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Technical Specification

**IMS Network Testing (INT);
Signalling Connection Control Part
User Adaptation Layer (SUA);
(IETF RFC 3868);
Test Suite Structure and Test Purposes (TSS&TP)
Conformance testing**

Reference

DTS/INT-00075

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Foreword

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

1   Scope

The present document proposes a Test Suite Structure and Test Purposes (TSS&TP) for the SIGTRAN SUA protocol as described in RFC 3868 [1].

2   References

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

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

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2.1   Normative references

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

[1]   IETF RFC 3868 (2004): "Signalling Connection Control Part User Adaptation Layer (SUA)".

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

[3]   ISO/IEC 9646-2: "Information technology -- Open Systems Interconnection -- Conformance testing methodology and framework -- Part 2: Abstract Test Suite specification".

[4]   ISO/IEC 9646-3: "Information technology -- Open Systems Interconnection -- Conformance testing methodology and framework -- Part 3: The Tree and Tabular Combined Notation (TTCN)".

2.2   Informative references

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

Not applicable.

3   Definitions and abbreviations

3.1   Definitions

For the purposes of the present document, the terms and definitions given in SUA RFC 3868 [1], ISO/IEC 9646-1 [2] to -3 [4] and the following apply.

inOpportune: tests that handle invalid signalling exchanges of messages, i.e. signalling messages that are properly structured and correctly encoded but are used out of sequence

invalid: tests that handle valid signalling exchanges of messages, which are either not properly structured or incorrectly encoded

Test Purpose (TP): non-formal high-level description of a test, mainly using text

NOTE: This test description can be used as the basis for a formal test specification (e.g. Abstract Test Suite in TTCN). See ISO/IEC 9646-2 [3] and ISO/IEC 9646-3 [4].

valid: tests that handle valid signalling exchanges of messages, which are properly structured and correctly encoded

3.2 Abbreviations

For the purposes of the present document, the following abbreviations apply:

AS	Application Server
ASP	Application Server Process
ASPM	ASP Maintenance Procedures
ASPSM	Application Server Process State Maintenance
ASPTM	Application Server Process Traffic Maintenance
CLDT	Connectionless Data Transfer
CLDR	Connectionless Data Response
COAK	Connection Acknowledge
CODA	Connection Oriented Data Acknowledge
CODT	Connection Oriented Data Transfer
COERR	Connection Oriented Error
COIT	Inactivity Test
COREF	Connection Refused
I	Invalid
IUT	Implementation Under Test
MSG	MeSsaGing
MTR	Message Transfer
O	inOpportune
RELCO	Release Complete
RELRE	Release Request
RESCO	Reset Confirm
RESRE	Release Request
RKM	Routing Key Management
SCTP	Stream Control Transmission Protocol
SGP	Signalling Gateway Process
SUT	System Under Test
TSS	Test Suite Structure
V	Valid

4 Test Suite Structure (TSS)

4.1 Introduction

4.1.1 SUA entities

Test Purposes have been written for SUA Peers according to the SUA RFC 3868 [1]. Two kinds of entities are considered successively as IUT:

- Signalling Gateway Process.

- Application Server Process.
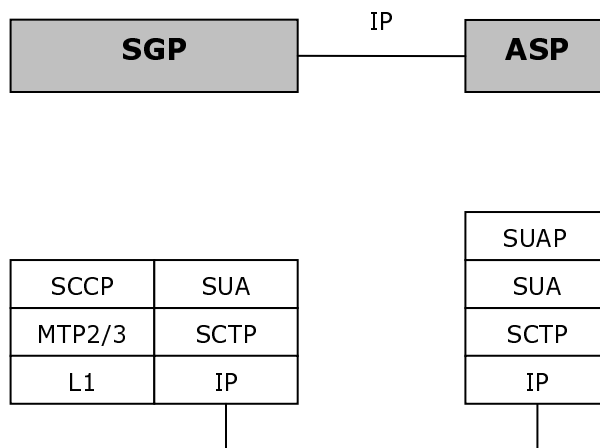
Figure 1: SUA protocol entities

To enable the verification of certain aspects of the protocol, certain test purposes will require the use of multiple ASPs within an AS.

4.1.2   General assumptions

Test Purposes have been written for behaviours requested with "MUST" or that appear as obvious in present form. In addition test purposes have been defined for implementation dependent behaviour, where at least one of the implementation options is mandatory.

A more complete set of torture tests for both ASPs and SGPs shall be provided.

4.1.3   System Under Test

In SIGTRAN SUA, one or more ASP can be contained within an ASP; furthermore, one or more SGP can be contained within an SGP.

ASPs and SGPs can be interconnected so that full redundancy is provided.

Several scenarios have been envisioned in the present document:

-    One ASP within the AS.

