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Universal Mobile Telecommunications System (UMTS);
LTE;
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- IMS Access Gateway (IMS-AGW);
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Contents

Foreword

This Technical Specification has been produced by the 3rd Generation Partnership Project (3GPP).

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1 Scope

The present document describes the protocol to be used on the IMS Application Level Gateway (ALG) – IMS Access Gateway (IMS-AGW) interface. The basis for this protocol is the H.248 protocol as specified in ITU-T. The IMS architecture is described in 3GPP TS 23.228 [2]. The underlying reference model and stage 2 information is described in Annex G of 3GPP TS 23.228 [2] and in 3GPP TS 23.334 [23].

This specification describes the application of H.248 on the Iq interface (see Figure 1). Required extensions use the H.248 standard extension mechanism. In addition certain aspects of the base protocol H.248 are not needed for this interface and thus excluded by this profile.

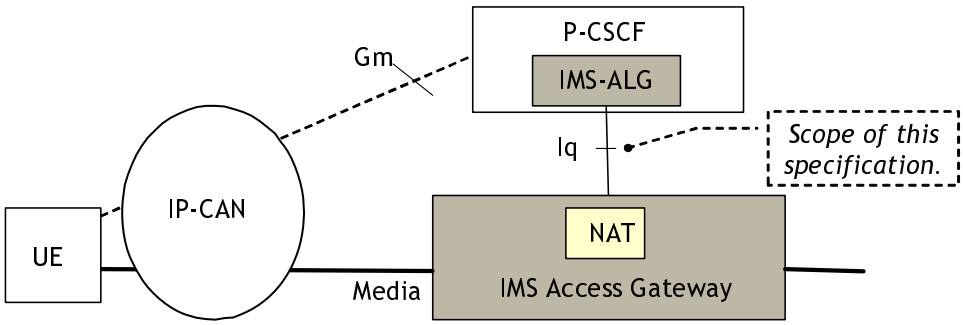

Figure 1: Reference model for IMS access

The reference model for the IMS-ALG and the IMS-AGW supporting the ATCF/ATGW function is shown in Figure 1a below.

