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SERIES Q: SWITCHING AND SIGNALLING

Testing specifications – Testing specifications for SIP-IMS

Conference service using IP multimedia core network subsystem; Conformance testing – Part 2: Network side; Test suite structure and test purposes

Recommendation ITU-T Q.4005.2

ITU-T Q-SERIES RECOMMENDATIONS

SWITCHING AND SIGNALLING

Recommendation ITU-T Q.4005.2

Conference service using IP multimedia core network subsystem; Conformance testing – Part 2: Network side; Test suite structure and test purposes

Summary

Recommendation ITU-T Q 4005-2 v.1 (2016) is a part 2 of the testing specifications for conference service (CONF) implemented on IP multimedia subsystem (IMS) basis on the network side. The standard specifies the test suite structure and test purposes (TSS&TP) which can be used for testing against the draft Recommendation ITU-T Q.3621 v.1.

The version number, v.1, indicates that this is version one of Recommendation ITU-T Q.4005.2 and that it relates to Release 10 of the relevant 3GPP/ETSI standard.

History

Edition	Recommendation	Approval	Study Group	Unique ID[*]
1.0	ITU-T Q.4005.2 v.1	2016-02-13	11	11.1002/1000/12739

Keywords

Conference service, CONF, IP multimedia subsystem, IMS, network side, session description protocol, SDP, session initiation protocol, SIP, testing, test purposes, TP, test suite structure, TSS, user side.

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Conference service using IP multimedia core network subsystem; Conformance testing – Part 2: Network side; Test suite structure and test purposes

1 Scope

This Recommendation specifies the test suite structure and test purposes (TSS&TP) for CONF service [ITU-T Q.3621 v.1] for the network side.

This Recommendation is part 2 of a multi-part deliverable covering CONF service, as identified below:

–   Part 1:   "Protocol implementation conformance statement (PICS)";

–   **Part 2:   "Test suite structure and test purposes; Network side (TSS&TP)";**

–   Part 3:   "Test suite structure and test purposes; User Side (TSS&TP)".

2 References

The following ITU-T Recommendations and other references contain provisions which, through reference in this text, constitute provisions of this Recommendation. At the time of publication, the editions indicated were valid. All Recommendations and other references are subject to revision; users of this Recommendation are therefore encouraged to investigate the possibility of applying the most recent edition of the Recommendations and other references listed below. A list of the currently valid ITU-T Recommendations is regularly published. The reference to a document within this Recommendation does not give it, as a stand-alone document, the status of a Recommendation.

[ITU-T Q.3621 v.1]	Recommendation ITU-T Q.3621 v.1 (2016), *CONF using IP multimedia core network subsystem – Protocol specification.*
[ITU-T Q.4005.1 v.1]	Recommendation ITU-T Q.4005.1 v.1 (2016), *Conference service using IP multimedia core network subsystem; Conformance testing – Part 1: Network side; User side, protocol implementation conformance statement.*
[ITU-T X.290]	Recommendation ITU-T X.290 (1995), *OSI conformance testing methodology and framework for protocol Recommendations for ITU-T applications – General concepts.*
[ETSI TS 124 147]	ETSI TS 124 147 V10.5.0 (2015), *Digital cellular telecommunications system (Phase 2+); Universal Mobile Telecommunications System (UMTS); LTE; Conferencing using the IP Multimedia (IM) Core Network (CN) subsystem; Stage 3 (3GPP TS 24.147 version 10.5.0 Release 10).*

3 Definitions

This Recommendation uses the following terms defined elsewhere:

For the purposes of this Recommendation, the terms and definitions given in [ITU-T X.290] and [ITU-T X.296] apply:

3.1   **implementation under test (IUT)**: Refer to [ITU-T X.290].

3.2   **PICS proforma**: Refer to [ITU-T X.290].

3.3   **point of control and observation**: Refer to [ITU-T X.290].

3.4   **protocol implementation conformance statement (PICS)**: Refer to [ITU-T X.290].

3.5   system under test (SUT): Refer to [ITU-T X.290].

3.6   test purpose (TP): Refer to [ITU-T X.290].

NOTE – This may contain additional information.

4   Abbreviations and acronyms

This Recommendation uses the following abbreviations and acronyms:

CONF   Conference calling

IUT   Implementation Under Test

SUT   System Under Test

UE   User Equipment

5   Test suite structure (TSS)

Table 1 – Test suite structure

ConferenceFocus		
	CreateConf	CONF_N01_xxx
	JoinConf	CONF_N02_xxx
	InviteToConf	CONF_N03_xxx
	LeaveConf	CONF_N04_xxx
	RemoveFromConf	CONF_N05_xxx
	TerminateConf	CONF_N06_xxx
Interaction		
	TIR	CONF_N08_xxx
	OIR	CONF_N09_xxx
	ACR-CB	CONF_N10_xxx

5.1   Configuration

The scope of this Recommendation is to test the signalling and procedural aspects of the stage 3 requirements as described in [ITU-T Q.3621 v.1]. The stage 3 description respects the requirements to several networks. Therefore several interfaces (reference points) are addressed to satisfy the test of the different entities.

5.1.1   Testing of the AS

The AS entity is responsible for performing and managing services. The IP multimedia subsystem service control (ISC) interface is the appropriate access point for testing (see Figure 5.1.1-1).
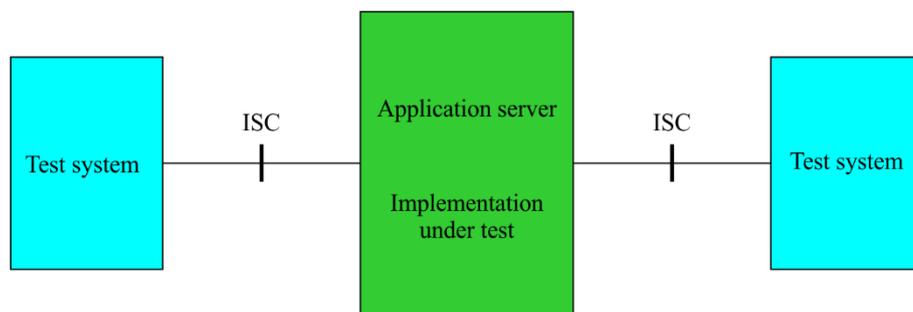
Q.4005.2v1(16)_F5.1.1-1