-    Several ASPs within the ASP.

-    One ASP connected to one SGP.

-    Several ASPs connected to one SGP.

4.2   Overview of the Test Suite Structure

The Test Suite Structures is based on the main functionalities as defined above.

Figure 2 shows the Test Suite Structure.

Last Sub groups may be subdivided in three subgroups: Valid behaviour (V), Invalid behaviour (I), inOpportune behaviour (O).

Test Suite	Main Functionalities	Functionality Subgroup	Test Group
SUA	SGP	ASP State Maintenance	V-I-O
		ASP Traffic Maintenance	V-I-O
		Message Transfer	V-I
		Routing Key Management	V-I
	ASP	ASP State Maintenance	V-I-O
		ASP Traffic Maintenance	V-I-O
		Message Transfer	V-I
		Routing Key Management	V-I

Figure 2: TSS for SUA

5   Test Purposes (TP)

5.1   Introduction

5.1.1   TP naming convention

Table 1: TP identifier naming convention scheme

Identifier: **<protocol>_<device under test>_<main functionality>_<type>_<nn>**

    <protocol>   SUA

    <device under test>   SGP (Signalling Gateway Process)
                                                      ASP (Application Server Process)

    <main functionality>   ASPM (ASP Maintenance procedures)
                                                      RKM (Routing Key Management)
                                                      MSG (MeSsaGing)

    <type>   Valid behaviour (V)
                                                      Invalid behaviour (I)
                                                      inOpportune behaviour (O)

    <nn>   sequential number   (01 to 99)

5.1.2   TP structure

Each test purpose is decomposed in six keywords:

- The **TPId** gives a unique identifier to each test purpose.

- The **Status** specifies whether the test purpose or the group is mandatory or optional according to RFC 3868 [1].

- The **Group Status** applies to all test purposes belonging to this group. Within the present document only test purposes that are mandatory have been defined.

- The **Precondition** determines the initial state of the SUT for the evaluating the test purpose.

- The **Reference** outlines the references in RFC 3868 [1] used to create the test purpose.

- The **Purpose** describes the objective of the test.

5.2 Test Purposes for Signalling Gateway Process (SGP)

5.2.1 ASP State Maintenance Procedures

5.2.1.1 Valid behaviour

TPId	SUA_SGP_ASPSM_V_01
Status	Mandatory
Pre-condition	Successfully established SCTP association between the SGP and the ASP ASP marked as ASP-DOWN at the SGP
Reference	[1] section: 4.3.4.1
Purpose	Ensure that the IUT, upon reception of an ASP Up message, responds with an ASP Up Ack.
Comments	This test case, even though included in SUA_SGP_ASPSM_V_02 validates the response with an ASP Up Ack regardless of the number of ASPs configured in the AS

TPId	SUA_SGP_ASPSM_V_02
Status	Mandatory
Pre-condition	Successfully established SCTP association between the SGP and the ASP One ASP configured within the AS ASP marked as ASP-DOWN at the SGP
Reference	[1] sections: 3.8.2 4.3.1 4.3.2 4.3.4.1 4.3.4.5
Purpose	Ensure that the IUT, upon reception of an ASP Up message, responds with an ASP Up Ack and sends a NOTIFY message indicating the AS state change to AS-INACTIVE
Comments	

TPId	SUA_SGP_ASPSM_V_03
Status	Mandatory
Pre-condition	Successfully established SCTP association between the SGP and the ASP ASP marked as ASP-INACTIVE at the SGP
Reference	[1] sections: 4.3.1 4.3.4.2
Purpose	Ensure that the IUT, upon reception of an ASP Down message, responds with an ASP Down Ack
Comments	

TPId	SUA_SGP_ASPSM_V_04
Status	Optional
Pre-condition	Successfully established SCTP association between the SGP and the ASP ASP marked as blocked at the SGP
Reference	[1] section: 4.3.4.1
Purpose	Ensure that the IUT, upon reception of an ASP Up message sent by an ASP marked as blocked at the SGP, responds with an ERROR message with reason 0x0d "Refused-Management Blocking"
Comments	

5.2.1.2 Invalid behaviour

TPId	SUA_SGP_ASPSM_I_01
Status	Mandatory
Pre-condition	Successfully established SCTP association between the SGP and the ASP
Reference	[1] sections: 3.1.1 4.3.4.1.1
Purpose	Ensure that the IUT, upon reception of an ASP Up message that contains an invalid SUA version (e.g. 2), responds with an ERROR message with reason 0x01 ("Invalid Version")
Comments	

