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Intelligentno omrežje (IN) - Prvi nabor zmožnosti (CS1) inteligentnega omrežja - Jedrni aplikacijski protokol inteligentnega omrežja (INAP) - 9. del: Zgradba preskušalnega niza in namena preskušanja (TSS&TP) - Specifikacija vmesnika med funkcijo krmiljenja storitev (SCF) in funkcijo preklapljanja storitev (SSF) ter med funkcijo krmiljenja storitev (SCF) in funkcijo posebnih virov (SRF)

Intelligent Network (IN); Intelligent Network Capability Set 1 (CS1); Core Intelligent Network Application Protocol (INAP); Part 9: Test Suite Structure and Test Purposes (TSS&TP) specification for the Service Control Function (SCF) to Service Switching Function and the SCF to Specialized Resource Function (SRF) interfaces

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Part 9: Test Suite Structure and Test Purposes (TSS&TP)
specification for the Service Control Function (SCF) to
Service Switching Function (SSF) and the SCF to
Specialized Resource Function (SRF) interfaces**

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Foreword

This European Telecommunication Standard (ETS) has been produced by the Signalling Protocols and Switching (SPS) Technical Committee of the European Telecommunications Standards Institute (ETSI).

This ETS is part 9 of a multi-part standard covering the Capability Set 1 (CS1) core Intelligent Network Application Protocol (INAP) as described below:

- Part 1: "Protocol specification";
- Part 2: "Protocol Implementation Conformance Statement (PICS) proforma specification for Service Switching Function (SSF), Specialized Resource Function (SRF) and Service Control Function (SCF)";
- Part 3: "Test Suite Structure and Test Purposes (TSS&TP) specification for Service Switching Function (SSF) and Specialized Resource Function (SRF)";
- Part 4: "Abstract Test Suite (ATS) and partial Protocol Implementation eXtra Information for Testing (PIXIT) proforma specification for Service Switching Function (SSF) and Specialized Resource Function (SRF)";
- Part 5: "Protocol specification for the Service Control Function (SCF) - Service Data Function (SDF) interface";
- Part 6: "Protocol Implementation Conformance Statement proforma specification for the Service Control Function (SCF) - Service Data Function (SDF) interface";
- Part 9: "Test Suite Structure and Test Purposes (TSS&TP) specification for the Service Control Function (SCF) to Service Switching Function (SSF) and the SCF to Specialized Resource Function (SRF) interface."**

NOTE: Parts 7 and 8 are currently not planned.

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Introduction

In order to be able to perform conformance testing for the core INAP SCF-SSF and SCF-SRF interfaces, a test suite needs to be available, giving detailed and unambiguous test cases that can be used for the conformance test campaign.

Before any test suite can be developed, it needs to be known which functional aspects needs to be tested, and what is the structure of the test suite. This ETS contains the test purposes and the test suite structure.

For testing core INAP SCF-SSF and SCF-SRF interfaces some kind of test functionality needs to be available that replaces the normal Service Logic and that configures the SCF's behaviour in a desired and predictable way. This test functionality may be implemented in various ways like a test responder or by creating a test service using Global Service Logic. In order to assist the implementors of such test functionality, examples are given of the latter possibility in annex B.

The test purposes in this ETS use a particular field of an operation to "trigger" the SCF to perform a particular behaviour e.g. to issue an operation to the SSF. The field "calledPartyNumber" of the "InitialDP" operation shall be used for this purpose.

Clause 1 defines the scope in which this ETS can be placed. In clause 2 the references to other relevant literature are given followed by a list of definitions and abbreviations in clause 3.

In clause 4 the Test Suite Structure is described. This includes a description of all defined branches in the Test Suite Structure as well as an overview of the possible physical scenarios on which the Test Purposes are based.

Clause 5 contains all the Test Purposes, each one consisting of a preamble, the actual test purpose, and a postamble.

In annex A a list is given of all values for the calledPartyNumber field of the InitialDP operation that are used to remotely control the behaviour of the test functionality that replaces the normal Service Logic.

