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Technical Specification

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Contents

Foreword

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1 Scope

The objective of this document is to address the Inter-IMS Network to Network Interface (II-NNI) consisting of Ici and Izi reference points between IMS networks in order to support end-to-end service interoperability.

The present document will address the issues related to control plane signalling (3GPP usage of SIP and SDP protocols, required SIP header fields) as well as other interconnecting aspects like security, numbering/naming/addressing and user plane issues as transport protocol, media and codecs actually covered in a widespread set of 3GPP specifications. A profiling of the Inter-IMS Network to Network Interface (II-NNI) is also provided.

Charging aspects will be addressed as far as SIP signalling is concerned.

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]   IETF RFC 791: "Internet Protocol".

[3]   3GPP TS 23.002: "Network architecture".

[4]   3GPP TS 23.228: "IP Multimedia Subsystem (IMS); Stage 2".

[5]   3GPP TS 24.229: "Internet Protocol (IP) multimedia call control protocol based on Session Initiation Protocol (SIP) and Session Description Protocol (SDP); Stage 3".

[6]   3GPP TR 24.930: "Signalling flows for the session setup in the IP Multimedia core network Subsystem (IMS) based on Session Initiation Protocol (SIP) and Session Description Protocol (SDP); Stage 3".

[7]   IETF RFC 2460: "Internet Protocol, Version 6 (IPv6) Specification".

[8]   3GPP TS 29.162: "Interworking between the IM CN subsystem and IP networks".

[9]   3GPP TS 22.228: "Service requirements for the IP multimedia core network subsystem".

[10]   3GPP TS 33.210: "3G security; Network Domain Security (NDS); IP network layer security".

[11]   3GPP TS 26.114: "IP Multimedia Subsystem (IMS); Multimedia Telephony; Media handling and interaction".

[12]   ETSI TS 181 005 1.1.1: "Telecommunications and Internet converged Services and Protocols for Advanced Networking (TISPAN); Services and Capabilities Requirements".

[13]   IETF RFC 3261: "SIP: Session Initiation Protocol".

[14]   IETF RFC 3966: "The tel URI for Telephone Numbers".

[15]   IETF RFC 3860: "Common Profile for Instant Messaging (CPIM)".

[16]   IETF RFC 3859: "Common Profile for Presence (CPP)".

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

[18]   IETF RFC 3262: "Reliability of provisional responses in Session Initiation Protocol (SIP)".

[19]   IETF RFC 3428: "Session Initiation Protocol (SIP) Extension for Instant Messaging".

[20]   IETF RFC 3265: "Session Initiation Protocol (SIP) Specific Event Notification".

[21]   IETF RFC 3903: "An Event State Publication Extension to the Session Initiation Protocol (SIP)".

[22]   IETF RFC 3515: "The Session Initiation Protocol (SIP) REFER method".

[23]   IETF RFC 3311: "The Session Initiation Protocol (SIP) UPDATE method".

[24]   IETF RFC 3455: "Private Header (P-Header) Extensions to the Session Initiation Protocol (SIP) for the 3rd-Generation Partnership Project (3GPP)".

[25]   IETF RFC 4244: "An Extension to the Session Initiation Protocol (SIP) for Request History Information".

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[28]   IETF RFC 2976: "The SIP INFO Method".

[29]   3GPP TS 32.260: "Telecommunication management; Charging management; IP Multimedia Subsystem (IMS) charging".

[30]   3GPP TS 22.173: "IP Multimedia Core Network Subsystem (IMS); Multimedia Telephony Service and supplementary services; Stage 1".

[31]   3GPP TS 24.173: "IMS multimedia telephony communication service and supplementary services; Stage 3".

[32]   3GPP TS 24.607: "Originating Identification Presentation (OIP) and Originating Identification Restriction (OIR) using IP Multimedia (IM); Core Network (CN) subsystem".

[33]   3GPP TS 24.616: "Malicious Communication Identification (MCID) using IP Multimedia (IM) Core Network (CN) subsystem".

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[35]   3GPP TS 23.003: "Numbering, addressing and identification".

[36]   3GPP TS 24.610: "Communication HOLD (HOLD) using IP Multimedia (IM) Core Network (CN) subsystem".

[37]   3GPP TS 24.615: "Communication Waiting (CW) using IP Multimedia (IM) Core Network (CN) subsystem".

[38]   3GPP TS 24.628: "Common Basic Communication procedures using IP Multimedia (IM) Core Network (CN) subsystem".

[39]   IETF RFC 6086: "Session Initiation Protocol (SIP) INFO Method and Package Framework".

[40]   IETF RFC 3312: "Integration of resource management and Session Initiation Protocol (SIP)".

[41]   IETF RFC 4032: "Update to the Session Initiation Protocol (SIP) Preconditions Framework".

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[44]   IETF RFC 3325: "Private Extensions to the Session Initiation Protocol (SIP) for Network Asserted Identity within Trusted Networks".

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[46]   IETF RFC 3486: "Compressing the Session Initiation Protocol (SIP)".

[47]   IETF RFC 3329: "Security Mechanism Agreement for the Session Initiation Protocol (SIP)".

[48]   IETF RFC 3326: "The Reason Header Field for the Session Initiation Protocol (SIP)".

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[51]   IETF RFC 3841: "Caller Preferences for the Session Initiation Protocol (SIP)".

[52]   IETF RFC 4028: "Session Timers in the Session Initiation Protocol (SIP)".

[53]   IETF RFC 3892: "The Session Initiation Protocol (SIP) Referred-By Mechanism".

[54]   IETF RFC 3891: "The Session Inititation Protocol (SIP) 'Replaces' Header".

[55]   IETF RFC 3911: "The Session Inititation Protocol (SIP) 'Join' Header".

[56]   IETF RFC 3840: "Indicating User Agent Capabilities in the Session Initiation Protocol (SIP)".

[57]   IETF RFC 5079: "Rejecting Anonymous Requests in the Session Initiation Protocol (SIP)".

[58]   IETF RFC 4458: "Session Initiation Protocol (SIP) URIs for Applications such as Voicemail and Interactive Voice Response (IVR)".

[59]   IETF RFC 4320: "Actions Addressing Identified Issues with the Session Initiation Protocol's (SIP) Non-INVITE Transaction".

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[61]   IETF RFC 5031: "A Uniform Resource Name (URN) for Services".

[62]   IETF RFC 5627: "Obtaining and Using Globally Routable User Agent (UA) URIs (GRUU) in the Session Initiation Protocol (SIP)".

[63]   Void

[64]   IETF RFC 5002: "The Session Initiation Protocol (SIP) P-Profile-Key Private Header (P-Header)".

[65]   IETF RFC 5626: "Managing Client-Initiated Connections in the Session Initiation Protocol (SIP)".

[66]   IETF 5768: "Indicating Support for Interactive Connectivity Establishment (ICE) in the Session Initiation Protocol (SIP)".

[67]   IETF RFC 5365: "Multiple-Recipient MESSAGE Requests in the Session Initiation Protocol (SIP)".

[68]   draft-ietf-sipcore-location-conveyance-04 (January 2011): "Location Conveyance for the Session Initiation Protocol".

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[69]   IETF RFC 5368: "Referring to Multiple Resources in the Session Initiation Protocol (SIP)".

[70]   IETF RFC 5366: "Conference Establishment Using Request-Contained Lists in the Session Initiation Protocol (SIP)".

[71]   IETF RFC 5367: "Subscriptions to Request-Contained Resource Lists in the Session Initiation Protocol (SIP)".

[72]   IETF RFC 4967: "Dial String Parameter for the Session Initiation Protocol Uniform Resource Identifier".

[73]   IETF RFC 4964: "The P-Answer-State Header Extension to the Session Initiation Protocol for the Open Mobile Alliance Push to Talk over Cellular".

[74]   IETF RFC 5009: "Private Header (P-Header) Extension to the Session Initiation Protocol (SIP) for Authorization of Early Media".

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[78]   IETF RFC 4412: "Communications Resource Priority for the Session Initiation Protocol (SIP)".

[79]   IETF RFC 5393: "Addressing an Amplification Vulnerability in Session Initiation Protocol (SIP) Forking Proxies".

[80]   IETF RFC 5049: "Applying Signaling Compression (SigComp) to the Session Initiation Protocol (SIP)".

[81]   IETF RFC 5688: "A Session Initiation Protocol (SIP) Media Feature Tag for MIME Application Sub-Types".

[82]   IETF RFC 5360: "A Framework for Consent-Based Communications in the Session Initiation Protocol (SIP)".

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[84]   draft-vanelburg-dispatch-private-network-ind-01 (June 2010): "The Session Initiation Protocol (SIP) P-Private-Network-Indication Private-Header (P-Header)".

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

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[87]   draft-dawes-sipping-debug-04 (February 2011): "Private Extension to the Session Initiation Protocol (SIP) for Debugging".

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[99]   3GPP TS 24.259: "Personal Network Management (PNM) using IP Multimedia (IM) Core Network (CN) subsystem".

[100]   3GPP TS 24.238: "Session Initiation Protocol (SIP) based user configuration".

[101]   3GPP TS 24.239: "Flexible Alerting (FA) using IP Multimedia (IM) Core Network (CN) subsystem".

[102]   Void.

[103]   3GPP TS 24.654: "Closed User Group (CUG) using IP Multimedia (IM) Core Network (CN) subsystem".

[104]   Void.

[105]   3GPP TS 24.605: "Conference (CONF) using IP Multimedia (IM) Core Network (CN) subsystem".

[106]   3GPP TS 24.147: "Conferencing using the IP Multimedia (IM) Core Network (CN) subsystem".

[107]   3GPP TS 24.611: "Anonymous Communication Rejection (ACR) using IP Multimedia (IM); Core Network (CN) subsystem".

[108]   Void.

[109]   3GPP TS 24.642: "Completion of Communications to Busy Subscriber (CCBS) Completion of Communications by No Reply (CCNR) using IP Multimedia (IM) Core Network (CN) subsystem".

[110]   3GPP TS 24.628: "Common Basic Communication procedures using IP Multimedia (IM) Core Network (CN) subsystem".

[111]   Void.

[112]   3GPP TS 24.606: "Message Waiting Indication (MWI) using IP Multimedia (IM) Core Network (CN) subsystem".

[113]   3GPP TS 24.608: "Terminating Identification Presentation (TIP) and Terminating Identification Restriction (TIR) using IP Multimedia (IM); Core Network (CN) subsystem".

[114]   3GPP TS 24.611: "Communication Barring (CB) using IP Multimedia (IM); Core Network (CN) subsystem".

[115]   Void.

[116]   3GPP TS 24.629: "Explicit Communication Transfer (ECT) using IP Multimedia (IM) Core Network (CN) subsystem".

[117]   3GPP TS 24.604: "Communication DIVersion (CDIV) using IP Multimedia (IM) Core Network (CN) subsystem".

[118]   IETF RFC 4458: "Session Initiation Protocol (SIP) URIs for Applications such as Voicemail and Interactive Voice Response (IVR)".

[119]   Void.

[120]   3GPP TS 23.292: "IP Multimedia Subsystem (IMS) Centralized Services; Stage 2".

[121]   3GPP TS 24.292: "IP Multimedia Core Network subsystem Centralized Services (ICS); Stage 3".

[122]   3GPP TS 24.647: "Advice Of Charge (AOC) using IP Multimedia (IM) Core Network (CN) subsystem".

[123]   Void.

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[127]   IETF RFC 5954: "Essential correction for IPv6 ABNF and URI comparison in RFC3261".

[128]   Void.

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[130]   3GPP TS 29.292: "Interworking between the IP Multimedia (IM) Core Network (CN) subsystem and MSC Server for IMS Centralized Services (ICS)".

[131]   3GPP TS 24.237: "IP Multimedia (IM) Core Network (CN) subsystem; IP Multimedia Subsystem (IMS) Service Continuity".

[132]   3GPP TS 24.141: "Presence service using the IP Multimedia (IM) Core Network (CN) subsystem".

[133]   draft-ietf-sip-session-policy-framework-09 (February 2011): "A Framework for Session Initiation Protocol (SIP) Session Policies".

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

[134]   IETF RFC 5875: "An Extensible Markup Language (XML) Configuration Access Protocol (XCAP) Diff Event Package".

[135]   IETF RFC 4488: "Suppression of Session Initiation Protocol (SIP) REFER Method Implicit Subscription".

[136]   draft-liess-dispatch-alert-info-urns-03 (October 2010): "Alert-Info header URNs for Session Initiation Protocol (SIP)".

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[141]   IETF RFC 5318: "The Session Initiation Protocol (SIP) P-Refused-URI-List Private-Header (P-Header)".

[142]   OMA-TS-Presence_SIMPLE-V1_1-20100225 "Presence SIMPLE Specification".

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[145]   draft-ietf-sip-session-policy-framework-08 (February 2010) "A Framework for Session Initiation Protocol (SIP) Session Policies".

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

[146]   IETF RFC 3264: "An Offer/Answer Model with the Session Description Protocol (SDP)".

[147]   IETF RFC 4566: "SDP: Session Description Protocol".

[148]   3GPP TS 29.079: "Optimal Media Routeing within the IP Multimedia Subsystem; Stage 3".

3   Definitions, symbols and abbreviations

3.1   Definitions

For the purposes of the present document, the terms and definitions given in 3GPP TR 21.905 [1] and the following apply. A term defined in the present document takes precedence over the definition of the same term, if any, in 3GPP TR 21.905 [1].

example: text used to clarify abstract rules by applying them literally.

IM CN subsystem: (IP Multimedia CN subsystem) comprises of all CN elements for the provision of IP multimedia applications over IP multimedia sessions, as specified in 3GPP TS 22.228 [9].

IP multimedia session: as specified in 3GPP TS 22.228 [9] an IP multimedia session is a set of multimedia senders and receivers and the data streams flowing from senders to receivers. IP multimedia sessions are supported by the IP multimedia CN Subsystem and are enabled by IP connectivity bearers (e.g. GPRS as a bearer). A user can invoke concurrent IP multimedia sessions.

non-roaming II-NNI: the II-NNI between IMS home networks.

roaming II-NNI: the II-NNI between a visited IMS network and the IMS home network.

For the purposes of the present document, the following terms and definitions given in 3GPP TS 23.292 [120] apply:

        MSC Server enhanced for ICS

3.2   Symbols

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

I2   Reference point between the MSC Server enhanced for ICS and the home IMS
Ici   Reference Point between an IBCF and another IBCF belonging to a different IM CN subsystem network

Izi	Reference Point between a TrGW and another TrGW or media handling node belonging to a different IM CN subsystem network
Mi	Reference Point between a BGCF and CSCF
Mm	Reference Point between a CSCF/BGCF/IMS ALG and an IP multimedia network.
Mw	Reference Point between a CSCF and another CSCF
Mx	Reference Point between a CSCF/BGCF/MSC Server enhanced for ICS and IBCF

3.3 Abbreviations

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

ACR	Anonymous Communication Rejection
ATCF	Access Transfer Control Function
B2BUA	Back 2 Back User Agent
BGCF	Breakout Gateway Control Function
CAT	Customized Alerting Tone
CB	Communication Barring
CCBS	Completion of Communications to Busy Subscriber
CCNR	Communication Completion on No Reply
CDIV	Communication Diversion
CDIVN	Communication Diversion Notification
CRS	Customized Ringing Signal
ECT	Explicit Communication Transfer
FA	Flexible Alerting
HOLD	Communication HOLD
CW	Communication Waiting
IBCF	Interconnection Border Control Function
ICB	Incoming Communication Barring
ICS	IMS Centralized Services
I-CSCF	Interrogating CSCF
II-NNI	Inter-IMS Network to Network Interface
IM	Instant Messaging
IMS-ALG	IMS Application Level Gateway
MCID	Malicious Communication IDentification
MRFC	Media Resource Function Controller
MSRP	Message Session Relay Protocol
MWI	Message Waiting Indication
NA(P)T-PT	Network Address (Port-Multiplexing) Translation-Protocol Translation
NNI	Network to Network Interface
OCB	Outgoing Communication Barring
OIP	Originating Identification Presentation
OIR	Originating Identification Restriction
OMA	Open Mobile Alliance
OMR	Optimal Media Routeing
P-CSCF	Proxy CSCF
PNM	Personal Network Management
PRES	Presence
TIP	Terminating Identification Presentation
TIR	Terminating Identification Restriction
TrGW	Transition Gateway
SRVCC	Single Radio Voice Call Continuity
IUT	Inter UE Transfer

4 Overview

Interconnection between two different IM CN subsystems shall be guaranteed in order to support end-to-end service interoperability. For this purpose, Inter-IMS Network to Network Interface (II-NNI) between two IM CN subsystem networks is adopted, according to the assumptions coming from 3GPP TS 23.002 [3] and 3GPP TS 23.228 [4].

NOTE: The end-to-end service interoperability within one IM CN subsystem over the Mi, Mm, Mw and I2 reference points not passing over the Mx reference point as defined in 3GPP TS 23.228 [4] is outside the scope of this document.

Aiming to support the delivery of IMS services between two separated IM CN subsystems, protocol interconnection has to occur:

- at a control plane level, in order that IMS procedures can be supported. In this case the adopted reference point is the Ici; and

- at a user plane level, where media streams are exchanged over the Izi reference point.

IP multimedia sessions are managed by SIP. The transport mechanism for both SIP session signalling and media transport is IPv4 (IETF RFC 791 [2]) or IPv6 (IETF RFC 2460 [7]). The 3GPP profile of SIP defining the usage of SIP within the IM CN subsystem is specified in 3GPP TS 24.229 [5]. Example call flows are provided in 3GPP TR 24.930 [6].

The general interconnection model is shown in Figure 4.1.
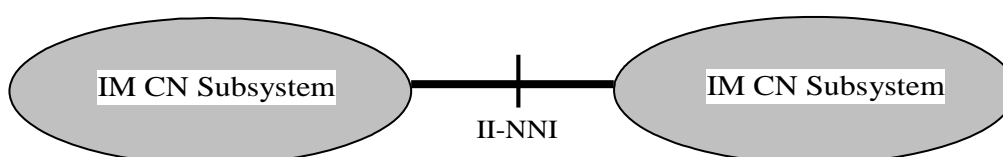
Figure 4.1: Interconnection Model for IM CN subsystems

The possible functional entities involved in the signalling plane interconnection (IBCF, I-CSCF, P-CSCF, ATCF, S-CSCF, BGCF and MSC Server enhanced for ICS) and in the user plane interconnection (TrGW) are specified in 3GPP TS 24.229 [5], in 3GPP TS 24.292 [121], 3GPP TS 29.292 [130] and in 3GPP TS 29.162 [8].

IP Version interworking is described within 3GPP TS 29.162 [8].

5 Reference model for interconnection between IM CN subsystems

5.1 General

Figure 5.1 illustrates the architecture diagram given in 3GPP TS 23.228 [4] showing the Inter-IMS Network to Network Interface (II-NNI) between two IM CN subsystem networks.
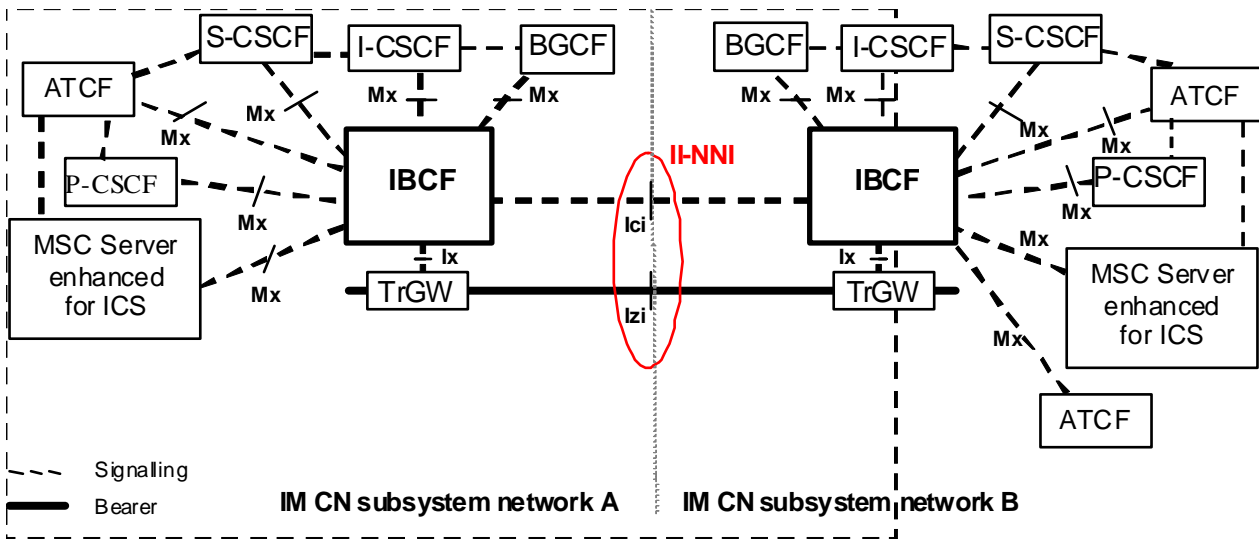
Figure 5.1.1: Inter-IMS Network to Network Interface between two IM CN subsystem networks

The protocols over the two reference points Ici and Izi make up the Inter-IMS Network to Network Interface.

The Ici reference point allows IBCFs to communicate with each other in order to provide the communication and forwarding of SIP signalling messaging between IM CN subsystem networks. The Izi reference point allows TrGWs to forward media streams between IM CN subsystem networks.

IMS roaming performed by using II-NNI is considered, when the IBCFs are inserted at the network borders. The applicability of roaming scenario by using II-NNI is based on agreement between the operators.

Whenever the Inter-IMS Network to Network Interface is used to interconnect two IM CN subsystem networks belonging to different security domains, security procedures apply as described in 3GPP TS 33.210 [10].

5.2 Functionalities performed by entities at the edge of the network

5.2.1 Interconnection Border Control Function (IBCF)

An IBCF provides application specific functions at the SIP/SDP protocol layer in order to perform interconnection between IM CN subsystem networks by using Ici reference point. According to 3GPP TS 23.228 [4], IBCF can act both as an entry point and as an exit point for a network.

The functionalities of IBCF are indicated in the 3GPP TS 23.228 [4] and specified in 3GPP TS 24.229 [5]. They include:

- network topology hiding;

- application level gateway (for instance enabling communication between IPv6 and IPv4 SIP applications, or between a SIP application in a private IP address space and a SIP application outside this address space);

- controlling transport plane functions;

- controlling media plane adaptations;

- screening of SIP signalling information;

- selecting the appropriate signalling interconnect;

- generation of charging data records; and

- privacy protection.

Based on local configuration, the IBCF performs transit routing functions as specified in 3GPP TS 24.229 [5].

The IBCF acts as a B2BUA when it performs IMS-ALG functionality.

5.2.2 Transition Gateway (TrGW)

According to 3GPP TS 23.002 [3], the TrGW is located at the network borders within the media path and is controlled by an IBCF. Forwarding of media streams between IM CN subsystem networks is applied over Izi reference point.

The TrGW provides functions like network address/port translation and IPv4/IPv6 protocol translation. NAT-PT binds addresses in IPv6 network with addresses in IPv4 network and vice versa to provide transparent routing between the two IP domains without requiring any changes to end points. NA(P)T-PT provides additional translation of transport identifier (TCP and UDP port numbers). The approach is similar to that one described also in 3GPP TS 29.162 [8].

Further details are described in 3GPP TS 23.228 [4].

6 Control plane interconnection

6.1 Definition of Inter-IMS Network to Network Interconnection

6.1.1 SIP methods and header fields

6.1.1.1 General

The functional entity closest to the border of an II-NNI (see reference model in Clause 5) shall provide the capabilities specified for that network element in Annex A.2 of 3GPP TS 24.229 [5] with modifications as described in the following sub clauses.

6.1.1.2 SIP methods

3GPP TS 24.229 [5] defines the methods allowing an IBCF to interconnect to an IBCF placed in another IM CN subsystem.

The following SIP methods are supported on the II-NNI as defined in table 6.1.

The following table is based on table A.5 and table A.163 of 3GPP TS 24.229 [5] and endorsed for this document:

Table 6.1: Supported SIP methods

Item	Method	Ref.	II-NNI	
			Sending	Receiving
1	ACK request	IETF RFC 3261 [13]	m	m
2	BYE request	IETF RFC 3261 [13]	m	m
3	BYE response	IETF RFC 3261 [13]	m	m
4	CANCEL request	IETF RFC 3261 [13]	m	m
5	CANCEL response	IETF RFC 3261 [13]	m	m
5A	INFO request	IETF RFC 6086 [28]	o	o
5B	INFO response	IETF RFC 6086 [28]	o	o
8	INVITE request	IETF RFC 3261 [13]	m	m
9	INVITE response	IETF RFC 3261 [13]	m	m
9A	MESSAGE request	IETF RFC 3428 [19]	o	o
9B	MESSAGE response	IETF RFC 3428 [19]	o	o
10	NOTIFY request	IETF RFC 3265 [20]	c1	c1
11	NOTIFY response	IETF RFC 3265 [20]	c1	c1
12	OPTIONS request	IETF RFC 3261 [13]	m	m
13	OPTIONS response	IETF RFC 3261 [13]	m	m
14	PRACK request	IETF RFC 3262 [18]	m	m
15	PRACK response	IETF RFC 3262 [18]	m	m
15A	PUBLISH request	IETF RFC 3903 [21]	c1	c1
15B	PUBLISH response	IETF RFC 3903 [21]	c1	c1
16	REFER request	IETF RFC 3515 [22]	o	o
17	REFER response	IETF RFC 3515 [22]	o	o
18	REGISTER request	IETF RFC 3261 [13]	c2	c2
19	REGISTER response	IETF RFC 3261 [13]	c2	c2
20	SUBSCRIBE request	IETF RFC 3265 [20]	c1	c1
21	SUBSCRIBE response	IETF RFC 3265 [20]	c1	c1
22	UPDATE request	IETF RFC 3311 [23]	m	m
23	UPDATE response	IETF RFC 3311 [23]	m	m
c1:	In case of roaming scenario, the support of the method is m, else o.			
c2:	In case of roaming scenario, the support of the method is m, else n/a.			
NOTE:	In the above table, m, o and c and n/a have the meanings indicated in table 6.3			

6.1.1.3 SIP header fields

6.1.1.3.0 General

The IBCF shall provide the capabilities to manage and modify SIP header fields according to subclause 5.10 and Annex A of 3GPP TS 24.229 [5] with modifications as described in the following sub-clauses.

