

ETSI TS 123 334 V12.10.0 (2016-04)



**Digital cellular telecommunications system (Phase 2+) (GSM);
Universal Mobile Telecommunications System (UMTS);
LTE;
IP Multimedia Subsystem (IMS)
Application Level Gateway (IMS-ALG)
- IMS Access Gateway (IMS-AGW) interface:
Procedures descriptions
(3GPP TS 23.334 version 12.10.0 Release 12)**



Reference

RTS/TSGC-0423334vca0

Keywords

GSM,LTE,UMTS

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

The present document can be downloaded from:
<http://www.etsi.org/standards-search>

The present document may be made available in electronic versions and/or in print. The content of any electronic and/or print versions of the present document shall not be modified without the prior written authorization of ETSI. In case of any existing or perceived difference in contents between such versions and/or in print, the only prevailing document is the print of the Portable Document Format (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:
<https://portal.etsi.org/People/CommiteeSupportStaff.aspx>

Copyright Notification

No part may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm except as authorized by written permission of ETSI.

The content of the PDF version shall not be modified without the written authorization of ETSI.
The copyright and the foregoing restriction extend to reproduction in all media.

© European Telecommunications Standards Institute 2016.
All rights reserved.

DECT™, **PLUGTESTS™**, **UMTS™** and the ETSI logo are Trade Marks of ETSI registered for the benefit of its Members.
3GPP™ and **LTE™** are Trade Marks of ETSI registered for the benefit of its Members and of the 3GPP Organizational Partners.
GSM® and the GSM logo are Trade Marks registered and owned by the GSM Association.

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 (<https://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 3rd Generation Partnership Project (3GPP).

The present document may refer to technical specifications or reports using their 3GPP identities, UMTS identities or GSM identities. These should be interpreted as being references to the corresponding ETSI deliverables.

The cross reference between GSM, UMTS, 3GPP and ETSI identities can be found under <http://webapp.etsi.org/key/queryform.asp>.

Modal verbs terminology

In the present document "**shall**", "**shall not**", "**should**", "**should not**", "**may**", "**need not**", "**will**", "**will not**", "**can**" and "**cannot**" are to be interpreted as described in clause 3.2 of the [ETSI Drafting Rules](#) (Verbal forms for the expression of provisions).

"**must**" and "**must not**" are **NOT** allowed in ETSI deliverables except when used in direct citation.

Contents

Intellectual Property Rights	2
Foreword.....	2
Modal verbs terminology.....	2
1 Scope	8
2 References	8
3 Definitions, symbols and abbreviations	11
3.1 Definitions	11
3.2 Symbols.....	12
3.3 Abbreviations	12
4 Architecture.....	12
4.1 Reference architecture	12
4.2 NAT Function	14
4.3 ATCF/ATGW Function	15
5 Functional Requirements.....	16
5.1 General	16
5.2 Gate Control & Local NAT	16
5.3 IP realm indication and availability.....	16
5.4 Remote NAT traversal support.....	17
5.5 Remote Source Address/Port Filtering	17
5.6 Traffic Policing	17
5.7 Hanging Termination Detection	17
5.8 QoS Packet Marking	18
5.9 Handling of RTCP streams.....	18
5.10 Media Inactivity Detection.....	19
5.11 IMS Media Plane Security	19
5.11.1 General.....	19
5.11.2 End-to-access-edge Security	19
5.11.2.1 End-to-access-edge security for RTP based media using SDES	19
5.11.2.2 End-to-access-edge security for TCP based media using TLS.....	20
5.11.2.2.1 General	20
5.11.2.2.2 e2ae security for session based messaging (MSRP).....	22
5.11.2.2.3 e2ae security for conferencing (BFCP)	22
5.11.2.3 End-to-access-edge security for UDP based media using DTLS	22
5.11.2.3.1 General	22
5.11.2.3.2 e2ae security for T.38 fax over UDP/UDPTL transport	23
5.11.2.4 End-to-access-edge security for RTP based media using DTLS-SRTP	24
5.11.2.5 End-to-access-edge security for RTP based voice and video media using DTLS-SRTP over TCP.....	24
5.11.3 End-to-end Security	25
5.11.3.1 End-to-end security for RTP based media	25
5.11.3.2 End-to-end security for TCP-based media using TLS	25
5.12 Explicit Congestion Notification support	25
5.12.1 General.....	25
5.12.2 Incoming SDP offer with ECN.....	26
5.12.3 Incoming SDP offer without ECN.....	26
5.12.4 Detection of ECN failures by IMS-AGW	26
5.13 Transcoding.....	26
5.13.1 General.....	26
5.13.2 Handling of common codec parameters.....	27
5.13.3 Handling of the EVS speech codec.....	28
5.13.4 Handling of the OPUS speech and audio codec for WebRTC.....	40
5.14 Multimedia Priority Service (MPS) Support	43
5.15 Coordination of Video Orientation.....	44
5.16 Generic image attributes.....	45