Annex B gives examples of how the needed test functionality at the Service Logic side of the SCF can be implemented using Service Logic building blocks.

Finally, annex C gives an overview of possible Abstract Test Methods that can be used to execute the test cases derived from the Test Purposes as described in this ETS.

Annex A is a normative annex that needs to be used by implementors of an Abstract Test Case while annex B and annex C informative only. The contents of annex B and C are rather meant to advise than to restrict the users of the ETS.

1 Scope

This European Telecommunication Standard (ETS) specifies the Test Suite Structure and Test Purposes (TSS&TP) for the Service Control Function (SCF) to Service Switching Function (SSF) and the SCF to Specialized Resource Function (SRF) interfaces of the core Intelligent Network Application Protocol (INAP) Capability Set 1 (CS1) according to ETS 300 374-1 [1].

ISO/IEC 9646-1 [3] and ISO/IEC 9646-2 [4] are used as the basis for the test methodology.

2 Normative references

This ETS incorporates by dated and undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this ETS only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

- [1] ETS 300 374-1 (1994): "Intelligent Network (IN); Intelligent Network Capability Set 1 (CS1); Core Intelligent Network Application Protocol (INAP); Part 1: Protocol specification".
- [2] ETS 300 374-2 (1996): "Intelligent Network (IN); Intelligent Network Capability Set 1 (CS1); Core Intelligent Network Application Protocol (INAP); Part 2: Protocol Implementation Conformance Statement (PICS) proforma specification for Service Switching Function (SSF), Specialized Resource Function (SRF) and Service Control Function (SCF)".
- [3] ISO/IEC 9646-1: "Information technology - Open Systems Interconnection - Conformance Testing Methodology and Framework - Part 1: General concepts".
- [4] ISO/IEC 9646-2: "Information technology - Open Systems Interconnection - Conformance Testing Methodology and Framework - Part 2: Abstract Test Suite Specification".

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3 Definitions and abbreviations

3.1 Definitions

For the definitions of Implementation Under Test (IUT), System Under Test (SUT), Abstract Test Suite (ATS) and Protocol Implementation Conformance Statement (PICS) refer to ISO/IEC 9646-1 [3].

3.2 Abbreviations

For the purposes of this ETS, the following abbreviations apply:

aC	SCF assist with relay handling
ATM	Abstract Test Method
ATS	Abstract Test Suite
bC	Basic SCF
BI	Invalid Behaviour test
BIT	Basic Interconnection Test
BO	inOpportune Behaviour test
BV	Valid Behaviour test
CA	CApability test
EDP-N	Event Detection Point - Notification
EDP-R	Event Detection Point - Request
ETS	European Telecommunication Standard
FE	Functional Entity
FSM	Finite State Machine
GSL	Global Service Logic
IN	Intelligent Network
INAP	Intelligent Network Application Protocol

IP	Intelligent Peripheral
ISO	International Standard Organisation
IUT	Implementation Under Test
LT	Lower Tester
pC	SCF direct path IP handling
PCO	Point of Control and Observation
PDU	Protocol Data Unit
PICS	Protocol Implementation Conformance Statement
rC	SCF-SSF relay handling
SCF	Service Control Functions
SCME	Service Control Management Entity
SCP	Service Control Point
SDF	Service Data Function
SDP	Service Data Point
SL	Service Logic
SRF	Specialized Resource Function
SSF	Service Switching Function
SSP	Service Switching Point
SUT	System Under Test
TCAP	Transaction Capabilities Application Part
TMP	Test Management Protocol
TP	Test Purpose
TSS	Test Suite Structure
UT	Upper Tester

4 Test Suite Structure (TSS)

4.1 Test Groups

4.1.1 Interface Groups

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In the test suite structure 4 interface groups shall be used that are described in the following subclauses.

