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Technical Specification

Technical Committee for IMS Network Testing (INT); IMS NNI Interworking Test Specifications; Part 1: Test Purposes for IMS NNI Interworking



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Foreword

This Technical Specification (TS) has been produced by IMS Network Testing (INT).

The present document specifies test purposes covering IMS network requirements that can be assessed at the NNI interface between two IMS network implementations, i.e. the Mw reference point. For the purpose of the present document an IMS network is considered consist of P-CSCF, I-CSCF, S-CSCF, and HSS components, i.e. a minimal IMS network configuration. IMS applications servers (AS) and user equipment (UE) are not considered to be part of a IMS network but to be external components that interact with the IMS network via ISC and Gm/ reference points, respectively. DNS servers are also considered to be IMS external entities.

NOTE: The concrete meaning of the Mw interface, e.g. if Mw refers to the interface between P-CSCF in IMS1 and I-CSCF in IMS2 or S-CSCF in IMS1 and I-CSCF in IMS2, is defined by the test configurations specified in annex A of the present document.

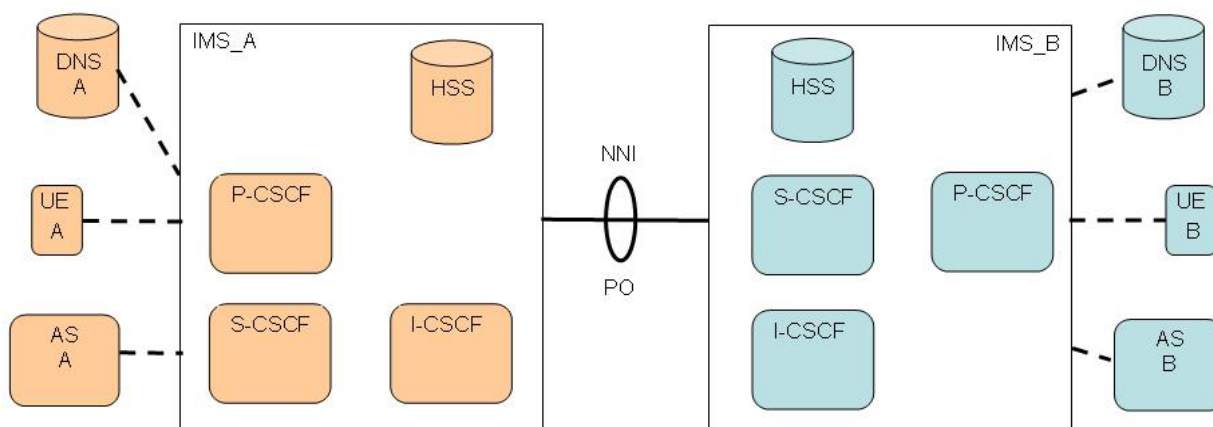


Figure 1: Interoperability test architecture for IMS NNI interworking

The present document is part 1 of a multi-part deliverable covering the IMS NNI Interworking Test Specifications, as identified below:

- Part 1:** "Test Purposes for IMS NNI Interworking";
- Part 2: "Test Descriptions for IMS NNI Interworking";
- Part 3: "ATS & PIXIT".

1 Scope

The present document specifies interoperability Test Purposes (TPs) for IMS NNI interworking based on the IP Multimedia Call Control Protocol based on Stage 3 Session Initiation Protocol (SIP) and Session Description Protocol (SDP) standard, TS 124 229 Release 6 [1]. TPs are defined using the TPLan notation also described in ES 202 553 [4]. Test purposes have been written based on the test specification framework described in TS 102 351 [2] and the interoperability testing methodology defined in TS 102 237-1 [3], i.e. interoperability testing with a conformance relation.

The scope of this test purpose specification is not a complete coverage of requirements specified in TS 124 229 [1]. It has been reduced to cover only requirements which relate to basic IMS call functionality for a minimal interworking IMS CN configuration, i.e. based on a P-CSCF, S-CSCF, I-CSCF, and HSS. Therefore, assessment of, e.g., IMS roaming, topology hiding, etc., at the NNI are not addressed in this test purpose specification. TPs have been only specified for requirements that are observable at the interface between two separate minimal IMS CN implementations, i.e. IMS NNI.

NOTE: Requirements which can only be observed at the interface between UE and IMS CN, i.e. home P-CSCF, are explicitly not within the scope of the present document. The latter requirements have been dealt with from a UE and conformance perspective in TS 134 229-2 [5].

2 References

References are either specific (identified by date of publication and/or edition number or version number) or non-specific.

- For a specific reference, subsequent revisions do not apply.
- Non-specific reference may be made only to a complete document or a part thereof and only in the following cases:
 - if it is accepted that it will be possible to use all future changes of the referenced document for the purposes of the referring document;
 - for informative references.

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2.1 Normative references

The following referenced documents are indispensable for the application of the present document. For dated references, only the edition cited applies. For non-specific references, the latest edition of the referenced document (including any amendments) applies.

- [1] ETSI TS 124 229 (V6.13.0): "Digital cellular telecommunications system (Phase 2+); Universal Mobile Telecommunications System (UMTS); Internet Protocol (IP) multimedia call control protocol based on Session Initiation Protocol (SIP) and Session Description Protocol (SDP); Stage 3 (3GPP TS 24.229 version 6.13.0 Release 6)".
- [2] ETSI TS 102 351: "Methods for Testing and Specification (MTS); Internet Protocol Testing (IPT); IPv6 Testing: Methodology and Framework".
- [3] ETSI TS 102 237-1: "Telecommunications and Internet Protocol Harmonization Over Networks (TIPHON) Release 4; Interoperability test methods and approaches; Part 1: Generic approach to interoperability testing".

- [4] ETSI ES 202 553: "Methods for Testing and Specification (MTS); TPLan: A notation for expressing Test Purposes".
- [5] ETSI TS 134 229-2 (V6.0.0): "Universal Mobile Telecommunications System (UMTS); Internet Protocol (IP) multimedia call control protocol based on Session Initiation Protocol (SIP) and Session Description Protocol (SDP); Part 2: Implementation Conformance Statement (ICS) specification (3GPP TS 34.229-2 version 6.0.0 Release 6)".
- [6] ETSI TS 123 228 (V6.15.0): "Digital cellular telecommunications system (Phase 2+); Universal Mobile Telecommunications System (UMTS); IP Multimedia Subsystem (IMS); Stage 2 (3GPP TS 23.228 version 6.15.0 Release 6)".

2.2 Informative references

The following referenced documents are not essential to the use of the present document but they assist the user with regard to a particular subject area. For non-specific references, the latest version of the referenced document (including any amendments) applies.

Not applicable.

3 Abbreviations

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

AS	(IMS) Application Server
ASO	Application Server Origination
AST	Termination at Application Server
CF	(Test) ConFfiguration
CN	Core Network
CSCF	Call Session Control Function
DNS	Domain Name System
EUT	Equipment Under Test
HSS	Home Subscriber Server
I-CSCF	Interrogating CSCF
IMS	IP Multimedia Subsystem
IOI	Inter Operator Identifier
IOP	InterOPerability
IP	Internet Protocol
MO	Mobile Origination
MT	Mobile Termination
NNI	Network-to-Network Interface
P-CSCF	Proxy CSCF
PSTN	Public Switched Telephone Network
RC	Requirements Catalogue
RQ	ReQuirement
S-CSCF	Serving CSCF
SDP	Session Description Protocol
SIP	Session Initiation Protocol
TP	Test Purpose
TPLan	Test Purpose Notation
TSS	Test Suite Structure
UE	User Equipment
URI	Uniform Record Identifier

4 Test Suite Structure (TSS)

The Test Suite Structure is based on a Requirements Catalogue which was established prior to test purpose specification. This RC extracts all requirements from TS 124 229 [1] which are relevant to the scope of the present document. The TSS is defined by the groups within the following TPLan specification of test purposes. The numbering is not contiguous so that new TPs can be added at a later date without the need to completely renumber the TSS groups.

NOTE: The requirements catalogue is at this point not accessible as an ETSI document. Requirement identifiers of the catalogue have been replaced in the present document with the location of the requirement in the base specification, i.e. base specification type, identifier, version, clause and paragraph.

EXAMPLE: TS 124 229 [1], clause 5.2.6.3, paragraph 66.

The test purposes have been divided into 6 major groups:

Group 1.1: General Capabilities

Group 1.2: IMS-ALG

Group 1.3: Initial dialog or standalone request procedures

Group 1.4: Registration procedures

Group 1.5: Special Cases

Group 1.6: Subsequent or target refresh requests on a dialog procedures

The sub-grouping of these 6 groups follows the structure of the RC. Some of the sub-groups of the RC contained no testable requirement. Headings for those sub-groups are in this test purpose document in the node group to give a full view on the relation between RQ and TSS&TP.

```
Group 1 'IMS_NNI_IOP'
Group 1.1 'General Capabilities'
Group 1.2 'IMS-ALG'
Group 1.3 'Initial dialog or standalone request procedures'
Group 1.3.1 'Initial dialog invite procedures'
Group 1.3.1.1 'Initial originating network'
Group 1.3.1.2 'Initial terminating network'
Group 1.3.2 'Standalone requests procedures'
Group 1.3.2.1 'Standalone originating network'
Group 1.3.2.2 'Standalone terminating network'
Group 1.4 'Registration procedures'
Group 1.5 'Special Cases'
Group 1.5.1 'Emergency'
Group 1.5.2 'Resources not available'
Group 1.6 'Subsequent or target refresh requests on a dialog procedures'
Group 1.6.1 'Subsequent requests on a dialog procedures'
Group 1.6.1.1 'Subsequent originating network'
Group 1.6.1.2 'Subsequent terminating network'
Group 1.6.2 'Target refresh request procedures'
Group 1.6.2.1 'Refresh originating network'
Group 1.6.2.2 'Refresh terminating network'
```

5 Test Purposes (TP)

All test purposes have been written in the formal notation TPLan (see TS 134 229-2 [5]). Configurations that are referenced by test purposes are shown in annex A. TPLan user definitions are listed in annex B.

5.1 Group IMS_NNI_IOP

Group 1 'IMS_NNI_IOP'

```

TP id      : TP_IMS_5053_01
summary    : 'When P-CSCF receives a request from the UE for an unknown method (not relating to an
existing dialog) the P-CSCF shall delete P-Preferred-Identity header and insert P-asserted-Identity
header'
TP type    : interoperability
RQ ref     : 3GPP TS 24.229(V6.13.0) §5.2.6.3 ¶66
EUT role   : IMS -- P-CSCF
config ref: CF_M02-SS1-MT2
with { UE_A registered in IMS_A and
      UE_B registered in IMS_B }
ensure that {
  when { UE_A sends Unknown_Method to UE_B
        }
  then { IMS_B receives Unknown_Method
        not containing P-Preferred-Identity_header and
        containing P-Asserted-Identity_header
        containing an address of UE_A
        and
        UE_B receives Unknown_Method
        }
}

```

5.1.1 Group General Capabilities

Group 1.1 'General Capabilities'

```

TP id      : TP_IMS_4002_01
summary    : 'IMS CN components shall support SIP messages > 1300 bytes'
TP type    : interoperability
RQ ref     : 3GPP TS 24.229(V6.13.0) §4.2A ¶1
EUT role   : IMS -- General
config ref: CF_M02-SS1-MT2
with { UE_A registered in IMS_A and
      UE_B registered in IMS_B }
ensure that {
  when { UE_A sends MESSAGE to UE_B
        containing a Message_Body bigger than 1500 bytes using TCP }
  then { IMS_B receives the MESSAGE
        containing a Message_Body bigger than 1500 bytes
        and
        containing a topmost Via header
        indicating TCP
        and
        UE_B receives MESSAGE
        }
}

```

End group 1.1

5.1.2 Group IMS-ALG

Group 1.2 'IMS-ALG'

-- TPs for IMS-ALG are out of scope

End group 1.2

5.1.3 Group Initial dialog or standalone request procedures

Group 1.3 'Initial dialog or standalone request procedures'

```

TP id      : TP_IMS_5097_01
summary    : 'S-CSCF must retain the icid parameter received in the P-Charging-Vector header for
initial INVITE'
TP type    : interoperability
RQ ref     : 3GPP TS 24.229(V6.13.0) §5.4.3.2 ¶1
EUT role   : IMS -- S-CSCF
config ref: CF_M02-SS1-MT2
with { UE_A registered in IMS_A and
      UE_B registered in IMS_B }
ensure that {
  when { UE_A sends an initial INVITE to UE_B }
  then { IMS_B receives the initial INVITE
        }
}

