PacketCable™ 2.0

E-UE Provisioning Data Model Specification

PKT-SP-EUE-DATA-C01-140314

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Document Status Sheet

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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

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1 SCOPE

1.1 Introduction and Purpose

This specification presents the data element definitions and associated requirements for use with the PacketCable 2.0 E-UE Provisioning Framework. Specifically, it defines data to be used for configuration and management of E-UEs, and associated users. For more information on the PacketCable 2.0 E-UE Provisioning Framework, please refer to [PKT-EUE-PROV].

This document does not consider PacketCable 2.0 application specific data within its scope. PacketCable 2.0 application-specifications are expected to specify such data.

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 providing a description of the PacketCable 2.0 E-UE Provisioning Data Model
- Section 6 – Normative section describing the data model requirements for PacketCable 2.0 E-UEs
- Annex A – PacketCable eUE Common Modules
- Annex B – PacketCable eUE Device Configuration Modules
- Annex C – PacketCable eUE Provisioning and Management Modules
- Annex D – PacketCable eUE Additional Modules
- Appendix I – Illustrative PacketCable Deployment Examples

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.

[CL-MIB-BB]	CableLabs Specifications, Battery Backup MIB Specification, CL-SP-MIB-BB-I04-100608, June 8, 2010, Cable Television Laboratories, Inc.
[DOCSIS-RFI]	DOCSIS Specification, Radio Frequency Interface Specification, CM-SP-RFIv1.1-C01-050907, September 7, 2005, Cable Television Laboratories, Inc.
[eDOCSIS]	eDOCSIS Specification, CM-SP-eDOCSIS-I26-130808, August 8, 2013, Cable Television Laboratories, Inc.
[IETF STD58]	IETF RFC 2578/STD0058, Structure of Management Information Version 2 (SMIv2), April 1999.
[IETF STD62]	IETF RFC 3411/STD0062, An Architecture for Describing Simple Network Management Protocol (SNMP) Management Frameworks, December 2002.
[PKT-EUE-PROV]	PacketCable 2.0 E-UE Provisioning Specification, PKT-SP-EUE-PROV-C01-140314, March 14, 2014, Cable Television Laboratories, Inc.
[PKT-MEM1.5]	PacketCable 1.5 Management Event Mechanism Specification, PKT-SP-MEM1.5-I05-100527, May 27, 2010, Cable Television Laboratories, Inc.
[PKT-SP-PROV1.5]	PacketCable 1.5 Specification, 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 3410]	IETF RFC 3410, Introduction and Applicability Statements for Internet Standard Management Framework, December 2002.
[RFC 3412]	IETF RFC 3412/STD0062, Message Processing and Dispatching for the Simple Network Management Protocol (SNMP), December 2002.
[RFC 3413]	IETF RFC 3413/STD0062, Simple Network Management Protocol (SNMP) Applications, December 2002.
[RFC 3414]	IETF RFC 3414/STD0062, User-based Security Model (USM) for version 3 of the Simple Network Management Protocol (SNMPv3), December 2002.
[RFC 3415]	IETF RFC 3415/STD0062, View-based Access Control Model (VACM) for the Simple Network Management Protocol (SNMP), December 2002.
[RFC 3418]	IETF RFC 3418, Management Information Base (MIB) for the Simple Network Management Protocol (SNMP).
[RFC 3986]	IETF RFC 3986, Uniform Resource Identifier (URI): Generic Syntax, January 2005.
[RFC 4113]	IETF RFC 4113, Management Information Base for the User Datagram Protocol (UDP), June 2005.
[RFC 4291]	IETF RFC 4291, IP Version 6 Addressing Architecture, February 2006.
[RFC 4293]	IETF RFC 4293, Management Information Base for the Internet Protocol (IP), April 2006.

2.2 Informative References

This specification uses the following informative references.

[ARCH-FRM TR]	PacketCable Architecture Framework Technical Report, PKT-TR-ARCH-FRM-C01-140314, March 14, 2014, 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.
- Internet Engineering Task Force (IETF) Secretariat, 48377 Fremont Blvd., Suite 117, Fremont, California 94538, USA, Phone: +1-510-492-4080, Fax: +1-510-492-4001, http://www.ietf.org/.

3 TERMS AND DEFINITIONS

This specification uses the following terms:

Cable Modem	DOCSIS-compliant device which provides data transport connectivity from RFI to IP networks.
Embedded Cable Modem (eCM)	An embedded Cable Modem that has been enhanced with the features of the CableLabs eDOCSIS specification.
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.
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.
Network Management	The functions related to the management of data across the network.
Object Identifier	The sequence of integer positive numbers uniquely identifying the position of each MIB Object in the MIB Hierarchy.
User Datagram Protocol	A connectionless protocol built upon Internet Protocol (IP).

4 ABBREVIATIONS AND ACRONYMS

This specification uses the following abbreviations:

CM	Cable Modem.
DOCSIS®	Data-Over-Cable Service Interface Specifications
eCM	Embedded Cable Modem.
MIB	Management Information Base
OID	Object Identifier.
RFC	Request for Comments. Technical policy documents approved by the IETF which are available on the World Wide Web at http://www.ietf.cnri.reston.va.us/rfc.html.
SNMP	Simple Network Management Protocol. Refer to IETF STD 62
UDP	User Datagram Protocol
VACM	View-based Access Control Model

5 TECHNICAL OVERVIEW

PacketCable 2.0 is a CableLabs specification effort designed to support the convergence of voice, video, data, and mobility technologies. This document is part of the PacketCable 2.0 set of specifications and technical reports that define the base architecture and specifies the data elements required to configure and manage E-UEs, associated users and applications, using the PacketCable 2.0 E-UE Provisioning Framework. For more information about PacketCable 2.0, please refer to the PacketCable 2.0 Architecture Framework Technical Report [ARCH-FRM TR]. For more information on the PacketCable 2.0 E-UE Provisioning Framework, please refer to [PKT-EUE-PROV].

The PacketCable 2.0 E-UE Provisioning Framework relies on SNMP, as specified in [IETF STD62], for configuration and management. The data is specified using Structure of Management Information, Version 2 (SMIv2) Management Information Bases (MIBs), as specified in [IETF STD58]. Thus, this document specifies the configuration and management MIBs for use with the PacketCable 2.0 E-UE Provisioning Framework.

In this specification, the term "DOCSIS" is used to refer to DOCSIS version 1.1 or later, unless explicitly specified otherwise. Additionally, all references to PacketCable within this document are assumed to be PacketCable 2.0, unless stated otherwise.

5.1 Embedded User Equipment (E-UE)

The E-UE is a single physical device embedded with an eDOCSIS-compliant DOCSIS Cable Modem (eCM) and an eUE that complies with eDOCSIS eSAFE and PacketCable UE requirements. For more information on E-UEs please refer to [PKT-EUE-PROV].

5.2 E-UE Provisioning Framework

The E-UE Provisioning Framework is a PacketCable 2.0 configuration and management framework based on the PacketCable 1.5 Device Provisioning specification. For more information on the E-UE Provisioning Framework, please refer to [PKT-EUE-PROV].

This document is to be used in conjunction with the E-UE Provisioning Framework, and also relies on the PacketCable 1.5 Device Provisioning specification. For more information on the latter, please refer to [PKT-SP-PROV1.5].

5.3 E-UE Provisioning Data Model

The E-UE Provisioning Data Model serves eCMs, eUEs, users and associated applications. For the eCM component it borrows from the DOCSIS suite of specifications with no additional enhancements. The eUE, user, and application data are logically separated, and specified in this document. Given the use of SNMP for configuration and management, the eUE component is provided with data pertaining to itself, users, and applications.

The logical representation of the E-UE Provisioning Data Model is specified in Figure 1.

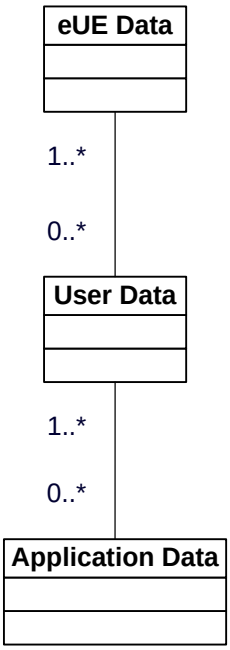

Figure 1 - E-UE Provisioning Data Model

6 E-UE PROVISIONING MIBS FRAMEWORK REQUIREMENTS

The E-UE MIBS framework provides the MIB module implementation requirements for the E-UE. An informative, logical framework depicting MIB modules in the E-UE components is presented in Figure 2. The rest of this section presents the specific requirements.

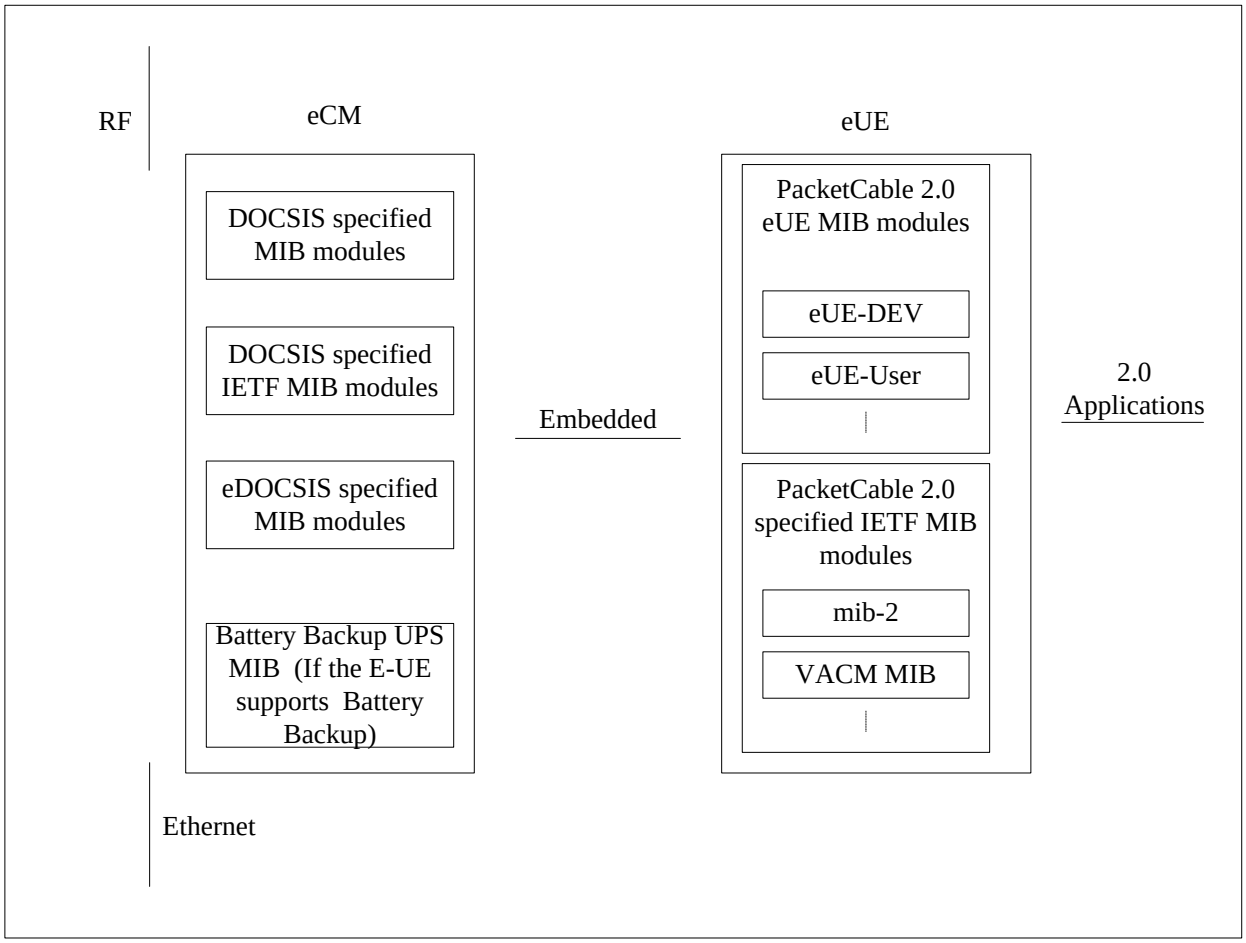

Figure 2 - E-UE Logical MIBs Framework

The eCM component of an E-UE needs to comply with the DOCSIS and eDOCSIS suite of specifications. The eUE component is required to support the data model that was informatively described in Section 5.3. To provide more information:

- The eUE can be associated with one or more Users.
- Each User can be associated with one or more applications.
- Each application has one more features; each feature has a set of configuration data.

Furthermore, each User can be associated with one or more eUEs. However, this is not possible to achieve using an SNMP-based framework that requires the data to be physically stored on a single client. In the E-UE Provisioning framework, this client is the eUE (for PacketCable data). Support for the other requirements is achieved by using an array of mappings:

- Association of an eUE with multiple Users,
- Association of a User with multiple Applications; each Application being associated with one Profile,
- Association of a Profile with multiple features; some of which could be shared with other Profiles belonging to the same Application.

6.1 eCM MIB Requirements

This section presents the MIB module requirements for the eCM component of the E-UE.

6.1.1 DOCSIS MIB Modules

The eCM component of an E-UE MUST comply with the DOCSIS MIB module requirements. For more information on the DOCSIS MIB modules, please refer to the DOCSIS specifications.

6.1.2 eDOCSIS MIB Modules

The eCM component of an E-UE MUST comply with the eDOCSIS MIB requirements. For more information on the eDOCSIS MIB module requirements, please refer to the eDOCSIS specification [eDOCSIS].

6.1.3 Battery Backup UPS MIB module

If the E-UE supports Battery Backup functionality, as specified in [CL-MIB-BB], the eCM component MUST support the Battery Backup and UPS MIB and associated requirements.

6.2 eUE MIB Requirements

This section presents the MIB module requirements for the eUE component of the E-UE.

6.2.1 eUE MIB Modules

The eUE component of the E-UE MUST comply with the PacketCable 2.0 specified eUE MIB configuration and management MIB modules specified in Annex B and Annex C, respectively. If an eUE supports PacketCable Presence, then the eUE MUST implement the eUE Presence MIB as specified in Annex D.2.

6.2.2 IETF MIB Modules

The eUE MUST implement the following MIB modules:

- MIB II system group as specified in [RFC 3418];
- IF MIB as specified in [RFC 2863];
- UDP MIB as specified in [RFC 4113]; and
- IP MIB as specified in [RFC 4293].

6.2.3 eDOCSIS MIB Modules

The eUE component of an E-UE MUST also comply with the eSAFE MIB requirements as specified in [eDOCSIS]; for example, requirements related to the implementation of MIB II.

6.2.4 SNMP MIB Requirements

6.2.4.1 eUEsysDescr Requirements

The eUE's MIB II sysDescr MIB object MUST conform to the format specified in the DOCSIS specifications governing the eCM component.

6.2.4.2 eUE ifTable Requirements

The eUE MUST implement the row entry specified in Table 1 for the ifTable as specified in [RFC 2863].

Table 1 - eUE ifTable Requirements

ifTable ([RFC 2863])	Row Entry
IfIndex	1
ifDescr	"DOCSIS Embedded Interface"
IfType	other(1)
IfMtu	0
IfSpeed	0
ifPhysAddress	eUE MAC address
IfAdminStatus	up(1)
ifOperStatus	up(1)
IfLastChange	per [RFC 2863]
ifInOctets (optional)	(n) if implemented, else 0
IfInNUCastPkts	Deprecated
IfInDiscards	0
IfInErrors	0
IfUnknownProtos	0
ifOutOctets (optional)	(n) if implemented, else 0
ifOutUCastPkts (optional)	(n) if implemented, else 0
IfOutNUCastPkts	Deprecated
IfOutDiscards	0
IfOutErrors	0
IfOutQlen	Deprecated
IfSpecific	Deprecated

6.2.4.3 eUE ipNetToPhysicalTable Requirements

The eUE MUST implement the row entry specified in Table 2 for the ipNetToPhysicalTable as specified in [RFC 4293].

Table 2 - ipNetToPhysicalTable MIB Object Details

ipNetToPhysicalTable	CM device
ipNetToPhysicalIfIndex	1
ipNetToPhysicalPhysAddress	eCM MAC Address
ipNetToPhysicalNetAddressType	ipv4(1) or ipv6(2)
ipNetToPhysicalNetAddress	eCM IP Address
ipNetToPhysicalLastUpdated	<refer to [RFC 4293]>
ipNetToPhysicalType	static(4)
ipNetToPhysicalState	<refer to [RFC 4293]>
ipNetToPhysicalRowStatus	'active'

6.2.4.4 eUE USM Requirements

This section presents the PacketCable 2.0 eUE USM requirements. Please refer to [RFC 3414] for more information on the User-based Security Model (USM) for SNMPv3.

An eUE, provisioned in the Secure Provisioning Flow, MUST configure the usmUserTable immediately after receiving the AP REPLY from the Provisioning Server, with the entry specified in Table 3.

Table 3 - eUE usmUserTable Entry

usmUserTable ([RFC 3414] [IETF STD62])	Row Entry
usmUserEngineID	The SNMP local engine id
usmUserName	eUE-Prov-xx:xx:xx:xx:xx:xx, where xx:xx:xx:xx:xx:xx represents the eUE's Mac address
usmUserSecurityName	eUE-Prov-xx:xx:xx:xx:xx:xx, where xx:xx:xx:xx:xx:xx represents the eUE's Mac address
usmUserCloneFrom	0.0
usmUserAuthProtocol	usmHMACMD5AuthProtocol or usmHMACSHAAuthProtocol
usmUserAuthKeyChange	""
usmUserOwnAuthKeyChange	""
usmUserPrivProtocol	usmDESPrivProtocol if privacy is indicated in AP REPLY usmNoPrivProtocol if privacy is not indicated in the AP REPLY
usmUserPrivKeyChange	""

usmUserTable ([RFC 3414] [IETF STD62])	Row Entry
usmUserOwnPrivKeyChange	""
usmUserPublic	""
usmUserStorageType	volatile
usmUserStatus	active

Initial authentication and privacy keys for this user are derived from the AP Reply message. The eUE MUST allow for cloning of users as specified in [IETF STD62]. This can be accomplished using the configuration file, or dynamically through SNMP SET operations.

6.2.4.5 eUE VACM Requirements

This section presents the PacketCable 2.0 eUE VACM requirements. For more information regarding View-based Access Control Model (VACM) for SNMP, please refer to [RFC 3415].

The eUE MUST configure the VacmSecurityToGroupTable with the entry specified in Table 4.

Table 4 - eUE VacmSecurityToGroupTable

vacmSecurityToGroupTable ([RFC 3415])	Row Entry
vacmSecurityModel	USM
vacmSecurityName	eUE-Prov-xx:xx:xx:xx:xx:xx
vacmGroupName	PacketCableFullAccess
vacmSecurityToGroupStorageType	volatile
vacmSecurityToGroupStatus	active

The eUE MUST configure the vacmAccessTable with the entry specified in Table 5 and the associated requirements that follow. This configuration allows for read access of all MIB modules in the eUE, write access to PacketCable 2.0 eUE MIB modules, and notifications as specified in the PacketCable 2.0 eUE MIB modules.

Table 5 - eUE vacmAccessTable

vacmAccessTable ([RFC 3415])	Row Entry
vacmGroupName	PacketCableFullAccess
vacmAccessContextPrefix	""
vacmAccessSecurityModel	USM
vacmAccessSecurityLevel	authPriv or authNoPriv (depending on whether privacy has been specified)
vacmAccessContextMatch	exact
vacmAccessReadViewName	ReadOnlyView

vacmAccessTable ([RFC 3415])	Row Entry
vacmAccessWriteViewName	FullAccessView
vacmAccessNotifyViewName	NotifyView
vacmAccessStorageType	volatile
vacmAccessStatus	active

The following requirements are associated with Table 5.

- The eUE's ReadOnlyView MUST consist of the entire MIB tree contained in the eUE.
- The eUE's FullAccessView MUST consist of all the PacketCable-specified MIB modules, the MIB-II system group, and the IF-MIB tree.
- The eUE's FullAccessView MAY include vendor-specific MIBs, VACM, USM, and Notifications MIB.
- The eUE's NotifyView MUST consist of all the PacketCable 2.0 specified MIB modules, the MIB-II system group, and the snmpTrapOID MIB tree.
- The eUE's NotifyView MAY include vendor-specific MIB trees.

6.2.4.6 SNMPv2c Management Requirements

The eUE MUST follow the SNMPv2c management requirements as specified in [PKT-SP-PROV1.5], "SNMPV2C MANAGEMENT REQUIREMENTS," with the following clarifications:

- The requirements applicable to the eMTA apply to the eUE.
- The string (or substring) "mta" is replaced with "eue" in snmpCommunityIndex, snmpCommunitySecurityName, snmpCommunityTransportTag, snmpTargetAddrName, snmpTargetAddrTagList, snmpTargetAddrParams, vacmSecurityName, vacmGroupName, VacmAccessReadViewName, VacmAccessWriteViewName, vacmAccessNotifyViewName, vacmViewTreeFamilyViewName, snmpTargetParamsName, snmpTargetParamsSecurityName, snmpNotifyName, snmpNotifyTag, snmpNotifyFilterProfileName and snmpNotifyFilterSubtree.
- Any references to MIB modules, such as pktcMtaNotification within the snmpNotifyFilterTable, applies to the PacketCable 2.0 E-UE MIB modules.