TPId	SUA_SGP_ASPSM_I_02
Status	Mandatory
Pre-condition	Successfully established SCTP association between the SGP and the ASP ASP marked as **ASP-DOWN** at the SGP
Reference	[1] sections: 3.1.2 4.3.2
Purpose	Ensure that the IUT, upon reception of a message which class is 3 (ASPSM) and type is different from 0 (Reserved) 1 (ASP Up), 2 (ASP Down), 3 (BEAT), 4 (ASP Up Ack), 5 (ASP Down Ack) and 6 (BEAT Ack) responds with an ERROR message with reason 0x04 "Unsupported Message Type"
Comments	

TPId	SUA_SGP_ASPSM_I_03
Status	Mandatory
Pre-condition	Successfully established SCTP association between the SGP and the ASP ASP marked as **ASP-DOWN** at the SGP
Reference	[1] sections: 3.1.2 4.3.2
Purpose	Ensure that the IUT, upon reception of a message which class is 4 (ASPTM) responds with an ERROR message with reason 0x06 "Unexpected Message" or silently discards the message
Comments	

TPId	SUA_SGP_ASPSM_I_04
Status	Mandatory
Pre-condition	Successfully established SCTP association between the SGP and the ASP ASP marked as **ASP-INACTIVE** at the SGP
Reference	[1] sections: 3.1.2 4.3.2
Purpose	Ensure that the IUT, upon reception of a message which class is 3 (ASPSM) and type is different from 0 (Reserved) 1 (ASP Up), 2 (ASP Down), 3 (BEAT), 4 (ASP Up Ack), 5 (ASP Down Ack) and 6 (BEAT Ack) responds with an ERROR message with reason 0x04 "Unsupported Message Type"
Comments	

5.2.1.3 inOpportune behaviour

TPId	SUA_SGP_ASPSM_O_01
Status	Mandatory
Pre-condition	Successfully established SCTP association between the SGP and the ASP ASP marked as ASP-INACTIVE at the SGP
Reference	[1] sections: 4.3.1 4.3.4.1
Purpose	Ensure that the IUT, upon reception of an ASP Up message, responds with an ASP Up Ack
Comments	

TPId	SUA_SGP_ASPSM_O_02
Status	Mandatory
Pre-condition	Successfully established SCTP association between the SGP and the ASP ASP marked as ASP-ACTIVE at the SGP One ASP in the AS

Reference	[1] sections: 4.3.1
	                    4.3.4.1
	                    4.3.4.4

Purpose	Ensure that the IUT, upon reception of an ASP Up message, responds with an ASP Up Ack, sends an ERROR message with reason 0x06 "Unexpected Message" and sends a NOTIFY message indicating the AS state change to AS-INACTIVE
Comments	

TPId	SUA_SGP_ASPSM_O_03
Status	Mandatory
Pre-condition	Successfully established SCTP association between the SGP and the ASP ASP marked as **ASP-DOWN** at the SGP
Reference	[1] sections: 4.3.1 4.3.4.2
Purpose	Ensure that the IUT, upon reception of an ASP Down message, responds with an ASP Down Ack
Comments	

5.2.2   ASP Traffic Maintenance procedures

5.2.2.1   Valid behaviour

TPId	SUA_SGP_ASPTM_V_01
Status	Mandatory
Pre-condition	Successfully established SCTP association between the SGP and the ASP ASP marked as ASP-INACTIVE at the SGP
Reference	[1] sections: 4.3.1 4.3.4.3
Purpose	Ensure that the IUT, upon reception of an ASP Active message, responds with an ASP Active Ack
Comments	

TPId	SUA_SGP_ASPTM_V_02
Status	Mandatory
Pre-condition	Successfully established SCTP association between the SGP and the ASP One ASP configured in the AS ASP marked as ASP-INACTIVE at the SGP

Reference	[1] sections: 4.3.1
	                    4.3.2
	                    4.3.4.3

Purpose	Ensure that the IUT, upon reception of an ASP Active message, responds with an ASP Active Ack and sends a NOTIFY message indicating the AS state change to AS-ACTIVE
Comments	

TPId	SUA_SGP_ASPTM_V_03
Status	Mandatory
Pre-condition	Successfully established SCTP association between the SGP and the ASP ASP marked as ASP-INACTIVE at the SGP
Reference	[1] section: 4.3.4.3
Purpose	Ensure that the IUT, upon reception of an ASP Active message that contains a Routing Context, responds with an ASP Active Ack that contains the Routing Context
Comments	

TPId	SUA_SGP_ASPTM_V_04
Status	Mandatory
Pre-condition	Successfully established SCTP association between the SGP and the ASP ASP marked as ASP-ACTIVE at the SGP
Reference	[1] sections: 4.3.1 4.3.4.4
Purpose	Ensure that the IUT, upon reception of an ASP Inactive message, responds with an ASP Inactive Ack
Comments	

TPId	SUA_SGP_ASPTM_V_05
Status	Mandatory
Pre-condition	Successfully established SCTP association between the SGP and the ASP ASP marked as ASP-ACTIVE at the SGP One ASP in the AS