```



```

        containing a P-Charging-Vector_header
        containing an icid_value_parameter
    and
    UE_B receives the INVITE }
}

TP id      : TP_IMS_5097_02
summary    : 'S-CSCF must insert orig-voi parameter, remove access-network-charging-info parameter
and P-Access-Network-Info header before sending initial INVITE over NNI'
TP type    : interoperability
RQ ref     : 3GPP TS 24.229(V6.13.0) §5.4.3.2 ¶1
EUT role   : IMS -- S-CSCF
config ref: CF_MO2-SS1-MT2
with { UE_A registered in IMS_A and
      UE_B registered in IMS_B }
ensure that {
  when { UE_A sends initial INVITE to UE_B }
  then { IMS_B receives the initial INVITE
        containing a topmost Record-Route_header
        indicating the originating S-CSCF_SIP_URI and
        containing a P-Charging-Vector_header
        (containing a orig-voi_parameter
         indicating voi of IMS_A and
         not containing an
         access-network-charging-info_parameter) and
        not containing a P-Access-Network-Info_header

        and
        UE_B receives the INVITE }
}

TP id      : TP_IMS_5097_03
summary    : 'S-CSCF inserts a second P-Asserted-Identity header indicating a registered tel URI if
not present for initial INVITE'
TP type    : interoperability
RQ ref     : 3GPP TS 24.229(V6.13.0) §5.4.3.2 ¶1
EUT role   : IMS -- S-CSCF
config ref: CF_MO2-SS1-MT2
with { UE_A registered in IMS_A and
      UE_B registered in IMS_B and
      UE_A registered_public_identities containing a Tel_URI and
      UE_A default_registered_public_identity is a SIP_URI }

ensure that {
  when { UE_A sends initial INVITE to UE_B
        not containing a P-Preferred-Identity_header or
        containing a P-Preferred-Identity_header
        not indicating a Tel_URI }
  then { IMS_B receives the initial INVITE
        containing a P-Asserted-Identity_header
        indicating the default_registered_public_identity of UE_A and
        containing a P-Asserted-Identity_header
        indicating a Tel_URI of UE_A

        and
        UE_B receives the INVITE }
}

TP id      : TP_IMS_5097_04
summary    : 'S-CSCF inserts a second P-Asserted-Identity header indicating a registered SIP URI if
not present for initial INVITE'
TP type    : interoperability
RQ ref     : 3GPP TS 24.229(V6.13.0) §5.4.3.2 ¶1
EUT role   : IMS -- S-CSCF
config ref: CF_MO2-SS1-MT2
with { UE_A registered in IMS_A and
      UE_B registered in IMS_B and
      UE_A default_registered_public_identity is a Tel_URI }

ensure that {
  when { UE_A sends initial INVITE to UE_B
        not containing a P-Preferred-Identity_header or
        containing a P-Preferred-Identity_header
        indicating a Tel_URI }
  then { IMS_B receives the initial INVITE
        containing a P-Asserted-Identity_header
        indicating the default_registered_public_identity of UE_A and
        containing a P-Asserted-Identity_header
        indicating a Tel_derived_SIP_URI of UE_A

        and

```

```

    UE_B receives the INVITE }
}

```

```

TP id      : TP_IMS_5097_05
summary    : 'S-CSCF uses ENUM/DNS to translate Tel URIs to SIP URIs in initial INVITE requests'
TP type    : interoperability
RQ ref     : 3GPP TS 24.229(V6.13.0) §5.4.3.2 ¶1
EUT role   : IMS -- S-CSCF
config ref: CF_M02-SS1-MT2c
with { UE_A registered in IMS_A and
      UE_B registered in IMS_B and
      DNS_B configured with an ENUM_entry for Tel_URI_E.164_Number of UE_B }
ensure that {
  when { UE_A sends initial INVITE to UE_B
        containing a Request_URI
        indicating a Tel_URI }
  then { IMS_A sends a DNS_Query to DNS_A
        containing the Tel_URI_E.164_Number }
  when { IMS_A receives DNS_Response
        containing a NAPTR_Resource_Record
        indicating the SIP_URI of UE_B }
  then { IMS_A sends the initial INVITE to IMS_B
        containing a Request_URI
        indicating a SIP_URI

        and
        UE_B receives the INVITE }
}

```

```

TP id      : TP_IMS_5097_06
summary    : 'S-CSCF must retain the icid parameter received in the P-Charging-Vector header for MESSAGE'
TP type    : interoperability
RQ ref     : 3GPP TS 24.229(V6.13.0) §5.4.3.2 ¶1
EUT role   : IMS -- S-CSCF
config ref: CF_M02-SS1-MT2
with { UE_A registered in IMS_A and
      UE_B registered in IMS_B }
ensure that {
  when { UE_A sends a MESSAGE to UE_B }
  then { IMS_B receives the MESSAGE
        containing a P-Charging-Vector_header
        containing an icid_value_parameter

        and
        UE_B receives the MESSAGE }
}

```

```

TP id      : TP_IMS_5097_07
summary    : 'S-CSCF must inserts orig-ioi parameter, remove access-network-charging-info parameter and P-Access-Network-Info header before sending MESSAGE over NNI'
TP type    : interoperability
RQ ref     : 3GPP TS 24.229(V6.13.0) §5.4.3.2 ¶1
EUT role   : IMS -- S-CSCF
config ref: CF_M02-SS1-MT2
with { UE_A registered in IMS_A and
      UE_B registered in IMS_B }
ensure that {
  when { UE_A sends MESSAGE to UE_B }
  then { IMS_B receives the MESSAGE
        containing a P-Charging-Vector_header
        (containing a orig-ioi_parameter
         indicating ioi of IMS_A and
         not containing a
         access-network-charging-info_parameter) and
        not containing a P-Access-Network-Info_header

        and
        UE_B receives the MESSAGE }
}

```

```

TP id      : TP_IMS_5097_08
summary    : 'S-CSCF inserts a second P-Asserted-Identity header indicating a registered tel URI if not present for MESSAGE'
TP type    : interoperability
RQ ref     : 3GPP TS 24.229(V6.13.0) §5.4.3.2 ¶1
EUT role   : IMS -- S-CSCF
config ref: CF_M02-SS1-MT2
with { UE_A registered in IMS_A and

```

UE_B registered in IMS_B and
 UE_A registered_public_identities containing a Tel_URI and
 UE_A default_registered_public_identity is a SIP_URI }

```
ensure that {
  when { UE_A sends MESSAGE to UE_B
        not containing a P-Preferred-Identity_header or
        containing a P-Preferred-Identity_header
        not indicating a Tel_URI for UE_A }
  then { IMS_B receives the MESSAGE
        containing a P-Asserted-Identity_header
        indicating the default_registered_public_identity of UE_A and
        containing a P-Asserted-Identity_header
        indicating a Tel_URI of UE_A
        and
        UE_B receives the MESSAGE }
}
```

TP id : TP_IMS_5097_09
 summary : 'S-CSCF inserts a second P-Asserted-Identity header indicating a registered SIP URI if not present for MESSAGE'
 TP type : interoperability
 RQ ref : 3GPP TS 24.229(V6.13.0) §5.4.3.2 ¶1
 EUT role : IMS -- S-CSCF
 config ref: CF_M02-SS1-MT2
 with { UE_A registered in IMS_A and
 UE_B registered in IMS_B and
 UE_A default_registered_public_identity is a Tel_URI }

```
ensure that {
  when { UE_A sends MESSAGE to UE_B
        not containing a P-Preferred-Identity_header or
        containing a P-Preferred-Identity_header
        indicating a Tel_URI }
  then { IMS_B receives the MESSAGE
        containing a P-Asserted-Identity_header
        indicating the default_registered_public_identity of UE_A and
        containing a P-Asserted-Identity_header
        indicating a Tel_derived_SIP_URI of UE_A
        and
        UE_B receives the MESSAGE }
}
```

TP id : TP_IMS_5097_10
 summary : 'S-CSCF uses ENUM/DNS to translate Tel URIs to SIP URIs in MESSAGE requests'
 TP type : interoperability
 RQ ref : 3GPP TS 24.229(V6.13.0) §5.4.3.2 ¶1
 EUT role : IMS -- S-CSCF
 config ref: CF_M02-SS1-MT2c
 with { UE_A registered in IMS_A and
 UE_B registered in IMS_B and
 DNS_B configured with an ENUM_entry for Tel_URI_E.164_Number of UE_B }

```
ensure that {
  when { UE_A sends MESSAGE to UE_B
        containing a Request_URI
        indicating a Tel_URI }
  then { IMS_A sends a DNS_Query to DNS_A
        containing the Tel_URI_E.164_Number }
  when { IMS_A receives DNS_Response
        containing a NAPTR_Resource_Record
        indicating the SIP_URI of UE_B }
  then { IMS_A sends the MESSAGE to IMS_B
        containing a Request_URI
        indicating a SIP_URI
        and
        UE_B receives the MESSAGE }
}
```

TP id : TP_IMS_5109_01
 summary : 'S-CSCF returns 408 or 5xx response to initial terminating INVITE when there is no response from AS and filter criterion indicates the value SESSION_TERMINATED'
 TP type : interoperability
 RQ ref : 3GPP TS 24.229(V6.13.0) §5.4.3.3 ¶35
 EUT role : IMS -- S-CSCF
 config ref: CF_M02-SS1-MT2-AST4b
 with { UE_A registered in IMS_A and
 UE_B not registered and

```

    IMS_B configured_with_a_terminating_unregistered_filter_criterion_for UE_B indicating
SESSION_TERMINATED_on_INVITE }
ensure that {
  when { UE_A sends INVITE to UE_B }
  then { IMS_B receives the INVITE and
        sends (a 408_response or a 5xx_response) to IMS_A
        and
        UE_A receives the response }
}

```

5.1.3.1 Group Initial dialog invite procedures

Group 1.3.1 'Initial dialog invite procedures'

5.1.3.1.1 Group Initial originating network

Group 1.3.1.1 'Initial originating network'

```

TP id      : TP_IMS_5046_01
summary    : 'The P-CSCF shall add its own address to the Via and Record-Route headers, remove the P-
Preferred-Identity_header and add a P-Asserted_header, and add a P-Charging-Vector with the icid
parameter in case of initial INVITE'
TP type    : interoperability
RQ ref     : 3GPP TS 24.229(V6.13.0) §5.2.6.3 ¶4
EUT role   : IMS -- P-CSCF
config ref: CF_MO2-SS1-MT2
with { UE_A registered in IMS_A and
      UE_B registered in IMS_B }
ensure that {
  when { UE_A sends INVITE to UE_B }
  then { IMS_B receives the INVITE
        containing an additional Via_header
        containing ( P-CSCF_via_port_number and
                     (P-CSCF-FQDN_address or
                      P-CSCF-IP_address)) of IMS_A and
        containing an additional Record-Route_header
        containing ( P-CSCF_port_number 'where it awaits
                     subsequent requests from the called party' and
                     (P-CSCF-FQDN_address or
                      P-CSCF-IP_address)) of IMS_A and
        not containing P-Preferred-Identity_header and
        containing P-Asserted-Identity_header
        containing an address of UE_A and
        containing P-Charging-Vector_header
        containing an icid_value_parameter

        and
        UE_B receives INVITE
      }
}

TP id      : TP_IMS_5131_01
summary    : 'I-CSCF remove P-Charging-Function-Addresses header from 1xx response to initial
requests'
TP type    : interoperability
RQ ref     : 3GPP TS 24.229(V6.13.0) §5.3.2.1 ¶44
EUT role   : IMS -- I-CSCF
config ref: CF_MO2-SS1-MT2
with { UE_A registered in IMS_A and
      UE_B registered in IMS_B and
      UE_B has_received_an_initial_request_for_a_dialog }
ensure that {
  when { UE_B sends 1xx_response to UE_A }
  then { IMS_A receives the 1xx_response
        not containing a P-Charging-Function-Addresses_header

        and
        UE_A receives the 1xx_response }
}

TP id      : TP_IMS_5131_02
summary    : 'I-CSCF remove P-Charging-Function-Addresses header from 2xx response to initial
request'
TP type    : interoperability
RQ ref     : 3GPP TS 24.229(V6.13.0) §5.3.2.1 ¶44
EUT role   : IMS -- I-CSCF
config ref: CF_MO2-SS1-MT2
with { UE_A registered in IMS_A and
      UE_B registered in IMS_B and

