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

Reference
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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. Full details of the entire series can be found in part 1 [4].

Modal verbs terminology

In the present document "**shall**", "**shall not**", "**should**", "**should not**", "**may**", "**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).

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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 Rf/Ro interfaces as specified in ETSI TS 132 260 [1] and ETSI TS 132 299 [2] in compliance with the relevant requirements and in accordance with the relevant guidance given in ISO/IEC 9646-7 [6] and ETSI ETS 300 406 [7].

2 References

2.1 Normative references

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

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

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

[1] ETSI TS 132 260 (V10.14.0): "Digital cellular telecommunications system (Phase 2+); Universal Mobile Telecommunications System (UMTS); LTE; Telecommunication management; Charging management; IP Multimedia Subsystem (IMS) charging (3GPP TS 32.260 version 10.14.0 Release 10)".

[2] ETSI TS 132 299 (V10.15.0): "Digital cellular telecommunications system (Phase 2+); Universal Mobile Telecommunications System (UMTS); LTE; Telecommunication management; Charging management; Diameter charging applications (3GPP TS 32.299 version 10.15.0 Release 10)".

[3] ETSI TS 102 790-2: "Technical Committee for IMS Network Testing (INT); Network Integration Testing; IMS specific use of Session Initiation Protocol (SIP) and Session Description Protocol (SDP); Conformance Testing; Part 2: Test Suite Structure (TSS) and Test Purposes (TP)".

[4] ETSI TS 103 374-1: "Core Network and Interoperability Testing (INT); Diameter Conformance testing for Rf/Ro interface; (3GPP™ Release 10); Part 1: Protocol Implementation Conformance Statement (PICS)".

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

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

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

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

[9] IETF RFC 4005: "Diameter Network Access Server Application".

[10] IETF RFC 4006: "Diameter Credit-Control Application".

2.2 Informative references

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

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

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 ETSI TS 132 260 [1], ETSI TS 132 299 [2] and the following apply:

Abstract Test Method (ATM): Refer to ISO/IEC 9646-1 [5].

Abstract Test Suite (ATS): Refer to ISO/IEC 9646-1 [5].

Implementation Under Test (IUT): Refer to ISO/IEC 9646-1 [5].

Test Purpose (TP): Refer to ISO/IEC 9646-1 [5].

3.2 Abbreviations

For the purposes of the present document, the abbreviations given in ETSI TS 132 260 [1], ETSI TS 132 299 [2] and the following apply:

CDF	Charging Data Function
CTF	Charging Trigger Function
TP	Test Purpose
TSS	Test Suite Structure

4 Test configurations

4.1 Introduction

Test purposes of the present document address the IMS functional entities that are accessible via the following standardized DIAMETER interfaces: Ro and Rf.

NOTE: In a real operating network the different Diameter nodes would not connect directly to each other. The connection is usually proxied through one or more Diameter Agents. In the following test architecture figures the Diameter Agent is not explicitly depicted as it is seen as a transparent message handler for conformance testing purposes.

4.2 Test configurations using Rf interface

The Rf interface is located between a CTF equipment hosted by an x-CSCF or a SIP AS and the CDF.

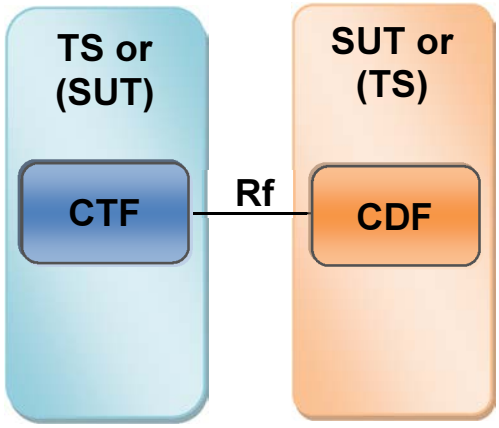

Figure 1: Test configuration CF_1Rf

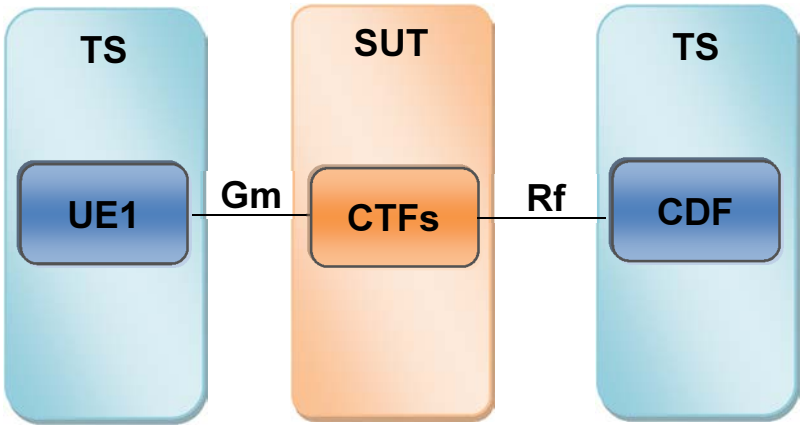

Figure 2: Test configuration CF_1Rf1Gm

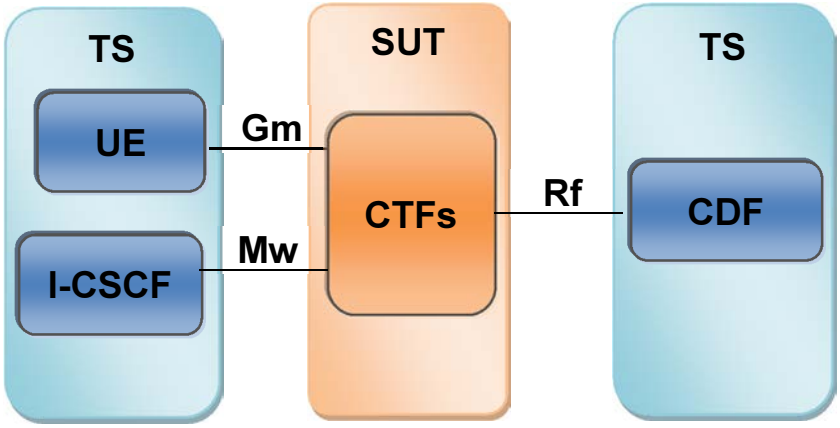

Figure 3: Test configuration CF_1Rf1Gm1Mw

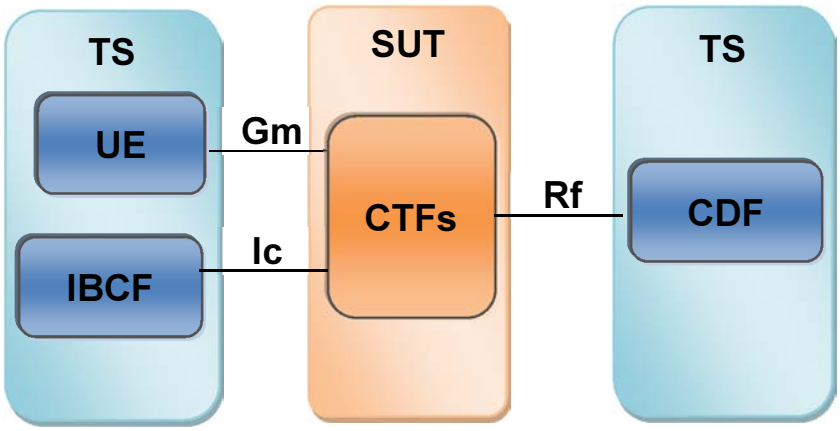

Figure 4: Test configuration CF_1Rf1Gm1Ic

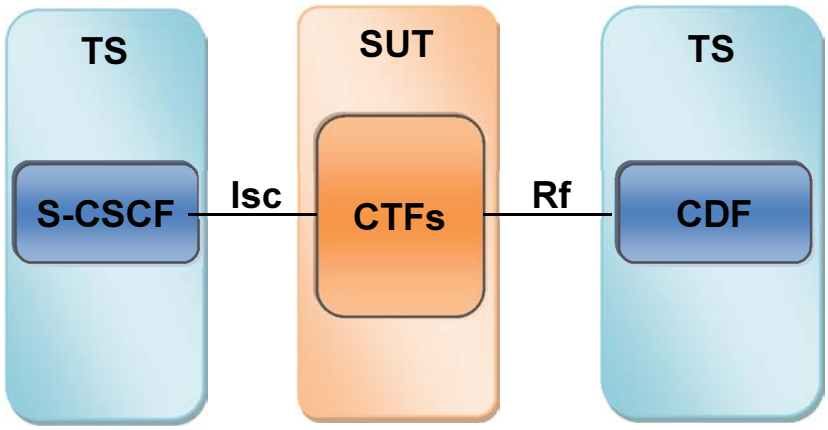

Figure 5: Test configuration CF_1Rf1Isc

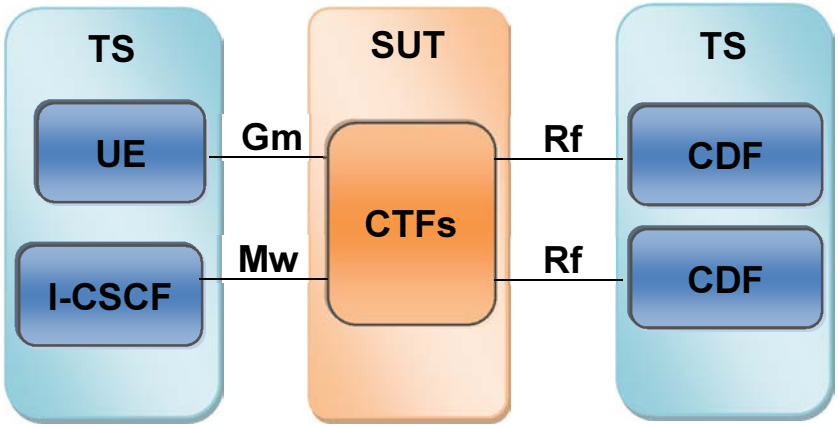

Figure 6: Test configuration CF_2Rf1Gm1Mw

4.3 Test configurations using Ro interface

The Ro interface is located between a CTF equipment hosted by an MRFC or a SIP AS or an IMS GW and the OCF.

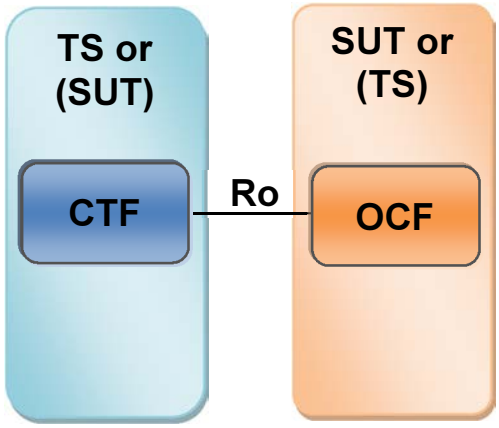

Figure 7: Test configuration CF_1Ro

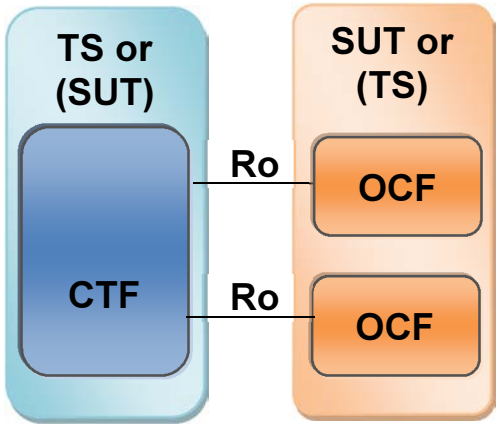

Figure 8: Test configuration CF_2Ro

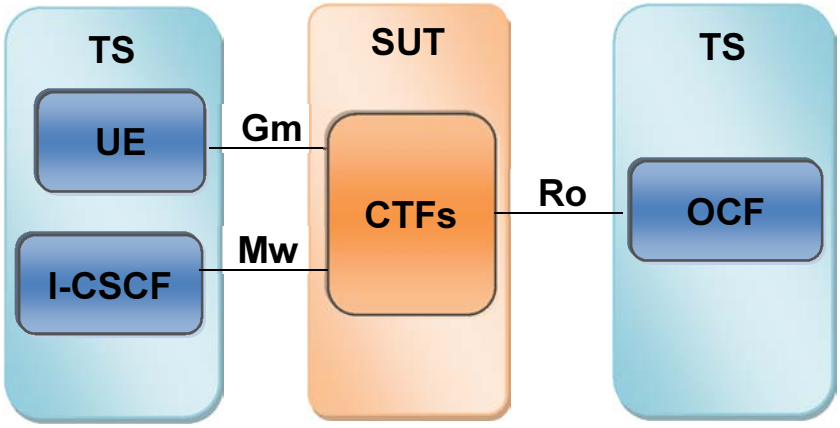

Figure 9: Test configuration CF_1Ro1Gm1Mw

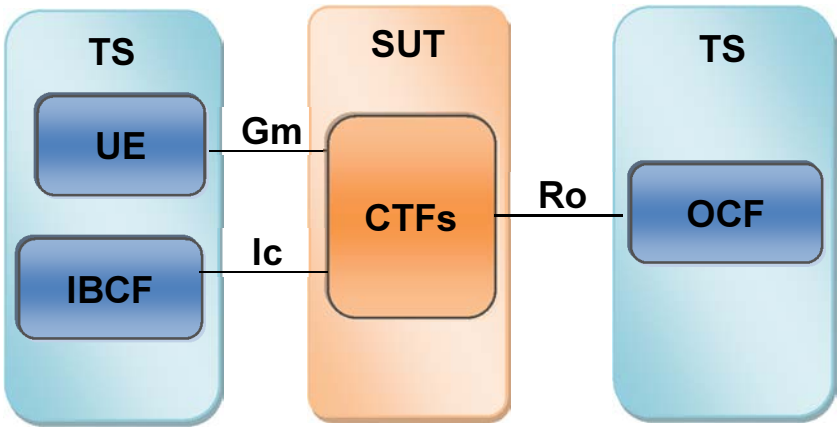

Figure 10: Test configuration CF_1Ro1Gm1Ic

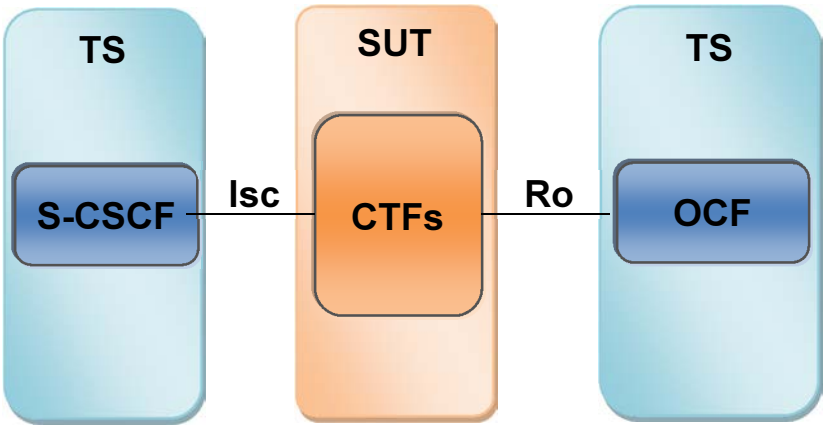

Figure 11: Test configuration CF_1Ro1Isc

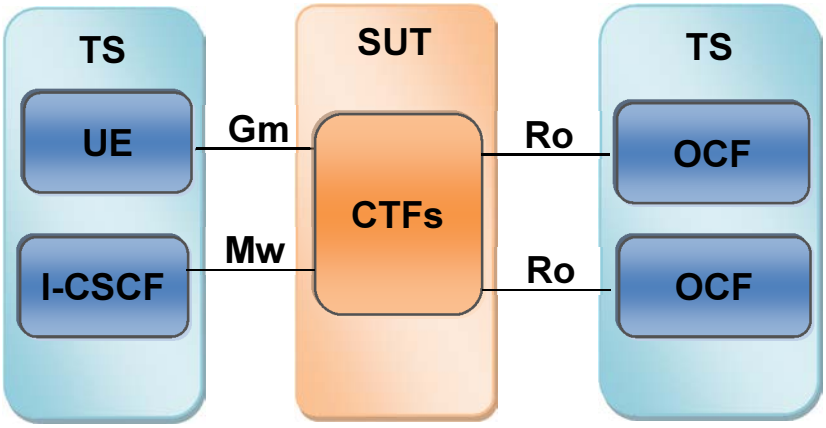

Figure 12: Test configuration CF_2Ro1Gm1Mw

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

5.1 Test Suite Structure

5.1.1 TP naming convention

TPs are numbered, starting at 01, 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"
<interface>		Interface:	RF or RO
<iut>	=	type of IUT:	CDF, OCF or CTF
<scope>	=	group	MS Message syntax
			TC Type of Charging
			EC Error Cases
			CH Tariff Changes
			RE Re-authorization
			FH Failure Handling
			FA Failover
			CP Credit Pooling
			OP Other procedures ([2], clause 6.5)
<nn>	=	sequential number	(01 to 99)

5.1.2 Test strategy

As the base standards in ETSI TS 132 260 [1] and ETSI TS 132 299 [2] contain no explicit requirements for testing, the TPs were generated as a result of an analysis of the base standard and the PICS specification ETSI TS 103 374-1 [4].

5.1.3 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. Table 2 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 ETSI TS 132 299 [2] >** **<PICS reference>**	see table 6.2.3 **clause 6.2.3** **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
Configuration	One of the test configurations as described in clauses 4.2 and 4.3	CF_1Rf
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	Ensure that the IUT in the <state> see IETF RFC 3588 [8] clause 5.6 and/or further actions before stimulus if the action is sending/receiving see below for message structure	 Open state having sent an AC-Request
Stimulus	<**trigger**>, see below for message structure or <goal>	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 are considered as "valid and compatible" unless otherwise specified in the test purpose. This includes the presence of all mandatory AVPs as specified in IETF RFC 3588 [8] and in ETSI TS 132 299 [2], clauses 6.2.2, 6.2.3, 6.4.2 and 6.4.3.

