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Foreword

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Introduction

The present document is 4th part of a multi-part conformance test specification for UEs and is valid for 3GPP Release 5 and above. The specification contains a TTCN design frame work and the detailed test specifications in TTCN-3 for the UE conformance at the Gm reference point.

3GPP TS 34.229-1 [5] contains a conformance test description in prose.

3GPP TS 34.229-2 [6] contains a pro-forma for the UE Implementation Conformance Statement (ICS).

3GPP TS 34.229-3 [49] contains the conformance test description in TTCN for the multi-tester model.

3GPP TS 34.229-4 the present document.

1 Scope

The present document specifies the protocol conformance testing in TTCN-3 for the 3GPP User Equipment (UE) at the Gm interface for the basic IMS test cases using the so-called IP-CAN test model. It also forms the basis for further conformance testing for IM applications.

The present document is the 4th part of a multi-part test specification, 3GPP TS 34.229. The following TTCN test specification and design considerations can be found in the present document:

- the overall test suite structure;
- the testing architecture;
- the test methods and PCO definitions;
- the test configurations;
- the design principles, assumptions, and used interfaces to the TTCN tester (System Simulator);
- TTCN styles and conventions;
- the partial PIXIT proforma;
- the TTCN-3 files for the mentioned protocols tests.

The present document is valid for UEs implemented according 3GPP Releases starting from Release 5 up to the Release indicated on the cover page of the present document.

2 References

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

- References are either specific (identified by date of publication, edition number, version number, etc.) or non-specific.
- For a specific reference, subsequent revisions do not apply.
- For a non-specific reference, the latest version applies. In the case of a reference to a 3GPP document (including a GSM document), a non-specific reference implicitly refers to the latest version of that document in the same Release as the present document.
  - For a Release 5 UE, references to 3GPP documents are to version 5.x.y, when available.
  - For a Release 6 UE, references to 3GPP documents are to version 6.x.y, when available.

[1] 3GPP TR 21.905: "Vocabulary for 3GPP Specifications".

[2] 3GPP TS 34.123-1: "User Equipment (UE) conformance specification; Part 1: Protocol conformance specification".

[3] Void.

[4] 3GPP TS 34.123-3: "User Equipment (UE) conformance specification; Part 3: Abstract Test Suites (ATS)".

[5] 3GPP TS 34.229-1: "Internet Protocol (IP) multimedia call control protocol based on Session Initiation Protocol (SIP) and Session Description Protocol (SDP); User Equipment (UE) conformance specification; Part 1: Protocol conformance specification ".

[6] 3GPP TS 34.229-2: "Internet Protocol (IP) multimedia call control protocol based on Session Initiation Protocol (SIP) and Session Description Protocol (SDP); User Equipment (UE) conformance specification; Part 2: Implementation Conformance Statement (ICS) specification".

[7] 3GPP TS 34.108: "Common test environments for User Equipment (UE) conformance testing".

[8] Void.

[9] Void.

[10] Void.

[11] 3GPP TS 24.229: "IP Multimedia Call Control Protocol based on Session Initiation Protocol (SIP) and Session Description Protocol (SDP); Stage 3".

[12] ETSI ES 201 873: "Methods for Testing and Specification (MTS); The Testing and Test Control Notation version 3".

[13] IETF RFC 3320: "Signalling Compression (SigComp)".

[14] IETF RFC 3485: "The Session Initiation Protocol (SIP) and Session Description Protocol (SDP) Static Dictionary for Signalling Compression (SigComp)".

[15] IETF RFC 3486: "Compressing the Session Initiation Protocol (SIP)".

[16] IETF RFC 3261: "SIP: Session Initiation Protocol".

[17] IETF RFC 4566: "SDP: Session Description Protocol".

[18] IETF RFC 1035: "Domain names - implementation and specification".

[19] IETF RFC 1533: "DHCP Options and BOOTP Vendor Extensions".

[20] IETF RFC 2131: "Dynamic Host Configuration Protocol".

[21] IETF RFC 3315: "Dynamic Host Configuration Protocol for IPv6 (DHCPv6)".

[22] IETF RFC 3319: "Dynamic Host Configuration Protocol (DHCPv6) Options for Session Initiation Protocol (SIP) Servers".

[23] IETF RFC 3361: "Dynamic Host Configuration Protocol (DHCP-for-IPv4) Option for Session Initiation Protocol (SIP) Servers".

[24] IETF RFC 3680: "A Session Initiation Protocol (SIP) Event Package for Registrations".

[25] 3GPP TS 24.173: "IMS multimedia telephony communication service and supplementary services; Stage 3".

[26] IETF RFC 4825: "The Extensible Markup Language (XML) Configuration Access Protocol (XCAP)".

[27] IETF RFC 2616: "Hypertext Transfer Protocol – HTTP/1.1".

[28] Void.

[29] Void.

[30] 3GPP TS 36.523-3: "Evolved Universal Terrestrial Radio Access (E-UTRA) and Evolved Packet Core (EPC); User Equipment (UE) conformance specification; Part 3: Test suites".

[31] 3GPP TS 36.508: "Evolved Universal Terrestrial Radio Access (E-UTRA) and Evolved Packet Core (EPC); Common test environments for User Equipment (UE) conformance testing".

[32] 3GPP TS 36.509: "Evolved Universal Terrestrial Radio Access (E-UTRA) and Evolved Packet Core (EPC); Special conformance testing functions for User Equipment (UE)".

[33] 3GPP TS 24.109: "Bootstrapping interface (Ub) and network application function interface (Ua); Protocol details".

[34] 3GPP TS 33.220: "Generic Authentication Architecture (GAA); Generic Bootstrapping Architecture".