6.1.1.3.1 Trust and no trust relationship

The IBCF acting as exit point applies the procedures described in clause 5.10.2 of 3GPP TS 24.229 [5] before forwarding the SIP signalling to the IBCF acting as entry point. The IBCF acting as entry point applies the procedures described in clause 5.10.3 of 3GPP TS 24.229 [5].

Additionally, in case there is no trust relationship between the two IM CN subsystems connected by II-NNI, the IBCF acting as exit point applies the procedures described in clause 4.4 of 3GPP TS 24.229 [5], before forwarding the SIP signalling to the next IBCF acting as an entry point. The IBCF acting as an entry point applies the procedures described in clause 5.10.3 of 3GPP TS 24.229 [5].

These procedures may be utilized on a per header field basis to realize overall trust as well as per service level screening of header fields. Trust relationships and trust domains may be defined by inter-operator agreements for individual services and/or individual SIP header fields.

The management of the SIP header fields (if present) over II-NNI in case of a presence or not of a trust relationship between the two interconnected IM CN subsystems is wrapped up in the following table.

Table 6.2: Management of SIP header fields over II-NNI in presence or not of a trust relationship

Item	Header field	Reference	Trust relationship	Not trust relationship
1	P-Asserted-Identity	IETF RFC 3325 [44]	As specified in 3GPP TS 24.229 [5], clause 4.4	As specified in 3GPP TS 24.229 [5], clause 4.4
2	P-Access-Network-Info	IETF RFC 3455 [24]	As specified in 3GPP TS 24.229 [5], clause 4.4	As specified in 3GPP TS 24.229 [5], clause 4.4
3	Resource-Priority	IETF RFC 4412 [78]	As specified in 3GPP TS 24.229 [5], clause 4.4	As specified in 3GPP TS 24.229 [5], clause 4.4
4	History-Info	IETF RFC 4244 [25]	As specified in 3GPP TS 24.229 [5], clause 4.4	As specified in clause 4.3.3 of RFC 4244 [25] and in 3GPP TS 24.229 [5], clause 4.4
5	P-Asserted-Service	IETF RFC 6050 [26]	As specified in 3GPP TS 24.229 [5], clause 4.4 (NOTE 3)	As specified in 3GPP TS 24.229 [5], clause 4.4 (NOTE 3)
6	P-Charging-Vector	IETF RFC 3455 [24]	As specified in 3GPP TS 24.229 [5], clause 5.10	As specified in 3GPP TS 24.229 [5], clause 5.10
7	P-Charging-Function-Addresses (NOTE 4)	IETF RFC 3455 [24]	As specified in 3GPP TS 24.229 [5], clause 5.10	As specified in 3GPP TS 24.229 [5], clause 5.10
8	P-Profile-Key (NOTE 2)	IETF RFC 5002 [64]	As specified in 3GPP TS 24.229 [5], clause 4.4	As specified in 3GPP TS 24.229 [5], clause 4.4
9	P-Private-Network-Indication (NOTE 1)	draft-vanelburg-dispatch-private-network-ind [84]	As specified in 3GPP TS 24.229 [5], clause 4.4	As specified in 3GPP TS 24.229 [5], clause 4.4
10	P-Served-User (NOTE 1, NOTE 2)	IETF RFC 5502 [85]	As specified in 3GPP TS 24.229 [5], clause 4.4	As specified in 3GPP TS 24.229 [5], clause 4.4
11	Reason (in a response)	draft-jesske-dispatch-reason-in-responses [49]	As specified in 3GPP TS 24.229 [5], clause 4.4	As specified in 3GPP TS 24.229 [5], clause 4.4
12	P-Early-Media	IETF RFC 5009 [74]	As specified in 3GPP TS 24.229 [5], clause 4.4	As specified in 3GPP TS 24.229 [5], clause 4.4
NOTE 1: For a roaming II-NNI, a trust relationship with respect to this header field is required.				
NOTE 2: This header field is only applicable on a roaming II-NNI.				
NOTE 3: In addition, value-dependent operator policies may be applied.				
NOTE 4: This header field is not applicable at II-NNI.				

6.1.1.3.2   Derivation of applicable SIP header fields from 3GPP TS 24.229 [5]

For any method in table 6.1, the SIP header fields applicable on the II-NNI are detailed in the corresponding method tables for the UA role and proxy role sending behaviour in annex A of 3GPP TS 24.229 [5]. Unless other information is specified in the normative part of the present specification, the applicability of header fields at the II-NNI can be derived for each method from the corresponding tables in annex A of 3GPP TS 24.229 [5] as follows:

- All header fields not present in the corresponding tables in annex A of 3GPP TS 24.229 or marked as "n/a" in both the "RFC status" and "profile status" columns for the UA role and proxy role sending behaviour of that tables are not applicable at the II-NNI.

  NOTE 1: Operators could choose to apply header fields for other SIP extensions on an II-NNI based on bilateral agreements, but this is outside the scope of the present specification.

- All header fields which are marked as "o" in at least one of the "RFC status" or the "profile status" profile columns for the sending behaviour in the corresponding UA role and proxy role tables in annex A of 3GPP TS 24.229 [5] and as "n/a" or "o" in the other such columns are applicable at II-NNI based on bilateral agreement between operators.

- All header fields which are marked as "m" in at least one of the "RFC status" or the "profile status" columns for the sending behaviour in the corresponding UA role or proxy role table in annex A of 3GPP TS 24.229 [5] and as "n/a", "o", or "m" in the other such columns are applicable at the II-NNI.

- If conditions are specified, they are also applicable at the II-NNI and the above rules are applicable to the "n/a", "o" and "m" values within the conditions.

NOTE 2: In the above rules, the RFC profile columns are taken into account in order to enable interworking with non-3GPP networks,

An informative summary of SIP header fields to be used over the II-NNI is proposed in annex A.

6.1.1.3.3 Applicability of SIP header fields on a roaming II-NNI

The following SIP header fields are only applicable on a roaming II-NNI:

- Proxy-Authenticate

- Proxy-Authorization

6.1.1.3.4 Applicability of SIP header fields on a non-roaming II-NNI

The following SIP header fields are not applicable on a non-roaming II-NNI:

- P-Called-Party-ID

- P-Preferred-Service

- P-Profile-Key

- P-Served-User

- P-Visited-Network-ID

- WWW-Authenticate

6.1.1.4 Notations of the codes

In the table 6.1 the status codes "m", "o", "c" and "n/a" have the following meanings:

Table 6.3: Key to notation codes for SIP messages

Notation code	Notation name	Sending side	Receiving side
m	mandatory	The message shall be supported at II-NNI. Supporting sending a SIP message at the II-NNI means that this message shall be sent over the II-NNI if received from the serving network. It does not imply that network elements inside the serving network or user equipment connected to this network shall support this message.	Supporting receiving a SIP message at the II-NNI means that this message shall be forwarded to the serving network. It does not imply that network elements inside the served network or user equipment connected to this network are supporting this message.
o	optional	The message may or may not be supported at II-NNI. The support of the method is provided based on bilateral agreement between the operators.	Same as for sending side.
n/a	not applicable	It is impossible to use/support the message.	It is impossible to use/support the message. This message will be discarded by the IBCF.
c <integer>	conditional	The requirement on the message ("m", "o" or "n/a") depends on the support of other optional or conditional items. <integer> is the identifier of the conditional expression.	Same as for sending side.

6.1.1.5 Modes of signalling

Overlap signalling may be used if agreement exists between operators to use overlap and which method to be used, otherwise enbloc shall be used at the II-NNI.

6.1.2 SDP protocol

6.1.2.1 General

The functional entity closest to the border of an II-NNI (see reference model in Clause 5) shall provide the capabilities specified for that network element in Annex A.3 of 3GPP TS 24.229 [5].

The SDP bodies shall be encoded as described in IETF RFC 3261 [13] and in IETF RFC 4566 [147].

The offer/answer model with the SDP as defined in IETF RFC 3264 [146] shall be applied.

6.1.3 Major capabilities

This subclause contains the major capabilities to be supported over the II-NNI.

The table 6.1.3.1 specifies which capabilities are applicable for II-NNI. The profile status codes within table 6.1.3.1 are defined in table 6.1.3.2.

For the "Basic SIP" capabilities part of table 6.1.3.1, the last column "Profile status over II-NNI" specifies the general status of applicability of the IETF RFC 3261 [13] main mechanisms described in the 2nd column "Capability over the Ici".

For the "Extensions to basic SIP" capabilities part, the last column "Profile status over II-NNI" specifies the general status of applicability of the RFC referenced in the 2nd column "Capability over the Ici".

If necessary, the applicability of RFCs at the II-NNI level is further detailed in the present Technical Specification.

The columns "Reference item in 3GPP TS 24.229 [5] for the profile status" provide informative references for comparison purposes into the UA and Proxy role major capabilities tables in 3GPP TS 24.229 [5], where the capabilities are defined via additional references.

Table 6.1.3.1: Major capabilities over II-NNI

Item	Capability over the Ici	Reference item in 3GPP TS 24.229 [5] for the profile status		Profile status over II-NNI
		UA Role (NOTE 1)	Proxy role (NOTE 2)	
	Basic SIP (IETF RFC 3261 [13])			
1	registrations	1, 2, 2A	-	c2
2	initiating a session	2B, 2C, 3, 4	-	m
3	terminating a session	5	3	m
4	General proxy behaviour	-	4, 5, 14, 15, 19F	n/a
5	Forking of initial requests	9,10	6	m
6	support of indication of TLS connections in the Record-Route header	-	7, 8	n/a
7	Support of authentication	7, 8, 8A	8A	c2
8	Timestamped requests (Timestamp header field)	6	-	m
9	Presence of date in requests and responses (Date header field)	11	9	m
10	Presence of alerting information data (Alert-info header field)	12	10	o
11	Support and handling of the Require header field for REGISTER and other requests or responses for methods other than REGISTER	-	11, 12, 13	m
12	Support and reading of the Supported and Unsupported header fields	-	16, 17, 18	m
13	Support of the Error-Info header field in 3xx - 6xx responses	-	19	o
14	Support and handling of the Organization header field	-	19A, 19B	m
15	Support and handling of the Call-Info header field	-	19C, 19D	m
16	Support of the Contact header field in 3xx response	-	19E	m
	Extensions to basic SIP			
17	IETF RFC 6086[39]: SIP INFO method and package framework	13	20	o
17A	draft-ietf-sipcore-info-events-08 [39]: legacy INFO usage	13A	20A	o
18	IETF RFC 3262 [18]: reliability of provisional responses in SIP (PRACK method)	14	21	m
19	IETF RFC 3515 [22]: the SIP REFER method	15	22	o
20	IETF RFC 3312 [40] and RFC 4032 [41]: integration of resource management and SIP (Preconditions framework)	16	23	o
21	IETF RFC 3311 [23]: the SIP UPDATE method	17	24	m
22	IETF RFC 3313 [42]: SIP extensions for media authorization (P-Media-Authorization header field)	19	26	n/a
23	IETF RFC 3265 [20]: SIP specific event notification (SUBSCRIBE/NOTIFY methods)	20, 21, 22, 23	27, 28	c1
24	IETF RFC 3327 [43]: session initiation protocol extension header field for registering non-adjacent contacts (Path header field)	24	29	c2
25	IETF RFC 3325 [44]: private extensions to the Session Initiation Protocol (SIP) for network asserted identity within trusted networks	25	30	c4
26	IETF RFC 3325 [44]: the P-Preferred-Identity header field extension	-	-	n/a
27	IETF RFC 3325 [44]: the P-Asserted-Identity header field extension	-	-	c4
28	IETF RFC 3323 [34]: a privacy mechanism for the Session Initiation Protocol (SIP) (Privacy header field)	26, 26A, 26B, 26C, 26D, 26E, 26F, 26G, 26H	31, 31A, 31B, 31C, 31D, 31E, 31F, 31G, 31H	m
29	IETF RFC 3428 [19]: a messaging mechanism for the Session Initiation Protocol (SIP) (MESSAGE method)	27	33	o
30	IETF RFC 3608 [45]: session initiation protocol extension header field for service route discovery during registration (Service-Route header field)	28	32	c2
31	IETF RFC 3486 [46]: compressing the session initiation protocol	29	34	n/a
32	IETF RFC 3455 [24]: private header extensions to the	30	35	o

	session initiation protocol for the 3rd-Generation Partnership Project (3GPP)			
32A	IETF RFC 3325 [44]: act as first entity within the trust domain for asserted identity	30A	30A	n/a
32B	IETF RFC 3325 [44]: act as entity within trust network that can route outside the trust network	30B	30B	n/a
32C	IETF RFC 3325: act as entity passing on identity transparently independent of trust domain	30C	30C	n/a
33	IETF RFC 3455 [24]: the P-Associated-URI header field extension	31	36	c2
34	IETF RFC 3455 [24]: the P-Called-Party-ID header field extension	32	37	c2
35	IETF RFC 3455 [24]: the P-Visited-Network-ID header field extension	33	38, 39	c2
36	IETF RFC 3455 [24]: the P-Access-Network-Info header field extension	34	41, 42, 43	c4
37	IETF RFC 3455 [24]: the P-Charging-Function-Addresses header field extension	35	44, 44A	n/a
38	IETF RFC 3455 [24]: the P-Charging-Vector header field extension	36	45, 46	c1
39	IETF RFC 3329 [47]: security mechanism agreement for the session initiation protocol	37	47	n/a
39A	draft-dawes-dispatch-mediasec-parameter-03 [137]: mediasec header field parameter for marking security mechanisms related to media	37A	47A	n/a
40	IETF RFC 3326 [48]: the Reason header field for the session initiation protocol	38	48	o
41	draft-jesske-dispatch-reason-in-responses-03 [49]: use of the Reason header field in Session Initiation Protocol (SIP) responses	38A	48A	c4
42	IETF RFC 3581 [50]: an extension to the session initiation protocol for symmetric response routeing	39	49	o
43	IETF RFC 3841 [51]: caller preferences for the session initiation protocol (Accept-Contact, Reject-Contact and Request-Disposition header fields)	40, 40A, 40B, 40C, 40D, 40E, 40F	50, 50A, 50B, 50C, 50D, 50E, 50F	m
44	IETF RFC 3903 [21]: an event state publication extension to the session initiation protocol (PUBLISH method)	41	51	c1
45	IETF RFC 4028 [52]: SIP session timer (Session-Expires and Min-SE headers)	42	52	m
46	IETF RFC 3892 [53]: the SIP Referred-By mechanism	43	53	m
47	IETF RFC 3891 [54]: the Session Initiation Protocol (SIP) "Replaces" header	44	54	o
48	IETF RFC 3911 [55]: the Session Initiation Protocol (SIP) "Join" header	45	55	o
49	IETF RFC 3840 [56]: the callee capabilities	46	56	o
50	IETF RFC 4244 [25]: an extension to the session initiation protocol for request history information (History-Info header field)	47	57	o
51	IETF RFC 5079 [57]: Rejecting anonymous requests in the session initiation protocol	48	58	o
52	IETF RFC 4458 [58]: session initiation protocol URIs for applications such as voicemail and interactive voice response (NOTE 3)	49	59	o
53	IETF RFC 4320 [59]: Session Initiation Protocol's (SIP) non-INVITE transactions	50	61	m
54	IETF RFC 4457 [60]: the P-User-Database private header field extension	51	60	n/a
55	IETF RFC 5031 [61]: a uniform resource name for services	52	62	n/a
56	IETF RFC 5627 [62]: obtaining and using GRUUs in the Session Initiation Protocol (SIP)	53	63	c1
	Void			
58	IETF RFC 4168 [27]: the Stream Control Transmission Protocol (SCTP) as a Transport for the Session Initiation Protocol (SIP)	55	65	o
59	IETF RFC 5002 [64]: the SIP P-Profile-Key private header field extension	56	66, 66A, 66B	c3

60	IETF RFC 5626 [65]: managing client initiated connections in SIP	57	67	c1
61	IETF RFC 5768 [66]: indicating support for interactive connectivity establishment in SIP	58	68	n/a
62	IETF RFC 5365 [67]: multiple-recipient MESSAGE requests in the session initiation protocol	59	69	o if 29, else n/a
63	draft-ietf-sipcore-location-conveyance-04 [68]: SIP location conveyance (Geolocation header)	60	70, 70A, 70B	m
64	IETF RFC 5368 [69]: referring to multiple resources in the session initiation protocol	61	71	o if 19, else n/a
65	IETF RFC 5366 [70]: conference establishment using request-contained lists in the session initiation protocol	62	72	o
66	IETF RFC 5367 [71]: subscriptions to request-contained resource lists in the session initiation protocol	63	73	o if 23, else n/a
67	IETF RFC 4967 [72]: dialstring parameter for the session initiation protocol uniform resource identifier	64	74	c2
68	IETF RFC 4964 [73]: the P-Answer-State header extension to the session initiation protocol for the open mobile alliance push to talk over cellular	65	75	o
69	IETF RFC 5009 [74]: the SIP P-Early-Media private header field extension for authorization of early media	66	76	c4
70	IETF RFC 4694 [75]: number portability parameters for the 'tel' URI	67, 67A, 67B	77, 77A, 77B	o
71	draft-yu-tel-dai-09 [76]: DAI Parameter for the 'tel' URI	68	78	o
72	IETF RFC 4411 [77]: extending the session initiation protocol Reason header for preemption events	69	79	o
73	IETF RFC 4412 [78]: communications resource priority for the session initiation protocol? (Resource-Priority header field)	70, 70A, 70B	80, 80A, 80B	o
74	IETF RFC 5393 [79]: addressing an amplification vulnerability in session initiation protocol forking proxies	71	81	m
75	IETF RFC 5049 [80]: the remote application identification of applying signalling compression to SIP	72	82	n/a
76	IETF RFC 5688 [81]: a session initiation protocol media feature tag for MIME application sub-types	73	83	c1
77	IETF RFC 6050 [26]: Identification of communication services in the session initiation protocol	74	84, 84A	o
78	IETF RFC 5360 [82]: a framework for consent-based communications in SIP?	75, 75A, 75B	85	o
79	draft-johnston-sipping-cc-uui-09 [83]: transporting user to user information for call centers using SIP?	76	86	c1
80	draft-vanelburg-dispatch-private-network-ind-01 [84]: The SIP P-Private-Network-Indication private-header (P-Header)	77	87	c1
81	IETF RFC 5502 [85]: the SIP P-Served-User private header	78	88	c2
83	draft-dawes-sipping-debug-04 [87]: the P-Debug-ID header extension	80	90	o
84	draft-ietf-sipcore-199-05 [88]: the 199 (Early Dialog Terminated) response code)	81	91	m
85	IETF RFC 5621 [89]: message body handling in SIP	82	92	m
86	draft-holmberg-sip-keep-12 [90]: indication of support for keep-alive	83	93	o
87	IETF RFC 5552 [91]: SIP Interface to VoiceXML Media Services	84	94	n/a
88	IETF RFC 3862 [92]: common presence and instant messaging (CPIM): message format	85	95	o
89	IETF RFC 5438 [93]: instant message disposition notification	86	96	o
90	IETF RFC 5373 [94]: requesting answering modes for SIP (Answer-Mode and Priv-Answer-Mode header fields)	87	97, 97A	o
	Void			
92	IETF RFC 3959 [96]: the early session disposition type for SIP	89	99	o
93	IETF RFC 4244 [97]: delivery of Request-URI targets to user agents	90	100	n/a
94	draft-kaplan-sip-session-id-02 [124]: The Session-ID header	91	101	o
95	IETF RFC 6026 [125]: correct transaction handling for 200 responses to Session Initiation Protocol INVITE requests	92	102	m
96	IETF RFC 5658 [126]: addressing Record-Route issues in	93	103	o

	the Session Initiation Protocol (SIP)			
97	IETF RFC 5954 [127]: essential correction for IPv6 ABNF and URI comparison in IETF RFC 3261 [13]	94	104	m
98	IETF RFC 4488 [135]: suppression of session initiation protocol REFER method implicit subscription	95	105	m if 19, else n/a
99	draft-liess-dispatch-alert-info-urns-03 [136]: Alert-Info URNs for the Session Initiation Protocol	96	106	o
100	Subclause 3.1 of 3GPP TS 24.229: multiple registrations	97	107	c2
101	IETF RFC 5318 [141]: the SIP P-Refused-URI-List private-header	98	108	o
102	IETF RFC 4538 [140]: request authorization through dialog Identification in the session initiation protocol (Target-Dialog header field)	99	109	o
c1: m in case of roaming II-NNI, else o				
c2: m in case of roaming II-NNI, else n/a				
c3: o in case of roaming II-NNI, else n/a				
c4: m in case of trust relationship between the interconnected networks, else n/a				
NOTE 1: The item numbering corresponds to the one provided in table A.4 in [5].				
NOTE 2: The item numbering corresponds to the one provided in table A.162 in [5].				
NOTE 3: A common URI namespace is required to apply this feature on the II-NNI.				

Table 6.1.3.2: Key to notation codes for major capabilities

Notation code	Notation name	Explanation
m	mandatory	The capability shall be supported at II-NNI. SIP message relating to this capability shall be sent over the II-NNI if received from the serving network, unless they also make use of other unsupported capabilities. SIP headers or other information elements relating to this capability shall be passed over the II-NNI if received from the sending side. This does not imply that network elements inside the serving network or served network or user equipment connected to these networks shall support this capability.
o	optional	The capability may or may not be supported at II-NNI. The support of the capability is provided based on bilateral agreement between the operators.
n/a	not applicable	It is impossible to use/support the capability at the II-NNI.
c \<integer\>	conditional	The support of the capability ("m", "o" or "n/a") depends on the support of other optional or conditional items. \<integer\> is the identifier of the conditional expression.

6.2 Control Plane Transport

6.2.1 General

The control plane transport of the II-NNI shall comply with Clause 4.2A of 3GPP TS 24.229 [5].

Support of SCTP as specified in IETF RFC 4168 [27] is optional for an IBCF connected by II-NNI. Nevertheless this option is favourable if the operators would like to improve reliability over the Ici.

7 User plane Interconnection

7.1 Media and Codec

For "end-to-end" media session involving the II-NNI, the SIP/SDP codec negotiation procedure can be applied between IM CN subsystems using different media codecs. It is possible that the end-to-end codec negotiation could fail because no common codec could be supported by the UEs, in particular for voice services.

To enhance interoperability, the IBCF, the MRFC, or other IMS network entities can interfere with the end-to-end codec negotiation to offer additional codec(s) available via transcoding, or to remove codecs. The IBCF can configure an attached TrGW to transcode, and the MRFC can configure an attached MRFP to transcode.

Codecs applicable at the II-NNI may be a subject of interworking agreements.

NOTE 1: Possible codecs which could be used at the II-NNI are described in 3GPP TS 26.114 [11] and ETSI TS 181 005 [12].

NOTE 2: As described in 3GPP TS 24.229 [5], the IETF RFC 4733 [61] is used to encode DTMF events and a payload type number associated with the MIME subtype "telephone-event" is included in a SDP message.

However, to avoid that transcoding is performed several times, applicable codecs at the II-NNI should be restricted as little as possible.

NOTE 3: Transcoding can be performed in an IMS network serving an SDP offerer or in an IMS network serving an SDP answerer. To avoid that transcoding is performed multiple times, inter-operator agreements can clarify if it is preferred that IMS network serving an SDP offerer or IMS network serving an SDP answerer modify an SDP offer to offer transcoding.

If the IBCF performs media transcoding control, the IBCF shall apply the related procedures in 3GPP TS 24.229 [5].

7.2 User Plane Transport

The user plane transport of the II-NNI may use the protocols listed in table 7.2.1. The used protocols to transport media are negotiated by means of SDP offer/answer.

Table 7.2.1: Supported transport-level RFCs to be described in SIP/SDP messages

Item	RFC	Title	Support
1	RFC 3550	RTP: A Transport Protocol for Real-Time Applications	Mandatory
2	RFC 768	User Datagram Protocol	Mandatory
3	RFC 3551	RTP Profile for Audio and Video Conferences with Minimal Control	Mandatory
4	RFC 3556	Session Description Protocol (SDP) Bandwidth Modifiers for RTP Control Protocol (RTCP) Bandwidth	Mandatory
5	RFC 4585	Extended RTP Profile for Real-time Transport Control Protocol (RTCP) - Based Feedback (RTP/AVPF)	Optional (NOTE 1)
6	RFC 793	Transmission Control Protocol	Optional (NOTE 2)
NOTE 1: used by MTSI, as indicated in 3GPP TS 26.114 [11] NOTE 2: used for MSRP service			

8 Numbering, Naming and Addressing

The following URI formats in SIP messages may be applied at the Ici as standardized in 3GPP TS 24.229 [5]:

- SIP URI defined in IETF RFC 3261 [13];

- tel URI defined in IETF RFC 3966 [14];

- IM URI defined in IETF RFC 3860 [15];

- PRES URI defined in IETF RFC 3859 [16].

Moreover, in case of MSRP sessions passing through the II-NNI, the MSRP URI may be also used at the Ici in the SDP exchange, following the formats defined in IETF RFC 4975 [17].

According to 3GPP TS 24.229 [5], the IBCF acting as an exit or entry point in the IMS network supports these URI formats.These URI formats shall be supported at the II-NNI. Other URI formats may be supported over the II-NNI depending on the operators' agreements.

A global number as defined in IETF RFC 3966 [14] shall be used in a tel-URI or in the user portion of a SIP URI with the user=phone parameter when conveyed via a non-roaming II-NNI in the Request-URI and in the P-Asserted-Identity header field, except when agreement exists between the operators to also allow other kinds of numbers.

NOTE 1: In a SIP URI the user portion of the Request-URI represents a telephone number only if the SIP URI includes the user=phone parameter.