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 ...
```

5.2 Test Purposes

5.2.1 PICS references

All PICS items referred to in this clause are as specified in ETSI TS 103 374-1 [4] 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.

5.2.2 Rf interface

5.2.2.1 CDF Role

5.2.2.1.1 Test selection

The IUT takes the role of the CDF; PICS A.2/1.

5.2.2.1.2 Message Syntax

TP_RF_CDF_MS_01	Standards Reference: Clause 6.2.3 - Table 6.2.3 and IETF RFC 4005 [9], clause 3.9¶2 and Clause 3.10¶3	PICS item:
Summary:	Verify that the IUT can successfully process all mandatory AVPs in an AC-Request received due to Charging Data Transfer.	
Configuration:	CF_1Rf	
Test purpose:	Ensure that the IUT **on receipt of an AC-Request** containing a Session-ID AVP containing an Origin-Host AVP containing an Origin-Realm AVP containing a Destination-Realm AVP containing an Accounting-Record-Type AVP containing an Accounting-Record-Number AVP containing an Acct-Application-Id AVP indicating the value 3 **sends an AC-Answer** containing a Session-ID AVP containing a Result-Code AVP indicating DIAMETER_SUCCESS **not** containing an Experimental-Result AVP containing an Origin-Host AVP containing an Origin-Realm AVP containing an Accounting-Record-Type AVP containing an Accounting-Record-Number AVP containing an Acct-Application-Id AVP indicating the value 3.	
Comments:		

TP_RF_CDF_MS_02	Standards Reference: IETF RFC 3588 [8], clause 3¶2 and ¶4	PICS item:
Summary:	Verify that the IUT can successfully process all mandatory AVPs in an AC-Request received due to Charging Data Transfer and responds with a valid AC-Answer message.	
Configuration:	CF_1Rf	
Test purpose:	Ensure that the IUT **on receipt of an AC-Request** containing a Session-ID AVP containing an Origin-Host AVP containing an Origin-Realm AVP containing a Destination-Realm AVP containing an Accounting-Record-Type AVP containing an Accounting-Record-Number AVP containing an Acct-Application-Id AVP indicating the value 3 **sends an AC-Answer** containing a Diameter-Header containing a Version indicating value '1' containing a Command-Flags containing T bit indicating value '0' containing r bits indicating value '0000'.	
Comments:		

5.2.2.1.3 Type of Charging

TP_RF_CDF_TC_01	Standards Reference: Clause 6.1.1/Steps1 to 4 - Table 6.2.2/3	PICS item: A.3/1.1
Summary:	Verify that the IUT can successfully process an AC-Request [Event] where Event Based Charging is used.	
Configuration:	CF_1Rf	
Test purpose:	Ensure that the IUT **on receipt of an AC-Request** containing an Accounting-Record-Type AVP indicating EVENT_RECORD containing an Event-Timestamp AVP **optionally** containing a Service-Information AVP containing at least one Subscription-ID AVP indicating the identification of the user **optionally** containing an IMS-Information AVP containing a Node-Functionality AVP indicating the value 3 **optionally** containing a Service-Generic-Information AVP indicating the service specific parameters **optionally** containing a Service-Context-Id AVP **sends an AC-Answer** containing a Result-Code AVP indicating DIAMETER_SUCCESS **not** containing an Experimental-Result AVP containing an Accounting-Record-Type AVP indicating EVENT_RECORD containing an Accounting-Record-Number AVP.	
Comments:		

TP_RF_CDF_TC_02	Standards Reference: Clause 6.1.2/Steps 2 to 4 - Table 6.2.2/3	PICS item: A.3/1.2
Summary:	Verify that the IUT can successfully process an AC-Request [Start] where Session Based Charging is used.	
Configuration:	CF_1Rf	
Test purpose:	Ensure that the IUT **on receipt of an AC-Request** containing an Accounting-Record-Type AVP containing an Accounting-Record-Type AVP indicating START_RECORD containing an Accounting-Record-Number AVP containing an Event-Timestamp AVP containing a Service-Information AVP indicating the service specific parameters **sends an AC-Answer** containing a Result-Code AVP indicating DIAMETER_SUCCESS **not** containing an Experimental-Result AVP containing an Accounting-Record-Type AVP indicating START_RECORD **optionally** containing an Acct-Interim-Interval AVP indicating the desired intermediate charging interval.	
Comments:	Postamble action: ACR [Stop] is sent.	

TP_RF_CDF_TC_03	Standards Reference: Clause 6.2.2/Steps 5 to 7 - Table 6.2.2/3	PICS item: A.3/1.2
Summary:	Verify that the IUT can successfully process an AC-Request [Interim] where Session Based Charging is used.	
Configuration:	CF_1Rf	
Test purpose:	Ensure that the IUT **on receipt of an AC-Request** containing an Accounting-Record-Type AVP containing an Accounting-Record-Type AVP indicating INTERIM_RECORD containing an Accounting-Record-Number AVP containing an Event-Timestamp AVP **optionally** containing a Service-Information AVP indicating a Subscription-Id AVP indicating an IMS-Information AVP **sends an AC-Answer** containing a Result-Code AVP indicating DIAMETER_SUCCESS **not** containing an Experimental-Result AVP containing an Accounting-Record-Type AVP indicating INTERIM_RECORD containing an Accounting-Record-Number AVP **optionally** containing an Acct-Interim-Interval AVP indicating the desired intermediate charging interval.	
Comments:	Preamble action: ACR, ACA [Start] are exchanged. Postamble action: ACR [Stop] is sent.	

TP_RF_CDF_TC_04	Standards Reference: Clause 6.2.2/Steps 9 to 11 - Table 6.2.2/3	PICS item: A.3/1.2
Summary:	Verify that the IUT can successfully process an AC-Request [Stop] where Session Based Charging is used.	
Configuration:	CF_1Rf	
Test purpose:	Ensure that the IUT **on receipt of an AC-Request** containing an Accounting-Record-Type AVP containing an Accounting-Record-Type AVP indicating STOP_RECORD containing an Accounting-Record-Number AVP containing an Event-Timestamp AVP **optionally** containing a Service-Information AVP indicating a Subscription-Id AVP indicating an IMS-Information AVP **sends an AC-Answer** containing a Result-Code AVP indicating DIAMETER_SUCCESS **not** containing an Experimental-Result AVP containing an Accounting-Record-Type AVP indicating STOP_RECORD.	
Comments:	Preamble action: ACR, ACA [Start] and ACR, ACA [Interim] are exchanged.	

5.2.2.1.4 Error Cases

TP_RF_CDF_EC_01	Standards Reference: Clause 6.1¶3 - Table 6.2.3 IETF RFC 3588 [8], clause 8.5	PICS item: A.3/1.2
Summary:	Verify that the IUT terminates the session in case of timer expiration when the Session Based Charging procedure is not completed properly.	
Configuration:	CF_1Rf	
Test purpose:	Ensure that the IUT **on timer expired** **sends an AS-Request** containing a Session-ID AVP containing an Origin-Host AVP containing an Origin-Realm AVP containing a Destination-Realm AVP containing a Destination-Host AVP containing an Auth-Application-Id AVP.	
Comments:	Preamble action: ACR, ACA [Start] are exchanged.	

TP_RF_CDF_EC_02	Standards Reference: Clause 6.1¶3 - Table 6.2.3 IETF RFC 3588 [8], clause 8.5	PICS item: A.3/1.2
Summary:	Verify that the IUT terminates the session in case of timer expiration when the Session Based Charging procedure is not completed properly.	
Configuration:	CF_1Rf	
Test purpose:	Ensure that the IUT **on timer expired** **sends an AS-Request** containing a Session-ID AVP containing an Origin-Host AVP containing an Origin-Realm AVP containing a Destination-Realm AVP containing a Destination-Host AVP containing an Auth-Application-Id AVP	
Comments:	Preamble action: ACR, ACA [Start] and ACR, ACA [Interim] are exchanged.	

TP_RF_CDF_EC_03	Standards Reference: Clause 6.1.3.3¶2 IETF RFC 3588 [8], clause 5.7	PICS item: A.3/1.1
Summary:	Verify that the IUT can successfully process Duplicate Detection AC-Request [Event] where Event Based Charging is used.	
Configuration:	CF_1Rf	
Test purpose:	Ensure that the IUT **on receipt of an AC-Request** containing a Diameter-Header containing a Command-Flags containing T-flag indicating value '1' containing an Accounting-Record-Type AVP indicating EVENT_RECORD containing an Event-Timestamp AVP **sends an AC-Answer** containing a Result-Code AVP indicating DIAMETER_SUCCESS **not** containing an Experimental-Result AVP containing an Accounting-Record-Type AVP indicating EVENT_RECORD containing an Accounting-Record-Number AVP	
Comments:		

TP_RF_CDF_EC_04	Standards Reference: Clause 6.1.3.3¶2 IETF RFC 3588 [8], clause 5.7	PICS item: A.3/1.2
Summary:	Verify that the IUT can successfully process Duplicate Detection AC-Request [Interim] where Session Based Charging is used.	
Configuration:	CF_1Rf	
Test purpose:	Ensure that the IUT **on receipt of an AC-Request** containing a Diameter-Header containing a Command-Flags containing T-flag indicating value '1' containing an Accounting-Record-Type AVP indicating INTERIM_RECORD containing an Event-Timestamp AVP **sends an AC-Answer** containing a Result-Code AVP indicating DIAMETER_SUCCESS **not** containing an Experimental-Result AVP containing an Accounting-Record-Type AVP indicating INTERIM _RECORD containing an Accounting-Record-Number AVP	
Comments:	Preamble action: ACR, ACA [Start] are exchanged. Postamble action: ACR [Stop] is sent.	

5.2.2.2 CTF Role

5.2.2.2.1 Test selection

The IUT takes the role of the CTF; PICS A.2/2.

5.2.2.2.2 Message Syntax

TP_RF_CTF_MS_01	Standards Reference: Clause 6.2.2 Table 6.2.2 and IETF RFC 4005 [9], clause 3.9¶2	PICS item:
Summary:	Verify that the IUT can send an AC-Request to indicate a Charging Data Transfer.	
Configuration:	CF_1Rf	
Test purpose:	Ensure that the IUT **to indicate** a request for Charging Data Transfer, **sends an AC-Request** containing a Session-ID AVP containing an Origin-Host AVP containing an Origin-Realm AVP containing a Destination-Realm AVP containing an Accounting-Record-Type AVP containing an Accounting-Record-Number AVP containing an Acct-Application-Id AVP indicating the value 3.	
Comments:		

TP_RF_CTF_MS_02	Standards Reference: IETF RFC 3588 [8], clause 3¶2 and ¶4	PICS item:
Summary:	Verify that the IUT can send an AC-Request with correct Diameter-Header parameters to indicate a Charging Data Transfer with valid Diameter-Header parameters.	
Configuration:	CF_1Rf	
Test purpose:	Ensure that the IUT **to indicate** a request for Charging Data Transfer, **sends an AC-Request** containing a Diameter-Header containing a Version indicating value '1' containing a Command-Flags containing T bit indicating value '0' containing E bit indicating value '0' containing r bits indicating value '0000'.	
Comments:		

5.2.2.2.3 Type of Charging

NOTE: Verify that IMS is able to trigger ACR events. (For initial condition check ETSI TS 132 260 [1] Table 5.2.1.1 and set correct Configuration which is related to ETSI TS 102 790-2 [3] (IMS Rel10 test purposes on Gm, Ic, Isc and Mw interfaces).

TP_RF_CTF_TC_01	Standards Reference: Clause 6.1.1/Steps 1 to 4 - Table 6.2.2/3 ETSI TS 132 260 [1], Table 5.2.1.1 - Clause 5.2.2.1.5	PICS item: A.4/1.1
Summary:	Verify that the IUT can successfully process an AC-Request [Event].	
Configuration:	CF_1Rf or CF_1Rf1Gm1Mw	
SIP Initial condition:	IUT receives SIP message and then sends DIAMETER ACR message to the CDF. Following Test Purposes from ETSI TS 102 790-2 [3] can be reused for triggering: VA_01: TP_IMST2_MW_GEN_03 (200 OK MESSAGE) VA_02: TP_IMST2_MW_GEN_03 (200 OK REGISTER) VA_03: TP_IMST2_MW_GEN_03 (200 OK SUBSCRIBE) VA_04: TP_IMST2_MW_SUB_03 (200 OK PUBLISH)	
Test purpose:	Ensure that the IUT **sends an AC-Request** containing an Accounting-Record-Type AVP indicating EVENT_RECORD containing an Accounting-Record-Number AVP containing an Event-Timestamp AVP containing a Service-Information AVP containing at least one Subscription-ID AVP indicating the identification of the user **optionally** containing an IMS-Information AVP containing a Node-Functionality AVP indicating the value 3 **optionally** containing a Service-Generic-Information AVP indicating the service specific parameters **optionally** containing a Service-Context-Id AVP **on receipt of an AC-Answer** containing a Result-Code AVP indicating DIAMETER_SUCCESS **not** containing an Experimental-Result AVP containing an Accounting-Record-Type AVP indicating EVENT_RECORD **accepts the message**.	
Comments:	Preamble action: UE initiates an initial REGISTRATION procedure.	

TP_RF_CTF_TC_02	Standards Reference: Clause 6.1.2/Step 2 - Table 6.2.2/3 ETSI TS 132 260 [1], Table 5.2.1.1 - Clause 5.2.2.1	PICS item: A.4/1.2
Summary:	Verify that the IUT can successfully process an AC-Request [Start].	
Configuration:	CF_1Rf or CF_1Rf1Gm1Mw	
SIP Initial condition:	IUT receives SIP message and then sends DIAMETER ACR message to the CDF. Following Test Purposes from ETSI TS 102 790-2 [3] can be reused for triggering: TP_IMST2_MW_GEN_08 (200 OK INVITE)	
Test purpose:	Ensure that the IUT **on receipt of SIP 200 OK INVITE** **sends an AC-Request** containing an Accounting-Record-Type AVP indicating START_RECORD containing an Accounting-Record-Number AVP containing an Event-Timestamp AVP containing a Service-Information AVP indicating the service specific parameters **on receipt of an AC-Answer** containing a Result-Code AVP indicating DIAMETER_SUCCESS **not** containing an Experimental-Result AVP containing an Accounting-Record-Type AVP indicating START_RECORD **optionally** containing an Acct-Interim-Interval AVP indicating the desired intermediate charging interval **accepts the message**.	
Comments:	Preamble action: UE initiates an INVITE procedure.	

TP_RF_CTF_TC_03	Standards Reference: Clause 6.1.2/Step 5 - Table 6.2.2/3	PICS item: A.4/1.2
Summary:	Verify that the time between several AC-Requests [Interim] received by the IUT is at least equal to the desired intermediate charging interval.	
Configuration:	CF_1Rf1Gm1Mw	
SIP Initial condition:	IUT receives SIP message and then sends DIAMETER ACR message to the CDF. Following Test Purposes from ETSI TS 102 790-2 [3] can be reused for triggering: TP_IMST2_MW_GEN_08 (200 OK INVITE)	
Test purpose:	Ensure that the IUT **on receipt of SIP 200 OK (Invite)** **sends an AC-Request** containing an Accounting-Record-Type AVP indicating START_RECORD containing an Accounting-Record-Number AVP **on receipt of an AC-Answer** containing an Accounting-Record-Type AVP indicating START_RECORD containing an Accounting-Record-Number AVP containing an Acct-Interim-Interval AVP containing the desired intermediate charging interval indicating a value INTERIM_INTERVAL not equal to 0 **sends periodically an AC-Request [Interim]** containing an Accounting-Record-Type AVP indicating INTERIM_RECORD containing an Accounting-Record-Number AVP containing a Service-Information AVP containing an Event-Timestamp AVP **on receipt of an AC-Answer** containing an Accounting-Record-Type AVP indicating INTERIM_RECORD containing an Accounting-Record-Number AVP **stops sending AC-Requests**.	
Comments:	Preamble action: UE establishes a call.	

TP_RF_CTF_TC_04	Standards Reference: Clause 6.1.2/Step 5 - Table 6.2.2/3	PICS item: A.4/1.2
Summary:	Verify that the IUT can successfully process an AC-Request [Interim].	
Configuration:	CF_1Rf1Gm1Mw	
SIP Initial condition:	IUT receives SIP message and then sends DIAMETER ACR message to the CDF. Following Test Purposes from ETSI TS 102 790-2 [3] can be reused for triggering: TP_IMST2_MW_TAR_03 (200 OK reINVITE)	
Test purpose:	Ensure that the IUT **on receipt of SIP 200 OK (Invite)** **sends an AC-Request** containing an Accounting-Record-Type AVP indicating START_RECORD containing an Accounting-Record-Number AVP **on receipt of an AC-Answer** containing a Result-Code AVP indicating DIAMETER_SUCCESS **not** containing an Experimental-Result AVP containing an Accounting-Record-Type AVP indicating START_RECORD containing an Accounting-Record-Number AVP **on receipt of SIP 200 OK (reInvite)** **sends an AC-Request [Interim]** containing an Accounting-Record-Type AVP indicating INTERIM_RECORD containing an Accounting-Record-Number AVP containing a Service-Information AVP containing an Event-Timestamp AVP **on receipt of an AC-Answer** containing a Result-Code AVP indicating DIAMETER_SUCCESS **not** containing an Experimental-Result AVP containing an Accounting-Record-Type AVP indicating INTERIM_RECORD containing an Accounting-Record-Number AVP **stops sending AC-Requests**.	
Comments:	Preamble action: UE establishes a call.	

TP_RF_CTF_TC_05	Standards Reference: Clause 6.1.2/Step 9 - Table 6.2.2/3 ETSI TS 132 260 [1], clause 5.2.1.1 IETF RFC 3588 [8], clause 6.9	PICS item: A.4/1.2
Summary:	Verify that the IUT can successfully process an AC-Request [Stop].	
Configuration:	CF_1Rf or CF_1Rf1Gm1Mw	
SIP Initial condition:	IUT receives SIP message and then sends DIAMETER ACR message to the CDF. Following Test Purposes from ETSI TS 102 790-2 [3] can be reused for triggering: TP_IMST2_MW_GEN_08 (BYE)	
Test purpose:	Ensure that the IUT **on receipt of SIP BYE** **sends an AC-Request** containing an Accounting-Record-Type AVP indicating STOP_RECORD containing an Accounting-Record-Number AVP containing an Acct-Application-Id AVP indicating the value 3 **on receipt of an AC-Answer** containing a Result-Code AVP indicating DIAMETER_SUCCESS **not** containing an Experimental-Result AVP containing an Accounting-Record-Type AVP indicating STOP_RECORD **accepts the message**.	
Comments:	Preamble action: A call is established and the UE initiates a BYE procedure.	

5.2.2.2.4 Error Cases

TP_RF_CTF_EC_01	Standards Reference: Clause 6.1.3 - Table 6.2.3 IETF RFC 3588 [8], clause 5.5.1	PICS item: A.4/1.2
Summary:	Verify that the IUT sends periodically Device-Watchdog-Request messages to the CDF.	
Configuration:	CF_1Rf or CF_1Rf1Gm1Mw	
SIP Initial condition:	IUT receives SIP message and then sends DIAMETER ACR message to the CDF. Following Test Purposes from ETSI TS 102 790-2 [3] can be reused for triggering: TP_IMST2_MW_GEN_08 (200 OK INVITE)	
Test purpose:	Ensure that the IUT **sends a DW-Request** containing a Diameter-Header containing a Hop-by-Hop AVP containing an End-To-End AVP containing an Origin-Host AVP containing an Origin-Realm AVP **on receipt of a DW-Answer** containing a Diameter-Header containing a Hop-by-Hop AVP containing an End-To-End AVP containing a Result-Code AVP indicating DIAMETER_SUCCESS containing an Origin-Host AVP containing an Origin-Realm AVP **accepts the message**.	
Comments:	Preamble action: ACR, ACA [Start] are exchanged.	

TP_RF_CTF_EC_02	Standards Reference: Clause 6.1.3.1¶1 - Table 6.2.3 IETF RFC 3588 [8], clause 5.5	PICS item: A.4/1.2 and A.4/5
Summary:	Verify that on connection failure with the primary CDF, the IUT sends an AC-Request [Interim] to the secondary CDF.	
Configuration:	CF_2Rf or CF_2Rf1Gm1Mw	
Initial conditions:	A secondary CDF is available	
SIP Initial condition:	IUT receives SIP message and then sends DIAMETER ACR message to the CDF. Following Test Purposes from ETSI TS 102 790-2 [3] can be reused for triggering: TP_IMST2_MW_GEN_08 (200 OK INVITE)	