[35] 3GPP TS 33.222: "Generic Authentication Architecture (GAA); Access to network application functions using Hypertext Transfer Protocol over Transport Layer Security (HTTPS)".

[36] 3GPP TS 24.623: "Extensible Markup Language (XML) Configuration Access Protocol (XCAP) over the Ut interface for Manipulating Supplementary Services ".

[37] RFC 2617: "HTTP Authentication: Basic and Digest Access Authentication".

[38] RFC 3966: "The tel URI for Telephone Numbers".

[39] RFC 2141: 'URN Syntax'.

[40] 3GPP TS 24.604: "Communication Diversion (CDIV) using IP Multimedia (IM) Core Network (CN) subsystem; Protocol specification".

[41] 3GPP TS 24.607: "Originating Identification Presentation (OIP) and Originating Identification Restriction (OIR) using IP Multimedia (IM) Core Network (CN) subsystem; Protocol specification".

[42] 3GPP TS 24.608: "Terminating Identification Presentation (TIP) and Terminating Identification Restriction (TIR) using IP Multimedia (IM) Core Network (CN) subsystem; Protocol specification".

[43] 3GPP TS 24.611: " Anonymous Communication Rejection (ACR) and Communication Barring (CB) using IP Multimedia (IM) Core Network (CN) subsystem; Protocol specification".

[44] IETF RFC 4119 "A Presence-based GEOPRIV Location Object Format".

[45] IETF RFC 4575: "A Session Initiation Protocol (SIP) Event Package for Conference State".

[46] IETF RFC 5628: "Registration Event Package Extension for Session Initiation Protocol (SIP) Globally Routable User Agent URIs (GRUUs)".

[47] IETF RFC 3863 "Presence Information Data Format (PIDF)".

[48] IETF RFC 4745: "Common Policy: A Document Format for Expressing Privacy Preferences".

[49] 3GPP TS 34.229-3: "Internet Protocol (IP) multimedia call control protocol based on Session Initiation Protocol (SIP) and Session Description Protocol (SDP); User Equipment (UE) conformance specification; Part 3: Abstract Test Suites (ATS)".

3 Definitions and abbreviations

3.1 Definitions

For the purposes of the present document, the terms and definitions given in 3GPP TR 21.905 [1] and 3GPP TS 34.229-1 [5] apply.

3.2 Abbreviations

For the purposes of the present document, the abbreviations given in 3GPP TR 21.905 [1] and 3GPP TS 34.229-1 [5] apply.

4 Requirements on the TTCN development

Please refer to TS 34.229-3 [49] clause 4.

5 Test model

5.1 IMS IP-CAN test model

The IP-CAN test model is shown in Figure 5.1.1.3-1.

5.1.1 Ports interfacing to SS

In TTCN-3, ports are defined in all test components and in the Test System Interface. This is the equivalent of PCOs in TTCN-2. These ports then have to be mapped, or connected, to the SS at the start of each test.

5.1.1.1 Data ports

The IMS IP-CAN Test Suite in TTCN-3 simulates the SIP behaviour at the P_CSCF side. TTCN-3 communicates with the UE under test through four data ports and the emulations beneath. Each port shall be able to distinguish the use of one of the dual protocol stacks of IPv4 / IPv6.

The type of port (client or server) used to send or received a message will depend on the transport protocol selected for the testing, i.e. UDP or TCP.

- UDP case: The SS will send requests and responses to the UE from its client port. The SS will receive requests and responses from the UE on its server port.

- TCP case: The SS will receive requests from the UE and will send responses to those requests on its server port. The SS will send requests to the UE and will receive responses to those requests on its client port.

For SIP requests originated by the UE, the transport protocol in UL is selected by the UE. This information is extracted in the TTCN-3 and used in subsequent responses sent by the SS.

For SIP requests originated by the SS in DL UDP is used as transport protocol at the test For the purpose of test coverage, TCP is used in the specific test cases as specified.

NOTE: According to RFC 3261 [16] clause 18.1.1 the server side (UE) has to be able to cope with a maximum datagram size of 65,535 bytes (independent of any guideline to restrict the maximum size of UDP packets at the client side).

If no security associations have been set up, the unprotected client and server ports will be used. The security ports shall be used by the TTCN-3 authors when a security association has been established.

5.1.1.2 Security Associations Setup

Four unidirectional SAs are established between the UE and the SS:

SA1: port_uc to port_ps
SA2: port_pc to port_us
SA3: port_ps to port_uc
SA4: port_us to port_pc

The first pair (SA1 and SA3) is for bidirectional traffic between port_uc and port_ps. The second pair (SA2 and SA4) is for bidirectional traffic between port_pc and port_us.

While TCP scenario will use all four SAs, in UDP, only two SAs are needed because there is no traffic from port_ps to port_uc nor from port_us to port_pc. Figure 5.1.1.2-1 shows one example of the use of ports and security association in UDP and TCP.