Reference	[1] sections: 4.3.1
	                    4.3.2
	                    4.3.4.4

Status	Mandatory
Purpose	Ensure that the IUT, upon reception of an ASP Inactive message, responds with an ASP Inactive Ack and sends a NOTIFY message indicating the AS state change to AS-PENDING
Comments	

TPId	SUA_SGP_ASPTM_V_06
Status	Mandatory
Pre-condition	Successfully established SCTP association between the SGP and the ASP ASP marked as ASP-ACTIVE at the SGP
Reference	[1] section: 4.3.4.6
Purpose	Ensure that the IUT, upon reception of a Heartbeat message, responds with a Heartbeat Ack
Comments	

TPId	SUA_SGP_ASPTM_V_07
Status	Mandatory
Pre-condition	Successfully established SCTP association between the SGP and the ASP ASP marked as ASP-ACTIVE at the SGP
Reference	[1] section: 4.3.4.6
Purpose	Ensure that the IUT, upon reception of a Heartbeat message that contains an opaque Heartbeat Data parameter, responds with a Heartbeat Ack that echoes back unchanged the opaque Heartbeat Data parameter
Comments	

TPId	SUA_SGP_ASPTM_V_08
Status	Optional
Pre-condition	Successfully established SCTP association between the SGP and the ASP 2 ASP in the AS Both ASPs marked as ASP ACTIVE at the SGP AS configure in Broadcast mode
Reference	[1] section: 4.3.4.4
Purpose	Ensure that the IUT, upon reception of an ASP Inactive message from ASP1 responds with an ASP Inactive Ack and sends a NOTIFY message with status "Insufficient ASP Resources Active in AS" to all Inactive ASPs
Comments	The use of "Broadcast" mode is not recommended by ETSI

TPId	SUA_SGP_ASPTM_V_09
Status	Optional
Pre-condition	Successfully established SCTP association between the SGP and the ASP 2 ASP in the AS ASP1 marked as ASP INACTIVE at the SGP ASP2 marked as ASP ACTIVE at the SGP ASP1 and ASP2 configured in "Override" mode
Reference	[1] section: 4.3.4.3
Purpose	Ensure that the IUT, upon reception of an ASP Active message from ASP1 that indicates a Traffic Handling Type of "Override", responds with an ASP Active Ack and sends a NOTIFY message with status "Alternate ASP Active" to ASP 2
Comments	

TPId	SUA_SGP_ASPTM_V_10
Status	Optional
Pre-condition	Successfully established SCTP association between the SGP and the ASP 2 ASP in the AS ASP1 marked as ASP INACTIVE at the SGP ASP2 marked as ASP ACTIVE at the SGP
Reference	[1] section: 4.3.4.3
Purpose	Ensure that the IUT, upon reception of an ASP Active message from ASP1 that indicates a Traffic Handling Type of "Override", responds with an ASP Active Ack and sends a NOTIFY message with status "Alternate ASP Active" to ASP 2 that includes the ASP ID of the Alternate ASP
Comments	

5.2.2.2   Invalid behaviour

TPId	SUA_SGP_ASPTM_I_01
Status	Optional
Pre-condition	Successfully established SCTP association between the SGP and the ASP ASP marked as ASP-INACTIVE at the SGP

Reference	[1] sections: 3.1.1
	                   3.8.1
	                   4.3.1
	                   4.3.4.3

Purpose	Ensure that the IUT, upon reception of an ASP Active message that contains an invalid SUA version (e.g. 2), responds with an ERROR message with reason 0x01 ("Invalid Version")
Comments	

TPId	SUA_SGP_ASPTM_I_02
Status	Optional
Pre-condition	Successfully established SCTP association between the SGP and the ASP ASP marked as ASP-INACTIVE at the SGP One ASP in the AS
Reference	[1] sections: 3.7.1 3.8.1 ETSI Profile [Broadcast mode not supported]
Purpose	Ensure that the IUT, upon reception of an ASP Active, that indicates a Traffic Mode Type of "Broadcast", responds with an ERROR message with reason 0x05 "Unsupported Traffic Mode Type"
Comments	

TPId	SUA_SGP_ASPTM_I_03
Status	Mandatory
Pre-condition	Successfully established SCTP association between the SGP and the ASP ASP marked as ASP-INACTIVE at the SGP One ASP in the AS
Reference	[1] sections: 3.7.1 3.8.1
Purpose	Ensure that the IUT, upon reception of an ASP Active, that indicates a Traffic Mode Type of "4" (i.e. not valid), responds with an ERROR message with reason 0x05 "Unsupported Traffic Mode Type"
Comments	