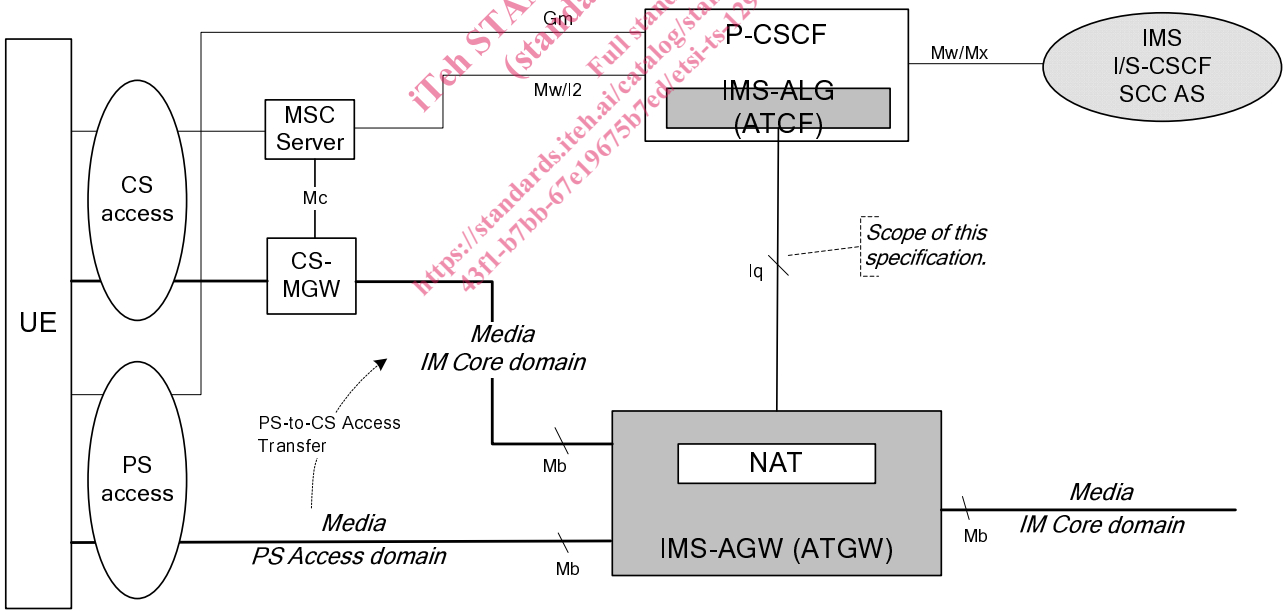

Figure 1a: Reference model for IMS-ALG/IMS-AGW with ATCF/ATGW function

See 3GPP TS 23.237 [38] clause 5.2 for a comprehensive description of the reference model.

The reference model for the P-CSCF enhanced for WebRTC (eP-CSCF) and the IMS-AGW enhanced for WebRTC (eIMS-AGW) to support WebRTC client access to IMS is shown in Figure 1b as below, see 3GPP TS 23.228 [2] Annex U for a comprehensive description of the reference model.

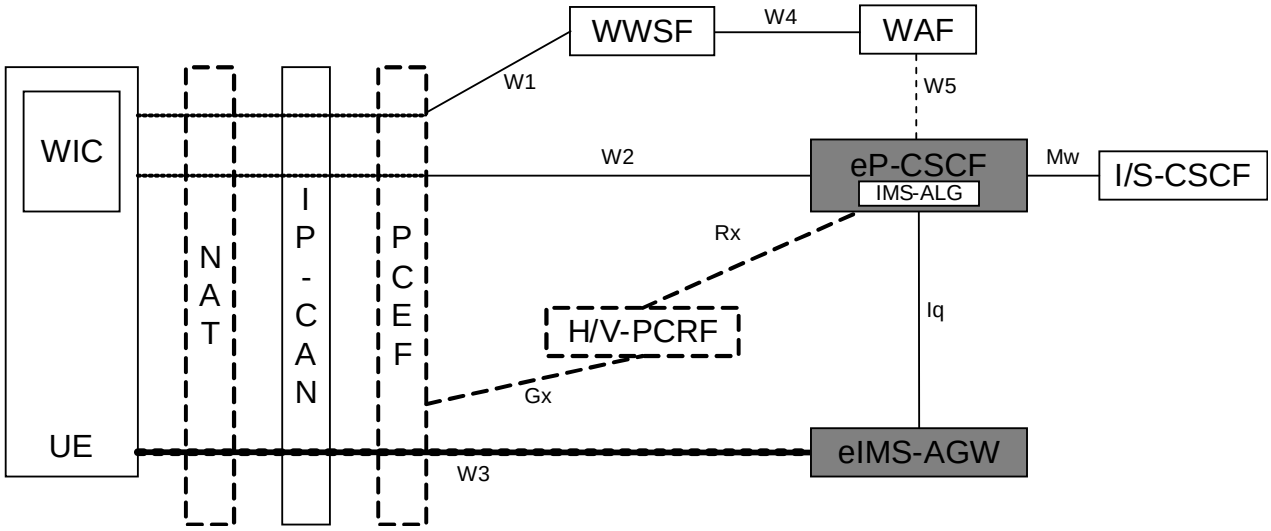

Figure 1b: Reference Architecture for eP-CSCF/eIMS-AGW supporting WebRTC access to IMS

NOTE: The presence of dashed elements in the figure depends on the configuration.
PCC functional elements are present only for EPC access with QoS.
The corresponding PCC elements for fixed access are also optionally supported but not shown.
The NAT in figure 1b is meant for non-cellular access to IMS.

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, edition number, version number, etc.) or non-specific.
- For a specific reference, subsequent revisions do not apply.
- For a non-specific reference, the latest version applies. In the case of a reference to a 3GPP document (including a GSM document), a non-specific reference implicitly refers to the latest version of that document *in the same Release as the present document*.

[1] 3GPP TR 21.905: "Vocabulary for 3GPP Specifications".

[2] 3GPP TS 23.228: "IP Multimedia Subsystem (IMS); Stage 2".