6.3 Configuration Data Element Requirements

The eCM MUST comply with the DOCSIS and eDOCSIS configuration data element requirements, including mandatory, optional, and prohibited MIB Objects. The eUE MUST report any configuration data elements deemed mandatory, and not provided in the respective configuration file as described either in Table 6, Section 6.4, and/or the respective data element specification.

6.3.1 Configuration File Requirements

This section provides the configuration data element requirements.

Table 6 - eUE Configuration Data Element Requirements

MIB Module (CL-PKTC-)	Data Element	Requirement	Additional Details
EUE-PROV-MGMT-MIB	pktcMtaDevEnabled	Mandatory	This element is always required.
EUE-PROV-MGMT-MIB	pktcMtaDevRealmOrgName	Conditionally Mandatory	This element is mandatory in the Secure Provisioning Flow.
EUE-DEV-MIB	pktcEUEDevOpTable	Conditionally Mandatory	One table entry is mandatory if the eUE has any active users associated with it.
EUE-DEV-MIB	pktcEUEDevDnsTable	Conditionally Mandatory	If absent in configuration the active user defaults to the eUE DNS server values (i.e., via DHCP or pktcMtaDevServerDns1, pktcMtaDevServerDns2 values).
EUE-DEV-MIB	pktcEUEDevPCSCFTable	Conditionally Mandatory	One table entry is mandatory if the eUE has any active users associated with it.
EUE-USER-MIB	pktcEUEUsrIMPUTable	Conditionally Mandatory	One table entry is mandatory if the eUE has any active users associated with it.
EUE-USER-MIB	pktcEUEUsrIMPITable	Conditionally Mandatory	One table entry is mandatory if the eUE has any active users which need authentication for registration.
EUE-USER-MIB	pktcEUEUsrAppMapTable	Conditionally Mandatory	One table entry is mandatory if any active user has any applications associated with it.

6.3.2 Certificate Bootstrapping File Requirements

This section provides the Certificate Bootstrapping configuration data element requirements. An eUE that supports Certificate Bootstrapping MUST be capable of accepting the contents of an XML instance document that complies with the XML Schema specified in Annex D.1. A Certificate Bootstrapping Server that provides Certificate Bootstrapping MUST support XML instance documents that comply with the XML Schema specified in Annex D.1, and the data element requirements in Table 7.

Once an eUE receives an XML instance document during the Certificate Bootstrapping process, the eUE MUST make sure that it complies with the data element and attributes requirements stated in Table 7. If the Certificate Bootstrapping XML instance document complies with the stated requirements the eUE MUST process the XML instance data elements and modify the pktcEUEUsrIMPITable accordingly. The eUE MUST validate the XML instance document prior to acceptance or modification of the MIB table 'pktcEUEUsrIMPITable'. If the received Certificate Bootstrapping XML instance document is valid the eUE MUST process the document. If the Configuration File XML instance document fails to meet the requirements stated in Appendix D.1 or Table 7, then the eUE MUST ignore the Certificate Bootstrapping XML instance document and report the appropriate events (specified in Table 8), and continue to support PacketCable applications as configured.

When the data element 'clearIMPIMIBTable' is present and set to a value of 'true', the eUE MUST process it prior to any IMPI elements and clear all the entries in the MIB table pktcEUEUsrIMPITable. The attribute 'mibIMPIIndex' provides the index value reference to the MIB table 'pktcEUEUsrIMPITable'. Irrespective of the current row entry corresponding to that index, the eUE MUST update it with the information provided during Certificate Bootstrapping. If there are row entries in the MIB table 'pktcEUEUsrIMPITable' that are not present in the Certificate Bootstrapping XML instance file, the eUE MUST NOT modify them in any way as a result of the Certificate Bootstrapping process.

The Certificate Bootstrapping procedure may result in duplicate IMPI entries, e.g., if the entries provided previously are not cleared using the element 'clearIMPIMIBTable'. In such cases, the eUE MUST still accept a valid Certificate Bootstrapping XML instance and report the appropriate event as specified in the IMPI MIB table (see Table 8 for the actual event).

Table 7 - eUE Configuration Bootstrapping File Requirements

XML Schema	Data Element or Attribute	Requirement	Additional Details
D.1	//clearIMPIMIBTable	Mandatory, if '//IMPI' is absent.	If this element is absent, then the eUE will not clear the IMPI table.
D.1	//IMPI	Mandatory, if '// clearIMPIMIBTable' is absent.	An IMPI element is required for each IM Private Identifier (IMPI) that is being specified.
D.1	//IMPI/@mibIMPIIndex	Mandatory if the element '//IMPI' is present.	A mibIMPIIndex attribute is required for each IMPI/ID element.
D.1	//IMPI/ID	Mandatory if the element '//IMPI' is present.	An ID element is required for each IMPI that is being specified.
D.1	//IMPI/Creds	Mandatory if the element '//IMPI' is present.	A Creds element is required for each IMPI that is being specified.
D.1	//IMPI/ID/@idType	Mandatory if the element '//IMPI' is present.	An idType attribute is required for each IMPI/ID element.
D.1	//IMPI/Creds/@credsType	Mandatory if the element '//IMPI' is present.	A credsType attribute is required for each IMPI/Creds element. When the attribute 'credsType' indicates 'none', it implies that the corresponding IMPI is not associated with any credentials (however, this should not affect the use of the IMPI for purposes such as registration).

6.4 Management Event Reporting Requirements

The E-UE MUST support all the Management Events specified in [PKT-MEM1.5], Table 4, except for the following:

- PROV-EV-12
- PROV-EV-12.1
- PROV-EV-13
- PROV-EV-13.1
- PROV-EV-14
- PROV-EV-14.1

Also, given that a eUE supports IPv6 address mode and DHCPv6, the eUE MUST implement the following, enhanced, definition of PROV-EV-16 (originally specified in [PKT-MEM1.5]):

- For DHCPv4 operation, this event is generated as specified in [PKT-MEM1.5]).
- For DHCPv6 operation, this event is generated as described by the following ABNF:

```
PROV-EV-16 = "DHCPv6_ERROR:" dhcpv6-message [";"error-info] [";" ipv6-address-list]
dhcpv6-message = 1*(VCHAR)
error-info = 1*(VCHAR)
ipv6-address-list = IPv6address ["," (IPv6address)]
; For definition of the 'IPv6address' element in ABNF refer to [RFC 3986]
('IPv6address' element) and [RFC 4291].
```

In addition, the eUE MUST support the management events specified in Table 8.

Table 8 - Additional eUE Management Events

Event Name	Default Severity for Event	Default Display String	PacketCable Event ID	Comments
EUE-EV-1	error	"Registration did not comply with SigSecurity configuration for user <user IMPU>	4000960000	The eUE MUST report this event if the directive specified in pktcEUEUsrIMPUSigSecurity is not met during registration of a user IMPU.
EUE-EV-2	critical	"Registration failed for user IMPU=<user IMPU>; IMPI=<user IMPI>; reason <reason>"	4000960001	The eUE MUST report this event if the registration for a specific user failed. The eUE MUST populate <user IMPU> with the user's IMPU and <user IMPI> with the user's IMPI.
EUE-EV-3	informational	"Certificate Bootstrapping Success"	4000960002	The eUE MUST report this event if a Certificate Bootstrapping procedure that was initiated was successfully completed.
EUE-EV-4	critical	"Certificate Bootstrapping Failure"	4000960003	The eUE MUST report this event if a Certificate Bootstrapping procedure was not successfully completed.
EUE-EV-5	critical	"Time unavailable from the ToD Server - Secure flow"	4000960004	The eUE MUST report this event if ToD is not available by the moment when the eUE completes its DHCP process and is required to attempt secure provisioning flow.
EUE-EV-6	warning	"Time unavailable from the ToD Server - Basic or Hybrid flow."	4000960005	The eUE MUST report this event if ToD is not available by the moment when the eUE completes its DHCP process and is required to attempt Basic or Hybrid provisioning flows.
EUE-EV-7	warning	"New time has been retrieved from ToD server."	4000960006	The eUE MUST report this event when the new value of the ToD has been retrieved for any reason, e.g., the ToD Server has been modified, the change of the Time Offset value in the corresponding DHCP option, or a previously non-responsive ToD Server becomes responsive.

Event Name	Default Severity for Event	Default Display String	PacketCable Event ID	Comments
EUE-EV-8	error	"Certificate Bootstrapping XML instance does not comply with the supported XML Schema"	4000960007	The eUE MUST report this event if it supports Certificate Bootstrapping and receives a Certificate Bootstrapping XML instance document that does not comply with the XML Schema specified in Annex D.1.
EUE-EV-9	error	"Certificate Bootstrapping XML instance document is compliant, but contains errors"	4000960008	The eUE MUST report this event if it supports Certificate Bootstrapping and receives a Certificate Bootstrapping XML instance document that complies with the XML Schema specified in Annex D.1, but the data elements do not meet the requirements specified in Table 7, or the data element values contain errors.
EUE-EV-10	warning	"Warning: Inconsistency in Table <X>." ;Where X is the name of the MIB table with inconsistencies.	4000960009	The eUE MUST report this event for inconsistencies in any MIB table that identifies potential inconsistencies that need to be reported as a warning, for example, unavailable IMPI index references in the IMPU table.
EUE-EV-11	Informational	"Info: Inconsistency in Table <X>." ;Where X is the name of the MIB table with inconsistencies.	4000960010	The eUE MUST report this event for inconsistencies in any MIB table that identifies potential inconsistencies that need to be reported as informational events, or are not explicitly required to be reported as 'warnings' within the MIB table description.
EUE-EV-12	Critical	"DAD_ERROR:" DAD-type ";" IPv6address [";"error-info]. Where DAD-type = "link-local" | "global"	4000960011	DAD verification failed for LinkLocal address created by EUE or global address assigned by DHCPv6 server
EUE-EV-13	Critical	"RA_ERROR:" ERROR-type [";"error-info]. Where ERROR-type = "link-local" | "global" Error-info =	4000960012	Router Advertisement messages are not received or improperly formed.
EUE-EV-14	Critical	"error: Failed to acquire Secondary IP address ADD-type.	4000960013	Secondary address not acquired.
EUE-EV-15	Info	"info: Secondary IP address ADD-type acquired.	4000960014	Secondary address acquired.

The following ABNF [RFC 3986] syntax is used in Table 8:

ADD-type = "V4 | V6"

error-info= 1*(VCHAR)

;For definition of the ‘IPv6address’ element in ABNF refers to [RFC 3986].

The eUE MUST handle the events with a severity of 'emergency', 'alert', 'critical' and 'error' as "NV-Events" per [PKT-MEM1.5].

6.5 E-UE MIB Objects Persistence Requirements

This section describes the persistence requirements for MIB object values.

A MIB Object is said to be "persistent" (e.g., stored in "non-volatile" memory) if its value is retained upon E-UE reset.

A MIB object is said to be "non-persistent" (e.g., stored in "volatile"" memory) when its value is not retained upon E-UE reset.

The E-UE MUST consider all MIB objects as "non-persistent" unless otherwise explicitly stated by the MIB Object.

Annex A PacketCable eUE Common Modules

A.1 Textual Conventions MIB Module

```
CL-PKTC-EUE-TC-MIB DEFINITIONS ::= BEGIN

IMPORTS
    MODULE-IDENTITY,
    Unsigned32
                    FROM SNMPv2-SMI
    TEXTUAL-CONVENTION
                    FROM SNMPv2-TC
    pktcEUEMibs
                    FROM CLAB-DEF-MIB;

pktcEUETCMIB MODULE-IDENTITY
    LAST-UPDATED "200912140000Z" -- December 14, 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 - Primary author,
             Sumanth Channabasappa, CableLabs
             Eduardo Cardona, CableLabs
             and members of the PacketCable PACM Focus Team."
    DESCRIPTION
            "This MIB module specifies the TEXTUAL CONVENTIONs
             for use in the definition of PacketCable E-UE
             MIB Objects."
    REVISION "200912140000Z" -- December 14, 2009
    DESCRIPTION
            "Revised Version includes ECN EUE-DATA-N-09.0602-3
            and published as I04"
    REVISION "200807100000Z" -- July 10, 2008
    DESCRIPTION
            "Revised Version includes ECN EUE-DATA-N-08.0524-5
            and published as I02"
    REVISION "200711060000Z" -- Nov 6, 2007
    DESCRIPTION
            "Initial version, published as part of the CableLabs
            E-UE Provisioning Data Model Specification
            PKT-SP-EUE-DATA-I01-071106
            Copyright 1999-2010 Cable Television Laboratories, Inc.
            All rights reserved."

    ::= { pktcEUEMibs 2 }

-- Administrative assignments
pktcEUETCNotifications     OBJECT IDENTIFIER ::= { pktcEUETCMIB 0 }
pktcEUETCObjects           OBJECT IDENTIFIER ::= { pktcEUETCMIB 1 }
pktcEUETCConformance       OBJECT IDENTIFIER ::= { pktcEUETCMIB 2 }

pktcEUETCCompliances       OBJECT IDENTIFIER ::= { pktcEUETCConformance 1 }
pktcEUETCGroups            OBJECT IDENTIFIER ::= { pktcEUETCConformance 2 }

-- MIB Objects
pktcEUETCUsageObjs         OBJECT IDENTIFIER ::= { pktcEUETCObjects 1 }
```

```
--- ---------------------------------------------------------------------
-- TEXTUAL CONVENTION for defining EUE Identifiers
--- ---------------------------------------------------------------------
  PktcEUETCID ::= TEXTUAL-CONVENTION
      STATUS  current
      DESCRIPTION
          " This TEXTUAL CONVENTION is being defined
            to contain identities that can be used
            within the PacketCable eUE data models.

            It specifies a hex string that can be
            used to represent the various identities.

            The types of possible identities are
            specified by the TEXTUAL CONVENTION
            'PktcEUETCIDType'.

            The following rules apply:
              - All identities, except macaddress refer
                to either UEs or Users.
                Mac addresses are UE specific
              - When used as a pair, the public and
                private identities MUST be separated
                by a '#', with the private identity
                following the public identity."
      SYNTAX   OCTET STRING(SIZE(0..1023))

--- ---------------------------------------------------------------------
-- TEXTUAL CONVENTION for defining EUE Identifier type
--- ---------------------------------------------------------------------
  PktcEUETCIDType ::= TEXTUAL-CONVENTION
      STATUS  current
      DESCRIPTION
          " This TEXTUAL CONVENTION is being defined
            as a way of indicating an identity
            specified by MIB Objects utilizing the
            TEXTUAL CONVENTION 'PktcEUETCID'.

            The defined types include:
              - other(1)
                  for types not described by the options
                  provided below
              - gruu(2)
                  for Globally Routable User Agent (UA) URIs
              - publicIdentity(3)
                  for Public Identities as defined by PacketCable
              - privateIdentity(4)
                  for Private Identities as defined by PacketCable
              - publicPrivatePair(5)
                  for Public and Private Identity pairs
                  as defined by PacketCable
              - username(6)
                  for username and password as defined by PacketCable
              - macaddress(7)
                  for mac addresses
              - packetcableIdentity(8)
                  for PacketCable specific types

            UE implementations must ensure that
            PktcEUETCIDType objects and any dependent
            objects (e.g., PktcEUETCID objects) are
            consistent.

            In general, the UE MUST generate an
            'inconsistentValue' error if an attempt
            to change a PktcEUETCIDType object would,
```

```
            for example, lead to an undefined PktcEUETCID
            value.
            In particular, PktcEUETCIDType/PktcEUEID pairs
            MUST be changed together."
      SYNTAX   INTEGER {
                        other(1),
                        gruu(2),
                        publicIdentity(3),
                        privateIdentity(4),
                        publicPrivatePair(5),
                        username(6),
                        macaddress(7),
                        packetcableIdentity(8)
                       }

--- ------------------------------------------------------------------
-- TEXTUAL CONVENTION for defining activation status
--- ------------------------------------------------------------------
  PktcEUETCAdminStatus ::= TEXTUAL-CONVENTION
      STATUS  current
      DESCRIPTION
          " This TEXTUAL CONVENTION is being defined to
            indicate activation status as defined in
            PacketCable.
            A value of 'active' indicates a status
            of active.
            A value of 'inactive' indicates a status
            of inactive."
      SYNTAX   INTEGER {
                        active(1),
                        inactive(2)
                       }

  PktcEUETCOperStatus ::= TEXTUAL-CONVENTION
      STATUS  current
      DESCRIPTION
          " This TEXTUAL CONVENTION is being defined to
            indicate operational activation status as defined in
            PacketCable.
            A value of 'active' indicates a status
            of active.
            A value of 'inactive' indicates a status
            of inactive.
            A value of 'notPresent' indicates the particular
            activation status is not supported.
            A value of 'unknown' indicates the activation status
            could not be determine by the other values."
      SYNTAX   INTEGER {
                        active(1),
                        inactive(2),
                        notPresent(3),
                        unknown(4)
                       }

--- ------------------------------------------------------------------
-- TEXTUAL CONVENTION for defining activation status info
--- ------------------------------------------------------------------
  PktcEUETCStatusInfo ::= TEXTUAL-CONVENTION
      STATUS  current
      DESCRIPTION
          " This TEXTUAL CONVENTION is being defined to provide
            additional activation status information."
      SYNTAX   OCTET STRING (SIZE(0..31))

--- ------------------------------------------------------------------
-- TEXTUAL CONVENTION for User Element Indices
--- ------------------------------------------------------------------
```

```
  PktcEUETCUsrElementIndexType ::= TEXTUAL-CONVENTION
      STATUS  current
      DESCRIPTION
          " This TEXTUAL CONVENTION is being defined to
            indicate any indices related to users, such as IMPUs
            and IMPIs, as defined in PacketCable.
            Such an instance can be referenced across
            tables to indicate an association.

            The values assigned for objects of this type SHOULD
            be sequential starting with the value of 1 and
            incrementing by 1 for each User. A value of '0',
            if allowed MUST be specified in the DESCRIPTION of
            any MIB Object using this data type."
      SYNTAX   Unsigned32 (0..63)

--- ------------------------------------------------------------------
-- TEXTUAL CONVENTION for defining App Org
--- ------------------------------------------------------------------
  PktcEUETCAppOrgIdentifier ::= TEXTUAL-CONVENTION
      STATUS  current
      DESCRIPTION
          " This TEXTUAL CONVENTION is being defined to
            identify the organization specifying
            a particular application.

            Any MIB Object specified to be of this type
            MUST represent the IANA assigned Enterprise number.

            For CableLabs specified applications, it MUST be
            4491."
      REFERENCE "http://www.iana.org/assignments/enterprise-numbers"
      SYNTAX   Unsigned32

--- ------------------------------------------------------------------
-- TEXTUAL CONVENTION for defining App Identifier
--- ------------------------------------------------------------------
  PktcEUETCAppIdentifier ::= TEXTUAL-CONVENTION
      STATUS  current
      DESCRIPTION
          " This TEXTUAL CONVENTION is being defined to
            identify the application id assigned by an
            organization.
            Each organization planning to specify an application
            MUST publish a registry which identifies each application
            and the corresponding ID that can be referenced."
      SYNTAX   Unsigned32(1..127)

--- ------------------------------------------------------------------
-- TEXTUAL CONVENTION for App Indices
--- ------------------------------------------------------------------
  PktcEUETCUsrAppIndexType ::= TEXTUAL-CONVENTION
      STATUS  current
      DESCRIPTION
          " This TEXTUAL CONVENTION is being defined to
            indicate any indices related to PacketCable Applications.

            The values assigned for objects of this type SHOULD
            be sequential starting with the value of 1 and
            incrementing by 1 for each User. A value of '0',
            if allowed MUST be specified in the DESCRIPTION of
            any MIB Object using this data type."
      SYNTAX   Unsigned32


--- ------------------------------------------------------------------
-- TEXTUAL CONVENTION for defining Credentials
```

```
--- ---------------------------------------------------------------------
  PktcEUETCCredsType ::= TEXTUAL-CONVENTION
      STATUS  current
      DESCRIPTION
          " This TEXTUAL CONVENTION represents credential
            types. Each definition of PktcEUETCCredsType MUST
            be accompanied by a definition of the textual
            convention PktcEUETCCreds.

            The specified types include:
              - other(1)
                  An unknown credentials type. It MAY be used to
                  indicate Credentials that are not in one of the
                  formats defined below such as a vendor-specific
                  format.

              - none(2)
                  A non-existent credentials type. This value MUST
                  be used if the value of the corresponding
                  PktcEUETCCreds object is a zero-length string.
                  It MAY be used when the credentials are no longer
                  valid.

              - password(3)
                  A password based credential. When this type is used
                  the credential value contained in PktcEUETCCreds MUST
                  be an ASCII string representing a user-readable
                  password.

              - presharedKey(4)
                  A pre-shared key based credential. When this type is
                  used the credential value contained in PktcEUETCCreds
                  MUST be interpreted as a pre-shared key represented
                  as an octet string.

              - X509certificate(5)
                  A certificate based credential. When this type is
                  used the credential value contained in PktcEUETCCreds
                  MUST be interpreted as a private key and an accompanying
                  X.509 certificate.

            Implementations must ensure that objects with
            SYNTAX of 'PktcEUETCCredsType' and dependent objects
            with SYNTAX of 'PktcEUETCCreds' are consistent.

            In general, the UE MUST generate an
            'inconsistentValue' error if an attempt
            to change an 'PktcEUETCCredsType' object would,
            for example, lead to an undefined 'PktcEUETCCreds'
            value."
      SYNTAX   INTEGER {
                        other(1),
                        none(2),
                        password(3),
                        preSharedKey(4),
                        certificate(5)
                       }

  PktcEUETCCreds ::= TEXTUAL-CONVENTION
      STATUS  current
      DESCRIPTION
          " This TEXTUAL CONVENTION allows for the definition
            of a credential.

            A PktcEUETCCreds value must always be associated with
            and interpreted within the context of a corresponding
            PktcEUETCCredsType.
```

```
            The value of a PktcEUETCCreds object must be consistent
            with the value of its associated PktcEUETCCredsType
            object. Any attempt to SET an object when these values
            are not consistent must fail with an inconsistentValue
            error.

            An object of this type MUST be interpreted as follows
            (in network byte order):

            Bytes 0-1:  Reserved. The application must define the
                        usage of these bytes, otherwise, ignored.
            Bytes 2-3:  Indicate the length of the credential value.
            Bytes 4-8191: Contain the credential value."
        SYNTAX   OCTET STRING (SIZE (0..8192))

END
```