5.17	TCP bearer connection control	45
5.17.1	Stateless TCP handling	45
5.17.2	State-aware TCP handling	46
5.17.2.1	General	46
5.17.2.2	State-aware TCP handling without support of modifying the TCP setup direction	46
5.17.2.3	State-aware TCP handling with support of modifying the TCP setup direction	47
5.18	Interactive Connectivity Establishment (ICE)	49
5.18.1	General	49
5.18.2	ICE lite	49
5.18.3	Full ICE	51
5.18.4	STUN consent freshness for WebRTC	53
5.19	MSRP handling	53
5.19.1	General	53
5.19.2	IMS-ALG procedures to support IETF RFC 6714 with application agnostic MSRP handling by the IMS-AGW	54
5.19.3	IMS-ALG procedures to support IETF draft-ietf-simple-msrp-sessmatch with application agnostic MSRP handling by the IMS-AGW	54
5.19.4	IMS-ALG procedures for application aware MSRP interworking by the IMS-AGW	55
5.19.5	Application-aware MSRP interworking at the IMS-AGW	55
5.20	Web Real Time Communication (WebRTC)	55
5.20.1	General	55
5.21	Alternate Connection (ALTC) Addresses Management	56
5.21.1	General	56
6	IMS-ALG to IMS-AGW Procedures	56
6.1	Non-Call Related Procedures	56
6.1.1	General	56
6.1.2	IMS-AGW Unavailable	56
6.1.3	IMS-AGW Available	57
6.1.4	IMS-AGW Recovery	58
6.1.5	IMS-ALG Recovery	59
6.1.5.1	General	59
6.1.5.2	IMS-ALG Restoration	59
6.1.6	IMS-AGW Re-register	59
6.1.7	IMS-AGW Re-registration Ordered by IMS-ALG	60
6.1.8	Audit of IMS-AGW	60
6.1.8.1	Audit of Value	60
6.1.8.2	Audit of Capability	61
6.1.9	IMS-AGW Capability Change	61
6.1.10	IMS-ALG Out of service	61
6.1.11	IMS-AGW Resource Congestion Handling - Activate	62
6.1.12	MGW Resource Congestion Handling - Indication	62
6.1.13	Control association monitoring	62
6.1.14	Realm Availability Monitoring	63
6.1.15	Failure of IP Port, Interface or Group of Interfaces	64
6.2	Call Related Procedures	64
6.2.1	Gate Control & Local NA(P)T procedure	64
6.2.2	IP realm indication procedure	67
6.2.3	Remote NA(P)T traversal support procedure	67
6.2.4	Remote Source Address/Port Filtering	67
6.2.5	Traffic Policing	68
6.2.6	Hanging Termination Detection	68
6.2.7	QoS Packet Marking	69
6.2.8	Media Inactivity Detection	69
6.2.9	Handling of RTCP streams	69
6.2.10	IMS end-to-access-edge Media Plane Security	70
6.2.10.1	General	70
6.2.10.2	End-to-access-edge security for RTP based media using SDES	70
6.2.10.3	End-to-access-edge security for TCP-based media using TLS	70
6.2.10.3.1	End-to-access-edge security for session based messaging (MSRP)	70
6.2.10.3.1.1	IMS UE originating procedures for e2ae	70
6.2.10.3.1.1.1	Incoming TCP bearer establishment triggers an outgoing TCP bearer establishment	70

