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Intelligent Network (IN); Intelligent Network Application Protocol (INAP); Capability Set 2 (CS2); Part 4: Abstract Test Suite (ATS) specification and Partial Protocol Implementation eXtra Information for Testing (PIXIT) proforma for Service Switching Function (SSF); Sub-part 1: Basic capability set of CS-1 including CS-2 complements

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Foreword

This European Standard (Telecommunications series) has been produced by ETSI Technical Committee Services and Protocols for Advanced Networks (SPAN).

The present document is part 4, sub-part 1 of a multi-part EN covering the Intelligent Network Application Protocol (INAP) capability set 2, as identified below:

- Part 1: "Protocol specification";
- Part 2: "Protocol Implementation Conformance Statement (PICS) proforma specification";
- Part 3: "Test Suite Structure and Test Purposes (TSS&TP) specification for Service Switching Function (SSF)";
- Part 4: "Abstract Test Suite (ATS) specification and Partial Protocol Implementation eXtra Information for Testing (PIXIT) proforma for Service Switching Function (SSF)";**
 - Sub-part 1: "Basic capability set of CS-1 including CS-2 complements";**
 - Sub-part 2: "Call Party Handling (CPH)";
 - Sub-part 3: "Specialized Resource Functions (SRF)";
- Part 5: "Distributed Functional Plane (DFP) [ITU-T Recommendation Q.1224 (1997), modified]".

National transposition dates

Date of adoption of this EN:	28 April 2000
Date of latest announcement of this EN (doa):	31 July 2000
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1 Scope

The present document provides the Abstract Test Suite (ATS) for testing of the Service Switching Function (SSF) and the Specialized Resource Function (SRF) of the core Intelligent Network Application Protocol (INAP) according to EN 301 140-1 [1].

In this specific part 4-1, the part of Capability Set 2 (CS2) dealing with CS1 functions is covered.

Annex A provides the Tree and Tabular Combined Notation (TTCN).

Annex B provides the Partial Protocol Implementation eXtra Information for Testing (PIXIT) Proforma.

Annex C provides the Protocol Conformance Test Report (PCTR) Proforma.

The ISO standard for the methodology of conformance testing, ISO/IEC 9646-1 [4], ISO/IEC 9646-2 [5], ISO/IEC 9646-3 [6] and ISO/IEC 9646-5 [7], as well as the ETSI rules for conformance testing, ETS 300 406 [9] are used as a basis for the test methodology.

2 References

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

- References are either specific (identified by date of publication, edition number, version number, etc.) or non-specific.
- For a specific reference, subsequent revisions do not apply.
- For a non-specific reference, the latest version applies.
- A non-specific reference to an ETS shall also be taken to refer to later versions published as an EN with the same number.

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- [1] ETSI EN 301 140-1 (V1.3): "Intelligent Network (IN); Intelligent Network Application Protocol (INAP); Capability Set 2 (CS2); Part 1: Protocol specification".
- [2] ETSI ETS 300 374-1: "Intelligent Network (IN); Intelligent Network Capability Set 1 (CS1); Core Intelligent Network Application Protocol (INAP); Part 1: Protocol specification".
- [3] ITU-T Recommendation Q.771: "Functional description of transaction capabilities".
- [4] ISO/IEC 9646-1: "Information technology - Open Systems Interconnection - Conformance testing methodology and framework - Part 1: General Concepts". (See also CCITT Recommendation X.290).
- [5] ISO/IEC 9646-2: "Information technology - Open Systems Interconnection - Conformance testing methodology and framework - Part 2: Abstract Test Suite Specification". (See also CCITT Recommendation X.291 (1991)).
- [6] ISO/IEC 9646-3: "Information technology - Open Systems Interconnection - Conformance testing methodology and framework - Part 3: The Tree and Tabular Combined Notation (TTCN)". (See also CCITT Recommendation X.292 (1992)).
- [7] ISO/IEC 9646-5: "Information technology - Open Systems Interconnection - Conformance testing methodology and framework - Part 5: Requirements on test laboratories and clients for the conformance assessment process". (See also CCITT Recommendation X.292 (1992)).
- [8] ISO/IEC 9646-6: "Information technology - Open Systems Interconnection - Conformance testing methodology and framework - Part 6: Protocol profile test specification".
- [9] ETSI ETS 300 406: "Methods for Testing and Specification (MTS); Protocol and profile conformance testing specifications; Standardization methodology".

- [10] ITU-T Recommendation Q.1224 (1997): "Distributed functional plane for intelligent network Capability Set 2".
- [11] ETSI EN 301 140-2: "Intelligent Network (IN); Intelligent Network Application Protocol (INAP); Capability Set 2 (CS2); Part 2: Protocol Implementation Conformance Statement (PICS) proforma specification".