Annex B PacketCable eUE Device Configuration Modules

B.1 Device Configuration MIB Module

```
CL-PKTC-EUE-DEV-MIB DEFINITIONS ::= BEGIN

IMPORTS
    PktcEUETCCredsType,
    PktcEUETCCreds
                    FROM CL-PKTC-EUE-TC-MIB
    MODULE-IDENTITY,
    OBJECT-TYPE,
    Unsigned32
                    FROM SNMPv2-SMI

    OBJECT-GROUP,
    MODULE-COMPLIANCE
                    FROM SNMPv2-CONF

    TEXTUAL-CONVENTION,
    RowStatus,
    TruthValue
                    FROM SNMPv2-TC
    SnmpAdminString
                    FROM SNMP-FRAMEWORK-MIB
    InetAddress,
    InetPortNumber,
    InetAddressDNS,
    InetAddressType,
    InetVersion
                    FROM INET-ADDRESS-MIB
    pktcEUEMibs
                    FROM CLAB-DEF-MIB;


pktcEUEDevMIB MODULE-IDENTITY
    LAST-UPDATED "201107110000Z" -- July 11, 2011
    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 - Primary author,
             Eugene Nechamkin, Broadcom
             Sumanth Channabasappa, CableLabs
             John Berg, CableLabs
             Eduardo Cardona, CableLabs
             and members of the PacketCable PACM Focus Team."

    DESCRIPTION
            "This MIB module contains Configuration MIB
             objects for the Embedded User Equipment (eUE) as
             required by the PacketCable E-UE Provisioning
             Framework Specification."
    REVISION "201107110000Z" -- July 11, 2011
    DESCRIPTION
            "Revised Version includes ECN EUE-DATA-N-11.0661-6
            and published as I06"
   REVISION "201012200000Z" -- Dec 20, 2010
```

```
    DESCRIPTION
            "Revised Version includes ECN EUE-DATA-N-10.10.0644-2
            and published as I06"
   REVISION "201004260000Z" -- April 26, 2010
    DESCRIPTION
            "Revised Version includes ECN EUE-DATA-N-10.10.0633-2
            and published as I05"
   REVISION "200912140000Z" -- December 14, 2009
    DESCRIPTION
            "Revised Version includes ECN EUE-DATA-N-09.0605-5
            and published as I04"
    REVISION "200905280000Z" -- May 28, 2009
    DESCRIPTION
            "Revised Version includes ECNs
            EUE-DATA-N-08.0528-3
            EUE-DATA-N-09.0556-3
            and published as part of PKT-SP-EUE-DATA-I03-090528."
    REVISION "200807100000Z" -- July 10, 2008
    DESCRIPTION
            "Revised Version includes ECN EUE-DATA-N-08.0524-5
            and published as part of PKT-SP-EUE-DATA-I02-080710."
    REVISION "200711060000Z" -- Nov 6, 2007
    DESCRIPTION
            "Initial version, published as part of the CableLabs
            E-UE Provisioning Data Model Specification
            PKT-SP-EUE-DATA-I01-071106
            Copyright 1999-2010 Cable Television Laboratories, Inc.
            All rights reserved."
    ::= { pktcEUEMibs 3 }

-- ----------------------------------------------------------------------
-- Pktc EUE DEV Textual Conventions
-- ----------------------------------------------------------------------

PktcEUEDevSipProtID ::= TEXTUAL-CONVENTION
             STATUS  current
             DESCRIPTION
                 "This TEXTUAL CONVENTION is being defined
                  as a way to enumerate the Protocols used for SIP."
             SYNTAX   INTEGER {
                              other(1),
                              udp(2),
                              tcp(3),
                              tls(4)
                              }


-- Administrative assignments
pktcEUEDevNotification      OBJECT IDENTIFIER ::= { pktcEUEDevMIB 0 }
pktcEUEDevObjects           OBJECT IDENTIFIER ::= { pktcEUEDevMIB 1 }
pktcEUEDevConformance       OBJECT IDENTIFIER ::= { pktcEUEDevMIB 2 }

pktcEUEDevCompliances       OBJECT IDENTIFIER ::= { pktcEUEDevConformance 1 }
pktcEUEDevGroups            OBJECT IDENTIFIER ::= { pktcEUEDevConformance 2 }




-- ----------------------------------------------------------------------
--  eUE Profile Information
-- ----------------------------------------------------------------------
pktcEUEDevProfile            OBJECT IDENTIFIER ::= { pktcEUEDevObjects 1 }


pktcEUEDevProfileVersion OBJECT-TYPE
    SYNTAX      SnmpAdminString(SIZE(0..6))
    MAX-ACCESS  read-only
```

```
    STATUS      current
    DESCRIPTION
        " This MIB Object represents the Device Profile Version for this
          MIB module. The eUE MUST set this MIB Object to a value of '1.0'."
    ::= { pktcEUEDevProfile 1 }

-- ---------------------------------------------------------------------
-- Operator Table
-- ---------------------------------------------------------------------
pktcEUEDevOpTable OBJECT-TYPE
    SYNTAX      SEQUENCE OF PktcEUEDevOpEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        " This data table contains Operator specific information
          associated with the eUE."
    ::= { pktcEUEDevProfile 2 }

pktcEUEDevOpEntry OBJECT-TYPE
    SYNTAX      PktcEUEDevOpEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        " Each entry in this data table describes Operator
          parameters associated with a specific domain name.

          For each Operator that is associated with a user,
          the corresponding parameters SHOULD be configured by
          the Operator.

          A domain name of '.' indicates any domain name.

          The eUE MUST use the values provided only for sessions
          established on behalf of the eUE identifier (e.g. eUE registration,
          eUE configuration, eUE Identifier based sessions).

          The conceptual rows MUST NOT persist across eUE resets."

    INDEX  { pktcEUEDevOpIndex }
    ::= { pktcEUEDevOpTable 1 }

PktcEUEDevOpEntry ::=
    SEQUENCE {
              pktcEUEDevOpIndex               Unsigned32,
              pktcEUEDevOpDomain              InetAddressDNS,
              pktcEUEDevOpSTUNAddrType        InetAddressType,
              pktcEUEDevOpSTUNAddr            InetAddress,
              pktcEUEDevOpSTUNAddrPort        InetPortNumber,
              pktcEUEDevOpTURNAddrType        InetAddressType,
              pktcEUEDevOpTURNAddr            InetAddress,
              pktcEUEDevOpTURNAddrPort        InetPortNumber,
              pktcEUEDevOpTURNCredsType       PktcEUETCCredsType,
              pktcEUEDevOpTURNCreds           PktcEUETCCreds,
              pktcEUEDevOpRowStatus           RowStatus
              }


pktcEUEDevOpIndex OBJECT-TYPE
    SYNTAX      Unsigned32(1..16)
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        " A unique value used to identify an instance of a set of
          values pertaining to an Operator domain identified
          by 'pktcEUEDevOpDomain'. The indices SHOULD be contiguous.
          When multiple entries are specified, the eUE MUST give
          precedence to the values indexed by lower indices."
```

```
    ::= { pktcEUEDevOpEntry 1 }

pktcEUEDevOpDomain  OBJECT-TYPE
    SYNTAX      InetAddressDNS
    MAX-ACCESS  read-create
    STATUS      current
    DESCRIPTION
        " This data element contains the Operator's Domain or sub-domain
          name. A value of '.' indicates any domainName."
    ::= { pktcEUEDevOpEntry 2 }

pktcEUEDevOpSTUNAddrType  OBJECT-TYPE
    SYNTAX      InetAddressType
    MAX-ACCESS  read-create
    STATUS      current
    DESCRIPTION
        " This data element identifies the data type of the
          value contained in 'pktcEUEDevOpSTUNAddr'."

    DEFVAL   { unknown }
    ::= { pktcEUEDevOpEntry 3 }

pktcEUEDevOpSTUNAddr  OBJECT-TYPE
    SYNTAX      InetAddress
    MAX-ACCESS  read-create
    STATUS      current
    DESCRIPTION
        " This data element contains the STUN server address
          associated with the domain name identified in
          'pktcEUEDevOpDomain'."

    DEFVAL   { "" }
    ::= { pktcEUEDevOpEntry 4 }

pktcEUEDevOpSTUNAddrPort  OBJECT-TYPE
    SYNTAX      InetPortNumber
    MAX-ACCESS  read-create
    STATUS      current
    DESCRIPTION
        " This data element contains the STUN server port
          associated with the server address identified in
          'pktcEUEDevOpSTUNAddr'."

    DEFVAL   { 0 }
    ::= { pktcEUEDevOpEntry 5 }

pktcEUEDevOpTURNAddrType  OBJECT-TYPE
    SYNTAX      InetAddressType
    MAX-ACCESS  read-create
    STATUS      current
    DESCRIPTION
        " This data element identifies the data type of the
          value contained in 'pktcEUEDevOpTURNAddr'."

    DEFVAL   { unknown }
    ::= { pktcEUEDevOpEntry 6 }

pktcEUEDevOpTURNAddr  OBJECT-TYPE
    SYNTAX      InetAddress
    MAX-ACCESS  read-create
    STATUS      current
    DESCRIPTION
        " This data element contains the TURN server address
          associated with the domain name identified in
          'pktcEUEDevOpDomain'."
```

```
    DEFVAL   { "" }
    ::= { pktcEUEDevOpEntry 7 }

pktcEUEDevOpTURNAddrPort  OBJECT-TYPE
    SYNTAX      InetPortNumber
    MAX-ACCESS  read-create
    STATUS      current
    DESCRIPTION
        " This data element contains the TURN server port
          associated with the server address identified in
          'pktcEUEDevOpTURNAddr'."

    DEFVAL   { 0 }
    ::= { pktcEUEDevOpEntry 8 }

pktcEUEDevOpTURNCredsType  OBJECT-TYPE
    SYNTAX      PktcEUETCCredsType
    MAX-ACCESS  read-create
    STATUS      current
    DESCRIPTION
        " This data element contains the creds type
          associated with the STUN Relay creds identified in
          'pktcEUEDevOpTURNCreds'."
    DEFVAL   { none }
    ::= { pktcEUEDevOpEntry 9 }

pktcEUEDevOpTURNCreds  OBJECT-TYPE
    SYNTAX      PktcEUETCCreds
    MAX-ACCESS  read-create
    STATUS      current
    DESCRIPTION
        " This optional data element MAY contain suitable credentials
          related to STUN Relay access.

          If read this data element MUST always return an empty
          string value."
    DEFVAL   { "" }
    ::= { pktcEUEDevOpEntry 10 }


pktcEUEDevOpRowStatus  OBJECT-TYPE
    SYNTAX      RowStatus
    MAX-ACCESS  read-create
    STATUS      current
    DESCRIPTION
        " This object defines the row status associated with the
          particular Operator in the pktcEUEDevOpTable.

          The value of this object has no effect on
          whether columnar objects in this row can be modified."
     ::= { pktcEUEDevOpEntry 11 }

-- ---------------------------------------------------------------------
-- Operator domain names associated with a eUE
-- ---------------------------------------------------------------------
pktcEUEDevDnsTable OBJECT-TYPE
    SYNTAX      SEQUENCE OF PktcEUEDevDnsEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        " This data table represents the eUE's knowledge
          of suitable DNS Server information on a per Operator
          basis.

          The eUE MUST use the values provided only for sessions
          established on behalf of the eUE identifier (e.g. eUE P-CSCF Discovery,
          eUE registration, eUE configuration, eUE Identifier based sessions)."
```

```
    ::= { pktcEUEDevProfile 3 }

pktcEUEDevDnsEntry OBJECT-TYPE
    SYNTAX      PktcEUEDevDnsEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        " Each entry in this data table contains an instance
          of a DNS Server entry for a given domain name as
          indicated by 'pktcEUEDevOpDomain'.

          The information in this table MAY be configured
          by the Operator.

          The conceptual rows MUST NOT persist across eUE resets."
    INDEX  { pktcEUEDevOpIndex, pktcEUEDevDnsIndex }
    ::= { pktcEUEDevDnsTable 1 }

PktcEUEDevDnsEntry ::=
    SEQUENCE {
              pktcEUEDevDnsIndex          Unsigned32,
              pktcEUEDevDnsAddrType       InetAddressType,
              pktcEUEDevDnsAddr           InetAddress,
              pktcEUEDevDnsRowStatus      RowStatus
              }

pktcEUEDevDnsIndex OBJECT-TYPE
    SYNTAX      Unsigned32(1..16)
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        " A unique value used to identify an instance in this
          data table. The indices SHOULD be contiguous.
          When multiple entries are specified, the eUE MUST give
          precedence to the values indexed by lower indices."
    ::= { pktcEUEDevDnsEntry 1 }

pktcEUEDevDnsAddrType  OBJECT-TYPE
    SYNTAX      InetAddressType
    MAX-ACCESS  read-create
    STATUS      current
    DESCRIPTION
        " This data element contains the type of the data
          element contained in 'pktcEUEDevDnsAddr'.
          The only valid values are 'ipv4' or 'ipv6'.
          The value 'unknown' may be used for row creation
          if the value of 'pktcEUEDevDnsAddr' is not specified."
    DEFVAL   { unknown }
    ::= { pktcEUEDevDnsEntry 2 }

pktcEUEDevDnsAddr  OBJECT-TYPE
    SYNTAX      InetAddress
    MAX-ACCESS  read-create
    STATUS      current
    DESCRIPTION
        " The IP address of a DNS server associated with
          the domain name indicated by the primary index
          'pktcEUEDevOpIndex', for the instance indicated
          by the secondary index 'pktcEUEDevDnsIndex'.
          In the case this object is empty the eUE MUST use
          the DNS servers obtained via the DHCP process during
          provisioning."
    DEFVAL   { "" }
    ::= { pktcEUEDevDnsEntry 3 }

pktcEUEDevDnsRowStatus  OBJECT-TYPE
```

```
    SYNTAX      RowStatus
    MAX-ACCESS  read-create
    STATUS      current
    DESCRIPTION
        " This object defines the row status associated with the
          particular Operator domain name in the pktcEUEDevDnsTable.

          The value of the 'pktcEUEDevDnsAddrType' object MUST not be
          modified while this object is 'active'.  The value of
          'pktcEUEDevDnsAddr' MAY be modified while this object is active
          if the value is consistent with the type specified by the
          'pktcEUEDevDnsAddrType' object. The EUE MUST not allow the
          row to become 'active' unless the value of 'pktcEUEDevDnsAddr'
          is consistent with the value of 'pktcEUEDevDnsAddrType'."
     ::= { pktcEUEDevDnsEntry 4 }


-- ---------------------------------------------------------------------
-- P-CSCFs associated with the eUE
-- ---------------------------------------------------------------------
pktcEUEDevPCSCFTable OBJECT-TYPE
    SYNTAX      SEQUENCE OF PktcEUEDevPCSCFEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        " This data table represents the eUE's knowledge
          of suitable P-CSCFs information on a per Operator
          basis."

    ::= { pktcEUEDevProfile 4 }

pktcEUEDevPCSCFEntry OBJECT-TYPE
    SYNTAX      PktcEUEDevPCSCFEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        " Each entry in this data table contains an instance
          of a P-CSCF Server entry for a given domain name.
          The information in this table MAY be configured
          by the Operator.

          The eUE MUST use the values provided only for sessions
          established on behalf of the eUE identifier (e.g. eUE registration,
          eUE configuration, eUE Identifier based sessions).

          The conceptual rows MUST NOT persist across eUE resets."

    INDEX  { pktcEUEDevOpIndex, pktcEUEDevPCSCFIndex }
    ::= { pktcEUEDevPCSCFTable 1 }

PktcEUEDevPCSCFEntry ::=
    SEQUENCE {
            pktcEUEDevPCSCFIndex                Unsigned32,
            pktcEUEDevPCSCFAddrType             InetAddressType,
            pktcEUEDevPCSCFAddr                 InetAddress,
            pktcEUEDevPCSCFSipPort              InetPortNumber,
            pktcEUEDevPCSCFUsedProtocol         PktcEUEDevSipProtID,
            pktcEUEDevPCSCFUsedInetAddressType  InetAddressType,
            pktcEUEDevPCSCFUsedInetAddress      InetAddress,
            pktcEUEDevPCSCFTimerT1              Unsigned32,
            pktcEUEDevPCSCFTimerT2              Unsigned32,
            pktcEUEDevPCSCFTimerT4              Unsigned32,
            pktcEUEDevPCSCFTimerTD              Unsigned32,
            pktcEUEDevPCSCFRowStatus            RowStatus,
            pktcEUEDevPCSCFInviteAttempts       Unsigned32,
            pktcEUEDevPCSCFMaxTime              Unsigned32,
            pktcEUEDevPCSCFBaseTimeAllFailed    Unsigned32,
```

```
            pktcEUEDevPCSCFBaseTimeAllNotFailed Unsigned32,
            pktcEUEDevPCSCFSubscribeRetry       Unsigned32
            }

pktcEUEDevPCSCFIndex OBJECT-TYPE
    SYNTAX      Unsigned32(1..16)
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        " A unique value used to identify an instance in this
          data table. The indices SHOULD be contiguous.
          When multiple entries are specified, the eUE MUST give
          precedence to the values indexed by lower indices."

    ::= { pktcEUEDevPCSCFEntry 1 }

pktcEUEDevPCSCFAddrType  OBJECT-TYPE
    SYNTAX      InetAddressType
    MAX-ACCESS  read-create
    STATUS      current
    DESCRIPTION
        " This data element contains the type of the data
          element contained in 'pktcEUEDevPCSCFAddr'."

    DEFVAL   { unknown }
    ::= { pktcEUEDevPCSCFEntry 2 }

pktcEUEDevPCSCFAddr  OBJECT-TYPE
    SYNTAX      InetAddress
    MAX-ACCESS  read-create
    STATUS      current
    DESCRIPTION
        " The IP address of a P-CSCF server associated with
          the domain name indicated by the primary index
          'pktcEUEDevOpIndex', for the instance indicated
          by the secondary index 'pktcEUEDevPCSCFIndex'."

    DEFVAL   { "" }
    ::= { pktcEUEDevPCSCFEntry 3 }

pktcEUEDevPCSCFSipPort     OBJECT-TYPE
    SYNTAX      InetPortNumber
    MAX-ACCESS  read-create
    STATUS      current
    DESCRIPTION
        " This MIB Object contains a SIP Port to send the
          SIP requests to (for the P-CSCF indicated by the
          table entry).
          By default port 5060 is defined for SIP udp/tcp
          transports and 5061 for tls."
    ::= { pktcEUEDevPCSCFEntry 4 }

pktcEUEDevPCSCFUsedProtocol  OBJECT-TYPE
    SYNTAX      PktcEUEDevSipProtID
    MAX-ACCESS  read-create
    STATUS      current
    DESCRIPTION
        " This MIB Object contains a SIP Protocol which is
          used by the EUE to communicate with the P-CSCF."
    ::= { pktcEUEDevPCSCFEntry 5 }

pktcEUEDevPCSCFUsedInetAddressType  OBJECT-TYPE
    SYNTAX      InetAddressType
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        " This MIB Object contains the Address Type of the P-CSCF
```

```
          IP address used by the EUE in communication with the P-CSCF.
          Only ipv4 and ipv6 address types are valid values
          for this MIB Object."
    ::= { pktcEUEDevPCSCFEntry 6 }

pktcEUEDevPCSCFUsedInetAddress OBJECT-TYPE
    SYNTAX      InetAddress
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        " This MIB Object contains the IP Address of the