Test purpose:	Ensure that the IUT **to indicate the CDF stop** **sends an AC-Request [Interim] to the secondary CDF** containing an Accounting-Record-Type AVP indicating INTERIM_RECORD containing an Accounting-Record-Number AVP containing a Service-Information AVP containing an Event-Timestamp AVP indicating a time ordered sequence **on receipt of an AC-Answer** containing a Session-ID AVP containing a Result-Code AVP indicating DIAMETER_SUCCESS **not** containing an Experimental-Result AVP containing an Accounting-Record-Type AVP containing an Accounting-Record-Number AVP **accepts the message**.	
Comments:	Preamble action: ACR, ACA [Start] and ACR, ACA [Interim] are exchanged.	
NOTE: Communication failure is based on DWR/DWA detection.		

TP_RF_CTF_EC_03	Standards Reference: Clause 6.1.3.1¶1 - Table 6.2.3 IETF RFC 3588 [8], clause 5.5	PICS item: A.4/1.2 and A.4/5
Summary:	Verify that on connection restored, the IUT sends an AC-Request [Interim] to the primary CDF.	
Configuration:	CF_2Rf or CF_2Rf1Gm1Mw	
Initial conditions:	A secondary CDF is available	
SIP Initial condition:	IUT receives SIP message and then sends DIAMETER ACR message to the CDF. Following Test Purposes from ETSI TS 102 790-2 [3] can be reused for triggering: TP_IMST2_MW_INI_05 (INVITE)	
Test purpose:	Ensure that the IUT **to indicate the CDF restart** **sends an AC-Request [Interim] to the primary CDF** containing an Accounting-Record-Type AVP indicating INTERIM_RECORD containing an Accounting-Record-Number AVP containing a Service-Information AVP containing an Event-Timestamp AVP indicating a time ordered sequence **on receipt of an AC-Answer** containing a Session-ID AVP containing a Result-Code AVP indicating DIAMETER_SUCCESS **not** containing an Experimental-Result AVP containing an Accounting-Record-Type AVP containing an Accounting-Record-Number AVP **accepts the message**.	
Comments:	Preamble action: ACR, ACA [Start] and ACR, ACA [Interim] are exchanged.	
NOTE: Communication failure is based on DWR/DWA detection.		

TP_RF_CTF_EC_04	Standards Reference: Clause 6.1.3.1¶2 - Table 6.2.3 IETF RFC 3588 [8], clause 9.4	PICS item: A.4/1.2 and A.4/2.1 and not A.4/5
Summary:	Verify that on communication failure, the IUT stores generated accounting data in a non-volatile memory and, on communication restored, sends them to the CDF, in the order they were stored in the buffer.	
Configuration:	CF_1Rf or CF_1Rf1Gm1Mw	
Initial conditions:	Secondary CDF is not available	
SIP Initial condition:	IUT receives SIP message and then sends DIAMETER ACR message to the CDF. Following Test Purposes from ETSI TS 102 790-2 [3] can be reused for triggering: TP_IMST2_MW_GEN_08 (200 OK INVITE)	
Test purpose:	Ensure that the IUT **to indicate the CDF restart** **sends the buffered AC-Request [Interim]** containing an Accounting-Record-Type AVP indicating INTERIM_RECORD containing an Accounting-Record-Number AVP containing a Service-Information AVP containing an Event-Timestamp AVP indicating a time ordered sequence **on receipt of one AC-Answer for each buffered AC-Request [Interim]** containing a Session-ID AVP containing a Result-Code AVP indicating DIAMETER_SUCCESS **not** containing an Experimental-Result AVP containing an Accounting-Record-Type AVP containing an Accounting-Record-Number AVP **accepts the messages**.	
Comments:	Preamble action: ACR, ACA [Start] and ACR, ACA [Interim] are exchanged and the CDF stops communication with the IUT.	
NOTE: Communication failure is based on DWR/DWA detection.		

TP_RF_CTF_EC_05	Standards Reference: Clause 6.1.3.2¶1 - Table 6.2.3	PICS item: A.4/1.2 and A.4/2.2
Summary:	Verify that the IUT retransmits an unacknowledged AC-Request [Interim] (T-flag).	
Configuration:	CF_1Rf or CF_1Rf1Gm1Mw	
SIP Initial condition:	IUT receives SIP message and then sends DIAMETER ACR message to the CDF. Following Test Purposes from ETSI TS 102 790-2 [3] can be reused for triggering: TP_IMST2_MW_GEN_08 (200 OK INVITE)	
Test purpose:	Ensure that the IUT **to indicate not having received an AC-Answer [Interim]** **send again an AC-Request [Interim]** containing a Diameter-Header containing a Command-Flags containing a T-flag indicating value '1' containing an Accounting-Record-Type AVP indicating INTERIM_RECORD containing an Accounting-Record-Number AVP containing a Service-Information AVP containing an Event-Timestamp AVP indicating a time ordered sequence **on receipt of an AC-Answer** containing a Session-ID AVP containing a Result-Code AVP indicating DIAMETER_SUCCESS **not** containing an Experimental-Result AVP containing an Accounting-Record-Type AVP containing an Accounting-Record-Number AVP **accepts the message**.	
Comments:	Preamble action: ACR, ACA [Start] and ACR, ACA [Interim] are exchanged and the CDF stops communication with the IUT.	

TP_RF_CTF_EC_06	Standards Reference: Clause 6.1.3.2¶1 - Table 6.2.3	PICS item: A.4/1.2 and A.4/2.1
Summary:	Verify that on reaching the maximum of retransmissions of unacknowledged AC-Requests [Interim] (T-flag), the IUT executes the CDF connection failure procedure.	
Configuration:	CF_1Rf or CF_1Rf1Gm1Mw	
SIP Initial condition:	IUT receives SIP message and then sends DIAMETER ACR message to the CDF. Following Test Purposes from ETSI TS 102 790-2 [3] can be reused for triggering: TP_IMST2_MW_GEN_08 (200 OK INVITE)	
Test purpose:	Ensure that the IUT **on maximum retransmission of AC-Request [Interim]** **to indicate the CDF restart** **sends the buffered AC-Request [Interim]** containing an Accounting-Record-Type AVP indicating INTERIM_RECORD containing an Accounting-Record-Number AVP containing a Service-Information AVP containing an Event-Timestamp AVP indicating a time ordered sequence **on receipt of one AC-Answer for each buffered AC-Request [Interim]** containing a Session-ID AVP containing a Result-Code AVP indicating DIAMETER_SUCCESS **not** containing an Experimental-Result AVP containing an Accounting-Record-Type AVP containing an Accounting-Record-Number AVP **accepts the messages**.	
Comments:	Preamble action: ACR, ACA [Start] and ACR, ACA [Interim] are exchanged and the CDF stops communication with the IUT.	

5.2.3 Ro interface

5.2.3.1 OCF Role

5.2.3.1.1 Test selection

The IUT takes the role of the OCF; PICS A.5/1.

5.2.3.1.2 Message Syntax

TP_RO_OCF_MS_01	Standards Reference: Clause 6.4.3 Table 6.4.3	PICS item:
Summary:	Verify that the IUT can successfully process all mandatory AVPs in a CC-Request received due to Charging Data Transfer.	
Configuration:	CF_1Ro	
Test purpose:	Ensure that the IUT **on receipt of a CC-Request** containing a Session-ID AVP containing an Origin-Host AVP containing an Origin-Realm AVP containing a Destination-Realm AVP containing an Auth-Application-Id AVP indicating the value 4 containing a Service-Context-Id AVP containing a CC-Request-Type AVP containing a CC-Request-Number AVP **sends a CC-Answer** containing a Session-ID AVP containing a Result-Code AVP indicating DIAMETER_SUCCESS containing an Origin-Host AVP containing an Origin-Realm AVP containing an Auth-Application-Id AVP containing a CC-Request-Type AVP containing a CC-Request-Number AVP.	
Comments:		

TP_RO_OCF_MS_02	Standards Reference: IETF RFC 3588 [8], clauses 3¶2 and 3¶4	PICS item:
Summary:	Verify that the IUT can successfully process all mandatory AVPs in a CC-Request received due to Charging Data Transfer and responds with a valid CC-Answer message.	
Configuration:	CF_1Ro	
Test purpose:	Ensure that the IUT **on receipt of a CC-Request** containing a Session-ID AVP containing an Origin-Host AVP containing an Origin-Realm AVP containing a Destination-Realm AVP containing an Auth-Application-Id AVP indicating the value 4 containing a Service-Context-Id AVP containing a CC-Request-Type AVP containing a CC-Request-Number AVP **sends a CC-Answer** containing a Diameter-Header containing a Version indicating value '1' containing a Command-Flags containing T bit indicating value '0' containing r bits indicating value '0000'.	
Comments:		

5.2.3.1.3 Type of Charging

TP_RO_OCF_TC_01	Standards Reference: Clause 6.3.3/ Steps 2 and 5 and IETF RFC 4006 [10], clauses 6.3 and 8.41	PICS item: A.6/3.1
Summary:	Verify that the IUT can successfully process a CC-Request [Event] with direct debiting due to Immediate Event Charging.	
Configuration:	CF_1Ro	
Test purpose:	Ensure that the IUT **on receipt of a CC-Request** containing a CC-Request-Type AVP indicating EVENT_REQUEST containing a CC-Request-Number AVP containing a Requested-Action AVP indicating DIRECT_DEBITING containing a Multiple-Services-Credit-Control AVP (containing a Requested-Service-Unit AVP **and/or** containing a Service-Identifier AVP) **sends a CC-Answer** containing a Result-Code AVP indicating DIAMETER_SUCCESS containing a CC-Request-Type AVP indicating EVENT_REQUEST containing a Multiple-Services-Credit-Control AVP containing a Granted-Service-Unit AVP indicating debits units.	
Comments:		

TP_RO_OCF_TC_02	Standards Reference: Clause 6.3.3/Step 5, note and IETF RFC 4006 [10], clauses 6.1, 8.7 and 8.41	PICS item: A.6/3.1
Summary:	Verify that the IUT can successfully process a CC-Request [Event] with price enquiry due to Immediate Event Charging.	
Configuration:	CF_1Ro	
Test purpose:	Ensure that the IUT **on receipt of a CC-Request** containing a CC-Request-Type AVP indicating EVENT_REQUEST containing a CC-Request-Number AVP containing a Requested Action AVP indicating PRICE_ENQUIRY containing a Multiple-Services-Credit-Control AVP containing a Service-Identifier AVP **sends a CC-Answer** containing a Result-Code AVP indicating DIAMETER_SUCCESS containing a CC-Request-Type AVP indicating EVENT_REQUEST containing a Cost-Information AVP containing a Unit-Value AVP containing a Value-Digits AVP containing a Currency-Code AVP.	
Comments:		

TP_RO_OCF_TC_03	**Standards Reference:** **Clause 6.3.3/Step 5, note and clause 7.2.172 and IETF RFC 4006 [10], clauses 6.2 and 8.41**	**PICS item:** **A.6/3.1**
Summary:	Verify that the IUT can successfully process a CC-Request [Event] with check balance due to Immediate Event Charging.	
Configuration:	CF_1Ro	
Test purpose:	Ensure that the IUT **on receipt of a CC-Request** containing a CC-Request-Type AVP indicating EVENT_REQUEST containing a CC-Request-Number AVP containing a Requested Action AVP indicating CHECK BALANCE **sends a CC-Answer** containing a Result-Code AVP indicating DIAMETER_SUCCESS containing a CC-Request-Type AVP indicating EVENT_REQUEST containing a Remaining-Balance AVP containing a Unit-Value AVP containing aValue-Digits AVP containing a Currency-Code AVP.	
Comments:		

TP_RO_OCF_TC_04	**Standards Reference:** **Clause 6.3.3/Steps 2 and 5 after Figure 6.3.3a and IETF RFC 4006 [10], clauses 6.4 and 8.41**	**PICS item:** **A.6/3.1**
Summary:	Verify that the IUT can successfully process a CC-Request [Event] with refund account due to Immediate Event Charging.	
Configuration:	CF_1Ro	
Test purpose:	Ensure that the IUT **on receipt of a CC-Request** containing a CC-Request-Type AVP indicating EVENT_REQUEST containing a CC-Request-Number AVP containing a Requested Action AVP indicating REFUND_ACCOUNT containing a Multiple-Services-Credit-Control AVP (containing a Requested-Service-Unit AVP **and/or** containing a Service-Identifier AVP) **sends a CC-Answer** containing a Result-Code AVP indicating DIAMETER_SUCCESS containing a CC-Request-Type AVP indicating EVENT_REQUEST containing a Multiple-Services-Credit-Control AVP containing a Granted-Service-Unit AVP indicating refunded units.	
Comments:	Preamble action: CCR, CCA [Event] direct debiting action are exchanged.	

TP_RO_OCF_TC_05	Standards Reference: Clause 6.3.4/Step 2	PICS item: A.6/3.2
Summary:	Verify that the IUT can successfully process a CC-Request [Initial] to reserve units due to Event Charging with Unit Reservation.	
Configuration:	CF_1Ro	
Test purpose:	Ensure that the IUT **on receipt of a CC-Request** containing a CC-Request-Type AVP indicating INITIAL_REQUEST containing a CC-Request-Number AVP containing a Multiple-Services-Credit-Control AVP containing a Requested-Service-Unit AVP **sends a CC-Answer** containing a Result-Code AVP indicating DIAMETER_SUCCESS containing a CC-Request-Type AVP indicating INITIAL_REQUEST containing a Multiple-Services-Credit-Control AVP containing a Granted-Service-Unit AVP indicating reserved units **optionally** containing a Cost-Information AVP containing Unit-Value AVP containing Value-Digits AVP containing Currency-Code AVP **optionally** containing a Remaining-Balance AVP containing Unit-Value AVP containing Value-Digits AVP containing Currency-Code AVP.	
Comments:		

TP_RO_OCF_TC_06	Standards Reference: Clause 6.3.4/Steps 2, 4, 6 and 8	PICS item: A.6/3.2
Summary:	Verify that the IUT can successfully process a CC-Request [Termination] to debit units due to Event Charging with Unit Reservation.	
Configuration:	CF_1Ro	
Test purpose:	Ensure that the IUT **on receipt of a CC-Request** containing a CC-Request-Type AVP indicating TERMINATION_REQUEST containing a CC-Request-Number AVP containing a Multiple-Services-Credit-Control AVP containing a Used-Service-Unit AVP **sends a CC-Answer** containing a Result-Code AVP indicating DIAMETER_SUCCESS containing a CC-Request-Type AVP indicating TERMINATION_REQUEST **optionally** containing a Cost-Information AVP containing Unit-Value AVP containing Value-Digits AVP containing Currency-Code AVP **optionally** containing a Remaining-Balance AVP containing Unit-Value AVP containing Value-Digits AVP containing Currency-Code AVP.	
Comments:	Preamble action: CCR, CCA [Initial] are exchanged.	

TP_RO_OCF_TC_07	Standards Reference: Clause 6.3.5/Steps 2 and 4	PICS item: A.6/3.3
Summary:	Verify that the IUT can successfully process a CC-Request [Initial] to reserve units due to Session Charging with Unit Reservation.	
Configuration:	CF_1Ro	
Test purpose:	Ensure that the IUT **on receipt of a CC-Request** containing a CC-Request-Type AVP indicating INITIAL_REQUEST containing a CC-Request-Number AVP containing a Multiple-Services-Credit-Control AVP containing a Requested-Service-Unit AVP **sends a CC-Answer** containing a Result-Code AVP indicating DIAMETER_SUCCESS containing a CC-Request-Type AVP indicating INITIAL_REQUEST containing a Multiple-Services-Credit-Control AVP containing a Granted-Service-Unit AVP indicating reserved units **optionally** containing a Cost-Information AVP containing Unit-Value AVP containing Value-Digits AVP containing Currency-Code AVP **optionally** containing a Remaining-Balance AVP containing Unit-Value AVP containing Value-Digits AVP containing Currency-Code AVP.	
Comments:		

TP_RO_OCF_TC_08	Standards Reference: Clause 6.3.5/Steps 2, 4, 6 and 8	PICS item: A.6/3.3
Summary:	Verify that the IUT can successfully process a CC-Request [Update] to reserve units and debit units due to Session Charging with Unit Reservation.	
Configuration:	CF_1Ro	
Test purpose:	Ensure that the IUT **on receipt of a CC-Request** containing a CC-Request-Type AVP indicating UPDATE_REQUEST containing a CC-Request-Number AVP containing a Multiple-Services-Credit-Control AVP containing a Used-Service-Unit AVP **sends a CC-Answer** containing a Result-Code AVP indicating DIAMETER_SUCCESS containing a CC-Request-Type AVP indicating UPDATE_REQUEST containing a Multiple-Services-Credit-Control AVP containing a Granted-Service-Unit AVP indicating reserved units **optionally** containing a Cost-Information AVP containing Unit-Value AVP containing Value-Digits AVP containing Currency-Code AVP **optionally** containing a Remaining-Balance AVP containing Unit-Value AVP containing Value-Digits AVP containing Currency-Code AVP.	
Comments:	Preamble action: CCR, CCA [Initial] are exchanged.	

TP_RO_OCF_TC_09	Standards Reference: Clause 6.3.5/Steps 2, 4, 6, 8, 10 and 12	PICS item: A.6/3.3
Summary:	Verify that the IUT can successfully process a CC-Request [Termination] to debit units due to Session Charging with Unit Reservation.	
Configuration:	CF_1Ro	
Test purpose:	Ensure that the IUT **on receipt of a CC-Request** containing a CC-Request-Type AVP indicating TERMINATION_REQUEST containing a CC-Request-Number AVP containing a Multiple-Services-Credit-Control AVP containing a Used-Service-Unit AVP **sends a CC-Answer** containing a Result-Code AVP indicating DIAMETER_SUCCESS containing a CC-Request-Type AVP indicating TERMINATION_REQUEST containing a Multiple-Services-Credit-Control AVP containing a Granted-Service-Unit AVP indicating reserved units **optionally** containing a Cost-Information AVP containing Unit-Value AVP containing Value-Digits AVP containing Currency-Code AVP **optionally** containing a Remaining-Balance AVP containing Unit-Value AVP containing Value-Digits AVP containing Currency-Code AVP.	
Comments:	Preamble action: CCR, CCA [Initial] and CCR, CCA [Update] are exchanged.	

5.2.3.1.4 Error Cases

TP_RO_OCF_EC_01	Standards Reference: Clause 6.3.6.1¶2 and IETF RFC 4006 [10], clause 6.5	PICS item: A.6/3.1
Summary:	Verify that the IUT can successfully process Duplicate Detection due to Immediate Event Charging with Direct Debiting.	
Configuration:	CF_1Ro	
Test purpose:	Ensure that the IUT **on receipt of a CC-Request** containing Diameter-Header containing Command-Flags containing T-flag indicating value '1' containing a CC-Request-Type AVP indicating EVENT_REQUEST containing a CC-Request-Number AVP containing a Requested-Action AVP indicating DIRECT_DEBITING containing a Multiple-Services-Credit-Control AVP (containing a Requested-Service-Unit AVP **and/or** containing a Service-Identifier AVP) **sends a CC-Answer** containing a Result-Code AVP indicating DIAMETER_SUCCESS containing a CC-Request-Type AVP indicating EVENT_REQUEST containing a Multiple-Services-Credit-Control AVP containing a Granted-Service-Unit AVP indicating debits units.	
Comments:		

TP_RO_OCF_EC_02	**Standards Reference:** **Clause 6.3.6.1¶2 and** **IETF RFC 4006 [10], clause 6.5**	**PICS item:** **A.6/3.3**
Summary:	Verify that the IUT can successfully process Duplicate Detection due to Event Charging with Unit Reservation.	
Configuration:	CF_1Ro	
Test purpose:	Ensure that the IUT **on receipt of a CC-Request** containing Diameter-Header containing Command-Flags containing T-flag indicating value '1' containing a CC-Request-Type AVP indicating INITIAL_REQUEST containing a CC-Request-Number AVP containing a Multiple-Services-Credit-Control AVP containing a Requested-Service-Unit AVP **sends a CC-Answer** containing a Result-Code AVP indicating DIAMETER_SUCCESS containing a CC-Request-Type AVP indicating INITIAL_REQUEST containing a Multiple-Services-Credit-Control AVP containing a Granted-Service-Unit AVP indicating reserved units **optionally** containing a Cost-Information AVP containing Unit-Value AVP containing Value-Digits AVP containing Currency-Code AVP **optionally** containing a Remaining-Balance AVP containing Unit-Value AVP containing Value-Digits AVP containing Currency-Code AVP.	
Comments:		

TP_RO_OCF_EC_03	**Standards Reference:** **Clause 6.3.6.1¶2 and** **IETF RFC 4006 [10], clause 6.5**	**PICS item:** **A.6/3.3**
Summary:	Verify that the IUT can successfully process Duplicate Detection due to Event Charging with Unit Reservation.	
Configuration:	CF_1Ro	
