ETSI TS 103 262-2 V1.1.1 (2014-07)

TECHNICAL SPECIFICATION

**Core Network and Interoperability Testing (INT);
Diameter Conformance testing for S9 interface;
(3GPP Release 10);
Part 2: Test Suite Structure (TSS) and Test Purposes (TP)**

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Foreword

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

The present document is part 2 of a multi-part deliverable covering the test specifications for the Diameter protocol on the S9 interface, as identified below:

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

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

Part 3:   "Abstract Test Suite (ATS) and partial Protocol Implementation eXtra Information for Testing (PIXIT) proforma specification".

Modal verbs terminology

In the present document "**shall**", "**shall not**", "**should**", "**should not**", "**may**", "**may not**", "**need**", "**need not**", "**will**", "**will not**", "**can**" and "**cannot**" are to be interpreted as described in clause 3.2 of the ETSI Drafting Rules (Verbal forms for the expression of provisions).

"**must**" and "**must not**" are **NOT** allowed in ETSI deliverables except when used in direct citation.

1 Scope

The present document provides the Test Suite Structure (TSS) and Test Purposes (TP) for the test specifications for the Diameter protocol on the S9 interface as specified in TS 129 215 [1] in compliance with the relevant requirements and in accordance with the relevant guidance given in ISO/IEC 9646-7 [4] and ETS 300 406 [5].

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 reference 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 129 215 (V10.6.0): "Digital cellular telecommunications system (Phase 2+); Universal Mobile Telecommunications System (UMTS); LTE; Policy and Charging Control (PCC) over S9 reference point; Stage 3 (3GPP TS 29.215 version 10.6.0 Release 10)".

[2] ETSI TS 103 262-1: " Core Network and Interoperability Testing (INT); Diameter Conformance testing for S9 interface; (3GPP Release 10); Part 1: Protocol Implementation Conformance Statement (PICS)".

[3] ISO/IEC 9646-1: "Information technology -- Open Systems Interconnection -- Conformance testing methodology and framework -- Part 1: General concepts".

[4] ISO/IEC 9646-7: "Information technology -- Open Systems Interconnection -- Conformance testing methodology and framework -- Part 7: Implementation Conformance Statements".

[5] ETSI ETS 300 406: "Methods for testing and Specification (MTS); Protocol and profile conformance testing specifications; Standardization methodology".

[6] IETF RFC 3588: "Diameter Base Protocol".

[7] ETSI TS 129 212 (V10.5.0): "Universal Mobile Telecommunications System (UMTS); LTE; Policy and Charging Control (PCC); Reference points (3GPP TS 29.212 version 10.5.0 Release 10)".

[8] ETSI TS 129 213 (V10.11.0): "Digital cellular telecommunications system (Phase 2+); Universal Mobile Telecommunications System (UMTS); LTE; Policy and charging control signalling flows and Quality of Service (QoS) parameter mapping (3GPP TS 29.213 version 10.11.0 Release 10)".

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 and abbreviations

3.1 Definitions

For the purposes of the present document, the terms and definitions given in TS 129 215 [1] and the following apply:

Abstract Test Method (ATM): Refer to ISO/IEC 9646-1 [3].

Abstract Test Suite (ATS): Refer to ISO/IEC 9646-1 [3].

Implementation Under Test (IUT): Refer to ISO/IEC 9646-1 [3].

Test Purpose (TP): Refer to ISO/IEC 9646-1 [3].

3.2 Abbreviations

For the purposes of the present document, the abbreviations given in TS 129 215 [1] and the following apply:

TP   Test Purpose
TSS   Test Suite Structure

4 Test Suite Structure (TSS) and Test Purposes (TP)

4.1 Test Suite Structure

4.1.1 TP naming convention

TPs are numbered, starting at 001, within each group. Groups are organized according to the TSS.

Table 1: TP identifier naming convention scheme

Identifier: **<TP>_<iut>_<scope>_<nn>**			
<tp>	=	Test Purpose:	fixed to "TP"
<iut>	=	type of IUT:	HPCRF or VPCRF
<scope>	=	group	MS S9 Message Syntax
			HSE Home Access/S9 Session Establishment
			HSM Home Access/S9 Session Modification
			HPQ Home Access/Provision of QoS Rules
			HST Home Access/S9 Session Termination
			HMB Home Access/Multiple BBERF Handling
			HDS Home Access/Deferred Session Linking Handling
			HSL Home Access/Session Linking Handling When Multiple PDN Connection to a single APN
			VQR Visited Access/QoS and PCC Rules
			VPQ Visited Access/Provision of QoS and PCC Rules
			VST Visited Access/S9 Session/Subsession Termination
			VMB Visited Access/Multiple BBERF Handling
			VRS Visited Access/Rx over S9
			VEH Visited Access/Event Handling
			VDS Visited Access/Deferred Session Linking Handling
			VSL Visited Access/Session Linking Handling When Multiple PDN Connection to a single APN
			VIF Visited Access/IP Flow mobility support
<nn>	=	sequential number	(01 to 99)

4.1.2 Test strategy

As the base standard TS 129 215 [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 103 262-1[2].

4.1.3 TP structure

Each TP has been written in a manner which is consistent with all other TPs. The intention of this is to make the TPs more readable and checkable. A particular structure has been used which is illustrated in table 2. This table should be read in conjunction with any TP, i.e. please use a TP as an example to facilitate the full comprehension of table 2.

Table 2: Structure of a single TP

TP part	Text	Example
Header	**<Identifier>** **<clause number in base TS 129 215 [1] >** **<PICS reference>**	see table 1 **clause 4.4.1** **A.2/3**
Summary	*Short free text description of the test objective*	Verify that the IUT can successfully process all mandatory AVPs in a CC-Request received due to IP-CAN session establishment.
Initial condition (optional)	*Free text description of the condition that the IUT has reached before the test purpose applies.*	The IUT has received AF provisions information about the AF signalling flows between UE and AF.
Start point Stimulus	Ensure that the IUT in the <state> *see RFC 3588 [6] clause 5.6* *and/or further actions before stimulus* *if the action is sending/receiving* *see below for message structure* **<trigger>**, *see below for message structure* *or* <goal>	Open state having sent an AA-Request on receipt of a Capabilities-Exchange-Request (see note 2) to require PCC supervision
Reaction	**<action>**. *if the action is sending* *see below for message structure* <next action>, *etc.*	sends, saves, does, etc.
Message structure	<message type> *a)* containing a(n) <avp name> AVP *b)* indicating <coding of the field> and *back to a) or b) (see note 3)*	Capabilities-Exchange-Answer, etc. (see note 2) Vendor-Id, etc.

NOTE 1: Text in italics will not appear in TPs and text between <> is filled in for each TP and may differ from one TP to the next.
NOTE 2: All messages shall be considered as "valid and compatible" unless otherwise specified in the test purpose. This includes the presence of all mandatory AVPs as specified in RFC 3588 [6] and in TS 129 215 [1], clause 5.
NOTE 3: An AVP can be embedded into another AVP. This is expressed by indentations, e.g. if Message1 contains AVP1 and AVP2 where AVP1 has AVP3 embedded this will be expressed like this:
    sends/receives Message 1
      containing AVP1
        containing AVP3
          indicating ...
      containing AVP2
        indicating ...		

4.2   Test Purposes

All PICS items referred to in this clause are as specified in TS 103 262-1 [2] unless indicated otherwise by another numbered reference. PICS items are only meant for test selection, therefore only PICS items with status optional or conditional are explicitly mentioned.

4.2.1   H-PCRF Role

Test Selection: IUT takes the role of the H-PCRF; PICS A.2/1

4.2.1.1   S9 Messages

TP_HPCRF_MS_01	Standards Reference: 5.5.3	PICS item:
Summary:	Verify that the IUT can successfully process all mandatory AVPs in a CC-Request received due to IP-CAN session establishment.	

Test purpose:	Ensure that the IUT
	on receipt of a CC-Request
	    containing a Session-Id AVP
	    containing an Auth-Application-Id AVP
	    containing an Origin-Host AVP
	    containing an Origin-Realm AVP
	    containing a Destination-Realm AVP
	    containing a CC-Request-Type AVP
	        indicating INITIAL_REQUEST
	    containing a CC-Request-Number AVP
	    containing a Subscription-Id AVP
	        containing the user identification
	    containing an IP-CAN-Type AVP
	        containing the type of IP-CAN
	    containing a RAT-Type AVP
	        containing the radio access technology
	    containing a Framed-IP-Address AVP
	        indicating the full IP address of the UE,
	sends a CC-Answer
	    containing a Session-Id AVP
	    containing an Auth-Application-Id AVP
	    containing an Origin-Host AVP
	    containing an Origin-Realm AVP
	    containing a CC-Request-Type AVP
	        indicating INITIAL_REQUEST
	    containing a CC-Request-Number AVP
	    containing a Result-Code AVP
	        indicating DIAMETER_SUCCESS.		

Comments:		

4.2.1.2 Home access

4.2.1.2.1 S9 Session Establishment

Test Selection: IUT takes the role of the H-PCRF; PICS A.2/1.1

TP_HPCRF_HSE_01	Standards Reference: 4.5.1.1 and 4.5.2.1¶19 and TS 129 212 [7], 4a.5.1¶3	PICS item: A.3/1
Summary:	Verify that the IUT can successfully provision QoS rules due to case 2a for S9 session establishment.	

Test purpose:	Ensure that the IUT
	   on receipt of a CC-Request
	      containing a CC-Request-Type AVP
	         indicating INITIAL_REQUEST
	      containing a Subscription-Id AVP
	         indicating IMSI
	      containing a AN-GW-Address AVP
	         indicating access network gateway address
	      containing attributes provided by the BBERF
	   sends a CC-Answer
	      containing a QoS-Rule-Install AVP
	      containing a Result-Code AVP
	         indicating DIAMETER_SUCCESS.	

Comments:		

TP_HPCRF_HSE_02	Standards Reference: 4.5.1.1 and 4.5.2.1¶20	PICS item: A.3/1
Summary:	Verify that the IUT can successfully provision QoS rules in CCA command due to case 2b for S9 session establishment.	

Test purpose:	Ensure that the IUT
	   on receipt of a CC-Request
	      containing a CC-Request-Type AVP
	         indicating INITIAL_REQUEST
	      containing a Subscription-Id AVP
	         indicating IMSI
	      containing a AN-GW-Address AVP
	         indicating access network gateway address
	      containing a Subsession-Enforcement-Info AVP
	         containing a Subsession-Id AVP
	            indicates a session-id from Gxx
	         containing a Subsession-Operation AVP
	            indicating ESTABLISHMENT
	      containing attributes provided by the BBERF
	   sends a CC-Answer
	      containing a Subsession-Decision-Info AVP
	         containing a QoS-Rule-Install AVP
	      containing a Result-Code AVP
	         indicating DIAMETER_SUCCESS.	

Comments:		

4.2.1.2.2 S9 Session Modification

TP_HPCRF_HSM_01	Standards Reference: 4.5.1.1 and 4.5.2.1¶19 and TS 129 212 [7], 4a.5.1¶7	PICS item:
Summary:	Verify that the IUT can successfully provision QoS rules due to case 2a for S9 session modification.	

Test purpose:	Ensure that the IUT
	   on receipt of a CC-Request
	      containing a CC-Request-Type AVP
	         indicating UPDATE_REQUEST
	      containing a QoS-Rule-Report AVP
	      containing attributes provided by the BBERF
	   sends a CC-Answer
	      containing a QoS-Rule-Install AVP
	      containing a Result-Code AVP
	         indicating DIAMETER_SUCCESS.	

