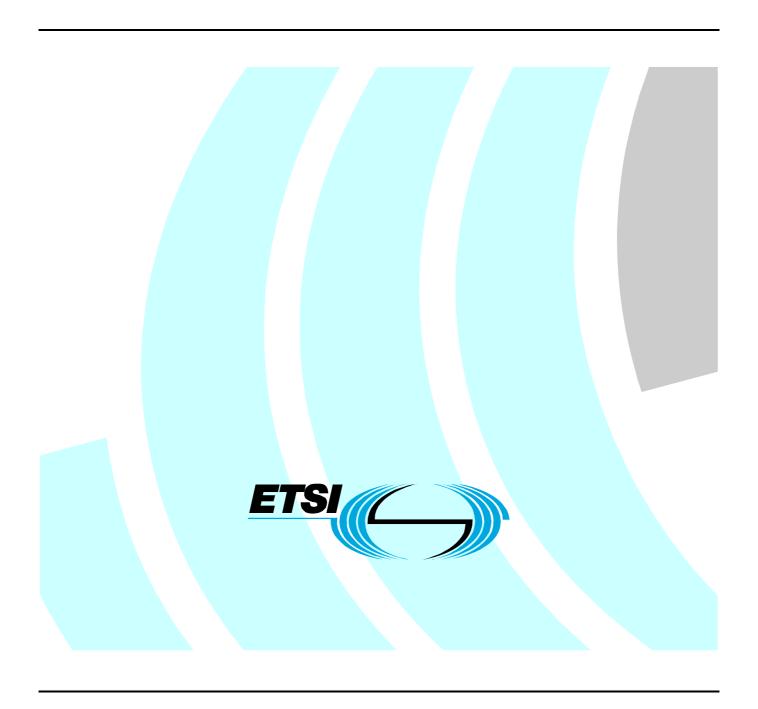# ETSI TS 103 161-1 V1.1.1 (2011-06)

Technical Specification

Access, Terminals, Transmission and Multiplexing (ATTM); Integrated Broadband Cable and Television Networks; IPCablecom 1.5; Part 1: Overview

ETSI

Reference

DTS/ATTM-003011-1

Keywords

access, broadband, cable, IP, PSTN

ETSI

650 Route des Lucioles
F-06921 Sophia Antipolis Cedex - FRANCE

Tel.: +33 4 92 94 42 00   Fax: +33 4 93 65 47 16

Siret N° 348 623 562 00017 - NAF 742 C
Association à but non lucratif enregistrée à la
Sous-Préfecture de Grasse (06) N° 7803/88

Important notice

Individual copies of the present document can be downloaded from:
http://www.etsi.org

The present document may be made available in more than one electronic version or in print. In any case of existing or
perceived difference in contents between such versions, the reference version is the Portable Document Format (PDF).
In case of dispute, the reference shall be the printing on ETSI printers of the PDF version kept on a specific network drive
within ETSI Secretariat.

Users of the present document should be aware that the document may be subject to revision or change of status.
Information on the current status of this and other ETSI documents is available at
http://portal.etsi.org/tb/status/status.asp

If you find errors in the present document, please send your comment to one of the following services:
http://portal.etsi.org/chaircor/ETSI_support.asp

Copyright Notification

Contents

Intellectual Property Rights

IPRs essential or potentially essential to the present document may have been declared to ETSI. The information pertaining to these essential IPRs, if any, is publicly available for **ETSI members and non-members**, and can be found in ETSI SR 000 314: *"Intellectual Property Rights (IPRs); Essential, or potentially Essential, IPRs notified to ETSI in respect of ETSI standards"*, which is available from the ETSI Secretariat. Latest updates are available on the ETSI Web server (http://ipr.etsi.org).

Pursuant to the ETSI IPR Policy, no investigation, including IPR searches, has been carried out by ETSI. No guarantee can be given as to the existence of other IPRs not referenced in ETSI SR 000 314 (or the updates on the ETSI Web server) which are, or may be, or may become, essential to the present document.