Test purpose:	Ensure that the IUT **on receipt of a CC-Request** containing Diameter-Header containing Command-Flags containing T-flag indicating value '1' containing a CC-Request-Type AVP indicating TERMINATION_REQUEST containing a CC-Request-Number AVP containing a Multiple-Services-Credit-Control AVP containing a Requested-Service-Unit AVP **sends a CC-Answer** containing a Result-Code AVP indicating DIAMETER_SUCCESS containing a CC-Request-Type AVP indicating TERMINATION_REQUEST containing a Multiple-Services-Credit-Control AVP containing a Granted-Service-Unit AVP indicating reserved units **optionally** containing a Cost-Information AVP containing Unit-Value AVP containing Value-Digits AVP containing Currency-Code AVP **optionally** containing a Remaining-Balance AVP containing Unit-Value AVP containing Value-Digits AVP containing Currency-Code AVP.	
Comments:	Preamble action: CCR, CCA [Initial] are exchanged.	

TP_RO_OCF_EC_04	**Standards Reference:** **Clause 6.3.6.1¶2 and** **IETF RFC 4006 [10], clause 6.5**	**PICS item:** **A.6/3.3**
Summary:	Verify that the IUT can successfully process Duplicate Detection due to Session Charging with Unit Reservation.	
Configuration:	CF_1Ro	
Test purpose:	Ensure that the IUT **on receipt of a CC-Request** containing Diameter-Header containing Command-Flags containing T-flag indicating value '1' containing a CC-Request-Type AVP indicating UPDATE_REQUEST containing a CC-Request-Number AVP containing a Multiple-Services-Credit-Control AVP containing a Requested-Service-Unit AVP **sends a CC-Answer** containing a Result-Code AVP indicating DIAMETER_SUCCESS containing a CC-Request-Type AVP indicating UPDATE _REQUEST containing a Multiple-Services-Credit-Control AVP containing a Granted-Service-Unit AVP indicating reserved units **optionally** containing a Cost-Information AVP containing Unit-Value AVP containing Value-Digits AVP containing Currency-Code AVP **optionally** containing a Remaining-Balance AVP containing Unit-Value AVP containing Value-Digits AVP containing Currency-Code AVP.	
Comments:	Preamble action: CCR, CCA [Initial] and CCR, CCA [Update] are exchanged and the OCF stops communication with the IUT.	

5.2.3.1.5 Tariff Changes

TP_RO_OCF_CH_01	Standards Reference: Clause 6.3.7.1¶3, 4; 6.3.3/Step 5, NOTE and IETF RFC 4006 [10], clauses 6.2 and 8.41	PICS item: A.6/5 and A.6/3.1
Summary:	Verify that the IUT supports Tariff-Change-Usage AVP and that the IUT can successfully process a CC-Request [Event] to perform tariff switch due to Immediate Event Charging and then responds with a CC-Answer with relevant Result-Code AVP and Tariff-Time-Change AVP.	
Configuration:	CF_1Ro	
Test purpose:	Ensure that the IUT **on receipt of a CC-Request** containing a CC-Request-Type AVP indicating EVENT_REQUEST containing a CC-Request-Number AVP containing a Requested Action AVP indicating CHECK BALANCE containing a Multiple-Services-Credit-Control AVP containing an Used-Service-Unit AVP containing a Tariff-Change-Usage AVP indicating UNIT_BEFORE_TARIFF_CHANGE **sends a CC-Answer** containing a Result-Code AVP indicating DIAMETER_SUCCESS containing a CC-Request-Type AVP indicating EVENT_REQUEST containing a Multiple-Services-Credit-Control AVP containing a Granted-Service-Unit AVP containing a Tariff-Time-Change AVP.	
Comments:		

TP_RO_OCF_CH_02	Standards Reference: Clause 6.3.7.1¶3, 4 and IETF RFC 4006 [10], clause 8.2	PICS item: A.6/5 and A.6/3.2
Summary:	Verify that the IUT supports Tariff-Change-Usage AVP and IUT can successfully process a CC-Request [Initial] to perform tariff switch due to Event Charging with Unit Reservation and then responds with a CC-Answer with relevant Result-Code AVP and Tariff-Time-Change AVP.	
Configuration:	CF_1Ro	
Test purpose:	Ensure that the IUT **on receipt of a CC-Request** containing a CC-Request-Type AVP indicating INITIAL_REQUEST containing a CC-Request-Number AVP containing a Multiple-Services-Credit-Control AVP containing a Requested-Service-Unit AVP containing an Used-Service-Unit AVP containing a Tariff-Change-Usage AVP indicating UNIT_BEFORE_TARIFF_CHANGE **sends a CC-Answer** containing a Result-Code AVP indicating DIAMETER_SUCCESS containing a CC-Request-Type AVP indicating INITIAL_REQUEST containing a Multiple-Services-Credit-Control AVP containing a Granted-Service-Unit AVP containing a Tariff-Time-Change AVP.	
Comments:		

TP_RO_OCF_CH_03	Standards Reference: Clause 6.3.7.1¶3, 4; 6.3.5/Steps 2 and 4	PICS item: A.6/5 and A.6/3.3
Summary:	Verify that the IUT supports Tariff-Change-Usage AVP and IUT can successfully process a CC-Request [Initial] to perform tariff switch due to Session Charging with Unit Reservation and then responds with a CC-Answer with relevant Result-Code AVP and Tariff-Time-Change AVP.	
Configuration:	CF_1Ro	
Test purpose:	Ensure that the IUT **on receipt of a CC-Request** containing a CC-Request-Type AVP indicating INITIAL_REQUEST containing a CC-Request-Number AVP containing a Multiple-Services-Credit-Control AVP containing a Requested-Service-Unit AVP containing an Used-Service-Unit AVP containing a Tariff-Change-Usage AVP indicating UNIT_BEFORE_TARIFF_CHANGE **sends a CC-Answer** containing a Result-Code AVP indicating DIAMETER_SUCCESS containing a CC-Request-Type AVP indicating INITIAL_REQUEST containing a Multiple-Services-Credit-Control AVP containing a Granted-Service-Unit AVP containing a Tariff-Time-Change AVP.	
Comments:		

5.2.3.1.6 Re-authorization

TP_RO_OCF_RE_01	Standards Reference: Clause 6.3.8 and 6.4.4 and IETF RFC 4006 [10], clause 5.5¶1	PICS item: A.6/6 and A.6/3.3
Summary:	Verify that the IUT re-authorizes multiple active quotas during Session Charging with Unit Reservation.	
Configuration:	CF_1Ro	
Test purpose:	Ensure that the IUT, when Session Charging with Unit Reservation is in progress **Indicate need for re-authorization** **sends an RA-Request** containing a Session-ID AVP containing an Origin-Host AVP containing an Origin-Realm AVP containing a Destination-Realm AVP containing a Destination-Host AVP containing an Auth-Application-Id AVP indicating the value 4 containing a Re-Auth-Request-Type AVP indicating AUTHORIZE_ONLY **on receipt of an RA-Answer** containing a Session-ID AVP containing a Result-Code AVP indicating DIAMETER_SUCCESS containing an Origin-Host AVP containing an Origin-Realm AVP **accepts the message**.	
Comments:	Preamble action: CCR, CCA [Initial] and CCR, CCA [Update] are exchanged.	

5.2.3.1.7 Failure Handling

TP_RO_OCF_FH_01	Standards Reference: Clause 6.3.9 and IETF RFC 4006 [10], clause 5.7	PICS item: A.6/3.1 and A.6/16.2
Summary:	Verify that the IUT can successfully transmit Credit-Control-Failure-Handling AVP (CCFH) with price enquiry.	
Configuration:	CF_1Ro	
Test purpose:	Ensure that the IUT **on receipt of a CC-Request** containing a CC-Request-Type AVP indicating EVENT_REQUEST containing a CC-Request-Number AVP containing a Requested Action AVP indicating PRICE_ENQUIRY containing a Multiple-Services-Credit-Control AVP containing a Service-Identifier AVP **sends a CC-Answer** containing a Result-Code AVP indicating DIAMETER_SUCCESS containing a CC-Request-Type AVP indicating EVENT_REQUEST containing Credit-Control-Failure-Handling AVP indicating RETRY_AND_TERMINATE.	
Comments:		

TP_RO_OCF_FH_02	Standards Reference: Clause 6.3.6 and IETF RFC 4006 [10], clause 6.5	PICS item: A.6/3.1 and A.6/17.1
Summary:	Verify that the IUT can successfully transmit Direct-Debiting-Failure-Handling AVP (DDFH) with direct debiting.	
Configuration:	CF_1Ro	
Test purpose:	Ensure that the IUT **on receipt of a CC-Request** containing a CC-Request-Type AVP indicating EVENT_REQUEST containing a CC-Request-Number AVP containing a Requested-Action AVP indicating DIRECT_DEBITING containing a Multiple-Services-Credit-Control AVP (containing a Requested-Service-Unit AVP **and/or** containing a Service-Identifier AVP) **sends a CC-Answer** containing a Result-Code AVP indicating DIAMETER_SUCCESS containing a CC-Request-Type AVP indicating EVENT_REQUEST containing Direct-Debiting-Failure-Handling AVP indicating TERMINATE_OR_BUFFER.	
Comments:		

TP_RO_OCF_FH_03	**Standards Reference:** **Clause 6.3.6 and** **IETF RFC 4006 [10], clause 6.5**	**PICS item:** **A.6/3.1 and A.6/17.2**
Summary:	Verify that the IUT can successfully transmit Direct-Debiting-Failure-Handling AVP (DDFH) with direct debiting.	
Configuration:	CF_1Ro	
Test purpose:	Ensure that the IUT **on receipt of a CC-Request** containing a CC-Request-Type AVP indicating EVENT_REQUEST containing a CC-Request-Number AVP containing a Requested-Action AVP indicating DIRECT_DEBITING containing a Multiple-Services-Credit-Control AVP (containing a Requested-Service-Unit AVP **and/or** containing a Service-Identifier AVP) **sends a CC-Answer** containing a Result-Code AVP indicating DIAMETER_SUCCESS containing a CC-Request-Type AVP indicating EVENT_REQUEST containing Direct-Debiting-Failure-Handling AVP indicating CONTINUE.	
Comments:		

5.2.3.1.8 Failover

TP_RO_OCF_FA_01	**Standards Reference:** **Clause 6.3.10¶1 - Table 6.4.3** **IETF RFC 4006 [10], clause 5.7**	**PICS item:** **A.6/3.2 and A.6/7**
Summary:	Verify that the IUT can successfully transmit CC-Session-Failover AVP.	
Configuration:	CF_1Ro	
Test purpose:	Ensure that the IUT **on receipt of a CC-Request** containing a CC-Request-Type AVP indicating INITIAL_REQUEST containing a CC-Request-Number AVP containing a Multiple-Services-Credit-Control AVP containing a Requested-Service-Unit AVP **sends a CC-Answer** containing a Result-Code AVP indicating DIAMETER_SUCCESS containing a CC-Request-Type AVP indicating INITIAL _REQUEST containing CC-Session-Failover AVP indicating FAILOVER_SUPPORTED.	
Comments:		

TP_RO_OCF_FA_02	Standards Reference: Clause 6.3.10¶1 - Table 6.4.3 IETF RFC 4006 [10], clause 5.7	PICS item: A.6/3.2 and A.6/7
Summary:	Verify that the IUT can successfully transmit CC-Session-Failover AVP.	
Configuration:	CF_1Ro	
Test purpose:	Ensure that the IUT **on receipt of a CC-Request** containing a CC-Request-Type AVP indicating INITIALREQUEST containing a CC-Request-Number AVP containing a Requested-Action AVP indicating DIRECT_DEBITING containing a Multiple-Services-Credit-Control AVP (containing a Requested-Service-Unit AVP **and/or** containing a Service-Identifier AVP) **sends a CC-Answer** containing a Result-Code AVP indicating DIAMETER_SUCCESS containing a CC-Request-Type AVP indicating INITIAL _REQUEST containing CC-Session-Failover AVP indicating FAILOVER_NOT_SUPPORTED.	
Comments:		

5.2.3.1.9 Credit Pooling

TP_RO_OCF_CP_01	Standards Reference: Clause 6.3.4/Step 2 and Clause 6.3.11 and IETF RFC 4006 [10], clause 5.1.2	PICS item: A.6/3.2 and A.6/8
Summary:	Verify that the IUT can successfully process a CC-Request [Initial] to perform credit pooling due to Event Charging with Unit Reservation and then responds with a CC-Answer with related AVPs.	
Configuration:	CF_1Ro	
Test purpose:	Ensure that the IUT **on receipt of a CC-Request** containing a CC-Request-Type AVP indicating INITIAL_REQUEST containing a CC-Request-Number AVP containing a Multiple-Services-Indicator AVP indicating MULTIPLE_SERVICES_SUPPORTED **sends a CC-Answer** containing a Result-Code AVP indicating DIAMETER_SUCCESS containing a CC-Request-Type AVP indicating INITIAL_REQUEST containing a Multiple-Services-Credit-Control AVP containing a G-S-U-Pool-Reference AVP containing a G-S-U-Pool-Identifier AVP containing a CC-Unit-Type AVP containing a Unit-Value AVP containing a Value-Digits AVP.	
Comments:		

TP_RO_OCF_CP_02	Standards Reference: Clause 6.3.5/Steps 2 and 4 and Clause 6.3.11 and IETF RFC 4006 [10], clause 5.1.2	PICS item: A.6/3.3 and A.6/8
Summary:	Verify that the IUT supports credit pooling and it can successfully process a CC-Request [Initial] to reserve units due to Session Charging with Unit Reservation.	
Configuration:	CF_1Ro	
Test purpose:	Ensure that the IUT **on receipt of a CC-Request** containing a CC-Request-Type AVP indicating INITIAL_REQUEST containing a CC-Request-Number AVP containing a Multiple-Services-Indicator AVP indicating MULTIPLE_SERVICES_SUPPORTED **sends a CC-Answer** containing a Result-Code AVP indicating DIAMETER_SUCCESS containing a CC-Request-Type AVP indicating INITIAL_REQUEST containing a Multiple-Services-Credit-Control AVP containing a G-S-U-Pool-Reference AVP containing a G-S-U-Pool-Identifier AVP containing a CC-Unit-Type AVP containing a Unit-Value AVP containing a Value-Digits AVP.	
Comments:		

5.2.3.1.10 Other procedures

TP_RO_OCF_OP_01	Standards Reference: Clause 6.5.1.1¶1 and 7.2.160	PICS item: A.6/3.3 and A6/9.1
Summary:	Verify that the IUT can specify an idle timeout associated with a granted quota	
Configuration:	CF_1Ro	
Test purpose:	Ensure that the IUT **on receipt of a CC-Request** containing a CC-Request-Type AVP indicating INITIAL_REQUEST containing a CC-Request-Number AVP **sends a CC-Answer** containing a Result-Code AVP indicating DIAMETER_SUCCESS containing a CC-Request-Type AVP indicating INITIAL _REQUEST containing a Multiple-Services-Credit-Control AVP containing a Quota-Holding-Time AVP indicating a non 0 value	
Comments:		

TP_RO_OCF_OP_02	**Standards Reference:** **Clause 6.5.1.2¶1, 3 and 7.2.235/236**	**PICS item:** **A.6/3.3 and A6/9.2**
Summary:	Verify that the IUT can successfully process a CC-Answer [Update] including various Trigger-Type AVPs and generate a credit re-authorization.	
Configuration:	CF_1Ro	
Test purpose:	Ensure that the IUT **on receipt of a CC-Request** containing a CC-Request-Type AVP indicating UPDATE_REQUEST containing a CC-Request-Number AVP **sends a CC-Answer** containing a Result-Code AVP indicating DIAMETER_SUCCESS containing a CC-Request-Type AVP indicating UPDATE_REQUEST containing a Multiple-Services-Credit-Control AVP containing a Trigger AVP containing a Trigger-Type AVP indicating one of the possible values (7.2.235/236) **and sends an RA-Request** containing a Session-ID AVP containing an Origin-Host AVP containing an Origin-Realm AVP containing a Destination-Realm AVP containing a Destination-Host AVP containing an Auth-Application-Id AVP indicating the value 4 containing a Re-Auth-Request-Type AVP indicating AUTHORIZE_ONLY.	
Comments:	Preamble action: CCR, CCA [Initial] are exchanged.	

TP_RO_OCF_OP_03	**Standards Reference:** **Clause 6.5.1.2¶2 and 7.2.236**	**PICS item:** **A.6/3.3 and A6/9.2**
Summary:	Verify that the IUT can successfully reset triggers which were already set.	
Configuration:	CF_1Ro	
Test purpose:	Ensure that the IUT **on receipt of a CC-Request** containing a CC-Request-Type AVP indicating UPDATE_REQUEST containing a CC-Request-Number AVP **sends a CC-Answer** containing a Result-Code AVP indicating DIAMETER_SUCCESS containing a CC-Request-Type AVP indicating UPDATE_REQUEST containing a Multiple-Services-Credit-Control AVP containing a Trigger AVP **not** containing a Trigger-Type AVP.	
Comments:	Preamble action: CCR, CCA [Initial] are exchanged.	

TP_RO_OCF_OP_04	Standards Reference: Clause 6.5.2¶1 and 7.2.229	PICS item: A.6/3.3 and A6/9 and A6/9.1
Summary:	Verify that the IUT can successfully indicate the remaining quota threshold by sending a CC-Answer with Time-Quota-Threshold AVP and trigger quota re-authorization.	
Configuration:	CF_1Ro	
Test purpose:	Ensure that the IUT **on receipt of a CC-Request** containing a CC-Request-Type AVP indicating UPDATE_REQUEST containing a CC-Request-Number AVP **sends a CC-Answer** containing a Result-Code AVP indicating DIAMETER_SUCCESS containing a CC-Request-Type AVP indicating UPDATE_REQUEST containing a Multiple-Services-Credit-Control AVP containing a Granted-Service-Units AVP containing a CC-Time AVP containing a Time-Quota-Threshold AVP **and sends an RA-Request**.	
Comments:	Preamble action: CCR, CCA [Initial] are exchanged.	

TP_RO_OCF_OP_05	Standards Reference: Clause 6.5.2¶1 and 7.2.243	PICS item: A.6/3.3 and A6/9 and A6/9.2
Summary:	Verify that the IUT can successfully indicate the remaining quota threshold by sending a CC-Answer with Volume-Quota-Threshold AVP and trigger quota re-authorization.	
Configuration:	CF_1Ro	
Test purpose:	Ensure that the IUT **on receipt of a CC-Request** containing a CC-Request-Type AVP indicating UPDATE_REQUEST containing a CC-Request-Number AVP **sends a CC-Answer** containing a Result-Code AVP indicating DIAMETER_SUCCESS containing a CC-Request-Type AVP indicating UPDATE_REQUEST containing a Multiple-Services-Credit-Control AVP containing a Granted-Service-Units AVP containing a CC-Total-Octets AVP or containing a CC-Input-Octets AVP or containing a CC-Output-Octets AVP containing a Volume-Quota-Threshold AVP **and sends an RA-Request**.	
Comments:	Preamble action: CCR, CCA [Initial] are exchanged.	

TP_RO_OCF_OP_06	Standards Reference: Clause 6.5.2¶1 and 7.2.240	PICS item: A.6/3.3 and A6/9 and A6/9.2
Summary:	Verify that the IUT can successfully indicate the remaining quota threshold by sending a CC-Answer with Unit-Quota-Threshold AVP and trigger quota re-authorization.	
Configuration:	CF_1Ro	
Test purpose:	Ensure that the IUT **on receipt of a CC-Request** containing a CC-Request-Type AVP indicating UPDATE_REQUEST containing a CC-Request-Number AVP **sends a CC-Answer** containing a Result-Code AVP indicating DIAMETER_SUCCESS containing a CC-Request-Type AVP indicating UPDATE_REQUEST containing a Multiple-Services-Credit-Control AVP containing a Granted-Service-Units AVP containing a CC-Service-Specific-Units AVP containing a Unit-Quota-Threshold AVP **and sends an RA-Request**.	
Comments:	Preamble action: CCR, CCA [Initial] are exchanged.	

TP_RO_OCF_OP_07	Standards Reference: Clause 6.5.3(1st item) IETF RFC 4006 [10], clause 5.6.1	PICS item: A.6/3.3
Summary:	Verify that the IUT can process termination action.	
Configuration:	CF_1Ro	
Test purpose:	Ensure that the IUT **on granted credits consumed** **on receipt of a CC-Request** containing a CC-Request-Type AVP indicating UPDATE_REQUEST containing a CC-Request-Number AVP **sends a CC-Answer** containing a Session-ID AVP containing a Result-Code AVP indicating DIAMETER_SUCCESS **not** containing an Experimental-Result AVP containing a CC-Request-Type AVP indicating UPDATE_REQUEST containing a Multiple-Services-Credit-Control AVP containing a Final-Unit-Indication AVP containing a Final-Unit-Action AVP indicating TERMINATE.	
Comments:	Preamble action: CCR, CCA [Initial] are exchanged.	

TP_RO_OCF_OP_08	**Standards Reference:** **Clause 6.5.3 (2nd item)** **IETF RFC 4006 [10], clause 5.6.1**	**PICS item:** **A.6/3.3**
Summary:	Verify that, IUT can process redirection action.	
Configuration:	CF_1Ro	
Test purpose:	Ensure that the IUT **on granted credits consumed** **on receipt of a CC-Request** containing a CC-Request-Type AVP indicating UPDATE_REQUEST containing a CC-Request-Number AVP **sends a CC-Answer** containing a Session-ID AVP containing a Result-Code AVP indicating DIAMETER_SUCCESS **not** containing an Experimental-Result AVP containing a CC-Request-Type AVP indicating UPDATE_REQUEST containing a Multiple-Services-Credit-Control AVP containing a Final-Unit-Indication AVP containing a Final-Unit-Action AVP indicating REDIRECT containing Redirect-Server AVP containing Redirect-Address-Type AVP containing Redirect-Server-Address AVP **optionally** containing Restriction-Filter-Rule AVP **optionally** containing Filter-Id AVP AVP.	