[3] ETSI TS 183 018 V3.5.1 (2009-07): "Telecommunications and Internet converged Services and Protocols for Advanced Networking (TISPAN); Resource and Admission Control: H.248 Profile Version 3 for controlling Border Gateway Functions (BGF) in the Resource and Admission Control Subsystem (RACS); Protocol specification".

[4] ITU-T Recommendation H.248.37 (06/2008): "Gateway control protocol: IP NAPT traversal package".

[5] ITU-T Recommendation H.248.57 (10/2014): "Gateway control protocol: RTP Control Protocol Package".

[6] ITU-T Recommendation H.248.43 (06/2008): "Gateway control protocol: Gate Management and Gate Control packages".

[7] ITU-T Recommendation H.248.53 (03/2009): "Gateway control protocol: Traffic management packages".

[8] ITU-T Recommendation H.248.41 Amendment 1 (06/2008): "Gateway control protocol: IP domain connection package: IP Realm Availability Package".

[9] ITU-T Recommendation H.248.36 (09/2005): "Gateway control protocol: Hanging Termination Detection package".

[10] ITU-T Recommendation H.248.1 (05/2002): "Gateway Control Protocol: Version 2" including the Corrigendum1 for Version 2 (03/04).

[11] ITU-T Recommendation H.248.14 (03/2009): "Gateway control protocol: Inactivity timer package".

[12] ITU-T Recommendation H.248.52 (06/2008): "Gateway control protocol: QoS support packages".

[13] ITU-T Recommendation H.248.11 (11/2002): "Gateway control protocol: Media gateway overload control package".
Inclusive Corrigendum 1 (06/2008) to H.248.11 " Gateway control protocol: Media gateway overload control package: Clarifying MG-overload event relationship to ADD commands".

[14] ITU-T Recommendation H.248.10 (07/2001): "Media gateway resource congestion handling package".

[15] IETF RFC 5234 (2008): "Augmented BNF for Syntax Specifications: ABNF".

[16] IETF RFC 4960 (2007): "Stream control transmission protocol".

[17] IETF RFC 4566 (2006): "SDP: Session Description Protocol".

[18] IETF RFC 4975 (2007): "The Message Session Relay Protocol (MSRP)".

[19] IETF RFC 3551 (2003): "RTP Profile for Audio and Video Conferences with Minimal Control".

[20] IETF RFC 4145 (2005): "TCP-Based Media Transport in the Session Description Protocol (SDP)".

[21] IETF RFC 3605 (2003): "Real Time Control Protocol (RTCP) attribute in Session Description Protocol (SDP)".

[22] ITU-T Recommendation X.690 (11/2008): "ASN.1 encoding rules: Specification of Basic Encoding Rules (BER), Canonical Encoding Rules (CER) and Distinguished Encoding Rules (DER)".

[23] 3GPP TS 23.334: "IMS Application Level Gateway (IMS-ALG) – IMS Access Gateway (IMS-AGW) interface: Procedures Descriptions".

[24] ITU-T Recommendation H.248.40 (01/2007): "Gateway control protocol: Application Data Inactivity Detection package".

[25] IETF RFC 4585 (2006): "Extended RTP Profile for Real-time Transport Control Protocol (RTCP) - Based Feedback (RTP/AVPF)".

[26] 3GPP TS 26.114: "IP Multimedia Subsystem (IMS); Multimedia telephony; Media handling and interaction".

[27] 3GPP TS 33.210: "Technical Specification Group Services and System Aspects;3G Security; Network Domain Security; IP Network Layer Security".

[28] IETF RFC 3556 (2003): "Session Description Protocol (SDP) Bandwidth Modifiers for RTP Control Protocol (RTCP) Bandwidth".

[29] IETF RFC 4568 (2006): "Session Description Protocol (SDP) Security Descriptions for Media Streams".

[30] IETF RFC 3711 (2004): "The Secure Real-time Transport Protocol (SRTP)".

[31] IETF RFC 5124 (2008): "Extended Secure RTP Profile for Real-time Transport Control Protocol (RTCP)-Based Feedback (RTP/SAVPF)".

[32] IETF RFC 2216 (1997): "Network Element Service Specification Template".

[33] Supplement 7 to ITU-T H-series Recommendations H.Sup7 (05/2008):" Gateway control protocol: Establishment procedures for the H.248 MGC-MG control association".