NOTE 2: Agreements can exist between operators to allow non-global number (e.g. national service numbers. business trunking numbers, or private numbers) at a non-roaming II-NNI. A SIP URI with such a number, a user=phone parameter, and a phone-context parameter agreed between the operators can then be used.

NOTE 3: 3GPP TS 24.229 [5] allows to restrict the number within a SIP Request-URI with user=phone parameter at a non-roaming II-NNI to be a global number (i.e. E.164 in international format) via an appropriate Application Server. Suitable configuration by the operator is needed to achieve the desired modification of the format.

NOTE 4: The allowed phone number formats in the P-Asserted-Identity header field of a served user are configured by the operator. According to 3GPP TS 23.003 [35], international E.164 format is used within a P-Asserted-Identity header field.

NOTE 5: The global number format usage within a SIP Request-URI with the user=phone parameter at a non-roaming II-NNI allows the terminating network to find the called subscriber, via HSS interrogation, without any further number translation and thus improves the success of the interconnection between IMS Operators.

The OLI and CPS URI parameters associated with a TEL URI are described in 3GPP TS 24.229 [5].

The "sos" parameter associated with a TEL URI is described in 3GPP TS 24.229 [5].

9 IP Version

The network elements interconnected by means of the II-NNI may support IPv4 only, IPv6 only or both.

The support of one or both of the IP versions is an operator option and should be based on bilateral agreement.

In case IPv4 and IPv6 networks are interconnected, the involved IBCFs and TrGWs shall apply the IP version interworking procedures as indicated in 3GPP TS 29.162 [8].

10 Security

The supported security mechanisms for IP signalling transport over II-NNI interfaces are described in 3GPP TS 33.210 [10].

11 Charging

The accounting information to be supported over the Ici is described in 3GPP TS 32.260 [29]. It shall be configurable by the operator to use or not the accounting mechanisms provided by the IBCF.

12 Supplementary services associated with the IMS multimedia telephony communication service

12.1 General

In order to assure the end-to-end service interoperability through the Inter-IMS Network to Network Interface (II-NNI), the associated supplementary services of the multimedia telephony communication service may be supported on the II-NNI between the two IMS networks.

The MMTel communication service is identified by means of the media feature tag +g.3gpp.icsi-ref set to "urn:urn-7:3gpp-service.ims.icsi.mmtel". The media feature tag can appear in the Contact header field, the Accept-Contact header field and the P-Asserted-Service header field.

The support of each associated supplementary service is based on agreement between operators.

If a supplementary service is supported, the related procedures from the 3GPP TS 22.173 [30], the protocol details from the 3GPP TS 24.173 [31] and specifications referenced in the 3GPP TS 24.173 [31] shall be applied with the requirements in the relevant subclause below due to the crossing of the II-NNI .

12.2 Malicious Communication IDentification (MCID)

Service specific requirements in accordance with 3GPP TS 24.616 [33] shall be supported over the II-NNI.

The P-Asserted-Identity header field shall be supported at the II-NNI.

The INFO request and the 200 (OK) response to the INFO request containing the "application/vnd.etsi.mcid+xml" MIME body defined in 3GPP TS 24.616 [33] may be supported at the II-NNI.

If a network terminating the dialog supports MCID, the terminating network shall only deliver the MCID request in the "application/mcid+xml" MIME body, as specified in the 3GPP TS 24.616 [33], if an agreement to use the MCID supplementary service according to the 3GPP TS 24.616 [33] exists with the network originating the dialog and if the INVITE request received by the terminating network does not contain the information of the originating party.

NOTE: The IBCF and the AS in the terminating network interact to deliver the MCID request only if an agreement to use the MCID supplementary service exists, as specified in 3GPP TS 24.616 [33] and 3GPP TS 24.229 [5].

The originating network and the terminating network shall have a bilateral agreement to support transportation of the minimum information specified in subclause 4.5.2.5.0 of the 3GPP TS 24.616 [33] between the networks.

12.3 Originating Identification Presentation (OIP) and Originating Identification Restriction (OIR)

Service specific requirements in accordance with 3GPP TS 24.607 [32] shall be supported over the II-NNI.

The P-Asserted-Identity header field and the Privacy header field with values "id", "user", "none", "header" and "critical" shall be supported at the II-NNI.

NOTE 1: P-Asserted-Identity header fields are intended for end-to-end operation. Removal of such header fields will impact the intended end-to-end operation between the end users. Where a trust relationship exists on the P-Asserted-Identity header field between the two IMS networks, this header field cannot be altered when passing through the II-NNI according to 3GPP TS 24.229 [5]. Where no trust relationship exists on the P-Asserted-Identity header field between the two IMS networks, the IBCF determines whether to remove the P-Asserted-Identity header field according to procedures described in 3GPP TS 24.229 [5] clause 4.4.2 referencing IETF RFC 3325 [44] and local policy rules for using additional screening capabilities as defined in 3GPP TS 24.229 [5] clause 5.10.6.

NOTE 2: Where a trust relationship exists with the remote domain the From header field will be passed transparently by the IBCF. If a request is received by the terminating network and the application of the OIR service is required with the value "user" for the Privacy header field then the From header field will be anonymised in accordance with IETF RFC 3323 [34] by the terminating network. Where no trust relationship exists with the remote domain, the From header field can be, based on local policy rules, anonymised by the IBCF of the originating network prior passing through the II-NNI using screening capabilities defined in 3GPP TS 24.229 [5] clause 5.10.6 and clause 5.10.8.

SIP based user configuration as described in 3GPP TS 24.238 [100] shall be supported at the roaming II-NNI.

12.4 Terminating Identification Presentation (TIP) and Terminating Identification Restriction (TIR)

Service specific requirements in accordance with 3GPP TS 24.608 [113] shall be supported over the II-NNI.

The P-Asserted-Identity header field and the Privacy header field with values "id", "user", "none", "header" and "critical" shall be supported at the II-NNI.

> NOTE: P-Asserted-Identity header fields are intended for end-to-end operation. Removal of such header fields will impact the intended end-to-end operation between the end users. Where a trust relationship exists on the P-Asserted-Identity header field between the two IMS networks, this header field will be passed transparently through the II-NNI according to 3GPP TS 24.229 [5]. Where no trust relationship exists on the P-Asserted-Identity header field between the two IMS networks, the IBCF determines whether to remove the P-Asserted-Identity header field according to procedures described in 3GPP TS 24.229 [5] clause4.4.2, referencing IETF RFC 3325 [44] and local policy rules for using additional screening capabilities as defined in3GPP TS 24.229 [5] clause 5.10.6.

The option tag "from-change" in the Supported header field should be supported at II-NNI.

12.5 Anonymous Communication Rejection (ACR)

Service specific requirements in accordance with 3GPP TS 24.611 [107] shall be supported over the II-NNI.

The P-Asserted-Identity header field and the Privacy header field shall be supported at the II-NNI.

Procedures as described in subclause 12.21.2 are used to provide announcements.

The response code 433 (Anonymity Disallowed) shall be supported at the II-NNI.

SIP based user configuration as described in 3GPP TS 24.238 [100] shall be supported at the roaming II-NNI.

12.6 Communication DIVersion (CDIV)

Service specific requirements in accordance with 3GPP TS 24.604 [117] shall be supported over the II-NNI.

> NOTE 1: The support of the Diversion header field not adopted in 3GPP TS 24.604 requires bilateral agreement between the operators.

Procedures as described in subclause 12.21.2 are used to provide announcements.

The Privacy header field with value "history" shall be supported at the II-NNI.

The History-Info header field as described by 3GPP TS 24.604 [117] and the Cause-Codes as defined by the IETF RFC 4458 [118] shall be supported over the II-NNI.

The response code 181 (Call Is Being Forwarded) shall be supported at the II-NNI.

The SUBSCRIBE requests with the event package name "comm-div-info" and the NOTIFY request procedure as specified in IETF RFC 3265 [20] and 3GPP TS 24.229 [5] shall be supported at the roaming II-NNI if CDIVN is provided.

The MESSAGE request procedure as specified in IETF RFC 3428 [19] and 3GPP TS 24.229 [5] should be supported at the roaming II-NNI if CDIVN is provided.

> NOTE 2: The content of the MESSAGE request is operator specific.

SIP based user configuration as described in 3GPP TS 24.238 [100] shall be supported at the roaming II-NNI.

> NOTE 3: The CDIVN supplementary service does not apply at the roaming II-NNI between the MSC Server enhanced for ICS and the IMS network where the communication is anchored.

12.7 Communication Waiting (CW)

Service specific requirements in accordance with 3GPP TS 24.615 [37] shall be supported over the II-NNI.

The "application/vnd.3gpp.cw+xml" MIME body defined in 3GPP TS 24.615 [37] in the INVITE request shall be supported at the roaming II-NNI.

The Alert-Info header field set to "urn:alert:service:call-waiting" in a 180 (Ringing) response shall be supported at the II-NNI.

As a network option, in case of expiry of the CW timer, the response code 480 (Temporarily Unavailable) including a Reason header field set to cause 19 shall be supported at the non-roaming II-NNI.

Procedures as described in subclause 12.21.2 are used to provide announcements.

12.8 Communication HOLD (HOLD)

Service specific requirements in accordance with 3GPP TS 24.610 [36] shall be supported over the II-NNI.

NOTE: The support of an alternative method not adopted in 3GPP TS 24.610 requires bilateral agreement between the operators and is outside the scope of the present document.

Procedures as described in subclause 12.21.3 are used to provide announcements.

12.9 Message Waiting Indication (MWI)

Service specific requirements in accordance with 3GPP TS 24.606 [112] shall be supported over the II-NNI.

The event package name "message-summary" according to IETF RFC 3265 [20] and 3GPP TS 24.229 [5] in the SUBSCRIBE request shall be supported at the roaming II-NNI.

The application/simple-message-summary+xml MIME body described in 3GPP TS 24.606 [112] in the NOTIFY request shall be supported at the roaming II-NNI.

12.10 Communication Barring (CB)

12.10.1 Incoming Communication Barring (ICB)

Service specific requirements in accordance with 3GPP TS 24.611 [114] shall be supported over the II-NNI.

Procedures as described in subclause 12.21.2 are used to provide announcements.

The response code 603 (Decline) including a Reason header field as described in 3GPP TS 24.611 [114] shall be supported at the II-NNI.

A Reason header field as described in 3GPP TS 24.611 [114] included in the BYE request shall be supported at the II-NNI.

SIP based user configuration as described in 3GPP TS 24.238 [100] shall be supported at the roaming II-NNI.

If the option IIFC (Inhibition of Incoming Forwarded Calls) is supported the transparency of information related to communication diversion (see clause 12.6) shall be supported at II-NNI.

12.10.2 Outgoing Communication Barring (OCB)

Service specific requirements in accordance with 3GPP TS 24.611 [114] shall be supported over the II-NNI.

Procedures as described in subclause 12.21.2 are used to provide announcements.

The response code 603 (Decline) including a Reason header field as described in 3GPP TS 24.611 [114] shall be supported at the roaming II-NNI.

SIP based user configuration as described in 3GPP TS 24.238 [100] shall be supported at the roaming II-NNI.

12.11 Completion of Communications to Busy Subscriber (CCBS)

Service specific requirements in accordance with 3GPP TS 24.642 [109] shall be supported over the II-NNI.

The response code 486 (Busy Here) containing a Call-Info header field with a "purpose" header field parameter set to "call-completion" and the m parameter set to "BS" shall be supported at the non-roaming II-NNI.

For invoking and revoking of the CCBS supplementary service, announcement procedures shall be used to provide announcements and inband-interaction procedures as described in subclause 12.21.2 shall be supported at the roaming II-NNI.

The response code 199 (Early Dialog Terminated) shall be supported at the roaming II-NNI.

Basic call procedures and in case of a call-completion recall initiated by a REFER request, normal REFER method handling procedures according to 3GPP TS 24.229 [5] shall be supported at the roaming II-NNI.

As a network option the special REFER request handling procedures according to 3GPP TS 24.628 [110] should be supported at the roaming II-NNI.

   NOTE 1: 3rd party call control procedures can be used when the REFER request is not supported at the II-NNI.

   NOTE 2: A REFER request can be rejected by IBCF based on operator policy as specified by 3GPP TS 24.229 [5].

The SUBSCRIBE and NOTIFY methods according to IETF RFC 3265 [20] and 3GPP TS 24.229 [5] containing the event package name "call-completion" and the Call-Info header field with a purpose parameter set to 'call-completion' and the m parameter set to "BS" shall be supported at the non-roaming II-NNI.

The Request-URI with the "m" SIP URI parameter with a value set to "BS" and the Call-Info header field with a purpose parameter set to 'call-completion' and the "m" parameter set to "BS" in the INVITE method shall be supported at the non-roaming II-NNI.

SIP based user configuration as described in 3GPP TS 24.238 [100] shall be supported at the roaming II-NNI.

12.12 Completion of Communications by No Reply (CCNR)

Service specific requirements in accordance with 3GPP TS 24.642 [109] shall be supported over the II-NNI.

The response code 180 (Ringing) containing a Call-Info header field with a purpose parameter set to 'call-completion' and the m parameter set to "NR" shall be supported at the non-roaming II-NNI.

For invoking and revoking of the CCNR supplementary service, announcement procedures shall be used to provide announcements and inband-interaction procedures as described in subclause 12.21.2 shall be supported at the roaming II-NNI.

The response code 199 (Early Dialog Terminated) shall be supported at the roaming II-NNI.

Basic call procedures and in case of a call-completion recall initiated by a REFER request, normal REFER method handling procedures according to 3GPP TS 24.229 [5] shall be supported at the roaming II-NNI.

As a network option the special REFER request handling procedures according to 3GPP TS 24.628 [110] should be supported at the roaming II-NNI.

   NOTE 1: 3rd party call control procedures can be used when the REFER request is not supported at the II-NNI.

   NOTE 2: A REFER request can be rejected by IBCF based on operator policy as specified by 3GPP TS 24.229 [5].

The SUBSCRIBE and NOTIFY methods according to IETF RFC 3265 [20] and 3GPP TS 24.229 [5] containing the event package name "call-completion" and the Call-Info header field with a purpose parameter set to 'call-completion' and the m parameter set to "NR" shall be supported at the non-roaming II-NNI.

The Request-URI with the "m" SIP URI parameter with a value set to "NR" and the Call-Info header field with a purpose parameter set to 'call-completion' and the "m" parameter set to "NR" in the INVITE method shall be supported at the non-roaming II-NNI.

SIP based user configuration as described in 3GPP TS 24.238 [100] shall be supported at the roaming II-NNI.

12.13 Explicit Communication Transfer (ECT)

Service specific requirements in accordance with 3GPP TS 24.629 [116] shall be supported over the II-NNI.

The REFER method, the Referred-By header field and the Replaces header field as specified in 3GPP TS 24.629 [116] and the NOTIFY method containing an "application/sipfrag" MIME body shall be supported at the II-NNI for call transfer without third party call control.

The REFER method, the Referred-By header field and the Replaces header field as specified in 3GPP TS 24.629 [116] and the NOTIFY method containing an "application/sipfrag" MIME body shall be supported at the roaming II-NNI for call transfer with third party call control.

12.14 Customized Alerting Tone (CAT)

Service specific requirements in accordance with 3GPP TS 24.182 [129] shall be supported over the II-NNI.

The P-Early-Media header field in as described in 3GPP TS 24.182 [129] shall be supported at the II-NNI.

The response code 183 (Session Progress) including a P-Early-Media header field shall be supported over the II-NNI.

The response code 199 (Early Dialog Terminated) shall be supported over the II-NNI.

The Supported header field and the Require header field with "early-session" option-tag may be supported at the II-NNI.

An "application/sdp" MIME body with the Content-Disposition set to "early-session" as specified in IETF RFC 3959 [96] may be supported at II-NNI.

The SIP INFO mechanism for DTMF transport, as defined in 3GPP TS 24.229 [5] may be supported at the II-NNI.

   NOTE 1: For telephone-event based DTMF transport, the DTMF digits are sent as media and not visible in the control plane.

   NOTE 2: Multiple methods for DTMF transport are defined in 3GPP TS 24.182 [129].

SIP based user configuration as described in 3GPP TS 24.238 [100] shall be supported at the roaming II-NNI.

12.15 Customized Ringing Signal (CRS)

Service specific requirements in accordance with 3GPP TS 24.183 [98] shall be supported over the II-NNI.

An Alert-Info header field in the initial INVITE request containing an URI followed by a URN "urn:alert:service:crs" shall be supported at the II-NNI.

A Contact header field in the initial INVITE request containing a "g.3gpp.crs" feature tag may be supported at the II-NNI.

The Supported header field and the Require header field with "early-session" option-tag may be supported at the II-NNI.

An "application/sdp" MIME body with the Content- Disposition set to "early-session" as specified in IETF RFC 3959 [96] may be supported at II-NNI.

The SIP INFO mechanism for DTMF transport, as defined in 3GPP TS 24.229 [5] may be supported at the II-NNI.

   NOTE: For telephone-event based DTMF transport, the DTMF digits are sent as media and not visible in the control plane.

SIP based user configuration as described in 3GPP TS 24.238 [100] shall be supported at the roaming II-NNI.

12.16 Closed User Group (CUG)

Service specific requirements in accordance with 3GPP TS 24.654 [103] shall be supported over the II-NNI.

The "application/vnd.etsi.cug+xml" MIME body as specified 3GPP TS 24.654 [103] shall be supported in INVITE requests at the II-NNI.

> NOTE: If no agreement between the originating network and the terminating network exists to support the CUG supplementary service the INVITE request is rejected as described in IETF RFC 5621 [89] when the "handling" parameter in the Content-Disposition of the " application/vnd.etsi.cug+xml" MIME body is set to "required".

The 403 (Forbidden) response, the 603 (Decline) response and the 500 (Server Internal Error) response shall be supported at II-NNI.

SIP based user configuration as described in 3GPP TS 24.238 [100] shall be supported at the roaming II-NNI.

12.17 Personal Network Management (PNM)

Service specific requirements in accordance with 3GPP TS 24.259 [99] shall be supported over the II-NNI.

A g.3gpp.iari_ref feature tag with the value urn:urn-7:3gpp-application.ims.iari.pnm-controller in the Contact header field of the REGISTER request shall be supported at the roaming II-NNI.

A g.3gpp.iari_ref feature tag with the value urn:urn-7:3gpp-application.ims.iari.pnm-controller in the Accept-Contact header field shall be supported at the II-NNI.

The History-Info header field shall be supported at II-NNI.

A "histinfo" option tag as described by 3GPP TS 24.259 [99] in the Supported header field shall be supported at II-NNI.

12.18 Three-Party (3PTY)

Service specific requirements in accordance with 3GPP TS 24.605 [105] shall be supported over the II-NNI.

> NOTE 1: The requirements below can be relaxed by bilateral agreements between operators.

The requirements for the 3PTY supplementary service are the same as for the CONF supplementary service specified in subclause 12.19 with the following additional requirement:

- If a REFER request is supported at the II-NNI, a Replaces header field in the header portion of the SIP URI of the Refer-to header field of the REFER request shall also be supported at II-NNI.

> NOTE 2: Subclause 12.19 describes the conditions for the support of the REFER request.

12.19 Conference (CONF)

Service specific requirements in accordance with 3GPP TS 24.605 [105] shall be supported over the II-NNI.

> NOTE 1: The requirements below can be relaxed by bilateral agreements between operators.

The REFER request shall be supported at the roaming II-NNI in the direction from visited to home network. Based on inter-operator agreement, the REFER request may be supported at the non-roaming II-NNI, and at the roaming II-NNI in the direction from home network to visited network.

NOTE 2: If the REFER request is not supported at the non-roaming II-NNI, or at the roaming II-NNI in the direction from home network to visited network, an attempt of an UE to send the REFER directly to peers to invite them to a conference without involvement of the conference focus can fail over such an II-NNI. However such failures can also occur if a peer is located in a circuit switched network, or if a peer does not support the REFER method. An operator can avoid such failures by configuring an AS to convert the REFER to an INVITE, as detailed in 3GPP TS 24.628 [38]. Information on security risks associated with the REFER request is provided within the "security consideration" of IETF RFC 3515 [22].

NOTE 3: A REFER request can be rejected by IBCF based on operator policy as specified by 3GPP TS 24.229 [5].

The application/resource-lists+xml MIME body shall be supported at the roaming II-NNI.

The Referred-By header field in the INVITE request shall be supported at the II-NNI.

The "isfocus" feature parameter indicated in Contact header field of the INVITE request and in the 200 (OK) response shall be supported at the II-NNI.

The SUBSCRIBE request including the "conference" event package name in the Event header field and the NOTIFY request procedures according to 3GPP TS 24.147 [106] shall be supported at the II-NNI.

NOTE 4: The subscription to "conference event" package does not apply at the roaming II-NNI between the MSC Server enhanced for ICS and the IMS network where the communication is anchored.

12.20 Flexible Alerting (FA)

Service specific requirements in accordance with 3GPP TS 24.239 [101] shall be supported over the II-NNI.

The 486 (Busy Here) response code shall be supported at the II-NNI.

SIP based user configuration as described in 3GPP TS 24.238 [100] shall be supported at the roaming II-NNI.

12.21 Announcements

12.21.1 General

Announcements may be provided during the establishment of a communication session or during an established communication session. Both of them shall be managed over the II-NNI.

12.21.2 Providing announcements during the establishment of a communication session

Procedures as described in 3GPP TS 24.628 [38] are used to provide announcements.

The P-Early-Media header field authorizing early media as defined in IETF RFC 5009 [74] during the establishment of a communication shall be supported at the II-NNI.

The Alert-Info header field in the 180 (Ringing) response to the INVITE request during the establishment of a communication, should be supported at the II-NNI.

NOTE: The IBCF can decide to remove the Alert-Info header field if required by local policy.

12.21.3 Providing announcements during an established communication session

Procedures as described in 3GPP TS 24.628 [38] are used to provide announcements.

In case of provision of an announcement to a user over the II-NNI during an established communication, the Call-Info header field in a re-INVITE request should be supported at the II-NNI.

NOTE 1: An alternative method to provide announcements is to use the existing media stream.

NOTE 2: The IBCF can decide to remove the Call-Info header field if required by local policy.

12.22 Advice of Charge (AOC)

Service specific requirements in accordance with 3GPP TS 24.647 [122] shall be supported over the II-NNI.

The Accept header field with "application/vnd.etsi.aoc+xml" shall be supported at the roaming II-NNI.

The INVITE method containing an "application/vnd.etsi.aoc+xml" MIME body shall be supported at the roaming II-NNI.

1xx provisional responses and the 200 (OK) response to the initial INVITE request containing an "application/vnd.etsi.aoc+xml" MIME body shall be supported at the roaming II-NNI.

The INFO method containing an application/vnd.etsi.aoc+xml MIME body shall be supported at the roaming II-NNI.

The response code 504 (Server Time-out) shall be supported at the II-NNI.

A Reason header field with a reason value with the protocol set to "SIP" and the cause set to "504" and a reason value with the protocol set to "Q.850" and the cause set to "31" in the BYE method shall be supported at the II-NNI.

An "application/vnd.etsi.aoc+xml" MIME body in the BYE request or the final response to the BYE request shall be supported over the roaming II-NNI.

12.23 Completion of Communications on Not Logged-in (CCNL)

Service specific requirements in accordance with 3GPP TS 24.642 [109] shall be supported over the II-NNI.

The response code 480 (Temporarily unavailable) containing a Call-Info header field with a purpose parameter set to 'call-completion' and the m parameter set to "NL" shall be supported at the non-roaming II-NNI.

For invoking and revoking of the CCNL supplementary service, announcement procedures shall be used to provide announcements and inband-interaction procedures as described in subclause 12.21.2 shall be supported at the roaming II-NNI.

The response code 199 (Early Dialog Terminated) shall be supported at the roaming II-NNI.

Basic call procedures and in case of a call-completion recall initiated by a REFER request, normal REFER method handling procedures according to 3GPP TS 24.229 [5] shall be supported at the roaming II-NNI.

As a network option the special REFER request handling procedures according to 3GPP TS 24.628 [110] should be supported at the roaming II-NNI.

NOTE: 3rd party call control procedures can be used when the REFER request is not supported at the II-NNI.

The SUBSCRIBE and NOTIFY methods according to IETF RFC 3265 [20] and 3GPP TS 24.229 [5] containing the event package name "call-completion" and the Call-Info header field with a purpose parameter set to 'call-completion' and the m parameter set to "NL" shall be supported at the non-roaming II-NNI.

The Request-URI with the "m" SIP URI parameter with a value set to "NL" and the Call-Info header field with a purpose parameter set to 'call-completion' and the "m" parameter set to "NL" in the INVITE method shall be supported at the non-roaming II-NNI.

SIP based user configuration as described in 3GPP TS 24.238 [100] shall be supported at the roaming II-NNI.

13 Interoperability of IMS Centralized Services (ICS) over II-NNI

13.1 General

In order to assure the end-to-end service interoperability through the Inter-IMS Network to Network Interface (II-NNI), the associated service of the IMS Centralized Services (ICS) may be supported on the II-NNI between two IMS networks. The support of ICS is based on agreement between operators.

If ICS is supported, the related procedures from the 3GPP TS 24.292 [121] and 3GPP TS 29.292 [130] shall be applied with the requirements in the subclause 13.2 due to the crossing of the II-NNI.

13.2 IMS Centralized Services (ICS)

Service specific requirements in accordance with 3GPP TS 24.292 [121] and 3GPP TS 29.292 [130] shall be supported over the II-NNI.

The "g.3gpp.ics" media feature tag in the Contact header field as specified in subclause annex B of 3GPP TS 24.292 [121] shall be supported at the roaming II-NNI.

The "g.3gpp.accesstype" media feature tag in the Contact header field as specified in subclause annex B of 3GPP TS 24.292 [121] shall be supported at the roaming II-NNI.

An Accept-Contact header field including the "g.3gpp.accesstype" in the INVITE request shall be supported at the roaming II-NNI.

The P-Early-Media header field from the MSC Server shall be supported on the roaming II-NNI.

The Reason header field with Q.850 cause values in the CANCEL request and the BYE request shall be supported at the roaming II-NNI.

Procedures as described in subclause 14.4 are used to provide MSC server assisted mid-call features.

