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Digital Broadband Cable Access to the Public Telecommunications Network; IP Multimedia Time Critical Services; Part 19: IPCablecom Audio Server Protocol Specification; Sub-part 1: H.248 option

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Digital Broadband Cable Access to the Public Telecommunications Network; IP Multimedia Time Critical Services; Part 19: IPCablecom Audio Server Protocol Specification; Sub-part 1: H.248 option

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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

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Foreword

This Technical Specification (TS) has been produced by ETSI Technical Committee Services and Protocols for Advanced Networks (SPAN).

The present document is part 19, sub-part 1 of a multi-part deliverable covering Digital Broadband Cable Access to the Public Telecommunications Network; IP Multimedia Time Critical Services. Full details of the entire series can be found in part 1 (TS 101 909-1 [10]).

Introduction

The present document describes the architecture and specifies a set of signalling interfaces that may be used for playing announcements in voice-over-IP (VoIP) IPCablecom networks. It defines one of these interfaces: the MPC-MP interface.

The ideal objective for this interface would be to have a standard based on a single technical solution. However, commercial implementations of the Audio Server application based on a potential candidate for such a solution, ITU-T Recommendation H.248 [3], cannot yet be validated against the Audio Server requirements.

The present document defines a solution based on H.248. The solution based on ITU-T Recommendation J.162 (see Bibliography) is defined in TS 101 909-19-2 [4].

1 Scope

The present document describes the architecture and protocols that are required for playing announcements in Voice-over IP (VoIP) IPCablecom networks, where the 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.

The present document identifies a set of signalling interfaces that are used to provide announcement services within a cable network, and specifies one of these interfaces: the MP-MPC interface, based on the protocol defined in ITU-T Recommendation H.248 [3].

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.

[1] ETSI TS 101 909-2: "Access and Terminals (AT); Digital Broadband Cable Access to the Public Telecommunications Network; IP Multimedia Time Critical Services; Part 2: Architectural framework for the delivery of time critical services over cable Television networks using cable modems".

[2] ETSI TS 101 909-13: "Access and Terminals (AT); Digital Broadband Cable Access to the Public Telecommunications Network; IP Multimedia Time Critical Services; Part 13: Trunking Gateway Control Protocol".

[3] ITU-T Recommendation H.248 (2000): "Audiovisual and multimedia systems - Gateway control protocol".

[4] ETSI TS 101 909-19-2: "Digital Broadband Cable Access to the Public Telecommunications Network; IP Multimedia Time Critical Services; Part 19: IPCablecom Audio Server Protocol Specification; Sub-part 2: MGCP option".

[5] Void.

[6] 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".

[7] 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".

[8] ETSI TS 101 909-10: "Access and Terminals (AT); Digital Broadband Cable Access to the Public Telecommunications Network; IP Multimedia Time Critical Services; Part 10: Event Message Requirements for the Provision of Real Time Services over Cable Television Networks using Cable Modems".

[9] ETSI ETR 187: "Human Factors (HF); Recommendation of characteristics of telephone services tones when locally generated in telephony terminals".

[10] ETSI TS 101 909-1: "Digital Broadband Cable Access to the Public Telecommunications Network; IP Multimedia Time Critical Services; Part 1: General".

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

[12] IETF RFC 2045: "Multipurpose Internet Mail Extensions (MIME) Part One: Format of Internet Message Bodies".

[13] ITU-T Recommendation E.182: "Application of tones and recorded announcements in telephone services".

[14] ITU-T Recommendation G.728: "Coding of speech at 16 kbit/s using low-delay code excited linear prediction".

[15] IETF RFC 2327: "SDP: Session Description Protocol".

[16] IETF RFC 1889: "RTP: A Transport Protocol for Real-Time Applications".

[17] IETF RFC 1890: "RTP Profile for Audio and Video Conferences with Minimal Control".

[18] IETF RFC 2543: "SIP: Session Initiation Protocol".

[19] IETF RFC 2234: "Augmented BNF for Syntax Specifications: ABNF".

[20] IETF RFC 2401: "Security Architecture for the Internet Protocol".

[21] IETF RFC 2409: "The Internet Key Exchange (IKE)".

3 Definitions and abbreviations

3.1 Definitions

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

announcement: announcement to be played and which consists of one or more audio segments

cable modem: cable modem is a layer two termination device that terminates the customer end of the J.112 connection (ITU-T Recommendation J.112)

digit map: one or more digit patterns to be collected

EuroPacketCable: 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

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

off-net(work): voice call or data transmission session in which either the originating or terminating device is connected to an IPCablecom network which is interconnected to another network which is supporting the second terminal

on-net(work): voice call or data transmission session in which the originating and terminating devices are connected to a single IPCablecom network which may consist of one or more zones or domains

3.2 Abbreviations

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

ABNF	Augmented Backus-Naurr Form
AS	Audio Server
CMS	Call Management Server
DNS	Domain Name Server
DTMF	Dual Tone Multi-Frequency

IKE	Internet Key Exchange
IPSEC	Internet Protocol Security
IVR	Interactive Voice Response system
MG	Media Gateway
MGC	Media Gateway Controller
MP	Media Player
MPC	Media Player Controller
MTA	Media Terminal Adapter
NCS	Network-based Call Signalling
PSTN	Public Switched Telephone Network
RTP	Real Time Protocol
RTCP	RTP Control Protocol
SDP	Session Description Protocol
SPI	Security Parameter Index
TGCP	Trunking Gateway Control protocol
VoIP	Voice over IP

4 Technical overview

The IPCablecom Audio Server Specification identifies a suite of signalling protocols for providing announcement and media services in an IPCablecom network. This clause:

- defines the architectural requirements for providing IPCablecom announcement and media services,
- defines and categorizes announcement and media types,
- defines the components and their roles in the IPCablecom Audio Server Architecture, and
- describes the signalling and media interfaces in the IPCablecom Audio Server Specification.