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4.1.1.1 Basic SCF (bC) [\(bC\)/standards.iteh.ai/catalog/standards/sist/95cfb2a0-a07b-471c-b8f9-7d14938e3ea9/sist-ets-300-374-9-1998](#)

Regarding ETS 300 374-1 [1], clauses 7, 8, 9 and 10, the defined test purposes cover the INAP procedures at the SCP for the basic functions. The basic functions (bC) are the INAP procedures at the SCP for the following operations:

- ActivateServiceFiltering
- ActivityTest
- ApplyCharging
- ApplyChargingReport
- CallGap
- CallInformationRequest
- CallInformationReport
- CollectInformation
- Connect
- Continue
- EventNotificationCharging
- EventReportBCSM
- FurnishChargingInformation
- InitialDP
- InitiateCallAttempt
- ReleaseCall
- RequestNotificationChargingEvent
- RequestReportBCSMEvent
- ResetTimer
- SendChargingInformation
- ServiceFilteringResponse

4.1.1.2 SCF-SSF relay handling (rC)

Regarding ETS 300 374-1 [1], clauses 7, 8, 9 and 10, the defined test purposes cover the INAP procedures at the SCP needed in addition to the basic functions (bC) for the interaction with the SSF relay. These are the procedures for the following operations:

- Cancel (PlayAnnouncement, PromptAndCollectUserInformation)
- ConnectToResource
- DisconnectForwardConnection
- PlayAnnouncement
- PromptAndCollectUserInformation
- SpecializedResourceReport

4.1.1.3 SCF assist with relay handling (aC)

Regarding ETS 300 374-1 [1], clauses 7, 8, 9 and 10, the defined test purposes cover the INAP procedures at the SCP needed in addition to the basic functions (bC) and the relay functions (rC) for the interaction with the assisting SSF with relay handling. These are the procedures for the following operations:

- AssistRequestInstructions;
- EstablishTemporaryConnection.

4.1.1.4 SCF direct path IP handling (pC)

Regarding ETS 300 374-1 [1], clauses 7, 8, 9 and 10, the defined test purposes cover the INAP procedures at the SCP needed in addition to the basic functions (bC) for the interaction with the IP in case of a direct path. These are the procedures for the following operations:

- AssistRequestInstructions
- Cancel
- DisconnectForwardConnection
- EstablishTemporaryConnection
- PlayAnnouncement
- PromptAndCollectUserInformation
- SpecializedResourceReport

4.1.2 Main Test Groups

For each interface group the test suite structure is subdivided into *main test groups*. Each main test group contains test cases which test the IUT's capabilities, valid behaviour, invalid behaviour and inopportune behaviour respectively as described in the following subclauses.

4.1.2.1 Basic interconnection tests (BIT)

Basic interconnection tests form the basis of the other tests in the test suite and therefore have to be executed previously to all the other tests. The tests assure that the IUT provides the basic functionality to set up connections that shall be used in the rest of the test suite.

4.1.2.2 Capability tests (CA)

Capability testing provides a limited testing to ascertain the capabilities stated in the PICS can be observed.

4.1.2.3 Valid behaviour tests (BV)

State transitions as defined in ETS 300 374-1 [1] are considered valid. The test purposes in the valid behaviour test group cover the verification of the procedures of the SCF-FSM and the SCME-FSM. The messages and their contents offered to the IUT are syntactically and semantically valid.

4.1.2.4 Invalid behaviour tests (BI)

The test purposes in this test group verify that the IUT reacts correctly on receiving messages that are syntactically incorrect.

4.1.2.5 Inopportune behaviour tests (BO)

The test purposes in this test group verify that the IUT reacts correctly in the case inopportune protocol events occur. Such events are syntactically correct but occur when not expected.

4.1.3 State Groups

The test cases in every main test group shall be divided into *state groups* depending on which state in the SCF FSM or SCME FSM is tested. Within such a state group another hierarchy exists that divides the test cases depending on the kind of event that is issued to the IUT just before to the last event of a test purpose on which the test verdict shall be based. The following four classes of events are distinguished:

<i>Network event:</i>	TCAP message has to be issued to the IUT to perform the test case.
<i>Operation:</i>	operation has to be issued to the IUT to perform the test case.
<i>Operation error:</i>	message containing an operation error has to be issued to the IUT to perform the test case.
<i>SL-event:</i>	Service Logic event has to be issued to the IUT to perform the test case.