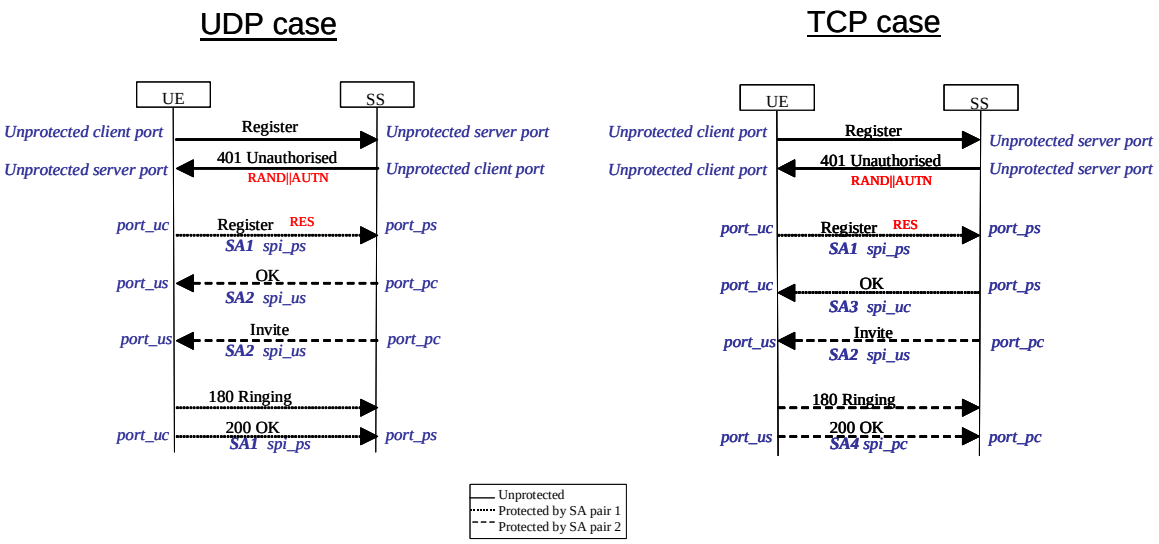

Figure 5.1.1.2-1: Use of port and SA in UDP and TCP

5.1.1.3 Control ports

The IMS IP-CAN Test Suite also controls the SS configuration and passes necessary parameters to the various emulation entities in the SS. This is done by ASPs through an **IP-CAN control port,** an **IP configuration port and a Signalling Compression control port**.

From the protocol stack point of view, SIP is an application layer protocol located above transport layer UDP / TCP which in turn use the services provided by the IP/IPsec layer. The IP packages are transmitted via the connected IP-CAN bearer, the EUTRA bearer, the UTRA bearer or the GERAN bearer. The emulations of these protocol layers in the SS shall be compliant with the relevant core specifications (3GPP and IETF).

The IP-CAN bearers are created, configured, modified and released though the ASP at the IP-CAN control port. The TTCN-3 codes shall also be able to control the UDP/IP/IPsec configurations and provide necessary parameters through the control ASPs.

The configuration of IP-CAN in the SS depends upon the technologies the UE supports. Unless otherwise specified, E-UTRA shall be configured for IMS test if E-UTRA technology is supported by the UE.

