## MODIFICATION RECORD

<table>
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<tr>
<th>Revision</th>
<th>Date</th>
<th>Note</th>
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<tr>
<td>0.3.0</td>
<td>Jun. 15, 2009</td>
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<tr>
<td>0.3.1</td>
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</tr>
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<td>Nov. 26, 2010</td>
<td>Major version up (trial version)</td>
</tr>
<tr>
<td></td>
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IPv6 Promotion Council
Certification Working Group
SIP IPv6 Sub Working Group

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Commentators:

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TABLE OF CONTENTS

1. INTRODUCTION ........................................................................................................................................................................ 5
2. REQUIREMENT ......................................................................................................................................................................... 7
3. Test Procedure for Interoperability test scenario for the IPv6 Ready Logo Phase 2 ............................................................. 10
   Group1: Registration and Authentication ................................................................................................................................. 11
   1.1 IMS-AKA .................................................................................................................................................................. 12
       Test IMS.Interop.1.1.1: Initial Registration .................................................................................................................... 12
       Test IMS.Interop.1.1.2: Reregistration ........................................................................................................................... 13
   1.2 SIP digest .................................................................................................................................................................. 14
       Test IMS.Interop.1.2.1: Initial Registration .................................................................................................................... 14
       Test IMS.Interop.1.2.2: Reregistration ........................................................................................................................... 15
   Group2: Registration-State Event Package ................................................................................................................................. 16
   2.1 IMS-AKA .................................................................................................................................................................. 17
       Test IMS.Interop.2.1.1: Subscription and Notification ................................................................................................... 17
   2.2 SIP digest .................................................................................................................................................................. 19
       Test IMS.Interop.2.2.1: Subscription and Notification ................................................................................................... 19
   Group3: Session .................................................................................................................................................................. 21
   3.1 IMS-AKA .................................................................................................................................................................. 22
       Test IMS.Interop.3.1.1: Call Initiation and Termination (UE-originating case) ......................................................... 22
       Test IMS.Interop.3.1.2: Call Initiation and Termination (UE-terminating case) ....................................................... 24
       Test IMS.Interop.3.1.3: Call Cancellation (call UE-originating case) ................................................................. 26
       Test IMS.Interop.3.1.4: Call Cancellation (call UE-terminating case) ............................................................... 28
   3.2 SIP digest .................................................................................................................................................................. 30
       Test IMS.Interop.3.2.1: Call Initiation and Termination (UE-originating case) ......................................................... 30
       Test IMS.Interop.3.2.2: Call Initiation and Termination (UE-terminating case) ....................................................... 32
       Test IMS.Interop.3.2.3: Call Cancellation (call UE-originating case) ................................................................. 34
       Test IMS.Interop.3.2.4: Call Cancellation (call UE-terminating case) ............................................................... 36
4. Topology Map for Interoperability test scenario for the IPv6 Ready Logo Phase 2 ............................................................. 38
5. Result Table for Interoperability test scenario for the IPv6 Ready Logo Phase 2 ............................................................. 44
1. INTRODUCTION

Overview

The IPv6 forum plays a major role to bring together industrial actors, to develop and deploy the new generation of IP protocols. Contrary to IPv4, which started with a small closed group of implementers, the universality of IPv6 leads to a huge number of implementations. Interoperability has always been considered as a critical feature in the Internet community.

Due to the large number of IPv6 implementations, it is important to provide the market a strong signal proving the level of interoperability across various products.

To avoid confusion in the mind of customers, a globally unique logo program should be defined. The IPv6 logo will give confidence to users that IPv6 is currently operational. It will also be a clear indication that the technology will still be used in the future. To summarize, this logo program will contribute to the feeling that IPv6 is available and ready to be used.

Abbreviations and Acronyms

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>UE</td>
<td>IMS User Equipment</td>
</tr>
<tr>
<td>P-CSCF</td>
<td>IMS Proxy- Call/Session Control Function</td>
</tr>
<tr>
<td>I-CSCF</td>
<td>IMS Interrogating- Call/Session Control Function</td>
</tr>
<tr>
<td>S-CSCF</td>
<td>IMS Serving- Call/Session Control Function</td>
</tr>
<tr>
<td>HSS</td>
<td>Home Subscriber Server</td>
</tr>
<tr>
<td>IF</td>
<td>Interface</td>
</tr>
<tr>
<td>UNI</td>
<td>User-Network Interface</td>
</tr>
<tr>
<td>NNI</td>
<td>Network-Network Interface</td>
</tr>
<tr>
<td>NUT</td>
<td>Node Under Test</td>
</tr>
</tbody>
</table>

REFERENCES

The following documents are referenced in this text:

[IMS]
(1) TS 24.229: IP multimedia call control protocol based on Session Initiation Protocol (SIP) and Session Description Protocol (SDP); Stage 3(Release 8), 3GPP TS 24.229 v8.10.0. (http://www.3gpp.org/ftp/Specs/html-info/24229.htm)

[SIP/SDP]
(3) RFC3265: Session Initiation Protocol (SIP)-Specific Event Notification


[IMS AKA and Security Association]


[SIP digest]


[Call Flow Examples]

(14) TS24.228: Signalling flows for the IP multimedia call control based on Session Initiation Protocol (SIP) and Session Description Protocol (SDP): Stage 3, 3GPP TS 24.228 v5.15.0. ([http://www.3gpp.org/ftp/Specs/html-info/24228.htm](http://www.3gpp.org/ftp/Specs/html-info/24228.htm))

2. REQUIREMENT

To obtain the IPv6 Ready Logo for IMS- Phase 2, the NUT (Node Under Test) must satisfy the following requirements.