14 Interoperability of IMS Service Continuity over II-NNI

14.1 General

In order to assure the end-to-end service interoperability through the Inter-IMS Network to Network Interface (II-NNI), the associated services of the IMS Service Continuity may be supported on the II-NNI between two IMS networks. The support of each service is based on agreement between operators.

If a service is supported, the related procedures from the 3GPP TS 24.237 [131] shall be applied with the requirements in the relevant subclause below due to the crossing of the II-NNI.

14.2 Single Radio Voice Call Continuity (SRVCC)

Service specific requirements in accordance with 3GPP TS 24.237 [131] shall be supported over the II-NNI.

The g.3gpp.atcf media feature tag in the Path header field of the REGISTER request as described in IETF draft-holmberg-sipcore-proxy-feature [143] shall be supported at the roaming NNI.

Editor's note: The transfer of ATU-STI and C-MSISDN from SCC AS to the MSC server over II-NNI will impact this section and is FFS in CT1 at the moment.

The Reason header field containing protocol "SIP" and reason parameter "cause" with value "487" in the re-INVITE request shall be supported at the roaming NNI.

An INFO request containing the Info-Package header field as specified in draft-ietf-sipcore-info-events [39] with 3gpp.state-and-event info package name and an "application/vnd. 3gpp.state-and-event-info +xml" XML body shall be supported at the roaming II-NNI.

The Reason header field containing a SIP 503 (Service Unavailable) response in the SIP BYE request shall be supported at the roaming NNI.

Procedures as described in subclause 14.4 are used to provide MSC server assisted mid-call features.

14.3   Inter UE Transfer (IUT)

14.3.1   IUT without establishment of a collaborative session

Service specific requirements in accordance with 3GPP TS 24.237 [131] shall be supported over the II-NNI.

The REFER request shall be supported at the roaming II-NNI.

The Refer-To header field containing a body parameter including a Replaces header field and the Require header field set to "replaces" shall be supported at the roaming II-NNI.

The Refer-To header field containing a body parameter including a Target-Dialog header field and the Require header field set to "tdialog" shall be supported at the roaming II-NNI.

The Refer-To header field containing a body parameter including an Accept-Contact header field with the "g.3gpp.icsi-ref" media feature tag and a P-Preferred-Service header field set to the IMS communication service identifier shall be supported at the roaming II-NNI.

The Contact header field containing a public GRUU or temporary GRUU as specified in 3GPP TS 24.229 [5] shall be supported at the roaming II-NNI.

NOTIFY requests containing a "sipfrag" MIME body as specified in IETF RFC 3515 [22] shall be supported at the roaming II-NNI.

14.3.2   IUT using a collaborative session

Service specific requirements in accordance with 3GPP TS 24.237 [131] shall be supported over the II-NNI.

The REFER request shall be supported at the roaming II-NNI.

The Refer-To header field containing a body parameter including a MIME sdp body shall be supported at the roaming II-NNI.

The Accept header field containing the MIME type "message/sipfrag" in the REFER request shall be supported at the II-NNI.

The Target-Dialog header field in the REFER request shall be supported at the roaming II-NNI.

The Contact header field in the REFER request containing the "g.3gpp.iut-controller" media feature tag as described in annex C of 3GPP TS 24.237 [131] shall be supported at the roaming II-NNI.

The NOTIFY request containing a "sipfrag" MIME body as specified in IETF RFC 3515 [22] shall be supported at the roaming II-NNI.

The SUBSCRIBE request including the "dialog" event package and the "dialog-info+xml" MIME body in NOTIFY requests shall be supported at the roaming II-NNI.

The Refer-To header field including the method parameter set to "BYE" shall be supported at the roaming II-NNI.

14.4   MSC server assisted mid-call feature

Editor's note: The impact on this subclause due to the release 10 transfer of conference call is FFS.

Service specific requirements in accordance with 3GPP TS 24.237 [131] shall be supported over the II-NNI.

The Contact header field of the REGISTER request and the 200 (OK) response containing g.3gpp.mid-call media feature tag as described in annex C of 3GPP 24.237 [131] shall be supported at the roaming II-NNI.

A Contact header field of the INVITE request and the 200 (OK) response containing "g.3gpp.mid-call" media feature tag as described in annex C of 3GPP 24.237 [131] shall be supported at the roaming II-NNI.

An Accept header field in the INVITE request containing the MIME type "vnd.3gpp.mid-call+xml" as specified in annex D.1 of 3GPP TS 24.237 [131] shall be supported at the roaming II-NNI.

The "vnd.3gpp.mid-call+xml" MIME body described in annex D.1.3 of 3GPP TS 24.237 [131] in the INVITE request shall be supported at the roaming II-NNI.

An INFO request containing the Info-Package header field as specified in draft-ietf-sipcore-info-events [39] with 3gpp.state-and-event info package name and an "application/vnd. 3gpp.state-and-event-info +xml" XML body shall be supported at the roaming II-NNI.

A REFER request sent inside an existing SIP dialog containing the "vnd.3gpp.mid-call+xml" body at the roaming II-NNI specified in the annex D.1.3 of 3GPP TS 24.237 [131] shall be supported at the roaming II-NNI.

The Refer-To header field in the REFER request containing the following:

- a Target-Dialog URI header field;

- a Require URI header field populated with the option tag value "tdialog";

- a To URI header field;

- a From URI header field;

- a Content-Type header field with "application/sdp"; and

- a "body" URI header field populated with an SDP MIME body

shall be supported at the roaming II-NNI.

The Contact header field of the REFER request and 2xx response to the request containing "g.3gpp.mid-call" media feature tag as described in annex C of 3GPP 24.237 [131] shall be supported at the roaming II-NNI.

15 Presence service

15.0 General

In order to assure the end-to-end service interoperability through the Inter-IMS Network to Network Interface (II-NNI), the associated functions of the Presence service may be supported on the II-NNI between two IMS networks. The support of each function is based on agreement between operators.

If a function is requirements is supported, the related procedures from the 3GPP TS 24.141 [132] shall be applied with the requirements in the relevant subclause below due to the crossing of the II-NNI.

15.1 Subscription of presence information

Service specific requirements in accordance with 3GPP TS 24.141 [132] shall be supported over the II-NNI.

A PUBLISH request identifying the Presentity using a SIP URI, a tel URI or a PRES URI and the Event header field with the value "presence" and containing an "application/pidf" MIME body shall be supported at the roaming II-NNI.

Additionally to the above and in any combination, a "multipart/related" content type and an "application/pidf-diff" MIME body can be included in the PUBLISH request and shall be supported at the roaming II-NNI.

The response code 488 (Not Acceptable Here) containing a Policy-Contact header field as defined in draft-ietf-sip-session-policy-framework [133] shall be supported at the roaming II-NNI.A NOTIFY request containing the "application/sipfrag" MIME body shall be supported at the roaming II-NNI.

A SUBSCRIBE request with a Request-URI containing a SIP URI, a TEL URI or a pres URI, the Event header field set to "presence" and Accept header fields with values "application/pidf+xml" and "multipart/related" shall be supported at the II-NNI.

Additionally to the above a "application/simple-filter" MIME body can appear in the SUBSCRIBE request and shall be supported at the II-NNI.

Additionally to the above and in any combination a "multipart/mixed" content type and an "application/resource-lists" MIME body can appear in the SUBSCRIBE request and shall be supported at the roaming II-NNI.

A NOTIFY request including an Event header field with the value "presence" and an "application/pidf" MIME body shall be supported at the II-NNI.

> NOTE: The NOTIFY request can contain substantial amount of data and TCP is expected to be used as the transport protocol.

15.2   Watcher subscribing to Presence List

Service specific requirements in accordance with 3GPP TS 24.141 [132] shall be supported over the II-NNI.

The requirements for the watcher subscribing to the Presence List are the same as subscribing to presence information as specified in subclause 15.1 with the following additional requirement:

- The SUBSCRIBE request containing a Supported header field with the value "eventlist" shall also be supported at the roaming II-NNI;

- The SUBSCRIBE request containing a Accept header field with the value "application/rlmi+xml" shall be supported at the roaming II-NNI;

- A response code 200 (OK) to the SUBSCRIBE request containing the Require header field with the value "eventlist" shall be supported at the roaming II-NNI; and,

- A NOTIFY message containing the "multipart/related" content type and an "application/rlmi+xml " MIME body shall be supported at the roaming II-NNI.

> NOTE: The NOTIFY request can contain substantial amount of data and TCP is expected to be used as the transport protocol.

15.3   Subscription to Watcher Information

Service specific requirements in accordance with 3GPP TS 24.141 [132] shall be supported over the II-NNI.

A SUBSCRIBE request containing an Event header field with the value "presence.wininfo" and an Accept header field with value "application/watcherinfo+xml" shall be supported at the roaming II-NNI.

A NOTIFY request containing the Event header field with the value "presence.wininfo" and an "application/watcherinfo" MIME body shall be supported at the roaming II-NNI.

> NOTE: The NOTIFY request can contain substantial amount of data and TCP is expected to be used as the transport protocol.

15.4   Subscription to state changes in XML documents

Service specific requirements in accordance with 3GPP TS 24.141 [132] shall be supported over the II-NNI.

A SUBSCRIBE request containing the Event header field with the value "ua-profile" and parameters specified in IETF RFC 5875 [134] shall be supported at the roaming II-NNI.

A NOTIFY request containing the Event header field with the value "ua-profile", the multipart/mixed content type and any MIME body shall be supported at the roaming II-NNI.

NOTE: The NOTIFY request can contain substantial amount of data and TCP is expected to be the transport protocol.

15.5 Presence enhancements specified in Open Mobile Alliance (OMA) Release 1.1

15.5.1 General

In order to assure the end-to-end service interoperability through the Inter-IMS Network to Network Interface (II-NNI), the associated functions of the OMA Presence service may be supported on the II-NNI between two IMS networks. The support of each function is based on agreement between operators.

If a function of the OMA Presence Release 1.1 is supported, the related procedures from the OMA-TS-Presence_SIMPLE-V1_1 [142] shall be applied with the requirements in the relevant subclause below due to the crossing of the II-NNI.

15.5.2 OMA subscription of presence information

The requirements for the OMA subscription of presence information are the same as subclause 15.1

15.5.3 OMA watcher subscribing to Presence List

The requirements for the OMA watcher subscribing to Presence List are the same as subclause 15.2.

15.5.4 OMA subscription to Watcher Information

The requirements for the OMA subscription to Watcher Information are the same as subclause 15.3

15.6 Presence enhancements specified in Open Mobile Alliance (OMA) Release 2.0

15.6.1 General

In order to assure the end-to-end service interoperability through the Inter-IMS Network to Network Interface (II-NNI), the associated functions of the OMA Presence service may be supported on the II-NNI between two IMS networks. The support of each function is based on agreement between operators.

If a function of the OMA Presence Release 2.0 is supported, the related procedures from the OMA-TS-Presence_SIMPLE-V2_0 [138] shall be applied with the requirements in the relevant subclause below due to the crossing of the II-NNI.

15.6.2 OMA subscription of presence information

The requirements for the OMA subscription of presence information are the same as subclause 15. 5.2 with the following additional requirement:

- A Policy-Contact header field in the 488 (Not Acceptable Here) response in PUBLISH request shall be supported at II-NNI.

- An Allow header field containing the value "REFER" in a PUBLISH request shall be supported at II-NNI.

- A Policy-Contact header field in a 488 (Not Acceptable Here) response to a PUBLISH request shall be supported at II-NNI.

- A Suppress-If- Match header field in a SUBSCRIBE request shall be supported at II-NNI.

- An Accept-Encoding header field containg the value "gzip" in a SUBSCRIBE request shall be supported at II-NNI.

- An "application/vnd.oma.suppnot+xml" MIME body in a SUBSCRIBE request shall be supported at II-NNI.

- A Content-Encoding header field containing the value "gzip" in a NOTIFY request shall be supported at II-NNI.

- A "multipart/mixed" content type in a SUBSCRIBE request shall be supported at II-NNI.

- A Refer-To header field with the value "method=PUBLISH?event=presence", a Refer-Sub header field and a SIP-If-Match header field in a REFER request shall be supported at II-NNI.

15.6.3   OMA watcher subscribing to Presence List

The requirements for the OMA watcher subscribing to Presence List are the same as subclause 15.5.3 with the following additional requirements;

- A Suppress-If- Match header field in a SUBSCRIBE request shall be supported at II-NNI.

- An Accept-Encoding header field containing the value "gzip" in a SUBSCRIBE request shall be supported at II-NNI.

- A body containing an "application/vnd.oma.suppnot+xml" content type in a SUBSCRIBE request shall be supported at II-NNI.

- A body containing an "application/resource-list+xml" content type in a SUBSCRIBE request shall be supported at II-NNI.

- A "multipart/mixed" content type in a SUBSCRIBE request shall be supported at II-NNI.

- A NOTIFY request with a Content-Encoding header field containing the value "gzip" shall be supported at II-NNI.

15.6.4   OMA subscription to Watcher Information

The requirements for the OMA subscription to Watcher Information are the same as subclause 15.5.4 with the following additional requirement:

- Indicating support for "multipart/mixed" and "application/simple-filter+xml" in the Accept header field of the SUBSCRIBE request shall be supported at II-NNI

- Multiple "application/simple-filter+xml" MIME bodies in the NOTIFY request shall be supported at II-NNI.

- A Suppress-If-Match header field in a SUBSCRIBE request shall be supported at II-NNI.

- An Accept-Encoding header field containing the value 'gzip' in the SUBSCRIBE request shall be supported at II-NNI.

- A body with multiple content of the multipart/mixed content type in a NOTIFY request shall be supported at II-NNI.

- A Content-Encoding header field with the value "gzip" in a NOTIFY request shall be supported at II-NNI.

- A Refer-To header field with the value "method=SUBSCRIBE?Event=presence.winfo" and a Refer-Sub header field in a REFER request sent to a Watcher Information Subscriber shall be supported at II-NNI.

15.6.5   Subscription to state changes in XML documents

The requirements for the OMA watcher subscribing to Presence List are the same as subclause 15.4 with the following additional requirements

- An Accept header field indicating the support for "application/xcap-diff+xml", "application/rlmi+xml" and "multipart/related" in a SUBSCRIBE request shall be supported at II-NNI.

- An Accept-Encoding header field with the value "gzip" in a SUBSCRIBE request shall be supported at II-NNI.

- A Content-Encoding header field containing the value "gzip" in a NOTIFY request shall be supported at II-NNI.

- mMultiple "multipart/related" MIME bodies in a NOTIFY request shall be supported at II-NNI.

- An "application/rlmi+xml" MIME bodies in a NOTIFY request shall be supported at II-NNI.

15.6.6   Void

15.6.7   Void

16   Messaging service

16.1   General

In order to assure the end-to-end service interoperability through the Inter-IMS Network to Network Interface (II-NNI), the associated function of the messaging service may be supported on the II-NNI between two IMS networks.

If a function is supported, the related procedures from the 3GPP TS 24.247 [139] shall be applied with the requirements in the relevant subclause below due to the crossing of the II-NNI.

16.2   Page-mode messaging

Service specific requirements in accordance with clause 5 of 3GPP TS 24.247 [139] shall be supported over the II-NNI.

A MESSAGE request containing the "application/recipient-list" MIME body specified in IETF RFC 5365 [67], a Required header field with the 'recipient-list-message' option-tag; and a body carrying payload shall be supported at the roaming II-NNI.

A MESSAGE request containing:

- a body that carrying payload; or

- the "application/im-iscomposing" MIME body.

shall be supported at II-NNI.

The response code 415 (Unsupported Media Type) and the response code 202 (Accepted) shall be supported at the II-NNI.

16.4   Session-mode messaging

Service specific requirements in accordance with clause 6 of 3GPP TS 24.247 [139] shall be supported over the II-NNI.

No restrictions at II-NNI identified.

16.5 Session-mode messaging conferences

Service specific requirements in accordance with clause 7 of 3GPP TS 24.247 [139] shall be supported over the II-NNI.

The "application/resource-lists" MIME body included in the INVITE request shall be supported at the roaming II-NNI.

The media feature tag isfocus in the Contact header field of the INVITE request and responses to the INVITE request shall be supported at the II-NNI.

The SUBSCRIBE request including the "conference" event package name in the Event header field and the NOTIFY request procedures according to 3GPP TS 24.147 [106] shall be supported at the II-NNI.

The REFER request containing a Referred-By header field and NOTIFY requests procedures according to 3GPP TS 24.147 [106] shall be supported at the II-NNI.

The REFER request containing the BYE method URI parameter in the Refer-To header shall be supported at the II-NNI.

The Referred-By header field in the INVITE request shall be supported at the II-NNI.

17 Optimal Media Routeing

17.1 General

Based on inter-operator agreement, the Optimal Media Routeing (OMR) procedures may be supported over the II-NNI,

If OMR procedures are supported, the procedures in 3GPP TS 29.079 [148] shall be applied and the capabilities below shall be provided at the II-NNI.

17.2 OMR related SDP attributes

The "visited-realm", "secondary-realm", "omr-codecs", "omr-m-att", "omr-s-att", "omr-m-bw", "omr-s-bw", "omr-s-cksum", and "omr-m-cksum" SDP attributes defined in 3GPP TS 24.229 [5] shall be supported at the II-NNI.

17.3 IP realm names

Operators need to agree on unique names for IP realms (as defined in 3GPP TS 29.079 [148]) used in their own and interconnecting networks to avoid a collision of IP realm names. Operators may choose to share an IP realm, and shall then also assign a single unique name to that realm. As defined in 3GPP TS 24.229 [5], a public IPv4 or IPv6 address reachable from the open internet is associated with the special realm "IN".

Annex A (informative): Summary of SIP header fields

A summary of the SIP header fields to be used in case of interconnection by using II-NNI is proposed in table A.1.

The starting point is the sending behaviour described for proxy and UA roles in annex A of 3GPP TS 24.229 [5]:

- In case of misalignment between table A.1 and the behaviour described in 3GPP TS 24.229 [5], the behaviour in 3GPP TS 24.229 [5] has the precedence.

- In case a header field is not described in table A.1 and it is described in 3GPP TS 24.229 [5], the description in 3GPP TS 24.229 [5] is applicable over II-NNI.

- If a header field is not described in 3GPP TS 24.229 [5], the description in table A.1 is applicable over II-NNI.

The notation of the codes used for the SIP headers listed in table A.1 has a different meaning to the one proposed for the SIP messages. The definition of these terms is provided in table A.2.

Table A.1: Supported header fields

Item	Header field	Ref.	II-NNI
1	Accept	[5]	m
2	Accept-Contact	[5]	m
3	Accept-Encoding	[5]	m
4	Accept-Language	[5]	m
4a	Accept-Resource-Priority	[5]	o
5	Alert-Info	[5]	o
6	Allow	[5]	m
7	Allow-Events	[5]	m
8	Authentication-Info	[5]	m
9	Authorization	[5]	m
9a	Answer-Mode	[5]	o
10	Call-ID	[5]	m
11	Call-Info	[5]	m
12	Contact	[5]	m
13	Content-Disposition	[5]	m
14	Content-Encoding	[5]	m
15	Content-Language	[5]	m
16	Content-Length	[5]	m
17	Content-Type	[5]	m
18	Cseq	[5]	m
19	Date	[5]	m
20	Error-Info	[5]	o
21	Expires	[5]	m
21a	Flow-Timer	[5]	m on roaming II-NNI between home and visited IMS, else o
22	Event	[5]	m
23	From	[5]	m
24	Geolocation	[5]	m
24a	Geolocation-Error	[5]	m
25	History-Info	subclause 6.1.1.3.1 (Table 6.2, item 4)	o
25a	Info-Package	[5]	o
26	In-Reply-To	[5]	o
27	Join	[5]	o
27a	Max-Breadth	[5]	n/a
28	Max-Forwards	[5]	m
29	Min-Expires	[5]	m
30	MIME-Version	[5]	m
31	Min-SE	[5]	m
32	Organization	[5]	m
33	P-Access-Network-Info	subclause 6.1.1.3.1 (Table 6.2, item 2)	m in case of a trust relationship between the interconnected networks, else n/a
33a	P-Answer-state	[5]	o
34	P-Asserted-Identity	subclause 6.1.1.3.1 (Table 6.2, item 1)	m in case of a trust relationship between the interconnected networks, else n/a
35	P-Asserted-Service	subclause 6.1.1.3.1 (Table 6.2, item 5)	o
35a	P-Associated-URI	[5]	m on roaming II-NNI between home and visited IMS, else n/a
36	P-Called-Party-ID	[5]	m on roaming II-NNI between home and visited IMS, else n/a
37	P-Charging-Function-Addresses	subclause 6.1.1.3.1 (Table 6.2,	n/a

Item	Header field	Ref.	II-NNI
		item 7)	
38	P-Charging-Vector	subclause 6.1.1.3.1 (Table 6.2, item 6)	m on roaming II-NNI, else o
38a	P-Debug-Id	[5]	o
39	P-Early-Media	subclause 6.1.1.3.1 (Table 6.2, item 12)	m in case of a trust relationship between the interconnected networks, else n/a
40	P-Media-Authorization	[5]	n/a
41	P-Preferred-Identity	[5]	n/a
42	P-Preferred-Service	[5]	m on roaming II-NNI, else n/a
43	P-Private-Network-Indication	subclause 6.1.1.3.1 (Table 6.2, item 9)	m on roaming II-NNI, else o
44	P-Profile-Key	subclause 6.1.1.3.1 (Table 6.2, item 8)	o on roaming NNI between home and visited IMS, else n/a
44a	P-Refused-URI-List	[5]	o on non-roaming II-NNI else n/a
45	P-Served-User	subclause 6.1.1.3.1 (Table 6.2, item 10)	m on roaming NNI between home and visited IMS, else n/a
46	P-User-Database	[5]	n/a
47	P-Visited-Network-ID	[5]	m on roaming II-NNI, else n/a
47a	Path	[5]	m on roaming II-NNI, else n/a
47b	Permission-Missing	[5]	o
47c	Policy-Contact	[145] and subclause 15.6.2	o
48	Priority	[5]	o
48a	Priv-Answer-Mode	[5]	o
49	Privacy	[5]	m
50	Proxy- Authenticate	[5]	m on roaming II-NNI, else n/a
51	Proxy-Authorization	[5]	m on roaming II-NNI, else n/a
52	Proxy-Require	[5]	m
52a	RAck	[5]	m
53	Reason	[5] and sub-clause 6.1.1.3.1 (Table 6.2, item 11)	o when in a request. When in a response, m in case of a trust relationship between the interconnected networks, else n/a
54	Record-Route	[5]	m
54a	Recv-Info	[5]	o
55	Referred-By	[5]	m
55a	Refer-Sub	[5]	m in the case the REFER request is supported, else n/a
55b	Refer-To	[5]	m in the case the REFER request is supported, else n/a
56	Reject-Contact	[5]	m
57	Replaces	[5]	o
58	Reply-To	[5]	o
59	Request-Disposition	[5]	m
60	Require	[5]	m
61	Resource-Priority	sub-clause 6.1.1.3.1 (Table 6.2, item 3)	o
61a	Retry-After	[5]	o
62	Route	[5]	m
62a	RSeq	[5]	m
63	Security-Client	[5]	n/a
63a	Security-Server	[5]	n/a

Item	Header field	Ref.	II-NNI
64	Security-Verify	[5]	n/a
65	Server	[5]	o
65a	Service-Route	[5]	m on roaming II-NNI, else n/a
65b	Session-ID	[5]	o
66	Session-Expires	[5]	m
66a	SIP-ETag	[5]	m in the case the PUBLISH request is supported, else n/a
66b	SIP-If-Match	[5]	m in the case the PUBLISH request is supported, else n/a
67	Subject	[5]	o
67a	Subscription-State	[5]	m in the case the NOTIFY request is supported, else n/a
67b	Suppress-If-Match	[144] and subclause 15.6.4	o
68	Supported	[5]	m
68a	Target-Dialog	[5]	o
69	Timestamp	[5]	m
70	To	[5]	m
71	Trigger-Consent	[5]	m
71a	Unsupported	[5]	m
72	User-Agent	[5]	m
73	User-to-User	[5]	o
74	Via	[5]	m
75	Warning	[5]	o
76	WWW-Authenticate	[5]	m on roaming II-NNI, else n/a

Table A.2: Key to notation codes for SIP header fields

Notation code	Meaning
m	The SIP header field is applicable at II-NNI. Supporting a SIP header field at the II-NNI means that this header field is passed through the IBCF. It does not imply that network elements inside the serving and served networks or user equipment connected to these networks shall support this header field, where 3GPP TS 24.229 [5] is applied. If specified in 3GPP TS 24.229, the IBCF modifies the SIP header field.
o	The applicability of SIP header field at II-NNI depends on bilateral agreement between the operators.
n/a	It is impossible to use the SIP header field at the II-NNI. This header field could be discarded by the IBCF.

Annex B (informative):
Dynamic view of SIP header fields within SIP messages

B.1   Scope

This annex provides the applicability of SIP header fields in SIP messages over II-NNI by using the methodology of a so-called "dynamic view", as used in IETF RFC 3261 [13] and other SIP related RFCs. This methodology documents the presence of SIP header fields in SIP messages over the II-NNI and also takes into account dynamic conditions, for instance the presence of a SIP header field in a SIP request message as condition for the SIP header field in the corresponding SIP response message.

Specific information about the applicability of SIP header fields in SIP messages in a dynamic view is also provided for cases where an MMTEL supplementary service is supported over the II-NNI between operators.

The applicability of SIP header fields described in this annex is based on the procedures described in 3GPP TS 24.229 [5] and the list of SIP header fields in annex A of 3GPP TS 24.229 [5].

B.2   Methodology

The meaning of the notation codes used in the tables in subsequent clauses is as follows:

In the "RFC status" column, the notation codes defined in IETF RFC 3261 [13] clause 20 are applied.

In the "II-NNI condition" column the notation codes defined in Table B.2.1 are used. If a capability of a SIP header field is specified as either optional or conditional in Table 6.1.3.1, then "II-NNI condition" of the SIP header field is described with conditional expression.

In each request-related table, each "Item" number for a SIP header field inherits that of annex A of 3GPP TS 24.229 [5].