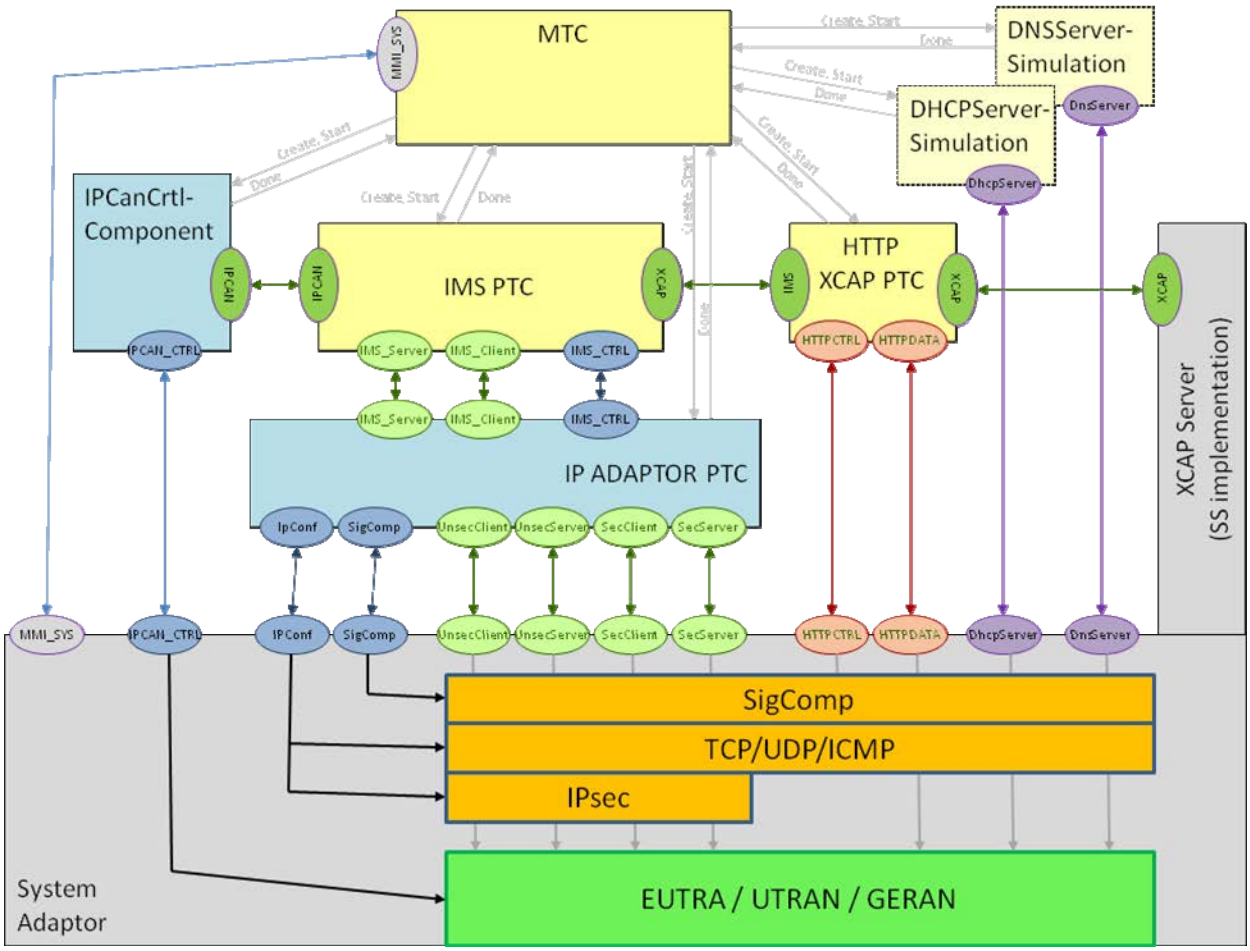

Figure 5.1.1.3-1: IMS IP-CAN test model

5.1.2 SAD

Security Association Database (SAD) shall be made accessible by the IPsec entity and contain sets of parameters corresponding to each security association. During registration/authentication, the UE and the SS will negotiate these parameters for setting up a security association. As the negotiation is carried out on SIP level (through SIP message exchanges), the resulting security parameters are obtained and stored in the IMS IP-CAN Test Suite. A number of ASPs are defined to convey these parameters from TTCN-3 codes to SAD. ASPs manipulating the SAD are also defined.

5.1.3 Network interface

Similar to the majority of TCP/IP stack implementations, a network interface (IF0, IF1, IF2, etc.) structure is used to connect the IP-CAN bearer to IP protocol entity. When the ASP for setting up an IP-CAN bearer is called via the IP-CAN control port, the SS shall connect the established radio access bearer to the relevant IF structure, in order to provide the radio bearer connectivity to the IP/IPsec layer. In order to ease maintenance, all IP-CAN control has been encapsulated into its own Parallel Test Component.

5.1.4 SigComp and related control port

SIP Compression is mandatory (clause 8 of 3GPP TS 24.229 [11]) and Signalling compression (RFC 3320 [13], RFC 3485 [14], RFC 3486 [15], RFC4896, RFC5049) protocol is used for SIP compression. The SigComp entity in the model is used to carry out the compression/decompression functions. In the receiving direction of the SS, the SigComp entity will detect whether the incoming SIP message is compressed and, if so, decompress it. In the sending direction of the SS, the TTCN controls whether the outgoing SIP message is compressed through the SigComp control port. If while decompressing a message, decompression failure occurs, the message shall be discarded. The SigComp layer in the SS shall automatically find if a secure port or un-secure port is being used for transmission or reception of messages. If an un-secure port is used for transmission, then as per clause 8 of 3GPP TS 24.229 [11], it shall not include state creation

instructions. If the state creation command is received in a compressed message on an un-secured port (clause 8 of 3GPP TS 24.229 [11]), a decompression failure shall be generated.

5.1.5 SIP TTCN-3 Codec

SIP is a text-based protocol, the messages exchanged between the UE and the SS are character strings. In TTCN-3 Test Suite the messages are structured to take the advantage of TTCN-3 functionality, and to make the debugging and maintenance of the Test Suite easier. When the TTCN-3 Test Suite sends a message to the UE, the SIP TTCN-3 codec converts the structured message to the corresponding character string then transfers it to the UE. When the SS receives a message from the UE, the TTCN-3 codec converts the received character string to the structured message and passes it to the TTCN-3 Test Suite.

5.1.6 DHCP and DNS data ports

The DHCP port is used for receiving the DHCP requests from the UE under test, and sending corresponding responses to the UE. The DNS port is used for receiving domain name resolution requests from the UE and sending the results back to the UE. The TTCN which implements the required DHCP and DNS server functions (only the functions necessary for testing purposes, not full functionality) will receive and send on these ports.

The DHCP and DNS server functionalities in the default test configuration are implemented as Parallel Test Components (PTCs).

5.2 Upper Tester (UT)

In order to support test automation and regression testing, there is an MMI port through which MMI commands (e.g. "Please initiate a call") are sent to an external entity of the system simulator. Implementations can customize the external entity according to their needs.

5.3 TTCN-3

TTCN-3 is used as the specification language. ES 201 873 [12] (TTCN-3) is applied to the notation.

5.4 Support of XCAP

Please refer to TS 34.229-3 [49] clause 5.5

6 ASP definitions

6.1 Control ASP

ASPs for configuring/controlling the SS are defined to operate in a pair of ASPs, Req (request) ASP and Cnf (Confirm) ASP of the blocking mode. The TTCN-3 execution after sending a Req ASP shall wait (be blocked) for the Cnf ASP.

Because the IMS Test Suite is radio access technology independent, few parameters are passed from the TTCN-3. Therefore the exact configuration procedures used are determined by the implementation.

The PIXIT px_RANTech (see below) is set by the operator according to the technology the UE supports and is passed through the TTCN to the SS. This is defined as an enumerated type and is used to specify which platform the test is to be run on (e.g. GERAN, UTRA or E-UTRA). Unless otherwise specified, E-UTRA shall be chosen if it is supported by the UE.

