ETSI TS 101 588-2 V5.1.1 (2012-10)

Technical Specification

**IMS Network Testing (INT);
Completion of Communications to Busy Subscriber (CCBS)
and Completion of Communications by No Reply (CCNR) using
IP Multimedia (IM) Core Network (CN) subsystem;
Conformance Test Specification;
Part 2: Test Suite Structure and Test Purposes (TSS&TP)**

ETSI

650 Route des Lucioles
F-06921 Sophia Antipolis Cedex - FRANCE

Tel.: +33 4 92 94 42 00   Fax: +33 4 93 65 47 16

Siret N° 348 623 562 00017 - NAF 742 C
Association à but non lucratif enregistrée à la
Sous-Préfecture de Grasse (06) N° 7803/88

Important notice

Individual copies of the present document can be downloaded from:
http://www.etsi.org

The present document may be made available in more than one electronic version or in print. In any case of existing or
perceived difference in contents between such versions, the reference version is the Portable Document Format (PDF).
In case of dispute, the reference shall be the printing on ETSI printers of the PDF version kept on a specific network drive
within ETSI Secretariat.

Users of the present document should be aware that the document may be subject to revision or change of status.
Information on the current status of this and other ETSI documents is available at
http://portal.etsi.org/tb/status/status.asp

If you find errors in the present document, please send your comment to one of the following services:
http://portal.etsi.org/chaircor/ETSI_support.asp

Copyright Notification

ETSI

Contents

Intellectual Property Rights

IPRs essential or potentially essential to the present document may have been declared to ETSI. The information pertaining to these essential IPRs, if any, is publicly available for **ETSI members and non-members**, and can be found in ETSI SR 000 314: *"Intellectual Property Rights (IPRs); Essential, or potentially Essential, IPRs notified to ETSI in respect of ETSI standards"*, which is available from the ETSI Secretariat. Latest updates are available on the ETSI Web server (http://ipr.etsi.org).

Pursuant to the ETSI IPR Policy, no investigation, including IPR searches, has been carried out by ETSI. No guarantee can be given as to the existence of other IPRs not referenced in ETSI SR 000 314 (or the updates on the ETSI Web server) which are, or may be, or may become, essential to the present document.

Foreword

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

The present document is part 2 of a multi-part deliverable covering Completion of Communications to Busy Subscriber (CCBS) and Completion of Communications by No Reply (CCNR) using IP Multimedia (IM) Core Network (CN) subsystem; Conformance Test Specification, as identified below:

Part 1:   "Protocol Implementation Conformance Statement (PICS)";

Part 2:   "Test Suite Structure and Test Purposes (TSS&TP)".

1 Scope

The present document specifies the test suite structure and test purposes of the Completion of Communications to Busy Subscriber (CCBS) service and the Completion of Communication on no Reply (CCNR) service, based on stage three of the IMS simulation services. Within the Next Generation Network (NGN) the stage 3 description is specified using the IP-Multimedia Call Control Protocol based on Session Initiation Protocol (SIP) and Session Description Protocol (SDP).

2 References

References are either specific (identified by date of publication and/or edition number or version number) or non-specific. For specific references,only the cited version applies. For non-specific references, the latest version of the referenced document (including any amendments) applies.

Referenced documents which are not found to be publicly available in the expected location might be found at http://docbox.etsi.org/Reference.

NOTE: While any hyperlinks included in this clause were valid at the time of publication, ETSI cannot guarantee their long term validity.

2.1 Normative references

The following referenced documents are necessary for the application of the present document.

[1] ETSI TS 124 642: "Digital cellular telecommunications system (Phase 2+); Universal Mobile Telecommunications System (UMTS); LTE; Completion of Communications to Busy Subscriber (CCBS) and Completion of Communications by No Reply (CCNR) using IP Multimedia (IM) Core Network (CN) subsystem; Protocol specification (3GPP TS 24.642 Release 10)".

[2] ETSI TS 101 588-1: "Technical Committee for IMS Network Testing (INT); Completion of Communications to Busy Subscriber (CCBS) and Completion of Communications by No Reply (CCNR) using IP Multimedia (IM) Core Network (CN) subsystem 3GPP Release 10; Part 1: Protocol Implementation Conformance Statement (PICS)".

2.2 Informative references

The following referenced documents are not necessary for the application of the present document but they assist the user with regard to a particular subject area.

Not applicable.

3 Definitions, symbols and abbreviations

3.1 Definitions

For the purposes of the present document, the terms and definitions given in TS 124 642 [1] apply.

3.2   Symbols

For the purposes of the present document, the symbols given in TS 124 642 [1] apply.

3.3   Abbreviations

For the purposes of the present document, the abbreviations given in TS 124 642 [1] apply.

4   Test Suite Structure (TSS)

Table 4-1: Test Suite Structure

CC			
	originating_AS	Invocation	CC_N01_xxx
		Revocation	CC_N02_xxx
		Operation	CC_N03_xxx
	terminating_AS	possibleIndication	CC_N04_xxx
		Invocation	CC_N05_xxx
		Revocation	CC_N06_xxx
		CCOperation	CC_N07_xxx
	Interaction	TIR	CC_N08_xxx
		CDIV	CC_N09_xxx

4.1   Configuration

The scope of the present document is to test the signalling and procedural aspects of the stage 3 requirements as described in [1]. The stage 3 description respects the requirements to several network entities and also to requirements regarding to end devices. Therefore several interfaces (reference points) are addressed to satisfy the test of the different entities.

Therefore to test the appropriate entities the configurations below are applicable:

Testing of the Application Server: This entity is responsible to perform the service. Hence the ISC interface is the appropriate access point. Figure 4-1 points to this.
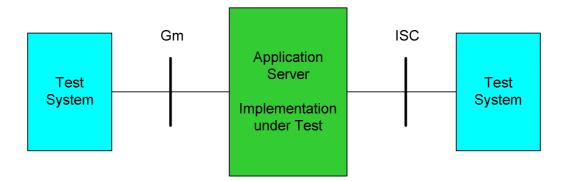

Figure 4-1: Applicable interface to test AS functionalities

If the ISC interface is not accessible it is also applicable to perform the test of the AS using any NNI (Mw, Mg, Mx) interface (consider figure 4-2). In case only the Gm interface is accessible this shall be used instead. In this case, be aware that the verification of several requirements is impeded.
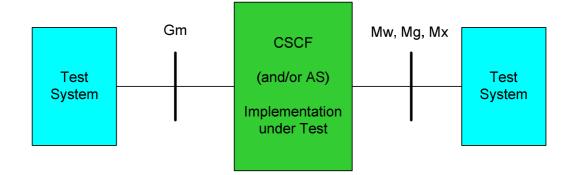
Figure 4-2: Applicable interfaces to test using the (generic) NNI interface

Testing of User Equipment: There are several requirements regarding to the end devices. Therefore a special configuration appears.
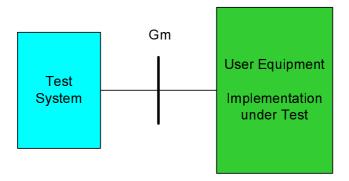

Figure 4-3: Applicable configuration to test the User Equipment

5 Test Purposes (TP)

5.1 Introduction

For each test requirement a TP is defined.

5.1.1 TP naming convention

TPs are numbered, starting at 001, within each group. Groups are organized according to the TSS. Additional references are added to identify the actual test suite and whether it applies to the network or the user (see table 5-1).

Table 5-1: TP identifier naming convention scheme

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

5.1.2   Test strategy

As the base standard TS 124 642 [1] contains no explicit requirements for testing, the TPs were generated as a result of an analysis of the base standard and the PICS specification TS 101 588-1 [2]. The criteria applied include the following:

- whether or not a test case can be built from the TP is not considered.

5.2   Actions at the originating AS

5.2.1   CC Invocation

TSS CC/originating_AS/Invocation	TP CC_N01_001	Reference 4.5.4.2.1.1.1, 4.5.4.2.1.1.3	Selection expression PICS 4.3.2-1/9
Test purpose *Detecting CCNL is possible.* Ensure that when an originating user establishes a session to a terminating user not logged in, a 183 (Session Progress) response is forwarded to the originating user if a 480 (Temporarily Unavailable) response has been received. The Application Server provides an announcement.			
Preconditions:			
SIP header values: 480 Temporarily Unavailable Call-Info: <sip:UE-B or T-AS>;purpose=call-completion;m=NL			
Comments:			

SIP 1 (Gm)		SUT		SIP 2 (ISC)
INVITE	→		→	INVITE
			←	480 (Temporarily Unavailable)
183 Session Progress	←		→	ACK
		Announcement that CC is possible		
		Apply post test routine		

TSS CC/originating_AS/Invocation	TP CC_N01_002	Reference 4.5.4.2.1.1.1, 4.5.4.2.1.1.3	Selection expression
Test purpose *Detecting CCBS is possible.* Ensure that when an originating user establishes a session to a terminating user is busy, a 183 (Session Progress) response is forwarded to the originating user if a 486 (Busy Here) response has been received. The Application Server provides an announcement.			
Preconditions:			
SIP header values: 486 Busy Here: Call-Info: <sip:UE-B or T-AS>;purpose=call-completion;m=BS			
Comments:			

SIP 1 (Gm)		SUT		SIP 2 (ISC)
INVITE	→		→	INVITE
			←	486 (Busy Here)
183 Session Progress	←		→	ACK
		Announcement that CC is possible		
		Apply post test routine		

TSS CC/originating_AS/Invocation	TP CC_N01_003	Reference 4.5.4.2.1.1.1, 4.5.4.2.1.1.3	Selection expression

Test purpose
Detecting CCNR is possible.

Ensure that when an originating user establishes a session to a terminating user is busy, a 183 (Session Progress) response is forwarded to the originating user if a 180 (Ringing) response has been received. The Application Server provides an announcement. The Call-Info header is removed from the 180 (Ringing) sent to the originating user.

Preconditions:

SIP header values:
180 Ringing 1
   Call-Info: <sip:UE-B or T-AS>;purpose=call-completion;m=NR

Comments:
SIP 1 (Gm)		SUT		SIP 2 (ISC)
INVITE	→		→	INVITE
			←	180 (Ringing) 1
180 (Ringing)	←	**Start CCNR-T5**		
		Timeout CCNR-T5		
	Announcement that CC is possible			
		Apply post test routine		

TSS CC/originating_AS/Invocation	TP CC_N01_004	Reference 4.5.4.2.1.1.3	Selection expression PICS 4.3.2-1/9

Test purpose
CCNL is possible hence not confirmed.

Ensure that when the originating user does not confirm the CCNL indication to invoke the service a 486 (Busy Here) is forwarded to the originating user when Retention timer CC-T1 is expired.

Preconditions:

SIP header values:
480 Temporarily Unavailable 1
   Call-Info: <sip:UE-B or T-AS>;purpose=call-completion;m=NL

Comments:
SIP 1 (Gm)		SUT		SIP 2 (ISC)
INVITE	→		→	INVITE
			←	480 (Temporarily Unavailable) 1
183 Session Progress	←	**Start CC-T1**	→	ACK
	Announcement that CC is possible			
480 (Temporarily Unavailable)	←	**Timeout CC-T1**		
ACK	→			
		Apply post test routine		

TSS	TP	Reference	Selection expression
CC/originating_AS/Invocation	CC_N01_005	4.5.4.2.1.1.3	

Test purpose
CCBS is possible hence not confirmed.

Ensure that when the originating user does not confirm the CCBS indication to invoke the service a 486 (Busy Here) is forwarded to the originating user when Retention timer CC-T1 is expired.

Preconditions:

SIP header values:
486 Busy Here:
   Call-Info: <sip:UE-B or T-AS>;purpose=call-completion;m=BS

Comments:

SIP 1 (Gm)		SUT		SIP 2 (ISC)
INVITE	→		→	INVITE
			←	486 (Busy Here)
183 Session Progress	←	**Start CC-T1**	→	ACK
Announcement that CC is possible				
486 (Busy Here)	←	**Timeout CC-T1**		
ACK	→			
		Apply post test routine		

TSS	TP	Reference	Selection expression
CC/originating_AS/Invocation	CC_N01_006	4.5.4.2.1.1.3	

Test purpose
CCNR is possible hence not confirmed.

Ensure that when the originating user does not confirm the CCBS indication to invoke the service a 199 (Early Dialog Terminated) is forwarded to the originating user when Retention timer CC-T1 is expired.

Preconditions:

SIP header values:
180 Ringing 1
   Call-Info: <sip:UE-B or T-AS>;purpose=call-completion;m=NR

Comments:

SIP 1 (Gm)		SUT		SIP 2 (ISC)
INVITE	→		→	INVITE
			←	180 (Ringing) 1
180 (Ringing)	←	**Start CCNR-T5, CC-T1**		
		Timeout CCNR-T5		
Announcement that CC is possible				
		Timeout CC-T1		
199 (Early Dialog Terminated)	←			
		Apply post test routine		

TSS	TP	Reference	Selection expression
CC/originating_AS/Invocation	CC_N01_007	4.5.4.2.1.1.5, 4.5.4.2.1.1.6	NOT PICS 4.3.2.1/10 AND NOT PICS 4.3.2.1/11

Test purpose

Successful CCBS request.

A 486 (Busy Here) is received from the terminating AS containing a Call-Info header field a purpose parameter set to call-completion and the m parameter is set to BS. Ensure that the AS withholds the 486 and sends a 183 Session Progress and starts to play an announcement to inform the originating user that Call Completion is possible. The originating user activates via inband interaction the CCBS call completion service. Ensure that the AS sends a SUBSCRIBE to the terminating AS. The NOTIFY received from the terminating AS confirms the successful invocation of the CC service. The Application Server confirms the successful invocation to the originating user by sending of a 486 (Busy Here) final response.

Preconditions:

SIP header values:

486 Busy Here 1:
    Call-Info: <sip:UE-B or T-AS>;purpose=call-completion;m=BS

SUBSRIBE sip: T-AS;m=BS
    From:<UE-A>
    To:<UE-B>
    Contact:<O-AS>
    Call.Info: <UE-A>; purpose=call-completion;m=BS
    P-Assertd-Identity: UE-A
    Expires: CC-T3
    Event:call-completion

NOTIFY
    Event:call-completion
    Content-Type: application/call-completion
      cc-state: queued

Comments:

SIP 1 (Gm)		SUT		SIP 2 (ISC)
INVITE	→		→	INVITE
			←	486 (Busy Here) 1
183 Session Progress	←		→	ACK
		Announcement that CCBS is possible		
		Inband-interaction procedures for the CC activation		
			→	SUBSCRIBE
			←	202 Accepted
			←	NOTIFY
			→	200 OK NOTIFY
		Confirm to the caller that the invocation was successful		
486 (Busy Here) 2	←			
ACK	→			
		Apply post test routine		

TSS	TP	Reference	Selection expression
CC/originating_AS/Invocation	CC_N01_008	4.5.4.2.1.1.5, 4.5.4.2.1.1.6	PICS 4.3.2.1/10 AND PICS 4.3.2.1/11

Test purpose

Successful CCBS request.

A 486 (Busy Here) is received from the terminating AS containing a Call-Info header field a purpose parameter set to call-completion and the m parameter is set to BS. Ensure that the AS withholds the 486 and sends a 183 Session Progress and starts to play an announcement to inform the originating user that Call Completion is possible. The originating user activates via inband interaction the CCBS call completion service. Ensure that the AS sends a SUBSCRIBE to the terminating AS. The NOTIFY received from the terminating AS confirms the successful invocation of the CC service. The Application Server confirms the successful invocation to the originating user by sending of a 486 (Busy Here) final response. Ensure that a Date header and a Content-Type header containing a message/external-body value are present in the 486 sent to the originating user.

Preconditions:

SIP header values:

486 Busy Here 1:
    Call-Info: <sip:UE-B or T-AS>;purpose=call-completion;m=BS

SUBSRIBE sip: T-AS;m=BS
    From:<UE-A>
    To:<UE-B>
    Contact:<O-AS>
    Call.Info: <UE-A>; purpose=call-completion;m=BS
    P-Assertd-Identity: UE-A
    Expires: CC-T3
    Event:call-completion

NOTIFY
    Event:call-completion
    Content-Type: application/call-completion
        cc-state: queued

486 Busy Here 2:
    Date: <current date and time>
    Content-Type: message/external-body; access-type="URL"; URL= < any url >

Comments:

SIP 1 (Gm)		SUT		SIP 2 (ISC)
INVITE	→		→	INVITE
			←	486 (Busy Here) 1
183 Session Progress	←		→	ACK
		Announcement that CCBS is possible		
		Inband-interaction procedures for the CC activation		
			→	SUBSCRIBE
			←	202 Accepted
			←	NOTIFY
			→	200 OK NOTIFY
		Confirm to the caller that the invocation was successful		
486 (Busy Here) 2	←			
ACK	→			
		Apply post test routine		

TSS	TP	Reference	Selection expression
CC/originating_AS/Invocation	CC_N01_009	4.5.4.2.1.1.1	

Test purpose
CCBS not possible, A CC queue limit has been exceeded.
Ensure that the AS does not offer the activation of the call completion service if the user A CCBS queue limit has been exceeded. The 486 is passed through.

Preconditions: CCBS queue limit exceeded

SIP header values:
486 Busy Here:
Call-Info: <sip:UE-B>;purpose=call-completion;m=BS

Comments:

SIP 1 (Gm)		SUT		SIP 2 (ISC)
		Set the A queue to limit		
INVITE	→		→	INVITE
100 Trying	←		←	100 Trying
486 (Busy Here)	←		←	486 (Busy Here)
ACK	→		→	ACK

TSS	TP	Reference	Selection expression
CC/originating_AS/Invocation	CC_N01_010	4.5.4.2.1.1.1	NOT PICS 4.3.2-1/3

Test purpose
CCBS invocation not possible, further identical request (communication parameters).
Ensure that the AS does not offer the activation of the CCBS call completion service if a request was activated for an identical communication, determined by the stored basic communication information.

Preconditions:

SIP header values:
486 Busy Here:
Call-Info: <sip:UE-B>;purpose=call-completion;m=BS

Comments:

SIP 1 (Gm)		SUT		SIP 2 (ISC)
		A successful CCBS request is already invoked		
INVITE	→		→	INVITE
100 Trying	←		←	100 Trying
486 (Busy Here)	←		←	486 (Busy Here)
ACK	→		→	ACK

TSS	TP	Reference	Selection expression
CC/originating_AS/Invocation	CC_N01_011	4.5.4.2.1.2	

Test purpose
Unsuccessful CCBS request.
Ensure when the originating user invokes the CCBS service and the Application Server receives a 480 (Temporarily Unavailable) to indicate short term denial or a 403 (Forbidden) to indicate long term denial the originating user receives a confirmation that the CCBS request was not successful.

Preconditions:

SIP header values:
486 Busy Here 1:
Call-Info: <sip:UE-B or T-AS>;purpose=call-completion;m=BS
SUBSRIBE sip: T-AS; m=BS
From:<UE-A>
To:<UE-B>
Contact:<O-AS>
Call.Info: <UE-A>; purpose=call-completion;m=BS
P-Assertd-Identity: UE-A
Expires: CC-T3
Event:call-completion

Comments:

SIP 1 (Gm)		SUT		SIP 2 (ISC)
INVITE	→		→	INVITE
			←	486 (Busy Here) 1
183 Session Progress	←		→	ACK
		Announcement that CCBS is possible		
	Inband-interaction procedures for the CC activation			
			→	SUBSCRIBE
CASE A			←	480 (Temporarily Unavailable)
CASE B				
			←	403 (Forbidden)
	Confirm to the caller that the invocation was not successful			
486 (Busy Here) 2	←			
ACK	→			
		Apply post test routine		

TSS CC/originating_AS/Invocation	**TP** CC_N01_012	**Reference** 4.5.4.2.1.1.5 4.8.1	**Selection expression**

Test purpose
CCBS request. Timeout CC-T2. Ensure that the CC request operation timer CC-T2 is started after CCBS request is received from caller. When the timer CC-T2 is expired because no NOTIFY is received from the terminating user as a confirmation that the CCBS request was successful at the terminating AS the CCBS request is rejected. The caller is informed.

Preconditions:

SIP header values:

486 Busy Here:
   Call-Info: <sip:UE-B>;purpose=call-completion;m=BS
SUBSRIBE sip:T-AS;m=BS
   From:<UE-A>
   To:<UE-B>
   Contact:<O-AS>
   Call.Info: <UE-A>; purpose=call-completion;m=BS
   P-Assertd-Identity: UE-A
   Expires: CC-T3
   Event:call-completion

Comments:

SIP 1 (Gm)		**SUT**		**SIP 2 (ISC)**
INVITE	→		→	INVITE
100 Trying	←		←	100 Trying
			←	486 (Busy Here)
183 Session Progress	←		→	ACK
		Announcement that CCBS is possible		
		Inband-interaction procedures for the CC activation		
			→	SUBSCRIBE
			←	202 Accepted
		Start Timer CC-T2		
		↓		
		Timeout Timer CC-T2		
		Confirm to the caller that the invocation was not successful		
486 (Busy Here)	←			
ACK	→			

TSS	TP	Reference	Selection expression
CC/originating_AS/Invocation	CC_N01_013	4.5.4.2.1.1.5, 4.5.4.2.1.1.6	

Test purpose

CCNR successful request.

A 180 (Ringing) is received from the terminating AS containing a Call-Info header field a purpose parameter set to call-completion and the m parameter is set to BS. Ensure that the Application Server forwards a 180 (Ringing) without the Call-Info header to the originating user and starts to play an announcement to inform the originating user that Call Completion is possible. The originating user activates via inband interaction the CCNR call completion service. Ensure that the AS sends a SUBSCRIBE to the terminating AS. The NOTIFY received from the terminating AS confirms the successful invocation of the CC service. The Application Server confirms the successful invocation to the originating user by sending of a 480 (Temporarily Unavailable) final response.

Preconditions:

SIP header values:

180 Ringing 2:
   Call-Info: <sip:UE-B or T-AS>;purpose=call-completion;m=NR

SUBSRIBE sip: T-AS;m=NR
   From:<UE-A>
   To:<UE-B>
   Contact:<O-AS>
   Call.Info: UE-A; purpose=call-completion;m=NR
   P-Assertd-Identity: UE-A
   Expires: CC-T3
   Event:call-completion

NOTIFY
   Event:call-completion
   Content-Type: application/call-completion
      cc-state: queued

480 Temporarily Unavailable
   Date: <current date and time>
   Content-Type: message/external-body; access-type="URL"; URL= < any url >

Comments:

SIP 1 (Gm)		SUT		SIP 2 (ISC)
INVITE	→		→	INVITE
100 Trying	←		←	100 Trying
			←	180 Ringing 1
180 Ringing 2	←			
		Announcement that CCNR is possible		
		Inband-interaction procedures for the CC activation		
			→	SUBSCRIBE
			←	202 Accepted
			←	NOTIFY
			→	200 OK NOTIFY
		Confirm to the caller that the invocation was successful		
			→	CANCEL
			←	200 OK CANCEL
480 (Temporarily Unavailable)	←		←	487 Request Terminated
ACK	→		→	ACK

TSS	TP	Reference	Selection expression
CC/originating_AS/Invocation	CC_N01_014	4.5.4.2.1	

Test purpose

CCNR not possible, A CC queue limit has been exceeded.

Ensure that the originating AS does not offered the call completion service if a 180 (Ringing) is received and a Call-Info header with a purpose parameter set to call-completion and a m parameter set to NR is received and the CCBS queue limit is exceeded.

Preconditions: CCBS queue limit exceeded

SIP header values:
180 Ringing 1:
Call-Info: <sip:UE-B>;purpose=call-completion;m=NR

Comments:

SIP 1 (Gm)		SUT		SIP 2 (ISC)
		Set the A queue to limit		
INVITE	→		→	INVITE
100 Trying	←		←	100 Trying
180 Ringing 2	←		←	180 Ringing 1
CANCEL	→		→	CANCEL
200 OK CANCEL	←		←	200 OK CANCEL
487 Request Terminated	←		←	487 Request Terminated
ACK	→		→	ACK

TSS	TP	Reference	Selection expression
CC/originating_AS/Invocation	CC_N01_015	4.5.4.2.1	NOT PICS 4.3.2-1/3

Test purpose

CCNR invocation not possible, further identical request (communication parameters).