Equipment Type

UE (User Equipment):

A node that initiates and receives requests to exchange parameters between P-CSCF.

UE must pass the interoperability test on the architecture as following (Figure 1). Also, it is recommended to execute the interoperability test with UE2 (REF UE) which is the same vendor as UE1 (TARGET UE). Moreover, UE2 must support the same functions as UE1, and IMS CSCFs1/HSS1 (REF) must support all BASIC functions.

The architecture for IMS Interoperability test

IMS IPv6 UE must execute the interoperability test with two or more vendor’s equipments (IMS P-CSCF1) that obtain IPv6 Ready Logo for IMS- Phase 2.

* Must set up as the following combinations.
  - If you use the IMS Core as the IMS CSCFs1/HSS1,
    Vender A (IMS CSCFs1/HSS1) -------------- Any Vender (UE2)
    Vender B (IMS CSCFs1/HSS1) -------------- Any Vender (UE2)
  - In other cases,
    Vender A (IMS P-CSCF1) + Any Vender (IMS CSCFs1/HSS1) -------------- Any Vender (UE2)
    Vender B (IMS P-CSCF1) + Any Vender (IMS CSCFs1/HSS1) -------------- Any Vender (UE2)
The process of the Interoperability test
The Outline of the “Interoperability test scenario for the IPv6 Ready Logo Phase 2 program” is as follows.

<1> Check the required nodes and scenarios for the interoperability test (See Table 1).
<2> Connect the necessary equipment properly. (See section 2.REQUIREMENT)
<3> Execute the tests according to the interoperability test scenario.
   (And you need to save the interoperability test logs.)
<4> Capture all packets on each link during the test with a device that is not part of the test. For each part of test put the captured packet into individual files within tcpdump format (cap).
<5> Write the result (‘OK’ or ‘NG’) on the check sheet every scenario.

As for the above <3>, the actual test scenarios are described in section 3 "Test Procedure for Interoperability test scenario for the IPv6 Ready Logo Phase 2". Each test scenario in the section provides the details of the test scenario to conduct the actual test.

As for the above <5>, refer to “The explanation of the submission for the SIPIMS IPv6 Ready Logo”.

For checking of the interoperability test results, you can use section 5 "Result Table for Interoperability test scenario for the IPv6 Ready Logo Phase 2” in this document.
IMS Interoperability Test Criteria

Table 2 is the list of IPv6 Ready Logo for IMS interoperability test criteria. It is recommended to start the test from the initial item in each category.

<table>
<thead>
<tr>
<th>T A R</th>
<th>Category</th>
<th>Security mechanism</th>
<th>Item num</th>
<th>Test scenario</th>
<th>TARGET/REF</th>
</tr>
</thead>
<tbody>
<tr>
<td>U E</td>
<td>Registration and Authentication</td>
<td>IMS-AKA</td>
<td>1</td>
<td>Initial Registration</td>
<td>UE1 TP P-CSCF1 CSCFs1 HSS1 UE2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>SIP digest</td>
<td>2</td>
<td>Reregistration</td>
<td></td>
</tr>
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<td></td>
<td></td>
<td></td>
<td>3</td>
<td>Initial Registration</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>4</td>
<td>Reregistration</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Registration-State Event Package</td>
<td>IMS-AKA</td>
<td>3</td>
<td>Subscription and Notification</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>SIP digest</td>
<td>5</td>
<td>Subscription and Notification</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Session</td>
<td>IMS-AKA</td>
<td>4</td>
<td>Call Initiation and Termination</td>
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<td>6</td>
<td>Call Initiation and Termination</td>
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<td></td>
<td></td>
<td></td>
<td>7</td>
<td>Call Initiation and Termination (UE-originating case)</td>
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<td>Call Initiation and Termination (UE-terminating case)</td>
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<td></td>
<td>9</td>
<td>Call Cancellation (call UE-originating case)</td>
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<td>10</td>
<td>Call Cancellation (call UE-terminating case)</td>
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<td>Call Initiation and Termination (UE-originating case)</td>
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<td>12</td>
<td>Call Initiation and Termination (UE-terminating case)</td>
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<td>13</td>
<td>Call Cancellation (call UE-originating case)</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>14</td>
<td>Call Cancellation (call UE-terminating case)</td>
<td></td>
</tr>
</tbody>
</table>

- : BASIC (IMS-AKA is mandatory for all UEs containing a UICC)
- : ADVANCED
- TU: TARGET UE (Applicant device)  TP: TARGET P-CSCF (Vendor A, B)  R: REF (Any Vendor)
3. Test Procedure for Interoperability test scenario for the IPv6 Ready Logo Phase 2

TEST ORGANIZATION

This document organizes tests by Section based on related test methodology or goals. Each group begins with a brief set of comments pertaining to all tests within that group. This is followed by a series of description blocks; each block describes a single test. The format of the description block is as follows:

Test Label: The test label and title comprise the first line of the test block. The test label is composed by concatenating the short test suite name, the section number, the group number, and the test number within the group. These elements are separated by periods. The Test Number is the section, group and test number, also separated by periods.