6.2.10.3.1.1.2	IMS-ALG requests sending an outgoing TCP bearer establishment	73
6.2.10.3.1.2	IMS UE terminating procedures for e2ae	75
6.2.10.3.1.2.1	Incoming TCP bearer establishment triggers an outgoing TCP bearer establishment	75
6.2.10.3.1.2.2	IMS-ALG requests sending an outgoing TCP bearer establishment	78
6.2.10.3.2	End-to-access-edge security for conferencing (BFCP).....	80
6.2.10.3.2.1	IMS UE originating procedures for e2ae	80
6.2.10.3.2.1.1	Incoming TCP bearer establishment triggers an outgoing TCP bearer establishment	80
6.2.10.3.2.2	IMS UE terminating procedures for e2ae	83
6.2.10.3.2.2.1	Incoming TCP bearer establishment triggers an outgoing TCP bearer establishment	83
6.2.10.4	End-to-access-edge security for UDP based media using DTLS	86
6.2.10.4.1	General	86
6.2.10.4.2	Session establishment from IMS access network for T.38 fax using "UDP/TLS/UDPTL"	86
6.2.10.4.3	Session establishment towards IMS access network for T.38 fax using "UDP/TLS/UDPTL"	88
6.2.10.4.4	IMS-AGW procedure for e2ae security of T.38 fax using "UDP/TLS/UDPTL"	90
6.2.10.4.5	DTLS session establishment failure indication	91
6.2.10.5	End-to-access-edge security for RTP based media using DTLS-SRTP	91
6.2.10A	IMS end-to-end Media Plane Security.....	96
6.2.10A.1	End-to-end security for RTP based media using SDES	96
6.2.10A.2	End-to-end security for TCP-based media using TLS	96
6.2.11	Change Through-Connection.....	96
6.2.12	Emergency Calls.....	96
6.2.13	Explicit Congestion Notification support	96
6.2.13.1	General	96
6.2.13.2	ECN Active Indicated (ECN transparent).....	96
6.2.13.3	ECN support requested (ECN endpoint)	97
6.2.13.4	ECN Failure Indication (ECN endpoint).....	97
6.2.14	Access Transfer procedures with media anchored in IMS-AGW (ATGW)	98
6.2.14.1	General	98
6.2.14.2	H.248 context model	98
6.2.14.3	PS session origination or termination with media anchoring in IMS-AGW (ATGW) signaling procedures	100
6.2.14.4	PS to CS Access Transfer procedure with media anchored in IMS-AGW (ATGW).....	102
6.2.14.5	ECN support during PS to CS Access Transfer procedure with media anchored in IMS-AGW (ATGW).....	103
6.2.14.6	Support of generic image attributes	104
6.2.14.6.1	General	104
6.2.14.6.2	Indication of generic image attributes	105
6.2.14.7	Handling of common codec parameters.....	105
6.2.14.8	EVS speech codec support	106
6.2.15	Multimedia Priority Congestion Control Procedures.....	118
6.2.15.1	General	118
6.2.15.2	IMS-AGW Resource Congestion in ADD response, request is queued.....	118
6.2.15.3	IMS-AGW Resource Congestion in ADD response, IMS-ALG seizes new IMS-AGW	119
6.2.15.4	IMS-AGW Priority Resource Allocation	119
6.2.15.5	IMS-AGW Priority User Data marking	120
6.2.15.6	IMS-AGW Priority Modification.....	120
6.2.16	Coordination of Video Orientation	121
6.2.17	Procedures for Interactive Connectivity Establishment (ICE)	122
6.2.17.1	ICE lite	122
6.2.17.2	Full ICE.....	122
6.2.17.3	Connectivity check result notification (full ICE)	123
6.2.17.4	New peer reflexive candidate notification (full ICE)	123
6.2.17.5	STUN consent freshness test.....	124
6.2.17.6	STUN Consent Freshness Test Failure Notification	125
6.2.18	TCP bearer connection control	125
6.2.18.1	General	125
6.2.18.2	Stateless TCP handling	125
6.2.18.3	State-aware TCP handling without support of modifying the TCP setup direction	125
6.2.18.4	State-aware TCP handling with support of modifying the TCP setup direction	125
6.2.19	Application-aware MSRP interworking at the IMS-AGW	127
6.2.20	Alternate Connection (ALTC) Addresses Management	128

7	Charging	130
8	Messages/Procedures and Contents.....	130
8.1	General	130
8.2	Reserve and Configure AGW Connection Point	131
8.3	Reserve AGW Connection Point Procedure.....	137
8.4	Configure AGW Connection Point Procedure	141
8.5	Release AGW Termination	146
8.6	Termination heartbeat indication.....	146
8.7	IMS-AGW Out-of-Service	147
8.8	IMS-AGW Communication Up	147
8.9	IMS-AGW Restoration.....	148
8.10	IMS-AGW Register.....	148
8.11	IMS-ALG Restoration	149
8.12	IMS-AGW Re-register	149
8.13	IMS-ALG Ordered Re-registration	150
8.14	Audit Value	150
8.15	Audit Capability	151
8.16	Capability Update.....	151
8.17	IMS-ALG Out of Service	152
8.18	IMS-AGW Resource Congestion Handling - Activate.....	152
8.19	IMS-AGW Resource Congestion Handling - Indication.....	153
8.20	Inactivity Timeout Activate.....	153
8.21	Inactivity Timeout Notification.....	154
8.22	Command Reject.....	154
8.23	Realm Availability Activate	155
8.24	Realm Availability Notification	155
8.25	IP Bearer Released	156
8.26	Media Inactivity Notification	156
8.27	Termination Out-of-Service	157
8.28	Change Through-Connection	157
8.29	Change Flow Direction	158
8.30	ECN Failure Indication	158
8.31	Notify (D)TLS session establishment Failure Indication	159
8.32	Notify TCP connection establishment Failure Indication.....	159
8.33	ICE Connectivity Check Result Notification	160
8.34	ICE New Peer Reflexive Candidate Notification	160
8.35	STUN Consent Freshness Test Failure Notification	161
	Annex A (informative): Change history	162
	History	164