4.1 Architectural requirements

The architectural requirements and assumptions for providing Audio and Media Services for an IPCablecom Network are listed below. These requirements are based upon the specifications and technical reports that define the IPCablecom architecture.

The reference architecture for the IPCablecom Network (TS 101 909-2 [1]) is shown in Figure 1 below.

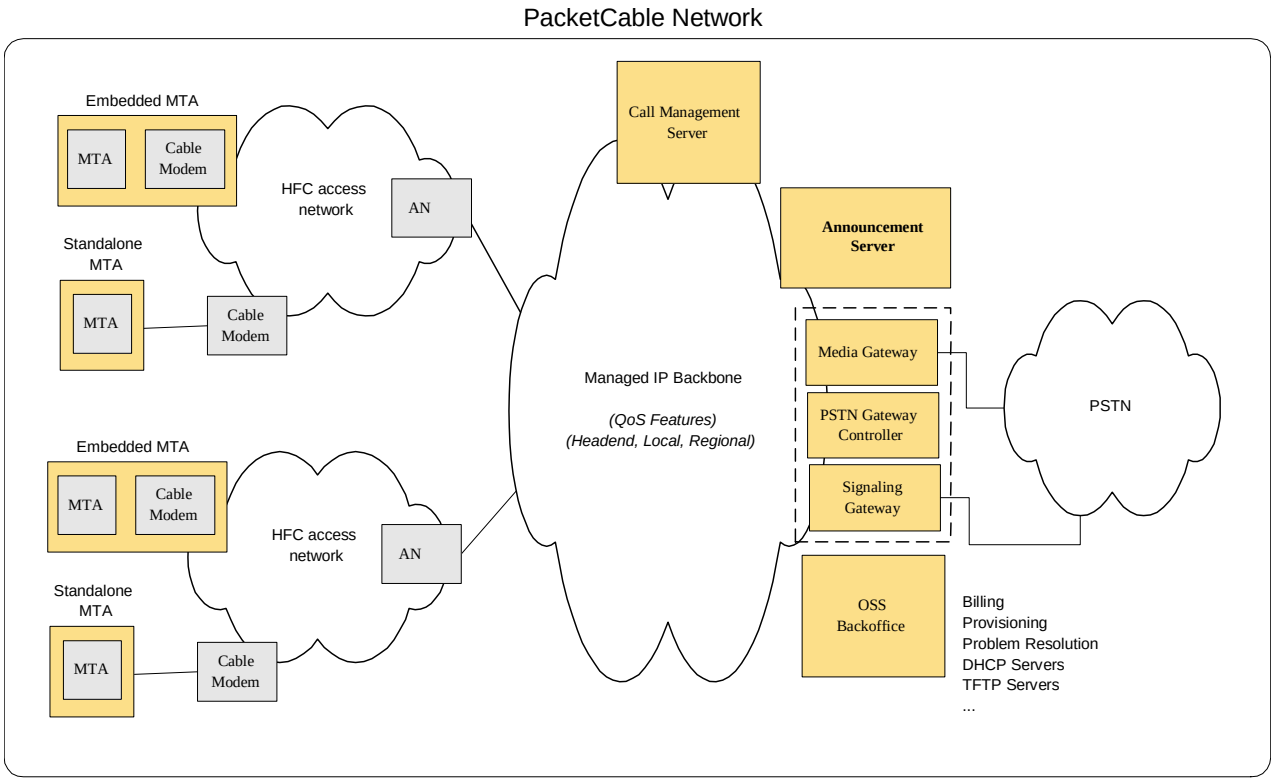

Figure 1: IPCablecom Network Component Reference Model

4.1.1 Call destination

The Audio Server Specification shall define how announcements are provided for IPCablecom on-net to off-net and on-net to on-net calls.

NOTE: Announcements for Off-net to on-net calls will usually be handled by the PSTN as a result of SS7 clearing messages. However when appropriate, they also may be played from the IPCablecom Media Gateway (MG).

4.1.2 Media formats

The required media formats for announcements are specified by the IPCablecom Codecs specification (TS 101 909-3 [6]).

4.1.3 Security

Audio shall be signalled and played in a secure manner. Security protocols defined in the IPCablecom Security specification TS 101 909-11 [7] shall be supported in the IPCablecom Audio Server Specification.

4.1.4 Operational Support Systems

Audio Servers may be required to support the IPCablecom billing and event message protocols as defined in [8].

4.2 Announcement definitions

Announcements can be divided into four distinct categories: tones, fixed-content, variable content, and interactive announcements.