT-SIP) in a protocol agnostic manner. The HD Voice Object Model is then expanded to the PacketCable defined management protocol interface definitions (MIBs for SNMP, and DDFs for OMA DM). The

management protocol interface definitions are then supported by PacketCable clients depending on their supported management protocols.

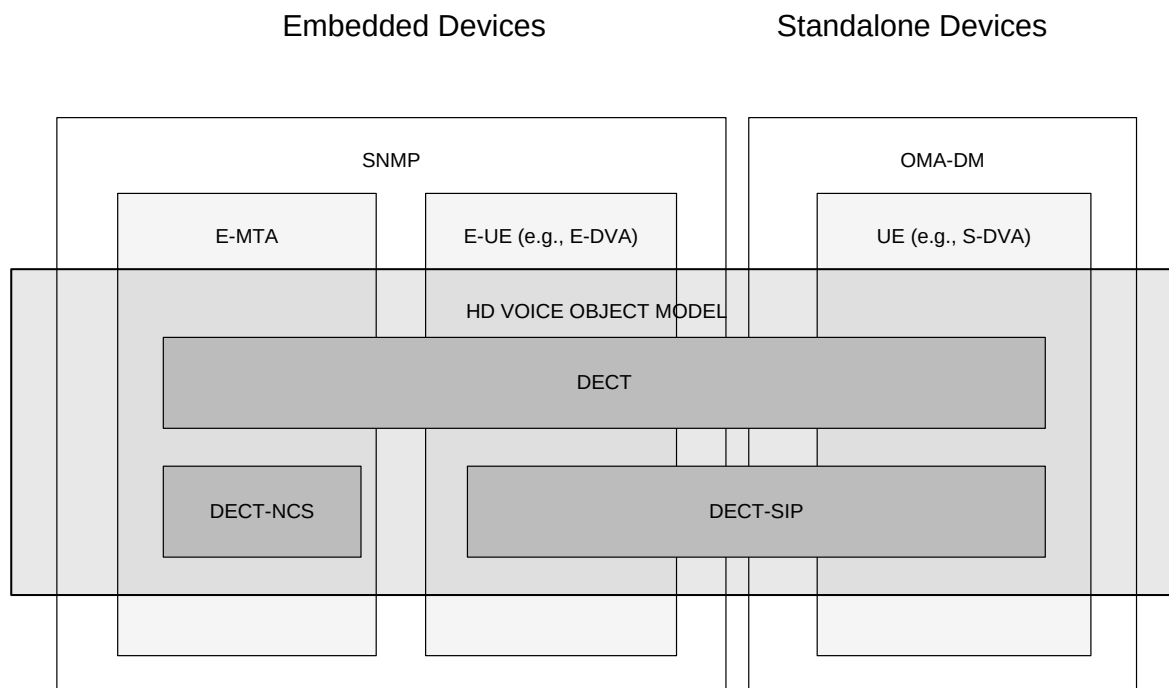


Figure 1 - HD Voice Provisioning Model

5.4 DHCP- and SNMP-based Provisioning & Management Interface

PacketCable specifies a DHCP- and SNMP-based framework for clients that are embedded with DOCSIS cable modems and are not behind NAT and Firewall devices (e.g., E-MTA, E-DVA). This framework is used for embedded devices that support HD Voice.

PacketCable HD Voice Embedded Devices represent the eSAFE class of devices as defined in the eDOCSIS Specification [eDOCSIS]. In addition to RJ11 POTS ports, the HD Voice Embedded Devices contain logical interfaces associated with the DECT handsets. The conceptual reference model for such devices is shown by the diagram in Figure 2. On this diagram, RJ11 Ports represent the telephony ports for connecting POTS Phones. DECT Ports represent the communication channels between each DECT Handset and the HD Voice Embedded Device.

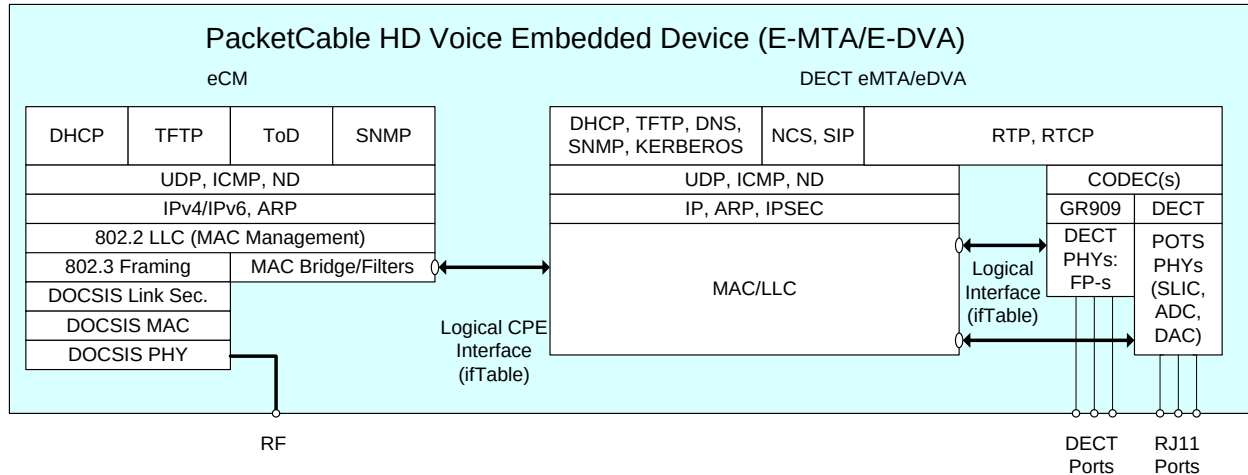


Figure 2 - HD Voice Embedded Device's Reference Model

5.5 OMA DM based Provisioning & Management Framework

OMA DM provides an interoperable framework for managing clients. The OMA management end points, termed OMA DM, specify a management interface between the following elements: DM client (e.g., end-user devices) and OMA DM Server (the management application, normally associated with a service provider or a third party organization). See [UE-PROV] for an overview of OMA DM overview.

6 HD VOICE MANAGEMENT MODEL

6.1 HD Voice PacketCable Service Delivery Model

This specification follows the model of [UE-DATA] to represent the HD Voice Provisioning and Management requirements. The HD Voice Object Model applies to any type of PacketCable clients that support HD Voice. For E-MTAs and E-DVAs, the HD Voice Object Model is mapped into SMIPv2 MIB Modules (for SNMP), and OMA DM DDF documents for S-DVAs.

6.2 PacketCable HD Voice (HDV) Client Abstraction Model

This section specifies modeling considerations to enhance PacketCable client and endpoint architecture in support of HD Voice, in particular the way PacketCable 1.5 and 2.0 devices are provisioned. As an example, consider PacketCable 1.5 E-MTAs and PacketCable 2.0 E-DVAs.

HDV clients capable of single-line support require the implementation of a single analog port and a DECT FP. PPs within the FP and the analog port are seen as a single endpoint. The HDV client single-line capable only supports a single signaling endpoint (i.e., one NCS signaling point -aaln/1; a single SIP IMPU).

HDV clients that support the multi-line feature allow that arrangement of a subset of PPs and analog ports to be configured as separate signaling endpoints. In other words, HDV clients capable of multi-line support could configure every single PP as a single phone line (e.g., an NCS endpoint for each PP), or a subset of PPs and analog ports can be configured to be part of a phone line. See [HDV] for additional details on use cases pertaining to HD Voice.

As a consequence of the above considerations, the concept of endpoints needs to be adapted to support such scenarios.

The PacketCable HDV client Abstraction Model has the following objectives:

- Address and manage the telephony services delivery from the network side.
- Address and manage the telephony services delivery from the terminating client side.
- Provide the ability to group the telephony services on the terminating client side, based on those in the network side, for the purpose of service features control and management.
- Address compatibility with existing PacketCable 1.5 and PacketCable 2.0 data models for E-MTAs and E-UEs. The DECT Data Model needs to preserve the ability to control and manage both NCS and SIP data elements. For example, the notion of the NCS "end-points" (ifTable representation) should have adequate data elements. This is true for SIP Data Elements, such as "User Name", "IMPUs", "IMPIs", etc.
- Be generic in order to accommodate other types of PacketCable HDV clients in the future. When such clients are introduced, the corresponding specifications may need to consider the PacketCable Service Delivery Model defined in this specification.
- Support for backward compatible configuration when the Operator can upgrade the subscriber's device to PacketCable HDV client but the configuration file or its template should not be updated and would still be able to provide the reasonable configuration of the HDV client utilizing the HD-DECT features (e.g., single- or multi-line support).

Figure 3 depicts the HDV client abstraction model representing the delivery of the Services from the Network to Terminating Devices. This figure abstracts the Service Delivery without specifying which particular service type is being delivered to the user's terminating device (e.g., voice, video, or data). Moreover, as this figure shows, this model also abstracts the particular types of communication channels between the HDV client and terminating devices (e.g., POTS Phone, DECT Handset, WiFi Phone). From this prospective, Figure 3 can be viewed as a generic model of delivering Media Services to the Terminating Devices.

While the HDV client abstraction model intends to cover a wider range of the services and Terminating Devices than currently defined by the PacketCable Architecture, the primary area of applicability of this model in this specification is limited to the telephony services.

Figure 3 shows the general "NxM" case of "N" Media Ports associated with "M" Network Service Interfaces, where a Media Port can be associated with zero or more Network Service Interfaces and in the opposite direction, one Network Service Interface can be associated with zero or more Media Ports.

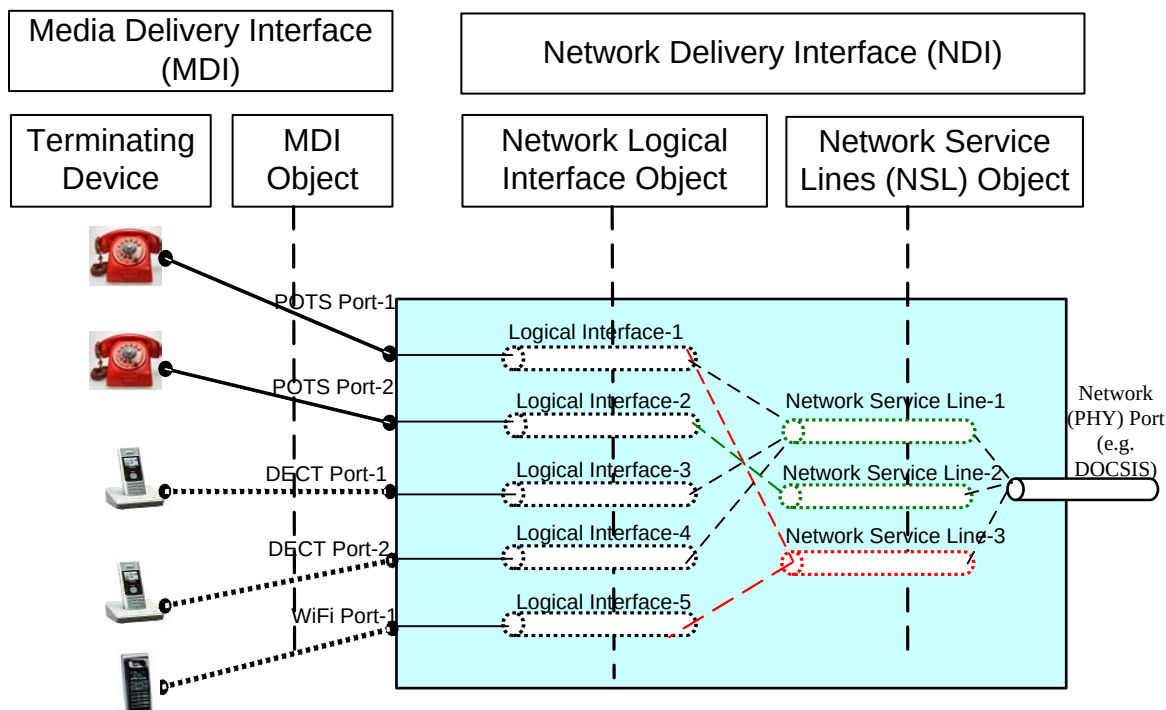


Figure 3 - PacketCable HDV Client Abstraction Model (general case)

The following sub-sections contain more detailed explanation and definitions of the PacketCable HDV client abstraction model used in this specification and describe some examples of how this model can be applied to some of the existing PacketCable configurations.

6.2.1 Terminating Devices

The PacketCable HDV client abstraction model uses the "Terminating Devices" concept to represent the collection of the physical clients (Customer Premises Equipment - CPE) used by the end-user to deliver the media services. For example, the POTS Phones are "Terminating Devices" for PacketCable 1.5 E-MTAs or PacketCable 2.0 E-DVAs. The DECT handsets are also the "Terminating Devices".

6.2.2 Media Ports and Media Delivery Interface

In this section, the concepts of Media Ports and Media Delivery Interface (MDI) are introduced. It addresses components that provide services and applications media to CPE.

PacketCable HD Voice client abstraction model uses "Media Ports" concept to represent the points of data originating and data terminating between the Terminating Device and the HD Voice Device. "Media Ports" represent a generalization of the "endpoints" introduced by the PacketCable architecture.

- An HDV client contains a collection of Media Ports which are sources or sinks of data being transferred between CPE and HD Voice Device. Similar to "endpoints", Media Ports can be "physical" or "virtual". Using the examples of "endpoints" described in the NCS Specification [NCS], the example of a "physical Media Port" is an interface in a HDV client that terminates an analog POTS connection to a phone. An example of a virtual "Media Port" is an audio source in an audio-content server.

- From this perspective, the Media Ports on Figure 3 which represent the connections to the POTS phones, are physical Media Ports, while the Media Ports representing the connections to the DECT Handsets are virtual Media Ports.

Note: Media Ports may be of different complexity and different physical nature. For example, it may be as simple as a POTS telephone handset providing a mere transformation of the acoustic signal to the electrical one, or vice-versa. Or, it may be as complex as DECT Handsets providing, in addition, the CODEC transformations.

- "Media Delivery Interface" represents the collection of the "Media Ports" used to deliver the media data to and from the terminating devices.

6.2.3 Network Delivery Interface

"Network Delivery Interface" provides the means for the operations on passing the electrical signals with the voice data over the IP networks with the corresponding addressing abilities. These operations as a whole are referred to as Network Delivery Interface (NDI) on Figure 3.

Note: Networking operations include the functionality of the OSI Network Layers (PHY, DATA, IP).

- On the other hand, "Network Delivery Interface" represents the abstraction of the process of delivery of the Services from the Service Provider (Operator) to the subscriber (end-user) over the IP networks. NDI comprises the following network abstracts: "Network Service Lines" and "Network Logical Interface".
- "Network Service Lines" (NSL) is an abstraction of an addressing schema used to identify the particular service delivery path of the voice related information from the Service Provider to a set of the "Terminating Devices" via corresponding "Media Ports". For the telephony (voice) services, each NSL is represented as a subscriber's Telephone number. For other types of services, the NSL interpretation should be specified in the corresponding specifications describing these services.
- "Network Logical Interface" represents an abstraction of the MDI to the network. Network Logical Interface allows the Service Provider to monitor and control various parameters related to each MDI Port from the network side (e.g., administrative and operational status, associated port type, etc.). For the HDV embedded clients, the Network Logical Interface is shown in Figure 2 and is represented by "ifTable" MIB Object as defined in the following PacketCable Specifications: [MIBS1.5] and [EUE-DATA]. For other types of the HD Voice devices, Network Logical Interface can be represented by different means which provide one-to-one relationship with the MDI Ports. Such representation should be established and described by the corresponding specifications for these devices.

6.2.4 Relationships between MDI and NSL

As stated previously, the HDV client capable of multi-line support requires the support of the MxN association between the Network Service Lines and the Media Ports. An Operator should be able to configure and/or monitor such association to control and manage different services types offered to subscribers according to operator's business policies. An Operator needs to be able to configure the DECT HDV client with single-line support so all DECT PPs are associated with a single phone line (NSL). The Operator also needs to be able to configure one or more Media Ports to one or more phone lines for HDV client with multi-line support.

Examples of various potential relationships between the NSLs and Media Ports and the corresponding configurations are shown on Figure 3, Figure 4, and Figure 5.

On Figure 3, a diverse number of Media Ports are associated with one or more Network Service Lines. The NSL-1 depicted in Figure 3, is associated with the Logical Interfaces 1, 3, and 4 which are terminated with "POTS Port-1", "DECT Port-1", and "DECT Port-2". Similarly, the NSL-2 is associated only with Logical Interface 2, terminated with "POTS Port-2", and the NSL-3 is associated with Logical Interfaces 1 and 5 terminated with "POTS Port-1", and "WiFi Port-1".

In addition, each NSL can be connected to a different type of Network PHY Ports (e.g., DOCSIS, Ethernet, etc.) depending on the network access or device types (CM embedded and non-embedded devices).

In Figure 4, a single NSL is associated with all four Logical Interfaces, each of which is terminated by a corresponding Media Port. This configuration models the single-line support of the HDV client.

In Figure 5, two NSLs are associated with a single Logical Interface, each of which is terminated by a single Media Port ("POTS Port-1" and "POTS Port-2"). This configuration models the PacketCable 1.5 embedded clients (E-MTAs).

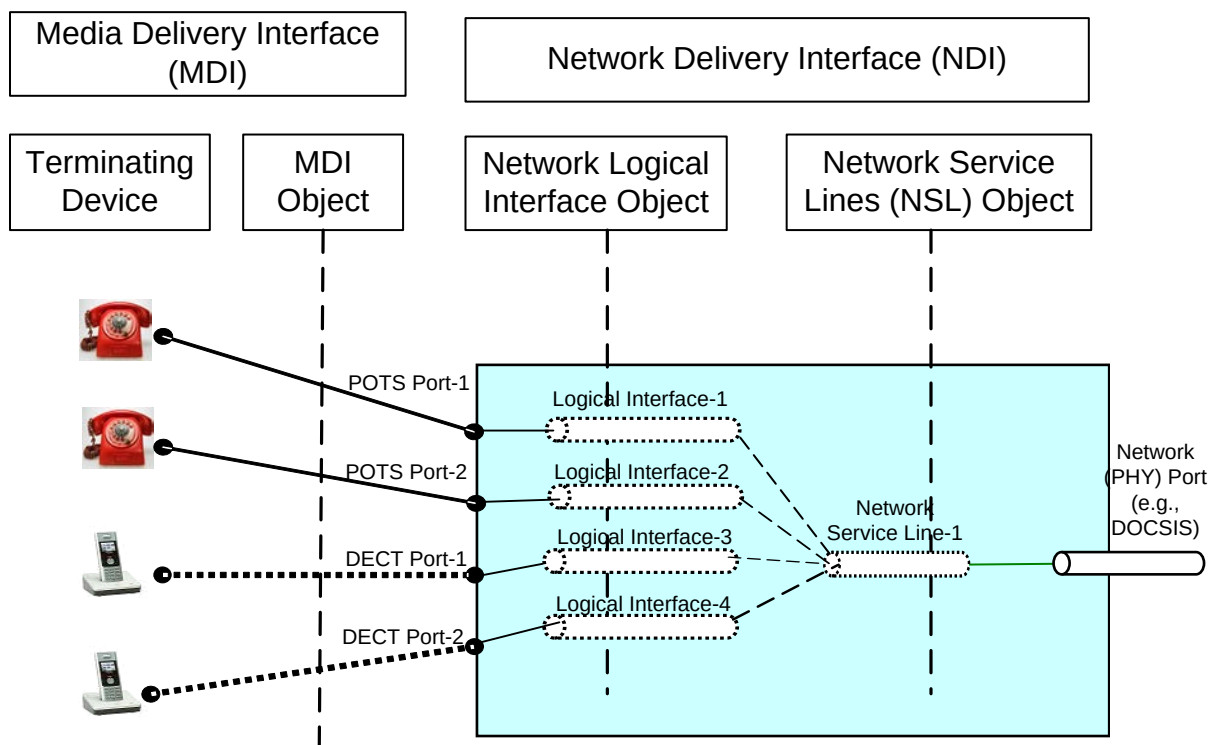


Figure 4 - PacketCable HDV Client Abstraction Single-line support

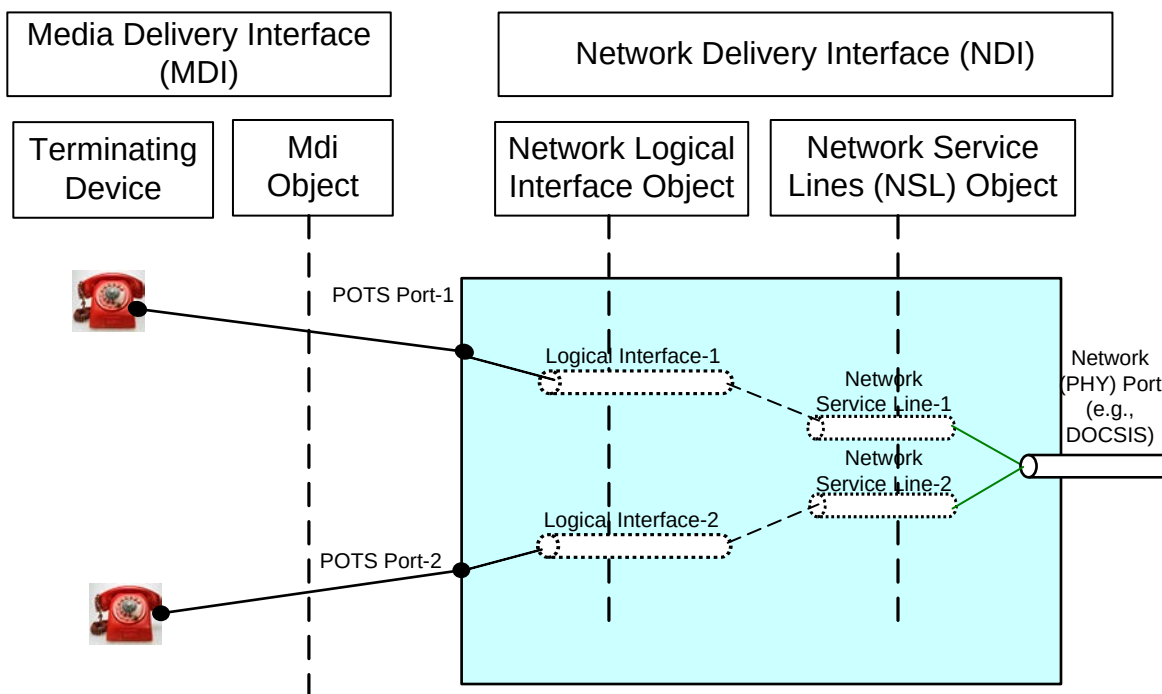


Figure 5 - PacketCable HDV Client Abstraction Model for PacketCable 1.5 E-MTAs

6.2.5 PacketCable HDV client

The PacketCable client performs all necessary operations to interface between the two layers - MDI and NDI (e.g., operations such as networking, signaling, and management). Examples of PacketCable clients include E-MTA, E-DVA, and S-DVA.

Annex C describes the MDI and NDI Object model and the corresponding mappings to different Management protocols supported by PacketCable clients.

6.3 General Description of the Data Model

This section presents a general description of the Data Model and its Objects corresponding to the PacketCable HDV client Abstraction Model of Section 6.2.

Along with that, the Data Model includes the necessary objects allowing the HDV client to accommodate the "List access service" as defined in [TS 102 527-3]. The data objects corresponding to the DECT List Access Service are presented in Annex B.

6.3.1 Media Delivery Interface (MDI) Data Model

"**Media Delivery Interface**" Data Model is represented by the Mdi object where the number of entries is equal to the number of all media ports (e.g., analog POTS and DECT handsets - for the voice media). The table is populated by the device based on the device design and presence of the POTS and DECT handsets. As described in Section 6.2.3, the Mdi object is an extension of the Interface object (e.g., an extension of the "ifTable" in case of the HD Voice embedded devices). The detailed description of the MDI object model is presented in Annex C.

6.3.2 Network Logical Interface Data Model

As stated in Section 6.2.3, for embedded HDV clients such as PacketCable 1.5 E-MTAs and PacketCable 2.0 E-DVAs, the Network Logical Interface is implemented as "ifTable" MIB Object (as per [RFC 2863]). In this case, each POTS and DECT Port is represented as an instance in the ifTable and qualified with an interface type (ifType of 'voiceOverCable' with numerical value of 198) as specified in [MIBS1.5] and [RST-EUE-PROV].

The Network Logical Interface Data Model for other types of the HDV clients is outside of the scope of this specification.

6.3.3 Network Service Lines (NSL) Data Model

"**Network Service Lines**" Data Model is represented by the Nsl Object where the number of entries is equal to the number of Service Lines (e.g., telephone numbers) assigned to the end-user and configured to the HDV client. The "nslTable" Data Object maps each Network Service Line to the particular set of the Media Delivery Ports for inbound and outgoing calls separately. The detailed description of the MDI Data Model is presented in Annex C.

6.4 PacketCable HDV Client Requirements

This section provides the detailed requirements for the following types of the PacketCable HDV clients: E-MTA, E-DVA (as described in Section 5.4) and S-DVA (as described in [HDV]). For other types of the PacketCable HDV clients, the requirements for the Network Logical Interface, Network Service Lines and Media Ports should be described and determined by the corresponding specifications.

The PacketCable HD Voice E-MTA, E-DVA, and S-DVA clients are further referred to as "HDV clients", unless stated otherwise.

6.4.1 PacketCable Client DECT Capabilities

An HDV client, within the scope of this specification has to indicate its capability of supporting one FP, even in cases where the client supports more than one physical FP (e.g., expand the handset capacity). An HDV client MUST at minimum indicate the support of a single FP in its capabilities (See Annex A).

6.4.2 Network Logical Interface Configuration and Provisioning Requirements

The configuration of the Network Logical Interface of the HDV clients is a part of the overall HDV client provisioning process.

To configure the Network Logical Interface, the HDV client MUST implement the Network Logical Interface in compliance with the IETF Interfaces Group MIB requirements ([RFC 2863]), so that, each POTS ports ("physical ports") and DECT ports ("virtual ports") are reported as an interface instance of type 'voiceOverCable'. The Interface information is populated by the device based on the design and presence of the POTS ports and on the number of DECT handsets which have been registered (paired) with the HDV client.

To configure the Network Logical Interface, the HDV client MUST start all instances corresponding to the "physical ports" (POTS ports) available on the HDV client, beginning from interface index 9 and then sequentially incrementing the interface index for additional POTS ports.

To configure the Network Logical Interface, the HDV client MUST start all instances, corresponding to the "virtual ports" (e.g., DECT Handsets) registered (paired) with the HDV client assigned the interface index based on the DECT Port Interface Index capability (Annex A) and sequentially incremented for each virtual port based on the Number of PPs capability (Annex A).

To configure the Network Logical Interface, the HDV client MUST follow the E-MTA and E-DVA requirements described in [MIBS1.5] and [EUE-DATA] for populating all other conceptual columns of the interface object.

To configure the Network Logical Interface, the HDV client MUST de-register the additional PPs beyond the maximum number of allowed PPs to register. Selection of the PPs to be deleted is vendor specific.

To configure the Network Logical Interface, the HDV client MUST delete the corresponding Interface object instances when a PP de-registers from the FP, with the exception of operator-initiated PP.RegCtrl set to 'deregister' where the PP is temporarily de-registered, but the operator is expected to initiate a new pairing process for that PP.

To configure the Network Logical Interface, the HDV client MUST add the corresponding Interface object instances when a new PP registers from the FP.

6.4.3 MDI Configuration and Provisioning Requirements

The MDI configuration is a part of the overall HDV client provisioning process.

The following MDI configuration requirements apply to the HDV client:

- The HDV client MUST populate the Mdi object with instances corresponding to the media delivery interface types known to the device (e.g., POTS and PPs).
- The HDV client MUST persist the value of the interface index of each MDI instance corresponding to a registered PP. This requirement is generated by the dynamic nature of the DECT handsets and provides the possibility for the Operator to configure the DECT handsets.
- The HDV client MAY reuse the value of the interface index only after the PP has been deregistered with the FP.
- The HDV client MUST report the value of the PP Interface operational status as 'up' whenever the value of PP.Status object attribute of the PP is 'activeLocked' or 'idleLocked'. Otherwise, the HDV client MUST report the value of the interface operational status as 'down'.

Note: When Zero Emission is enabled this value may not be accurate.

- The HDV client MUST delete the corresponding instance of the Mdi object when a PP de-registers from the FP and made the instance index available for re-use in future PP pairing processes.
- The HDV client MUST add the corresponding instance of the Mdi object when a new PP registers from the FP.
- Depending on the type of the Media Port, the HDV clients MUST populate by default the MDI object instances as indicated in Table 1.

Table 1 - Mdi Object Configuration based on Media Port Types

Media Port Type	Interface Index	Type	Name
POTS Port	[Per Section 6.4.2]	'pots'	"POTS <ifIndex-num>" (*)
DECT Port	[Per Section 6.4.2]	'dectPP'	"DECT Handset <term-id-num>"(**)
Notes: (*) "POTS <ifIndex-num>" (without quotation marks) consists of the word POTS, the SPACE character and the interface index number of the MDI port (**) "DECT Handset <term-id-num>" (without quotation marks) consists of the words DECT Handset, SPACE character and the DECT Terminal and corresponds to the DECT "Internal names list" "number" field [TS 102 527-2].			

6.4.4 Configuration Requirements for HDV Clients with Single-line Support

The requirements in this section apply to the HDV clients that support Single Line Configuration and do not support the multi-line feature.

The HDV client reuses the endpoint configuration models of [PROV1.5], [RST-EUE-PROV] and [RST-UE-PROV]. In those specifications, the endpoint defines a one-to-one relationship of signaling endpoint and analog port configuration. To support single-line capable HDV clients, this specification defines rules to allow the configuration of single signaling endpoint while supporting one or more analog ports. As a rule, the signaling endpoint requirements are tied to interface index = 9 irrespective of the number of analog ports. In addition, requirements for per POTS port for the single-line device are provided.

An HDV client that supports single-line configuration **MUST** configure the Network Logical Interface as described in Section 6.4.2

An HDV client that supports single-line configuration **MUST** configure the Mdi object as described in Section 6.4.3.

An HDV client that supports single-line configuration **MUST** configure the NSL object with a single instance (Nsl.Index=1) corresponding to a single telephone line available to a user, and provide read and write operations for the NSL object instance.

An HDV client that supports single-line configuration **MUST** reject all management operations that request the creation or deletion of instances in the NSL object, by indicating an error as required by the management protocol defined in Section 6.4.8.

An HDV client that supports single-line configuration **MUST** populate by default the Nsl.Name single instance with a user defined value of the 'Line settings list' field 'Line name', or the default value "Line n" (without the quotes) where n is the Nsl.Index value.

An HDV client that supports single-line configuration **MUST** ignore set operations to the NSL object and log the warning condition based on the requirements in Section 6.4.8.

An HDV client that supports single-line configuration **MUST** associate the Media Ports listed in the Mdi object with the attributes Nsl.PortListIn and NslListOut of the Nsl object instance. Post initialization requirements of the single-line HDV client Mdi object are described in Sections 6.4.2 and 6.4.3.

A PacketCable 1.5 HDV client that supports single-line configuration **MUST** use the configuration of the NCS endpoint "aaln/1" (NCS endpoint configuration ifIndex = 9) for the single NSL, e.g., when configuring pktcSigEndPntConfigTable, pktcNcsEndPntConfigTable, pktcEnNcsEndPntConfigTable, pktcEnNcsEndPntLVMgmtTable.

A PacketCable 1.5 HDV client that supports single-line configuration **MUST** ignore the configuration of any NCS endpoint different of "aaln/1" and log the warning condition based on the requirements in Section 6.4.8.

A PacketCable 1.5 HDV client that supports single-line configuration **MUST** use by default the configuration of the instance denoted by ifIndex = 9 of pktcEnEndPntInfoTable for each POTS port not configured.

A PacketCable 2.0 HDV client that supports single-line configuration **MUST** use the first IMPU instance in the configuration (i.e., lowest index or key entry) for the assignment to the single phone, ignore additional IMPU instances, and log the warning condition based on the requirements in Section 6.4.8.

A PacketCable 2.0 HDV client that supports single-line configuration MUST use the configuration of the 'IMPU Additional Info' noted as NSL#N, in case both NSL#N and IEP#N/OEP#M notations are present in the configuration.

A PacketCable 2.0 HDV client that supports single-line configuration MUST use the configuration of the instance denoted by interface index = 9 of pktcEnNcsEndPntLVMgmtTable, pktcEDVANetDiscTable, and pktcEDVAEndPntConfigTable, pktcEDVAPrLossTable and pktcEDVAMWISignalTypesTable.