Purpose: The Purpose is a short statement describing what the test attempts to achieve. It is usually phrased as a simple assertion of the feature or capability to be tested.

References: The References section lists cross-references to the specifications and documentation that might be helpful in understanding and evaluating the test and results.

Resource Requirements: The Resource Requirements section specifies the software, hardware, and test equipment that will be needed to perform the test.

Test Setup: The Test Setup section describes the configuration of all devices prior to the start of the test. Different parts of the procedure may involve configuration steps that deviate from what is given in the test setup. If a value is not provided for a protocol parameter, then the protocol’s default is used for that parameter.

Procedure: This section of the test description contains the step-by-step instructions for carrying out the test. These steps include such things as enabling interfaces, unplugging devices from the network, or sending packets from a test station. The test procedure also cues the tester to make observations, which are interpreted in accordance with the observable results given for that test part.

Observable Results: This section lists observable results that can be examined by the tester to verify that the NUT is operating properly. When multiple observable results are possible, this section provides a short discussion on how to interpret them. The determination of a pass or fail for each test is usually based on how the NUT’s behavior compares to the results described in this section.

Possible Problems: This section contains a description of known issues with the test procedure, which may affect test results in certain situations.
Group1: Registration and Authentication

Scope
Test in this group verify that the target devices properly registers and authenticates.

Overview
The following tests verify operations such as initial registration, and reregister.
1.1 IMS-AKA

Test IMS.Interop.1.1.1: Initial Registration

Purpose: To verify that a UE completes initial registration properly.

References:

• [TS24.229] – Section 5.1.1.1
• [TS24.229] – Section 5.1.1.2.1
• [TS24.229] – Section 5.1.1.2.2

Test Setup: Connect the devices as per the figure below. Configure the P-CSCF, S-CSCF, I-CSCF, and HSS to be in the same domain. UE1 is unregistered.

Procedure:

1. Initialize UE1.
2. Observe the packets on all networks.

Observable Results:

Step 2: UE1 transmits a REGISTER request to P-CSCF. UE1 receives a 401 Unauthorized response from P-CSCF. UE1 transmits a new REGISTER request including valid credentials to P-CSCF by using temporary security associations. UE1 receives a 200 OK response from P-CSCF using security associations.

Possible Problems:

• None.
Test IMS.Interop.1.1.2: Reregistration

Purpose: To verify that a UE can perform the reregistration.

References:

- [TS24.229] – Section 5.1.1.4
- [TS24.229] – Section 5.1.1.4.1
- [TS24.229] – Section 5.1.1.4.2

Test Setup: Connect the devices as per the figure below. Configure the P-CSCF, S-CSCF, I-CSCF, and HSS to be in the same domain. UE1 is unregistered. Configure the registration expired time to 120 seconds in the S-CSCF.

![Diagram of test setup](image)

Procedure:

1. Initialize UE1.
2. UE1 transmits a REGISTER request to P-CSCF.
3. P-CSCF transmits a 401 Unauthorized response to UE1.
4. UE1 transmits a REGISTER request with valid credentials to P-CSCF.
5. P-CSCF transmits a 200 OK response to UE1.
6. Wait expiration Interval after in the successful initial registration.
7. Observe the packets on all networks.

Observable Results:

Step 7: UE1 transmits a REGISTER request to the P-CSCF using the existing security associations. UE1 receives a 200 OK response from P-CSCF using the existing security associations.

Addition 1: All of messages between UE and P-CSCF are protected by SA after Registration.

Addition 2: If UE1 supports SigComp, UE1 uses SigComp after Registration.

Possible Problems:

- None.
1.2 SIP digest

Test IMS.Interop.1.2.1: Initial Registration

Purpose: To verify that a UE completes initial registration properly.

References:

- [TS24.229] – Section 5.1.1.1
- [TS24.229] – Section 5.1.1.2.1
- [TS24.229] – Section 5.1.1.2.2

Test Setup: Connect the devices as per the figure below. Configure the P-CSCF, S-CSCF, I-CSCF, and HSS to be in the same domain. UE1 is unregistered.

Procedure:

1. Initialize UE1.
2. Observe the packets on all networks.

Observable Results:

Step 2: UE1 transmits a REGISTER request to P-CSCF. UE1 receives a 401 Unauthorized response from P-CSCF. UE1 transmits a new REGISTER request including valid credentials to P-CSCF. UE1 receives a 200 OK response from P-CSCF.

Possible Problems:

- None.
Test IMS.Interop.1.2.2: Reregistration

Purpose: To verify that a UE can perform the reregistration.