Comments:	Preamble action: CCR, CCA [Initial] are exchanged.	

TP_RO_OCF_OP_09	**Standards Reference:** **Clauses 6.5.4 and 7.2.159**	**PICS item:** **A.6/3.3 and A6/11**
Summary:	Verify that, IUT can process quota consumption time.	
Configuration:	CF_1Ro	
Test purpose:	Ensure that the IUT **on receipt of a CC-Request** containing a CC-Request-Type AVP indicating INITIAL_REQUEST containing a CC-Request-Number AVP **sends a CC-Answer** containing a Session-ID AVP containing a Result-Code AVP indicating DIAMETER_SUCCESS **not** containing an Experimental-Result AVP containing a CC-Request-Type AVP indicating INITIAL_REQUEST containing a Multiple-Services-Credit-Control AVP containing a Granted-Service-Units AVP containing a CC-Time AVP containing a Quota-Consumption-Time AVP indicating a period equal to the Quota Consumption Time.	
Comments:		

TP_RO_OCF_OP_10	Standards Reference: Clause 6.5.5	PICS item: A.6/3.3 and A.6/12 and A.6/12.1
Summary:	Verify that the IUT can successfully terminate session after CCR, CCA [Update] exchange.	
Configuration:	CF_1Ro	
Test purpose:	Ensure that the IUT **on service termination request** **on receipt of a CC-Request** containing a CC-Request-Type AVP indicating TERMINATION_REQUEST containing a CC-Request-Number AVP containing a Multiple-Services-Credit-Control AVP containing a Used-Service-Unit AVP **sends a CC-Answer** containing a Result-Code AVP indicating DIAMETER-AUTHORIZATION-REJECTED containing a CC-Request-Type AVP indicating TERMINATION_REQUEST.	
Comments:	Preamble action: CCR, CCA [Initial] and CCR, CCA [Update] are exchanged.	

TP_RO_OCF_OP_11	Standards Reference: Clause 6.5.5	PICS item: A.6/3.3 and A.6/12 and not A.6/12.1 and A.6/12.2
Summary:	Verify that the IUT can successfully terminate sessions with ASR,ASA exchange.	
Configuration:	CF_1Ro	
Test purpose:	Ensure that the IUT **on service termination request** **sends an AS-Request** containing a Session-ID AVP containing an Origin-Host AVP containing an Origin-Realm AVP containing a Destination-Realm AVP containing a Destination-Host AVP containing an Auth-Application-Id AVP **on receipt of an AS-Answer** containing a Session-ID AVP containing a Result-Code AVP indicating DIAMETER_SUCCESS **not** containing an Experimental-Result AVP containing an Origin-Host AVP containing an Origin-Realm AVP **and on receipt of a CC-Request** containing a CC-Request-Type AVP indicating TERMINATION_REQUEST containing a CC-Request-Number AVP **sends a CC-Answer** containing a Result-Code AVP indicating DIAMETER-AUTHORIZATION-REJECTED containing a CC-Request-Type AVP indicating TERMINATION_REQUEST.	
Comments:	Preamble action: CCR, CCA [Initial] and CCR, CCA [Update] are exchanged.	

TP_RO_OCF_OP_12	**Standards Reference:** **Clause 6.5.6**	**PICS item:** **A.6/3.3 and A.6/13**
Summary:	Verify that the IUT can successfully process Envelope AVP.	
Configuration:	CF_1Ro	
Test purpose:	**Ensure that the IUT** **on receipt of a CC-Request** containing a CC-Request-Type AVP indicating INITIAL_REQUEST containing a CC-Request-Number AVP containing a Multiple-Services-Credit-Control AVP containing a Requested-Service-Unit AVP **sends a CC-Answer** containing a Result-Code AVP indicating DIAMETER-SUCCESS containing a CC-Request-Type AVP indicating INITIAL_REQUEST containing a Multiple-Services-Credit-Control AVP containing an Envelope-Reporting AVP indicating REPORT_ENVELOPES_WITH_VOLUME on **receipt of a CC-Request** containing a Result-Code AVP indicating DIAMETER_SUCCESS containing a CC-Request-Type AVP indicating UPDATE_REQUEST containing a Multiple-Services-Credit-Control AVP containing a Granted-Service-Unit AVP indicating reserved units containing an Envelope AVP containing an Envelope-Start-Time AVP **optionally** containing an Envelope-Stop-Time AVP containing a CC-Total-Octets AVP containing a CC-Input-Octets AVP containing a CC-Output-Octets AVP **optionally** containing a CC-Service-Specific-Units AVP **sends a CC-Answer** containing a Result-Code AVP indicating DIAMETER-SUCCESS containing a CC-Request-Type AVP indicating UPDATE_REQUEST.	
Comments:		

TP_RO_OCF_OP_13	Standards Reference: Clause 6.5.7¶1	PICS item: A.6/3.3 and A.6/14
Summary:	Verify that the IUT can successfully process combinational quota.	
Configuration:	CF_1Ro	
Test purpose:	**Ensure that the IUT** **on receipt of a CC-Request** containing a CC-Request-Type AVP indicating INITIAL_REQUEST containing a CC-Request-Number AVP containing a Multiple-Services-Credit-Control AVP containing a Requested-Service-Unit AVP **sends a CC-Answer** containing a Result-Code AVP indicating DIAMETER-SUCCESS containing a CC-Request-Type AVP indicating INITIAL_REQUEST containing a Multiple-Services-Credit-Control AVP containing a Time-Quota-Mechanism AVP containing a Time-Quota-Type AVP indicating value Table 3 containing a Base-Time-Interval AVP indicating the length of the base time interval **on receipt of a CC-Request** containing a CC-Request-Type AVP indicating UPDATE_REQUEST containing a Multiple-Services-Credit-Control AVP containing a Granted-Service-Unit AVP indicating reserved units containing an Envelope AVP **sends a CC-Answer** containing a Result-Code AVP indicating DIAMETER-SUCCESS containing a CC-Request-Type AVP indicating UPDATE_REQUEST.	
Comments:		

Table 3: Time-Quota-Type AVP values:

Test purpose variants	Time Quota Type AVP values
VA_01	DISCRETE_TIME_PERIOD (0)
VA_02	CONTINUOUS_TIME_PERIOD (1)

TP_RO_OCF_OP_14	Standards Reference: Clause 6.5.8	PICS item: A.6/3.3 and A.6/11 and A.6/13 and A.6/15
Summary:	Verify that the IUT can successfully process control of offline charging information.	
Configuration:	CF_1Ro	
Test purpose:	Ensure that the IUT **on receipt of a CC-Request** containing a CC-Request-Type AVP indicating INITIAL_REQUEST containing a CC-Request-Number AVP containing a Multiple-Services-Credit-Control AVP containing a Requested-Service-Unit AVP **sends a CC-Answer** containing a Result-Code AVP indicating DIAMETER-SUCCESS containing a CC-Request-Type AVP indicating INITIAL_REQUEST containing a Service-Information AVP containing a PS-Information AVP containing an Offline-Charging AVP containing a Quota-Consumption-Time AVP or, containing a Time-Quota-Mechanism AVP **optionally** containing an Envelope-Reporting AVP indicating REPORT_ENVELOPES_WITH_VOLUME.	
Comments:		

5.2.3.2 CTF Role

5.2.3.2.1 Test selection

The IUT takes the role of the CTF; PICS A.5/2.

5.2.3.2.2 Message Syntax

TP_RO_CTF_MS_01	Standards Reference: Clause 6.4.2, Table 6.4.2	PICS item:
Summary:	Verify that the IUT can send a CC-Request to indicate a Charging Data Transfer.	
Configuration:	CF_1Ro	
Test purpose:	Ensure that the IUT **to indicate** a request for Charging Data Transfer, **sends a CC-Request** containing a Session-ID AVP containing an Origin-Host AVP containing an Origin-Realm AVP containing a Destination-Realm AVP containing an Auth-Application-Id AVP indicating the value 4 containing a Service-Context-Id AVP containing a CC-Request-Type AVP containing a CC-Request-Number AVP.	
Comments:		

TP_RO_CTF_MS_02	Standards Reference: IETF RFC 3588 [8], clauses 3¶2 and 3¶4	PICS item:
Summary:	Verify that the IUT can send a CC-Request to indicate a Charging Data Transfer with valid Diameter-Header parameters.	
Configuration:	CF_1Ro	
Test purpose:	Ensure that the IUT **to indicate** a request for Charging Data Transfer, **sends a CC-Request** containing a Diameter-Header containing a Version indicating value '1' containing a Command-Flags containing T bit indicating value '0' containing E bit indicating value '0' containing r bits indicating value '0000'.	
Comments:		

5.2.3.2.3 Type of Charging

NOTE: Verify that IMS is able to trigger ACR event. (For initial condition check ETSI TS 132 260 [1], Table 5.3.1.1 and set correct Configuration which is related to ETSI TS 102 790-2 [3] (IMS Rel10 test purposes on Gm, Ic, Isc and Mw interfaces).

TP_RO_CTF_TC_01	Standards Reference: Clause 6.3.3 ETSI TS 132 260 [1] Table 5.3.1.1 and clause 5.3.2.1	PICS item: A.7/3.1
Summary:	Verify that the IUT sends a CC-Request [Event] with direct debiting due to Immediate Event Charging.	
Configuration:	CF_1Ro or CF_1Ro1Gm1Mw	
SIP Initial condition:	IUT receives SIP message and then sends DIAMETER CCR message to the OCF. Following Test Purposes from ETSI TS 102 790-2 [3] can be reused for triggering: TP_IMST2_MW_GEN_09 (MESSAGE)	
Test purpose:	Ensure that the IUT **on receipt of a SIP message** **sends a CC-Request** containing a CC-Request-Type AVP indicating EVENT_REQUEST containing a CC-Request-Number AVP containing a Requested-Action AVP indicating DIRECT_DEBITING containing a Multiple-Services-Credit-Control AVP (containing a Requested-Service-Unit AVP **and/or** containing a Service-Identifier AVP).	
Comments:		

TP_RO_CTF_TC_02	**Standards Reference:** **Clause 6.3.3** **ETSI TS 132 260 [1]** **Table 5.3.1.1 and clause 5.3.2.1 and IETF RFC 4006 [10], clauses 6.1, 8.7 and 8.41**	**PICS item:** **A.7/3.1**
Summary:	Verify that the IUT sends a CC-Request [Event] with price enquiry due to Immediate Event Charging.	
Configuration:	CF_1Ro or CF_1Ro1Gm1Mw	
SIP Initial condition:	IUT receives SIP message and then sends DIAMETER CCR message to the OCF. Following Test Purposes from ETSI TS 102 790-2 [3] can be reused for triggering: TP_IMST2_MW_GEN_09 (MESSAGE)	
Test purpose:	Ensure that the IUT **on receipt of a SIP message** **sends a CC-Request** containing a CC-Request-Type AVP indicating EVENT_REQUEST containing a CC-Request-Number AVP containing a Requested Action AVP indicating PRICE_ENQUIRY containing a Multiple-Services-Credit-Control AVP containing a Service-Identifier AVP.	
Comments:		

TP_RO_CTF_TC_03	**Standards Reference:** **Clause 6.3.3** **ETSI TS 132 260 [1]** **Table 5.3.1.1 and clause 5.3.2.1 and IETF RFC 4006 [10], clauses 6.2 and 8.41**	**PICS item:** **A.7/3.1**
Summary:	Verify that the IUT sends a CC-Request [Event] with check balance due to Immediate Event Charging.	
Configuration:	CF_1Ro or CF_1Ro1Gm1Mw	
SIP Initial condition:	IUT receives SIP message and then sends DIAMETER CCR message to the OCF. Following Test Purposes from ETSI TS 102 790-2 [3] can be reused for triggering: TP_IMST2_MW_GEN_09 (MESSAGE)	
Test purpose:	Ensure that the IUT **on receipt of a SIP message** **sends a CC-Request** containing a CC-Request-Type AVP indicating EVENT_REQUEST containing a CC-Request-Number AVP containing a Requested Action AVP indicating CHECK BALANCE.	
Comments:		

TP_RO_CTF_TC_04	Standards Reference: Clause 6.3.3 ETSI TS 132 260 [1] Table 5.3.1.1 and clause 5.3.2.1 and IETF RFC 4006 [10], clauses, 6.4 and 8.41	PICS item: A.7/3.1
Summary:	Verify that the IUT sends a CC-Request [Event] with refund account due to Immediate Event Charging.	
Configuration:	CF_1Ro or CF_1Ro1Gm1Mw	
SIP Initial condition:	IUT receives SIP message and then sends DIAMETER CCR message to the OCF. Following Test Purposes from ETSI TS 102 790-2 [3] can be reused for triggering: TP_IMST2_MW_GEN_09 (MESSAGE)	
Test purpose:	Ensure that the IUT **on receipt of a SIP message** **sends a CC-Request** containing a CC-Request-Type AVP indicating EVENT_REQUEST containing a CC-Request-Number AVP containing a Requested Action AVP indicating REFUND_ACCOUNT containing a Multiple-Services-Credit-Control AVP (containing a Requested-Service-Unit AVP **and/or** containing a Service-Identifier AVP).	
Comments:	Preamble action: CCR, CCA [Event] with direct debiting are exchanged.	

TP_RO_CTF_TC_05	Standards Reference: Clause 6.3.3/Step 2 after figure 6.3.3a ETSI TS 132 260 [1] Table 5.3.1.1 and clause 5.3.2.1	PICS item: A.7/3.1
Summary:	Verify that the IUT sends a second CC-Request [Event] with refund account due to Immediate Event Charging with Refund-Information AVP if it was received in the previous CC-Answer.	
Configuration:	CF_1Ro or CF_1Ro1Gm1Mw	
SIP Initial condition:	IUT receives SIP message and then sends DIAMETER CCR message to the OCF. Following Test Purposes from ETSI TS 102 790-2 [3] can be reused for triggering: TP_IMST2_MW_GEN_09 (MESSAGE)	
Test purpose:	Ensure that the IUT **on receipt of a SIP message** **sends a CC-Request** containing a CC-Request-Type AVP indicating EVENT_REQUEST containing a Requested-Action AVP indicating DIRECT_DEBITING **on receipt of a CC-Answer** containing a Session-ID AVP containing a Result-Code AVP indicating DIAMETER_SUCCESS containing an Origin-Host AVP containing an Origin-Realm AVP containing an Auth-Application-Id AVP containing a CC-Request-Type AVP containing a CC-Request-Number AVP containing a Multiple-Services-Credit-Control AVP containing a Refund-Information AVP **sends a CC-Request** containing a CC-Request-Type AVP indicating EVENT_REQUEST containing a Requested Action AVP indicating REFUND_ACCOUNT containing a Multiple-Services-Credit-Control AVP containing a Refund-Information AVP.	
Comments:		

TP_RO_CTF_TC_06	Standards Reference: Clause 6.3.4/Step 2 and ETSI TS 132 260 [1] Table 5.3.1.1 and clause 5.3.2.2.1.3.2	PICS item: A.7/3.2
Summary:	Verify that the IUT sends a CC-Request [Initial] to reserve units due to Event Charging with Unit Reservation.	
Configuration:	CF_1Ro or CF_1Ro1Gm1Mw	
SIP Initial condition:	IUT receives SIP message and then sends DIAMETER CCR message to the OCF. Following Test Purposes from ETSI TS 102 790-2 [3] can be reused for triggering: TP_IMST2_MW_GEN_09 (MESSAGE)	
Test purpose:	Ensure that the IUT **on receipt of a SIP message** **sends a CC-Request** containing a CC-Request-Type AVP indicating INITIAL_REQUEST containing a CC-Request-Number AVP containing a Multiple-Services-Credit-Control AVP containing a Requested-Service-Unit AVP.	
Comments:		

TP_RO_CTF_TC_07	Standards Reference: Clause 6.3.4/Steps 2 and 6 and ETSI TS 132 260 [1] Table 5.3.1.1 and clause 5.3.2.2.1.3.2	PICS item: A.7/3.2
Summary:	Verify that the IUT sends a CC-Request [Termination] to debit units due to Event Charging with Unit Reservation.	
Configuration:	CF_1Ro or CF_1Ro1Gm1Mw	
SIP Initial condition:	IUT receives SIP response message and then sends DIAMETER CCR message to the OCF. Following Test Purposes from ETSI TS 102 790-2 [3] can be reused for triggering: TP_IMST2_MW_GEN_09 (200 OK MESSAGE)	
Test purpose:	Ensure that the IUT **on receipt of a SIP message** **sends a CC-Request** containing a CC-Request-Type AVP indicating TERMINATION_REQUEST containing a CC-Request-Number AVP containing a Multiple-Services-Credit-Control AVP containing a Used-Service-Unit AVP.	
Comments:	Preamble action: CCR, CCA [Initial] are exchanged	

TP_RO_CTF_TC_08	Standards Reference: Clause 6.3.5/Step 2 and ETSI TS 132 260 [1] Table 5.3.1.1 and clause 5.3.2.2.1.3.1	PICS item: A.7/3.3
Summary:	Verify that the IUT sends a CC-Request [Initial] to reserve units due to Session Charging with Unit Reservation.	
Configuration:	CF_1Ro or CF_1Ro1Gm1Mw	
SIP Initial condition:	IUT receives SIP message and then sends DIAMETER CCR message to the OCF. Following Test Purpose from ETSI TS 102 790-2 [3] can be reused for triggering: TP_IMST2_MW_GEN_07 (INVITE)	
Test purpose:	Ensure that the IUT **on receipt of a SIP message** **sends a CC-Request** containing a CC-Request-Type AVP indicating INITIAL_REQUEST containing a CC-Request-Number AVP containing a Multiple-Services-Credit-Control AVP containing a Requested-Service-Unit AVP.	
Comments:		

TP_RO_CTF_TC_09	Standards Reference: Clause 6.3.5/Step 6 and ETSI TS 132 260 [1] Table 5.3.1.1 and clause 5.3.2.2.1.3.1-1	PICS item: A.7/3.3
Summary:	Verify that the IUT sends a CC-Request [Update] to reserve and debit units due to Session Charging with Unit Reservation.	
Configuration:	CF_1Ro or CF_1Ro1Gm1Mw	
SIP Initial condition:	IUT receives SIP response message and then sends DIAMETER CCR message to the OCF. Following Test Purpose from ETSI TS 102 790-2 [3] can be reused for triggering: TP_IMST2_MW_GEN_07 (200 OK INVITE)	
Test purpose:	Ensure that the IUT **on receipt of a SIP message** **sends a CC-Request** containing a CC-Request-Type AVP indicating UPDATE_REQUEST containing a CC-Request-Number AVP containing a Multiple-Services-Credit-Control AVP containing a Used-Service-Unit AVP.	
Comments:	Preamble action: CCR, CCA [Initial] are exchanged	

TP_RO_CTF_TC_10	Standards Reference: Clause 6.3.5/Step 11 and ETSI TS 132 260 [1] Table 5.3.1.1 and clause 5.3.2.2.1.3.1-4	PICS item: A.7/3.3
Summary:	Verify that the IUT sends a CC-Request [Termination] to debit units due to Session Charging with Unit Reservation.	
Configuration:	CF_1Ro or CF_1Ro1Gm1Mw	
SIP Initial condition:	IUT receives SIP message and then sends DIAMETER CCR message to the OCF. Following Test Purpose from ETSI TS 102 790-2 [3] can be reused for triggering: TP_IMST2_MW_GEN_07 (BYE)	
Test purpose:	Ensure that the IUT **on receipt of a SIP message** **sends a CC-Request** containing a CC-Request-Type AVP indicating TERMINATION_REQUEST containing a CC-Request-Number AVP containing a Multiple-Services-Credit-Control AVP containing a Used-Service-Unit AVP.	
Comments:		
NOTE: Preamble action: CCR, CCA [Initial] and CCR, CCA [Update] are exchanged.		

5.2.3.2.4 Error Cases

NOTE: Verify that IMS is able to trigger CCR event. (For initial condition check ETSI TS 132 260 [1], Table 5.2.1.1 and set correct Configuration which is related to standard ETSI TS 102 790-2 [3] (IMS Release 10 test purposes on Gm, Ic, Isc and Mw interfaces).

TP_RO_CTF_EC_01	Standards Reference: Clause 6.3.6.1¶2 and IETF RFC 4006 [10], clause 6.5	PICS item: A.7/3.1
Summary:	Verify that the IUT retransmits an unacknowledged CC-Request (T-flag) with direct debiting.	
Configuration:	CF_1Ro or CF_1Ro1Gm1Mw	
Initial conditions:	Secondary OCF is not available	
SIP Initial condition:	IUT receives SIP message and then sends DIAMETER CCR message to the OCF. Following Test Purposes from ETSI TS 102 790-2 [3] can be reused for triggering: TP_IMST2_MW_GEN_09 (MESSAGE)	
Test purpose:	Ensure that the IUT **to indicate not having received a CC-Answer** **sends again the CC-Request** containing Diameter-Header containing Command-Flags containing T-flag indicating value '1' containing a CC-Request-Type AVP indicating EVENT_REQUEST containing a CC-Request-Number AVP containing a Requested-Action AVP indicating DIRECT_DEBITING containing a Multiple-Services-Credit-Control AVP (containing a Requested-Service-Unit AVP **and/or** containing a Service-Identifier AVP) **on receipt of a CC-Answer** containing a Result-Code AVP indicating DIAMETER_SUCCESS containing a CC-Request-Type AVP indicating EVENT_REQUEST **accepts the message**.	
Comments:		

TP_RO_CTF_EC_02	Standards Reference: Clause 6.3.6.1¶2 and IETF RFC 4006 [10], clause 6.5	PICS item: A.7/3.1
Summary:	Verify that the IUT retransmits an unacknowledged CC-Request (T-flag) with price enquiry.	
Configuration:	CF_1Ro or CF_1Ro1Gm1Mw	
Initial conditions:	A secondary OCF is not available	
SIP Initial condition:	IUT receives SIP message and then sends DIAMETER CCR message to the OCF. Following Test Purposes from ETSI TS 102 790-2 [3] can be reused for triggering: TP_IMST2_MW_GEN_09 (MESSAGE)	