Figure 5.1.1-1 – Applicable interface to test AS functionalities

If the ISC interface is not accessible it is also possible to perform the test of the AS using any NNI (Mw, Mg, Mx) interface (see Figure 5.1.1-2). In case only the Gm interface is accessible this interface can be used instead for testing, but the verification of all requirements may not be possible.
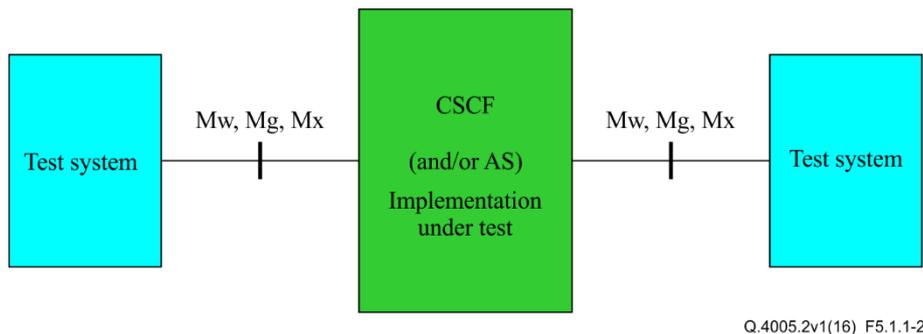
Q.4005.2v1(16)_F5.1.1-2

Figure 5.1.1-2 – Applicable interfaces for tests using a (generic) NNI interface

6 Test purposes (TP)

6.1 Introduction

The reference column makes reference to [ITU-T Q.3621 v.1], except where explicitly stated otherwise.

6.1.1 TP naming convention

Test purposes (TPs) are numbered, starting at 001, within each group. Groups are organized according to the test suite structure (TSS). Additional references are added to identify the actual test suite and whether it applies to the network or the user (see Table 2).

Table 2 – TP identifier naming convention scheme

Identifier: **<ss>_<iut><group>_<nnn>**		
<ss> = supplementary service:	e.g. "CONF"	
<iut> = type of IUT:	U N yyy	User Network service
<group> = group	2 digit field representing group reference according to TSS	
<nnn> = sequential number	(001-999)	

6.1.2 Test strategy

As the base standard [ITU-T Q.3621 v.1] contains no explicit requirements for testing, the TPs were generated as a result of an analysis of the base standard and the protocol implementation conformance statement (PICS) specification [ITU-T Q.4005.1 v.1].

6.2 Signalling requirements

6.2.1 Conference focus

6.2.1.1 Conference creation

TSS	TP	Reference	Selection expression
ConferenceFocus/CreateConf	CONF_N01_001	5.3.2.3.1, 5.3.3 of [ETSI TS 124 147]	PICS 5.1/2

Test purpose

*Conference creation with a **conference factory URI**. Conference event package subscribed.*

Ensure that a conference can be created by a UE using the conference factory URI. The "isfocus" feature parameter indicated in Contact header is received in the 200 OK (INVITE). In addition the conference participant subscribes to the conference event package and receives a NOTIFY request describing the conference status.

SIP header values:	
INVITE:	Request URI indicating the conference factory URI
200 OK:	conference URI and "isfocus" feature parameter included in Contact header field
SUBSCRIBE:	Request URI indicating the conference URI
	Event header contains "conference"
NOTIFY:	Event contains **conference**; Subscription-State contains **active; expires=xxxx**

Comments:

ISC#1   **Focus**

INVITE   →

200 OK (INVITE)   ←

ACK   →

SUBSCRIBE   →

200 OK (SUBSCRIBE) ←

NOTIFY   ←

200 OK NOTIFY   →

Apply post test routine

TSS	TP	Reference	Selection expression
ConferenceFocus/CreateConf	CONF_N01_002	5.3.2.3.1of [ETSI TS 124 147]	PICS 5.1/2

Test purpose

*Conference creation with a **conference factory URI**. Conference event package not subscribed.*

Ensure that a conference can be created by a UE using the conference factory URI. The "isfocus" feature parameter indicated in Contact header is received in the 200 OK (INVITE). The conference participant does not subscribe to the conference event package.

SIP header values:	
INVITE:	Request URI indicating the conference factory URI
200 OK:	conference URI and "isfocus" feature parameter included in Contact header field

Comments:

ISC#1   **Focus**

INVITE   →

200 OK (INVITE)   ←

ACK   →

Apply post test routine

TSS		TP	Reference	Selection expression
ConferenceFocus/CreateConf		CONF_N01_003	5.3.2.3.2, 5.3.3 of [ETSI TS 124 147]	PICS 5.1/2

Test purpose

*Conference creation with a **conference URI**. Conference event package subscribed.*

Ensure that a conference can be created by a UE using the conference URI. The "isfocus" feature parameter indicated in Contact header is received in the 200 OK (INVITE). In addition the conference participant subscribes to the conference event package and receives a NOTIFY request describing the conference status.

SIP header values:

INVITE: Request URI indicating the conference URI
200 OK: "isfocus" feature parameter included in Contact header field
             conference URI contained in the Contact header field
SUBSCRIBE: Request URI indicating the conference URI
             Event header contains "conference"
NOTIFY: Event contains **conference**; Subscription-State contains **active; expires=xxxx**

Comments:

ISC#1   **Focus**
INVITE   ➔

200 OK (INVITE)   ⬅
ACK   ➔

SUBSCRIBE   ➔
200 OK (SUBSCRIBE)   ⬅
NOTIFY   ⬅
200 OK NOTIFY   ➔
                              Apply post test routine

TSS		TP	Reference	Selection expression
ConferenceFocus/**CreateConf**		CONF_N01_004	5.3.2.3.2of [ETSI TS 124 147]	PICS 5.1/2

Test purpose

*Conference creation with a **conference URI**. Conference event package not subscribed.*

Ensure that a conference can be created by a UE using the conference URI. The "isfocus" feature parameter indicated in Contact header is received in the 200 OK (INVITE). The conference participant does not subscribe to the conference event package.