References:

- [TS24.229] – Section 5.1.1.4
- [TS24.229] – Section 5.1.1.4.1
- [TS24.229] – Section 5.1.1.4.2

Test Setup: Connect the devices as per the figure below. Configure the P-CSCF, S-CSCF, I-CSCF, and HSS to be in the same domain. UE1 is unregistered. Configure the registration expired time to 120 seconds in the S-CSCF.

Procedure:

1. Initialize UE1.
2. UE1 transmits a REGISTER request to P-CSCF.
3. P-CSCF transmits a 401 Unauthorized response to UE1.
4. UE1 transmits a REGISTER request with valid credentials to P-CSCF.
5. P-CSCF transmits a 200 OK response to UE1.
6. Wait expiration Interval after in the successful initial registration.
7. Observe the packets on all networks.

Observable Results:

Step 7: UE1 transmits a REGISTER request to the P-CSCF. UE1 receives a 200 OK response from P-CSCF.
Addition 1: If UE1 supports SigComp, UE1 uses SigComp after Registration.

Possible Problems:

- None.
Group2: Registration-State Event Package

Scope

Test in this group verify that the target devices properly receives the registration-state event package.

Overview

The following tests verify operations of registration-state event package using the SUBSCRIBE and NOTIFY framework.
2.1 IMS-AKA

Test IMS.Interop.2.1.1: Subscription and Notification

Purpose: To verify that a UE properly supports subscription and notification.

References:

- [TS24.229] – Section 5.1.2

Test Setup: Connect the devices as per the figure below. Configure the P-CSCF, S-CSCF, I-CSCF, and HSS to be in the same domain. UE1 is unregistered.

![Diagram of IMS architecture](image)

Procedure:

1. Initialize UE1.
2. UE1 transmits a REGISTER request to P-CSCF.
3. P-CSCF transmits a 401 Unauthorized response to UE1.
4. UE1 transmits a REGISTER request with valid credentials to P-CSCF.
5. P-CSCF transmits a 200 OK response to UE1.
6. Observe the packets on all networks.
7. P-CSCF transmits a 200 OK response to UE1.
8. P-CSCF transmits a NOTIFY request to UE1.
9. Observe the packets on all networks.

Observable Results:

- **Step 6:** UE1 transmits a SUBSCRIBE request to P-CSCF.
- **Step 9:** UE1 transmits a 200 OK response to P-CSCF.
- **Addition 1:** All of messages between UE and P-CSCF are protected by SA after Registration.
- **Addition 2:** If UE1 supports SigComp, UE1 uses SigComp after Registration.

Possible Problems:
• None.
2.2 SIP digest

Test IMS.Interop.2.2.1: Subscription and Notification

Purpose: To verify that a UE properly supports subscription and notification.

References:

• [TS24.229] – Section 5.1.2

Test Setup: Connect the devices as per the figure below. Configure the P-CSCF, S-CSCF, I-CSCF, and HSS to be in the same domain. UE1 is unregistered.

Procedure:

1. Initialize UE1.
2. UE1 transmits a REGISTER request to P-CSCF.
3. P-CSCF transmits a 401 Unauthorized response to UE1.
4. UE1 transmits a REGISTER request with valid credentials to P-CSCF.
5. P-CSCF transmits a 200 OK response to UE1.
6. Observe the packets on all networks.
7. P-CSCF transmits a 200 OK response to UE1.
8. P-CSCF transmits a NOTIFY request to UE1.
9. Observe the packets on all networks.

Observable Results:

Step 6: UE1 transmits a SUBSCRIBE request to P-CSCF.
Step 9: UE1 transmits a 200 OK response to P-CSCF.
Addition 1: If UE1 supports SigComp, UE1 uses SigComp after Registration.

Possible Problems:
• None.
Group3: Session

Scope

Test in this group verify that the target devices properly initiates and receives IMS calls.

Overview

The following tests verify that IMS call all can be completed and properly process cancellation.
3.1 IMS-AKA

Test IMS.Interop.3.1.1: Call Initiation and Termination (UE-originating case)

**Purpose:** To verify that a UE properly initiate a session (by sending an INVITE request). To verify that UE properly terminate a session (by receiving a BYE request).

**References:**

- [TS24.229] – Section 5.1.2A.1
- [TS24.229] – Section 5.1.3

**Test Setup:** Connect the devices as per the figure below. Configure the P-CSCF, S-CSCF, I-CSCF, and HSS to be in the same domain. UE1 is unregistered. UE2 is already registered.

![Test Setup Diagram]

**Procedure:**

1. Initialize UE1.
2. UE1 transmits a REGISTER request to P-CSCF.
3. P-CSCF transmits a 401 Unauthorized response to UE1.
4. UE1 transmits a REGISTER request with valid credentials to P-CSCF.
5. P-CSCF transmits a 200 response to UE1.
6. UE1 subscribes to the registration-state event package.
7. UE1 calls UE2.
8. Observe the packets on all networks.
9. UE2 answers.
10. Observe the packets on all networks.
11. UE2 hangs up.
12. Observe the packets on all networks.

**Observable Results:**

**Step 8:** UE1 transmits an INVITE request to P-CSCF. UE1 receives 100 Trying response from P-CSCF. UE1 receives the 180 Ringing response from P-CSCF.