A PacketCable 2.0 HDV client that supports single-line configuration MUST ignore any instance of pktcEnNcsEndPntLVMgmtTable, pktcEDVANetDiscTable, pktcEDVAEndPntConfigTable, pktcEDVAPrLossTable, and pktcEDVAMWISignalTypesTable different than the one identified by interface index = 9, and log the warning condition based on the requirements in Section 6.4.8.

A PacketCable 2.0 HDV client that supports single-line configuration MUST use by default the configuration of the instance denoted by ifIndex = 9 of pktcEnEndPntInfoTable for each POTS port not configured.

Note: The notation for single-line configuration defined above provides backward compatibility with single-line E-MTA and E-DVA configuration. No phone line service is provided for the MTA if the aaln/1 endpoint is not configured or if the E-DVA IMPU has no explicit association with the NSL or endpoint (IEP, OEP).

6.4.5 Configuration Requirements for HDV Clients with Multi-line Support

The requirements for the configuration and provisioning of the HDV clients described in this section are applicable only to HDV clients capable of multi-line support.

To support multi-line capable HDV clients, this specification defines rules to allow the configuration of each signaling endpoint separated of the analog ports. For example, for the multi-line HDV client this specification requires the association of the interface index with MDI ports and the NCS signaling identifiers directly associated with the NSL identifier by conventions defined in this section.

An HDV Client that supports multiple-line configuration MUST configure the Network Logical Interface as described in Section 6.4.2.

An HDV Client that supports multiple-line configuration MUST configure the Mdi object as described in Section 6.4.3.

An HDV Client that supports multiple-line configuration MUST allow the creation, deletion and update of instances of the NSL object.

An HDV Client that supports multiple-line configuration MUST allow the configuration of the device as single-line as defined in Section 6.4.4, in a backward compatible manner (e.g., in the absence of operator configuration of the NSL object).

An HDV Client that supports multiple-line configuration MUST populate by default the Nsl.Name with a user defined value of the 'Line settings list' field 'Line name', or the default value "Line n" (without the quotes) where n is the Nsl.Index value.

The HDV client MUST support the notification of list changes of "Line settings list" and "Internal names list" to affected PPS as defined in the List change notification section of [TS 102 527-2] whenever the FP receive updates to the NSL and MDI objects via list commands from the PP or by operator updates to the device configuration. The relationships between Nsl and Mdi objects attributes and DECT list access are shown in Table 2.

Table 2 - DECT List Access Service and Line Configuration Object Relationships

List Service Access Name	List Service Access Field Name	Configuration element
Line settings list	line id	Nsl.Index
Line settings list	line name	NSL.Name
Line settings list	attached handsets	NSL.PortListIn, Nsl.PortListOut
Internal names list	name	[Per Section 6.4.2]

The HDV client MUST support the modification of a PP name by means of the "Internal names list" from any PP and notify the PP being renamed.

The HDV client MAY support the deletion of a PP by another PP attached to the same line by means of the "Internal names list". An HDV client that supports the deletion of PPs via "Internal names list" MUST remove the PP from the network (e.g., remove pairing of the deleted PP).

The multi-line PacketCable 1.5 HDV client MUST use the Nsl.Index attribute to identify the NCS signaling endpoint name so that the endpoint signaling name of "aaln/N" corresponds to the NSLN (Nsl.Index = N) and vice-versa. For example, the NCS endpoint name "aaln/1" identifies NSL1.

The multi-line PacketCable 1.5 HDV client MUST preserve the endpoint interface index relationship to aaln/N independent of the MDI ports identification and their association with the NSL. For example, aaln/1 corresponds to endpoint signaling ifIndex = 9; aaln/2 corresponds to endpoint signaling ifIndex = 10. The prior case is valid to configure MDI ports ifIndex 9,10 with aaln/1 (signaling endpoint ifIndex = 9) or aaln/2 (signaling endpoint ifIndex = 10), aaln/3 (signaling endpoint ifIndex = 11), etc.

The multi-line PacketCable 2.0 HDV client MUST support the "NSL#N" tag for the UsrIMPU.AdditionalInfo object attribute where N corresponds to the Nsl.Index value, so that if UsrIMPU.AdditionalInfo attribute contains the value NSLN, it corresponds to the Service Line NSL=N assigned to the particular IMPU.

The multi-line PacketCable 2.0 HDV client MUST use the NSL#N tag if the UsrIMPU.AdditionalInfo object attribute contains the NSL#N tag along with either IEP#N, OEP#N tags or both, and ignore the IEP#N, OEP#N tags.

The multi-line PacketCable 2.0 HDV client MUST ignore a NSL#N tag in an UsrIMPU.AdditionalInfo object attribute pointing to a non-existing instance of the NSL object, and log the warning condition as defined in Section 6.4.8.

The multi-line PacketCable 2.0 HDV client MUST reject the configuration of two or more IMPUs (i.e., IMPU AdditionalInfo attribute) to the same NSL#N, and log the failure condition as defined in Section 6.4.8.

The multi-line PacketCable 2.0 HDV client MUST provide a single-line HDV client and PacketCable 2.0 client configuration (see Section 6.4.4) when configuring a single instance of UsrIMPU.AdditionalInfo with IEP#9 and/or OEP#9 notation.

6.4.6 Configuration Requirements for the Inbound and Outgoing Service Requests

The HDV client MUST NOT enable telephony features on a particular MDI Port if the MDI port is not associated - by default or explicit configuration - with an instance of the NSL Object, or if the MDI port interface administrative status is set to 'down'.

If more than one service line is configured in the outgoing direction for a particular Media Port, the HDV client MUST use the service line with the lowest value of Nsl.Index for outgoing calls unless the Media Port is capable of indicating the preferred NSL.

6.4.7 List Access Service Support

The "List access service" provides storage and configuration capabilities for users of information related to the DECT system. The HDV client uses the list access services to retrieve service information, such as call logs and of feature configuration like the assignment of handsets to phone lines. See [TS 102 527-3] for information about the "List access service" feature.

The HDV client capable of a single line configuration MAY support the List Access Service Object Model as defined in Annex B.

The HDV client capable of multi-line configuration MUST support the following Annex B objects associated with List access services:

- ListAccess
- InternalNamesList
- DectSystemSettingsList

- LineSettingsList

The following requirements provide rules to prevent user and operator conflict assignment of handsets to phone lines.

The PacketCable provisioning framework does not support persistence of the provisioning information in general. In the multi-line configuration of DECT handsets, the model is extended to allow users to modify the assignment of PPs to NSLs. To offer a reliable user experience, persistence of the PPs assignment is required. From the operator perspective, it is not practical to track the user configuration of PPs via the configuration data at boot time. However ad-hoc operations may be used to modify the terminals assignment via operator management interface (e.g., Web portal).

Note: The operator can disable the user ability to modify the line settings by locking the Line settings list via the FP.LockListCfg object attribute to have full control over the provisioning interface.

The HDV client supporting Multi-line must apply the following rules when the user is allowed to modify the line settings.

The HDV client supporting Multi-line MUST apply the following rule when the user is allowed to modify the line settings; if the HDV client operator configuration contains NSL information and does not contain PPs assigned to the NSL, the device updates the NSL.PortListIn, PortsListOut attributes with the "Line settings list" field "attached handsets" field available in the device (i.e., LineSettingsList object).

The HDV client supporting Multi-line MUST apply the following rule when the user is allowed to modify the line settings; if the HDV client operator configuration contains NSL information and does contain PPs assigned to the NSL, the configured PPs to NSLs from the operator configuration prevails over the user configuration. Other PPs not included in the operator NSL configuration but in the Line settings list are updated in the device NSL object. Then the new line settings is communicated back to the affected PPs via DECT List change notification [TS 102 527-3].

The HDV client supporting Multi-line MUST notify the affected PPs via DECT List change notification procedures [TS 102 527-3] the changes to the NSL and MDI objects when the user is allowed to modify the line settings.

6.4.8 Provisioning and Configuration Error Status Reporting

During provisioning, error conditions can occur. In some cases the HDV client is rejecting the provisioning process due the nature of the failure, and in some cases those failures conditions are ignored and logged by the device. Depending on the HDV provisioning model, "rejecting" or "ignoring" a configuration item through this document is interpreted as defined below.

HDV clients supporting SNMP-based provisioning as defined in [PROV1.5] and [EUE-PROV] specifications include the download of a config file that is processed by the HDV client. Depending on the information being configured, the HDV client will either "reject" the configuration and reinitialize the provisioning process, or will "ignore" the provisioned item and complete the provisioning process. See details on the provisioning state and log of exception in [PROV1.5], [MIBS1.5], [EUE-PROV], and [EUE-DATA] specifications.

The HDV client that supports the SNMP and DHCP provisioning framework in a "reject" condition MUST set the client provisioning state to "failureOtherReason" and report the problem in the pktcMtaDevErrorOidsTable.

The HDV client that supports the SNMP and DHCP provisioning framework in an "ignore" condition MUST set the client provisioning state to "passWithWarnings" and will report the warning in the pktcMtaDevErrorOidsTable.

The HDV client that supports OMA DM-based provisioning as defined in [UE-PROV] specification performs OMA DM sessions. In terms of device provisioning, the OMA DM session may include e.g., OMA DM 'Add' and 'Replace', 'Delete' commands. During the OMA DM session, the client accepts or rejects a configuration item. It is up to the DM server to stop or continue the provisioning process within the DM session. Therefore, 'rejecting' or 'ignoring' a configuration item implies an HDV client OMA DM message response (status message) different than 'OK'.

6.5 HD Voice Clients Requirements for DHCP- and SNMP-based Provisioning

This section specifies requirements to support the HD Voice provisioning requirements for the PacketCable HDV clients that support DHCP- and SNMP-based provisioning. The HDV clients that supports the SNMP management interface MUST comply with the Object Models and SNMP MIB Modules as specified in Table 3.

Table 3 - HD Voice Data Requirements for SNMP-based Provisioning

Reference	Object Model*	MIB Module	Description
Annex B	DECT	PCKT-DECT-MIB	DECT Features
Annex B	DECT-SIP	PCKT-DECT-SIP-MIB	DECT SIP Signaling interoperability for E-UEs (e.g., E-DVA)
Annex C	MDI	PKTC-MDI-MIB	Telephony Delivery Interface
Note: There are no requirements for modeling [HDV-NCS].			

6.5.1 HD Voice E-MTA SNMP Requirements

An E-MTA that is PacketCable HD Voice capable MUST support the following:

- the HD Voice Capabilities, as specified in Annex A;
- the HD Voice Object Model, as specified in Annex B;
- the PKTC-DECT-MIB Module, as specified in Annex B;
- HD Voice PacketCable Service Delivery Model defined in Annex C;
- the PKTC-MDI-MIB Module, as specified in Annex C;
- the management requirements defined in [PROV1.5].

6.5.2 HD Voice E-DVA SNMP Requirements

An E-DVA that supports PacketCable HD Voice MUST support the following:

- the HD Voice Capabilities, as specified in Annex A;
- the HD Voice Object Model, as specified in Annex B;
- the PKTC-DECT-MIB Module, as specified in Annex B;
- the PKTC-DECT-SIP-MIB Module defined in Annex B;
- HD Voice PacketCable Service Delivery Model defined in Annex C;
- the PKTC-MDI-MIB Module, as specified in Annex C;
- the management requirements defined in [RST-EUE-PROV] and [EUE-DATA].

6.6 HD Voice Clients Requirements for OMA DM-based Provisioning

This section specifies requirements to support the HD Voice provisioning requirements for PacketCable DVAs that support the OMA DM based management interface. PacketCable DVAs that support the OMA DM management interface MUST comply with the Object Models and OMA DM DDFs defined in Table 4.

Table 4 - OMA DM HD Voice Provisioning Data Requirements

Reference	Object* Model	MO DDF URN	DDF Path	Description
Annex B	DECT	urn:cablelabs:packetcable:ddf:dect	./Pktc	DECT Features
Annex B	DECT-SIP	urn:cablelabs:packetcable:ddf:dect-sip	./Pktc	DECT SIP Signaling interoperability for UEs (e.g., S-DVA)
Annex C	MDI	urn:cablelabs:packetcable:ddf:mdi	./Pktc	Telephony Delivery Interface
Note: [HDV-NCS] is not applicable to devices that support OMA DM Provisioning requirements (e.g., S-DVAs).				

6.6.1 HD Voice OMA DM Requirements

An S-DVA that supports PacketCable HD Voice MUST support the following requirements:

- the HD Voice Capabilities, as specified in Annex A;
- the HD Voice Object Model, as specified in Annex B;
- the DECT DDF, as specified in Annex B;
- the DECT-SIP DDF, as specified in Annex B;
- HD Voice PacketCable Service Delivery Model defined in Annex C;
- the MDI-DDF Module, as specified in Annex C;
- the management requirements defined in [RST-UE-PROV] and [UE-DATA].

Annex A HDV Client Capabilities

This annex contains HD Voice related capabilities for the PacketCable client.

DHCP- and SNMP-based Provisioning PacketCable clients represent the HD Voice capabilities as defined in [PROV1.5] and [EUE-PROV].

OMA DM-based Provisioning PacketCable clients represent the HD Voice capabilities as defined in [UE-PROV].

This TLV indicates the HDV client capabilities.

Type	Length	Values	Comment	Default value
5.37	n	composite		N/A

A.1 HDV Client Number of Lines

This TLV indicates the maximum number of phone lines supported by the PacketCable HDV client. For PacketCable 1.5 HDV clients, it corresponds to the maximum number of voice endpoints and, therefore, NSL instances that can be configured active simultaneously. For PacketCable 2.0 HDV clients, it corresponds to the maximum number of IMPUs that can be configured in the device. The direct implication for the PacketCable 2.0 HDV client is that the number of NSL active instances is less than or equal to the maximum number of active IMPUs that can be configured in a HDV client.

Type	Length	Values	Comment	Default value
5.37.1	1	0..128		N/A

A.2 DECT Port Interface Index

This TLV indicates the value of the IfIndex of the first PP in a PacketCable client device FP.

Type	Length	Values	Comment	Default value
5.37.2	2	1..65535	First PP in HDV client	N/A

A.3 Number of PPs

This TLV indicates the number of PPs supported by the HDV client.

Type	Length	Values	Comment	Default value
5.37.3	2	1..65535	Number of PPs in HDV client	N/A

Annex B HD Voice Management Requirements

B.1 DECT Object Model Overview

This section specifies the management model for the HD Voice Application. Unless specified, the PacketCable clients will not persist operator configured data after reinitialization for the data models herein described. This data model is defined after the PacketCable clients E-MTA, E-DVA, and S-DVA and may be applicable to other types of PacketCable devices.

B.2 DECT Object Model Definitions

B.2.1 DECT Object Model Data Types

This section defines the data types used in the DECT object model.

Table 5 - Data Type Definitions

Data Type Name	Base Type	Permitted Values
PktcSpecVersion	unsignedByte	0..255
PktcDectPPState	Enum	unknown(1) idleUnlocked(2) activeUnlocked(3) idleLocked(4) activeLocked(5) noFPInRange(6) waitingEasyPairing(7) easyPairingFailed(8) easyPINFailed(9)

PktcSpecVersion

This data type represents the publication spec number of the corresponding requirement being referenced.

PacketCable specifications have the notation PKT-SP-<SPECNAME>I<##>-YYMMDD.

This PacketCable Specification Version value corresponds to the integer representation of <##>.

Reference: [HDV]

PktcDectPPState

This data type describes the DECT PP MAC later state or status indication.

The combination of states and status provides remote debugging capabilities by knowing the actions that determine e.g., the fallback to a specific state.

Some values may have a temporary duration and not observable due their transient nature. Event logging might be defined for such cases.

Below are the states definitions as defined by the DECT standard:

- 'activeLocked'
where the PP is synchronized to at least one RFP transmission and has one or more connections in progress.
- 'idleLocked'
where the PP is synchronized to at least one RFP transmission. It is able to make or receive connections, but has no connections in progress.

- 'activeUnlocked'

where the PP is not synchronized to any RFP transmissions, and is unable to make or receive connections. The PP makes occasional attempts to detect a suitable RFP and enter the 'IdleLocked' state.

- 'idleUnlocked'

The PP is not synchronized to any RFP and does not attempt to detect RFPs.

Other values.

The state 'activeUnlocked' does not define any possible reason why the PP has not progressed into a locked state. Below are possible values to report:

- 'noFPInRange'

The PP could not find any FP in range.

- 'waitingEasyPairing'

The PP is waiting for easy pairing to be activated by the FP.

- 'easyPairingFailed'

The FP rejects the easyPairing access rights request.

- 'easyPINFailed'

The FP rejects the easyPIN access rights.

Reference: [HDV]

B.2.2 DECT Object Model Class Diagram

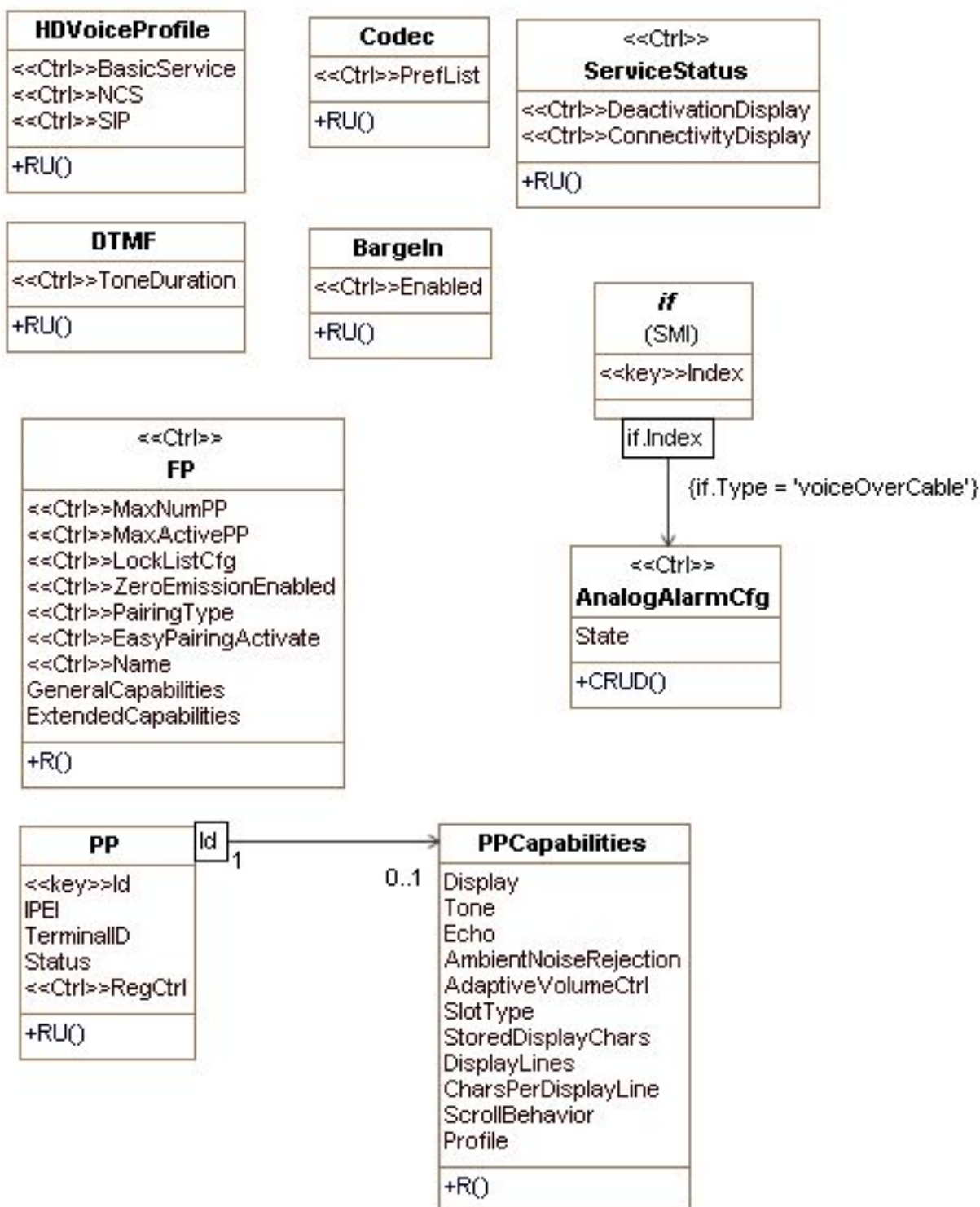


Figure 6 - DECT Object Model Class Diagram

B.2.3 DECT Object Model Description

B.2.3.1 *FP Object*

This object represents configuration parameters associated with the FP.

Object Operations: None

Reference: [HDV]

Table 6 - FP Object

Attribute Name	Type	Access	Type Constraints	Units	Default
MaxNumPP	unsignedInt	R		PPs	
MaxActivePP	unsignedInt	RU		PPs	
LockListCfg	EnumBits	R	listOfSupportedLists(0) missedCallsList(1) outgoingCallsList(2) incomingAcceptedCallsList(3) allCallsList(4) contactList(5) internalNamesList(6) dectSsystemSettingsList(7) lineSettingsList(8)		
ZeroEmissionEnabled	boolean	R			'true'
PairingType	AdminString	RU			"0000"
PairingActivate	boolean	R			'false'
Name	AdminString	RU			'true'
GeneralCapabilities	EnumBits	R			
ExtendedCapabilities	EnumBits	R	listAccess(14) parallelCall(19) zeroEmission(23) multipleLines(26) multipleCalls(27)		

MaxNumPP

This attribute represents the maximum number of PPs supported by the FP.

Reference: [HDV]

MaxActivePP

This attribute represents the maximum number of PPs that can reach the state Idle_Unlocked simultaneously. The FP ages out PPs as soon as the PP leaves the Idle_Unlocked state to either Active_unlocked or unknown, allowing another PP to attempt synchronization with the FP. By default, this attribute reports the MaxNumPP attribute value.

Reference: [HDV]

LockListCfg

This attribute indicates the lock state of user invocation of List Access Service 'Edit entry', 'Save entry', 'Delete entry' and 'Delete list' commands. If a bit is set to '1', it indicates the corresponding list is locked for the commands listed above. If a bit is set to '0', the bit associated list is not locked for the modification commands listed above. A bit set to a non-supported list is ignored and returned as '0' on a subsequent read operation of this attribute. Other list commands are always allowed.

The default value is the bit set to '1' for all lists that the device supports as editable lists.

ZeroEmissionEnabled

This attribute indicates the status of the Zero Emission mode. The value 'true' indicates Zero Emission is enabled and the FP will invoke the initiation of the no-emission mode if all registered PPs are no-emission capable.

PairingType

This attribute represents the control method the FP will use for registration of PPs, either using pairing or easy PIN with the PIN to be used. Setting this attribute to values containing ascii octets not in the range [0-9] returns an error. The value '0000' indicates the easy pairing procedure to be used for registering new PPs. Otherwise, the PIN procedure will be used for registering new PPs with the PIN indicated.

Reference: Easy PIN code and easy pairing registration section [TS 102 527-3].

PairingActivate

This attribute represents the status pairing invocation by the FP.

The value 'false' indicates pairing is not active.

The value 'true' indicates the FP imitates the pairing process. After the first PP attempts pairing or a timer expires, whichever occurs first, the pairing is disabled and this attribute falls back to 'false'.

Reference: Easy PIN code and easy pairing registration, Digital Enhanced Cordless Telecommunications (DECT) [TS 102 527-3].

Name

This attribute corresponds to the FP name.

Reference: Base station name selection section [TS 102 527-3]

GeneralCapabilities

This attribute represents the General FP capabilities. A bit set to '1' indicates support of the specific profile feature, a bit set to '0' indicates no support of the profile feature. Bits are numbered left to right (MSB = 0). The possible values are encoded starting from bit a12 to a47.

Bit a12 represents bit 0 of this enumeration, a47 is bit 35 in this attribute encoding.

ExtendedCapabilities

This attribute represents the FP capabilities. A bit set to '1' indicates support of the specific profile feature, a bit set to '0' indicates no support of the profile feature. Bits are numbered left to right (MSB = 0). The possible values are encoded starting from bit a12 to a47.

Bit a12 represents bit 0 of this enumeration, a47 is bit 35 in this attribute encoding (only the most relevant are shown):

- 'parallelCall': Common parallel call procedure support
- 'listAccess': list Access feature support
- 'zeroEmission': support for Zero Emission
- 'multipleLines': multiple lines support
- 'multipleCalls': multiple calls support

B.2.3.2 PP

This object represents the list of PPs and related identifiers.

For debugging purposes this object lists more PPs than the maximum number of PPs.

Table 7 - PP Object

Attribute Name	Type	Access	Type Constraints	Units	Default
Id	unsignedShort	key			
IPEI	hexBinary	R	Size (0..5)		
TerminalID	unsignedShort	R			
Status	PktcDectPPStatus	R			
RegCtrl	Enum	R	register(1) deregister(2) remove(3)		

Id

This key represents the unique identifier of the PP.

The Id of PPs already registered corresponds to the interface Index associated with the PP MDI. For PPs not registered, the FP selects an Id outside the range of well known Interface Index values defined for the device.

The FP lists only PPs that have previously paired or attempted to pair within the FP during an FP initiated pairing process. This prevents PPs from neighboring areas from appearing on another FP.

TerminalID

This attribute represents the Terminal Identifier the FP assigns to the PP. For simple operation the FP may maintain the same PP Terminal Identifier from the initial Locate during pairing during device initialization.

IPEI

This attribute represents the International Portable Equipment Identifier of the device. Other than residential/default handset, identifiers are not required.

Status

This attribute represents the state of a PP as seen by the FP based on last PP/FP interaction.

The FP may report only the values 'idleLocked' and 'activeLocked' for registered PPs.

Unregistered PPs are reported as 'unknown' or the latest failure occurred such as 'easyPINFailed', 'easyPairingFailed'.

Note: In no-emission mode, the FP may not accurately report the PP state.

RegCtrl

This attribute provides control of the PP registration status.

The value 'deregister' directs the PP to initiate the procedure to terminate PP access rights without deleting the identity of the PP in this object (e.g., for troubleshooting purposes).

The value 'register' initiates the registration process either easy pairing or PIN registration depending on the FP configuration (FP.PairingType). Subsequently, the FP will register the PP for which the register action was invoked. See the FP InitiateRegistration to invoke the pairing of any PP.

The value 'remove' invokes the action to de-register the PP (if so) and deletes the PP information of the FP.

B.2.3.3 PPCapability**Table 8 - PPCapability Object**

Attribute Name	Type	Access	Type Constraints	Units	Default
Display	Enum	R	na(0) noDisplay(1) numeric(2) numericPlus(3) alphanumeric(4) fullDisplay(5)		
Tone	Enum	R	na(0) notone(1) dialTone(2) e182(3) dect(4)		
Echo	Enum	R	na(0) minTCL(1) fullTCL(2) voip(3)		
AmbientNoiseRejection	Enum	R	na(0) noSupport(1) support(2)		
AdaptiveVolumeCtrl	Enum	R	na(0) noSupported(1) used(2) disabled(3)		
SlotType	EnumBits	R	doubleSlot(3) fullSlot(4) halfSlot(7)		
StoredDisplayChars	unsignedShort	R	0..16363		
DisplayLines	unsignedByte	R	1..128		
ChrsPerDisplayLine	unsignedByte	R	1..128		
ScrollBehavior	Enum	R	na(0) type1(1) type(2)		
Profile	EnumBits	R	gapSupport(5) zeroEmissionSupport(41) multipleLines(50) parallelCall(51) callIdentification(52) wideband(53) part3(54)		

Display

This attribute represents the PP display capability. The possible values are:

- 'na': not applicable
- 'noDisplay': no display
- 'numeric': numeric characters (space, 0-9, *, #)
- 'numericPlus': extended numeric characters (space, 0-9, *, #, a, b, c, d)

- 'alphanumeric': alphanumeric characters (space, 0-9, *, #, a-z and A-Z)
- 'fullDisplay' : displayable characters up to 0x7F

Tone

This attribute represents the PP tone capability. The possible values are:

- 'na': not applicable
- 'notone': no tone capability supported
- 'dialTone': dialtone supported
- 'e182': ITU-T E.182 tones supported
- 'dect': complete DECT tone set

Echo

This attribute represents the PP echo capability. The possible values are:

- 'na': not applicable
- 'minTCL': > 34 dB
- 'fullTCL': > 46 dB
- 'voip' : > 55 dB

AmbientNoiseRejection

This attribute represents the PP echo capability. The possible values are:

- 'na': not applicable
- 'noSupport': no noise rejection
- 'support': noise rejection provided

AdaptiveVolumeCtrl

This attribute represents the PP adaptive volume control capability. The possible values are:

- 'na': not applicable
- 'noSupported': no adaptive volume control
- 'used': supported and in use
- 'disabled': supported not in use

SlotType

This attribute represents the PP slot type capabilities. A bit set to '1' indicates support of the slot type, a bit set to '0' indicates no support of the slot type. Bits are numbered left to right (MSB = 0). The possible values are:

- 'doubleSlot': double slot
- 'fullSlot': full slot
- 'halfSlot': half slot, j = 0

StoredDisplayChars

This attribute represents the PP number of stored display characters.

DisplayLines

This attribute represents the number of lines in the PP display.

ChrPerDisplayLine

This attribute represents the PP number of characters per line in the display.

ScrollBehavior

This attribute represents the PP scroll behavior capability. The possible values are:

- 'na': not applicable, specified
- 'type1': type 1
- 'type2': type 2

Profile

This attribute represents the PP profile feature capabilities. A bit set to '1' indicates support of the specific profile feature, a bit set to '0' indicates not support of the profile feature. Bits are numbered left to right (MSB = 0). The possible values are (only the most relevant are shown):

- 'gapSupport': GAP profile support
- zeroEmissionSupport': Zero Emission support
- 'multipleLlines': multiple lines
- 'parallelCall': Common parallel call procedures
- 'callIdentification': Call Identification support
- 'wideband': Wideband support
- 'part3' : Extended wideband speech services support

B.2.3.4 HDVoiceProfile Object

This object indicates the DH Voice profile capabilities of the FP.

Object Operations: None

Reference: [HDV]

Table 9 - HDVoiceProfile Object

Attribute Name	Type	Access	Type Constraints	Units	Default
BasicService	PktcSpecVersion	R			
NCS	PktcSpecVersion	R			
SIP	PktcSpecVersion	R			

BasicService

This attribute represents the supported HD Voice profile for basic service.

Reference: [HDV]

NCS

This attribute represents the supported HD voice profile for NCS.

Reference: [HDV-NCS]

SIP

This attribute represents the supported HD Voice profile for SIP.

Reference: [HDV-SIP]

B.2.3.5 Codec Object

This object represents the configuration of Codec related parameters for FPs.

Object Operations: None

Reference: [HDV]

Table 10 - Codec Object

Attribute Name	Type	Access	Type Constraints	Units	Default
PrefList	AdminString	RU			"G722,PCMU,PCMA"

PrefList

This attribute represents the codec selection in preferred order from left to right. The codec list is comma separated with no additional characters between code names. When a user associated with an endpoint linked to this FP has configured its own preferred codec list, this attribute is ignored.

Reference: [HDV]

B.2.3.6 DTMF Object

This object represents the configuration of DTMF related parameters for FPs.

Object Operations: None

Reference: [HDV]

Table 11 - DTMF Object

Attribute Name	Type	Access	Type Constraints	Units	Default
ToneDuration	unsignedInt	RU		milliseconds	100

ToneDuration

This attribute specifies the tone duration for DTMF defined length events sent by a PP to the FP.

Reference: [HDV]

B.2.3.7 Bargain Object

This object represents the configuration parameters of the Barge-In feature of DECT capable PacketCable clients. For the HDV clients with multi-line support this object defines the 'Barge-In' feature only for the set of Media Ports (POTS or DECT) associated with the same NSL. This object is not applicable to the Media Ports associated with different NSLs.

Object Operations: None

Reference: [HDV]

Table 12 - Bargain Object

Attribute Name	Type	Access	Type Constraints	Units	Default
Enabled	boolean	RU			true

Enabled

This attribute indicates the barge-in state of this instance. The value 'true' indicates barge-in is enabled. The value 'false' indicates barge-in is disabled.

Reference: [HDV]

B.2.3.8 ServiceStatus Object

This object represents configuration parameters to display service status to PP associated with the FP.

Object Operations: None

Reference: [HDV]

Table 13 - Service Status Object

Attribute Name	Type	Access	Type Constraints	Units	Default
DeactivationDisplay	AdminString	RU			"Service Deactivated"
ConnectivityDisplay	AdminString	RU			"Network Unavailable"

DeactivationDisplay

This attribute indicates the configured text to display in the PP when the PacketCable Client service is disconnected.

Reference: [HDV]

ConnectivityDisplay

This attribute indicates the configured text to display in the PP when the PacketCable Client has no Network (Service) Connectivity.