          P-CSCF used by the EUE. Only IPv4 and IPv6 addresses are
          valid values for this MIB Object."
    ::= { pktcEUEDevPCSCFEntry 7 }

pktcEUEDevPCSCFTimerT1  OBJECT-TYPE
    SYNTAX      Unsigned32
    UNITS       "milliseconds"
    MAX-ACCESS  read-create
    STATUS      current
    DESCRIPTION
        " This is the SIP Timer T1, an estimate for the round
          trip time in the system (UE to P-CSCF). Please
          refer to the PacketCable IMS Delta Session Initiation
          Protocol (SIP) and Session Description Protocol (SDP),
          Stage 3 Specification 3GPP TS 24.229 for more
          information."
    REFERENCE
       "PacketCable IMS Delta Session Initiation Protocol (SIP)
        and Session Description Protocol (SDP), Stage 3
        Specification 3GPP TS 24.229"
    DEFVAL {500}
    ::= { pktcEUEDevPCSCFEntry 8 }

pktcEUEDevPCSCFTimerT2  OBJECT-TYPE
    SYNTAX      Unsigned32
    UNITS       "milliseconds"
    MAX-ACCESS  read-create
    STATUS      current
    DESCRIPTION
        " This is the SIP Timer T2, an estimate for the maximum
          retransmit interval for non-INVITE requests and INVITE
          responses. Please refer to the PacketCable IMS Delta
          Session Initiation Protocol (SIP) and Session Description
          Protocol (SDP), Stage 3 Specification 3GPP TS 24.229
          for more information."
    REFERENCE
       "PacketCable IMS Delta Session Initiation Protocol (SIP)
        and Session Description Protocol (SDP), Stage 3
        Specification 3GPP TS 24.229"
    DEFVAL {4000}
    ::= { pktcEUEDevPCSCFEntry 9 }

pktcEUEDevPCSCFTimerT4  OBJECT-TYPE
    SYNTAX      Unsigned32
    UNITS       "milliseconds"
    MAX-ACCESS  read-create
    STATUS      current
    DESCRIPTION
        " This is the SIP Timer TD, indicates the wait time
          for response retransmits.
          Please refer to the PacketCable IMS Delta Session
          Initiation Protocol (SIP) and Session Description
          Protocol (SDP), Stage 3 Specification 3GPP TS 24.229
          for more information."
    REFERENCE
       "PacketCable IMS Delta Session Initiation Protocol (SIP)
```

```
        and Session Description Protocol (SDP), Stage 3
        Specification 3GPP TS 24.229"
    DEFVAL {5000}
    ::= { pktcEUEDevPCSCFEntry 10 }


pktcEUEDevPCSCFTimerTD  OBJECT-TYPE
    SYNTAX      Unsigned32 (0|32000..4294967295)
    UNITS       "milliseconds"
    MAX-ACCESS  read-create
    STATUS      current
    DESCRIPTION
        " This is the SIP Timer TD, an estimate for the maximum
          duration a message will remain in the network.
          Please refer to the PacketCable IMS Delta Session
          Initiation Protocol (SIP) and Session Description
          Protocol (SDP), Stage 3 Specification 3GPP TS 24.229
          for more information.
          If the protocol used for a SIP Session is UDP this value is
          used for SIP Timer D, otherwise is ignored."
    REFERENCE
       "PacketCable IMS Delta Session Initiation Protocol (SIP)
        and Session Description Protocol (SDP), Stage 3
        Specification 3GPP TS 24.229"
    DEFVAL {32000}
    ::= { pktcEUEDevPCSCFEntry 11 }

pktcEUEDevPCSCFRowStatus  OBJECT-TYPE
    SYNTAX      RowStatus
    MAX-ACCESS  read-create
    STATUS      current
    DESCRIPTION
        " This object defines the row status associated with the
          particular P-CSCF Server entry for the particular domain name.

          The value of the 'pktcEUEDevPCSCFAddrType' object MUST not be
          modified while this object is 'active'.  The value of
          'pktcEUEDevPCSCFAddr' MAY be modified while this object is active
          if the value is consistent with the type specified by the
          'pktcEUEDevPCSCFAddrType' object."
     ::= { pktcEUEDevPCSCFEntry 12 }

pktcEUEDevPCSCFInviteAttempts  OBJECT-TYPE
    SYNTAX      Unsigned32 (1..7)
    UNITS       "attempts"
    MAX-ACCESS  read-create
    STATUS      current
    DESCRIPTION
        " This is the total number of INVITE message attempts before
          the SIP transaction is considered as failed due to no response.

          The total Timer TB MUST be derived from the total number of SIP
          INVITE message attempts as follows:

          TB = [2^(n -1) - 1]* T1

          n: total number of INVITE attempts
          T1 = Timer T1

          For example, if the number of INVITE attempts is 3, (initial
          INVITE + 2 retries)

          TB = [2^(3 - 1) -1]*0.5 = 3*0.5  = 1.5 secs.


          When the number of attempts is 7, timer B matches the Timer B
          default value defined PacketCable IMS Delta Session Initiation
```

```
          Protocol (SIP) and Session Description Protocol (SDP).

          Please refer to the PacketCable IMS Delta Session Initiation
          Protocol (SIP) and Session Description Protocol (SDP),
          Stage 3 Specification 3GPP TS 24.229 for more
          information."
    REFERENCE
       "PacketCable IMS Delta Session Initiation Protocol (SIP)
        and Session Description Protocol (SDP), Stage 3
        Specification 3GPP TS 24.229"
    DEFVAL { 2 }
    ::= { pktcEUEDevPCSCFEntry 13 }

pktcEUEDevPCSCFMaxTime  OBJECT-TYPE
    SYNTAX      Unsigned32
    UNITS       "seconds"
    MAX-ACCESS  read-create
    STATUS      current
    DESCRIPTION
        " This is the 'max-time' SIP Registration Recovery Timer
          as defined in RFC 5626.
          Please refer to the PacketCable IMS Delta Session
          Initiation Protocol (SIP) and Session Description
          Protocol (SDP), Stage 3 Specification 3GPP TS 24.229,
          and RFC 5626 for more information.
          If the protocol used for a SIP Session is UDP this value is
          used for SIP Timer D, otherwise is ignored."
    REFERENCE
       "PacketCable IMS Delta Session Initiation Protocol (SIP)
        and Session Description Protocol (SDP), Stage 3
        Specification 3GPP TS 24.229"
    DEFVAL {1800}
    ::= { pktcEUEDevPCSCFEntry 14 }

pktcEUEDevPCSCFBaseTimeAllFailed  OBJECT-TYPE
    SYNTAX      Unsigned32
    UNITS       "seconds"
    MAX-ACCESS  read-create
    STATUS      current
    DESCRIPTION
        " This is the 'base-time (if all failed)' SIP Registration
          Recovery Timer as defined in RFC 5626.
          Please refer to the PacketCable IMS Delta Session
          Initiation Protocol (SIP) and Session Description
          Protocol (SDP), Stage 3 Specification 3GPP TS 24.229,
          and RFC 5626 for more information.
          If the protocol used for a SIP Session is UDP this value is
          used for SIP Timer D, otherwise is ignored."
    REFERENCE
       "PacketCable IMS Delta Session Initiation Protocol (SIP)
        and Session Description Protocol (SDP), Stage 3
        Specification 3GPP TS 24.229"
    DEFVAL {30}
    ::= { pktcEUEDevPCSCFEntry 15 }

pktcEUEDevPCSCFBaseTimeAllNotFailed  OBJECT-TYPE
    SYNTAX      Unsigned32
    UNITS       "seconds"
    MAX-ACCESS  read-create
    STATUS      current
    DESCRIPTION
        " This is the 'base-time (if all have not failed)' SIP
          Registration Recovery Timer as defined in RFC 5626.
          Please refer to the PacketCable IMS Delta Session
          Initiation Protocol (SIP) and Session Description
          Protocol (SDP), Stage 3 Specification 3GPP TS 24.229,
          and RFC 5626 for more information.
```

```
          If the protocol used for a SIP Session is UDP this value is
          used for SIP Timer D, otherwise is ignored."
    REFERENCE
       "PacketCable IMS Delta Session Initiation Protocol (SIP)
        and Session Description Protocol (SDP), Stage 3
        Specification 3GPP TS 24.229"
    DEFVAL {90}
    ::= { pktcEUEDevPCSCFEntry 16 }

pktcEUEDevPCSCFSubscribeRetry  OBJECT-TYPE
    SYNTAX      Unsigned32
    UNITS       "seconds"
    MAX-ACCESS  read-create
    STATUS      current
    DESCRIPTION
        " This is the retry period for the initial SUBSCRIBE due to error
          responses, the absence of a retry period in the Retry-After
          header response or a request timeout. Please
          refer to the PacketCable IMS Delta Session Initiation
          Protocol (SIP) and Session Description Protocol (SDP),
          Stage 3 Specification 3GPP TS 24.229 for more
          information."
    REFERENCE
       "PacketCable IMS Delta Session Initiation Protocol (SIP)
        and Session Description Protocol (SDP), Stage 3
        Specification 3GPP TS 24.229"
    DEFVAL {900}
    ::= { pktcEUEDevPCSCFEntry 17 }


-- ------------------------------------------------------------------
-- BSFs associated with a eUE
-- ------------------------------------------------------------------
pktcEUEDevBSFTable OBJECT-TYPE
    SYNTAX      SEQUENCE OF PktcEUEDevBSFEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        " This data table represents the eUE's knowledge
          of suitable BSFs to contact."

    ::= { pktcEUEDevProfile 5 }

pktcEUEDevBSFEntry OBJECT-TYPE
    SYNTAX      PktcEUEDevBSFEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        " Each entry in this data table contains an instance
          of a BSF, specific to a AS type, for a given Operator's
          Domain Name.
          The entries represent the eUE's knowledge
          of suitable BSFs to contact, as per the IMS GBA
          architecture to obtain credentials and enabling secure
          sessions to Application Servers. A list of
          BSFs for each Operator and application
          types MAY be configured by the Operator.

          The conceptual rows MUST NOT persist across eUE resets."

    INDEX  { pktcEUEDevOpIndex, pktcEUEDevBSFASType, pktcEUEDevBSFIndex }
    ::= { pktcEUEDevBSFTable 1 }

PktcEUEDevBSFEntry ::=
    SEQUENCE {
             pktcEUEDevBSFASType     SnmpAdminString,
             pktcEUEDevBSFIndex      Unsigned32,
```

```
            pktcEUEDevBSFAddrType   InetAddressType,
            pktcEUEDevBSFAddr       InetAddress,
            pktcEUEDevBSFRowStatus  RowStatus
            }

pktcEUEDevBSFASType OBJECT-TYPE
    SYNTAX      SnmpAdminString (SIZE (0..108))
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        " A unique value used to indicate the AS type to
          which the BSFs correspond.
          Applications using GBA are required to specify
          such identifiers explicitly."

    ::= { pktcEUEDevBSFEntry 1 }

pktcEUEDevBSFIndex OBJECT-TYPE
    SYNTAX      Unsigned32 (1..16)
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        " A unique value used to identify an instance in this
          data table. The indices SHOULD be contiguous.
          When multiple entries are specified, the eUE MUST give
          precedence to the values indexed by lower indices."

    ::= { pktcEUEDevBSFEntry 2 }

pktcEUEDevBSFAddrType  OBJECT-TYPE
    SYNTAX      InetAddressType
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        " This data element contains the type of the data
          element contained in 'pktcEUEDevBSFAddr'."

    DEFVAL   { unknown }
    ::= { pktcEUEDevBSFEntry 3 }

pktcEUEDevBSFAddr  OBJECT-TYPE
    SYNTAX      InetAddress
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        " The address of a BSF server associated with
          the domain name indicated by the indices
          'pktcEUEDevOpIndex' (Operator Domain),
          'pktcEUEDevBSFASType' and 'pktcEUEDevBSFIndex'."

    DEFVAL   { "" }
    ::= { pktcEUEDevBSFEntry 4 }

pktcEUEDevBSFRowStatus  OBJECT-TYPE
    SYNTAX      RowStatus
    MAX-ACCESS  read-create
    STATUS      current
    DESCRIPTION
        " This object defines the row status associated with this
          instance of a BSF.

          The value of the 'pktcEUEDevBSFAddrType' object MUST not be
          modified while this object is 'active'.  The value of
          'pktcEUEDevBSFAddr' MAY be modified while this object is active
          if the value is consistent with the type specified by the
          'pktcEUEDevBSFAddrType' object."
     ::= { pktcEUEDevBSFEntry 5 }
```

```
-- ---------------------------------------------------------------------
-- Certificate Bootstrapping Data
-- ---------------------------------------------------------------------
pktcEUECBSupport OBJECT-TYPE
    SYNTAX      TruthValue
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "This MIB Object is used by the eUE to report
         support for Certificate Bootstrapping.
         If the MIB Object is set to a value of true(1)
         it indicates that the device supports Certificate
         Bootstrapping.
         If the MIB Object is set to a value of false(1)
         it indicates that the device does not support
         Certificate Bootstrapping."
    ::= { pktcEUEDevProfile 6 }

pktcEUECBEnable OBJECT-TYPE
    SYNTAX      TruthValue
    MAX-ACCESS  read-write
    STATUS      current
    DESCRIPTION
        "This MIB Object is used to initiate the Certificate
         Bootstrapping procedure in an eUE.

         If this value is set to a value of true(1) and the
         MIB Object pktcEUECBData contains a non-zero HTTP/HTTPS
         URI, then the eUE MUST initiate the Certificate
         Bootstrapping procedure, if supported.

         If the eUE does not support the Certificate
         Bootstrapping procedure, it rejects any attempt
         to set this MIB Object to a value of true(1).
         The eUE MUST return a value of false(2) when this
         MIB Object is read.

         If the Certificate Bootstrapping procedure was
         successful, the eUE MUST act on the Certificate
         Bootstrapping configuration file provided.

         If the procedure was unsuccessful (e.g.,
         authentication error or unresponsive server),
         the eUE MUST report the corresponding management
         event."
    DEFVAL {false}
    ::= { pktcEUEDevProfile 7 }

pktcEUECBData OBJECT-TYPE
    SYNTAX      OCTET STRING(SIZE(0..1023))
    MAX-ACCESS  read-write
    STATUS      current
    DESCRIPTION
        "This MIB Object contains a HTTP/HTTPS URI to be used for
         Certificate Bootstrapping. Any attempt to set it to
         anything other than a HTTP/HTTPS URI MUST be rejected
         by the eUE."
    ::= { pktcEUEDevProfile 8 }


-- ---------------------------------------------------------------------
-- Scalar MIB Objects for the EUE Device
-- ---------------------------------------------------------------------

pktcEUEDevSipPort OBJECT-TYPE
    SYNTAX      InetPortNumber
```

```
    MAX-ACCESS  read-write
    STATUS      current
    DESCRIPTION
        "This MIB Object contains the SIP Port to receive the
         SIP Requests on."
    DEFVAL { 5060 }
    ::= { pktcEUEDevProfile 9 }

pktcEUEPreferredCandidatePair OBJECT-TYPE
    SYNTAX      InetVersion
    MAX-ACCESS  read-write
    STATUS      current
    DESCRIPTION
        "This MIB Object identifies the preferred IP version to be used
        when selecting the valid candidate pair for a media stream.

         The following requirements apply depending on the value of
         this MIB Object:

         - 'ipv4'
         The eUE MUST prefer IPv4 for media.

         - 'ipv6'
         The eUE MUST prefer IPv6 for media.

         - 'unknown'
          The eUE MUST prefer the IP version for media that matches
          the IP version of the primary IP address."

    REFERENCE
        "PacketCable IMS Delta Session Initiation Protocol (SIP)
        and Session Description Protocol (SDP), Stage 3
        Specification 3GPP TS 24.229."

    DEFVAL { unknown }
    ::= { pktcEUEDevProfile 10 }



-- ---------------------------------------------------------------------
-- Conformance Information
-- ---------------------------------------------------------------------


-- ----------------------
-- Compliance Statements
-- ----------------------
pktcEUEDevMIBCompliance MODULE-COMPLIANCE
    STATUS      current
    DESCRIPTION
        " The compliance statement for implementations of the eUE MIB."
    MODULE
        MANDATORY-GROUPS {
                        pktcEUEDevProfileGroup,
                        pktcEUEDevOpGroup,
                        pktcEUEDevDnsGroup,
                        pktcEUEDevPCSCFGroup,
                        pktcEUEDevBSFGroup,
                        pktcEUEDevPerDeviceGroup
                          }

    ::= { pktcEUEDevCompliances 1 }

pktcEUEDevProfileGroup OBJECT-GROUP
      OBJECTS {
         pktcEUEDevProfileVersion
      }
```

```
      STATUS  current
      DESCRIPTION
            "The eUE Device Profile Group."
      ::= { pktcEUEDevGroups 1}

pktcEUEDevOpGroup OBJECT-GROUP
      OBJECTS {
         pktcEUEDevOpDomain,
         pktcEUEDevOpSTUNAddrType,
         pktcEUEDevOpSTUNAddr,
         pktcEUEDevOpSTUNAddrPort,
         pktcEUEDevOpTURNAddrType,
         pktcEUEDevOpTURNAddr,
         pktcEUEDevOpTURNAddrPort,
         pktcEUEDevOpTURNCredsType,
         pktcEUEDevOpTURNCreds,
         pktcEUEDevOpRowStatus
      }
      STATUS  current
      DESCRIPTION
            "The eUE Operator Group."
      ::= { pktcEUEDevGroups 2}

pktcEUEDevDnsGroup OBJECT-GROUP
      OBJECTS {
         pktcEUEDevDnsAddrType,
         pktcEUEDevDnsAddr,
         pktcEUEDevDnsRowStatus
      }
      STATUS  current
      DESCRIPTION
            "The eUE DNS Group."
      ::= { pktcEUEDevGroups 3}

pktcEUEDevPCSCFGroup OBJECT-GROUP
      OBJECTS {
         pktcEUEDevPCSCFAddrType,
         pktcEUEDevPCSCFAddr,
         pktcEUEDevPCSCFSipPort,
         pktcEUEDevPCSCFUsedProtocol,
         pktcEUEDevPCSCFUsedInetAddressType,
         pktcEUEDevPCSCFUsedInetAddress,
         pktcEUEDevPCSCFTimerT1,
         pktcEUEDevPCSCFTimerT2,
         pktcEUEDevPCSCFTimerT4,
         pktcEUEDevPCSCFTimerTD,
         pktcEUEDevPCSCFRowStatus,
         pktcEUEDevPCSCFInviteAttempts,
         pktcEUEDevPCSCFMaxTime,
         pktcEUEDevPCSCFBaseTimeAllFailed,
         pktcEUEDevPCSCFBaseTimeAllNotFailed,
         pktcEUEDevPCSCFSubscribeRetry
      }
      STATUS  current
      DESCRIPTION
            "The eUE P-CSCF Group."
      ::= { pktcEUEDevGroups 4}

pktcEUEDevBSFGroup OBJECT-GROUP
      OBJECTS {
         pktcEUEDevBSFAddrType,
         pktcEUEDevBSFAddr,
         pktcEUEDevBSFRowStatus
      }
      STATUS  current
      DESCRIPTION
            "The eUE BSF Group."
```

```
      ::= { pktcEUEDevGroups 5}


pktcEUEDevPerDeviceGroup  OBJECT-GROUP
      OBJECTS {
         pktcEUECBSupport,
         pktcEUECBEnable,
         pktcEUECBData,
         pktcEUEDevSipPort,
         pktcEUEPreferredCandidatePair

      }
      STATUS  current
      DESCRIPTION
            "The eUE per Device list of objects Group."
      ::= { pktcEUEDevGroups 6}

END
```