Comments:	NOTE: CCR and CCA command with INITIAL_REQUEST exchanged before above check.	

TP_HPCRF_HSM_02	Standards Reference: 4.5.1.1 and 4.5.2.1¶20 and TS 129 212 [7], 4a.5.1¶7	PICS item:
Summary:	Verify that the IUT can successfully provision QoS rules in CCA command due to case 2b for S9 session modification.	

Test purpose:	Ensure that the IUT
	   on receipt of a CC-Request
	      containing a CC-Request-Type AVP
	         indicating UPDATE_REQUEST
	      containing a QoS-Rule-Report AVP
	      containing a Subsession-Enforcement-Info AVP
	         containing a Subsession-Id AVP
	            indicates a session-id from Gxx
	         containing a Subsession-Operation AVP
	            indicating MODIFICATION
	      containing attributes provided by the BBERF
	   sends a CC-Answer
	      containing a Subsession-Decision-Info AVP
	         containing a QoS-Rule-Install AVP
	      containing a Result-Code AVP
	         indicating DIAMETER_SUCCESS.	

Comments:	NOTE: CCR and CCA command with INITIAL_REQUEST exchanged before above check.	

TP_HPCRF_HSM_03	**Standards Reference:** **4.5.1.1 and 4.5.2.1¶21,22 and** **TS 129 212 [7], 4a.5.1¶7**	**PICS item:**
Summary:	Verify that the IUT in case of incomplete, erroneous or missing information when it is not able to provision a policy decision to a specific subsession sent CC-Answer with appropriate error within Experimental-Result-Code AVP at the command level and Subsession-Decision-Info AVP for each of the rejected subsessions.	

Test purpose:	Ensure that the IUT
	   on receipt of a CC-Request
	      containing a CC-Request-Type AVP
	         indicating UPDATE_REQUEST
	      containing a QoS-Rule-Report AVP
	      containing a Subsession-Enforcement-Info AVP
	         containing a Subsession-Id AVP
	            indicates an erroneous session-id from Gxx
	         containing a Subsession-Operation AVP
	            indicating MODIFICATION
	      containing attributes provided by the BBERF
	   sends a CC-Answer
	      containing an Experimental-Result AVP
	         containing an Experimental-Result-Code AVP
	            indicating DIAMETER_ERROR_SUBSESSION
	      containing a Subsession-Decision-Info AVP
	         containing a Subsession-Id AVP
	            indicating rejected value
	         (containing an Experimental-Result AVP **or**
	         containing a Result-Code AVP).	

Comments:	NOTE 1: CCR and CCA command with INITIAL_REQUEST exchanged before above check. NOTE 2: Case 2b used.	

TP_HPCRF_HSM_04	**Standards Reference:** **4.5.1.1 and 4.5.2.1¶21,23 and** **TS 129 212 [7], 4a.5.1¶7**	**PICS item:**
Summary:	Verify that the IUT in case of incomplete, erroneous or missing information when it is not able to provision a policy decision to any of the subsessions or provision a policy decision at the command level the IUT shall sent CC-Answer with appropriate error within Experimental-Result-Code AVP.	

Test purpose:	Ensure that the IUT
	   on receipt of a CC-Request
	      containing a CC-Request-Type AVP
	         indicating UPDATE_REQUEST
	      containing a QoS-Rule-Report AVP
	      containing a Subsession-Enforcement-Info AVP
	         containing a Subsession-Id AVP
	            indicates a session-id from Gxx
	         containing a Subsession-Operation AVP
	            indicating MODIFICATION
	      containing a QoS-Information AVP
	         indicating QoS exceeding the subscriber bandwidth
	      containing attributes provided by the BBERF
	   sends a CC-Answer
	      containing an Experimental-Result AVP
	         containing an Experimental-Result-Code AVP
	            indicating DIAMETER_ERROR_INITIAL_PARAMETERS.	

Comments:	NOTE 1: CCR and CCA command with INITIAL_REQUEST exchanged before above check. NOTE 2: Case 2b used.	

4.2.1.2.3   Provision of QoS Rules by the H-PCRF

TP_HPCRF_HPQ_01	Standards Reference: 4.5.2.2¶3		PICS item: A.4/1
Summary:	Verify that the IUT can successfully provision QoS rules without obtaining a request from the V-PCRF due to case 2a.		

Test purpose:	Ensure that the IUT
	    to indicate a request for QoS rules,
	    sends an RA-Request
	        containing a QoS-Rule-Install AVP.		

Comments:			

TP_HPCRF_HPQ_02	Standards Reference: 4.5.2.2¶4		PICS item: A.4/1
Summary:	Verify that the IUT can successfully provision QoS rules without obtaining a request from the V-PCRF due to case 2b.		

Test purpose:	Ensure that the IUT
	    to indicate a request for QoS rules,
	    sends an RA-Request
	        containing a Subsession-Decision-Info AVP
	            containing a QoS-Rule-Install AVP.		

Comments:			

4.2.1.2.4   S9 Session Termination

TP_HPCRF_HST_01	Standards Reference: 4.5.1.1 and 4.5.2.3¶2,3 (item 1)		PICS item: A.3/2
Summary:	Verify that the IUT when receives CC-Request for S9 session termination it shall send CC-Answer due to case 2a.		

Test purpose:	Ensure that the IUT
	    on receipt of a CC-Request
	        containing a CC-Request-Type AVP
	            indicating TERMINATION_REQUEST
	        containing attributes provided by the BBERF
	    sends a CC-Answer
	        containing a Result-Code AVP
	            indicating DIAMETER_SUCCESS.		

Comments:	NOTE: CCR and CCA command with INITIAL_REQUEST exchanged before above check.		

TP_HPCRF_HST_02	Standards Reference: 4.5.1.2 and 4.5.2.3¶4,5 (item 2)		PICS item: A.3/2
Summary:	Verify that the IUT when receives CC-Request for S9 subsession termination it shall send CC-Answer due to case 2b.		

Test purpose:	Ensure that the IUT
	    on receipt of a CC-Request
	        containing a CC-Request-Type AVP
	            indicating UPDATE_REQUEST
	        containing a Subsession-Enforcement-Info AVP
	            containing a Subsession-Id AVP
	                indicates a subsession-id from Gxx
	            containing a Subsession-Operation AVP
	                indicating TERMINATION
	    sends a CC-Answer
	        containing a Subsession-Decision-Info AVP
	            containing a Subsession-Id AVP
	            containing a Result-Code AVP
	                indicating DIAMETER_SUCCESS.		

Comments:	NOTE: CCR and CCA command with INITIAL_REQUEST exchanged before above check.		

TP_HPCRF_HST_03	Standards Reference: 4.5.1.2 and 4.5.2.4¶3	PICS item: A.3/2
Summary:	Verify that the IUT shall send RA-Request to terminate the S9 session towards V-PCRF due to an internal trigger or trigger from the SPR and in case 2a.	

Test purpose:	Ensure that the IUT
	   to indicate a request for S9 session termination,
	   sends an RA-Request
	      containing a Session-Release-Cause AVP.	

Comments:	NOTE: CCR and CCA command with INITIAL_REQUEST exchanged before above check.	

TP_HPCRF_HST_04	Standards Reference: 4.5.1.2 and 4.5.2.4¶4	PICS item: A.3/2
Summary:	Verify that the IUT shall send RA-Request to terminate the S9 session towards V-PCRF due to an internal trigger or trigger from the SPR and in case 2b.	

Test purpose:	Ensure that the IUT
	   to indicate a request for S9 subsession termination,
	   sends an RA-Request
	      containing a Subsession-Decision-Info AVP
	         containing a Session-Release-Cause AVP.	

Comments:	NOTE: CCR and CCA command with INITIAL_REQUEST exchanged before above check.	

4.2.1.2.5   Multiple BBERF Handling

TP_HPCRF_HMB_01	Standards Reference: 4.5.1.4 and 4.5.2.5.2¶6 and TS 129 212 [7], 4a.5.7.2	PICS item: A.4/3.1
Summary:	Verify that the IUT can successfully sent a CC-Answer in case when request is received for multiple BBERF handling associated with the same IP-CAN session during handover upon Gateway Control Session establishment due to case 2a.	

Test purpose:	Ensure that the IUT
	   on receipt of a CC-Request
	      containing a Session-Id AVP
	         indicating existing gateway control session
	      containing a CC-Request-Type AVP
	         indicating INITIAL_REQUEST
	      containing a Multiple-BBERF-Action AVP
	         indicating ESTABLISHMENT
	      containing a AN-GW-Address AVP
	   sends a CC-Answer
	      containing a Result-Code AVP
	         indicating DIAMETER_SUCCESS.	

Comments:	NOTE: CCR and CCA command with INITIAL_REQUEST for old BBERF exchanged before above check.	

TP_HPCRF_HMB_02	Standards Reference: 4.5.1.4 and 4.5.2.5.2¶6 and TS 129 212 [7], 4a.5.7.2	PICS item: A.4/3.1
Summary:	Verify that the IUT can successfully sent a CC-Answer in case when request is received for multiple BBERF handling associated with the same IP-CAN session during handover upon Gateway Control Session establishment due to case 2b.	

Test purpose:	Ensure that the IUT
	   on receipt of a CC-Request
	     containing a Session-Id AVP
	      indicating existing gateway control session
	     containing a CC-Request-Type AVP
	      indicating INITIAL_REQUEST
	     containing a Subsession-Enforcement-Info AVP
	      containing a Subsession-Id AVP
	       indicates a session-id from Gxx
	      containing a Subsession-Operation AVP
	       indicating MODIFICATION
	      containing a Multiple-BBERF-Action AVP
	       indicating ESTABLISHMENT
	      containing a AN-GW-Address AVP
	   sends a CC-Answer
	     containing a Result-Code AVP
	      indicating DIAMETER_SUCCESS.	

Comments:	NOTE: CCR and CCA command with INITIAL_REQUEST for old BBERF exchanged before above check.	

TP_HPCRF_HMB_03	Standards Reference: 4.5.1.4 and 4.5.2.5.2¶9 and TS 129 212 [7], 4a.5.7.2	PICS item: A.4/3.1
Summary:	Verify that the IUT can successfully sent a CC-Answer in case when request is received for multiple BBERF handling associated with the same IP-CAN session during handover upon Gateway Control Session modification due to case 2a.	

Test purpose:	Ensure that the IUT
	   on receipt of a CC-Request
	     containing a Session-Id AVP
	      indicating existing gateway control session
	     containing a CC-Request-Type AVP
	      indicating UPDATE_REQUEST
	     containing a Multiple-BBERF-Action AVP
	      indicating ESTABLISHMENT
	     containing a AN-GW-Address AVP
	   sends a CC-Answer
	     containing a Result-Code AVP
	      indicating DIAMETER_SUCCESS.	

Comments:	NOTE: CCR and CCA command with INITIAL_REQUEST and UPDATE_REQUEST for old BBERF exchanged before above check.	

TP_HPCRF_HMB_04	Standards Reference: 4.5.1.4 and 4.5.2.5¶9 and TS 129 212 [7], 4a.5.7.2	PICS item: A.4/3.1
Summary:	Verify that the IUT can successfully sent a CC-Answer in case when request is received for multiple BBERF handling associated with the same IP-CAN session during handover upon Gateway Control Session modification due to case 2b.	

