

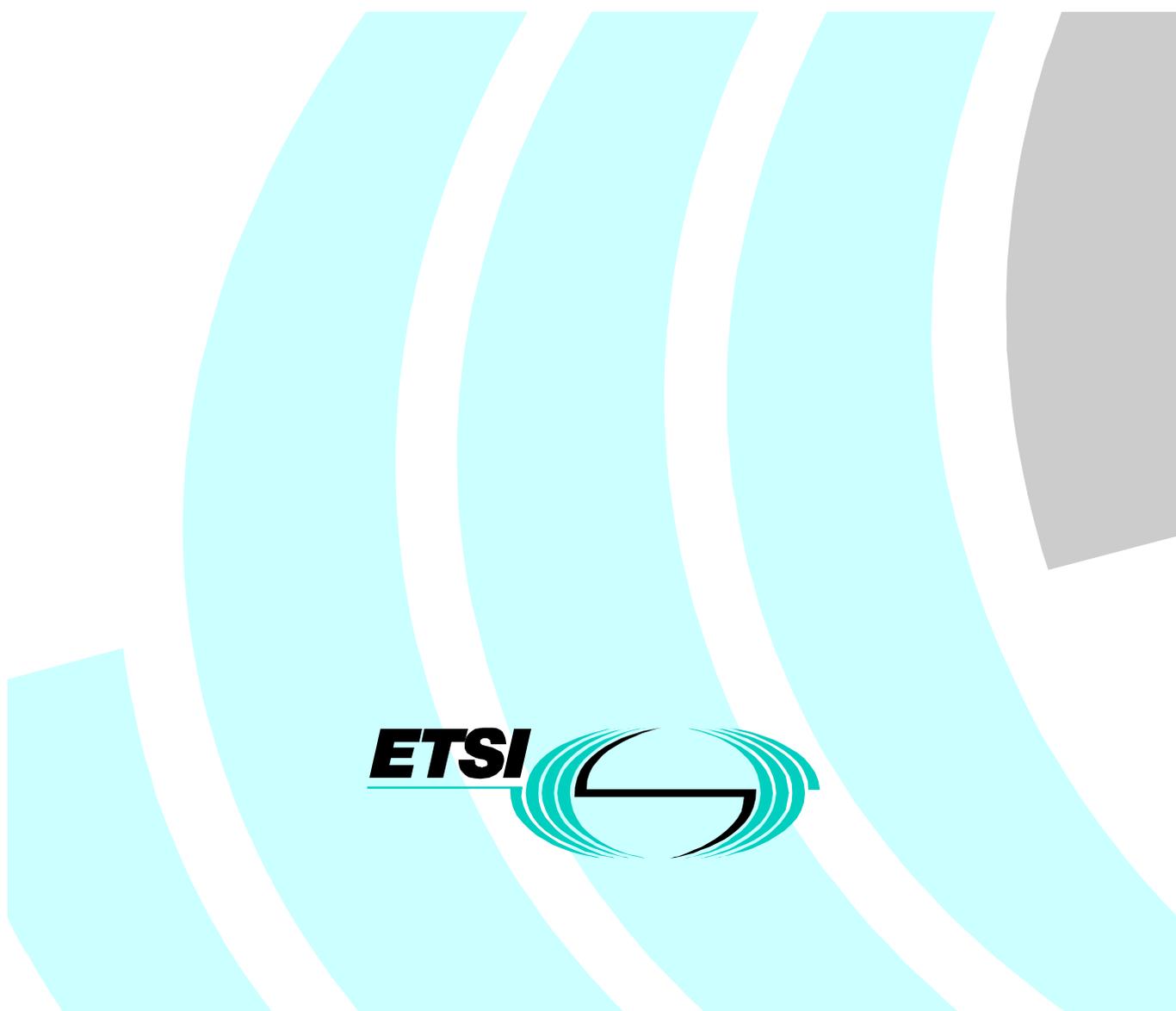
# ETSI TS 101 909-1 V1.1.1 (2001-06)

---

*Technical Specification*

## **Access and Terminals (AT); Digital Broadband Cable Access to the Public Telecommunications Network; IP Multimedia Time Critical Services; Part 1: General**

---



---

**Reference**

DTS/AT-020020-01

---

**Keywords**

access, broadband, cable, IP, multimedia, 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://www.etsi.org/tb/status/>

If you find errors in the present document, send your comment to:  
editor@etsi.fr

---

**Copyright Notification**

No part may be reproduced except as authorized by written permission.  
The copyright and the foregoing restriction extend to reproduction in all media.