When mentioning *operations* INAP operations are referred to and *operation errors* are error messages that are issued due to reception of a syntactically or semantically erroneous INAP operation. The events issued to the IUT by the Service Logic are called *SL events*.

4.2 Physical scenarios

The test suite structure is based on the mapping of functional entities (FE) to physical entities (PE) given in table 1. In the table the following abbreviations are used:

O	Optional;
M	Mandatory;
N/A	Not Applicable.

Table 1: Mapping FE to PE

PE	FE			
	SRF	SSF	SCF	SDF
SSP	O	M	N/A	N/A
SCP	N/A	N/A	M	O
SDP	N/A	N/A	N/A	M
IP	M	N/A	N/A	N/A

The application of the test suite according to subclause 4.1 depends on the physical scenario in which the SCP exists. For a number of different example physical scenarios the application of the test suite is given in the figures 1 to 4, shown below.

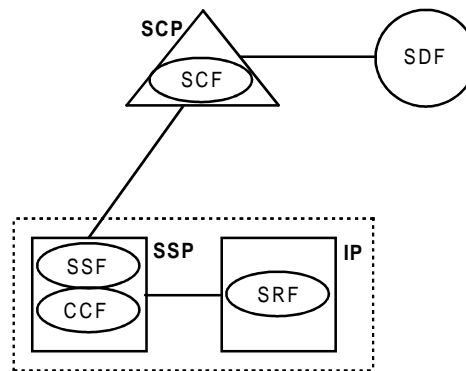


Figure 1: Example for SCP with single SSP and (non)integrated SRF

Applied test suite groups for SCP testing in physical scenario as in figure 1: bC + rC.

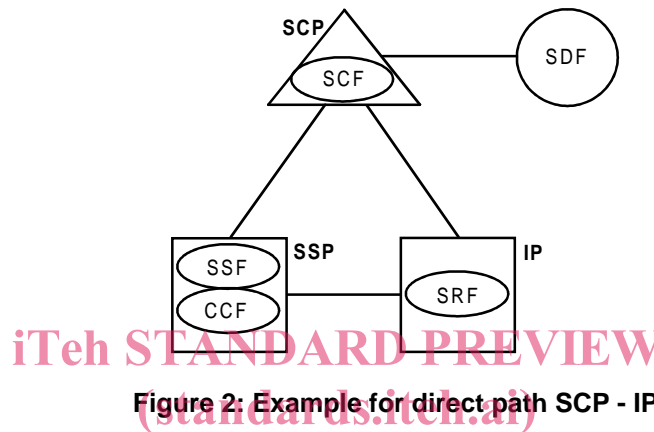


Figure 2: Example for direct path SCP - IP

Applied test suite groups for SCP testing in physical scenario as shown in figure 2: bC + pC.

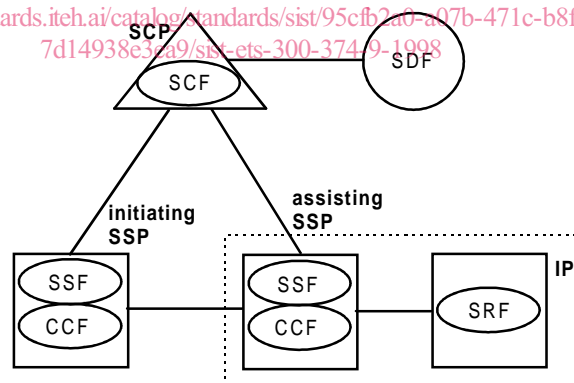


Figure 3: Example for SCP with an initiating and an assisting SSP

Applied test suite groups for SCP testing: bC + aC + rC.