B.2 User Configuration MIB Module

```
CL-PKTC-EUE-USER-MIB DEFINITIONS ::= BEGIN

IMPORTS
    PktcEUETCIDType,
    PktcEUETCID,
    PktcEUETCCredsType,
    PktcEUETCCreds,
    PktcEUETCUsrElementIndexType,
    PktcEUETCUsrAppIndexType,
    PktcEUETCAppOrgIdentifier,
    PktcEUETCAppIdentifier,
    PktcEUETCAdminStatus,
    PktcEUETCOperStatus,
    PktcEUETCStatusInfo
                    FROM CL-PKTC-EUE-TC-MIB
    MODULE-IDENTITY,
    OBJECT-TYPE
                    FROM SNMPv2-SMI
    OBJECT-GROUP,
    MODULE-COMPLIANCE
                    FROM SNMPv2-CONF
    SnmpAdminString
                    FROM SNMP-FRAMEWORK-MIB
    TruthValue,
    RowStatus
                    FROM SNMPv2-TC
    pktcEUEMibs
                    FROM CLAB-DEF-MIB;



pktcEUEUserMIB MODULE-IDENTITY
    LAST-UPDATED "201005030000Z" -- May 3, 2010
    ORGANIZATION "Cable Television Laboratories, Inc."
    CONTACT-INFO
            "Broadband Network Services
             Cable Television Laboratories, Inc.
             858 Coal Creek Circle,
             Louisville, CO 80027, USA
             Phone: +1 303-661-3307
             Email: mibs@cablelabs.com

             Acknowledgements:
             Thomas Clack, Broadcom - Primary author,
```

```
             Eugene Nechamkin, Broadcom
             Sumanth Channabasappa, CableLabs
             John Berg, CableLabs
             Eduardo Cardona, CableLabs
             and members of the PacketCable 2.0 Provisioning Focus Team."

    DESCRIPTION
            "This MIB module contains configuration MIB
             objects for the PacketCable Users as
             required by the PacketCable
             E-UE Provisioning Framework."
    REVISION "201005030000Z" -- May 3, 2010
    DESCRIPTION
            "Revised Version includes ECNs
            EUE-DATA-N-10.0631-3
            and published as part of PKT-SP-EUE-DATA-I05-100527."
    REVISION "200905280000Z" -- May 28, 2009
    DESCRIPTION
            "Revised Version includes ECNs
            EUE-DATA-N-08.0528-3
            EUE-DATA-N-09.0556-3
            and published as part of PKT-SP-EUE-DATA-I03-090528."
    REVISION "200807100000Z" -- July 10, 2008
    DESCRIPTION
            "Revised Version includes ECN EUE-DATA-N-08.0524-5
            and published as part of PKT-SP-EUE-DATA-I02-080710."
    REVISION "200711060000Z" -- Nov 6, 2007
    DESCRIPTION
            "Initial version, published as part of the CableLabs
            E-UE Provisioning Data Model Specification
            PKT-SP-EUE-DATA-I01-071106
            Copyright 1999-2010 Cable Television Laboratories, Inc.
            All rights reserved."

    ::= { pktcEUEMibs 4 }


-- Administrative assignments
pktcEUEUsrNotification      OBJECT IDENTIFIER ::= { pktcEUEUserMIB 0 }
pktcEUEUsrObjects           OBJECT IDENTIFIER ::= { pktcEUEUserMIB 1 }
pktcEUEUsrConformance       OBJECT IDENTIFIER ::= { pktcEUEUserMIB 2 }

pktcEUEUsrCompliances       OBJECT IDENTIFIER ::= { pktcEUEUsrConformance 1 }
pktcEUEUsrGroups            OBJECT IDENTIFIER ::= { pktcEUEUsrConformance 2 }


-- ---------------------------------------------------------------------
--  User Profile Information
-- ---------------------------------------------------------------------
pktcEUEUsrProfile           OBJECT IDENTIFIER ::= { pktcEUEUsrObjects 1 }

pktcEUEUsrProfileVersion OBJECT-TYPE
    SYNTAX      SnmpAdminString(SIZE(0..6))
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        " This MIB Object represents the User Profile Version for this
          MIB module. The eUE MUST set this MIB Object to value of '1.0'."
    ::= { pktcEUEUsrProfile 1 }


-- ---------------------------------------------------------------------
--  User table
-- ---------------------------------------------------------------------
pktcEUEUsrIMPUTable OBJECT-TYPE
    SYNTAX      SEQUENCE OF PktcEUEUsrIMPUEntry
    MAX-ACCESS  not-accessible
```

```
    STATUS      current
    DESCRIPTION
        " This data table represents Users associated with
          the eUE. Specifically it provides information related
          to the IM Public Identity (IMPU) of the User."
    ::= { pktcEUEUsrProfile 2 }

pktcEUEUsrIMPUEntry OBJECT-TYPE
    SYNTAX      PktcEUEUsrIMPUEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        " Each entry in this data table describes an association
          of a user IMPU with the eUE, indexed by an IMPU Identifier.

          The eUE uses the entries in this table to register the
          user in a PacketCable Network.

          The credentials for registration are obtained using the
          association with an IMPI in the MIB table
          pktcEUEUsrIMPITable, referenced via the MIB Object
          pktcEUEUsrIMPIIndexRef.

          If two or more active entries have the same IMPU ID,
          the eUE uses the entry with the lowest Index.

          The conceptual rows MUST NOT persist across eUE resets."

    INDEX  { pktcEUEUsrIMPUIndex }
    ::= { pktcEUEUsrIMPUTable 1 }

PktcEUEUsrIMPUEntry ::=
    SEQUENCE {
              pktcEUEUsrIMPUIndex             PktcEUETCUsrElementIndexType,
              pktcEUEUsrIMPUIdType            PktcEUETCIDType,
              pktcEUEUsrIMPUId                PktcEUETCID,
              pktcEUEUsrIMPUIMPIIndexRef      PktcEUETCUsrElementIndexType,
              pktcEUEUsrIMPUDispInfo          SnmpAdminString,
              pktcEUEUsrIMPUOpIndexRefs       SnmpAdminString,
              pktcEUEUsrIMPUAdminStat         PktcEUETCAdminStatus,
              pktcEUEUsrIMPUAdminStatInfo     PktcEUETCStatusInfo,
              pktcEUEUsrIMPUOperStat          PktcEUETCOperStatus,
              pktcEUEUsrIMPUOperStatInfo      PktcEUETCStatusInfo,
              pktcEUEUsrIMPUSigSecurity       TruthValue,
              pktcEUEUsrIMPUAdditionalInfo    SnmpAdminString,
              pktcEUEUsrIMPURowStatus         RowStatus
              }

pktcEUEUsrIMPUIndex  OBJECT-TYPE
    SYNTAX      PktcEUETCUsrElementIndexType
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        " This MIB Object provides a user IMPU index.
          When the user IMPU is referenced elsewhere, such as
          to associate the device and a user IMPU, this
          MIB Object MUST be used as an index reference.
          A value of '0' MUST NOT be used."
    ::= { pktcEUEUsrIMPUEntry 1 }

pktcEUEUsrIMPUIdType  OBJECT-TYPE
    SYNTAX      PktcEUETCIDType
    MAX-ACCESS  read-create
    STATUS      current
    DESCRIPTION
        " This MIB Object MUST indicate the 'Identifier
          type' of the data value contained in 'pktcEUEUsrIMPUId'.
```

```
          Valid types are other(1), publicIdentity(3) and
          username(6)."
    DEFVAL   { other }
    ::= { pktcEUEUsrIMPUEntry 2 }

pktcEUEUsrIMPUId  OBJECT-TYPE
    SYNTAX      PktcEUETCID
    MAX-ACCESS  read-create
    STATUS      current
    DESCRIPTION
        " This MIB Object MUST identify the User IMPU being
          associated with the eUE.

          The type of Identifier is indicated by the
          MIB Object 'pktcEUEUsrIMPUIdType'."
    DEFVAL   { "" }
    ::= { pktcEUEUsrIMPUEntry 3 }

pktcEUEUsrIMPUIMPIIndexRef  OBJECT-TYPE
    SYNTAX      PktcEUETCUsrElementIndexType
    MAX-ACCESS  read-create
    STATUS      current
    DESCRIPTION
        " This MIB Object MUST provide an index reference
          to a IMPI associated with the corresponding IMPU
          specified in this table entry.

          The index reference points to an entry in the MIB
          table 'pktcEUEUsrIMPITable'.


          If this contains a value of '0', it indicates that
          the user IMPU is not yet associated with an IMPI
          and cannot be used in networks requiring
          authentication."
    DEFVAL {0}
    ::= { pktcEUEUsrIMPUEntry 4 }


pktcEUEUsrIMPUDispInfo  OBJECT-TYPE
    SYNTAX      SnmpAdminString
    MAX-ACCESS  read-create
    STATUS      current
    DESCRIPTION
        " This optional MIB Object MAY contain human readable
          text describing User characteristics. Examples include
          User Display Name, Subscriber Identifier etc."
    DEFVAL   { "" }
    ::= { pktcEUEUsrIMPUEntry 5 }

pktcEUEUsrIMPUOpIndexRefs  OBJECT-TYPE
    SYNTAX      SnmpAdminString
    MAX-ACCESS  read-create
    STATUS      current
    DESCRIPTION
        " This optional MIB Object MAY contain a list of comma
          separated Operator domain entries where the user specified
          in this entry 'pktcEUEUsrIMPUId' can be used.

          The entries MUST be index references to the operator
          table associated with the eUE.

          The eUE MAY attempt to use the user entry in a
          domain or sub-domain specified by the operator table,
          corresponding to the entries listed here.
```

```
          The eUE MUST NOT attempt to use the user entry in a
          domain that is not specified by this entry.

          If unspecified, the eUE MUST use the domain identified
          by the IMPU."
    DEFVAL   { "" }
    ::= { pktcEUEUsrIMPUEntry 6 }

pktcEUEUsrIMPUAdminStat OBJECT-TYPE
    SYNTAX      PktcEUETCAdminStatus
    MAX-ACCESS  read-create
    STATUS      current
    DESCRIPTION
        " This MIB Object contains the administratively desired
          activation status of the user IMPU.

          The eUE MUST allow access to the User identified in
          'pktcEUEUsrIMPUId' if the value is set to 'active',
          unless determined otherwise and reported in
          pktcEUEUsrIMPUOperStat.

          The eUE SHOULD attempt to register a User identified in
          'pktcEUEUsrIMPUId' if the value is set to 'active'.
          PacketCable Applications can specify additional
          requirements for registration.

          If this object is set to 'inactive', all applicable
          sessions (e.g. SIP registration) are gracefully terminated.

          The eUE MUST disallow access to the User identified in
          'pktcEUEUsrIMPUId' if the value is set to 'inactive'"
    DEFVAL   { active }
    ::= { pktcEUEUsrIMPUEntry 7 }

pktcEUEUsrIMPUAdminStatInfo OBJECT-TYPE
    SYNTAX      PktcEUETCStatusInfo
    MAX-ACCESS  read-create
    STATUS      current
    DESCRIPTION
        " This MIB Object MAY contain information that describes
          the activation status indicated in 'pktcEUEIMPUAdminStat'.
          Indicates Administratively added information associated
          with administrative status of the User IMPU.
          For example 'User temporarily deactivated for
          maintenance'."
    DEFVAL   { "" }
    ::= { pktcEUEUsrIMPUEntry 8 }

pktcEUEUsrIMPUOperStat OBJECT-TYPE
    SYNTAX      PktcEUETCOperStatus
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION

        " This MIB Object contains the operational activation status
          of the user IMPU.

          This object returns the following values:

          'active'
          When pktcEUEUsrIMPUAdminStat is 'active' and there are
          no run-time conditions and/or configuration errors that
          prohibit the users from communicating with the operator.

          'inactive'
          When pktcEUEUsrIMPUAdminStat is 'inactive'
          or
```

```
            When pktcEUEUsrIMPUAdminStat is 'active' and there
            are run-time conditions that prohibit the users from
            communicating with the operator.

            'notPresent'
            This value is not applicable.

            'unknown'
            Other conditions not covered by the previous values.

            An example of run-time condition that can result in a value
            of 'inactive' is unsuccessful registration.

            PacketCable applications can specify additional conditions for
            how an IMPU is considered 'active', 'inactive' or 'notPresent',
            and corresponding state machine."
        ::= { pktcEUEUsrIMPUEntry 9 }

pktcEUEUsrIMPUOperStatInfo OBJECT-TYPE
        SYNTAX      PktcEUETCStatusInfo
        MAX-ACCESS  read-only
        STATUS      current
        DESCRIPTION
            " This MIB Object contains information that describes the
              activation status indicated in 'pktcEUEUsrIMPUOperStat' or
              the zero-length string is not detail information is available.

              For example 'User deactivated based on user interface input."
        DEFVAL   { "" }
        ::= { pktcEUEUsrIMPUEntry 10 }

pktcEUEUsrIMPUSigSecurity OBJECT-TYPE
        SYNTAX      TruthValue
        MAX-ACCESS  read-write
        STATUS      current
        DESCRIPTION
            " This element indicates the network requirement for
              SIP signaling with the P-CSCF.

              If set to 'true', the UE MUST attempt secure SIP
              signaling with the P-CSCF.

              If set to 'false', the UE MUST attempt to communicate
              without a secure SIP communication channel with the P-CSCF.

              The P-CSCF is considered to be authoritative and the UE will
              follow the requirements in PKT 24.229.

              After the P-CSCF confirm or set the SIP secure mode
              the UE MUST report such state."
        REFERENCE
            "PacketCable IMS Delta Session Initiation Protocol (SIP)
            and Session Description Protocol (SDP), Stage 3
            Specification 3GPP TS 24.229"
        DEFVAL      {true}
        ::= { pktcEUEUsrIMPUEntry 11 }


pktcEUEUsrIMPUAdditionalInfo OBJECT-TYPE
        SYNTAX      SnmpAdminString
        MAX-ACCESS  read-create
        STATUS      current
        DESCRIPTION
            " This MIB Object MAY contain information that describes
              additional information defined by PacketCable specifications,
              including those defining PacketCable features.
```

```
          PacketCable specifications are expected to use this data
          element to obtain additional information.

          To specify such additional info, the following rules apply:

          - Each specification planning to use this MIB Object
            MUST specify data in the following format:
            '<Keyword>#<value>', # being the delimiter
               e.g. FEATURE_X#ABC
                    FEATURE_Y#<value of XYZ>.

          - This MIB Object MUST be a semi-colon separated
            concatenation of such '<keyword>#<value>' pairs. e.g.
            FEATURE_X#ABC;FEATURE_Z#DEF.

          - Since the '#' and ';' characters are used as delimiters,
            they SHOULD not be specified in the keyword. If specified, any
            occurrence of these characters in the value field MUST be
            preceded by the escape character '\' (e.g. FEATURE_X#A\#C).
            Occurrences of '\' MUST be preceded by itself
           (e.g. FEATURE_X#A\\C\#).

           The following rules apply on the eUE:

          - The eUE MUST first separate all the keyword value pairs,
            using a '#' that is not preceded by '\' as the delimiter

          - The eUE MUST, For all recognized keywords, decipher the value
            by interpreting the data after considering the use of '\' as
            defined in this definition.

          - The eUE MUST ignore and report all unrecognized keywords
            using PacketCable Management."
    DEFVAL   { "" }
    ::= { pktcEUEUsrIMPUEntry 12 }

pktcEUEUsrIMPURowStatus OBJECT-TYPE
    SYNTAX      RowStatus
    MAX-ACCESS  read-create
    STATUS      current
    DESCRIPTION
        " This MIB Object defines the row status associated with this
          particular User in the pktcEUEUsrIMPUTable.

          An entry in this table is not qualified for activation
          until the object instances of all corresponding columns
          have been initialized, either by default values or via
          explicit SET operations.  Until all object instances in
          this row are initialized, the status value for this realm
          must be 'notReady(3)'.

          In particular, two columnar objects must be SET: the
          'pktcEUEUsrIMPUIdType' and the 'pktcEUEUsrIMPUId. Once these
          two objects have been set the row status may be SET to 'active(1)'
          The eUE MUST not allow these two objects to be changed while
          the row is 'active'. The value of this object has no effect on
          whether other columnar objects in this row can be modified."
    ::= { pktcEUEUsrIMPUEntry 13 }


-- ---------------------------------------------------------------------
-- User IMPI Table
-- ---------------------------------------------------------------------
pktcEUEUsrIMPITable OBJECT-TYPE
    SYNTAX      SEQUENCE OF PktcEUEUsrIMPIEntry
    MAX-ACCESS  not-accessible
    STATUS      current
```

```
    DESCRIPTION
        " This data table contains the user IMPI information
          associated with users provisioned on the device."

    ::= { pktcEUEUsrProfile 3 }

pktcEUEUsrIMPIEntry OBJECT-TYPE
    SYNTAX      PktcEUEUsrIMPIEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "Each entry in this data table contains an instance
         of a user IMPI and associated credentials.

         Each IMPU provisioned in the eUE SHOULD be associated
         with an entry in this table. The exception is in networks
         where certain users are unauthenticated for application
         access.

         At boot time the eUE MUST populate conceptual rows in this
         order:
         - First, instances provisioned via device configuration (e.g.,
           config file, dynamically created via SNMP). These instances
           MUST NOT persist across reboots.
         - Second, entries provisioned via Certificate Bootstrapping
           File. These entries may appear  again after device
               re-initialization, depending on Certificate Bootstrapping
               file persistence requirements defined elsewhere.

         As a side effect, if an instance loaded from a Certificate
         Bootstrapping file is updated via SNMP later on, those changes
         are not required to be reflected in the CB file persistence
         storage (if CB file persistence is supported). Instead, the
         trigger of a new CB file download is preferred to update CB
         information."
    INDEX  { pktcEUEUsrIMPIIndex }
    ::= { pktcEUEUsrIMPITable 1 }

PktcEUEUsrIMPIEntry ::=
    SEQUENCE {
              pktcEUEUsrIMPIIndex             PktcEUETCUsrElementIndexType,
              pktcEUEUsrIMPIIdType            PktcEUETCIDType,
              pktcEUEUsrIMPIId                PktcEUETCID,
              pktcEUEUsrIMPICredsType         PktcEUETCCredsType,
              pktcEUEUsrIMPICredentials       PktcEUETCCreds,
              pktcEUEUsrIMPIRowStatus         RowStatus
             }

pktcEUEUsrIMPIIndex OBJECT-TYPE
    SYNTAX      PktcEUETCUsrElementIndexType
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        " This MIB Object provides a user IMPI index.
          When the user IMPI is referenced elsewhere, such as
          to associate the IMPU and an IMPI, this
          MIB Object MUST be used as an index reference.
          A value of '0' MUST NOT be used."
    ::= { pktcEUEUsrIMPIEntry 1 }

pktcEUEUsrIMPIIdType  OBJECT-TYPE
    SYNTAX      PktcEUETCIDType
    MAX-ACCESS  read-create
    STATUS      current
    DESCRIPTION
        " This MIB Object MUST indicate the 'Identifier
          type' of the data value contained in 'pktcEUEUsrIMPIId'.
```

```
          Valid types are other(1), privateIdentity(4) and
          username(6)."
    DEFVAL   { other }
    ::= { pktcEUEUsrIMPIEntry 2 }

pktcEUEUsrIMPIId  OBJECT-TYPE
    SYNTAX      PktcEUETCID
    MAX-ACCESS  read-create
    STATUS      current
    DESCRIPTION
        " This MIB Object MUST identify a User IMPI being
          specified in this table.

          The type of Identifier is indicated by the
          MIB Object 'pktcEUEUsrIMPIIdType'."
    DEFVAL   { "" }
    ::= { pktcEUEUsrIMPIEntry 3 }


pktcEUEUsrIMPICredsType  OBJECT-TYPE
    SYNTAX      PktcEUETCCredsType
    MAX-ACCESS  read-create
    STATUS      current
    DESCRIPTION
        " This MIB Object contains the type of credentials
          contained in the MIB Object 'pktcEUEUsrIMPICredentials'."
    DEFVAL   { none }
    ::= { pktcEUEUsrIMPIEntry 4 }

pktcEUEUsrIMPICredentials  OBJECT-TYPE
    SYNTAX      PktcEUETCCreds
    MAX-ACCESS  read-create
    STATUS      current
    DESCRIPTION
        " This MIB Object allows the Operator to configure credentials
          associated with an IMPI. This value is used with, and must
          be consistent with, the value
          of the associated 'pktcEUEUsrIMPIcredsType' object.

          If read this MIB Object MUST always return an empty
          string value for privacy reasons.

          An Operator SHOULD provide this MIB Object only
          over a secured configuration interface to avoid
          security threats due to compromised credentials."
    DEFVAL   { "" }
    ::= { pktcEUEUsrIMPIEntry 5 }

pktcEUEUsrIMPIRowStatus  OBJECT-TYPE
    SYNTAX      RowStatus
    MAX-ACCESS  read-create
    STATUS      current
    DESCRIPTION
        " This MIB Object defines the row status associated with this
          entry.

          The value of the 'pktcEUEUsrIMPICredsType' object MUST NOT be
          modified while this object is 'active'.

          The value of 'pktcEUEUsrIMPICredentials' MAY be modified
          while this object is active if the value is consistent with
          the type specified by the 'pktcEUEUsrIMPICredsType' object."
     ::= { pktcEUEUsrIMPIEntry 6 }

-- ----------------------------------------------------------------------
-- User to Apps Mapping Table
```

```
-- ---------------------------------------------------------------------
pktcEUEUsrAppMapTable OBJECT-TYPE
    SYNTAX      SEQUENCE OF PktcEUEUsrAppMapEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        " This data table represents Applications associated with
          a User IMPU."
    ::= { pktcEUEUsrProfile 4 }

pktcEUEUsrAppMapEntry OBJECT-TYPE
    SYNTAX      PktcEUEUsrAppMapEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        " Each entry in this data table identifies an application
          associated with the user, the application profile index
          reference, administrative status and the operational
          status information.

          The conceptual rows MUST NOT persist across eUE resets."
    INDEX   { pktcEUEUsrIMPUIndex, pktcEUEUsrAppMapAppIndex }
    ::= { pktcEUEUsrAppMapTable 1 }

PktcEUEUsrAppMapEntry ::=
    SEQUENCE    {
                 pktcEUEUsrAppMapAppIndex           PktcEUETCUsrAppIndexType,
                 pktcEUEUsrAppMapAppOrgID           PktcEUETCAppOrgIdentifier,
                 pktcEUEUsrAppMapAppIdentifier      PktcEUETCAppIdentifier,
                 pktcEUEUsrAppMapAppIndexRef        PktcEUETCUsrAppIndexType,
                 pktcEUEUsrAppMapAppAdminStat       PktcEUETCAdminStatus,
                 pktcEUEUsrAppMapAppAdminStatInfo   PktcEUETCStatusInfo,
                 pktcEUEUsrAppMapAppOperStat        PktcEUETCOperStatus,
                 pktcEUEUsrAppMapAppOperStatInfo    PktcEUETCStatusInfo,
                 pktcEUEUsrAppMapRowStatus          RowStatus
                }

pktcEUEUsrAppMapAppIndex OBJECT-TYPE
    SYNTAX      PktcEUETCUsrAppIndexType
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        " This MIB Object represents an index to map
          an Application instance associated with the User
          IMPU."
    ::= { pktcEUEUsrAppMapEntry 1 }



pktcEUEUsrAppMapAppOrgID OBJECT-TYPE
    SYNTAX      PktcEUETCAppOrgIdentifier
    MAX-ACCESS  read-create
    STATUS      current
    DESCRIPTION
        " This MIB Object identifies the Organization
          specifying the app identifier contained in
          the MIB Object 'pktcEUEUsrAppMapAppIdentifier'."
    ::= { pktcEUEUsrAppMapEntry 2 }


pktcEUEUsrAppMapAppIdentifier OBJECT-TYPE
    SYNTAX      PktcEUETCAppIdentifier
    MAX-ACCESS  read-create
    STATUS      current
    DESCRIPTION
        " This MIB Object represents the identifier
          for an Application associated with the User.
```

```
          The application identifier MUST represent
          an application specified by the organization
          specified in 'pktcEUEUsrAppMapAppOrgID'."
    ::= { pktcEUEUsrAppMapEntry 3 }


pktcEUEUsrAppMapAppIndexRef OBJECT-TYPE
    SYNTAX      PktcEUETCUsrAppIndexType
    MAX-ACCESS  read-create
    STATUS      current
    DESCRIPTION
        " This MIB Object represents the index reference
          to an application profile for the application
          identified by the MIB Object
          'pktcEUEUsrAppMapAppIDentifier'.
          If this value is set to a value of '0' then
          the following conditions apply:
          - If the application has no specific configuration
          data, the network activation status MUST be
          considered by the eUE
          - If the application has configuration data elements
          the eUE MUST deactivate the application. The deactivation
          is reported by 'pktcEUEUsrAppMapAppOperStat'."
    DEFVAL {0}
    ::= { pktcEUEUsrAppMapEntry 4 }


pktcEUEUsrAppMapAppAdminStat OBJECT-TYPE
    SYNTAX      PktcEUETCAdminStatus
    MAX-ACCESS  read-create
    STATUS      current
    DESCRIPTION
        " This MIB Object contains the administratively desired
          activation status of this instance.

          If 'active' the User can use the application.
          If 'inactive' the user can not use the application."
    DEFVAL {active}
    ::= { pktcEUEUsrAppMapEntry 5 }


pktcEUEUsrAppMapAppAdminStatInfo OBJECT-TYPE
    SYNTAX      PktcEUETCStatusInfo
    MAX-ACCESS  read-create
    STATUS      current
    DESCRIPTION
        " This MIB Object represents additional
          information for the status information
          represented by 'pktcEUEUsrAppMapAppAdminStat'."
    ::= { pktcEUEUsrAppMapEntry 6 }


pktcEUEUsrAppMapAppOperStat OBJECT-TYPE
    SYNTAX      PktcEUETCOperStatus
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        " This MIB Object represents the current operational status
          of the user using the application specified in this entry.

          This object returns the following values:

          'active'
          When pktcEUEUsrAppMapAppAdminStat is 'active' and there are
          no run-time conditions and/or configuration errors that prohibit
          the IMPU to use this application.
```

```
            'inactive'
            When pktcEUEUsrAppMapAppAdminStat is 'inactive'
            or
            When pktcEUEUsrAppMapAppAdminStat is 'active' and there
            are run-time conditions and/or configuration errors that
            prohibit the IMPU to use this application.

            'notPresent'
            When the application is not available or unknown to the UE.

            'unknown'
            Other conditions not covered by the previous values.

            An example of a run-time condition that can result in a value
            of 'inactive' is unsuccessful user registration.

            PacketCable applications can specify additional conditions for
            how an application is considered 'active', 'inactive' or
            'notPresent' for an IMPU."
        ::= { pktcEUEUsrAppMapEntry 7 }

pktcEUEUsrAppMapAppOperStatInfo OBJECT-TYPE
    SYNTAX      PktcEUETCStatusInfo
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        " This MIB Object represents additional
          information for the status information
          represented by 'pktcEUEUsrAppMapAppOperStat'.

          For example, the  pktcEUEUsrAppMapAppOperStat value
          'notPresent'  can report in this object the value
          'UE does not support this application'."
    ::= { pktcEUEUsrAppMapEntry 8 }

pktcEUEUsrAppMapRowStatus  OBJECT-TYPE
    SYNTAX      RowStatus
    MAX-ACCESS  read-create
    STATUS      current
    DESCRIPTION
        " This MIB Object defines the row status associated with this
          particular User in the pktcEUEUsrAppMapTable.

          An entry in this table is not qualified for activation
          until the object instances of all corresponding columns
          have been initialized, either by default values or via
          explicit SET operations.  Until all object instances in
          this row are initialized, the status value for this realm
          must be 'notReady(3)'.

          In particular, two columnar objects must be SET: the
          'pktcEUEUsrAppMapAppOrgID' and pktcEUEUsrAppMapAppIdentifier.
          Once these two objects have been set the row status may be SET
          to 'active(1)'.

          The eUE MUST not allow these two objects to be changed while
          the row is 'active'. The value of this object has no effect on
          whether other columnar objects in this row can be modified."

     ::= { pktcEUEUsrAppMapEntry 9 }


-- ---------------------------------------------------------------------
-- Conformance Information
-- ---------------------------------------------------------------------

-- ----------------------
```

```
-- Compliance Statements
-- ----------------------

pktcEUEUsrMIBCompliance MODULE-COMPLIANCE
    STATUS      current
    DESCRIPTION
            "The compliance statement for implementations of the User Mib."
    MODULE   -- this module
        MANDATORY-GROUPS {
                 pktcEUEUsrProfileGroup,
                 pktcEUEUsrIMPUGroup,
                 pktcEUEUsrIMPIGroup,
                 pktcEUEUsrAppMapGroup
                 }
    ::= { pktcEUEUsrCompliances 1 }

pktcEUEUsrProfileGroup OBJECT-GROUP
      OBJECTS {
         pktcEUEUsrProfileVersion
      }
      STATUS  current
      DESCRIPTION
            "The eUE Usr Profile Group."
      ::= { pktcEUEUsrGroups 1 }

pktcEUEUsrIMPUGroup OBJECT-GROUP
      OBJECTS {
         pktcEUEUsrIMPUIdType,
         pktcEUEUsrIMPUId,
         pktcEUEUsrIMPUIMPIIndexRef,
         pktcEUEUsrIMPUDispInfo,
         pktcEUEUsrIMPUOpIndexRefs,
         pktcEUEUsrIMPUAdminStat,
         pktcEUEUsrIMPUAdminStatInfo,
         pktcEUEUsrIMPUOperStat,
         pktcEUEUsrIMPUOperStatInfo,
         pktcEUEUsrIMPUSigSecurity,
         pktcEUEUsrIMPUAdditionalInfo,
         pktcEUEUsrIMPURowStatus
      }
      STATUS  current
      DESCRIPTION
            "The user IMPU Group."
      ::= { pktcEUEUsrGroups 2}


pktcEUEUsrIMPIGroup OBJECT-GROUP
      OBJECTS {
          pktcEUEUsrIMPICredsType,
          pktcEUEUsrIMPICredentials,
          pktcEUEUsrIMPIIdType,
          pktcEUEUsrIMPIId,
          pktcEUEUsrIMPIRowStatus
      }
      STATUS  current
      DESCRIPTION
            "The user IMPI Group."
      ::= { pktcEUEUsrGroups 3 }

pktcEUEUsrAppMapGroup OBJECT-GROUP
      OBJECTS {
           pktcEUEUsrAppMapAppOrgID,
           pktcEUEUsrAppMapAppIdentifier,
           pktcEUEUsrAppMapAppIndexRef,
           pktcEUEUsrAppMapAppAdminStat,
           pktcEUEUsrAppMapAppAdminStatInfo,
           pktcEUEUsrAppMapAppOperStat,
```

```
            pktcEUEUsrAppMapAppOperStatInfo,
            pktcEUEUsrAppMapRowStatus
      }
      STATUS  current
      DESCRIPTION
            "The User to Applications Mapping Group."
      ::= { pktcEUEUsrGroups 4 }

END
```