**Step 10:** UE1 receives a 200 response from P-CSCF. UE1 transmits ACK to P-CSCF.
Step 12: UE1 receives the BYE request from P-CSCF. UE1 transmits a 200 OK response to P-CSCF.

Addition 1: All of messages between UE and P-CSCF are protected by SA after Registration.

Addition 2: If UE1 supports SigComp, UE1 use SigComp after Registration.

Possible Problems:

• None.
Test IMS.Interop.3.1.2: Call Initiation and Termination (UE-terminating case)

**Purpose:** To verify that a UE properly initiate a session (by receiving an INVITE request). To verify that UE properly terminate a session (by sending a BYE request).

**References:**

- [TS24.229] – Section 5.1.2A.2
- [TS24.229] – Section 5.1.3

**Test Setup:** Connect the devices as per the figure below. Configure the P-CSCF, S-CSCF, I-CSCF, and HSS to be in the same domain. UE1 is unregistered. UE2 is already registered.

![Diagram of IMS network components](image)

**Procedure:**

1. Initialize UE1.
2. UE1 transmits a REGISTER request.
3. P-CSCF transmits a 401 Unauthorized response.
4. UE1 transmits a REGISTER request with valid credentials to P-CSCF.
5. P-CSCF transmits a 200 response to UE1.
6. UE1 subscribes to the registration-state event package.
7. UE2 calls UE1.
8. Observe the packets on all networks.
9. UE1 answers.
10. Observe the packets on all networks.
11. UE1 hangs up.
12. Observe the packets on all networks.

**Observable Results:**

**Step 8:** UE1 receives the INVITE request from P-CSCF. UE1 transmits a 180 Ringing response to P-CSCF.

**Step 10:** UE1 transmits a 200 OK response to P-CSCF. UE1 receives the ACK request from P-CSCF.

**Step 12:** UE1 transmits a BYE request to P-CSCF. UE1 receives 200 OK response from P-CSCF.

**Addition 1:** All of messages between UE and P-CSCF are protected by SA after Registration.

**Addition 2:** If UE1 supports SigComp, UE1 use SigComp after Registration.
Possible Problems:

• None.
Test IMS.Interop.3.1.3: Call Cancellation (call UE-originating case)

**Purpose:** To verify that a UE properly cancels a session (by sending a CANCEL request). To verify that a UE properly process a 487 response (by receiving a 487 response).

**References:**

- [RFC3261] – Section 9

**Test Setup:** Connect the devices as per the figure below. Configure the P-CSCF, S-CSCF, I-CSCF, and HSS to be in the same domain. UE1 is unregistered. UE2 is already registered.

**Procedure:**

1. Initialize UE1.
2. UE1 transmits a REGISTER request to P-CSCF.
3. P-CSCF transmits a 401 Unauthorized response to UE1.
4. UE1 transmits a REGISTER request with valid credentials to P-CSCF.
5. P-CSCF transmits a 200 response to UE1.
6. UE1 subscribes to the registration-state event package.
7. UE1 calls UE2.
8. UE1 transmits a INVITE request to P-CSCF and then UE2 receives a INVITE request.
9. UE1 receives a 180 Ringing response from P-CSCF.
10. UE1 cancels the call
11. Observe the packets on all networks.
12. UE2 responds for a canceled call.
13. Observe the packets on all networks.

**Observable Results:**

**Step 11:** UE1 transmits a CANCEL request to P-CSCF. UE1 receives a 200 OK response from P-CSCF.
**Step 13:** UE1 receives a 487 response from P-CSCF. UE1 transmits an ACK to P-CSCF.
**Addition 1:** All of messages between UE and P-CSCF are protected by SA after Registration.
**Addition 2:** If UE1 supports SigComp, UE1 use SigComp after Registration.
Possible Problems:

- None.
Test IMS.Interop.3.1.4: Call Cancellation (call UE-terminating case)

**Purpose:** To verify that a UE properly cancels a session (by receiving a CANCEL request). To verify that a UE properly respond to the original INVITE request with a 487 response.

**References:**

- [RFC3261] – Section 9

**Test Setup:** Connect the devices as per the figure below. Configure the P-CSCF, S-CSCF, I-CSCF, and HSS to be in the same domain. UE1 is unregistered. UE2 is already registered.

**Procedure:**

1. Initialize UE1.
2. UE1 transmits a REGISTER request to P-CSCF.
3. P-CSCF transmits a 401 Unauthorized response to UE1.
4. UE1 transmits a REGISTER request with valid credentials to P-CSCF.
5. P-CSCF transmits a 200 response to UE1.
6. UE1 subscribes to the registration-state event package.
7. UE2 calls UE1.
8. UE2 transmits a INVITE request and then UE1 receives a INVITE request from P-CSCF.
9. UE1 transmits a 180 Ringing response to P-CSCF.
10. UE2 cancels the call
11. Observe the packets on all networks.
12. UE1 responds for a canceled call.
13. Observe the packets on all networks.