Reference: [HDV]

B.2.3.9 AnalogAlarmCfg Object

This object represents the configuration of an end point to support the Analog Alarm Configuration.

Reference: [HDV]

Object Operations

When an endpoint instance is configured to enable the analog Alarm Configuration, the largest POTS MDI identifier (PktcMdiType = 'pots') in the endpoint takes the role of analog alarm port. Therefore, an endpoint is allowed to have only one POTS configured as an analog Alarm port.

End points not instantiated in this object have no analog Alarm configured (i.e., equivalent to analogAlarmCfg.State = 'none').

Table 14 - AnalogAlarmCfg Object

Attribute Name	Type	Access	Type Constraints	Units	Default
ifIndex	InterfaceIndex	key	ifType = voiceOverCable		
State	Enum	CRUD	none(1) preemptive(2) simultaneousCalls(3)		'none'

IfIndex

This key represents the interface Index associated with the endpoint the analog alarm is configured to.

State

This attribute represents alarm configuration type assigned for this analog port. The possible values are:

- 'none' indicates the end point has no analog alarm configuration
- 'preemptive' indicates the analog alarm is configured in a preemptive mode of operation.

'SimultaneousCalls' indicates the PacketCable client can have a regular phone call and an alarm call simultaneously. This type of analog alarm configuration is not applicable to PacketCable clients that support NCS signaling (i.e., E-MTAs) and a set to this attribute with this value is rejected.

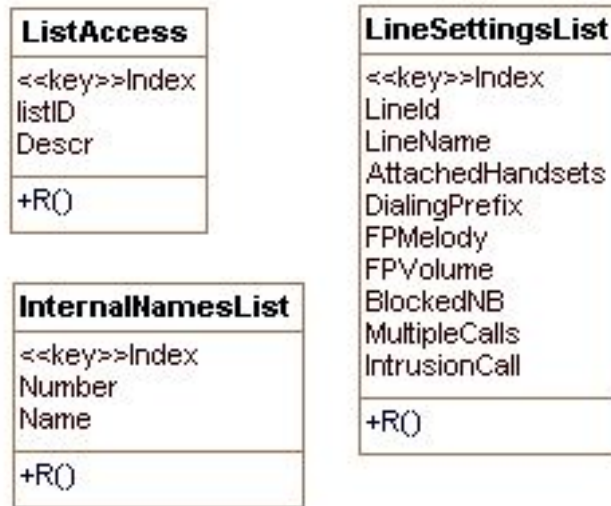


Figure 7 - List Access Service Object Model Class Diagram

B.2.3.10 ListAccess Object

This object represents the list of lists stored in the FP.

Object Operations: None

Table 15 - List Access Object

Attribute Name	Type	Access	Type Constraints	Units	Default
Index	unsignedShort	key			
listID	unsignedShort	R			
Description	AdminString	R			

Index

This key represents the unique identifier of the list element.

listID

This attribute defines the ID of the supported list.

Descr

This attribute represents the name of the list. For standard list this corresponds to the exact name as the list is referred to in the specification. Vendor specific list may include name and references to documentation (e.g., URNs).

B.2.3.11 InternalNamesList Object

This object represents the list of registered PPs

Object Operations: None

Table 16 - InternalNamesListObject

Attribute Name	Type	Access	Type Constraints	Units	Default
Index	unsignedShort	key			
Number	unsignedShort	R			
Name	AdminString	R			

Index

This Key represents the unique identifier of the list element.

Number

This attribute indicates the terminal identity number.

Name

This attribute indicates the name of the internal party.

B.2.3.12 *LineSettingsList Object*

This object represents Information pertaining to the DECT Line settings list. Operator settings to this line are performed via the NSL object.

A PacketCable device allows the user to modify any line parameter via PP List Access Service commands with the exception of the 'Dialing Prefix' field.

Object Operations: None

Table 17 - LineSettingsList Object

Attribute Name	Type	Access	Type Constraints	Units	Default
Index	unsignedShort	key	1..127		
LineId	unsignedShort	R	1..127		
LineName	AdminString	R			
AttachedHandsets	AdminString	R			
DialingPrefix	AdminString	R			
FPMelody	unsignedShort	R			
FPVolume	unsignedShort	R	0..10		
BlockedNB	boolean	R			
MultipleCalls	boolean	R			
IntrusionCall	boolean	R			

Index

This Key represents the unique identifier of the list element.

recordLineId

This attribute represents the line identifier.

LineName

This attribute represents the name of the line.

AttachedHandsets

This attribute represents the list of registered handsets which are attached to the line.

This attribute is formatted as a string where each octet represents the 'Terminal Identifier' of the handset.

Note: The over the air 'Line settings list' defines the 'Attached handsets' as a sequence of bits, each representing a 'Terminal Id' handset.

DialingPrefix

This attribute represents a prefix to add to called party numbers for calls placed on the line.

FPMelody

This attribute represents the melody of the FP linked to this line.

FPVolume

This attribute represents the melody volume of the FP linked to this line.

BlockedNB

This attribute represents forbidden called party numbers on the line.

MultipleCalls

This attribute represents the current mode of the line:

- The value 'true' indicates support for multiple call mode.
- The value 'false' indicates support for single call mode.
- For PacketCable client devices supporting only single call mode this value always use the value 'false'.

IntrusionCall

This attribute represents the call intrusion mode for the line.

- The value 'true' indicates the line has 'call intrusion' enabled. Otherwise the value 'false' is reported.
- The PacketCable client device should always use the configured BargeIn.Enabled attribute value as the highest possible value. It means if BargeIn.Enabled is set to 'false', the user can't modify the call intrusion to 'true' via list access commands. In the contrary, if BargeIn.Enabled is set to 'true' the user could set this attribute to false via 'line settings list' commands.

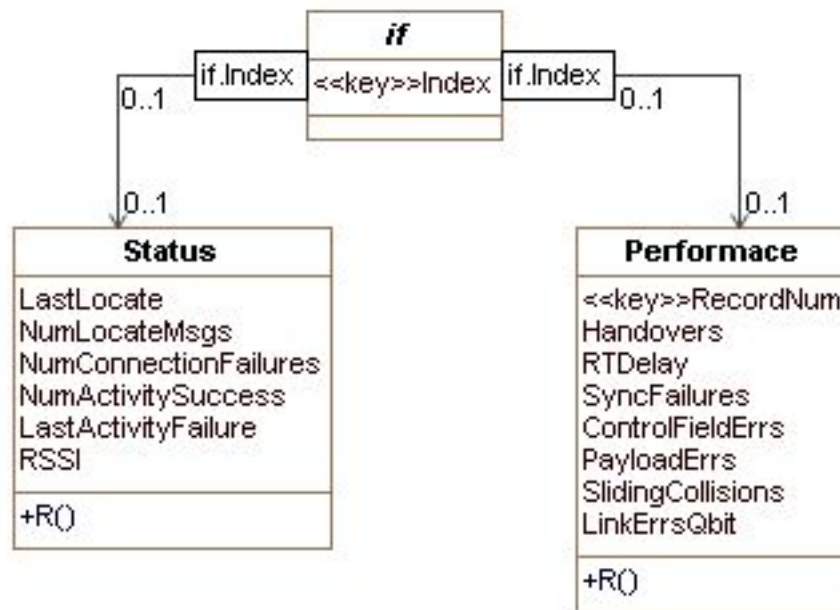


Figure 8 - DECT Air Interface Object Model Class Diagram

B.2.3.13 Performance Object

This object represents the performance statistics of each PP. When Zero Emission is enabled, this object stores statistics on a per call basis. When Zero Emission is off, this object may contain a single instance per PP (Terminal ID) referent to all the messages activity in the upstream direction (PP to FP) or maintain per call statistics.

Object Operations: None

Table 18 - Performance Object

Attribute Name	Type	Access	Type Constraints	Units	Default
RecordNum	unsignedShort	key			
Handovers	Counter32	R			
RTDelay	Counter32	R			
SyncFailures	Counter32	R			
ControlFieldErrs	Counter32	R			
PayloadErrs	Counter32	R			
SlidingCollisions	Counter32	R			
LinkErrsQbit	Counter32	R			

RecordNum

This key represents the identifier of the logged statistics of a previous call. When Zero Emission is enabled, the FP maintains an incrementing log information and deletes the oldest log instance when reaching the maximum number of entries.

When Zero Emission is disabled, this object creates a single instance with RecordNum = 0 and continuously collects the data associated with the object attributes.

Handovers

This attribute indicates how many channel handovers the PP has realized since the first activity related to this logged call.

RTDelay

This attribute indicates the round trip delay calculated by the FP.

The FP measures the RoundTrip Delay at the beginning of the call.

SyncFailures

This attribute indicates the number of synchronization failures that have occurred during the current call.

ControlFieldErrs

This attribute indicates the number of Control field errors encountered during this time period.

PayloadErrs

This attribute indicates the number of CRC errors accumulated during this period of time.

SlidingCollisions

This attribute indicates the number of sliding collisions detected during this period of time.

LinkErrsQbit

This attribute indicates the number of link errors being signaled with the Q-bit during this period of time.

B.2.3.14 Status Object

This object represents the PP status and related connectivity information.

Object Operations: None

Table 19 - Status Object

Attribute Name	Type	Access	Type Constraints	Units	Default
LastLocate	dateTime	R			
NumLocateMsgs	Counter32	R			
NumConnectionFailures	Counter32	R			
NumActivitySuccess	Counter32	R			
LastActivityFailure	dateTime	R			
RSSI	unsignedShort	R			

LastLocate

This attribute represents the time when the last Locate message was sent by the PP to the FP.

NumLocateMsgs

This attribute represents the number of times the PP has subscribed since last FP reboot.

NumConnectionFailures

This attribute represents the number of times the PP has failed connections with the FP since last FP reinitialization.

NumActivitySuccess

This attribute indicates the number of times the PP has initiated any activity successfully since last FP reinitialization.

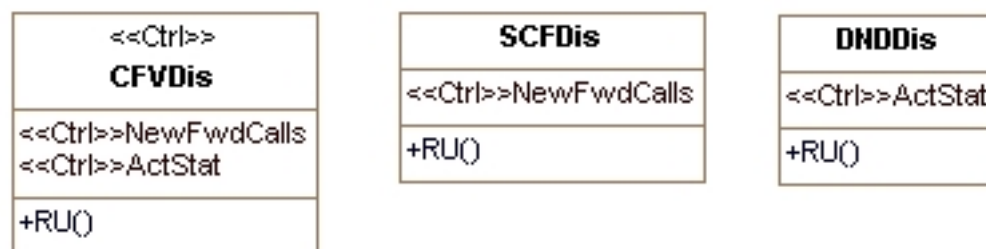
LastActivityFailure

This attribute indicates the time then the last PP initiated activity and was rejected by the FP.

RSSI

This attribute represents the instantaneous Received Signal Strength from the PP.

B.2.4 DECT-SIP Object Model Class Diagram

**Figure 9 - DECT-SIP Object Model Diagram**

B.2.5 DECT-SIP Object Model Description

B.2.5.1 CFVDis Object

This object represents FP configuration parameters for User Identities with the CFV feature activated.

Object Operations: None

Reference: [HDV]

Table 20 - CFVFDIs Object

Attribute Name	Type	Access	Type Constraints	Units	Default
NewFwdCalls	AdminString	RU			""
ActStat	AdminString	RU			""

NewFwdCalls

This attribute represents the text to be displayed by the PacketCable client PPs when new calls are forwarded based on the CFV feature.

Reference: [HDV-SIP]

ActStat

This attribute represents the text to be displayed by the PacketCable client PPs going off-hook when the CFV feature is active.

Reference: [HDV]

B.2.5.2 SCFDis Object

This object represents FP configuration parameters for User Identities with the SCF feature activated.

Object Operations: None

Reference: [HDV]

Table 21 - SCFDis Object

Attribute Name	Type	Access	Type Constraints	Units	Default
NewFwdCalls	AdminString	RU			""

NewFwdCalls

This attribute represents the text to be displayed by the PacketCable client PPs when new calls are forwarded based on the CFV feature.

Reference: [HDV]

B.2.5.3 DNDDis Object

This object represents FP configuration parameters for User Identities with the DND feature activated.

Object Operations: None

Reference: [HDV]

Table 22 - DNDIs Object

Attribute Name	Type	Access	Type Constraints	Units	Default
ActStat	AdminString	RU			""

ActStat

This attribute represents the text to be displayed by the PacketCable client PPs going off-hook when the DND feature is active.

Reference: [HDV]

B.3 DECT SNMP MIB MODULES

B.3.1 DECT SNMP MIB MODULE

```

DECT SNMP MIB MODULE
PKTC-DECT-MIB DEFINITIONS ::= BEGIN
IMPORTS
    MODULE-IDENTITY,
    OBJECT-TYPE,
    Unsigned32,
    Counter32
        FROM SNMPv2-SMI
    OBJECT-GROUP,
    MODULE-COMPLIANCE
        FROM SNMPv2-CONF
    SnmpAdminString
        FROM SNMP-FRAMEWORK-MIB
    TEXTUAL-CONVENTION,
    TruthValue,
    DateAndTime
        FROM SNMPv2-TC
    ifIndex
        FROM IF-MIB
    pktcApplicationMibs
        FROM CLAB-DEF-MIB;

pktcDectMib MODULE-IDENTITY
LAST-UPDATED "201304110000Z" -- April 11, 2013
ORGANIZATION "Cable Television Laboratories, Inc."
CONTACT-INFO
    "Broadband Network Services
     Cable Television Laboratories, Inc.
     858 Coal Creek Circle,
     Louisville, CO 80027, USA
     Phone: +1 303-661-9100
     Email: mibs@cablelabs.com

     Acknowledgements:
     Thomas Clack, Broadcom
     Eugene Nechamkin, Broadcom
     Josh Littlefield, Cisco
     Jerry Mahler, Motorola
     Eduardo Cardona, CableLabs"
DESCRIPTION
    "This MIB module contains the PacketCable client
     HD Voice management requirements."
REVISION "201304110000Z" -- April 11, 2013
DESCRIPTION
    "Revised version includes ECN
     DECT-PROV-N-13.1069-3
     and published as part of PKT-SP-DECT-PROV-I04"

REVISION "200909170000Z" -- September 17, 2009
DESCRIPTION
    "Revised version includes ECN
     DECT-PROV-N-09.0576-8
     and published as part of PKT-SP-DECT-PROV-I02"

REVISION "200902260000Z" -- February 26, 2009
DESCRIPTION
    "Initial version, published as part of the CableLabs
     DECT Provisioning Specification PKT-SP-DECT-PROV-I01-090226
     Copyright(c) 2009 Cable Television Laboratories, Inc.

```



```

        All rights reserved."
    ::= { pktcApplicationMibs 4 }

-- Textual Conventions

PktcSpecVersion ::= TEXTUAL-CONVENTION
    STATUS      current
    DESCRIPTION
        "This data type represents the publication spec number of
        the corresponding requirement being referenced.
        PacketCable specifications have the notation
        PKT-SP-<SPECNAME>I<##>-YYMMDD.
        This value corresponds to the integer representation
        of <##>."
    REFERENCE
        "PacketCable DECT-HDV Specification."
    SYNTAX      Unsigned32

PktcDectPPState ::= TEXTUAL-CONVENTION
    STATUS      current
    DESCRIPTION
        "This data type describes the DECT PP MAC later state
        or status indication.
        The combination of states and status provide remote
        debugging capabilities by knowing the actions that
        determines e.g., the fallback to a specific state.
        Some values may have a temporary duration and not
        observable due their transient nature. Event logging
        might be defined for such cases.

        Below are the states definitions as defined by the DECT
        standard
        'activeLocked'
        where the PP is synchronized to at least one RFP
        transmission and has one or more connections in progress.
        'idleLocked'
        where the PP is synchronized to at least one RFP transmission.
        It is able to make or receive connections, but has no
        connections in progress.
        'activeUnlocked'
        where the PP is not synchronized to any RFP transmissions,
        and is unable to make or receive connections.
        The PP makes occasional attempts to detect a suitable RFP
        and enter the 'IdleLocked' state.
        'idleUnlocked'
        The PP is not synchronized to any RFP and does not attempt
        to detect RFPs.

        Other values.
        The state 'activeUnlocked' does not define any possible
        reason why the PP has not progressed into a locked state.
        Below are possible values to report:
        'noFPInRange'
        The PP could not find any FP in range.
        'waitingEasyPairing'
        The PP is waiting for easy pairing to be activated by the FP.
        'easyPairingFailed'
        The FP rejects the easyPairing access rights request.
        'easyPINFailed'
        The FP rejects the easyPIN access rights."
    REFERENCE
        "PacketCable DECT-HDV Specification."
    SYNTAX      INTEGER {

```

```

        unknown(1),
        idleUnlocked(2),
        activeUnlocked(3),
        idleLocked(4),
        activeLocked(5),
        noFPInRange(6),
        waitingEasyPairing(7),
        easyPairingFailed(8),
        easyPINFailed(9)
    }

-- Object Definitions
pktcDectNotifications OBJECT IDENTIFIER ::= { pktcDectMib 0 }
pktcDectObjects       OBJECT IDENTIFIER ::= { pktcDectMib 1 }
pktcDectFP            OBJECT IDENTIFIER ::= { pktcDectObjects 1 }

pktcDectFPMaxNumPP OBJECT-TYPE
    SYNTAX      Unsigned32
    UNITS       "PPs"
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "This attribute represents the maximum number of PPs
        supported by the FP."
    REFERENCE
        "PacketCable DECT-HDV Specification."
    ::= { pktcDectFP 1 }

pktcDectFPMaxActivePP OBJECT-TYPE
    SYNTAX      Unsigned32
    UNITS       "PPs"
    MAX-ACCESS  read-write
    STATUS      current
    DESCRIPTION
        "This attribute represents the maximum number of PPs that
        can reach the state Idle_Unlocked simultaneously. The FP
        ages out PPs as soon as the PP leaves the Idle_Unlocked
        state to either Active_unlocked or unknown, allowing
        another PP to attempt synchronization with the FP.
        By Default this attribute reports the MaxNumPP
        attribute value."
    REFERENCE
        "ETSI EN 300 175-3, Digital Enhanced Cordless
        Telecommunications (DECT); Common Interface (CI); Part 3:
        Medium Access Control (MAC) layer"
    ::= { pktcDectFP 2 }

pktcDectFPLockListCfg OBJECT-TYPE
    SYNTAX      BITS {
        listOfSupportedLists(0),
        missedCallsList(1),
        outgoingCallsList(2),
        incomingAcceptedCallsList(3),
        allCallsList(4),
        contactList(5),
        internalNamesList(6),
        dectSystemSettingsList(7),
        lineSettingsList(8)
    }
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "This attribute indicates the lock state of user

```

invocation of access list 'Edit entry', 'Save entry', 'Delete entry' and 'Delete list' commands.

If a bit is set to '1' it indicates the corresponding list is locked for the commands listed above.

If a bit is set to '0' the bit associated list is not locked for the modification commands listed above.

A bit set to a non supported list is ignored and returned as '0' on a subsequent read operation of this attribute.

Other list commands are always allowed.
The default value is the bit set to '1' for all lists that the device supports as editable lists."

```
::= { pktcDectFP 3 }
```

pktcDectFPZeroEmissionEnabled OBJECT-TYPE

SYNTAX TruthValue

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"This attribute indicates the status of the Zero Emission mode.

the value 'true' indicates Zero Emission is enabled and the FP will invoke the initiation of the no-emission mode if all registered PPs are no-emission capable."

DEFVAL { true }

```
::= { pktcDectFP 4 }
```

pktcDectFPPairingType OBJECT-TYPE

SYNTAX SnmpAdminString

MAX-ACCESS read-write

STATUS current

DESCRIPTION

"This attribute represents the control method the FP will use for registration of PPs, either easy pairing or easy pin with the PIN to be used.

Setting this attribute to values containing ascii octets not in the range [0-9] returns an error.

The value '0000' indicates easy pairing procedure to be used for registering new PPs. Otherwise, the PIN procedure will be used for registering new PPs."

DEFVAL { "0000" }

```
::= { pktcDectFP 5 }
```

pktcDectFPEasyPairingActivate OBJECT-TYPE

SYNTAX TruthValue

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"This attribute represents the control of pairing invocation by the FP.

The value 'false' indicates pairing is not active.

The value 'true' indicates the FP initiates the pairing process.

After the first PP attempts pairing or a timer expires, whichever occurs first, the pairing is disabled and this attribute falls back to 'false'."

DEFVAL { false }

```
::= { pktcDectFP 6 }
```

```

pktcDectFPName      OBJECT-TYPE
    SYNTAX      SnmpAdminString
    MAX-ACCESS   read-write
    STATUS      current
    DESCRIPTION
        "This attribute corresponds to the FP name."
    ::= {pktcDectFP 7 }

pktcDectFPGeneralCapabilities  OBJECT-TYPE
    SYNTAX      BITS { none(0)
    }
    MAX-ACCESS   read-only
    STATUS      current
    DESCRIPTION
        "This attribute represents the General FP capabilities.
        A bit set to '1' indicates support of the specific
        profile feature, a bit set to '0' indicates not support
        of the profile feature. Bits are numbered left to right
        (MSB = 0). The possible values are encoded starting from
        bit a12 to a47. Bit a12 represents bit 0 of this
        enumeration, a47 is bit 35 in this attribute encoding."
    ::= {pktcDectFP 8 }

pktcDectFPExtendedCapabilities  OBJECT-TYPE
    SYNTAX      BITS {
        listAccess(14),
        parallelCall(19),
        zeroEmission(23),
        multipleLines(26),
        multipleCalls(27)
    }
    MAX-ACCESS   read-only
    STATUS      current
    DESCRIPTION
        "This attribute represents the FP capabilities.
        A bit set to '1' indicates support of the specific profile
        feature, a bit set to '0' indicates not support of the
        profile feature. Bits are numbered left to right (MSB = 0).
        The possible values are encoded starting from bit a12 to
        a47.
        Bit a12 represents bit 0 of this enumeration, a47 is bit 35
        in this attribute encoding (only the most relevant are
        shown):

        'parallelCall': Common parallel call procedure support
        'listAccess':   list Access Service support
        'zeroEmission': support for Zero Emission
        'multipleLines': multiple lines support
        'multipleCalls': multiple calls support."
    ::= {pktcDectFP 9 }

pktcDectHDVoiceProfile OBJECT IDENTIFIER ::= { pktcDectObjects 2 }

pktcDectHDVoiceProfileBasicService OBJECT-TYPE
    SYNTAX      PktnSpecVersion
    MAX-ACCESS   read-only
    STATUS      current
    DESCRIPTION
        "This attribute represents the supported HD Voice
        profile for basic service."
    REFERENCE
        "PacketCable DECT-HDV Specification."

```

```

    ::= { pktcDectHDVoiceProfile 1 }

pktcDectHDVoiceProfileNCS OBJECT-TYPE
    SYNTAX      PktcSpecVersion
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "This attribute represents the supported HD voice
        profile for NCS."
    REFERENCE
        "PacketCable DECT-HDV Specification"
    ::= { pktcDectHDVoiceProfile 2 }

pktcDectHDVoiceProfileSIP OBJECT-TYPE
    SYNTAX      PktcSpecVersion
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "This attribute represents the supported HD Voice
        profile for SIP."
    REFERENCE
        "PacketCable DECT-HDV Specification"
    ::= { pktcDectHDVoiceProfile 3 }

pktcDectCodec OBJECT IDENTIFIER ::= { pktcDectObjects 3 }

pktcDectCodecPrefList OBJECT-TYPE
    SYNTAX      SnmpAdminString
    MAX-ACCESS  read-write
    STATUS      current
    DESCRIPTION
        "This attribute represents the codec selection in prefer
        order from left to right. The codec list is comma separated
        with no additional characters between code names.
        When a user associated with an endpoint linked to this
        FP has configured its own preferred codec list this
        attribute is ignored."
    REFERENCE
        "PacketCable DECT-HDV Specification"
    DEFVAL      { "G722,PCMU,PCMA" }
    ::= { pktcDectCodec 1 }

pktcDectDTMF OBJECT IDENTIFIER ::= { pktcDectObjects 4 }

pktcDectDTMFToneDuration OBJECT-TYPE
    SYNTAX      Unsigned32
    UNITS       "milliseconds"
    MAX-ACCESS  read-write
    STATUS      current
    DESCRIPTION
        "This attribute specifies the tone duration for DTMF
        defined length events sent by a PP to the FP."
    REFERENCE
        "PacketCable DECT-HDV Specification"
    DEFVAL      { 100 }
    ::= { pktcDectDTMF 1 }

pktcDectBargeIn OBJECT IDENTIFIER ::= { pktcDectObjects 5 }

pktcDectBargeInEnabled OBJECT-TYPE
    SYNTAX      TruthValue
    MAX-ACCESS  read-write
    STATUS      current

```

DESCRIPTION

"This attribute indicates the barge-in state of this instance. The value 'true' indicates barge-in is enabled. The value 'false' indicates barge-in is disabled."

REFERENCE

"PacketCable DECT-HDV Specification"

DEFVAL { true }

::= { pktcDectBargeIn 1 }

pktcDectServiceStatus OBJECT IDENTIFIER ::= { pktcDectObjects 6 }

pktcDectServiceStatusDeactivationDisplay OBJECT-TYPE

SYNTAX SnmpAdminString

MAX-ACCESS read-write

STATUS current

DESCRIPTION

"This attribute indicates the configured text to display in the PP when the PacketCable Client service is disconnected."

REFERENCE

"PacketCable DECT-HDV Specification"

DEFVAL { "Service Deactivated" }

::= { pktcDectServiceStatus 1 }

pktcDectServiceStatusConnectivityDisplay OBJECT-TYPE

SYNTAX SnmpAdminString

MAX-ACCESS read-write

STATUS current

DESCRIPTION

"This attribute indicates the configured text to display in the PP when the PacketCable Client has no Network (Service) Connectivity."

REFERENCE

"PacketCable DECT-HDV Specification"

DEFVAL { "Network Unavailable" }

::= { pktcDectServiceStatus 2 }

pktcDectAnalogAlarmCfgTable OBJECT-TYPE

SYNTAX SEQUENCE OF PkctDectAnalogAlarmCfgEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"This object represents the configuration of an end point to support the Analog Alarm Configuration."

REFERENCE

"PacketCable DECT-HDV Specification."

::= {pktcDectObjects 7 }

pktcDectAnalogAlarmCfgEntry OBJECT-TYPE

SYNTAX PkctDectAnalogAlarmCfgEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"The Conceptual row of pktcDectAnalogAlarmCfgTable. When an endpoint instance is configured to enable the analog Alarm Configuration, the largest POTS MDI identifier (PkctMdiType = 'pots') in the endpoint takes the role of analog alarm port. Therefore, an endpoint is allowed to have only one POTS configured as an analog Alarm port.

End points not instantiated in this object have no analog Alarm configured (i.e., equivalent to

```

        analogAlarmCfg.State = 'none')."
INDEX {
    ifIndex
}
::= {pktcDectAnalogAlarmCfgTable 1 }

PktcDectAnalogAlarmCfgEntry ::= SEQUENCE {
    pktcDectAnalogAlarmCfgState
        INTEGER

}

pktcDectAnalogAlarmCfgState OBJECT-TYPE
SYNTAX      INTEGER {
                none(1),
                preemptive(2),
                simultaneousCalls(3)
            }
MAX-ACCESS  read-write
STATUS      current
DESCRIPTION
    "This attribute represents alarm configuration type
    assigned for this analog port. The possible values
    are:

    'none' indicates the end point has no analog alarm
    Configuration

    'preemptive' indicates the analog alarm is configured
    in a preemptive mode of operation.

    'SimultaneousCalls' indicates the PacketCable client can
    have a regular phone call and an alarm call simultaneously.

    This type of analog alarm configuration is not applicable
    to PacketCable clients that support NCS signaling
    (i.e., E-MTAs) and a set to this attribute with this value
    is rejected."
::= {pktcDectAnalogAlarmCfgEntry 1 }

pktcDectPPTable OBJECT-TYPE
SYNTAX      SEQUENCE OF PktcDectPPEntry
MAX-ACCESS  not-accessible
STATUS      current
DESCRIPTION
    "This object represents the list of PPs and related
    identifiers.
    For debugging purposes this object lists more PPs than
    the maximum number of PPs."
::= {pktcDectObjects 8 }

pktcDectPPEntry OBJECT-TYPE
SYNTAX      PktcDectPPEntry
MAX-ACCESS  not-accessible
STATUS      current
DESCRIPTION
    "The Conceptual row of pktcDectPPTable."
INDEX {
    pktcDectPPId
}
::= {pktcDectPPTable 1 }

PktcDectPPEntry ::= SEQUENCE {

```

```

    pktcDectPPId
        Unsigned32,
    pktcDectPPIPEI
        OCTET STRING,
    pktcDectPPTerminalID
        Unsigned32,
    pktcDectPPStatus
        PktcDectPPState,
    pktcDectPPRegCtrl
        INTEGER
}

pktcDectPPId OBJECT-TYPE
    SYNTAX      Unsigned32 (1..128)
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "This key represents the unique identifier of the PP.
        The Id of PPs already registered corresponds to the
        interface Index associated with the PP MDI.
        For PPs not registered the FP selects an Id outside
        the range of well-known Interface Index values
        defined for the device.

        The FP lists only PPs that have previously paired or
        attempted to pair within the FP during an FP initiated
        pairing process. This avoid first time PPs from
        neighbor areas to appear on a different subscriber FP."
    ::= {pktcDectPPEntry 1 }

pktcDectPPIPEI OBJECT-TYPE
    SYNTAX      OCTET STRING (SIZE(0..5))
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "This attribute represents the International Portable
        Equipment Identifier of the device. Other than
        residential/default handset identifiers are not
        required."
    ::= {pktcDectPPEntry 2 }

pktcDectPPTerminalID OBJECT-TYPE
    SYNTAX      Unsigned32 (1..128)
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "This attribute represents the Terminal Identifier the FP
        assigns to the PP. For simple operation the FP may maintain
        the same PP Terminal Identifier from the initial Locate
        during pairing across device initialization."
    ::= {pktcDectPPEntry 3 }

pktcDectPPStatus OBJECT-TYPE
    SYNTAX      PktcDectPPState
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "This attribute represents the state of a PP as seen by
        the FP based on last PP/FP interaction.

        The FP may report only the values 'idleLocked' and
        activeLocked' for registered PPs.
        Unregistered PPs are reported as 'unknown' or the latest

```


failure occurred such as 'easyPINFailed',
'easyPairingFailed'.

Note that in no-emission mode the FP may not accurately
report the PP state."

::= {pktcDectPPEntry 4 }

pktcDectPPRegCtrl OBJECT-TYPE

SYNTAX INTEGER {
register(1),
deregister(2),
remove(3)
}

MAX-ACCESS read-write

STATUS current

DESCRIPTION

"This attribute provides control of the PP registration
status.

The value 'deregister' directs the PP to initiate the
procedure to terminate PP access rights without deleting
the identity of the PP in this object (e.g., for
troubleshooting purposes).

The value 'register' initiates the registration process
either easy pairing or PIN registration depending on the
FP configuration (FP.PairingType). Subsequently,
the FP will register the PP for which the register
action was invoked. See the FP InitiateRegistration
to invoke the pairing of any PP.

The value 'remove' invokes the action to de-register the PP
(if so) and deletes the PP information of the FP."

::= {pktcDectPPEntry 5 }

pktcDectPPCapabilitiesTable OBJECT-TYPE

SYNTAX SEQUENCE OF PktcDectPPCapabilitiesEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"This object represents the PP reported capabilities."

::= {pktcDectObjects 9 }

pktcDectPPCapabilitiesEntry OBJECT-TYPE

SYNTAX PktcDectPPCapabilitiesEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"The Conceptual row of pktcDectPPCapabilitiesTable."