Test purpose:	Ensure that the IUT **to indicate not having received a CC-Answer** **sends again the CC-Request** containing Diameter-Header containing Command-Flags containing T-flag indicating value '1' containing a CC-Request-Type AVP indicating EVENT_REQUEST containing a CC-Request-Number AVP containing a Requested-Action AVP indicating PRICE_ENQUIRY containing a Multiple-Services-Credit-Control AVP (containing a Requested-Service-Unit AVP **and/or** containing a Service-Identifier AVP) **on receipt of a CC-Answer** containing a Result-Code AVP indicating DIAMETER_SUCCESS containing a CC-Request-Type AVP indicating EVENT_REQUEST **accepts the message**.	
Comments:		

TP_RO_CTF_EC_03	Standards Reference: Clause 6.3.6.1¶2 and IETF RFC 4006 [10], clause 6.5	PICS item: A.7/3.2
Summary:	Verify that the IUT retransmits an unacknowledged CC-Request (T-flag).	
Configuration:	CF_1Ro or CF_1Ro1Gm1Mw	
Initial conditions:	Secondary OCF is not available	
SIP Initial condition:	IUT receives SIP message and then sends DIAMETER CCR message to the OCF. Following Test Purposes from ETSI TS 102 790-2 [3] can be reused for triggering: TP_IMST2_MW_GEN_09 (MESSAGE)	
Test purpose:	Ensure that the IUT **to indicate not having received a CC-Answer** **sends again the CC-Request** containing Diameter-Header containing Command-Flags containing T-flag indicating value '1' containing a CC-Request-Type AVP indicating INITIAL_REQUEST containing a CC-Request-Number AVP containing a Multiple-Services-Credit-Control AVP containing a Requested-Service-Unit AVP **on receipt of a CC-Answer** containing a Result-Code AVP indicating DIAMETER_SUCCESS containing a CC-Request-Type AVP indicating INITIAL_REQUEST **accepts the message**.	
Comments:		

TP_RO_CTF_EC_04	Standards Reference: Clause 6.3.6.1¶2 and IETF RFC 4006 [10], clause 6.5	PICS item: A.7/3.2
Summary:	Verify that the IUT retransmits an unacknowledged CC-Request (T-flag).	
Configuration:	CF_1Ro or CF_1Ro1Gm1Mw	
Initial conditions:	Secondary OCF is not available	
SIP Initial condition:	IUT receives SIP response message and then sends DIAMETER CCR message to the OCF. Following Test Purposes from ETSI TS 102 790-2 [3] can be reused for triggering: TP_IMST2_MW_GEN_09 (200 OK MESSAGE)	
Test purpose:	Ensure that the IUT **to indicate not having received a CC-Answer** **sends again the CC-Request** containing Diameter-Header containing Command-Flags containing T-flag indicating value '1' containing a CC-Request-Type AVP indicating TERMINATION_REQUEST containing a CC-Request-Number AVP containing a Multiple-Services-Credit-Control AVP containing a Used-Service-Unit AVP **on receipt of one CC-Answer for each buffered CC-Request** containing a Result-Code AVP indicating DIAMETER_SUCCESS containing a CC-Request-Type AVP indicating TERMINATION_REQUEST **accepts the messages**.	
Comments:	Preamble action: CCR, CCA [Initial] are exchanged.	

TP_RO_CTF_EC_05	Standards Reference: Clause 6.3.6.1¶2 and IETF RFC 4006 [10], clause 6.5	PICS item: A.7/3.3
Summary:	Verify that the IUT retransmits an unacknowledged CC-Request (T-flag).	
Configuration:	CF_1Ro or CF_1Ro1Gm1Mw	
Initial conditions:	Secondary OCF is not available	
SIP Initial condition:	IUT receives SIP response message and then sends DIAMETER CCR message to the OCF. Following Test Purposes from ETSI TS 102 790-2 [3] can be reused for triggering: TP_IMST2_MW_GEN_07 (200 OK INVITE)	
Test purpose:	Ensure that the IUT **to indicate not having received a CC-Answer** **sends again the CC-Request** containing Diameter-Header containing Command-Flags containing T-flag indicating value '1' containing a CC-Request-Type AVP indicating UPDATE_REQUEST containing a CC-Request-Number AVP containing a Multiple-Services-Credit-Control AVP containing a Used-Service-Unit AVP **on receipt of one CC-Answer** containing a Result-Code AVP indicating DIAMETER_SUCCESS containing a CC-Request-Type AVP indicating UPDATE_REQUEST **accepts the messages**.	
Comments:	Preamble action: CCR, CCA [Initial] and CCR, CCA [Update] are exchanged and the OCF stops communication with the IUT.	

TP_RO_CTF_EC_06	Standards Reference: IETF RFC 4006 [10], clauses 5.7 and 6.5¶8	PICS item: A.7/3.1 and A.7/18.2 and not A.7/8
Summary:	Verify that on communication failure, the IUT stores generated accounting data in a non-volatile memory and, on communication restored, sends them to the OCF, in the order they were stored in the buffer.	
Configuration:	CF_1Ro or CF_1Ro1Gm1Mw	
Initial conditions:	Secondary OCF is not available	
SIP Initial condition:	IUT receives SIP response message and then sends DIAMETER CCR message to the OCS. Following Test Purposes from ETSI TS 102 790-2 [3] can be reused for triggering: TP_IMST2_MW_GEN_09 (MESSAGE)	
Test purpose:	Ensure that the IUT **to indicate the OCF restart** **sends the buffered CC-Request** containing a CC-Request-Type AVP indicating EVENT_REQUEST containing a CC-Request-Number AVP containing a Requested Action AVP indicating REFUND_ACCOUNT containing a Multiple-Services-Credit-Control AVP (containing a Requested-Service-Unit AVP **and/or** containing a Service-Identifier AVP) on **receipt of one CC-Answer for each buffered CC-Request** containing a Session-ID AVP containing a Result-Code AVP indicating DIAMETER_SUCCESS **not** containing an Experimental-Result AVP containing a CC-Request-Type AVP indicating EVENT_REQUEST **accepts the messages**.	
Comments:	Preamble action: The OCF stops communication with the IUT.	
NOTE: IUT is configured with DDFH/CONTINUE value.		

TP_RO_CTF_EC_07	Standards Reference: IETF RFC 4006 [10], clauses 5.7 and 6.5	PICS item: A.7/3.1 and A.7/18.2 and not A.7/8
Summary:	Verify that on communication failure, the IUT stores generated accounting data in a non-volatile memory and, on communication restored, sends them to the OCF, in the order they were stored in the buffer.	
Configuration:	CF_1Ro or CF_1Ro1Gm1Mw	
Initial conditions:	Secondary OCF is not available	
SIP Initial condition:	IUT receives SIP message and then sends DIAMETER ACR message to the CDF. Following Test Purposes from ETSI TS 102 790-2 [3] can be reused for triggering: TP_IMST2_MW_GEN_09 (MESSAGE)	
Test purpose:	Ensure that the IUT **to indicate the OCF restart** **sends a CC-Request** containing Diameter-Header containing Command-Flags **not** containing T-flag containing a CC-Request-Type AVP indicating EVENT_REQUEST containing a CC-Request-Number AVP containing a Requested-Action AVP indicating DIRECT_DEBITING containing a Multiple-Services-Credit-Control AVP (containing a Requested-Service-Unit AVP **and/or** containing a Service-Identifier AVP) **on receipt of a CC-Answer** containing a Session-ID AVP containing a Result-Code AVP indicating DIAMETER_SUCCESS **not** containing an Experimental-Result AVP containing a CC-Request-Type AVP indicating EVENT_REQUEST **accepts the message**.	
Comments:	Preamble action: The OCF stops communication with the IUT.	
NOTE: IUT is configured with DDFH/CONTINUE value.		

5.2.3.2.5 Tariff Changes

TP_RO_CTF_CH_01	Standards Reference: Clause 6.3.7.1¶4,5; 6.3.4/Step 2 ETSI TS 132 260 [1] Table 5.3.1.1 and clause 5.3.2.2.1.3.2 IETF RFC 4006 [10], clause 8.27	PICS item: A.7/3.2 and A.7/5
Summary:	Verify that the IUT sends a CC-Request [Initial] to reserve units due to Event Charging with Unit Reservation and indicates tariff time change.	
Configuration:	CF_1Ro or CF_1Ro1Gm1Mw	
SIP Initial condition:	IUT receives SIP message and then sends DIAMETER CCR message to the OCF. Following Test Purposes from ETSI TS 102 790-2 [3] can be reused for triggering: TP_IMST2_MW_GEN_09 (MESSAGE)	
Test purpose:	Ensure that the IUT **to indicate tariff time change** **on receipt of a SIP message** **sends a CC-Request** containing a CC-Request-Type AVP indicating INITIAL_REQUEST containing a CC-Request-Number AVP containing a Multiple-Services-Credit-Control AVP **not** containing a Tariff-Change-Usage AVP containing a Requested-Service-Unit AVP containing an Used-Service-Units AVP containing a Tariff-Change-Usage AVP.	
Comments:		

TP_RO_CTF_CH_02	**Standards Reference:** **Clause 6.3.7.1; 6.3.4/Step 2** **ETSI TS 132 260 [1]** **Table 5.3.1.1 and clause 5.3.2.2.1.3.2** **IETF RFC 4006 [10], clause 8.20**	**PICS item:** **A.7/3.2 and A.7/5**
Summary:	Verify that the IUT sends a CC-Request [Initial] to reserve units due to Event Charging with Unit Reservation and when the IUT receives a CC-Answer with Tariff-Time-Change AVP the IUT accepts it and sends a CC-Request after the SIP session is released.	
Configuration:	CF_1Ro or CF_1Ro1Gm1Mw	
SIP Initial condition:	IUT receives SIP message and then sends DIAMETER CCR message to the OCF. Following Test Purposes from ETSI TS 102 790-2 [3] can be reused for triggering: TP_IMST2_MW_GEN_09 (MESSAGE)	
Test purpose:	Ensure that the IUT **on receipt of a SIP message** **sends a CC-Request** containing a CC-Request-Type AVP indicating INITIAL_REQUEST containing a CC-Request-Number AVP containing a Multiple-Services-Credit-Control AVP containing a Requested-Service-Unit AVP containing an Used-Service-Units AVP containing a Tariff-Change-Usage AVP **on receipt of a CC-Answer** containing a Result-Code AVP indicating DIAMETER_SUCCESS containing a CC-Request-Type AVP indicating INITIAL_REQUEST containing a Multiple-Services-Credit-Control AVP containing a Granted-Service-Unit AVP containing a Tariff-Time-Change AVP **and on receipt of a SIP message** **sends a CC-Request** containing a CC-Request-Type AVP indicating TERMINATION_REQUEST containing a CC-Request-Number AVP containing a Multiple-Services-Credit-Control AVP containing a Used-Service-Unit AVP.	
Comments:		

TP_RO_CTF_CH_03	Standards Reference: Clause 6.3.7.1; 6.3.4/Step 2 ETSI TS 132 260 [1] Table 5.3.1.1 and clause 5.3.2.2.1.3.2 IETF RFC 4006 [10], clause 8.20¶2	PICS item: A.7/3.2 and NOT A.7/5
Summary:	Verify that the IUT sends a CC-Request [Initial] to reserve units due to Event Charging with Unit Reservation and when the IUT receives a CC-Answer with Tariff-Time-Change AVP the IUT rejects it and sends a CC-Request with Termination-Cause AVP.	
Configuration:	CF_1Ro or CF_1Ro1Gm1Mw	
SIP Initial condition:	IUT receives SIP message and then sends DIAMETER CCR message to the OCF. Following Test Purposes from ETSI TS 102 790-2 [3] can be reused for triggering: TP_IMST2_MW_GEN_09 (MESSAGE)	
Test purpose:	Ensure that the IUT **on receipt of a SIP message** **sends a CC-Request** containing a CC-Request-Type AVP indicating INITIAL_REQUEST containing a CC-Request-Number AVP containing a Multiple-Services-Credit-Control AVP containing a Requested-Service-Unit AVP containing an Used-Service-Units AVP containing a Tariff-Change-Usage AVP **on receipt of a CC-Answer** containing a Result-Code AVP indicating DIAMETER_SUCCESS containing a CC-Request-Type AVP indicating INITIAL_REQUEST containing a Multiple-Services-Credit-Control AVP containing a Granted-Service-Unit AVP containing a Tariff-Time-Change AVP **sends a CC-Request** containing a Termination-Cause AVP indicating DIAMETER_BAD_ANSWER.	
Comments:		

TP_RO_CTF_CH_04	Standards Reference: Clause 6.3.7.1¶4,5; 6.3.4/Step 2 ETSI TS 132 260 [1] Table 5.3.1.1 and clause 5.3.2.2.1.3.2 IETF RFC 4006 [10], clause 8.27	PICS item: A.7/3.3 and A.7/5
Summary:	Verify that the IUT sends a CC-Request [Initial] to reserve units due to Session Charging with Unit Reservation and indicates tariff time change.	
Configuration:	CF_1Ro or CF_1Ro1Gm1Mw	
SIP Initial condition:	IUT receives SIP message and then sends DIAMETER CCR message to the OCF. Following Test Purpose from ETSI TS 102 790-2 [3] can be reused for triggering: TP_IMST2_MW_GEN_07 (INVITE)	
Test purpose:	Ensure that the IUT **to indicate tariff time change** **on receipt of a SIP message** **sends a CC-Request** containing a CC-Request-Type AVP indicating INITIAL_REQUEST containing a CC-Request-Number AVP containing a Multiple-Services-Credit-Control AVP **not** containing a Tariff-Change-Usage AVP containing a Requested-Service-Unit AVP containing an Used-Service-Units AVP containing a Tariff-Change-Usage AVP.	
Comments:		

TP_RO_CTF_CH_05	**Standards Reference:** **Clause 6.3.7.1; 6.3.4/Step 2** **ETSI TS 132 260 [1]** **Table 5.3.1.1 and clause 5.3.2.2.1.3.2** **IETF RFC 4006 [10], clause 8.20**	**PICS item:** **A.7/3.3 and A.7/5**
Summary:	Verify that the IUT sends a CC-Request [Initial] to reserve units due to Session Charging with Unit Reservation and when the IUT receives a CC-Answer with Tariff-Time-Change AVP the IUT accepts it and sends a CC-Request after the SIP session is released.	
Configuration:	CF_1Ro or CF_1Ro1Gm1Mw	
SIP Initial condition:	IUT receives SIP message and then sends DIAMETER CCR message to the OCF. Following Test Purpose from ETSI TS 102 790-2 [3] can be reused for triggering: TP_IMST2_MW_GEN_07 (INVITE)	
Test purpose:	Ensure that the IUT **on receipt of a SIP message** **sends a CC-Request** containing a CC-Request-Type AVP indicating INITIAL_REQUEST containing a CC-Request-Number AVP containing a Multiple-Services-Credit-Control AVP containing a Requested-Service-Unit AVP containing an Used-Service-Units AVP containing a Tariff-Change-Usage AVP **on receipt of a CC-Answer** containing a Result-Code AVP indicating DIAMETER_SUCCESS containing a CC-Request-Type AVP indicating INITIAL_REQUEST containing a Multiple-Services-Credit-Control AVP containing a Granted-Service-Unit AVP containing a Tariff-Time-Change AVP **and on receipt of a SIP message** **sends a CC-Request** containing a CC-Request-Type AVP indicating TERMINATION_REQUEST containing a CC-Request-Number AVP containing a Multiple-Services-Credit-Control AVP containing a Used-Service-Unit AVP.	
Comments:		

TP_RO_CTF_CH_06	**Standards Reference:** **Clause 6.3.7.1; 6.3.4/Step 2** **ETSI TS 132 260 [1]** **Table 5.3.1.1 and clause 5.3.2.2.1.3.2** **IETF RFC 4006 [10], clause 8.20¶2**	**PICS item:** **A.7/3.3 and NOT A.7/5**
Summary:	Verify that the IUT sends a CC-Request [Initial] to reserve units due to Session Charging with Unit Reservation and when the IUT receives a CC-Answer with Tariff-Time-Change AVP the IUT rejects it and sends a CC-Request with Termination-Cause AVP.	
Configuration:	CF_1Ro or CF_1Ro1Gm1Mw	
SIP Initial condition:	IUT receives SIP message and then sends DIAMETER CCR message to the OCF. Following Test Purpose from ETSI TS 102 790-2 [3] can be reused for triggering: TP_IMST2_MW_GEN_07 (INVITE)	
Test purpose:	Ensure that the IUT **on receipt of a SIP message** **sends a CC-Request** containing a CC-Request-Type AVP indicating INITIAL_REQUEST containing a CC-Request-Number AVP containing a Multiple-Services-Credit-Control AVP containing a Requested-Service-Unit AVP containing an Used-Service-Units AVP containing a Tariff-Change-Usage AVP **on receipt of a CC-Answer** containing a Result-Code AVP indicating DIAMETER_SUCCESS containing a CC-Request-Type AVP indicating INITIAL_REQUEST containing a Multiple-Services-Credit-Control AVP containing a Granted-Service-Unit AVP containing a Tariff-Time-Change AVP **sends a CC-Request** containing a Termination-Cause AVP indicating DIAMETER_BAD_ANSWER.	
Comments:		

5.2.3.2.6 Re-authorization

TP_RO_CTF_RE_01	**Standards Reference: Clauses 6.3.8; 6.4.4; 6.4.5 and IETF RFC 4006 [10], clause 5.5¶1**	**PICS item: A.7/6 and A.7/3.3**
Summary:	Verify that the IUT sends a CC-Request [Update] to reserve and debit units due to Session Charging with Unit Reservation and when the re-authorization procedure starts the IUT sends appropriate answer after an RA-Request is received.	
Configuration:	CF_1Ro or CF_1Ro1Gm1Mw	
SIP Initial condition:	IUT receives SIP response message and then sends DIAMETER CCR message to the OCF. Following Test Purpose from ETSI TS 102 790-2 [3] can be reused for triggering: TP_IMST2_MW_GEN_07 (200 OK INVITE)	
Test purpose:	Ensure that the IUT **on receipt of a SIP message** **sends a CC-Request** containing a CC-Request-Type AVP indicating UPDATE_REQUEST containing a CC-Request-Number AVP containing a Multiple-Services-Credit-Control AVP containing a Used-Service-Unit AVP **on receipt of a CC-Answer and** **and on receipt of an RA-Request** containing a Session-ID AVP containing an Origin-Host AVP containing an Origin-Realm AVP containing a Destination-Realm AVP containing a Destination-Host AVP containing an Auth-Application-Id AVP indicating the value 4 containing a Re-Auth-Request-Type AVP indicating AUTHORIZE_ONLY **sends an RA-Answer** containing a Session-ID AVP containing a Result-Code AVP indicating DIAMETER_SUCCESS containing an Origin-Host AVP containing an Origin-Realm AVP.	
Comments:	Preamble action: CCR, CCA [Initial] are exchanged	

5.2.3.2.7 Failure Handling

TP_RO_CTF_FH_01	**Standards Reference:** **Clause 6.3.9¶1 and** **IETF RFC 4006 [10], clause 5.7**	**PICS item:** **A.7/3.2 and A.7/17.3**
Summary:	Verify that the IUT can successfully override local CCFH values due to Event Charging with Unit Reservation.	
Configuration:	CF_2Ro or CF_2Ro1Gm1Mw	
SIP Initial condition:	IUT receives SIP message and then sends DIAMETER CCR message to the OCF. Following Test Purposes from ETSI TS 102 790-2 [3] can be reused for triggering: TP_IMST2_MW_GEN_09 (MESSAGE)	
Test purpose:	Ensure that the IUT **sends a CC-Request to the primary OCF** containing a CC-Request-Type AVP indicating INITIAL_REQUEST containing a CC-Request-Number AVP containing a Multiple-Services-Credit-Control AVP containing a Requested-Service-Unit AVP **on receipt of a CC-Answer** containing a Result-Code AVP indicating DIAMETER_SUCCESS containing a CC-Request-Type AVP indicating INITIAL_REQUEST containing a Multiple-Services-Credit-Control AVP containing a Granted-Service-Unit AVP indicating reserved units containing Credit-Control-Failure-Handling AVP indicating CONTINUE **when the primary OCF stops responding** **sends a CC-Request to the secondary OCF** containing a CC-Request-Type AVP indicating INITIAL_REQUEST containing a CC-Request-Number AVP containing a Multiple-Services-Credit-Control AVP containing a Requested-Service-Unit AVP **and on not receiving a CC-Answer** **sends a CC-Request to the secondary OCF** containing a CC-Request-Type AVP indicating INITIAL_REQUEST containing an Alternate-Charged-Party-Address AVP indicating a different OCF server containing a CC-Request-Number AVP containing a Multiple-Services-Credit-Control AVP containing a Requested-Service-Unit AVP.	
Comments:		
NOTE: IUT is configured with CCFH/CONTINUE value.		

TP_RO_CTF_FH_02	**Standards Reference:** **Clause 6.3.9¶1 and** **IETF RFC 4006 [10], clause 6.5¶4**	**PICS item:** **A.7/3.1 and A.7/18.1**
Summary:	Verify that the IUT can successfully override local DDFH value with Direct Debiting.	
Configuration:	CF_2Ro or CF_2Ro1Gm1Mw	
SIP Initial condition:	IUT receives SIP message and then sends DIAMETER CCR message to the OCF. Following Test Purposes from ETSI TS 102 790-2 [3] can be reused for triggering: TP_IMST2_MW_GEN_09 (MESSAGE)	
