

# 3GPP TR 29.865 V8.0.0 (2008-09)

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*Technical Report*

## **3rd Generation Partnership Project; Technical Specification Group Core Network and Terminals; Inter-IMS Network to Network Interface; (Release 8)**



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## Foreword

This Technical Report has been produced by the 3<sup>rd</sup> Generation Partnership Project (3GPP).

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

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- z the third digit is incremented when editorial only changes have been incorporated in the document.

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## Introduction

*This clause is optional. If it exists, it is always the second unnumbered clause.*

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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 headers) 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.

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

The purpose of this document is to prepare some material that could be moved to the foreseen Technical Specification for the profiling of the Inter-IMS Network to Network Interface (II-NNI) and to propose if any needed modifications of the 3GPP core specifications are required.

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# 2 References

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

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

- [1] 3GPP TR 21.905: "Vocabulary for 3GPP Specifications".
- [2] 3GPP TS 22.228: "Service requirements for the IP multimedia core network subsystem".
- [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 33.210: "3G security; Network Domain Security (NDS); IP network layer security".
- [10] IETF RFC 3261: "SIP: Session Initiation Protocol".
- [11] IETF RFC 3966: "The tel URI for Telephone Numbers".
- [12] IETF RFC 3860: "Common Profile for Instant Messaging (CPIM)".
- [13] IETF RFC 3859: "Common Profile for Presence (CPP)".
- [14] IETF RFC 4975: "The Message Session Relay Protocol (MSRP)".

- [15] 3GPP TS 26.114: "IP Multimedia Subsystem (IMS); Multimedia Telephony; Media handling and interaction".
- [16] ETSI TS 181 005: "Telecommunications and Internet converged Services and Protocols for Advanced Networking (TISPAN); Services and Capabilities Requirements"
- [17] IETF RFC 791: "Internet Protocol"
- [18] RFC 3262: "Reliability of provisional responses in Session Initiation Protocol (SIP)".
- [19] RFC 3428: "Session Initiation Protocol (SIP) Extension for Instant Messaging".
- [20] RFC 3265: "Session Initiation Protocol (SIP) Specific Event Notification".
- [21] RFC 3903: "An Event State Publication Extension to the Session Initiation Protocol (SIP)".
- [22] RFC 3515: "The Session Initiation Protocol (SIP) REFER method".
- [23] RFC 3311: "The Session Initiation Protocol (SIP) UPDATE method".
- [24] RFC 3455: "Private Header (P-Header) Extensions to the Session Initiation Protocol (SIP) for the 3rd-Generation Partnership Project (3GPP)".
- [25] RFC 4244: "An Extension to the Session Initiation Protocol (SIP) for Request History Information".
- [26] draft-drage-sipping-service-identification-01 (July 2007): "A Session Initiation Protocol (SIP) Extension for the Identification of Services".

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

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## 3 Definitions, symbols and abbreviations

*Delete from the above heading those words which are not applicable.*

*Subclause numbering depends on applicability and should be renumbered accordingly.*

### 3.1 Definitions

For the purposes of the present document, the terms and definitions given in 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 TR 21.905 [1].

*Definition format*

*<defined term>: <definition>.*

**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 [2].

**IP multimedia session:** as specified in 3GPP TS 22.228 [2] 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 may invoke concurrent IP multimedia sessions.

## 3.2 Symbols

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

### *Symbol format*

<symbol>	<Explanation>
Ici	Reference Point between an IBCF and another IBCF or I-CSCF 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 and IBCF

## 3.3 Abbreviations

For the purposes of the present document, the abbreviations given in 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 TR 21.905 [1].