INDEX {

pktcDectPPId

}

::= {pktcDectPPCapabilitiesTable 1 }

PktcDectPPCapabilitiesEntry ::= SEQUENCE {

pktcDectPPCapabilitiesDisplay

INTEGER,

pktcDectPPCapabilitiesTone

INTEGER,

pktcDectPPCapabilitiesEcho

INTEGER,

pktcDectPPCapabilitiesAmbientNoiseRejection

```

        INTEGER,
pkctDectPPCapabilitiesAdaptiveVolumeCtrl
        INTEGER,
pkctDectPPCapabilitiesSlotType
        BITS,
pkctDectPPCapabilitiesStoredDisplayChars
        Unsigned32,
pkctDectPPCapabilitiesDisplayLines
        Unsigned32,
pkctDectPPCapabilitiesCharsPerDisplayLine
        Unsigned32,
pkctDectPPCapabilitiesScrollBehavior
        INTEGER,
pkctDectPPCapabilitiesProfile
        BITS
    }

pkctDectPPCapabilitiesDisplay    OBJECT-TYPE
SYNTAX      INTEGER {
                                na(0),
                                noDisplay(1),
                                numeric(2),
                                numericPlus(3),
                                alphanumeric(4),
                                fullDisplay(5)
                                }
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
    "This attribute represents the PP display capability.
    The possible values are:
    'na' : not applicable
    'noDisplay': no display
    'numeric': numeric characters (space, 0-9, *, #)
    'numericPlus': extended numeric characters
                  (space, 0-9, *, #, a, b, c, d)
    'alphanumeric': alphanumeric characters
                  (space, 0-9, *, #, a-z and A-Z)
    'fullDisplay' : displayable characters up to 0x7F."
 ::= {pkctDectPPCapabilitiesEntry 1 }

pkctDectPPCapabilitiesTone    OBJECT-TYPE
SYNTAX      INTEGER {
                                na(0),
                                notone(1),
                                dialTone(2),
                                e182(3),
                                dect(4)
                                }
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
    "This attribute represents the PP tone capability.
    The possible values are:
    'na': not applicable
    'notone': no tone capability supported
    'dialTone': dialtone supported
    'e182': ITU-T E.182 tones supported
    'dect': complete DECT tone set."
 ::= {pkctDectPPCapabilitiesEntry 2 }

pkctDectPPCapabilitiesEcho    OBJECT-TYPE
SYNTAX      INTEGER {

```

```

        na(0),
        minTCL(1),
        fullTCL(2),
        voip(3)
    }
MAX-ACCESS read-only
STATUS current
DESCRIPTION
    "This attribute represents the PP echo capability.
    The possible values are:
    'na': not applicable
    'minTCL': > 34 dB
    'fullTCL': > 46 dB
    'voip' : > 55 dB."
 ::= {pktcDectPPCapabilitiesEntry 3 }

pktcDectPPCapabilitiesAmbientNoiseRejection OBJECT-TYPE
SYNTAX INTEGER {
    na(0),
    noSupport(1),
    support(2)
}
MAX-ACCESS read-only
STATUS current
DESCRIPTION
    "This attribute represents the PP ambient noise rejection
    capability. The possible values are:
    'na': not applicable
    'noSupport': no noise rejection
    'support': noise rejection provided."
 ::= {pktcDectPPCapabilitiesEntry 4 }

pktcDectPPCapabilitiesAdaptiveVolumeCtrl OBJECT-TYPE
SYNTAX INTEGER {
    na(0),
    noSupported(1),
    used(2),
    disabled(3)
}
MAX-ACCESS read-only
STATUS current
DESCRIPTION
    "This attribute represents the PP adaptive volume
    control capability. The possible values are:
    'na': not applicable
    'noSupported': no adaptive volume control
    'used': supported and in use
    'disabled': supported not in use."
 ::= {pktcDectPPCapabilitiesEntry 5 }

pktcDectPPCapabilitiesSlotType OBJECT-TYPE
SYNTAX BITS {
    doubleSlot(3),
    fullSlot(4),
    halfSlot(7)
}
MAX-ACCESS read-only
STATUS current
DESCRIPTION
    "This attribute represents the PP slot type
    capabilities.
    A bit set to '1' indicates support of the
    slot type,

```

A bit set to '0' indicates not support of the slot type. Bits are numbered left to right (MSB = 0). The possible values are:
 'halfSlot': half slot, j = 0
 'fullSlot': full slot
 'doubleSlot': double slot"

```

  ::= {pktcDectPPCapabilitiesEntry 6 }

pktcDectPPCapabilitiesStoredDisplayChars    OBJECT-TYPE
    SYNTAX      Unsigned32 (0..16363)
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "This attribute represents the PP number of stored
        display characters."
    ::= {pktcDectPPCapabilitiesEntry 7 }

pktcDectPPCapabilitiesDisplayLines          OBJECT-TYPE
    SYNTAX      Unsigned32 (0..128)
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "This attribute represents the number of lines in the
        PP display."
    ::= {pktcDectPPCapabilitiesEntry 8 }

pktcDectPPCapabilitiesCharsPerDisplayLine   OBJECT-TYPE
    SYNTAX      Unsigned32 (0..128)
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "This attribute represents the PP number of characters
        per line in the display."
    ::= {pktcDectPPCapabilitiesEntry 9 }

pktcDectPPCapabilitiesScrollBehavior        OBJECT-TYPE
    SYNTAX      INTEGER {
        na(0),
        type1(1),
        type2(2)
    }
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "This attribute represents the PP scroll behavior
        capability. The possible values are:
        'na': not applicable, specified
        'type1': type 1
        'type2': type 2."
    ::= {pktcDectPPCapabilitiesEntry 10 }

pktcDectPPCapabilitiesProfile              OBJECT-TYPE
    SYNTAX      BITS {
        gapSupport(5),
        zeroEmissionSupport(41),
        multipleLines(50),
        parallelCall(51),
        callIdentification(52),
        wideband(53),
        part3(54)
    }
    MAX-ACCESS  read-only
    STATUS      current

```

DESCRIPTION

"This attribute represents the PP profile feature capabilities.
 A bit set to '1' indicates support of the specific profile feature, a bit set to '0' indicates not support of the profile feature. Bits are numbered left to right (MSB = 0).
 The possible values are (only the most relevant are shown):
 'gapSupport': GAP profile support
 'zeroEmission': Zero Emission support
 'multipleLines': multiple lines
 'parallelCall': Common parallel call procedures
 'callIdentification': Call Identification support
 'wideband': Wideband support
 'part3' : Extended wideband speech services support"

::= {pktcDectPPCapabilitiesEntry 11 }

pktcDectListAccessTable OBJECT-TYPE

SYNTAX SEQUENCE OF PktcDectListAccessEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"This object represents the list of lists stored in the FP."

::= {pktcDectObjects 10 }

pktcDectListAccessEntry OBJECT-TYPE

SYNTAX PktcDectListAccessEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"The Conceptual row of pktcDectListAccessTable."

INDEX {
 pktcDectListAccessIndex
 }

::= {pktcDectListAccessTable 1 }

PktcDectListAccessEntry ::= SEQUENCE {

 pktcDectListAccessIndex
 Unsigned32,
 pktcDectListAccesslistID
 Unsigned32,
 pktcDectListAccessDescr
 SnmpAdminString
 }

pktcDectListAccessIndex OBJECT-TYPE

SYNTAX Unsigned32 (1..128)

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"This Key represents the unique identifier of the list element."

::= {pktcDectListAccessEntry 1 }

pktcDectListAccesslistID OBJECT-TYPE

SYNTAX Unsigned32 (1..128)

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"This attribute defines the ID of the supported list."

::= {pktcDectListAccessEntry 2 }

pktcDectListAccessDescr OBJECT-TYPE

SYNTAX SnmpAdminString

```

MAX-ACCESS    read-only
STATUS        current
DESCRIPTION
    "This attribute represents the name of the list.
    For standard list this corresponds to the exact name as the
    list is referred in the specification.
    Vendor specific list may include name and references to
    documentation (e.g., URNs)."
```

::= {pktcDectListAccessEntry 3 }

```

pktcDectInternalNamesListTable OBJECT-TYPE
SYNTAX        SEQUENCE OF PktcDectInternalNamesListEntry
MAX-ACCESS    not-accessible
STATUS        current
DESCRIPTION
    "This object represents the list of registered PPs"
 ::= {pktcDectObjects 11 }
```

```

pktcDectInternalNamesListEntry OBJECT-TYPE
SYNTAX        PktcDectInternalNamesListEntry
MAX-ACCESS    not-accessible
STATUS        current
DESCRIPTION
    "The Conceptual row of pktcDectInternalNamesListTable."
INDEX {
    pktcDectInternalNamesListIndex
}
 ::= {pktcDectInternalNamesListTable 1 }
```

```

PktcDectInternalNamesListEntry ::= SEQUENCE {
    pktcDectInternalNamesListIndex
        Unsigned32,
    pktcDectInternalNamesListNumber
        Unsigned32,
    pktcDectInternalNamesListName
        SnmpAdminString
}
```

```

pktcDectInternalNamesListIndex OBJECT-TYPE
SYNTAX        Unsigned32 (1..32767)
MAX-ACCESS    not-accessible
STATUS        current
DESCRIPTION
    "This Key represents the unique identifier of the list element."
 ::= {pktcDectInternalNamesListEntry 1 }
```

```

pktcDectInternalNamesListNumber OBJECT-TYPE
SYNTAX        Unsigned32 (1..32767)
MAX-ACCESS    read-only
STATUS        current
DESCRIPTION
    "This attribute indicates the terminal identity number."
 ::= {pktcDectInternalNamesListEntry 2 }
```

```

pktcDectInternalNamesListName OBJECT-TYPE
SYNTAX        SnmpAdminString
MAX-ACCESS    read-only
STATUS        current
DESCRIPTION
    "This attribute indicates the name of the internal party."
 ::= {pktcDectInternalNamesListEntry 3 }
```

```

pktcDectLineSettingsListTable OBJECT-TYPE
```

SYNTAX SEQUENCE OF PktcDectLineSettingsListEntry
 MAX-ACCESS not-accessible
 STATUS current
 DESCRIPTION
 "This object represents Information pertaining to the list.
 Operator settings to this line are performed via the NSL object.
 Primarily association of PPs to the phone line.
 A PacketCable device allows the user to modify any line
 parameter via PP access list commands with the exception of the
 'Dialing Prefix' field."

::= {pktcDectObjects 12 }

pktcDectLineSettingsListEntry OBJECT-TYPE
 SYNTAX PktcDectLineSettingsListEntry
 MAX-ACCESS not-accessible
 STATUS current
 DESCRIPTION
 "The Conceptual row of pktcDectLineSettingsListTable."
 INDEX {
 pktcDectLineSettingsListIndex
 }
 ::= {pktcDectLineSettingsListTable 1 }

PktcDectLineSettingsListEntry ::= SEQUENCE {
 pktcDectLineSettingsListIndex
 Unsigned32,
 pktcDectLineSettingsListLineId
 Unsigned32,
 pktcDectLineSettingsListLineName
 SnmpAdminString,
 pktcDectLineSettingsListAttachedHandsets
 SnmpAdminString,
 pktcDectLineSettingsListDialingPrefix
 SnmpAdminString,
 pktcDectLineSettingsListFPMelody
 Unsigned32,
 pktcDectLineSettingsListFPVolume
 Unsigned32,
 pktcDectLineSettingsListBlockedNB
 TruthValue,
 pktcDectLineSettingsListMultipleCalls
 TruthValue,
 pktcDectLineSettingsListIntrusionCall
 TruthValue
 }

pktcDectLineSettingsListIndex OBJECT-TYPE
 SYNTAX Unsigned32 (1..127)
 MAX-ACCESS not-accessible
 STATUS current
 DESCRIPTION
 "This Key represents the unique identifier of the list
 element."
 ::= {pktcDectLineSettingsListEntry 1 }

pktcDectLineSettingsListLineId OBJECT-TYPE
 SYNTAX Unsigned32 (1..127)
 MAX-ACCESS read-only
 STATUS current
 DESCRIPTION
 "This attribute represents the line identifier."
 ::= {pktcDectLineSettingsListEntry 2 }

```

pkctcDectLineSettingsListLineName      OBJECT-TYPE
    SYNTAX      SnmpAdminString
    MAX-ACCESS   read-only
    STATUS       current
    DESCRIPTION
        "This attribute represents the name of the line."
    ::= {pkctcDectLineSettingsListEntry 3 }

pkctcDectLineSettingsListAttachedHandsets  OBJECT-TYPE
    SYNTAX      SnmpAdminString
    MAX-ACCESS   read-only
    STATUS       current
    DESCRIPTION
        "This attribute represents the list of registered handsets
        which are attached to the line.
        This attribute is formatted as a string where each octet
        represents the 'Terminal Identifier' of the handset.
        Note that the over the air 'Line settings list' defines
        the 'Attached handsets' as a sequence of bits, each
        representing a 'Terminal Id' handset."
    ::= {pkctcDectLineSettingsListEntry 4 }

pkctcDectLineSettingsListDialingPrefix      OBJECT-TYPE
    SYNTAX      SnmpAdminString
    MAX-ACCESS   read-only
    STATUS       current
    DESCRIPTION
        "This attribute represents a prefix to add to called
        party numbers for calls placed on the line."
    ::= {pkctcDectLineSettingsListEntry 5 }

pkctcDectLineSettingsListFPMelody      OBJECT-TYPE
    SYNTAX      Unsigned32 (0..128)
    MAX-ACCESS   read-only
    STATUS       current
    DESCRIPTION
        "This attribute represents the melody of the FP linked to
        this line."
    ::= {pkctcDectLineSettingsListEntry 6 }

pkctcDectLineSettingsListFPVolume      OBJECT-TYPE
    SYNTAX      Unsigned32 (0..128)
    MAX-ACCESS   read-only
    STATUS       current
    DESCRIPTION
        "This attribute represents the melody volume of the FP
        linked to this line."
    ::= {pkctcDectLineSettingsListEntry 7 }

pkctcDectLineSettingsListBlockedNB      OBJECT-TYPE
    SYNTAX      TruthValue
    MAX-ACCESS   read-only
    STATUS       current
    DESCRIPTION
        "This attribute represents forbidden called party numbers
        on the line."
    ::= {pkctcDectLineSettingsListEntry 8 }

pkctcDectLineSettingsListMultipleCalls      OBJECT-TYPE
    SYNTAX      TruthValue
    MAX-ACCESS   read-only
    STATUS       current

```


DESCRIPTION

"This attribute represents the current mode of the line:
 The value 'true' indicates support for multiple call mode
 The value 'false' indicates support for single call mode.
 For PacketCable Client devices supporting only single call
 mode this value always use the value 'false'."

::= {pktcDectLineSettingsListEntry 9 }

pktcDectLineSettingsListIntrusionCall OBJECT-TYPE

SYNTAX TruthValue

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"This attribute represents the call intrusion mode for
 the line.
 The value 'true' indicates the line has 'call intrusion'
 is enabled. Otherwise the value 'false' is reported.

The PacketCable Client device should always use the
 configured BargeIn.Enabled attribute value as the highest
 possible value. It means if BargeIn.Enabled is set to 'false',
 the user can't modify the call intrusion to 'true' via list
 access commands. In the contrary, if BargeIn.Enabled is set to
 'true' the user could set this attribute to 'false' via 'line
 settings list' commands."

::= {pktcDectLineSettingsListEntry 10 }

pktcDectPerformanceTable OBJECT-TYPE

SYNTAX SEQUENCE OF PkctcDectPerformanceEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"This object represents the performance statistics of each PP.
 When Zero Emission is enabled this object store statistics on
 a per call basis.
 When Zero Emission is disabled, this object may contains a
 single instance per PP (Terminal ID)
 referent to all the messages activity in the upstream direction
 (PP to FP) or maintain per call statistics."

::= {pktcDectObjects 13 }

pktcDectPerformanceEntry OBJECT-TYPE

SYNTAX PkctcDectPerformanceEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"The Conceptual row of pktcDectPerformanceTable."

INDEX {
 ifIndex
 }

::= {pktcDectPerformanceTable 1 }

PkctcDectPerformanceEntry ::= SEQUENCE {

 pktcDectPerformanceRecordNum

 Unsigned32,

 pktcDectPerformanceHandovers

 Counter32,

 pktcDectPerformanceRTDelay

 Unsigned32,

 pktcDectPerformanceSyncFailures

 Counter32,

 pktcDectPerformanceControlFieldErrs

 Counter32,

```

    pktcDectPerformancePayloadErrs
        Counter32,
    pktcDectPerformanceSlidingCollisions
        Counter32,
    pktcDectPerformanceLinkErrsQbit
        Counter32
    }

pktcDectPerformanceRecordNum    OBJECT-TYPE
    SYNTAX      Unsigned32
    MAX-ACCESS   read-only
    STATUS      current
    DESCRIPTION
        "This key represents the identifier of the logged
        statistics of a previous call. When Zero Emission is enabled
        the FP maintains an incrementing log information and
        deletes the oldest log instance when reaching the maximum
        number of entries.
        When Zero Emission is disabled this object creates a single
        instance with RecordNum = 0 and collects continuously the
        data associated with the object attributes."
    ::= {pktcDectPerformanceEntry 1 }

pktcDectPerformanceHandovers    OBJECT-TYPE
    SYNTAX      Counter32
    MAX-ACCESS   read-only
    STATUS      current
    DESCRIPTION
        "This attribute indicates how many channel handovers the PP
        has realized since the first activity related to this
        logged call."
    ::= {pktcDectPerformanceEntry 2 }

pktcDectPerformanceRTDelay      OBJECT-TYPE
    SYNTAX      Unsigned32
    MAX-ACCESS   read-only
    STATUS      current
    DESCRIPTION
        "This attribute indicates the round trip delay calculated
        by the FP.
        The FP measures the RoundTrip Delay at the beginning of
        the call."
    ::= {pktcDectPerformanceEntry 3 }

pktcDectPerformanceSyncFailures OBJECT-TYPE
    SYNTAX      Counter32
    MAX-ACCESS   read-only
    STATUS      current
    DESCRIPTION
        "This attribute indicates the number of synchronization
        failures that have occurred during the current call."
    ::= {pktcDectPerformanceEntry 4 }

pktcDectPerformanceControlFieldErrs OBJECT-TYPE
    SYNTAX      Counter32
    MAX-ACCESS   read-only
    STATUS      current
    DESCRIPTION
        "This attribute indicates the number of Control field errors
        encountered during this time period"
    ::= {pktcDectPerformanceEntry 5 }

pktcDectPerformancePayloadErrs    OBJECT-TYPE

```

```

SYNTAX      Counter32
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
    "This attribute indicates the number of CRC errors
    accumulated during this period of time."
 ::= {pktcDectPerformanceEntry 6 }

```

```

pktcDectPerformanceSlidingCollisions OBJECT-TYPE
    SYNTAX      Counter32
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "This attribute indicates the number of sliding collisions
        detected during this period of time."
    ::= {pktcDectPerformanceEntry 7 }

```

```

pktcDectPerformanceLinkErrsQbit OBJECT-TYPE
    SYNTAX      Counter32
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "this attribute indicates the number of link errors being
        signaled with the Q-bit during this period of time."
    ::= {pktcDectPerformanceEntry 8 }

```

```

pktcDectStatusTable OBJECT-TYPE
    SYNTAX      SEQUENCE OF PkctDectStatusEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "This object represents the PP status and related
        connectivity information"
    ::= {pktcDectObjects 14 }

```

```

pktcDectStatusEntry OBJECT-TYPE
    SYNTAX      PkctDectStatusEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "The Conceptual row of pktcDectStatusTable."
    INDEX {
        ifIndex
    }
    ::= {pktcDectStatusTable 1 }

```

```

PkctDectStatusEntry ::= SEQUENCE {
    pktcDectStatusLastLocate
        DateAndTime,
    pktcDectStatusNumLocateMsgs
        Counter32,
    pktcDectStatusNumConnectionFailures
        Counter32,
    pktcDectStatusNumActivitySuccess
        Counter32,
    pktcDectStatusLastActivityFailure
        DateAndTime,
    pktcDectStatusRSSI
        Unsigned32
}

```

```

pktcDectStatusLastLocate OBJECT-TYPE
    SYNTAX      DateAndTime

```

```

MAX-ACCESS read-only
STATUS current
DESCRIPTION
    "This attribute represents the time when the last Locate
    message was sent by the PP to the FP."
 ::= {pktcDectStatusEntry 1 }

pktcDectStatusNumLocateMsgs OBJECT-TYPE
    SYNTAX Counter32
    MAX-ACCESS read-only
    STATUS current
    DESCRIPTION
        "This attribute represents the number of times the PP
        has subscribed since last FP reboot."
    ::= {pktcDectStatusEntry 2 }

pktcDectStatusNumConnectionFailures OBJECT-TYPE
    SYNTAX Counter32
    MAX-ACCESS read-only
    STATUS current
    DESCRIPTION
        "This attribute represents the number of times the PP
        has failed connections with the FP since last FP
        reinitialization."
    ::= {pktcDectStatusEntry 3 }

pktcDectStatusNumActivitySuccess OBJECT-TYPE
    SYNTAX Counter32
    MAX-ACCESS read-only
    STATUS current
    DESCRIPTION
        "This attribute indicates the number of times the PP
        has initiated any activity successfully since
        last time the FP reinitializes."
    ::= {pktcDectStatusEntry 4 }

pktcDectStatusLastActivityFailure OBJECT-TYPE
    SYNTAX DateAndTime
    MAX-ACCESS read-only
    STATUS current
    DESCRIPTION
        "This attribute indicates the time where the last PP
        initiated activity and being rejected by the FP."
    ::= {pktcDectStatusEntry 5 }

pktcDectStatusRSSI OBJECT-TYPE
    SYNTAX Unsigned32
    MAX-ACCESS read-only
    STATUS current
    DESCRIPTION
        "This attribute represents the instantaneous
        Received Signal Strength from the PP."
    ::= {pktcDectStatusEntry 6 }

-- Conformance Definitions
pktcDectMibConformance OBJECT IDENTIFIER ::= { pktcDectMib 2 }
pktcDectMibCompliances OBJECT IDENTIFIER ::= { pktcDectMibConformance 1 }
pktcDectMibGroups OBJECT IDENTIFIER ::= { pktcDectMibConformance 2 }

pktcDectCompliance MODULE-COMPLIANCE
    STATUS current
    DESCRIPTION

```

```

        "The compliance statement for the HD Voice PacketCable
        Client device."
MODULE -- this MODULE
MANDATORY-GROUPS {
    pktcDectGroup
}
::= { pktcDectMibCompliances 1 }

pktcDectGroup OBJECT-GROUP
OBJECTS {
    pktcDectFPMaxNumPP,
    pktcDectFPMaxActivePP,
    pktcDectFPLOCKListCfg,
    pktcDectFPZeroEmissionEnabled,
    pktcDectFPPairingType,
    pktcDectFPPairingActivate,
    pktcDectFPName,
    pktcDectFPGeneralCapabilities,
    pktcDectFPExtendedCapabilities,
    pktcDectHDVoiceProfileBasicService,
    pktcDectHDVoiceProfileNCS,
    pktcDectHDVoiceProfileSIP,
    pktcDectCodecPrefList,
    pktcDectDTMFToneDuration,
    pktcDectBargeInEnabled,
    pktcDectServiceStatusDeactivationDisplay,
    pktcDectServiceStatusConnectivityDisplay,
    pktcDectAnalogAlarmCfgState,
    pktcDectListAccesslistID,
    pktcDectListAccessDescr,
    pktcDectInternalNamesListNumber,
    pktcDectInternalNamesListName,
    pktcDectLineSettingsListLineId,
    pktcDectLineSettingsListLineName,
    pktcDectLineSettingsListAttachedHandsets,
    pktcDectLineSettingsListDialingPrefix,
    pktcDectLineSettingsListFPMelody,
    pktcDectLineSettingsListFPVolume,
    pktcDectLineSettingsListBlockedNB,
    pktcDectLineSettingsListMultipleCalls,
    pktcDectLineSettingsListIntrusionCall,
    pktcDectPerformanceRecordNum,
    pktcDectPerformanceHandovers,
    pktcDectPerformanceRTDelay,
    pktcDectPerformanceSyncFailures,
    pktcDectPerformanceControlFieldErrs,
    pktcDectPerformancePayloadErrs,
    pktcDectPerformanceSlidingCollisions,
    pktcDectPerformanceLinkErrsQbit,
    pktcDectStatusLastLocate,
    pktcDectStatusNumLocateMsgs,
    pktcDectStatusNumConnectionFailures,
    pktcDectStatusNumActivitySuccess,
    pktcDectStatusLastActivityFailure,
    pktcDectStatusRSSI,
    pktcDectPPIPEI,
    pktcDectPPTerminalID,
    pktcDectPPStatus,
    pktcDectPPRegCtrl,
    pktcDectPPCapabilitiesDisplay,
    pktcDectPPCapabilitiesTone,
    pktcDectPPCapabilitiesEcho,
    pktcDectPPCapabilitiesAmbientNoiseRejection,

```

```

        pktcDectPPCapabilitiesAdaptiveVolumeCtrl,
        pktcDectPPCapabilitiesSlotType,
        pktcDectPPCapabilitiesStoredDisplayChars,
        pktcDectPPCapabilitiesDisplayLines,
        pktcDectPPCapabilitiesCharsPerDisplayLine,
        pktcDectPPCapabilitiesScrollBehavior,
        pktcDectPPCapabilitiesProfile
    }
    STATUS          current
    DESCRIPTION
        "Group of objects implemented in the HD Voice PacketCable
        Client device."
    ::= { pktcDectMibGroups 1 }
END

B.3.2 DECT-NCS SNMP MIB MODULE
There are no SNMP MIB Modules specified for [HDV-NCS].
B.3.3 DECT-SIP SNMP MIB MODULE

PKTC-DECT-SIP-MIB DEFINITIONS ::= BEGIN
IMPORTS
    MODULE-IDENTITY,
    OBJECT-TYPE
        FROM SNMPv2-SMI
    OBJECT-GROUP,
    MODULE-COMPLIANCE
        FROM SNMPv2-CONF
    SnmpAdminString
        FROM SNMP-FRAMEWORK-MIB
    pktcApplicationMibs
        FROM CLAB-DEF-MIB;

pktcDectSipMib MODULE-IDENTITY
    LAST-UPDATED "200902260000Z" -- February 26, 2009
    ORGANIZATION "Cable Television Laboratories, Inc."
    CONTACT-INFO
        "Broadband Network Services
        Cable Television Laboratories, Inc.
        858 Coal Creek Circle,
        Louisville, CO 80027, USA
        Phone: +1 303-661-9100
        Email: mibs@cablelabs.com

        Acknowledgements:
        Thomas Clack, Broadcom
        Eugene Nechamkin, Broadcom
        Josh Littlefield, Cisco
        Jerry Mahler, Motorola
        Eduardo Cardona, CableLabs"
    DESCRIPTION
        "This MIB module contains the PacketCable client
        HD Voice SIP integration management requirements."
    REVISION "200902260000Z" -- February 26, 2009
    DESCRIPTION
        "Initial version, published as part of the CableLabs
        DECT Provisioning Specification PKT-SP-DECT-PROV-I01-090226
        Copyright 2009 Cable Television Laboratories, Inc.
        All rights reserved."
    ::= { pktcApplicationMibs 5 }

-- Textual Conventions

-- Object Definitions

```

```
pktcDectSipNotifications OBJECT IDENTIFIER ::= { pktcDectSipMib 0 }
pktcDectSipObjects        OBJECT IDENTIFIER ::= { pktcDectSipMib 1 }
pktcDectSipCFVDis         OBJECT IDENTIFIER ::= { pktcDectSipObjects 1 }

pktcDectSipCFVDisNewFwdCalls OBJECT-TYPE
    SYNTAX      SnmpAdminString
    MAX-ACCESS  read-write
    STATUS      current
    DESCRIPTION
        "This attribute represents the text to be displayed by the
        PacketCable client PPs when new calls are forwarded based
        on the CFV feature."
    REFERENCE
        "PacketCable DECT-SIP Specification"
    DEFVAL      { "" }
    ::= { pktcDectSipCFVDis 1 }

pktcDectSipCFVDisActStat OBJECT-TYPE
    SYNTAX      SnmpAdminString
    MAX-ACCESS  read-write
    STATUS      current
    DESCRIPTION
        "This attribute represents the text to be displayed by the
        PacketCable client PPs going off-hook when the CFV feature
        is active."
    REFERENCE
        "PacketCable DECT-SIP Specification"
    DEFVAL      { "" }
    ::= { pktcDectSipCFVDis 2 }

pktcDectSipSCFDis OBJECT IDENTIFIER ::= { pktcDectSipObjects 2 }

pktcDectSipSCFDisNewFwdCalls OBJECT-TYPE
    SYNTAX      SnmpAdminString
    MAX-ACCESS  read-write
    STATUS      current
    DESCRIPTION
        "This attribute represents the text to be displayed by the
        PacketCable client PPs when new calls are forwarded based
        on the CFV feature."
    REFERENCE
        "PacketCable DECT-SIP Specification"
    DEFVAL      { "" }
    ::= { pktcDectSipSCFDis 1 }

pktcDectSipDNDDis OBJECT IDENTIFIER ::= { pktcDectSipObjects 3 }

pktcDectSipDNDDisActStat OBJECT-TYPE
    SYNTAX      SnmpAdminString
    MAX-ACCESS  read-write
    STATUS      current
    DESCRIPTION
        "This attribute represents the text to be displayed by the
        PacketCable client PPs going off-hook when the DND feature
        is active."
    REFERENCE
        "PacketCable DECT-SIP Specification"
    DEFVAL      { "" }
    ::= { pktcDectSipDNDDis 1 }

-- Conformance Definitions
pktcDectSipMibConformance OBJECT IDENTIFIER ::= { pktcDectSipMib 2 }
pktcDectSipMibCompliances OBJECT IDENTIFIER ::= { pktcDectSipMibConformance 1 }
```

```
pktcDectSipMibGroups      OBJECT IDENTIFIER ::= { pktcDectSipMibConformance 2 }
```

```
pktcDectSipCompliance MODULE-COMPLIANCE
```

```
    STATUS      current
```

```
    DESCRIPTION
```

```
        "The compliance statement for the SIP requirements of
        the HD Voice PacketCable client device."
```

```
    MODULE -- this MODULE
```

```
    MANDATORY-GROUPS {
```

```
        pktcDectSipGroup
```

```
    }
```

```
    ::= { pktcDectSipMibCompliances 1 }
```

```
pktcDectSipGroup OBJECT-GROUP
```

```
    OBJECTS {
```

```
        pktcDectSipCFVDisNewFwdCalls,
```

```
        pktcDectSipCFVDisActStat,
```

```
        pktcDectSipSCFDisNewFwdCalls,
```

```
        pktcDectSipDNDDisActStat
```

```
    }
```

```
    STATUS      current
```

```
    DESCRIPTION
```

```
        "Group of objects for SIP DECT extensions."
```

```
    ::= { pktcDectSipMibGroups 1 }
```

B.3.2 ENDDect-NCS SNMP MIB MODULE

There are no SNMP MIB Modules specified for [HDV-NCS].