Ensure that the AS does not offer the activation of the CCNR call completion service if a request was activated for an identical communication, determined by the stored basic communication information.

Preconditions:

SIP header values:
180 Ringing 1:
Call-Info: <sip:UE-B>;purpose=call-completion;m=NR

Comments:

SIP 1 (Gm)		SUT		SIP 2 (ISC)
		A successful CCNR request is already invoked		
INVITE	→		→	INVITE
100 Trying	←		←	100 Trying
180 Ringing 2	←		←	180 Ringing 1
		No offer to invoke CCNR		
CANCEL	→		→	CANCEL
200 OK CANCEL	←		←	200 OK CANCEL
487 Request Terminated	←		←	487 Request Terminated
ACK	→		→	ACK

TSS	TP	Reference	Selection expression
CC/originating_AS/Invocation	CC_N01_016	4.5.4.2.1.1.4	PICS 4.3.2-1/12

Test purpose

Communication to user B is cancelled when CCNR is invoked by the originating user.

Ensure when the confirmation of the CCNR invocation is received from user A before timeout CC-T1 the Application Server terminated the session with user B by sending a CANCEL request to user B.

Preconditions:

SIP header values:

180 Ringing 1:
    Call-Info: <sip:UE-B or T-AS>;purpose=call-completion;m=NR

Comments:

SIP 1 (Gm)		SUT		SIP 2 (ISC)
INVITE	→		→	INVITE
100 Trying	←		←	100 Trying
			←	180 Ringing 1
180 Ringing 2	←			
		Announcement that CCNR is possible		
		Inband-interaction procedures for the CC activation		
			→	CANCEL
			←	200 OK CANCEL
			←	487 Request Terminated
			→	ACK
		Apply post test routine		

TSS	TP	Reference	Selection expression
CC/originating_AS/Invocation	CC_N01_017	4.5.4.2.1.2	

Test purpose

Unsuccessful CCNR request.

Ensure when the originating user invokes the CCNR service and the Application Server receives a 480 (Temporarily Unavailable) to indicate short term denial or a 403 (Forbidden) to indicate long term denial the originating user receives a confirmation that the CCBS requesr was not successful.

Preconditions:

SIP header values:

180 Ringing 1:
    Call-Info: <sip:UE-B or T-AS>;purpose=call-completion;m=NR

SUBSRIBE sip: T-AS;m=NR
    From:<UE-A>
    To:<UE-B>
    Contact:<O-AS>
    Call.Info: <UE-A>; purpose=call-completion;m=NR
    P-Assertd-Identity: UE-A
    Expires: CC-T3
    Event:call-completion

Comments:

SIP 1 (Gm)		SUT		SIP 2 (ISC)
INVITE	→		→	INVITE
			←	180 Ringing 1
180 Ringing 2	←			
		Announcement that CCBS is possible		
		Inband-interaction procedures for the CC activation		
			→	SUBSCRIBE
CASE A				
			←	480 (Temporarily Unavailable)
CASE B				
			←	403 (Forbidden)
		Confirm to the caller that the invocation was not successful		
		Apply post test routine		

TSS	TP	Reference	Selection expression
CC/originating_AS/Invocation	CC_N01_018	4.5.4.2.1.1.5 4.8.1	

Test purpose

CCNR request. Timeout CC-T2.

Ensure that the CC request operation timer CC-T2 is started after CCNR request is received from caller. When the timer CC-T2 is expired because no NOTIFY is received from the terminating user as a confirmation that the CCBS request was successful at the terminating AS the CCNR request is rejected. The caller is informed.

Preconditions:

SIP header values:
180 Ringing 2:
   Call-Info: <sip:UE-B>;purpose=call-completion;m=NR
SUBSRIBE sip:T-AS;m=NR
   From:<UE-A>
   To:<UE-B>
   Contact:<O-AS>
   Call.Info: <UE-A>; purpose=call-completion;m=NR
   P-Assertd-Identity: UE-A
   Expires: CC-T3
   Event:call-completion

Comments:

SIP 1 (Gm)		SUT		SIP 2 (ISC)
INVITE	→		→	INVITE
100 Trying	←		←	100 Trying
			←	180 Ringing 1
180 Ringing 2	←			
Announcement that CCBS is possible				
Inband-interaction procedures for the CC activation			→	SUBSCRIBE
			←	202 Accepted
Start Timer CC-T2				
↓				
Timeout Timer CC-T2				
Confirm to the caller that the invocation was not successful				
CANCEL	→		→	CANCEL
200 OK CANCEL	←		←	200 OK CANCEL
487 Request Terminated	←		←	487 Request Terminated
ACK	→		→	ACK

TSS CC/originating_AS/Invocation	TP CC_N01_019	Reference 4.5.4.2.1.1.5, 4.5.4.2.1.1.6	Selection expression PICS 4.3.2-1/9

Test purpose
CCNL successful request.

A 480 (Temporarily Unavailable) is received from the terminating AS containing a Call-Info header field a purpose parameter set to call-completion and the m parameter is set to NL. Ensure that the Application Server sends a 183 (Session Progress) to the originating user and starts to play an announcement to inform the originating user that Call Completion is possible. The originating user activates via inband interaction the CCNL call completion service. Ensure that the AS sends a SUBSCRIBE to the terminating AS. The NOTIFY received from the terminating AS confirms the successful invocation of the CC service. The Application Server confirms the successful invocation to the originating user by sending of a 480 (Temporarily Unavailable) final response.

Preconditions:

SIP header values:
480 Temporarily Unavailable 1:
   Call-Info: <sip:UE-B or T-AS>;purpose=call-completion;m=NL

SUBSRIBE sip: T-AS;m=NL
   From:<UE-A>
   To:<UE-B>
   Contact:<O-AS>
   Call.Info: UE-A; purpose=call-completion;m=NL
   P-Assertd-Identity: UE-A
   Expires: CC-T3
   Event:call-completion

NOTIFY
   Event:call-completion
   Content-Type: application/call-completion
     cc-state: queued

480 Temporarily Unavailable 2
   Date: <current date and time>
   Content-Type: message/external-body; access-type="URL"; URL= < any url >

Comments:

SIP 1 (Gm)		SUT		SIP 2 (ISC)
INVITE	→		→	INVITE
			←	480 (Temporarily Unavailable) 1
			→	ACK
183 (Session Progress)	←			
		Announcement that CCNR is possible		
		Inband-interaction procedures for the CC activation		
			→	SUBSCRIBE
			←	202 Accepted
			←	NOTIFY
			→	200 OK NOTIFY
		Confirm to the caller that the invocation was successful		
480 (Temporarily Unavailable) 2	←			
ACK	→			

ETSI

TSS CC/originating_AS/Invocation	TP CC_N01_020	Reference 4.5.4.2.1.1.1	Selection expression PICS 4.3.2-1/9
Test purpose			
CCNL not possible, A CC queue limit has been exceeded. Ensure that the AS does not offer the activation of the call completion service if the user A CCNL queue limit has been exceeded. The 480 (Temporarily Unavailable) is passed through.			
Preconditions: CCBS queue limit exceeded			
SIP header values: 480 Temporarily Unavailable 1: Call-Info: <sip:UE-B>;purpose=call-completion;m=NL			
Comments:			

SIP 1 (Gm)	SUT	SIP 2 (ISC)
	Set the A queue to limit	
INVITE	→ →	INVITE
100 Trying	← ←	100 Trying
480 (Temporarily Unavailable)	← ←	480 (Temporarily Unavailable) 1
ACK	→ →	ACK

TSS CC/originating_AS/Invocation	TP CC_N01_021	Reference 4.5.4.2.1.1.1	Selection expression PICS 4.3.2-1/9 AND NOT PICS 4.3.2-1/3
Test purpose			
CCNL invocation not possible, further identical request (communication parameters). Ensure that the AS does not offer the activation of the CCNL call completion service if a request was activated for an identical communication, determined by the stored basic communication information. The 480 (Temporarily Unavailable) is passed through.			
Preconditions:			
SIP header values: 480 Temporarily Unavailable 1: Call-Info: <sip:UE-B>;purpose=call-completion;m=NL			
Comments:			

SIP 1 (Gm)	SUT	SIP 2 (ISC)
	A successful CCNL request is already invoked	
INVITE	→ →	INVITE
100 Trying	← ←	100 Trying
480 (Temporarily Unavailable)	← ←	480 (Temporarily Unavailable) 1
ACK	→ →	ACK

TSS		TP	Reference	Selection expression
CC/originating_AS/Invocation		CC_N01_022	4.5.4.2.1.2	PICS 4.3.2-1/9

Test purpose

Unsuccessful CCNL request.

Ensure when the originating user invokes the CCNL service and the Application Server receives a 480 (Temporarily Unavailable) to indicate short term denial or a 403 (Forbidden) to indicate long term denial the originating user receives a confirmation that the CCNL requesr was not successful.

Preconditions:

SIP header values:

480 Temporarily Unavailable 1:
    Call-Info: <sip:UE-B or T-AS>;purpose=call-completion;m=NL

SUBSRIBE sip: T-AS;m=NL
    From:<UE-A>
    To:<UE-B>
    Contact:<O-AS>
    Call.Info: <UE-A>; purpose=call-completion;m=NL
    P-Assertd-Identity: UE-A
    Expires: CC-T3
    Event:call-completion

Comments:

SIP 1 (Gm)		SUT		SIP 2 (ISC)
INVITE	➔		➔	INVITE
			⬅	480 (Temporarily Unavailable) 1
183 Session Progress	⬅		➔	ACK

Announcement that CCBS is possible

Inband-interaction procedures for the CC activation

			➔	SUBSCRIBE
CASE A				
			⬅	480 (Temporarily Unavailable)
CASE B				
			⬅	403 (Forbidden)

Confirm to the caller that the invocation was not successful

480 (Temporarily Unavailable) 2	⬅			
ACK	➔			

Apply post test routine

TSS	TP	Reference	Selection expression
CC/originating_AS/Invocation	CC_N01_023	4.5.4.2.1.1.5 4.8.1	PICS 4.3.2-1/9

Test purpose
CCNL request. Timeout CC-T2.

Ensure that the CC request operation timer CC-T2 is started after CCNL request is received from caller. When the timer CC-T2 is expired because no NOTIFY is received from the terminating user as a confirmation that the CCNL request was successful at the terminating AS the CCNL request is rejected. The caller is informed.

Preconditions:

SIP header values:
480 Temporarily Unavailable:
   Call-Info: <sip:UE-B>;purpose=call-completion;m=NL
SUBSRIBE sip:T-AS;m=NL
   From:<UE-A>
   To:<UE-B>
   Contact:<O-AS>
   Call.Info: <UE-A>; purpose=call-completion;m=NL
   P-Assertd-Identity: UE-A
   Expires: CC-T3
   Event:call-completion

Comments:

SIP 1 (Gm)		SUT		SIP 2 (ISC)
INVITE	→		→	INVITE
100 Trying	←		←	100 Trying
			←	480 (Temporarily Unavailable)
183 Session Progress	←		→	ACK

        Announcement that CCBS is possible
      Inband-interaction procedures for the CC activation

			→	SUBSCRIBE
			←	202 Accepted

         Start Timer CC-T2
           ↓
        Timeout Timer CC-T2
   Confirm to the caller that the invocation was not successful

480 (Temporarily Unavailable)	←			
ACK	→			

5.2.2 CC Revocation

TSS		TP	Reference	Selection expression
CC/originating_AS/Revocation		CC_N02_001	4.5.4.2.2.1.2	PICS 4.3.2-1/8
Test purpose				
CCBS revocation request received from the user. Ensure that the originating AS sends a SUBCRIBE request and the Expires header is set to zero when the originating user revokes the outstanding CCBS request. The revocation is performed by an INVITE request and the userpart of the Request URI is set to the service code command to cancel a CCBS request.				
Preconditions:				

SIP header values:
INVITE: Request URI= **Service Code Command (revoke CCBS request)**
SUBSRIBE sip:T-AS;m=BS
   Call.Info: UE-A (Public user identity); purpose=call-completion;m=BS
   P-Assertd-Identity: UE-A (Public user identity)
   Event:call-completion
   Expires=0
 	
NOTIFY sip:O-AS
   Event:call-completion
   Subscription-State: terminated; reason=timeout				

Comments:				

```
SIP 1 (Gm)                                      SUT           SIP 2 (ISC)
            Establish a successful CCBS request

            Revocation request from the user
INVITE                                    →
200 OK INVITE                             ←
ACK                                       →

                                               →        SUBSCRIBE
                                               ←        202 Accepted

                                               ←        NOTIFY
                                               →        200 OK NOTIFY
            Confirm to the caller that the revocation was successful
BYE                                       →
200 OK BYE                                ←
```

TSS	TP	Reference	Selection expression
CC/originating_AS/Revocation	CC_N02_002	4.5.4.2.2.1.2	PICS 4.3.2-1/8

Test purpose
CCNR revocation request received from the user.
Ensure that the originating AS sends a SUBCRIBE request and the Expires header is set to zero when the originating user revokes the outstanding CCNR request. The revocation is performed by an INVITE request and the userpart of the Request URI is set to the service code command to cancel a CCNR request.

Preconditions:

SIP header values:
INVITE: Request URI= **Service Code Command (revoke CCNR request)**
SUBSRIBE sip:T-AS;m=NR
Call.Info: UE-A (Public user identity)**;** purpose=call-completion;m=NR
P-Assertd-Identity: UE-A (Public user identity)
Event:call-completion
Expires=0
NOTIFY sip:O-AS
Event:call-completion
Subscription-State: terminated; reason=timeout

Comments:

SIP 1 (Gm)		SUT	SIP 2 (ISC)
	Establish a successful CCNR request		
	Revocation request from the user		
INVITE	➔		
200 OK INVITE	←		
ACK	➔		
		➔	SUBSCRIBE
		←	202 Accepted
		←	NOTIFY
		➔	200 OK NOTIFY
	Confirm to the caller that the revocation was successful		
BYE	➔		
200 OK BYE	←		

TSS	TP	Reference	Selection expression
CC/originating_AS/Revocation	CC_N02_003	4.5.4.2.2.1.2	PICS 4.3.2-1/8 AND PICS 4.3.2-1/9

Test purpose
CCNL revocation request received from the user. Ensure that the originating AS sends a SUBCRIBE request and the Expires header is set to zero when the originating user revokes the outstanding CCNL request. The revocation is performed by an INVITE request and the userpart of the Request URI is set to the service code command to cancel a CCNL request.

Preconditions:

SIP header values:

INVITE: Request URI= **Service Code Command (revoke CCNL request)**
 	
SUBSRIBE sip:T-AS; m=NL
    Call.Info: UE-A (Public user identity); purpose=call-completion;m=NL
    P-Assertd-Identity: UE-A (Public user identity)
    Event:call-completion
    Expires=0
 	
NOTIFY sip:O-AS
    Event:call-completion
    Subscription-State: terminated; reason=timeout

Comments:

SIP 1 (Gm)   **SUT**   **SIP 2 (ISC)**
              Establish a successful CCNL request
 	
              Revocation request from the user
INVITE   →
200 OK INVITE   ←
ACK   →
 	
                                                →   SUBSCRIBE
                                                ←   202 Accepted
 	
                                                ←   NOTIFY
                                                →   200 OK NOTIFY
         Confirm to the caller that the revocation was successful
BYE   →
200 OK BYE   ←

TSS	TP	Reference	Selection expression
CC/originating_AS/Revocation	CC_N02_004	4.5.4.2.2.1.3	

Test purpose

CCBS revocation caused by timer expiry CC-T3.

Ensure that the originating AS revokes the outstanding CCBS request if the CC service duration timer CC-T3 expires.

Preconditions:			

SIP header values:

SUBSRIBE sip:T-AS;m=BS
   Event:call-completion
   Call.Info: UE-A (Public user identity); purpose=call-completion;m=NL
   P-Assertd-Identity: UE-A (Public user identity)
   Expires=0

NOTIFY sip:O-AS
   Event:call-completion
   Subscription-State: terminated; reason=timeout

Comments:

SIP 1 (Gm)	SUT	SIP 2 (ISC)
	Establish a successful CCBS request	
	Start CC-T3	
	Timeout CC-T3	
	➔	SUBSCRIBE
	←	202 Accepted
	←	NOTIFY
	➔	200 OK NOTIFY

TSS	TP	Reference	Selection expression
CC/originating_AS/Revocation	CC_N02_005	4.5.4.2.2.1.3	

Test purpose

CCNR revocation caused by timer expiry CC-T3.

Ensure that the originating AS revokes the outstanding CCNR request if the CC service duration timer CC-T3 expires.

Preconditions:			

SIP header values:

SUBSRIBE sip:T-AS;m=NR
   Call.Info: UE-A (Public user identity); purpose=call-completion;m=NR
   P-Assertd-Identity: UE-A (Public user identity)
   Event:call-completion
   Expires=0

NOTIFY sip:O-AS
   Event:call-completion
   Subscription-State: terminated; reason=timeout

Comments:

SIP 1 (Gm)	SUT	SIP 2 (ISC)
	Establish a successful CCBS request	
	Start CC-T3	
	Timeout CC-T3	
	➔	SUBSCRIBE
	←	202 Accepted
	←	NOTIFY
	➔	200 OK NOTIFY

TSS	TP	Reference	Selection expression
CC/originating_AS/Revocation	CC_N02_006	4.5.4.2.2.1.3	PICS 4.3.2-1/9
Test purpose			
CCNL revocation caused by timer expiry CC-T3. Ensure that the originating AS revokes the outstanding CCNL request if the CC service duration timer CC-T3 expires.			
Preconditions:			
SIP header values: SUBSRIBE sip:T-AS **Call.Info: UE-A** (Public user identity); purpose=call-completion;m=NL **P-Assertd-Identity: UE-A** (Public user identity) Event:call-completion Expires=0 NOTIFY sip:O-AS Event:call-completion Subscription-State: terminated; reason=timeout			

Comments:			
SIP 1 (Gm)		**SUT**	**SIP 2 (ISC)**
	Establish a successful CCNL request		
	Start CC-T3		
	Timeout CC-T3		
		➔	SUBSCRIBE
		⬅	202 Accepted
		⬅	NOTIFY
		➔	200 OK NOTIFY

TSS	TP	Reference	Selection expression
CC/originating_AS/Revocation	CC_N02_007	4.5.4.2.2.2	
Test purpose			
CCBS revocation caused by terminating AS. Ensure that the originating AS revokes the outstanding CCBS request if the AS receives a NOTIFY request from the terminating user and the the Subscription-State header field set to "terminated"; and the "reason" Subscription-State header field parameter set to "noresource".			
Preconditions:			
SIP header values: NOTIFY sip:O-AS Event:call-completion Subscription-State: terminated; reason= noresource			

Comments:			
SIP 1 (Gm)		**SUT**	**SIP 2 (ISC)**
	Establish a successful CCBS request		
		⬅	NOTIFY
		➔	200 OK NOTIFY

TSS	TP	Reference	Selection expression
CC/originating_AS/Revocation	CC_N02_008	4.5.4.2.2.2	
Test purpose			
CCNR revocation caused by terminating AS. Ensure that the originating AS revokes the outstanding CCNR request if the AS receives a NOTIFY request from the terminating user and the the Subscription-State header field set to "terminated"; and the "reason" Subscription-State header field parameter set to "noresource".			
Preconditions:			

SIP header values:
NOTIFY sip:O-AS
    Event:call-completion
    Subscription-State: terminated; reason= noresource			

Comments:			

SIP 1 (Gm)   **SUT**   **SIP 2 (ISC)**
        Establish a successful CCNR request

                                                            ←   NOTIFY
                                                            →   200 OK NOTIFY

TSS	TP	Reference	Selection expression
CC/originating_AS/Revocation	CC_N02_009	4.5.4.2.2.2	PICS 4.3.2-1/9
Test purpose			
CCNL revocation caused by terminating AS. Ensure that the originating AS revokes the outstanding CCNL request if the AS receives a NOTIFY request from the terminating user and the the Subscription-State header field set to "terminated"; and the "reason" Subscription-State header field parameter set to "noresource".			
Preconditions:			

SIP header values:
NOTIFY sip:O-AS
    Event:call-completion
    Subscription-State: terminated; reason= noresource			

Comments:			

SIP 1 (Gm)   **SUT**   **SIP 2 (ISC)**
        Establish a successful CCNL request

                                                            ←   NOTIFY
                                                            →   200 OK NOTIFY

5.2.3   CC Operation

TSS	TP	Reference	Selection expression
CC/originating_AS/Operation	CC_N03_001	4.5.4.2.3.1	NOT PICS 4.3.2-1/4
Test purpose			
CCBS Recall successful by sending a REFER request to the originating user. Ensure that the originating AS starts the CCBS recall procedure when the indication that the callee is available to recall indicated in a NOTIFY request and the state header in the call-completion MIME body is set to "ready". A REFER request is sent to the caller. The m parameter of the Request line is set to BS in the INVITE request sent to the callee as the result of the received INVITE request from the caller.			
Preconditions:			

SIP header values:
NOTIFY 1   sip:O-AS
               Event:call-completion
               Content-Type: application/call-completion
                 cc-state: ready
REFER: sip: UE A; m=BS
               Refer-To; UE B; method=INVITE
INVITE 1:   sip: UE B; m=BS
               From: UE A
               To: UE B
               Call-Info: <sip:UE-A>;purpose=call-completion;m=BS
NOTIFY 2   sip:O-AS
               Event:call-completion
               Subscription-State: terminated; reason=timeout			

Comments:

SIP 1 (Gm)		SUT		SIP 2 (ISC)
		Invoke CCBS request		
		CCBS request confirmed by AS		
				Terminating user available for recall
		NOTIFY ←		NOTIFY 1
		200 OK NOTIFY →		200 OK NOTIFY
REFER	←	REFER		
202 Accepted	→	202 Accepted		
NOTIFY (100)	→	NOTIFY (100)		
200 OK NOTIFY	←	200 OK NOTIFY		
INVITE	→	INVITE		
			INVITE 1 →	INVITE
180 Ringing	←		←	180 Ringing
		NOTIFY ←		NOTIFY 2
		200 OK NOTIFY →		200 OK NOTIFY
200 OK INVITE	←		←	200 OK INVITE
ACK	→		→	ACK
NOTIFY (200)	→	NOTIFY (200)		
200 OK NOTIFY	←	200 OK NOTIFY		
		Apply post test routine		

TSS	TP	Reference	Selection expression
CC/originating_AS/Operation	CC_N03_002	4.5.4.2.3.1	NOT PICS 4.3.2-1/4

Test purpose

CCNR Recall successful by sending a REFER request to the originating user.

Ensure that the originating AS starts the CCNR recall procedure when the indication that the callee is available to recall indicated in a NOTIFY request and the state header in the call-completion MIME body is set to "ready". A REFER request is sent to the caller. The m parameter of the Request line is set to NR in the INVITE request sent to the callee as the result of the received INVITE request from the caller.

Preconditions:

SIP header values:

NOTIFY 1	sip:O-AS
	Event:call-completion
	Content-Type: application/call-completion
	cc-state: ready
REFER:	sip: UE A; m=NR
	Refer-To; UE B; method=INVITE
INVITE 1:	sip: UE B; m=NR
	From: UE A
	To: UE B
	Call-Info: <sip:UE-A>;purpose=call-completion;m=NR
NOTIFY 2	sip:O-AS
	Event:call-completion
	Subscription-State: terminated; reason=timeout

Comments:

SIP 1 (Gm)		SUT		SIP 2 (ISC)
		Invoke CCNR request		
		CCNR request confirmed by AS		
				Terminating user available for recall
		NOTIFY	←	NOTIFY 1
		200 OK NOTIFY	→	200 OK NOTIFY
REFER	←	REFER		
202 Accepted	→	202 Accepted		
NOTIFY (100)	→	NOTIFY (100)		
200 OK NOTIFY	←	200 OK NOTIFY		
INVITE	→	INVITE		
			→	INVITE 1
180 Ringing	←		←	180 Ringing
		NOTIFY	←	NOTIFY 2
		200 OK NOTIFY	→	200 OK NOTIFY
200 OK INVITE	←		←	200 OK INVITE
ACK	→		→	ACK
NOTIFY (200)	→	NOTIFY (200)		
200 OK NOTIFY	←	200 OK NOTIFY		
		Apply post test routine		

TSS	TP	Reference	Selection expression
CC/originating_AS/Operation	CC_N03_003	4.5.4.2.3.1	NOT PICS 4.3.2-1/4 AND PICS 4.3.2-1/9

Test purpose
CCNL Recall successful by sending a REFER request to the originating user.
Ensure that the originating AS starts the CCNL recall procedure when the indication that the callee is available to recall indicated in a NOTIFY request and the state header in the call-completion MIME body is set to "ready". A REFER request is sent to the caller. The m parameter of the Request line is set to NL in the INVITE request sent to the callee as the result of the received INVITE request from the caller.