TPId	SUA_SGP_ASPTM_I_04
Status	Mandatory
Pre-condition	Successfully established SCTP association between the SGP and the ASP ASP marked as ASP-INACTIVE at the SGP
Reference	[1] section: 4.3.4.3
Purpose	Ensure that the IUT, upon reception of an ASP Active message that contains a Routing Context which has not been provisioned at the SGP, responds with ERROR message with reason "Invalid Routing Context"
Comments	

TPId	SUA_SGP_ASPTM_I_05
Status	Mandatory
Pre-condition	Successfully established SCTP association between the SGP and the ASP ASP marked as ASP-INACTIVE at the SGP
Reference	[1] sections: 3.1.2 3.8.1
Purpose	Ensure that the IUT, upon reception of a message which class is 4 (ASPTM) and type is different from 0 (Reserved) 1 (ASP Active), 2 (ASP Inactive), 3 (ASP Active Ack), and 4 (ASP Inactive Ack) responds with an ERROR message with reason 0x04 "Unsupported Message Type"
Comments	

TPId	SUA_SGP_ASPTM_I_06
Status	Mandatory
Pre-condition	Successfully established SCTP association between the SGP and the ASP ASP marked as ASP-ACTIVE at the SGP
Reference	[1] sections: 3.1.2 3.8.1
Purpose	Ensure that the IUT, upon reception of a message which class is 4 (ASPTM) and type is different from 0 (Reserved) 1(ASP Active), 2 (ASP Inactive), 3 (ASP Active Ack), and 4 (ASP Inactive Ack) responds with an ERROR message with reason 0x04 "Unsupported Message Type"
Comments	

TPId	SUA_SGP_ASPTM_I_07
Status	Optional
Pre-condition	Successfully established SCTP association between the SGP and the ASP 2 ASPs in AS ASPs marked as ASP-ACTIVE at the SGP
Reference	[1] sections: 3.8.2 4.3.3
Purpose	Ensure that the IUT that has lost SCTP connectivity with ASP1 sends a NOTIFY message with status "ASP Failure" to ASP2
Comments	

TPId	SUA_SGP_ASPTM_I_08
Status	Mandatory
Pre-condition	Successfully established SCTP association between the SGP and the ASP ASP marked as ASP-ACTIVE at the SGP
Reference	[1] sections: 3.1.4 4.3.4.4
Purpose	Ensure that the IUT, upon reception of an ASP Inactive message, responds with an ASP Inactive Ack which Message Length, in the Common Message Header, includes the parameter padding bytes, if any
Comments	

5.2.2.3   inOpportune behaviour

TPId	SUA_SGP_ASPTM_O_01
Status	Mandatory
Pre-condition	Successfully established SCTP association between the SGP and the ASP ASP marked as ASP-ACTIVE at the SGP
Reference	[1] section: 4.3.4.3
Purpose	Ensure that the IUT, upon reception of an ASP Active, responds with an ASP Active Ack
Comments	

TPId	SUA_SGP_ASPTM_O_02
Status	Mandatory
Pre-condition	Successfully established SCTP association between the SGP and the ASP ASP marked as ASP-INACTIVE at the SGP
Reference	[1] section: 4.3.4.4
Purpose	Ensure that the IUT, upon reception of an ASP Inactive, responds with an ASP Inactive Ack
Comments	

5.2.3   Message Transfer

5.2.3.1   Valid behaviour

TPId	SUA_SGP_MTR_V_01
Status	Optional
Pre-condition	Successfully established SCTP association between the SGP and the ASP ASPs marked as ASP Active at the SGP Multiple Routing Keys and Routing Contexts are being used across a common association
Reference	[1] section: 3.3.1
Purpose	Ensure that the IUT includes a valid Routing Context in any Payload Data Message
Comments	FIXME

TPId	SUA_SGP_MTR_V_02
Status	Mandatory
Pre-condition	Successfully established SCTP association between the SGP and the ASP ASPs marked as ASP Active at the SGP
Reference	[1] section: 3.3.1
Purpose	Ensure that the IUT includes the Protocol Data parameter in any Payload Data Message
Comments	FIXME

TPId	SUA_SGP_MTR_V_03
Status	Mandatory
Pre-condition	Successfully established SCTP association between the SGP and the ASP
Reference	[1] section: 4.1.1
Purpose	Ensure that the IUT sends DATA messages on any valid SCTP stream other than stream "0"
Comments	FIXME

TPId	SUA_SGP_MTR_V_04
Status	Optional
Pre-condition	Successfully established SCTP association between the SGP and the ASP AS configured as Broadcast mode At least one ASP within the AS marked as ASP-ACTIVE
Reference	[1] section: 4.3.4.3
Purpose	Ensure that the IUT tags the first DATA message broadcast whenever an ASP becomes active
Comments	FIXME