SIP header values:

INVITE: Request URI indicating the conference URI
200 OK: "isfocus" feature parameter indicated in Contact header field
             conference URI contained in the Contact header field

Comments:

ISC#1   **Focus**
INVITE   ➔

200 OK (INVITE)   ⬅
ACK   ➔
                              Apply post test routine

TSS	TP	Reference	Selection expression
ConferenceFocus/CreateConf	CONF_N01_005	5.3.2.3.1 of [ETSI TS 124 147]	PICS 5.1/2 AND PICS 5.3/4

Test purpose

Conference creation with a conference factory URI. Preconditions indicated a conference URI is sent in the first provisional response.

Ensure that a conference can be created by a UE using the conference factory URI. Preconditions are requested by the originating UE. The "isfocus" feature parameter indicated in Contact header is received in the 200 OK (INVITE).

SIP header values:
INVITE: Request URI indicating the conference factory URI
      SDP a=curr:qos local none
                a=curr:qos remote none
                a=des:qos mandatory local sendrecv
                a=des:qos none remote sendrecv

183   conference URI contained in the Contact header field
      SDP a=curr:qos local none
                a=curr:qos remote none
                a=des:qos mandatory local sendrecv
                a=des:qos mandatory remote sendrecv
                a=conf:qos remote sendrecv

UPDATE:
      SDP   a=curr:qos local sendrecv
                a=curr:qos remote none
                a=des:qos mandatory local sendrecv
                a=des:qos mandatory remote sendrecv

200 OK UPDATE
      SDP   a=curr:qos local sendrecv
                a=curr:qos remote sendrecv
                a=des:qos mandatory local sendrecv
                a=des:qos mandatory remote sendrecv

200 OK: "isfocus" feature parameter included in Contact header field
                  conference URI contained in the Contact header field

Comments:
ISC#1   **Focus**
INVITE   ➔
183 Session Progress   ⬅
PRACK   ➔
200 OK PRACK   ⬅
UPDATE   ➔
200 OK UPDATE   ⬅
200 OK (INVITE)   ⬅
ACK   ➔
                  Apply post test routine

TSS	TP	Reference	Selection expression
ConferenceFocus/CreateConf	CONF_N01_006	5.3.2.3.1of [ETSI TS 124 147]	PICS 5.1/2

Test purpose

Conference creation with a conference factory URI not allocated in the focus, unsuccessful.

Ensure that a conference cannot be created by a UE using a conference factory URI not allocated in the focus. The request is rejected by the focus with a **488 Not Acceptable Here** final response.

SIP header values:
INVITE: Request URI indicating a conference factory URI not allocated in the focus

Comments:
ISC#1   **Focus**
INVITE   ➔
488 Not Acceptable Here   ⬅
ACK   ➔

6.2.1.2   Joining a conference

TSS ConferenceFocus/JoinConf	TP CONF_N02_001	Reference 5.3.2.4.1 of [ETSI TS 124 147]	Selection expression PICS 5.1/2
Test purpose *Participant **dial-in** the conference, the conference URI is used.* UE1 (via ISC#1) established a conference. UE2 (via ISC#2) joins in that conference by sending an INVITE request to the conferencing AS (the conference URI is known at the UE2). The request is successful.			
SIP header values: INVITE 2: Request URI indicating the conference URI 18x "isfocus" feature parameter included in Contact header field 200 OK: "isfocus" feature parameter included in Contact header field conference URI contained in the Contact header field			

Comments:
ISC#1   **Focus**   **ISC#2**
                                              Conference creation
INVITE   ➔   INVITE
200 OK (INVITE)   ⬅   200 OK (INVITE)
ACK   ➔   ACK
 	
                                         UE#2 joining in the conference
                                                         INVITE   ⬅   INVITE 2
                                                            18x   ➔   18x
                                               200 OK INVITE   ➔   200 OK INVITE
                                                           ACK   ⬅   ACK
                                              Apply post test routine			

TSS ConferenceFocus/JoinConf	TP CONF_N02_002	Reference 5.3.2.4.1 of [ETSI TS 124 147]	Selection expression PICS 5.1/2
Test purpose *Participant **dial-in** the conference, the conference URI is not allocated, the request is rejected.* UE2 (via ISC#2) tries to join in a conference but the conference URI in the INVITE request is not allocated at the focus. The request is rejected with the final response 4xx.			
SIP header values: INVITE: Request URI contained the conference URI not allocated in the focus (PIXIT)			

Comments:
ISC#1   **Focus**   **ISC#2**
                              UE#2 joining in the conference
                                                    INVITE   ⬅   INVITE 2
                                                        4xx   ➔   4xx
                                                      ACK ⬅ ACK			

6.2.1.3   Inviting other users to a conference

TSS	TP	Reference	Selection expression
ConferenceFocus/InviteToConf	CONF_N03_001	5.3.2.5.2, 5.3.2.5.4 of [ETSI TS 124 147]	PICS 5.1/2 AND NOT PICS 5.3/3

Test purpose
Inviting participant by sending REFER to the focus.

UE1 (via ISC#1) established a conference and invites UE2 (connected via ISC#2) to join into the conference. UE1 sends a REFER to the focus; the focus sends an INVITE request to UE2 to invite it to the conference.

SIP header values:
REFER: Request URI indicating the **conference URI**
                  Refer-To contains the URI of **UE2**, method=INVITE
                  Referred-By contains SIP URI of **UE1**
INVITE 2:   Request URI indicating the address of UE2
                  The P-Asserted-Identity contains the conference URI.
                  conference URI and "isfocus" feature parameter indicated in Contact header field
                  Referred-By contains SIP or tel URI of **UE1**
NOTIFY 1   Event contains **refer**; Subscription-State contains **active**
                  message/sipfrag contains **SIP/2.0 100 Trying**
NOTIFY 2   Event contains **refer**; Subscription-State contains **terminated**
                  message/sipfrag contains **SIP/2.0 200 OK**

Comments:

ISC#1		Focus		ISC#2
		Conference creation		
INVITE	→	INVITE		
200 OK (INVITE)	←	200 OK (INVITE)		
ACK	→	ACK		
		UE#1 invites UE#2 to the conference		
REFER	→	REFER		
202 Accepted	←	202 Accepted		
		Focus dials out to invite UE#2		
		INVITE 2	→	INVITE
NOTIFY	←	NOTIFY 1		
200 OK NOTIFY	→	200 OK NOTIFY		
		180 Ringing	←	180 Ringing
		200 OK INVITE	←	200 OK INVITE
		ACK	→	ACK
NOTIFY	←	NOTIFY 2		
200 OK NOTIFY	→	200 OK NOTIFY		
		Apply post test routine		

TSS ConferenceFocus/InviteToConf	TP CONF_N03_002	Reference 5.3.2.5.3, 5.3.2.5.4 of [ETSI TS 124 147]	Selection expression PICS 5.1/2 AND PICS 5.3/3

Test purpose

Inviting participant by sending a participant list to the focus.