Foreword

This Technical Specification (TS) has been produced by ETSI Technical Committee Access, Terminals, Transmission and Multiplexing (ATTM).

The present document is part 1 of a multi-part IPCablecom 1.5 deliverable covering the Digital Broadband Cable Access to the Public Telecommunications Network; IP Multimedia Time Critical Services, as identified below:

Part 1: **"Overview";**

Part 2: "Architectural framework for the delivery of time critical services over Cable Television networks using cable modems";

Part 3: "Audio Codec Requirements for the Provision of Bi-Directional Audio Service over Cable Television Networks using Cable Modems";

Part 4: "Network Call Signalling Protocol";

Part 5: "Dynamic Quality of Service for the Provision of Real Time Services over Cable Television Networks using Cable Modems";

Part 6: "Event Message Specification";

Part 7: "Media Terminal Adapter (MTA) Management Information Base (MIB)";

Part 8: "Network Call Signalling (NCS) MIB Requirements";

Part 9: "Security";

Part 10: "Management Information Base (MIB) Framework";

Part 11: "Media terminal adapter (MTA) device provisioning";

Part 12: "Management Event Mechanism";

Part 13: "Trunking Gateway Control Protocol - MGCP option";

Part 14: "Embedded MTA Analog Interface and Powering Specification";

Part 15 "Analog Trunking for PBX Specification";

Part 16: "Signalling for Call Management Server";

Part 17: "CMS Subscriber Provisioning Specification";

Part 18: "Media Terminal Adapter Extension MIB";

Part 19: "IPCablecom Audio Server Protocol Specification - MGCP option";

Part 20: "Management Event MIB Specification";

Part 21:   "Signaling Extension MIB Specification".

NOTE: The choice of a multi-part format for this deliverable is to facilitate maintenance and future enhancements.

These ETSI Standards are based on the CableLabs® PacketCable™ 1.5 set of specifications which are also standardized in the United States by SCTE. The table below indicates for the specifications in this series the equivalent CableLabs® PacketCable™ specifications and SCTE Standards.

ETSI Standards	CableLabs® PacketCable™ 1.5 Specifications	SCTE Standards
TS 103 161-1	None	None
TS 103 161-2 [i.6]	PacketCable™ 1.5 Architecture Framework Technical Report	ANSI/SCTE 165-1
TS 103 161-3 [i.7]	PacketCable™ 1.5 Audio/Video Codecs Specification	ANSI/SCTE 165-2
TS 103 161-4 [i.8]	PacketCable™ 1.5 Network-Based Call Signaling Protocol Specification	ANSI/SCTE 165-3
TS 103 161-5 [i.9]	PacketCable™ 1.5 Dynamic Quality of Service Specification	ANSI/SCTE 165-4
TS 103 161-6 [i.10]	PacketCable™ 1.5 Event Messages Specification	ANSI/SCTE 165-9
TS 103 161-7 [i.11]	PacketCable™ 1.5 MTA MIB Specification	ANSI/SCTE 165-7
TS 103 161-8 [i.12]	PacketCable™ 1.5 Signaling MIB Specification	ANSI/SCTE 165-8
TS 103 161-9 [i.13]	PacketCable™ 1.5 Security Specification	ANSI/SCTE 165-10
TS 103 161-10 [i.14]	PacketCable™ 1.5 MIBS Framework Specification	ANSI/SCTE 165-6
TS 103 161-11 [i.15]	PacketCable™ 1.5 MTA Provisioning Specification	ANSI/SCTE 165-5
TS 103 161-12 [i.16]	PacketCable™ 1.5 Management Event Mechanism Specification	ANSI/SCTE 165-16
TS 103 161-13 [i.17]	PacketCable™ 1.5 PSTN Gateway Call Signaling Protocol Specification	ANSI/SCTE 165-12
TS 103 161-14 [i.18]	PacketCable™ 1.5 Embedded MTA Analog Interface and Powering Specification	ANSI/SCTE 165-14
TS 103 161-15 [i.19]	PacketCable™ 1.5 Analog Trunking for PBX Specification	ANSI/SCTE 165-11
TS 103 161-16 [i.20]	PacketCable™ 1.5 CMS to CMS Signaling Specification	ANSI/SCTE 165-18
TS 103 161-17 [i.21]	PacketCable™ 1.5 CMS Subscriber Provisioning Specification	ANSI/SCTE 165-19
TS 103 161-18 [i.22]	PacketCable™ 1.5 MTA Extension MIB Specification	ANSI/SCTE 165-20
TS 103 161-19 [i.23]	PacketCable™ 1.5 Audio Server Protocol Specification	ANSI/SCTE 165-17
TS 103 161-20 [i.24]	PacketCable™ 1.5 Management Event MIB Specification	ANSI/SCTE 165-15
TS 103 161-21 [i.25]	PacketCable™ 1.5 Signaling Extension MIB Specification	ANSI/SCTE 165-21