IBCF	Interconnection Border Control Function
II-NNI	Inter-IMS Network to Network Interface
NA (P) T-PT	Network Address (Port-Multiplexing) Translation-Protocol Translation
TrGW	Transition Gateway

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# 4 Overview

## 4.1 Introduction

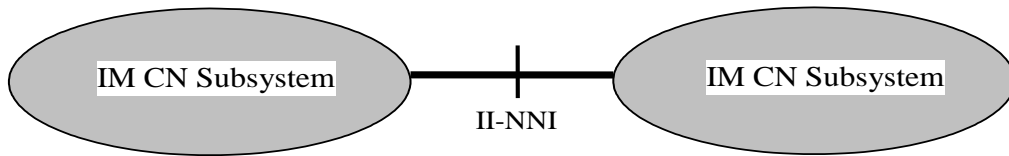
Interconnection between two different IM CN subsystems shall be guaranteed in order to support end-to-end service interoperability. For this purpose, Inter-IMS Network to Network Interface (II-NNI) between two IM CN subsystem networks is adopted, according to the assumptions coming from 3GPP TS 23.002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

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

The management of IP multimedia sessions is acted by using SIP. The transport mechanism for both SIP session signalling and media transport is IPv4 (IETF RFC 791 [17]) 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.



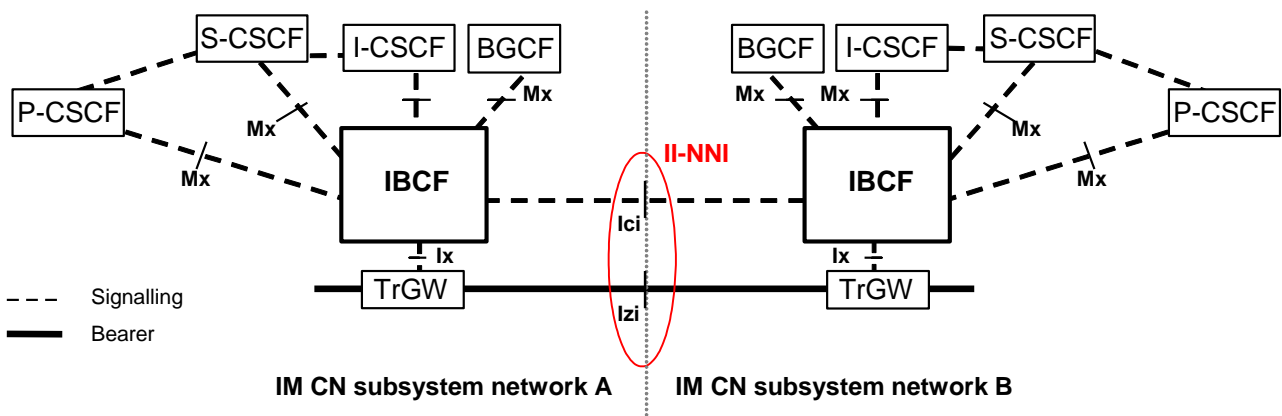
**Figure 4.1: Interconnection Model for IM CN Subsystems**

The possible functional entities involved in the signalling plane interconnection (IBCF, I-CSCF, BGCF) and in the user plane interconnection (TrGW) are specified in 3GPP TS 24.229 [5] and in 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: 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.

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 TS 33.210 [9].



## 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 Icf reference point. According to 3GPP TS 23.228 [4], it may 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 (enabling communication between IPv6 and IPv4 SIP applications);
- controlling transport plane functions;
- screening of SIP signalling information;
- selecting the appropriate signalling interconnect;
- generation of charging data records;
- inclusion of an IWF if appropriate, when interworking between different SIP profiles.

NOTE: the functionality of IWF when interworking between different protocols (e.g., SIP and H.323) is not necessary in case of interconnection between two IMS networks

Based on local configuration, the IBCF may perform transit routing functions [4].

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. NAT-PT provides additional translation of transport identifier (TCP and UDP port numbers). The approach is similar to that one described also in TS 29.162 [8].

Further details are described in TS 23.228 [4].

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## 6 Control plane interconnection

### 6.1 Definition of Inter-IMS Network to Network Interconnection

#### 6.1.1 SIP methods and headers

##### 6.1.1.1 General

The functional entity closest to the border of an IMS network towards an Inter-IMS Network to Network Interconnection (see reference model in Clause 5) shall provide the capabilities specified for that network element in Annex A.2 of 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 shall be supported on the II-NNI.