UE1 (via ISC#1) established a conference. A participant list is contained in the INVITE to create the conference. The AS establishes a communication to the UE2 (via ISC#2) indicated in the participant list.

SIP header values:

```
INVITE 1:    Request URI=Focus
                      <resource-lists
                          <entry uri="sip:UE#2 cp:copycontrol="to" />

INVITE 2:    Request URI = UE#2
                      The P-Asserted-Identity contains the conference URI.
                      conference URI and "isfocus" feature parameter indicated in Contact header field
```

Comments:

ISC#1		Focus	ISC#2
		Conference creation	
INVITE 1	➔	INVITE	
200 OK (INVITE)	⬅	200 OK (INVITE)	
ACK	➔	ACK	
		Focus dials out to invite UE#2	
		INVITE 2 ➔	INVITE
		200 OK INVITE ⬅	200 OK INVITE
		ACK ➔	ACK
		Apply post test routine	

TSS	TP	Reference	Selection expression
ConferenceFocus/InviteToConf	CONF_N03_004	5.3.1.3.3, 5.3.1.5.2 of [ETSI TS 124 147]	PICS 5.1/2 AND NOT PICS 5.3/3

Test purpose
Three-way session creation. REFER is sent to the participants.

Ensure that it is possible that two active sessions S1 and S2 towards UE2 (via ISC#2) and UE3 (via ISC#3) are joined in a three way session by UE1 and that the existing sessions S1 and S2 can be released by the served user UE1. The remote users receive a REFER request with the Refer-To header containing the address of the Focus directly from UE1. The remote users use the URI of the Refer-To header as the Request URI of the INVITE request.

SIP header values:
REFER (S1): Request line=UE#2
                 Refer-To=Focus; method=INVITE
                 Referred-By=UE#1
REFER (S2): Request line=UE#3
                 Refer-To=Focus; method=INVITE
                 Referred-By=UE#1
INVITE (S4): Request URI=Focus
                 Referred-By=UE#1
INVITE (S5): Request URI=Focus
                 Referred-By=UE#1

Comments:

ISC#1		Focus	ISC#2		ISC#3
		Establish session #1			
		Session #1 on hold			
		Establish session #2			
		Session #2 on hold			
		Conference creation (session #3)			
INVITE (S3)	→	INVITE			
200 OK (INVITE)	←	200 OK (INVITE)			
ACK	→	ACK			
REFER (S1)	→		→	REFER	
202 Accepted	←		←	202 Accepted	
NOTIFY (100)	←		←	NOTIFY (100)	
200 OK (NOTIFY)	→		→	200 OK (NOTIFY)	
		INVITE ←	INVITE (S4)		
		200 OK (INVITE) →	200 OK (INVITE)		
		ACK ←	ACK		
NOTIFY (200)	←		←	NOTIFY (200)	
200 OK (NOTIFY)	→		→	200 OK (NOTIFY)	
BYE (S1)	→		→	BYE (S1)	
200 OK (BYE)	←		←	200 OK (BYE)	
REFER (S2)	→			→	REFER
202 Accepted	←			←	202 Accepted
NOTIFY (100)	←			←	NOTIFY (100)
200 OK (NOTIFY)	→			→	200 OK (NOTIFY)
		INVITE ←		←	INVITE (S5)
		200 OK (INVITE) →		→	200 OK (INVITE)
		ACK ←		←	ACK
NOTIFY (200)	←			←	NOTIFY (200)
200 OK (NOTIFY)	→			→	200 OK (NOTIFY)
BYE (S1)	→			→	BYE (S2)
200 OK (BYE)	←			←	200 OK (BYE)
		Apply post test routine			

TSS	TP	Reference	Selection expression
ConferenceFocus/InviteToConf	CONF_N03_005	5.3.1.3.3, 5.3.1.5.3, 5.3.2.5.2 of [ETSI TS 124 147]	PICS 5.1/2

Test purpose

Three-way session creation. REFER is sent to the Focus.

Ensure that it is possible that two active sessions S1 and S2 towards UE2 (via ISC#2) and UE3 (via ISC#3) are joined in a three way session by UE1 and that the existing sessions S1 and S2 can be released by the served user UE1. UE1 sends two REFER requests to the conference focus which then sends INVITE requests to UE2 and UE3 containing the Referred-By header indicating UE1.

SIP header values:

REFER (S1): Request line=Focus
                  Refer-To=UE#2; method=INVITE
                  Referred-By=UE#1
REFER (S1): Request line=Focus
                  Refer-To=UE#3; method=INVITE
                  Referred-By=UE#1
INVITE (S4): Request URI=UE#2
                  Referred-By=UE#1
INVITE (S5): Request URI=UE#3
                  Referred-By=UE#1

Comments:

ISC#1		Focus	ISC#2	ISC#3
		Establish session #1		
		Session #1 on hold		
		Establish session #2		
		Session #2 on hold		
		Conference creation (session #3)		
INVITE (S3)	→	INVITE		
200 OK (INVITE)	←	200 OK (INVITE)		
ACK	→	ACK		
REFER (S1)	→	REFER		
202 Accepted	←	202 Accepted		
NOTIFY (100)	←	NOTIFY (100)		
200 OK (NOTIFY)	→	200 OK (NOTIFY)		
		INVITE (S4) →	INVITE	
		200 OK (INVITE) ←	200 OK (INVITE)	
		ACK →	ACK	
NOTIFY (200)	←	NOTIFY (200)		
200 OK (NOTIFY)	→	200 OK (NOTIFY)		
BYE (S1)	→	→	BYE (S1)	
200 OK (BYE)	←	←	200 OK (BYE)	
REFER (S2)	→	REFER		
202 Accepted	←	202 Accepted		
NOTIFY (100)	←	NOTIFY (100)		
200 OK (NOTIFY)	→	200 OK (NOTIFY)		
		INVITE (S5) →	→	INVITE
		200 OK (INVITE) ←	←	200 OK (INVITE)
		ACK →	→	ACK
NOTIFY (200)	←	NOTIFY (200)		
200 OK (NOTIFY)	→	200 OK (NOTIFY)		
BYE (S1)	→		→	BYE (S2)
200 OK (BYE)	←		←	200 OK (BYE)
		Apply post test routine		

TSS	TP	Reference	Selection expression
ConferenceFocus/InviteToConf	CONF_N03_006	5.3.1.3.3, 5.3.1.5.3, 5.3.2.5.2 of [ETSI TS 124 147]	PICS 5.1/2

Test purpose

Three-way session creation. REFER is sent to the Focus. Replaces header included in the REFER.

Ensure that it is possible that two active sessions S1 and S2 towards UE2 (via ISC#2) and UE3 (via ISC#3) are joined in a three way session by UE1 and that the existing sessions S1 and S2 can be released by the remote users UE2 and UE3. UE1 sends two REFER requests including Replaces headers to the conference focus which then sends INVITE requests to UE2 and UE3 containing the Referred-By header indicating UE1 and containing the Replaces header indicating the original dialog sessions.

SIP header values:

REFER (S1): Request line=Focus
                Refer-To=UE#2; method=INVITE?Replaces=S1;to-tag=S1;from-tag=S1
                Referred-By=UE#1
REFER (S1): Request line=Focus
                Refer-To=UE#3; method=INVITE?Replaces=S2;to-tag=S2;from-tag=S2
                Referred-By=UE#1
INVITE (S4): Request URI=UE#2
                Referred-By=UE#1
                Replaces=S1;to-tag=S1;from-tag=S1
INVITE (S5): Request URI=UE#3
                Referred-By=UE#1
                Replaces=S2;to-tag=S2;from-tag=S2

Comments:

ISC#1		Focus	ISC#2	ISC#3
		Establish session #1		
		Session #1 on hold		
		Establish session #2		
		Session #2 on hold		
		Conference creation (session #3)		
INVITE (S3)	→	INVITE		
200 OK (INVITE)	←	200 OK (INVITE)		
ACK	→	ACK		
REFER (S1)	→	REFER		
202 Accepted	←	202 Accepted		
NOTIFY (100)	←	NOTIFY (100)		
200 OK (NOTIFY)	→	200 OK (NOTIFY)		
		INVITE (S4) →	INVITE	
		200 OK (INVITE) ←	200 OK (INVITE)	
		ACK →	ACK	
NOTIFY (200)	←	NOTIFY (200)		
200 OK (NOTIFY)	→	200 OK (NOTIFY)		
BYE (S1)	←	←	BYE (S1)	
200 OK (BYE)	→	→	200 OK (BYE)	
REFER (S2)	→	REFER		
202 Accepted	←	202 Accepted		
NOTIFY (100)	←	NOTIFY (100)		
200 OK (NOTIFY)	→	200 OK (NOTIFY)		
		INVITE (S5) →	→	INVITE
		200 OK (INVITE) ←	←	200 OK (INVITE)
		ACK →	→	ACK
NOTIFY (200)	←	NOTIFY (200)		
200 OK (NOTIFY)	→	200 OK (NOTIFY)		
BYE (S1)	←		←	BYE (S2)
200 OK (BYE)	→		→	200 OK (BYE)
		Apply post test routine		

TSS	TP	Reference	Selection expression
ConferenceFocus/InviteToConf	CONF_N03_007	Clause 4.5.2.2.1 of [ITU-T Q.3621 v.1]]	PICS 5.1/2

Test purpose

Referred-By value does not contain a valid identity of the requesting user.

Ensure that the invalid identity in the Referred-By header received in the REFER request from UE1 is replaced with the valid value matching the REFER request's P-Asserted-Identity when sending the INVITE request to UE2.

SIP header values:

REFER 1:   Request line=Focus
                 Refer-To=UE#2; method=INVITE
                 Referred-By=any value not indicating UE#1(PIXIT)
                 P-Asserted-Identity=UE#1
INVITE 1:   Request URI=UE#2
                 Referred-By=UE#1

Comments:

ISC#1		Focus		ISC#2
		Conference creation		
INVITE	➔	INVITE		
200 OK (INVITE)	⬅	200 OK (INVITE)		
ACK	➔	ACK		
		UE#1 invites UE#2 to the conference		
REFER 1	➔	REFER		
202 Accepted	⬅	202 Accepted		
		Focus dials out to invite UE#2		
		INVITE 1 ➔		INVITE
NOTIFY	⬅	NOTIFY 1		
200 OK NOTIFY	➔	200 OK NOTIFY		
		200 OK INVITE	⬅	200 OK INVITE
		ACK	➔	ACK
NOTIFY	⬅	NOTIFY 2		
200 OK NOTIFY	➔	200 OK NOTIFY		
		Apply post test routine		

TSS	TP	Reference	Selection expression
ConferenceFocus/InviteToConf	CONF_N03_008	Clause 4.5.2.2.1 of [ITU-T Q.3621 v.1]	PICS 5.1/2

Test purpose
Referred-By header not present.

Ensure that the missing Referred-By header in the received REFER request from UE1 is inserted with the valid value matching the REFER request's P-Asserted-Identity when sending the INVITE request to UE2.