Annex C PacketCable eUE Provisioning and Management Modules

C.1 Provisioning and Management MIB Module

```
CL-PKTC-EUE-PROV-MGMT-MIB DEFINITIONS ::= BEGIN

IMPORTS
    OBJECT-TYPE,
    MODULE-IDENTITY,
    Unsigned32
                        FROM SNMPv2-SMI

    OBJECT-GROUP,
    MODULE-COMPLIANCE   FROM SNMPv2-CONF
    SnmpAdminString
                        FROM SNMP-FRAMEWORK-MIB
    InetAddressType,
    InetAddress
                        FROM INET-ADDRESS-MIB
    pktcEUEMibs         FROM CLAB-DEF-MIB;


pktcEUEProvMgmtMIB MODULE-IDENTITY
    LAST-UPDATED "201101170000Z" -- Jan 17, 2011
    ORGANIZATION "Cable Television Laboratories, Inc."
    CONTACT-INFO
            "Broadband Network Services
             Postal: Cable Television Laboratories, Inc
             858 Coal Creek Circle
             Louisville, CO 80027
             U.S.A.
             Phone: +1 303 661 9100
             Fax: +1 303 661 9199
             E-mail:mibs@cablelabs.com

             Acknowledgements:
             Thomas Clack, Broadcom  - Primary author
             Josh Littlefield, Cisco,
             Eugene Nechamkin, Broadcom
             Sumanth Channabasappa, CableLabs
             Eduardo Cardona, CableLabs
             and members of the PacketCable 2.0 Provisioning Focus Team."

    DESCRIPTION
            "This MIB module provides the provisioning and management
            MIB module for the E-UE Provisioning Framework."
    REVISION "201101170000Z" -- Jan 17, 2011
    DESCRIPTION
            "Revised Version includes ECN EUE-DATA-N-11.0659-1
            and published as I06"
    REVISION "200807100000Z" -- July 10, 2008
    DESCRIPTION
            "Revised Version includes ECN EUE-DATA-N-08.0524-5
            and published as I02"
    REVISION "200711060000Z" -- Nov 6, 2007
    DESCRIPTION
            "Initial version, published as part of the CableLabs
            E-UE Provisioning Data Model Specification
            PKT-SP-EUE-DATA-I01-071106
            Copyright 1999-2007 Cable Television Laboratories, Inc.
            All rights reserved."
    ::= { pktcEUEMibs 5 }

-- Administrative assignments
pktcEUEProvMgmtNotifications     OBJECT IDENTIFIER ::= { pktcEUEProvMgmtMIB 0 }
```

```
pktcEUEProvMgmtObjects          OBJECT IDENTIFIER ::= { pktcEUEProvMgmtMIB 1 }
pktcEUEProvMgmtConformance      OBJECT IDENTIFIER ::= { pktcEUEProvMgmtMIB 2 }



pktcEUEProvMgmtVersion OBJECT-TYPE
    SYNTAX      SnmpAdminString(SIZE(0..6))
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        " This MIB Object represents the Provisioning and Management Module
          version. The eUE MUST set this MIB Object to value of '1.0'."
    ::= { pktcEUEProvMgmtObjects  1 }


-- DHCP Servers for IPv6
pktcEUEDhcpv6ServerId1   OBJECT-TYPE
       SYNTAX      OCTET STRING (SIZE(0..32))
       MAX-ACCESS  read-only
       STATUS      current
       DESCRIPTION
           " This MIB Object contains the primary DHCP Server identifier
             (DSS_ID)the E-UE was provided with, during provisioning.

             The eUE MUST populate this MIB Object with the first
             thirty-two bytes of the DHCPv6 Server identifier
             provided within the eCM's CL_OPTION_CCCV6 or CL_V4OPTION_CCCV6,
             sub-option 1."
       DEFVAL   { ''H }
       ::= { pktcEUEProvMgmtObjects 2 }

pktcEUEDhcpv6ServerId2  OBJECT-TYPE
       SYNTAX      OCTET STRING (SIZE(0..32))
       MAX-ACCESS  read-only
       STATUS      current
       DESCRIPTION
           " This MIB Object contains the secondary DHCP Server identifier
             (DSS_ID) the E-UE was provided with, during provisioning.

             The eUE MUST populate this MIB Object with the first
             thirty-two bytes of the DHCPv6 Server identifier
             provided within the eCM's CL_OPTION_CCCV6 or CL_V4OPTION_CCCV6,
             sub-option 2."
       DEFVAL   { ''H }
             ::= { pktcEUEProvMgmtObjects 3 }


pktcEUEDhcpv6ServerAddressType  OBJECT-TYPE
       SYNTAX      InetAddressType
       MAX-ACCESS  read-only
       STATUS      current
       DESCRIPTION
           "This MIB Object contains the DHCP Server Address type
            contained in the MIB Object 'pktcEUEDhcpv6ServerAddress'.
            Valid values are 'ipv6(2)' and 'unknown(0)'."
             ::= { pktcEUEProvMgmtObjects 4 }


pktcEUEDhcpv6ServerAddress  OBJECT-TYPE
       SYNTAX      InetAddress
       MAX-ACCESS  read-only
       STATUS      current
       DESCRIPTION
           "This MIB Object contains the DHCPv6 Server address from
            which the eUE obtained its IPv6 address, if the eUE
            is in IPv6 mode, and can obtain the information."
             ::= { pktcEUEProvMgmtObjects 5 }
```

```
-- DNS Servers for IPv6
pktcEUEDnsv6ServerAddressType  OBJECT-TYPE
       SYNTAX      InetAddressType
       MAX-ACCESS  read-only
       STATUS      current
       DESCRIPTION
           "This MIB Object contains the DNS Server Address type
            contained in the MIB Object 'pktcEUEDnsv6ServerAddress'.
            Valid values are 'ipv6(2)' and 'unknown(0)'."
       ::= { pktcEUEProvMgmtObjects 6}

pktcEUEDnsv6ServerAddress1  OBJECT-TYPE
       SYNTAX      InetAddress
       MAX-ACCESS  read-write
       STATUS      current
       DESCRIPTION
           "This MIB Object contains the primary DNSv6 Server address
            which the eUE obtained via DHCPv6, when the eUE
            is in IPv6 mode."
       ::= { pktcEUEProvMgmtObjects 7 }

pktcEUEDnsv6ServerAddress2  OBJECT-TYPE
       SYNTAX      InetAddress
       MAX-ACCESS  read-write
       STATUS      current
       DESCRIPTION
           "This MIB Object contains the secondary DNSv6 Server address
            which the eUE obtained via DHCPv6, when the eUE
            is in IPv6 mode."
       ::= { pktcEUEProvMgmtObjects 8 }

-- Object Groups
-- The object groups used in this MIB module are imported from
-- the PKTC-IETF-MTA-MIB MIB (RFC4682).

-- Conformance Statements
pktcEUEProvMgmtCompliances  OBJECT IDENTIFIER ::= { pktcEUEProvMgmtConformance 1 }
pktcEUEProvMgmtGroups       OBJECT IDENTIFIER ::= { pktcEUEProvMgmtConformance 2 }

-- Compliance Statements
pktcEUEProvMgmtCompliance MODULE-COMPLIANCE
    STATUS  current
    DESCRIPTION
        "The compliance statement for PacketCable eUE devices
        that implement the PacketCable eUE Provisioning Framework.

        This compliance statement specifies, for the PacketCable
        eUE Provisioning framework, the required objects from the 'Multimedia
        Terminal Adapter(MTA)Management Information Base for
        PacketCable and IPCablecom-Compliant Devices'(RFC 4682)MIB.

        Some objects from RFC4682 have been enhanced for applicability
        to eUEs. Similarly, inapplicable objects are clearly indicated.

        As indicated in the eUE Provisioning specification, references
        to E-MTA and eMTA in RFC4682 are to be understood to be applicable
        to E-UE and eUE, respectively."
    REFERENCE
        "PacketCable E-UE Provisioning Framework Specification"

    MODULE   PKTC-IETF-MTA-MIB
        MANDATORY-GROUPS {
               pktcMtaGroup,
               pktcMtaNotificationGroup
        }
```

```
-- The following pktcEUEDevBase group describes the base eUE objects

  OBJECT  pktcMtaDevResetNow
  DESCRIPTION
      " This MIB Object controls the eUE software reset.
        The eUE MUST return a value of 'false' upon an Object read.
        The eUE MUST reset itself when this object is set to a value of
        'true', and perform the following actions:
          - All Services (if present) are immediately terminated.
          - Any sessions (even on the behalf of Users) are gracefully
            terminated.
          - The provisioning flow is started at step eUE-1.

        If a value is written into an instance of 'pktcMtaDevResetNow',
        the agent MUST NOT retain the supplied value across eUE
        re-initializations or reboots."

  --  OBJECT  pktcMtaDevSerialNumber                  - Same as PKTC-IETF-MTA-MIB
  --  OBJECT  pktcMtaDevSwCurrentVers                 - Same as PKTC-IETF-MTA-MIB
  --  OBJECT  pktcMtaDevFQDN                          - Same as PKTC-IETF-MTA-MIB

  OBJECT  pktcMtaDevEndPntCount
  MIN-ACCESS  not-accessible
  DESCRIPTION
      " Object not applicable for the eUE."

  OBJECT  pktcMtaDevEnabled
  DESCRIPTION
      " This MIB Object contains the eUE Admin Status of this device.
        If this object is set to 'true', the eUE is
        administratively enabled, and the eUE MUST be able to
        interact with the PacketCable entities, such as the
        Provisioning Server, KDC, and other eUEs on all
        PacketCable interfaces.

        If this object is set to 'false', the eUE is
        administratively disabled and MUST do the following:
          - All Services (if present) are immediately terminated.
          - Any sessions (even on the behalf of Users) are gracefully
            terminated.

        Additionally, the eUE MUST maintain the SNMP Interface
        for management and also the SNMP Key management interface.
        Also, the eUE MUST NOT continue Kerberized key management
        with any devices, except with the Provisioning server, until
        this object is set to 'true'.

        If a value is written into an instance of
        pktcMtaDevEnabled, the agent MUST NOT retain the supplied
        value across eUE re-initializations or reboots."
  --  OBJECT  pktcMtaDevTypeIdentifier                - Same as PKTC-IETF-MTA-MIB
  --  OBJECT  pktcMtaDevProvisioningState             - Same as PKTC-IETF-MTA-MIB
  --  OBJECT  pktcMtaDevHttpAccess                    - Same as PKTC-IETF-MTA-MIB
  --  OBJECT  pktcMtaDevProvisioningTimer             - Same as PKTC-IETF-MTA-MIB
  --  OBJECT  pktcMtaDevProvisioningCounter           - Same as PKTC-IETF-MTA-MIB
  --  OBJECT  pktcMtaDevErrorOidIndex                 - Same as PKTC-IETF-MTA-MIB
  --  OBJECT  pktcMtaDevErrorOid                      - Same as PKTC-IETF-MTA-MIB
  --  OBJECT  pktcMtaDevErrorValue                    - Same as PKTC-IETF-MTA-MIB
  --  OBJECT  pktcMtaDevErrorReason                   - Same as PKTC-IETF-MTA-MIB


-- The following object group describes server access and parameters used.

  OBJECT  pktcMtaDevDhcpServerAddressType
  DESCRIPTION
      " This MIB Object is only required to support the DHCPv4 address type."
```

```
-- NOTE: pktcMtaDevServerDhcp1 and pktcMtaDevServerDhcp2 are intended for
--       IPv4 DHCP Servers per RFC 4682. IPv6 DHCP information is contained
--       in the prov-mgmt extension MIB module.
  --  OBJECT  pktcMtaDevServerDhcp1                   - Same as PKTC-IETF-MTA-MIB
  --  OBJECT  pktcMtaDevServerDhcp2                   - Same as PKTC-IETF-MTA-MIB


  OBJECT  pktcMtaDevDnsServerAddressType
  DESCRIPTION
      " This MIB Object is only required to support the DHCPv4 address type."

-- NOTE: pktcMtaDevServerDns1 and pktcMtaDevServerDns2 are intended for
--       IPv4 DNS Servers per RFC 4682. IPv6 DNS information is contained
--       in the prov-mgmt extension MIB module.

  --  OBJECT  pktcMtaDevServerDns1                    - Same as PKTC-IETF-MTA-MIB
  --  OBJECT  pktcMtaDevServerDns2                    - Same as PKTC-IETF-MTA-MIB

  OBJECT  pktcMtaDevTimeServerAddressType
  MIN-ACCESS  not-accessible
  DESCRIPTION
      " This MIB Object is not applicable for the eUE."

  OBJECT  pktcMtaDevTimeServer
  MIN-ACCESS  not-accessible
  DESCRIPTION
      " This MIB Object not applicable for the eUE."

  OBJECT  pktcMtaDevProvConfigKey
  DESCRIPTION
      " When the key value is less than 32 octets the most significant
        unused bits must be set to zero.
        For example, the key (text: 'ABCDEFGH') '4142434445464748'H is
        set as:
        '00000000000000000000000000000000000000000000000041424344454647 48'H."


  --  OBJECT  pktcMtaDevConfigFile                    - Same as PKTC-IETF-MTA-MIB
  --  OBJECT  pktcMtaDevSnmpEntity                    - Same as PKTC-IETF-MTA-MIB
  --  OBJECT  pktcMtaDevProvConfigHash                - Same as PKTC-IETF-MTA-MIB

  --  OBJECT  pktcMtaDevProvConfigEncryptAlg          - Same as PKTC-IETF-MTA-MIB
  --  OBJECT  pktcMtaDevProvSolicitedKeyTimeout       - Same as PKTC-IETF-MTA-MIB
  --  OBJECT  pktcMtaDevProvUnsolicitedKeyMaxTimeout  - Same as PKTC-IETF-MTA-MIB
  --  OBJECT  pktcMtaDevProvUnsolicitedKeyNomTimeout  - Same as PKTC-IETF-MTA-MIB
  --  OBJECT  pktcMtaDevProvUnsolicitedKeyMaxRetries  - Same as PKTC-IETF-MTA-MIB
  --  OBJECT  pktcMtaDevProvKerbRealmName             - Same as PKTC-IETF-MTA-MIB
  --  OBJECT  pktcMtaDevProvState                     - Same as PKTC-IETF-MTA-MIB



-- The following object group describes the security objects.

  --  OBJECT  pktcMtaDevManufacturerCertificate       - Same as PKTC-IETF-MTA-MIB
  --  OBJECT  pktcMtaDevCertificate                   - Same as PKTC-IETF-MTA-MIB
  --  OBJECT  pktcMtaDevCorrelationId                 - Same as PKTC-IETF-MTA-MIB
  --  OBJECT  pktcMtaDevTelephonyRootCertificate      - Same as PKTC-IETF-MTA-MIB

  OBJECT  pktcMtaDevRealmAvailSlot
  SYNTAX      Unsigned32 (0)
  MIN-ACCESS  read-only
  DESCRIPTION
      " eUE will report 0 available rows since eUE will
        have one row entry for pktcMtaDevRealmTable."
```

```
OBJECT  pktcMtaDevRealmName
MIN-ACCESS  read-only
DESCRIPTION
    " eUE will only have one row entry for this object."

OBJECT  pktcMtaDevRealmPkinitGracePeriod
MIN-ACCESS  read-only
DESCRIPTION
    " eUE will only have one read-only row entry for this object."

OBJECT  pktcMtaDevRealmTgsGracePeriod
MIN-ACCESS  read-only
DESCRIPTION
    " eUE will only have one read-only row entry for this object."

OBJECT  pktcMtaDevRealmOrgName
MIN-ACCESS  read-only
DESCRIPTION
    " eUE will only have one read-only row entry for this object."

OBJECT  pktcMtaDevRealmUnsolicitedKeyMaxTimeout
MIN-ACCESS  read-only
DESCRIPTION
    " eUE will only have one read-only row entry for this object."

OBJECT  pktcMtaDevRealmUnsolicitedKeyNomTimeout
MIN-ACCESS  read-only
DESCRIPTION
    " eUE will only have one read-only row entry for this object."

OBJECT  pktcMtaDevRealmUnsolicitedKeyMaxRetries
MIN-ACCESS  read-only
DESCRIPTION
    " eUE will only have one read-only row entry for this object."

OBJECT  pktcMtaDevRealmStatus
MIN-ACCESS  not-accessible
DESCRIPTION
    " eUE will only have one row entry for this object.

      This table only has one row."

OBJECT  pktcMtaDevCmsAvailSlot
MIN-ACCESS  not-accessible
DESCRIPTION
    " Object not applicable for the eUE."

OBJECT  pktcMtaDevCmsFqdn
MIN-ACCESS   not-accessible
DESCRIPTION
    " Object not applicable for the eUE."

OBJECT  pktcMtaDevCmsKerbRealmName
MIN-ACCESS   not-accessible
DESCRIPTION
    " Object not applicable for the eUE."

OBJECT  pktcMtaDevCmsMaxClockSkew
MIN-ACCESS   not-accessible
DESCRIPTION
    " Object not applicable for the eUE."

OBJECT  pktcMtaDevCmsSolicitedKeyTimeout
MIN-ACCESS   not-accessible
DESCRIPTION
    " Object not applicable for the eUE."
```

```
  OBJECT  pktcMtaDevCmsUnsolicitedKeyMaxTimeout
  MIN-ACCESS   not-accessible
  DESCRIPTION
      " Object not applicable for the eUE."

  OBJECT  pktcMtaDevCmsUnsolicitedKeyNomTimeout
  MIN-ACCESS   not-accessible
  DESCRIPTION
      " Object not applicable for the eUE."

  OBJECT  pktcMtaDevCmsUnsolicitedKeyMaxRetries
  MIN-ACCESS   not-accessible
  DESCRIPTION
      " Object not applicable for the eUE."

  OBJECT  pktcMtaDevCmsIpsecCtrl
  MIN-ACCESS   not-accessible
  DESCRIPTION
      " Object not applicable for the eUE."

  OBJECT  pktcMtaDevCmsStatus
  MIN-ACCESS   not-accessible
  DESCRIPTION
      " Object not applicable for the eUE."

  OBJECT  pktcMtaDevResetKrbTickets
  SYNTAX  BITS {
                invalidateProvOnReboot   (0)
              }
  DESCRIPTION
      " the eUE only support the
        invalidateProvOnReboot bit (bit 0) for this object. The
        invalidateAllCmsOnReboot bit (bit 1) is not supported."


  MODULE
        MANDATORY-GROUPS {
              pktcEUEProvMgmtGroup
        }
    ::= { pktcEUEProvMgmtCompliances 1 }

pktcEUEProvMgmtGroup OBJECT-GROUP
      OBJECTS {
          pktcEUEProvMgmtVersion,
          pktcEUEDhcpv6ServerId1,
          pktcEUEDhcpv6ServerId2,
          pktcEUEDhcpv6ServerAddressType,
          pktcEUEDhcpv6ServerAddress,
          pktcEUEDnsv6ServerAddressType,
          pktcEUEDnsv6ServerAddress1,
          pktcEUEDnsv6ServerAddress2
      }
      STATUS  current
      DESCRIPTION
            "The eUE Operator Group."
      ::= { pktcEUEProvMgmtGroups 1}

-- Notifications
  --  pktcMtaDevProvisioningEnrollment  NOTIFICATION-TYPE
      -- Same as PKTC-IETF-MTA-MIB
  --  pktcMtaDevProvisioningStatus      NOTIFICATION-TYPE
      -- Same as PKTC-IETF-MTA-MIB

END
```