Test purpose:	Ensure that the IUT
	   on receipt of a CC-Request
	     containing a Session-Id AVP
	      indicating existing gateway control session
	     containing a CC-Request-Type AVP
	      indicating UPDATE_REQUEST
	     containing a Subsession-Enforcement-Info AVP
	      containing a Subsession-Id AVP
	       indicates a session-id from Gxx
	      containing a Subsession-Operation AVP
	       indicating MODIFICATION
	      containing a Multiple-BBERF-Action AVP
	       indicating ESTABLISHMENT
	      containing a AN-GW-Address AVP
	   sends a CC-Answer
	     containing a Result-Code AVP
	      indicating DIAMETER_SUCCESS.	

Comments:	NOTE: CCR and CCA command with INITIAL_REQUEST and UPDATE_REQUEST for old BBERF exchanged before above check.	

TP_HPCRF_HMB_05	Standards Reference: 4.5.1.4 and 4.5.2.5¶14,15 and TS 129 212 [7], 4a.5.7.2	PICS item: A.4/3.1
Summary:	Verify that the IUT can successfully sent a CC-Answer in case when request is received for multiple BBERF handling associated with the same IP-CAN session during handover upon Gateway Control Session termination due to case 2a.	

Test purpose:	Ensure that the IUT
	   on receipt of a CC-Request
	     containing a Session-Id AVP
	      indicating existing gateway control session
	     containing a CC-Request-Type AVP
	      indicating TERMINATION_REQUEST
	     containing a Multiple-BBERF-Action AVP
	      indicating TERMINATION
	     containing a AN-GW-Address AVP
	   sends a CC-Answer
	     containing a Result-Code AVP
	      indicating DIAMETER_SUCCESS.	

Comments:	NOTE: CCR and CCA command with INITIAL_REQUEST for old BBERF exchanged before above check.	

TP_HPCRF_HMB_06	Standards Reference: 4.5.1.4 and 4.5.2.5.2¶14,16 and TS 129 212 [7], 4a.5.7.2	PICS item: A.4/3.1
Summary:	Verify that the IUT can successfully sent a CC-Answer in case when request is received for multiple BBERF handling associated with the same IP-CAN session during handover upon Gateway Control Session termination due to case 2b.	

Test purpose:	Ensure that the IUT
	   on receipt of a CC-Request
	      containing a Session-Id AVP
	         indicating existing gateway control session
	      containing a CC-Request-Type AVP
	         indicating TERMINATION_REQUEST
	      containing a Subsession-Enforcement-Info AVP
	         containing a Subsession-Id AVP
	            indicates a session-id from Gxx
	         containing a Subsession-Operation AVP
	            indicating MODIFICATION
	         containing a Multiple-BBERF-Action AVP
	            indicating TERMINATION
	         containing a AN-GW-Address AVP
	   sends a CC-Answer
	      containing a Result-Code AVP
	         indicating DIAMETER_SUCCESS.	

Comments:	NOTE: CCR and CCA command with INITIAL_REQUEST for old BBERF exchanged before above check.	

TP_HPCRF_HMB_07	Standards Reference: 4.5.1.4 and 4.5.2.5.2¶20	PICS item: A.3/2
Summary:	Verify that the IUT shall send RA-Request to terminate the S9 session towards V-PCRF for multiple BBERF handling due to an internal trigger or trigger from the SPR and in case 2a.	

Test purpose:	Ensure that the IUT
	   to indicate a request for S9 session termination in case of multiple BBERF handling,
	   sends an RA-Request
	      containing a Session-Release-Cause AVP
	      containing a Multiple-BBERF-Action AVP
	         indicating TERMINATION
	      containing an AN-GW-Address AVP.	

Comments:	NOTE: CCR and CCA command with INITIAL_REQUEST exchanged before above check.	

4.2.1.3   Visited access

Test Selection: IUT takes the role of the H-PCRF; PICS A.2/1.2

4.2.1.3.1   QoS and PCC Rules

TP_HPCRF_VQR_01	**Standards Reference:** **4.5.1.1 and 4.5.3.1¶2,6,7,8,13,14,15 and** **TS 129 212 [7], 4.5.1(item 2)**	**PICS item:**
Summary:	Verify that the IUT in case of incomplete, erroneous or missing information when it is not able to provision a policy decision to a specific subsession sent CC-Answer with appropriate error within Experimental-Result-Code AVP at the command level and Subsession-Decision-Info AVP for each of the rejected subssesions.	

Test purpose:	Ensure that the IUT
	   on receipt of a CC-Request
	      containing a CC-Request-Type AVP
	         indicating UPDATE_REQUEST
	      containing a Charging-Rule-Report AVP
	         containing previously provisioned PCC rule(s) and their status
	      containing an Event-Trigger AVP
	         containing the reason for the IP-CAN session modification
	      containing a Subsession-Enforcement-Info AVP
	         containing an erroneous Subsession-Id AVP
	            indicates a session-id mapped from Gx
	         containing a Subsession-Operation AVP
	            indicating MODIFICATION
	   sends a CC-Answer
	      containing an Experimental-Result AVP
	         containing an Experimental-Result-Code AVP
	            indicating DIAMETER_ERROR_SUBSESSION
	      containing a Subsession-Decision-Info AVP
	         containing a Subsession-Id AVP
	            indicating rejected value
	         (containing an Experimental-Result AVP **or**
	         containing a Result-Code AVP).

Comments:	NOTE: CCR and CCA command with INITIAL_REQUEST exchanged before above check.

TP_HPCRF_VQR_02	Standards Reference: 4.5.1.1 and 4.5.3.1¶3,6,7,8,14,15 and TS 129 212 [7], 4a.5.1¶7	PICS item:
Summary:	Verify that the IUT in case of incomplete, erroneous or missing information when it is not able to provision a policy decision to a specific subsessions the IUT shall sent CC-Answer with appropriate error within Experimental-Result-Code AVP at the command level and Subsession-Decision-Info AVP for each of the rejected subssesions.	

Test purpose:	Ensure that the IUT
	   on receipt of a CC-Request
	      containing a CC-Request-Type AVP
	         indicating UPDATE_REQUEST
	      containing a Charging-Rule-Report AVP
	         containing previously provisioned PCC rule(s) and their status
	      containing an Event-Trigger AVP
	         containing the reason for the IP-CAN session modification
	      containing a Subsession-Enforcement-Info AVP
	         containing a Subsession-Id AVP
	            indicates a session-id mapped from Gxx
	         containing a Subsession-Operation AVP
	            indicating MODIFICATION
	      containing a QoS-Information AVP
	         indicating QoS exceeding the subscriber bandwidth
	   sends a CC-Answer
	      containing an Experimental-Result AVP
	         containing an Experimental-Result-Code AVP
	            indicating DIAMETER_ERROR_SUBSESSION	

Comments:	NOTE 1: CCR and CCA command with INITIAL_REQUEST exchanged before above check. NOTE 2: Case 2b used.	

TP_HPCRF_VQR_03	Standards Reference: 4.5.1.1 and 4.5.3.1¶2,6,7,8,13,14,16 and TS 129 212 [7], 4.5.1(item 2)	PICS item:
Summary:	Verify that the IUT in case of incomplete, erroneous or missing information when it is not able to provision a policy decision to any of the subsessions or provision a policy decision at the command level the IUT shall sent CC-Answer with appropriate error within Experimental-Result-Code AVP.	

Test purpose:	Ensure that the IUT
	   on receipt of a CC-Request
	      containing a CC-Request-Type AVP
	         indicating UPDATE_REQUEST
	      containing a Charging-Rule-Report AVP
	         containing previously provisioned PCC rule(s) and their status
	      containing an Event-Trigger AVP
	         containing the reason for the IP-CAN session modification
	      containing a Subsession-Enforcement-Info AVP
	         containing an erroneous Subsession-Id AVP
	            indicates a session-id mapped from Gx
	         containing a Subsession-Operation AVP
	            indicating MODIFICATION
	   sends a CC-Answer
	      containing an Experimental-Result AVP
	         containing an Experimental-Result-Code AVP
	            indicating DIAMETER_ERROR_INITIAL_PARAMETERS
	      containing a Subsession-Decision-Info AVP
	         containing a Subsession-Id AVP
	            indicating rejected value.	

Comments:	NOTE: CCR and CCA command with INITIAL_REQUEST exchanged before above check.	

TP_HPCRF_VQR_04	Standards Reference: 4.5.1.1 and 4.5.3.1¶3,6,7,8,14,16 and TS 129 212 [7], 4a.5.1¶7	PICS item:
Summary:	Verify that the IUT in case of incomplete, erroneous or missing information when it is not able to provision a policy decision to any of the subsessions or provision a policy decision at the command level the IUT shall sent CC-Answer with appropriate error within Experimental-Result-Code AVP.	

Test purpose:	Ensure that the IUT
	   on receipt of a CC-Request
	      containing a CC-Request-Type AVP
	         indicating UPDATE_REQUEST
	      containing a Charging-Rule-Report AVP
	         containing previously provisioned PCC rule(s) and their status
	      containing an Event-Trigger AVP
	         containing the reason for the IP-CAN session modification
	      containing a Subsession-Enforcement-Info AVP
	         containing a Subsession-Id AVP
	            indicates a session-id mapped from Gxx
	         containing a Subsession-Operation AVP
	            indicating MODIFICATION
	      containing a QoS-Information AVP
	         indicating QoS exceeding the subscriber bandwidth
	   sends a CC-Answer
	      containing an Experimental-Result AVP
	         containing an Experimental-Result-Code AVP
	            indicating DIAMETER_ERROR_INITIAL_PARAMETERS
	      containing a Subsession-Decision-Info AVP
	         containing a Subsession-Id AVP
	            indicating rejected value.	

Comments:	NOTE 1: CCR and CCA command with INITIAL_REQUEST exchanged before above check. NOTE 2: Case 2b used.	

4.2.1.3.2   Provision of QoS and PCC Rules

TP_HPCRF_VPQ_01	Standards Reference: 4.5.3.2¶1,2	PICS item: A.5/6.1
Summary:	Verify that the IUT shall provision QoS rules for case 2a in the CC-Answer using PULL procedure.	

Test purpose:	Ensure that the IUT
	   on receipt of a CC-Request
	   sends a CC-Answer
	      containing a QoS_Rule_Install AVP.	

Comments:		

TP_HPCRF_VPQ_02	Standards Reference: 4.5.3.2¶1,2	PICS item: A.5/6.1
Summary:	Verify that the IUT shall provision PCC rules for other cases in the CC-Answer using PULL procedure.	

Test purpose:	Ensure that the IUT
	   on receipt of a CC-Request
	   sends a CC-Answer
	      containing a Subsession-Decision-Info AVP
	         containing a Subsession-Id AVP
	         containing a Charging-Rule-Install AVP.	

Comments:		

TP_HPCRF_VPQ_03	Standards Reference: 4.5.3.2¶1,3	PICS item: A.5/6.2
Summary:	Verify that the IUT shall provision QoS rules for case 2a in the RA-Request using PUSH procedure.	

Test purpose:	Ensure that the IUT
	    to indicate a request to provision QoS rules using PUSH procedure,
	    sends an RA-Request
	        containing a QoS_Rule_Install AVP.	

Comments:		

TP_HPCRF_VPQ_04	Standards Reference: 4.5.3.2¶1,3	PICS item: A.5/6.2
Summary:	Verify that the IUT shall provision PCC rules for other cases in the RA-Request using PUSH procedure.	