Historically, these were also standardized in the ITU-T as J.160 through J.169 and J.170 through J.178 Recommendations.

Introduction

The cable industry has recognized the need to develop ETSI Technical Specifications aimed at developing interoperable interface specifications and mechanisms for the delivery of end to end advanced real time IP multimedia time critical services over bi-directional broadband cable networks.

IPCablecom 1.5 defines interface specifications that can be used to develop interoperable equipment capable of providing packet-based voice, video and other high-speed multimedia services over hybrid fiber coax (HFC) cable systems utilizing the DOCSIS® protocol. IPCablecom utilizes a network superstructure that overlays the two-way data-ready cable television network. While the initial service offerings in the IPCablecom product line are anticipated to be Packet Voice, the long-term project vision encompasses packet video and a large family of other packet-based services.

IPCablecom 1.5 builds upon and extends IPCablecom 1.0 to include support of the following additional capabilities:

- VoIP signalling between Call Management Servers.

- Subscriber provisioning of Call Management Servers.

- Enhanced alarm and informational event collection and reporting.

- Enhanced reliability and availability (e.g. E-MTA battery backup).

- Reliable transmission of voice-band-band data (e.g., FAX and DTMF relay).

- Enhanced audio codecs.

The cable industry is a global market and therefore the ETSI standards are developed to align to the extent possible with standards either already developed or under development in other regions. The ETSI specifications are consistent to the extent possible with the CableLabs®/PacketCable™ set of specifications as published by the SCTE. An agreement has been established between ETSI and SCTE in the US to ensure, where appropriate, that the release of PacketCable™ and IPCablecom set of specifications are aligned and to avoid unnecessary duplication.

1 Scope

The present document, provides an overview of the standards in TS 103 161 series.

2 References

References are either specific (identified by date of publication and/or edition number or version number) or non-specific. For specific references, only the cited version applies. For non-specific references, the latest version of the reference document (including any amendments) applies.

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

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

2.1 Normative References

The following referenced documents are necessary for the application of the present document.

Not applicable.

2.2 Informative references

The following referenced documents are not necessary for the application of the present document but they assist the user with regard to a particular subject area.

[i.1] ETSI TS 101 909-3: "Access and Terminals (AT); Digital Broadband Cable Access to the Public Telecommunications Network; IP Multimedia Time Critical Services; Part 3: Audio Codec Requirements for the Provision of Bi-Directional Audio Service over Cable Television Networks using Cable Modems".

[i.2] IETF RFC 2833: "RTP Payload for DTMF Digits, Telephony Tones and Telephony Signals".

[i.3] ITU-T Recommendation T.38: "Procedures for real-time Group 3 facsimile communication over IP networks".

[i.4] WSDL 1.1: "Web Services Description Language".

NOTE: Available at http://www.w3.org/TR/wsdl.

[i.5] SOAP 1.1: "Simple Object Access Protocol".