3 Definitions and abbreviations

3.1 Definitions

For the purposes of the present document, the terms and definitions given in EN 301 140-1 [1] apply.

3.2 Abbreviations

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

BI	Invalid Behaviour tests
BO	Inopportune Behaviour tests
BV	Valid Behaviour tests
CA	Capability tests
CP	Co-ordination Point
CS	Capability Set
IN	Intelligent Network
INAP	Intelligent Network Application Protocol
IUT	Implementation Under Test
MSC	Message Sequence Chart
MTC	Master Test Component
PDU	Protocol Data Units
PTC	Parallel Test Component
SCF	Service Control Function
SCP	Service Control Point
SDL	System Description Language
SRF	Specialized Resource Function
SSF	Service Switching Function
SSP	Service Switching Point
SUT	System Under Test
TCAP	Transaction Capabilities Application Part
TDP	Trigger Detection Point

3.3 ISO 9646 abbreviations

For the purposes of the present document the following ISO/IEC 9646-1 [4] abbreviations apply:

ASP	Abstract Service Primitive
ATM	Abstract Test Method
ATS	Abstract Test Suite
ICS	Implementation Conformance Statement
IUT	Implementation Under Test
IXIT	Implementation eXtra Information for Testing
LT	Lower Tester
NWK	Network Layer
PCO	Point of Control and Observation
PDU	Protocol Data Unit
PICS	Protocol Implementation Conformance Statement
PIXIT	Protocol Implementation eXtra Information for Testing
SAP	Service Access Point
SPyT	Single Party Testing
SUT	System Under Test
TC	Test Case
TP	Test Purpose
TSS	Test Suite Structure
TTCN	Tree and Tabular Combined Notation
UT	Upper Tester

3.4 ISO 9646 definitions

For the purposes of the present document the following ISO/IEC 9646-3 [6] definitions apply:

TTCN.GR
TTCN.MP

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For the purposes of the present document the following ISO/IEC 9646-5 [7] definitions apply:

Protocol Conformance Test Report (PCTR)
PCTR proforma

4 Test architecture

4.1 Abstract Test Method (ATM)

This clause describes the ATM used for testing the INAP protocol. It is the embedded variant of the remote test method used in Multy Party Testing (MPyT) context, as defined in ISO/IEC 9646-2 [5]. This test method has been selected, because:

- this test method implies no specific requirements from the Implementation Under Test (IUT);
- the upper Service Access Point (SAP) of the IUT cannot be directly observed;
- this test method places minimum limitations in the realization of conformance testing.

4.2 Overall configuration

Figure 1 describes the test architecture which will be used for the definition of the ATS.

A single test architecture covers all testing configuration requirements.