```

```

        UE_B has_received_an_initial_request_for_a_dialog }
ensure that {
  when { UE_B sends 2xx_response to UE_A }
  then { IMS_A receives the 2xx_response
        not containing a P-Charging-Function-Addresses_header
        and
        UE_A receives the 2xx_response }
}

```

End group 1.3.1.1

5.1.3.1.2 Group Initial terminating network

Group 1.3.1.2 'Initial terminating network'

```

TP id      : TP_IMS_5055_01
summary    : 'A P-CSCF shall include a route header without a comp parameter in lxx UE responses on
an initial request for a dialog'
TP type    : interoperability
RQ ref     : 3GPP TS 24.229(V6.13.0) §5.2.6.4 ¶15
EUT role   : IMS -- P-CSCF
config ref: CF_MO2-SS1-MT2
with { UE_A registered in IMS_A and
      UE_B registered in IMS_B and
      UE_B has_received_an_initial_request_for_a_dialog from UE_A }
ensure that {
  when { UE_B sends a lxx_response to UE_A }
  then { IMS_A receives lxx_response
        containing Record-Route_header
        containing the P-CSCF_port_number of IMS_B
        'where it expects subsequent requests' and
        not containing comp_parameter and
        not containing P-Preferred-Identity_header and
        containing P-Asserted-Identity_header
        indicating the address 'sent in P-Called_Party-ID header
        of the initial request'

        and
        UE_A receives lxx_response
}
}

```

```

TP id      : TP_IMS_5055_02
summary    : 'A P-CSCF shall include a route header without a comp parameter in 2xx UE responses on
an initial request for a dialog'
TP type    : interoperability
RQ ref     : 3GPP TS 24.229(V6.13.0) §5.2.6.4 ¶15
EUT role   : IMS -- P-CSCF
config ref: CF_MO2-SS1-MT2
with { UE_A registered in IMS_A and
      UE_B registered in IMS_B and
      UE_B has_received_an_initial_request_for_a_dialog from UE_A
}
ensure that {
  when { UE_B sends a 2xx_response to UE_A }
  then { IMS_A receives 2xx_response
        containing Record-Route_header
        containing the P-CSCF_port_number of IMS_B
        'where it expects subsequent requests' and
        not containing comp_parameter and
        not containing P-Preferred-Identity_header and
        containing P-Asserted-Identity_header
        indicating the address 'sent in P-Called_Party-ID header of the initial request'

        and
        UE_B receives 2xx_response
}
}

```

```

TP id      : TP_IMS_5115_01
summary    : 'S-CSCF include term-ioi parameter and restores orig-ioi in lxx responses from UE to
initial requests in terminating network'
TP type    : interoperability
RQ ref     : 3GPP TS 24.229(V6.13.0) §5.4.3.3 ¶44
EUT role   : IMS -- S-CSCF
config ref: CF_MO2-SS1-MT2
with { UE_A registered in IMS_A and
      UE_B registered in IMS_B and
      UE_B has_received_an_initial_request_for_a_dialog from UE_A }
ensure that {

```

```

when { UE_B sends lxx_response to UE_A }
then { IMS_A receives the lxx_response
      containing a P-Charging-Vector_header
      containing a orig-voi_parameter
      indicating IMS_A and
      containing a term-voi_parameter
      indicating IMS_B
      and
      UE_A receives the lxx_response }
}

TP id      : TP_IMS_5115_02
summary    : 'S-CSCF include term-voi parameter and restores orig-voi in 2xx responses from UE to
initial requests in terminating network'
TP type    : interoperability
RQ ref     : 3GPP TS 24.229(V6.13.0) §5.4.3.3 ¶44
EUT role   : IMS -- S-CSCF
config ref: CF_M02-SS1-MT2
with { UE_A registered in IMS_A and
      UE_B registered in IMS_B and
      UE_B has_received_an_initial_request_for_a_dialog from UE_A }
ensure that {
  when { UE_B sends 2xx_response to UE_A }
  then { IMS_A receives the 2xx_response
        containing a P-Charging-Vector_header
        containing an orig-voi_parameter
        indicating IMS_A and
        containing a term-voi_parameter
        indicating IMS_B
        and
        UE_A receives the 2xx_response }
}

TP id      : TP_IMS_5115_03
summary    : 'S-CSCF inserts a second P-Asserted-Identity header in lxx response for from UE initial
request indicating a registered tel URI if not present'
TP type    : interoperability
RQ ref     : 3GPP TS 24.229(V6.13.0) §5.4.3.3 ¶44
EUT role   : IMS -- S-CSCF
config ref: CF_M02-SS1-MT2
with { UE_A registered in IMS_A and
      UE_B registered in IMS_B and
      UE_B registered_public_identities containing a Tel_URI and
      UE_B default_registered_public_identity is a SIP_URI and
      UE_B has_received_an_initial_request_for_a_dialog from UE_A }
ensure that {
  when { UE_B sends lxx_response to UE_A
        not containing a P-Preferred-Identity_header or
        containing a P-Preferred-Identity_header
        indicating a SIP_URI }
  then { IMS_A receives the lxx_response
        containing a P-Asserted-Identity_header
        indicating the default_registered_public_identity of UE_B and
        containing a P-Asserted-Identity_header
        indicating a Tel_URI of UE_B
        and
        UE_A receives the lxx_response }
}

TP id      : TP_IMS_5115_04
summary    : 'S-CSCF inserts a second P-Asserted-Identity header in 2xx response from UE for initial
request indicating a registered tel URI if not present'
TP type    : interoperability
RQ ref     : 3GPP TS 24.229(V6.13.0) §5.4.3.3 ¶44
EUT role   : IMS -- S-CSCF
config ref: CF_M02-SS1-MT2
with { UE_A registered in IMS_A and
      UE_B registered in IMS_B and
      UE_B registered_public_identities containing a Tel_URI and
      UE_B default_registered_public_identity is a SIP_URI and
      UE_B has_received_an_initial_request_for_a_dialog from UE_A }
ensure that {
  when { UE_B sends 2xx_response to UE_A
        not containing a P-Preferred-Identity_header or
        containing a P-Preferred-Identity_header
        not indicating a Tel_URI }
}

```

```

then { IMS_A receives the 2xx_response
        containing a P-Asserted-Identity_header
        indicating the default_registered_public_identity of UE_B and
        containing a P-Asserted-Identity_header
        indicating a Tel_URI of UE_B
    and
    UE_A receives the 2xx_response }
}

TP id      : TP_IMS_5115_05
summary    : 'S-CSCF inserts a second P-Asserted-Identity header in lxx response from UE for initial
request indicating a registered SIP URI if not present'
TP type    : interoperability
RQ ref     : 3GPP TS 24.229(V6.13.0) §5.4.3.3 ¶44
EUT role   : IMS -- S-CSCF
config ref: CF_M02-SS1-MT2
with { UE_A registered in IMS_A and
        UE_B registered in IMS_B and
        UE_B default_registered_public_identity is a Tel_URI and
        UE_B has_received_an_initial_request_for_a_dialog from UE_A }

ensure that {
    when { UE_B sends lxx_response to UE_A
            not containing a P-Preferred-Identity_header or
            containing a P-Preferred-Identity_header
            indicating a Tel_URI }
    then { IMS_A receives the lxx_response
            containing a P-Asserted-Identity_header
            indicating the default_registered_public_identity of UE_B and
            containing a P-Asserted-Identity_header
            indicating a Tel_derived_SIP_URI of UE_B
        and
        UE_A receives the lxx_response }
}

TP id      : TP_IMS_5115_06
summary    : 'S-CSCF inserts a second P-Asserted-Identity header in 2xx response from UE for initial
request indicating a registered SIP URI if not present'
TP type    : interoperability
RQ ref     : 3GPP TS 24.229(V6.13.0) §5.4.3.3 ¶44
EUT role   : IMS -- S-CSCF
config ref: CF_M02-SS1-MT2
with { UE_A registered in IMS_A and
        UE_B registered in IMS_B and
        UE_B default_registered_public_identity is a Tel_URI and
        UE_B has_received_an_initial_request_for_a_dialog from UE_A }

ensure that {
    when { UE_B sends 2xx_response to UE_A
            not containing a P-Preferred-Identity_header or
            containing a P-Preferred-Identity_header
            indicating a Tel_URI }
    then { IMS_A receives the 2xx_response
            containing a P-Asserted-Identity_header
            indicating the default_registered_public_identity of UE_B and
            containing a P-Asserted-Identity_header
            indicating a Tel_derived_SIP_URI of UE_B
        and
        UE_A receives the 2xx_response }
}

TP id      : TP_IMS_5115_07
summary    : 'S-CSCF include term-ioi parameter and restores orig-ioi in lxx responses from AS to
initial requests in terminating network'
TP type    : interoperability
RQ ref     : 3GPP TS 24.229(V6.13.0) §5.4.3.3 ¶44
EUT role   : IMS -- S-CSCF
config ref: CF_M02-SS1-MT2-AST4
with { UE_A registered in IMS_A and
        UE_B not registered in IMS_B and
        AS_B has_received_an_initial_request_for_a_dialog from UE_A }
ensure that {
    when { AS_B sends lxx_response to UE_A }
    then { IMS_A receives the lxx_response
            containing a P-Charging-Vector_header
            containing a orig-ioi_parameter
            indicating ioi of IMS_A and
            containing a term-ioi_parameter
    }
}

```

```

        indicating ioi of IMS_B
    and
    UE_A receives the lxx_response }
}

TP id      : TP_IMS_5115_08
summary    : 'S-CSCF include term-ioi parameter and restores orig-ioi in 2xx responses from AS to
initial requests in terminating network'
TP type    : interoperability
RQ ref     : 3GPP TS 24.229(V6.13.0) §5.4.3.3 ¶44
EUT role   : IMS -- S-CSCF
config ref: CF_MO2-SS1-MT2-AST4
with { UE_A registered in IMS_A and
    UE_B not registered in IMS_B and
    AS_B has received an initial request for a dialog from UE_A }
ensure that {
    when { AS_B sends 2xx_response to UE_A }
    then { IMS_A receives the 2xx_response
        containing a P-Charging-Vector_header
        containing an orig-ioi_parameter
        indicating ioi of IMS_A and
        containing a term-ioi_parameter
        indicating ioi of IMS_B

        and
        UE_A receives the 2xx_response }
}

TP id      : TP_IMS_5132_01
summary    : 'I-CSCF returns 404 or 604 response to initial request to non-existent user'
TP type    : interoperability
RQ ref     : 3GPP TS 24.229(V6.13.0) §5.3.2.1 ¶32
EUT role   : IMS -- I-CSCF
config ref: CF_MO2-SS1
with { UE_A registered in IMS_A }
ensure that {
    when { UE_A sends INVITE
        containing a Request_URI
        indicating a non_existing_user in IMS_B}
    then { IMS_B receives the INVITE
        and
        IMS_B sends (a 404_response or a 604_response)
        and
        UE_A receives the response }
}

TP id      : TP_IMS_5133_01
summary    : 'I-CSCF returns 480 response to initial request to non-registered user'
TP type    : interoperability
RQ ref     : 3GPP TS 24.229(V6.13.0) §5.3.2.1 ¶33
EUT role   : IMS -- I-CSCF
config ref: CF_MO2-SS1-MT2b
with { UE_A registered in IMS_A and
    UE_B not registered in IMS_B and
    IMS_B not configured_with_a_terminating_unregistered_filter_criterion_for UE_B
}
ensure that {
    when { UE_A sends INVITE to UE_B }
    then { IMS_B receives the INVITE and
        sends a 480_response to IMS_A
        and
        UE_A receives the 480_response }
}