SIP header values:
REFER 1:   Request line=Focus
                       Refer-To=UE#2; method=INVITE
                       P-Asserted-Identity=UE#1
INVITE 1:   Request URI=UE#2
                       Referred-By=UE#1

Comments:

ISC#1		Focus	ISC#2
		Conference creation	
INVITE 1	→	INVITE	
200 OK (INVITE)	←	200 OK (INVITE)	
ACK	→	ACK	
		UE#1 invites UE#2 to the conference	
REFER 1	→	REFER	
202 Accepted	←	202 Accepted	
		Focus dials out to invite UE#2	
		INVITE 1 →	INVITE
NOTIFY	←	NOTIFY 1	
200 OK NOTIFY	→	200 OK NOTIFY	
		180 Ringing ←	180 Ringing
		200 OK INVITE ←	200 OK INVITE
		ACK →	ACK
NOTIFY	←	NOTIFY 2	
200 OK NOTIFY	→	200 OK NOTIFY	
		Apply post test routine	

6.2.1.4   Leaving a conference

TSS	TP	Reference	Selection expression
ConferenceFocus/LeaveConf	CONF_N04_001	5.3.2.6.1 of [ETSI TS 124 147]	PICS 5.1/2

Test purpose
A participant leaves the conference.

UE#2 wishes to leave the conference by sending a BYE request to the focus in accordance to the basic call procedures.

Comments:

ISC#1		Focus	ISC#2
		Conference creation	
INVITE	→	INVITE	
200 OK (INVITE)	←	200 OK (INVITE)	
ACK	→	ACK	
REFER	→		
202 Accepted	←		
		Focus dials out to invite UE#2	
		INVITE →	INVITE 2
		180 Ringing ←	180 Ringing
		200 OK INVITE ←	200 OK INVITE
		ACK →	ACK
		Conference communication	
		UE#2 leaves the conference	
		←	BYE
		→	200 OK BYE
		Apply post test routine	

6.2.1.5   Removing a conference participant from a conference

TSS	TP	Reference	Selection expression
ConferenceFocus/RemoveFromConf	CONF_N05_001	5.3.2.6.2.2, 5.3.2.6.2.3 of [ETSI TS 124 147]	PICS 5.1/2

Test purpose
The conference owner asks the focus to remove a participant from the conference.
UE1 (via ISC#1) sends a REFER request to removes UE2 from the conference. The focus sends a BYE request to UE2 (via ISC#2).

SIP header values:
REFER 1:   Request URI contained the URI of **conference URI**
Refer-To contains the **UE#2 URI**, method=BYE
Referred-By contains the URI of **UE#1 URI**
NOTIFY 2   Event contains **conference**;
Subscription-State
contains **active**
message/sipfrag contains **SIP/2.0 200 OK**

Comments:

```
ISC#1                               Focus            ISC#2
                          Conference creation
INVITE                    ➔    INVITE
200 OK (INVITE)           ⬅    200 OK (INVITE)
ACK                       ➔    ACK
REFER 1                   ➔
202 Accepted             ⬅
                     UE#2 joining in the conference
NOTIFY                    ⬅    NOTIFY 1
200 OK NOTIFY             ➔    200 OK NOTIFY
                                     INVITE    ➔    INVITE 2
                                 200 OK INVITE  ⬅    200 OK INVITE
                                        ACK    ➔    ACK
NOTIFY                    ⬅    NOTIFY 2
200 OK NOTIFY             ➔    200 OK NOTIFY
                        Conference communication
              UE#1 wishes to remove UE#2 from the conference
REFER 2                   ➔    REFER
202 Accepted             ⬅    202 Accepted
                         Focus removes UE#2 from the conference
                                            ➔    BYE
                                            ⬅    200 OK BYE
NOTIFY                    ⬅    NOTIFY 3
200 NOTIFY               ➔    200 NOTIFY
                        Apply post test routine
```

TSS	TP	Reference	Selection expression
ConferenceFocus/RemoveFromConf	CONF_N05_002	5.3.2.6.2.2 of [ETSI TS 124 147]	PICS 5.1/2

Test purpose

The conference owner asks the focus to remove a user that is not participant from the conference.

UE1 (via ISC#1) sends a REFER request to removes a user that is not participant in the conference from the conference. The focus rejects the request.

SIP header values:

REFER 2:   Request URI contained the URI of **conference URI**

            Refer-To contains the **URI** of a user that is not conference participant, method=BYE

            Referred-By contains the URI of **UE#1 URI**

Comments:

ISC#1		Focus	ISC#2
		Conference creation	
INVITE	➔	INVITE	
200 OK (INVITE)	←	200 OK (INVITE)	
ACK	➔	ACK	
REFER 1	➔		
202 Accepted	←		
		UE#2 joining in the conference	
		INVITE ➔	INVITE 2
		200 OK INVITE ←	200 OK INVITE
		ACK ➔	ACK
		Conference communication	
		UE#1 wishes to remove non-participant from the conference	
REFER 2	➔	REFER	
4xx	←	4xx	
		Apply post test routine	

6.2.1.6 Conference termination

TSS	TP	Reference	Selection expression
ConferenceFocus/TerminateConf	CONF_N06_001	5.3.2.7 of [ETSI TS 124 147]	PICS 5.1/2

Test purpose

The conference owner releases the entire conference by sending a BYE to the focus.

UE1 (via ISCP#1), the conference owner, sends a BYE request to the focus. The entire conference is released.

SIP header values:

BYE 1:

        Request URI = conference URI

Comments:

ISC#1		Focus	ISC#2
		Conference creation	
INVITE	➔	INVITE	
200 OK (INVITE)	←	200 OK (INVITE)	
ACK	➔	ACK	
REFER	➔		
202 Accepted	←		
		Focus dials out to invite UE#2	
		INVITE ➔	INVITE 2
		180 Ringing ←	180 Ringing
		200 OK INVITE ←	200 OK INVITE
		ACK ➔	ACK
		Conference communication	
		UE#1 wishes to finish the entire conference	
BYE 1	➔	BYE	
200 OK BYE	←	200 OK BYE	
		Focus removes UE#2 from the conference	
		➔	BYE
		←	200 OK BYE
		Apply post test routine	

TSS	TP	Reference	Selection expression
ConferenceFocus/TerminateConf	CONF_N06_002	5.3.2.7 of [ETSI TS 124 147]	PICS 5.1/2 AND PICS 5.3/5

Test purpose

Conference termination when the conference creator has left the conference.