Test purpose:	Ensure that the IUT
	    to indicate a request to provision PCC rules using PUSH procedure,
	    sends an RA-Request
	        containing a Subsession-Decision-Info AVP
	            containing a Subsession-Id AVP
	            containing a Charging-Rule-Install AVP.	

Comments:		

TP_HPCRF_VPQ_05	Standards Reference: 4.5.3.2¶1,3	PICS item: A.5/6.2
Summary:	Verify that the IUT is able to remove provisioned PCC rules with the RA-Request using PUSH procedure.	

Test purpose:	Ensure that the IUT
	    to indicate a request to provision PCC rules using PUSH procedure,
	    sends an RA-Request
	        containing a Subsession-Decision-Info AVP
	            containing a Subsession-Id AVP
	            containing a Charging-Rule-Install AVP
	    on receipt of an RA-Answer
	    sends an RA-Request
	        containing a Subsession-Decision-Info AVP
	            containing a Subsession-Id AVP
	            containing a Charging-Rule-Remove AVP.	

Comments:		

4.2.1.3.3 S9 Session/Subsession Termination

TP_HPCRF_VST_01	Standards Reference: 4.5.1.1 and 4.5.3.3¶2,8	PICS item: A.3/2
Summary:	Verify that the IUT when receives CC-Request for S9 session termination it shall send CC-Answer due to case 2a.	

Test purpose:	Ensure that the IUT
	    on receipt of a CC-Request
	        containing a CC-Request-Type AVP
	            indicating TERMINATION_REQUEST
	    sends a CC-Answer
	        containing a Result-Code AVP
	            indicating DIAMETER_SUCCESS.	

Comments:	NOTE 1: CCR and CCA command with INITIAL_REQUEST exchanged before above check. NOTE 2: AF could be informed over Rx interface about IP-CAN session termination and in this case H-PCRF sends AS-Request towards AF.	

TP_HPCRF_VST_02	Standards Reference: 4.5.1.2 and 4.5.3.3¶3,8	PICS item: A.3/2
Summary:	Verify that the IUT when receives CC-Request for S9 subsession termination it shall send CC-Answer.	

Test purpose:	Ensure that the IUT
	   on receipt of a CC-Request
	      containing a CC-Request-Type AVP
	         indicating UPDATE_REQUEST
	      containing a Subsession-Enforcement-Info AVP
	         containing a Subsession-Id AVP
	            indicates a subsession-id from Gxx
	         containing a Subsession-Operation AVP
	            indicating TERMINATION
	   sends a CC-Answer
	      containing a Subsession-Decision-Info AVP
	         containing a Subsession-Id AVP
	         containing a Result-Code AVP
	            indicating DIAMETER_SUCCESS.	

Comments:	NOTE 1: CCR and CCA command with INITIAL_REQUEST exchanged before above check. NOTE 2: AF could be informed over Rx interface about IP-CAN session termination and in this case H-PCRF sends AS-Request towards AF.	

TP_HPCRF_VST_03	Standards Reference: 4.5.1.2 and 4.5.3.4¶1 and 4.5.2.4¶3	PICS item: A.3/2 and A.5/7
Summary:	Verify that the IUT shall send RA-Request to terminate the S9 session towards V-PCRF due to an internal trigger or trigger from the SPR and in case 2a.	

Test purpose:	Ensure that the IUT
	   to indicate a request for S9 session termination,
	   sends an RA-Request
	      containing a Session-Release-Cause AVP.	

Comments:	NOTE: CCR and CCA command with INITIAL_REQUEST exchanged before above check.	

TP_HPCRF_VST_04	Standards Reference: 4.5.1.2 and 4.5.3.4¶1 and 4.5.2.4¶4	PICS item: A.3/2 and A.5/7
Summary:	Verify that the IUT shall send RA-Request to terminate the S9 session towards V-PCRF due to an internal trigger or trigger from the SPR and in case 2b.	

Test purpose:	Ensure that the IUT
	   to indicate a request for S9 subsession termination,
	   sends an RA-Request
	      containing a Subsession-Decision-Info AVP
	         containing a Session-Release-Cause AVP.	

Comments:	NOTE: CCR and CCA command with INITIAL_REQUEST exchanged before above check.	

4.2.2   V-PCRF Role

Test Selection: IUT takes the role of the V-PCRF; PICS A.2/2

4.2.2.1   S9 Messages

TP_VPCRF_MS_01	Standards Reference: 5.5.2	PICS item:
Summary:	Verify that the IUT can indicate request for PCC rules at IP-CAN session establishment with a CC-Request.	
Initial condition:		

Test purpose:	Ensure that the IUT
	    to indicate a request for PCC rules at IP-CAN session establishment,
	    sends a CC-Request
	        containing a Session-Id AVP
	        containing an Auth-Application-Id AVP
	        containing an Origin-Host AVP
	        containing an Origin-Realm AVP
	        containing a Destination-Realm AVP
	        containing a CC-Request-Type AVP
	           indicating INITIAL_REQUEST
	        containing a CC-Request-Number AVP.	

Comments:		

4.2.2.2   Home Access

Test Selection: IUT takes the role of the V-PCRF; PICS A.2/2.1

4.2.2.2.1   S9 Session Establishment

TP_VPCRF_HSE_01	Standards Reference: 4.5.1.1 and 4.5.2.1¶2,4,5 (item 1 with case 2a 1st dashed line) and TS 129 212 [7], 4a.5.1¶3 and TS 129 213 [8], 4.0¶6	PICS item: A.6/1
Summary:	Verify that the IUT shall establish a new S9 session towards H-PCRF in case when IUT receives CCR with CC-Request-type "INITIAL_REQUEST" from BBERF over Gxx interface for home access that cannot be associated with any existing S9 session to the H-PCRF for that UE.	

Initial condition:	The IUT is connected with BBERF over Gxx interface and
	    receive a CC-Request
	        containing a CC-Request-Type AVP
	           indicating INITIAL_REQUEST
	        containing a Subscription-Id AVP
	           indicating IMSI
	        containing a AN-GW-Address AVP
	           indicating access network gateway address
	        not containing a Called-Station-Id AVP.	

Test purpose:	Ensure that the IUT
	    to indicate a request for S9 session establishment,
	    sends a CC-Request
	        containing a CC-Request-Type AVP
	           indicating INITIAL_REQUEST
	        containing a Subscription-Id AVP
	           indicating IMSI
	        containing a AN-GW-Address AVP
	           indicating access network gateway address
	        containing attributes provided by the BBERF	

Comments:		

TP_VPCRF_HSE_02	**Standards Reference:** **4.5.1.1 and 4.5.2.1¶2,7,8** **(item 1 with case 2b) and** **TS 129 212 [7], 4a.5.1¶3 and** **TS 129 213 [8], 4.0¶6**	**PICS item:** **A.6/1**
Summary:	Verify that the IUT shall establish a new S9 session towards H-PCRF in case when IUT receives CCR with CC-Request-type "INITIAL_REQUEST" from BBERF over Gxx interface for home access that cannot be associated with any existing S9 session to the H-PCRF for that UE.	

Initial condition:	The IUT is connected with BBERF over Gxx interface and
	    receive a CC-Request
	        containing a CC-Request-Type AVP
	           indicating INITIAL_REQUEST
	        containing a Subscription-Id AVP
	           indicating IMSI
	        containing a AN-GW-Address AVP
	           indicating access network gateway address
	        containing a Called-Station-Id AVP
	           indicating PDN information.	

Test purpose:	Ensure that the IUT
	    to indicate a request for S9 session establishment,
	    sends a CC-Request
	        containing a CC-Request-Type AVP
	           indicating INITIAL_REQUEST
	        containing a Subscription-Id AVP
	           indicating IMSI
	         containing a AN-GW-Address AVP
	           indicating access network gateway address
	        containing a Subsession-Enforcement-Info AVP
	           containing a Subsession-Id AVP
	             indicates a session-id from Gxx
	           containing a Subsession-Operation AVP
	             indicating ESTABLISHMENT
	        containing attributes provided by the BBERF	

Comments:		

4.2.2.2.2 S9 Session Modification

TP_VPCRF_HSM_01	**Standards Reference:** **4.5.1.1 and 4.5.2.1¶13,14,15** **(item 2 with case 2a) and** **TS 129 212 [7], 4a.5.1¶7 and** **TS 129 213 [8], 4.0¶6**	**PICS item:**
Summary:	Verify that the IUT shall send CC-Request to modify an S9 session towards H-PCRF in case when IUT receives CCR with CC-Request-type "UPDATE_REQUEST" from BBERF over Gxx interface for home access.	

Initial condition:	The IUT is connected with BBERF over Gxx interface and
	    receive a CC-Request
	        containing a CC-Request-Type AVP
	           indicating UPDATE_REQUEST
	        containing a QoS-Rule-Report AVP
	        not containing a Called-Station-Id AVP.	

Test purpose:	Ensure that the IUT
	    to indicate a request with updated information,
	    sends a CC-Request
	        containing a CC-Request-Type AVP
	           indicating UPDATE_REQUEST
	        containing a QoS-Rule-Report AVP
	        containing attributes provided by the BBERF	

Comments:		

TP_VPCRF_HSM_02	Standards Reference: 4.5.1.1 and 4.5.2.1¶13,14,16 (item 2 with case 2b) and TS 129 212 [7], 4a.5.1¶7 and TS 129 213 [8], 4.0¶6	PICS item:
Summary:	Verify that the IUT shall send CC-Request to modify an S9 session towards H-PCRF in case when IUT receives CCR with CC-Request-type "UPDATE_REQUEST" from BBERF over Gxx interface for home.	

Initial condition:	The IUT is connected with BBERF over Gxx interface and
	   receive a CC-Request
	      containing a CC-Request-Type AVP
	        indicating UPDATE_REQUEST
	      containing a QoS-Rule-Report AVP
	      containing a Called-Station-Id AVP
	        indicating PDN information.	

Test purpose:	Ensure that the IUT
	   to indicate a request with updated information,
	   sends a CC-Request
	      containing a CC-Request-Type AVP
	        indicating UPDATE_REQUEST
	      containing a Subsession-Enforcement-Info AVP
	        containing a Subsession-Id AVP
	          indicates a session-id mapped from Gxx
	        containing a Subsession-Operation AVP
	          indicating MODIFICATION
	        containing a QoS-Rule-Report AVP
	      containing attributes provided by the BBERF	

Comments:		

TP_VPCRF_HSM_03	Standards Reference: 4.5.1.1 and 4.5.2.1¶26,27,28 (3rd numbered list item 1a for case 2a) and TS 129 213 [8], 4.0¶6	PICS item:
Summary:	Verify that the IUT shall validate the QoS Rules contained in CC-Answer and if QoS validation fails than IUT shall send CC-Request due to case 2a to indicate that QoS rules were not accepted.	

Initial condition:	The IUT is connected with BBERF over Gxx interface and
	   receive a CC-Request
	      containing a CC-Request-Type AVP
	        indicating UPDATE_REQUEST
	      containing a QoS-Rule-Report AVP
	      not containing a Called-Station-Id AVP.	