[34] 3GPP TS 33.328: "IMS Media Plane Security".

[35] Void

[36] Void

[37] Void

[38] 3GPP TS 23.237: "IP Multimedia subsystem (IMS) Service Continuity; Stage 2".

[39] 3GPP TS 22.153: "Multimedia Priority Service".

[40] ITU-T Recommendation H.248.82 (03/2013): "Gateway control protocol: Explicit Congestion Notification Support".

[41] IETF RFC 5285 (2008): "A General Mechanism for RTP Header Extensions".

[42] IETF RFC 6236: "Negotiation of Generic Image Attributes in the Session Description Protocol (SDP)".

[43] Draft ITU-T Recommendation H.248.50 (2015): "Gateway control protocol: NAT traversal toolkit packages".

Editor's Note: The above document cannot be formally referenced until it is published as an ITU-T Recommendation. The latest draft of revised H.248.50 is available from the following link: http://wftp3.itu.int/av-arch/avc-site/2013-2016/1411_Seo/TD-08.zip

[44] IETF RFC 5245: "Interactive Connectivity Establishment (ICE): A Protocol for Network Address Translator (NAT) Traversal for Offer/Answer Protocols".

[45] 3GPP TS 24.229: "IP Multimedia Call Control Protocol based on SIP and SDP".

[46] ITU-T Recommendation H.248.84 (07/2012): "Gateway control protocol: NAT traversal for peer-to-peer services".

[47] ITU-T Recommendation H.248.89 (10/2014): "Gateway control protocol: TCP support packages".

[48] ITU-T Recommendation H.248.90 (10/2014): "Gateway control protocol: ITU-T H.248 packages for control of transport security using transport layer security (TLS)".

[49] ITU-T Recommendation H.248.92 (10/2014): "Gateway control protocol: Stream endpoint interlinkage package".

[50] ITU-T Recommendation H.248.93 (10/2014): "Gateway control protocol: ITU-T H.248 support for control of transport security using the datagram transport layer security (DTLS) protocol".

[51] IETF RFC 793: "Transmission Control Protocol – DARPA Internet Program – Protocol Specification".

[52] IETF RFC 4582: "The Binary Floor Control Protocol (BFCP)".

[53] IETF RFC 5246: "The Transport Layer Security (TLS) Protocol Version 1.2".

[54] IETF draft-schwarz-mmusic-sdp-for-gw-04: "SDP codepoints for gateway control".

Editor's Note: The above document cannot be formally referenced until it is published as an RFC.

[55] IETF RFC 8122: "Connection-Oriented Media Transport over the Transport Layer Security (TLS) Protocol in the Session Description Protocol (SDP)".

[56] Draft ITU-T Recommendation H.248.78 (Ed. 0.9, 11/2014): "Gateway control protocol: Bearer-level message backhauling and application level gateway".

Editor's Note: The above document is currently under revision by ITU-T. The latest output draft of the revised ITU-T Recommendation H.248.78 is available from the following link: http://wftp3.itu.int/av-arch/avc-site/2013-2016/1411_Seo/TD-09.zip.

[57] IETF RFC 6714: "Connection Establishment for Media Anchoring (CEMA) for the Message Session Relay Protocol (MSRP)".

[58] IETF RFC 7675: "Session Traversal Utilities for NAT (STUN) Usage for Consent Freshness".

[59] IETF RFC 5761: "Multiplexing RTP Data and Control Packets on a Single Port".

[60] IETF RFC 5763: "Framework for Establishing a Secure Real-time Transport Protocol (SRTP) Security Context Using Datagram Transport Layer Security (DTLS)".

[61] IETF RFC 5764: "Datagram Transport Layer Security (DTLS) Extension to Establish Keys for the Secure Real-time Transport Protocol (SRTP)".

[62] IETF RFC 4573: "MIME Type Registration for RTP Payload Format for H.224".

[63] ITU-T Recommendation H.224 (01/2005): "A real time control protocol for simplex applications using the H.221 LSD/HSD/MLP channels".

[64] ITU-T Recommendation H.281 (11/1994): "A far end camera control protocol for videoconferences using H.224".