5.2.3.2   Invalid behaviour

TPId	SUA_SGP_MTR_I_01
Status	Optional
Pre-condition	Successfully established SCTP association between the SGP and the ASP ASP marked as ASP-ACTIVE at the SGP
Reference	[1] section: 3.8.1
Purpose	Ensure that the IUT, upon reception of a DATA message that specifies a protocol version 2, responds with an ERROR message with reason 0x01 "Invalid Version"
Comments	

TPId	SUA_SGP_MTR_I_02
Status	Mandatory
Pre-condition	Successfully established SCTP association between the SGP and the ASP ASP marked as ASP-ACTIVE at the SGP
Reference	[1] sections: 3.1.2 3.8.1
Purpose	Ensure that the IUT, upon reception of a message that specifies a class different from 0 ("Management Message"), 2 ("SS7 Signalling Network Message"), 3 ("ASP State Maintenance Message"), 4 ("ASP Traffic Maintenance Message"), 7 ("connectionless Messages), 8 ("Connection Oriented Messages") or 9 ("Routing Key Management"), responds with an ERROR message with reason 0x03 "Unsupported Message Class"
Comments	

TPId	SUA_SGP_MTR_I_03
Status	Mandatory
Pre-condition	Successfully established SCTP association between the SGP and the ASP ASP marked as ASP-ACTIVE at the SGP
Reference	[1] sections: 3.1.2 3.8.1
Purpose	Ensure that the IUT, upon reception of a message that specifies a class equal to 7 ("Connectionless Messages") and a type different from 0 ("Reserved"), and 1 ("CLDT Messages") and 2 ("CLDR Messages") responds with an ERROR message with reason 0x04 "Unsupported Message Type"
Comments	

TPId	SUA_SGP_MTR_I_04
Status	Mandatory
Pre-condition	Successfully established SCTP association between the SGP and the ASP ASP marked as ASP-ACTIVE at the SGP
Reference	[1] sections: 3.1.2 　　　　　　　3.8.1
Purpose	Ensure that the IUT, upon reception of a message that specifies a class equal to 8 ("Connection-Oriented Messages") and a type different from 0 ("Reserved"), and 1 ("CORE Messages"), 2 ("COAK Messages"), 3 ("COREF Messages"), 4 ("RELRE Messages"), 5 ("RELCO Messages"), 6 ("RESCO Messages"), 7 ("RESRE Messages"), 8 ("CODT Messages"), 9 ("CODA Messages"), 10 ("COERR Messages") and 11 ("COIT Messages") responds with an ERROR message with reason 0x04 "Unsupported Message Type"
Comments	

5.2.3.3 inOpportune Behaviour

Void

5.3 Test Purposes for Application Server Process

5.3.1 ASP State Maintenance Procedures

5.3.1.1 Valid behaviour

TPId	SUA_ASP_ASPSM_V_01
Status	Mandatory
Pre-condition	Successfully established SCTP association between the SGP and the ASP ASP marked as ASP-DOWN at the SGP
Reference	[1] sections: 3.1.1 　　　　　　4.3.4.1
Purpose	Ensure that the IUT sends an ASP Up with a Version in the Common Message Header set to 1
Comments	

TPId	SUA_ASP_ASPSM_V_02
Status	Optional
Pre-condition	Successfully established SCTP association between the SGP and the ASP ASP marked as ASP-INACTIVE at the SGP
Reference	[1] sections: 3.1.1 　　　　　　4.3.4.2
Purpose	Ensure that the IUT sends an ASP Down with a Version in the Common Message Header set to 1
Comments	

5.3.1.2 Invalid behaviour

TPId	SUA_ASP_ASPSM_I_01
Status	Optional
Pre-condition	Successfully established SCTP association between the SGP and the ASP ASP marked as ASP-INACTIVE at the SGP
Reference	[1] sections: 3.1.1 　　　　　　　3.8.1
Purpose	Ensure that the IUT, upon reception of an ASP Up Ack that indicates a version 2 of the SUA protocol, responds with an ERROR message with reason 0x01 "Invalid Version"
Comments	

TPId	SUA_ASP_ASPSM_I_02
Status	Optional
Pre-condition	Successfully established SCTP association between the SGP and the ASP ASP marked as ASP-INACTIVE at the SGP
Reference	[1] sections: 3.1.1 3.8.1
Purpose	Ensure that the IUT, upon reception of an ASP Down Ack that indicates a version 2 of the SUA protocol, responds with an ERROR message with reason 0x01 "Invalid Version"
Comments	