NOTE: Available at http://www.w3.org/TR/SOAP.

[i.6] ETSI TS 103 161-2: "Access, Terminals, Transmission and Multiplexing (ATTM) Integrated Broadband Cable and Television Networks; IPCablecom 1.5 Part 2: Architectural framework for the delivery of time critical services over cable Television networks using cable modems".

[i.7] ETSI TS 103 161-3: "Access, Terminals, Transmission and Multiplexing (ATTM); Integrated Broadband Cable and Television Networks; IPCablecom 1.5; Part 3: Audio Codec Requirements for the Provision of Bi-Directional Audio Service over Cable Television Networks using Cable Modems".

[i.8] ETSI TS 103 161-4: "Access, Terminals, Transmission and Multiplexing (ATTM) Integrated Broadband Cable and Television Networks; IPCablecom 1.5 Part 4: Network Call Signalling Protocol".

[i.9]	ETSI TS 103 161-5: "Access, Terminals, Transmission and Multiplexing (ATTM) Integrated Broadband Cable and Television Networks; IPCablecom 1.5 Part 5: Dynamic Quality of Service for the Provision of Real Time Services over Cable Television Networks using Cable Modems".

[i.10]	ETSI TS 103 161-6: "Access, Terminals, Transmission and Multiplexing (ATTM); Integrated Broadband Cable and Television Networks; IPCablecom 1.5; Part 6: Event Message Specification".

[i.11]	ETSI TS 103 161-7: "Access, Terminals, Transmission and Multiplexing (ATTM) Integrated Broadband Cable and Television Networks; IPCablecom 1.5 Part 7: Media Terminal Adapter (MTA) Management Information Base (MIB)".

[i.12]	ETSI TS 103 161-8: "Access, Terminals, Transmission and Multiplexing (ATTM) Integrated Broadband Cable and Television Networks; IPCablecom 1.5 Part 8: Network Call Signalling (NCS) MIB Requirements".

[i.13]	ETSI TS 103 161-9: "Access, Terminals, Transmission and Multiplexing (ATTM) Integrated Broadband Cable and Television Networks; IPCablecom 1.5 Part 9: Security".

[i.14]	ETSI TS 103 161-10: "Access, Terminals, Transmission and Multiplexing (ATTM) Integrated Broadband Cable and Television Networks; IPCablecom 1.5 Part 10: Management Information Base (MIB) Framework".

[i.15]	ETSI TS 103 161-11: "Access, Terminals, Transmission and Multiplexing (ATTM) Integrated Broadband Cable and Television Networks; IPCablecom 1.5 Part 11: Media Terminal Adapter (MTA) device provisioning".

[i.16]	ETSI TS 103 161-12: "Access, Terminals, Transmission and Multiplexing (ATTM) Integrated Broadband Cable and Television Networks; IPCablecom 1.5 Part 12: Management Event Mechanism".

[i.17]	ETSI TS 103 161-13: "Access, Terminals, Transmission and Multiplexing (ATTM) Integrated Broadband Cable and Television Networks; IPCablecom 1.5 Part 13: Trunking Gateway Control Protocol - MGCP option".

[i.18]	ETSI TS 103 161-14: "Access, Terminals, Transmission and Multiplexing (ATTM); Integrated Broadband Cable and Television Networks; IPCablecom 1.5; Part 14: Embedded MTA Analog Interface and Powering Specification".

[i.19]	ETSI TS 103 161-15: "Access, Terminals, Transmission and Multiplexing (ATTM) Integrated Broadband Cable and Television Networks; IPCablecom 1.5 Part 15: Analog Trunking for PBX Specification".

[i.20]	ETSI TS 103 161-16: "Access, Terminals, Transmission and Multiplexing (ATTM); Integrated Broadband Cable and Television Networks; IPCablecom 1.5; Part 16: Signalling for Call Management Server".