Ensure that the conference is terminated when the conference creator which has created the conference using the conference factory has left the conference.

SIP header values:

INVITE S1:   Request URI indicating the conference factory URI

200 OK S1:   conference URI and "isfocus" feature parameter included in Contact header field

Comments:

ISC#1		Focus	ISC#2
		Conference creation	
INVITE (S1)	➔	INVITE	
200 OK (INVITE) (S1)	⬅	200 OK (INVITE)	
ACK	➔	ACK	
REFER	➔		
202 Accepted	⬅		
		Focus dials out to invite UE#2	
		INVITE (S2) ➔	INVITE 2
		200 OK INVITE ⬅	200 OK INVITE
		ACK ➔	ACK
		Conference communication	
		Conference creator leaves the conference	
BYE (S1)	➔	BYE (S1)	
200 OK BYE	⬅	200 OK BYE	
		BYE (S2) ➔	BYE
		200 OK BYE ⬅	200 OK BYE

6.3 Interaction with other supplementary services

6.3.1 Terminating identification restriction (TIR)

TSS	TP	Reference	Selection expression
Interaction/TIR	CONF_N08_001	Clause 4.6.3 of [ITU-T Q.3621 v.1]	PICS 5.1/2 AND PICS 5.3/3 AND PICS 5.3/6

Test purpose
Remote user requests TIR, no identity information in the conference notification info send in the NOTIFY request to the conference creator.

Ensure the no identity is sent to the conference creator if a Privacy header was received and the privacy value was set to "id" in the 200 OK to the INVITE from the conference focus to invite the participant to the conference.

SIP header values:
200 OK INVITE 2: Privacy: id
NOTIFY 2:   Event contains **conference**; Subscription-State contains **active**
                application/conference-info+xml:
                    <conference-info>
                          entity=conference URI, state="full", version="x"
                        <conference-state>
                              <user-count>2</user-count> if present
                              <active>true</active> if present
                    <users>
                        <user entity=ISC#1 URI state="full"
                            <endpoint entity=endpoint ISC#1 URI
                                <status>connected</status>
                                <joining-method>dialed-in</ joining-method>
                                <media id="1"
                                    <status>sendrecv</status>
                          [No identity information of UE#2 or Element is not present]

Comments:

ISC#1		Focus	ISC#2
		Conference creation	
INVITE	➔	INVITE	
200 OK (INVITE)	⬅	200 OK (INVITE)	
ACK	➔	ACK	
SUBSCRIBE	➔	SUBSCRIBE	
200 OK (SUBSCRIBE)	⬅	200 OK (SUBSCRIBE)	
		UE1#1 invites UE#2 via the conference focus	
REFER	➔		
200 OK (REFER)	⬅		
		Focus invites UE#2 to the conference	
NOTIFY	⬅	NOTIFY 1	
200 OK NOTIFY	➔	200 OK NOTIFY	
		INVITE ➔	INVITE 2
		200 OK INVITE ⬅	200 OK INVITE 2
		ACK ➔	ACK
NOTIFY	⬅	NOTIFY 2	
200 OK NOTIFY	➔	200 OK NOTIFY	
		Apply post test routine	

6.3.2 Originating Identification Restriction (OIR)

TSS	TP	Reference	Selection expression
Interaction/OIR	CONF_N09_001	Clause 4.6.5 of [ITU-T Q.3621 v.1]	PICS 5.1/2 PICS 5.3/1 AND PICS 5.3/5

Test purpose

Conference creator subscribes to OIR in permanent mode. There is no identity information of the creator included in the conference notification sent to the conference participants.

Ensure that the conference notification sent in the NOTIFY request to the participant after it has joined the conference if the conference creator has subscribed to the OIR service.

SIP header values:
SUBSCRIBE: Request URI contained the conference URI, Event contains "conference"
                Event header contains "conference"
NOTIFY 3:   Event contains **conference**; Subscription-State contains **active; expires=xxxx**
                application/conference-info+xml:
                    <conference-info>
                        entity=conference URI state="full" version="x"
                        <conference-state>
                            <user-count>2</user-count> if present
                            <active>true</active> if present
                    <users>
                        [No identity information of UE#1 or Element is not present]
                        <user entity=ISC#2 URI state="full"
                            <endpoint entity=endpoint ISC#2 URI
                                <status>connected</status>
                                <joining-method>dialed-in</ joining-method>
                                <media id="1"
                                    <status>sendrecv</status>

Comments:

ISC#1		Focus	ISC#2
		Conference creation	
INVITE	→	INVITE	
200 OK (INVITE)	←	200 OK (INVITE)	
ACK	→	ACK	
		UE1#1 invites UE#2 via the conference focus	
REFER	→		
200 OK (REFER)	←		
		Focus invites UE#2 to the conference	
NOTIFY	←	NOTIFY 1	
200 OK NOTIFY	→	200 OK NOTIFY	
		INVITE →	INVITE 2
		200 OK INVITE ←	200 OK INVITE
		ACK →	ACK
NOTIFY	←	NOTIFY 2	
200 OK NOTIFY	→	200 OK NOTIFY	
			← SUBSCRIBE
			→ 200 OK (SUBSCRIBE)
		NOTIFY 3 →	NOTIFY
		200 OK NOTIFY ←	200 OK NOTIFY
		Apply post test routine	

TSS	TP	Reference	Selection expression
Interaction/OIR	CONF_N09_002	Clause 4.6.5 of [ITU-T Q.3621 v.1]	PICS 5.1/2 AND PICS 5.3/5

Test purpose

Conference creator subscribes to OIR in temporary mode. Referred-By is not sent in the INVITE request if a Privacy header set to value "user" was received in the REFER.

Ensure that the Referred-By header received in the REFER request to the conference focus is not sent in the INVITE request to the participant to be invited to the conference if the REFER request contained Referred-By header and a Privacy header set to "user".