6.1.1 Cell Control

Name	CreateCellReq	
Port	IPCANctl	
Comment	ASP type for creating a cell	
Parameter Name	**Parameter Type**	**Comment**
ranTech	RANTech	
primaryFrequencyBand	integer	

union {
noSSAC,
ssacBarringFactorVoice,
ssacBarringFactorVideo
}
		Optional.
		Specific ac-Barring Factor

mccValue	hexstring (3)	Optional
mncValue	hexstring (2..3)	Optional

Name	CreateCellCnf	
Port	IPCANctl	
Comment	ASP type which returns the result of the execution of CreateCellReq	
Parameter Name	**Parameter Type**	**Comment**
status	Status	

Name	ReleaseCellReq	
Port	IPCANctl	
Comment	ASP type for releasing resources allocated to the cell	
Parameter Name	**Parameter Type**	**Comment**

Name	ReleaseCellCnf	
Port	IPCANctl	
Comment	ASP type which returns the result of the execution of ReleaseCellReq	
Parameter Name	**Parameter Type**	**Comment**
status	Status	

Name	RANTech
Type	enumerated
Parameters	GERAN, UTRA_FDD, UTRA_TDD, EUTRA_FDD, EUTRA_TDD, dummy1, dummy2
Comment	Indicates the radio access network technology used for transport of SIP signalling messages over the air interface

Name	Status
Type	enumerated
Parameters	success, failure, inconclusive
Comment	Indicates the status result of the requesting ASP

Name	ModifyCellReq	
Port	IPCANctl	
Comment	ASP type for modifying system information parameters in a cell	
Parameter Name	**Parameter Type**	**Comment**

union {
noSSAC,
ssacBarringFactorVoice,
ssacBarringFactorVideo
}
		Optional.
		Specific ac-Barring Factor

Name	ModifyCellCnf	
Port	IPCANctl	
Comment	ASP type which returns the result of the execution of ModifyCellReq	
Parameter Name	**Parameter Type**	**Comment**
status	Status	

6.1.2 IdleUpdated

Name	IdleUpdatedReq	
Port	IPCANctl	
Comment	ASP type which requests the SS to bring the UE into an idle updated state and GMM or EMM registered	
Parameter Name	**Parameter Type**	**Comment**
ueAddress	IPAddress	UE address to be assigned via NAS signalling
bearerInfo	List of integers	Optional. For use in EUTRA to specify the default bearer to be used and possibly one or more dedicated bearers to be established in the preamble.
isEmergency	Boolean	Optional. To indicate if this is an emergency attach
withUICC	Boolean	Optional. To indicate if the UE has a UICC

Name	IdleUpdatedCnf	
Port	IPCANctl	
Comment	ASP type which returns the result of the execution of IdleUpdatedReq	
Parameter Name	**Parameter Type**	**Comment**
status	Status	

Name	DetachReq	
Port	IPCANctl	
Comment	ASP type which requests the SS to bring the UE into detached state	
Parameter Name	**Parameter Type**	**Comment**
moFlag	Boolean	Set to true if the SS is requested to accept a mobile originated detach. Set to false if the SS is requested to initiate the detach

Name	DetachCnf	
Port	IPCANctl	
Comment	ASP type which returns the result of the execution of DetachReq	
Parameter Name	**Parameter Type**	**Comment**
status	Status	

Name	HandoverReq	
Port	IPCANctl	
Comment	ASP type which requests the SS to allow the UE to handover to another RAT	
Parameter Name	**Parameter Type**	**Comment**
ranTech	RANTech	Info to which RAT the UE will handover
handoverType	HandoverType	Type of handover

Name	HandoverCnf	
Port	IPCANctl	
Comment	ASP type which returns the result of the execution of HandoverReq	
Parameter Name	**Parameter Type**	**Comment**
status	Status	

Name	HandoverType
Type	enumerated
Parameters	ho_csfb, ho_reselection
Comment	Indicates the type of handover to be performed

6.1.3 PDPContext

Name	AddPDNReq	
Port	IPCANctl	
Comment	ASP type which requests the SS to be prepared to establish a new PDN	
Parameter Name	**Parameter Type**	**Comment**
ueAddress	IPAddress	UE address to be assigned via NAS signalling
bearerInfo	List of integers	For use in EUTRA to add DRB(s) for the concerned PDN connectivity
pdnTypeFor	PDNTypeFor	To indicate what the bearer identified in bearerInfo is to be used for

Name	AddPDNCnf	
Port	IPCANctl	
Comment	ASP type which returns the result of the execution of AddPDNReq	
Parameter Name	**Parameter Type**	**Comment**
status	Status	

Name	PDNTypeFor
Type	enumerated
Parameters	emergencyPDN, xcapPDN
Comment	Indicates what the PDN bearer is to be used for

Name	PCORequest	
Port	IPCANctl	
Comment	ASP type which returns the contents of the ProtocolConfigurationOptions IE received in the ActivatePDPContextRequest / EPS Bearer Request to the TTCN	
Parameter Name	**Parameter Type**	**Comment**
configOptList	ConfigOptList	
bearerContextId	integer	

Name	PCOResponse	
Port	IPCANctl	
Comment	ASP type which sends back the ProtocolConfigurationOptions IE to the SS.	
Parameter Name	**Parameter Type**	**Comment**
configOptList	ConfigOptList	
bearerContextId	integer	

Name	DedicatedBearerReq	
Port	IPCANctl	
Comment	ASP type which in requests the SS to establish one or more secondary PDP context / dedicated bearers; or informs the SS to expect the UE to request one or more secondary PDP context / dedicated bearers. Includes the bearer info to be configured and media ports to be used	
Parameter Name	**Parameter Type**	**Comment**
bearerInfoList	{{bearerContextId, bearerInfo, mediaPort}}	
moFlag	boolean	Set to true if the SS is requested to accept a mobile initiated dedicated bearer establishment procedure; set to false if the SS is to establish the dedicated bearer.