Preconditions:

SIP header values:
NOTIFY 1   sip:O-AS
Event:call-completion
Content-Type: application/call-completion
cc-state: ready
REFER: sip: UE A; m=NL
Refer-To; UE B; method=INVITE
INVITE 1:   sip: UE B; m=NL
From: UE A
To: UE B
Call-Info: <sip:UE-A>;purpose=call-completion;m=NL
NOTIFY 2   sip:O-AS
Event:call-completion
Subscription-State: terminated; reason=timeout

Comments:

SIP 1 (Gm)		SUT		SIP 2 (ISC)
		Invoke CCNL request		
		CCNL request confirmed by AS		
				Terminating user available for recall
		NOTIFY ←		NOTIFY 1
		200 OK NOTIFY →		200 OK NOTIFY
REFER	←	REFER		
202 Accepted	→	202 Accepted		
NOTIFY (100)	→	NOTIFY (100)		
200 OK NOTIFY	←	200 OK NOTIFY		
INVITE	→	INVITE		
			→	INVITE 1
180 Ringing	←		←	180 Ringing
		NOTIFY ←		NOTIFY 2
		200 OK NOTIFY →		200 OK NOTIFY
200 OK INVITE	←		←	200 OK INVITE
ACK	→		→	ACK
NOTIFY (200)	→	NOTIFY (200)		
200 OK NOTIFY	←	200 OK NOTIFY		
		Apply post test routine		

TSS	TP	Reference	Selection expression
CC/originating_AS/Operation	CC_N03_004	4.5.4.2.3.1	PICS 4.3.2-1/4

Test purpose

CCBS Recall successful by using the special REFER interworking. Sending an INVITE request to the originating user.

Ensure that the originating AS starts the CCBS recall procedure when the indication that the callee is available to recall indicated in a NOTIFY request and the state header in the call-completion MIME body is set to "ready". An INVITE request is sent to the caller. When the session with the caller is answered, an INVITE request is sent to the callee and the m parameter in the Request line is set to BS. When the callee answers the session, caller and callee are connected.

Preconditions:

SIP header values:

NOTIFY 1   sip:O-AS
            Event:call-completion
            Content-Type: application/call-completion
              cc-state: ready

INVITE 2:   sip: UE B; m=BS
            From: UE A
            To: UE B
            Call-Info: <sip:UE-A>;purpose=call-completion;m=BS

NOTIFY 2   sip:O-AS
            Event:call-completion
            Subscription-State: terminated; reason=noresource

Comments:

SIP 1 (Gm)	SUT	SIP 2 (ISC)
	Invoke CCBS request	
	CCBS request confirmed by AS	
	Terminating user available for recall	
	NOTIFY ←	NOTIFY 1
	200 OK NOTIFY →	200 OK NOTIFY
INVITE	← INVITE 1	
180 Ringing	→ 180 Ringing	
200 OK INVITE	→ 200 OK INVITE	
ACK	← ACK	→ INVITE 2
		← 180 Ringing
	NOTIFY ←	NOTIFY 2
	200 OK NOTIFY →	200 OK NOTIFY
		← 200 OK INVITE
		→ ACK
	Apply post test routine	

TSS	TP	Reference	Selection expression
CC/originating_AS/Operation	CC_N03_005	4.5.4.2.3.1	PICS 4.3.2-1/4

Test purpose

CCNR Recall successful by using the special REFER interworking. Sending an INVITE request to the originating user.

Ensure that the originating AS starts the CCNR recall procedure when the indication that the callee is available to recall indicated in a NOTIFY request and the state header in the call-completion MIME body is set to "ready". An INVITE request is sent to the caller. When the session with the caller is answered, an INVITE request is sent to the callee and the m parameter in the Request line is set to NR. When the callee answers the session, caller and callee are connected.

Preconditions:

SIP header values:

NOTIFY 1   sip:O-AS
        Event:call-completion
        Content-Type: application/call-completion
          cc-state: ready

INVITE 2:   sip: UE B; m=NR
        From: UE A
        To: UE B
        Call-Info: <sip:UE-A>;purpose=call-completion;m=NR

NOTIFY 2   sip:O-AS
        Event:call-completion
        Subscription-State: terminated; reason=noresource

Comments:

SIP 1 (Gm)		SUT		SIP 2 (ISC)
		Invoke CCNR request		
		CCNR request confirmed by AS		
		Terminating user available for recall		
		NOTIFY ←		NOTIFY 1
		200 OK NOTIFY →		200 OK NOTIFY
INVITE	←	INVITE 1		
180 Ringing	→	180 Ringing		
200 OK INVITE	→	200 OK INVITE	→	INVITE 2
ACK	←	ACK	←	180 Ringing
		NOTIFY ←		NOTIFY 2
		200 OK NOTIFY →		200 OK NOTIFY
			←	200 OK INVITE
			→	ACK
		Apply post test routine		

TSS	TP	Reference	Selection expression
CC/originating_AS/Operation	CC_N03_006	4.5.4.2.3.1	PICS 4.3.2-1/4 AND PICS 4.3.2-1/9

Test purpose

CCNL Recall successful by using the special REFER interworking. Sending an INVITE request to the originating user.

Ensure that the originating AS starts the CCNL recall procedure when the indication that the callee is available to recall indicated in a NOTIFY request and the state header in the call-completion MIME body is set to "ready". An INVITE request is sent to the caller. When the session with the caller is answered, an INVITE request is sent to the callee and the m parameter in the Request line is set to NL. When the callee answers the session, caller and callee are connected.

Preconditions:

SIP header values:

NOTIFY 1   sip:O-AS
           Event:call-completion
           Content-Type: application/call-completion
             cc-state: ready

INVITE 2:   sip: UE B; m=NL
           From: UE A
           To: UE B
           Call-Info: <sip:UE-A>;purpose=call-completion;m=NL

NOTIFY 2   sip:O-AS
           Event:call-completion
           Subscription-State: terminated; reason=noresource

Comments:

SIP 1 (Gm)	SUT	SIP 2 (ISC)
	Invoke CCNL request	
	CCNL request confirmed by AS	
	Terminating user available for recall	
	NOTIFY ←	NOTIFY 1
	200 OK NOTIFY →	200 OK NOTIFY
INVITE ←	INVITE 1	
180 Ringing →	180 Ringing	
200 OK INVITE →	200 OK INVITE →	INVITE 2
ACK ←	ACK ←	180 Ringing
	NOTIFY ←	NOTIFY 2
	200 OK NOTIFY →	200 OK NOTIFY
	←	200 OK INVITE
	→	ACK
	Apply post test routine	

TSS	TP	Reference	Selection expression
CC/originating_AS/Operation	CC_N03_007	4.5.4.2.3.2.1	

Test purpose
CCBS Recall not accepted by originating user. CC-T4 expires. Ensure that the originating AS revokes the outstanding CCBS request after having received the notification that the CCBS recall to the callee is possible and the caller does not accept the recall offer. A SUBCRIBE is sent to the terminating AS and the Expires header is set to zero.

Preconditions:

SIP header values:

NOTIFY 1   sip:O-AS
             Event:call-completion
             Content-Type: application/call-completion
               cc-state: ready
REFER: sip: UE A; m=BS
             Refer-To; UE B method=INVITE
INVITE: sip: UE A; m=BS
             Call.Info: UE-A (*from the From header of original communication*); purpose=call-completion;m=BS
             From: UE B
SUBSRIBE sip:T-AS
   Call.Info: UE-A (Public user identity); purpose=call-completion;m=NL
   P-Assertd-Identity: UE-A (Public user identity)
   Event:call-completion
   Expires=0
NOTIFY 2 sip:O-AS
   Event:call-completion
   Subscription-State: terminated; reason=timeout

Comments:
<pre>SIP 1 (Gm)   SUT   SIP 2 (ISC)
                        Invoke CCBS request
                   CCBS request confirmed by AS
                                          Terminating user available for recall
                                    NOTIFY   ←   NOTIFY 1
                              200 OK NOTIFY   →   200 OK NOTIFY

CASE A
REFER   ←   REFER
202 Accepted   →   202 Accepted
                                  Start Timer CC-T4

CASE B
INVITE   ←   INVITE
180 (Ringing)   →   180 (Ringing)
                                  Start Timer CC-T4

                                       ↓
                              Timeout Timer CC-T4
                                    SUBSCRIBE   →   SUBSCRIBE
                                    202 Accepted   ←   202 Accepted

                                       NOTIFY   ←   NOTIFY 2
                              200 OK NOTIFY   →   200 OK NOTIFY
                              Apply post test routine</pre> |

TSS	TP	Reference	Selection expression
CC/originating_AS/Operation	CC_N03_008	4.5.4.2.3.2.1	

Test purpose

CCNR Recall not accepted by originating user.

Ensure that the originating AS revokes the outstanding CCNR request after having received the notification that the CCNR recall to the callee is possible and the caller does not accept the recall offer. A SUBCRIBE is sent to the terminating AS and the Expires header is set to zero.

Preconditions:

SIP header values:

NOTIFY 1   sip:O-AS
            Event:call-completion
            Content-Type: application/call-completion
              cc-state: ready
REFER: sip: UE A; m=NR
            Refer-To; UE B; method=INVITE
INVITE: sip: UE A; m=NR
            Call.Info: UE-A (*from the From header of original communication*); purpose=call-completion;m=NR
            From: UE B
SUBSRIBE sip:T-AS
   Call.Info: UE-A (Public user identity); purpose=call-completion;m=NL
   P-Assertd-Identity: UE-A (Public user identity)
   Event:call-completion
   Expires=0
NOTIFY 2 sip:O-AS
   Event:call-completion
   Subscription-State: terminated; reason=timeout

Comments:

SIP 1 (Gm)		SUT	SIP 2 (ISC)
		Invoke CCBS request	
		CCBS request confirmed by AS	
		Terminating user available for recall	
		NOTIFY ←	NOTIFY 1
		200 OK NOTIFY →	200 OK NOTIFY
CASE A			
REFER	←	REFER	
202 Accepted	→	202 Accepted	
		Start Timer CC-T4	
CASE B			
INVITE	←	INVITE	
180 (Ringing)	→	180 (Ringing)	
		Start Timer CC-T4	
		↓	
		Timeout Timer CC-T4	
		SUBSCRIBE →	SUBSCRIBE
		202 Accepted ←	202 Accepted
		NOTIFY ←	NOTIFY 2
		200 OK NOTIFY →	200 OK NOTIFY
		Apply post test routine	

TSS	TP	Reference	Selection expression
CC/originating_AS/Operation	CC_N03_009	4.5.4.2.3.2.1	PICS 4.3.2-1/9

Test purpose

CCNL Recall not accepted by originating user.

Ensure that the originating AS revokes the outstanding CCNL request after having received the notification that the CCNL recall to the callee is possible and the caller does not accept the recall offer. A SUBCRIBE is sent to the terminating AS and the Expires header is set to zero.

Preconditions:

SIP header values:

NOTIFY 1   sip:O-AS
             Event:call-completion
             Content-Type: application/call-completion
               cc-state: ready
REFER: sip: UE A; m=NL
             Refer-To; UE B; method=INVITE
INVITE: sip: UE A; m=NL
             Call.Info: UE-A (*from the From header of original communication*); purpose=call-completion;m=NL
             From: UE B
SUBSRIBE sip:T-AS
   Call.Info: UE-A (Public user identity); purpose=call-completion;m=NL
   P-Assertd-Identity: UE-A (Public user identity)
   Event:call-completion
   Expires=0
NOTIFY 2 sip:O-AS
   Event:call-completion
   Subscription-State: terminated; reason=timeout

Comments:

SIP 1 (Gm)		SUT	SIP 2 (ISC)
	Invoke CCBS request		
	CCBS request confirmed by AS		
		Terminating user available for recall	
	NOTIFY ←	NOTIFY 1	
	200 OK NOTIFY →	200 OK NOTIFY	
CASE A			
REFER ←	REFER		
202 Accepted →	202 Accepted		
	Start Timer CC-T4		
CASE B			
INVITE ←	INVITE		
180 (Ringing) →	180 (Ringing)		
	Start Timer CC-T4		
	↓		
	Timeout Timer CC-T4		
	SUBSCRIBE →	SUBSCRIBE	
	202 Accepted ←	202 Accepted	
	NOTIFY ←	NOTIFY 2	
	200 OK NOTIFY →	200 OK NOTIFY	
	Apply post test routine		

TSS	TP	Reference	Selection expression
CC/originating_AS/Operation	CC_N03_010	4.5.4.2.3.2.2	NOT PICS 4.3.2-1/4

Test purpose

CCBS Caller is found to be busy, when a CC recall notification has been received.

Ensure that when the caller is found to be busy, when a CCBS CC recall notification has been received, then the originating AS shall suspend the CC request until the caller becomes not busy. The originating AS shall send a PUBLISH request to the terminating AS containing a presence XML body status set to "closed". The originating AS shall send a PUBLISH request to the terminating AS containing a presence XML body status set to "open" when the caller is no longer busy.

Preconditions:

SIP header values:

NOTIFY 1   sip:O-AS
              Event:call-completion
              Content-Type: application/call-completion
                 cc-state: ready
REFER: sip: UE A; m=BS
              Refer-To; UE B; method=INVITE
INVITE: sip: UE A; m=BS
              Call.Info: UE-A (*from the From header of original communication*); purpose=call-completion;m=BS
              From: UE B
PUBLISH 1:   sip T-AS
              Call.Info: UE-A (*Public user identity*); purpose=call-completion;m=BS
              P-Assertd-Identity: UE A (Public user identity)
              Expires=(> 0)
              Event: presence
              Content-Type: application/pidf+xml
              <?xml version="1.0" encoding="UTF-8"?>
              <presence
                 <tuple id=" any uri ">
                    <status>
                       <basic>closed</basic>
NOTIFY 2 sip:O-AS
   Event:call-completion
   Content-Type: application/call-completion
      cc-state: queued

PUBLISH 2:   sip T-AS
              To: UE B
              Call.Info: UE-A (*Public user identity*); purpose=call-completion;m=BS
              P-Assertd-Identity: UE A (Public user identity)
              Expires=(> 0)
              Event: presence
              Content-Type: application/pidf+xml
              <?xml version="1.0" encoding="UTF-8"?>
              <presence
                 <tuple id=" any uri ">
                    <status>
                       <basic>open</basic>

Comments:

SIP 1 (Gm)		SUT		SIP 2 (ISC)
Invoke CCBS request				
CCBS request confirmed by AS				
				Terminating user available for recall
Establish a session to SIP 2 (make UE A busy)				
		NOTIFY 1	←	NOTIFY 1
		200 OK NOTIFY	→	200 OK NOTIFY
CASE A				
REFER	←	REFER		
486 (Busy Here)	→	486 (Busy Here)		
		PUBLISH 1	→	PUBLISH
		200 OK PUBLISH	←	200 OK PUBLISH
		NOTIFY 1	←	NOTIFY 2
		200 OK NOTIFY	→	200 OK NOTIFY
CASE B				
INVITE	←	INVITE		
486 (Busy Here)	→	486 (Busy Here)		
		PUBLISH 1	→	PUBLISH
		200 OK PUBLISH	←	200 OK PUBLISH
		NOTIFY 1	←	NOTIFY 2
		200 OK NOTIFY	→	200 OK NOTIFY
Disconnect session to SIP 2 (make UE A available)				
		PUBLISH 2	→	PUBLISH
		200 OK PUBLISH	←	200 OK PUBLISH
		NOTIFY 1	←	NOTIFY 2
		200 OK NOTIFY	→	200 OK NOTIFY
Apply post test routine				

TSS	TP	Reference	Selection expression
CC/originating_AS/Operation	CC_N03_011	4.5.4.2.3.2.2	NOT PICS 4.3.2-1/4

Test purpose

CCNR Caller is found to be busy, when a CC recall notification has been received.

Ensure that when the caller is found to be busy, when a CCNR CC recall notification has been received, then the originating AS shall suspend the CC request until the caller becomes not busy. The originating AS shall send a PUBLISH request to the terminating AS containing a presence XML body status set to "closed". The originating AS shall send a PUBLISH request to the terminating AS containing a presence XML body status set to "open" when the caller is no longer busy.

Preconditions:

SIP header values:

NOTIFY 1   sip:O-AS
            Event:call-completion
            Content-Type: application/call-completion
                cc-state: ready
REFER: sip: UE A; m=NR
            Refer-To; UE B; method=INVITE
INVITE: sip: UE A; m=NR
            Call.Info: UE-A (*from the From header of original communication*); purpose=call-completion;m=NR
            From: UE B
PUBLISH 1:   sip T-AS
            Call.Info: UE-A (Public user identity); purpose=call-completion;m=NR
            P-Assertd-Identity: UE A (Public user identity)
            Expires=(> 0)
            Event: presence
            Content-Type: application/pidf+xml
            <?xml version="1.0" encoding="UTF-8"?>
            <presence
                <tuple id=" any uri ">
                    <status>
                        <basic>closed</basic>
NOTIFY 2 sip:O-AS
    Event:call-completion
    Content-Type: application/call-completion
        cc-state: queued

PUBLISH 2:   sip T-AS
            To: UE B
            Call.Info: UE-A (Public user identity); purpose=call-completion;m=NR
            P-Assertd-Identity: UE A (Public user identity)
            Expires=(> 0)
            Event: presence
            Content-Type: application/pidf+xml
            <?xml version="1.0" encoding="UTF-8"?>
            <presence
                <tuple id=" any uri ">
                    <status>
                        <basic>open</basic>

```
Comments:
SIP 1 (Gm)                              SUT              SIP 2 (ISC)
                      Invoke CCNR request
                 CCNR request confirmed by AS
                                            Terminating user available for recall
          Establish a session to SIP 2 (make UE A busy)
                                    NOTIFY 1     ←     NOTIFY 1
                                200 OK NOTIFY    →     200 OK NOTIFY
CASE A
REFER                     ←     REFER
486 (Busy Here)           →     486 (Busy Here)
                                    PUBLISH 1    →     PUBLISH
                                200 OK PUBLISH   ←     200 OK PUBLISH

                                    NOTIFY 1     ←     NOTIFY 2
                                200 OK NOTIFY    →     200 OK NOTIFY
CASE B
INVITE                    ←     INVITE
486 (Busy Here)           →     486 (Busy Here)
                                    PUBLISH 1    →     PUBLISH
                                200 OK PUBLISH   ←     200 OK PUBLISH

                                    NOTIFY 1     ←     NOTIFY 2
                                200 OK NOTIFY    →     200 OK NOTIFY
          Disconnect session to SIP 2 (make UE A available)
                                    PUBLISH 2    →     PUBLISH
                                200 OK PUBLISH   ←     200 OK PUBLISH

                                    NOTIFY 1     ←     NOTIFY 2
                                200 OK NOTIFY    →     200 OK NOTIFY
                      Apply post test routine
```

TSS CC/originating_AS/Operation	TP CC_N03_012	Reference 4.5.4.2.3.2.2	Selection expression NOT PICS 4.3.2-1/4PICS 4.3.2-1/9

Test purpose

CCNL Caller is found to be busy, when a CC recall notification has been received.

Ensure that when the caller is found to be busy, when a CCNL CC recall notification has been received, then the originating AS shall suspend the CC request until the caller becomes not busy. The originating AS shall send a PUBLISH request to the terminating AS containing a presence XML body status set to "closed". The originating AS shall send a PUBLISH request to the terminating AS containing a presence XML body status set to "open" when the caller is no longer busy.

Preconditions:

SIP header values:

NOTIFY 1   sip:O-AS
             Event:call-completion
             Content-Type: application/call-completion
               cc-state: ready
REFER: sip: UE A; m=NL
             Refer-To; UE B; method=INVITE
INVITE: sip: UE A; m=NL
             Call.Info: UE-A (*from the From header of original communication*); purpose=call-completion;m=NL
             From: UE B
PUBLISH 1: sip T-AS
             Call.Info: UE-A (Public user identity); purpose=call-completion;m=NL
             P-Assertd-Identity: UE A (Public user identity)
             Expires=(> 0)
             Event: presence
             Content-Type: application/pidf+xml
             <?xml version="1.0" encoding="UTF-8"?>
             <presence
               <tuple id=" any uri ">
                  <status>
                     <basic>closed</basic>
NOTIFY 2 sip:O-AS
   Event:call-completion
   Content-Type: application/call-completion
      cc-state: queued

PUBLISH 2: sip T-AS
             To: UE B
             Call.Info: UE-A (Public user identity); purpose=call-completion;m=NL
             P-Assertd-Identity: UE A (Public user identity)
             Expires=(> 0)
             Event: presence
             Content-Type: application/pidf+xml
             <?xml version="1.0" encoding="UTF-8"?>
             <presence
               <tuple id=" any uri ">
                 <status>
                    <basic>open</basic>

Comments:		
SIP 1 (Gm)	SUT	SIP 2 (ISC)
	Invoke CCNL request	
	CCNL request confirmed by AS	
		Terminating user available for recall
	Establish a session to SIP 2 (make UE A busy)	
	NOTIFY 1 ←	NOTIFY 1
	200 OK NOTIFY →	200 OK NOTIFY
CASE A		
REFER ←	REFER	
486 (Busy Here) →	486 (Busy Here)	
	PUBLISH 1 →	PUBLISH
	200 OK PUBLISH ←	200 OK PUBLISH
	NOTIFY 1 ←	NOTIFY 2
	200 OK NOTIFY →	200 OK NOTIFY
CASE B		
INVITE ←	INVITE	
486 (Busy Here) →	486 (Busy Here)	
	PUBLISH 1 →	PUBLISH
	200 OK PUBLISH ←	200 OK PUBLISH
	NOTIFY 1 ←	NOTIFY 2
	200 OK NOTIFY →	200 OK NOTIFY
	Disconnect session to SIP 2 (make UE A available)	
	PUBLISH 2 →	PUBLISH
	200 OK PUBLISH ←	200 OK PUBLISH
	NOTIFY 1 ←	NOTIFY 2
	200 OK NOTIFY →	200 OK NOTIFY
	Apply post test routine	

TSS	TP	Reference	Selection expression
CC/originating_AS/Operation	CC_N03_013	4.5.4.2.3.2.3	NOT PICS 4.3.2-1/3

Test purpose
The caller initiates another communication to the same destination B and activates the same CC service CCBS again. The two communications are identical. The AS discards the current request.
Ensure that the caller initiates another communication to the same destination B and activates the same CC service (CCBS) again then the originating AS retains the original request and discards the current request and informs the caller that the request has not been accepted because a CC request had already been stored against the requested callee.

Preconditions:

SIP header values:
486 Busy Here: Call-Info: <sip:UE-B>;purpose=call-completion;m=BS

Comments:		
SIP 1 (Gm)	SUT	SIP 2 (ISC)
	Invoke CCBS request	
	CCBS request confirmed by AS	
INVITE →	→	INVITE
100 Trying ←	←	100 Trying
	486 (Busy Here) ←	486 (Busy Here)
183 Session Progress ←	183 Session Progress →	ACK
	Announcement that CCBS is possible	
	Inband-interaction procedures for the CC activation	
	Announcement that CCBS is not invoked	
	Apply post test routine	

TSS	TP	Reference	Selection expression
CC/originating_AS/Operation	CC_N03_014	4.5.4.2.3.2.3	NOT PICS 4.3.2-1/3

Test purpose
The caller initiates another communication to the same destination B and activates the same CC service CCNR again.
The two communications are identical. The AS discards the current request.

Ensure that the caller initiates another communication to the same destination B and activates the same CC service (CCNR) again then the originating AS retains the original request and discards the current request and informs the caller that the request has not been accepted because a CC request had already been stored against the requested callee.