Test purpose:	Ensure that the IUT
	   to indicate a request with updated information,
	   sends a CC-Request
	      containing a CC-Request-Type AVP
	        indicating UPDATE_REQUEST
	      containing a QoS-Rule-Report AVP
	      containing attributes provided by the BBERF
	   on receipt of a CC-Answer
	      containing a QoS-Rule-Install AVP
	        containing a QoS-Rule-Name AVP
	          indicating not acceptable QoS-Rules
	   sends a CC-Request
	      containing a CC-Request-Type AVP
	        indicating UPDATE_REQUEST
	      containing a QoS-Rule-Report AVP
	        containing a QoS-Rule-Name AVP
	          indicating not accepted QoS-Rules
	        containing a Rule-Failure-Code AVP
	          indicating UNSUCCESSFUL_QOS_VALIDATION
	      containing a QoS-Information AVP
	        indicating the acceptable QoS	

Comments:		

TP_VPCRF_HSM_04	**Standards Reference:** **4.5.1.1 and 4.5.2.1¶26,27,29** **(3rd numbered list item 1b for case 2b)** **and TS 129 213 [8], 4.0¶6**	**PICS item:**
Summary:	Verify that the IUT shall validate the QoS Rules contained in CC-Answer and if QoS validation fails than IUT shall send CC-Request due to case 2b to indicate that QoS rules were not accepted.	

Initial condition:	The IUT is connected with BBERF over Gxx interface and
	     receive a CC-Request
	         containing a CC-Request-Type AVP
	             indicating UPDATE_REQUEST
	         containing a QoS-Rule-Report AVP
	         containing a Called-Station-Id AVP
	             indicating PDN information.	

Test purpose:	Ensure that the IUT
	     to indicate a request with updated information,
	     sends a CC-Request
	         containing a CC-Request-Type AVP
	             indicating UPDATE_REQUEST
	         containing a Subsession-Enforcement-Info AVP
	             containing a Subsession-Id AVP
	                 indicates a session-id from Gxx
	             containing a Subsession-Operation AVP
	                 indicating MODIFICATION
	         containing a QoS-Rule-Report AVP
	         containing attributes provided by the BBERF
	     on receipt of a CC-Answer
	         containing a QoS-Rule-Install AVP
	             containing a QoS-Rule-Name AVP
	                 indicating not acceptable QoS-Rules
	     sends a CC-Request
	         containing a CC-Request-Type AVP
	             indicating UPDATE_REQUEST
	         containing a Subsession-Enforcement-Info AVP
	             containing a Subsession-Id AVP
	             containing a QoS-Rule-Report AVP
	                 containing a QoS-Rule-Name AVP
	                     indicating not accepted QoS-Rules
	                 containing a Rule-Failure-Code AVP
	                     indicating UNSUCCESSFUL_QOS_VALIDATION
	             containing a QoS-Information AVP
	             indicating the acceptable QoS	

Comments:		

4.2.2.2.3   Provision of QoS Rules by the H-PCRF

TP_VPCRF_HPQ_01	Standards Reference: 4.5.2.2¶7	PICS item:
Summary:	Verify that the IUT shall validate the QoS Rules contained in RA-Request and if QoS validation fails than IUT shall send RA-Answer due to case 2a to indicate that QoS rules were not accepted.	
Initial condition:		

Test purpose:	Ensure that the IUT
	   on receipt of an RA-Request
	      containing a QoS-Rule-Install AVP
	        indicating not acceptable QoS-Rules,
	   sends an RA-Answer
	      containing an Experimental-Result AVP
	        containing an Experimental-Result-Code AVP
	          indicating DIAMETER_PCC_RULE_EVENT
	      containing a QoS-Rule-Report AVP
	        containing a QoS-Rule-Name AVP **or**
	          indicating not accepted QoS-Rules
	        containing a Rule-Failure-Code AVP
	          indicating UNSUCCESSFUL_QOS_VALIDATION
	      containing a QoS-Information AVP
	        indicating the acceptable QoS.

Comments:	

TP_VPCRF_HPQ_02	Standards Reference: 4.5.2.2¶8	PICS item:
Summary:	Verify that the IUT shall validate the QoS Rules contained in RA-Request and if QoS validation fails than IUT shall send RA-Answer due to case 2b to indicate that QoS rules were not accepted.	
Initial condition:		

Test purpose:	Ensure that the IUT
	   on receipt of an RA-Request
	      containing a Subsession-Decision-Info AVP
	        containing a QoS-Rule-Install AVP
	          indicating not acceptable QoS-Rules,
	   sends an RA-Answer
	      containing an Experimental-Result AVP
	        containing an Experimental-Result-Code AVP
	          indicating DIAMETER_PCC_RULE_EVENT
	      containing a Subsession-Enforcement-Info AVP
	        containing a Subsession-Id AVP
	        containing a QoS-Rule-Report AVP
	          containing a QoS-Rule-Name AVP
	            indicating not accepted QoS-Rules
	          containing a Rule-Failure-Code AVP
	            indicating UNSUCCESSFUL_QOS_VALIDATION
	        containing a QoS-Information AVP
	          indicating the acceptable QoS.

Comments:	

TP_VPCRF_HPQ_03	Standards Reference: 4.5.2.2¶10	PICS item:
Summary:	Verify that the IUT shall validate the QoS Rules contained in RA-Request and if QoS validation succeeds than IUT shall send RA-Answer due to case 2a and with corresponding result code.	
Initial condition:		

Test purpose:	Ensure that the IUT
	   on receipt of an RA-Request
	      containing a QoS-Rule-Install AVP
	         indicating acceptable QoS-Rules,
	   sends an RA-Answer
	      containing a Result-Code AVP
	         indicating DIAMETER_SUCCESS.	

Comments:		

TP_VPCRF_HPQ_04	Standards Reference: 4.5.2.2¶11	PICS item:
Summary:	Verify that the IUT shall validate the QoS Rules contained in RA-Request and if QoS validation succeeds than IUT shall send RA-Answer due to case 2b and with S9 Subsession-Enforcement-Info AVP for each specific S9 subsession with the corresponding result code.	
Initial condition:		

Test purpose:	Ensure that the IUT
	   on receipt of an RA-Request
	      containing a Subsession-Decision-Info AVP
	         containing a QoS-Rule-Install AVP
	            indicating acceptable QoS-Rules,
	   sends an RA-Answer
	      containing a Subsession-Enforcement-Info AVP
	         containing a Subsession-Id AVP
	            indicating acceptable QoS-Rules
	         containing a Result-Code AVP
	            indicating DIAMETER_SUCCESS.	

Comments:		

4.2.2.2.4   S9 Session Termination

TP_VPCRF_HST_01	Standards Reference: 4.5.1.2 and 4.5.2.3¶2	PICS item: A.6/2
Summary:	Verify that the IUT shall send CC-Request to terminate the last S9 session towards H-PCRF in case when IUT receives CCR with CC-Request-type "TERMINATION_REQUEST" from BBERF over Gxx interface for home access for the roaming user.	

Initial condition:	The IUT is connected with BBERF over Gxx interface and
	   receive a CC-Request
	      containing a CC-Request-Type AVP
	         indicating TERMINATION_REQUEST
	      not containing a Called-Station-Id AVP.	

Test purpose:	Ensure that the IUT
	   to indicate a request for S9 session termination,
	   sends a CC-Request
	      containing a CC-Request-Type AVP
	         indicating TERMINATION_REQUEST.	

Comments:		

TP_VPCRF_HST_02	Standards Reference: 4.5.1.2 and 4.5.2.3¶4	PICS item: A.6/2
Summary:	Verify that the IUT shall send CC-Request to update the S9 session towards H-PCRF if there are remaining S9 subsessions for the roaming user for the case when IUT receives CCR with CC-Request-type "TERMINATION_REQUEST" from BBERF over Gxx interface for home access for the roaming user.	

Initial condition:	The IUT is connected with BBERF over Gxx interface and
	   receive a CC-Request
	      containing a CC-Request-Type AVP
	         indicating TERMINATION_REQUEST
	      containing a Called-Station-Id AVP
	         indicating PDN information.	

Test purpose:	Ensure that the IUT
	   to indicate a request for S9 session update,
	   sends a CC-Request
	      containing a CC-Request-Type AVP
	         indicating UPDATE_REQUEST
	      containing a Subsession-Enforcement-Info AVP
	         containing a Subsession-Id AVP
	            indicates a subsession-id from Gxx
	         containing a Subsession-Operation AVP
	            indicating TERMINATION.	

Comments:		

TP_VPCRF_HST_03	Standards Reference: 4.5.1.2 and 4.5.2.4¶3	PICS item: A.6/2
Summary:	Verify that the IUT when receives RA-Request for S9 session termination it shall send corresponding RA-Answer to H-PCRF for case 2a.	
Initial condition:		

Test purpose:	Ensure that the IUT
	   on receipt of an RA-Request
	      containing a Session-Release-Cause AVP
	   sends an RA-Answer	

Comments:		

TP_VPCRF_HST_04	Standards Reference: 4.5.1.2 and 4.5.2.4¶4	PICS item: A.6/2
Summary:	Verify that the IUT when receives RA-Request for S9 session termination it shall send corresponding RA-Answer to H-PCRF for case 2b.	
Initial condition:		

Test purpose:	Ensure that the IUT
	   on receipt of an RA-Request
	      containing a Subsession-Decision-Info AVP
	         containing a Session-Release-Cause AVP
	   sends an RA-Answer	

Comments:		

4.2.2.2.5   Multiple BBERF Handling

TP_VPCRF_HMB_01	Standards Reference: 4.5.1.4 and 4.5.2.5.2¶3,4 (item 1 with case 2a)	PICS item: A.7/2.1
Summary:	Verify that the IUT shall modify an S9 session towards H-PCRF in case when IUT receives CCR for Gateway Control Session Establishment from a new BBERF over Gxx interface for home access and case 2a applies.	

Initial condition:	The IUT is connected with BBERF over Gxx interface and
	receive a CC-Request
	    containing a CC-Request-Type AVP
	      indicating INITIAL_REQUEST
	    containing a Subscription-Id AVP
	      indicating IMSI
	    containing a AN-GW-Address AVP
	      indicating access network gateway address
	    not containing a Called-Station-Id AVP.	

Test purpose:	Ensure that the IUT
	    to indicate a request for S9 session modification in case of new BBERF,
	    sends a CC-Request
	      containing a Session-Id AVP
	        indicating existing gateway control session
	      containing a CC-Request-Type AVP
	        indicating INITIAL_REQUEST
	      containing a Multiple-BBERF-Action AVP
	        indicating ESTABLISHMENT
	      containing an AN-GW-Address AVP	

Comments:	NOTE: Two BBERF components shall be present as a test components.	

TP_VPCRF_HMB_02	Standards Reference: 4.5.1.4 and 4.5.2.5.2¶3,5 (item 1 with case 2b)	PICS item: A.7/2.1
Summary:	Verify that the IUT shall modify an S9 subsession towards H-PCRF in case when IUT receives CCR for Gateway Control Session Establishment from a new BBERF over Gxx interface for home access and case 2b applies.	

Initial condition:	The IUT is connected with BBERF over Gxx interface and
	receive a CC-Request
	    containing a CC-Request-Type AVP
	      indicating INITIAL_REQUEST
	    containing a Subscription-Id AVP
	      indicating IMSI
	    containing a AN-GW-Address AVP
	      indicating access network gateway address
	    containing a Called-Station-Id AVP
	      indicating PDN information.	

Test purpose:	Ensure that the IUT
	    to indicate a request for S9 session modification in case of new BBERF,
	    sends a CC-Request
	      containing a Session-Id AVP
	        indicating existing gateway control session
	      containing a CC-Request-Type AVP
	        indicating INITIAL_REQUEST
	      containing a Subsession-Enforcement-Info AVP
	        containing a Subsession-Id AVP
	          indicates a session-id from Gxx
	        containing a Subsession-Operation AVP
	          indicating MODIFICATION
	        containing a Multiple-BBERF-Action AVP
	          indicating ESTABLISHMENT
	        containing an AN-GW-Address AVP.	