C.2 Management Event MIB Module

```
CL-PKTC-EUE-EVENT-MIB DEFINITIONS ::= BEGIN

IMPORTS

    OBJECT-TYPE,
    MODULE-IDENTITY    FROM SNMPv2-SMI
    OBJECT-GROUP,
    MODULE-COMPLIANCE  FROM SNMPv2-CONF
    SnmpAdminString
                       FROM SNMP-FRAMEWORK-MIB
    pktcEUEMibs        FROM CLAB-DEF-MIB;


pktcEUEEventMIB MODULE-IDENTITY
    LAST-UPDATED "201210300000Z" -- October 30, 2012
    ORGANIZATION "Cable Television Laboratories, Inc."
    CONTACT-INFO
            "Sumanth Channabasappa
             Postal: Cable Television Laboratories, Inc
             858 Coal Creek Circle
             Louisville, CO 80027
             U.S.A.
             Phone: +1 303 661 9100
             Fax: +1 303 661 9199
             E-mail:mibs@cablelabs.com

             Acknowledgements:
             Thomas Clack, Broadcom - Primary author,
             and members of the PacketCable PACM Focus Team."

    DESCRIPTION
            "This MIB module provides the management objects for the
            Management Event mechanism as specified by the PacketCable
            E-UE Provisioning Framework."
    REVISION "201210300000Z" -- October 30, 2012
    DESCRIPTION
            "Revised Version includes ECN EUE-DATA-N-11.0686-1
            and published as I06"
    REVISION "200711060000Z" -- Nov 6, 2007
    DESCRIPTION
            "Initial version, published as part of the CableLabs
            E-UE Provisioning Data Model Specification
            PKT-SP-EUE-DATA-I01-071106
            Copyright 1999-2007 Cable Television Laboratories, Inc.
            All rights reserved."
    ::= { pktcEUEMibs 6 }

-- Administrative assignments
pktcEUEEventNotifications     OBJECT IDENTIFIER ::= { pktcEUEEventMIB 0 }
pktcEUEEventObjects           OBJECT IDENTIFIER ::= { pktcEUEEventMIB 1 }
pktcEUEEventConformance       OBJECT IDENTIFIER ::= { pktcEUEEventMIB 2 }

pktcEUEMEMVersion OBJECT-TYPE
    SYNTAX      SnmpAdminString(SIZE(0..6))
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        " This MIB Object represents the Management Event Reporting Module
          version. The eUE MUST set this MIB Object to value of '1.0'."
    ::= { pktcEUEEventObjects  1 }

-- Object Groups
--    The object groups used in this MIB module are imported from
--    the PKTC-EVENT-MIB (PKT-SP-EVEMIB1.5).
```

```
-- Conformance Statements
pktcEUEEventCompliances  OBJECT IDENTIFIER ::= { pktcEUEEventConformance 1 }
pktcEUEEventGroups       OBJECT IDENTIFIER ::= { pktcEUEEventConformance 2 }

-- Compliance Statements
pktcEUEEventCompliance MODULE-COMPLIANCE
    STATUS      current
    DESCRIPTION
        "The compliance statement for CableLabs compliant eUE devices
        that implement the PacketCable E-UE Provisioning Framework.

        This compliance statement specifies, for PacketCable
        E-UE Provisioning, the required objects from the PKTC-EVENT-MIB
        defined in the PacketCable 1.5 Specifications Management Event
        MIB Specification, PKT-SP-EVEMIB1.5-I02-050812.

        Some objects from RFC4682 have been enhanced for applicability
        to eUEs. Similarly, inapplicable objects are clearly indicated."

    REFERENCE
        "PacketCable Embedded UE Provisioning Framework Specification"

    MODULE   PKTC-EVENT-MIB
        MANDATORY-GROUPS {
                 pktcEventGroup,
                 pktcEventNotificationGroup
                 }


--  Event Reporting control objects

  --  OBJECT  pktcDevEvControl                  - Same as PKTC-EVENT-MIB
  --  OBJECT  pktcDevEvSyslogAddressType        - Same as PKTC-EVENT-MIB
  --  OBJECT  pktcDevEvSyslogAddress            - Same as PKTC-EVENT-MIB
  --  OBJECT  pktcDevEvSyslogUdpPort            - Same as PKTC-EVENT-MIB


--  Event throttling control

  --  OBJECT  pktcDevEvThrottleAdminStatus
  --  OBJECT  pktcDevEvThrottleThreshold        - Same as PKTC-EVENT-MIB
  --  OBJECT  pktcDevEvThrottleInterval         - Same as PKTC-EVENT-MIB


--  Status Reporting

  --  OBJECT  pktcDevEvTransmissionStatus       - Same as PKTC-EVENT-MIB


-- Event Descriptions

  --  OBJECT  pktcDevEventDescrId               - Same as PKTC-EVENT-MIB
  --  OBJECT  pktcDevEventDescrEnterprise       - Same as PKTC-EVENT-MIB
  --  OBJECT  pktcDevEventDescrFacility         - Same as PKTC-EVENT-MIB
  --  OBJECT  pktcDevEventDescrLevel            - Same as PKTC-EVENT-MIB
  --  OBJECT  pktcDevEventDescrReporting        - Same as PKTC-EVENT-MIB
  --  OBJECT  pktcDevEventDescrText             - Same as PKTC-EVENT-MIB


--  Events generated

  --  OBJECT  pktcDevEvLogIndex                 - Same as PKTC-EVENT-MIB
  --  OBJECT  pktcDevEvLogTime                  - Same as PKTC-EVENT-MIB
  --  OBJECT  pktcDevEvLogEnterprise            - Same as PKTC-EVENT-MIB
  --  OBJECT  pktcDevEvLogId                    - Same as PKTC-EVENT-MIB
  --  OBJECT  pktcDevEvLogText                  - Same as PKTC-EVENT-MIB
```

```
  --  OBJECT  pktcDevEvLogEndpointName          - Same as PKTC-EVENT-MIB
  --  OBJECT  pktcDevEvLogType                  - Same as PKTC-EVENT-MIB

  OBJECT  pktcDevEvLogTargetInfo
  DESCRIPTION
            "This MIB Object contains a comma separated list of the
            actions taken for external notifications, along with the
            target IP address for the generated events. Locally
            stored events must not be recorded in this MIB Object.

            The syntax is as:
            <action-1/IP>,<action-2/IP>,<action-3/IP>

            Where <action-n/IP> is to be denoted as follows:
              For syslog events:
                     syslog/<IP address of the syslog Server>
              For SNMP traps:
                     snmpTrap/<IP address of the SNMP Server>
              For SNMP INFORMS:
                     snmpInform/<IP address of the SNMP Server>

             If there are multiple targets for the same type (SNMP
             Traps sent to multiple IP addresses) or if there are
             multiple messages sent to the same IP (syslog and SNMP
             sent to the same IP address) they need to be reported
             individually."

   --  OBJECT  pktcDevEvLogCorrelationId      - Same as PKTC-EVENT-MIB
   --  OBJECT  pktcDevEvLogAdditionalInfo     - Same as PKTC-EVENT-MIB


  MODULE
        MANDATORY-GROUPS {
               pktcEUEMEMGroup
        }
    ::= { pktcEUEEventCompliances 1 }


  pktcEUEEventEuroCompliance MODULE-COMPLIANCE
    STATUS      current
    DESCRIPTION
            "The compliance statement for implementations of the EUE Event
             MIB Module that implement the PacketCable E-UE Provisioning
             Framework with the European Technology Option.

    MODULE      PKTC-IETF-EVENT-MIB  -- Group of MIB Objects from RFC 5428
        MANDATORY-GROUPS {
                pktcEventGroup,
                pktcEventNotificationGroup
                }

    MODULE   -- this module
        MANDATORY-GROUPS {
                pktcEUEMEMGroup
        }

    ::= { pktcEUEEventCompliances 2 }


pktcEUEMEMGroup OBJECT-GROUP
      OBJECTS {
          pktcEUEMEMVersion
      }
      STATUS  current
      DESCRIPTION
            "The eUE Operator Group."
      ::= { pktcEUEEventGroups 1}
```

```
--  Notifications

  --  pktcDevEvInform NOTIFICATION-TYPE          - Same as PKTC-EVENT-MIB
  --   OBJECTS {pktcDevEvLogIndex, pktcDevEvLogTime,
  --   pktcDevEvLogEnterprise,pktcDevEvLogId,
  --   pktcDevEvLogEndpointName,pktcDevEvLogCorrelationId,ifPhysAddress}

  -- pktcDevEvTrap NOTIFICATION-TYPE             - Same as PKTC-EVENT-MIB
  --  OBJECTS {pktcDevEvLogIndex, pktcDevEvLogTime,
  --  pktcDevEvLogEnterprise,pktcDevEvLogId,
  --  pktcDevEvLogEndpointName,pktcDevEvLogCorrelationId,ifPhysAddress}

END
```

Annex D PacketCable eUE Additional Modules

D.1 Certificate Bootstrapping XML Schema

```
<?xml version="1.0" encoding="UTF-8"?>
<!--(C) 2008 CableLabs. All rights reserved -->
<!--PacketCable E-UE Provisioning Certificate Bootstrapping XML Schema -->
<xsd:schema
        xmlns="http://www.cablelabs.com/namespaces/PacketCable/2.0/XSD/v1/CL-PKTC-CB"
        xmlns:xsd="http://www.w3.org/2001/XMLSchema"

targetNamespace="http://www.cablelabs.com/namespaces/PacketCable/2.0/XSD/v1/CL-PKTC-
CB"
        elementFormDefault="qualified" attributeFormDefault="unqualified"
xml:lang="en">

  <xsd:annotation>
    <xsd:documentation>
       This XML Schema is specified for use with the PacketCable E-UE Certificate
       Bootstrapping procedure.

       It is used to transmit IM Private Identifiers (IMPIs) and associated
       credentials.
       </xsd:documentation>
  </xsd:annotation>


  <xsd:element name="pktcEUECreds">
    <xsd:complexType>
      <xsd:sequence>
       <xsd:element name="clearIMPIMIBTable" type="xsd:boolean" minOccurs="0"
maxOccurs="1"/>
        <xsd:element minOccurs="0" maxOccurs="unbounded" ref="IMPI"/>
      </xsd:sequence>
    </xsd:complexType>
  </xsd:element>


  <xsd:element name="IMPI" type="IMPIType">
   <xsd:unique name="uniqueIMPIIndex">
     <xsd:selector xpath="./pktcEUECreds"/>
     <xsd:field xpath="@mibIMPIIndex"/>
   </xsd:unique>
  </xsd:element>

  <xsd:complexType name="IMPIType">
    <xsd:sequence>
      <xsd:element ref="ID"/>
      <xsd:element ref="Creds"/>
    </xsd:sequence>
    <xsd:attribute name="mibIMPIIndex" use="required" type="xsd:positiveInteger"/>
  </xsd:complexType>

  <xsd:element name="ID">
    <xsd:complexType mixed="true">
      <xsd:attribute name="idType" use="required" type="IDTYPE"/>
    </xsd:complexType>
  </xsd:element>

  <xsd:element name="Creds">
    <xsd:complexType mixed="true">
          <xsd:attribute name="credsType" use="required" type="CREDENTIALTYPE"/>
    </xsd:complexType>
  </xsd:element>
```

```
  <xsd:simpleType name="IDTYPE">
    <xsd:restriction base="xsd:NMTOKEN">
      <xsd:enumeration value="privateIdentity"/>
    </xsd:restriction>
  </xsd:simpleType>

  <xsd:simpleType name="CREDENTIALTYPE">
    <xsd:restriction base="xsd:NMTOKEN">
      <xsd:enumeration value="none"/>
      <xsd:enumeration value="password"/>
      <xsd:enumeration value="presharedkey"/>
      <xsd:enumeration value="certificate"/>
    </xsd:restriction>
  </xsd:simpleType>

</xsd:schema>
```