```

End group 1.3.1.2

End group 1.3.1

5.1.3.2 Group Standalone requests procedures

Group 1.3.2 'Standalone requests procedures'

5.1.3.2.1 Group Standalone originating network

Group 1.3.2.1 'Standalone originating network'

```

TP id      : TP_IMS_5050_01
summary    : 'When P-CSCF receives a MESSAGE request from the UE it shall remove P-Preferred-
Identity_header and insert P-Asserted-Identity and add a P-Charging-Vector with icid parameter'
TP type    : interoperability

```



```

RQ ref      : 3GPP TS 24.229(V6.13.0) §5.2.6.3 ¶46
EUT role    : IMS -- P-CSCF
config ref  : CF_MO2-SS1-MT2
with { UE_A registered in IMS_A and
      UE_B registered in IMS_B
}
ensure that {
  when { UE_A sends MESSAGE to UE_B }
  then { IMS_B receives MESSAGE
        not containing P-Preferred-Identity_header and
        containing P-Asserted-Identity_header
          containing an address of UE_A
        and
        containing the P-Charging-Vector_header
          containing icid_parameter
        and
        UE_B receives MESSAGE
      }
}

TP id       : TP_IMS_5050_02
summary     : 'When P-CSCF receives a INFO request from the UE it shall remove P-Preferred-
Identity_header and insert P-Asserted-Identity and add a P-Charging-Vector with icid parameter'
TP type     : interoperability
RQ ref      : 3GPP TS 24.229(V6.13.0) §5.2.6.3 ¶46
EUT role    : IMS -- P-CSCF
config ref  : CF_MO2-SS1-MT2
with { UE_A registered in IMS_A and
      UE_B registered in IMS_B
}
ensure that {
  when { UE_A sends INFO to UE_B }
  then { IMS_B receives INFO
        not containing P-Preferred-Identity_header and
        containing P-Asserted-Identity_header
          containing an address of UE_A
        and
        containing the P-Charging-Vector_header
          containing icid_parameter
        and
        UE_B receives INFO
      }
}

```

End group 1.3.2.1

5.1.3.2.2 Group Standalone terminating network

Group 1.3.2.2 'Standalone terminating network'

```

TP id       : TP_IMS_5061_01
summary     : 'P-CSCF removes P-Preferred-Identity_header and adds P-Asserted-Identity_header when
receives lxx response from the UE on an standalone request'
TP type     : interoperability
RQ ref      : 3GPP TS 24.229(V6.13.0) §5.2.6.4 ¶89
EUT role    : IMS -- P-CSCF
config ref  : CF_MO2-SS1-MT2
with { UE_A registered in IMS_A and
      UE_B registered in IMS_B
      UE_B has_received_a_standalone_request from UE_A
}
ensure that {
  when { UE_B sends a lxx_response from UE_A }
  then { IMS_A receives the lxx_response
        not containing P-Preferred-Identity_header and
        containing P-Asserted-Identity_header
          containing the address 'sent in P-Called_Party-ID header of
          the standalone request'
        and
        UE_A receives the lxx_response
      }
}

TP id       : TP_IMS_5061_02
summary     : 'P-CSCF removes P-Preferred-Identity_header and adds P-Asserted-Identity_header when
receives 2xx response from the UE on an standalone request'
TP type     : interoperability
RQ ref      : 3GPP TS 24.229(V6.13.0) §5.2.6.4 ¶89

```

```

EUT role : IMS -- P-CSCF
config ref: CF_M02-SS1-MT2
with { UE_A registered in IMS_A and
      UE_B registered in IMS_B
      UE_B has_received_a_standalone_request from UE_A
}
ensure that {
  when { UE_B sends a 2xx_response from UE_A }
  then { IMS_A receives the 2xx_response
        not containing P-Preferred-Identity_header and
        containing P-Asserted-Identity_header
        containing the address 'sent in P-Called_Party-ID header of
                               the standalone request'

        and
        UE_A receives the 2xx_response
      }
}

TP id : TP_IMS_5061_03
summary : 'P-CSCF removes P-Preferred-Identity_header and adds P-Asserted-Identity_header when
receives lxx response from the UE on a request for an unknown method'
TP type : interoperability
RQ ref : 3GPP TS 24.229(V6.13.0) §5.2.6.4 ¶89
EUT role : IMS -- P-CSCF
config ref: CF_M02-SS1-MT2
with { UE_A registered in IMS_A and
      UE_B registered in IMS_B
      UE_B has_received_a_request_for_an_unknown_method from UE_A
}
ensure that {
  when { UE_B sends a lxx_response from UE_A }
  then { IMS_A receives the lxx_response
        not containing P-Preferred-Identity_header and
        containing P-Asserted-Identity_header
        containing the address 'sent in P-Called_Party-ID header of
                               the standalone request'

        and
        UE_A receives the lxx_response
      }
}

TP id : TP_IMS_5061_04
summary : 'P-CSCF removes P-Preferred-Identity_header and adds P-Asserted-Identity_header when
receives 2xx response from the UE on a request for an unknown method'
TP type : interoperability
RQ ref : 3GPP TS 24.229(V6.13.0) §5.2.6.4 ¶89
EUT role : IMS -- P-CSCF
config ref: CF_M02-SS1-MT2
with { UE_A registered in IMS_A and
      UE_B registered in IMS_B
      UE_B has_received_a_request_for_an_unknown_method from UE_A
}
ensure that {
  when { UE_B sends a 2xx_response from UE_A }
  then { IMS_A receives the 2xx_response
        not containing P-Preferred-Identity_header and
        containing P-Asserted-Identity_header
        containing the address 'sent in P-Called_Party-ID header of
                               the standalone request'

        and
        UE_A receives the 2xx_response
      }
}

TP id : TP_IMS_5061_05
summary : 'P-CSCF removes P-Preferred-Identity_header and adds P-Asserted-Identity_header when
receives 3xx response from the UE on an standalone request'
TP type : interoperability
RQ ref : 3GPP TS 24.229(V6.13.0) §5.2.6.4 ¶89
EUT role : IMS -- P-CSCF
config ref: CF_M02-SS1-MT2
with { UE_A registered in IMS_A and
      UE_B registered in IMS_B
      UE_B has_received_a_standalone_request from UE_A
}
ensure that {
  when { UE_B sends a 3xx_response from UE_A }
  then { IMS_A receives the 3xx_response

```

```

        not containing P-Preferred-Identity_header and
        containing P-Asserted-Identity_header
            containing the address 'sent in P-Called_Party-ID header of
            the standalone request'
    and
    UE_A receives the 3xx_response
}
}

TP id      : TP_IMS_5061_06
summary    : 'P-CSCF removes P-Preferred-Identity_header and adds P-Asserted-Identity_header when
receives 4xx response from the UE on an standalone request'
TP type    : interoperability
RQ ref     : 3GPP TS 24.229(V6.13.0) §5.2.6.4 ¶89
EUT role   : IMS -- P-CSCF
config ref: CF_MO2-SS1-MT2
with { UE_A registered in IMS_A and
      UE_B registered in IMS_B
      UE_B has_received_a_standalone_request from UE_A
}
ensure that {
  when { UE_B sends a 4xx_response from UE_A }
  then { IMS_A receives the 4xx_response
        not containing P-Preferred-Identity_header and
        containing P-Asserted-Identity_header
            containing the address 'sent in P-Called_Party-ID header of
            the standalone request'

        and
        UE_A receives the 4xx_response
}
}

TP id      : TP_IMS_5061_07
summary    : 'P-CSCF removes P-Preferred-Identity_header and adds P-Asserted-Identity_header when
receives 5xx response from the UE on an standalone request'
TP type    : interoperability
RQ ref     : 3GPP TS 24.229(V6.13.0) §5.2.6.4 ¶89
EUT role   : IMS -- P-CSCF
config ref: CF_MO2-SS1-MT2
with { UE_A registered in IMS_A and
      UE_B registered in IMS_B
      UE_B has_received_a_standalone_request from UE_A
}
ensure that {
  when { UE_B sends a 5xx_response from UE_A }
  then { IMS_A receives the 5xx_response
        not containing P-Preferred-Identity_header and
        containing P-Asserted-Identity_header
            containing the address 'sent in P-Called_Party-ID header of
            the standalone request'

        and
        UE_A receives the 5xx_response
}
}

TP id      : TP_IMS_5061_08
summary    : 'P-CSCF removes P-Preferred-Identity_header and adds P-Asserted-Identity_header when
receives 6xx response from the UE on an standalone request'
TP type    : interoperability
RQ ref     : 3GPP TS 24.229(V6.13.0) §5.2.6.4 ¶89
EUT role   : IMS -- P-CSCF
config ref: CF_MO2-SS1-MT2
with { UE_A registered in IMS_A and
      UE_B registered in IMS_B
      UE_B has_received_a_standalone_request from UE_A
}
ensure that {
  when { UE_B sends a 6xx_response from UE_A }
  then { IMS_A receives the 6xx_response
        not containing P-Preferred-Identity_header and
        containing P-Asserted-Identity_header
            containing the address 'sent in P-Called_Party-ID header of
            the standalone request'

        and
        UE_A receives the 6xx_response
}
}
}

```

```

TP id      : TP_IMS_5061_09
summary    : 'P-CSCF removes P-Preferred-Identity_header and adds P-Asserted-Identity_header when
receives 3xx response from the UE on a request for an unknown method'
TP type    : interoperability
RQ ref     : 3GPP TS 24.229(V6.13.0) §5.2.6.4 ¶89
EUT role   : IMS -- P-CSCF
config ref: CF_M02-SS1-MT2
with { UE_A registered in IMS_A and
      UE_B registered in IMS_B
      UE_B has_received_a_request_for_an_unknown_method from UE_A
}
ensure that {
  when { UE_B sends a 3xx_response from UE_A }
  then { IMS_A receives the 3xx_response
        not containing P-Preferred-Identity_header and
        containing P-Asserted-Identity_header
        containing the address 'sent in P-Called_Party-ID header of
                               the standalone request'

        and
        UE_A receives the 3xx_response
      }
}

TP id      : TP_IMS_5061_10
summary    : 'P-CSCF removes P-Preferred-Identity_header and adds P-Asserted-Identity_header when
receives 4xx response from the UE on a request for an unknown method'
TP type    : interoperability
RQ ref     : 3GPP TS 24.229(V6.13.0) §5.2.6.4 ¶89
EUT role   : IMS -- P-CSCF
config ref: CF_M02-SS1-MT2
with { UE_A registered in IMS_A and
      UE_B registered in IMS_B
      UE_B has_received_a_request_for_an_unknown_method from UE_A
}
ensure that {
  when { UE_B sends a 4xx_response from UE_A }
  then { IMS_A receives the 4xx_response
        not containing P-Preferred-Identity_header and
        containing P-Asserted-Identity_header
        containing the address 'sent in P-Called_Party-ID header of
                               the standalone request'

        and
        UE_A receives the 4xx_response
      }
}

TP id      : TP_IMS_5061_11
summary    : 'P-CSCF removes P-Preferred-Identity_header and adds P-Asserted-Identity_header when
receives 5xx response from the UE on a request for an unknown method'
TP type    : interoperability
RQ ref     : 3GPP TS 24.229(V6.13.0) §5.2.6.4 ¶89
EUT role   : IMS -- P-CSCF
config ref: CF_M02-SS1-MT2
with { UE_A registered in IMS_A and
      UE_B registered in IMS_B
      UE_B has_received_a_request_for_an_unknown_method from UE_A
}
ensure that {
  when { UE_B sends a 5xx_response from UE_A }
  then { IMS_A receives the 5xx_response
        not containing P-Preferred-Identity_header and
        containing P-Asserted-Identity_header
        containing the address 'sent in P-Called_Party-ID header of
                               the standalone request'

        and
        UE_A receives the 5xx_response
      }
}

TP id      : TP_IMS_5061_12
summary    : 'P-CSCF removes P-Preferred-Identity_header and adds P-Asserted-Identity_header when
receives 6xx response from the UE on a request for an unknown method'
TP type    : interoperability
RQ ref     : 3GPP TS 24.229(V6.13.0) §5.2.6.4 ¶89
EUT role   : IMS -- P-CSCF
config ref: CF_M02-SS1-MT2
with { UE_A registered in IMS_A and
      UE_B registered in IMS_B