TPId	SUA_ASP_ASPSM_I_03
Status	Mandatory
Pre-condition	Successfully established SCTP association between the SGP and the ASP ASP marked as ASP-INACTIVE at the SGP
Reference	[1] sections: 3.1.2 3.8.1
Purpose	Ensure that the IUT, after sending an ASP Up, upon reception of a message which class is 3 (ASPSM) and type is different from 0 (Reserved) 1(ASP Up), 2 (ASP Down), 3 (Heartbeat), 4 (ASP Up Ack), and 5 (ASP Down Ack) responds with an ERROR message with reason 0x04 "Unsupported Message Type"
Comments	

5.3.1.3   inOpportune behaviour

TPId	SUA_ASP_ASPSM_O_01
Status	Mandatory
Pre-condition	Successfully established SCTP association between the SGP and the ASP ASP marked as ASP-DOWN at the SGP
Reference	[1] section: 4.3.4.1
Purpose	Ensure that the IUT, after sending an ASP Up, upon reception of an ASP Down Ack, does not send an ASP Active
Comments	

TPId	SUA_ASP_ASPSM_O_02
Status	Mandatory
Pre-condition	Successfully established SCTP association between the SGP and the ASP ASP marked as ASP-DOWN at the SGP
Reference	[1] section: 3.8.1
Purpose	Ensure that the IUT, after sending an ASP Up, upon reception of an ASP Active Ack, does not send DATA messages
Comments	The IUT MAY send an error message "unexpected message" and/or retransmit the ASP Up after T(Ack) expiry

5.3.2   ASP Traffic Maintenance Procedures

5.3.2.1   Valid behaviour

TPId	SUA_ASP_ASPTM_V_01
Status	Mandatory
Pre-condition	Successfully established SCTP association between the SGP and the ASP ASP marked as ASP-INACTIVE at the SGP
Reference	[1] section: 4.3.4.3
Purpose	Ensure that the IUT sends an ASP Active to indicate that it is ready to start processing traffic
Comments	

TPId	SUA_ASP_ASPTM_V_02
Status	Optional
Pre-condition	Successfully established SCTP association between the SGP and the ASP ASP marked as ASP-INACTIVE at the SGP
Reference	[1] sections: 3.1.1 4.3.4.3
Purpose	Ensure that the IUT sends an ASP Active with a Version in the Common Message Header set to 1
Comments	

TPId	SUA_ASP_ASPTM_V_03
Status	Optional
Pre-condition	Successfully established SCTP association between the SGP and the ASP ASP marked as ASP-ACTIVE at the SGP
Reference	[1] sections: 3.1.1 4.3.4.4
Purpose	Ensure that the IUT sends an ASP Inactive with a Version in the Common Message Header set to 1
Comments	

TPId	SUA_ASP_ASPTM_V_04
Status	Mandatory
Pre-condition	Successfully established SCTP association between the SGP and the ASP ASP marked as ASP-ACTIVE at the SGP
Reference	[1] section: 4.3.4.6
Purpose	Ensure that the IUT, upon reception of a Heartbeat message, responds with a Heartbeat Ack
Comments	

TPId	SUA_ASP_ASPTM_V_05
Status	Mandatory
Pre-condition	Successfully established SCTP association between the SGP and the ASP ASP marked as ASP-ACTIVE at the SGP
Reference	[1] section: 4.3.4.6
Purpose	Ensure that the IUT, upon reception of a Heartbeat message that contains an opaque Heartbeat Data parameter, responds with a Heartbeat Ack that echoes back unchanged the opaque Heartbeat Data parameter
Comments	

5.3.2.2   Invalid behaviour

TPId	SUA_ASP_ASPTM_I_01
Status	Optional
Pre-condition	Successfully established SCTP association between the SGP and the ASP ASP marked as ASP-INACTIVE at the SGP
Reference	[1] section: 3.8.1
Purpose	Ensure that the IUT, upon reception of an ASP Active Ack that indicates a version 2 of the SUA protocol, responds with an ERROR message with reason 0x01 "Invalid Version" and does not send DATA messages since the ASP Active Ack was invalid
Comments	

TPId	SUA_ASP_ASPTM_I_02
Status	Optional
Pre-condition	Successfully established SCTP association between the SGP and the ASP ASP marked as ASP-INACTIVE at the SGP
Reference	[1] section: 3.8.1
Purpose	Ensure that the IUT, upon reception of an ASP Inactive Ack that indicates a version 2 of the SUA protocol, responds with an ERROR message with reason 0x01 "Invalid Version"
Comments	

TPId	SUA_ASP_ASPTM_I_03
Status	Mandatory
Pre-condition	Successfully established SCTP association between the SGP and the ASP ASP marked as ASP-DOWN at the SGP
Reference	[1] sections: 3.1.2 3.8.1
Purpose	Ensure that the IUT, after sending an ASP Active, upon reception of a message which class is 4 (ASPTM) and type is different from 0 (Reserved) 1 (ASP Active), 2 (ASP Inactive), 3 (ASP Active Ack), and 4 (ASP Inactive Ack), responds with an ERROR message with reason 0x04 "Unsupported Message Type"
Comments	