Preconditions:

SIP header values:
180 Ringing 2:
    Call-Info: <sip:UE-B>;purpose=call-completion;m=NR

Comments:

SIP 1 (Gm)		SUT		SIP 2 (ISC)
		Invoke CCNR request		
		CCNR request confirmed by AS		
INVITE	→		→	INVITE
100 Trying	←		←	100 Trying
			←	180 Ringing 1
180 Ringing 2	←			
		Announcement that CCNR is possible		
		Inband-interaction procedures for the CC activation		
		Announcement that CCBS is not invoked		
CANCEL	→		→	CANCEL
200 OK CANCEL	←		←	200 OK CANCEL
487 Request Terminated	←		←	487 Request Terminated
ACK	→		→	ACK
		Apply post test routine		

TSS	TP	Reference	Selection expression
CC/originating_AS/Operation	CC_N03_015	4.5.4.2.3.2.3	PICS 4.3.2-1/9 AND NOT PICS 4.3.2-1/3

Test purpose
The caller initiates another communication to the same destination B and activates the same CC service CCNL again.
The two communications are identical. The AS discards the current request.

Ensure that the caller initiates another communication to the same destination B and activates the same CC service (CCNL) again then the originating AS retains the original request and discards the current request and informs the caller that the request has not been accepted because a CC request had already been stored against the requested callee.

Preconditions:

SIP header values:
480 Temporarily Unavailable:
    Call-Info: <sip:UE-B>;purpose=call-completion;m=NL

Comments:

SIP 1 (Gm)		SUT		SIP 2 (ISC)
		Invoke CCBS request		
		CCBS request confirmed by AS		
INVITE	→		→	INVITE
100 Trying	←		←	100 Trying
		480 (Temporarily Unavailable)	←	480 (Temporarily Unavailable)
183 Session Progress	←	183 Session Progress	→	ACK
		Announcement that CCBS is possible		
		Inband-interaction procedures for the CC activation		
		Announcement that CCBS is not invoked		
		Apply post test routine		

TSS	TP	Reference	Selection expression
CC/originating_AS/Operation	CC_N03_016	4.5.4.2.3.2.3	PICS 4.3.2-1/3

Test purpose

The caller initiates another communication to the same destination B and activates the same CC service CCBS again.
The two communications are identical. The AS treat this as a new CC request.

Ensure that the caller initiates another communication to the same destination B and activates the same CC service (CCBS) again, the originating AS shall treat this as a new CC request, A SUBSRIBE request is sent to the terminating AS indicating a CCBS request - a m parameter set to "BS" is attached at the Request line.

Preconditions:

SIP header values:

486 Busy Here:
    Call-Info: <sip:UE-B>;purpose=call-completion;m=BS
SUBSRIBE sip:T-AS;m=BS
    From:<UE-A>
    To:<UE-B>
    Contact:<O-AS>
    Call.Info: <UE-A>; purpose=call-completion;m=BS
    P-Assertd-Identity: UE-A
    Expires: CC-T3
    Event:call-completion
NOTIFY sip:O-AS
    Event:call-completion
    Content-Type: application/call-completion
      cc-state: queued

Comments:

SIP 1 (Gm)	SUT		SIP 2 (ISC)
	Invoke CCBS request		
	CCBS request confirmed by AS		
INVITE	➔	➔	INVITE
100 Trying	⬅	⬅	100 Trying
	486 (Busy Here)	⬅	486 (Busy Here)
183 Session Progress	⬅ 183 Session Progress	➔	ACK
	Announcement that CCBS is possible		
	Inband-interaction procedures for the CC activation		
		➔	SUBSCRIBE
		⬅	202 Accepted
		⬅	NOTIFY
		➔	200 OK NOTIFY
	Confirm to the caller that the invocation was successful		
	Apply post test routine		

TSS	TP	Reference	Selection expression
CC/originating_AS/Operation	CC_N03_017	4.5.4.2.3.2.3	PICS 4.3.2-1/4

Test purpose
The caller initiates another communication to the same destination B and activates the same CC service CCNR again. The two communications are identical. The AS treat this as a new CC request.
Ensure that the caller initiates another communication to the same destination B and activates the same CC service (CCNR) again, the originating AS shall treat this as a new CC request, A SUBSRIBE request is sent to the terminating AS indicating a CCBS request - a m parameter set to "NR" is attached at the Request line.

Preconditions:

SIP header values:
180 Ringing 2:
Call-Info: <sip:UE-B>;purpose=call-completion;m=NR
SUBSRIBE sip:T-AS;m=NR
From:<UE-A>
To:<UE-B>
Contact:<O-AS>
Call.Info: <UE-A>; purpose=call-completion;m=NR
P-Assertd-Identity: UE-A
Expires: CC-T3
Event:call-completion
NOTIFY sip:O-AS
Event:call-completion
Content-Type: application/call-completion
cc-state: queued

Comments:
SIP 1 (Gm)   SUT   SIP 2 (ISC)
Invoke CCNR request
CCNR request confirmed by AS
INVITE   →   →   INVITE
100 Trying   ←   ←   100 Trying
←   180 Ringing 1
180 Ringing 2   ←
Announcement that CCNR is possible
Inband-interaction procedures for the CC activation
→   SUBSCRIBE
←   202 Accepted
←   NOTIFY
→   200 OK NOTIFY
Confirm to the caller that the invocation was successful
Apply post test routine

TSS	TP	Reference	Selection expression
CC/originating_AS/Operation	CC_N03_018	4.5.4.2.3.2.3	PICS 4.3.2-1/3 AND PICS 4.3.2-1/9

Test purpose

The caller initiates another communication to the same destination B and activates the same CC service CCNL again. The two communications are identical. The AS treats this as a new CC request.

Ensure that the caller initiates another communication to the same destination B and activates the same CC service (CCNL) again, the originating AS shall treat this as a new CC request, A SUBSRIBE request is sent to the terminating AS indicating a CCNL request - a m parameter set to "NL" is attached at the Request line.

Preconditions:

SIP header values:

480 Temporarily Unavailable:
   Call-Info: <sip:UE-B>;purpose=call-completion;m=NL
SUBSRIBE sip:T-AS;m=NL
   From:<UE-A>
   To:<UE-B>
   Contact:<O-AS>
   Call.Info: <UE-A>; purpose=call-completion;m=NL
   P-Assertd-Identity: UE-A
   Expires: CC-T3
   Event:call-completion
NOTIFY sip:O-AS
   Event:call-completion
   Content-Type: application/call-completion
     cc-state: queued

Comments:

SIP 1 (Gm)		SUT		SIP 2 (ISC)
		Invoke CCBS request		
		CCBS request confirmed by AS		
INVITE	→		→	INVITE
100 Trying	←		←	100 Trying
		480 (Temporarily Unavailable)	←	480 (Temporarily Unavailable)
183 Session Progress	←	183 Session Progress	→	ACK
		Announcement that CCBS is possible		
		Inband-interaction procedures for the CC activation		
			→	SUBSCRIBE
			←	202 Accepted
			←	NOTIFY
			→	200 OK NOTIFY
		Confirm to the caller that the invocation was successful		
		Apply post test routine		

5.3   Actions at the terminating AS

5.3.1   CC possible indication

TSS		TP	Reference	Selection expression
CC/terminating_AS/possibleIndication		CC_N04_001	4.5.4.3.1.1	
Test purpose				
The terminating AS inserts a Call-Info header in the 486 final response received from the terminating user. Ensure that the terminating AS inserts a Call-Info header and the purpose parameter is set to call-completion and the m parameter is set to BS in the 486 (Busy Here) received from the callee and forwards to the originating AS.				
Preconditions:				
SIP header values: 486 (Busy Here) 1: Call-Info: <sip:UE-B>;purpose=call-completion;m=BS				
Comments:				
SIP 1 (ISC)		**SUT**		**SIP 2 (Gm)**
INVITE	→		→	INVITE
100 Trying	←		←	100 Trying
486 (Busy Here) 1	←		←	486 (Busy Here)
ACK	→		→	ACK
		Apply post test routine		

TSS		TP	Reference	Selection expression
CC/terminating_AS_AS/possibleIndication		CC_N04_002	4.5.4.3.1.1	
Test purpose				
The terminating AS inserts a Call-Info header in the 486 final response in case of NDUB. Ensure that the terminating AS in case of NDUB sends a 486 (Busy Here) containing a Call-Info header and the purpose parameter is set to call-completion and the m parameter is set to BS to the originating AS.				
Preconditions: Callee is network determined user busy				
SIP header values: 486 (Busy Here) 1: Call-Info: <sip:UE-B>;purpose=call-completion;m=BS				
Comments:				
SIP 1 (ISC)		**SUT**		**SIP 2 (Gm)**
INVITE	→			
100 Trying	←			
486 (Busy Here) 1	←			
ACK	→			
		Apply post test routine		

TSS		TP	Reference	Selection expression
CC/terminating_AS_AS/possibleIndication		CC_N04_003	4.5.4.3.1.1	
Test purpose				
The terminating AS inserts a Call-Info header in the 180 provisional response. Ensure that the terminating AS inserts a Call-Info header in the 180 (Ringing) and the purpose parameter is set to call-completion and the m parameter is set to NR received from the callee and forwards to the originating AS.				
Preconditions:				
SIP header values: 180 (Ringing) 1: Call-Info: <sip:UE-B>;purpose=call-completion;m=NR				
Comments:				
SIP 1 (ISC)		**SUT**		**SIP 2 (Gm)**
INVITE	→		→	INVITE
100 Trying	←		←	100 Trying
180 (Ringing) 1	←		←	180 (Ringing)
		Apply post test routine		

TSS	TP	Reference	Selection expression
CC/terminating_AS/possibleIndication	CC_N04_004	4.5.4.3.1.1	PICS 4.3.2-1/9

Test purpose

The terminating AS inserts a Call-Info header in the 480 final response if the terminating user is not logged-in.

Ensure that the terminating AS inserts a Call-Info header and the purpose parameter is set to call-completion and the m parameter is set to NL in the 480 (Temporarily Unavailable) if the terminating user is not logged-in and forwards to the originating AS.

Preconditions:			

SIP header values:
480 Temporarily Unavailable:
    Call-Info: <sip:UE-B>;purpose=call-completion;m=NL

Comments:

SIP 1 (ISC)		SUT	SIP 2 (Gm)
INVITE	→		
100 Trying	←		
480 (Temporarily Unavailable)	←		
ACK	→		

Apply post test routine

TSS	TP	Reference	Selection expression
CC/terminating_AS_AS/possibleIndication	CC_N04_005	4.5.4.3.1.1	

Test purpose

Terminating user does not subscribe to the CCBS service. No Call-Info header field included.

Ensure that no Call-Info header is included in the 486 (Busy Here) If the terminating AS knows that the CC is not possible on destination B (callee).

Preconditions: Terminating user does not subscribe to the CC service

SIP header values:
486 (Busy Here) 1:
    Call-Info not included

Comments:

SIP 1 (ISC)		SUT		SIP 2 (Gm)
INVITE	→		→	INVITE
100 Trying	←		←	100 Trying
486 (Busy Here) 1	←		←	486 (Busy Here)
ACK	→		→	ACK

Apply post test routine

TSS	TP	Reference	Selection expression
CC/terminating_AS_AS/possibleIndication	CC_N04_006	4.5.4.3.1.1	

Test purpose

Terminating user does not subscribe to the CCNR service. No Call-Info header field included.

Ensure that no Call-Info header is included in the 180 (Ringing) If the terminating AS knows that the CC is not possible on destination B (callee).

Preconditions: Terminating user does not subscribe to the CC service

SIP header values:
180 (Ringing) 1:
    Call-Info not included

Comments:

SIP 1 (ISC)		SUT		SIP 2 (Gm)
INVITE	→		→	INVITE
100 Trying	←		←	100 Trying
180 (Ringing) 1	←		←	180 (Ringing)

Apply post test routine

TSS	TP	Reference	Selection expression
CC/terminating_AS_AS/possibleIndication	CC_N04_007	4.5.4.3.1.1	PICS 4.3.2-1/9

Test purpose

Terminating user does not subscribe to the CCNL service. No Call-Info header field included.

Ensure that no Call-Info header is included in the 480 (Temporarily Unavailable) If the terminating AS knows that the CC is not possible on destination B (callee) and the terminating user is not logged-in.

Preconditions: Terminating user does not subscribe to the CC service

SIP header values:
480 Temporarily Unavailable:
   Call-Info not included

Comments:

SIP 1 (ISC)		SUT	SIP 2 (Gm)
INVITE	→		
100 Trying	←		
480 (Temporarily Unavailable)	←		
ACK	→		
	Apply post test routine		

5.3.2 CC Invocation

TSS	TP	Reference	Selection expression
CC/terminating_AS/Invocation	CC_N05_001	4.5.4.3.2.1	

Test purpose

CCBS service invocation successful at the terminating AS.

Ensure that the terminating AS is able to queue the CCBS request received in a SUBSCRIBE request from the originating AS and responds with a NOTIFY request. In the NOTIFY request the state header of the call-completion MIME body is set to queued.

Preconditions:

SIP header values:
486 (Busy Here) 1:
   Call-Info: <sip:UE-B>;purpose=call-completion;m=BS
SUBSRIBE sip:T-AS;m=BS
   From:<UE-A>
   To:<UE-B>
   Contact:<O-AS>
   Call.Info: <UE-A>; purpose=call-completion;m=BS
   P-Assertd-Identity: UE-A
   Expires: CC-T3
   Event:call-completion
202 Accepted
   Expires: ≤ value received in SUBSRIBE
NOTIFY sip:O-AS
   From:<UE-B>
   To:<UE-A>
   Event:call-completion
   Subscription-State: active;expires=< any value >
   Content-Type: application/call-completion
      cc-state: queued

Comments:

SIP 1 (ISC)		SUT		SIP 2 (Gm)
INVITE	→		→	INVITE
100 Trying	←		←	100 Trying
486 (Busy Here) 1	←		←	486 (Busy Here)
ACK	→		→	ACK
SUBSCRIBE	→			
202 Accepted	←			
NOTIFY	←			
200 OK NOTIFY	→			
		Apply post test routine		

TSS		TP	Reference	Selection expression
CC/terminating_AS/Invocation		CC_N05_002	4.5.4.3.2.1	
Test purpose				
CCNR service invocation successful at the terminating AS. Ensure that the terminating AS is able to queue the CCNR request received in a SUBSCRIBE request from the originating AS and responds with a NOTIFY request. In the NOTIFY request the state header of the call-completion MIME body is set to queued.				
Preconditions:				

SIP header values:
180 Ringing 1:
   Call-Info: <sip:UE-B>;purpose=call-completion;m=NR
SUBSRIBE sip:T-AS;m=NR
   From:<UE-A>
   To:<UE-B>
   Contact:<O-AS>
   Call.Info: <UE-A>; purpose=call-completion;m=NR
   P-Assertd-Identity: UE-A
   Expires: CC-T3
   Event:call-completion
202 Accepted
   Expires: ≤ value received in SUBSRIBE
NOTIFY sip:O-AS
   From:<UE-B>
   To:<UE-A>
   Event:call-completion
   Subscription-State: active;expires=< any value >
   Content-Type: application/call-completion
      cc-state: queued				

Comments: **SIP 1 (ISC)**	**SUT**		**SIP 2 (Gm)**	
INVITE	→	→	INVITE	
100 Trying	←	←	100 Trying	
180 Ringing 1	←	←	180 Ringing	
SUBSCRIBE	→			
202 Accepted	←			
NOTIFY	←			
200 OK NOTIFY	→			
	Apply post test routine			

TSS	TP	Reference	Selection expression
CC/terminating_AS/Invocation	CC_N05_003	4.5.4.3.2.1	PICS 4.3.2-1/9

Test purpose
CCNL service invocation successful at the terminating AS.
Ensure that the terminating AS is able to queue the CCNL request received in a SUBSCRIBE request from the originating AS and responds with a NOTIFY request. In the NOTIFY request the state header of the call-completion MIME body is set to queued.

Preconditions:

SIP header values:
480 (Temporarily Unavailable) 1:
Call-Info: <sip:UE-B>;purpose=call-completion;m=NL
SUBSRIBE sip:T-AS;m=NL
From:<UE-A>
To:<UE-B>
Contact:<O-AS>
Call.Info: <UE-A>; purpose=call-completion;m=NL
P-Assertd-Identity: UE-A
Expires: CC-T3
Event:call-completion
202 Accepted
Expires: ≤ value received in SUBSRIBE
NOTIFY sip:O-AS
From:<UE-B>
To:<UE-A>
Event:call-completion
Subscription-State: active;expires=< any value >
Content-Type: application/call-completion
cc-state: queued

Comments:				
SIP 1 (ISC)		**SUT**		**SIP 2 (Gm)**
INVITE	→		→	INVITE
100 Trying	←		←	100 Trying
480 (Temporarily Unavailable) 1	←		←	480 (Temporarily Unavailable)
ACK	→		→	ACK
SUBSCRIBE	→			
202 Accepted	←			
NOTIFY	←			
200 OK NOTIFY	→			
		Apply post test routine		

TSS	TP	Reference	Selection expression
CC/terminating_AS/Invocation	CC_N05_004	4.5.4.3.2.2	

Test purpose
CCBS service invocation unsuccessful at the terminating AS. Maximum number of queue entries is reached.
Ensure that the terminating AS responds to the SUBSCRIBE request containing the CCBS invoke received from the originating AS with a 480 (Temporarily Unavailable) if the callee's B queue limit is reached.

Preconditions:

SIP header values:
SUBSRIBE sip:T-AS;m=BS
From:<UE-A>
To:<UE-B>
Call.Info: <UE-A>; purpose=call-completion;m=BS
P-Assertd-Identity: UE-A
Expires: CC-T3
Contact:<O-AS>
Event:call-completion

Comments:			
SIP 1 (ISC)		**SUT**	**SIP 2 (Gm)**
		Set the B queue to limit	
INVITE	→	→	INVITE
100 Trying	←	←	100 Trying
486 (Busy Here)	←	←	486 (Busy Here)
ACK	→	→	ACK
SUBSCRIBE	→		
480 Temporarily Unavailable	←		
		Apply post test routine	

TSS	TP	Reference	Selection expression
CC/terminating_AS/Invocation	CC_N05_005	4.5.4.3.2.2	

Test purpose
CCBS service invocation unsuccessful at the terminating AS. No CC queue for the terminatin user available.
Ensure that the terminating AS responds to the SUBSCRIBE request containing the CCBS invoke received from the originating AS with a 403 Forbidden if no CC queue is available for the requested CC service at the terminating AS for the terminating user.

Preconditions:

SIP header values:
SUBSRIBE sip:T-AS;m=BS
From:<UE-A>
To:<UE B>
Call.Info: <UE-A>; purpose=call-completion;m=BS
P-Assertd-Identity: UE-A
Expires: CC-T3
Contact:<O-AS>
Event:call-completion

Comments:			
SIP 1 (ISC)		**SUT**	**SIP 2 (Gm)**
INVITE	→	→	INVITE
100 Trying	←	←	100 Trying
486 (Busy Here)	←	←	486 (Busy Here)
ACK	→	→	ACK
SUBSCRIBE	→		
403 Forbidden	←		
		Apply post test routine	

TSS	TP	Reference	Selection expression
CC/terminating_AS/Invocation	CC_N05_006	4.5.4.3.2.2	

Test purpose

CCNR service invocation unsuccessful at the terminating AS. Maximum number of queue entries is reached.

Ensure that the terminating AS responds to the SUBSCRIBE request containing the CCNR invoke received from the originating AS with a 480 (Temporarily Unavailable) if the callee's B queue limit is reached.

Preconditions:

SIP header values:
SUBSRIBE sip:T-AS;m=NR
   From:<UE-A>
   To:<UE-B>
   Call.Info: <UE-A>; purpose=call-completion;m=BS
   P-Assertd-Identity: UE-A
   Expires: CC-T3
   Contact:<O-AS>
   Event:call-completion

Comments:

SIP 1 (ISC)		SUT		SIP 2 (Gm)
		Set the B queue to limit		
INVITE	→		→	INVITE
100 Trying	←		←	100 Trying
180 Ringing 1	←		←	180 Ringing
SUBSCRIBE	→			
480 Temporarily Unavailable	←			
		Apply post test routine		

TSS	TP	Reference	Selection expression
CC/terminating_AS/Invocation	CC_N05_007	4.5.4.3.2.2	

Test purpose

CCNR service invocation unsuccessful at the terminating AS. No CC queue for the terminatin user available.

Ensure that the terminating AS responds to the SUBSCRIBE request containing the CCNR invoke received from the originating AS with a 403 Forbidden if no CC queue is available for the requested CC service at the terminating AS.

Preconditions:

SIP header values:
SUBSRIBE sip:T-AS;m=NR
   From:<UE-A>
   To:<UE B>
   Call.Info: <UE-A>; purpose=call-completion;m=BS
   P-Assertd-Identity: UE-A
   Expires: CC-T3
   Contact:<O-AS>
   Event:call-completion

Comments:

SIP 1 (ISC)		SUT		SIP 2 (Gm)
INVITE	→		→	INVITE
100 Trying	←		←	100 Trying
180 (Ringing)	←		←	180 (Ringing)
SUBSCRIBE	→			
403 Forbidden	←			
		Apply post test routine		

TSS	TP	Reference	Selection expression
CC/terminating_AS/Invocation	CC_N05_008	4.5.4.3.2.2	PICS 4.3.2-1/9

Test purpose

CCNL service invocation unsuccessful at the terminating AS. Maximum number of queue entries is reached.

Ensure that the terminating AS responds to the SUBSCRIBE request containing the CCNL invoke received from the originating AS with a 480 (Temporarily Unavailable) if the callee's B queue limit is reached.

Preconditions:

SIP header values:

SUBSRIBE sip:T-AS;m=NL
   From:<UE-A>
   To:<UE-B>
   Call.Info: <UE-A>; purpose=call-completion;m=NL
   P-Assertd-Identity: UE-A
   Expires: CC-T3
   Contact:<O-AS>
   Event:call-completion

Comments:

SIP 1 (ISC)		SUT		SIP 2 (Gm)
		Set the B queue to limit		
INVITE	→		→	INVITE
100 Trying	←		←	100 Trying
486 (Busy Here)	←		←	486 (Busy Here)
ACK	→		→	ACK
SUBSCRIBE	→			
480 Temporarily Unavailable	←			
		Apply post test routine		

TSS	TP	Reference	Selection expression
CC/terminating_AS/Invocation	CC_N05_009	4.5.4.3.2.2	PICS 4.3.2-1/9

Test purpose

CCNL service invocation unsuccessful at the terminating AS. No CC queue for the terminatin user available.

Ensure that the terminating AS responds to the SUBSCRIBE request containing the CCNL invoke received from the originating AS with a 403 Forbidden if no CC queue is available for the requested CC service at the terminating AS for the terminating user.

Preconditions:

SIP header values:

SUBSRIBE sip:T-AS;m=BS
   From:<UE-A>
   To:<UE B>
   Call.Info: <UE-A>; purpose=call-completion;m=BS
   P-Assertd-Identity: UE-A
   Expires: CC-T3
   Contact:<O-AS>
   Event:call-completion

Comments:

SIP 1 (ISC)		SUT		SIP 2 (Gm)
INVITE	→		→	INVITE
100 Trying	←		←	100 Trying
486 (Busy Here)	←		←	486 (Busy Here)
ACK	→		→	ACK
SUBSCRIBE	→			
403 Forbidden	←			
		Apply post test routine		

TSS	TP	Reference	Selection expression
CC/terminating_AS/Invocation	CC_N05_010	4.5.4.3.2.1	PICS 4.3.2-1/2

Test purpose

CCBS service invocation successful at the terminating AS. Retain option supported.

Ensure that the terminating AS is able to queue the CCBS request received in a SUBSCRIBE request from the originating AS and responds with a NOTIFY request. In the NOTIFY request the state header of the call-completion MIME body is set to queued and the service-retention header is present and set to 'true'.