```

```

        UE_B has_received_a_request_for_an_unknown_method from UE_A
    }
    ensure that {
        when { UE_B sends a 6xx_response from UE_A }
        then { IMS_A receives the 6xx_response
                not containing P-Preferred-Identity_header and
                containing P-Asserted-Identity_header
                containing the address 'sent in P-Called_Party-ID header of
                the standalone request'

            and
            UE_A receives the 6xx_response
        }
    }
}

TP id      : TP_IMS_5117_01
summary    : 'S-CSCF remove access-network-charging-info parameter and P-Access-Network-Info header
from lxx response to standalone transaction'
TP type    : interoperability
RQ ref     : 3GPP TS 24.229(V6.13.0) §5.4.3.3 ¶49
EUT role   : IMS -- S-CSCF
config ref: CF_MO2-SS1-MT2
with { UE_A registered in IMS_A and
        UE_B registered in IMS_B and
        UE_B has_received_a_standalone_request }
ensure that {
    when { UE_B sends lxx_response to UE_A }
    then { IMS_A receives the lxx_response
            containing a P-Charging-Vector_header
            not containing an
            access-network-charging-info_parameter and
            not containing a P-Access-Network-Info_header

        and
        UE_A receives the lxx_response }
}

TP id      : TP_IMS_5117_02
summary    : 'S-CSCF remove access-network-charging-info parameter and P-Access-Network-Info header
from 2xx response to standalone transaction'
TP type    : interoperability
RQ ref     : 3GPP TS 24.229(V6.13.0) §5.4.3.3 ¶49
EUT role   : IMS -- S-CSCF
config ref: CF_MO2-SS1-MT2
with { UE_A registered in IMS_A and
        UE_B registered in IMS_B and
        UE_B has_received_a_standalone_request }
ensure that {
    when { UE_B sends 2xx_response to UE_A }
    then { IMS_A receives the 2xx_response
            containing a P-Charging-Vector_header
            not containing an
            access-network-charging-info_parameter and
            not containing a P-Access-Network-Info_header

        and
        UE_A receives the 2xx_response }
}

TP id      : TP_IMS_5117_03
summary    : 'S-CSCF inserts a second P-Asserted-Identity header in lxx response for from UE initial
or standalone request indicating a registered tel URI if not present'
TP type    : interoperability
RQ ref     : 3GPP TS 24.229(V6.13.0) §5.4.3.3 ¶49
EUT role   : IMS -- S-CSCF
config ref: CF_MO2-SS1-MT2
with { UE_A registered in IMS_A and
        UE_B registered in IMS_B and
        UE_B registered_public_identities containing a Tel_URI and
        UE_B default_registered_public_identity is a SIP_URI and
        UE_B has_received_a_standalone_request from UE_A }

ensure that {
    when { UE_B sends lxx_response to UE_A
            not containing a P-Preferred-Identity_header or
            containing a P-Preferred-Identity_header
            indicating a SIP_URI }
    then { IMS_A receives the lxx_response
            containing a P-Asserted-Identity_header
            indicating the default_registered_public_identity and
            containing a P-Asserted-Identity_header
    }
}

```

```

        indicating a Tel_URI
    and
    UE_A receives the lxx_response }
}

TP id      : TP_IMS_5117_04
summary    : 'S-CSCF inserts a second P-Asserted-Identity header in 2xx response from UE for initial
or standalone request indicating a registered tel URI if not present'
TP type    : interoperability
RQ ref     : 3GPP TS 24.229(V6.13.0) §5.4.3.3 ¶49
EUT role   : IMS -- S-CSCF
config ref: CF_M02-SS1-MT2
with { UE_A registered in IMS_A and
      UE_B registered in IMS_B and
      UE_B registered_public_identities containing a Tel_URI and
      UE_B default_registered_public_identity is a SIP_URI and
      UE_B has_received_a_standalone_request from UE_A }

ensure that {
  when { UE_B sends 2xx_response to UE_A
        not containing a P-Preferred-Identity_header or
        containing a P-Preferred-Identity_header
        not indicating a Tel_URI of UE_B}
  then { IMS_A receives the 2xx_response
        containing a P-Asserted-Identity_header
        indicating the default_registered_public_identity of UE_B and
        containing a P-Asserted-Identity_header
        indicating a Tel_URI of UE_B

        and
        UE_A receives the 2xx_response }
}

TP id      : TP_IMS_5117_05
summary    : 'S-CSCF inserts a second P-Asserted-Identity header in 1xx response from UE for initial
request indicating a registered SIP URI if not present'
TP type    : interoperability
RQ ref     : 3GPP TS 24.229(V6.13.0) §5.4.3.3 ¶49
EUT role   : IMS -- S-CSCF
config ref: CF_M02-SS1-MT2
with { UE_A registered in IMS_A and
      UE_B registered in IMS_B and
      UE_B default_registered_public_identity is a Tel_URI and
      UE_B has_received_a_standalone_request from UE_A }

ensure that {
  when { UE_B sends 1xx_response to UE_A
        not containing a P-Preferred-Identity_header or
        containing a P-Preferred-Identity_header
        indicating a Tel_URI }
  then { IMS_A receives the 1xx_response
        containing a P-Asserted-Identity_header
        indicating the default_registered_public_identity and
        containing a P-Asserted-Identity_header
        indicating a Tel_derived_SIP_URI

        and
        UE_A receives the 1xx_response }
}

TP id      : TP_IMS_5117_06
summary    : 'S-CSCF inserts a second P-Asserted-Identity header in 2xx response from UE for initial
request indicating a registered SIP URI if not present'
TP type    : interoperability
RQ ref     : 3GPP TS 24.229(V6.13.0) §5.4.3.3 ¶49
EUT role   : IMS -- S-CSCF
config ref: CF_M02-SS1-MT2
with { UE_A registered in IMS_A and
      UE_B registered in IMS_B and
      UE_B default_registered_public_identity is a Tel_URI and
      UE_B has_received_a_standalone_request from UE_A }

ensure that {
  when { UE_B sends 2xx_response to UE_A
        not containing a P-Preferred-Identity_header or
        containing a P-Preferred-Identity_header
        indicating a Tel_URI of UE_B }
  then { IMS_A receives the 2xx_response
        containing a P-Asserted-Identity_header

```

```

        indicating the default_registered_public_identity of UE_B and
        containing a P-Asserted-Identity_header
        indicating a Tel_derived_SIP_URI of UE_B
    and
    UE_A receives the 2xx_response }
}

TP id      : TP_IMS_5118_01
summary    : 'S-CSCF include term-ioi parameter and restores orig-ioi in 200 responses to standalone
requests'
TP type    : interoperability
RQ ref     : 3GPP TS 24.229(V6.13.0) §5.4.3.3 ¶54
EUT role   : IMS -- S-CSCF
config ref: CF_M02-SS1-MT2
with { UE_A registered in IMS_A and
      UE_B registered in IMS_B and
      UE_B has_received_a_standalone_request from UE_A }
ensure that {
  when { UE_B sends 200_response to UE_A }
  then { IMS_A receives the 200_response
        containing a P-Charging-Vector_header
        containing a orig-ioi_parameter
        indicating ioi of IMS_A and
        containing a term-ioi_parameter
        indicating ioi of IMS_B

        and
        UE_A receives the 200_response }
}

TP id      : TP_IMS_5118_02
summary    : 'S-CSCF include term-ioi parameter and restores orig-ioi in 200 responses from AS to
standalone requests'
TP type    : interoperability
RQ ref     : 3GPP TS 24.229(V6.13.0) §5.4.3.3 ¶54
EUT role   : IMS -- S-CSCF
config ref: CF_M02-SS1-MT2-AST4
with { UE_A registered in IMS_A and
      UE_B not registered in IMS_B and
      AS_B has_received_a_standalone_request from UE_A }
ensure that {
  when { AS_B sends 200_response to UE_A }
  then { IMS_A receives the 200_response
        containing a P-Charging-Vector_header
        containing a orig-ioi_parameter
        indicating ioi of IMS_A and
        containing a term-ioi_parameter
        indicating ioi of IMS_B

        and
        UE_A receives the 200_response }
}

End group 1.3.2.2
End group 1.3.2
End group 1.3

```

5.1.4 Group Registration procedures

```

Group 1.4 'Registration procedures'
-- NNI TPs for registration are only applicable in roaming configurations
-- and therefore out of scope
End group 1.4

```

5.1.5 Group Special Cases

```

Group 1.5 'Special Cases'

TP id      : TP_IMS_5139_01
summary    : 'S-CSCF serving caller sends BYE in case of S-CSCF-initiated call release'
TP type    : interoperability
RQ ref     :
EUT role   : IMS -- S-CSCF
config ref: CF_M02-SS1-MT2
with { UE_A registered in IMS_A and
      UE_B registered in IMS_B and
      UE_A has_initiated_a_dialog_with with UE_B
      }
ensure that {

```

```

when { IMS_A receives 'an indication that UE_A is to be de-registered' }
then { IMS_A sends a BYE to IMS_B
      containing Request_URI
        indicating the initial 200 OK Contact_header_value sent by IMS_B and
      containing To_header
        indicating the initial 200_OK_To_value sent by IMS_B and
      containing From_header
        indicating the initial INVITE_From_value sent by IMS_A and
      containing Call-ID_header
        indicating the initial INVITE_Call_Id_value sent by IMS_A and
      containing CSeq_header
        indicating the initial INVITE Cseq_value sent by IMS_A incremented by 1 and
      containing Route_header
        indicating 'dialog specific routing information for UE_B'
      and
      'further headers based on local policy or call release reason'
    and
    UE_B receives BYE
  }
}

TP id      : TP_IMS_5139_02
summary    : 'S-CSCF serving callee sends BYE in case of S-CSCF-initiated call release'
TP type    : interoperability
RQ ref     :
EUT role   : IMS -- S-CSCF
config ref: CF_M02-SS1-MT2
with { UE_A registered in IMS_A and
      UE_B registered in IMS_B and
      UE_A has_initiated_a_dialog_with with UE_B
    }
ensure that {
  when { IMS_B receives 'an indication that UE_B is no_longer_available' }
  then { IMS_B sends a BYE to IMS_A
        containing Request_URI
          indicating the initial INVITE Contact_value sent by IMS_A and
        containing To_header
          indicating the initial INVITE_From_value sent by IMS_A and
        containing From_header
          indicating the initial 200_OK_To_value sent by IMS_B and
        containing Call-ID_header
          indicating the initial INVITE_Call_Id_value sent by IMS_A and
        containing CSeq_header
          indicating the Cseq_value of the last request sent by IMS_B incremented by 1 and
        containing Route_header
          indicating 'dialog specific routing information for UE_A'
        and
        'further headers based on local policy or call release reason'
      and
      UE_A receives BYE
    }
}

```

5.1.5.1 Group Emergency

```

Group 1.5.1 'Emergency'
-- NNI TPs not applicable
End group 1.5.1

```

5.1.5.2 Group Resources not available

```

Group 1.5.2 'Resources not available'

```

```

TP id      : TP_IMS_5072_01
summary    : 'P-CSCF sends CANCEL in case its UE goes down during dialog initiation'
TP type    : interoperability
RQ ref     : 3GPP TS 24.229(V6.13.0) §5.2.8.1.1 ¶1
EUT role   : IMS -- P-CSCF
config ref: CF_M02-SS1-MT2
with { UE_A registered in IMS_A and
      UE_B registered in IMS_B and
      UE_B has_received_an_initial_request_for_a_dialog from UE_A
    }
ensure that {
  when { IMS_A receives 'an indication that UE_A is no longer available' }
  then { IMS_A sends a CANCEL to IMS_B and
        UE_B receives the CANCEL
      }
}