Name	DedicatedBearerCnf	
Port	IPCANctl	
Comment	ASP type which returns the result of the execution of DedicatedBearerReq, when it is completed	
Parameter Name	**Parameter Type**	**Comment**
status	Status	

Name	ModifyBearerReq	
Port	IPCANctl	
Comment	ASP type which informs the SS to expect the UE to request to modify an existing PDP context / Dedicated Bearer. Includes the bearer info for this to be modified to	
Parameter Name	**Parameter Type**	**Comment**
bearerContextId	integer	
bearerInfo	integer	

Name	ModifyBearerCnf	
Port	IPCANctl	
Comment	ASP type which returns the result of the execution of ModifyBearerReq, when it is completed	
Parameter Name	**Parameter Type**	**Comment**
status	Status	

Name	DeactivateBearerReq	
Port	IPCANctl	
Comment	ASP type which requests the SS deactivate the indicated PDP context. A value of bearerContextId = 0 indicates that all existing PDP contexts are to be deactivated.	
Parameter Name	**Parameter Type**	**Comment**
bearerContextId	integer	
moInititiated	boolean	Flag indicating if the PDP context deactivation is initiated by the UE

Name	DeactivateBearerCnf	
Port	IPCANctl	
Comment	ASP type which returns the result of the execution of DeactivateBearerReq	
Parameter Name	**Parameter Type**	**Comment**
status	Status	

Name	BearerInfo
Type	integer
Comment	References the RAB to be configured. This is RAN independent and can be added to/reduced as required This is simply a list of RAB identifiers. It is expected, in the future, for these identifiers to equate to specific RAB requirements, for all available radio access technologies See clause 8.1 for more information.

Name	ConfigOptList
Type	set of ConfigOpt
Comment	Used to contain the protocol configuration options IE used in the PDP context messages

Name	ConfigOpt	
Type	octetstring	
Parameter Name	**Parameter Type**	
ContainerId	octetstring [2]	
ContainerLength	octetstring [1]	
ContainerContents	octetstring optional	

6.1.4 IP Configuration

Name	InstallKeyReq	
Port	IPconf	
Comment	ASP type which installs the keys into the IP layer in the SS	
Parameter Name	**Parameter Type**	**Comment**
MD5_96Key	bitstring	length (128)
SHA_1_96Key	bitstring	length (160)
DES_EDE3_CBCKey	bitstring	length (192)
AES_CBCKey	bitstring	length (128)

Name	InstallKeyCnf	
Port	IPconf	
Comment	ASP type which returns the result of the execution of InstallKeyReq	
Parameter Name	**Parameter Type**	**Comment**
status	Status	

Name	AssignIPaddrReq	
Port	IPconf	
Comment	ASP type which assigns the IP address to the IP layer in the SS	
Parameter Name	**Parameter Type**	**Comment**
p_cscf_Addr	IPAddr	
dhcp_Addr	IPAddr	
dns_Addr	IPAddr	
ue_Addr	IPAddr	
peerUE_Addr	IPAddr	

Name	AssignIPaddrCnf	
Port	IPconf	
Comment	ASP type which returns the result of the execution of AssignIPaddrReq	
Parameter Name	**Parameter Type**	**Comment**
status	Status	

Name	IPAddr
Type	charstring
Comment	in either colon separated or dotted decimal format

Name	ReleaseIPConfigurationReq	
Port	IPconf	
Comment	ASP type which releases the IMS IP layer configurations including Security Associations. This ASP is meant to be used when starting a new test case to make sure that the IP layer is in a well defined initial state irrespective of the execution of previous tests.	
Parameter Name	**Parameter Type**	**Comment**
-	-	No parameters

Name	ReleaseIPConfigurationCnf	
Port	IPconf	
Comment	ASP type which returns the result of the execution of ReleaseIPConfigurationReq	
Parameter Name	**Parameter Type**	**Comment**
status	Status	

Name	AddPCSCFaddrReq	
Port	IPconf	
Comment	ASP type which configures a new address of the P-CSCF component in the IP layer in the SS	
Parameter Name	**Parameter Type**	**Comment**
p_cscf_Addr	IPAddr	New IP address of P-CSCF component to be simulated

Name	AddPCSCFaddrCnf	
Port	IPconf	
Comment	ASP type which returns the result of the execution of AddPCSCFaddrReq	
Parameter Name	**Parameter Type**	**Comment**
status	Status	

Name	SignallingCompressionReq	
Port	SigComp	
Comment	ASP type which starts/stops signalling compression of messages	
Parameter Name	**Parameter Type**	**Comment**
startCompression	boolean	

Name	SignallingCompressionCnf	
Port	SigComp	
Comment	ASP type which returns the result of the execution of SignallingCompressionReq	
Parameter Name	**Parameter Type**	**Comment**
status	Status	

Name	RcvdCompartmentId	
Port	SigComp	
Comment	ASP type which feeds back the Compartment Id back to the Sigcomp layer, extracted from the last received message, used by SigComp layer to store any state appropriately.	
Parameter Name	**Parameter Type**	**Comment**
compartmentId	charstring	Call-Id of the SIP message will be used as compartment Id

Name	DecompFailureType
Type	enumerated
Parameters	stateCreation,dummy1,dummy2,dummy3
Comment	Indicates the mechanism through which decompression failure errors shall be inserted during compressing message stateCreation: This type indicates, decompression failure shall be generated by inserting "State Creation" instructions in DL messages sent on unsecured SS Port (clause 8 of 3GPP TS 24.229 [11])

Name	UpdateRemotePCSCFPortNumberReq	
Port	IPconf	
Comment	ASP type use by TTCN to reconfigure P-CSCF server and client ports to contact the UE at given port number	
Parameter Name	**Parameter Type**	**Comment**
uePortNumber	integer	