**Observable Results:**

**Step 11:** UE1 receives a CANCEL request from P-CSCF. UE1 transmits a 200 OK response to P-CSCF.

**Step 13:** UE1 transmits a 487 Request Terminated response to P-CSCF. UE1 receives an ACK from P-CSCF.

**Addition 1:** All of messages between UE and P-CSCF are protected by SA after Registration.
**Addition 2:** If UE1 supports SigComp, UE1 use SigComp after Registration.

**Possible Problems:**

- None.
3.2 SIP digest

Test IMS.Interop.3.2.1: Call Initiation and Termination (UE-originating case)

**Purpose:** To verify that a UE properly initiate a session (by sending an INVITE request). To verify that UE properly terminate a session (by receiving a BYE request).

**References:**

- [TS24.229] – Section 5.1.2A.1
- [TS24.229] – Section 5.1.3

**Test Setup:** Connect the devices as per the figure below. Configure the P-CSCF, S-CSCF, I-CSCF, and HSS to be in the same domain. UE1 is unregistered. UE2 is already registered.

**Procedure:**

1. Initialize UE1.
2. UE1 transmits a REGISTER request to P-CSCF.
3. P-CSCF transmits a 401 Unauthorized response to UE1.
4. UE1 transmits a REGISTER request with valid credentials to P-CSCF.
5. P-CSCF transmits a 200 response to UE1.
6. UE1 subscribes to the registration-state event package.
7. UE1 calls UE2.
8. Observe the packets on all networks.
9. UE2 answers.
10. Observe the packets on all networks.
11. UE2 hangs up.
12. Observe the packets on all networks.

**Observable Results:**

**Step 8:** UE1 transmits an INVITE request to P-CSCF. UE1 receives 100 Trying response from P-CSCF. UE1 receives the 180 Ringing response from P-CSCF.

**Step 10:** UE1 receives a 200 response from P-CSCF. UE1 transmits ACK to P-CSCF.
Step 12: UE1 receives the BYE request from P-CSCF. UE1 transmits a 200 OK response to P-CSCF.

Addition 1: If UE1 supports SigComp, UE1 use SigComp after Registration.

Possible Problems:

• None.
Test IMS.Interop.3.2.2: Call Initiation and Termination (UE-terminating case)

**Purpose:** To verify that a UE properly initiate a session (by receiving an INVITE request). To verify that UE properly terminate a session (by sending a BYE request).

**References:**

- [TS24.229] – Section 5.1.2A.2
- [TS24.229] – Section 5.1.3

**Test Setup:** Connect the devices as per the figure below. Configure the P-CSCF, S-CSCF, I-CSCF, and HSS to be in the same domain. UE1 is unregistered. UE2 is already registered.

**Procedure:**

1. Initialize UE1.
2. UE1 transmits a REGISTER request.
3. P-CSCF transmits a 401 Unauthorized response.
4. UE1 transmits a REGISTER request with valid credentials to P-CSCF.
5. P-CSCF transmits a 200 response to UE1.
6. UE1 subscribes to the registration-state event package.
7. UE2 calls UE1.
8. Observe the packets on all networks.
9. UE1 answers.
10. Observe the packets on all networks.
11. UE1 hangs up.
12. Observe the packets on all networks.

**Observable Results:**

**Step 8:** UE1 receives the INVITE request form P-CSCF. UE1 transmits a 180 Ringing response to P-CSCF.

**Step 10:** UE1 transmits a 200 OK response to P-CSCF. UE1 receives the ACK request from P-CSCF.

**Step 12:** UE1 transmits a BYE request to P-CSCF. UE1 receives 200 OK response from P-CSCF.

**Addition 1:** If UE1 supports SigComp, UE1 use SigComp after Registration.
Possible Problems:

• None.
Test IMS.Interop.3.2.3: Call Cancellation (call UE-originating case)

Purpose: To verify that a UE properly cancels a session (by sending a CANCEL request).
To verify that a UE properly process a 487 response (by receiving a 487 response).

References:

•[RFC3261] – Section 9

Test Setup: Connect the devices as per the figure below. Configure the P-CSCF, S-CSCF, I-CSCF, and HSS to be in the same domain. UE1 is unregistered. UE2 is already registered.

Procedure:

1. Initialize UE1.
2. UE1 transmits a REGISTER request to P-CSCF.
3. P-CSCF transmits a 401 Unauthorized response to UE1.
4. UE1 transmits a REGISTER request with valid credentials to P-CSCF.
5. P-CSCF transmits a 200 response to UE1.
6. UE1 subscribes to the registration-state event package.
7. UE1 calls UE2.
8. UE1 transmits a INVITE request to P-CSCF and then UE2 receives a INVITE request.
9. UE1 receives a 180 Ringing response from P-CSCF.
10. UE1 cancels the call
11. Observe the packets on all networks.
12. UE2 responds for a canceled call.
13. Observe the packets on all networks.

Observable Results:

Step 11: UE1 transmits a CANCEL request to P-CSCF. UE1 receives a 200 OK response from P-CSCF.
Step 13: UE1 receives a 487 response from P-CSCF. UE1 transmits an ACK to P-CSCF.
Addition 1: If UE1 supports SigComp, UE1 use SigComp after Registration.