```



```

    }
}

TP id      : TP_IMS_5073_01
summary    : 'P-CSCF sends BYE in case its calling UE goes down in ongoing dialog'
TP type    : interoperability
RQ ref     : 3GPP TS 24.229(V6.13.0) §5.2.8.1.2 ¶1
EUT role   : IMS -- P-CSCF
config ref: CF_MO2-SS1-MT2
with { UE_A registered in IMS_A and
      UE_B registered in IMS_B and
      UE_A has_initiated_a_dialog_with with UE_B
}
ensure that {
  when { UE_A is 'no_longer_available' }
  then { IMS_B receives a BYE from IMS_A
        containing Request_URI
          indicating the Contact_header_value of UE_B and
        containing To_header
          indicating the initial 200_OK_To_value from UE_B
        containing From_header
          indicating the initial INVITE_From_value from UE_A and
        containing Call-ID_header
          indicating the initial INVITE_Call_Id_value from UE_A and
        containing CSeq_header
          indicating an incremented Sequence_Number and
        containing Route_header
          indicating 'dialog specific routing information for UE_B'
        and
          'further headers based on local policy or call release reason'
        and
        UE_B receives BYE
      }
}

```

```

TP id      : TP_IMS_5074_01
summary    : 'P-CSCF sends BYE in case its called UE goes down in ongoing dialog'
TP type    : interoperability
RQ ref     : 3GPP TS 24.229(V6.13.0) §5.2.8.1.2 ¶10
EUT role   : IMS -- P-CSCF
config ref: CF_MO2-SS1-MT2
with { UE_A registered in IMS_A and
      UE_B registered in IMS_B and
      UE_A has_initiated_a_dialog_with with UE_B
}
ensure that {
  when { UE_B is 'no_longer_available' }
  then { IMS_A receives a BYE to IMS_B
        containing Request_URI
          indicating the Contact_header_value of UE_A and
        containing To_header
          indicating the initial INVITE_To_value from UE_A
        containing From_header
          indicating the initial 200_OK_From_value from UE_B and
        containing Call-ID_header
          indicating the initial INVITE_Call_Id_value from UE_A and
        containing CSeq_header
          indicating an incremented Sequence_Number and
        containing Route_header
          indicating 'dialog specific routing information for UE_A'
        and
          'further headers based on local policy or call release reason'
        and
        UE_A receives BYE
      }
}

```

End group 1.5.2

End group 1.5

5.1.6 Group Subsequent or target refresh requests on a dialog procedures

Group 1.6 'Subsequent or target refresh requests on a dialog procedures'

```

TP id      : TP_IMS_5121_01
summary    : 'S-CSCF remove access-network-charging-info parameter and P-Access-Network-Info header
from lxx response to subsequent or target refresh requests'
TP type    : interoperability

```

```

RQ ref      : 3GPP TS 24.229(V6.13.0) §5.4.3.3 ¶60
EUT role    : IMS -- S-CSCF
config ref  : CF_M02-SS1-MT2
with { UE_A registered in IMS_A and
      UE_B registered in IMS_B and
      UE_B has_received_a_subsequent_request_in_a_dialog or
      UE_B has_received_a_target_refresh_request_in_a_dialog }
ensure that {
  when { UE_B sends lxx_response to UE_A }
  then { IMS_A receives the lxx_response
        containing a P-Charging-Vector_header
        not containing an
        access-network-charging-info_parameter and
        not containing a P-Access-Network-Info_header
        and
        UE_A receives the lxx_response }
}

TP id       : TP_IMS_5121_02
summary     : 'S-CSCF remove access-network-charging-info parameter and P-Access-Network-Info header
from 2xx response to subsequent or target refresh requests'
TP type     : interoperability
RQ ref      : 3GPP TS 24.229(V6.13.0) §5.4.3.3 ¶60
EUT role    : IMS -- S-CSCF
config ref  : CF_M02-SS1-MT2
with { UE_A registered in IMS_A and
      UE_B registered in IMS_B and
      UE_B has_received_a_subsequent_request_in_a_dialog or
      UE_B has_received_a_target_refresh_request_in_a_dialog }
ensure that {
  when { UE_B sends 2xx_response to UE_A }
  then { IMS_A receives the 2xx_response
        (containing a P-Charging-Vector_header
        not containing an
        access-network-charging-info_parameter or
        not containing a P-Charging-Vector_header) and
        not containing a P-Access-Network-Info_header
        and
        UE_A receives the 2xx_response }
}

```

5.1.6.1 Group Subsequent requests on a dialog procedures

Group 1.6.1 'Subsequent requests on a dialog procedures'

5.1.6.1.1 Group Subsequent originating network

Group 1.6.1.1 'Subsequent originating network'

```

TP id       : TP_IMS_5052_01
summary     : 'When P-CSCF receives a NOTIFY request from UE for a non INVITE dialog then add P-
Charging-Vector with the icid parameter'
TP type     : interoperability
RQ ref      : 3GPP TS 24.229(V6.13.0) §5.2.6.3 ¶56
EUT role    : IMS -- P-CSCF
config ref  : CF_M02-SS1-MT2
with { UE_A registered in IMS_A and
      UE_B registered in IMS_B and
      UE_A has_initiated_a_non_INVITE_dialog_with UE_B }
ensure that {
  when { UE_A sends NOTIFY to UE_B
        }
  then { IMS_B receives NOTIFY
        containing the P-Charging-Vector_header
        containing icid_parameter
        and
        UE_B receives NOTIFY
        }
}

TP id       : TP_IMS_5107_01
summary     : 'S-CSCF remove access-network-charging-info parameter and P-Access-Network-Info header
before sending PRACK requests over NNI'
TP type     : interoperability
RQ ref      : 3GPP TS 24.229(V6.13.0) §5.4.3.2 ¶49
EUT role    : IMS -- S-CSCF
config ref  : CF_M02-SS1-MT2

```

```

with { UE_A registered in IMS_A and
      UE_B registered in IMS_B and
      UE_A has_initiated_a_dialog_with UE_B }
ensure that {
  when { UE_A sends PRACK to UE_B }
  then { IMS_B receives the PRACK
        (containing a P-Charging-Vector_header
         not containing an
         access-network-charging-info_parameter or
         not containing a P-Charging-Vector_header) and
         not containing a P-Access-Network-Info_header

        and
        UE_B receives the PRACK }
}

TP id      : TP_IMS_5107_02
summary    : 'S-CSCF remove access-network-charging-info parameter and P-Access-Network-Info header
before sending BYE requests over NNI'
TP type    : interoperability
RQ ref     : 3GPP TS 24.229(V6.13.0) §5.4.3.2 ¶49
EUT role   : IMS -- S-CSCF
config ref: CF_MO2-SS1-MT2
with { UE_A registered in IMS_A and
      UE_B registered in IMS_B and
      UE_A has_initiated_a_dialog_with UE_B }
ensure that {
  when { UE_A sends BYE to UE_B }
  then { IMS_B receives the BYE
        (containing a P-Charging-Vector_header
         not containing an
         access-network-charging-info_parameter or
         not containing a P-Charging-Vector_header) and
         not containing a P-Access-Network-Info_header

        and
        UE_B receives the BYE }
}

TP id      : TP_IMS_5107_03
summary    : 'S-CSCF remove access-network-charging-info parameter and P-Access-Network-Info header
before sending ACK requests over NNI'
TP type    : interoperability
RQ ref     : 3GPP TS 24.229(V6.13.0) §5.4.3.2 ¶49
EUT role   : IMS -- S-CSCF
config ref: CF_MO2-SS1-MT2
with { UE_A registered in IMS_A and
      UE_B registered in IMS_B and
      UE_A has_received_200OK_on_initial_request_for_dialog UE_B }
ensure that {
  when { UE_A sends ACK to UE_B }
  then { IMS_B receives the ACK
        (containing a P-Charging-Vector_header
         not containing an
         access-network-charging-info_parameter or
         not containing a P-Charging-Vector_header) and
         not containing a P-Access-Network-Info_header

        and
        UE_B receives the ACK }
}

TP id      : TP_IMS_5107_04
summary    : 'S-CSCF remove access-network-charging-info parameter and P-Access-Network-Info header
before sending CANCEL requests over NNI'
TP type    : interoperability
RQ ref     : 3GPP TS 24.229(V6.13.0) §5.4.3.2 ¶49
EUT role   : IMS -- S-CSCF
config ref: CF_MO2-SS1-MT2
with { UE_A registered in IMS_A and
      UE_B registered in IMS_B and
      UE_B has_received_an_initial_request_for_a_dialog from UE_A }
ensure that {
  when { UE_A sends CANCEL to UE_B }
  then { IMS_B receives the CANCEL
        (containing a P-Charging-Vector_header
         not containing an
         access-network-charging-info_parameter or
         not containing a P-Charging-Vector_header) and
         not containing a P-Access-Network-Info_header

        and
}

```

```

        UE_B receives the CANCEL }
    }

```

End group 1.6.1.1

5.1.6.1.2 Group Subsequent terminating network

Group 1.6.1.2 'Subsequent terminating network'

-- NNI TPs are not applicable

End group 1.6.1.2

End group 1.6.1

5.1.6.2 Group Target refresh request procedures

Group 1.6.2 'Target refresh request procedures'

5.1.6.2.1 Group Refresh originating network

Group 1.6.2.1 'Refresh originating network'

```

TP id      : TP_IMS_5048_01
summary    : 'First IMS P-CSCF adds own via and record-route header in case of re-INVITE'
TP type    : interoperability
RQ ref     : 3GPP TS 24.229(V6.13.0) §5.2.6.3 ¶26
EUT role   : IMS -- P-CSCF
config ref: CF_M02-SS1-MT2
with { UE_A registered in IMS_A and
        UE_B registered in IMS_B and
        UE_A has_initiated_a_dialog_with UE_B
    }
ensure that {
    when { UE_A sends a subsequent INVITES to UE_B }
    then { IMS_B receives the subsequent INVITES
            containing an additional Via_header
            containing ( P-CSCF_port_number
                        'where it awaits the responses to arrive' and
                        (P-CSCF-FQDN_address or
                        P-CSCF-IP_address)) of IMS_A and
            containing an additional topmost Record-Route_header
            containing ( P-CSCF_port_number 'where it awaits subsequent
                        requests from the called party' and
                        (P-CSCF-FQDN_address or
                        P-CSCF-IP_address)) of IMS_A
        }
    and
    UE_B receives INVITE
}
}

TP id      : TP_IMS_5048_02
summary    : 'First IMS P-CSCF adds own via and record route header in case of UPDATE'
TP type    : interoperability
RQ ref     : 3GPP TS 24.229(V6.13.0) §5.2.6.3 ¶26
EUT role   : IMS -- P-CSCF
config ref: CF_M02-SS1-MT2
with { UE_A registered in IMS_A and
        UE_B registered in IMS_B and
        UE_A has_initiated_a_dialog_with UE_B
    }
ensure that {
    when { UE_A sends UPDATE to UE_B }
    then { IMS_B receives the UPDATE
            containing an additional Via_header
            containing ( P-CSCF_port_number 'where it awaits the
                        responses to arrive' and
                        (P-CSCF-FQDN_address or
                        P-CSCF-IP_address)) of IMS_A and
            containing an additional topmost Record-Route_header
            containing ( P-CSCF_port_number 'where it awaits subsequent
                        requests from the called party' and
                        (P-CSCF-FQDN_address or
                        P-CSCF-IP_address)) of IMS_A
        }
    and
    UE_B receives UPDATE
}
}

```

```

TP id      : TP_IMS_5106_01
summary    : 'S-CSCF must remove Record-Route, remove access-network-charging-info parameter and P-
Access-Network-Info header before sending target refresh over NNI'
TP type    : interoperability
RQ ref     : 3GPP TS 24.229(V6.13.0) §5.4.3.2 ¶42
EUT role   : IMS -- S-CSCF
config ref: CF_MO2-SS1-MT2
with { UE_A registered in IMS_A and
      UE_B registered in IMS_B and
      UE_A has_initiated_a_dialog_with UE_B }
ensure that {
  when { UE_A sends subsequent INVITES to UE_B }
  then { IMS_B receives the subsequent INVITES
        containing a topmost Record-Route_header
        containing the S-CSCF_SIP_URI of IMS_A and
        containing a P-Charging-Vector_header
        not containing an
        access-network-charging-info_parameter and
        not containing a P-Access-Network-Info_header
        and
        UE_B receives the INVITES }
}

TP id      : TP_IMS_5106_02
summary    : 'S-CSCF must Record-Route, remove access-network-charging-info parameter and P-Access-
Network-Info header before sending target refresh UPDATE over NNI'
TP type    : interoperability
RQ ref     : 3GPP TS 24.229(V6.13.0) §5.4.3.2 ¶42
EUT role   : IMS -- S-CSCF
config ref: CF_MO2-SS1-MT2
with { UE_A registered in IMS_A and
      UE_B registered in IMS_B and
      UE_A has_initiated_a_dialog_with UE_B }
ensure that {
  when { UE_A sends subsequent UPDATE to UE_B }
  then { IMS_B receives the subsequent UPDATE
        containing a topmost Record-Route_header
        containing the S-CSCF_SIP_URI of IMS_A and
        containing a P-Charging-Vector_header
        not containing an
        access-network-charging-info_parameter and
        not containing a P-Access-Network-Info_header
        and
        UE_B receives the UPDATE }
}

