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Vmesniki V pri digitalnih krajevnih centralah (LE) – Vmesnik V5.2 za podporo dostopovnemu omrežju (AN) – 6. del: Abstraktni preskušalni niz (ATS) in delna dodatna informacija za preskušanje izvedbe protokola (PIXIT) – Proforma specifikacija za omrežno plast na strani krajevne centrale (LE)

V interfaces at the digital Local Exchange (LE); V5.2 interface for the support of Access Network (AN); Part 6: Abstract Test Suite (ATS) and partial Protocol Implementation eXtra Information for Testing (PIXIT) proforma specification for the network layer (LE side)

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Foreword

This draft European Telecommunication Standard (ETS) has been produced by the Signalling Protocol and Switching (SPS) Technical Committee of the European Telecommunications Standards Institute (ETSI), and is now submitted for the Public Enquiry phase of the ETSI standards approval procedure.

This ETS is part 6 of a multi-part standard covering the V5.2 interface as described below:

Part 1: "V5.2 interface specification";

Part 2: "Protocol Implementation Conformance Statement (PICS) proforma";

Part 3: "Test Suite Structure and Test Purposes (TSS&TP) specification for the network layer (AN side)";

Part 4: "Abstract Test Suite (ATS) and partial Protocol Implementation eXtra Information for Testing (PIXIT) proforma specification for the network layer (AN side)";

Part 5: "Test Suite Structure and Test Purposes (TSS&TP) specification for the network layer (LE side)";

Part 6: "Abstract Test Suite (ATS) and partial Protocol Implementation eXtra Information for Testing (PIXIT) proforma specification for the network layer (LE side)";

Part 7: "Test Suite Structure and Test Purposes (TSS&TP) specification for the data link layer";

Part 8: "Abstract Test Suite (ATS) and partial Protocol Implementation eXtra Information for Testing (PIXIT) proforma specification for the data link layer";

Part 9: "Test specification for the physical layer".

Proposed transposition dates	
Date of latest announcement of this ETS (doa):	3 months after ETSI publication
Date of latest publication of new National Standard or endorsement of this ETS (dop/e):	6 months after doa
Date of withdrawal of any conflicting National Standard (dow):	6 months after doa

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1 Scope

This sixth part of ETS 300 347 contains the Abstract Test Suite (ATS) as well as the Abstract Test Method (ATM) and the partial Protocol Implementation eXtra Information for Testing (PIXIT) proforma for the Network layer (NWK) of the V5.2 interface and parts of the system management of the Local Exchange (LE) side of a V5.2 interface.

The objective of this ETS is to provide an ATS containing conformance tests which give a high probability of inter-operability of an Access Network (AN) and a LE from different manufacturers over the V5.2 interface.

ISO/IEC 9646-1 [7] and ISO/IEC 9646-2 [8] are used as the basis for the test methodology. The ATS is defined using the Tree and Tabular Combined Notation (TTCN) according to ISO/IEC 9646-3 [9].

The ATS in annex A describes a set of Test Cases (TCs) which are based on the Test Purposes (TPs) specified in ETS 300 347-5 [6] (which is an extension of ETS 300 324-5 [2]). The TCs provide the implementation of the TPs and can be converted into an executable test suite by using available TTCN translators and the corresponding tools.

Annex B provides the partial PIXIT proforma.

Annex C lists the informative references.

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 300 324-1 (1994) including amendment A1 (1996): "Signalling Protocols and Switching (SPS); V interfaces at the digital Local Exchange (LE); V5.1 interface for the support of Access Network (AN); Part 1: V5.1 interface specification".

[2] ETS 300 324-5: "Signalling Protocols and Switching (SPS); V interfaces at the digital Local Exchange (LE); V5.1 interface for the support of Access Network (AN); Part 5: Test Suite Structure and Test Purposes (TSS&TP) specification for the network layer (LE side)".

[3] ETS 300 324-6: "Signalling Protocols and Switching (SPS); V interfaces at the digital Local Exchange (LE); V5.1 interface for the support of Access Network (AN); Part 6: Abstract Test Suite (ATS) and partial Protocol Implementation eXtra Information for Testing (PIXIT) proforma specification for the network layer (LE side)".

[4] ETS 300 347-1 (1994) including amendment A1 (1997): "Signalling Protocols and Switching (SPS); V interfaces at the digital Local Exchange (LE); V5.2 interface for the support of Access Network (AN); Part 1: V5.2 interface specification".

[5] ETS 300 347-2 (1994) including amendment A1 (1997): "Signalling Protocols and Switching (SPS); V interfaces at the digital Local Exchange (LE); V5.2 interface for the support of Access Network (AN); Part 2: Protocol Implementation Conformance Statement (PICS) proforma".

[6] ETS 300 347-5: "Signalling Protocols and Switching (SPS); V interfaces at the digital Local Exchange (LE); V5.2 interface for the support of Access Network (AN); Part 5: Test Suite Structure and Test Purposes (TSS&TP) specification for the network layer (LE side)".

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

[8] ISO/IEC 9646-2: "Information Technology - Open Systems Interconnection - Conformance testing methodology and framework - Part 2: Abstract test suite specification".

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

[10] 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".

3 Definitions and abbreviations

3.1 Definitions

For the purposes of this ETS, all definitions given in ETS 300 324-6 [3] apply.