Preconditions:

SIP header values:
486 (Busy Here) 1:
   Call-Info: <sip:UE-B>;purpose=call-completion;m=BS
SUBSRIBE sip:T-AS;m=BS
   From:<UE-A>
   To:<UE-B>
   Call.Info: <UE-A>; purpose=call-completion;m=BS
   P-Assertd-Identity: UE-A
   Expires: CC-T3
   Contact:<O-AS>
   Event:call-completion
NOTIFY sip:O-AS
   From:<UE-B>
   To:<UE-A>
   Event:call-completion
   Subscription-State: active;expires=< any value >
   Event:call-completion
   Content-Type: application/call-completion
      cc-state: queued
      cc-service-retention: true

Comments:

SIP 1 (ISC)		SUT		SIP 2 (Gm)
INVITE	→		→	INVITE
100 Trying	←		←	100 Trying
486 (Busy Here) 1	←		←	486 (Busy Here)
ACK	→		→	ACK
SUBSCRIBE	→			
202 Accepted	←			
NOTIFY	←			
200 OK NOTIFY	→			
		Apply post test routine		

TSS	TP	Reference	Selection expression
CC/terminating_AS/Invocation	CC_N05_0011	4.5.4.3.2.1	NOT PICS 4.3.2-1/2

Test purpose

CCNR service invocation successful at the terminating AS. Retain option not supported.

Ensure that the terminating AS is able to queue the CCBS request received in a SUBSCRIBE request from the originating AS and responds with a NOTIFY request. In the NOTIFY request the state header of the call-completion MIME body is set to queued and the service-retention header is **not** present.

Preconditions:

SIP header values:

486 Busy Here 1:
   Call-Info: <sip:UE-B>;purpose=call-completion;m=BS
SUBSRIBE sip:T-AS;m=BS
   From:<UE-A>
   To:<UE-B>
   Call.Info: <UE-A>; purpose=call-completion;m=BS
   P-Assertd-Identity: UE-A
   Expires: CC-T3
   Contact:<O-AS>
   Event:call-completion
NOTIFY sip:O-AS
   From:<UE-B>
   To:<UE-A>
   Event:call-completion
   Subscription-State: active;expires=< any value >
   Event:call-completion
   Content-Type: application/call-completion
     cc-state: queued

Comments:

SIP 1 (ISC)		SUT		SIP 2 (Gm)
INVITE	→		→	INVITE
100 Trying	←		←	100 Trying
486 (Busy Here) 1	←		←	486 (Busy Here)
ACK	→		→	ACK
SUBSCRIBE	→			
202 Accepted	←			
NOTIFY	←			
200 OK NOTIFY	→			
		Apply post test routine		

TSS	TP	Reference	Selection expression
CC/terminating_AS/Invocation	CC_N05_012	4.5.4.3.2.1	PICS 4.3.2-1/2

Test purpose

CCNR service invocation successful at the terminating AS. Retain option supported.

Ensure that the terminating AS is able to queue the CCNR request received in a SUBSCRIBE request from the originating AS and responds with a NOTIFY request. In the NOTIFY request the state header of the call-completion MIME body is set to queued and the service-retention header is present and set to 'true'.

Preconditions:

SIP header values:

180 Ringing 1:
   Call-Info: <sip:UE-B>;purpose=call-completion;m=NR
SUBSRIBE sip:T-AS;m=NR
   From:<UE-A>
   To:<UE-B>
   Call.Info: <UE-A>; purpose=call-completion;m=NR
   P-Assertd-Identity: UE-A
   Expires: CC-T3
   Contact:<O-AS>
   Event:call-completion
NOTIFY sip:O-AS
   From:<UE-B>
   To:<UE-A>
   Event:call-completion
   Subscription-State: active;expires=< any value >
   Event:call-completion
   Content-Type: application/call-completion
      cc-state: queued
      cc-service-retention: true

Comments:

SIP 1 (ISC)		SUT		SIP 2 (Gm)
INVITE	→		→	INVITE
100 Trying	←		←	100 Trying
180 Ringing 1	←		←	180 Ringing
SUBSCRIBE	→			
202 Accepted	←			
NOTIFY	←			
200 OK NOTIFY	→			
		Apply post test routine		

TSS	TP	Reference	Selection expression
CC/terminating_AS/Invocation	CC_N05_0013	4.5.4.3.2.1	NOT PICS 4.3.2-1/2

Test purpose
CCNR service invocation successful at the terminating AS. Retain option not supported.
Ensure that the terminating AS is able to queue the CCNR request received in a SUBSCRIBE request from the originating AS and responds with a NOTIFY request. In the NOTIFY request the state header of the call-completion MIME body is set to queued and the service-retention header is **not** present.

Preconditions:

SIP header values:
180 Ringing 1:
Call-Info: <sip:UE-B>;purpose=call-completion;m=NR
SUBSRIBE sip:T-AS;m=NR
From:<UE-A>
To:<UE-B>
Call.Info: <UE-A>; purpose=call-completion;m=NR
P-Assertd-Identity: UE-A
Expires: CC-T3
Contact:<O-AS>
Event:call-completion
NOTIFY sip:O-AS
From:<UE-B>
To:<UE-A>
Event:call-completion
Subscription-State: active;expires=< any value >
Event:call-completion
Content-Type: application/call-completion
cc-state: queued

Comments:			
SIP 1 (ISC)	**SUT**		**SIP 2 (Gm)**
INVITE	→	→	INVITE
100 Trying	←	←	100 Trying
180 Ringing 1	←	←	180 Ringing
SUBSCRIBE	→		
202 Accepted	←		
NOTIFY	←		
200 OK NOTIFY	→		
	Apply post test routine		

TSS CC/terminating_AS/Invocation	TP CC_N05_014	Reference 4.5.4.3.2.1	Selection expression PICS 4.3.2-1/2 AND PICS 4.3.2-1/9

Test purpose

CCNL service invocation successful at the terminating AS. Retain option supported.

Ensure that the terminating AS is able to queue the CCNL request received in a SUBSCRIBE request from the originating AS and responds with a NOTIFY request. In the NOTIFY request the state header of the call-completion MIME body is set to queued and the service-retention header is present and set to 'true'.

Preconditions:

SIP header values:
480 Temporarily Unavailable 1:
    Call-Info: <sip:UE-B>;purpose=call-completion;m=NL
SUBSRIBE sip:T-AS;m=NL
    From:<UE-A>
    To:<UE-B>
    Call.Info: <UE-A>; purpose=call-completion;m=NL
    P-Assertd-Identity: UE-A
    Expires: CC-T3
    Contact:<O-AS>
    Event:call-completion
NOTIFY sip:O-AS
    From:<UE-B>
    To:<UE-A>
    Event:call-completion
    Subscription-State: active;expires=< any value >
    Event:call-completion
    Content-Type: application/call-completion
        cc-state: queued
        cc-service-retention: true

Comments:

SIP 1 (ISC)		SUT		SIP 2 (Gm)
INVITE	→		→	INVITE
100 Trying	←		←	100 Trying
480 (Temporarily Unavailable) 1	←		←	480 (Temporarily Unavailable)
ACK	→		→	ACK
SUBSCRIBE	→			
202 Accepted	←			
NOTIFY	←			
200 OK NOTIFY	→			
		Apply post test routine		

TSS	TP	Reference	Selection expression
CC/terminating_AS/Invocation	CC_N05_0015	4.5.4.3.2.1	NOT PICS 4.3.2-1/2 AND PICS 4.3.2-1/9

Test purpose
CCNL service invocation successful at the terminating AS. Retain option not supported.
Ensure that the terminating AS is able to queue the CCNL request received in a SUBSCRIBE request from the originating AS and responds with a NOTIFY request. In the NOTIFY request the state header of the call-completion MIME body is set to queued and the service-retention header is **not** present.

Preconditions:

SIP header values:
480 Temporarily Unavailable 1:
Call-Info: <sip:UE-B>;purpose=call-completion;m=NL
SUBSRIBE sip:T-AS;m=NL
From:<UE-A>
To:<UE-B>
Call.Info: <UE-A>; purpose=call-completion;m=NL
P-Assertd-Identity: UE-A
Expires: CC-T3
Contact:<O-AS>
Event:call-completion
NOTIFY sip:O-AS
From:<UE-B>
To:<UE-A>
Event:call-completion
Subscription-State: active;expires=< any value >
Event:call-completion
Content-Type: application/call-completion
cc-state: queued

Comments:

SIP 1 (ISC)		**SUT**		**SIP 2 (Gm)**
INVITE	➜		➜	INVITE
100 Trying	⬅		⬅	100 Trying
480 (Temporarily Unavailable) 1	⬅		⬅	480 (Temporarily Unavailable)
ACK	➜		➜	ACK
SUBSCRIBE	➜			
202 Accepted	⬅			
NOTIFY	⬅			
200 OK NOTIFY	➜			
		Apply post test routine		

5.3.3   CC Revocation

TSS		TP	Reference	Selection expression
CC/terminating_AS/Revocation		CC_N06_001	4.5.4.3.3.1	
Test purpose				
CCBS service revocation successful at the terminating AS. Ensure that the terminating AS is able to respond a NOTIFY request and the Subscription-State header is set to terminated and the reason parameter is set to timeout for a CCBS queue entry if a SUBSCRIBE request is received and the Expires header is set to '0'.				
Preconditions:				

SIP header values:
SUBSRIBE sip:T-AS;m=BS
   From:<UE-A>
   To:<UE-B>
   Contact:<O-AS>
   Call.Info: <UE-A>; purpose=call-completion;m=BS
   P-Assertd-Identity: UE-A
   Expires: CC-T3
   Event:call-completion
   Expires=0
NOTIFY sip:O-AS
   From:<UE-B>
   To:<UE-A>
   Event:call-completion
   Subscription-State: terminated; reason=timeout				

Comments:				

SIP 1 (ISC)   **SUT**   **SIP 2 (Gm)**
     Invoke CCBS request
 	
SUBSCRIBE   →
202 Accepted   ←
 	
NOTIFY   ←
200 OK NOTIFY   →
     Apply post test routine				

TSS	TP	Reference	Selection expression
CC/terminating_AS/Revocation	CC_N06_002	4.5.4.3.3.1	

Test purpose

CCNR service revocation successful at the terminating AS.

Ensure that the terminating AS is able to respond a NOTIFY request and the Subscription-State header is set to terminated and the reason parameter is set to timeout for a CCNR queue entry if a SUBSCRIBE request is received and the Expires header is set to '0'.

Preconditions:

SIP header values:
SUBSRIBE sip:T-AS;m=NR
   From:<UE-A>
   To:<UE-B>
   Call.Info: <UE-A>; purpose=call-completion;m=NR
   P-Assertd-Identity: UE-A
   Expires: CC-T3
   Event:call-completion
   Expires=0
NOTIFY sip:O-AS
   Event:call-completion
   Subscription-State: terminated; reason=timeout

Comments:

SIP 1 (ISC)   SUT   SIP 2 (Gm)

          Invoke CCBS request

SUBSCRIBE   →
202 Accepted   ←

NOTIFY   ←
200 OK NOTIFY   →

          Apply post test routine

TSS	TP	Reference	Selection expression
CC/terminating_AS/Revocation	CC_N06_003	4.5.4.3.3.1	PICS 4.3.2-1/9

Test purpose

CCNL service revocation successful at the terminating AS.

Ensure that the terminating AS is able to respond a NOTIFY request and the Subscription-State header is set to terminated and the reason parameter is set to timeout for a CCNL queue entry if a SUBSCRIBE request is received and the Expires header is set to '0'.

Preconditions:

SIP header values:
SUBSRIBE sip:T-AS;m=NL
   From:<UE-A>
   To:<UE-B>
   Call.Info: <UE-A>; purpose=call-completion;m=NL
   P-Assertd-Identity: UE-A
   Expires: CC-T3
   Event:call-completion
   Expires=0
NOTIFY sip:O-AS
   Event:call-completion
   Subscription-State: terminated; reason=timeout

Comments:

SIP 1 (ISC)   SUT   SIP 2 (Gm)

          Invoke CCBS request

SUBSCRIBE   →
202 Accepted   ←

NOTIFY   ←
200 OK NOTIFY   →

          Apply post test routine

TSS	TP	Reference	Selection expression
CC/terminating_AS/Revocation	CC_N06_004	4.5.4.3.3.2	

Test purpose

CCBS service revocation at the terminating AS. CC-T7 expires.

Ensure that the terminating AS is able to revoke a CCBS queue entry if the CC service duration timer CC-T7 expires. A NOTIFY request is sent to the originating AS and the Subscription-State header is set to "terminated" and the reason header is set to "noresource".

Preconditions:

SIP header values:
NOTIFY sip:O-AS
Event:call-completion
Subscription-State: terminated; reason=noresource

Comments:

SIP 1 (ISC)	SUT	SIP 2 (Gm)
Invoke CCBS request		
	Start CC-T7	
	↓	
	CC-T7 expires	
NOTIFY ←		
200 OK NOTIFY →		
	Apply post test routine	

TSS	TP	Reference	Selection expression
CC/terminating_AS/Revocation	CC_N06_005	4.5.4.3.3.2	

Test purpose

CCNR service revocation at the terminating AS. CC-T7 expires.

Ensure that the terminating AS is able to revoke a CCNR queue entry if the CC service duration timer CC-T7 expires. A NOTIFY request is sent to the originating AS and the Subscription-State header is set to "terminated" and the reason header is set to "noresource".

Preconditions:

SIP header values:
NOTIFY sip:O-AS
Event:call-completion
Subscription-State: terminated; reason=noresource

Comments:

SIP 1 (ISC)	SUT	SIP 2 (Gm)
Invoke CCNR request		
	Start CC-T7	
	↓	
	CC-T7 expires	
NOTIFY ←		
200 OK NOTIFY →		
	Apply post test routine	

TSS	TP	Reference	Selection expression
CC/terminating_AS/Revocation	CC_N06_006	4.5.4.3.3.2	PICS 4.3.2-1/9

Test purpose

CCNL service revocation at the terminating AS. CC-T7 expires.

Ensure that the terminating AS is able to revoke a CCNL queue entry if the CC service duration timer CC-T7 expires. A NOTIFY request is sent to the originating AS and the Subscription-State header is set to "terminated" and the reason header is set to "noresource".

Preconditions:

SIP header values:
NOTIFY sip:O-AS
   Event:call-completion
   Subscription-State: terminated; reason=noresource

Comments:

SIP 1 (ISC)		SUT	SIP 2 (Gm)
	Invoke CCNR request		
		Start CC-T7	
		↓	
		CC-T7 expires	
NOTIFY	←		
200 OK NOTIFY	→		
		Apply post test routine	

5.3.4　CC Operation

TSS	TP	Reference	Selection expression
CC/terminating_AS/CCOperation	CC_N07_001	4.5.4.3.4.1.1, 4.5.4.3.4.1.2	

Test purpose

Callee becomes not busy, CCBS recall procedure performed.

Ensure that the terminating AS starts the call completion recall procedure if the callee becomes not busy. The terminating AS starts the Destination B idle guard timer CC-T8. When the timer CC-T8 expires, a NOTIFY request is sent to the originating AS. The state header in the call-completion MIME body is set to "ready".

Preconditions:

SIP header values:
NOTIFY sip:O-AS
   From: UE B
   To: UE A
   Event:call-completion
   Subscription-State: active; expires=< any value >
   Content-Type: application/call-completion
      cc-state: ready

Comments:

SIP 1 (ISC)		SUT		SIP 2 (Gm)
	Invoke CCBS request			
		Callee is busy		
BYE	←		←	BYE
200 OK BYE	→		→	200 OK BYE
		Start CC-T8		
		↓		
		CC-T8 expires		
NOTIFY	←			
200 OK NOTIFY	→			
		Apply post test routine		

TSS CC/terminating_AS/CCOperation	TP CC_N07_002	Reference 4.5.4.3.4.1.1, 4.5.4.3.4.1.2	Selection expression

Test purpose

Callee becomes not busy after having initiated an activity, CCNR recall procedure performed.

Ensure that the terminating AS starts the call completion recall procedure if the callee is having initiated an activity. The terminating AS starts the Destination B idle guard timer CC-T8. When the timer CC-T8 expires, a NOTIFY request is sent to the originating AS. The state header in the call-completion MIME body is set to "ready".

Preconditions:

SIP header values:
NOTIFY sip:O-AS
   From: UE B
   To: UE A
   Event:call-completion
   Subscription-State: active; expires=< any value >
   Content-Type: application/call-completion
     cc-state: ready

Comments:

SIP 1 (ISC)		SUT		SIP 2 (Gm)
	Invoke CCNR request			
		Callee is idle		
INVITE	←		←	INVITE
486 Busy Here	→		→	486 Busy Here
ACK	←		←	ACK
		Start CC-T8		
		↓		
		CC-T8 expires		
NOTIFY	←			
200 OK NOTIFY	→			
		Apply post test routine		

TSS CC/terminating_AS/CCOperation	TP CC_N07_003	Reference 4.5.4.3.4.1.1, 4.5.4.3.4.1.2	Selection expression PICS 4.3.2-1/9

Test purpose

Callee becomes not busy after is logged-in, CCNL recall procedure performed.

Ensure that the terminating AS starts the call completion recall procedure if the callee is having initiated an activity. The terminating AS starts the Destination B idle guard timer CC-T8. When the timer CC-T8 expires, a NOTIFY request is sent to the originating AS. The state header in the call-completion MIME body is set to "ready".

Preconditions:

SIP header values:
NOTIFY sip:O-AS
   From: UE B
   To: UE A
   Event:call-completion
   Subscription-State: active; expires=< any value >
   Content-Type: application/call-completion
     cc-state: ready

Comments:

SIP 1 (ISC)		SUT	SIP 2 (Gm)
	Invoke CCNL request		
		Callee is logged-in	
		Start CC-T8	
		↓	
		CC-T8 expires	
NOTIFY	←		
200 OK NOTIFY	→		
		Apply post test routine	

ETSI

TSS CC/terminating_AS/CCOperation	TP CC_N07_004	Reference 4.5.4.3.4.1.3, 4.5.4.3.4.1.4	Selection expression

Test purpose

CCBS: An INVITE request received while a CC recall is processed. CC call indicator present in the Request line.

Ensure that when an INVITE request is received from the originating AS while CC-T9 is running and in the Request line the m parameter is present set to "BS" and a Call-Info header is present the m parameter is set to 'BS', this INVITE is processed to the callee. An INVITE is sent to the callee and the m parameter is not present in the Request line. When a 180 (Ringing) is received from the callee a NOTIFY request is sent to the originating AS and Subscription-State header is set to "terminated" and the reason header is set to "noresource".

Preconditions:

SIP header values:

NOTIFY 1 sip:O-AS
   From: UE B
   To: UE A
   Subscription-State: active; expires=< any value >
   Event:call-completion
   Content-Type: application/call-completion
      cc-state: ready
INVITE 1: sip: UE B; m=BS
   Call-Info: <sip:UE-A>;purpose=call-completion;m=BS
NOTIFY 2 sip:O-AS
   Event:call-completion
   Subscription-State: terminated; reason=noresource

Comments:

SIP 1 (ISC)		SUT	SIP 2 (Gm)
Invoke CCBS request			
		Callee is busy	
BYE	←	←	BYE
200 OK BYE	→	→	200 OK BYE
NOTIFY 1	←		
200 OK NOTIFY	→		
INVITE 1	→	→	INVITE
180 Ringing	←	←	180 Ringing
NOTIFY 2	←		
200 OK NOTIFY	→		
200 OK INVITE	←	←	200 OK INVITE
ACK	→	→	ACK
		Apply post test routine	

TSS CC/terminating_AS/CCOperation	TP CC_N07_005	Reference 4.5.4.3.4.1.3, 4.5.4.3.4.1.4	Selection expression

Test purpose

CCNR: An INVITE request received while a CC recall is processed. CC call indicator present in the Request line.

Ensure that when an INVITE request is received from the originating AS while CC-T9 is running and in the Request line the m parameter is present set to "NR" and a Call-Info header is present the m parameter is set to 'NR', this INVITE is processed to the callee. An INVITE is sent to the callee and the m parameter is not present in the Request line. When a 180 (Ringing) is received from the callee a NOTIFY request is sent to the originating AS and Subscription-State header is set to "terminated" and the reason header is set to "noresource".

Preconditions:

SIP header values:

NOTIFY sip:O-AS
   From: UE B
   To: UE A
   Subscription-State: active; expires=< any value >
   Event:call-completion
   Content-Type: application/call-completion
     cc-state: ready
INVITE 1: sip: UE B; m=NR
       Call-Info: <sip:UE-A>;purpose=call-completion;m=NR
NOTIFY 2 sip:O-AS
   Event:call-completion
   Subscription-State: terminated; reason=noresource

Comments:

SIP 1 (ISC)		SUT	SIP 2 (Gm)	
	Invoke CCNR request			
		Callee is idle		
INVITE	←		←	INVITE
486 Busy Here	→		→	486 Busy Here
ACK	←		←	ACK
NOTIFY 1	←			
200 OK NOTIFY	→			
INVITE 1	→		→	INVITE
180 Ringing	←		←	180 Ringing
NOTIFY 2	←			
200 OK NOTIFY	→			
200 OK INVITE	←		←	200 OK INVITE
ACK	→		→	ACK
		Apply post test routine		

TSS	TP	Reference	Selection expression
CC/terminating_AS/CCOperation	CC_N07_006	4.5.4.3.4.1.3, 4.5.4.3.4.1.4	PICS 4.3.2-1/9

Test purpose

CCNL: An INVITE request received while a CC recall is processed. CC call indicator present in the Request line.

Ensure that when an INVITE request is received from the originating AS while CC-T9 is running and in the Request line the m parameter is present set to "NL" and a Call-Info header is present the m parameter is set to 'NL', this INVITE is processed to the callee. An INVITE is sent to the callee and the m parameter is not present in the Request line. When a 180 (Ringing) is received from the callee a NOTIFY request is sent to the originating AS and Subscription-State header is set to "terminated" and the reason header is set to "noresource".

Preconditions:

SIP header values:

NOTIFY 1 sip:O-AS
   From: UE B
   To: UE A
   Subscription-State: active; expires=< any value >
   Event:call-completion
   Content-Type: application/call-completion
     cc-state: ready
INVITE 1: sip: UE B; m=NL
        Call-Info: <sip:UE-A>;purpose=call-completion;m=NL
NOTIFY 2 sip:O-AS
   Event:call-completion
   Subscription-State: terminated; reason=noresource

Comments:

SIP 1 (ISC)		SUT	SIP 2 (Gm)
	Invoke CCNL request		
		Callee is logged-in	
NOTIFY 1	←		
200 OK NOTIFY	→		
INVITE 1	→	→	INVITE
180 Ringing	←	←	180 Ringing
NOTIFY 2	←		
200 OK NOTIFY	→		
200 OK INVITE	←	←	200 OK INVITE
ACK	→	→	ACK
		Apply post test routine	

TSS CC/terminating_AS/CCOperation	TP CC_N07_007	Reference 4.5.4.3.4.1.3, 4.5.4.3.4.1.4	Selection expression

Test purpose

CCBS: An INVITE request received while a CC recall is processed. CC call indicator not present in the Request line. Service requirements and destination selection information are not identical to the stored values. The call is rejected.

Ensure that the terminating AS has sent a NOTIFY request to a CCBS entry and the state parameter in the call-completion MIME body was set to "ready" after the terminating AS receives an INVITE request and there is no 'm' parameter in the Request line and no Call-Info header is present the m parameter set to 'NL', the terminating AS rejects the call.

Preconditions:

SIP header values:

NOTIFY sip:O-AS
   From: UE B
   To: UE A
   Subscription-State: active; expires=< any value >
   Event:call-completion
   Content-Type: application/call-completion
     cc-state: ready
INVITE: sip: UE B
   destination selection information and **Service requirements** not identical as used in the dialogue as CCBS was requested
486 Busy Here
   Call-Info: <sip:UE-B>;purpose=call-completion;m=BS

Comments:

SIP 1 (ISC)		SUT	SIP 2 (Gm)
	Invoke CCBS request		
		Callee is busy	
BYE	←	←	BYE
200 OK BYE	→	→	200 OK BYE
NOTIFY 1	←		
200 OK NOTIFY	→		
INVITE	→		
486 (Busy Here)	←		
ACK	→		
		Apply post test routine	

ETSI

TSS	TP	Reference	Selection expression
CC/terminating_AS/CCOperation	CC_N07_008	4.5.4.3.4.1.3, 4.5.4.3.4.1.4	

Test purpose

CCNR: An INVITE request received while a CC recall is processed. CC call indicator not present in the Request line. Service requirements and destination selection information are not identical to the stored values. The call is rejected.