In each response-related table, the SIP status code for which the header field is applicable is described in the "SIP status code" column. The notation codes for the "where" column as defined in IETF RFC 3261 [13] clause 20 are applied. The notation code "r" in "SIP status code" column corresponds to any SIP status code which is described in annex A of 3GPP TS 24.229 [5] for the corresponding method. Any SIP header field not listed in a table is not applicable for the corresponding SIP message.

Table B.2.1: Key to notation codes for SIP header fields in dynamic view for II-NNI

Notation code (NOTE1)	Meaning
dc	The SIP header field is required to be present in a SIP message over II-NNI depending on the context of the SIP message.
dm	The SIP header field shall be always present in a SIP message over II-NNI, and if received, it must be handled according to 3GPP TS 24.229 [5].
dm*	The SIP header field should be present in a SIP message over II-NNI, but the IMS network need to be prepared to receive a SIP message without that header field.
do	The SIP header field can be present in a SIP message over II-NNI, and if received, it must be handled according to 3GPP TS 24.229 [5]. (NOTE2)
dt	The header field should be present in a SIP message over II-NNI, but the IMS network need to be prepared to receive a SIP message without that header field. If TCP is used as a transport, then the header field must be present in a SIP message.
d*	The SIP header field is required to be present in a SIP message if the message body is not empty.
dn/a	The SIP header field is shall not be present in a SIP message over II-NNI. (NOTE3)
NOTE1:	The meaning of the notation codes is same as IETF RFC 3261 [13] clause 20, and "d" is used to emphasise the dynamic view.
NOTE2:	If specified by local policy rules, the IBCF acting as entry point may omit or modify any received SIP header fields prior to forwarding SIP messages as specified in 3GPP TS 24.229 [5] subclause 5.10.6.2.
NOTE3:	The SIP header field can be removed at the IBCF acting as exit point by using screening functionality defined in 3GPP TS 24.229 [5] clause 5.10.6.2.

B.3 ACK method

Table B.3.1: Supported header fields within the ACK request

Item	Header field	Ref.	RFC status	II-NNI condition
1	Accept-Contact	[51]	o	do
2	Allow-Events	[20]	o	IF Table 6.1.3.1/23 THEN do
3	Authorization	[13]	o	IF Table 6.1.3.1/7 THEN do
4	Call-ID	[13]	m	dm
6	Content-Disposition	[13]	o	do
7	Content-Encoding	[13]	o	do
8	Content-Language	[13]	o	do
9	Content-Length	[13]	t	dt
10	Content-Type	[13]	*	d*
11	Cseq	[13]	m	dm
12	Date	[13]	o	do
13	From	[13]	m	dm
13B	Max-Breadth	[79]	o	do
14	Max-Forwards	[13]	m	dm
15	MIME-Version	[13]	o	do
15A	P-Debug-ID	[87]	o	IF Table 6.1.3.1/83 THEN do
15B	Privacy	[34]	o	do
16	Proxy-Authorization	[13]	o	IF Table 6.1.3.1/7 THEN do
17	Proxy-Require	[13]	n/a	dn/a
17A	Reason	[48]	o	IF Table 6.1.3.1/40 do
17B	Recv-Info	[39]	n/a	dn/a
17C	Reject-Contact	[51]	o	do
17D	Request-Disposition	[51]	o	do
18	Require	[13]	n/a	dn/a
18A	Resource-Priority	[78]	o	IF Table 6.1.3.1/73 THEN do
19	Route	[13]	c	dc
19A	Session-ID	[124]	m	IF Table 6.1.3.1/94 THEN dm
20	Timestamp	[13]	o	do
21	To	[13]	m	dm
22	User-Agent	[13]	o	do
23	Via	[13]	m	dm

B.4 BYE method

Table B.4.1: Supported header fields within the BYE request

Item	Header field	Ref.	RFC status	II-NNI condition
1	Accept	[13]	o	do
1A	Accept-Contact	[51]	o	do
2	Accept-Encoding	[13]	o	do
3	Accept-Language	[13]	o	do
3A	Allow	[13]	o	do
4	Allow-Events	[20]	o	IF Table 6.1.3.1/23 THEN do
5	Authorization	[13]	o	IF Table 6.1.3.1/7 THEN do
6	Call-ID	[13]	m	dm
7	Content-Disposition	[13]	o	do
8	Content-Encoding	[13]	o	do
9	Content-Language	[13]	o	do
10	Content-Length	[13]	t	dt
11	Content-Type	[13]	*	d*
12	Cseq	[13]	m	dm
13	Date	[13]	o	do
14	From	[13]	m	dm
14A	Geolocation	[68]	o	do
14B	Max-Breadth	[79]	o	do
15	Max-Forwards	[13]	m	dm
16	MIME-Version	[13]	o	do
16A	P-Access-Network-Info	[24]	o	IF Table 6.1.3.1/36 THEN do
16B	P-Asserted-Identity	[44]	o	IF Table 6.1.3.1/27 THEN do
16C	P-Charging-Function-Addresses	[24]	o	dn/a
16D	P-Charging-Vector	[24]	o	dn/a
16E	P-Debug-ID	[87]	o	IF Table 6.1.3.1/83 THEN do
16F	P-Preferred-Identity	[44]	o	dn/a
16G	Privacy	[34]	o	do
17	Proxy-Authorization	[13]	o	IF Table 6.1.3.1/7 THEN do
18	Proxy-Require	[13]	o	do
18A	Reason	[48]	o	IF Table 6.1.3.1/40 THEN do
19	Record-Route	[13]	o	do
19A	Referred-By	[53]	o	do
19B	Reject-Contact	[51]	o	do
19C	Request-Disposition	[51]	o	do
20	Require	[13]	c	dc
20A	Resource-Priority	[78]	o	IF Table 6.1.3.1/73 THEN do
21	Route	[13]	c	dc
21A	Security-Client	[47]	o	dn/a
21B	Security-Verify	[47]	o	dn/a
21C	Session-ID	[124]	m	IF Table 6.1.3.1/94 THEN dm
22	Supported	[13]	o	do
23	Timestamp	[13]	o	do
24	To	[13]	m	dm
25	User-Agent	[13]	o	do
25A	User-to-User	[83]	o	IF Table 6.1.3.1/79 THEN do
26	Via	[13]	m	dm

Table B.4.2: Supported header fields within the BYE response

Item	Header field	SIP status code	Ref.	RFC status	II-NNI condition
1	Accept	415	[13]	c	dc
2	Accept-Encoding	415	[13]	c	dc
3	Accept-Language	415	[13]	c	dc
4	Accept-Resource-Priority	2xx 417	[78]	o	IF Table 6.1.3.1/73 THEN do
5	Allow	2xx	[13]	o	do
		405		m	dm
		others		o	do
6	Allow-Events	2xx	[20]	o	IF Table 6.1.3.1/23 THEN do
7	Authentication-Info	2xx	[13]	o	IF Table 6.1.3.1/7 THEN do
8	Call-ID	100 others	[13]	m	dm
9	Contact	3xx 485	[13]	o	do
10	Content-Disposition	r	[13]	o	do
11	Content-Encoding	r	[13]	o	do
12	Content-Language	r	[13]	o	do
13	Content-Length	100 others	[13]	t	dt
14	Content-Type	r	[13]	*	d*
15	Cseq	100 others	[13]	m	dm
16	Date	100 others	[13]	o	do
17	Error-Info	3xx-6xx	[13]	o	IF Table 6.1.3.1/13 THEN do
18	From	100 others	[13]	m	dm
19	Geolocation-Error	r	[68]	o	do
20	MIME-version	r	[13]	o	do
21	P-Access-Network-Info	r	[24]	o	IF Table 6.1.3.1/36 THEN do
22	P-Asserted-Identity	r	[44]	o	IF Table 6.1.3.1/27 THEN do
23	P-Charging-Function-Addresses	r	[24]	o	dn/a
24	P-Charging-Vector	r	[24]	o	dn/a
25	P-Debug-ID	100 others	[87]	o	IF Table 6.1.3.1/83 THEN do
26	P-Preferred-Identity	r	[44]	o	dn/a
27	Privacy	r	[34]	o	do
28	Proxy-Authenticate	401 (NOTE)	[13]	o	do
		407 (NOTE)		m	dm
29	Record-Route	2xx	[13]	o	do
30	Require	r	[13]	c	dc
31	Retry-After	404 413 480 486 500 503 600 603	[13]	o	do
32	Security-Server	2xx	[47]	n/a	dn/a
		421 494		o	dn/a
33	Server	r	[13]	o	do
34	Session-ID	r	[124]	m	IF Table 6.1.3.1/94 THEN dm
35	Supported	2xx	[13]	o	do
36	Timestamp	r	[13]	o	do
37	To	100 others	[13]	m	dm

Item	Header field	SIP status code	Ref.	RFC status	II-NNI condition
38	Unsupported	420	[13]	m	dm
39	User-Agent	r	[13]	o	do
40	User-to-User	r	[83]	o	IF Table 6.1.3.1/79 THEN do
41	Via	100 others	[13]	m	dm
42	Warning	r	[13]	o	do
43	WWW-Authenticate	401 (NOTE)	[13]	m	dm
		407 (NOTE)		o	do
NOTE: The SIP status code is only applicable over the roaming II-NNI.					

B.5   CANCEL method

Table B.5.1: Supported header fields within the CANCEL request

Item	Header field	Ref.	RFC status	II-NNI condition
1	Accept-Contact	[51]	o	do
5	Authorization	[13]	o	IF Table 6.1.3.1/7 THEN do
6	Call-ID	[13]	m	dm
8	Content-Length	[13]	t	dt
9	Cseq	[13]	m	dm
10	Date	[13]	o	do
11	From	[13]	m	dm
11A	Max-Breadth	[79]	o	do
12	Max-Forwards	[13]	m	dm
13	P-Debug-ID	[87]	o	IF Table 6.1.3.1/83 THEN do
14	Privacy	[34]	o	do
15	Reason	[48]	o	IF Table 6.1.3.1/40 THEN do
16	Record-Route	[13]	o	do
17	Reject-Contact	[51]	o	do
17A	Request-Disposition	[51]	o	do
17B	Resource-Priority	[78]	o	IF Table 6.1.3.1/73 THEN do
18	Route	[13]	c	dc
18A	Session-ID	[124]	m	IF Table 6.1.3.1/94 THEN dm
19	Supported	[13]	o	do
20	Timestamp	[13]	o	do
21	To	[13]	m	dm
22	User-Agent	[13]	o	do
23	Via	[13]	m	dm

Table B.5.2: Supported header fields within the CANCEL response

Item	Header field	SIP status code	Ref.	RFC status	II-NNI condition
1	Accept-Resource-Priority	2xx 417	[78]	o	IF Table 6.1.3.1/73 THEN do
2	Call-ID	r	[13]	m	dm
3	Content-Length	r	[13]	t	dt
4	Cseq	r	[13]	m	dm
5	Date	r	[13]	o	do
6	Error-Info	3xx-6xx	[13]	o	IF Table 6.1.3.1/13 THEN do
7	From	r	[13]	m	dm
8	P-Debug-ID	r	[87]	o	IF Table 6.1.3.1/83 THEN do
9	Privacy	r	[34]	o	do
10	Record-Route	2xx	[13]	o	do
11	Retry-After	404 413 480 486 500 503 600 603	[13]	o	do
12	Session-ID	r	[124]	m	IF Table 6.1.3.1/94 THEN dm
13	Supported	2xx	[13]	o	do
14	Timestamp	r	[13]	o	do
15	To	r	[13]	m	dm
16	User-Agent	r	[13]	o	do
17	Via	r	[13]	m	dm
18	Warning	r	[13]	o	do

B.6 INFO method

As described in Table 6.1, the support of INFO method over the II-NNI is based on bilateral agreement between the operators.

Table B.6.1: Supported header fields within the INFO request

Item	Header field	Ref.	RFC status	II-NNI condition
1	Accept	[13], [39]	o	do
2	Accept-Encoding	[13], [39]	o	do
3	Accept-Language	[13], [39]	o	do
4	Allow	[13], [39]	o	do
5	Allow-Events	[20]	o	IF Table 6.1.3.1/23 THEN do
6	Authorization	[13], [39]	o	IF Table 6.1.3.1/7 THEN do
7	Call-ID	[13], [39]	m	dm
7A	Call-Info	[13], [39]	o	do
9	Content-Disposition	[13], [39]	o	do
10	Content-Encoding	[13], [39]	o	do
11	Content-Language	[13], [39]	o	do
12	Content-Length	[13], [39]	o	do
13	Content-Type	[13], [39]	*	d*
14	Cseq	[13], [39]	m	dm
15	Date	[13], [39]	o	do
16	From	[13], [39]	m	dm
17	Geolocation	[68]	o	do
18	Info-Package	[39]	m*	IF Table 6.1.3.1/17 THEN do
19	Max-Breadth	[79], [39]	n/a	dn/a
20	Max-Forwards	[13], [39]	o	do
21	MIME-Version	[13], [39]	o	do
22	P-Access-Network-Info	[24]	o	IF Table 6.1.3.1/36 THEN do
23	P-Charging-Function-Addresses	[24]	o	dn/a
24	P-Charging-Vector	[24]	o	IF Table 6.1.3.1/38 THEN do
25	P-Debug-ID	[87]	o	IF Table 6.1.3.1/83 THEN do
26	Privacy	[34], [39]	o	do
27	Proxy-Authorization	[13], [39]	o	IF Table 6.1.3.1/7 THEN do
28	Proxy-Require	[13], [39]	o	do
29	Reason	[48], [39]	o	IF Table 6.1.3.1/40 THEN do
30	Record-Route	[13], [39]	o	do
31	Referred-By	[53], [39]	o	do
33	Request-Disposition	[51], [39]	o	do
34	Require	[13], [39]	o	do
35	Resource-Priority	[78], [39]	o	IF Table 6.1.3.1/73 THEN do
36	Route	[13], [39]	o	do
37	Security-Client	[47], [39]	o	dn/a
38	Security-Verify	[47], [39]	o	dn/a
38A	Session-ID	[124]	m	IF Table 6.1.3.1/94 THEN dm
39	Subject	[13], [39]	o	do
40	Supported	[13], [39]	o	do
41	Timestamp	[13], [39]	o	do
42	To	[13], [39]	m	dm
43	User-Agent	[13], [39]	o	do
44	Via	[13], [39]	m	dm

Table B.6.2: Supported header fields within the INFO response

Item	Header field	SIP status code	Ref.	RFC status	II-NNI condition
1	Accept	2xx 415	[13], [39]	o	do
2	Accept-Encoding	2xx	[13], [39]	o	do
		415		c	dc
3	Accept-Language	2xx 415	[13], [39]	o	do
4	Accept-Resource-Priority	2xx 417	[78], [39]	o	IF Table 6.1.3.1/73 THEN do
5	Allow	405	[13], [39]	m	dm
		others		o	do
6	Allow-Events	2xx	[20]	o	IF Table 6.1.3.1/23 THEN do
7	Authentication-Info	2xx	[13], [39]	o	IF Table 6.1.3.1/7 THEN do
8	Call-ID	100 others	[13], [39]	m	dm
9	Call-Info	r	[13], [39]	o	do
10	Content-Disposition	r	[13], [39]	o	do
11	Content-Encoding	r	[13], [39]	o	do
12	Content-Language	r	[13], [39]	o	do
13	Content-Length	100 others	[13], [39]	o	do
14	Content-Type	r	[13], [39]	*	d*
15	Cseq	100 others	[13], [39]	m	dm
16	Date	100 others	[13], [39]	o	do
17	Error-Info	3xx-6xx	[13], [39]	o	IF Table 6.1.3.1/13 THEN do
18	From	100 others	[13], [39]	m	dm
19	Geolocation-Error	r	[68], [39]	o	do
20	MIME-version	r	[13], [39]	o	do
21	Organization	r	[13], [39]	n/a	dn/a
22	P-Access-Network-Info	r	[24]	o	IF Table 6.1.3.1/36 THEN do
23	P-Charging-Function-Addresses	r	[24]	o	dn/a
24	P-Charging-Vector	r	[24]	o	IF Table 6.1.3.1/38 THEN do
25	P-Debug-ID	100 others	[87]	o	IF Table 6.1.3.1/83 THEN do
26	Privacy	r	[34], [39]	o	do
27	Proxy-Authenticate	401 (NOTE)	[13], [39]	o	do
28	Require	r	[13], [39]	o	do
29	Retry-After	404 413 480 486 500 503 600 603	[13], [39]	o	do
30	Security-Server	2xx	[47], [39]	n/a	dn/a
		421 494		o	dn/a
31	Server	r	[13], [39]	o	do
32	Session-ID	r	[124]	m	IF Table 6.1.3.1/94 THEN dm
33	Supported	2xx	[13], [39]	o	do
34	Timestamp	r	[13], [39]	o	do
35	To	100 others	[13], [39]	m	dm
36	Unsupported	420	[13], [39]	o	do
37	User-Agent	r	[13], [39]	o	do

Item	Header field	SIP status code	Ref.	RFC status	II-NNI condition
38	Via	100 others	[13], [39]	m	dm
39	Warning	r	[13], [39]	o	do
40	WWW-Authenticate	401 (NOTE)	[13], [39]	m	dm
NOTE: The SIP status code is only applicable over the roaming II-NNI.					

B.7 INVITE method

Table B.7.1: Supported header fields within the INVITE request

Item	Header field	Ref.	RFC status	II-NNI condition
1	Accept	[13]	o	do
1A	Accept-Contact	[51]	o	do
2	Accept-Encoding	[13]	o	do
3	Accept-Language	[13]	o	do
4	Alert-Info	[13]	o	IF Table 6.1.3.1/10 THEN do
5	Allow	[13]	o	do
6	Allow-Events	[20]	o	IF Table 6.1.3.1/23 THEN do
7	Answer-Mode	[94]	o	IF Table 6.1.3.1/90 THEN do
8	Authorization	[13]	o	IF Table 6.1.3.1/7 THEN do
9	Call-ID	[13]	m	dm
10	Call-Info	[13]	o	do
11	Contact	[13]	m	dm
12	Content-Disposition	[13]	o	do
13	Content-Encoding	[13]	o	do
14	Content-Language	[13]	o	do
15	Content-Length	[13]	t	dt
16	Content-Type	[13]	*	d*
17	Cseq	[13]	m	dm
18	Date	[13]	o	do
19	Expires	[13]	o	do
20	From	[13]	m	dm
20A	Geolocation	[68]	o	do
20B	History-Info	[25]	o	IF Table 6.1.3.1/50 THEN do
21	In-Reply-To	[13]	o	do
21A	Join	[55]	o	IF Table 6.1.3.1/48 THEN do
21B	Max-Breadth	[79]	o	do
22	Max-Forwards	[13]	m	dm
23	MIME-Version	[13]	o	do
23A	Min-SE	[52]	o	do
24	Organization	[13]	o	do
24A	P-Access-Network-Info	[24]	o	IF Table 6.1.3.1/36 THEN do
24B	P-Asserted-Identity	[44]	o	IF Table 6.1.3.1/27 AND initial request THEN dm
24C	P-Asserted-Service	[26]	o	IF NOT roaming II-NNI (from visited to home) AND Table 6.1.3.1/77 AND initial request THEN do
24D	P-Called-Party-ID	[24]	o	IF Table 6.1.3.1/34 (from home to visited) THEN do
24E	P-Charging-Function-Addresses	[24]	o	dn/a
24F	P-Charging-Vector	[24]	o	IF Table 6.1.3.1/38 THEN do
24G	P-Debug-ID	[87]	o	IF Table 6.1.3.1/83 THEN do
24H	P-Early-Media	[74]	o	IF Table 6.1.3.1/69 THEN do
25	P-Media-Authorization	[42]	o	dn/a
25A	P-Preferred-Identity	[44]	o	dn/a
25B	P-Preferred-Service	[26]	o	IF roaming II-NNI (from visited to home) AND Table 6.1.3.1/77 AND initial request THEN do
25C	P-Private-Network-Indication	[84]	o	IF Table 6.1.3.1/80 THEN do
25D	P-Profile-Key	[64]	o	IF Table 6.1.3.1/59 AND initial request THEN do
25E	P-Served-User	[85]	o	dn/a
25F	P-User-Database	[60]	o	dn/a
25G	P-Visited-Network-ID	[24]	o	dn/a
26	Priority	[13]	o	do
26A	Privacy	[34]	o	do
26B	Priv-Answer-Mode	[94]	o	IF Table 6.1.3.1/90 THEN do
27	Proxy-Authorization	[13]	o	IF Table 6.1.3.1/7 THEN do
28	Proxy-Require	[13]	o	do
28A	Reason	[48]	o	IF Table 6.1.3.1/40 AND subsequent request THEN do

Item	Header field	Ref.	RFC status	II-NNI condition
29	Record-Route	[13]	o	do
29A	Recv-Info	[39]	m	IF Table 6.1.3.1/17 THEN dm
30	Referred-By	[53]	o	do
31	Reject-Contact	[51]	o	do
31A	Replaces	[54]	o	IF Table 6.1.3.1/47 THEN do
31B	Reply-To	[13]	o	do
31C	Request-Disposition	[51]	o	do
32	Require	[13]	c	dc
32A	Resource-Priority	[78]	o	IF Table 6.1.3.1/73 THEN do
33	Route	[13]	c	dc
33A	Security-Client	[47]	o	dn/a
33B	Security-Verify	[47]	o	dn/a
33D	Session-Expires	[52]	o	do
33E	Session-ID	[124]	m	IF Table 6.1.3.1/94 THEN dm
34	Subject	[13]	o	do
35	Supported	[13]	m*	dm*
36	Timestamp	[13]	o	do
37	To	[13]	m	dm
37A	Trigger-Consent	[82]	o	IF Table 6.1.3.1/78 THEN do
38	User-Agent	[13]	o	do
38A	User-to-User	[83]	o	IF Table 6.1.3.1/79 THEN do
39	Via	[13]	m	dm

Table B.7.2: Supported header fields within the INVITE response

Item	Header field	SIP status code	Ref.	RFC status	II-NNI condition
1	Accept	2xx	[13]	o	do
		415		c	dc
2	Accept-Encoding	2xx	[13]	o	do
		415		c	dc
3	Accept-Language	2xx	[13]	o	do
		415		c	dc
4	Accept-Resource-Priority	2xx 417	[78]	o	IF Table 6.1.3.1/73 THEN do
5	Alert-Info	180	[13]	o	IF Table 6.1.3.1/10 THEN do
6	Allow	2xx	[13]	m*	dm*
		405		m	dm
		others		o	do
7	Allow-Events	2xx	[20]	o	IF Table 6.1.3.1/23 THEN do
8	Answer-Mode	2xx	[94]	o	IF Table 6.1.3.1/90 THEN do
9	Authentication-Info	2xx	[13]	o	IF Table 6.1.3.1/7 THEN do
10	Call-ID	r	[13]	m	dm
11	Call-Info	r	[13]	o	do
12	Contact	18x 199	[13]	o	do
		2xx		m	dm
		3xx 485		o	do
13	Content-Disposition	r	[13]	o	do
14	Content-Encoding	r	[13]	o	do
15	Content-Language	r	[13]	o	do
16	Content-Length	100 others	[13]	t	dt
17	Content-Type	r	[13]	*	d*
18	Cseq	100 others	[13]	m	dm
19	Date	100 others	[13]	o	do
20	Error-Info	3xx-6xx	[13]	o	IF Table 6.1.3.1/13 THEN do
21	Expires	r	[13]	o	do
22	From	100 others	[13]	m	dm
23	Geolocation-Error	r	[68]	o	do
24	History-Info	r	[25]	o	IF Table 6.1.3.1/50 THEN do
25	MIME-version	r	[13]	o	do
26	Min-SE	422	[52]	m	dm
27	Organization	r	[13]	o	do
28	P-Access-Network-Info	r	[24]	o	IF Table 6.1.3.1/36 THEN do
29	P-Answer-State	18x 2xx	[73]	o	IF Table 6.1.3.1/68 THEN do
30	P-Asserted-Identity	r	[44]	o	IF Table 6.1.3.1/27 AND response to initial request THEN do
31	P-Charging-Function-Addresses	r	[24]	o	dn/a
32	P-Charging-Vector	r	[24]	o	IF Table 6.1.3.1/38 THEN do
33	P-Debug-ID	100 others	[87]	o	IF Table 6.1.3.1/83 THEN do
34	P-Early-Media	18x	[74]	o	IF Table 6.1.3.1/69 THEN do
35	P-Media-Authorization	18x 2xx	[42]	o	dn/a
36	P-Preferred-Identity	r	[44]	o	dn/a
37	Permission-Missing	470	[82]	o	IF Table 6.1.3.1/78 THEN do
38	Privacy	r	[34]	o	do
39	Priv-Answer-Mode	2xx	[94]	o	IF Table 6.1.3.1/90 THEN do
40	Proxy-Authenticate	401 (NOTE)	[13]	o	do

Item	Header field	SIP status code	Ref.	RFC status	II-NNI condition
		407 (NOTE)		m	dm
41	Reason	18x 199 3xx-6xx	[48]	o	IF Table 6.1.3.1/40 THEN do
42	Record-Route	18x 199 2xx	[13]	o	do
43	Recv-Info	18x 199 2xx	[39]	c	IF Table 6.1.3.1/17 THEN dc
44	Reply-To	r	[13]	o	do
45	Require	r	[13]	c	dc
46	Retry-After	404 413 480 486 500 503 600 603	[13]	o	do
47	Rseq	18x 199	[18]	o	do
48	Security-Server	421 494	[47]	o	dn/a
49	Server	r	[13]	o	do
50	Session-Expires	2xx	[52]	o	do
51	Session-ID	r	[124]	m	IF Table 6.1.3.1/94 THEN dm
52	Supported	2xx	[13]	m*	dm*
53	Timestamp	r	[13]	o	do
54	To	100 others	[13]	m	dm
55	Unsupported	420	[13]	m	dm
56	User-Agent	r	[13]	o	do
57	User-to-User	r	[83]	o	IF Table 6.1.3.1/79 THEN do
58	Via	100 others	[13]	m	dm
59	Warning	r	[13]	o	do
60	WWW-Authenticate	401 (NOTE)	[13]	m	dm
		407 (NOTE)		o	do
NOTE: The SIP status code is only applicable over the roaming II-NNI.					