B.3.3 DECT-SIP SNMP MIB MODULE

```
PKTC-DECT-SIP-MIB DEFINITIONS ::= BEGIN
```

```
IMPORTS
```

```
    MODULE-IDENTITY,
```

```
    OBJECT-TYPE
```

```
        FROM SNMPv2-SMI
```

```
    OBJECT-GROUP,
```

```
    MODULE-COMPLIANCE
```

```
        FROM SNMPv2-CONF
```

```
    SnmpAdminString
```

```
        FROM SNMP-FRAMEWORK-MIB
```

```
    pktcApplicationMibs
```

```
        FROM CLAB-DEF-MIB;
```

```
pktcDectSipMib MODULE-IDENTITY
```

```
    LAST-UPDATED "200902260000Z" -- February 26, 2009
```

```
    ORGANIZATION "Cable Television Laboratories, Inc."
```

```
    CONTACT-INFO
```

```
        "Broadband Network Services
        Cable Television Laboratories, Inc.
        858 Coal Creek Circle,
        Louisville, CO 80027, USA
        Phone: +1 303-661-9100
        Email: mibs@cablelabs.com"
```

```
    Acknowledgements:
```

```
        Thomas Clack, Broadcom
```

```
        Eugene Nechamkin, Broadcom
```

```
        Josh Littlefield, Cisco
```

```
        Jerry Mahler, Motorola
```

```
        Eduardo Cardona, CableLabs"
```

```
    DESCRIPTION
```

```
        "This MIB module contains the PacketCable client
```



```
        HD Voice SIP integration management requirements."
REVISION "200902260000Z" -- February 26, 2009
DESCRIPTION
    "Initial version, published as part of the CableLabs
    DECT Provisioning Specification PKT-SP-DECT-PROV-I01-090226
    Copyright 2009 Cable Television Laboratories, Inc.
    All rights reserved."
 ::= { pktcApplicationMibs 5 }

-- Textual Conventions

-- Object Definitions
pktcDectSipNotifications OBJECT IDENTIFIER ::= { pktcDectSipMib 0 }
pktcDectSipObjects       OBJECT IDENTIFIER ::= { pktcDectSipMib 1 }
pktcDectSipCFVDis        OBJECT IDENTIFIER ::= { pktcDectSipObjects 1 }

pktcDectSipCFVDisNewFwdCalls OBJECT-TYPE
    SYNTAX      SnmpAdminString
    MAX-ACCESS   read-write
    STATUS       current
    DESCRIPTION
        "This attribute represents the text to be displayed by the
        PacketCable client PPs when new calls are forwarded based
        on the CFV feature."
    REFERENCE
        "PacketCable DECT-SIP Specification"
    DEFVAL      { "" }
    ::= { pktcDectSipCFVDis 1 }

pktcDectSipCFVDisActStat OBJECT-TYPE
    SYNTAX      SnmpAdminString
    MAX-ACCESS   read-write
    STATUS       current
    DESCRIPTION
        "This attribute represents the text to be displayed by the
        PacketCable client PPs going off-hook when the CFV feature
        is active."
    REFERENCE
        "PacketCable DECT-SIP Specification"
    DEFVAL      { "" }
    ::= { pktcDectSipCFVDis 2 }

pktcDectSipSCFDis OBJECT IDENTIFIER ::= { pktcDectSipObjects 2 }

pktcDectSipSCFDisNewFwdCalls OBJECT-TYPE
    SYNTAX      SnmpAdminString
    MAX-ACCESS   read-write
    STATUS       current
    DESCRIPTION
        "This attribute represents the text to be displayed by the
        PacketCable client PPs when new calls are forwarded based
        on the CFV feature."
    REFERENCE
        "PacketCable DECT-SIP Specification"
    DEFVAL      { "" }
    ::= { pktcDectSipSCFDis 1 }

pktcDectSipDNDDis OBJECT IDENTIFIER ::= { pktcDectSipObjects 3 }

pktcDectSipDNDDisActStat OBJECT-TYPE
    SYNTAX      SnmpAdminString
    MAX-ACCESS   read-write
    STATUS       current
```

```

DESCRIPTION
    "This attribute represents the text to be displayed by the
    PacketCable client PPs going off-hook when the DND feature
    is active."
REFERENCE
    "PacketCable DECT-SIP Specification"
DEFVAL    { "" }
::= { pktcDectSipDNDDis 1 }

-- Conformance Definitions
pktcDectSipMibConformance OBJECT IDENTIFIER ::= { pktcDectSipMib 2 }
pktcDectSipMibCompliances OBJECT IDENTIFIER ::= { pktcDectSipMibConformance 1 }
pktcDectSipMibGroups      OBJECT IDENTIFIER ::= { pktcDectSipMibConformance 2 }

pktcDectSipCompliance MODULE-COMPLIANCE
    STATUS      current
    DESCRIPTION
        "The compliance statement for the SIP requirements of
        the HD Voice PacketCable client device."
    MODULE -- this MODULE
    MANDATORY-GROUPS {
        pktcDectSipGroup
    }
    ::= { pktcDectSipMibCompliances 1 }

pktcDectSipGroup OBJECT-GROUP
    OBJECTS {
        pktcDectSipCFVDisNewFwdCalls,
        pktcDectSipCFVDisActStat,
        pktcDectSipSCFDisNewFwdCalls,
        pktcDectSipDNDDisActStat
    }
    STATUS      current
    DESCRIPTION
        "Group of objects for SIP DECT extensions."
    ::= { pktcDectSipMibGroups 1 }
END

```

B.4 DECT OMA Management Objects (MO)

B.4.1 DECT High Level MO

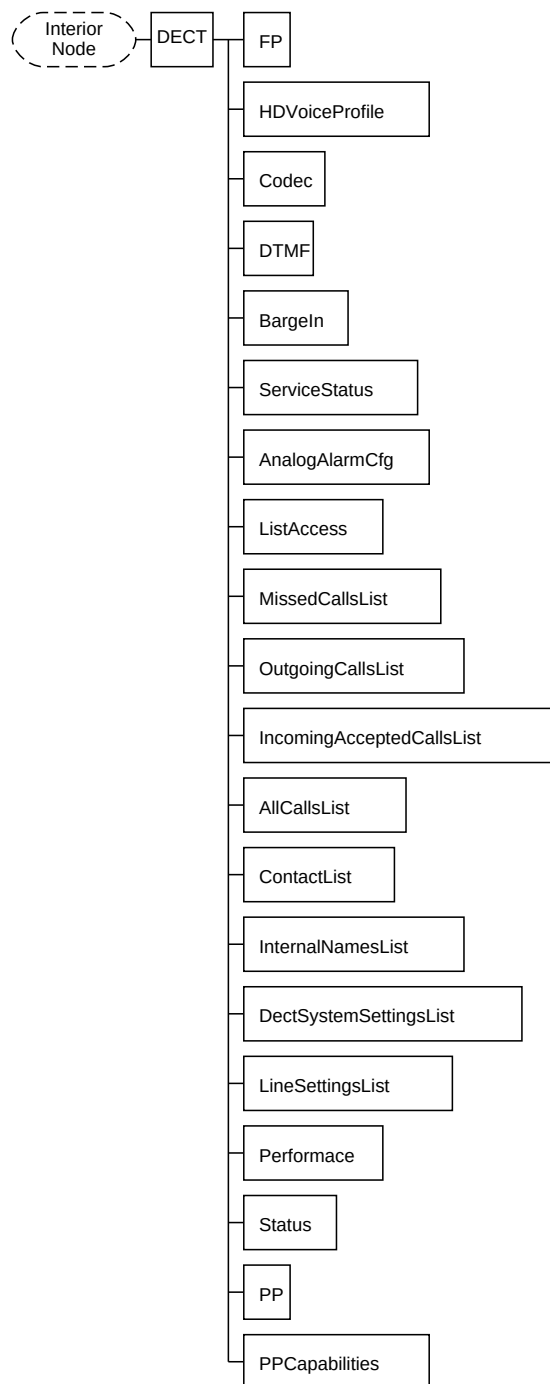


Figure 10 - DECT High Level OMA Management

B.4.2 DECT Nodes

B.4.2.1 DECT FP Node MO tree

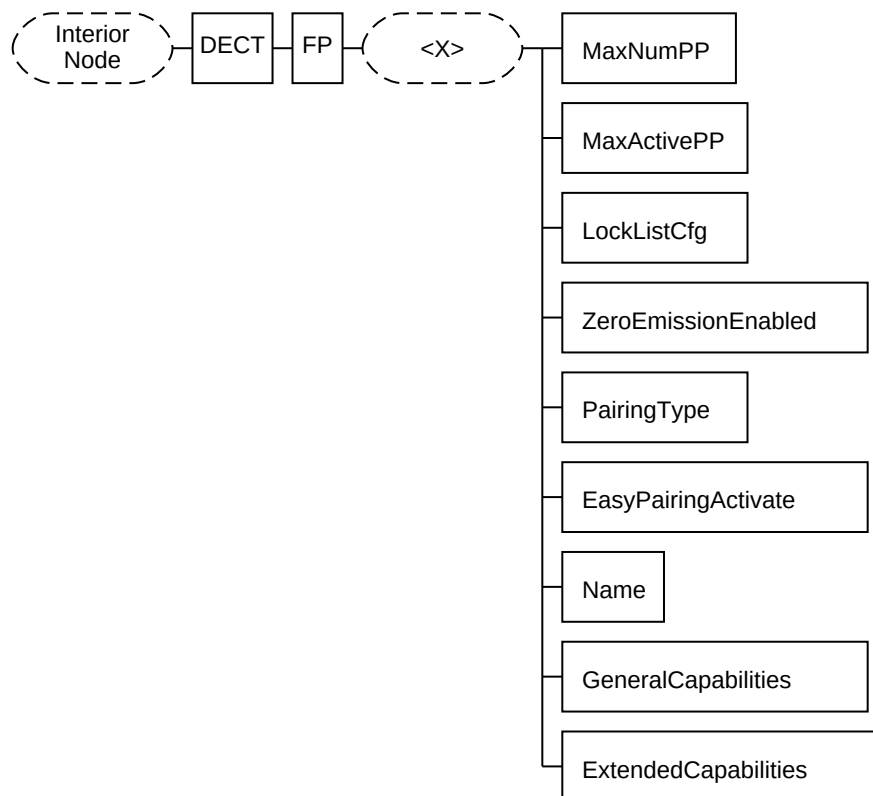
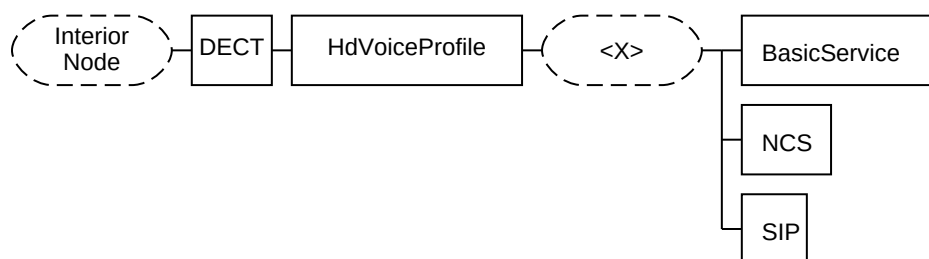


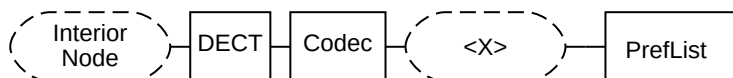
Figure 11 - Node FP of DECT OMA Management

B.4.2.2 DECT FP MO Node Description

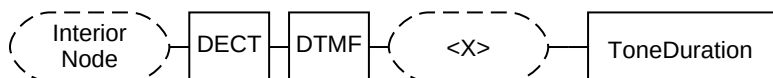
MO Element	Status	Occurrence	Format	Access Type
./DECT/FP	current	One	Node	Get
./DECT/FP<X>	current	OneOrMore	Node	Get
./DECT/MaxNumPP/<X>/MaxNumPP	current	OneOrZero	int	Get
./DECT/MaxActivePP/<X>/MaxActivePP	current	OneOrZero	int	Get, Replace
./DECT/LockListCfg/<X>/LockListCfg	current	OneOrZero	bin	Get
./DECT/ZeroEmissionEnabled/<X>/ZeroEmissionEnabled	current	OneOrZero	bool	Get
./DECT/PairingType/<X>/PairingType	current	OneOrZero	chr	Get, Replace
./DECT/PairingActivate/<X>/PairingActivate	current	OneOrZero	bool	Get
./DECT/Name/<X>/Name	current	OneOrZero	chr	Get, Replace
./DECT/GeneralCapabilities/<X>/GeneralCapabilities	current	OneOrZero	bin	Get
./DECT/ExtendedCapabilities/<X>/ExtendedCapabilities	current	OneOrZero	bin	Get

B.4.2.3 DECT HdVoiceProfile Node MO tree**Figure 12 - Node HDVoiceProfile of DECT OMA Management****B.4.2.4 DECT HdVoiceProfile MO Node Description**

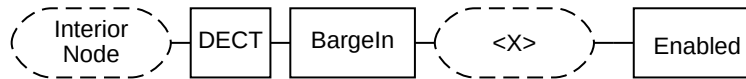
MO Element	Status	Occurrence	Format	Access Type
./DECT/HDVoiceProfile	current	One	Node	Get
./DECT/HDVoiceProfile<X>	current	OneOrMore	Node	Get
./DECT/BasicService/<X>/BasicService	current	OneOrZero	chr	Get
./DECT/NCS/<X>/NCS	current	OneOrZero	chr	Get
./DECT/SIP/<X>/SIP	current	OneOrZero	chr	Get

B.4.2.5 DECT Codec Node MO tree**Figure 13 - Node Codec of DECT OMA Management****B.4.2.6 DECT Codec MO Node Description**

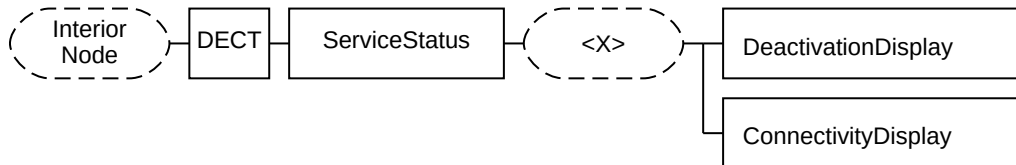
MO Element	Status	Occurrence	Format	Access Type
./DECT/Codec	current	One	Node	Get
./DECT/Codec<X>	current	OneOrMore	Node	Get
./DECT/PrefList/<X>/PrefList	current	OneOrZero	chr	Get, Replace

B.4.2.7 DECT DTMF Node MO tree**Figure 14 - Node DTMF of DECT OMA Management****B.4.2.8 DECT DTMF MO Node Description**

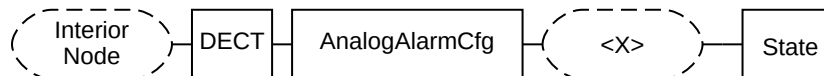
MO Element	Status	Occurrence	Format	Access Type
./DECT/DTMF	current	One	Node	Get
./DECT/DTMF<X>	current	OneOrMore	Node	Get
./DECT/ToneDuration/<X>/ToneDuration	current	OneOrZero	int	Get, Replace

B.4.2.9 DECT Bargeln Node MO tree**Figure 15 - Node Bargeln of DECT OMA Management****B.4.2.10 DECT Bargeln MO Node Description**

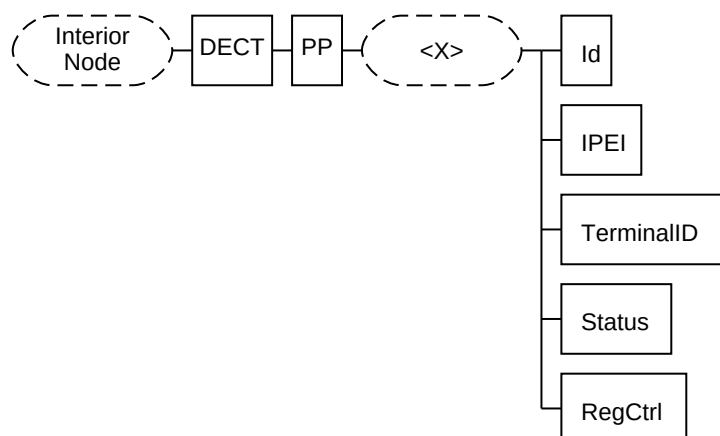
MO Element	Status	Occurrence	Format	Access Type
./DECT/Bargeln	current	One	Node	Get
./DECT/Bargeln<X>	current	OneOrMore	Node	Get
./DECT/Enabled/<X>/Enabled	current	OneOrZero	int	Get, Replace

B.4.2.11 DECT ServiceStatus Node MO tree**Figure 16 - Node ServiceStatus of DECT OMA Management****B.4.2.12 DECT ServiceStatus MO Node Description**

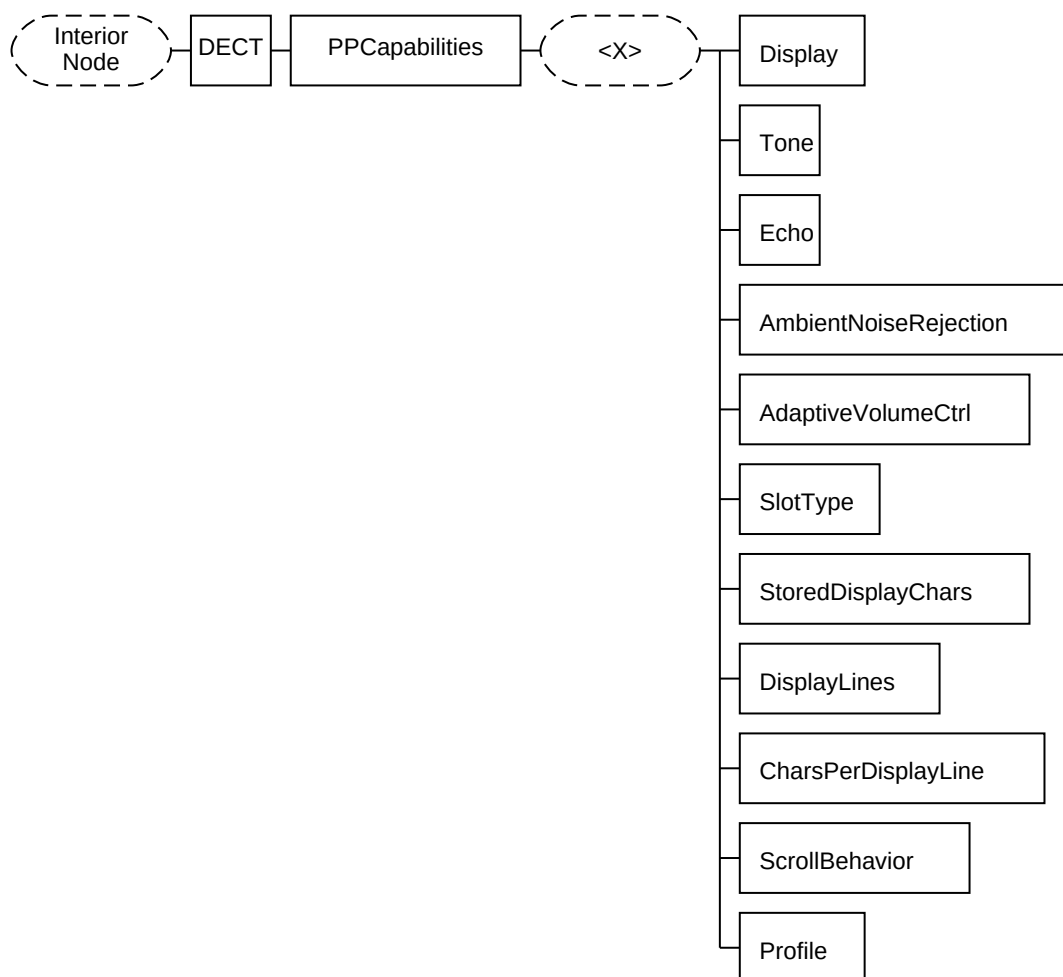
MO Element	Status	Occurrence	Format	Access Type
./DECT/ServiceStatus	current	One	Node	Get
./DECT/ServiceStatus<X>	current	OneOrMore	Node	Get
./DECT/DeactivationDisplay/<X>/DeactivationDisplay	current	OneOrZero	Chr	Get, Replace
./DECT/ConnectivityDisplay/<X>/ConnectivityDisplay	current	OneOrZero	Chr	Get, Replace

B.4.2.13 DECT AnalogAlarmCfg tree**Figure 17 - Node AnalogAlarmCfg of DECT OMA Management****B.4.2.14 DECT AnalogAlarmCfg MO Node Description**

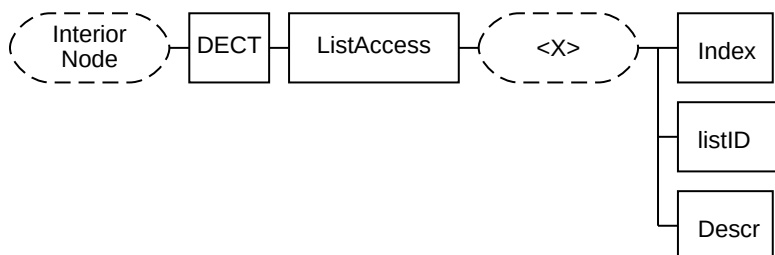
MO Element	Status	Occurrence	Format	Access Type
./DECT/AnalogAlarmCfg	current	One	Node	Get
./DECT/AnalogAlarmCfg/<X>/State	current	OneOrZero	int	Add, Get, Replace

B.4.2.15 DECT PP MO Node tree**Figure 18 - Node PP of DECT OMA Management****B.4.2.16 DECT PP MO Node Description**

MO Element	Status	Occurrence	Format	Access Type
./DECT/PP	current	One	Node	Get
./DECT/PP<X>	current	OneOrMore	Node	
./DECT/Id/<X>/Id	current	OneOrZero	int	Get, Replace
./DECT/IPEI/<X>/IPEI	current	OneOrZero	bin	Get
./DECT/TerminalID/<X>/TerminalID	current	OneOrZero	int	Get
./DECT/Status/<X>/Status	current	OneOrZero		Get
./DECT/RegCtrl/<X>/RegCtrl	current	OneOrZero	int	Get, Replace

B.4.2.17 DECT PPCapabilities MO Node tree**Figure 19 - Node PPCapabilities of DECT OMA Management****B.4.2.18 DECT PPCapabilities MO Node Description**

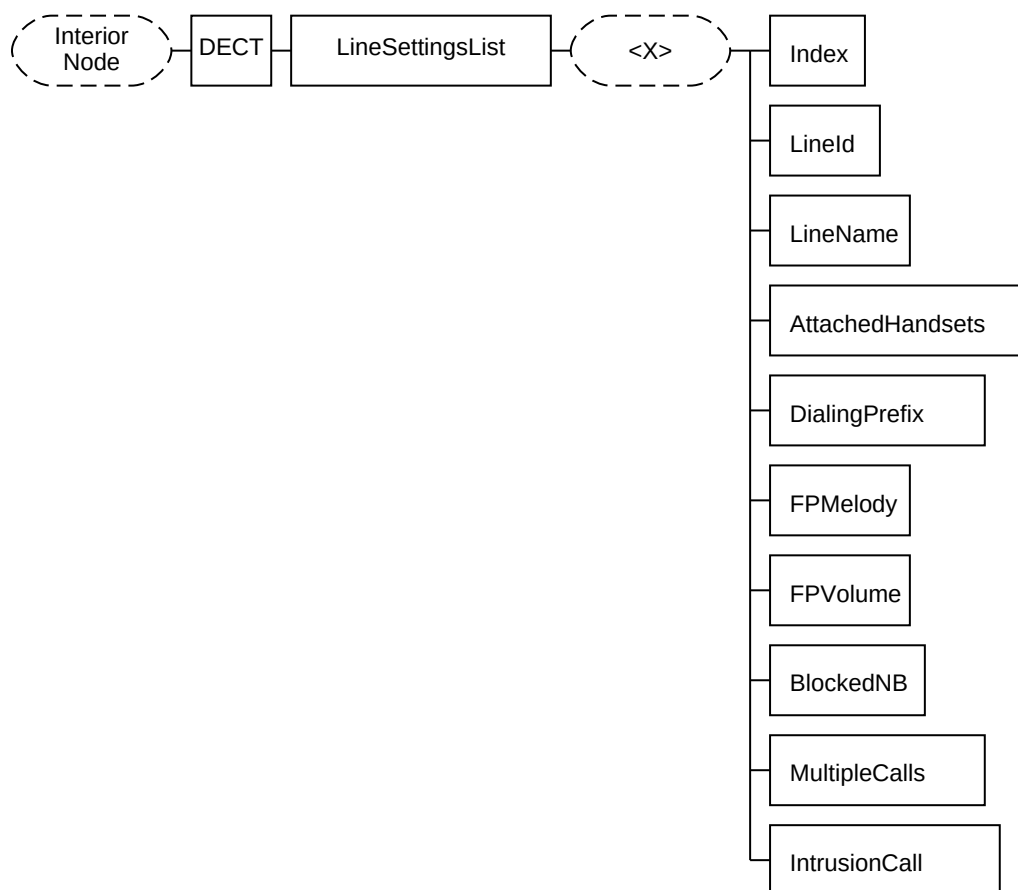
MO Element	Status	Occurrence	Format	Access Type
./DECT/PPCapabilities	current	One	Node	Get
./DECT/PPCapabilities<X>	current	OneOrMore	Node	Get
./DECT/Display/<X>/Display	current	OneOrZero	int	Get, Replace
./DECT/Tone/<X>/Tone	current	OneOrZero	int	Get, Replace
./DECT/Echo/<X>/Echo	current	OneOrZero	int	Get, Replace
./DECT/AmbientNoiseRejection/<X>/AmbientNoiseRejection	current	OneOrZero	int	Get, Replace
./DECT/AdaptiveVolumeCtrl/<X>/AdaptiveVolumeCtrl	current	OneOrZero	int	Get, Replace
./DECT/SlotType/<X>/SlotType	current	OneOrZero	bin	Get, Replace
./DECT/StoredDisplayChars/<X>/StoredDisplayChars	current	OneOrZero	int	Get, Replace
./DECT/DisplayLines/<X>/DisplayLines	current	OneOrZero	int	Get, Replace
./DECT/CharsPerDisplayLine/<X>/CharsPerDisplayLine	current	OneOrZero	int	Get, Replace
./DECT/ScrollBehavior/<X>/ScrollBehavior	current	OneOrZero	int	Get, Replace
./DECT/Profile/<X>/Profile	current	OneOrZero	bin	Get, Replace

B.4.2.19 DECT ListAccess MO Node tree**Figure 20 - Node ListAccess of DECT OMA Management****B.4.2.20 DECT ListAccess MO Node Description**

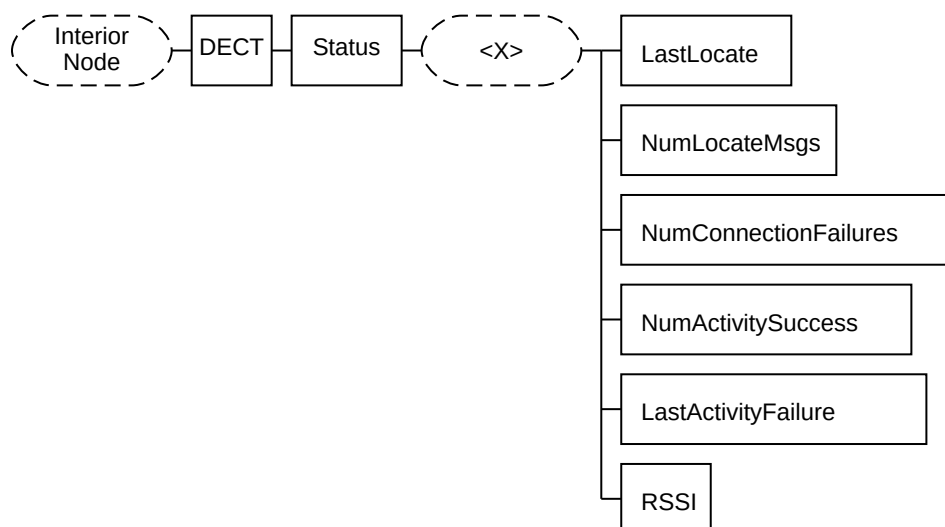
MO Element	Status	Occurrence	Format	Access Type
./DECT/ListAccess	current	One	Node	Get
./DECT/ListAccess<X>	current	OneOrMore	Node	Get
./DECT/Index/<X>/Index	current	OneOrZero	int	Get, Replace
./DECT/listID/<X>/listID	current	OneOrZero	int	Get
./DECT/Descr/<X>/Descr	current	OneOrZero	chr	Get

B.4.2.21 DECT InternalNamesList MO Node tree**Figure 21 - Node InternalNamesList of DECT OMA Management****B.4.2.22 DECT InternalNamesList MO Node Description**

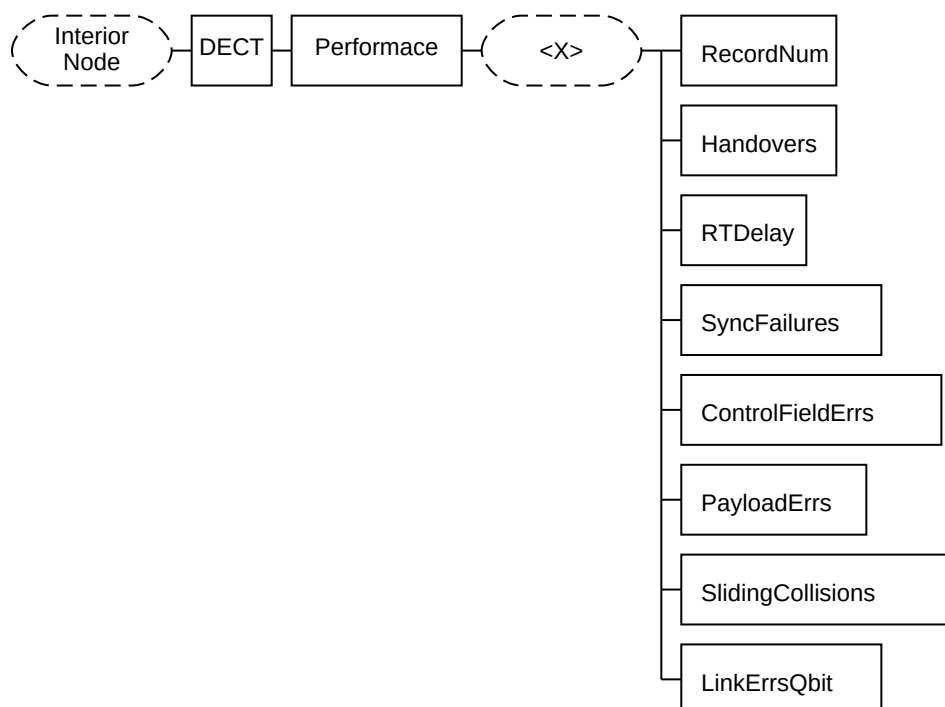
MO Element	Status	Occurrence	Format	Access Type
./DECT/InternalNamesList	current	One	Node	Get
./DECT/InternalNamesList<X>	current	OneOrMore	Node	Get
./DECT/Index/<X>/Index	current	OneOrZero	int	Get, Replace
./DECT/Number/<X>/Number	current	OneOrZero	int	Get
./DECT/Name/<X>/Name	current	OneOrZero	chr	Get

B.4.2.23 DECT LineSettingsList MO Node tree**Figure 22 - Node LineSettingsList of DECT OMA Management****B.4.2.24 DECT LineSettingsList MO Node Description**

MO Element	Status	Occurrence	Format	Access Type
./DECT/LineSettingsList	current	One	Node	Get
./DECT/LineSettingsList<X>	current	OneOrMore	Node	Get
./DECT/Index/<X>/Index	current	OneOrZero	int	Get, Replace
./DECT/LineId/<X>/LineId	current	OneOrZero	int	Get, Replace
./DECT/LineName/<X>/LineName	current	OneOrZero	chr	Get
./DECT/AttachedHandsets/<X>/AttachedHandsets	current	OneOrZero	chr	Get
./DECT/DialingPrefix/<X>/DialingPrefix	current	OneOrZero	bin	Get
./DECT/FPMelody/<X>/FPMelody	current	OneOrZero	int	Get
./DECT/FPVolume/<X>/FPVolume	current	OneOrZero		Get
./DECT/BlockedNB/<X>/BlockedNB	current	OneOrZero	bool	Get
./DECT/MultipleCalls/<X>/MultipleCalls	current	OneOrZero	bool	Get
./DECT/IntrusionCall/<X>/IntrusionCall	current	OneOrZero	bool	Get

B.4.2.25 DECT Status MO Node tree**Figure 23 - Node Status of DECT OMA Management****B.4.2.26 DECT Status MO Node Description**

MO Element	Status	Occurrence	Format	Access Type
./DECT/Status	current	One	Node	Get
./DECT/Status<X>	current	OneOrMore	Node	Get
./DECT/LastLocate/<X>/LastLocate	current	OneOrZero	date	Get, Replace
./DECT/NumLocateMsgs/<X>/NumLocateMsgs	current	OneOrZero	int	Get, Replace
./DECT/NumConnectionFailures/<X>/NumConnectionFailures	current	OneOrZero	int	Get, Replace
./DECT/NumActivitySuccess/<X>/NumActivitySuccess	current	OneOrZero	int	Get, Replace
./DECT/LastActivityFailure/<X>/LastActivityFailure	current	OneOrZero	date	Get, Replace
./DECT/RSSI/<X>/RSSI	current	OneOrZero	int	Get, Replace

B.4.2.27 DECT Performance MO Node tree**Figure 24 - Node Performance of DECT OMA Management****B.4.2.28 DECT Performance MO Node Description**

MO Element	Status	Occurrence	Format	Access Type
./DECT/Performance	current	One	Node	Get
./DECT/Performance<X>	current	OneOrMore	Node	Get
./DECT/RecordNum/<X>/RecordNum	current	OneOrZero	int	Get, Replace
./DECT/Handovers/<X>/Handovers	current	OneOrZero	int	Get, Replace
./DECT/RTDelay/<X>/RTDelay	current	OneOrZero	int	Get, Replace
./DECT/SyncFailures/<X>/SyncFailures	current	OneOrZero	int	Get, Replace
./DECT/ControlFieldErrs/<X>/ControlFieldErrs	current	OneOrZero	int	Get, Replace
./DECT/PayloadErrs/<X>/PayloadErrs	current	OneOrZero	int	Get, Replace
./DECT/SlidingCollisions/<X>/SlidingCollisions	current	OneOrZero	int	Get, Replace
./DECT/LinkErrsQbit/<X>/LinkErrsQbit	current	OneOrZero	int	Get, Replace

B.4.3 DECT OMA Device Description Framework (DDF)

```

<?xml version="1.0"?>
<MgmtTree">
  <VerDTD>1.2</VerDTD>
  <Man>PacketCable - Cable Laboratories Inc.</Man>
  <!--This DDF considers as model the UE MO (as defined in the PacketCable
specifications) followed by a colon character (e.g., DECT:) -->
  <Mod>DECT:</Mod>
  <Node>
    <NodeName>DECT</NodeName>
    <Path>./Pktc</Path>
    <DFProperties>