Comments:	NOTE: Two BBERF components shall be present as a test components.	

TP_VPCRF_HMB_03	Standards Reference: 4.5.1.4 and 4.5.2.5.2¶9	PICS item: A.7/2.1
Summary:	Verify that the IUT shall modify an S9 session towards H-PCRF in case when IUT receives CCR for Gateway Control Session Modification from a new BBERF over Gxx interface for home access and case 2a applies.	

Initial condition:	The IUT is connected with BBERF over Gxx interface and
	   receive a CC-Request
	      containing a CC-Request-Type AVP
	         indicating UPDATE_REQUEST
	      containing a QoS-Rule-Report AVP
	      not containing a Called-Station-Id AVP.	

Test purpose:	Ensure that the IUT
	   to indicate a request for S9 session modification in case of new BBERF,
	   sends a CC-Request
	      containing a Session-Id AVP
	         indicating existing gateway control session
	      containing a CC-Request-Type AVP
	         indicating UPDATE_REQUEST
	      containing a Multiple-BBERF-Action AVP
	         indicating ESTABLISHMENT
	      containing an AN-GW-Address AVP	

Comments:	NOTE: Two BBERF components shall be present as a test components.	

TP_VPCRF_HMB_04	Standards Reference: 4.5.1.4 and 4.5.2.5.2¶9	PICS item: A.7/2.1
Summary:	Verify that the IUT shall modify an S9 subsession towards H-PCRF in case when IUT receives CCR for Gateway Control Session Modification from a new BBERF over Gxx interface for home access and case 2b applies.	

Initial condition:	The IUT is connected with BBERF over Gxx interface and
	   receive a CC-Request
	      containing a CC-Request-Type AVP
	         indicating UPDATE_REQUEST
	      containing a QoS-Rule-Report AVP
	      containing a Called-Station-Id AVP
	         indicating PDN information.	

Test purpose:	Ensure that the IUT
	   to indicate a request for S9 session modification in case of new BBERF,
	   sends a CC-Request
	      containing a Session-Id AVP
	         indicating existing gateway control session
	      containing a CC-Request-Type AVP
	         indicating UPDATE_REQUEST
	      containing a Subsession-Enforcement-Info AVP
	         containing a Subsession-Id AVP
	            indicates a session-id from Gxx
	         containing a Subsession-Operation AVP
	            indicating MODIFICATION
	         containing a Multiple-BBERF-Action AVP
	            indicating ESTABLISHMENT
	         containing an AN-GW-Address AVP.	

Comments:	NOTE: Two BBERF components shall be present as a test components.	

TP_VPCRF_HMB_05	Standards Reference: 4.5.1.4 and 4.5.2.5.2¶14,15	PICS item: A.7/2.1
Summary:	Verify that the IUT shall terminate an S9 session towards H-PCRF in case when IUT receives CCR for Gateway Control Session Termination from a new BBERF over Gxx interface for home access and case 2a applies.	

Initial condition:	The IUT is connected with BBERF over Gxx interface and
	    receive a CC-Request
	        containing a CC-Request-Type AVP
	           indicating TERMINATION_REQUEST
	        not containing a Called-Station-Id AVP.	

Test purpose:	Ensure that the IUT
	    to indicate a request for S9 session termination in case of new BBERF,
	    sends a CC-Request
	        containing a Session-Id AVP
	           indicating existing gateway control session
	        containing a CC-Request-Type AVP
	           indicating TERMINATION_REQUEST
	        containing a Multiple-BBERF-Action AVP
	           indicating TERMINATION
	        containing an AN-GW-Address AVP	

Comments:	NOTE: Two BBERF components shall be present as a test components.	

TP_VPCRF_HMB_06	Standards Reference: 4.5.1.4 and 4.5.2.5.2¶14,16	PICS item: A.7/2.1
Summary:	Verify that the IUT shall terminate an S9 subsession towards H-PCRF in case when IUT receives CCR for Gateway Control Session Termination from a new BBERF over Gxx interface for home access and case 2b applies.	

Initial condition:	The IUT is connected with BBERF over Gxx interface and
	    receive a CC-Request
	        containing a CC-Request-Type AVP
	           indicating TERMINATION_REQUEST
	        containing a Called-Station-Id AVP
	           indicating PDN information.	

Test purpose:	Ensure that the IUT
	    to indicate a request for S9 session termination in case of new BBERF,
	    sends a CC-Request
	        containing a Session-Id AVP
	           indicating existing gateway control session
	        containing a CC-Request-Type AVP
	           indicating TERMINATION_REQUEST
	        containing a Subsession-Enforcement-Info AVP
	           containing a Subsession-Id AVP
	               indicates a session-id from Gxx
	           containing a Subsession-Operation AVP
	               indicating MODIFICATION
	           containing a Multiple-BBERF-Action AVP
	               indicating TERMINATION
	           containing an AN-GW-Address AVP.	

Comments:	NOTE: Two BBERF components shall be present as a test components.	

TP_VPCRF_HMB_07	Standards Reference: 4.5.1.4 and 4.5.2.5.2¶20	PICS item: A.7/2.1
Summary:	Verify that the IUT when receives RA-Request for S9 session termination in case of multiple BBERF handling it shall send corresponding RA-Answer to H-PCRF.	
Initial condition:		

Test purpose:	Ensure that the IUT
	    on receipt of an RA-Request
	        containing a Session-Release-Cause AVP
	        containing a Multiple-BBERF-Action AVP
	           indicating TERMINATION
	        containing an AN-GW-Address AVP
	    sends an RA-Answer	

Comments:	NOTE: Two BBERF components shall be present as a test components.	

4.2.2.2.6 Deferred Session Linking Handling

TP_VPCRF_HDS_01	Standards Reference: 4.5.2.6¶4	PICS item: A.6/11
Summary:	Verify that the IUT shall establish a new S9 subsession towards H-PCRF in case when IUT receives CCR with CC-Request-type "INITIAL_REQUEST" and Session-Linking-Indicator AVP from BBERF over Gxx interface for home access.	

Initial condition:	The IUT is connected with BBERF over Gxx interface and
	   receive a CC-Request
	      containing a CC-Request-Type AVP
	         indicating INITIAL_REQUEST
	      containing a Subscription-Id AVP
	         containing the user identification
	      containing a AN-GW-Address AVP
	         containing the access network gateway address
	      containing an IP-CAN-Type AVP
	         containing the type of IP-CAN
	      containing a RAT-Type AVP
	         containing the radio access technology
	      containing a Framed-IP-Address AVP
	         indicating the full IP address of the UE
	      containing a Session-Linking-Indicator AVP
	         indicating SESSION_LINKING_DEFERRED.	

Test purpose:	Ensure that the IUT
	   to indicate a request for S9 subsession establishment with deferred session linking,
	   sends a CC-Request
	      containing a CC-Request-Type AVP
	         indicating INITIAL_REQUEST
	      containing a Subsession-Enforcement-Info AVP
	         containing a Subsession-Id AVP
	             indicates a new subsession-id
	         containing a Subsession-Operation AVP
	             indicating ESTABLISHMENT
	         containing a Session-Linking-Indicator AVP
	             indicating SESSION_LINKING_DEFERRED	

Comments:	NOTE: Two BBERF components shall be present as a test components.	

4.2.2.2.7   Session Linking Handling When Multiple PDN Connection to a single APN

TP_VPCRF_HSL_01	Standards Reference: 4.5.2.7¶3	PICS item: A.6/12
Summary:	Verify that when the IUT receives CCR with CC-Request-type "INITIAL_REQUEST" and PDN-Connection-Id AVP from BBERF over Gxx interface for home access due to case 2b and there is not already established S9 session for this roaming user the IUT shall establish a new S9 session towards H-PCRF.	

Initial condition:	The IUT is connected with BBERF over Gxx interface and
	   receive a CC-Request
	      containing a CC-Request-Type AVP
	         indicating INITIAL_REQUEST
	      containing a Subscription-Id AVP
	         containing the user identification
	      containing a AN-GW-Address AVP
	         containing the access network gateway address
	      containing an IP-CAN-Type AVP
	         containing the type of IP-CAN
	      containing a RAT-Type AVP
	         containing the radio access technology
	      containing a Framed-IP-Address AVP
	         indicating the full IP address of the UE
	      containing a PDN-Connection-ID AVP
	      containing a Called-Station-Id AVP
	         indicating PDN information.	

Test purpose:	Ensure that the IUT
	   to indicate a request for S9 session establishment for roaming user,
	   sends a CC-Request
	      containing a CC-Request-Type AVP
	         indicating INITIAL_REQUEST
	      containing a Subscription-Id AVP
	      containing a Subsession-Enforcement-Info AVP
	         containing a Subsession-Id AVP
	            indicates a new S9 subsession-id
	         containing a Subsession-Operation AVP
	            indicating ESTABLISHMENT
	         containing a PDN-Connection-ID AVP
	         containing a Called-Station-Id AVP.	

Comments:	NOTE: Two BBERF components shall be present as a test components.	

4.2.2.3   Visited access

Test Selection: IUT takes the role of the V-PCRF; PICS A.2/2.2

4.2.2.3.1   QoS and PCC Rules

TP_VPCRF_VQR_01	Standards Reference: 4.5.1.1 and 4.5.3.1¶2,5,7,8,11 and TS 129 212 [7], 4.5.1¶3	PICS item: A.8/3
Summary:	Verify that the IUT receives CCR with CC-Request-type "INITIAL_REQUEST" from PCEF for a roaming user and that IUT shall establish a new S9 session towards H-PCRF if there is no existing S9 session for this roaming user.	

Initial condition:	The IUT is connected with PCEF over Gx interface and
	    receive a CC-Request
	        containing a CC-Request-Type AVP
	          indicating INITIAL_REQUEST
	        containing a Subscription-Id AVP
	          containing the user identification
	        containing an IP-CAN-Type AVP
	          containing the type of IP-CAN
	        containing a RAT-Type AVP
	          containing the radio access technology
	        containing a Framed-IP-Address AVP
	          indicating the full IP address of the UE
	        containing a Charging-Rule-Report AVP
	          containing a PCC-Rule-Name AVP.	

Test purpose:	Ensure that the IUT
	    to indicate a request for PCC rules for a roaming user,
	    sends a CC-Request
	        containing a CC-Request-Type AVP
	          indicating INITIAL_REQUEST
	        containing a Charging-Rule-Report AVP
	          containing a PCC-Rule-Name AVP.
	        containing a Subsession-Enforcement-Info AVP
	          containing a Subsession-Id AVP
	            indicates a session-id mapped from Gx
	          containing a Subsession-Operation AVP
	            indicating ESTABLISHMENT.	

Comments:		

TP_VPCRF_VQR_02	Standards Reference: 4.5.1.1 and 4.5.3.1¶3,5,7,8 and TS 129 212 [7], 4a.5.1¶3	PICS item: A.8/3
Summary:	Verify that the IUT receives CCR with CC-Request-type "INITIAL_REQUEST" from BBERF in case 2a for a roaming user and that IUT shall establish a new S9 session towards H-PCRF if there is no existing S9 session for this roaming user.	