B.8   MESSAGE method

As described in Table 6.1, the support of MESSAGE method over the II-NNI is based on bilateral agreement between the operators.

Table B.8.1: Supported header fields within the MESSAGE request

Item	Header field	Ref.	RFC status	II-NNI condition
1	Accept-Contact	[51]	o	do
1A	Allow	[13], [19]	o	do
2	Allow-Events	[20]	o	IF Table 6.1.3.1/23 THEN do
3	Authorization	[13], [19]	o	IF Table 6.1.3.1/7 THEN do
4	Call-ID	[13], [19]	m	dm
5	Call-Info	[13], [19]	o	do
6	Content-Disposition	[13], [19]	o	do
7	Content-Encoding	[13], [19]	o	do
8	Content-Language	[13], [19]	o	do
9	Content-Length	[13], [19]	t	dt
10	Content-Type	[13], [19]	*	d*
11	Cseq	[13], [19]	m	dm
12	Date	[13], [19]	o	do
13	Expires	[13], [19]	o	do
14	From	[13], [19]	m	dm
14A	Geolocation	[68]	o	do
14B	History-Info	[25]	o	IF Table 6.1.3.1/50 THEN do
15	In-Reply-To	[13], [19]	o	do
15A	Max-Breadth	[79]	o	do
16	Max-Forwards	[13], [19]	m	dm
17	MIME-Version	[13]	o	do
18	Organization	[13], [19]	o	do
18A	P-Access-Network-Info	[24]	o	IF Table 6.1.3.1/36 THEN do
18B	P-Asserted-Identity	[44]	o	IF Table 6.1.3.1/27 AND request outside an existing dialog THEN dm
18C	P-Asserted-Service	[26]	o	IF NOT roaming II-NNI (from visited to home) AND Table 6.1.3.1/77 AND request outside an existing dialog THEN do
18D	P-Called-Party-ID	[24]	o	IF Table 6.1.3.1/34 (from home to visited) THEN do
18E	P-Charging-Function-Addresses	[24]	o	dn/a
18F	P-Charging-Vector	[24]	o	IF Table 6.1.3.1/38 THEN do
18G	P-Debug-ID	[87]	o	IF Table 6.1.3.1/83 THEN do
18H	P-Preferred-Identity	[44]	o	dn/a
18I	P-Preferred-Service	[26]	o	IF roaming II-NNI (from visited to home) AND Table 6.1.3.1/77 AND request outside an existing dialog THEN do
18J	P-Private-Network-Indication	[84]	o	IF Table 6.1.3.1/80 THEN do
18K	P-Profile-Key	[64]	o	IF Table 6.1.3.1/59 AND request outside an existing dialog THEN do
18L	P-Served-User	[85]	o	dn/a
18M	P-User-Database	[60]	o	dn/a
18N	P-Visited-Network-ID	[24]	o	dn/a
19	Priority	[13], [19]	o	do
19A	Privacy	[34]	o	do
20	Proxy-Authorization	[13], [19]	o	IF Table 6.1.3.1/7 THEN do
21	Proxy-Require	[13], [19]	o	do
21A	Reason	[48]	o	IF Table 6.1.3.1/40 AND request inside an existing dialog THEN do
22	Record-Route	[13], [19]	n/a	dn/a
22A	Referred-By	[53]	o	do
23	Reject-Contact	[51]	o	do
23A	Reply-To	[13], [19]	o	do
23B	Request-Disposition	[51]	o	do
24	Require	[13], [19]	c	dc
24A	Resource-Priority	[78]	o	IF Table 6.1.3.1/73 THEN do
25	Route	[13], [19]	c	dc
25A	Security-Client	[47]	o	dn/a
25B	Security-Verify	[47]	o	dn/a
25C	Session-ID	[124]	m	IF Table 6.1.3.1/94 THEN dm
26	Subject	[13], [19]	o	do

Item	Header field	Ref.	RFC status	II-NNI condition
27	Supported	[13]	o	do
28	Timestamp	[13], [19]	o	do
29	To	[13], [19]	m	dm
29A	Trigger-Consent	[82]	o	IF Table 6.1.3.1/78 THEN do
30	User-Agent	[13], [19]	o	do
31	Via	[13], [19]	m	dm

Table B.8.2: Supported header fields within the MESSAGE response

Item	Header field	SIP status code	Ref.	RFC status	II-NNI condition
1	Accept	415	[13], [19]	m*	dm*
2	Accept-Encoding	415	[13], [19]	m*	dm*
3	Accept-Language	415	[13], [19]	m*	dm*
4	Accept-Resource-Priority	2xx 417	[78]	o	IF Table 6.1.3.1/73 THEN do
5	Allow	2xx	[13], [19]	o	do
		405		m	dm
		others		o	do
6	Allow-Events	2xx	[20]	o	IF Table 6.1.3.1/23 THEN do
7	Authentication-Info	2xx	[13], [19]	o	IF Table 6.1.3.1/7 THEN do
8	Call-ID	100 others	[13], [19]	m	dm
9	Call-Info	r	[13], [19]	o	do
10	Contact	3xx 485	[13], [19]	o	do
11	Content-Disposition	r	[13], [19]	o	do
12	Content-Encoding	r	[13], [19]	o	do
13	Content-Language	r	[13], [19]	o	do
14	Content-Length	100 others	[13], [19]	t	dt
15	Content-Type	r	[13], [19]	*	d*
16	Cseq	100 others	[13], [19]	m	dm
17	Date	100 others	[13], [19]	o	do
18	Error-Info	3xx-6xx	[13], [19]	o	IF Table 6.1.3.1/13 THEN do
19	Expires	r	[13], [19]	o	do
20	From	100 others	[13], [19]	m	dm
21	Geolocation-Error	r	[68]	o	do
22	History-Info	r	[25]	o	IF Table 6.1.3.1/50 THEN do
23	MIME-version	r	[13]	o	do
24	Organization	r	[13], [19]	o	do
25	P-Access-Network-Info	r	[24]	o	IF Table 6.1.3.1/36 THEN do
26	P-Asserted-Identity	r	[44]	o	IF Table 6.1.3.1/27 AND response to request outside an existing dialog THEN do
27	P-Charging-Function-Addresses	r	[24]	o	dn/a
28	P-Charging-Vector	r	[24]	o	IF Table 6.1.3.1/38 THEN do
29	P-Debug-ID	100 others	[87]	o	IF Table 6.1.3.1/83 THEN do
30	P-Preferred-Identity	r	[44]	o	dn/a
31	Permission-Missing	470	[82]	o	IF Table 6.1.3.1/78 THEN do
32	Privacy	r	[34]	o	do
33	Proxy-Authenticate	401 (NOTE)	[13], [19]	o	do
		407 (NOTE)		m	dm
34	Record-Route	2xx	[13], [19]	n/a	dn/a
35	Reply-To	r	[13], [19]	o	do
36	Require	r	[13], [19]	c	dc
37	Retry-After	404 413 480 486 500 503 600 603	[13], [19]	o	do
38	Security-Server	2xx	[47]	n/a	dn/a

Item	Header field	SIP status code	Ref.	RFC status	II-NNI condition
		421 494		o	dn/a
39	Server	r	[13], [19]	o	do
40	Session-ID	r	[124]	m	IF Table 6.1.3.1/94 THEN dm
41	Supported	2xx	[13]	o	do
42	Timestamp	r	[13], [19]	o	do
43	To	100 others	[13], [19]	m	dm
44	Unsupported	420	[13], [19]	o	do
45	User-Agent	r	[13], [19]	o	do
46	Via	100 others	[13], [19]	m	dm
47	Warning	r	[13], [19]	o	do
48	WWW-Authenticate	401 (NOTE)	[13], [19]	m	dm
		407 (NOTE)		o	do
NOTE: The SIP status code is only applicable over the roaming II-NNI.					

B.9 NOTIFY method

As described in Table 6.1, the support of NOTIFY method over the non-roaming II-NNI is based on bilateral agreement between the operators.

Table B.9.1: Supported header fields within the NOTIFY request

Item	Header field	Ref.	RFC status	II-NNI condition
1	Accept	[13], [20]	o	do
1A	Accept-Contact	[51]	o	do
2	Accept-Encoding	[13], [20]	o	do
3	Accept-Language	[13], [20]	o	do
3A	Allow	[13], [20]	o	do
4	Allow-Events	[20]	o	do
5	Authorization	[13], [20]	o	IF Table 6.1.3.1/7 THEN do
6	Call-ID	[13], [20]	m	dm
6A	Call-Info	[13]	o	do
6B	Contact	[13], [20]	m	dm
7	Content-Disposition	[13], [20]	o	do
8	Content-Encoding	[13], [20]	o	do
9	Content-Language	[13], [20]	o	do
10	Content-Length	[13], [20]	t	dt
11	Content-Type	[13], [20]	*	d*
12	Cseq	[13], [20]	m	dm
13	Date	[13], [20]	o	do
14	Event	[20]	m	dm
15	From	[13], [20]	m	dm
15A	Geolocation	[68]	o	do
15B	History-Info	[25]	o	IF Table 6.1.3.1/50 THEN do
15C	Max-Breadth	[79]	o	do
16	Max-Forwards	[13], [20]	m	dm
17	MIME-Version	[13], [20]	o	do
17A	P-Access-Network-Info	[24]	o	IF Table 6.1.3.1/36 THEN do
17B	P-Asserted-Identity	[44]	o	IF Table 6.1.3.1/27 THEN do
17C	P-Charging-Function-Addresses	[24]	o	dn/a
17D	P-Charging-Vector	[24]	o	dn/a
17E	P-Debug-ID	[87]	o	IF Table 6.1.3.1/83 THEN do
17F	P-Preferred-Identity	[44]	o	dn/a
17G	Privacy	[34]	o	do
18	Proxy-Authorization	[13], [20]	o	IF Table 6.1.3.1/7 THEN do
19	Proxy-Require	[13], [20]	o	do
19A	Reason	[48]	o	IF Table 6.1.3.1/40 THEN do
20	Record-Route	[13], [20]	o	do
20A	Referred-By	[53]	o	do
20B	Reject-Contact	[51]	o	do
20C	Request-Disposition	[51]	o	do
21	Require	[13], [20]	o	do
22	Route	[13], [20]	c	dc
22A	Resource-Priority	[78]	o	IF Table 6.1.3.1/73 THEN do
22B	Security-Client	[47]	o	dn/a
22C	Security-Verify	[47]	o	dn/a
22D	Session-ID	[124]	m	IF Table 6.1.3.1/94 THEN dm
23	Subscription-State	[20]	m	dm
24	Supported	[13], [20]	o	do
25	Timestamp	[13], [20]	o	do
26	To	[13], [20]	m	dm
27	User-Agent	[13], [20]	o	do
28	Via	[13], [20]	m	dm
29	Warning	[13], [20]	o	do

Table B.9.2: Supported header fields within the NOTIFY response

Item	Header field	SIP status code	Ref.	RFC status	II-NNI condition
1	Accept	415	[13], [20]	o	do
2	Accept-Encoding	415	[13], [20]	o	do
3	Accept-Language	415	[13], [20]	o	do
4	Accept-Resource-Priority	2xx 417	[78]	o	IF Table 6.1.3.1/73 THEN do
5	Allow	405	[13], [20]	m	dm
		others		o	do
6	Allow-Events	2xx	[20]	o	do
		489		m	dm
7	Authentication-Info	2xx	[13], [20]	o	IF Table 6.1.3.1/7 THEN do
8	Call-ID	100 others	[13], [20]	m	dm
9	Contact	2xx	[13], [20]	o	do
		3xx		m	dm
		485		o	do
10	Content-Disposition	r	[13], [20]	o	do
11	Content-Encoding	r	[13], [20]	o	do
12	Content-Language	r	[13], [20]	o	do
13	Content-Length	100 others	[13], [20]	t	dt
14	Content-Type	r	[13], [20]	*	d*
15	Cseq	100 others	[13], [20]	m	dm
16	Date	100 others	[13], [20]	o	do
17	Error-Info	3xx-6xx	[13], [20]	o	IF Table 6.1.3.1/13 THEN do
18	From	100 others	[13], [20]	m	dm
19	Geolocation-Error	r	[68]	o	do
20	MIME-version	r	[13], [20]	o	do
21	P-Access-Network-Info	r	[24]	o	IF Table 6.1.3.1/36 THEN do
22	P-Asserted-Identity	r	[44]	o	IF Table 6.1.3.1/27 THEN do
23	P-Charging-Function-Addresses	r	[24]	o	dn/a
24	P-Charging-Vector	r	[24]	o	dn/a
25	P-Debug-ID	100 others	[87]	o	IF Table 6.1.3.1/83 THEN do
26	P-Preferred-Identity	r	[44]	o	dn/a
27	Privacy	r	[34]	o	do
28	Proxy-Authenticate	401 (NOTE)	[13], [20]	o	do
		407 (NOTE)		m	dm
29	Record-Route	2xx	[13], [20]	o	do
30	Require	r	[13], [20]	o	do
31	Retry-After	404 413 480 486 500 503 600 603	[13], [20]	o	do
32	Security-Server	2xx	[47]	n/a	dn/a
		421 494		o	dn/a
33	Server	r	[13], [20]	o	do
34	Session-ID	r	[124]	m	IF Table 6.1.3.1/94 THEN dm
35	Supported	2xx	[13], [20]	o	do
36	Timestamp	r	[13], [20]	o	do

Item	Header field	SIP status code	Ref.	RFC status	II-NNI condition
37	To	100 others	[13], [20]	m	dm
38	Unsupported	420	[13], [20]	o	do
39	User-Agent	r	[13], [20]	o	do
40	Via	100 others	[13], [20]	m	dm
41	Warning	r	[13], [20]	o	do
42	WWW-Authenticate	401 (NOTE)	[13], [20]	m	dm
		407 (NOTE)		o	do
NOTE: The SIP status code is only applicable over the roaming II-NNI.					

B.10 OPTIONS method

Table B.10.1: Supported header fields within the OPTIONS request

Item	Header field	Ref.	RFC status	II-NNI condition
1	Accept	[13]	m*	dm*
1A	Accept-Contact	[51]	o	do
2	Accept-Encoding	[13]	o	do
3	Accept-Language	[13]	o	do
3A	Allow	[13]	o	do
4	Allow-Events	[20]	o	IF Table 6.1.3.1/23 THEN do
5	Authorization	[13]	o	IF Table 6.1.3.1/7 THEN do
6	Call-ID	[13]	m	dm
7	Call-Info	[13]	o	do
8	Contact	[13]	o	do
9	Content-Disposition	[13]	o	do
10	Content-Encoding	[13]	o	do
11	Content-Language	[13]	o	do
12	Content-Length	[13]	t	dt
13	Content-Type	[13]	*	d*
14	Cseq	[13]	m	dm
15	Date	[13]	o	do
16	From	[13]	m	dm
16A	Geolocation	[68]	o	do
16B	History-Info	[25]	o	IF Table 6.1.3.1/50 THEN do
16C	Max-Breadth	[79]	o	do
17	Max-Forwards	[13]	m	dm
18	MIME-Version	[13]	o	do
19	Organization	[13]	o	do
19A	P-Access-Network-Info	[24]	o	IF Table 6.1.3.1/36 THEN do
19B	P-Asserted-Identity	[44]	o	IF Table 6.1.3.1/27 AND request outside an existing dialog THEN dm
19C	P-Asserted-Service	[26]	o	IF roaming II-NNI (from visited to home) AND Table 6.1.3.1/77 AND request outside an existing dialog THEN do
19D	P-Called-Party-ID	[24]	o	IF Table 6.1.3.1/34 (from home to visited) THEN do
19E	P-Charging-Function-Addresses	[24]	o	dn/a
19F	P-Charging-Vector	[24]	o	IF Table 6.1.3.1/38 THEN do
19G	P-Debug-ID	[87]	o	IF Table 6.1.3.1/83 THEN do
19H	P-Preferred-Identity	[44]	o	dn/a
19I	P-Preferred-Service	[26]	o	IF roaming II-NNI (from visited to home) AND Table 6.1.3.1/77 THEN do
19J	P-Private-Network-Indication	[84]	o	IF Table 6.1.3.1/80 THEN do
19K	P-Profile-Key	[64]	o	IF Table 6.1.3.1/59 AND request outside an existing dialog THEN do
19L	P-Served-User	[85]	o	dn/a
19M	P-User-Database	[60]	o	dn/a
19N	P-Visited-Network-ID	[24]	o	dn/a
19O	Privacy	[34]	o	do
20	Proxy-Authorization	[13]	o	IF Table 6.1.3.1/7 THEN do
21	Proxy-Require	[13]	o	do
21A	Reason	[48]	o	IF Table 6.1.3.1/40 AND request inside an existing dialog THEN do
22	Record-Route	[13]	o	do
22A	Recv-Info	[39]	n/a	dn/a
22B	Referred-By	[53]	o	do
22C	Reject-Contact	[51]	o	do
22D	Request-Disposition	[51]	o	do
23	Require	[13]	c	dc
23A	Resource-Priority	[78]	o	IF Table 6.1.3.1/73 THEN do
24	Route	[13]	c	dc
24A	Security-Client	[47]	o	dn/a
24B	Security-Verify	[47]	o	dn/a

Item	Header field	Ref.	RFC status	II-NNI condition
24C	Session-ID	[124]	m	IF Table 6.1.3.1/94 THEN dm
25	Supported	[13]	o	do
26	Timestamp	[13]	o	do
27	To	[13]	m	dm
28	User-Agent	[13]	o	do
29	Via	[13]	m	dm

Table B.10.2: Supported header fields within the OPTIONS response

Item	Header field	SIP status code	Ref.	RFC status	II-NNI condition
1	Accept	2xx	[13]	m*	dm*
		415		c	dc
2	Accept-Encoding	2xx	[13]	m*	dm*
		415		c	dc
3	Accept-Language	2xx	[13]	m*	dm*
		415		c	dc
4	Accept-Resource-Priority	2xx 417	[78]	o	IF Table 6.1.3.1/73 THEN do
5	Allow	2xx	[13]	m*	dm*
		405		m	dm
		others		o	do
6	Allow-Events	2xx	[20]	o	IF Table 6.1.3.1/23 THEN do
7	Authentication-Info	2xx	[13]	o	IF Table 6.1.3.1/7 THEN do
8	Call-ID	100 others	[13]	m	dm
9	Call-Info	r	[13]	o	do
10	Contact	2xx 3xx 485	[13]	o	do
11	Content-Disposition	r	[13]	o	do
12	Content-Encoding	r	[13]	o	do
13	Content-Language	r	[13]	o	do
14	Content-Length	100 others	[13]	t	dt
15	Content-Type	r	[13]	*	d*
16	Cseq	100 others	[13]	m	dm
17	Date	100 others	[13]	o	do
18	Error-Info	3xx-6xx	[13]	o	IF Table 6.1.3.1/13 THEN do
19	From	100 others	[13]	m	dm
20	Geolocation-Error	r	[68]	o	do
21	History-Info	r	[25]	o	IF Table 6.1.3.1/50 THEN do
22	MIME-version	r	[13]	o	do
23	Organization	r	[13]	o	do
24	P-Access-Network-Info	r	[24]	o	IF Table 6.1.3.1/36 THEN do
25	P-Asserted-Identity	r	[44]	o	IF Table 6.1.3.1/27 AND response to request outside an existing dialog THEN do
26	P-Charging-Function-Addresses	r	[24]	o	dn/a
27	P-Charging-Vector	r	[24]	o	IF Table 6.1.3.1/38 THEN do
28	P-Debug-ID	100 others	[87]	o	IF Table 6.1.3.1/83 THEN do
29	P-Preferred-Identity	r	[44]	o	dn/a
30	Privacy	r	[34]	o	do
31	Proxy-Authenticate	401 (NOTE)	[13]	o	do
		407 (NOTE)		m	dm
32	Record-Route	2xx	[13]	o	do
33	Recv-Info	2xx others	[39]	n/a	dn/a
34	Require	r	[13]	c	dc

Item	Header field	SIP status code	Ref.	RFC status	II-NNI condition
35	Retry-After	404 413 480 486 500 503 600 603	[13]	o	do
36	Security-Server	2xx	[47]	n/a	dn/a
		421 494		o	dn/a
37	Server	r	[13]	o	do
38	Session-ID	r	[124]	m	IF Table 6.1.3.1/94 THEN dm
39	Supported	2xx	[13]	m*	dm*
40	Timestamp	r	[13]	o	do
41	To	100 others	[13]	m	dm
42	Unsupported	420	[13]	m	dm
43	User-Agent	r	[13]	o	do
44	Via	100 others	[13]	m	dm
45	Warning	r	[13]	o	do
46	WWW-Authenticate	401 (NOTE)	[13]	m	dm
		407 (NOTE)		o	do
NOTE: The SIP status code is only applicable over the roaming II-NNI.					

B.11 PRACK method

Table B.11.1: Supported header fields within the PRACK request

Item	Header field	Ref.	RFC status	II-NNI condition
1	Accept	[13], [18]	o	do
1A	Accept-Contact	[51]	o	do
2	Accept-Encoding	[13], [18]	o	do
3	Accept-Language	[13], [18]	o	do
3A	Allow	[13], [18]	o	do
4	Allow-Events	[20]	o	IF Table 6.1.3.1/23 THEN do
5	Authorization	[13], [18]	o	IF Table 6.1.3.1/7 THEN do
6	Call-ID	[13], [18]	m	dm
7	Content-Disposition	[13], [18]	o	do
8	Content-Encoding	[13], [18]	o	do
9	Content-Language	[13], [18]	o	do
10	Content-Length	[13], [18]	t	dt
11	Content-Type	[13], [18]	*	d*
12	Cseq	[13], [18]	m	dm
13	Date	[13], [18]	o	do
14	From	[13], [18]	m	dm
14A	Max-Breadth	[79]	o	do
15	Max-Forwards	[13], [18]	m	dm
16	MIME-Version	[13], [18]	o	do
16A	P-Access-Network-Info	[24]	o	IF Table 6.1.3.1/36 THEN do
16B	P-Charging-Function-Addresses	[24]	o	dn/a
16C	P-Charging-Vector	[24]	o	dn/a
16D	P-Debug-ID	[87]	o	IF Table 6.1.3.1/83 THEN do
16E	P-Early-Media	[74]	o	IF Table 6.1.3.1/69 THEN do
16F	Privacy	[34]	o	do
17	Proxy-Authorization	[13], [18]	o	IF Table 6.1.3.1/7 THEN do
18	Proxy-Require	[13], [18]	o	do
19	RAck	[18]	m	dm
19A	Reason	[48]	o	IF Table 6.1.3.1/40 THEN do
20	Record-Route	[13], [18]	o	do
20A	Recv-Info	[39]	o	IF Table 6.1.3.1/17 THEN do
20B	Referred-By	[53]	o	do
20C	Reject-Contact	[51]	o	do
20D	Request-Disposition	[51]	o	do
21	Require	[13], [18]	c	dc
21A	Resource-Priority	[78]	o	IF Table 6.1.3.1/73 THEN do
22	Route	[13], [18]	c	dc
22A	Session-ID	[124]	m	IF Table 6.1.3.1/94 THEN dm
23	Supported	[13], [18]	o	do
24	Timestamp	[13], [18]	o	do
25	To	[13], [18]	m	dm
26	User-Agent	[13], [18]	o	do
27	Via	[13], [18]	m	dm

Table B.11.2: Supported header fields within the PRACK response

Item	Header field	SIP status code	Ref.	RFC status	II-NNI condition
1	Accept	415	[13], [18]	c	dc
2	Accept-Encoding	415	[13], [18]	c	dc
3	Accept-Language	415	[13], [18]	c	dc
4	Accept-Resource-Priority	2xx 417	[78]	o	IF Table 6.1.3.1/73 THEN do
5	Allow	2xx	[13], [18]	o	do
		405		m	dm
		others		o	do
6	Allow-Events	2xx	[20]	o	IF Table 6.1.3.1/23 THEN do
7	Authentication-Info	2xx	[13], [18]	o	IF Table 6.1.3.1/7 THEN do
8	Call-ID	100 r	[13], [18]	m	dm
9	Contact	3xx 485	[13], [18]	o	do
10	Content-Disposition	r	[13], [18]	o	do
11	Content-Encoding	r	[13], [18]	o	do
12	Content-Language	r	[13], [18]	o	do
13	Content-Length	100 others	[13], [18]	t	dt
14	Content-Type	r	[13], [18]	*	d*
15	Cseq	100 others	[13], [18]	m	dm
16	Date	100 others	[13], [18]	o	do
17	Error-Info	3xx-6xx	[13], [18]	o	IF Table 6.1.3.1/13 THEN do
18	From	100 others	[13], [18]	m	dm
19	MIME-version	r	[13], [18]	o	do
20	P-Access-Network-Info	r	[24]	o	IF Table 6.1.3.1/36 THEN do
21	P-Charging-Function-Addresses	r	[24]	o	dn/a
22	P-Charging-Vector	r	[24]	o	dn/a
23	P-Debug-ID	100 others	[87]	o	IF Table 6.1.3.1/83 THEN do
24	P-Early-Media	2xx	[74]	o	IF Table 6.1.3.1/69 THEN do
		others		n/a	dn/a
25	Privacy	r	[34]	o	do
26	Proxy-Authenticate	401 (NOTE)	[13], [18]	o	do
		407 (NOTE)		m	dm
27	Record-Route	2xx	[13], [18]	o	do
28	Recv-Info	2xx	[39]	c	IF Table 6.1.3.1/17 THEN dc
		others		o	IF Table 6.1.3.1/17 THEN do
29	Require	r	[13], [18]	c	dc
30	Retry-After	404 413 480 486 500 503 600 603	[13], [18]	o	do
31	Security-Server	421 494	[47]	n/a	dn/a
32	Server	r	[13], [18]	o	do
33	Session-ID	r	[124]	m	IF Table 6.1.3.1/94 THEN dm
34	Supported	2xx	[13], [18]	o	do
35	Timestamp	r	[13], [18]	o	do
36	To	100 others	[13], [18]	m	dm

Item	Header field	SIP status code	Ref.	RFC status	II-NNI condition
37	Unsupported	420	[13], [18]	m	dm
38	User-Agent	r	[13], [18]	o	do
39	Via	100 others	[13], [18]	m	dm
40	Warning	r	[13], [18]	o	do
41	WWW-Authenticate	401 (NOTE)	[13], [18]	m	dm
		407 (NOTE)		o	do
NOTE: The SIP status code is only applicable over the roaming II-NNI.					