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

**Table 6.1: Supported methods**

Item	PDU	Sending		Receiving	
		Ref.	II-NNI	Ref.	II-NNI
1	ACK request	[10]	m	[10]	m
2	BYE request	[10]	m	[10]	m
3	BYE response	[10]	m	[10]	m
4	CANCEL request	[10]	m	[10]	m
5	CANCEL response	[10]	m	[10]	m
8	INVITE request	[10]	m	[10]	m
9	INVITE response	[10]	m	[10]	m
9A	MESSAGE request	[19]	m	[19]	m
9B	MESSAGE response	[19]	m	[19]	m
10	NOTIFY request	[20]	m	[20]	m
11	NOTIFY response	[20]	m	[20]	m
12	OPTIONS request	[10]	m	[10]	m
13	OPTIONS response	[10]	m	[10]	m
14	PRACK request	[18]	m	[18]	m
15	PRACK response	[18]	m	[18]	m
15A	PUBLISH request	[21]	c1	[21]	c1
15B	PUBLISH response	[21]	c1	[21]	c1
16	REFER request	[22]	m	[22]	m
17	REFER response	[22]	m	[22]	m
18	REGISTER request	[10]	c2	[10]	c2
19	REGISTER response	[10]	c2	[10]	c2
20	SUBSCRIBE request	[20]	m	[20]	m
21	SUBSCRIBE response	[20]	m	[20]	m
22	UPDATE request	[23]	m	[23]	m
23	UPDATE response	[23]	m	[23]	m
NOTE: the IBCF profile is indicated in Table A.5 and Table A.162 of TS 24.229 [5].					
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.					

In the above table, m, o, c, i and N/A have the meanings indicated in Table 6.4.

**Editor's Note:** Insertion in the Table 6.1 of columns indicating the IBCF profile, as proposed in TS 24.229, for sending and receiving side is FFS..

**Editor's Note:** Insertion in the Table 6.1 of the INFO method is FFS.

### 6.1.1.3 SIP headers

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

#### 6.1.1.3.1 Trust and not trust domain

In case there is a trust relationship between the two IM CN subsystems connected by II-NNI, the IBCF acting as contact point shall apply the procedures described in the section 4.4 of TS 24.229 [5], before forwarding the SIP signalling to the next IBCF.

In case there is not a trust relationship between the two IM CN subsystems connected by II-NNI, the IBCF acting as exit point shall apply the procedures described in the section 5.10.2 of TS 24.229 [5] before forwarding the SIP signalling to the IBCF acting as entry point; this one shall apply the procedures described in the section 5.10.3 of TS 24.229 [5].

Moreover, the IBCF shall apply procedures in Clause 4.3.3 of RFC 4244 [25] to process the History-Info header.

The IBCF shall apply procedures in Clause 5.1.2 of draft-draze-sipping-service-identification [26] to process the P-Asserted-service header. In addition, value-dependent operator policies may be applied.

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

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

Item	Header	Trust domain	Not trust domain
1	P-Asserted-ID	As specified in 3GPP TS 24.229 [5], clause 4.4	As specified in 3GPP TS 24.229 [5], clause 5.10
2	P-Access-Network-Info	As specified in 3GPP TS 24.229 [5], clause 4.4	As specified in 3GPP TS 24.229 [5], clause 5.10
3	Resource-Priority	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	As specified in 3GPP TS 24.229 [5], clause 4.4	As specified in Clause 4.3.3 of RFC 4244 [25]
5	P-Asserted-Service	As specified in 3GPP TS 24.229 [5], clause 4.4	As specified in Clause 5.1.2 of draft-draze-sipping-service-identification [26]. In addition, value-dependent operator policies may be applied.
6	P-Charging-Vector (see 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-Address (see 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

#### 6.1.1.3.2 Summary of SIP headers

The following SIP headers shall be supported on the II-NNI.