D.2 Presence Configuration MIB

```
CL-PKTC-EUE-PRS-MIB DEFINITIONS ::= BEGIN

IMPORTS
    MODULE-IDENTITY,
    OBJECT-TYPE,
    Unsigned32
                    FROM SNMPv2-SMI
    RowStatus
                    FROM SNMPv2-TC
    OBJECT-GROUP,
    MODULE-COMPLIANCE
                    FROM SNMPv2-CONF
    SnmpAdminString
                    FROM SNMP-FRAMEWORK-MIB
    pktcEUEDevOpIndex
                    FROM CL-PKTC-EUE-DEV-MIB
    pktcEUEUsrIMPUIndex
                    FROM CL-PKTC-EUE-USER-MIB
    pktcEUEMibs
                    FROM CLAB-DEF-MIB;



pktcEUEPrsMIB MODULE-IDENTITY
    LAST-UPDATED "200905280000Z" -- May 28, 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 - Primary author,
             Zu Qiang, Ericsson
             Sumanth Channabasappa, CableLabs
             Eduardo Cardona, CableLabs
             and members of the PacketCable PACM Focus Team."
    DESCRIPTION
            "This MIB module contains the configuration MIB
             objects for the Presence Service feature as defined
             by the PacketCable E-UE Provisioning Framework
             Specification."
```

```
    REVISION "200905280000Z" -- May 28, 2009
    DESCRIPTION
            "Revised Version includes ECNs
            EUE-DATA-N-08.0528-3
            EUE-DATA-N-09.0556-3
            and published as part of PKT-SP-EUE-DATA-I03-090528."
    REVISION "200807100000Z" -- July 10, 2008
    DESCRIPTION
            "Initial version published as part of the CableLabs
             E-UE Provisioning Data Model Specification (PKT-SP-EUE-DATA).
             Included in ECN EUE-DATA-N-08.0504-7 and published as part of
             PKT-SP-EUE-DATA-I02-080710."
    ::= { pktcEUEMibs 7 }


-- Administrative assignments
pktcEUEPRSNotifications    OBJECT IDENTIFIER ::= { pktcEUEPrsMIB 0 }
pktcEUEPRSObjects          OBJECT IDENTIFIER ::= { pktcEUEPrsMIB 1 }
pktcEUEPRSConformance      OBJECT IDENTIFIER ::= { pktcEUEPrsMIB 2 }

pktcEUEPRSCompliances      OBJECT IDENTIFIER ::= { pktcEUEPRSConformance 1 }
pktcEUEPRSGroups           OBJECT IDENTIFIER ::= { pktcEUEPRSConformance 2 }

--
-- The NETWORK-Indexed Presence Configuration Table
--
pktcEUEPRSNwCfgTable OBJECT-TYPE
    SYNTAX      SEQUENCE OF PktcEUEPRSNwCfgEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        " This data table represents the network-based Presence entries."

    REFERENCE "PacketCable E-UE Provisioning Framework Specification,
               OMA Presence SIMPLE Specification"
    ::= { pktcEUEPRSObjects 1 }

pktcEUEPRSNwCfgEntry OBJECT-TYPE
    SYNTAX      PktcEUEPRSNwCfgEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        " Each entry in this table represents a Presence configuration
          parameter within the scope of a Device Operator.

          The conceptual rows MUST NOT persist across eUE resets."
    INDEX  {pktcEUEDevOpIndex}
    ::= { pktcEUEPRSNwCfgTable 1 }

PktcEUEPRSNwCfgEntry ::=
    SEQUENCE {
              pktcEUEPRSNwProvID       SnmpAdminString,
              pktcEUEPRSNwAppName      SnmpAdminString,
              pktcEUEPRSNwStatus       RowStatus
             }

pktcEUEPRSNwProvID  OBJECT-TYPE
    SYNTAX     SnmpAdminString
    MAX-ACCESS read-create
    STATUS     current
    DESCRIPTION
        " This element identifies the Presence Service Provider.
          This value corresponds to the 'PROVIDER-ID' object
          defined in the OMA Presence SIMPLE specification.

          This element is optional."
    DEFVAL {""}
```

```
    ::= { pktcEUEPRSNwCfgEntry 1 }

pktcEUEPRSNwAppName  OBJECT-TYPE
    SYNTAX     SnmpAdminString
    MAX-ACCESS read-create
    STATUS     current
    DESCRIPTION
        " This element provides a user displayable name for the Presence
          Framework. This value corresponds to the 'NAME' object defined
          in the OMA Presence SIMPLE specification.

          This element is optional."
    DEFVAL {""}
    ::= { pktcEUEPRSNwCfgEntry 2 }

pktcEUEPRSNwStatus  OBJECT-TYPE
    SYNTAX     RowStatus
    MAX-ACCESS read-create
    STATUS     current
    DESCRIPTION
        " This object defines the row status associated with this
          particular row in the MIB table.

          The values of the objects 'pktcEUEPRSNwAppName' and
          'pktcEUEPRSNwProvID' MUST not be modified while this row is set to
          'active'."
    ::= { pktcEUEPRSNwCfgEntry 3 }


--
-- The USER-Indexed Presence Configuration Table
--

pktcEUEPRSUsrCfgTable OBJECT-TYPE
    SYNTAX      SEQUENCE OF PktcEUEPRSUsrCfgEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        " This data table represents the user-based Presence entries
        "
    REFERENCE "PacketCable E-UE Provisioning Framework Specification,
               OMA Presence SIMPLE Specification"

    ::= { pktcEUEPRSObjects 2 }

pktcEUEPRSUsrCfgEntry OBJECT-TYPE
    SYNTAX      PktcEUEPRSUsrCfgEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        " Each entry in this table represents a Presence configuration
          parameter within the scope of a User.

          The conceptual rows MUST NOT persist across eUE resets."
    INDEX  {pktcEUEUsrIMPUIndex}
    ::= { pktcEUEPRSUsrCfgTable 1 }

PktcEUEPRSUsrCfgEntry ::=
    SEQUENCE {
              pktcEUEPRSUsrClientObjDataLim      Unsigned32,
              pktcEUEPRSUsrContSvrURI            SnmpAdminString,
              pktcEUEPRSUsrSrcThrottlePub        Unsigned32,
              pktcEUEPRSUsrMaxPrsSubs            Unsigned32,
              pktcEUEPRSUsrMaxSubsPrsList        Unsigned32,
              pktcEUEPRSUsrSvcURITemplate        SnmpAdminString,
              pktcEUEPRSUsrStatus                RowStatus
             }
```

```
pktcEUEPRSUsrClientObjDataLim  OBJECT-TYPE
    SYNTAX     Unsigned32 (0..65535)
    MAX-ACCESS read-create
    STATUS     current
    DESCRIPTION
        " A Presence Source may use either direct or indirect content. Direct
          Content is the delivery of the Presence document as MIME content
          within a SIP message. Indirect content is the redirection of the
          Presence watcher by the Presence source to a Content Server for the
          delivery of the Presence document.

          Should the Presence source make use of direct content then this
          object MUST be used for determining the size limit, in bytes, of
          the MIME Content delivered in a SIP method.

          If the Presence source makes use of indirect content then this
          configuration element MUST be ignored.

          This element is mandatory in the specifications however direct content
          is an optional capability."
    DEFVAL {4096}
    ::= { pktcEUEPRSUsrCfgEntry 1 }

pktcEUEPRSUsrContSvrURI  OBJECT-TYPE
    SYNTAX     SnmpAdminString
    MAX-ACCESS read-create
    STATUS     current
    DESCRIPTION
        " If the Presence Source makes use of content indirection as described
          in the 'OMA Presence SIMPLE Specification', then this object MUST be
          used as the HTTP or HTTPS URI of the Content Server on which the MIME
          object containing the Presence document will be stored.
          The Presence source will then use the content indirection mechanism
          defined in RFC 4483 to provide the watcher with the URI of the stored
          content.

          This element is optional"
    DEFVAL {""}
    ::= { pktcEUEPRSUsrCfgEntry 2 }

pktcEUEPRSUsrSrcThrottlePub  OBJECT-TYPE
    SYNTAX     Unsigned32 (1..3600)
    MAX-ACCESS read-create
    STATUS     current
    DESCRIPTION
        " This element defines the minimum time interval in seconds between two
          consecutive publications of a Presence document from a Presence Source
          using a SIP PUBLISH request.

          This element is optional"
    DEFVAL {60}
    ::= { pktcEUEPRSUsrCfgEntry 3 }

pktcEUEPRSUsrMaxPrsSubs  OBJECT-TYPE
    SYNTAX     Unsigned32 (1..1000)
    MAX-ACCESS read-create
    STATUS     current
    DESCRIPTION
        " This element defines the maximum number of subscriptions
          to the presence event package that a watcher may have.

          Should a service provider wish to limit the number of subscriptions
          to different Presence sources from a Presence watcher then this
          element MUST be used.
          This is in effect the maximum number of discrete Public Identities
```

```
          from which a watcher can obtain Presence information.

          This element is optional"
    DEFVAL {100}
    ::= { pktcEUEPRSUsrCfgEntry 4 }

pktcEUEPRSUsrMaxSubsPrsList  OBJECT-TYPE
    SYNTAX     Unsigned32 (1..1000)
    MAX-ACCESS read-create
    STATUS     current
    DESCRIPTION
        " A Presence watcher may subscribe to multiple Presence sources that
          are represented by a single Resource List, see RFC 4662. A Resource
          List Server in the network then handles the discrete individual
          subscriptions to the elements within the list.
          Should a service provider wish to limit the number of elements within
          a resource list to which a watcher can subscribe (thus limiting the
          number of SIP subscriptions) then this element MUST be used.

          This element is optional"
    DEFVAL {100}
    ::= { pktcEUEPRSUsrCfgEntry 5 }

pktcEUEPRSUsrSvcURITemplate  OBJECT-TYPE
    SYNTAX     SnmpAdminString
    MAX-ACCESS read-create
    STATUS     current
    DESCRIPTION
        " This element defines the syntax of the service URI.
          The Service URI Template MUST be a URI Template as
          specified in [OMA XDM-CORE].

          This element is optional"
    DEFVAL {"<xui>;presence-list=<id>"}
    ::= { pktcEUEPRSUsrCfgEntry 6 }

pktcEUEPRSUsrStatus  OBJECT-TYPE
    SYNTAX     RowStatus
    MAX-ACCESS read-create
    STATUS     current
    DESCRIPTION
        " This object defines the row status associated with this
          particular row in the MIB table.

          The values of any objects in this row MUST not be
          modified while this row is set to 'active'."
    ::= { pktcEUEPRSUsrCfgEntry 7 }


-- ---------------------------------------------------------------------
-- Conformance Information
-- ---------------------------------------------------------------------
pktcEUEPrsMIBCompliances  OBJECT IDENTIFIER ::= { pktcEUEPRSCompliances 1 }
pktcEUEPrsMIBGroups       OBJECT IDENTIFIER ::= { pktcEUEPRSGroups 2 }

-- Compliance Statements
pktcEUEPrsMIBCompliance MODULE-COMPLIANCE
    STATUS      current
    DESCRIPTION
            "The compliance statement for implementations of the EUE-PRS MIB."
    MODULE   -- this module
        MANDATORY-GROUPS {
                 pktcEUEPRSReqObjGroup
        }
    -- optional groups
    GROUP pktcEUEPRSOptObjGroup
    DESCRIPTION
```

```
                "This group is of optional support."

    ::= { pktcEUEPrsMIBCompliances 1 }

pktcEUEPRSReqObjGroup OBJECT-GROUP
      OBJECTS {
         pktcEUEPRSUsrClientObjDataLim
      }
      STATUS  current
      DESCRIPTION
            "The group of required objects."
      ::= { pktcEUEPrsMIBGroups 1}

pktcEUEPRSOptObjGroup OBJECT-GROUP
      OBJECTS {
         pktcEUEPRSNwAppName,
         pktcEUEPRSNwProvID,
         pktcEUEPRSNwStatus,
         pktcEUEPRSUsrContSvrURI,
         pktcEUEPRSUsrSrcThrottlePub,
         pktcEUEPRSUsrMaxPrsSubs,
         pktcEUEPRSUsrMaxSubsPrsList,
         pktcEUEPRSUsrSvcURITemplate,
         pktcEUEPRSUsrStatus
      }
      STATUS  current
      DESCRIPTION
            "The group of optional objects."
      ::= { pktcEUEPrsMIBGroups 2}

END
```

Appendix I Illustrative PacketCable Deployment Examples

I.1 Example 1: Deployment with multiple Users and one PacketCable Application

An example of an eUE associated with two users, each associated with the same application, is illustrated in Figure 3. As a note, the use of Video On Demand (VOD) as an application is only an illustrative example, not an actual PacketCable application.

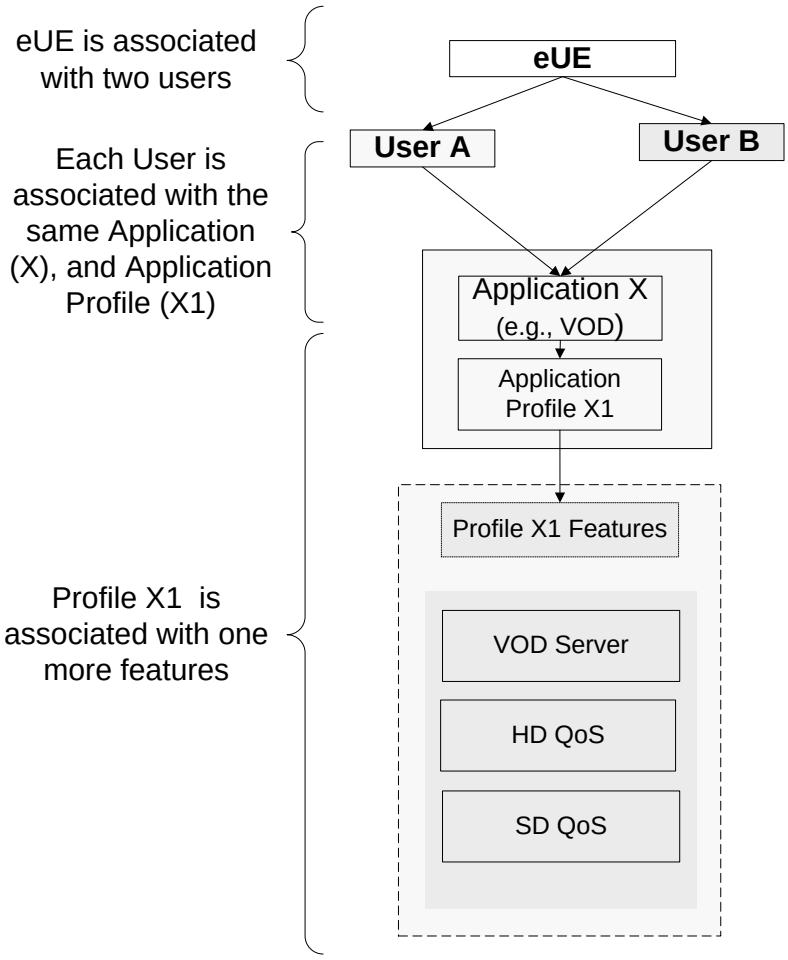

Figure 3 - Deployment with multiple users and one PacketCable application

The MIB table assignments for the illustration in Figure 3 is given below, with the following assumptions:

- Application X has specified the Application Profile to Features Mapping Table, and Feature Tables.
- User identifiers 1 and 2 represent Users A and B, respectively.
- Application identifier 1 identifies Application X (VOD).
- Feature identifiers 1, 2, and 3 identify features VOD Server, HD QoS, and SD QoS, respectively.

```
User to Application Profile Mapping Table
```

```
(Mapping of User A to an application profile)

UsrAppMapTable entries
    AppOrgID.1.1              = 4491 (CableLabs)
    AppIdentifier.1.1         = 1    (App X, VOD)
    AppIndexRef.1.1           = 10   (Profile X1)

(Mapping of User B to an application profile)
UsrAppMapTable entries
    AppOrgID.2.1.3            = 4491 (CableLabs)
    AppIdentifier.2.1         = 1    (App X, VOD)
    AppIndexRef.2.1           = 10   (Profile X1)

Application Profile to Features Mapping Table (Application X)

(Profile X1)
XAppProfileToFeatureMapTable entries

    AppFeatureIdentifier.10.1   =1(VOD Server)
    AppFeatureTableIndexRef.10.1=5

    AppFeatureIdentifier.10.2   =2(HD QoS)
    AppFeatureTableIndexRef.10.2=5

    AppFeatureIdentifier.10.3   =3(SD QoS)
    AppFeatureTableIndexRef.10.3=5

Feature Tables
(VOD Server Table).5="vod.example.com"
(HD QoS Table).5="VIDEOCODEC=VX; AUDIOCODEC=AX; BANDWITH=XMBPS"
(SD QoS Table).5="VIDEOCODEC=VY; AUDIOCODEC=AY; BANDWITH=YMBPS"
```

I.2 Example 2: Deployment with multiple Users and multiple PacketCable Applications

An example of an eUE associated with multiple users, each with one or more applications, is illustrated in Figure 4. As a note, the use of voice as an application is only an illustrative example, not an actual PacketCable application.

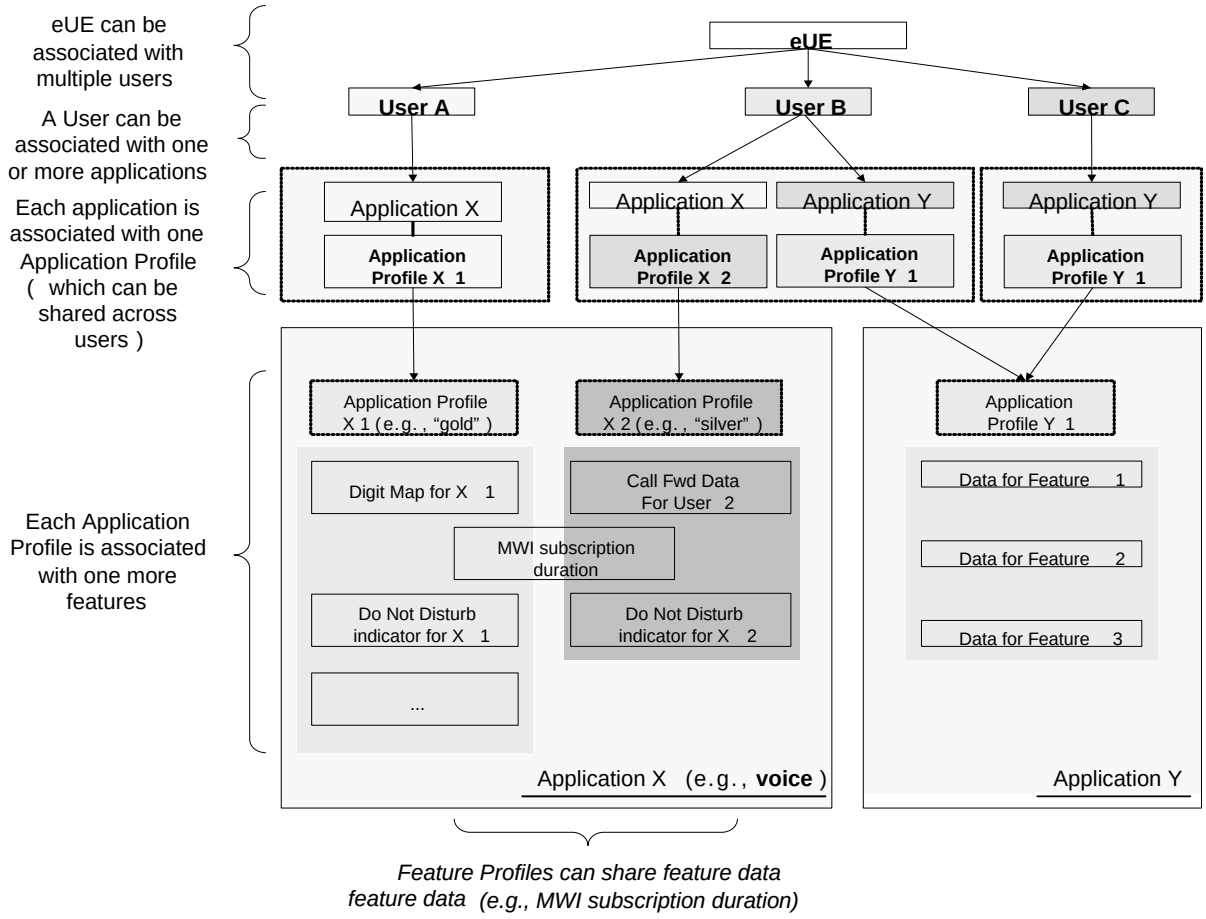

Figure 4 - Deployment with multiple users and multiple PacketCable applications

The MIB table assignments for the illustration in Figure 4 is given below, with the following assumptions:

- Applications X and Y have specified the Application Profile to Features Mapping Table, as required by this document
- User identifiers 1, 2 and 3 represent Users A, B and C, respectively
- Application identifiers 1 and 99 identify Applications X and Y, respectively
- Feature identifiers 1, 2, and 3 identify features Digit Map, MWI, and DND, respectively

```
User to Application Profile Mapping Table:

(Mapping of User A to an application profile)
UsrAppMapTable entries
    AppOrgID.1.1              = 4491 (CableLabs)
    AppIdentifier.1.1         = 1  (App X)
    AppIndexRef.1.1           = 11  (Profile X1)

(Mapping of User B to an application profile)
UsrAppMapTable entries
    AppOrgID.2.1              = 4491 (CableLabs)
    AppIdentifier.2.1         = 1  (App X)
    AppIndexRef.2.1           = 12  (Profile X2)
```

```
    AppOrgID.2.2            = 4491 (CableLabs)
    AppIdentifier.2.2       = 99 (App Y)
    AppIndexRef.2.2         = 20  (Profile Y1)

(Mapping of User C to an application profile)

UsrAppMapTable entries
    AppOrgID.3.1            = 4491 (CableLabs)
    AppIdentifier.3.1       = 99 (App Y)
    AppIndexRef.3.1         = 20  (Profile Y1)

Application Profile to Features Mapping Table (Application X):

(Profile X1)
XAppProfileToFeatureMapTable entries
    AppFeatureIdentifier.11.1   = 1(DIGIT MAP)
    AppFeatureTableIndexRef.11.1= 1

    AppFeatureIdentifier.11.2   = 2(MWI SUB)
    AppFeatureTableIndexRef.11.2= 11

    AppFeatureIdentifier.11.3   = 3(DND)
    AppFeatureTableIndexRef.11.3= 3

(Profile X2)
XAppProfileToFeatureMapTable entries
    AppFeatureIdentifier.12.1   = 1(DIGIT MAP)
    AppFeatureTableIndexRef.12.1= 2

    AppFeatureIdentifier.12.2   = 2(MWI SUB)
    AppFeatureTableIndexRef.12.2= 11

    AppFeatureIdentifier.12.3   = 3(DND)
    AppFeatureTableIndexRef.12.3= 4

Application Profile to Features Mapping Table (Application Y):
(Profile Y1)

YAppProfileToFeatureMapTable entries
    AppFeatureIdentifier.20.1   = 1
    AppFeatureTableIndexRef.20.1= 25

    AppFeatureIdentifier.20.2   = 2
    AppFeatureTableIndexRef.20.2= 0
    AppNWFeatureStatus.20.2     = False
Note: An IndexRef of 0 can indicate that there are only activation controls for the
feature; see also additional note for the next feature

YAppProfileToFeatureMapTable entries
    AppFeatureIdentifier.20.1 = 3
    AppFeatureTableIndexRef.20.1= 0
Note: An IndexRef of 0 can also indicate other settings such as per Operator data

Application X Feature Tables
(DIGIT MAP).1="<<DIGIT MAP ABC>>"
(DIGIT MAP).2="<<DIGIT MAP XYZ>>"
(MWI SUB).11="60 secs"
(DND).3="True"
(DND).4="False"

Application Y Feature Tables

(Feature 1 has a Feature Table)
(Feature 1).25="<<Feature 1 data>>"
```

```
(Feature 2 has no configuration data)

(Feature 3 is per Operator configuration)
(Feature 3).Operator="<<Feature 3 data>>
```

Appendix II Acknowledgements

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John Berg (CableLabs)

Josh Littlefield (Cisco)

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Eduardo Cardona and the PacketCable Architects, CableLabs, Inc.

Appendix III Revision History

The following Engineering Change Notices were incorporated in PKT-SP-EUE-DATA-I02-080710.

ECN	ECN Date	Summary
EUE-DATA-N-08.0504-7	5/27/2008	Incorporation of feedback from vendor and ATP focus teams
EUE-DATA-N-08.0524-5	5/27/2008	Alignment of management requirements between PacketCable 1.5 and PacketCable 2.0

The following Engineering Change Notices were incorporated in PKT-SP-EUE-DATA-I03-090528.

ECN	ECN Date	Summary
EUE-DATA-N-08.0528-3	12/8/2008	Updates to EUE DATA MIB
EUE-DATA-N-08.0556-3	4/27/2009	EUE MIB Objects Persistency requirements

The following Engineering Change Notices were incorporated in PKT-SP-EUE-DATA-I04-100120.

ECN	ECN Date	Summary
EUE-DATA-N-09.0602-3	11/30/2009	Clarifications on PktcEUETCCreds Textual Convention
EUE-DATA-N-09.0603-2	11/30/2009	Clarifications on Configuration Data Element Requirements
EUE-DATA-N-09.0605-5	12/14/2009	Clarifications and Enhancements to the EUE Device MIB

The following Engineering Change Notices were incorporated in PKT-SP-EUE-DATA-I05-100527.

ECN	ECN Date	Summary
EUE-DATA-N-10.0633-2	4/26/2010	Updates to EUE DEVICE MIB
EUE-DATA-N-10.0631-3	5/3/2010	Updates on User Configuration MIB: IMPI Persistence & IMPU Implicit Registration Clarifications

The following Engineering Change Notices were incorporated in PKT-SP-EUE-DATA-I06-110127.

ECN	ECN Date	Summary
EUE-DATA-N-10.0644-2	12/20/2010	Corrections on Device Configuration MIB
EUE-DATA-N-11.0659-1	1/17/2011	ECR to correct Change#2 in EUE-DATA-N-10.0644-2

The following Engineering Change Notices was incorporated in PKT-SP-EUE-DATA-I07-110825.

ECN	ECN Date	Summary
EUE-DATA-N-11.0661-6	7/11/2011	Media IP stack preference in SDP - Dual IP stack new features

The following Engineering Change Notice was incorporated in PKT-SP-EUE-DATA-I08-121030.

ECN	ECN Date	Summary
EUE-DATA-N-12.0686-1	7/16/2012	Compliance of CL-PKTC-EUE-EVENT-MIB Module with European requirements