Initial condition:	The IUT is connected with BBERF over Gxx interface and
	    receive a CC-Request
	        containing a CC-Request-Type AVP
	          indicating INITIAL_REQUEST
	        containing a Subscription-Id AVP
	          indicating IMSI
	        containing a AN-GW-Address AVP
	          indicating access network gateway address
	        containing a QoS-Rule-Report AVP
	          containing QoS-Rule-Name AVP
	        not containing a Called-Station-Id AVP.	

Test purpose:	Ensure that the IUT
	    to indicate a request for PCC rules for a roaming user,
	    sends a CC-Request
	        containing a CC-Request-Type AVP
	          indicating INITIAL_REQUEST
	        containing a QoS-Rule-Report AVP
	          containing QoS-Rule-Name AVP.	

Comments:		

TP_VPCRF_VQR_03	Standards Reference: 4.5.1.1 and 4.5.3.1¶3,5,7,9,11 and TS 129 212 [7], 4a.5.1¶3	PICS item: A.8/3
Summary:	Verify that the IUT receives CCR with CC-Request-type "INITIAL_REQUEST" from BBERF in case 2b for a roaming user and that IUT shall establish a new S9 subsession towards H-PCRF if there is no existing S9 session for this roaming user.	

Initial condition:	The IUT is connected with BBERF over Gxx interface and
	    receive a CC-Request
	        containing a CC-Request-Type AVP
	           indicating INITIAL_REQUEST
	        containing a QoS-Rule-Report AVP
	           containing QoS-Rule-Name AVP
	        containing a Called-Station-Id AVP
	           indicating PDN information.	

Test purpose:	Ensure that the IUT
	    to indicate a request for PCC rules for a roaming user,
	    sends a CC-Request
	        containing a CC-Request-Type AVP
	           indicating INITIAL_REQUEST
	        containing a QoS-Rule-Report AVP
	           containing QoS-Rule-Name AVP
	        containing a Subsession-Enforcement-Info AVP
	           containing a Subsession-Id AVP
	               indicates a session-id mapped from Gxx
	           containing a Subsession-Operation AVP
	               indicating ESTABLISHMENT.	

Comments:		

TP_VPCRF_VQR_04	Standards Reference: 4.5.1.1 and 4.5.3.1¶2,6,7,8,13 and TS 129 212 [7], 4.5.1(item 2)	PICS item: A.8/3
Summary:	Verify that the IUT receives CCR with CC-Request-type "UPDATE_REQUEST" from PCEF for a roaming user and that IUT shall update an existing S9 session towards H-PCRF if there is existing S9 session for this roaming user.	

Initial condition:	The IUT is connected with PCEF over Gx interface and
	    receive a CC-Request
	        containing a CC-Request-Type AVP
	           indicating UPDATE_REQUEST
	        containing a Charging-Rule-Report AVP
	           containing a PCC-Rule-Name AVP.	

Test purpose:	Ensure that the IUT
	    to indicate a request for PCC rules for a roaming user,
	    sends a CC-Request
	        containing a CC-Request-Type AVP
	           indicating UPDATE_REQUEST
	        containing a Charging-Rule-Report AVP
	           containing a PCC-Rule-Name AVP
	        containing a Subsession-Enforcement-Info AVP
	           containing a Subsession-Id AVP
	               indicates a session-id mapped from Gx
	           containing a Subsession-Operation AVP
	               indicating MODIFICATION.	

Comments:		

TP_VPCRF_VQR_05	Standards Reference: 4.5.1.1 and 4.5.3.1¶3,6,7,8 and TS 129 212 [7], 4a.5.1¶7	PICS item: A.8/3
Summary:	Verify that the IUT receives CCR with CC-Request-type "UPDATE_REQUEST" from BBERF in case 2a for a roaming user and that IUT shall update an existing S9 session towards H-PCRF if there is existing S9 session for this roaming user.	

Initial condition:	The IUT is connected with BBERF over Gxx interface and
	    receive a CC-Request
	        containing a CC-Request-Type AVP
	          indicating UPDATE_REQUEST
	        containing a QoS-Rule-Report AVP
	          containing QoS-Rule-Name AVP
	        not containing a Called-Station-Id AVP.	

Test purpose:	Ensure that the IUT
	    to indicate a request for PCC rules for a roaming user,
	    sends a CC-Request
	        containing a CC-Request-Type AVP
	          indicating UPDATE_REQUEST
	        containing a QoS-Rule-Report AVP
	          containing QoS-Rule-Name AVP.	

Comments:		

TP_VPCRF_VQR_06	Standards Reference: 4.5.1.1 and 4.5.3.1¶3,6,7,9,13 and TS 129 212 [7], 4a.5.1¶7	PICS item: A.8/3
Summary:	Verify that the IUT receives CCR with CC-Request-type "UPDATE_REQUEST" from BBERF in case 2b for a roaming user and that IUT shall update an existing S9 session towards H-PCRF if there is existing S9 session for this roaming user.	

Initial condition:	The IUT is connected with BBERF over Gxx interface and
	    receive a CC-Request
	        containing a CC-Request-Type AVP
	          indicating UPDATE_REQUEST
	        containing a QoS-Rule-Report AVP
	          containing QoS-Rule-Name AVP
	        containing a Called-Station-Id AVP
	          indicating PDN information.	

Test purpose:	Ensure that the IUT
	    to indicate a request for PCC rules for a roaming user,
	    sends a CC-Request
	        containing a CC-Request-Type AVP
	          indicating UPDATE_REQUEST
	        containing a QoS-Rule-Report AVP
	          containing QoS-Rule-Name AVP
	        containing a Subsession-Enforcement-Info AVP
	          containing a Subsession-Id AVP
	            indicates a session-id mapped from Gxx
	          containing a Subsession-Operation AVP
	            indicating MODIFICATION.	

Comments:		

4.2.2.3.2   Provision of QoS and PCC Rules

TP_VPCRF_VPQ_01	Standards Reference: 4.5.3.2¶5	PICS item: A.8/4.2
Summary:	Verify that the IUT checks the QoS information which is provisioned at command level and in case if validation fails IUT shall send corresponding RA-Answer.	
Initial condition:		

Test purpose:	Ensure that the IUT
	    on receipt of an RA-Request
	      containing a QoS_Rule_Install AVP
	        containing a QoS_Rule_Name AVP
	          indicating not acceptable QoS information
	    sends an RA-Answer
	      containing an Experimental-Result AVP
	        containing an Experimental-Result-Code AVP
	          indicating DIAMETER_PCC_RULE_EVENT
	      containing a QoS-Rule-Report AVP
	        containing a QoS-Rule-Name AVP
	          indicating not acceptable QoS rule
	        containing a Rule-Failure-Code AVP
	          indicating UNSUCCESSFUL_QOS_VALIDATION
	      containing a QoS-Information AVP
	        indicating acceptable QoS

Comments:		

TP_VPCRF_VPQ_02	Standards Reference: 4.5.3.2¶7,14,16	PICS item: A.8/4.2
Summary:	Verify that the IUT checks the QoS information which is provisioned at subsession level and in case if validation for all subsessions fails IUT shall send corresponding RA-Answer.	
Initial condition:		

Test purpose:	Ensure that the IUT
	    on receipt of an RA-Request
	      containing a Subsession-Decision-Info AVP
	        containing a Subsession-Id AVP
	        containing a Charging-Rule-Install AVP
	        not acceptable information
	    sends an RA-Answer
	      containing a Subsession-Enforcement-Info AVP
	        containing a Subsession-Id AVP
	          indicating rejected subsession
	        containing an Experimental-Result AVP
	          containing an Experimental-Result-Code AVP
	            indicating DIAMETER_PCC_RULE_EVENT
	        containing a Charging-Rule-Report AVP
	          containing a Charging-Rule-Name AVP
	            indicating not acceptable charging rule
	          containing a Rule-Failure-Code AVP
	            indicating UNSUCCESSFUL_QOS_VALIDATION
	        containing a QoS-Information AVP
	          indicating acceptable QoS
	      (containing an Experimental-Result AVP
	        indicating DIAMETER_ERROR_SUBSESSION **or**
	      containing a Result-Code AVP
	        indicating DIAMETER_ERROR_SUBSESSION).

Comments:		

4.2.2.3.3   S9 Session/Subsession Termination

TP_VPCRF_VST_01	Standards Reference: 4.5.1.2 and 4.5.3.3¶2	PICS item: A.8/5
Summary:	Verify that the IUT shall send CC-Request to terminate S9 session or the last S9 subsession towards H-PCRF in case when IUT receives CCR with CC-Request-type "TERMINATION_REQUEST" from PCEF over Gx interface for visited access for the roaming user.	

Initial condition:	The IUT is connected with PCEF over Gx interface and
	     receive a CC-Request
	          containing a CC-Request-Type AVP
	               indicating TERMINATION_REQUEST.	

Test purpose:	Ensure that the IUT
	     to indicate a request for S9 session termination or last S9 subsession termination,
	     sends a CC-Request
	          containing a CC-Request-Type AVP
	               indicating TERMINATION_REQUEST.	

Comments:	NOTE: Received indication of an IP-CAN Session Termination from PCEF.	

TP_VPCRF_VST_02	Standards Reference: 4.5.1.2 and 4.5.3.3¶2	PICS item: A.8/5
Summary:	Verify that the IUT shall send CC-Request to terminate S9 session or the last S9 subsession towards H-PCRF in case when IUT receives CCR with CC-Request-type "TERMINATION_REQUEST" from BBERF over Gxx interface for visited access for the roaming user.	

Initial condition:	The IUT is connected with BBERF over Gxx interface and
	     receive a CC-Request
	          containing a CC-Request-Type AVP
	               indicating TERMINATION_REQUEST**.**	

Test purpose:	Ensure that the IUT
	     to indicate a request for S9 session termination or last S9 subsession termination,
	     sends a CC-Request
	          containing a CC-Request-Type AVP
	               indicating TERMINATION_REQUEST.	

Comments:	NOTE: Received indication of an IP-CAN Session Termination from BBERF.	

TP_VPCRF_VST_03	Standards Reference: 4.5.1.2 and 4.5.3.3¶3	PICS item: A.8/5
Summary:	Verify that the IUT shall send CC-Request to update the S9 subsession towards H-PCRF if there are remaining S9 subsessions for the roaming user for the case when IUT receives CCR with CC-Request-type "TERMINATION_REQUEST" from BBERF over Gxx interface for visited access for the roaming user.	

Initial condition:	The IUT is connected with BBERF over Gxx interface and
	     receive a CC-Request
	          containing a CC-Request-Type AVP
	               indicating TERMINATION_REQUEST.	

Test purpose:	Ensure that the IUT
	     to indicate a request for S9 session update,
	     sends a CC-Request
	          containing a CC-Request-Type AVP
	               indicating UPDATE_REQUEST
	          containing a Subsession-Enforcement-Info AVP
	               containing a Subsession-Id AVP
	                    indicates a subsession-id from Gxx
	               containing a Subsession-Operation AVP
	                    indicating TERMINATION.	