Name	UpdateRemotePCSCFPortNumberCnf	
Port	IPconf	
Comment	ASP type which the result of the execution of UpdateRemotePCSCFPortNumberReq	
Parameter Name	**Parameter Type**	**Comment**
status	Status	

6.1.5 SA Database

Name	DoubleAddSADReq	
Port	IPconf	
Comment	ASP type which sets two entries of SAD in the SS	
Parameter Name	**Parameter Type**	**Comment**
sa1	SA	
sa2	SA	

Name	DoubleAddSADCnf	
Port	IPconf	
Comment	ASP type which returns the result of the execution of DoubleAddSADReq	
Parameter Name	**Parameter Type**	**Comment**
status	Status	

Name	DelSADReq	
Port	IPconf	
Comment	ASP type which deletes the SAD entries	
Parameter Name	**Parameter Type**	**Comment**
spi1	SPI	
spi2	SPI	optional
spi3	SPI	optional
spi4	SPI	optional
spi5	SPI	optional
spi6	SPI	optional
spi7	SPI	optional
spi8	SPI	optional
spi9	SPI	optional

Name	DelSADCnf	
Port	IPconf	
Comment	ASP type which returns the result of the execution of DelSADReq	
Parameter Name	**Parameter Type**	**Comment**
status	Status	

Name	SA
Port	IPconf
Comment	ASP type which sets a single entry of parameters for a security association in the SS
Parameter Name	**Parameter Type**
spi	SPI
srcIPaddr	IPAddr
desIPaddr	IPAddr
srcUDPport	integer
desUDPport	integer
intAlgo	IntAlgo
ciphAlgo	CiphAlgo

Name	IntAlgo
Type	enumerated
Parameters	hmac_md5_96, hmac_sha_1_96
Comment	Integrity algorithms

Name	CiphAlgo
Type	enumerated
Parameters	des_ede3_cbc, aes_cbc, nociph
Comment	Ciphering algorithms, "nociph" means no ciphering

Name	SPI
Type	integer (0..4294967295)
Comment	security parameter index for IPsec

6.1.6 Emergency CS Call

Name	ExpectEmergencyCSCall	
Port	IPCANctl	
Comment	ASP type which informs the SS to expect the UE to request an emergency CS call	
Parameter Name	**Parameter Type**	**Comment**

Name	EmergencyCSCallActive	
Port	IPCANctl	
Comment	ASP type which returns the result of the execution of ExpectEmergencyCSCall when it is in call active state	
Parameter Name	**Parameter Type**	**Comment**
status	Status	

Name	ReleaseCSCallReq	
Port	IPCANctl	
Comment	ASP type which requests the SS to release the CS call previously established during ExpectEmergencyCSCall	
Parameter Name	**Parameter Type**	**Comment**

Name	ReleaseCSCallCnf	
Port	IPCANctl	
Comment	ASP type which returns the result of the execution of ReleaseCSCallReq	
Parameter Name	**Parameter Type**	**Comment**
status	Status	

6.1.7 CS Voice Call

Name	CSCallReq	
Port	IPCANctl	
Comment	ASP type which informs the SS to establish a CS voice call with the UE	
Parameter Name	**Parameter Type**	**Comment**
moFlag	Boolean	Set to true if the SS is requested to accept a mobile originated CS voice call; Set to false if SS is requested to establish a CS voice call
phoneNumber	charstring	Optional. The phone number to be signalled to the UE in the mobile terminated case

Name	CSCallCnf	
Port	IPCANctl	
Comment	ASP type which returns the result of the execution of CSCallReq when it's in call active state	
Parameter Name	**Parameter Type**	**Comment**
status	Status	

6.1.8 IPCANConnection

Name	ReleaseIpcanConnectionReq	
Port	IPCANctl	
Comment	ASP which requests the SS to release the RRC connection in EUTRA case. The DRB resources are reserved for restoring.	
Parameter Name	**Parameter Type**	**Comment**

Name	ReleaseIpacnConnectionCnf	
Port	IPCANctl	
Comment	ASP which returns the result of the execution of the ASP ReleaseIPCANConnectionReq	
Parameter Name	**Parameter Type**	**Comment**
status	Status	

Name	RestoreIpcanConnectionReq	
Port	IPCANctl	
Comment	ASP which requests the SS to restore the DRB connection in EUTRA	
Parameter Name	**Parameter Type**	**Comment**
moFlag	Boolean	In case of EUTRA Set to true - SS will wait for the UE to restore / re-establish DRB Set to false - SS is requested to page UE and restore /re-establish DRB

Name	RestoreIpcanConnectionCnf	
Port	IPCANctl	
Comment	ASP which returns the result of the execution of the ASP RestoreIpcanConnectionReq	
Parameter Name	**Parameter Type**	**Comment**
status	Status	

6.2 IMS-IP-CAN Data ASP definitions

6.2.1 ASP_DataRequest

Name	ASP_DataRequest	
Port	DataPort	
Comment	ASP type for receiving/sending SIP Request Messages	
Parameter Name	**Parameter Type**	**Comment**
sigCompInfo	SigCompInfo	OPTIONAL. Information for/from SigComp layer. Absence means compression is/shall be not applied in received/send message.
portInfo	SSPortInfo	
msg	union {REGISTER_Request, INVITE_Request, OPTIONS_Request, BYE_Request, CANCEL_Request, ACK_Request, PRACK_Request, NOTIFY_Request, SUBSCRIBE_Request, PUBLISH_Request, UPDATE_Request, REFER_Request , MESSAGE_Request}	SIP message