The following table is based on Annex A.2 of TS 24.229 [5] and endorsed for this document:

**Table 6.3: Supported headers**

Item	Header	Sending		Receiving	
		Ref.	II-NNI	Ref.	II-NNI
1	Accept	[5]	m	[5]	m
2	Accept-Contact	[5]	c1	[5]	c1
3	Accept-Encoding	[5]	m	[5]	m
4	Accept-Language	[5]	m	[5]	m
5	Alert-Info	[5]	c2	[5]	c2
6	Allow	[5]	m	[5]	m
7	Allow-Events	[5]	m	[5]	m
8	Authentication-Info	[5]	m	[5]	m
9	Authorization	[5]	m	[5]	m
10	Call-ID	[5]	m	[5]	m
11	Call-Info	[5]	m	[5]	m
12	Contact	[5]	m	[5]	m
13	Content-Disposition	[5]	m	[5]	m
14	Content-Encoding	[5]	m	[5]	m
15	Content-Language	[5]	m	[5]	m
16	Content-Length	[5]	m	[5]	m
17	Content-Type	[5]	m	[5]	m
18	Cseq	[5]	m	[5]	m
19	Date	[5]	m	[5]	m
20	Error-Info	[5]	o	[5]	m
21	Expires	[5]	m	[5]	m
22	Event	[5]	c3	[5]	c3
23	From	[5]	m	[5]	m
24	Geolocation	[5]	c4	[5]	c4
25	History-Info	sub-clause 6.1.1.3.1	m	sub-clause 6.1.1.3.1	m
26	In-Reply-To	[5]	o	[5]	m
27	Join	[5]	c2	[5]	c2
28	Max-Forwards	[5]	m	[5]	m
29	Min-Expires	[5]	c5	[5]	c5
30	MIME-Version	[5]	m	[5]	m
31	Min-SE	[5]	m	[5]	m
32	Organization	[5]	m	[5]	m
33	P-Access-Network-Info	sub-clause 6.1.1.3.1	c6	sub-clause 6.1.1.3.1	c6
34	P-Asserted-Identity	sub-clause 6.1.1.3.1	c6	sub-clause 6.1.1.3.1	c6
35	P-Asserted-Service	sub-clause 6.1.1.3.1	c7	sub-clause 6.1.1.3.1	c7
36	P-Called-Party-ID	[5]	o	[5]	m
37	P-Charging-Function-Addresses	[5]	n/a	[5]	n/a
38	P-Charging-Vector	[5]	n/a	[5]	n/a
39	P-Early-Media	[5]	c8	[5]	c8
40	P-Media-Authorization	[5]	n/a	[5]	n/a
41	P-Preferred-Identity	[5]	n/a	[5]	n/a
42	P-Preferred-Service	[5]	n/a	[5]	n/a
43	P-Profile-Key	[5]	m	[5]	m
44	P-User-Database	[5]	o	[5]	o
45	P-Visited-Network-ID	[5]	c9	[5]	c9
46	Priority	[5]	c10	[5]	c11
47	Privacy	[5]	m	[5]	m
48	Proxy-Authentication	[5]	m	[5]	m
49	Proxy-Authorization	[5]	m	[5]	m
50	Proxy-Require	[5]	m	[5]	m
51	Reason	[5]	o	[5]	m
52	Record-Route	[5]	m	[5]	m
53	Referred-By	[5]	m	[5]	m
54	Reject-Contact	[5]	c12	[5]	c12
55	Replaces	[5]	c13	[5]	c13
56	Reply-To	[5]	o	[5]	m
57	Request-Disposition	[5]	c12	[5]	c12
58	Require	[5]	m	[5]	m
59	Resource-Priority	sub-clause	m	sub-clause	m