3.2 Abbreviations

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

AN	Access Network
ASP	Abstract Service Primitive
ATC	Abstract Test Case
ATM	Abstract Test Method
ATS	Abstract Test Suite
BCC	Bearer Channel Connection
BI	Invalid Behaviour
BO	Inopportune Behaviour
BV	Valid Behaviour
CA	CApability test
CTRL	Control
DLL	Data Link Layer
DSAP	Data link SAP
FE	Function Element
FSM	Finite State Machine
IE	Information Element
IEI	Information Element Identifier
ISDN	Integrated Services Digital Network
ISDN-BA	ISDN-Basic Access
ISDN-PRA	ISDN-Primary Rate Access
IT	basic Interconnection Test
IUT	Implementation Under Test
L3addr	Layer 3 address
LC	Line Circuit
LT1	Lower Tester 1
MPH	Management Physical layer
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
REQ	Request
SAP	Service Access Point
SUT	System Under Test
TP	Test Purposes
TSS	Test Suite Structure
TTCN	Tree and Tabular Combined Notation
UL	Upper Layer
UT	Upper Tester
V5DLaddr	V5 Data Link address

4 Abstract test method

This clause describes the Abstract Test Method (ATM) and the Point of Control and Observation (PCO) used to test the NWK of the V5.2 protocol for the LE components.

4.1 ATM

Principally, the remote test method is used for V5.2 LE NWK conformance testing. Certain V5.2 LE NWK TPs need also part of the service and national functions. Therefore, the embedded variant of the remote test method is applied.

The national dependent information is defined in the PIXIT.

4.2 NWK layer protocol testing

The V5.2 implementations do not offer a direct access to the upper service boundary. The remote test method was chosen because any co-ordination procedures can only be expressed in an informal way.

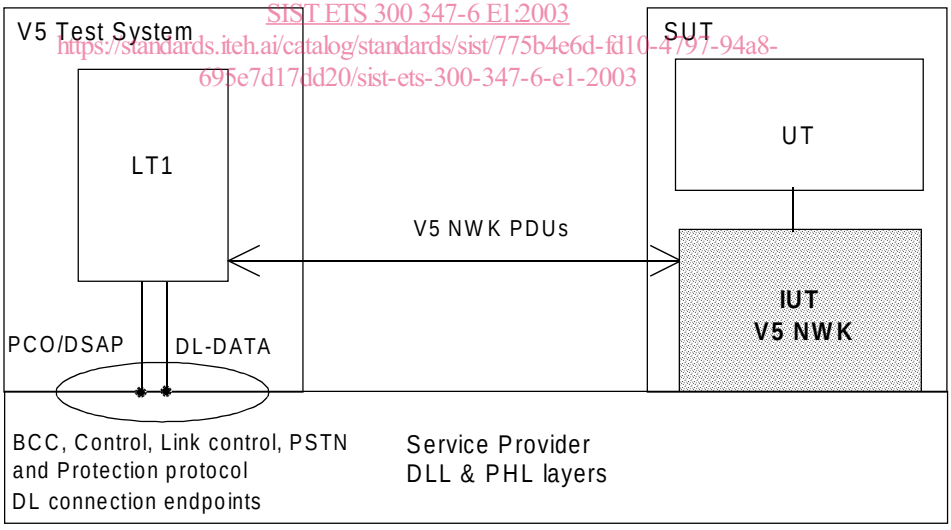

Figure 1: Remote test method applied to the V5.2 NWK layer testing

LT1: A Lower Tester (LT1) is located in a remote V5.2 test system. It controls and observes the behaviours of the IUT.

DSAP: A unique Data link Service Access Point (DSAP) is defined at the V5.2 interface and commonly used for exchanging service data of the different network layer protocol functional entities: PSTN, Control protocols.

PCO: The PCOs for NWK testing are located on the DSAP, PSAP, PSTN_ACCESS and PCM_ACCESS interfaces. All test events at the DSAP are specified in terms of data link layer Abstract Service Primitives (ASPs) and network layer PDUs. All test events at the PSAP are specified in terms of physical layer ASPs. All test events at PSTN_ACCESS and PCM_ACCESS are defined as ASPs.

UT: No explicit Upper Tester (UT) exists in the test system. However, the SUT needs to carry out some UL functions to achieve some effects of test co-ordination procedures. Designing ATS, the capability of the system management functions, such as controls of the IUT, its interactions with the Q interface may be taken into account. The controls of the IUT will be implied or informally expressed in the ATS, but no assumption shall be made regarding their feasibility or realization. Examples of such controls could be to provoke restarting IUT or blocking/unblocking procedures through Q interface.

4.3 Data link addresses

Within the DSAP, different V5DLaddr are used to identify each corresponding data link connection. Each network layer protocol functional entity can have only one data link connection, e.g. all PSTN signalling information share one data link connection.

Table 1 shows the allocated V5DLaddr used by the protocol function entities.

Table 1: V5DLaddr

Protocol	PSTN	Control	BCC	Protection	Link Control
V5DLaddr	8176	8177	8178	8179	8180

4.4 Execution of TCs

4.4.1 Handling of error indication

During the execution of the NWK ATS many error indications will be sent to the system management due to the invalid and the inopportune TCs. It is up to the IUT supplier to take the necessary precautions to avoid any impact on the test result.

4.4.2 TC execution sequence

The following test sequence shall be applied:

The TC containing the start-up procedure shall always be the first TC executed. Also in any case where the IUT has to be restarted this TC shall be first executed.

Protocol groups: CTRL ⇒ LINK⇒ PROTECTION⇒ BCC⇒ PSTN.
Test groups: IT ⇒ CA ⇒ TI ⇒ BV ⇒ BO ⇒ BI.

Interactions between the different test groups are not considered. It is up to the IUT supplier to take the necessary precautions to avoid any impact on the test result.