Test purpose:	Ensure that the IUT **sends a CC-Request to the primary OCF** containing a CC-Request-Type AVP indicating EVENT_REQUEST containing a CC-Request-Number AVP containing a Requested-Action AVP indicating DIRECT_DEBITING containing a Multiple-Services-Credit-Control AVP (containing a Requested-Service-Unit AVP **and/or** containing a Service-Identifier AVP) **on receipt of a CC-Answer** containing a Result-Code AVP indicating DIAMETER_SUCCESS containing a CC-Request-Type AVP indicating EVENT_REQUEST containing a CC-Request-Number AVP containing a Multiple-Services-Credit-Control AVP containing a Requested-Service-Unit AVP containing Direct-Debiting-Failure-Handling AVP indicating TERMINATE_OR_BUFFER **when the primary OCF stops responding** **sends a CC-Request the secondary OCF** containing Diameter-Header containing Command-Flags containing T-flag indicating value '1' containing a CC-Request-Type AVP indicating EVENT_REQUEST containing a CC-Request-Number AVP containing a Multiple-Services-Credit-Control AVP containing a Requested-Service-Unit AVP.	
Comments:		
NOTE: IUT is configured with DDFH/ TERMINATE_OR_BUFFER value.		

5.2.3.2.8 Failover

TP_RO_CTF_FA_01	**Standards Reference:** **Clause 6.3.10¶2** **IETF RFC 4006 [10], clause 6.5¶3**	**PICS item:** **A.7/3.1 and A.7/8**
Summary:	Verify that on connection failure with the primary OCF, the IUT sends a CC-Request [Event] to the secondary OCF.	
Configuration:	CF_2Ro or CF_2Ro1Gm1Mw	
Initial conditions:	A secondary OCF is available	
SIP Initial condition:	IUT receives SIP message and then sends DIAMETER CCR message to the OCF. Following Test Purposes from ETSI TS 102 790-2 [3] can be reused for triggering: TP_IMST2_MW_GEN_09 (MESSAGE)	
Test purpose:	Ensure that the IUT **to indicate the OCF stop** **sends the CC-Request to the secondary OCF** containing an CC-Request-Type AVP indicating EVENT_REQUEST containing a CC-Request-Number AVP containing a Requested-Action AVP indicating PRICE_ENQUIRY containing a Multiple-Services-Credit-Control AVP containing a Service-Identifier AVP **on receipt of a CC-Answer** containing a Session-ID AVP containing a Result-Code AVP indicating DIAMETER_SUCCESS **not** containing an Experimental-Result AVP containing a CC-Request-Type AVP indicating EVENT_REQUEST containing a Cost-Information AVP containing Unit-Value AVP containing Value-Digits AVP containing Currency-Code AVP **accepts the message**.	
Comments:		

TP_RO_CTF_FA_02	Standards Reference: Clause 6.3.10¶2 IETF RFC 4006 [10], clause 6.5¶3	PICS item: A.7/3.1 and A.7/8
Summary:	Verify that on connection restored, the IUT sends a CC-Request [Event] to the primary OCF.	
Configuration:	CF_2Ro or CF_2Ro1Gm1Mw	
Initial conditions:	A secondary OCF is available	
SIP Initial condition:	IUT receives SIP message and then sends DIAMETER CCR message to the OCF. Following Test Purposes from ETSI TS 102 790-2 [3] can be reused for triggering: TP_IMST2_MW_GEN_09 (MESSAGE)	
Test purpose:	Ensure that the IUT **to indicate the OCF restart** **sends a CC-Request to the primary OCF** containing an CC-Request-Type AVP indicating EVENT_REQUEST containing a CC-Request-Number AVP containing a Requested-Action AVP indicating PRICE_ENQUIRY containing a Multiple-Services-Credit-Control AVP containing a Service-Identifier AVP **on receipt of a CC-Answer** containing a Session-ID AVP containing a Result-Code AVP indicating DIAMETER_SUCCESS **not** containing an Experimental-Result AVP containing a CC-Request-Type AVP indicating EVENT_REQUEST containing a Cost-Information AVP containing Unit-Value AVP containing Value-Digits AVP containing Currency-Code AVP **accepts the message**.	
Comments:		

TP_RO_CTF_FA_03	Standards Reference: Clause 6.3.10¶2 IETF RFC 4006 [10], clause 6.5¶3	PICS item: A.7/3.2 and A.7/8
Summary:	Verify that on connection failure with the primary OCF, the IUT sends a CC-Request [Initial] to the secondary OCF.	
Configuration:	CF_2Ro or CF_2Ro1Gm1Mw	
Initial conditions:	The primary OCF is unavailable A secondary OCF is available	
SIP Initial condition:	IUT receives SIP message and then sends DIAMETER CCR message to the OCF. Following Test Purposes from ETSI TS 102 790-2 [3] can be reused for triggering: TP_IMST2_MW_GEN_09 (MESSAGE)	
Test purpose:	Ensure that the IUT **sends a CC-Request to the secondary OCF** containing an CC-Request-Type AVP indicating INITIAL_REQUEST containing a CC-Request-Number AVP **on receipt of a CC-Answer** containing a Session-ID AVP containing a Result-Code AVP indicating DIAMETER_SUCCESS **not** containing an Experimental-Result AVP containing a CC-Request-Type AVP indicating INITIAL_REQUEST containing a Remaining-Balance AVP containing Unit-Value AVP containing Value-Digits AVP containing Currency-Code AVP **accepts the message**.	
Comments:		

TP_RO_CTF_FA_04	Standards Reference: Clause 6.3.10¶2 IETF RFC 4006 [10], clause 6.5¶3	PICS item: A.7/3.1 and A.7/8
Summary:	Verify that, on connection restored, the IUT sends a CC-Request [Initial] to the primary OCF.	
Configuration:	CF_2Ro or CF_2Ro1Gm1Mw	
Initial conditions:	A secondary OCF is available	
SIP Initial condition:	IUT receives SIP message and then sends DIAMETER CCR message to the OCF. Following Test Purposes from ETSI TS 102 790-2 [3] can be reused for triggering: TP_IMST2_MW_GEN_09 (MESSAGE)	
Test purpose:	Ensure that the IUT **to indicate the OCF restart** **sends a CC-Request to the primary OCF** containing a CC-Request-Type AVP indicating EVENT_REQUEST containing a CC-Request-Number AVP containing a Requested-Action AVP indicating CHECK_BALANCE **on receipt of a CC-Answer** containing a Session-ID AVP containing a Result-Code AVP indicating DIAMETER_SUCCESS **not** containing an Experimental-Result AVP containing a CC-Request-Type AVP indicating INITIAL_REQUEST containing a Remaining-Balance AVP containing Unit-Value AVP containing Value-Digits AVP containing Currency-Code AVP **accepts the message**.	
Comments:		

5.2.3.2.9 Credit Pooling

TP_RO_CTF_CP_01	Standards Reference: Clause 6.3.4/Step 2 and IETF RFC 4006 [10], clause 5.1.2¶5	PICS item: A.7/3.2 and A.7/19
Summary:	Verify that the IUT supports independent credit-control of multiple services within a (sub-) session and sends a CC-Request [Initial] to reserve units due to Event Charging with Unit Reservation.	
Configuration:	CF_1Ro or CF_1Ro1Gm1Mw	
SIP Initial condition:	IUT receives SIP message and then sends DIAMETER CCR message to the OCF. Following Test Purposes from ETSI TS 102 790-2 [3] can be reused for triggering: TP_IMST2_MW_GEN_09 (MESSAGE)	
Test purpose:	Ensure that the IUT **on receipt of a SIP message** **sends a CC-Request** containing a CC-Request-Type AVP indicating INITIAL_REQUEST containing a CC-Request-Number AVP containing a Multiple-Services-Indicator AVP indicating MULTIPLE_SERVICES_SUPPORTED containing a Multiple-Services-Credit-Control AVP containing a Requested-Service-Unit AVP.	
Comments:	Postamble action: CCR, CCA [Termination] are exchanged with the IUT.	

TP_RO_CTF_CP_02	Standards Reference: Clause 6.3.5/Step 2 and IETF RFC 4006 [10], clause 5.1.2¶5	PICS item: A.7/3.3 and A.7/19
Summary:	Verify that the IUT supports independent credit-control of multiple services within a (sub-) session and sends a CC-Request [Initial] to reserve units due to Session Charging with Unit Reservation.	
Configuration:	CF_1Ro or CF_1Ro1Gm1Mw	
SIP Initial condition:	IUT receives SIP message and then sends DIAMETER CCR message to the OCF. Following Test Purpose from ETSI TS 102 790-2 [3] can be reused for triggering: TP_IMST2_MW_GEN_07 (INVITE)	
Test purpose:	Ensure that the IUT **on receipt of a SIP message** **sends a CC-Request** containing a CC-Request-Type AVP indicating INITIAL_REQUEST containing a CC-Request-Number AVP containing a Multiple-Services-Indicator AVP indicating MULTIPLE_SERVICES_SUPPORTED containing a Multiple-Services-Credit-Control AVP containing a Requested-Service-Unit AVP.	
Comments:	Postamble action: CCR, CCA [Update] and CCR, CCA [Termination] are exchanged with the IUT.	

5.2.3.2.10 Other procedures

TP_RO_CTF_OP_01	Standards Reference: Clause 6.5.1.1 Clauses 7.2.160 and 7.2.243	PICS item: A.7/3.3
Summary:	Verify that, IUT can return the quotas when the traffic ceases.	
Configuration:	CF_1Ro or CF_1Ro1Gm1Mw	
SIP Initial condition:	IUT receives SIP response message and then sends DIAMETER CCR message to the OCF. Following Test Purposes from ETSI TS 102 790-2 [3] can be reused for triggering: TP_IMST2_MW_GEN_07 (200 OK INVITE)	
Test purpose:	Ensure that the IUT **when traffic stops** **sends a CC-Request** containing a CC-Request-Type AVP indicating UPDATE_REQUEST containing a CC-Request-Number AVP containing a Multiple-Services-Credit-Control AVP containing a Volume-Quota-Threshold AVP containing a Granted-Service-Units AVP containing a CC-Total-Octets AVP or, containing a CC-Input-Octets AVP or, containing a CC-Output-Octets AVP **on receipt of a CC-Answer** containing a Session-ID AVP containing a Result-Code AVP indicating DIAMETER_SUCCESS **not** containing an Experimental-Result AVP containing a CC-Request-Type AVP indicating UPDATE_REQUEST **accepts the message**.	
Comments:	Preamble action: The IUT receives a CCA [Initial] including Quota-Holding-Time AVP indicating a non 0.	

TP_RO_CTF_OP_02	Standards Reference: Clause 6.5.1.1 Clause 7.2.160 and 7.2.243 IETF RFC 4006 [10], clause 6.5¶3	PICS item: A.7/3.3
Summary:	Verify that the IUT does not return the quotas when the traffic ceases.	
Configuration:	CF_1Ro or CF_1Ro1Gm1Mw	
SIP Initial condition:	IUT receives SIP response message and then sends DIAMETER CCR message to the OCF. Following Test Purposes from ETSI TS 102 790-2 [3] can be reused for triggering: TP_IMST2_MW_GEN_07 (200 OK INVITE)	
Test purpose:	Ensure that the IUT **when traffic stops** **sends a CC-Request** containing a CC-Request-Type AVP indicating UPDATE_REQUEST containing a CC-Request-Number AVP containing a Multiple-Services-Credit-Control AVP **not** containing a Volume-Quota-Threshold AVP **not** containing a Granted-Service-Units AVP **on receipt of a CC-Answer** containing a Session-ID AVP containing a Result-Code AVP indicating DIAMETER_SUCCESS **not** containing an Experimental-Result AVP containing a CC-Request-Type AVP indicating UPDATE_REQUEST **accepts the message**.	
Comments:	Preamble action: The IUT receives a CCA [Initial] including Quota-Holding-Time AVP indicating a 0 value and the IUT exchanges some CCR, CCA [Update].	

TP_RO_CTF_OP_03	Standards Reference: Clause 6.5.1.1 Clauses 7.2.160 and 7.2.243 IETF RFC 4006 [10], clause 6.5¶3	PICS item: A.7/3.3
Summary:	Verify that, IUT can return the quotas when the traffic ceases - Based on IUT local value.	
Configuration:	CF_1Ro or CF_1Ro1Gm1Mw	
SIP Initial condition:	IUT receives SIP response message and then sends DIAMETER CCR message to the OCF. Following Test Purposes from ETSI TS 102 790-2 [3] can be reused for triggering: TP_IMST2_MW_GEN_07 (200 OK INVITE)	
Test purpose:	Ensure that the IUT **when traffic stops** **sends a CC-Request** containing a CC-Request-Type AVP indicating UPDATE_REQUEST containing a CC-Request-Number AVP containing a Multiple-Services-Credit-Control AVP containing a Volume-Quota-Threshold AVP containing a Granted-Service-Units AVP containing a CC-Total-Octets AVP or, containing a CC-Input-Octets AVP or, containing a CC-Output-Octets AVP **on receipt of a CC-Answer** containing a Session-ID AVP containing a Result-Code AVP indicating DIAMETER_SUCCESS **not** containing an Experimental-Result AVP containing a CC-Request-Type AVP indicating UPDATE_REQUEST **accepts the message**.	
Comments:	Preamble action: The IUT receives a CCA [Initial] **not** including Quota-Holding-Time AVP.	
NOTE: The IUT has a non 0 local Quota-Holding-Time value.		

TP_RO_CTF_OP_04	**Standards Reference:** **Clause 6.5.1.2¶3 and 7.2.235/236** **IETF RFC 4006 [10], clause 5.5**	**PICS item:** **A.7/3.3 and A.7/9**
Summary:	Verify that the IUT supports a credit re-authorization and returns an appropriate RA-Answer.	
Configuration:	CF_1Ro or CF_1Ro1Gm1Mw	
SIP Initial condition:	IUT receives SIP response message and then sends DIAMETER CCR message to the OCF. Following Test Purposes from ETSI TS 102 790-2 [3] can be reused for triggering: TP_IMST2_MW_GEN_07 (200 OK INVITE)	
Test purpose:	Ensure that the IUT **on change of charging conditions** **on receipt of a CC-Request** containing a CC-Request-Type AVP indicating UPDATE_REQUEST containing a CC-Request-Number AVP **sends a CC-Answer** containing a Result-Code AVP indicating DIAMETER_SUCCESS containing a CC-Request-Type AVP indicating UPDATE_REQUEST containing a Multiple-Services-Credit-Control AVP containing a Trigger AVP containing a Trigger-Type AVP **on receipt of an RA-Request** containing a Session-ID AVP containing an Origin-Host AVP containing an Origin-Realm AVP containing a Destination-Realm AVP containing a Destination-Host AVP containing an Auth-Application-Id AVP indicating the value 4 containing a Re-Auth-Request-Type AVP indicating AUTHORIZE_ONLY **sends an RA-Answer** containing a Session-ID AVP containing a Result-Code AVP indicating DIAMETER_SUCCESS containing an Origin-Host AVP containing an Origin-Realm AVP.	
Comments:	Preamble action: CCR, CCA [Initial] are exchanged.	

TP_RO_CTF_OP_05	**Standards Reference:** **Clause 6.5.1.3** **Clause 7.2.175** **IETF RFC 4006 [10], clause 6.5¶3**	**PICS item:** **A.7/3.3**
Summary:	Verify that the IUT can return the reporting quota usage in a Multiple-Services-Credit-Control AVP (Table 4).	
Configuration:	CF_1Ro or CF_1Ro1Gm1Mw	
SIP Initial condition:	IUT receives SIPresponse message and then sends DIAMETER CCR message to the OCF. Following Test Purposes from ETSI TS 102 790-2 [3] can be reused for triggering: TP_IMST2_MW_GEN_07 (200 OK INVITE)	
Test purpose:	Ensure that the IUT **on change of charging conditions** **sends a CC-Request** containing a CC-Request-Type AVP indicating UPDATE_REQUEST containing a CC-Request-Number AVP containing a Multiple-Services-Credit-Control AVP containing a Reporting-Reason AVP (Table 4) **on receipt of a CC-Answer** containing a Session-ID AVP containing a Result-Code AVP indicating DIAMETER_SUCCESS **not** containing an Experimental-Result AVP containing a CC-Request-Type AVP indicating UPDATE_REQUEST **accepts the message**.	
Comments:	Preamble action: CCR, CCA [Initial] are exchanged.	

Table 4: Reporting-Reason AVP value

Test purpose variants	Reporting-Reason AVP values
VA_01	QHT (1)
VA_02	FINAL (2)
VA_03	VALIDITY_TIME (4)
VA_04	FORCED_REAUTHORISATION (7)

TP_RO_CTF_OP_06	**Standards Reference:** **Clause 6.5.1.3** **Clause 7.2.175** **IETF RFC 4006 [10], clause 6.5¶3**	**PICS item:** **A.7/3.3**
Summary:	Verify that the IUT can return the reporting quota usage in a Multiple-Services-Credit-Control AVP - RATING_CONDITION_CHANGE (6).	
Configuration:	CF_1Ro or CF_1Ro1Gm1Mw	
SIP Initial condition:	IUT receives SIP response message and then sends DIAMETER CCR message to the OCF. Following Test Purposes from ETSI TS 102 790-2 [3] can be reused for triggering: TP_IMST2_MW_GEN_07 (200 OK INVITE)	
Test purpose:	Ensure that the IUT **on change of charging conditions** **sends a CC-Request** containing a CC-Request-Type AVP indicating UPDATE_REQUEST containing a CC-Request-Number AVP containing a Multiple-Services-Credit-Control AVP containing a Reporting-Reason AVP indicating RATING_CONDITION_CHANGE containing a Trigger AVP **on receipt of a CC-Answer** containing a Session-ID AVP containing a Result-Code AVP indicating DIAMETER_SUCCESS **not** containing an Experimental-Result AVP containing a CC-Request-Type AVP indicating UPDATE_REQUEST **accepts the message**.	
Comments:	Preamble action: CCR, CCA [Initial] are exchanged.	

TP_RO_CTF_OP_07	**Standards Reference:** **Clause 6.5.1.3** **Clause 7.2.175** **IETF RFC 4006 [10], clause 6.5¶3**	**PICS item:** **A.7/3.3**
Summary:	Verify that the IUT can return the reporting quota usage in a Used-Service-Unit AVP (Table 5).	
Configuration:	CF_1Ro or CF_1Ro1Gm1Mw	
SIP Initial condition:	IUT receives SIP response message and then sends DIAMETER CCR message to the OCF. Following Test Purposes from ETSI TS 102 790-2 [3] can be reused for triggering: TP_IMST2_MW_GEN_07 (200 OK INVITE)	
Test purpose:	Ensure that the IUT **on change of charging conditions** **sends a CC-Request** containing a CC-Request-Type AVP indicating UPDATE_REQUEST containing a CC-Request-Number AVP containing a Multiple-Services-Credit-Control AVP containing a Used-Service-Unit AVP containing a Reporting-Reason AVP (Table 5) **on receipt of a CC-Answer** containing a Session-ID AVP containing a Result-Code AVP indicating DIAMETER_SUCCESS **not** containing an Experimental-Result AVP containing a CC-Request-Type AVP indicating UPDATE_REQUEST **accepts the message**.	
Comments:	Preamble action: CCR, CCA [Initial] are exchanged.	

Table 5: Reporting-Reason AVP values

Test purpose variants	Reporting-Reason AVP values
VA_01	THRESHOLD (0)
VA_02	QUOTA_EXHAUSTED (3)
VA_03	OTHER_QUOTA_TYPE (5)
VA_04	POOL_EXHAUSTED (8)

TP_RO_CTF_OP_08	**Standards Reference:** **Clause 6.5.3(1st item)** **IETF RFC 4006 [10], clause 5.6.1**	**PICS item:** **A.7/3.3**
Summary:	Verify that the IUT can process termination action.	
Configuration:	CF_1Ro or CF_1Ro1Gm1Mw	
SIP Initial condition:	IUT receives SIP response message and then sends DIAMETER CCR message to the OCF. Following Test Purposes from ETSI TS 102 790-2 [3] can be reused for triggering: TP_IMST2_MW_GEN_07 (200 OK INVITE)	
Test purpose:	Ensure that the IUT **sends a CC-Request** containing a CC-Request-Type AVP indicating UPDATE_REQUEST containing a CC-Request-Number AVP containing a Multiple-Services-Credit-Control AVP containing a Used-Service-Unit AVP **on receipt a CC-Answer** containing a Session-ID AVP containing a Result-Code AVP indicating DIAMETER_SUCCESS **not** containing an Experimental-Result AVP containing a CC-Request-Type AVP indicating UPDATE_REQUEST containing a Multiple-Services-Credit-Control AVP containing a Final-Unit-Indication AVP containing a Final-Unit-Action AVP indicating TERMINATE **sends a CC-Request** containing a CC-Request-Type AVP indicating TERMINATION_REQUEST containing a CC-Request-Number AVP containing a Multiple-Services-Credit-Control AVP containing a Used-Service-Unit AVP **and on receipt of a CC-Answer** containing a Session-ID AVP containing a Result-Code AVP indicating DIAMETER_SUCCESS **not** containing an Experimental-Result AVP containing a CC-Request-Type AVP indicating TERMINATION_REQUEST **accepts the message**.	
Comments:	Preamble action: CCR, CCA [Initial] are exchanged.	

TP_RO_CTF_OP_09	**Standards Reference:** **Clause 6.5.3(2nd item)** **IETF RFC 4006 [10], clause 5.6.1**	**PICS item:** **A.7/3.3**
Summary:	Verify that the IUT can process termination action after redirection.	
Configuration:	CF_1Ro or CF_1Ro1Gm1Mw	
SIP Initial condition:	IUT receives SIP message and then sends DIAMETER CCR message to the OCF. (See note)	