Item	Header	Sending		Receiving	
		Ref.	II-NNI	Ref.	II-NNI
		6.1.1.3.1		6.1.1.3.1	
60	Route	[5]	m	[5]	m
61	Security-Client	[5]	n/a	[5]	n/a
62	Security-Verify	[5]	n/a	[5]	n/a
63	Server	[5]	o	[5]	m
64	Session-Expires	[5]	c14	[5]	c14
65	Subject	[5]	c15	[5]	c16
66	Supported	[5]	m	[5]	m
67	Timestamp	[5]	m	[5]	m
68	To	[5]	m	[5]	m
69	Trigger-Consent	[5]	c17	[5]	c17
70	User-Agent	[5]	m	[5]	m
71	User-to-User	[5]	c18	[5]	c18
72	Via	[5]	m	[5]	m
73	Warning	[5]	o	[5]	o
74	WWW-Authenticate	[5]	m	[5]	m
c1:	m in case of presence of caller preferences and ICSI or IARI values.				
c2:	IF Table 6.1/8 THEN m ELSE i - - INVITE request method.				
c3:	IF (Table 6.1/10 OR Table 6.1/15A OR Table 6.1/20) THEN m ELSE i - - NOTIFY request method or PUBLISH request method or SUBSCRIBE request method.				
c4:	m in case of SIP location conveyance, else n/a.				
c5:	IF (Table 6.1/15B OR Table 6.1/19 OR Table 6.1/21) THEN m ELSE i - - PUBLISH response method or REGISTER response method or SUBSCRIBE response method.				
c6:	m in case of a trust relationship between the interconnected networks, else n/a.				
c7:	m in case of a trust relationship between the interconnected networks, else o.				
c8:	IF (Table 6.1/8 OR Table 6.1/9 OR Table 6.1/14 OR Table 6.1/15 OR Table 6.1/22 OR Table 6.1/23) THEN m ELSE n/a - - INVITE request or INVITE response or PRACK request or PRACK response or UPDATE request or UPDATE response				
c9:	IF Table 6.1/18 THEN m ELSE n/a - - REGISTER request method.				
c10:	IF (Table 6.1/8 OR Table 6.1/9A) THEN i ELSE n/a - - INVITE request method or MESSAGE request method.				
c11:	IF (Table 6.1/8 OR Table 6.1/9A) THEN m ELSE n/a - - INVITE request method or MESSAGE request method.				
c12:	m in case of presence of caller preferences.				
c13:	IF Table 6.1/8 THEN m ELSE n/a - - INVITE request method.				
c14:	m in case of presence of SIP session timer.				
c15:	IF (Table 6.1/8 OR Table 6.1/9A OR Table 6.1/15A) THEN o ELSE n/a - - INVITE request method or MESSAGE request method or PUBLISH request method.				
c16:	IF (Table 6.1/8 OR Table 6.1/9A OR Table 6.1/15A) THEN m ELSE n/a - - INVITE request method or MESSAGE request method or PUBLISH request method.				
c17:	m in case of a framework for consent-based communications in SIP				
c18:	m in case of transporting user to user information for call centers using SIP				

In the above table, m, o, c, i and N/A have the meanings indicated in Table 6.4.

**Editor's Note:** Insertion in the Table 6.3 of columns indicating the IBCF profile, as proposed in TS 24.229, for sending and receiving side is FFS.

#### 6.1.1.4 Notations of the codes

In the table 6.1 and table 6.3, the status codes m, o, c, i and n/a have the following meanings:

Table 6.4: Key to status codes

Status code	Status name	Sending side	Receiving side
m	mandatory	The capability shall be supported at II-NNI. Supporting sending a SIP message or header at the II-NNI means that this message or header shall be sent over the II-NNI if received from the served network. It does not imply that network elements inside the served network or user equipment connected to this network shall support this message or header.	Supporting receiving a SIP message or header at the II-NNI means that, if received from the II-NNI, this message or header shall be forwarded to the served network. It does not imply that network elements inside the served network or user equipment connected to this network shall support this message or header.
o	optional	The capability may or may not be supported at II-NNI. It is an implementation choice.	Same as for sending side.
n/a	not applicable	It is impossible to use the capability. No answer in the support column is required.	Same as for sending side.
c <integer>	conditional	The requirement on the capability ("m", "o", "n/a" or "x") depends on the support of other optional or conditional items. <integer> is the identifier of the conditional expression.	Same as for sending side.
i	irrelevant	Capability outside the scope of the given specification. Normally, this notation should be used in a base specification ICS proforma only for transparent parameters in received PDUs. However, it may be useful in other cases, when the base specification is in fact based on another standard.	Same as for sending side.