© European Telecommunications Standards Institute 2001.  
All rights reserved.

---

# Contents

Intellectual Property Rights .....	4
Foreword.....	4
Introduction.....	5
1 Scope.....	6
2 References .....	6
3 Definitions and abbreviations.....	6
3.1 Definitions .....	6
3.2 Abbreviations.....	7
4 Overview of the multipart Technical Specification.....	7
4.1 Part 1: General .....	7
4.2 Part 2: Architectural framework for the delivery of time critical services over cable Television networks using cable modems .....	7
4.3 Part 3: Audio Codec Requirements for the Provision of Bi-Directional Audio Service over Cable Television Networks using Cable Modems .....	7
4.4 Part 4: Network Call signalling Protocol .....	7
4.5 Part 5: Dynamic Quality of Service for the Provision of Real Time Services over Cable Television Networks using Cable Modems .....	8
4.6 Part 6: Media Terminal Adapter (MTA) device provisioning.....	8
4.7 Part 7: Management Information Base (MIB) Framework .....	8
4.8 Part 8: Media Terminal Adaptor (MTA) Management Information Base (MIB).....	8
4.9 Part 9: Network Call Signalling (NCS) MIB Requirements .....	8
4.10 Part 10: Event Message Requirements for the Support of Real-Time Services over Cable Television Networks using Cable Modems .....	8
4.11 Part 11: Security.....	8
4.12 Part 12: Internet Signalling Transport Protocol.....	8
4.13 Part 13: Trunking Gateway Control Protocol.....	9
4.14 Part 14: Operation System Support .....	9
<b>Annex A (informative): Bibliography.....</b>	<b>10</b>
History .....	12

---

# 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://www.etsi.org/ipr>).

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 and Terminals (AT).

The present document is part 1 of a multi-part deliverable supporting real-time multi media services, as identified below:

- Part 1: "General";**
- 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: "Media Terminal Adapter (MTA) device provisioning";
- Part 7: "Management Information Base (MIB) Framework";
- Part 8: "Media Terminal Adapter (MTA) Management Information Base (MIB)";
- Part 9: "Network Call Signalling (NCS) MIB Requirements";
- Part 10: "Event Message Requirements for the Provision of Real Time Services over Cable Television Networks using Cable Modems";
- Part 11: "Security";
- Part 12: "Internet Signalling Transport Protocol";
- Part 13: "Trunking Gateway Control Protocol";
- Part 14: "Operation System Support".

NOTE 1: The above list is complete for the first version of this Technical Specification (TS) (V1.1.1 2001-06). Additional parts are being proposed and these will be added to the list in future versions.

The present part is part 1 of the above mentioned series of ETSI deliverables and specifies general aspects of IPCablecom.

NOTE 2: The choice of a multi-part format for this deliverable is to facilitate maintenance and future enhancements.

---

## Introduction

The cable industry in Europe and across other Global regions have already deployed broadband cable television Hybrid Fibre Coax (HFC) data networks running the Cable Modem Protocol. The Cable Industry is in the rapid stages of deploying IP Voice and other time critical multimedia services over these broadband cable television networks.

The cable industry has recognized the urgent 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 is a set of protocols and associated element functional requirements developed to deliver Quality-of-Service (QoS) enhanced secure IP multimedia time critical communications services using packetized data transmission technology to a consumer's home over the broadband cable television Hybrid Fibre/Coaxial (HFC) data network running the Cable Modem 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.

The cable industry is a global market and therefore the ETSI standards are developed to align with standards either already developed or under development in other regions. The ETSI Specifications are consistent 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. The set of IPCablecom ETSI specifications also refers to ITU-SG9 draft and published recommendations relating to IP Cable Communication.

The whole set of multi-part ETSI deliverables to which the present document belongs specify a Cable Communication Service for the delivery of IP Multimedia Time Critical Services over a HFC Broadband Cable Network to the consumers home cable telecom terminal. 'IPCablecom' also refers to the ETSI working group program that shall define and develop these ETSI deliverables.