Possible Problems:
• None.
Test IMS.Interop.3.2.4: Call Cancellation (call UE-terminating case)

**Purpose:** To verify that a UE properly cancels a session (by receiving a CANCEL request). To verify that a UE properly respond to the original INVITE request with a 487 response.

**References:**

- [RFC3261] – Section 9

**Test Setup:** Connect the devices as per the figure below. Configure the P-CSCF, S-CSCF, I-CSCF, and HSS to be in the same domain. UE1 is unregistered. UE2 is already registered.

![Test Setup Diagram]

**Procedure:**

1. Initialize UE1.
2. UE1 transmits a REGISTER request to P-CSCF.
3. P-CSCF transmits a 401 Unauthorized response to UE1.
4. UE1 transmits a REGISTER request with valid credentials to P-CSCF.
5. P-CSCF transmits a 200 response to UE1.
6. UE1 subscribes to the registration-state event package.
7. UE2 calls UE1.
8. UE2 transmits an INVITE request and then UE1 receives an INVITE request from P-CSCF.
9. UE1 transmits a 180 Ringing response to P-CSCF.
10. UE2 cancels the call
11. Observe the packets on all networks.
12. UE1 responds for a canceled call.
13. Observe the packets on all networks.

**Observable Results:**

**Step 11:** UE1 receives a CANCEL request from P-CSCF. UE1 transmits a 200 OK response to P-CSCF.

**Step 13:** UE1 transmits a 487 Request Terminated response to P-CSCF. UE1 receives an ACK from P-CSCF.

**Addition 1:** If UE1 supports SigComp, UE1 use SigComp after Registration.
Possible Problems:

- None.
4. Topology Map for Interoperability test scenario for the IPv6 Ready Logo Phase 2

Topology Map
(*This form is required for each session of Interoperability test.)
Please describe topology map based on the test environment.
Some examples are described below, see Example-1 to Example-2.

Form-1)

Please describe the topology map
Interoperability test scenario Item num: _______________

UEa1: Vendor name: ______________  Device name: ______________
P-CSCFa1: Vendor name: ______________  Device name: ______________
S-CSCFa1: Vendor name: ______________  Device name: ______________
I-CSCFa1: Vendor name: ______________  Device name: ______________
HSS: Vendor name: ______________  Device name: ______________

Link 1

UEa1  P-CSCFa1  I-CSCFa1  S-CSCFa1  HSS

IP address information

Link
Link 1
Network Prefix: ____________________________

User Equipment Node
UEa1
Global Address: ____________________________
Link Local Address: ____________________________
MAC Address: ____________________________

Server Node
P-CSCFa1
Global Address: ____________________________
Link Local Address: ____________________________
MAC Address: ____________________________

S-CSCFa1
Global Address : _______________________________________
Link Local Address : __________________ _____________________
MAC Address : __________________________

I-CSCFa1
Global Address : _______________________________________
Link Local Address : __________________ _____________________
MAC Address : __________________________

HSS
Global Address : _______________________________________
Link Local Address : __________________ _____________________
MAC Address : __________________________

AKA information (* Please describe when using IMS-AKA.)
Subscriber key (Secret key) : ____________________________ (ASCII/HEX)

SIP digest secret key information (* Please describe when using SIP digest.)
Secret key : ____________________________ (ASCII)

________________________________________________________________________

Form-2)
________________________________________________________________________

Please describe the topology map
Interoperability test scenario Item num :

UEa1 : Vendor name : ___________  Device name : ___________
UEa2 : Vendor name : ___________  Device name : ___________
P-CSCFa1 : Vendor name : ___________  Device name : ___________
S-CSCFa1 : Vendor name : ___________  Device name : ___________
I-CSCFa1 : Vendor name : ___________  Device name : ___________
HSS : Vendor name : ___________  Device name : ___________

--+------------+-------------+-------------+----------------+--------------+----- Link 1
|                     |                     |                     |                 |
|                     |                     |                     |                 |
UEa1  UEa2  P-CSCFa1  S-CSCFa1  I-CSCFa1  HSS

IP address information

Link
Link1
Network Prefix: ________________________

User Equipment Node
UEa1
Global Address : ________________________
Link Local Address : __________________
MAC Address : ________________________

UEa2
Global Address : ________________________
Link Local Address : __________________
MAC Address : ________________________

Server Node
P-CSCFa1
Global Address : ________________________
Link Local Address : __________________
MAC Address : ________________________

S-CSCFa1
Global Address : ________________________
Link Local Address : __________________
MAC Address : ________________________

I-CSCFa1
Global Address : ________________________
Link Local Address : __________________
MAC Address : ________________________

HSS
Global Address : ________________________
Link Local Address : __________________
MAC Address : ________________________

AKA information (* Please describe when using IMS-AKA.)
Subscriber key (Secret key) : ____________________________ (ASCII/HEX)

SIP digest secret key information (* Please describe when using SIP digest.)
Secret key : ____________________________ (ASCII)

Example-1
Topology map

Please describe the topology map
Interoperability test scenario Item num : Test IMS.Interop.1.1.1