Comments:		

TP_VPCRF_VST_04	Standards Reference: 4.5.1.2 and 4.5.3.4¶1 and 4.5.2.4¶3	PICS item:
Summary:	Verify that the IUT when receives RA-Request for S9 session termination it shall send corresponding RA-Answer to H-PCRF.	
Initial condition:		

Test purpose:	Ensure that the IUT
	   on receipt of an RA-Request
	      containing a Session-Release-Cause AVP
	   sends an RA-Answer	

Comments:		

TP_VPCRF_VST_05	Standards Reference: 4.5.1.2 and 4.5.3.4¶1 and 4.5.3.4¶4	PICS item:
Summary:	Verify that the IUT when receives RA-Request for S9 subsession termination it shall send corresponding RA-Answer to H-PCRF for case 2b.	
Initial condition:		

Test purpose:	Ensure that the IUT
	   on receipt of an RA-Request
	      containing a Subsession-Decision-Info AVP
	         containing a Session-Release-Cause AVP
	   sends an RA-Answer	

Comments:		

4.2.2.3.4   Multiple BBERF Handling

TP_VPCRF_VMB_01	Standards Reference: 4.5.3.5¶6 and TS 129 212 [7], 5.3.7 value(21)	PICS item:
Summary:	Verify that the IUT when receives an IP-CAN session modification from PCEF due to handover with event trigger set to AN_GW_CHANGE than IUT shall send a CCR message to H-PCRF with the same Event-Trigger AVP.	

Initial condition:	The IUT is connected with PCEF over Gx interface and
	   receive a CC-Request
	      containing a CC-Request-Type AVP
	         indicating UPDATE_REQUEST
	      containing a Charging-Rule-Report AVP
	         containing previously provisioned PCC rule(s) and their status
	      containing an Event-Trigger AVP
	         indicating AN_GW_CHANGE
	      containing an AN-GW-Address AVP.	

Test purpose:	Ensure that the IUT
	   to indicate a request for S9 session modification in case of event trigger,
	   sends a CC-Request
	      containing a CC-Request-Type AVP
	         indicating UPDATE_REQUEST
	      containing a Charging-Rule-Report AVP
	         containing previously provisioned PCC rule(s) and their status
	      containing an Event-Trigger AVP
	         indicating AN_GW_CHANGE
	      containing an AN-GW-Address AVP.	

Comments:		

TP_VPCRF_VMB_02	Standards Reference: 4.5.3.5¶6 and TS 129 212 [7], 5.3.7 value(7)	PICS item:
Summary:	Verify that the IUT when receives an IP-CAN session modification from PCEF due to handover with event trigger set to IP-CAN_CHANGE than IUT shall send a CCR message to H-PCRF with the same Event-Trigger AVP.	

Initial condition:	The IUT is connected with PCEF over Gx interface and
	   receive a CC-Request
	      containing a CC-Request-Type AVP
	         indicating UPDATE_REQUEST
	      containing a Charging-Rule-Report AVP
	         containing previously provisioned PCC rule(s) and their status
	      containing an Event-Trigger AVP
	         indicating IP-CAN_CHANGE
	      containing an IP-CAN-Type AVP
	      containing a RAT-Type AVP.	

Test purpose:	Ensure that the IUT
	   to indicate a request for S9 session modification in case of event trigger,
	   sends a CC-Request
	      containing a CC-Request-Type AVP
	         indicating UPDATE_REQUEST
	      containing a Charging-Rule-Report AVP
	         containing previously provisioned PCC rule(s) and their status
	      containing an Event-Trigger AVP
	         indicating IP-CAN_CHANGE
	      containing an IP-CAN-Type AVP
	      containing a RAT-Type AVP.	

Comments:		

4.2.2.3.5   Deferred Session Linking Handling

TP_VPCRF_VDS_01	Standards Reference: 4.5.3.7¶3	PICS item: A.6/11
Summary:	Verify that the IUT does not send a CCR to H-PCRF when IUT receives a CCR for Gateway Control Session Establishment including Session-Linking-Indicator AVP set to value "SESSION_LINKING_DEFERRED" from new BBERF related with an existing Gateway Control session.	

Initial condition:	The IUT is connected with BBERF over Gxx interface and
	   receive a CC-Request
	      containing a CC-Request-Type AVP
	         indicating INITIAL_REQUEST
	      containing a Subscription-Id AVP
	         containing the user identification
	      containing a AN-GW-Address AVP
	         containing the access network gateway address
	      containing an IP-CAN-Type AVP
	         containing the type of IP-CAN
	      containing a RAT-Type AVP
	         containing the radio access technology
	      containing a Framed-IP-Address AVP
	         indicating the full IP address of the UE
	      containing a Session-Linking-Indicator AVP
	         indicating SESSION_LINKING_DEFERRED
	   sends a CC-Answer.	

Test purpose:	Ensure that the IUT **not send a CC-Request.**	
Comments:		

TP_VPCRF_VDS_02	Standards Reference: 4.5.3.7¶4	PICS item: A.6/11
Summary:	Verify that the IUT sends a CCR to H-PCRF to modify the S9 subsession when IUT receives the CCR for IP-CAN session modification that has the same values in the Subscription-Id AVP and Called-Station-Id AVP as the new Gateway Control session	

Initial condition:	The IUT is connected with BBERF over Gxx interface and
	    receive a CC-Request
	        containing a CC-Request-Type AVP
	            indicating UPDATE_REQUEST
	        containing a Subscription-Id AVP
	            containing the user identification
	        containing a Called-Station-Id AVP.	

Test purpose:	Ensure that the IUT
	    to indicate a request for S9 subsession modification with deferred session linking,
	    sends a CC-Request
	        containing a CC-Request-Type AVP
	            indicating UPDATE_REQUEST
	        containing a Subsession-Enforcement-Info AVP
	            containing a Subsession-Id AVP
	                indicates already allocated subsession-id
	            containing a Subsession-Operation AVP
	                indicating MODIFICATION.	

Comments:		

TP_VPCRF_VDS_03	Standards Reference: 4.5.3.7¶5	PICS item: A.6/11
Summary:	Verify that the IUT sends a CCR to H-PCRF to establish a new S9 subsession identifier when IUT receives the CCR for IP-CAN session establishment that has the same values in the Subscription-Id AVP and Called-Station-Id AVP as the new Gateway Control session.	

Initial condition:	The IUT is connected with BBERF over Gxx interface and
	    receive a CC-Request
	        containing a CC-Request-Type AVP
	            indicating INITIAL_REQUEST
	        containing a Subscription-Id AVP
	            containing the user identification
	        containing a AN-GW-Address AVP
	            containing the access network gateway address
	        containing an IP-CAN-Type AVP
	            containing the type of IP-CAN
	        containing a RAT-Type AVP
	            containing the radio access technology
	        containing a Framed-IP-Address AVP
	            indicating the full IP address of the UE
	        containing a Called-Station-Id AVP.	

Test purpose:	Ensure that the IUT
	    to indicate a request for S9 subsession modification with deferred session linking,
	    sends a CC-Request
	        containing a CC-Request-Type AVP
	            indicating INITIAL_REQUEST
	        containing a Subsession-Enforcement-Info AVP
	            containing a Subsession-Id AVP
	                indicates new subsession-id
	            containing a Subsession-Operation AVP
	                indicating ESTABLISHMENT.	

Comments:		

4.2.2.3.6 Session Linking Handling When Multiple PDN Connection to a single APN

TP_VPCRF_VSL_01	Standards Reference: 4.5.3.8¶3	PICS item: A.6/12
Summary:	Verify that when the IUT receives CCR with CC-Request-type "INITIAL_REQUEST" and PDN-Connection-Id AVP from PCEF for visited access due to case 2b and there is not already established S9 session for this roaming user the IUT shall establish a new S9 session towards H-PCRF.	

Initial condition:	The IUT is connected with PCEF over Gx interface and
	   receive a CC-Request
	      containing a CC-Request-Type AVP
	         indicating INITIAL_REQUEST
	      containing a Subscription-Id AVP
	         containing the user identification
	      containing an IP-CAN-Type AVP
	         containing the type of IP-CAN
	      containing a RAT-Type AVP
	         containing the radio access technology
	      containing a Framed-IP-Address AVP
	         indicating the full IP address of the UE
	      containing a PDN-Connection-ID AVP
	      containing a Called-Station-Id AVP
	         indicating PDN information.	

Test purpose:	Ensure that the IUT
	   to indicate a request for S9 session establishment for roaming user,
	   sends a CC-Request
	      containing a CC-Request-Type AVP
	         indicating INITIAL_REQUEST
	      containing a Subscription-Id AVP
	      containing a Subsession-Enforcement-Info AVP
	         containing a Subsession-Id AVP
	            indicates a new S9 subsession-id
	         containing a Subsession-Operation AVP
	            indicating ESTABLISHMENT
	         not containing a PDN-Connection-ID AVP.	

Comments:		

4.2.2.3.7   IP flow mobility support

TP_VPCRF_VIF_01	Standards Reference: 4.5.3.9¶2	PICS item:
Summary:	Verify that when the IUT receives a CCR command for IP-CAN Session establishment with the Routing-Rule-Install AVP from the PCEF than IUT shall send CCR to H-PCRF to established a new S9 subsession.	
Initial condition:	The IUT is connected with PCEF over Gx interface and **receive a CC-Request** containing a CC-Request-Type AVP indicating INITIAL_REQUEST containing a Subscription-Id AVP containing the user identification containing an IP-CAN-Type AVP containing the type of IP-CAN containing a RAT-Type AVP containing the radio access technology containing a Framed-IP-Address AVP indicating the full IP address of the UE containing a Routing-Rule-Install AVP containing one or more Routing-Rule-Definition AVPs containing a Routing-Filter AVP.
Test purpose:	Ensure that the IUT **to indicate** a request for S9 session establishment for IP flow mobility, **sends a CC-Request** containing a CC-Request-Type AVP indicating INITIAL_REQUEST containing a Subscription-Id AVP containing a Subsession-Enforcement-Info AVP containing a Subsession-Id AVP indicates a new S9 subsession-id containing a Subsession-Operation AVP indicating ESTABLISHMENT containing a Routing-Rule-Install AVP.
Comments:	NOTE: V-PCRF knows that AN_GW_CHANGE or IP-CAN_CHANGE event trigger is installed on H-PCRF.

TP_VPCRF_VIF_02	Standards Reference: 4.5.3.9¶3	PICS item:
Summary:	Verify that when the IUT receives a CCR command for IP-CAN Session modification with the Routing-Rule-Install AVP from the PCEF than IUT shall send CCR to H-PCRF to modify S9 subsession.	

Initial condition:	The IUT is connected with PCEF over Gx interface and
	  receive a CC-Request
	    containing a CC-Request-Type AVP
	      indicating UPDATE_REQUEST
	    containing a Subscription-Id AVP
	      containing the user identification
	    containing an IP-CAN-Type AVP
	      containing the type of IP-CAN
	    containing a RAT-Type AVP
	      containing the radio access technology
	    containing a Framed-IP-Address AVP
	      indicating the full IP address of the UE
	    containing a Routing-Rule-Remove AVP
	    containing a Event-Trigger AVP
	      indicating ROUTING RULE CHANGE.	

Test purpose:	Ensure that the IUT
	  to indicate a request for S9 session establishment for IP flow mobility,
	  sends a CC-Request
	    containing a CC-Request-Type AVP
	      indicating UPDATE_REQUEST
	    containing a Subscription-Id AVP
	    containing a Subsession-Enforcement-Info AVP
	      containing a Subsession-Id AVP
	        indicates a new S9 subsession-id
	      containing a Subsession-Operation AVP
	        indicating MODIFICATION
	      containing a Routing-Rule-Remove AVP
	      containing a Event-Trigger AVP
	        indicating ROUTING RULE CHANGE.	

Comments:	NOTE: V-PCRF knows that AN_GW_CHANGE or IP-CAN_CHANGE event trigger is installed on H-PCRF.	

History

Document history		
V1.1.1	July 2014	Publication