### 6.1.1.5 Modes of signalling

Overlap signalling may be used if agreement exists between operators, otherwise enbloc shall be used at the NNI.

## 6.1.2 SDP protocol

### 6.1.2.1 General

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

## 6.2 Control Plane Transport

### 6.2.1 General

The control plane transport of the IMS Inter-Operator Service Interconnection Interface shall comply with Clause 4.2A of TS 24.229 [5] with modifications as described in the following sub-clauses.

NOTE: Support of SCTP as specified in RFC 4168 [x] is optional for IBCF connected by II-NNI. Nevertheless this option is favorable 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 could interfere with the end-to-end codec negotiation to offer additional codec(s) the TrGW is able to transcode, based on the interworking agreements.

NOTE: Possible codecs which could be used at the II-NNI are described in 3GPP TS 26.114 [15] and ETSI TS 181 005 [16].

In case the codec negotiation procedure determines that the two IMS endpoints share a common codec, the user plane may be transported through the IM CN subsystem without being transcoded by any IM CN subsystem entity.

If a common codec is not supported by the UEs, the core IMS entities (i. e. TrGW controlled by IBCF) may provide functionalities to provide transcoding of the user plane.

NOTE: Possible functionalities for codec transcoding in the IBCF/TrGW should be documented in 3GPP TS 24.229.

### 7.2 User Plane Transport

The user plane transport of the IMS Inter-Operator Service Interconnection Interface may use the protocols listed in Table 7.1. The used protocols to transport media are negotiated by means of SDP offer/answer.

**Table 7.1: 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 [15]			
NOTE 2: used for MSRP service			

## 8 Numbering, Naming and Addressing

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

- SIP URI defined in IETF RFC 3261 [10];
- tel URI defined in IETF RFC 3966 [11];
- IM URI defined in IETF RFC 3860 [12];
- PRES URI defined in IETF RFC 3859 [13];

- MRSP URI defined in IETF RFC 4975 [14].

The IBCF shall support these URI formats. Other URI formats may be supported over the II-NNI depending on the operators' policies.

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## 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].

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## 10 Security

The supported security mechanisms for IP signalling transport over II-NNI interfaces are described in 3GPP TS 33.210 [9].

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## 11 Charging

**Editor's Note: In this section impacts on existing charging and accounting specifications will be investigated.**



## Annex <X>: Change history

*It is usual to include an annex (usually the final annex of the document) for reports under TSG change control which details the change history of the report using a table as follows:*

Change history							
Date	TSG #	TSG Doc.	CR	Rev	Subject/Comment	Old	New
24/08/2007					TR Skeleton (C3-070815)	-	0.0.0
30/08/2007					Added agreed text of C3-070817, C3-070818, C3-070820 and C3-070821	0.0.0	0.1.0
16/11/2007					Added agreed text of C3-070976, C3-071051, and C3-071155	0.1.0	0.2.0
31/01/2008					Added agreed text of C3-080036, C3-080173, C3-080181, C3-080182, C3-080184 and C3-080186	0.2.0	1.0.0
15/05/2008					Added agreed text of C3-080698 and C3-080700	1.0.0	1.1.0
07/07/2008					Added agreed text of C3-080994 and C3-081157	1.1.0	1.2.0
28/08/2008					Added agreed text of C3-081673	1.2.0	1.3.0
01/09/2008					Version 2.0.0 created for presentation to TSG by MCC	1.3.0	2.0.0
16/09/2008	TSG#41				Versino 8.0.0 created by MCC	2.0.0	8.0.0