5.3.2.3   inOpportune behaviour

TPId	SUA_ASP_ASPTM_O_01
Status	Mandatory
Pre-condition	Successfully established SCTP association between the SGP and the ASP ASP marked as ASP-INACTIVE at the SGP
Reference	[1] sections: 3.8.1 4.3.4.3
Purpose	Ensure that the IUT, after sending an ASP Active, upon reception of an ASP Up Ack, does not send DATA messages
Comments	The IUT MAY send an error message "unexpected message" and/or retransmit the ASP Active after T(Ack) expiry

5.3.3   Message Transfer

5.3.3.1   Valid behaviour

TPId	SUA_ASP_MTR_V_01
Status	Mandatory
Pre-condition	Successfully established SCTP association between the SGP and the ASP ASPs marked as ASP Active at the SGP Multiple Routing Keys and Routing Contexts are being used across a common association
Reference	[1] section: 3.3.1
Purpose	Ensure that the IUT includes the Routing Context in any Payload Data Message
Comments	FIXME

TPId	SUA_ASP_MTR_V_02
Status	Optional
Pre-condition	Successfully established SCTP association between the SGP and the ASP ASPs marked as ASP Active at the SGP Multiple Routing Keys and Routing Contexts are being used across a common association
Reference	[1] section: 3.3.1
Purpose	Ensure that the IUT includes the Protocol Data parameter in any Payload Data Message
Comments	FIXME

TPId	SUA_ASP_MTR_V_03
Status	Mandatory
Pre-condition	Successfully established SCTP association between the SGP and the ASP
Reference	[1] section: 4.1.1
Purpose	Ensure that the IUT sends DATA messages on a valid SCTP stream other than stream "0"
Comments	FIXME

5.3.3.2 Invalid behaviour

TPId	SUA_ASP_MTR_I_01
Status	Optional
Pre-condition	Successfully established SCTP association between the SGP and the ASP ASP marked as ASP-ACTIVE at the SGP
Reference	[1] section: 3.8.1
Purpose	Ensure that the IUT, upon reception of a DATA message that specifies a protocol version 2, responds with an ERROR message with reason 0x01 "Invalid Version"
Comments	

TPId	SUA_ASP_MTR_I_02
Status	Mandatory
Pre-condition	Successfully established SCTP association between the SGP and the ASP ASP marked as ASP-ACTIVE at the SGP
Reference	[1] sections: 3.1.2 3.8.1
Purpose	Ensure that the IUT, upon reception of a message that specifies a class different from 0 ("Management Message"), 2 ("SS7 Signalling Network Message"), 3 ("ASP State Maintenance Message"), 4 ("ASP Traffic Maintenance Message"), 7 ("connectionless Messages), 8 ("Connection Oriented Messages") or 9 ("Routing Key Management"), responds with an ERROR message with reason 0x03 "Unsupported Message Class"
Comments	

TPId	SUA_ASP_MTR_I_03
Status	Mandatory
Pre-condition	Successfully established SCTP association between the SGP and the ASP ASP marked as ASP-ACTIVE at the SGP
Reference	[1] sections: 3.1.2 3.8.1
Purpose	Ensure that the IUT, upon reception of a message that specifies a class equal to 7 ("Connectionless Messages") and a type different from 0 ("Reserved"), and 1 ("CLDT Messages") and 2 ("CLDR Messages") responds with an ERROR message with reason 0x04 "Unsupported Message Type"
Comments	

TPId	SUA_ASP_MTR_I_04
Status	Mandatory
Pre-condition	Successfully established SCTP association between the SGP and the ASP ASP marked as ASP-ACTIVE at the SGP
Reference	[1] sections: 3.1.2 3.8.1
Purpose	Ensure that the IUT, upon reception of a message that specifies a class equal to 8 ("Connection-Oriented Messages") and a type different from 0 ("Reserved"), and 1 ("CORE Messages"), 2 ("COAK Messages"), 3 ("COREF Messages"), 4 ("RELRE Messages"), 5 ("RELCO Messages"), 6 ("RESCO Messages"), 7 ("RESRE Messages"), 8 ("CODT Messages"), 9 ("CODA Messages"), 10 ("COERR Messages") and 11 ("COIT Messages") responds with an ERROR message with reason 0x04 "Unsupported Message Type"
Comments	

Annex A (informative):
Bibliography

- ETSI TS 102 143: "Services and Protocols for Advanced networks (SPAN); MTP/SCCP/SSCOP and SIGTRAN (Transport of SS7 over IP); Signalling connection control part User Adaptation layer (SUA) (2003)".

History

Document history		
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