Ensure that the terminating AS has sent a NOTIFY request to a CCNR entry and the state parameter in the call-completion MIME body was set to "ready" after the terminating AS receives an INVITE request and there is no 'm' parameter in the Request line the terminating AS rejects the call.

Preconditions:

SIP header values:
NOTIFY sip:O-AS
   From: UE B
   To: UE A
   Subscription-State: active; expires=< any value >
   Event:call-completion
   Content-Type: application/call-completion
     cc-state: ready
INVITE: sip: UE B
   destination selection information and **Service requirements** not identical as used in the dialogue as CCNR was requested
486 Busy Here
   Call-Info: <sip:UE-B>;purpose=call-completion;m=BS

Comments:

SIP 1 (ISC)		SUT	SIP 2 (Gm)
	Invoke CCNR request		
		Callee is idle	
INVITE	←	←	INVITE
486 Busy Here	→	→	486 Busy Here
ACK	←	←	ACK
NOTIFY 1	←		
200 OK NOTIFY	→		
INVITE	→		
486 (Busy Here)	←		
ACK	→		
		Apply post test routine	

TSS CC/terminating_AS/CCOperation	TP CC_N07_009	Reference 4.5.4.3.4.1.3, 4.5.4.3.4.1.4	Selection expression PICS 4.3.2-1/9

Test purpose

CCNL: An INVITE request received while a CC recall is processed. CC call indicator not present in the Request line. Service requirements and destination selection information are not identical to the stored values. The call is rejected.

Ensure that the terminating AS has sent a NOTIFY request to a CCNL entry and the state parameter in the call-completion MIME body was set to "ready" after the terminating AS receives an INVITE request and there is no 'm' parameter in the Request line the terminating AS rejects the call.

Preconditions:

SIP header values:

NOTIFY sip:O-AS
   From: UE B
   To: UE A
   Subscription-State: active; expires=< any value >
   Event:call-completion
   Content-Type: application/call-completion
     cc-state: ready
INVITE: sip: UE B
   destination selection information and **Service requirements** not identical as used in the dialogue as CCNL
   was requested
486 Busy Here
   Call-Info: <sip:UE-B>;purpose=call-completion;m=BS

Comments:

SIP 1 (ISC)		SUT	SIP 2 (Gm)
	Invoke CCNR request		
		Callee is logged-in	
NOTIFY 1	←		
200 OK NOTIFY	→		
INVITE	→		
486 (Busy Here)	←		
ACK	→		
		Apply post test routine	

TSS	TP	Reference	Selection expression
CC/terminating_AS/CCOperation	CC_N07_010	4.5.4.3.4.2 a)	

Test purpose
CCBS: Terminating user becomes busy while CC-T8 is running.
If in case of CCBS, upon expiry of the destination B idle guard timer CC-T8, the callee is busy (e.g. the callee has initiated an outgoing communication), then the terminating AS shall defer servicing of the destination B CC queue until the callee becomes not busy again. After the callee is not busy, the terminating AS starts the recall procedure again.

Preconditions:

SIP header values:
NOTIFY sip:O-AS
From: UE B
To: UE A (S2)
Subscription-State: active; expires=< any value >
Event:call-completion
Content-Type: application/call-completion
cc-state: ready

Comments:

SIP 1 (ISC)		SUT		SIP 2 (Gm)
	Invoke CCBS request			
		Callee is busy		
BYE	←		←	BYE
200 OK BYE	→		→	200 OK BYE
		Start CC-T8		
		↓		
INVITE (S1)	←		←	INVITE
200 OK INVITE	→		→	200 OK INVITE
ACK	←		←	ACK
		CC-T8 expires		
BYE	←		←	BYE
200 OK BYE	→		→	200 OK BYE
		Start CC-T8		
		↓		
		CC-T8 expires		
NOTIFY	←			
200 OK NOTIFY	→			
		Apply post test routine		

TSS	TP	Reference	Selection expression
CC/terminating_AS/CCOperation	CC_N07_011	4.5.4.3.4.2 a)	

Test purpose

CCNR: Terminating user becomes busy while CC-T8 is running.

If in case of CCNR, upon expiry of the destination B idle guard timer CC-T8, the callee is busy (e.g. the callee has initiated an outgoing communication), then the terminating AS shall defer servicing of the destination B CC queue until the callee becomes not busy again. After the callee is not busy, the terminating AS starts the recall procedure again.

Preconditions:

SIP header values:
NOTIFY sip:O-AS
   From: UE B
   To: UE A (S2)
   Subscription-State: active; expires=< any value >
   Event:call-completion
   Content-Type: application/call-completion
     cc-state: ready

Comments:

SIP 1 (ISC)		SUT		SIP 2 (Gm)
	Invoke CCNR request			
		Callee is idle		
INVITE	←		←	INVITE
486 Busy Here	→		→	486 Busy Here
ACK	←		←	ACK
		Start CC-T8		
		↓		
INVITE (S1)	←		←	INVITE
200 OK INVITE	→		→	200 OK INVITE
ACK	←		←	ACK
		CC-T8 expires		
BYE	←		←	BYE
200 OK BYE	→		→	200 OK BYE
		Start CC-T8		
		↓		
		CC-T8 expires		
NOTIFY	←			
200 OK NOTIFY	→			
		Apply post test routine		

TSS	TP	Reference	Selection expression
CC/terminating_AS/CCOperation	CC_N07_012	4.5.4.3.4.2 a)	PICS 4.3.2-1/9

Test purpose

CCNL: Terminating user becomes busy while CC-T8 is running.

If in case of CCNL, upon expiry of the destination B idle guard timer CC-T8, the callee is busy (e.g. the callee has initiated an outgoing communication), then the terminating AS shall defer servicing of the destination B CC queue until the callee becomes not busy again. After the callee is not busy, the terminating AS starts the recall procedure again.

Preconditions:

SIP header values:

NOTIFY 1 sip:O-AS
   From: UE B
   To: UE A (S2)
   Subscription-State: active; expires=< any value >
   Event:call-completion
   Content-Type: application/call-completion
     cc-state: ready

Comments:

SIP 1 (ISC)		SUT		SIP 2 (Gm)
	Invoke CCNL request			
		Callee is logged-in		
		Start CC-T8		
		↓		
INVITE (S1)	←		←	INVITE
200 OK INVITE	→		→	200 OK INVITE
ACK	←		←	ACK
		CC-T8 expires		
BYE	←		←	BYE
200 OK BYE	→		→	200 OK BYE
		Start CC-T8		
		↓		
		CC-T8 expires		
NOTIFY	←			
200 OK NOTIFY	→			
		Apply post test routine		

TSS	TP	Reference	Selection expression
CC/terminating_AS/CCOperation	CC_N07_013	4.5.4.3.4.2 c)	NOT PICS 4.3.2-1/2

Test purpose

CCBS: The callee is busy upon arrival of the CC call. Retain option not supported.

Ensure that if the callee is busy upon arrival of the CC call and the retain option is not supported at the terminating AS, the terminating AS shall cancel the corresponding CCBS request; **the terminating AS shall send a 486 (Busy Here) response with a Call-Info header field** with a "purpose" header field parameter set to "call-completion" and a m parameter set to "BS" to the originating AS. The CC request is cancelled.

Preconditions:

SIP header values:
NOTIFY sip:O-AS
   From: UE B
   To: UE A
   Subscription-State: active; expires=< any value >
   Event:call-completion
   Content-Type: application/call-completion
     cc-state: ready
INVITE 1: sip: UE B; m=BS
   Call-Info: <sip:UE-A>;purpose=call-completion;m=BS
486 (Busy Here):
   Call-Info: <sip:UE-B>;purpose=call-completion;m=BS
NOTIFY 2 sip:O-AS
   Event:call-completion
   Subscription-State: terminated; reason=noresource

Comments:

SIP 1 (ISC)		SUT	SIP 2 (Gm)
	Invoke CCBS request		
		Callee is busy	
BYE	←		← BYE
200 OK BYE	→		→ 200 OK BYE
NOTIFY 1	←		
200 OK NOTIFY	→		
INVITE	←		← INVITE (S1)
200 OK INVITE	→		→ 200 OK INVITE
ACK	←		← ACK
INVITE 1 (S2)	→		→ *INVITE*
486 (Busy Here)	←		← *486 (Busy Here)*
ACK	→		→ *ACK*
NOTIFY 2	←		
200 OK NOTIFY	→		
BYE	←		← BYE
200 OK BYE	→		→ 200 OK BYE

TSS	TP	Reference	Selection expression
CC/terminating_AS/CCOperation	CC_N07_014	4.5.4.3.4.2 c)	NOT PICS 4.3.2-1/2

Test purpose

CCNR: The callee is busy upon arrival of the CC call. Retain option not supported.

Ensure that if the callee is busy upon arrival of the CC call and the retain option is not supported at the terminating AS, the terminating AS shall cancel the corresponding CCNR request; **the terminating AS shall send a 486 (Busy Here) response with a Call-Info header field** with a "purpose" header field parameter set to "call-completion" and a m parameter set to "BS" to the originating AS. The CC request is cancelled.

Preconditions:

SIP header values:

NOTIFY sip:O-AS
   From: UE B
   To: UE A
   Subscription-State: active; expires=< any value >
   Event:call-completion
   Content-Type: application/call-completion
     cc-state: ready
INVITE 1: sip: UE B; m=NR
   Call-Info: <sip:UE-A>;purpose=call-completion;m=NR
486 (Busy Here):
   Call-Info: <sip:UE-B>;purpose=call-completion;m=BS
NOTIFY 2 sip:O-AS
   Event:call-completion
   Subscription-State: terminated; reason=noresource

Comments:

SIP 1 (ISC)		SUT	SIP 2 (Gm)	
	Invoke CCNR request			
		Callee is idle		
INVITE	←		←	INVITE
486 Busy Here	→		→	486 Busy Here
ACK	←		←	ACK
NOTIFY 1	←			
200 OK NOTIFY	→			
INVITE	←		←	INVITE (S1)
200 OK INVITE	→		→	200 OK INVITE
ACK	←		←	ACK
INVITE 1 (S2)	→		→	*INVITE*
486 (Busy Here)	←		←	*486 (Busy Here)*
ACK	→		→	*ACK*
NOTIFY 2	←			
200 OK NOTIFY	→			
BYE	←		←	BYE
200 OK BYE	→		→	200 OK BYE

TSS CC/terminating_AS/CCOperation	TP CC_N07_015	Reference 4.5.4.3.4.2 c)	Selection expression NOT PICS 4.3.2-1/2 AND PICS 4.3.2-1/9
Test purpose *CCNL: The callee is busy upon arrival of the CC call. Retain option not supported.* Ensure that if the callee is busy upon arrival of the CC call and the retain option is not supported at the terminating AS, the terminating AS shall cancel the corresponding CCNR request; **the terminating AS shall send a 486 (Busy Here) response with a Call-Info header field** with a "purpose" header field parameter set to "call-completion" and a m parameter set to "BS" to the originating AS. The CC request is cancelled.			
Preconditions:			

SIP header values:
NOTIFY sip:O-AS
   From: UE B
   To: UE A
   Subscription-State: active; expires=< any value >
   Event:call-completion
   Content-Type: application/call-completion
     cc-state: ready
INVITE 1: sip: UE B; m=NL
   Call-Info: <sip:UE-A>;purpose=call-completion;m=NL
486 (Busy Here):
   Call-Info: <sip:UE-B>;purpose=call-completion;m=BS
NOTIFY 2 sip:O-AS
   Event:call-completion
   Subscription-State: terminated; reason=noresource			

Comments:			

SIP 1 (ISC)		SUT	SIP 2 (Gm)	
	Invoke CCNL request			
		Callee is logged-in		
NOTIFY 1	←			
200 OK NOTIFY	→			
INVITE	←		←	INVITE (S1)
200 OK INVITE	→		→	200 OK INVITE
ACK	←		←	ACK
INVITE 1 (S2)	→		→	*INVITE*
486 (Busy Here)	←		←	*486 (Busy Here)*
ACK	→		→	*ACK*
NOTIFY 2	←			
200 OK NOTIFY	→			
BYE	←		←	BYE
200 OK BYE	→		→	200 OK BYE

TSS	TP	Reference	Selection expression
CC/terminating_AS/CCOperation	CC_N07_016	4.5.4.3.4.2 c)	PICS 4.3.2-1/2

Test purpose

CCBS: The callee is busy upon arrival of the CC call. Retain option supported.

Ensure that if the callee is busy upon arrival of the CC call and the retain option is supported at the terminating AS, **the terminating AS shall** retain the original CCBS request in the queue; in this case the terminating AS shall continue to monitor destination B, shall not restart the timer CCBS-T7, shall stop timer CC-T9 and shall **send a 486 (Busy Here) response with a Call-Info header field** with a "purpose" header field parameter set to "call-completion" and the m parameter set to "BS" to the originating AS. After the callee becomes not busy, the recall procedure is started again.

Preconditions:

SIP header values:
NOTIFY sip:O-AS
   From: UE B
   To: UE A
   Subscription-State: active; expires=< any value >
   Event:call-completion
   Content-Type: application/call-completion
      cc-state: ready
INVITE 1: sip: UE B; m=BS
   Call-Info: <sip:UE-A>;purpose=call-completion;m=BS
486 (Busy Here):
   Call-Info: <sip:UE-B>;purpose=call-completion;m=BS

Comments:

SIP 1 (ISC)		SUT	SIP 2 (Gm)
	Invoke CCBS request		
		Callee is busy	
BYE	←		← BYE
200 OK BYE	→		→ 200 OK BYE
NOTIFY 1	←		
200 OK NOTIFY	→		
INVITE	←		← INVITE (S1)
200 OK INVITE	→		→ 200 OK INVITE
ACK	←		← ACK
INVITE 1 (S2)	→		→ *INVITE*
486 (Busy Here)	←		← *486 (Busy Here)*
ACK	→		→ *ACK*
BYE	←		← BYE
200 OK BYE	→		→ 200 OK BYE
		Start CC-T8	
		↓	
		CC-T8 expires	
NOTIFY 1	←		
200 OK NOTIFY	→		
		Apply post test routine	

TSS	TP	Reference	Selection expression
CC/terminating_AS/CCOperation	CC_N07_017	4.5.4.3.4.2 c)	PICS 4.3.2-1/2

Test purpose

CCNR: The callee is busy upon arrival of the CC call. Retain option supported.

Ensure that if the callee is busy upon arrival of the CC call and the retain option is supported at the terminating AS, **the terminating AS shall** retain the original CCNR request in the queue; in this case the terminating AS shall continue to monitor destination B, shall not restart the timer CCBS-T7, shall stop timer CC-T9 and shall **send a 486 (Busy Here) response with a Call-Info header field** with a "purpose" header field parameter set to "call-completion" and the m parameter set to "BS" to the originating AS. After the callee becomes not busy, the recall procedure is started again.

Preconditions:

SIP header values:
NOTIFY sip:O-AS
   From: UE B
   To: UE A
   Subscription-State: active; expires=< any value >
   Event:call-completion
   Content-Type: application/call-completion
     cc-state: ready
INVITE 1: sip: UE B; m=NR
   Call-Info: <sip:UE-A>;purpose=call-completion;m=NR
486 (Busy Here):
   Call-Info: <sip:UE-B>;purpose=call-completion;m=BS

Comments:

SIP 1 (ISC)		SUT	SIP 2 (Gm)	
	Invoke CCNR request			
		Callee is idle		
INVITE	←		←	INVITE
486 Busy Here	→		→	486 Busy Here
ACK	←		←	ACK
NOTIFY 1	←			
200 OK NOTIFY	→			
INVITE	←		←	INVITE (S1)
200 OK INVITE	→		→	200 OK INVITE
ACK	←		←	ACK
INVITE 1 (S2)	→		→	*INVITE*
486 (Busy Here)	←		←	*486 (Busy Here)*
ACK	→		→	*ACK*
BYE	←		←	BYE
200 OK BYE	→		→	200 OK BYE
		Start CC-T8		
		↓		
		CC-T8 expires		
NOTIFY 1	←			
200 OK NOTIFY	→			
		Apply post test routine		

TSS	TP	Reference	Selection expression
CC/terminating_AS/CCOperation	CC_N07_018	4.5.4.3.4.2 c)	PICS 4.3.2-1/2 AND PICS 4.3.2-1/9

Test purpose

CCNL: The callee is busy upon arrival of the CC call. Retain option supported.

Ensure that if the callee is busy upon arrival of the CC call and the retain option is supported at the terminating AS, **the terminating AS shall** retain the original CCNL request in the queue; in this case the terminating AS shall continue to monitor destination B, shall not restart the timer CCBS-T7, shall stop timer CC-T9 and shall **send a 486 (Busy Here) response with a Call-Info header field** with a "purpose" header field parameter set to "call-completion" and the m parameter set to "BS" to the originating AS. After the callee becomes not busy, the recall procedure is started again.

Preconditions:

SIP header values:

NOTIFY sip:O-AS
   From: UE B
   To: UE A
   Subscription-State: active; expires=< any value >
   Event:call-completion
   Content-Type: application/call-completion
     cc-state: ready
INVITE 1: sip: UE B; m=NL
   Call-Info: <sip:UE-A>;purpose=call-completion;m=NL
486 (Busy Here):
   Call-Info: <sip:UE-B>;purpose=call-completion;m=BS

Comments:

SIP 1 (ISC)		SUT	SIP 2 (Gm)	
	Invoke CCNR request			
		Callee is idle		
INVITE	←		←	INVITE
486 Busy Here	→		→	486 Busy Here
ACK	←		←	ACK
NOTIFY 1	←			
200 OK NOTIFY	→			
INVITE	←		←	INVITE (S1)
200 OK INVITE	→		→	200 OK INVITE
ACK	←		←	ACK
INVITE 1 (S2)	→		→	*INVITE*
486 (Busy Here)	←		←	*486 (Busy Here)*
ACK	→		→	*ACK*
BYE	←		←	BYE
200 OK BYE	→		→	200 OK BYE
		Start CC-T8		
		↓		
		CC-T8 expires		
NOTIFY 1	←			
200 OK NOTIFY	→			
		Apply post test routine		

TSS	TP	Reference	Selection expression
CC/terminating_AS/CCOperation	CC_N07_019	4.5.4.3.4.2 d)	

Test purpose
CCBS: Recall does not apply, CC-T9 expires.
Ensure that the terminating As revokes the CCBS request after the Recall timer. CC-T9 is expired. The terminating AS sends a NOTIFY request to the originating AS and the Subscription-State header is set to "terminated" and the reason header is set to "rejected".

Preconditions:

SIP header values:
NOTIFY 1 sip:O-AS
From: UE B
To: UE A
Subscription-State: active; expires=< any value >
Event:call-completion
Content-Type: application/call-completion
cc-state: ready
NOTIFY 2 sip:O-AS
From: UE B
To: UE A
Event:call-completion
Subscription-State: terminated; reason=rejected

Comments:

SIP 1 (ISC)		SUT	SIP 2 (Gm)
	Invoke CCBS request		
		Callee is busy	
BYE	←		← BYE
200 OK BYE	→		→ 200 OK BYE
		Start CC-T8	
		↓	
		CC-T8 expires	
NOTIFY 1	←		
200 OK NOTIFY	→		
		Start CC-T9	
		↓	
		CC-T9 expires	
NOTIFY 2	←		
200 OK NOTIFY	→		

TSS	TP	Reference	Selection expression
CC/terminating_AS/CCOperation	CC_N07_020	4.5.4.3.4.2 d)	

Test purpose

CCNR: Recall does not apply, CC-T9 expires.

Ensure that the terminating As revokes the CCNR request after the Recall timer. CC-T9 is expired. The terminating AS sends a NOTIFY request to the originating AS and the Subscription-State header is set to "terminated" and the reason parameter is set to "rejected".

Preconditions:

SIP header values:

NOTIFY sip:O-AS
   From: UE B
   To: UE A
   Subscription-State: active; expires=< any value >
   Event:call-completion
   Content-Type: application/call-completion
      cc-state: ready
NOTIFY 2 sip:O-AS
   From: UE B
   To: UE A
   Event:call-completion
   Subscription-State: terminated; reason=rejected

Comments:

SIP 1 (ISC)		SUT	SIP 2 (Gm)
	Invoke CCNR request		
		Callee is idle	
INVITE	←		← INVITE
486 Busy Here	→		→ 486 Busy Here
ACK	←		← ACK
		Start CC-T8	
		↓	
		CC-T8 expires	
NOTIFY 1	←		
200 OK NOTIFY	→		
		Start CC-T9	
		↓	
		CC-T9 expires	
NOTIFY 2	←		
200 OK NOTIFY	→		

TSS	TP	Reference	Selection expression
CC/terminating_AS/CCOperation	CC_N07_021	4.5.4.3.4.2 d)	PICS 4.3.2-1/9

Test purpose

CCNL: Recall does not apply, CC-T9 expires.

Ensure that the terminating As revokes the CCNL request after the Recall timer. CC-T9 is expired. The terminating AS sends a NOTIFY request to the originating AS and the Subscription-State header is set to "terminated" and the reason parameter is set to "rejected".

Preconditions:			

SIP header values:
NOTIFY sip:O-AS
   From: UE B
   To: UE A
   Subscription-State: active; expires=< any value >
   Event:call-completion
   Content-Type: application/call-completion
      cc-state: ready
NOTIFY 2 sip:O-AS
   From: UE B
   To: UE A
   Event:call-completion
   Subscription-State: terminated; reason=rejected

Comments:

SIP 1 (ISC)		SUT	SIP 2 (Gm)
	Invoke CCNR request		
		Callee is idle	
INVITE	←		← INVITE
486 Busy Here	→		→ 486 Busy Here
ACK	←		← ACK
		Start CC-T8	
		↓	
		CC-T8 expires	
NOTIFY 1	←		
200 OK NOTIFY	→		
		Start CC-T9	
		↓	
		CC-T9 expires	
NOTIFY 2	←		
200 OK NOTIFY	→		

TSS	TP	Reference	Selection expression
CC/terminating_AS/CCOperation	CC_N07_022	4.5.4.3.3.2	

Test purpose

CCBS: Service duration timer, CC-T7 expires.

Ensure that the terminating AS revokes the CCBS request after the CC service duration timer CC-T7 expires. A NOTIFY is sent to the originating AS and the Subscription-State header is set to "terminated" and the reason parameter is set to "noresource".

Preconditions:			

SIP header values:
NOTIFY 2 sip:O-AS
   From: UE B
   To: UE A
   Event:call-completion
   Subscription-State: terminated; reason= noresource

Comments:

SIP 1 (ISC)		SUT	SIP 2 (Gm)
	Invoke CCBS request		
		Start CC-T7	
		Callee is busy	
		↓	
		CC-T7 expires	
NOTIFY 2	←		
200 OK NOTIFY	→		

TSS	TP	Reference	Selection expression
CC/terminating_AS/CCOperation	CC_N07_023	4.5.4.3.3.2	
Test purpose			
CCNR: Service duration timer, CC-T7 expires. Ensure that the terminating AS revokes the CCNR request after the CC service duration timer CC-T7 expires. A NOTIFY is sent to the originating AS and the Subscription-State header is set to "terminated" and the reason parameter is set to "noresource".			
Preconditions:			

SIP header values:
NOTIFY 1 sip:O-AS
   From: UE B
   To: UE A
   Event:call-completion
   Subscription-State: terminated; reason= noresource			

Comments:			

```
SIP 1 (ISC)                          SUT              SIP 2 (Gm)
              Invoke CCNR request
                                   Start CC-T7
                                   Callee is idle
                                         ↓
                                   CC-T7 expires
NOTIFY 1                           ←
200 OK NOTIFY                      →
```

TSS	TP	Reference	Selection expression
CC/terminating_AS/CCOperation	CC_N07_024	4.5.4.3.3.2	PICS 4.3.2-1/9
Test purpose			
CCNL: Service duration timer, CC-T7 expires. Ensure that the terminating AS revokes the CCNL request after the CC service duration timer CC-T7 expires. A NOTIFY is sent to the originating AS and the Subscription-State header is set to "terminated" and the reason parameter is set to "noresource".			
Preconditions:			

SIP header values:
NOTIFY 1 sip:O-AS
   From: UE B
   To: UE A
   Event:call-completion
   Subscription-State: terminated; reason= noresource			

Comments:			

```
SIP 1 (ISC)                          SUT              SIP 2 (ISC)
              Invoke CCNL request
                                   Start CC-T7
                                   Callee is idle
                                         ↓
                                   CC-T7 expires
NOTIFY 1                           ←
200 OK NOTIFY                      →
```

TSS	TP	Reference	Selection expression
CC/terminating_AS/CCOperation	CC_N07_025	4.5.4.3.4.1.5	

Test purpose

CCBS: Caller becomes busy while CC recall procedure.