[i.21]	ETSI TS 103 161-17: "Access, Terminals, Transmission and Multiplexing (ATTM); Integrated Broadband Cable and Television Networks; IPCablecom 1.5; Part 17: CMS Subscriber Provisioning Specification".

[i.22]	ETSI TS 103 161-18: "Access, Terminals, Transmission and Multiplexing (ATTM) Integrated Broadband Cable and Television Networks; IPCablecom 1.5 Part 18: Media Terminal Adapter Extension MIB".

[i.23]	ETSI TS 103 161-19: "Access, Terminals, Transmission and Multiplexing (ATTM) Integrated Broadband Cable and Television Networks; IPCablecom 1.5 Part 19: IPCablecom Audio Server Protocol Specification - MGCP option".

[i.24]	ETSI TS 103 161-20: "Access, Terminals, Transmission and Multiplexing (ATTM); Integrated Broadband Cable and Television Networks; IPCablecom 1.5; Part 20: Management Event MIB Specification".

[i.25]   ETSI TS 103 161-21: "Access, Terminals, Transmission and Multiplexing (ATTM); Integrated Broadband Cable and Television Networks; IPCablecom 1.5; Part 21: Signalling Extension MIB Specification".

3   Definitions and abbreviations

3.1   Definitions

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

IPCablecom: ETSI deliverables including an architecture and a series of specifications that enable the delivery of real time services (such as telephony) over the cable television networks using cable modems

3.2   Abbreviations

For the purposes of the present document, the following abbreviations apply:

CMS	Call Management Server
CMSS	Call Management Server Signaling
CMTS	Cable Modem Termination System
DTMF	Dual Tone Multi Frequency
E-MTA	Embedded Media Terminal Adapter
IP	Internet Protocol
IVR	Interactive Voice Response
MGCI	Media Gateway Controller Interface
MGCP	Media Gateway Controller Protocol
MIB	Management Information Base
MTA	Media Terminal Adapter
NCS	Network Call Signalling
PBX	Private Branch Exchange
PS	Provisioning Server
PSTN	Public Switch Telephone Network
QoS	Quality of Service
SIP	Session Initiation Protocol
SMIv2	Structure of Management Information version 2
SNMP	Signalling Network Management Protocol
TGCP	Trunking Gateway Control Protocol
VoIP	Voice over IP

4   Overview of the multi-part deliverable

The ETSI TS 103 161 series together present an IPCablecom 1.5 network architecture for the provision of voice and multimedia IP services. The TS 103 161 series of standards represent a cohesive set of interwoven specifications that jointly evolved to present different phases of IPCablecom 1.5 network developments. Changes made to one part of the series have to identify the consequence to other parts of the series to ensure the elements interface properly.

4.1   Part 1: Overview

TS 103 161-1 is the present document.

4.2   Part 2: Architectural framework for the delivery of time critical services over Cable Television networks using cable modems

TS 103 161-2 [i.6] defines architecture framework for IPCablecom 1.5 networks including all major system components and network interfaces necessary for delivery of IPCablecom 1.5 services.

4.3   Part 3: Audio Codec Requirements for the Provision of Bi-Directional Audio Service over Cable Television Networks using Cable Modems

TS 103 161-3 [i.7] defines the audio and video codecs necessary to provide the highest quality and the most resource-efficient service delivery to the customer. Also specifies the performance required in client devices to support future IPCablecom codecs and describes suggested methodology for optimal network support for codecs.

This document also extends the existing IPCablecom 1.0 Codec specification [i.1] by introducing two new low-bit codecs, ITU-T Recommendation T.38 [i.3] fax relay for reliable fax transmission, RFC 2833 [i.2] DTMF Relay for reliable DTMF transmission, and metrics to measure voice quality.

4.4   Part 4: Network Call Signalling Protocol

TS 103 161-4 [i.8] defines a profile of the Media Gateway Controller Protocol (MGCP) for IPCablecom 1.5 embedded clients, MGCP is a call signalling protocol for use in a centralized call control architecture, and assumes relatively simple client devices. The call signalling protocol is one layer of the overall IPCablecom 1.5 suite of documents and relies upon companion protocol documents to provide complete end-to-end IPCablecom functionality.