```

```

        <AccessType>
            <Get/>
        </AccessType>
        <DefaultValue/>
        <Description>The node that defines the DECT M0
tree.</Description>
        <DFFormat>
            <node/>
        </DFFormat>
        <Occurrence>
            <One/>
        </Occurrence>
        <Scope>
            <Permanent/>
        </Scope>
        <DFTitle>The interior node holding all nodes of the PacketCable
DECT M0 three</DFTitle>
        <DFType>
            <DDFName>urn:cablelabs:packetcable:ddf:dect</DDFName>
        </DFType>
        <CaseSense>
            <CIS/>
        </CaseSense>
    </DFProperties>
    <Node>
        <NodeName>FP</NodeName>
        <DFProperties>
            <AccessType>
                <Get/>
            </AccessType>
            <DFFormat>
                <node/>
            </DFFormat>
            <Occurrence>
                <One/>
            </Occurrence>
            <DFTitle>DECT.FP</DFTitle>
            <DFType>
                <DDFName/>
            </DFType>
        </DFProperties>
    </Node>
        <NodeName/>
        <DFProperties>
            <AccessType></AccessType>
            <DFFormat>
                <node/>
            </DFFormat>
            <Occurrence>
                <OneOrMore/>
            </Occurrence>
            <DFTitle/>
            <DFType>
                <DDFName/>
            </DFType>
        </DFProperties>
    <Node>
        <NodeName>MaxNumPP</NodeName>
        <DFProperties>
            <AccessType>
                <Get/>
            </AccessType>
            <DefaultValue></DefaultValue>

```

```

        <Description/>
        <DFFormat>
            <int/>
        </DFFormat>
        <Occurrence>
            <One/>
        </Occurrence>
        <Scope>
            <Permanent/>
        </Scope>
        <DFTitle/>
        <DFType>
            <MIME>text/plain</MIME>
        </DFType>
        <CaseSense/>
    </DFProperties>
    <Value/>
</Node>
<Node>
    <NodeName>MaxActivePP</NodeName>
    <DFProperties>
        <AccessType></AccessType>
        <DefaultValue></DefaultValue>
        <Description/>
        <DFFormat>
            <int/>
        </DFFormat>
        <Occurrence>
            <One/>
        </Occurrence>
        <Scope>
            <Permanent/>
        </Scope>
        <DFTitle/>
        <DFType>
            <MIME>text/plain</MIME>
        </DFType>
        <CaseSense/>
    </DFProperties>
    <Value/>
</Node>
<Node>
    <NodeName>LockListCfg</NodeName>
    <DFProperties>
        <AccessType></AccessType>
        <DefaultValue>'H</DefaultValue>
        <Description/>
        <DFFormat>
            <bin/>
        </DFFormat>
        <Occurrence>
            <One/>
        </Occurrence>
        <Scope>
            <Permanent/>
        </Scope>
        <DFTitle/>
        <DFType>
            <MIME>text/plain</MIME>
        </DFType>
        <CaseSense/>
    </DFProperties>
    <Value/>

```

```

</Node>
<Node>
  <NodeName>ZeroEmissionEnabled</NodeName>
  <DFProperties>
    <AccessType></AccessType>
    <DefaultValue>true</DefaultValue>
    <Description/>
    <DFFormat>
      <bool/>
    </DFFormat>
    <Occurrence>
      <One/>
    </Occurrence>
    <Scope>
      <Permanent/>
    </Scope>
    <DFTitle/>
    <DFType>
      <MIME>text/plain</MIME>
    </DFType>
    <CaseSense/>
  </DFProperties>
  <Value/>
</Node>
<Node>
  <NodeName>PairingType</NodeName>
  <DFProperties>
    <AccessType></AccessType>
    <DefaultValue>0000</DefaultValue>
    <Description/>
    <DFFormat>
      <chr/>
    </DFFormat>
    <Occurrence>
      <One/>
    </Occurrence>
    <Scope>
      <Permanent/>
    </Scope>
    <DFTitle/>
    <DFType>
      <MIME>text/plain</MIME>
    </DFType>
    <CaseSense/>
  </DFProperties>
  <Value/>
</Node>
<Node>
  <NodeName>EasyPairingActivate</NodeName>
  <DFProperties>
    <AccessType></AccessType>
    <DefaultValue>true</DefaultValue>
    <Description/>
    <DFFormat>
      <bool/>
    </DFFormat>
    <Occurrence>
      <One/>
    </Occurrence>
    <Scope>
      <Permanent/>
    </Scope>
    <DFTitle/>

```

```

        <DFTType>
            <MIME>text/plain</MIME>
        </DFTType>
        <CaseSense/>
    </DFProperties>
    <Value/>
</Node>
<Node>
    <NodeName>Name</NodeName>
    <DFProperties>
        <AccessType></AccessType>
        <DefaultValue></DefaultValue>
        <Description/>
        <DFFormat>
            <chr/>
        </DFFormat>
        <Occurrence>
            <One/>
        </Occurrence>
        <Scope>
            <Permanent/>
        </Scope>
        <DFTitle/>
        <DFTType>
            <MIME>text/plain</MIME>
        </DFTType>
        <CaseSense/>
    </DFProperties>
    <Value/>
</Node>
<Node>
    <NodeName>GeneralCapabilities</NodeName>
    <DFProperties>
        <AccessType></AccessType>
        <DefaultValue></DefaultValue>
        <Description/>
        <DFFormat>
            <bin/>
        </DFFormat>
        <Occurrence>
            <One/>
        </Occurrence>
        <Scope>
            <Permanent/>
        </Scope>
        <DFTitle/>
        <DFTType>
            <MIME>text/plain</MIME>
        </DFTType>
        <CaseSense/>
    </DFProperties>
    <Value/>
</Node>
<Node>
    <NodeName>ExtendedCapabilities</NodeName>
    <DFProperties>
        <AccessType></AccessType>
        <DefaultValue></DefaultValue>
        <Description/>
        <DFFormat>
            <bin/>
        </DFFormat>
        <Occurrence>

```



```

        <One/>
      </Occurrence>
    <Scope>
      <Permanent/>
    </Scope>
    <DFTitle/>
    <DFType>
      <MIME>text/plain</MIME>
    </DFType>
    <CaseSense/>
  </DFProperties>
  <Value/>
</Node>
</Node>
</Node>
<Node>
  <NodeName>HDVoiceProfile</NodeName>
  <DFProperties>
    <AccessType>
      <Get/>
    </AccessType>
    <DFFormat>
      <node/>
    </DFFormat>
    <Occurrence>
      <One/>
    </Occurrence>
    <DFTitle>DECT.HDVoiceProfile</DFTitle>
    <DFType>
      <DDFName/>
    </DFType>
  </DFProperties>
  <Node>
    <NodeName/>
    <DFProperties>
      <AccessType></AccessType>
      <DFFormat>
        <node/>
      </DFFormat>
      <Occurrence>
        <OneOrMore/>
      </Occurrence>
      <DFTitle/>
      <DFType>
        <DDFName/>
      </DFType>
    </DFProperties>
    <Node>
      <NodeName>BasicService</NodeName>
      <DFProperties>
        <AccessType></AccessType>
        <DefaultValue></DefaultValue>
        <Description/>
        <DFFormat>
          <int/>
        </DFFormat>
        <Occurrence>
          <One/>
        </Occurrence>
        <Scope>
          <Permanent/>
        </Scope>
        <DFTitle/>

```

```

        <DFTType>
            <MIME>text/plain</MIME>
        </DFTType>
        <CaseSense/>
    </DFProperties>
    <Value/>
</Node>
<Node>
    <NodeName>NCS</NodeName>
    <DFProperties>
        <AccessType></AccessType>
        <DefaultValue></DefaultValue>
        <Description/>
        <DFFormat>
            <int/>
        </DFFormat>
        <Occurrence>
            <One/>
        </Occurrence>
        <Scope>
            <Permanent/>
        </Scope>
        <DFTitle/>
        <DFTType>
            <MIME>text/plain</MIME>
        </DFTType>
        <CaseSense/>
    </DFProperties>
    <Value/>
</Node>
<Node>
    <NodeName>SIP</NodeName>
    <DFProperties>
        <AccessType></AccessType>
        <DefaultValue></DefaultValue>
        <Description/>
        <DFFormat>
            <int/>
        </DFFormat>
        <Occurrence>
            <One/>
        </Occurrence>
        <Scope>
            <Permanent/>
        </Scope>
        <DFTitle/>
        <DFTType>
            <MIME>text/plain</MIME>
        </DFTType>
        <CaseSense/>
    </DFProperties>
    <Value/>
</Node>
</Node>
<Node>
    <NodeName>Codec</NodeName>
    <DFProperties>
        <AccessType>
            <Get/>
        </AccessType>
        <DFFormat>
            <node/>

```

```

        </DFFormat>
        <Occurrence>
            <One/>
        </Occurrence>
        <DFTitle>DECT.Codec</DFTitle>
        <DFType>
            <DDFName/>
        </DFType>
    </DFProperties>
    <Node>
        <NodeName/>
        <DFProperties>
            <AccessType></AccessType>
            <DFFormat>
                <node/>
            </DFFormat>
            <Occurrence>
                <OneOrMore/>
            </Occurrence>
            <DFTitle/>
            <DFType>
                <DDFName/>
            </DFType>
        </DFProperties>
    </Node>
    <Node>
        <NodeName>PrefList</NodeName>
        <DFProperties>
            <AccessType></AccessType>
            <DefaultValue>"G722, PCMU, PCMA"</DefaultValue>
            <Description/>
            <DFFormat>
                <chr/>
            </DFFormat>
            <Occurrence>
                <One/>
            </Occurrence>
            <Scope>
                <Permanent/>
            </Scope>
            <DFTitle/>
            <DFType>
                <MIME>text/plain</MIME>
            </DFType>
            <CaseSense/>
        </DFProperties>
        <Value/>
    </Node>
</Node>
</Node>
<Node>
    <NodeName>DTMF</NodeName>
    <DFProperties>
        <AccessType>
            <Get/>
        </AccessType>
        <DFFormat>
            <node/>
        </DFFormat>
        <Occurrence>
            <One/>
        </Occurrence>
        <DFTitle>DECT.DTMF</DFTitle>
        <DFType>

```

```

        <DDFName/>
      </DFTType>
    </DFProperties>
  <Node>
    <NodeName/>
    <DFProperties>
      <AccessType></AccessType>
      <DFFormat>
        <node/>
      </DFFormat>
      <Occurrence>
        <OneOrMore/>
      </Occurrence>
      <DFTitle/>
      <DFTType>
        <DDFName/>
      </DFTType>
    </DFProperties>
  <Node>
    <NodeName>ToneDuration</NodeName>
    <DFProperties>
      <AccessType></AccessType>
      <DefaultValue>100</DefaultValue>
      <Description/>
      <DFFormat>
        <int/>
      </DFFormat>
      <Occurrence>
        <One/>
      </Occurrence>
      <Scope>
        <Permanent/>
      </Scope>
      <DFTitle/>
      <DFTType>
        <MIME>text/plain</MIME>
      </DFTType>
      <CaseSense/>
    </DFProperties>
    <Value/>
  </Node>
</Node>
</Node>
<Node>
  <NodeName>BargeIn</NodeName>
  <DFProperties>
    <AccessType>
      <Get/>
    </AccessType>
    <DFFormat>
      <node/>
    </DFFormat>
    <Occurrence>
      <One/>
    </Occurrence>
    <DFTitle>DECT.BargeIn</DFTitle>
    <DFTType>
      <DDFName/>
    </DFTType>
  </DFProperties>
<Node>
  <NodeName/>
  <DFProperties>

```

```

        <AccessType></AccessType>
        <DFFormat>
            <node/>
        </DFFormat>
        <Occurrence>
            <OneOrMore/>
        </Occurrence>
        <DFTitle/>
        <DFType>
            <DDFName/>
        </DFType>
    </DFProperties>
</Node>
<Node>
    <NodeName>Enabled</NodeName>
    <DFProperties>
        <AccessType></AccessType>
        <DefaultValue>true</DefaultValue>
        <Description/>
        <DFFormat>
            <bool/>
        </DFFormat>
        <Occurrence>
            <One/>
        </Occurrence>
        <Scope>
            <Permanent/>
        </Scope>
        <DFTitle/>
        <DFType>
            <MIME>text/plain</MIME>
        </DFType>
        <CaseSense/>
    </DFProperties>
    <Value/>
</Node>
</Node>
</Node>
<Node>
    <NodeName>ServiceStatus</NodeName>
    <DFProperties>
        <AccessType>
            <Get/>
        </AccessType>
        <DFFormat>
            <node/>
        </DFFormat>
        <Occurrence>
            <One/>
        </Occurrence>
        <DFTitle>DECT.ServiceStatus</DFTitle>
        <DFType>
            <DDFName/>
        </DFType>
    </DFProperties>
</Node>
    <NodeName/>
    <DFProperties>
        <AccessType></AccessType>
        <DFFormat>
            <node/>
        </DFFormat>
        <Occurrence>
            <OneOrMore/>

```

```

        </Occurrence>
        <DFTitle/>
        <DFType>
            <DDFName/>
        </DFType>
    </DFProperties>
    <Node>
        <NodeName>DeactivationDisplay</NodeName>
        <DFProperties>
            <AccessType></AccessType>
            <DefaultValue>Service
Deactivated</DefaultValue>
            <Description/>
            <DFFormat>
                <chr/>
            </DFFormat>
            <Occurrence>
                <One/>
            </Occurrence>
            <Scope>
                <Permanent/>
            </Scope>
            <DFTitle/>
            <DFType>
                <MIME>text/plain</MIME>
            </DFType>
            <CaseSense/>
        </DFProperties>
        <Value/>
    </Node>
    <Node>
        <NodeName>ConnectivityDisplay</NodeName>
        <DFProperties>
            <AccessType></AccessType>
            <DefaultValue>Network
Unavailable</DefaultValue>
            <Description/>
            <DFFormat>
                <chr/>
            </DFFormat>
            <Occurrence>
                <One/>
            </Occurrence>
            <Scope>
                <Permanent/>
            </Scope>
            <DFTitle/>
            <DFType>
                <MIME>text/plain</MIME>
            </DFType>
            <CaseSense/>
        </DFProperties>
        <Value/>
    </Node>
</Node>
<Node>
    <NodeName>AnalogAlarmCfg</NodeName>
    <DFProperties>
        <AccessType>
            <Get/>
        </AccessType>
        <DFFormat>

```

```

        <node/>
    </DFFormat>
    <Occurrence>
        <One/>
    </Occurrence>
    <DFTitle>DECT.AnalogAlarmCfg</DFTitle>
    <DFType>
        <DDFName/>
    </DFType>
</DFProperties>
<Node>
    <NodeName/>
    <DFProperties>
        <AccessType></AccessType>
        <DFFormat>
            <node/>
        </DFFormat>
        <Occurrence>
            <OneOrMore/>
        </Occurrence>
        <DFTitle/>
        <DFType>
            <DDFName/>
        </DFType>
    </DFProperties>
    <Node>
        <NodeName>ifIndex</NodeName>
        <DFProperties>
            <AccessType></AccessType>
            <DefaultValue></DefaultValue>
            <Description/>
            <DFFormat>
                <int/>
            </DFFormat>
            <Occurrence>
                <One/>
            </Occurrence>
            <Scope>
                <Permanent/>
            </Scope>
            <DFTitle/>
            <DFType>
                <MIME>text/plain</MIME>
            </DFType>
            <CaseSense/>
        </DFProperties>
        <Value/>
    </Node>
    <Node>
        <NodeName>State</NodeName>
        <DFProperties>
            <AccessType></AccessType>
            <DefaultValue></DefaultValue>
            <Description/>
            <DFFormat>
                <int/>
            </DFFormat>
            <Occurrence>
                <One/>
            </Occurrence>
            <Scope>
                <Permanent/>
            </Scope>

```

```

                                <DFTitle/>
                                <DFType>
                                    <MIME>text/plain</MIME>
                                </DFType>
                                <CaseSense/>
                            </DFProperties>
                            <Value/>
                        </Node>
                    </Node>
                </Node>
            <Node>
            <Node>
                <NodeName>ListAccess</NodeName>
                <DFProperties>
                    <AccessType>
                        <Get/>
                    </AccessType>
                    <DFFormat>
                        <node/>
                    </DFFormat>
                    <Occurrence>
                        <One/>
                    </Occurrence>
                    <DFTitle>DECT.ListAccess</DFTitle>
                    <DFType>
                        <DDFName/>
                    </DFType>
                </DFProperties>
            <Node>
                <NodeName/>
                <DFProperties>
                    <AccessType></AccessType>
                    <DFFormat>
                        <node/>
                    </DFFormat>
                    <Occurrence>
                        <OneOrMore/>
                    </Occurrence>
                    <DFTitle/>
                    <DFType>
                        <DDFName/>
                    </DFType>
                </DFProperties>
            <Node>
                <NodeName>Index</NodeName>
                <DFProperties>
                    <AccessType></AccessType>
                    <DefaultValue></DefaultValue>
                    <Description/>
                    <DFFormat>
                        <int/>
                    </DFFormat>
                    <Occurrence>
                        <One/>
                    </Occurrence>
                    <Scope>
                        <Permanent/>
                    </Scope>
                    <DFTitle/>
                    <DFType>
                        <MIME>text/plain</MIME>
                    </DFType>
                    <CaseSense/>
                </DFProperties>
            </Node>
        </Node>
    </Node>

```



```

        <Value/>
    </Node>
    <Node>
        <NodeName>listID</NodeName>
        <DFProperties>
            <AccessType>
                <Get/>
            </AccessType>
            <DefaultValue></DefaultValue>
            <Description/>
            <DFFormat>
                <int/>
            </DFFormat>
            <Occurrence>
                <One/>
            </Occurrence>
            <Scope>
                <Permanent/>
            </Scope>
            <DFTitle/>
            <DFType>
                <MIME>text/plain</MIME>
            </DFType>
            <CaseSense/>
        </DFProperties>
        <Value/>
    </Node>
    <Node>
        <NodeName>Descr</NodeName>
        <DFProperties>
            <AccessType>
                <Get/>
            </AccessType>
            <DefaultValue></DefaultValue>
            <Description/>
            <DFFormat>
                <chr/>
            </DFFormat>
            <Occurrence>
                <One/>
            </Occurrence>
            <Scope>
                <Permanent/>
            </Scope>
            <DFTitle/>
            <DFType>
                <MIME>text/plain</MIME>
            </DFType>
            <CaseSense/>
        </DFProperties>
        <Value/>
    </Node>
</Node>
<Node>
    <NodeName>InternalNamesList</NodeName>
    <DFProperties>
        <AccessType>
            <Get/>
        </AccessType>
        <DFFormat>
            <node/>
        </DFFormat>
    </DFProperties>

```

```

        <Occurrence>
            <One/>
        </Occurrence>
        <DFTitle>DECT.InternalNamesList</DFTitle>
        <DFType>
            <DDFName/>
        </DFType>
    </DFProperties>
</Node>
    <NodeName/>
    <DFProperties>
        <AccessType></AccessType>
        <DFFormat>
            <node/>
        </DFFormat>
        <Occurrence>
            <OneOrMore/>
        </Occurrence>
        <DFTitle/>
        <DFType>
            <DDFName/>
        </DFType>
    </DFProperties>
</Node>
    <NodeName>Index</NodeName>
    <DFProperties>
        <AccessType></AccessType>
        <DefaultValue></DefaultValue>
        <Description/>
        <DFFormat>
            <int/>
        </DFFormat>
        <Occurrence>
            <One/>
        </Occurrence>
        <Scope>
            <Permanent/>
        </Scope>
        <DFTitle/>
        <DFType>
            <MIME>text/plain</MIME>
        </DFType>
        <CaseSense/>
    </DFProperties>
    <Value/>
</Node>
<Node>
    <NodeName>Number</NodeName>
    <DFProperties>
        <AccessType>
            <Get/>
        </AccessType>
        <DefaultValue></DefaultValue>
        <Description/>
        <DFFormat>
            <int/>
        </DFFormat>
        <Occurrence>
            <One/>
        </Occurrence>
        <Scope>
            <Permanent/>
        </Scope>
    </DFProperties>
    <Value/>
</Node>

```

```

        <DFTitle/>
        <DFType>
            <MIME>text/plain</MIME>
        </DFType>
        <CaseSense/>
    </DFProperties>
    <Value/>
</Node>
<Node>
    <NodeName>Name</NodeName>
    <DFProperties>
        <AccessType>
            <Get/>
        </AccessType>
        <DefaultValue></DefaultValue>
        <Description/>
        <DFFormat>
            <chr/>
        </DFFormat>
        <Occurrence>
            <One/>
        </Occurrence>
        <Scope>
            <Permanent/>
        </Scope>
        <DFTitle/>
        <DFType>
            <MIME>text/plain</MIME>
        </DFType>
        <CaseSense/>
    </DFProperties>
    <Value/>
</Node>
</Node>
</Node>
<Node>
    <NodeName>LineSettingsList</NodeName>
    <DFProperties>
        <AccessType>
            <Get/>
        </AccessType>
        <DFFormat>
            <node/>
        </DFFormat>
        <Occurrence>
            <One/>
        </Occurrence>
        <DFTitle>DECT.LineSettingsList</DFTitle>
        <DFType>
            <DDFName/>
        </DFType>
    </DFProperties>
    <Node>
        <NodeName/>
        <DFProperties>
            <AccessType></AccessType>
            <DFFormat>
                <node/>
            </DFFormat>
            <Occurrence>
                <OneOrMore/>
            </Occurrence>
            <DFTitle/>

```

```

        <DFTType>
            <DDFName/>
        </DFTType>
    </DFProperties>
</Node>
<Node>
    <NodeName>Index</NodeName>
    <DFProperties>
        <AccessType></AccessType>
        <DefaultValue></DefaultValue>
        <Description/>
        <DFFormat>
            <int/>
        </DFFormat>
        <Occurrence>
            <One/>
        </Occurrence>
        <Scope>
            <Permanent/>
        </Scope>
        <DFTitle/>
        <DFTType>
            <MIME>text/plain</MIME>
        </DFTType>
        <CaseSense/>
    </DFProperties>
    <Value/>
</Node>
<Node>
    <NodeName>LineId</NodeName>
    <DFProperties>
        <AccessType></AccessType>
        <DefaultValue></DefaultValue>
        <Description/>
        <DFFormat>
            <int/>
        </DFFormat>
        <Occurrence>
            <One/>
        </Occurrence>
        <Scope>
            <Permanent/>
        </Scope>
        <DFTitle/>
        <DFTType>
            <MIME>text/plain</MIME>
        </DFTType>
        <CaseSense/>
    </DFProperties>
    <Value/>
</Node>
<Node>
    <NodeName>LineName</NodeName>
    <DFProperties>
        <AccessType>
            <Get/>
        </AccessType>
        <DefaultValue></DefaultValue>
        <Description/>
        <DFFormat>
            <chr/>
        </DFFormat>
        <Occurrence>
            <One/>

```

```

        </Occurrence>
        <Scope>
            <Permanent/>
        </Scope>
        <DFTitle/>
        <DFType>
            <MIME>text/plain</MIME>
        </DFType>
        <CaseSense/>
    </DFProperties>
    <Value/>
</Node>
<Node>
    <NodeName>AttachedHandsets</NodeName>
    <DFProperties>
        <AccessType>
            <Get/>
        </AccessType>
        <DefaultValue></DefaultValue>
        <Description/>
        <DFFormat>
            <bin/>
        </DFFormat>
        <Occurrence>
            <One/>
        </Occurrence>
        <Scope>
            <Permanent/>
        </Scope>
        <DFTitle/>
        <DFType>
            <MIME>text/plain</MIME>
        </DFType>
        <CaseSense/>
    </DFProperties>
    <Value/>
</Node>
<Node>
    <NodeName>DialingPrefix</NodeName>
    <DFProperties>
        <AccessType>
            <Get/>
        </AccessType>
        <DefaultValue></DefaultValue>
        <Description/>
        <DFFormat>
            <chr/>
        </DFFormat>
        <Occurrence>
            <One/>
        </Occurrence>
        <Scope>
            <Permanent/>
        </Scope>
        <DFTitle/>
        <DFType>
            <MIME>text/plain</MIME>
        </DFType>
        <CaseSense/>
    </DFProperties>
    <Value/>
</Node>
</Node>

```

```

        <NodeName>FPMelody</NodeName>
        <DFProperties>
            <AccessType>
                <Get/>
            </AccessType>
            <DefaultValue></DefaultValue>
            <Description/>
            <DFFormat>
                <int/>
            </DFFormat>
            <Occurrence>
                <One/>
            </Occurrence>
            <Scope>
                <Permanent/>
            </Scope>
            <DFTitle/>
            <DFType>
                <MIME>text/plain</MIME>
            </DFType>
            <CaseSense/>
        </DFProperties>
        <Value/>
    </Node>
    <Node>
        <NodeName>FPVolume</NodeName>
        <DFProperties>
            <AccessType>
                <Get/>
            </AccessType>
            <DefaultValue></DefaultValue>
            <Description/>
            <DFFormat>
                <int/>
            </DFFormat>
            <Occurrence>
                <One/>
            </Occurrence>
            <Scope>
                <Permanent/>
            </Scope>
            <DFTitle/>
            <DFType>
                <MIME>text/plain</MIME>
            </DFType>
            <CaseSense/>
        </DFProperties>
        <Value/>
    </Node>
    <Node>
        <NodeName>BlockedNB</NodeName>
        <DFProperties>
            <AccessType>
                <Get/>
            </AccessType>
            <DefaultValue></DefaultValue>
            <Description/>
            <DFFormat>
                <bool/>
            </DFFormat>
            <Occurrence>
                <One/>
            </Occurrence>

```

```

        <Scope>
            <Permanent/>
        </Scope>
        <DFTitle/>
        <DFType>
            <MIME>text/plain</MIME>
        </DFType>
        <CaseSense/>
    </DFProperties>
    <Value/>
</Node>
<Node>
    <NodeName>MultipleCalls</NodeName>
    <DFProperties>
        <AccessType>
            <Get/>
        </AccessType>
        <DefaultValue></DefaultValue>
        <Description/>
        <DFFormat>
            <bool/>
        </DFFormat>
        <Occurrence>
            <One/>
        </Occurrence>
        <Scope>
            <Permanent/>
        </Scope>
        <DFTitle/>
        <DFType>
            <MIME>text/plain</MIME>
        </DFType>
        <CaseSense/>
    </DFProperties>
    <Value/>
</Node>
<Node>
    <NodeName>IntrusionCall</NodeName>
    <DFProperties>
        <AccessType>
            <Get/>
        </AccessType>
        <DefaultValue></DefaultValue>
        <Description/>
        <DFFormat>
            <bool/>
        </DFFormat>
        <Occurrence>
            <One/>
        </Occurrence>
        <Scope>
            <Permanent/>
        </Scope>
        <DFTitle/>
        <DFType>
            <MIME>text/plain</MIME>
        </DFType>
        <CaseSense/>
    </DFProperties>
    <Value/>
</Node>
</Node>
</Node>
</Node>

```

```

<Node>
  <NodeName>Performance</NodeName>
  <DFProperties>
    <AccessType>
      <Get/>
    </AccessType>
    <DFFormat>
      <node/>
    </DFFormat>
    <Occurrence>
      <One/>
    </Occurrence>
    <DFTitle>DECT.Performance</DFTitle>
    <DFType>
      <DDFName/>
    </DFType>
  </DFProperties>
</Node>
  <Node>
    <NodeName/>
    <DFProperties>
      <AccessType></AccessType>
      <DFFormat>
        <node/>
      </DFFormat>
      <Occurrence>
        <OneOrMore/>
      </Occurrence>
      <DFTitle/>
      <DFType>
        <DDFName/>
      </DFType>
    </DFProperties>
  </Node>
    <Node>
      <NodeName>ifIndex</NodeName>
      <DFProperties>
        <AccessType></AccessType>
        <DefaultValue></DefaultValue>
        <Description/>
        <DFFormat>
          <int/>
        </DFFormat>
        <Occurrence>
          <One/>
        </Occurrence>
        <Scope>
          <Permanent/>
        </Scope>
        <DFTitle/>
        <DFType>
          <MIME>text/plain</MIME>
        </DFType>
        <CaseSense/>
      </DFProperties>
      <Value/>
    </Node>
  </Node>
    <Node>
      <NodeName>RecordNum</NodeName>
      <DFProperties>
        <AccessType></AccessType>
        <DefaultValue></DefaultValue>
        <Description/>
        <DFFormat>
          <int/>
        </DFFormat>
      </DFProperties>
    </Node>
  </Node>
</Node>

```



```

        </DFFormat>
        <Occurrence>
            <One/>
        </Occurrence>
        <Scope>
            <Permanent/>
        </Scope>
        <DFTitle/>
        <DFType>
            <MIME>text/plain</MIME>
        </DFType>
        <CaseSense/>
    </DFProperties>
    <Value/>
</Node>
<Node>
    <NodeName>Handovers</NodeName>
    <DFProperties>
        <AccessType></AccessType>
        <DefaultValue></DefaultValue>
        <Description/>
        <DFFormat>
            <int/>
        </DFFormat>
        <Occurrence>
            <One/>
        </Occurrence>
        <Scope>
            <Permanent/>
        </Scope>
        <DFTitle/>
        <DFType>
            <MIME>text/plain</MIME>
        </DFType>
        <CaseSense/>
    </DFProperties>
    <Value/>
</Node>
<Node>
    <NodeName>RTDelay</NodeName>
    <DFProperties>
        <AccessType></AccessType>
        <DefaultValue></DefaultValue>
        <Description/>
        <DFFormat>
            <int/>
        </DFFormat>
        <Occurrence>
            <One/>
        </Occurrence>
        <Scope>
            <Permanent/>
        </Scope>
        <DFTitle/>
        <DFType>
            <MIME>text/plain</MIME>
        </DFType>
        <CaseSense/>
    </DFProperties>
    <Value/>
</Node>
<Node>
    <NodeName>SyncFailures</NodeName>

```

```

    <DFProperties>
      <AccessType></AccessType>
      <DefaultValue></DefaultValue>
      <Description/>
      <DFFormat>
        <int/>
      </DFFormat>
      <Occurrence>
        <One/>
      </Occurrence>
      <Scope>
        <Permanent/>
      </Scope>
      <DFTitle/>
      <DFType>
        <MIME>text/plain</MIME>
      </DFType>
      <CaseSense/>
    </DFProperties>
    <Value/>
  </Node>
  <Node>
    <NodeName>ControlFieldErrs</NodeName>
    <DFProperties>
      <AccessType></AccessType>
      <DefaultValue></DefaultValue>
      <Description/>
      <DFFormat>
        <int/>
      </DFFormat>
      <Occurrence>
        <One/>
      </Occurrence>
      <Scope>
        <Permanent/>
      </Scope>
      <DFTitle/>
      <DFType>
        <MIME>text/plain</MIME>
      </DFType>
      <CaseSense/>
    </DFProperties>
    <Value/>
  </Node>
  <Node>
    <NodeName>PayloadErrs</NodeName>
    <DFProperties>
      <AccessType></AccessType>
      <DefaultValue></DefaultValue>
      <Description/>
      <DFFormat>
        <int/>
      </DFFormat>
      <Occurrence>
        <One/>
      </Occurrence>
      <Scope>
        <Permanent/>
      </Scope>
      <DFTitle/>
      <DFType>
        <MIME>text/plain</MIME>
      </DFType>
    </DFProperties>
  </Node>

```

```

        <CaseSense/>
      </DFProperties>
      <Value/>
    </Node>
    <Node>
      <NodeName>SlidingCollisions</NodeName>
      <DFProperties>
        <AccessType></AccessType>
        <DefaultValue></DefaultValue>
        <Description/>
        <DFFormat>
          <int/>
        </DFFormat>
        <Occurrence>
          <One/>
        </Occurrence>
        <Scope>
          <Permanent/>
        </Scope>
        <DFTitle/>
        <DFType>
          <MIME>text/plain</MIME>
        </DFType>
        <CaseSense/>
      </DFProperties>
      <Value/>
    </Node>
    <Node>
      <NodeName>LinkErrsQbit</NodeName>
      <DFProperties>
        <AccessType></AccessType>
        <DefaultValue></DefaultValue>
        <Description/>
        <DFFormat>
          <int/>
        </DFFormat>
        <Occurrence>
          <One/>
        </Occurrence>
        <Scope>
          <Permanent/>
        </Scope>
        <DFTitle/>
        <DFType>
          <MIME>text/plain</MIME>
        </DFType>
        <CaseSense/>
      </DFProperties>
      <Value/>
    </Node>
  </Node>
  <Node>
    <NodeName>Status</NodeName>
    <DFProperties>
      <AccessType>
        <Get/>
      </AccessType>
      <DFFormat>
        <node/>
      </DFFormat>
      <Occurrence>
        <One/>
      </Occurrence>
    </DFProperties>
  </Node>