Ensure that the terminating AS after the originating AS has suspended the CC recall procedure sends a NOTIFY request and the MIME body contains the state parameter set to 'queued'. When the originating AS resumes the CC call procedure after expiry of the B idle guard timer CC-T8 sends again the remote user free indication after the caller indicates no longer busy. A NOTIFY is sent an den MIME body contains the state parameter set to "queued".

Preconditions:

SIP header values:
NOTIFY 1 sip:O-AS
   From: UE B
   To: UE A
   Subscription-State: active; expires=< any value >
   Event:call-completion
   Content-Type: application/call-completion
      cc-state: ready
PUBLISH 1   sip:T-AS
         Event: presence
         Content-Type: application/pidf+xml
         <?xml version="1.0" encoding="UTF-8"?>
         <presence
           <status>
             <basic>closed</basic>
PUBLISH 2   sip:T-AS
         Event: presence
         Content-Type: application/pidf+xml
         <?xml version="1.0" encoding="UTF-8"?>
         <presence
           <status>
             <basic>open</basic>
NOTIFY 2 sip:O-AS
   From: UE B
   To: UE A
   Subscription-State: active; expires=< any value >
   Event:call-completion
   Content-Type: application/call-completion
      cc-state: queued

Comments:

SIP 1 (ISC)		SUT	SIP 2 (Gm)
	Invoke CCBS request		
		Callee is busy	
BYE	←		← BYE
200 OK BYE	→		→ 200 OK BYE
NOTIFY 1	←	NOTIFY 1	
200 OK NOTIFY	→	200 OK NOTIFY	
PUBLISH	→	PUBLISH	
200 OK PUBLISH	←	200 OK PUBLISH	
NOTIFY 2	←	NOTIFY 2	
200 OK NOTIFY	→	200 OK NOTIFY	
PUBLISH	→	PUBLISH	
200 OK PUBLISH	←	200 OK PUBLISH	
NOTIFY 2	←	NOTIFY 2	
200 OK NOTIFY	→	200 OK NOTIFY	
		Start CC-T8	
		↓	
		CC-T8 expires	
NOTIFY 1	←	NOTIFY 1	
200 OK NOTIFY	→	200 OK NOTIFY	
		Apply post test routine	

TSS	TP	Reference	Selection expression
CC/terminating_AS/CCOperation	CC_N07_026	4.5.4.3.4.1.5	

Test purpose

CCNR: Caller becomes busy while CC recall procedure.

Ensure that the terminating AS after the originating AS has suspended the CC recall procedure sends a NOTIFY request and the MIME body contains the state parameter set to 'queued'. When the originating AS resumes the CC call procedure after expiry of the B idle guard timer CC-T8 sends again the remote user free indication after the caller indicates no longer busy. A NOTIFY is sent an den MIME body contains the state parameter set to "queued".

Preconditions:

SIP header values:
NOTIFY 1 sip:O-AS
   From: UE B
   To: UE A
   Subscription-State: active; expires=< any value >
   Event:call-completion
   Content-Type: application/call-completion
      cc-state: ready
PUBLISH 1   sip:T-AS
         Event: presence
         Content-Type: application/pidf+xml
         <?xml version="1.0" encoding="UTF-8"?>
         <presence
           <status>
              <basic>closed</basic>
PUBLISH 2   sip:T-AS
         Event: presence
         Content-Type: application/pidf+xml
         <?xml version="1.0" encoding="UTF-8"?>
         <presence
           <status>
              <basic>open</basic>
NOTIFY 2 sip:O-AS
   From: UE B
   To: UE A
   Subscription-State: active; expires=< any value >
   Event:call-completion
   Content-Type: application/call-completion
     cc-state: queued

Comments:

SIP 1 (ISC)		SUT	SIP 2 (Gm)
	Invoke CCNR request		
	Callee is available for CC recall		
NOTIFY 1	←	NOTIFY 1	
200 OK NOTIFY	→	200 OK NOTIFY	
PUBLISH	→	PUBLISH	
200 OK PUBLISH	←	200 OK PUBLISH	
NOTIFY 2	←	NOTIFY 2	
200 OK NOTIFY	→	200 OK NOTIFY	
PUBLISH	→	PUBLISH	
200 OK PUBLISH	←	200 OK PUBLISH	
NOTIFY 2	←	NOTIFY 2	
200 OK NOTIFY	→	200 OK NOTIFY	
		Start CC-T8	
		↓	
		CC-T8 expires	
NOTIFY 1	←	NOTIFY 1	
200 OK NOTIFY	→	200 OK NOTIFY	
		Apply post test routine	

TSS	TP	Reference	Selection expression
CC/terminating_AS/CCOperation	CC_N07_027	4.5.4.3.4.1.5	PICS 4.3.2-1/9

Test purpose

CCNL: Caller becomes busy while CC recall procedure.

Ensure that the terminating AS after the originating AS has suspended the CC recall procedure sends a NOTIFY request and the MIME body contains the state parameter set to 'queued'. When the originating AS resumes the CC call procedure after expiry of the B idle guard timer CC-T8 sends again the remote user free indication after the caller indicates no longer busy. A NOTIFY is sent an den MIME body contains the state parameter set to "queued".

Preconditions:

SIP header values:

NOTIFY 1 sip:O-AS
   From: UE B
   To: UE A
   Subscription-State: active; expires=< any value >
   Event:call-completion
   Content-Type: application/call-completion
     cc-state: ready
PUBLISH 1   sip:T-AS
         Event: presence
         Content-Type: application/pidf+xml
         <?xml version="1.0" encoding="UTF-8"?>
         <presence
           <status>
             <basic>closed</basic>
PUBLISH 2   sip:T-AS
         Event: presence
         Content-Type: application/pidf+xml
         <?xml version="1.0" encoding="UTF-8"?>
         <presence
           <status>
             <basic>open</basic>
NOTIFY 2 sip:O-AS
   From: UE B
   To: UE A
   Subscription-State: active; expires=< any value >
   Event:call-completion
   Content-Type: application/call-completion
     cc-state: queued

Comments:

SIP 1 (ISC)		SUT	SIP 2 (Gm)
	Invoke CCNL request		
		Callee is available for CC recall	
NOTIFY 1	←	NOTIFY 1	
200 OK NOTIFY	→	200 OK NOTIFY	
PUBLISH	→	PUBLISH	
200 OK PUBLISH	←	200 OK PUBLISH	
NOTIFY 2	←	NOTIFY 2	
200 OK NOTIFY	→	200 OK NOTIFY	
PUBLISH	→	PUBLISH	
200 OK PUBLISH	←	200 OK PUBLISH	
NOTIFY 2	←	NOTIFY 2	
200 OK NOTIFY	→	200 OK NOTIFY	
		Start CC-T8	
		↓	
		CC-T8 expires	
NOTIFY 1	←	NOTIFY 1	
200 OK NOTIFY	→	200 OK NOTIFY	
		Apply post test routine	

5.4 Interaction of Call-Completion with other services

5.4.1 Terminating Identification Restriction (TIR)

TSS	TP	Reference	Selection expression
CC/ Interaction/TIR	CC_N08_001	4.6.4	PICS 4.3.2-1/4
Test purpose			
CCBS, CCNR, CCNL Recall successful by using the special REFER interworking. TIR settings considered in the CC recall. Ensure that the originating AS starts the CCBS recall procedure and in the 200 OK INVITE from the originating user is privacy indicated, the P-Asserted-Identity in the INVITE request set to the terminating user is also restricted.			
Preconditions:			
SIP header values:			

SIP header values:
200 OK 1
      Privacy: id
INVITE 2:   sip: UE B; m=BS/NR/NL
      From: UE A
      To: UE B
      P-Asserted-Identity: UE-A
      Privacy: id
      Call-Info: <sip:UE-A>;purpose=call-completion;m=BS/NR/NL

Comments:

SIP 1 (Gm)		SUT		SIP 2 (ISC)
		Invoke CCBS request		
		CCBS request confirmed by AS		
				Terminating user available for recall
		NOTIFY	←	NOTIFY 1
		200 OK NOTIFY	→	200 OK NOTIFY
INVITE	←	INVITE 1		
180 Ringing	→	180 Ringing		
200 OK INVITE 1	→	200 OK INVITE		
ACK	←	ACK	→	INVITE 2
			←	180 Ringing
		NOTIFY	←	NOTIFY 2
		200 OK NOTIFY	→	200 OK NOTIFY
			←	200 OK INVITE
			→	ACK
		Apply post test routine		

5.4.2 Communication diversion services (CDIV)

TSS	TP	Reference	Selection expression
CC/Interaction/CDIV	CC_N09_001	4.6.8.2	
Test purpose			
Detecting CCBS is possible. Ensure that when an originating user establishes a session to User B and the user B has activated communication diversion unconditional to user C, the terminating user C is busy, a 486 (Busy Here) response is sent to the originating AS and the Call-Info header contains the URI of user C or the terminating AS.			
Preconditions:			
SIP header values:			

SIP header values:
486 Busy Here 1:
    Call-Info: <sip:UE-C or T-AS>;purpose=call-completion;m=BS

Comments:

SIP 1 (ISC)		SUT		SIP 2 (Gm) UE C
INVITE	→		→	INVITE
486 (Busy Here) 1	←		←	486 (Busy Here)
ACK	→		→	ACK
		Apply post test routine		

TSS CC/Interaction/CDIV	TP CC_N09_002	Reference 4.6.8.2	Selection expression
Test purpose *Detecting CCNR is possible.* Ensure that when an originating user establishes a session to User B and the user B has activated communication diversion unconditional to user C, a 180 (Ringing) response is sent to the originating AS and the Call-Info header contains the URI of user C or the terminating AS.			
Preconditions:			
SIP header values: 180 Ringing 1: Call-Info: <sip:UE-C or T-AS>;purpose=call-completion;m=NR			
Comments:			

SIP 1 (ISC)		SUT		SIP 2 (Gm) UE C
INVITE	→		→	INVITE
180 (Ringing) 1	←		←	180 (Ringing)
		Apply post test routine		

TSS CC/Interaction/CDIV	TP CC_N09_003	Reference 4.6.8.2	Selection expression PICS 4.3.2-1/9
Test purpose *Detecting CCNL is possible.* Ensure that when an originating user establishes a session to User B and the user B has activated communication diversion unconditional to user C, the terminating user C is not logged-in, a 480 (Temporarily Unavailable) response is sent to the originating AS and the Call-Info header contains the URI of user C or the terminating AS.			
Preconditions:			
SIP header values: 480 Temporarily Unavailable 1: Call-Info: <sip:UE-C or T-AS>;purpose=call-completion;m=NL			
Comments:			

SIP 1 (ISC)		SUT		SIP 2 (Gm) UE C
INVITE	→		→	INVITE
480 (Temporarily Unavailable) 1	←		←	480 (Temporarily Unavailable)
ACK	→		→	ACK
		Apply post test routine		

TSS	TP	Reference	Selection expression
CC/Interaction/CDIV	CC_N09_004	4.6.8.2	
Test purpose			
*CCBS Recall is given to the **CC served user** after CFU was activated.* User A invokes a CCBS request to user B. subsequently user A activates CFU to user C. Ensure that the CCBS recall is sent to user A instead of forwarded to user C.			
Preconditions:			

SIP header values:
NOTIFY sip:O-AS
       From: UE B
       To: UE A
       Event:call-completion
       Subscription-State: active; expires=< any value >
       Content-Type: application/call-completion
        cc-state: ready
REFER: sip: UE A; m=BS
          Refer-To; UE B method=INVITE
INVITE: sip: UE A; m=BS
          Call.Info: UE-A; purpose=call-completion;m=BS			

Comments:			

```
SIP 1 (Gm) UE A                           SUT                      SIP 2 (ISC)
                 Establish a successful CCBS request
                 Activate CFU to user C
                                         Terminating user available for recall
                                   NOTIFY    ←    NOTIFY 1
                                   200 OK NOTIFY  →    200 OK NOTIFY
CASE A
REFER                      ←    REFER
202 Accepted               →    202 Accepted

CASE B
INVITE                     ←    INVITE
180 (Ringing)              →    180 (Ringing)
                 Apply post test routine
```

TSS	TP	Reference	Selection expression
CC/Interaction/CDIV	CC_N09_005	4.6.8.2	
Test purpose			
*CCNR Recall is given to the **CC served user** after CFU was activated.* User A invokes a CCNR request to user B. subsequently user A activates CFU to user C. Ensure that the CCNR recall is sent to user A instead of forwarded to user C.			
Preconditions:			

SIP header values:
NOTIFY sip:O-AS
        From: UE B
        To: UE A
        Event:call-completion
        Subscription-State: active; expires=< any value >
        Content-Type: application/call-completion
         cc-state: ready
REFER: sip: UE A; m=NR
        Refer-To; UE B method=INVITE
INVITE: sip: UE A; m=NR
        Call.Info: UE-A; purpose=call-completion;m=NR			

Comments:		
SIP 1 (Gm)	**SUT**	**SIP 2 (ISC)**
	Establish a successful CCNR request	
	Activate CFU to user C	
		Terminating user available for recall
	NOTIFY ←	NOTIFY 1
	200 OK NOTIFY →	200 OK NOTIFY
CASE A		
REFER	← REFER	
202 Accepted	→ 202 Accepted	
CASE B		
INVITE	← INVITE	
180 (Ringing)	→ 180 (Ringing)	
	Apply post test routine	

TSS	TP	Reference	Selection expression
CC/Interaction/CDIV	CC_N09_006	4.6.8.2	PICS 4.3.2-1/9

Test purpose

*CCNL Recall is given to the **CC served user** after CFU was activated.*

User A invokes a CCNL request to user B. subsequently user A activates CFU to user C. Ensure that the CCBS recall is sent to user A instead of forwarded to user C.

Preconditions:			

SIP header values:

NOTIFY sip:O-AS
        From: UE B
        To: UE A
        Event:call-completion
        Subscription-State: active; expires=< any value >
        Content-Type: application/call-completion
         cc-state: ready
REFER: sip: UE A; m=NL
        Refer-To; UE B method=INVITE
INVITE: sip: UE A; m=NL
        Call.Info: UE-A; purpose=call-completion;m=NL

Comments:

SIP 1 (Gm)	SUT	SIP 2 (ISC)
	Establish a successful CCNL request	
	Activate CFU to user C	
		Terminating user available for recall
	NOTIFY ←	NOTIFY 1
	200 OK NOTIFY →	200 OK NOTIFY
CASE A		
REFER	← REFER	
202 Accepted	→ 202 Accepted	
CASE B		
INVITE	← INVITE	
180 (Ringing)	→ 180 (Ringing)	
	Apply post test routine	

TSS	TP	Reference	Selection expression
CC/Interaction/CDIV	CC_N09_007	4.6.8.2	

Test purpose

CCBS revocation after terminating user has activated .

Ensure that the terminating AS revokes the outstanding CCBS request if the terminating user activates CFU to user C after the originating user has established CCBS on the terminating user B. The terminating AS sends a NOTIFY request to the originating AS and the Subscription-State header field set to "terminated"; and the "reason" Subscription-State header field parameter set to "noresource".

Preconditions:			

SIP header values:

NOTIFY sip:O-AS
   From:<UE-B>
   To:<UE-A>
   Event:call-completion
   Subscription-State: terminated; reason= noresource

Comments:

SIP 1 (ISC)	SUT	SIP 2 (Gm) User B
	Establish a successful CCBS request	
		Activate CFU to user C
NOTIFY	←	
200 OK NOTIFY	→	

TSS	TP	Reference	Selection expression
CC/Interaction/CDIV	CC_N09_008	4.6.8.2	

Test purpose

CCNR revocation after terminating user has activated .

Ensure that the terminating AS revokes the outstanding CCNR request if the terminating user activates CFU to user C after the originating user has established CCNR on the terminating user B. The terminating AS sends a NOTIFY request to the originating AS and the Subscription-State header field set to "terminated"; and the "reason" Subscription-State header field parameter set to "noresource".

Preconditions:

SIP header values:
NOTIFY sip:O-AS
From:<UE-B>
To:<UE-A>
Event:call-completion
Subscription-State: terminated; reason= noresource

Comments:

SIP 1 (ISC)	SUT	SIP 2 (Gm) User B
Establish a successful CCNR request		
		Activate CFU to user C
NOTIFY	←	
200 OK NOTIFY	→	

TSS	TP	Reference	Selection expression
CC/Interaction/CDIV	CC_N09_009	4.6.8.2	PICS 4.3.2-1/9

Test purpose

CCNL revocation after terminating user has activated .

Ensure that the terminating AS revokes the outstanding CCNL request if the terminating user activates CFU to user C after the originating user has established CCNL on the terminating user B. The terminating AS sends a NOTIFY request to the originating AS and the Subscription-State header field set to "terminated"; and the "reason" Subscription-State header field parameter set to "noresource".

Preconditions:

SIP header values:
NOTIFY sip:O-AS
From:<UE-B>
To:<UE-A>
Event:call-completion
Subscription-State: terminated; reason= noresource

Comments:

SIP 1 (ISC)	SUT	SIP 2 (Gm) User B
Establish a successful CCNL request		
		Activate CFU to user C
NOTIFY	←	
200 OK NOTIFY	→	

TSS	TP	Reference	Selection expression
CC/Interaction/CDIV	CC_N09_010	4.6.8.3	

Test purpose

CCBS indication is sent if the original call is diverted on Busy.

The terminating user has activated the CFB service. In case of a callee is busy the communication is forwarded to User C and the callee has subscribed the call completion service, ensure that terminating AS inform the caller that CCBS is possible at the diverted-to user UE C if busy or at the callee UE B.

Preconditions: Communication Forwarding Busy is activated

SIP header values:

486 Busy Here 1:
        Call-Info: <sip:UE C>;purpose=call-completion;m=BS
486 Busy Here 2:
        Call-Info: <sip: UE B>;purpose=call-completion;m=BS

Comments:				
SIP 1 (ISC)		**SUT**	**SIP 2 (Gm) UE B**	**SIP 3 (Gm) UE C**
INVITE	→		→ INVITE	
			← 486 (Busy Here)	
			→ ACK	
			CFB applies	
CASE A				→ INVITE
486 (Busy Here) 1	←			← 486 (Busy Here)
ACK	→			→ ACK
CASE B				→ INVITE
486 (Busy Here) 2	←			← 486 (Busy Here)
ACK	→			→ ACK
		Apply post test routine		

TSS	TP	Reference	Selection expression
CC/Interaction/CDIV	CC_N09_0011	4.6.8.3	

Test purpose

CCNR indication is sent if the original call was diverted on Busy.

The terminating user has activated the CFNR service. In case of a callee is busy the communication is forwarded to User C and the callee has subscribed the call completion service, ensure that terminating AS inform the caller that CCNR is possible at the diverted-to user UE C if not answer the communication or at the callee UE B.

Preconditions:

SIP header values:

180 Ringing 1:
    Call-Info: <sip:UE-C>;purpose=call-completion;m=NR
486 Busy Here 1
        Call-Info: <sip:UE-B>;purpose=call-completion;m=BS

Comments:				
SIP 1 (ISC)		**SUT**	**SIP 2 (Gm) UE B**	**SIP 3 (Gm) UE C**
INVITE	→		→ INVITE	
			← 486 (Busy Here)	
			→ ACK	
			CFB applies	
CASE A				→ INVITE
180 (Ringing) 1	←			← 180 (Ringing)
CASE B				→ INVITE
486 (Busy Here) 1	←			← 180 (Ringing)
ACK	→			
		Apply post test routine		

TSS	TP	Reference	Selection expression
CC/Interaction/CDIV	CC_N09_0012	4.6.8.3	PICS 4.3.2-1/9
Test purpose			
CCNL indication is sent if the original call was diverted on Busy. The terminating user has activated the CFNL service. In case of a callee is busy the communication is forwarded to User C and the callee has subscribed the call completion service, ensure that terminating AS inform the caller that CCNL is possible at the diverted-to user UE C if not logged-in or at the callee UE B.			
Preconditions:			
SIP header values:			

480 Temporarily Unavailable 1:
    Call-Info: <sip:UE-C>;purpose=call-completion;m=NL
486 (Busy Here) 1
        Call-Info: <sip:UE-B>;purpose=call-completion;m=BS			

Comments:

SIP 1 (ISC)		SUT		SIP 2 (Gm) UE B	SIP 3 (Gm) UE C
INVITE	→		→	INVITE	
			←	486 (Busy Here)	
			→	ACK	
				CFB applies	
CASE A					**UE C is not logged-in**
480 (Temporarily Unavailable) 1	←				
ACK	→				
CASE B					
486 (Busy Here) 1	←				
ACK	→				
		Apply post test routine			

TSS	TP	Reference	Selection expression
CC/Interaction/CDIV	CC_N09_013	4.6.8.3	

Test purpose

CCBS recall after the callee activates CFB. Recall is considered as being busy.

Ensure that User B activates CFB after User A has activated CCBS on User B. The CC recall from user A encounters a busy condition at user B:
- the terminating AS considers a CC recall to a busy callee and the AS indicates CCBS is possible to the originating AS
  - or
- the AS forwards the communication to User C.

Preconditions:

SIP header values:

NOTIFY 1 sip:O-AS
   From: UE-B
   To: UE-A
   Event:call-completion
   Content-Type: application/call-completion
      cc-state: ready
486 Busy Here 1
   Call-Info: <sip:UE-B>;purpose=call-completion;m=BS

Comments:

SIP 1 (ISC)		SUT	SIP 2 (Gm) UE B		SIP 2 (Gm) UE C
	Invoke CCBS request				
			Terminating user activates CFB		
			User B becomes available		
NOTIFY	←	NOTIFY 1			
200 OK NOTIFY	→	200 OK NOTIFY			
INVITE	←		← INVITE		
200 OK INVITE	→		→ 200 OK INVITE		
ACK	←		← ACK		
INVITE	→				
CASE A					
			→ INVITE		
486 (Busy Here) 1	←		← 486 (Busy Here)		
ACK	→		→ ACK		
CASE B					
				→	INVITE
180 (Ringing)	←			←	180 (Ringing)
		Apply post test routine			

ETSI

TSS	TP	Reference	Selection expression
CC/Interaction/CDIV	CC_N09_014	4.6.8.3	

Test purpose

CCNR recall after the callee activates CFB. Recall is considered as being busy.

Ensure that User B activates CFB after User A has activated CCNR on User B. The CC recall from user A encounters a busy condition at user B:
- the terminating AS considers a CC recall to a busy callee and the AS indicates CCBS is possible to the originating AS
    or
- the AS forwards the communication to User C.

Preconditions:

SIP header values:

NOTIFY 1 sip:O-AS
    From: UE-B
    To: UE-A
    Event:call-completion
    Content-Type: application/call-completion
        cc-state: ready
486 Busy Here 1
    Call-Info: <sip:UE-B>;purpose=call-completion;m=BS

Comments:

SIP 1 (ISC)		SUT		SIP 2 (Gm) UE B		SIP 2 (Gm) UE C
	Invoke CCNR request					
			Terminating user activates CFB			
			User B becomes available			
NOTIFY	←	NOTIFY 1				
200 OK NOTIFY	→	200 OK NOTIFY				
INVITE	←			← INVITE		
200 OK INVITE	→			→ 200 OK INVITE		
ACK	←			← ACK		
INVITE	→					
CASE A						
				→ INVITE		
486 (Busy Here) 1	←			← 486 (Busy Here)		
ACK	→			→ ACK		
CASE B						
					→	INVITE
180 (Ringing)	←				←	180 (Ringing)
			Apply post test routine			

TSS	TP	Reference	Selection expression
CC/Interaction/CDIV	CC_N09_015	4.6.8.3	PICS 4.3.2-1/9

Test purpose

CCNL recall after the callee activates CFB. Recall is considered as being busy.

Ensure that User B activates CFB after User A has activated CCNL on User B. The CC recall from user A encounters a busy condition at user B:
- the terminating AS considers a CC recall to a busy callee and the AS indicates CCBS is possible to the originating AS
        or
- the AS forwards the communication to User C.