B.12   PUBLISH method

As described in Table 6.1, the support of PUBLISH method over the non-roaming II-NNI is based on bilateral agreement between the operators.

Table B.12.1: Supported header fields within the PUBLISH request

Item	Header field	Ref.	RFC status	II-NNI condition
1	Accept-Contact	[51]	o	do
2	Allow	[13], [21]	o	do
3	Allow-Events	[20]	o	IF Table 6.1.3.1/23 THEN do
4	Authorization	[13], [21]	o	IF Table 6.1.3.1/7 THEN do
5	Call-ID	[13], [21]	m	dm
6	Call-Info	[13], [21]	o	do
6A	Contact	[13], [21]	n/a	dn/a
7	Content-Disposition	[13], [21]	o	do
8	Content-Encoding	[13], [21]	o	do
9	Content-Language	[13], [21]	o	do
10	Content-Length	[13], [21]	t	dt
11	Content-Type	[13], [21]	*	d*
12	Cseq	[13], [12]	m	dm
13	Date	[13], [21]	o	do
14	Event	[20]	m	dm
15	Expires	[13], [21]	o	do
16	From	[13], [21]	m	dm
16A	Geolocation	[68]	o	do
16B	History-Info	[25]	o	IF Table 6.1.3.1/50 THEN do
17	In-Reply-To	[13], [21]	n/a	dn/a
17A	Max-Breadth	[79]	o	do
18	Max-Forwards	[13], [21]	m	dm
19	MIME-Version	[13], [21]	o	do
20	Organization	[13], [21]	o	do
21	P-Access-Network-Info	[24]	o	IF Table 6.1.3.1/36 THEN do
22	P-Asserted-Identity	[44]	o	IF Table 6.1.3.1/27 AND response to request outside an existing dialog THEN dm
22A	P-Asserted-Service	[26]	o	IF NOT roaming II-NNI (from visited to home) AND Table 6.1.3.1/77 AND request outside an existing dialog THEN do
23	P-Called-Party-ID	[24]	o	IF Table 6.1.3.1/34 (from home to visited) THEN do
24	P-Charging-Function-Addresses	[24]	o	dn/a
25	P-Charging-Vector	[24]	o	IF Table 6.1.3.1/38 THEN do
25A	P-Debug-ID	[87]	o	IF Table 6.1.3.1/83 THEN do
26	P-Preferred-Identity	[44]	o	dn/a
26A	P-Preferred-Service	[26]	o	IF roaming II-NNI (from visited to home) AND Table 6.1.3.1/77 AND request outside an existing dialog THEN do
26B	P-Private-Network-Indication	[84]	o	IF Table 6.1.3.1/80 THEN do
26C	P-Profile-Key	[64]	o	IF Table 6.1.3.1/59 AND request outside an existing dialog THEN do
26D	P-Served-User	[85]	o	dn/a
26E	P-User-Database	[60]	o	dn/a
27	P-Visited-Network-ID	[24]	o	dn/a
28	Priority	[13], [21]	o	do
29	Privacy	[34]	o	do
30	Proxy-Authorization	[13], [21]	o	IF Table 6.1.3.1/7 THEN do
31	Proxy-Require	[13], [21]	o	do
32	Reason	[48]	o	IF Table 6.1.3.1/40 AND request inside an existing dialog THEN do
33	Reject-Contact	[39]	o	do
33A	Referred-By	[53]	o	do
34	Request-Disposition	[54]	o	do
35	Reply-To	[13], [21]	n/a	dn/a
36	Require	[13], [21]	o	do
36A	Resource-Priority	[78]	o	IF Table 6.1.3.1/73 THEN do
37	Route	[13], [21]	c	dc
38	Security-Client	[47]	o	dn/a
39	Security-Verify	[47]	o	dn/a
39A	Session-ID	[124]	m	IF Table 6.1.3.1/94 THEN dm
40	SIP-If-Match	[21]	o	do

Item	Header field	Ref.	RFC status	II-NNI condition
41	Subject	[13], [21]	o	do
42	Supported	[13], [21]	o	do
43	Timestamp	[13], [21]	o	do
44	To	[13], [21]	m	dm
45	User-Agent	[13], [21]	o	do
46	Via	[13], [21]	m	dm

Table B.12.2: Supported header fields within the PUBLISH response

Item	Header field	SIP status code	Ref.	RFC status	II-NNI condition
1	Accept	415	[13], [21]	m*	dm*
2	Accept-Encoding	415	[13], [21]	m*	dm*
3	Accept-Language	415	[13], [21]	m*	dm*
4	Accept-Resource-Priority	2xx 417	[78]	o	IF Table 6.1.3.1/73 THEN do
5	Allow	405	[13], [21]	m	dm
		r		o	do
6	Allow-Events	2xx	[20]	o	IF Table 6.1.3.1/23 THEN do
		489		m	dm
7	Authentication-Info	2xx	[13], [21]	o	IF Table 6.1.3.1/7 THEN do
8	Call-ID	100 others	[13], [21]	m	dm
9	Call-Info	r	[13], [21]	o	do
10	Contact	3xx 485	[13], [21]	o	do
11	Content-Disposition	r	[13], [21]	o	do
12	Content-Encoding	r	[13], [21]	o	do
13	Content-Language	r	[13], [21]	o	do
14	Content-Length	100 others	[13], [21]	t	dt
15	Content-Type	r	[13], [21]	*	d*
16	Cseq	100 others	[13], [21]	m	dm
17	Date	100 others	[13], [21]	o	do
18	Error-Info	3xx-6xx	[13], [21]	o	IF Table 6.1.3.1/13 THEN do
19	Expires	2xx	[13], [21]	m	dm
		r		o	do
20	From	100 others	[13], [21]	m	dm
21	Geolocation-Error	r	[68]	o	do
22	History-Info	r	[25]	o	IF Table 6.1.3.1/50 THEN do
23	MIME-version	r	[13], [21]	o	do
24	Min-Expires	423	[13], [21]	m	dm
25	Organization	r	[13], [21]	o	do
26	P-Access-Network-Info	r	[24]	o	IF Table 6.1.3.1/36 THEN do
27	P-Asserted-Identity	r	[44]	o	IF Table 6.1.3.1/27 AND response to request outside an existing dialog THEN do
28	P-Charging-Function-Addresses	r	[24]	o	dn/a
29	P-Charging-Vector	r	[24]	o	IF Table 6.1.3.1/38 THEN do
30	P-Debug-ID	100 others	[87]	o	IF Table 6.1.3.1/83 THEN do
31	P-Preferred-Identity	r	[44]	o	dn/a
32	Privacy	r	[34]	o	do
33	Proxy-Authenticate	401 (NOTE)	[13], [21]	o	do
		407 (NOTE)		m	dm
34	Require	r	[13], [21]	o	do
35	Retry-After	404 413 480 486 500 503 600 603	[13], [21]	o	do
36	Security-Server	2xx	[47]	n/a	dn/a

ETSI

Item	Header field	SIP status code	Ref.	RFC status	II-NNI condition
		421 494		o	dn/a
37	Server	r	[13], [21]	o	do
38	Session-ID	r	[124]	m	IF Table 6.1.3.1/94 THEN dm
39	SIP-Etag	2xx	[21]	m	dm
40	Supported	2xx	[13], [21]	o	do
41	Timestamp	r	[13], [21]	o	do
42	To	100 others	[13], [21]	m	dm
43	Unsupported	420	[13], [21]	o	do
44	User-Agent	r	[13], [21]	o	do
45	Via	100 others	[13], [21]	m	dm
46	Warning	r	[13], [21]	o	do
47	WWW-Authenticate	401 (NOTE)	[13], [21]	m	dm
		407 (NOTE)		o	do
NOTE: The SIP status code is only applicable over the roaming II-NNI.					

B.13   REFER method

As described in Table 6.1, the support of REFER method over the II-NNI is based on bilateral agreement between the operators.

Table B.13.1: Supported header fields within the REFER request

Item	Header field	Ref.	RFC status	II-NNI condition
0A	Accept	[13], [22]	o	do
0B	Accept-Contact	[51]	o	do
0C	Accept-Encoding	[13], [22]	o	do
1	Accept-Language	[13], [22]	o	do
1A	Allow	[13], [22]	o	do
2	Allow-Events	[20]	o	IF Table 6.1.3.1/23 THEN do
3	Authorization	[13], [22]	o	IF Table 6.1.3.1/7 THEN do
4	Call-ID	[13], [22]	m	dm
5	Contact	[13], [22]	m	dm
5A	Content-Disposition	[13], [22]	o	do
5B	Content-Encoding	[13], [22]	o	do
5C	Content-Language	[13], [22]	o	do
6	Content-Length	[13], [22]	o	do
7	Content-Type	[13], [22]	*	d*
8	Cseq	[13], [22]	m	dm
9	Date	[13], [22]	o	do
10	Expires	[13], [22]	o	do
11	From	[13], [22]	m	dm
11A	Geolocation	[68]	o	do
11B	History-Info	[25]	o	IF Table 6.1.3.1/50 AND initial request THEN do
11C	Max-Breadth	[79]	o	do
12	Max-Forwards	[13], [22]	m	dm
13	MIME-Version	[13], [22]	o	do
14	Organization	[13], [22]	o	do
14A	P-Access-Network-Info	[24]	o	IF Table 6.1.3.1/36 THEN do
14B	P-Asserted-Identity	[44]	o	IF Table 6.1.3.1/27 AND request outside an existing dialog THEN dm
14C	P-Asserted-Service	[26]	o	IF NOT roaming II-NNI (from visited to home) AND Table 6.1.3.1/77 AND request outside an existing dialog THEN do
14D	P-Called-Party-ID	[24]	o	IF Table 6.1.3.1/34 (form home to visited) THEN do
14E	P-Charging-Function-Addresses	[24]	o	dn/a
14F	P-Charging-Vector	[24]	o	IF Table 6.1.3.1/38 THEN do
14G	P-Debug-ID	[87]	o	IF Table 6.1.3.1/83 THEN do
14H	P-Preferred-Identity	[44]	o	dn/a
14I	P-Preferred-Service	[26]	o	IF roaming II-NNI (from visited to home) AND Table 6.1.3.1/77 AND request outside an existing dialog THEN do
14J	P-Private-Network-Indication	[84]	o	IF Table 6.1.3.1/80 THEN do
14K	P-Profile-Key	[64]	o	IF Table 6.1.3.1/59 AND request outside an existing dialog THEN do
14L	P-Served-User	[85]	o	dn/a
14M	P-User-Database	[60]	o	dn/a
14N	P-Visited-Network-ID	[24]	o	dn/a
14O	Privacy	[34]	o	do
15	Proxy-Authorization	[13], [22]	o	IF Table 6.1.3.1/7 THEN do
16	Proxy-Require	[13], [22]	o	do
16A	Reason	[48]	o	IF Table 6.1.3.1/40 AND request inside an existing dialog THEN do
17	Record-Route	[13], [22]	o	do
17A	Refer-Sub	[135]	o	do
18	Refer-To	[22]	dm	dm
18A	Referred-By	[53]	o	do
18B	Reject-Contact	[51]	o	do
18C	Request-Disposition	[51]	o	do
19	Require	[13], [22]	c	dc
19A	Resource-Priority	[78]	o	IF Table 6.1.3.1/73 THEN do
20	Route	[13], [22]	c	dc
20A	Security-Client	[47]	o	dn/a
20B	Security-Verify	[47]	o	dn/a

Item	Header field	Ref.	RFC status	II-NNI condition
20C	Session-ID	[124]	m	IF Table 6.1.3.1/94 THEN dm
21	Supported	[13], [22]	o	do
22	Timestamp	[13], [22]	o	do
23	To	[13], [22]	m	dm
23A	Trigger-Consent	[82]	o	IF Table 6.1.3.1/78 THEN do
24	User-Agent	[13], [22]	o	do
25	Via	[13], [22]	m	dm

Table B.13.2: Supported header fields within the REFER response

Item	Header field	SIP status code	Ref.	RFC status	II-NNI condition
1	Accept	415	[13], [22]	c	dc
2	Accept-Encoding	415	[13], [22]	c	dc
3	Accept-Language	415	[13], [22]	c	dc
4	Accept-Resource-Priority	2xx 417	[78]	o	IF Table 6.1.3.1/73 THEN do
5	Allow	405	[13], [22]	m	dm
		others		o	do
6	Allow-Events	2xx	[20]	o	IF Table 6.1.3.1/23 THEN do
7	Authentication-Info	2xx	[13], [22]	o	IF Table 6.1.3.1/7 THEN do
8	Call-ID	100 others	[13], [22]	m	dm
9	Contact	1xx	[13], [22]	n/a	dn/a
		2xx		m	dm
		3xx-6xx		o	do
10	Content-Disposition	r	[13], [22]	o	do
11	Content-Encoding	r	[13], [22]	o	do
12	Content-Language	r	[13], [22]	o	do
13	Content-Length	100 others	[13], [22]	t	dt
14	Content-Type	r	[13], [22]	*	d*
15	Cseq	100 others	[13], [22]	m	dm
16	Date	100 others	[13], [22]	o	do
17	Error-Info	3xx-6xx	[13], [22]	o	IF Table 6.1.3.1/13 THEN do
18	From	100 others	[13], [22]	m	dm
19	Geolocation-Error	r	[68]	o	do
20	History-Info	r	[25]	o	IF Table 6.1.3.1/50 THEN do
21	MIME-version	r	[13], [22]	o	do
22	Organization	r	[13], [22]	o	do
23	P-Access-Network-Info	r	[24]	o	IF Table 6.1.3.1/36 THEN do
24	P-Asserted-Identity	r	[44]	o	IF Table 6.1.3.1/27 AND response to request outside an existing dialog THEN do
25	P-Charging-Function-Addresses	r	[24]	o	dn/a
26	P-Charging-Vector	r	[24]	o	IF Table 6.1.3.1/38 THEN do
27	P-Debug-ID	100 others	[87]	o	IF Table 6.1.3.1/83 THEN do
28	P-Preferred-Identity	r	[44]	o	dn/a
29	Permission-Missing	470	[82]	o	IF Table 6.1.3.1/78 THEN do
30	Privacy	r	[34]	o	do
31	Proxy-Authenticate	401 (NOTE)	[13], [22]	o	do
		407 (NOTE)		m	dm
32	Record-Route	2xx	[13], [22]	o	do
33	Refer-Sub	2xx	[135]	o	IF Table 6.1.3.1/83 THEN do
34	Require	r	[13], [22]	c	dc
35	Retry-After	404 413 480 486 500 503 600 603	[13], [22]	o	do
36	Security-Server	2xx	[47]	n/a	dn/a
		421 494		o	dn/a

Item	Header field	SIP status code	Ref.	RFC status	II-NNI condition
37	Server	r	[13], [22]	o	do
38	Session-ID	r	[124]	m	IF Table 6.1.3.1/94 THEN dm
39	Supported	2xx	[13], [22]	o	do
40	Timestamp	r	[13], [22]	o	do
41	To	100 others	[13], [22]	m	dm
42	Unsupported	420	[13], [22]	o	do
43	User-Agent	r	[13], [22]	o	do
44	Via	100 others	[13], [22]	m	dm
45	Warning	r	[13], [22]	o	do
46	WWW-Authenticate	401 (NOTE)	[13], [22]	m	dm
		407 (NOTE)		o	do
NOTE: The SIP status code is only applicable over the roaming II-NNI.					

B.14 REGISTER method

As described in Table 6.1, the REGISTER method is supported only over the roaming II-NNI.

Table B.14.1: Supported header fields within the REGISTER request

Item	Header field	Ref.	RFC status	II-NNI condition
1	Accept	[13]	o	do
2	Accept-Encoding	[13]	o	do
3	Accept-Language	[13]	o	do
3A	Allow	[13]	o	do
4	Allow-Events	[20]	o	IF Table 6.1.3.1/23 THEN do
5	Authorization	[13]	o	IF using IMS AKA OR using SIP digest THEN dm ELSE do
6	Call-ID	[13]	m	dm
7	Call-Info	[13]	o	do
8	Contact	[13]	o	dm
9	Content-Disposition	[13]	o	do
10	Content-Encoding	[13]	o	do
11	Content-Language	[13]	o	do
12	Content-Length	[13]	t	dt
13	Content-Type	[13]	*	d*
14	Cseq	[13]	m	dm
15	Date	[13]	o	do
16	Expires	[13]	o	do
17	From	[13]	m	dm
17A	Geolocation	[68]	o	do
17B	History-Info	[25]	o	IF Table 6.1.3.1/50 THEN do
17C	Max-Breadth	[79]	o	do
18	Max-Forwards	[13]	m	dm
19	MIME-Version	[13]	o	do
20	Organization	[13]	o	do
20A	P-Access-Network-Info	[24]	o	IF Table 6.1.3.1/36 THEN do
20B	P-Charging-Function-Addresses	[24]	o	dn/a
20C	P-Charging-Vector	[24]	o	dm
20D	P-Debug-ID	[87]	o	IF Table 6.1.3.1/83 THEN do
20E	P-User-Database	[60]	o	dn/a
20F	P-Visited-Network-ID	[24]	o	dm
20G	Path	[43]	o	dm
20H	Privacy	[34]	o	dn/a
21	Proxy-Authorization	[13]	o	do
22	Proxy-Require	[13]	o	do
22A	Reason	[48]	o	do
22B	Recv-Info	[39]	o	IF Table 6.1.3.1/17 THEN do
22C	Referred-By	[53]	o	do
22D	Request-Disposition	[51]	o	do
23	Require	[13]	c	dm
23A	Resource-Priority	[78]	o	IF Table 6.1.3.1/73 THEN do
24	Route	[13]	c	dc
24A	Security-Client	[47]	o	dn/a
24B	Security-Verify	[47]	o	dn/a
24C	Session-ID	[124]	m	IF Table 6.1.3.1/94 THEN dm
25	Supported	[13]	o	dm
26	Timestamp	[13]	o	do
27	To	[13]	m	dm
28	User-Agent	[13]	o	do
29	Via	[13]	m	dm

Table B.14.2: Supported header fields within the REGISTER response

Item	Header field	SIP status code	Ref.	RFC status	II-NNI condition
1	Accept	2xx	[13]	o	do
		415		c	dc
2	Accept-Encoding	2xx	[13]	o	do
		415		c	dc
3	Accept-Language	2xx	[13]	o	do
		415		c	dc
4	Accept-Resource-Priority	2xx 417	[78]	o	IF Table 6.1.3.1/73 THEN do
5	Allow	2xx	[13]	o	do
		405		m	dm
		others		o	do
6	Allow-Events	2xx	[20]	o	IF Table 6.1.3.1/23 THEN do
7	Authentication-Info	2xx	[13]	o	do
8	Call-ID	100 others	[13]	m	dm
9	Call-Info	r	[13]	o	do
10	Contact	2xx	[13]	o	dm
		3xx 485		o	do
11	Content-Disposition	r	[13]	o	do
12	Content-Encoding	r	[13]	o	do
13	Content-Language	r	[13]	o	do
14	Content-Length	100 others	[13]	t	dt
15	Content-Type	r	[13]	*	d*
16	Cseq	100 others	[13]	m	dm
17	Date	100 others	[13]	o	do
18	Error-Info	3xx-6xx	[13]	o	IF Table 6.1.3.1/13 THEN do
19	Flow-Timer	2xx	[65]	o	do
20	From	100 others	[13]	m	dm
21	Geolocation-Error	r	[68]	o	do
22	History-Info	r	[25]	o	IF Table 6.1.3.1/50 THEN do
23	MIME-version	r	[13]	o	do
24	Min-Expires	423	[13]	m	dm
25	Organization	r	[13]	o	do
26	P-Access-Network-Info	r	[24]	o	IF Table 6.1.3.1/36 THEN do
27	P-Associated-URI	2xx	[24]	o	dm
28	P-Charging-Function-Addresses	r	[24]	o	dn/a
29	P-Charging-Vector	r	[24]	o	dm
30	P-Debug-ID	r	[87]	o	IF Table 6.1.3.1/83 THEN do
31	Path	2xx	[43]	o	dm
32	Privacy	r	[34]	o	do
33	Proxy-Authenticate	401	[13]	o	do
		407		m	dm
34	Require	r	[13]	c	dc
35	Retry-After	404 413 480 486 500 503 600 603	[13]	o	do
36	Security-Server	2xx 401	[47]	n/a	dn/a
		421 494		o	dn/a

Item	Header field	SIP status code	Ref.	RFC status	II-NNI condition
37	Server	r	[13]	o	do
38	Service-Route	2xx	[45]	o	dm
39	Session-ID	r	[124]	m	IF Table 6.1.3.1/94 THEN dm
40	Supported	2xx	[13]	o	do
41	Timestamp	r	[13]	o	do
42	To	100 others	[13]	m	dm
43	Unsupported	420	[13]	m	dm
44	User-Agent	r	[13]	o	do
45	Via	100 others	[13]	m	dm
46	Warning	r	[13]	o	do
47	WWW-Authenticate	401	[13]	m	dm
		407		o	do

B.15   SUBSCRIBE method

As described in Table 6.1, the support of SUBSCRIBE method over the non-roaming II-NNI is based on bilateral agreement between the operators.

Table B.15.1: Supported header fields within the SUBSCRIBE request

Item	Header field	Ref.	RFC status	II-NNI condition
1	Accept	[13], [20]	o	do
1A	Accept-Contact	[51]	o	do
2	Accept-Encoding	[13], [20]	o	do
3	Accept-Language	[13], [20]	o	do
3A	Allow	[13], [20]	o	do
4	Allow-Events	[20]	o	do
5	Authorization	[13], [20]	o	IF Table 6.1.3.1/7 THEN do
6	Call-ID	[13], [20]	m	dm
6A	Contact	[13], [20]	m	dm
7	Content-Disposition	[13], [20]	o	do
8	Content-Encoding	[13], [20]	o	do
9	Content-Language	[13], [20]	o	do
10	Content-Length	[13], [20]	t	dt
11	Content-Type	[13], [20]	*	d*
12	Cseq	[13], [20]	m	dm
13	Date	[13], [20]	o	do
14	Event	[20]	m	dm
15	Expires	[13], [20]	o	IF using reg event package THEN dm ELSE do
16	From	[13], [20]	m	dm
16A	Geolocation	[68]	o	do
16B	History-Info	[25]	o	IF Table 6.1.3.1/50 AND initial request THEN do
16C	Max-Breadth	[79]	o	dn/a
17	Max-Forwards	[13], [20]	m	dm
18	MIME-Version	[13], [20]	o	do
18A	Organization	[13], [20]	o	do
18B	P-Access-Network-Info	[24]	o	IF Table 6.1.3.1/36 THEN do
18C	P-Asserted-Identity	[44]	o	IF Table 6.1.3.1/27 AND initial request THEN dm
18D	P-Asserted-Service	[26]	o	IF NOT roaming II-NNI (from visited to home) AND Table 6.1.3.1/77 AND initial request THEN do
18E	P-Called-Party-ID	[24]	o	IF Table 6.1.3.1/34 (form home to visited) THEN do
18F	P-Charging-Function-Addresses	[24]	o	dn/a
18G	P-Charging-Vector	[24]	o	IF Table 6.1.3.1/38 THEN do
18H	P-Debug-ID	[87]	o	IF Table 6.1.3.1/83 THEN do
18I	P-Preferred-Identity	[44]	o	dn/a
18J	P-Preferred-Service	[26]	o	IF roaming II-NNI (from visited to home) AND Table 6.1.3.1/77 AND initial request THEN do
18K	P-Private-Network-Indication	[84]	o	IF Table 6.1.3.1/80 THEN do
18L	P-Profile-Key	[64]	o	IF Table 6.1.3.1/59 AND initial request THEN do
18M	P-Served-User	[85]	o	dn/a
18N	P-User-Database	[60]	o	dn/a
18O	P-Visited-Network-ID	[24]	o	dn/a
18P	Privacy	[34]	o	do
19	Proxy-Authorization	[13], [20]	o	IF Table 6.1.3.1/7 THEN do
20	Proxy-Require	[13], [20]	o	do
20A	Reason	[48]	o	IF Table 6.1.3.1/40 AND subsequent request THEN do
21	Record-Route	[13], [20]	o	do
21A	Referred-By	[53]	o	do
21B	Reject-Contact	[51]	o	do
21C	Request-Disposition	[51]	o	do
22	Require	[13], [20]	o	do
22A	Resource-Priority	[78]	o	IF Table 6.1.3.1/73 THEN do
23	Route	[13], [20]	c	dc
23A	Security-Client	[47]	o	dn/a
23B	Security-Verify	[47]	o	dn/a
23E	Session-ID	[124]	m	IF Table 6.1.3.1/94 THEN dm
24	Supported	[13], [20]	o	do

Item	Header field	Ref.	RFC status	II-NNI condition
25	Timestamp	[13], [20]	o	do
26	To	[13], [20]	m	dm
26A	Trigger-Consent	[82]	o	IF Table 6.1.3.1/78 THEN do
27	User-Agent	[13], [20]	o	do
28	Via	[13], [20]	m	dm

Table B.15.2: Supported header fields within the SUBSCRIBE response

Item	Header field	SIP status code	Ref.	RFC status	II-NNI condition
1	Accept	415	[13], [20]	o	do
2	Accept-Encoding	415	[13], [20]	o	do
3	Accept-Language	415	[13], [20]	o	do
4	Accept-Resource-Priority	2xx 417	[78]	o	IF Table 6.1.3.1/73 THEN do
5	Allow	405	[13], [20]	m	dm
		others		o	do
6	Allow-Events	2xx	[20]	o	do
		489		m	dm
7	Authentication-Info	2xx	[13], [20]	o	IF Table 6.1.3.1/7 THEN do
8	Call-ID	100 r	[13], [20]	m	dm
9	Contact	2xx 3xx	[13], [20]	m	dm
		485		o	do
10	Content-Disposition	r	[13], [20]	o	do
11	Content-Encoding	r	[13], [20]	o	do
12	Content-Language	r	[13], [20]	o	do
13	Content-Length	100 others	[13], [20]	t	dt
14	Content-Type	r	[13], [20]	*	d*
15	Cseq	100 others	[13], [20]	m	dm
16	Date	100 others	[13], [20]	o	do
17	Error-Info	3xx-6xx	[13], [20]	o	IF Table 6.1.3.1/13 THEN do
18	Expires	2xx	[13], [20]	m	dm
19	From	100 others	[13], [20]	m	dm
20	Geolocation-Error	r	[68]	o	do
21	History-Info	r	[25]	o	IF Table 6.1.3.1/50 THEN do
22	MIME-version	r	[13], [20]	o	do
23	Min-Expires	423	[13], [20]	m	dm
24	Organization	r	[13], [20]	o	do
25	P-Access-Network-Info	r	[24]	o	IF Table 6.1.3.1/36 THEN do
26	P-Asserted-Identity	r	[44]	o	IF Table 6.1.3.1/27 AND response to initial request THEN do
27	P-Charging-Function-Addresses	r	[24]	o	dn/a
28	P-Charging-Vector	r	[24]	o	IF Table 6.1.3.1/38 THEN do
29	P-Debug-ID	100 others	[87]	o	IF Table 6.1.3.1/83 THEN do
30	P-Preferred-Identity	r	[44]	o	dn/a
31	Permission-Missing	470	[82]	o	IF Table 6.1.3.1/78 THEN do
32	Privacy	r	[34]	o	do
33	Proxy-Authenticate	401 (NOTE)	[13], [20]	o	do
		407 (NOTE)		m	dm
34	Record-Route	2xx	[13], [20]	o	do
35	Require	r	[13], [20]	o	do
36	Retry-After	404 413 480 486 500 503 600 603	[13], [20]	o	do
37	Security-Server	2xx	[47]	n/a	dn/a

ETSI

Item	Header field	SIP status code	Ref.	RFC status	II-NNI condition
		421 494		o	dn/a
38	Server	415 others	[13], [20]	o	do
39	Session-ID	r	[124]	m	IF Table 6.1.3.1/94 THEN dm
40	Supported	2xx	[13], [20]	o	do
41	Timestamp	r	[13], [20]	o	do
42	To	100 others	[13], [20]	m	dm
43	Unsupported	420	[13], [20]	o	do
44	User-Agent	r	[13], [20]	o	do
45	Via	100 others	[13], [20]	m	dm
46	Warning	r	[13], [20]	o	do
47	WWW-Authenticate	401 (NOTE)	[13], [20]	m	dm
		407 (NOTE)		o	do
NOTE: The SIP status code is only applicable over the roaming II-NNI.					