---+------------+---------------+--------------+------------+----- Link 1
          |           |           |          |
UEa1   P-CSCFa1   I-CSCFa1   S-CSCFa1    HSS

IP address information

Link
Link1
Network Prefix: 3ffe:0501:ffff:0005::/64

User Equipment Node
UEa1
Global Address : 3ffe:0501:ffff:0005:0200:00ff:fe00:0100
Link Local Address : fe80::0200:00ff:fe00:0100
MAC Address : 00:00:00:00:01:00

Server Node
P-CSCFa1
Global Address : 3ffe:0501:ffff:0005:0200:00ff:fe00:0200
Link Local Address : fe80::0200:00ff:fe00:0200
MAC Address : 00:00:00:00:02:00

S-CSCFa1
Global Address : 3ffe:0501:ffff:0005:0200:00ff:fe00:0300
Link Local Address : fe80::0200:00ff:fe00:0300
MAC Address : 00:00:00:00:03:00

I-CSCFa1
Global Address : 3ffe:0501:ffff:0005:0200:00ff:fe00:0400
Link Local Address : fe80::0200:00ff:fe00:0400
MAC Address : 00:00:00:00:04:00

HSS
Global Address : 3ffe:0501:ffff:0005:0200:00ff:fe00:0500
Link Local Address : fe80::0200:00ff:fe00:0500
MAC Address : 00:00:00:00:05:00

AKA information (* Please describe when using IMS-AKA.)
Subscriber key (Secret key) : 0x465b5ce8b199b49faa5f0a2ee238a6bc (HEX)

SIP digest secret key information (* Please describe when using SIP digest.)
Secret key : 123456789 (ASCII)

Example-2
Topology map

Please describe the topology map
Interoperability test scenario Item num : Test IMS.Interop.3.1.1

UEa1 : Vendor name :Foo Corp        Device name :Hoge UE
UEa2 : Vendor name :Fuga Corp        Device name :Fuga UE
P-CSCFa1 : Vendor name :Bar Corp        Device name :Bar P-CSCF
S-CSCFa1 : Vendor name :fooBar Corp        Device name :fooBar S-CSCF
I-CSCFa1 : Vendor name :fooBar Corp        Device name :fooBar I-CSCF
HSS : Vendor name :fooBar Corp        Device name :fooBar HSS

<table>
<thead>
<tr>
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<td></td>
<td></td>
</tr>
<tr>
<td>UEa1</td>
<td>UEa2</td>
<td>P-CSCFa1</td>
<td>S-CSCFa1</td>
<td>I-CSCFa1</td>
</tr>
</tbody>
</table>

IP address information

Link
Link1
Network Prefix: 3ffe:0501:ffff:0005::/64

User Equipment Node
UEa1
Global Address : 3ffe:0501:ffff:0005:0200:00ff:fe00:0100
Link Local Address : fe80::0200:00ff:fe00:0100
MAC Address : 00:00:00:00:01:00

UEa2
Global Address : 3ffe:0501:ffff:0005:0200:00ff:fe00:0101
Link Local Address : fe80::0200:00ff:fe00:00101
MAC Address      : 00:00:00:00:00:01:01

Server Node
P-CSCFa1
  Global Address : 3ffe:0501:ffff:0005:0200:00ff:fe00:0200
  Link Local Address : fe80::0200:00ff:fe00:0200
  MAC Address : 00:00:00:00:00:02:00

S-CSCFa1
  Global Address : 3ffe:0501:ffff:0005:0200:00ff:fe00:0300
  Link Local Address : fe80::0200:00ff:fe00:0300
  MAC Address : 00:00:00:00:00:03:00

I-CSCFa1
  Global Address : 3ffe:0501:ffff:0005:0200:00ff:fe00:0400
  Link Local Address : fe80::0200:00ff:fe00:0400
  MAC Address : 00:00:00:00:00:04:00

HSS
  Global Address : 3ffe:0501:ffff:0005:0200:00ff:fe00:0500
  Link Local Address : fe80::0200:00ff:fe00:0500
  MAC Address : 00:00:00:00:00:05:00

AKA information (* Please describe when using IMS-AKA.)
  Subscriber key (Secret key) : alice (ASCII)

SIP digest secret key information (* Please describe when using SIP digest.)
  Secret key :  123456789 (ASCII)
5. Result Table for Interoperability test scenario for the IPv6 Ready Logo Phase 2

Result Table
(* This is need per one application.)

Please fill in the blanks relating to your executed test results as example below.

For UE

UE is a candidate for Phase 2 certification.

IO test result

<table>
<thead>
<tr>
<th>Target</th>
<th>IMS CSCFs No1.</th>
<th>IMS CSCFs No2.</th>
</tr>
</thead>
<tbody>
<tr>
<td>UEa1</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Example)

For UE

UE is a candidate for Phase 2 certification.

IO test result

<table>
<thead>
<tr>
<th>Target</th>
<th>IMS CSCFs No1.</th>
<th>IMS CSCFs No2.</th>
</tr>
</thead>
<tbody>
<tr>
<td>UEa1</td>
<td>PASS</td>
<td>PASS</td>
</tr>
</tbody>
</table>
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