```

```

        </Occurrence>
        <DFTitle>DECT.Status</DFTitle>
        <DFType>
            <DDFName/>
        </DFType>
    </DFProperties>
</Node>
    <NodeName/>
    <DFProperties>
        <AccessType></AccessType>
        <DFFormat>
            <node/>
        </DFFormat>
        <Occurrence>
            <OneOrMore/>
        </Occurrence>
        <DFTitle/>
        <DFType>
            <DDFName/>
        </DFType>
    </DFProperties>
</Node>
    <NodeName>ifIndex</NodeName>
    <DFProperties>
        <AccessType></AccessType>
        <DefaultValue></DefaultValue>
        <Description/>
        <DFFormat>
            <int/>
        </DFFormat>
        <Occurrence>
            <One/>
        </Occurrence>
        <Scope>
            <Permanent/>
        </Scope>
        <DFTitle/>
        <DFType>
            <MIME>text/plain</MIME>
        </DFType>
        <CaseSense/>
    </DFProperties>
    <Value/>
</Node>
</Node>
    <NodeName>LastLocate</NodeName>
    <DFProperties>
        <AccessType></AccessType>
        <DefaultValue></DefaultValue>
        <Description/>
        <DFFormat>
            <date/>
        </DFFormat>
        <Occurrence>
            <One/>
        </Occurrence>
        <Scope>
            <Permanent/>
        </Scope>
        <DFTitle/>
        <DFType>
            <MIME>text/plain</MIME>
        </DFType>
    </DFProperties>
    <Value/>
</Node>

```

```

        <CaseSense/>
      </DFProperties>
      <Value/>
    </Node>
    <Node>
      <NodeName>NumLocateMsgs</NodeName>
      <DFProperties>
        <AccessType></AccessType>
        <DefaultValue></DefaultValue>
        <Description/>
        <DFFormat>
          <int/>
        </DFFormat>
        <Occurrence>
          <One/>
        </Occurrence>
        <Scope>
          <Permanent/>
        </Scope>
        <DFTitle/>
        <DFType>
          <MIME>text/plain</MIME>
        </DFType>
        <CaseSense/>
      </DFProperties>
      <Value/>
    </Node>
    <Node>
      <NodeName>NumConnectionFailures</NodeName>
      <DFProperties>
        <AccessType></AccessType>
        <DefaultValue></DefaultValue>
        <Description/>
        <DFFormat>
          <int/>
        </DFFormat>
        <Occurrence>
          <One/>
        </Occurrence>
        <Scope>
          <Permanent/>
        </Scope>
        <DFTitle/>
        <DFType>
          <MIME>text/plain</MIME>
        </DFType>
        <CaseSense/>
      </DFProperties>
      <Value/>
    </Node>
    <Node>
      <NodeName>NumActivitySuccess</NodeName>
      <DFProperties>
        <AccessType></AccessType>
        <DefaultValue></DefaultValue>
        <Description/>
        <DFFormat>
          <int/>
        </DFFormat>
        <Occurrence>
          <One/>
        </Occurrence>
        <Scope>

```

```

        <Permanent/>
      </Scope>
    </DFTitle/>
    <DFType>
      <MIME>text/plain</MIME>
    </DFType>
    <CaseSense/>
  </DFProperties>
  <Value/>
</Node>
<Node>
  <NodeName>LastActivityFailure</NodeName>
  <DFProperties>
    <AccessType></AccessType>
    <DefaultValue></DefaultValue>
    <Description/>
    <DFFormat>
      <date/>
    </DFFormat>
    <Occurrence>
      <One/>
    </Occurrence>
    <Scope>
      <Permanent/>
    </Scope>
    </DFTitle/>
    <DFType>
      <MIME>text/plain</MIME>
    </DFType>
    <CaseSense/>
  </DFProperties>
  <Value/>
</Node>
<Node>
  <NodeName>RSSI</NodeName>
  <DFProperties>
    <AccessType></AccessType>
    <DefaultValue></DefaultValue>
    <Description/>
    <DFFormat>
      <int/>
    </DFFormat>
    <Occurrence>
      <One/>
    </Occurrence>
    <Scope>
      <Permanent/>
    </Scope>
    </DFTitle/>
    <DFType>
      <MIME>text/plain</MIME>
    </DFType>
    <CaseSense/>
  </DFProperties>
  <Value/>
</Node>
</Node>
<Node>
  <NodeName>PP</NodeName>
  <DFProperties>
    <AccessType>
      <Get/>
    </AccessType>
  </DFProperties>
  <Value/>
</Node>

```

```

        </AccessType>
        <DFFormat>
            <node/>
        </DFFormat>
        <Occurrence>
            <One/>
        </Occurrence>
        <DFTitle>DECT.PP</DFTitle>
        <DFType>
            <DDFName/>
        </DFType>
    </DFProperties>
</Node>
    <NodeName/>
    <DFProperties>
        <AccessType></AccessType>
        <DFFormat>
            <node/>
        </DFFormat>
        <Occurrence>
            <OneOrMore/>
        </Occurrence>
        <DFTitle/>
        <DFType>
            <DDFName/>
        </DFType>
    </DFProperties>
</Node>
    <NodeName>Id</NodeName>
    <DFProperties>
        <AccessType></AccessType>
        <DefaultValue></DefaultValue>
        <Description/>
        <DFFormat>
            <int/>
        </DFFormat>
        <Occurrence>
            <One/>
        </Occurrence>
        <Scope>
            <Permanent/>
        </Scope>
        <DFTitle/>
        <DFType>
            <MIME>text/plain</MIME>
        </DFType>
        <CaseSense/>
    </DFProperties>
    <Value/>
</Node>
<Node>
    <NodeName>IPEI</NodeName>
    <DFProperties>
        <AccessType>
            <Get/>
        </AccessType>
        <DefaultValue></DefaultValue>
        <Description/>
        <DFFormat>
            <bin/>
        </DFFormat>
        <Occurrence>
            <One/>

```

```

        </Occurrence>
        <Scope>
            <Permanent/>
        </Scope>
        <DFTitle/>
        <DFType>
            <MIME>text/plain</MIME>
        </DFType>
        <CaseSense/>
    </DFProperties>
    <Value/>
</Node>
<Node>
    <NodeName>TerminalID</NodeName>
    <DFProperties>
        <AccessType>
            <Get/>
        </AccessType>
        <DefaultValue></DefaultValue>
        <Description/>
        <DFFormat>
            <int/>
        </DFFormat>
        <Occurrence>
            <One/>
        </Occurrence>
        <Scope>
            <Permanent/>
        </Scope>
        <DFTitle/>
        <DFType>
            <MIME>text/plain</MIME>
        </DFType>
        <CaseSense/>
    </DFProperties>
    <Value/>
</Node>
<Node>
    <NodeName>Status</NodeName>
    <DFProperties>
        <AccessType>
            <Get/>
        </AccessType>
        <DefaultValue></DefaultValue>
        <Description/>
        <DFFormat>
            <int/>
        </DFFormat>
        <Occurrence>
            <One/>
        </Occurrence>
        <Scope>
            <Permanent/>
        </Scope>
        <DFTitle/>
        <DFType>
            <MIME>text/plain</MIME>
        </DFType>
        <CaseSense/>
    </DFProperties>
    <Value/>
</Node>
</Node>

```



```

        <NodeName>RegCtrl</NodeName>
        <DFProperties>
            <AccessType></AccessType>
            <DefaultValue></DefaultValue>
            <Description/>
            <DFFormat>
                <int/>
            </DFFormat>
            <Occurrence>
                <One/>
            </Occurrence>
            <Scope>
                <Permanent/>
            </Scope>
            <DFTitle/>
            <DFType>
                <MIME>text/plain</MIME>
            </DFType>
            <CaseSense/>
        </DFProperties>
        <Value/>
    </Node>
</Node>
</Node>
<Node>
    <NodeName>PPCCapabilities</NodeName>
    <DFProperties>
        <AccessType>
            <Get/>
        </AccessType>
        <DFFormat>
            <node/>
        </DFFormat>
        <Occurrence>
            <One/>
        </Occurrence>
        <DFTitle>DECT.PPCCapabilities</DFTitle>
        <DFType>
            <DDFName/>
        </DFType>
    </DFProperties>
    <Node>
        <NodeName/>
        <DFProperties>
            <AccessType></AccessType>
            <DFFormat>
                <node/>
            </DFFormat>
            <Occurrence>
                <OneOrMore/>
            </Occurrence>
            <DFTitle/>
            <DFType>
                <DDFName/>
            </DFType>
        </DFProperties>
    </Node>
    <NodeName>Id</NodeName>
    <DFProperties>
        <AccessType></AccessType>
        <DefaultValue></DefaultValue>
        <Description/>
        <DFFormat>

```

```

        <int/>
      </DFFormat>
      <Occurrence>
        <One/>
      </Occurrence>
      <Scope>
        <Permanent/>
      </Scope>
      <DFTitle/>
      <DFType>
        <MIME>text/plain</MIME>
      </DFType>
      <CaseSense/>
    </DFProperties>
    <Value/>
  </Node>
  <Node>
    <NodeName>Display</NodeName>
    <DFProperties>
      <AccessType></AccessType>
      <DefaultValue></DefaultValue>
      <Description/>
      <DFFormat>
        <int/>
      </DFFormat>
      <Occurrence>
        <One/>
      </Occurrence>
      <Scope>
        <Permanent/>
      </Scope>
      <DFTitle/>
      <DFType>
        <MIME>text/plain</MIME>
      </DFType>
      <CaseSense/>
    </DFProperties>
    <Value/>
  </Node>
  <Node>
    <NodeName>Tone</NodeName>
    <DFProperties>
      <AccessType></AccessType>
      <DefaultValue></DefaultValue>
      <Description/>
      <DFFormat>
        <int/>
      </DFFormat>
      <Occurrence>
        <One/>
      </Occurrence>
      <Scope>
        <Permanent/>
      </Scope>
      <DFTitle/>
      <DFType>
        <MIME>text/plain</MIME>
      </DFType>
      <CaseSense/>
    </DFProperties>
    <Value/>
  </Node>
</Node>

```

```

    <NodeName>Echo</NodeName>
    <DFProperties>
      <AccessType></AccessType>
      <DefaultValue></DefaultValue>
      <Description/>
      <DFFormat>
        <int/>
      </DFFormat>
      <Occurrence>
        <One/>
      </Occurrence>
      <Scope>
        <Permanent/>
      </Scope>
      <DFTitle/>
      <DFType>
        <MIME>text/plain</MIME>
      </DFType>
      <CaseSense/>
    </DFProperties>
    <Value/>
  </Node>
  <Node>
    <NodeName>AmbientNoiseRejection</NodeName>
    <DFProperties>
      <AccessType></AccessType>
      <DefaultValue></DefaultValue>
      <Description/>
      <DFFormat>
        <int/>
      </DFFormat>
      <Occurrence>
        <One/>
      </Occurrence>
      <Scope>
        <Permanent/>
      </Scope>
      <DFTitle/>
      <DFType>
        <MIME>text/plain</MIME>
      </DFType>
      <CaseSense/>
    </DFProperties>
    <Value/>
  </Node>
  <Node>
    <NodeName>AdaptiveVolumeCtrl</NodeName>
    <DFProperties>
      <AccessType></AccessType>
      <DefaultValue></DefaultValue>
      <Description/>
      <DFFormat>
        <int/>
      </DFFormat>
      <Occurrence>
        <One/>
      </Occurrence>
      <Scope>
        <Permanent/>
      </Scope>
      <DFTitle/>
      <DFType>
        <MIME>text/plain</MIME>
      </DFType>
    </DFProperties>
    <Value/>
  </Node>

```

```

        </DFTType>
        <CaseSense/>
    </DFProperties>
    <Value/>
</Node>
<Node>
    <NodeName>SlotType</NodeName>
    <DFProperties>
        <AccessType></AccessType>
        <DefaultValue></DefaultValue>
        <Description/>
        <DFFormat>
            <bin/>
        </DFFormat>
        <Occurrence>
            <One/>
        </Occurrence>
        <Scope>
            <Permanent/>
        </Scope>
        <DFTitle/>
        <DFTType>
            <MIME>text/plain</MIME>
        </DFTType>
        <CaseSense/>
    </DFProperties>
    <Value/>
</Node>
<Node>
    <NodeName>StoredDisplayChars</NodeName>
    <DFProperties>
        <AccessType></AccessType>
        <DefaultValue></DefaultValue>
        <Description/>
        <DFFormat>
            <int/>
        </DFFormat>
        <Occurrence>
            <One/>
        </Occurrence>
        <Scope>
            <Permanent/>
        </Scope>
        <DFTitle/>
        <DFTType>
            <MIME>text/plain</MIME>
        </DFTType>
        <CaseSense/>
    </DFProperties>
    <Value/>
</Node>
<Node>
    <NodeName>DisplayLines</NodeName>
    <DFProperties>
        <AccessType></AccessType>
        <DefaultValue></DefaultValue>
        <Description/>
        <DFFormat>
            <int/>
        </DFFormat>
        <Occurrence>
            <One/>
        </Occurrence>
    </DFProperties>
    <Value/>

```

```

        <Scope>
            <Permanent/>
        </Scope>
        <DFTitle/>
        <DFType>
            <MIME>text/plain</MIME>
        </DFType>
        <CaseSense/>
    </DFProperties>
    <Value/>
</Node>
<Node>
    <NodeName>CharsPerDisplayLine</NodeName>
    <DFProperties>
        <AccessType></AccessType>
        <DefaultValue></DefaultValue>
        <Description/>
        <DFFormat>
            <int/>
        </DFFormat>
        <Occurrence>
            <One/>
        </Occurrence>
        <Scope>
            <Permanent/>
        </Scope>
        <DFTitle/>
        <DFType>
            <MIME>text/plain</MIME>
        </DFType>
        <CaseSense/>
    </DFProperties>
    <Value/>
</Node>
<Node>
    <NodeName>ScrollBehavior</NodeName>
    <DFProperties>
        <AccessType></AccessType>
        <DefaultValue></DefaultValue>
        <Description/>
        <DFFormat>
            <int/>
        </DFFormat>
        <Occurrence>
            <One/>
        </Occurrence>
        <Scope>
            <Permanent/>
        </Scope>
        <DFTitle/>
        <DFType>
            <MIME>text/plain</MIME>
        </DFType>
        <CaseSense/>
    </DFProperties>
    <Value/>
</Node>
<Node>
    <NodeName>Profile</NodeName>
    <DFProperties>
        <AccessType></AccessType>
        <DefaultValue></DefaultValue>
        <Description/>

```

```

        <DFFormat>
            <bin/>
        </DFFormat>
        <Occurrence>
            <One/>
        </Occurrence>
        <Scope>
            <Permanent/>
        </Scope>
        <DFTitle/>
        <DFType>
            <MIME>text/plain</MIME>
        </DFType>
        <CaseSense/>
    </DFProperties>
    <Value/>
</Node>
</Node>
</Node>
</MgmtTree>

```

B.5 DECT-SIP OMA Management Objects (MO)

B.5.1 DECT-SIP High Level MO

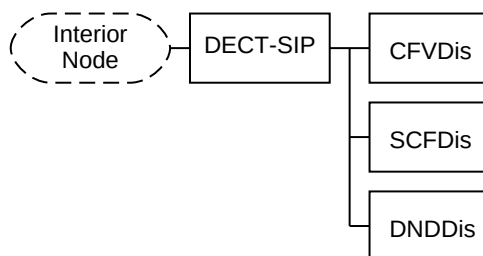


Figure 25 - DECT-SIP High Level OMA Management

B.5.2 DECT-SIP Nodes

B.5.2.1 DECT-SIP CFVDis Node MO tree

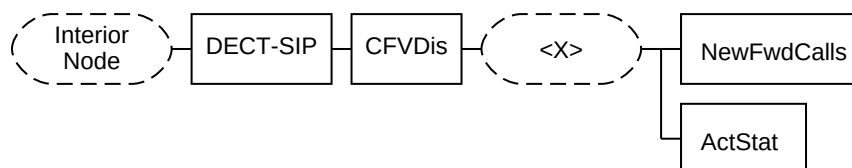


Figure 26 - Node CFVDis of DECT OMA Management

B.5.2.2 DECT-SIP CFVDis MO Node Description

MO Element	Status	Occurrence	Format	Access Type
./DECT-SIP/CFVDis	current	One	Node	Get
./DECT-SIP/CFVDis<X>	current	OneOrMore	Node	Get, Replace
./DECT-SIP/NewFwdCalls/<X>/NewFwdCalls	current	OneOrZero	chr	Get, Replace
./DECT-SIP/ActStat/<X>/ActStat	current	OneOrZero	Chr	Get, Replace

B.5.2.3 DECT-SIP SCFDis Node MO tree**Figure 27 - Node SCFDis of DECT OMA Management****B.5.2.4 DECT-SIP SCFDis MO Node Description**

MO Element	Status	Occurrence	Format	Access Type
./DECT-SIP/SCFDis	current	One	Node	Get
./DECT-SIP/SCFDis<X>	current	OneOrMore	Node	Get, Replace
./DECT-SIP/NewFwdCalls/<X>/NewFwdCalls	current	OneOrZero	chr	Get, Replace

B.5.2.5 DECT-SIP DNDDis Node MO tree**Figure 28 - Node DNDDis of DECT OMA Management****B.5.2.6 DECT-SIP DNDDis MO Node Description**

MO Element	Status	Occurrence	Format	Access Type
./DECT-SIP/DNDDis	current	One	Node	Get
./DECT-SIP/DNDDis<X>	current	OneOrMore	Node	Get, Replace
./DECT-SIP/ActStat/<X>/ActStat	current	OneOrZero	chr	Get, Replace

B.5.3 DECT-SIP OMA Device Description Framework (DDF)

```

<?xml version="1.0"?>
<MgmtTree">
  <VerDTD>1.2</VerDTD>
  <Man>PacketCable - Cable Laboratories Inc.</Man>
  <!--This DDF considers as model the UE MO (as defined in the PacketCable
specifications) followed by a colon character (e.g., DECT-SIP:) -->
  <Mod>DECT-SIP:</Mod>
  <Node>
    <NodeName>DECT-SIP</NodeName>
    <Path>./Pktc</Path>
    <DFProperties>
      <AccessType>
        <Get/>
      </AccessType>
    </DFProperties>
  </Node>
</MgmtTree>
  
```

```

        <DefaultValue/>
        <Description>The node that defines the DECT-SIP  M0
tree.</Description>
        <DFFormat>
            <node/>
        </DFFormat>
        <Occurrence>
            <One/>
        </Occurrence>
        <Scope>
            <Permanent/>
        </Scope>
        <DFTitle>The interior node holding all nodes of the PacketCable
DECT-SIP M0 three</DFTitle>
        <DFType>
            <DDFName>urn:cablelabs:packetcable:ddf:dect-sip</DDFName>
        </DFType>
        <CaseSense>
            <CIS/>
        </CaseSense>
    </DFProperties>
    <Node>
        <NodeName>CFVDis</NodeName>
        <DFProperties>
            <AccessType>
                <Get/>
            </AccessType>
            <DFFormat>
                <node/>
            </DFFormat>
            <Occurrence>
                <One/>
            </Occurrence>
            <DFTitle>DECT-SIP.CFVDis</DFTitle>
            <DFType>
                <DDFName/>
            </DFType>
        </DFProperties>
    </Node>
    <Node>
        <NodeName/>
        <DFProperties>
            <AccessType></AccessType>
            <DFFormat>
                <node/>
            </DFFormat>
            <Occurrence>
                <OneOrMore/>
            </Occurrence>
            <DFTitle/>
            <DFType>
                <DDFName/>
            </DFType>
        </DFProperties>
    </Node>
    <Node>
        <NodeName>NewFwdCalls</NodeName>
        <DFProperties>
            <AccessType></AccessType>
            <DefaultValue>""</DefaultValue>
            <Description/>
            <DFFormat><chr/></DFFormat>
            <Occurrence>
                <One/>
            </Occurrence>

```



```

        <Scope>
            <Permanent/>
        </Scope>
        <DFTitle/>
        <DFType>
            <MIME>text/plain</MIME>
        </DFType>
        <CaseSense/>
    </DFProperties>
    <Value/>
</Node>
<Node>
    <NodeName>ActStat</NodeName>
    <DFProperties>
        <AccessType></AccessType>
        <DefaultValue>""</DefaultValue>
        <Description/>
        <DFFormat><chr/></DFFormat>
        <Occurrence>
            <One/>
        </Occurrence>
        <Scope>
            <Permanent/>
        </Scope>
        <DFTitle/>
        <DFType>
            <MIME>text/plain</MIME>
        </DFType>
        <CaseSense/>
    </DFProperties>
    <Value/>
</Node>
</Node>
</Node>
<Node>
    <NodeName>SCFDis</NodeName>
    <DFProperties>
        <AccessType>
            <Get/>
        </AccessType>
        <DFFormat>
            <node/>
        </DFFormat>
        <Occurrence>
            <One/>
        </Occurrence>
        <DFTitle>DECT-SIP.SCFDis</DFTitle>
        <DFType>
            <DDFName/>
        </DFType>
    </DFProperties>
    <Node>
        <NodeName/>
        <DFProperties>
            <AccessType></AccessType>
            <DFFormat>
                <node/>
            </DFFormat>
            <Occurrence>
                <OneOrMore/>
            </Occurrence>
            <DFTitle/>
            <DFType>

```

```

        <DDFName/>
      </DFTType>
    </DFProperties>
  <Node>
    <NodeName>NewFwdCalls</NodeName>
    <DFProperties>
      <AccessType></AccessType>
      <DefaultValue>""</DefaultValue>
      <Description/>
      <DFFormat><chr/></DFFormat>
      <Occurrence>
        <One/>
      </Occurrence>
      <Scope>
        <Permanent/>
      </Scope>
      <DFTitle/>
      <DFTType>
        <MIME>text/plain</MIME>
      </DFTType>
      <CaseSense/>
    </DFProperties>
    <Value/>
  </Node>
</Node>
<Node>
  <NodeName>DNDDis</NodeName>
  <DFProperties>
    <AccessType>
      <Get/>
    </AccessType>
    <DFFormat>
      <node/>
    </DFFormat>
    <Occurrence>
      <One/>
    </Occurrence>
    <DFTitle>DECT-SIP.DNDDis</DFTitle>
    <DFTType>
      <DDFName/>
    </DFTType>
  </DFProperties>
  <Node>
    <NodeName/>
    <DFProperties>
      <AccessType></AccessType>
      <DFFormat>
        <node/>
      </DFFormat>
      <Occurrence>
        <OneOrMore/>
      </Occurrence>
      <DFTitle/>
      <DFTType>
        <DDFName/>
      </DFTType>
    </DFProperties>
  <Node>
    <NodeName>ActStat</NodeName>
    <DFProperties>
      <AccessType></AccessType>
      <DefaultValue>""</DefaultValue>

```

```

        <Description/>
        <DFFormat><chr/></DFFormat>
        <Occurrence>
            <One/>
        </Occurrence>
        <Scope>
            <Permanent/>
        </Scope>
        <DFTitle/>
        <DFType>
            <MIME>text/plain</MIME>
        </DFType>
        <CaseSense/>
    </DFProperties>
    <Value/>
</Node>
</Node>
</Node>
</MgmtTree>
```

Annex C PacketCable HDV Client Object Model

C.1 MDI Object Model Overview

This section defines the management model for the Media Delivery Interface (MDI) as described in Section 6.1. Unless specified, the PacketCable clients will not persist operator configured data after reinitialization for the data models herein described. Other documents that reference this object model might change the persistent requirement of the device. This data model is defined after the PacketCable clients E-MTA, E-DVA, and S-DVA and may be applicable to other types of PacketCable devices.

C.2 MDI Object Model Definitions

C.2.1 MDI Object Model Data Types

This section defines the data types used in the MDI object model.

Table 23 - Data Type Definitions

Data Type Name	Base Type	Permitted Values
PkctMdiType	Enum	pots(1) dectPP(2)

C.2.1.1 *PkctMdiType*

This data type represents the MDI types.

The term 'pots' refers to Plan Old Telephony Service analog phone lines.

The term 'dect' refers to DECT PP air interface.

C.2.2 MDI Object Model Class Diagram

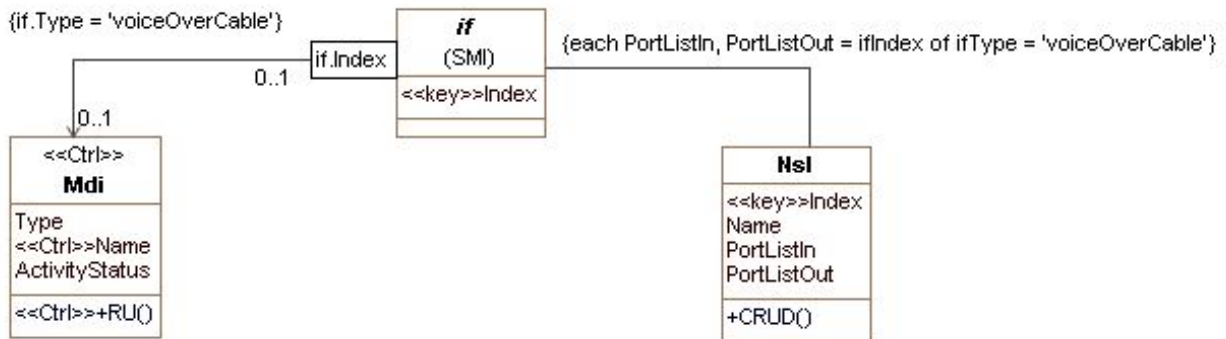


Figure 29 - MDI Object Model Diagram

C.2.3 MDI Object Model Description

C.2.3.1 *Mdi Object*

This object represents the list of Media Delivery Interfaces (MDI) of the device.

Object Operations:

The device associates one instance of this object for each type of port.

For POTS Ports the Instance identifier corresponds to the Interface Index (i.e., ifIndex) associated to the POTS (e.g., ifIndex 9).

For DECT Ports there is an instance for each paired PP in the order of appearance in a manner that the assigned entry identifier (Interface Index) is persistent cross device initializations while the PP stays paired within the FP. Each PP association with the interface Index is maintained by the unique PP identifier (e.g., IPEI). The starting ifIndex number is defined in the device capabilities.

Reference: [HDV]

Table 24 - Mdi Object

Attribute Name	Type	Access	Type Constraints	Units	Default
Type	PktcMdiType	R			
Name	AdminString	RU			
ActivityStatus	Enum	R	inactive(1) active (2)		

Type

This attribute represents the interface Type of the MDI port.

Name

This attribute represents the name assigned by the user or operator to the media port. This attribute provides an identification of the media port in a human readable format. For example: 'Office Line', 'Fax Line', telephone number, etc.

By default the FP populates the following values:

- For POTS as 'TERM n' where n = 1..m and n=1 corresponds to ifIndex = 9
- For DECT handsets as 'handset n' where n = 1..p and p is the maximum number of PP supported or allowed to register, whichever is small. Typically 'n' corresponds to the PP terminal identifier.

ActivityStatus

This attribute indicates the service media activities potentially going on for the particular MDI:

- 'notactive': No service media activities are currently happening through the port.
- 'active': There are service media activities on the port. Examples of services media activities (e.g., telephony) are: tones generated on the port in response to SIP requests, loopback tests, etc. The particular definition of all Telephony activities should be specified in the corresponding document for the particular PacketCable client.

C.2.3.2 Nsl Object

This object represents the Network Service Line definitions of the device. This object allows the aggregation of MDIs as part of a NSL.

Object Operations

A PacketCable HDV client that supports a single analog line MUST consider all the MDIs as part of a single line NSL#1.

A PacketCable HDV client capable of multi-line support that has not configured an instance in the Nsl object MUST consider all MDIs as part of a single line NSL#1.

Table 25 - Nsl Object

Attribute Name	Type	Access	Type Constraints	Units	Default
Index	Index	key	1..256		

Name	AdminString	CRUD			"
PortListIn	AdminString	CRUD			"
PortListOut	AdminString	CRUD			"

Index

This key represent the unique identifier of a Network Service Line (NSL) assigned by the Operator to the Subscriber. In NCS this value represents the numeric value of an CNS telephony endpoint (aaln/#).

In RST this number represents the number in a NSL#N tag and is used in the mapping of RST users and PacketCable applications.

Name

This attribute represents the line name assigned by a User or by the operator. This attribute provides an identification of the Service Line in a human readable format. For example: 'Office Line', 'Fax Line' etc. Another example of human-readable identification is the Telephone Number associated with the particular NSL.

PortListIn

This attribute represents the comma separated list of MDI Indexes (MDI.Index attribute) associated with this NSL object instance for incoming calls.

PortListOut

This attribute represents the comma separated list of MDI Indexes (MDI.Index attribute) associated with this NSL object instance for outgoing requests. For the voice telephony service, this attribute does not preclude a HDV PP to make an outgoing call from a phone line not associated with the NSL.

C.3 MDI SNMP MIB MODULES

C.3.1 MDI SNMP MIB MODULE

```

PKTC-MDI-MIB DEFINITIONS ::= BEGIN
IMPORTS
    MODULE-IDENTITY,
    OBJECT-TYPE,
    Unsigned32
        FROM SNMPv2-SMI
    OBJECT-GROUP,
    MODULE-COMPLIANCE
        FROM SNMPv2-CONF
    SnmpAdminString
        FROM SNMP-FRAMEWORK-MIB

    TEXTUAL-CONVENTION,
    RowStatus
        FROM SNMPv2-TC
    ifIndex
        FROM IF-MIB
    pktcApplicationMibs
        FROM CLAB-DEF-MIB;

pktcMdiMib MODULE-IDENTITY
    LAST-UPDATED "200909170000Z" -- September 17, 2009
    ORGANIZATION "Cable Television Laboratories, Inc."
    CONTACT-INFO
        "Broadband Network Services
        Cable Television Laboratories, Inc.
        858 Coal Creek Circle,
        Louisville, CO 80027, USA
        Phone: +1 303-661-9100
        Email: mibs@cablelabs.com

        Acknowledgements:
        Thomas Clack, Broadcom
        Eugene Nechamkin, Broadcom
        Josh Littlefield, Cisco
        Jerry Mahler, Motorola
        Eduardo Cardona, CableLabs."
    DESCRIPTION
        "This MIB module contains the PacketCable client
        Telephony Delivery Interface (MDI) and Network
        Delivery Interface relationships."
    REVISION "200909170000Z" -- September 17, 2009
    DESCRIPTION
        "Revised version includes ECN
        DECT-PROV-N-09.0576-8
        and published as part of PKT-SP-DECT-PROV-I02"
    REVISION "200902260000Z" -- February 26, 2009
    DESCRIPTION
        "Initial version, published as part of the CableLabs
        DECT Provisioning Specification
        PKT-SP-DECT-PROV-I01-090226
        Copyright 2009 Cable Television Laboratories, Inc.
        All rights reserved."
    ::= { pktcApplicationMibs 6 }

-- Textual Conventions

PktcMdiType ::= TEXTUAL-CONVENTION
    STATUS      current

```

```

DESCRIPTION
    "This data type represents the MDI types.
    'pots' refers to Plan Old Telephony Service analog phone
    lines.
    'dectFP' refers to DECT FP air interface.
    'dectPP' refers to DECT PP air interface."
REFERENCE
    "PacketCable DECT-HDV Specification"
SYNTAX      INTEGER
            {
                pots(1),
                dectPP(2)
            }

-- Object Definitions
pktcMdiNotifications OBJECT IDENTIFIER ::= { pktcMdiMib 0 }
pktcMdiObjects OBJECT IDENTIFIER ::= { pktcMdiMib 1 }

pktcMdiMdiTable OBJECT-TYPE
    SYNTAX      SEQUENCE OF PktcMdiMdiEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "This object represents the list of Media Delivery
        Interface (MDI) of the device."
    REFERENCE
        "PacketCable DECT Provisioning Specification"
    ::= {pktcMdiObjects 1 }

pktcMdiMdiEntry OBJECT-TYPE
    SYNTAX      PktcMdiMdiEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "The Conceptual row of pktcMdiMdiTable.
        The device associates one instance of this object for each
        type of port.
        For POTS Ports the Instance identifier corresponds to the
        Interface Index (i.e., ifIndex) associated to the POTS
        (e.g., ifIndex 9...)
        For DECT Ports there is an instance for each paired PP in
        the order of appearance in a manner that the assigned entry
        identifier (Interface Index) is persistent cross device
        initializations while the PP stays paired within the FP. Each
        PP association with the interface Index is maintained by the
        unique PP identifier (e.g., IPEI). The starting ifIndex number
        is defined in the device capabilities."
    INDEX {
        ifIndex
    }
    ::= {pktcMdiMdiTable 1 }

PktcMdiMdiEntry ::= SEQUENCE {

    pktcMdiMdiType
        PktcMdiType,
    pktcMdiMdiName
        SnmpAdminString,
    pktcMdiMdiActivityStatus
        INTEGER
    }

pktcMdiMdiType OBJECT-TYPE

```


SYNTAX PktdMdiType
 MAX-ACCESS read-only
 STATUS current
 DESCRIPTION
 "This attribute represents the identifier of the Media Port in the context of the MDI type.
 It can be used as a reference point to objects related to the particular Media Port. For DECT Media Ports, this attribute represents a unique identifier of the DECT handset (PP), typically the value of 'IPEI' contained in the PUN part of the IPUI is used by default, and for DECT handsets of type residential/default. IPEI is 36 bits, therefore, the representation of this attribute is a 5-octet string with the 4 MSB set to '0'. For POTS media Ports this attribute has no meaning and reports a sequential number for the set of POTS available."
 ::= {pktdMdiMdiEntry 1 }

pktdMdiMdiName OBJECT-TYPE
 SYNTAX SnmpAdminString
 MAX-ACCESS read-write
 STATUS current
 DESCRIPTION
 "This attribute represents the name assigned by the user or operator to the media port. This attribute provides an identification of the media port in a human readable format. For example: 'Office Line', 'Fax Line', telephone number, etc.