---

# 1 Scope

The present set of documents specify IPCablecom, a set of protocols and associated element functional requirements. These have been developed to deliver Quality-of-Service (QoS), enhanced secure IP multimedia time critical communication services, using packetized data transmission technology to a consumer's home over a cable television Hybrid Fibre/Coaxial (HFC) data network.

NOTE 1: IPCablecom set of documents utilize a network superstructure that overlays the two-way data-ready cable television network, e.g. as specified within ES 201 488 and ES 200 800.

While the initial service offerings in the IPCablecom product line are anticipated to be Packet Voice and Packet Video, the long-term project vision encompasses a large family of packet-based services. This may require in the future, not only careful maintenance control, but also an extension of the present set of documents.

NOTE 2: The present set of documents aims for global acceptance and applicability. It is therefore developed in alignment with standards either already existing or under development in other regions and in International Telecommunications Union (ITU).

---

# 2 References

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

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

ITU-T Recommendation J.112: "Transmission systems for interactive cable television services".

ETSI ES 201 488: "Data-Over-Cable Service Interface Specifications; Radio Frequency Interface Specification".

ETSI ES 200 800: "Digital Video Broadcasting (DVB); DVB interaction channel for Cable TV distribution systems (CATV)".

---

# 3 Definitions and abbreviations

## 3.1 Definitions

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

**Access Node:** layer two termination device that terminates the network end of the ITU-T Recommendation J.112 connection

NOTE: It is technology specific. In ITU-T Recommendation J.112, annex A, it is called the INA while in annex B it is the CMTS.

**Cable Modem:** layer two termination device that terminates the customer end of the J.112 connection

**IPCablecom:** ETSI working group project that includes 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:

AN	Access Node
CM	Cable Modem
CMS	Call Management Server
CPE	Customer Premise Equipment
DHCP	Dynamic Host Configuration Protocol
DNS	Domain Naming System
FQDN	Fully Qualified Domain Name
HFC	Hybrid Fibre Coax
HTTP	HyperText Transfer Protocol
IP	Internet Protocol
IPSEC	Internet Protocol Security
MAC	Media Access Control
MTA	Media Terminal Adaptor
PSTN	Public Switched Telephone Network
QoS	Quality of Service
SNMP	Signalling Network Management Protocol
TFTP	Trivial File Transfer Protocol
TGS	Ticket Granting Server

---

## 4 Overview of the multipart Technical Specification

### 4.1 Part 1: General

The present document.

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

Defines architecture framework for IPCablecom networks including all major system components and network interfaces necessary for delivery of IPCablecom services.

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

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.

### 4.4 Part 4: Network Call signalling Protocol

Defines a profile of the Media Gateway Control Protocol (MGCP) for IPCablecom embedded clients, referred to as the Network-based Call Signalling (NCS) protocol. MGCP is a call signalling protocol for use in a centralized call control architecture, and assumes relatively simple client devices.

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

Defines the QoS Architecture for the "Access" portion of the PacketCable network, provided to requesting applications on a per-flow basis. The access portion of the network is defined to be between the Multimedia Terminal Adapter (MTA) and the Cable Modem Termination System (CMTS). The method of QoS allocation over the backbone is unspecified in the present document.

## 4.6 Part 6: Media Terminal Adapter (MTA) device provisioning

Defines the protocol mechanisms for provisioning of an IPCablecom embedded-MTA device by a single provisioning and network management provider.

## 4.7 Part 7: Management Information Base (MIB) Framework

Describes the framework in which IPCablecom MIBs (Management Information Base) 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.

## 4.8 Part 8: Media Terminal Adaptor (MTA) Management Information Base (MIB)

Defines the MIB module which supplies the basic management objects for the MTA Device.

## 4.9 Part 9: Network Call Signalling (NCS) MIB Requirements

Defines the MIB module which supplies the basic management object for the NCS protocol.

## 4.10 Part 10: Event Message Requirements for the Support of Real-Time Services over Cable Television Networks using Cable Modems

Defines the concept of Event Messages used to collect usage for the purposes of billing within the IPCablecom architecture.