6.2.2 ASP_DataResponse

Name	ASP_DataResponse	
Port	DataPort	
Comment	ASP type for receiving/sending SIP RESPONSE Message	
Parameter Name	**Parameter Type**	**Comment**
sigCompInfo	SigCompInfo	OPTIONAL. Information for/from SigComp layer. Absence means compression is/shall be not applied in received/send message.
portInfo	SSPortInfo	
msg	Response	SIP RESPONSE message

Name	SigCompInfo	
Type	Union	
Parameter Name	**Parameter Type**	**Comment**
compartmentId	charstring	Used for Sending messages from TTCN. To be used by SigComp Layer
isCompressed	boolean	Used for received messages. If set, means received message was compressed

Name	SSPortInfo	
Type	record	
Parameter Name	**Parameter Type**	**Comment**
ipAddr	IPAddr	IP address of simulated network node
transportProtocol	TransportProtocol	

Name	TransportProtocol
Type	enumerated
Parameters	UDP, TCP

6.3 Ut ASP definitions

Name	MMIMessage	
Port	MMIPort	
Comment	ASP type for sending messages to upper tester	
Parameter Name	**Parameter Type**	**Comment**
mmiMessage	charstring	Action required by upper tester

6.4 HTTP Layer ASP definitions

HTTP Layer ASPs are applicable to clause 5.1.1.3

Please refer to TS 34.229-3 [49] annex H.3 for details.

6.5 XCAP server ASP definitions

XCAP Layer ASPs are applicable to clause 5.1.1.3.

Please refer to TS 34.229-3 [49] clause 6.5 for details.

7 Codec definitions for IP User Data

Please refer to TS 34.229-3 [49] clause 7.

8 Design consideration

8.1 Bearer Configurations for IMS Testing

8.1.1 Bearer Information for UTRAN

BearerInfo	RANTech = UTRAN_FDD	Description
1	TS 34.108 [7], clause 6.10.2.4.1.56	To be used for IMS Signalling only
2	TS 34.108 [7], clause 6.10.2.4.6.6	Not supported in Rel-5
3	TS 34.108 [7], clause 6.10.2.4.6.7	Not supported in Rel-5
4	TS 25.993, clause 7.1.122	Only supported in Rel-5
5	TS 25.993, clause 7.1.124	Not supported in Rel-5

8.1.2 Bearer Information for GERAN

No specific bearer information has yet been defined. The QoS to be used is therefore dependant on the media applications supported by the UE.

8.1.3 Bearer Information for E-UTRA

BearerInfo	RANTech = E-UTRA_FDD	Description
1	TS 36.508 [31], clause 6.6.1 Reference default EPS bearer context #2	For IMS Signalling and media text
2	TS 36.508 [31], clause 6.6.2 Reference dedicated EPS bearer context #4	For IMS media voice and video
3	TS 36.508 [31], clause 6.6.1 Reference default EPS bearer context #2, except that it is on the Emergency Call PDN	Default bearer for emergency call signalling
4	TS 36.508 [31], clause 6.6.2 Reference dedicated EPS bearer context #4	Dedicated bearer for emergency voice media

8.2 Security

TBD.

8.3 External Function Definitions

The following external functions are required to be implemented by the SS.

TTCN-3 External Function		
Name	**fx_MD5_Hex**	
Description	to calculate the MD5 Message-Digest Algorithm according to RFC 1231	
Parameters	data	octetstring
Return Value	octetstring	

Additionally, the following external function is used as defined in TS 36.523-3 [30]:

fx_GetSystemTime

8.4 AT commands

No AT commands have yet been defined for IMS operations

8.5 Timer Tolerances

Please refer to TS 34.229-3 [49] clause 8.5 for details.

Annex A (normative): Test Suite

Please refer to TS 34.229-3 [49] annex A for details.

Annex B (normative): Partial IXIT proforma

Please refer to TS 34.229-3 [49] annex B. In addition to the PIXITs defined in TS 34.229-3 [49] annex B.1 model specific PIXITs are defined in Table B-1:

Table B-1: PIXIT

Parameter name	Description	Type	Default value	Supported value
px_AuthN	Length of Extended value min 31, max 127 (TS 34.108 [7] cl. 8.1.2)	integer	127	
px_DHCPServer_IPAddr	IP address of DHCP server (in v4 or v6 format	IPAddr	"10.122.11.33"	
px_DNS_DomainName	DNS server fully qualified domain name (FQDN) Editors note: FFS	charstring	"dnsserver.3gpp.org"	
px_RANTech	RAN Technology	RANTech	UTRAN_FDD	enumerated type: GERAN, UTRA_FDD, UTRA_TDD, EUTRA_FDD, EUTRA_TDD
px_UE_IPAddr	IP address assigned to UE (in v4 or v6 format)	IPAddr	"10.122.11.145"	
px_UE_IPAddr2	IP address assigned to UE for 2nd PDN (in v4 or v6 format)	IPAddr	"10.122.11.31"	
px_UE_Release	UE Release	integer	8	

Annex C (informative): TTCN-3 style guide for the IMS IP-CAN Test Suite

Please refer to TS 34.229-3 [49] annex E.

Annex D (informative): BNF Message Definitions

Please refer to TS 34.229-3 [49] annex F

Annex E (Normative): SIP Type Definitions and XSD References

Please refer to TS 34.229-3 [49] annex G

Annex F (informative): Change history

Date	TSG #	TSG Doc.	CR	Rev	Subject/Comment	Old	New
2014-08	RAN#65	RP-141156	-	-	Version for RAN Plenary Approval	-	2.1.0
2014-09	RAN#65	-	-	-	brought under change control as v11.0.0 with no change	2.1.0	11.0.0

History

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V11.0.0	September 2014	Publication