[65] ITU-T Recommendation H.248.96 (11/2015): "Gateway control protocol: H.248 support for control of SCTP bearer connections".

[66] ITU-T Recommendation H.248.97 (11/2015): "Gateway control protocol: H.248 support for control of SCTP bearer connections".

[67] ITU-T Recommendation H.248.94 (11/2015): "Gateway control protocol: Web-based real-time communication services – H.248 protocol support and profile guidelines".

[68] IETF draft-ietf-mmusic-sctp-sdp-26: "Session Description Protocol (SDP) Offer/Answer Procedures For Stream Control Transmission Protocol (SCTP) over Datagram Transport Layer Security (DTLS) Transport".

Editor's note: The above document cannot be formally referenced until it is published as an RFC.

[69] IETF draft-ietf-mmusic-data-channel-sdpneg-06: "SDP-based Data Channel Negotiation".

Editor's note: The above document cannot be formally referenced until it is published as an RFC.

[70] IETF draft-ietf-mmusic-msrp-usage-data-channel-13: "MSRP over Data Channels".

Editor's note: The above document cannot be formally referenced until it is published as an RFC.

[71] ITU-T Recommendation H.248.88 (01/2014): "Gateway control protocol: RTP topology dependent RTCP handling by ITU-T H.248 media gateways with IP terminations".

[72] IETF RFC 5939: "Session Description Protocol (SDP) Capability Negotiation".

[73] ITU-T Recommendation H.248.80 (01/2014): "Gateway control protocol: Usage of the revised SDP offer/answer model with ITU-T H.248".

3 Definitions, symbols and abbreviations

3.1 Definitions

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

Address: term used for "network address" (IP address)

End-to-access edge security: media protection extending between an IMS UE and the first IMS core network node in the media path without being terminated by any intermediary node.

Port: term used for "transport port" (L4 port).

Transcoding: transcoding in general is the translation from one type of encoded media format to another different media format, e.g. G.711 A-law to μ-law or vice versa, G.729 to AMR with 4.75 rate.

NOTE 1: The definition of "transcoding" is according clause 3.10 of ITU-T Recommendation V.152 [23].

NOTE 2: Transcoding belongs to the category of "media aware" IP-to-IP interworking.

Transparent Forwarding: media gateway packet forwarding behaviour with the characteristic of Lx-PDU integrity. This is a unidirectional characteristic of an Lx-PDU flow.

NOTE 3: The definition is according clause 3.2.10 of ITU-T Recommendation H.248.88 [71].

NOTE 4: The semantic covers both traffic directions when applied on H.248 Streams (due to their inherent characteristic of bidirectionality).

Transport Address: term used for the combination of a *Network Address* and a *Transport Port.*

For the purposes of the present document, the following terms and definitions as defined in 3GPP TS 23.334 [23] apply:

ICE lite

Full ICE.

3.2 Symbols

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

Iq Interface between the IMS Application Level Gateway (ALG) (IMS-ALG) and the IMS Access Gateway (IMS-AGW)

3.3 Abbreviations

For the purposes of the present document, the abbreviations defined in 3GPP TR 21.905 [1] apply, with the following additions. An abbreviation defined in the present document takes precedence over the definition of the same abbreviation, if any, in 3GPP TR 21.905 [1].

ABNF	Augmented Backus-Naur Form
ATCF	Access Transfer Control Function
ATGW	Access Transfer Gateway
B-ALG	Bearer Level Application-Level Gateway
BFCP	Binary Floor Control Protocol
CVO	Coordination of Video Orientation
DSCP	Differentiated Service Code Point
e2ae	End-to-Access-Edge (security model)
ECN	Explicit Congestion Notification
eIMS-AGW	IMS Access Gateway enhanced for WebRTC
eP-CSCF	P-CSCF enhanced for WebRTC
FECC	Far End Camera Control
ICE	Interactive Connectivity Establishment
IMS-AGW	IMS Access Gateway
IMS-ALG	IMS Application Level Gateway
IP	Internet Protocol
LD	Local Descriptor (H.248 protocol element)
MG	Media Gateway
MGC	Media Gateway Controller
MPS	Multimedia Priority Service