SIP header values:

REFER 1:   Referred-By=UE#1
                      Privacy: user
INVITE 1:   Request   URI=UE#2
                      no Referred-By included

Comments:

ISC#1		Focus		ISC#2
		Conference creation		
INVITE	➔	INVITE		
200 OK (INVITE)	⬅	200 OK (INVITE)		
ACK	➔	ACK		
		UE1#1 invites UE#2 via the conference focus		
REFER 1	➔	REFER		
202 Accepted	⬅	202 Accepted		
		Focus dials out to invite UE#2		
			INVITE 1 ➔	INVITE
NOTIFY	⬅	NOTIFY 1		
200 OK NOTIFY	➔	200 OK NOTIFY		
			200 OK INVITE ⬅	200 OK INVITE
			ACK ➔	ACK
NOTIFY	⬅	NOTIFY 2		
200 OK NOTIFY	➔	200 OK NOTIFY		
		Apply post test routine		

TSS	TP	Reference	Selection expression
Interaction/OIR	CONF_N09_003	Clause 4.6.5 of [ITU-T Q.3621 v.1]	PICS 5.1/2 AND PICS 5.3/5

Test purpose

Conference creator subscribes to OIR in temporary mode. Referred-By is not inserted into the INVITE request if Privacy value "user" was received in the REFER.

Ensure that if the Referred-By header is not received in the REFER request to the conference focus, it is not inserted into the INVITE request sent to the participant to be invited to the conference if the REFER request contained a Privacy header set to "user".

SIP header values:

REFER 1:   no Referred-By present
                 Privacy: user
INVITE 1:   Request   URI=UE#2
               no Referred-By inserted

Comments:

ISC#1		Focus		ISC#2
		Conference creation		
INVITE	➔	INVITE		
200 OK (INVITE)	←	200 OK (INVITE)		
ACK	➔	ACK		
		UE1#1 invites UE#2 via the conference focus		
REFER 1	➔	REFER		
202 Accepted	←	202 Accepted		
		Focus dials out to invite UE#2		
		INVITE 1 ➔		INVITE
NOTIFY	←	NOTIFY 1		
200 OK NOTIFY	➔	200 OK NOTIFY		
		200 OK INVITE ←		200 OK INVITE
		ACK ➔		ACK
NOTIFY	←	NOTIFY 2		
200 OK NOTIFY	➔	200 OK NOTIFY		
		Apply post test routine		

TSS	TP	Reference	Selection expression
Interaction/OIR	CONF_N09_004	Clause 4.6.5 of [ITU-T Q.3621 v.1]	PICS 5.1/2 AND PICS 5.3/5

Test purpose

Conference creator subscribes to OIR in temporary mode. Referred-By is not inserted into the INVITE request if Privacy value "header" was received in the REFER.

Ensure that if the Referred-By header is not received in the REFER request to the conference focus, it is not inserted into the INVITE request sent to the participant to be invited to the conference if the REFER request contained a Privacy header set to "header".

SIP header values:

REFER 1:   no Referred-By present

              Privacy: header

INVITE 1:   Request URI=UE#2

              no Referred-By inserted

Comments:

ISC#1		Focus	ISC#2
		Conference creation	
INVITE	➔	INVITE	
200 OK (INVITE)	←	200 OK (INVITE)	
ACK	➔	ACK	
		UE1#1 invites UE#2 via the conference focus	
REFER 1	➔	REFER	
202 Accepted	←	202 Accepted	
		Focus dials out to invite UE#2	
		INVITE 1 ➔ INVITE	
NOTIFY	←	NOTIFY 1	
200 OK NOTIFY	➔	200 OK NOTIFY	
		200 OK INVITE ← 200 OK INVITE	
		ACK ➔ ACK	
NOTIFY	←	NOTIFY 2	
200 OK NOTIFY	➔	200 OK NOTIFY	
		Apply post test routine	

6.3.3 Anonymous communication rejection and communication barring (ACR/CB)

TSS	TP	Reference	Selection expression
Interaction/ACR-CB	CONF_N10_001	4.6.9 of [ITU-T Q.3621 v.1]	PICS 5.1/2 AND PICS 5.3/7

Test purpose

Conference creator subscribes to ACR/CB and has Outgoing Call Barring activated for UE2. Conference invitation for UE2 via REFER is rejected.

Ensure that the conference AS rejects the REFER request targeted at a participant (UE2) that is barred by the conference creator's Outgoing Communication Barring rules.

SIP header values:

REFER: Request URI contained the **conference URI**

            Refer-To contains the URI of **UE#2**, method=invite

            Referred-By contains SIP URI of **UE#1**

Comments:

ISC#1		Focus	ISC#2
		Conference creation	
INVITE	➔	INVITE	
200 OK (INVITE)	←	200 OK (INVITE)	
ACK	➔	ACK	
		UE1#1 invites outgoing call barred UE#2 via the conference focus	
REFER	➔	REFER	
4xx	←	4xx	
		Apply post test routine	

TSS Interaction/ACR-CB	TP CONF_N10_002	Reference 4.6.9 of [ITU-T Q.3621 v.1]	Selection expression PICS 5.1/2 AND PICS 5.3/3 AND PICS 5.3/7

Test purpose

Conference creator subscribes to ACR/CB and has Outgoing Call Barring activated for UE2. Conference invitation for UE2 via the URI-list is rejected.

Ensure that the focus AS removes the URI of UE2 that is barred by the conference creator's Outgoing Communication Barring rules from the list of URIs in the "recipient-list" body of INVITE request. UE2 is not invited to the conference.

SIP header values:

INVITE (S1)   Request URI indicating Conference Factory
Content-Type: application/resource-lists+xml
Content-Disposition: recipient-list

```
<?xml version="1.0" encoding="UTF-8"?>
<resource-lists xmlns="urn:ietf:params:xml:ns:resource-lists" xmlns:cp="urn:ietf:params:xml:ns:copyControl">
    <list>
        <entry uri="UE#2" cp:copyControl="to"/>
        <entry uri="UE#3" cp:copyControl="to"/>
    </list>
</resource-lists>
```

Comments:

ISC#1		Focus	ISC#2		ISC#3
INVITE (S1)	➔	INVITE			
200 OK (INVITE)	⬅	200 OK (INVITE)			
ACK	➔	ACK			
			INVITE (S2)	➔	INVITE
			200 OK (INVITE)	⬅	200 OK (INVITE)
			ACK	➔	ACK

Apply post test routine

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