```

End group 1.6.2.1

5.1.6.2.2 Group Refresh terminating network

Group 1.6.2.2 'Refresh terminating network'

```

TP id      : TP_IMS_5058_01
summary    : 'A P-CSCF shall include a route header without a comp parameter in lxx UE responses on
target refresh requests for a dialog'
TP type    : interoperability
RQ ref     : 3GPP TS 24.229(V6.13.0) §5.2.6.4 ¶67
EUT role   : IMS -- P-CSCF
config ref: CF_MO2-SS1-MT2
with { UE_A registered in IMS_A and
      UE_B registered in IMS_B and
      UE_B has_received_a_target_refresh_request_in_a_dialog from UE_A
}
ensure that {
  when { UE_B sends a lxx_response to UE_A }
  then { IMS_A receives lxx_response
        containing Record-Route_header
        containing the same P-CSCF_port_number of IMS_B 'as in the
        response to the previous initial request' and
        not containing a comp_parameter
        and
        UE_A receives lxx_response
}
}

TP id      : TP_IMS_5058_02
summary    : 'A P-CSCF shall include a route header without a comp parameter in 2xx UE responses on
target refresh requests for a dialog'

```

```

TP type : interoperability
RQ ref : 3GPP TS 24.229(V6.13.0) §5.2.6.4 ¶67
EUT role : IMS -- P-CSCF
config ref: CF_M02-SS1-MT2
with { UE_A registered in IMS_A and
        UE_B registered in IMS_B and
        UE_B has_received_a_target_refresh_request_in_a_dialog from UE_A
}
ensure that {
  when { UE_B sends a 2xx_responses for subsequent INVITES to UE_A }
  then { IMS_A receives 2xx_response
         containing Record-Route_header
         containing the same P-CSCF_port_number of IMS_B 'as in the
         response to the previous initial request' and
         not containing a comp_parameter
       and
        UE_A receives 2xx_responses
      }
}

TP id : TP_IMS_5059_01
summary : 'A P-CSCF shall include a route header without a comp parameter in 3xx UE responses on
target refresh requests for a dialog'
TP type : interoperability
RQ ref : 3GPP TS 24.229(V6.13.0) §5.2.6.4 ¶74
EUT role : IMS -- P-CSCF
config ref: CF_M02-SS1-MT2
with { UE_A registered in IMS_A and
        UE_B registered in IMS_B and
        UE_B has_received_a_target_refresh_request_in_a_dialog from UE_A
}
ensure that {
  when { UE_B sends a 3xx_response to UE_A }
  then { IMS_A receives 3xx_response
         containing Record-Route_header
         containing the P-CSCF_port_number of IMS_B 'where it expects
         subsequent requests' and
         not containing a comp_parameter
       and
        UE_B receives 3xx_response
      }
}

TP id : TP_IMS_5059_02
summary : 'A P-CSCF shall include a route header without a comp parameter in 4xx UE responses on
target refresh requests for a dialog'
TP type : interoperability
RQ ref : 3GPP TS 24.229(V6.13.0) §5.2.6.4 ¶74
EUT role : IMS -- P-CSCF
config ref: CF_M02-SS1-MT2
with { UE_A registered in IMS_A and
        UE_B registered in IMS_B and
        UE_B has_received_a_target_refresh_request_in_a_dialog from UE_A
}
ensure that {
  when { UE_B sends a 4xx_response to UE_A }
  then { IMS_A receives 4xx_response
         containing Record-Route_header
         containing the P-CSCF_port_number of IMS_B 'where it expects
         subsequent requests' and
         not containing a comp_parameter
       and
        UE_B receives 4xx_response
      }
}

TP id : TP_IMS_5059_03
summary : 'A P-CSCF shall include a route header without a comp parameter in 5xx UE responses on
target refresh requests for a dialog'
TP type : interoperability
RQ ref : 3GPP TS 24.229(V6.13.0) §5.2.6.4 ¶74
EUT role : IMS -- P-CSCF
config ref: CF_M02-SS1-MT2
with { UE_A registered in IMS_A and
        UE_B registered in IMS_B and
        UE_B has_received_a_target_refresh_request_in_a_dialog from UE_A
}
ensure that {

```

```

when { UE_B sends a 5xx_response to UE_A }
then { IMS_A receives 5xx_response
      containing Record-Route_header
      containing the P-CSCF_port_number of IMS_B 'where it expects
      subsequent requests' and
      not containing a comp_parameter
      and
      UE_B receives 5xx_response
    }
}

TP id      : TP_IMS_5059_04
summary    : 'A P-CSCF shall include a route header without a comp parameter in 6xx UE responses on
target refresh requests for a dialog'
TP type    : interoperability
RQ ref     : 3GPP TS 24.229(V6.13.0) §5.2.6.4 ¶74
EUT role   : IMS -- P-CSCF
config ref: CF_MO2-SS1-MT2
with { UE_A registered in IMS_A and
      UE_B registered in IMS_B and
      UE_B has_received_a_target_refresh_request_in_a_dialog from UE_A
    }
ensure that {
  when { UE_B sends a 6xx_response to UE_A }
  then { IMS_A receives 6xx_response
        containing Record-Route_header
        containing the P-CSCF_port_number of IMS_B 'where it expects
        subsequent requests' and
        not containing a comp_parameter
        and
        UE_B receives 6xx_response
      }
}

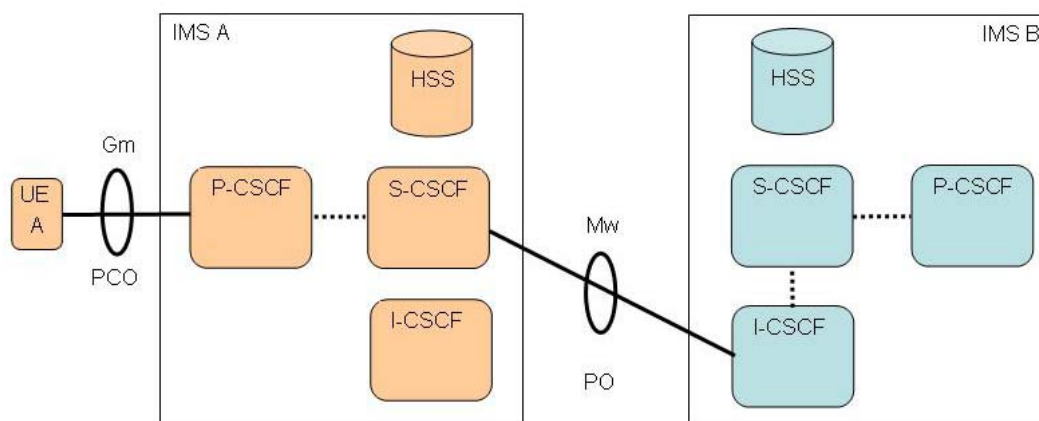
End group 1.6.2.2
End group 1.6.2
End group 1.6
End group 1

```

Annex A (normative): IMS NNI Interoperability Test Configurations

IMS NNI interoperability test configuration:

- 1) are named based on convention specified in clause 5.5.1 of TS 123 228 [6];
- 2) reuse the following abbreviations:
 - SS1: Different network operators performing origination and termination.
 - MO2: Mobile Origination, home. The "Originating Network" of S-S#1 is therefore the home network.
 - ASO: Application Server Origination. The "Originating Network" of S-S#1 is the home network.
 - MT2: Mobile Termination, located in home service area. The "Terminating Network" of S-S#1 is the home network.
 - AST4: Termination at Application Server based on service logic.
- 3) exclude PSTN, non-IMS endpoints and roaming since these are out of scope;
- 4) further differentiate IMS NNI observation points based on:
 - IN: initial request/response for a dialog.
 - SU: subsequent requests/responses in a dialog.
 - ST: standalone requests/response.
- 5) indicate:
 - observable interfaces as a solid line.
 - non-observable interfaces as dashed lines.



Precondition:

Different network operators performing origination and termination (SS1), UE_A in Home network A (MO2), UE_A registered, neither AS nor THIG nor IMS-ALG involved

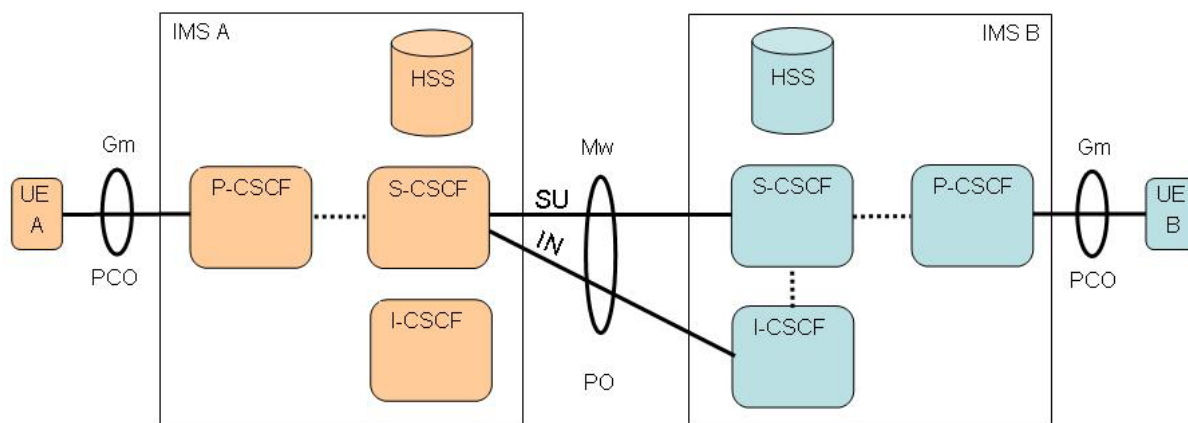
Test configuration for:

Unsuccessful initial requests and responses from UE_A

Example:

Initial INVITE in IMS VoIP voice call from UE_A to non-existing user

Figure A.1: CF_MO2-SS1



Precondition:

Different network operators performing origination and termination (SS1), UE_A in Home network A (MO2), UE_B in Home network B (MT2), *both UEs registered*, neither AS nor THIG nor IMS-ALG involved, in SU case dialog initiated between UE_A and UE_B

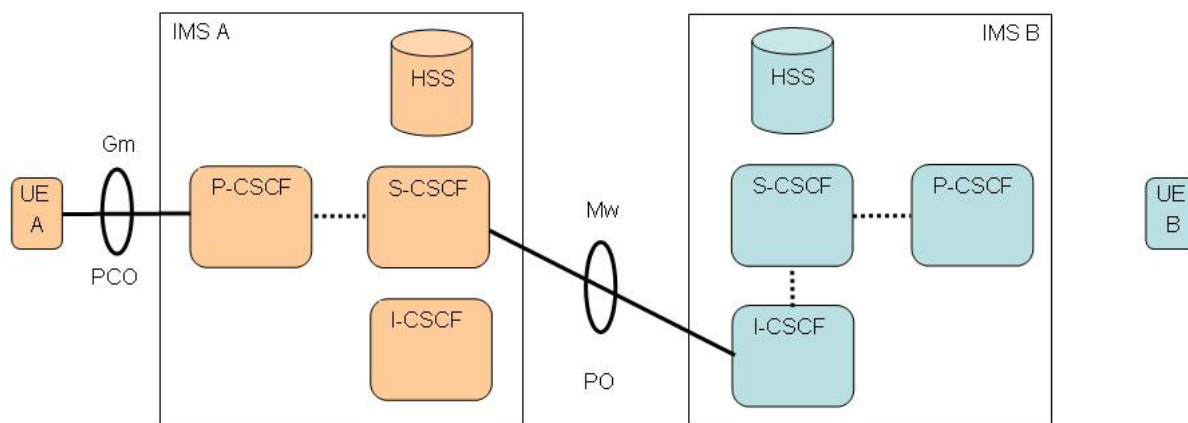
Test configuration for:

Initial (IN) and Subsequent (SU) requests and responses between UE_A and UE_B

Example:

IN: Initial INVITE in IMS VoIP voice call from UE_A to UE_B
 SU: BYE request, UE_B terminates IMS VoIP call towards UE_B

Figure A.2: CF_MO2-SS1-MT2



Precondition:

Different network operators performing origination and termination (SS1), UE_A in Home network A (MO2), UE_B in Home network B (MT2), *only UE_A registered*, neither AS nor THIG nor IMS-ALG involved, in SU case dialog initiated between UE_A and UE_B

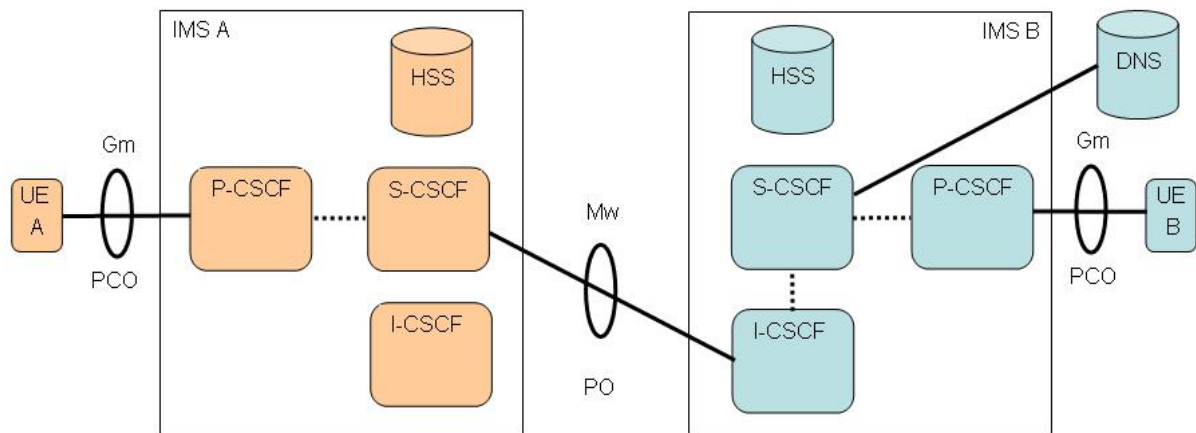
Test configuration for:

Unsuccessful initial requests and responses from UE_A

Example:

Initial INVITE in IMS VoIP voice call from UE_A

Figure A.3: CF_MO2-SS1-MT2b



Precondition:

Different network operators performing origination and termination (SS1), UE_A in Home network A (MO2), UE_B in Home network B (MT2), both UEs registered, DNS server involved in network B, neither AS nor THIG nor IMS-ALG involved, in SU case dialog initiated between UE_A and UE_B

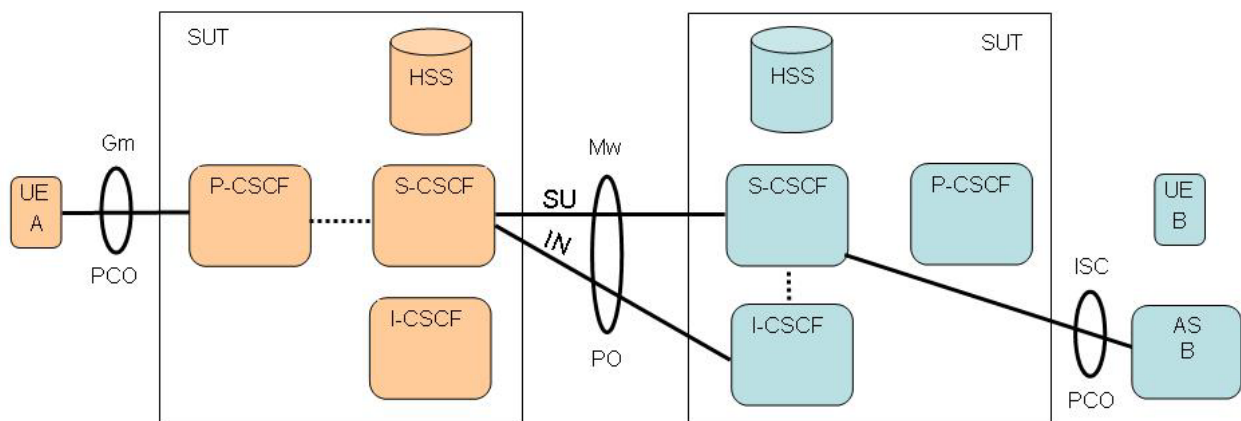
Test configuration for:

Initial requests and responses between UE_A and UE_B

Example:

Initial INVITE in IMS VoIP voice call from UE_A

Figure A.4: CF_MO2-SS1-MT2c



Precondition:

Different network operators performing origination and termination (SS1), UE_A in Home network A (MO#2), UE_B in Home network B (MT#2), AS_B discovered based on service logic in Home network B (AST#4), only UE_A registered, in SU case dialog initiated between UE_A and AS_B, neither THIG nor IMS-ALG involved

Test configuration for:

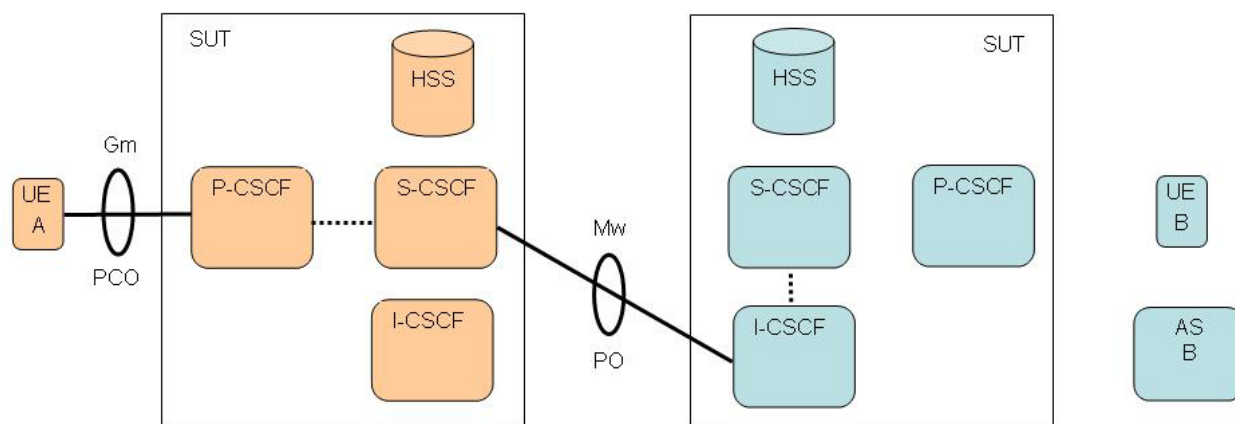
Initial (IN) and Subsequent (SU) requests and responses between UE_A and AS_B

Example:

IN: Initial INVITE, IMS VoIP voice call from UE_A forwarded to AS_B as a result of filter criteria. ASB acts as routing AS

SU: BYE request, UE_A terminates IMS VoIP voice call towards AS_B

Figure A.5: CF_MO2-SS1-MT2-AST4



Precondition:

Different network operators performing origination and termination (SS1), UE_A in Home network A (MO#2), UE_B in Home network B (MT#2), AS_B discovered based on service logic in Home network B (AST#4), only UE_A registered, AS_B not responding, neither THIG nor IMS-ALG involved

Test configuration for:

Initial (IN) and Subsequent (SU) requests and responses between UE_A and AS_B

Example:

IN: Unsuccessful initial INVITE, IMS VoIP voice call from UE_A forwarded to AS_B as a result of filter criteria but no response.

Figure A.6: CF_MO2-SS1-MT2-AST4b

Annex B (normative): IMS NNI TPLan interoperability testing user definitions

```

-- entities under test
def entity IMS_A
def entity IMS_B

-- external entities
def entity AS_B
def entity UE_A
def entity UE_B
def entity DNS_B

-- events

-- SIP Requests
def event INVITE {
    Via_header,
    Record-Route_header,
    P-Charging-Vector_header,
    P-Asserted-Identity_header,
    P-Preferred-Identity_header,

    P-Access-Network-Info_header,
    P-Charging-Function-Addresses_header,
    Route_header
}

def event ACK {
    P-Access-Network-Info_header,
    P-Charging-Function-Addresses_header,
    P-Charging-Vector_header
}

def event UPDATE {
    Via_header,
    Record-Route_header
}

def event CANCEL { P-Charging-Vector_header }

def event BYE {
    P-Charging-Vector_header,
    Request_URI,
    To_header,
    From_header,
    Call-ID_header,
    CSeq_header,
    Route_header,
    P-Access-Network-Info_header,
    P-Charging-Function-Addresses_header
}

def event MESSAGE {
    Message_Body
}

def event INFO {
    P-Charging-Vector_header,
    P-Preferred-Identity_header,
    P-Asserted-Identity_header
}

def event PRACK {
    P-Charging-Vector_header,
    P-Access-Network-Info_header,
    P-Charging-Function-Addresses_header
}

def event NOTIFY {
    P-Charging-Vector_header
}

```

```

def event Unknown_Method {
    P-Preferred-Identity_header,
    P-Asserted-Identity_header
}

def event DNS_Query

def event DNS_Response {
    NAPTR_Resource_Record
}

-- SIP Responses
def event 1xx_response
def event 2xx_response
def event 200_response
def event 3xx_response
def event 4xx_response
def event 404_response
def event 408_response
def event 480_response
def event 5xx_response
def event 6xx_response
def event 604_response
def event response -- any xxx response

-- values
def value term-ioi_parameter
def value Tel_URI
def value Tel_URI_E.164_Number
def value SIP_URI
def value Tel_derived_SIP_URI
def value Request_URI
def value non_existing_user
def value registered_public_identities
def value default_registered_public_identity
def value P-CSCF_via_port_number -- port number in accordance with RFC 3261
def value P-CSCF_port_number
def value P-CSCF-FQDN_address -- FQDN equals "fully qualified domain name"
def value P-CSCF-IP_address
def value address -- either IP address of FQDN address
def value orig-ioi_parameter
def value ioi -- equals inter operator identifier
def value icid_parameter -- NOTE: correct values defined in 3GPP TS 32.260 !!
def value comp_parameter
def value S-CSCF_SIP_URI
def value access-network-charging-info_parameter
def value ENUM_entry

def value Contact_header_value
def value INVITE_To_value
def value INVITE_From_value
def value INVITE_Call_ID_value
def value 200_OK_To_value
def value 200_OK_From_value
def value Sequence_Number

def value SESSION_TERMINATED_on_INVITE

-- conditions
def condition configured
def condition registered
def condition has_received_an_initial_request_for_a_dialog -- meaning INVITE or
SUBSCRIBE
def condition has_received_200OK_on_initial_request_for_dialog -- meaning INVITE or SUBSCRIBE/200OK
def condition has_initiated_a_dialog_with -- meaning INVITE or SUBSCRIBE/200OK/ACK
def condition has_initiated_a_non_INVITE_dialog_with -- meaning e.g. SUBSCRIBE/200OK/ACK
def condition has_received_a_standalone_request -- meaning MESSAGE, INFO
def condition has_received_a_subsequent_request_in_a_dialog -- meaning BYE, CANCEL, ACK, PRACK,
NOTIFY
def condition has_received_a_target_refresh_request_in_a_dialog -- Meaning re-INVITE, UPDATE
def condition has_received_a_request_for_an_unknown_method
def condition configured_with_a_terminating_unregistered_filter_criterion

-- words
def word initial

```

```
def word additional
def word topmost
def word originating
def word subsequent
def word incremented

-- Useful expressions
def word same
def word both

def word for
def word while

-- Logic expressions
def word than
def word bigger
def word smaller
def word equals

-- Units

-- memory size
def unit byte
def unit bytes
```

History

Document history		
V1.1.1	March 2009	Publication