B.16 UPDATE method

Table B.16.1: Supported header fields within the UPDATE request

Item	Header field	Ref.	RFC status	II-NNI condition
1	Accept	[13], [23]	o	do
1A	Accept-Contact	[51]	o	do
2	Accept-Encoding	[13], [23]	o	do
3	Accept-Language	[13], [23]	o	do
4	Allow	[13], [23]	o	do
5	Allow-Events	[20]	n/a	dn/a
6	Authorization	[13], [23]	o	IF Table 6.1.3.1/7 THEN do
7	Call-ID	[13], [23]	m	dm
8	Call-Info	[13], [23]	o	do
9	Contact	[13], [23]	m	dm
10	Content-Disposition	[13], [23]	o	do
11	Content-Encoding	[13], [23]	o	do
12	Content-Language	[13], [23]	o	do
13	Content-Length	[13], [23]	t	dt
14	Content-Type	[13], [23]	*	d*
15	Cseq	[13], [23]	m	dm
16	Date	[13], [23]	o	do
17	From	[13], [23]	m	dm
17A	Geolocation	[68]	o	do
17B	Max-Breadth	[79]	o	dn/a
18	Max-Forwards	[13], [23]	m	dm
19	MIME-Version	[13], [23]	o	do
19A	Min-SE	[52]	o	do
20	Organization	[13], [23]	o	do
20A	P-Access-Network-Info	[24]	o	IF Table 6.1.3.1/36 THEN do
20B	P-Charging-Function-Addresses	[24]	o	dn/a
20C	P-Charging-Vector	[24]	o	IF Table 6.1.3.1/38 THEN do
20D	P-Debug-ID	[87]	o	IF Table 6.1.3.1/83 THEN do
20E	P-Early-Media	[74]	o	IF Table 6.1.3.1/69 THEN do
20F	Privacy	[34]	o	do
21	Proxy-Authorization	[13], [23]	o	IF Table 6.1.3.1/7 THEN do
22	Proxy-Require	[13], [23]	o	do
22A	Reason	[48]	o	IF Table 6.1.3.1/40 THEN do
23	Record-Route	[13], [23]	o	do
23A	Recv-Info	[39]	o	IF Table 6.1.3.1/17 THEN do
23B	Referred-By	[53]	o	do
23C	Reject-Contact	[51]	o	do
23D	Request-Disposition	[51]	o	do
24	Require	[13], [23]	c	dc
24A	Resource-Priority	[78]	o	IF Table 6.1.3.1/73 THEN do
25	Route	[13], [23]	c	dc
25A	Security-Client	[47]	o	dn/a
25B	Security-Verify	[47]	o	dn/a
25C	Session-Expires	[52]	o	do
25D	Session-ID	[124]	m	IF Table 6.1.3.1/94 THEN dm
26	Supported	[13], [23]	o	do
27	Timestamp	[13], [23]	o	do
28	To	[13], [23]	m	dm
29	User-Agent	[13], [23]	o	do
30	Via	[13], [23]	m	dm

Table B.16.2: Supported header fields within the UPDATE response

Item	Header field	SIP status code	Ref.	RFC status	II-NNI condition
1	Accept	2xx	[13], [23]	o	do
		415		c	dc
2	Accept-Encoding	2xx	[13], [23]	o	do
		415		c	dc
3	Accept-Language	2xx	[13], [23]	o	do
		415		c	dc
4	Accept-Resource-Priority	2xx 417	[78]	o	IF Table 6.1.3.1/73 THEN do
5	Allow	2xx	[13], [23]	o	do
		405		m	dm
		others		o	do
6	Allow-Events	2xx	[20]	n/a	dn/a
7	Authentication-Info	2xx	[13], [23]	o	IF Table 6.1.3.1/7 THEN do
8	Call-ID	100 others	[13], [23]	m	dm
9	Call-Info	r	[13], [23]	o	do
10	Contact	2xx	[13], [23]	m	dm
		3xx 485		o	do
		others		o	do
11	Content-Disposition	r	[13], [23]	o	do
12	Content-Encoding	r	[13], [23]	o	do
13	Content-Language	r	[13], [23]	o	do
14	Content-Length	100 others	[13], [23]	t	dt
15	Content-Type	r	[13], [23]	*	d*
16	Cseq	100 others	[13], [23]	m	dm
17	Date	100 others	[13], [23]	o	do
18	Error-Info	3xx-6xx	[13], [23]	o	IF Table 6.1.3.1/13 THEN do
19	From	100 others	[13], [23]	m	dm
20	Geolocation-Error	r	[68]	o	do
21	MIME-version	r	[13], [23]	o	do
22	Min-SE	422	[52]	m	dm
23	Organization	r	[13], [23]	o	do
24	P-Access-Network-Info	r	[24]	o	IF Table 6.1.3.1/36 THEN do
25	P-Charging-Function-Addresses	r	[24]	o	dn/a
26	P-Charging-Vector	r	[24]	o	IF Table 6.1.3.1/38 THEN do
27	P-Debug-ID	100 others	[87]	o	IF Table 6.1.3.1/83 THEN do
28	P-Early-Media	2xx	[74]	o	IF Table 6.1.3.1/69 THEN do
29	Privacy	r	[34]	o	do
30	Proxy-Authenticate	401 (NOTE)	[13], [23]	o	do
		407 (NOTE)		m	dm
31	Recv-Info	2xx	[39]	c	IF Table 6.1.3.1/17 THEN dc
		others		o	IF Table 6.1.3.1/17 THEN do
32	Require	r	[13], [23]	c	dc
33	Retry-After	404 413 480 486 500 503 600 603	[13], [23]	o	do

Item	Header field	SIP status code	Ref.	RFC status	II-NNI condition
34	Security-Server	421 494	[47]	o	dn/a
35	Server	r	[13], [23]	o	do
36	Session-Expires	2xx	[52]	o	do
37	Session-ID	r	[124]	m	IF Table 6.1.3.1/94 THEN dm
38	Supported	2xx	[13], [23]	o	do
39	Timestamp	r	[13], [23]	o	do
40	To	100 others	[13], [23]	m	dm
41	Unsupported	420	[13], [23]	m	dm
42	User-Agent	r	[13], [23]	o	do
43	Via	100 others	[13], [23]	m	dm
44	Warning	r	[13], [23]	o	do
45	WWW-Authenticate	401 (NOTE)	[13], [23]	m	dm
		407 (NOTE)		o	do
NOTE: The SIP status code is only applicable over the roaming II-NNI.					

Annex C:
Change history

Date	TSG #	TSG Doc.	CR	Rev	Subject/Comment	Old	New
					Change history		
4/05/2008					TS Skeleton (C3-080779)	-	0.0.0
07/07/2008					Added agreed text of C3-080991, C3-081158 and C3-081208	0.0.0	0.1.0
28/08/2008					Added agreed text of C3-081282 and C3-081672	0.1.0	0.2.0
01/09/2008					Version 1.0.0 created for presentation to TSG by MCC	0.2.0	1.0.0
17/10/2008					Added agreed text of C3-081721 and C3-082105	1.0.0	1.1.0
20/11/2008					Added agreed text of C3-082303, C3-082446, C3-082447 and C3-082611	1.0.0	1.2.0
26/11/2008					v 2.0.0 was produced by MCC for Approval in CT#42	1.2.0	2.0.0
13/12/2008	TSG#42				V 8.0.0 was produced by MCC	2.0.0	8.0.0
03/2008	TSG#43	CP-090087	002	3	Charging requirements on II-NNI	8.0.0	8.1.0
03/2008	TSG#43	CP-090087	004	1	Modification of the REFER method status	8.0.0	8.1.0
03/2008	TSG#43	CP-090087	007	2	NNI header tables	8.0.0	8.1.0
05/2009	TSG#44	CP-090341	008	4	Use of E.164 number at the II-NNI	8.1.0	8.2.0
05/2009	TSG#44	CP-090341	009	4	Correction to SIP headers table	8.1.0	8.2.0
09/2009	TSG#45	CP-090576	017	1	Removal of left-over text from TS drafting phase and update of a reference	8.2.0	8.3.0
09/2009	TSG#45	CP-090576	018	2	Applicability of SIP headers for roaming II-NNI	8.2.0	8.3.0
09/2009	TSG#45	CP-090576	019	1	Application level gateway usage to enable communication from private IP address space	8.2.0	8.3.0
09/2009	TSG#45	CP-090576	020	3	Codecs at the NNI	8.2.0	8.3.0
09/2009	TSG#45	CP-090584	011	4	Major capabilities on II-NNI	8.3.0	9.0.0
09/2009	TSG#45	CP-090584	013	4	Management of SIP headers over II-NNI in presence of trust or no trusted relationship (V1)	8.3.0	9.0.0
09/2009	TSG#45	CP-090584	015	4	Requirements for the end-to-end interoperability of supplementary services	8.3.0	9.0.0
09/2009	TSG#45	CP-090584	016	3	Deletion of the note about the normalization of phone numbers	8.3.0	9.0.0
12/2009	TSG#46	CP-090854	021	5	Requirements for HOLD service over II-NNI	9.0.0	9.1.0
12/2009	TSG#46	CP-090854	022	5	Requirements for CW service over II-NNI	9.0.0	9.1.0
12/2009	TSG#46	CP-090844	024	3	Aligning references to P-Asserted-Service	9.0.0	9.1.0
12/2009	TSG#46	CP-090844	026		Annex A header updated with Answer-Mode, Priv-Answer-Mode and P-Answer-State	9.0.0	9.1.0
12/2009	TSG#46	CP-090854	031	6	Filling of the table about major capabilities on II-NNI	9.0.0	9.1.0
12/2009	TSG#46	CP-090854	032	1	Customized Ringing Signal (CRS) modification	9.0.0	9.1.0
12/2009	TSG#46	CP-090854	033	2	Completing the Personal Network Management (PNM) supplementary service	9.0.0	9.1.0
12/2009	TSG#46	CP-090854	034	1	Aligning existing supplementary services	9.0.0	9.1.0

12/2009	TSG#46	CP-090854	035	1	Completing the Flexible Alerting (FA) supplementary service	9.0.0	9.1.0
12/2009	TSG#46	CP-090854	036	1	Completing the Closed User Group (CUG) supplementary service	9.0.0	9.1.0
12/2009	TSG#46	CP-090854	037	3	Completing the Three-Party (3PTY) and Conference (CONF) supplementary services	9.0.0	9.1.0
12/2009	TSG#46	CP-090854	038	3	Completing the Anonymous Communication Rejection (ACR) supplementary service	9.0.0	9.1.0
12/2009	TSG#46	CP-090854	039	3	Completing Completion of Communications to Busy Subscriber (CCBS) and Completion of Communications by No Reply (CCNR) supplementary services	9.0.0	9.1.0
12/2009	TSG#46	CP-090854	040		Completing Message Waiting Indication (MWI) supplementary service	9.0.0	9.1.0
12/2009	TSG#46	CP-090854	041	1	Completing the Terminating Identification Presentation (TIP) and Terminating Identification Restriction (TIR) needs to be completed.	9.0.0	9.1.0
12/2009	TSG#46	CP-090854	042	3	Completing the Communication Barring (CB) supplementary service	9.0.0	9.1.0
12/2009	TSG#46	CP-090854	043	2	Completing Explicit Communication Transfer (ECT)	9.0.0	9.1.0
12/2009	TSG#46	CP-090854	044	3	Completing Communication DIVersion (CDIV) supplementary services	9.0.0	9.1.0
12/2009	TSG#46	CP-090854	046	2	Deletion of an editors note on OIR service	9.0.0	9.1.0
12/2009	TSG#46	CP-090844	047	3	Annex A header updated	9.0.0	9.1.0
03/2010	TSG#47	CP-100077	051	2	Format of Request URI	9.1.0	9.2.0
03/2010	TSG#47	CP-100077	055	2	MSC Server enhanced for ICS missing in architecture	9.1.0	9.2.0
03/2010	TSG#47	CP-100087	058		AOC added to supplementary services	9.1.0	9.2.0
03/2010	TSG#47	CP-100087	059		CPC and OLI IETF reference update	9.1.0	9.2.0
03/2010	TSG#47	CP-100087	060	3	CPC and OLI and trust domain	9.1.0	9.2.0
03/2010	TSG#47	CP-100087	061	1	Modifying CUG interactions	9.1.0	9.2.0
03/2010	TSG#47	CP-100087	062		Correcting minor errors	9.1.0	9.2.0
03/2010	TSG#47	CP-100087	063	4	Updating Major Capability according to latest 24.229	9.1.0	9.2.0
03/2010	TSG#47	CP-100087	064	1	Major Capabilities revision 2	9.1.0	9.2.0
03/2010	TSG#47	CP-100087	067	1	Table 6.2 update	9.1.0	9.2.0
03/2010	TSG#47	CP-100087	068	1	Modification of OIP/OIR paragraph description (R9 29.165)	9.1.0	9.2.0
03/2010	TSG#47	CP-100087	071	1	References numbers update (R9 29.165)	9.1.0	9.2.0
06/2010	TSG#48	CP-100319	073	1	The Session-ID added to annex A	9.2.0	9.3.0
06/2010	TSG#48	CP-100319	077	2	Correcting incorrect interface name	9.2.0	9.3.0
06/2010	TSG#48	CP-100319	079	2	Supported URI formats also based on operator agreements	9.2.0	9.3.0
06/2010	TSG#48	CP-100319	080	2	Customized Alerting Tone (CAT)	9.2.0	9.3.0
06/2010	TSG#48	CP-100319	081	2	Customized Ringing Signal (CRS)	9.2.0	9.3.0
06/2010	TSG#48	CP-100319	082	1	Correcting miscellaneous errors	9.2.0	9.3.0
06/2010	TSG#48	CP-100319	084	2	Applicability of "critical" privacy value	9.2.0	9.3.0
06/2010	TSG#48	CP-100319	085		Making Alert-Info not mandatory	9.2.0	9.3.0
06/2010	TSG#48	CP-100319	086	1	Draft-johnston-sipping-cc-uui reference updated to new version	9.2.0	9.3.0

06/2010	TSG#48	CP-100319	087	2	Correcting references for removal of P-Asserted-Identity	9.2.0	9.3.0
06/2010	TSG#48	CP-100319	091	2	Correction of Mayor Capabilities	9.2.0	9.3.0
06/2010	TSG#48	CP-100319	093	2	Usage of "Refer" for conferencing and 3PTY	9.2.0	9.3.0
06/2010	TSG#48	CP-100325	083	4	ICS, SRVCC, IUT and MSC Server mid-call assisted feature interoperability	9.3.0	10.0.0
09/2010	TSG#49	CP-100614	094	1	Presence service at II-NNI	10.0.0	10.1.0
09/2010	TSG#49	CP-100553	096	2	Support of REFER checked by entry IBCF	10.0.0	10.1.0
09/2010	TSG#49	CP-100545	099	2	Removing unnecessary normative text	10.0.0	10.1.0
09/2010	TSG#49	CP-100553	101	1	CCBS and CCNR and the m-parameter	10.0.0	10.1.0
09/2010	TSG#49	CP-100559	102	2	CCNL support in the II-NNI	10.0.0	10.1.0
09/2010	TSG#49	CP-100553	104	1	Correcting references	10.0.0	10.1.0
09/2010	TSG#49	CP-100553	106		Adding missing "history" privacy value to CDIV	10.0.0	10.1.0
09/2010	TSG#49	CP-100553	109	3	MCID and identity information transfer clarification	10.0.0	10.1.0
09/2010	TSG#49	CP-100553	111	2	Correcting name of the Authenticate header field and the applicability over II-NNI	10.0.0	10.1.0
09/2010	TSG#49	CP-100553	113	2	Aligning Major Capabilities Table with 24.229	10.0.0	10.1.0
09/2010	TSG#49	CP-100614	114	2	SRVCC additions and reference to subclause 14.2	10.0.0	10.1.0
12/2010	TSG#50	CP-100781	118	2	Aligning annex A with Major Capabilities Table	10.1.0	10.2.0
12/2010	TSG#50	CP-100775	121		Release version added to ETSI specification	10.1.0	10.2.0
12/2010	TSG#50	CP-100785	123		Privacy protection in IBCF	10.1.0	10.2.0
12/2010	TSG#50	CP-100775	126		Correcting errors in SIP method subclause	10.1.0	10.2.0
12/2010	TSG#50	CP-100781	128		Duplications of rows in Major capability table	10.1.0	10.2.0
12/2010	TSG#50	CP-100785	129	1	Editorial corrections	10.1.0	10.2.0
12/2010	TSG#50	CP-100785	130		Missing reference to 24.229 in major capability table	10.1.0	10.2.0
12/2010	TSG#50	CP-100775	133	1	IBCF and URI formats	10.1.0	10.2.0
12/2010	TSG#50	CP-100775	136	1	Roaming and non-roaming definition added	10.1.0	10.2.0
12/2010	TSG#50	CP-100886	137	3	Clarification of relevance of restrictions over II-NNI	10.1.0	10.2.0
12/2010	TSG#50	CP-100775	140	2	Refer-Sub and Refer-To missing in annex A	10.1.0	10.2.0
12/2010	TSG#50	CP-100781	142	2	Supplementary services corrections	10.1.0	10.2.0
12/2010	TSG#50	CP-100785	143	2	OMA presence additions to 3GPP	10.1.0	10.2.0
12/2010	TSG#50	CP-100785	144	1	Instant messaging	10.1.0	10.2.0
12/2010	TSG#50	CP-100785	145	3	adding references to table 6.2	10.1.0	10.2.0
12/2010	TSG#50	CP-100785	146	1	Editors change of major capability n98	10.1.0	10.2.0
12/2010	TSG#50	CP-100785	147	2	ICB	10.1.0	10.2.0
12/2010	TSG#50	CP-100785	148	2	Service OIP/OIR, TIP/TIR	10.1.0	10.2.0
12/2010	TSG#50	CP-100781	149	1	MCID and ACR	10.1.0	10.2.0
12/2010	TSG#50	CP-100785	150	1	Clarifications of operator option items	10.1.0	10.2.0
03/2011	TSG#51	CP-110113	156		Correction on Major Capabilities over II-NNI	10.2.0	10.3.0

ETSI

03/2011	TSG#51	CP-110113	158	1	Addition of the Target-Dialog header field to the table of major capabilities and Annex A	10.2.0	10.3.0
03/2011	TSG#51	CP-110113	160	2	Correcting major capabilities related to trust domain	10.2.0	10.3.0
03/2011	TSG#51	CP-110116	161	1	RFC 5318 in the Major capability table	10.2.0	10.3.0
03/2011	TSG#51	CP-110116	162	2	Updating OMA presence requirements	10.2.0	10.3.0
03/2011	TSG#51	CP-110113	164	3	Reference clause updates	10.2.0	10.3.0
03/2011	TSG#51	CP-110116	165		Introduction of ATCF	10.2.0	10.3.0
03/2011	TSG#51	CP-110116	166	2	Interoperability of IMS Service Continuity over II-NNI updates	10.2.0	10.3.0
03/2011	TSG#51	CP-110113	168	2	Updates of the Major capability table	10.2.0	10.3.0
03/2011	TSG#51	CP-110116	169	3	Adding new header fields Annex A	10.2.0	10.3.0
03/2011	TSG#51	CP-110107	172	1	Correcting header table in annex A	10.2.0	10.3.0
03/2011	TSG#51	CP-110113	174		Reference update: RFC 6086	10.2.0	10.3.0
03/2011	TSG#51	CP-110116	175	1	Reference points Mi, Mm, Mw and I2	10.2.0	10.3.0
03/2011	TSG#51	CP-110107	178		Adding MMTel feature tag in clause 12	10.2.0	10.3.0
03/2011	TSG#51	CP-110116	179		Minor corrections to 3GPP TS 29.165	10.2.0	10.3.0
03/2011	TSG#51	CP-110116	180		Alignment with 23.228 Ici reference point	10.2.0	10.3.0
03/2011	TSG#51	CP-110116	181	1	Miscellaneous error corrections to 3GPP TS 29.165	10.2.0	10.3.0
03/2011	TSG#51	CP-110129	182	5	New annex for dynamic view of SIP messages	10.2.0	10.3.0
03/2011	TSG#51	CP-110129	183	3	Summary of notation codes in dynamic view (ACK method)	10.2.0	10.3.0
03/2011	TSG#51	CP-110129	184	5	Summary of notation codes in dynamic view (BYE method)	10.2.0	10.3.0
03/2011	TSG#51	CP-110129	185	3	Summary of notation codes in dynamic view (CANCEL method)	10.2.0	10.3.0
03/2011	TSG#51	CP-110129	186	5	Summary of notation codes in dynamic view (INVITE method)	10.2.0	10.3.0
03/2011	TSG#51	CP-110129	187	5	Summary of notation codes in dynamic view (MESSAGE method)	10.2.0	10.3.0
03/2011	TSG#51	CP-110129	188	5	Summary of notation codes in dynamic view (OPTIONS method)	10.2.0	10.3.0
03/2011	TSG#51	CP-110129	189	5	Summary of notation codes in dynamic view (PRACK method)	10.2.0	10.3.0
03/2011	TSG#51	CP-110129	190	5	Summary of notation codes in dynamic view (PUBLISH method)	10.2.0	10.3.0
03/2011	TSG#51	CP-110129	191	3	Summary of notation codes in dynamic view (REGISTER method)	10.2.0	10.3.0
03/2011	TSG#51	CP-110129	192	5	Summary of notation codes in dynamic view (UPDATE method)	10.2.0	10.3.0
03/2011	TSG#51	CP-110113	194	4	Alignment of INFO support for DTMF transport with TS 24.182	10.2.0	10.3.0
03/2011	TSG#51	CP-110116	197	2	Addition of normative references for in band DTMF and SDP messages	10.2.0	10.3.0
03/2011	TSG#51	CP-110113	199	1	Correcting the management of SIP header field relating to trust relationship	10.2.0	10.3.0
03/2011	TSG#51	CP-110116	206	1	Correcting related to references	10.2.0	10.3.0
03/2011	TSG#51	CP-110113	212	1	Updating references in TS29.165	10.2.0	10.3.0
03/2011	TSG#51	CP-110116	213		Minor correction on reference in table 6.2 of TS 29.165	10.2.0	10.3.0
03/2011	TSG#51	CP-110116	214	1	Updating references in TS29.16 release 10	10.2.0	10.3.0
03/2011	TSG#51	CP-110113	217	3	Removal av draft-patel-dispatch-cpc-oli-parameter from references	10.2.0	10.3.0
03/2011	TSG#51	CP-110113	219	1	Removal of draft-patel-ecrit-sos-parameter	10.2.0	10.3.0

03/2011	TSG#51	CP-110129	224	2	Summary of notation codes in dynamic view (INFO method)	10.2.0	10.3.0
03/2011	TSG#51	CP-110129	225	2	Summary of notation codes in dynamic view (NOTIFY method)	10.2.0	10.3.0
03/2011	TSG#51	CP-110129	226	2	Summary of notation codes in dynamic view (REFER method)	10.2.0	10.3.0
03/2011	TSG#51	CP-110129	227	2	Summary of notation codes in dynamic view (SUBSCRIBE method)	10.2.0	10.3.0
03/2011	TSG#51	CP-110117	228	2	OMR	10.2.0	10.3.0
03/2011	TSG#51	CP-110116	234		Unification of the words and phrases in clause 12	10.2.0	10.3.0
03/2011	TSG#51				Editorial changes made by MCC	10.3.0	10.3.1

History

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