 By default the FP populates the following values:
 For POTS as 'TERM n' where n = 1..m and n=1 corresponds to ifIndex = 9
 For DECT handsets as 'handset n' where n = 1..p and p is the maximum number of PP supported or allowed to register, which ever is small. Typically 'n' corresponds to the PP terminal identifier."
 ::= {pktdMdiMdiEntry 2 }

pktdMdiMdiActivityStatus OBJECT-TYPE
 SYNTAX INTEGER
 {
 active(1),
 inactive(2)
 }

 MAX-ACCESS read-only
 STATUS current
 DESCRIPTION
 "This attribute indicates the service media activities potentially going on for the particular MDI:

 'notActive':
 No service media activities are currently happening through the port.

 'active':
 There are service media activities on the port. Examples of Services media activities (e.g., telephony) are: tones generated on the port in response to SIP requests, loopback tests, etc.

 The particular definition of all Telephony activities should be specified in the corresponding document for the particular PacketCable client."
 ::= {pktdMdiMdiEntry 3 }

```

pktcMdiNslTable OBJECT-TYPE
    SYNTAX      SEQUENCE OF PktcMdiNslEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "This object represents the Network Service Line definitions
        of the device. This object allows the aggregation of MDIs as
        part of a NSL."
    REFERENCE
        "PacketCable DECT Provisioning Specification"
    ::= {pktcMdiObjects 2 }

pktcMdiNslEntry    OBJECT-TYPE
    SYNTAX      PktcMdiNslEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "The Conceptual row of pktcMdiNslTable.
        A PacketCable HDV client that supports a single analog line
        must consider all the MDIs as part of a single line NSL#1
        A PacketCable HDV client capable of multi-line support that has
        not configured an instance in the Nsl object must consider all
        MDIs as part of a single line NSL#1."
    INDEX {
        pktcMdiNslIndex
    }
    ::= {pktcMdiNslTable 1 }

PktcMdiNslEntry ::= SEQUENCE {
    pktcMdiNslIndex
        Unsigned32,
    pktcMdiNslName
        SnmpAdminString,
    pktcMdiNslPortListIn
        SnmpAdminString,
    pktcMdiNslPortListOut
        SnmpAdminString,
    pktcMdiNslRowStatus
        RowStatus
}

pktcMdiNslIndex    OBJECT-TYPE
    SYNTAX      Unsigned32
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "This key represents the unique identifier of a Network Service
        Line (NSL) assigned by the Operator to the Subscriber. In NCS
        this value represents the numeric value of an CNS telephony
        endpoint (aaln/#).

        In RST this number represents the number in a NSL# tag and used
        in the mapping of RST users and PacketCable applications."
    ::= {pktcMdiNslEntry 1 }

pktcMdiNslName      OBJECT-TYPE
    SYNTAX      SnmpAdminString
    MAX-ACCESS  read-create
    STATUS      current
    DESCRIPTION
        "This attribute represents the line name assigned by a User
        or by the operator. This attribute provides an identification

```

```

    of the Service Line in a human-readable format.
    For example: 'Office Line', 'Fax Line' etc.
    Another example of human-readable identification is the
    Telephone Number associated with the particular NSL."
 ::= {pktcMdiNslEntry 2 }

pktcMdiNslPortListIn    OBJECT-TYPE
    SYNTAX      SnmpAdminString
    MAX-ACCESS   read-create
    STATUS      current
    DESCRIPTION
        "This attribute represents the comma separated list of MDI
        Indexes (MDI.Index attribute) associated with this NSL object
        instance for incoming calls."
 ::= {pktcMdiNslEntry 3 }

pktcMdiNslPortListOut    OBJECT-TYPE
    SYNTAX      SnmpAdminString
    MAX-ACCESS   read-create
    STATUS      current
    DESCRIPTION
        "This attribute represents the comma separated list of MDI
        Indexes (MDI.Index attribute) associated with this NSL
        object instance for outgoing requests.
        For the voice telephony service this attribute does not
        preclude a HDV PP to make an outgoing call from a phone
        line not associated with the NSL."
 ::= {pktcMdiNslEntry 4 }

pktcMdiNslRowStatus      OBJECT-TYPE
    SYNTAX      RowStatus
    MAX-ACCESS   read-create
    STATUS      current
    DESCRIPTION
        "The conceptual row status of this object."
 ::= {pktcMdiNslEntry 5 }

-- Conformance Definitions
    pktcMdiMibConformance OBJECT IDENTIFIER ::= { pktcMdiMib 2 }
pktcMdiMibCompliances OBJECT IDENTIFIER ::= { pktcMdiMibConformance 1 }
pktcMdiMibGroups      OBJECT IDENTIFIER ::= { pktcMdiMibConformance 2 }

pktcMdiCompliance MODULE-COMPLIANCE
    STATUS      current
    DESCRIPTION
        "The compliance statement for the MDI requirements of
        the PacketCable client device."
    MODULE -- this MODULE
    MANDATORY-GROUPS {
        pktcMdiGroup
    }
 ::= { pktcMdiMibCompliances 1 }

    pktcMdiGroup OBJECT-GROUP
OBJECTS {
    pktcMdiMdiType,
    pktcMdiMdiName,
    pktcMdiMdiActivityStatus,
    pktcMdiNslName,
    pktcMdiNslPortListIn,
    pktcMdiNslPortListOut,
    pktcMdiNslRowStatus
}

```

```

STATUS      current
DESCRIPTION
    "Group of objects for Telephony Delivery
    Interfaces (MDI)."
```

::= { pktcMdiMibGroups 1 }

END

C.3.2 MDI High Level MO

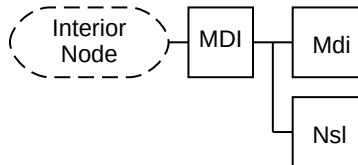


Figure 30 - MDI High Level OMA Management

C.3.3 MDI Nodes

C.3.3.1 MDI Mdi Node MO tree

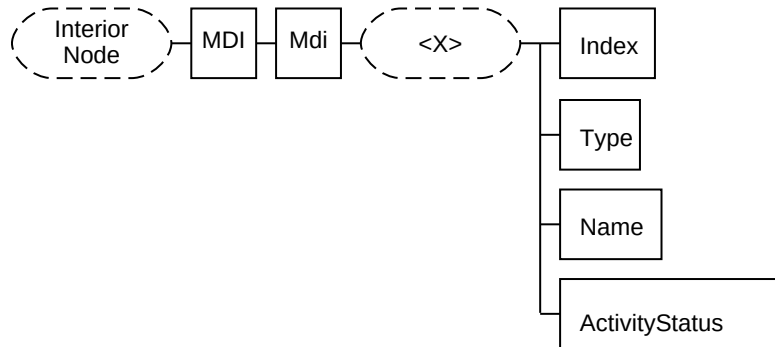
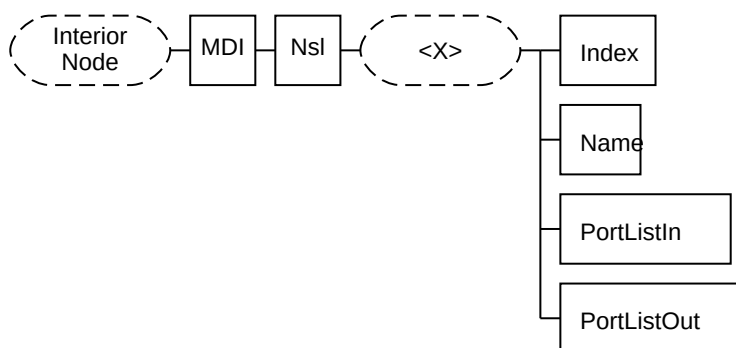


Figure 31 - Node Mdi of MDI OMA Management

C.3.3.2 MDI Mdi MO Node Description

MO Element	Status	Occurrence	Format	Access Type
./MDI/Mdi	current	One	Node	Get
./MDI/Mdi<X>	current	OneOrMore	Node	Get
./MDI/Index/<X>/Index	current	OneOrZero	int	Get
./MDI/Type/<X>/Type	current	OneOrZero	int	Get
./MDI/Name/<X>/Name	current	OneOrZero	chr	Get
./MDI/ActivityStatus/<X>/ActivityStatus	current	OneOrZero	int	Get

C.3.3.3 MDI Nsl Node MO tree**Figure 32 - Node Nsl of MDI OMA Management****C.3.3.4 MDI Nsl MO Node Description**

MO Element	Status	Occurrence	Format	Access Type
./MDI/Nsl	current	One	Node	Get
./MDI/Nsl<X>	current	OneOrMore	Node	Add, Delete, Get, Replace
./MDI/Index/<X>/Index	current	OneOrZero	int	Add, Get, Replace
./MDI/Name/<X>/Name	current	OneOrZero	chr	Add, Get, Replace
./MDI/PortListIn/<X>/PortListIn	current	OneOrZero	chr	Add, Get, Replace
./MDI/PortListOut/<X>/PortListOut	current	OneOrZero	chr	Add, Get, Replace

C.4 MDI OMA Device Description Framework (DDF)

```

<?xml version="1.0"?>
<MgmtTree>
  <VerDTD>1.2</VerDTD>
  <Man>PacketCable - Cable Laboratories Inc.</Man>
  <!--This DDF considers as model the UE MO (as defined in the PacketCable
specifications) followed by a colon character (e.g., MDI:) -->
  <Mod>MDI:</Mod>
  <Node>
    <NodeName>MDI</NodeName>
    <Path>./Pktc</Path>
    <DFProperties>
      <AccessType>
        <Get/>
      </AccessType>
      <DefaultValue/>
      <Description>The node that defines the MDI MO tree.</Description>
      <DFFormat>
        <node/>
      </DFFormat>
      <Occurrence>
        <One/>
      </Occurrence>
      <Scope>
        <Permanent/>
      </Scope>
      <DFTitle>The interior node holding all nodes of the PacketCable
MDI MO three</DFTitle>
      <DFType>

```

```

        <DDFName>urn:cablelabs:packetcable:ddf:mdi</DDFName>
    </DFTType>
    <CaseSense>
        <CIS/>
    </CaseSense>
</DFProperties>
<Node>
    <NodeName>Mdi</NodeName>
    <DFProperties>
        <AccessType>
            <Get/>
        </AccessType>
        <DFFormat>
            <node/>
        </DFFormat>
        <Occurrence>
            <One/>
        </Occurrence>
        <DFTitle>MDI.Mdi</DFTitle>
        <DFTType>
            <DDFName/>
        </DFTType>
    </DFProperties>
</Node>
    <NodeName/>
    <DFProperties>
        <AccessType></AccessType>
        <DFFormat>
            <node/>
        </DFFormat>
        <Occurrence>
            <OneOrMore/>
        </Occurrence>
        <DFTitle/>
        <DFTType>
            <DDFName/>
        </DFTType>
    </DFProperties>
</Node>
    <NodeName>ifIndex</NodeName>
    <DFProperties>
        <AccessType></AccessType>
        <DefaultValue></DefaultValue>
        <Description/>
        <DFFormat>
            <int/>
        </DFFormat>
        <Occurrence>
            <One/>
        </Occurrence>
        <Scope>
            <Permanent/>
        </Scope>
        <DFTitle/>
        <DFTType>
            <MIME>text/plain</MIME>
        </DFTType>
        <CaseSense/>
    </DFProperties>
    <Value/>
</Node>
<Node>
    <NodeName>Type</NodeName>

```

```

    <DFProperties>
      <AccessType>
        <Get/>
      </AccessType>
      <DefaultValue></DefaultValue>
      <Description/>
      <DFFormat>
        <int/>
      </DFFormat>
      <Occurrence>
        <One/>
      </Occurrence>
      <Scope>
        <Permanent/>
      </Scope>
      <DFTitle/>
      <DFType>
        <MIME>text/plain</MIME>
      </DFType>
      <CaseSense/>
    </DFProperties>
    <Value/>
  </Node>
  <Node>
    <NodeName>Name</NodeName>
    <DFProperties>
      <AccessType></AccessType>
      <DefaultValue></DefaultValue>
      <Description/>
      <DFFormat>
        <chr/>
      </DFFormat>
      <Occurrence>
        <One/>
      </Occurrence>
      <Scope>
        <Permanent/>
      </Scope>
      <DFTitle/>
      <DFType>
        <MIME>text/plain</MIME>
      </DFType>
      <CaseSense/>
    </DFProperties>
    <Value/>
  </Node>
  <Node>
    <NodeName>ActivityStatus</NodeName>
    <DFProperties>
      <AccessType>
        <Get/>
      </AccessType>
      <DefaultValue></DefaultValue>
      <Description/>
      <DFFormat>
        <int/>
      </DFFormat>
      <Occurrence>
        <One/>
      </Occurrence>
      <Scope>
        <Permanent/>
      </Scope>
    </DFProperties>
  </Node>

```

```

                                <DFTitle/>
                                <DFType>
                                    <MIME>text/plain</MIME>
                                </DFType>
                                <CaseSense/>
                            </DFProperties>
                            <Value/>
                        </Node>
                    </Node>
                </Node>
            <Node>
                <NodeName>Nsl</NodeName>
                <DFProperties>
                    <AccessType>
                        <Get/>
                    </AccessType>
                    <DFFormat>
                        <node/>
                    </DFFormat>
                    <Occurrence>
                        <One/>
                    </Occurrence>
                    <DFTitle>MDI.Nsl</DFTitle>
                    <DFType>
                        <DDFName/>
                    </DFType>
                </DFProperties>
            </Node>
            <Node>
                <NodeName/>
                <DFProperties>
                    <AccessType></AccessType>
                    <DFFormat>
                        <node/>
                    </DFFormat>
                    <Occurrence>
                        <OneOrMore/>
                    </Occurrence>
                    <DFTitle/>
                    <DFType>
                        <DDFName/>
                    </DFType>
                </DFProperties>
            </Node>
            <Node>
                <NodeName>Index</NodeName>
                <DFProperties>
                    <AccessType></AccessType>
                    <DefaultValue></DefaultValue>
                    <Description/>
                    <DFFormat>
                        <int/>
                    </DFFormat>
                    <Occurrence>
                        <One/>
                    </Occurrence>
                    <Scope>
                        <Permanent/>
                    </Scope>
                    <DFTitle/>
                    <DFType>
                        <MIME>text/plain</MIME>
                    </DFType>
                    <CaseSense/>
                </DFProperties>
            </Node>
        </Node>
    </Node>
</Node>

```



```

        <Value/>
    </Node>
    <Node>
        <NodeName>Name</NodeName>
        <DFProperties>
            <AccessType></AccessType>
            <DefaultValue></DefaultValue>
            <Description/>
            <DFFormat>
                <chr/>
            </DFFormat>
            <Occurrence>
                <One/>
            </Occurrence>
            <Scope>
                <Permanent/>
            </Scope>
            <DFTitle/>
            <DFType>
                <MIME>text/plain</MIME>
            </DFType>
            <CaseSense/>
        </DFProperties>
        <Value/>
    </Node>
    <Node>
        <NodeName>PortListIn</NodeName>
        <DFProperties>
            <AccessType></AccessType>
            <DefaultValue></DefaultValue>
            <Description/>
            <DFFormat>
                <chr/>
            </DFFormat>
            <Occurrence>
                <One/>
            </Occurrence>
            <Scope>
                <Permanent/>
            </Scope>
            <DFTitle/>
            <DFType>
                <MIME>text/plain</MIME>
            </DFType>
            <CaseSense/>
        </DFProperties>
        <Value/>
    </Node>
    <Node>
        <NodeName>PortListOut</NodeName>
        <DFProperties>
            <AccessType></AccessType>
            <DefaultValue></DefaultValue>
            <Description/>
            <DFFormat>
                <chr/>
            </DFFormat>
            <Occurrence>
                <One/>
            </Occurrence>
            <Scope>
                <Permanent/>
            </Scope>

```

```

                                <DFTitle/>
                                <DFType>
                                    <MIME>text/plain</MIME>
                                </DFType>
                                <CaseSense/>
                            </DFProperties>
                            <Value/>
                        </Node>
                    </Node>
                </Node>
            </Node>
        </MgmtTree>
```

Appendix I Examples of Network Service Line Configuration

This section covers the configuration of single-line capable HDV clients and multi-line capable HDV clients for both PacketCable 1.5 and PacketCable 2.0.

In all scenarios it is assumed an HDV client with five terminals (MDI ports): two POTS and three DECT handsets.

Table 26 shows the Media Ports representation in the Interface Table [RFC 2863] (e.g., E-MTA and E-DVA).

Table 26 - Endpoint Representation in the Interface Table

ifIndex	ifType	ifDescription	ifAdminStatus
9	198	"Voice Over Cable Interface"	'up'
10	198	"Voice Over Cable Interface"	'up'
11	198	"Voice Over Cable Interface"	'up'
12	198	"Voice Over Cable Interface"	'up'
13	198	"Voice Over Cable Interface"	'up'

Notation: through these scenarios ***Bold Italic*** text corresponds to operator provisioned data elements, *Italic* text corresponds to default device configuration.

I.1 HDV client Single-line Provisioning

This example assumes an HDV client with a single line subscription and 5 termination devices: two POTS and three DECT. The single-line configuration is shown in Figure 33. The Interfaces index 9 and 10 correspond to the POTS MDIs and the interface Index 11, 12,13 correspond to the DECT handsets after completing pairing and properly registered with the FP.

For the single-line HDV client all MDI Ports are associated with the single-line allowed to the operator. The operator only needs to configure the signaling endpoints.

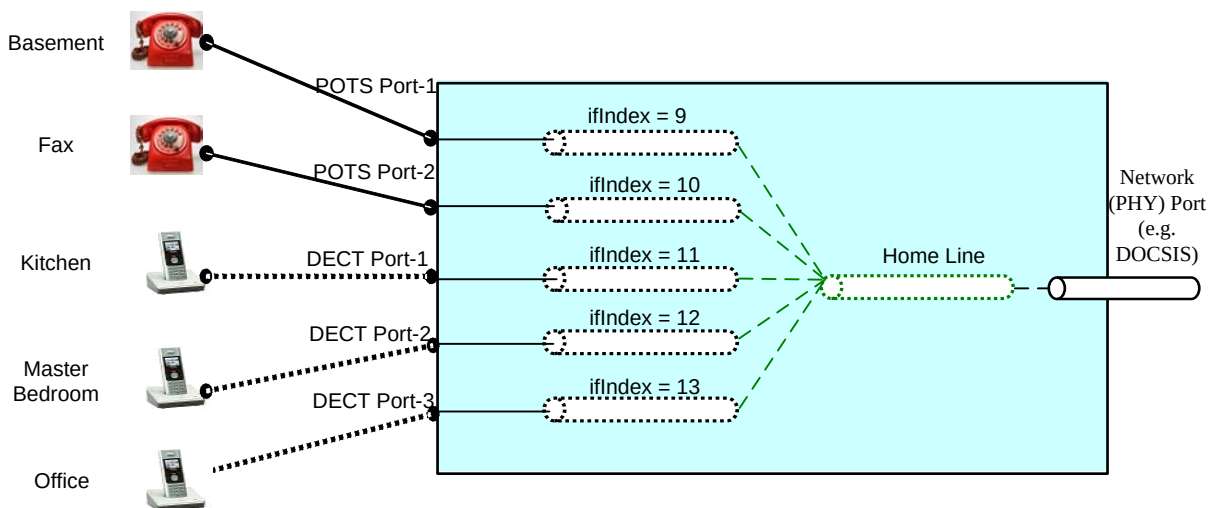


Figure 33 - Single-line Service Configuration

I.1.1 MDI and NSL Provisioning

From the service perspective the Media Ports appear to the operator and user as phone extensions. The operator may optionally configure the MDI Port names (both POTS and DECT PPs) and the single NSL; however, it may be outside the scope of the provisioning system when adding HDV capabilities to the traditional single-line service offer.

I.1.1.1 Mdi Object Configuration

The operator has access to the MDI Ports in the Mdi object for management purposes. Table 27 shows the default configuration of the Mdi object.

Table 27 - Mdi Object Provisioning of POTS

ifIndex	Type	Name	ActivityStatus
9	'pots'	"POTS 9"	'notActive'
10	'pots'	"POTS 10"	'notActive'
11	'pots'	"DECT Handset 1"	'notActive'
12	'pots'	"DECT Handset 2"	'notActive'
13	'pots'	"DECT Handset 3"	'notActive'

The operator may configure the POTS names via the management interface. The operator may configure the DECT PPs name via the management interface after the PPs are paired with the system. The user may configure the names of the DECT PPs locally. However, if the HDV client supports the DECT "List access service" feature, that configuration maybe transferred to the FP and accessible to the operator. Table 28 shows the optional configuration of MDI Port Names. POTS names are configured by the operator and the user configures PP names.

Table 28 - Mdi Object Provisioning of DECT Handsets by the Operator

ifIndex	Type	Name	ActivityStatus
10	'pots'	"Basement"	'notActive'
11	'pots'	"Fax"	'notActive'
11	'dectPP'	"Kitchen"	'notActive'
12	'dectPP'	"Master Bedroom"	'notActive'
13	'dectPP'	"Office"	'notActive'

I.1.1.2 Nsl Object Configuration

Table 29 shows the default instance of the NSL object for the single-line capable HDV client.

Table 29 - Nsl Object Configuration

Index	Name	PortListIn	PortListOut
1	"Line 1"	9,10,11,12,13	9,10,11,12,13

Similarly, as in the case of the MDI object, the operator can configure the name of the NSL via the management interface.

If supported, the user may configure the NSL name via the DECT "Line settings list" List access service as shown in Table 30. At any time the user may change the name of the phone line if allowed (see FP.LockListCfg object attribute in Annex B).

Table 30 - Nsl Object Configuration, DECT Handsets Assigned by User

Index	Name	PortListIn	PortListOut
1	"Home Line"	9,10,11,12,13	9,10,11,12,13

I.1.2 Signaling Provisioning

I.1.2.1 PacketCable 1.5 Signaling HDV Client Provisioning

The operator configures endpoint aaln/1 for the single-line service. The relevant information of the pktNcsEndPntConfigTable is shown in Table 31.

Table 31 - Multi-line Example NCS Endpoint configuration

ifIndex	pktnCsEndPntConfigCallAgentId
9	userALine1@mso1.com

Note: The HDV Single-line client configuration uses a PacketCable 1.5 backward-compatible notation for the endpoint (endpoint ifIndex 9 represents the single line).

I.1.2.2 PacketCable 2.0 Signaling HDV Client Provisioning

The operator configures the user IMPU Object for the RST application. Relevant attributes for the case are shown in Table 32.

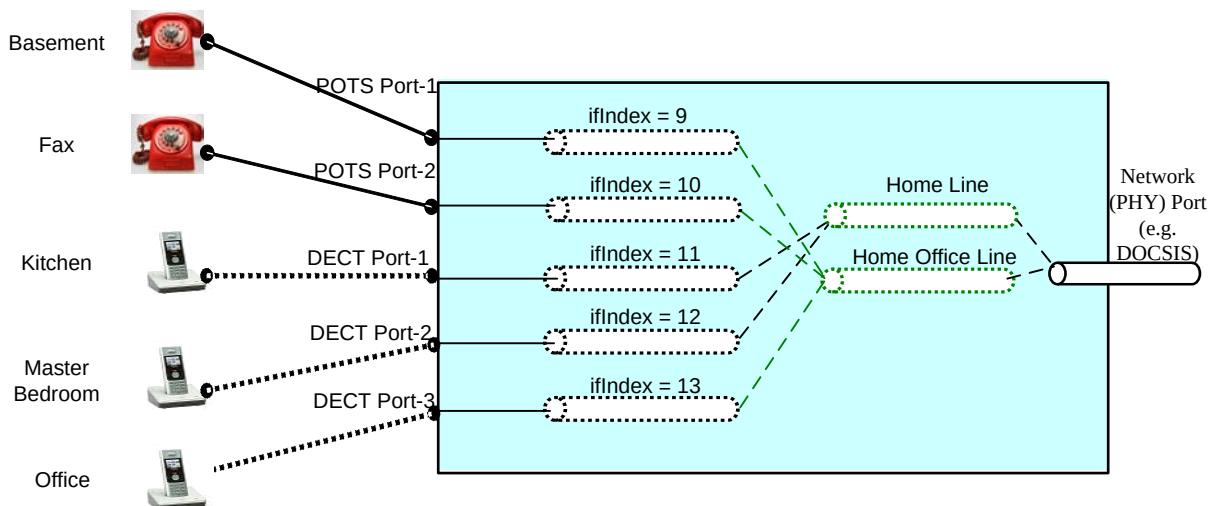
Table 32 - Multi-line Example User Configuration for RST

IMPU.Index	IMPU.Id	IMPU.AdditionalInfo
1	userALine1@mso1.com	IEP#9:OEP#9

Note: The HDV Single-line client configuration uses a PacketCable 2.0 backward-compatible notation.

I.2 HDV client Multi-line Provisioning

This example assumes an HDV client with 2 line subscription: "Home Line" and "Home Office Line"; and 5 termination devices: two POTS and three DECT. The line configuration is shown in Figure 34. The Interfaces index 9 and 10 correspond to the POTS MDIs and the interface Index 11, 12,13 correspond to the DECT handsets after completing pairing and properly registered with the FP.

**Figure 34 - Multi-line Service Configuration**

I.2.1 MDI and NSL Provisioning

The user contracts two phone lines with the operator. The user requested naming the lines as "Home Line", "Office Line" and "Fax Line". The user decides to have 2 analog phones used for the office and one DECT handset. Additionally, the user installs two DECT handsets. The user provides the handsets from retail.

The offered service allows the user to customize the telephone lines configuration assign POTS and DECT handsets to a specific phone lines. To change the association of POTS with phone lines, the user calls the operator, or logs into the operator service portal to make those changes. The configuration of DECT Handsets is possible from the handsets themselves.

The scenarios described for a service in this section are based on the assumption the user defines the layout of the home configuration by assigning the names of the household media ports as "Master Bedroom", "Kitchen", "Office", "Fax" and "Basement". The association of phone lines and terminals as specified in the contract is shown in Table 33. This scenario also assumes the operator configures all terminals for incoming or outgoing call devices.

Table 33 - Media Ports and Phone Lines Configuration

Line Name	Media Port Name
"Office Line"	"Office" (DECT), "Fax" (POTS), "Basement" (POTS)
"Home Line"	"Master Bedroom" (DECT), "Kitchen"(DECT)

I.2.1.1 Mdi Object Provisioning by the Operator

The operator configures the Mdi object instances for the POTS ports as shown in Table 34.

Table 34 - Mdi Object Provisioning of POTS

ifIndex	Type	Name	ActivityStatus
9	'pots'	"Basement"	'notActive'
10	'pots'	"Fax"	'notActive'

For the DECT handsets there are several options to complete the provisioning: The Mdi Indices of the DECT Handsets are not known until the handsets registers with the FP. Therefore, defining what handset type (e.g., model) goes on which line is a user preference rather than an operator decision. Possible scenarios are described in Table 35 and Table 36.

After the user activates the HDV client, the operator assigns the handsets names if requested for the user. This is the case where the operator assists the configuration of the handsets. The operator configured information is then transfer to all handsets as specified in Section 6. This scenario is shown in Table 35.

Table 35 - Mdi Object Provisioning of DECT Handsets by the Operator

ifIndex	Type	Name	ActivityStatus
11	'dectPP'	"Kitchen"	'notActive'
12	'dectPP'	"Master Bedroom"	'notActive'
13	'dectPP'	"Office"	'notActive'

In a second scenario, the user configures the handset names by means of the DECT "Internal name list" List access service as shown in Table 36.

Table 36 - Mdi Object Provisioning of DECT Handsets by the User

ifIndex	Type	Name	ActivityStatus
11	'dectPP'	"Kitchen"	'notActive'
12	'dectPP'	"Master Bedroom"	'notActive'
13	'dectPP'	"Office"	'notActive'

Note: The DECT handsets are not instantiated in the Mdi object until they register with the FP.

At any time the user can change the names of the PPs.

I.2.1.2 Nsl Object Provisioning by the Operator

Table 37 shows the operator provisioning of the Nsl object with the desired mapping of media ports to phone lines (Network Service Lines).

Similarly, as in the case of the MDI object, the operator can configure the POTS assignment to NSL objects first and assist the user with the configuration of the DECT handsets after those are paired.

Table 37 - Nsl Object Configured by Operator

Index	Name	PortListIn	PortListOut
1	Home Office Line	9,10,13	9,10,13
2	Home Line	11,12	11,12

The Nsl object configuration is shown Table 38 for the case where the user configures the DECT handsets assignment to phone lines via the DECT "Line Settings List" List access service.

Table 38 - Nsl Object Configuration, DECT Handsets Assigned by User

Index	Name	PortListIn	PortListOut
1	Home Office Line	9,10,13	9,10,13
2	Home Line	11,12	11,12

If allowed (e.g., see FP.LockListCfg object attribute in Annex B), the user may change the name of the phone line

I.2.2 Signaling Provisioning

I.2.2.1 PacketCable 1.5 Signaling HDV Client Provisioning

The operator configures endpoint aaln/1 as the "Home Office Line" and aaln/2 for the "Home Line", the relevant information of the pktNcsEndPntConfigTable is shown in Table 39.

Table 39 - Multi-line Example NCS Endpoint configuration

ifIndex	pktnCsEndPntConfigCallAgentId
9	userALine1@mso1.com
10	userALine1@mso1.com

I.2.2.2 PacketCable 2.0 Signaling HDV Client Provisioning

The operator configures the user IMPU Object for the RST application. Relevant attributes for the case are shown in Table 40.

Table 40 - Multi-line Example User Configuration for RST

IMPU.Index	IMPU.Id	IMPU.AdditionalInfo
1	<i>userALine1@mso1.com</i>	<i>NSL#1</i>
2	<i>userALine2@mso1.com</i>	<i>NSL#2</i>

Appendix II Acknowledgements

CableLabs wishes to thank the PacketCable Provisioning focus team participants for various contributions and efforts that led to the development of this specification. Specifically, the following individuals are thanked for their direct contributions (alphabetical by company name).

Thomas Clack, Broadcom

Eugene Nechamkin, Broadcom

Josh Littlefield, Cisco

Effi Shiri, DSP Group

Donald Joong, Ericsson

Jerry Mahler, Motorola

Oliver Maiwald, Sitel

Mark Trayer, Samsung

Special thanks are extended to Eugene Nechamkin for being the primary author of this specification.

Luther Smith and the PacketCable Architects, CableLabs, Inc.

Appendix III Revision History

The following Engineering Change Notice was incorporated into PKT-SP-DECT-PROV-I02-091709.

ECN	Date Accepted	Summary
DECT-PROV-N-09.0576-8	8/31/2009	HDVoice Phase II Requirements - Multiline Support (Provisioning)

The following Engineering Change Notice was incorporated into PKT-SP-HDV-PROV-I03-120823.

ECN	Date Accepted	Summary
DECT-PROV-N-12.0681-2	6/25/2012	Adding analog interface to DECT specification

The following Engineering Change Notice was incorporated into PKT-SP-HDV-PROV-I04-130411.

ECN	Date Accepted	Summary	Author
HDV-PROV-N-13.0696-3	2/11/2013	Correction/clarity to MIB definitions. Allows permissions of MIB across the document.	Smith