Preconditions:

SIP header values:

NOTIFY 1 sip:O-AS
   From: UE-B
   To: UE-A
   Event:call-completion
   Content-Type: application/call-completion
     cc-state: ready
486 Busy Here 1
   Call-Info: <sip:UE-B>;purpose=call-completion;m=BS

Comments:

SIP 1 (ISC)		SUT	SIP 2 (Gm) UE B		SIP 2 (Gm) UE C
	Invoke CCNL request				
			Terminating user activates CFB		
			User B becomes available		
NOTIFY	←	NOTIFY 1			
200 OK NOTIFY	→	200 OK NOTIFY			
INVITE	←		← INVITE		
200 OK INVITE	→		→ 200 OK INVITE		
ACK	←		← ACK		
INVITE	→				
CASE A					
			→ INVITE		
486 (Busy Here) 1	←		← 486 (Busy Here)		
ACK	→		→ ACK		
CASE B					
				→	INVITE
180 (Ringing)	←			←	180 (Ringing)
		Apply post test routine			

TSS	TP	Reference	Selection expression
CC/Interaction/CDIV	CC_N09_016	4.6.8.4	

Test purpose

CCBS: indication is sent if the original call was diverted on no Reply.

In case of a diverted-to user after CFNR was performed is busy and the callee has subscribed the call completion service, ensure that the terminating AS informs the caller:
- that CCBS is possible at User C

  or
- that CCNR is possible at User B.

Preconditions:

SIP header values:
486 (Busy Here) 1:
    Call-Info: <sip:UE C>;purpose=call-completion;m=BS
180 (Ringing) 1
    Call-Info: <sip:UE B>;purpose=call-completion;m=NR

Comments:

SIP 1 (ISC)		SUT	SIP 2 (Gm) UE B	SIP 3 (Gm) UE C
INVITE	→		→ INVITE	
180 (Ringing) 1	←		← 180 (Ringing)	
		CFNR applies		
CASE A				→ INVITE
486 (Busy Here) 1	←			← 486 (Busy Here)
ACK	→			→ ACK
CASE B				→ INVITE
				← 486 (Busy Here)
				→ ACK
		Apply post test routine		

TSS	TP	Reference	Selection expression
CC/Interaction/CDIV	CC_N09_017	4.6.8.4	

Test purpose

CCNR: indication is sent if the original call was diverted on no Reply.

In case of a diverted-to user after CFNR was performed does not answer the communication request and the callee has subscribed the call completion service, ensure that the terminating AS informs the caller:
- that CCNR is possible at User C

  or
- that CCNR is possible at User B

Preconditions:

SIP header values:
180 Ringing 1:
    Call-Info: <sip:UE B>;purpose=call-completion;m=NR
180 Ringing 2
    Call-Info: <sip:UE C>;purpose=call-completion;m=NR

Comments:

SIP 1 (ISC)		SUT	SIP 2 (Gm) UE B	SIP 3 (Gm) UE C
INVITE	→		→ INVITE	
180 (Ringing) 1	←		← 180 (Ringing)	
		CFNR applies		
CASE A				→ INVITE
180 (Ringing) 2	←			← 180 (Ringing)
CASE B				→ INVITE
				← 180 (Ringing)
		Apply post test routine		

TSS	TP	Reference	Selection expression
CC/Interaction/CDIV	CC_N09_018	4.6.8.4	PICS 4.3.2-1/9

Test purpose

CCNL: indication is sent if the original call was diverted on no Reply.

In case of a diverted-to user after CFNR was performed is not logged-in and the callee has subscribed the call completion service, ensure that the terminating AS informs the caller:
- that CCNL is possible at User C

    or
- that CCNR is possible at User B.

Preconditions:

SIP header values:

480 Temporarily Unavailable 1:
   Call-Info: <sip:UE C>;purpose=call-completion;m=NL
180 (Ringing 1
   Call-Info: <sip: UE B>;purpose=call-completion;m=NR

Comments:

SIP 1 (ISC)		SUT		SIP 2 (Gm) UE B	SIP 3 (Gm) UE C
INVITE	→		→	INVITE	
180 (Ringing) 1	←		←	180 (Ringing)	
		CFNR applies			
CASE A					**UE C is not logged-in**
480 (Temporarily Unavailable) 1	←				
ACK	→				
CASE B					
		Apply post test routine			

TSS	TP	Reference	Selection expression
CC/Interaction/CDIV	CC_N09_019	4.6.8.4	

Test purpose
CCBS: Recall after CFNR was activated.

The terminating user activates CFNR after the originating user has requested the CCBS service at the terminating user. Ensure that the CC recall is:
- applied as a CC recall
  or
- forwarded as a normal call.

Preconditions:

SIP header values:

NOTIFY 1 sip:O-AS
  From: UE-B
  To: UE-A
  Event:call-completion
  Content-Type: application/call-completion
    cc-state: ready
INVITE 1: sip: UE-B; m=BS

Comments:

SIP 1 (ISC)		SUT	SIP 2 (Gm) UE B		SIP 3 (Gm) UE C
	Invoke CCBS request				
		User B becomes available			
NOTIFY 1	←				
200 OK NOTIFY	→				
		Callee activates CCNR			
INVITE 1	→				
CASE A			→	INVITE	
180 Ringing	←		←	180 Ringing	
CASE B			→	INVITE	
180 Ringing	←		←	180 Ringing	
		CFNR is performed			
				→	INVITE
				←	180 Ringing
180 Ringing	←				
		Apply post test routine			

TSS	TP	Reference	Selection expression
CC/Interaction/CDIV	CC_N09_020	4.6.8.4	

Test purpose
CCNR: Recall after CFNR was activated.

The terminating user activates CFNR after the originating user has requested the CCNR service at the terminating user. Ensure that the CC recall is:
- applied as a CC recall

  or
- forwarded as a normal call.

Preconditions:

SIP header values:

NOTIFY 1 sip:O-AS
   From: UE-B
   To: UE-A
   Event:call-completion
   Content-Type: application/call-completion
     cc-state: ready
INVITE 1: sip: UE-B; m=NR

Comments:

SIP 1 (ISC)	SUT	SIP 2 (Gm) UE B	SIP 3 (Gm) UE C
	Invoke CCNR request		
	User B becomes available		
NOTIFY 1	←		
200 OK NOTIFY	→		
	Callee activates CCNR		
INVITE 1	→		
CASE A		→ INVITE	
180 Ringing	←	← 180 Ringing	
CASE B		→ INVITE	
180 Ringing	←	← 180 Ringing	
	CFNR is performed		
		→	INVITE
180 Ringing	←		← 180 Ringing
	Apply post test routine		

TSS	TP	Reference	Selection expression
CC/Interaction/CDIV	CC_N09_021	4.6.8.4	PICS 4.3.2-1/9

Test purpose

CCNL: Recall after CFNR was activated.

The terminating user activates CFNR after the originating user has requested the CCNL service at the terminating user. Ensure that the CC recall is:
- applied as a CC recall
  or
- forwarded as a normal call.

Preconditions:

SIP header values:

NOTIFY 1 sip:O-AS
   From: UE-B
   To: UE-A
   Event:call-completion
   Content-Type: application/call-completion
     cc-state: ready
INVITE 1: sip: UE-B; m=NL

Comments:

SIP 1 (ISC)	SUT	SIP 2 (Gm) UE B	SIP 3 (Gm) UE C
	Invoke CCNL request		
		User B becomes available	
NOTIFY 1	←		
200 OK NOTIFY	→		
		Callee activates CCNR	
INVITE 1	→		
CASE A		→ INVITE	
180 Ringing	←	← 180 Ringing	
CASE B		→ INVITE	
180 Ringing	←	← 180 Ringing	
		CFNR is performed	
			→ INVITE
180 Ringing	←		← 180 Ringing
	Apply post test routine		

TSS	TP	Reference	Selection expression
CC/Interaction/CDIV	CC_N09_022	4.6.8.5	

Test purpose

CCBS: indication is sent if the original call was diverted on not logged-in.

In case of a diverted-to user after CFNL was performed is busy and the diverted-to user (User C) has subscribed the call completion service, ensure that the terminating AS inform the caller:
- that CCBS is possible at User C
  or
- that CCNL is possible at User B.

Preconditions:

SIP header values:

486 Busy Here 1:
   Call-Info: <sip:UE C>;purpose=call-completion;m=BS
480 Temporarily Unavailable 1
   Call-Info: <sip: UE B>;purpose=call-completion;m=NL

Comments:

SIP 1 (ISC)	SUT	SIP 2 (Gm) UE B	SIP 3 (Gm) UE C
INVITE	→		
		CFNL applies	
CASE A			→ INVITE
486 (Busy Here) 1	←		← 486 (Busy Here)
ACK	→		→ ACK
CASE B			→ INVITE
480 (Temporarily Unavailable) 1	←		← 486 (Busy Here)
ACK	→		→ ACK
	Apply post test routine		

TSS	TP	Reference	Selection expression
CC/Interaction/CDIV	CC_N09_023	4.6.8.5	

Test purpose

CCNR: indication is sent if the original call was diverted on not logged-in.

In case of a diverted-to user after CFNL was performed does not answer the communication request and the diverted-to user (User C) has subscribed the call completion service, ensure that the terminating AS inform the caller:
- that CCNR is possible at User C

    or
- that CCNL is possible at User B.

Preconditions:

SIP header values:

180 Ringing1:
    Call-Info: <sip:UE C>;purpose=call-completion;m=NR
480 Temporarily Unavailable 1
    Call-Info: <sip: UE B>;purpose=call-completion;m=NL

Comments: SIP 1 (ISC)		SUT	SIP 2 (Gm) UE B	SIP 3 (Gm) UE C
INVITE	→			
			CFNL applies	
CASE A				→ INVITE
180 (Ringing) 1	←			← 180 (Ringing)
CASE B				→ INVITE
480 (Temporarily Unavailable) 1	←			← 180 (Ringing)
ACK	→			
		Apply post test routine		

TSS	TP	Reference	Selection expression
CC/Interaction/CDIV	CC_N09_024	4.6.8.5	PICS 4.3.2-1/9

Test purpose

CCNL: indication is sent if the original call was diverted on not logged-in.

In case of a diverted-to user after CFNL was performed is not logged-in and the diverted-to user (User C) has subscribed the call completion service, ensure that the terminating AS inform the caller:
- that CCNL is possible at User C

    or
- that CCNL is possible at User B.

Preconditions:

SIP header values:

480 (Temporarily Unavailable) 1:
    Call-Info: <sip:UE C>;purpose=call-completion;m=NL
480 Temporarily Unavailable 2
    Call-Info: <sip: UE B>;purpose=call-completion;m=NL

Comments: SIP 1 (ISC)		SUT	SIP 2 (Gm) UE B	SIP 3 (Gm) UE C
INVITE	→			
			CFNL applies	**UE C is not logged-in**
CASE A				
480 (Temporarily Unavailable) 1	←			
ACK	→			
CASE B				
480 (Temporarily Unavailable) 2	←			
ACK	→			
		Apply post test routine		

TSS	TP	Reference	Selection expression
CC/Interaction/CDIV	CC_N09_025	4.6.8.6	

Test purpose

CCBS: indication is sent if the original call was deflected.

In case of a diverted-to user after CD (alerting) was performed is busy and the diverted-to user has subscribed the call completion service, ensure that the terminating AS informs the caller that CCBS is possible at User C.

Preconditions:

SIP header values:

486 (Busy Here) 1:
    Call-Info: <sip:UE C>;purpose=call-completion;m=BS

Comments:

SIP 1 (ISC)		SUT		SIP 2 (Gm) UE B		SIP 3 (Gm) UE C
INVITE	➔		➔	INVITE		
180 (Ringing)	←		←	180 (Ringing)		
			←	302 (Moved Temporarily)		
			➔	ACK		
			CD applies			
					➔	INVITE
486 (Busy Here) 1	←				←	486 (Busy Here)
ACK	➔				➔	ACK
		Apply post test routine				

TSS	TP	Reference	Selection expression
CC/Interaction/CDIV	CC_N09_026	4.6.8.6	

Test purpose

CCNR: indication is sent if the original call was deflected.

In case of a diverted-to user after CD (alerting) was performed does not answer the communication request and the diverted-to user has subscribed the call completion service, ensure that the terminating AS informs the caller that CCNR is possible at User C.

Preconditions:

SIP header values:

180 Ringing 1:
    Call-Info: <sip:UE C>;purpose=call-completion;m=NR

Comments:

SIP 1 (ISC)		SUT		SIP 2 (Gm) UE B		SIP 3 (Gm) UE C
INVITE	➔		➔	INVITE		
180 (Ringing)	←		←	180 (Ringing)		
			←	302 (Moved Temporarily)		
			➔	ACK		
			CD applies			
					➔	INVITE
180 (Ringing) 1	←				←	180 (Ringing)
		Apply post test routine				

TSS	TP	Reference	Selection expression
CC/Interaction/CDIV	CC_N09_027	4.6.8.6	PICS 4.3.2-1/9

Test purpose

CCNL: indication is sent if the original call was deflected.

In case of a diverted-to user after CD (alerting) was performed is not logged-in and the diverted-to user has subscribed the call completion service, ensure that the terminating AS informs the caller that CCNL is possible at User C.

Preconditions:

SIP header values:
480 Temporarily Unavailable 1:
    Call-Info: <sip:UE C>;purpose=call-completion;m=NL

Comments:

SIP 1 (ISC)		SUT		SIP 2 (Gm) UE B	SIP 3 (Gm) UE C
INVITE	→		→	INVITE	
180 (Ringing)	←		←	180 (Ringing)	
			←	302 (Moved Temporarily)	
			→	ACK	
				CD applies	**UE C is not logged-in**
480 (Temporarily Unavailable) 1	←				
ACK	→				
		Apply post test routine			

TSS	TP	Reference	Selection expression
CC/Interaction/CDIV	CC_N09_028	4.6.8.6	

Test purpose

CCBS recall is not deflected.

Ensure that a CCBS recall is not deflected at the terminating Application Server.

Preconditions:

SIP header values:
NOTIFY 1 sip:O-AS
    From: UE-B
    To: UE-A
    Event:call-completion
    Content-Type: application/call-completion
        cc-state: ready
INVITE 1:   sip: UE B; m=BS
               From: UE A
               To: UE B
               Call-Info: <sip:UE-A>;purpose=call-completion;m=BS

Comments:

SIP 1 (ISC)		SUT		SIP 2 (Gm)
	Invoke CCBS request			
		User B becomes available		
NOTIFY	←	NOTIFY 1		
200 OK NOTIFY	→	200 OK NOTIFY		
INVITE 1	→		→	INVITE
180 (Ringing)	←		←	180 (Ringing)
4xx	←		←	302 (Moved Temporarily)
ACK	→		→	ACK

TSS	TP	Reference	Selection expression
CC/Interaction/CDIV	CC_N09_029	4.6.8.6	
Test purpose			
CCNR recall is not deflected. Ensure that a CCNR recall is not deflected at the terminating Application Server.			
Preconditions:			

SIP header values:
NOTIFY 1 sip:O-AS
   From: UE-B
   To: UE-A
   Event:call-completion
   Content-Type: application/call-completion
    cc-state: ready
INVITE 1:   sip: UE B; m=NR
        From: UE A
        To: UE B
        Call-Info: <sip:UE-A>;purpose=call-completion;m=NR			

Comments:

SIP 1 (ISC)		SUT		SIP 2 (Gm)
	Invoke CCBS request			
		User B becomes available		
NOTIFY	←	NOTIFY 1		
200 OK NOTIFY	→	200 OK NOTIFY		
INVITE 1	→		→	INVITE
180 (Ringing)	←		←	180 (Ringing)
4xx	←		←	302 (Moved Temporarily)
ACK	→		→	ACK

TSS	TP	Reference	Selection expression
CC/Interaction/CDIV	CC_N09_030	4.6.8.6	PICS 4.3.2-1/9
Test purpose			
CCNL recall is not deflected. Ensure that a CCNL recall is not deflected at the terminating Application Server.			
Preconditions:			

SIP header values:
NOTIFY 1 sip:O-AS
   From: UE-B
   To: UE-A
   Event:call-completion
   Content-Type: application/call-completion
    cc-state: ready
INVITE 1:   sip: UE B; m=NL
        From: UE A
        To: UE B
        Call-Info: <sip:UE-A>;purpose=call-completion;m=NL			

Comments:

SIP 1 (ISC)		SUT		SIP 2 (Gm)
	Invoke CCBS request			
		User B becomes available		
NOTIFY	←	NOTIFY 1		
200 OK NOTIFY	→	200 OK NOTIFY		
INVITE 1	→		→	INVITE
180 (Ringing)	←		←	180 (Ringing)
4xx	←		←	302 (Moved Temporarily)
ACK	→		→	ACK

TSS	TP	Reference	Selection expression
CC/Interaction/CDIV	CC_N09_031	4.6.8.1	

Test purpose
CCBS recall is not forwarded.
The originating user activates CCBS. Before the terminating user becomes available the originating user activates CFU: Ensure that the CCBS recall is not forwarded if the originating user has activated CFU.

Preconditions:

SIP header values:
NOTIFY 1 sip:O-AS
From: UE-B
To: UE-A
Event:call-completion
Content-Type: application/call-completion
cc-state: ready
REFER: sip: UE A; m=BS
Refer-To; UE B; method=INVITE
INVITE 1:   sip: UE B; m=BS
From: UE A
To: UE B
Call-Info: <sip:UE-A>;purpose=call-completion;m=BS

Comments:		
SIP 1 (Gm) UE A	**SUT**	**SIP 2 (ISC)**
Invoke CCBS request		
Activate CFU to user C		
	User B becomes available	
	NOTIFY ←	NOTIFY 1
	200 OK NOTIFY →	200 OK NOTIFY
CASE A		
REFER ←	REFER	
202 Accepted →	202 Accepted	
CASE B		
INVITE ←	INVITE	
180 (Ringing) →	180 (Ringing)	
	Apply post test routine	

TSS	TP	Reference	Selection expression
CC/Interaction/CDIV	CC_N09_032	4.6.8.1	

Test purpose
CCNR recall is not forwarded.
The originating user activates CCNR. Before the terminating user becomes available the originating user activates CFU. Ensure that the CCNR recall is not forwarded if the originating user has activated CFU.

Preconditions:

SIP header values:
NOTIFY 1 sip:O-AS
From: UE-B
To: UE-A
Event:call-completion
Content-Type: application/call-completion
cc-state: ready
REFER: sip: UE A; m=NR
Refer-To; UE B; method=INVITE
INVITE 1:   sip: UE B; m=NR
From: UE A
To: UE B
Call-Info: <sip:UE-A>;purpose=call-completion;m=NR

Comments:
SIP 1 (Gm) UE A   SUT   SIP 2 (ISC)
Invoke CCBS request
Activate CFU to user C
User B becomes available
NOTIFY ← NOTIFY 1
200 OK NOTIFY → 200 OK NOTIFY
CASE A
REFER   ←   REFER
202 Accepted   →   202 Accepted
CASE B
INVITE   ←   INVITE
180 (Ringing)   →   180 (Ringing)
Apply post test routine

TSS	TP	Reference	Selection expression
CC/Interaction/CDIV	CC_N09_033	4.6.8.1	PICS 4.3.2-1/9

Test purpose

CCNL recall is not forwarded.

The originating user activates CCNL. Before the terminating user becomes available the originating user activates CFU. Ensure that the CCNL recall is not forwarded if the originating user has activated CFU.

Preconditions:

SIP header values:

NOTIFY 1 sip:O-AS
   From: UE-B
   To: UE-A
   Event:call-completion
   Content-Type: application/call-completion
     cc-state: ready
REFER: sip: UE A; m=NL
   Refer-To; UE B; method=INVITE
INVITE 1:   sip: UE B; m=NL
   From: UE A
   To: UE B
   Call-Info: <sip:UE-A>;purpose=call-completion;m=NL

Comments:

SIP 1 (Gm) UE A	SUT	SIP 2 (ISC)
Invoke CCBS request		
Activate CFU to user C		
	User B becomes available	
	NOTIFY ←	NOTIFY 1
	200 OK NOTIFY →	200 OK NOTIFY
CASE A		
REFER ←	REFER	
202 Accepted →	202 Accepted	
CASE B		
INVITE ←	INVITE	
180 (Ringing) →	180 (Ringing)	
	Apply post test routine	

TSS	TP	Reference	Selection expression
CC/Interaction/CDIV	CC_N09_034	4.6.8.1	

Test purpose

CCBS recall is not forwarded. Originating user is not logged-in.

The originating user activates CCBS. Before the terminating user becomes available the originating user activates CFU. Ensure that the CCBS recall is suspended if the originating user has activated CFU and is not logged-in.

Preconditions:

SIP header values:
NOTIFY 1 sip:O-AS
   From: UE-B
   To: UE-A
   Event:call-completion
   Content-Type: application/call-completion
     cc-state: ready
PUBLISH: sip T-AS
         Call.Info: UE-A; purpose=call-completion;m=BS
         P-Assertd-Identity: UE A
         Expires=(> 0)
         Event: presence
         Content-Type: application/pidf+xml
         <?xml version="1.0" encoding="UTF-8"?>
         <presence
           <tuple id=" any uri ">
              <status>
                 <basic>closed</basic>

Comments:

SIP 1 (Gm) UE A	SUT	SIP 2 (ISC)
Invoke CCBS request		
Activate CFU to user C		
	User B becomes available	
	NOTIFY ←	NOTIFY 1
	200 OK NOTIFY →	200 OK NOTIFY
	PUBLISH →	PUBLISH
	200 OK PUBLISH ←	200 OK PUBLISH
	Apply post test routine	

TSS CC/Interaction/CDIV	TP CC_N09_035	Reference 4.6.8.1	Selection expression

Test purpose

CCNR recall is not forwarded. Originating user is not logged-in.

The originating user activates CCNR. Before the terminating user becomes available the originating user activates CFU. Ensure that the CCNR recall is suspended if the originating user has activated CFU and is not logged-in.

Preconditions:

SIP header values:
NOTIFY 1 sip:O-AS
   From: UE-B
   To: UE-A
   Event:call-completion
   Content-Type: application/call-completion
     cc-state: ready
PUBLISH: sip T-AS
         Call.Info: UE-A; purpose=call-completion;m=NR
         P-Assertd-Identity: UE A
         Expires=(> 0)
         Event: presence
         Content-Type: application/pidf+xml
         <?xml version="1.0" encoding="UTF-8"?>
         <presence
           <tuple id=" any uri ">
             <status>
               <basic>closed</basic>

Comments:

SIP 1 (Gm) UE A	SUT	SIP 2 (ISC)
Invoke CCBS request		
Activate CFU to user C		
	User B becomes available	
	NOTIFY ←	NOTIFY 1
	200 OK NOTIFY →	200 OK NOTIFY
	PUBLISH →	PUBLISH
	200 OK PUBLISH ←	200 OK PUBLISH
	Apply post test routine	

TSS	TP	Reference	Selection expression
CC/Interaction/CDIV	CC_N09_036	4.6.8.1	PICS 4.3.2-1/9

Test purpose

CCNL recall is not forwarded. Originating user is not logged-in.

The originating user activates CCNL. Before the terminating user becomes available the originating user activates CFU. Ensure that the CCNL recall is suspended if the originating user has activated CFU and is not logged-in.

Preconditions:

SIP header values:
NOTIFY 1 sip:O-AS
   From: UE-B
   To: UE-A
   Event:call-completion
   Content-Type: application/call-completion
      cc-state: ready
PUBLISH: sip T-AS
         Call.Info: UE-A; purpose=call-completion;m=NL
         P-Assertd-Identity: UE A
         Expires=(> 0)
         Event: presence
         Content-Type: application/pidf+xml
         <?xml version="1.0" encoding="UTF-8"?>
         <presence
            <tuple id=" any uri ">
               <status>
                  <basic>closed</basic>

Comments:

SIP 1 (Gm) UE A	SUT	SIP 2 (ISC)
Invoke CCBS request		
Activate CFU to user C		
	User B becomes available	
	NOTIFY ←	NOTIFY 1
	200 OK NOTIFY →	200 OK NOTIFY
	PUBLISH →	PUBLISH
	200 OK PUBLISH ←	200 OK PUBLISH
	Apply post test routine	

History

Document history		
V5.1.1	October 2012	Publication