The document describes an IPCablecom profile of an application programming interface (MGCI), and a corresponding protocol (MGCP) for controlling Voice-over-IP (VoIP) embedded clients external call control elements. The profile is referred to as the Network Call Signalling (NCS) Protocol.

4.5   Part 5: Dynamic Quality of Service for the Provision of Real Time Services over Cable Television Networks using Cable Modems

TS 103 161-5 [i.9] defines the QoS Architecture for the "Access" portion of the IPCablecom 1.5 network, provided to requesting applications on a per-flow basis. The access portion of the network is defined to be between the Media Terminal Adapter (MTA) and the Cable Modem Termination System (CMTS). The method of QoS allocation over the backbone is unspecified in the present version of the document.

The Dynamic QoS specification incorporates protocols to enable providers of packet-based voice communications using the IPCablecom framework to use different charging models, including both flat-rate charging as well as usage-based charging. It is the intent of the document to ensure that enhanced QoS is provided only to authorized and authenticated users.

4.6   Part 6: Event Message Specification

TS 103 161-6 [i.10] defines the concept of Event Messages used to collect usage for the purposes of billing within the IPCablecom 1.5 architecture. It details the protocol used to carry these messages, defines the various Event Messages, lists the attributes each Event Message contains, and lists the required and optional Event Messages associated with each type of end-user service supported.

4.7   Part 7: Media Terminal Adapter (MTA) Management Information Base (MIB)

TS 103 161-7 [i.11] defines the MIB module in full which supplies the basic management objects for the IPCablecom 1.5 MTA Device.

4.8   Part 8: Network Call Signalling (NCS) MIB Requirements

TS 103 161-8 [i.12] defines the MIB module in full which supplies the basic management object for the IPCablecom 1.5 NCS protocol.

4.9   Part 9: Security

TS 103 161-9 [i.13] defines the Security architecture, protocols, algorithms, associated functional and technological requirements that provide for the security of the IPCablecom 1.5 network.

4.10   Part 10: Management Information Base (MIB) Framework

TS 103 161-10 [i.14] describes the framework in which IPCablecom 1.5 MIBs are defined. It provides information on the management requirements of IPCablecom specified devices and functions, and how these requirements are supported in the MIB. It is intended to support and complement the actual MIB documents, which are issued separately (parts 7, 8, 18, 20, and 21).

4.11   Part 11: Media terminal adapter (MTA) device provisioning

TS 103 161-11 [i.15] defines the protocol mechanisms for provisioning of an IPCablecom 1.5 embedded-MTA device by a single provisioning and network management provider.

4.12   Part 12: Management Event Mechanism

TS 103 161-12 [i.16] defines the Management Event Mechanism that IPCablecom 1.5 elements can use to report asynchronous events that indicate malfunction situations and notifications about important non-fault situations.

Events are defined in this part as conditions requiring the reporting of information to management systems and/or local log.

4.13   Part 13: Trunking Gateway Control Protocol - MGCP option

TS 103 161-13 [i.17] describes the Trunking Gateway Control Protocol (TGCP) profile of an application programming interface (MGCI) and a corresponding protocol (MGCP) for controlling trunking gateways from external call control elements. A trunking gateway is a network element that provides analog, emulated analog, or digital bearer and channel-associated signaling trunk circuit access to a Voice over IP (VoIP) network. TGCP is designed to meet the protocol requirements for the Media Gateway Controller to Media Gateway interface defined in the IPCablecom 1.5 architecture.