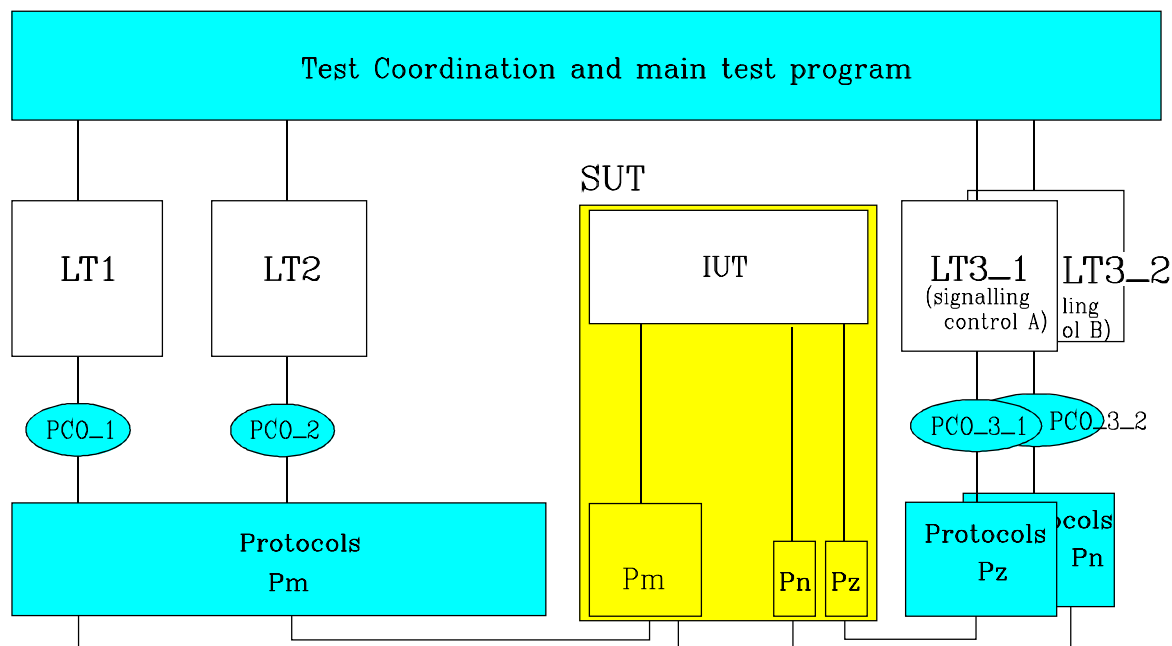


Figure 1: Multi-party, single-layer testing context: one IUT and 4 types of LTs

Figure 1 shows the multi-party, single layer testing context. The same architecture can be used for testing several interfaces. The roles of IUT and LTs change according to the protocol to be tested in the IUT.

Table 1 gives the nature of the IUT and LTs according to the protocol under test.

Table 1: possible testing configurations

Test Config	Tested Interface	IUT	LT1	LT2	LT3_1	LT3_2	Functional Configuration
1	SSF-SCF	SSF	SCF	SRF	Sig con A	Sig con B	A
2	SSF-SCF	SSF	SCF	-	Sig con A	Sig con B	B
3	SCF-SCF	SCF	SSF	SCF	Sig con A	Sig con B	C

4.3 Test of SSF-SCF interface using INAP

The test program contains the program of the main LT1 main tester as well as the co-ordination points to co-ordinate the tasks with the other testers LT2 and LT3.

IUT: is the SSF-INAP.

LT1: test program is the SCF.

LT2: test program is the SRF-INAP when required.

LT3: informal test program for actions and observation at the signalling control points, to play the role of end users A, B and C for instance.

There are as many LT3 as required by the test configuration (LT3_1, LT3_2, ..) according to the number of end users A, B and C involved in a service scenario for instance, using different types of protocols).

Pm: contains the protocols used below the INAP between SCP and SSP, also between SSP and SRF. They could be e.g. TCAP, SCCP and MTP of SS7 etc.

Pn: contains the protocols used below the LT3_1 between the IUT and the Signalling control point. It could be the DSS1 protocols or ISUP SS7 protocol (in the case of having a transit exchange).

Pz: contains the used protocols below the LT3_2 between the IUT and the Signalling control point. It could be the DSS1 protocols or ISUP SS7 protocol (in the case of having a transit exchange).

4.4 Test of SCF-SCF interface using INAP

The test program contains the program of the main LT1 main tester as well as the co-ordination points to co-ordinate the tasks with the other testers LT2 and LT3.

IUT: is the SCF-INAP under test.

LT1: test program is the SSF.

LT2: test program is the Second SCF.

LT3: informal test program for actions and observation at the signalling control points, to play the role of end users A, B and C for instance.

There are as many LT3 as required by the test configuration (LT3_1, LT3_2, ..) according to the number of end users A, B and C involved in a service scenario for instance, using different types of protocols).

Pm: contains the protocols used below the INAP between SCP and SSP, also between SSP and SRF. They could be e.g. TCAP, SCCP and MTP of SS7 etc.

Pn: contains the protocols used below the LT3_1 between the IUT and the Signalling control point. It could be the DSS1 protocols or ISUP SS7 protocol (in the case of having a transit exchange).

Pz: contains the used protocols below the LT3_2 between the IUT and the Signalling control point. It could be the DSS1 protocols or ISUP SS7 protocol (in the case of having a transit exchange).

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4.5 Points of control and observation (PCOs)

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PCO-Declarations.

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PCO_1: This PCO is at the core INAP interface between SSP and SCP. The lower layer protocol is Pm. It could be e.g. TCAP.

PCO_2: This PCO is at the core INAP interface between SSP and SRF. The lower layer protocol is Pm. It could be e.g. TCAP, ISUP, B-ISUP, TUP or the NWK of DSS1.

PCO_3_1: This PCO is at the interface between SSP and Signalling Control A. The lower layer protocol is Pn. It could be e.g. ISUP, B-ISUP, TUP or the NWK of DSS1.

PCO_3_2: This PCO is at the interface between SSP and Signalling Control B. The lower layer protocol is Pz. It could be e.g. ISUP, B-ISUP, TUP or the NWK of DSS1.

4.6 Test system

It is expected that the test system supports the protocols Pm, Pm-1, Pm-2 and the protocols for Pn and Pz.

It is expected that the test system supports the PCO Requirements of PCO_1, PCO_2, PCO_3_1 and PCO_3_n.