Test purpose:	Ensure that the IUT **sends a CC-Request** containing a CC-Request-Type AVP indicating UPDATE_REQUEST containing a CC-Request-Number AVP containing a Multiple-Services-Credit-Control AVP containing a Used-Service-Unit AVP **on receipt of a CC-Answer** containing a Session-ID AVP containing a Result-Code AVP indicating DIAMETER_SUCCESS **not** containing an Experimental-Result AVP containing a CC-Request-Type AVP indicating UPDATE_REQUEST containing a Multiple-Services-Credit-Control AVP containing a Final-Unit-Indication AVP containing a Final-Unit-Action AVP indicating REDIRECT containing Redirect-Server AVP containing Redirect-Address-Type AVP containing Redirect-Server-Address AVP **optionally** containing Restriction-Filter-Rule AVP **optionally** containing Filter-Id AVP **sends a CC-Request** containing a CC-Request-Type AVP indicating TERMINATION_REQUEST containing a CC-Request-Number AVP indicating User B **and on receipt of a CC-Answer** containing a Session-ID AVP containing a Result-Code AVP indicating DIAMETER_SUCCESS **not** containing an Experimental-Result AVP containing a CC-Request-Type AVP indicating TERMINATION_REQUEST containing a CC-Request-Number AVP indicating User B **sends a CC-Request** containing a CC-Request-Type AVP indicating INITIAL_REQUEST containing a CC-Request-Number AVP indicating User C **and on receipt of a CC-Answer** containing a Session-ID AVP containing a Result-Code AVP indicating DIAMETER_SUCCESS **not** containing an Experimental-Result AVP containing a CC-Request-Type AVP indicating INITIAL_REQUEST containing a CC-Request-Number AVP indicating User C **accepts the message**.	
Comments:	Preamble action: CCR, CCA [Initial] are exchanged	
NOTE: SIP interaction with redirection need to be supported.		

TP_RO_CTF_OP_10	**Standards Reference:** **Clause 6.5.4** **Clause 7.2.159**	**PICS item:** **A.7/3.3**
Summary:	Verify that the IUT can process quota consumption time.	
Configuration:	CF_1Ro or CF_1Ro1Gm1Mw	
SIP Initial condition:	IUT receives SIP message and then sends DIAMETER CCR message to the OCF. Following Test Purposes from ETSI TS 102 790-2 [3] can be reused for triggering: TP_IMST2_MW_GEN_07 (INVITE)	
Test purpose:	Ensure that the IUT **sends a CC-Request** containing a CC-Request-Type AVP indicating INITIAL_REQUEST containing a CC-Request-Number AVP containing a Multiple-Services-Credit-Control AVP containing a Requested-Service-Unit AVP **on receipt of a CC-Answer** containing a Session-ID AVP containing a Result-Code AVP indicating DIAMETER_SUCCESS **not** containing an Experimental-Result AVP containing a CC-Request-Type AVP indicating INITIAL_REQUEST containing a Multiple-Services-Credit-Control AVP containing a Granted-Service-Units AVP containing a CC-Time AVP containing a Quota-Consumption-Time AVP indicating a period equal to the Quota Consumption Time **sends a CC-Request** containing a CC-Request-Type AVP indicating UPDATE_REQUEST containing a CC-Request-Number AVP containing a Multiple-Services-Credit-Control AVP containing a Used-Service-Unit AVP.	
Comments:		

TP_RO_CTF_OP_11	Standards Reference: Clause 6.5.5	PICS item: A.7/3.3
Summary:	Verify that the IUT can successfully terminate sessions on a CCR, CCA [Update] exchange.	
Configuration:	CF_1Ro or CF_1Ro1Gm1Mw	
SIP Initial condition:	IUT receives SIP message and then sends DIAMETER CCR message to the OCF. Following Test Purposes from ETSI TS 102 790-2 [3] can be reused for triggering: TP_IMST2_MW_GEN_07 (INVITE)	
Test purpose:	Ensure that the IUT **sends a CC-Request** containing a CC-Request-Type AVP indicating UPDATE_REQUEST containing a CC-Request-Number AVP containing a Multiple-Services-Credit-Control AVP containing a Used-Service-Unit AVP **on receipt of a CC-Answer** containing a Result-Code AVP indicating DIAMETER-AUTHORIZATION-REJECTED containing a CC-Request-Type AVP indicating UPDATE_REQUEST **sends a CC-Request** containing a CC-Request-Type AVP indicating TERMINATION_REQUEST containing a CC-Request-Number AVP **and on receipt of a CC-Answer** containing a Session-ID AVP containing a Result-Code AVP indicating DIAMETER_SUCCESS **not** containing an Experimental-Result AVP containing a CC-Request-Type AVP indicating TERMINATION_REQUEST containing a CC-Request-Number AVP **accepts the message**.	
Comments:	Preamble action: CCR, CCA [Initial] are exchanged.	

TP_RO_CTF_OP_12	Standards Reference: Clause 6.5.5	PICS item: A.7/3.3
Summary:	Verify that the IUT can successfully terminate session on an ASR, ASA exchange.	
Configuration:	CF_1Ro or CF_1Ro1Gm1Mw	
SIP Initial condition:	IUT receives SIP message and then sends DIAMETER CCR message to the OCF. Following Test Purposes from ETSI TS 102 790-2 [3] can be reused for triggering: TP_IMST2_MW_GEN_07 (INVITE)	
Test purpose:	Ensure that the IUT **on receipt of an AS-Request** containing a Session-ID AVP containing an Origin-Host AVP containing an Origin-Realm AVP containing a Destination-Realm AVP containing a Destination-Host AVP containing an Auth-Application-Id AVP **sends an AS-Answer** containing a Session-ID AVP containing a Result-Code AVP indicating DIAMETER_SUCCESS **not** containing an Experimental-Result AVP containing an Origin-Host AVP containing an Origin-Realm AVP **and sends a CC-Request** containing a CC-Request-Type AVP indicating TERMINATION_REQUEST containing a CC-Request-Number AVP **on receipt of a CC-Answer** containing a Result-Code AVP indicating DIAMETER-AUTHORIZATION-REJECTED containing a CC-Request-Type AVP indicating TERMINATION_REQUEST **accepts the message**.	
Comments:	Preamble action: CCR, CCA [Initial] and CCR, CCA [Update] are exchanged.	

TP_RO_CTF_OP_13	Standards Reference: Clause 6.5.6	PICS item: A.7/3.3
Summary:	Verify that the IUT can successfully process Envelope-Reporting AVP [DO_NOT_REPORT_ENVELOPES].	
Configuration:	CF_1Ro or CF_1Ro1Gm1Mw	
SIP Initial condition:	IUT receives SIP message and then sends DIAMETER CCR message to the OCF. Following Test Purposes from ETSI TS 102 790-2 [3] can be reused for triggering: TP_IMST2_MW_GEN_07 (INVITE)	
Test purpose:	Ensure that the IUT **sends a CC-Request** containing a CC-Request-Type AVP indicating INITIAL_REQUEST containing a CC-Request-Number AVP containing a Multiple-Services-Credit-Control AVP containing a Requested-Service-Unit AVP **on receipt of a CC-Answer** containing a Result-Code AVP indicating DIAMETER-SUCCESS containing a CC-Request-Type AVP indicating INITIAL_REQUEST containing a Multiple-Services-Credit-Control AVP containing an Envelope-Reporting AVP indicating DO_NOT_REPORT_ENVELOPES **sends a CC-Request** containing a CC-Request-Type AVP indicating UPDATE_REQUEST containing a CC-Request-Number AVP containing a Multiple-Services-Credit-Control AVP containing a Used-Service-Unit AVP **not** containing an Envelope AVP.	
Comments:		

TP_RO_CTF_OP_14	**Standards Reference:** **Clause 6.5.6**	**PICS item:** **A.7/3.3**
Summary:	Verify that the IUT can successfully process Envelope-Reporting AVP [REPORT_ENVELOPES].	
Configuration:	CF_1Ro or CF_1Ro1Gm1Mw	
SIP Initial condition:	IUT receives SIP message and then sends DIAMETER CCR message to the OCF. Following Test Purposes from ETSI TS 102 790-2 [3] can be reused for triggering: TP_IMST2_MW_GEN_07 (INVITE)	
Test purpose:	Ensure that the IUT **sends a CC-Request** containing a CC-Request-Type AVP indicating INITIAL_REQUEST containing a CC-Request-Number AVP containing a Multiple-Services-Credit-Control AVP containing a Requested-Service-Unit AVP **on receipt of a CC-Answer** containing a Result-Code AVP indicating DIAMETER-SUCCESS containing a CC-Request-Type AVP indicating INITIAL_REQUEST containing a Multiple-Services-Credit-Control AVP containing an Envelope-Reporting AVP indicating REPORT_ENVELOPES **sends a CC-Request** containing a CC-Request-Type AVP indicating UPDATE_REQUEST containing a CC-Request-Number AVP containing a Multiple-Services-Credit-Control AVP containing a Used-Service-Unit AVP containing an Envelope AVP containing an Envelope-Start-Time AVP **optionally** containing an Envelope-Stop-Time AVP **optionally** containing a CC-Total-Octets AVP **optionally** containing a CC-Input-Octets AVP **optionally** containing a CC-Output-Octets AVP **optionally** containing a CC-Service-Specific-Units AVP.	
Comments:		

TP_RO_CTF_OP_15	**Standards Reference:** **Clause 6.5.6**	**PICS item:** **A.7/3.3**
Summary:	Verify that the IUT can successfully process Envelope-Reporting AVP [REPORT_ENVELOPES_WITH_VOLUME].	
Configuration:	CF_1Ro or CF_1Ro1Gm1Mw	
SIP Initial condition:	IUT receives SIP message and then sends DIAMETER CCR message to the OCF. Following Test Purposes from ETSI TS 102 790-2 [3] can be reused for triggering: TP_IMST2_MW_GEN_07 (INVITE)	
Test purpose:	Ensure that the IUT **sends a CC-Request** containing a CC-Request-Type AVP indicating INITIAL_REQUEST containing a CC-Request-Number AVP containing a Multiple-Services-Credit-Control AVP containing a Requested-Service-Unit AVP **on receipt of a CC-Answer** containing a Result-Code AVP indicating DIAMETER-SUCCESS containing a CC-Request-Type AVP indicating INITIAL_REQUEST containing a Multiple-Services-Credit-Control AVP containing an Envelope-Reporting AVP indicating REPORT_ENVELOPES_WITH_VOLUME **sends a CC-Request** containing a CC-Request-Type AVP indicating UPDATE_REQUEST containing a CC-Request-Number AVP containing a Multiple-Services-Credit-Control AVP containing a Used-Service-Unit AVP containing an Envelope AVP containing an Envelope-Start-Time AVP **optionally** containing an Envelope-Stop-Time AVP containing a CC-Total-Octets AVP containing a CC-Input-Octets AVP containing a CC-Output-Octets AVP **not** containing a CC-Service-Specific-Units AVP.	
Comments:		

TP_RO_CTF_OP_16	**Standards Reference:** **Clause 6.5.6**	**PICS item:** **A.7/3.3**
Summary:	Verify that the IUT can successfully process Envelope-Reporting AVP [REPORT_ENVELOPES_WITH_EVENT].	
Configuration:	CF_1Ro or CF_1Ro1Gm1Mw	
SIP Initial condition:	IUT receives SIP message and then sends DIAMETER CCR message to the OCF. Following Test Purposes from ETSI TS 102 790-2 [3] can be reused for triggering: TP_IMST2_MW_GEN_07 (INVITE)	
Test purpose:	Ensure that the IUT **sends a CC-Request** containing a CC-Request-Type AVP indicating INITIAL_REQUEST containing a CC-Request-Number AVP containing a Multiple-Services-Credit-Control AVP containing a Requested-Service-Unit AVP **on receipt of a CC-Answer** containing a Result-Code AVP indicating DIAMETER-SUCCESS containing a CC-Request-Type AVP indicating INITIAL_REQUEST containing a Multiple-Services-Credit-Control AVP containing an Envelope-Reporting AVP indicating REPORT_ENVELOPES_WITH_EVENT **sends a CC-Request** containing a CC-Request-Type AVP indicating UPDATE_REQUEST containing a CC-Request-Number AVP containing a Multiple-Services-Credit-Control AVP containing a Used-Service-Unit AVP containing an Envelope AVP containing an Envelope-Start-Time AVP **optionally** containing an Envelope-Stop-Time AVP **not** containing a CC-Total-Octets AVP **not** containing a CC-Input-Octets AVP **not** containing a CC-Output-Octets AVP containing a CC-Service-Specific-Units AVP.	
Comments:		

TP_RO_CTF_OP_17	**Standards Reference:** **Clause 6.5.6**	**PICS item:** **A.7/3.3**
Summary:	Verify that the IUT can successfully process Envelope-Reporting AVP [REPORT_ENVELOPES_WITH_VOLUME_AND_EVENT].	
Configuration:	CF_1Ro or CF_1Ro1Gm1Mw	
SIP Initial condition:	IUT receives SIP message and then sends DIAMETER CCR message to the OCF. Following Test Purposes from ETSI TS 102 790-2 [3] can be reused for triggering: TP_IMST2_MW_GEN_07 (INVITE)	
Test purpose:	Ensure that the IUT **sends a CC-Request** containing a CC-Request-Type AVP indicating INITIAL_REQUEST containing a CC-Request-Number AVP containing a Multiple-Services-Credit-Control AVP containing a Requested-Service-Unit AVP **on receipt of a CC-Answer** containing a Result-Code AVP indicating DIAMETER-SUCCESS containing a CC-Request-Type AVP indicating INITIAL_REQUEST containing a Multiple-Services-Credit-Control AVP containing an Envelope-Reporting AVP indicating REPORT_ENVELOPES_WITH_VOLUME_AND_EVENT **sends a CC-Request** containing a CC-Request-Type AVP indicating UPDATE_REQUEST containing a CC-Request-Number AVP containing a Multiple-Services-Credit-Control AVP containing a Used-Service-Unit AVP containing an Envelope AVP containing an Envelope-Start-Time AVP **optionally** containing an Envelope-Stop-Time AVP containing a CC-Total-Octets AVP containing a CC-Input-Octets AVP containing a CC-Output-Octets AVP containing a CC-Service-Specific-Units AVP.	
Comments:		

TP_RO_CTF_OP_18	Standards Reference: Clause 6.5.7¶1	PICS item: A.7/3.3
Summary:	Verify that the IUT can successfully process combinational quota.	
Configuration:	CF_1Ro or CF_1Ro1Gm1Mw	
SIP Initial condition:	IUT receives SIP message and then sends DIAMETER CCR message to the OCF. Following Test Purposes from ETSI TS 102 790-2 [3] can be reused for triggering: TP_IMST2_MW_GEN_07 (INVITE)	
Test purpose:	**Ensure that the IUT** **sends a CC-Request** containing a CC-Request-Type AVP indicating INITIAL_REQUEST containing a CC-Request-Number AVP containing a Multiple-Services-Credit-Control AVP containing a Requested-Service-Unit AVP **on receipt of a CC-Answer** containing a Result-Code AVP indicating DIAMETER-SUCCESS containing a CC-Request-Type AVP indicating INITIAL_REQUEST containing a Multiple-Services-Credit-Control AVP containing a Time-Quota-Mechanism AVP containing a Time-Quota-Type AVP indicating Table 6 containing a Base-Time-Interval AVP indicating the length of the base time interval **optionally** containing a Multiple-Services-Credit-Control AVP **sends a CC-Request** containing a Result-Code AVP indicating DIAMETER_SUCCESS containing a CC-Request-Type AVP indicating UPDATE_REQUEST containing a Multiple-Services-Credit-Control AVP containing a Granted-Service-Unit AVP indicating reserved units containing an Envelope AVP.	
Comments:		

Table 6: Time-Quota-Type AVP values

Test purpose variants	Reporting-Reason AVP values
VA_01	DISCRETE_TIME_PERIOD (0)
VA_02	CONTINUOUS_TIME_PERIOD (1)

TP_RO_CTF_OP_19	**Standards Reference:** **Clause 6.5.7¶19**	**PICS item:** **A.7/3.3**
Summary:	Verify that the IUT can successfully process combinational quota - DTP algorithm.	
Configuration:	CF_1Ro or CF_1Ro1Gm1Mw	
SIP Initial condition:	IUT receives SIP message and then sends DIAMETER CCR message to the OCF. Following Test Purposes from ETSI TS 102 790-2 [3] can be reused for triggering: TP_IMST2_MW_GEN_07 (INVITE)	
Test purpose:	**Ensure that the IUT** **sends a CC-Request** containing a CC-Request-Type AVP indicating INITIAL_REQUEST containing a CC-Request-Number AVP containing a Multiple-Services-Credit-Control AVP containing a Requested-Service-Unit AVP on **receipt of a CC-Answer** containing a Result-Code AVP indicating DIAMETER-SUCCESS containing a CC-Request-Type AVP indicating INITIAL_REQUEST containing a Multiple-Services-Credit-Control AVP containing a Time-Quota-Mechanism AVP containing a Time-Quota-Type AVP indicating DISCRETE_TIME_PERIOD containing a Base-Time-Interval AVP indicating the length of the base time interval containing a Quota-Consumption-Time AVP indicating a period equal to the Quota Consumption Time **optionally** containing a Multiple-Services-Credit-Control AVP **sends a CC-Request** containing a Result-Code AVP indicating DIAMETER_SUCCESS containing a CC-Request-Type AVP indicating UPDATE_REQUEST containing a Multiple-Services-Credit-Control AVP containing a Granted-Service-Unit AVP indicating reserved units containing an Envelope AVP containing an Envelope-Start-Time AVP containing an Envelope-Stop-Time AVP indicating a delta time equal to DTP_VALUE **optionally** containing a CC-Total-Octets AVP **optionally** containing a CC-Input-Octets AVP **optionally** containing a CC-Output-Octets AVP **optionally** containing a CC-Service-Specific-Unit AVP.	
Comments:		

TP_RO_CTF_OP_20	**Standards Reference:** **Clause 6.5.7¶5**	**PICS item:** **A.7/3.3**
Summary:	Verify that the IUT can successfully process combinational quota - CTP algorithm.	
Configuration:	CF_1Ro or CF_1Ro1Gm1Mw	
SIP Initial condition:	IUT receives SIP message and then sends DIAMETER CCR message to the OCF. Following Test Purposes from ETSI TS 102 790-2 [3] can be reused for triggering: TP_IMST2_MW_GEN_07 (INVITE)	
Test purpose:	**Ensure that the IUT** **sends a CC-Request** containing a CC-Request-Type AVP indicating INITIAL_REQUEST containing a CC-Request-Number AVP containing a Multiple-Services-Credit-Control AVP containing a Requested-Service-Unit AVP on **receipt of a CC-Answer** containing a Result-Code AVP indicating DIAMETER-SUCCESS containing a CC-Request-Type AVP indicating INITIAL_REQUEST containing a Multiple-Services-Credit-Control AVP containing a Time-Quota-Mechanism AVP containing a Time-Quota-Type AVP indicating CONTINUOUS_TIME_PERIOD containing a Base-Time-Interval AVP indicating the length of the base time interval containing a Quota-Consumption-Time AVP indicating a period equal to the Quota Consumption Time **optionally** containing a Multiple-Services-Credit-Control AVP **sends a CC-Request** containing a Result-Code AVP indicating DIAMETER_SUCCESS containing a CC-Request-Type AVP indicating UPDATE_REQUEST containing a Multiple-Services-Credit-Control AVP containing a Granted-Service-Unit AVP indicating reserved units containing an Envelope AVP containing an Envelope-Start-Time AVP containing an Envelope-Stop-Time AVP **not** indicating a delta time equal to CTP_VALUE	
Comments:		

TP_RO_CTF_OP_21	Standards Reference: Clause 6.5.7¶6	PICS item: A.7/3.3
Summary:	Verify that the IUT can successfully process combinational quota when Quota-Consumption-Time AVP is present.	
Configuration:	CF_1Ro or CF_1Ro1Gm1Mw	
SIP Initial condition:	IUT receives SIP message and then sends DIAMETER CCR message to the OCF. Following Test Purposes from ETSI TS 102 790-2 [3] can be reused for triggering: TP_IMST2_MW_GEN_07 (INVITE)	
Test purpose:	**Ensure that the IUT** **sends a CC-Request** containing a CC-Request-Type AVP indicating INITIAL_REQUEST containing a CC-Request-Number AVP containing a Multiple-Services-Credit-Control AVP containing a Requested-Service-Unit AVP on **receipt of a CC-Answer** containing a Result-Code AVP indicating DIAMETER-SUCCESS containing a CC-Request-Type AVP indicating INITIAL_REQUEST containing a Multiple-Services-Credit-Control AVP containing a Time-Quota-Mechanism AVP containing a Time-Quota-Type AVP indicating Table 7 containing a Base-Time-Interval AVP indicating the length of the base time interval containing a Quota-Consumption-Time AVP indicating a period equal to the Quota Consumption Time **optionally** containing a Multiple-Services-Credit-Control AVP **sends a CC-Request** containing a Result-Code AVP indicating DIAMETER_SUCCESS containing a CC-Request-Type AVP indicating UPDATE_REQUEST containing a Multiple-Services-Credit-Control AVP containing a Granted-Service-Unit AVP indicating reserved units containing an Envelope AVP.	
Comments:		

Table 7: Time-Quota-Type AVP values

test purpose variants	Reporting-Reason AVP values
VA_01	DISCRETE_TIME_PERIOD (0)
VA_02	CONTINUOUS_TIME_PERIOD (1)

History

Document history		
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