4.14   Part 14: Embedded MTA Analog Interface and Powering Specification

TS 103 161-14 [i.18] defines the embedded MTA (E-MTA) requirements for the analog interface and for powering of the E-MTA. An embedded MTA is a DOCSIS cable modem (CM) integrated with an IPCablecom media terminal adapter (MTA). The requirements defined will enable a service that is sufficiently reliable to meet an assumed consumer expectation of essentially constant availability, including, specifically, availability during power failure at the customer's premises, and (assuming the service is used to connect to the PSTN), access to emergency services

4.15   Part 15: Analog Trunking for PBX Specification

TS 103 161-15 [i.19] defines extensions to the IPCablecom Network-based Call Signaling (NCS) protocol to support the analog trunking for PBX interfaces on an embedded Voice over IP client device in a IPCablecom environment. It describes the functional requirements for an embedded client to support one-way incoming, one-way outgoing, and two-way PBX trunks. The physical interfaces used to support these trunk types are also defined.

4.16   Part 16: Signalling for Call Management Server

TS 103 161-16 [i.20] describes the IPCablecom Call Management Server (CMS) to CMS Signalling protocol intended for use by a CMS to communicate with another CMS in order to support packet-based voice and other real-time multimedia applications. This part defines a profile of the IETF SIP protocol for use within IPCablecom networks. This SIP profile (known as CMSS - "Call Management Server to Call Management Server Signalling Specification") contains extensions to the SIP protocol and usage rules to support IPCablecom services.

This part specifies the protocols and procedures to use between CMSs belonging to a single service provider as well as between CMSs that belong to different service providers. In the case that the CMSs are owned by multiple service providers, it is assumed that the service providers have a mutual trust relationship.

4.17   Part 17: CMS Subscriber Provisioning Specification

TS 103 161-17 [i.21] defines the interface used between the Call Management Server (CMS) and Provisioning Server (PS) for the exchange of service provisioning information. The interface employs a Web Service model. Specified in Web Service Description Language 1.1 (WSDL 1.1) [i.4], the interface transports XML encoded objects within Simple Object Access Protocol 1.1 (SOAP 1.1) [i.5] encoded messages over an HTTP 1.1 transport. This interface is secured via IPSec.

The scope of this document is limited to the provisioning of an IPCablecom CMS by a single service provider.

4.18   Part 18: Media Terminal Adapter Extension MIB

TS 103 161-18 [i.22] defines the Media terminal adapter Extension MIB which includes new objects that are being introduced beyond IPCablecom 1.0 for MTA.

4.19   Part 19: IPCablecom Audio Server Protocol Specification - MGCP option

TS 103 161-19 [i.23] defines a set of signalling protocols that are used to provide announcement services within a cable network.

This part also describes the architecture and protocols that are required for playing announcements in Voice over IP (VoIP) IPCablecom 1.5 networks, including where an IVR (Interactive Voice Response) system is embedded in the IPCablecom network. Announcements are typically needed for calls that do not complete. Additionally, they may be used to provide enhanced information services to the caller. Different carrier service feature sets require different announcement sets and announcement formats.

Announcements can be as basic as fixed-content announcements (e.g. all circuits busy) or as complex as those provided by intelligent IVR (Interactive Voice Response) systems. The IPCablecom service model requires that all announcements be provisioned and signalled in a standard manner for all supported call features and use case scenarios.

4.20   Part 20: Management Event MIB Specification

TS 103 161-20 [i.24], Management Event MIB, provides a common data and format definition for events (informative, alarm, etc.). It also specifies by what means events are transmitted. Use of a common event mechanism facilitates management of the MTA in a multi-vendor environment and provides a standard means to implement IPCablecom specified events.

This document describes an SNMP MIB in SMIv2, to support the management event mechanism as described in Part 12 [i.16]. It is intended to be implemented in the MTA and management devices.

4.21   Part 21: Signalling Extension MIB Specification

TS 103 161-21 [i.25] defines the IPCablecom 1.5 IPCablecom Extension Signaling MIB. New objects that are being introduced beyond IPCablecom 1.0 for Signaling MIBS are grouped in this document.

History

Document history		
V1.1.1	June 2011	Publication