Foreword

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

The contents of the present document are subject to continuing work within the TSG and may change following formal TSG approval. Should the TSG modify the contents of the present document, it will be re-released by the TSG with an identifying change of release date and an increase in version number as follows:

Version x.y.z

where:

- x the first digit:
 - 1 presented to TSG for information;
 - 2 presented to TSG for approval;
 - 3 or greater indicates TSG approved document under change control.
- y the second digit is incremented for all changes of substance, i.e. technical enhancements, corrections, updates, etc.
- z the third digit is incremented when editorial only changes have been incorporated in the document.

1 Scope

Annex G of 3GPP TS 23.228 [2] gives out an IMS Application Level Gateway (IMS-ALG) and IMS Access Media Gateway (IMS-AGW) based reference model to support NAPT-PT, gate control and traffic policing between IP-CAN and IMS domain.

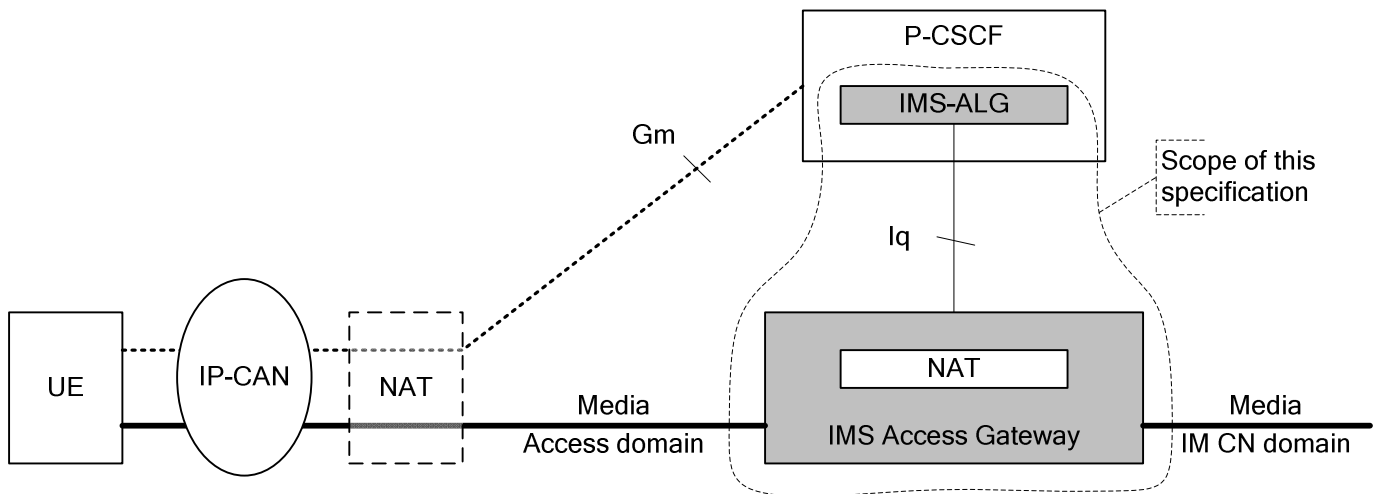


Figure 1.1: Scope of the specification

Figure 1.1 illustrates the reference model for Iq:

- the dashed line represents the IP signalling-path with SIP (at Gm) as call/session control protocol between the UE and the P-CSCF (IMS-ALG);
- the bold, horizontal line represents the IP media-path (also known as (IP) bearer-path or (IP) data-path; the notion 'media' is used as generic term for "IP application data"); and
- the vertical line represents the Iq control-path with H.248 as gateway/policy control protocol between the IMS-ALG and the IMS-AGW (H.248 messages are transported over IP).

The Iq reference point is between the P-CSCF (IMS-ALG) and the IMS-AGW. It conveys the necessary information that is needed to allocate, modify and release (IP) transport addresses.

The present document defines the stage 2 description for the Iq reference point. The stage 2 shall cover the information flow between the P-CSCF (IMS-ALG) and IMS-AGW. The protocol used over the Iq interface is the gateway control protocol according ITU-T Recommendation H.248 (which is specified for Iq by an H.248 profile according 3GPP TS 29.334 [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, 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".