## 4.11 Part 11: Security

Defines the Security architecture, protocols, algorithms, associated functional requirements and any technological requirements that can provide for the security of the system for the IPCablecom network.

## 4.12 Part 12: Internet Signalling Transport Protocol

Defines the Internet Signalling Transport Protocol (ISTP) for IPCablecom PSTN Signalling Gateways. ISTP is a protocol that provides a signalling interconnection service between the IPCablecom network control elements (Call Management Server and Media Gateway Controller) and the PSTN C7 Signalling network through the C7 Signalling Gateway.

## 4.13 Part 13: Trunking Gateway Control Protocol

Defines a trunking gateway control protocol (TGCP) for use in a centralized call control architecture that assumes relatively simple endpoint devices. TGCP is designed to meet the protocol requirements for the Media Gateway Controller to Media Gateway interface defined in the IP-Cablecom architecture.

## 4.14 Part 14: Operation System Support

Defines terminology, architecture, operational processes, interfaces and data flows. It also introduces a range of operational processes that a European Cable Operator might employ to launch and manage IP-Cablecom products and services.

The main areas for OSS are fault management, performance management, security management, accounting management and configuration management.

---

## Annex A (informative): Bibliography

RFC 2132 (1997): "DHCP Options and BOOTP Vendor Extensions".

RFC 1340 (1992): "Assigned Numbers".

RFC 1350/STD 33 (1992): "The TFTP Protocol (Revision 2)".

ITU-T Recommendation J.83 (1997): "Digital multi-programme systems for television, sound and data services for cable distribution".

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".

ETSI TS 101 909-5: "Access and Terminals (AT); Digital Broadband Cable Access to the Public Telecommunications Network; IP Multimedia Time Critical Services; Part 5: Dynamic Quality Of Service For The Provision Of Real Time Services Over Cable Television Networks Using Cable Modems".

ETSI TS 101 909-4: "Access and Terminals (AT); Digital Broadband Cable Access to the Public Telecommunications Network; IP Multimedia Time Critical Services; Part 4: Network Call signalling Protocol".

ETSI TS 101 909-8: "Access and Terminals (AT); Digital Broadband Cable Access to the Public Telecommunications Network; IP Multimedia Time Critical Services; Part 8: Media Terminal Adaptor (MTA) Management Information Base (MIB)".

ETSI TS 101 909-9: "Access and Terminals (AT); Digital Broadband Cable Access to the Public Telecommunications Network; IP Multimedia Time Critical Services; Part 9: Network Call Signalling (NCS) MIB Requirements".

ETSI TS 101 909-11: "Access and Terminals (AT); Digital Broadband Cable Access to the Public Telecommunications Network; IP Multimedia Time Critical Services; Part 11: Security".

RFC 2131: "Dynamic Host Configuration Protocol".

### List of ITU-T Recommendations referring to IP Cablecom:

ITU-T Recommendation J.160: "Architectural framework for the delivery of time critical services over cable television networks using cable modems".

ITU-T Recommendation J.161: "Audio codec requirements for the provision of bi-directional audio service over cable television networks using cable modems".

ITU-T Recommendation J.162: "Network call signalling protocol for the delivery of time critical services over cable television networks using cable modems".

ITU-T Recommendation J.163: "Dynamic quality of service for the provision of real time services over cable television networks using cable modems".

ITU-T Recommendation J.164: "IPCablecom event messages".

ITU-T Recommendation J.165: "IPCablecom Internet Signalling Transport Protocol".

ITU-T Recommendation J.166: "IPCablecom management information base (MIB) framework".

ITU-T Recommendation J.167: "Media terminal adapter (MTA) device provisioning requirements for the delivery of real time services over cable television networks using cable modems".

ITU-T Recommendation J.168: "IPCablecom Media Terminal Adapter (MTA) MIB requirements".

ITU-T Recommendation J.169: "IPCablecom network call signalling (NCS) MIB requirements".

ITU-T Recommendation J.170: "IPCablecom Security specification".

ITU-T Recommendation J.171: "IPcablecom Trunking Gateway Control Protocol (TGCP)".

---

## History

<b>Document history</b>		
V1.1.1	June 2001	Publication