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Metode za preskušanje in specificiranje (MTS) – Specifikacije za preskušanje skladnosti protokola in profila – Metodologija standardiziranja

Methods for Testing and Specification (MTS); Protocol and profile conformance testing specifications; Standardization methodology

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Foreword

This European Telecommunication Standard (ETS) has been produced by the Methods for Testing and Specification (MTS) Technical Committee of the European Telecommunications Standards Institute (ETSI).

This ETS provides rules and guidance on how to develop telecommunications conformance testing specifications with the final objective to standardize them.

ETSI has explored innovative solutions for the long term, and at present, a "proposer" in harmonized approaches to the pressing requirement of developing testing standards in various areas of telecommunications. It is also essential that ETSI remains aware of what is going on in the information technology area outside ETSI, in close relations with its own technical activities.

The production of conformance testing standards in ETSI has already started in various technical areas, and needs to be continued with the best harmonization of efforts.

ETSI TC-MTS recommends that the TC and STC chairmen in their role of co-ordinators of standard development ensure that the groups of experts working in conformance testing in their bodies are fully aware of the status of affairs in this area so that initiatives are co-ordinated properly. Special care should be devoted to the consistency of the methodology used (test specifications' structure, test notations, criteria for acceptance, etc.), to the need of not duplicating efforts and to the strategy of improving convergence for testing at the European and international levels.

With the co-operation of all ETSI members, an initial orientation towards a harmonized approach to conformance testing standards and practice is desirable and possible. This is why the TC MTS work program includes the production of a comprehensive methodology guide that will represent a further step forward in harmonization and consistency.

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Proposed transposition dates	
Date of latest announcement of this ETS (doa):	31 July 1995
Date of latest publication of new National Standard or endorsement of this ETS (dop/e):	31 January 1996
Date of withdrawal of any conflicting National Standard (dow):	31 January 1996

Introduction

This ETS is one element of a series of documents produced during 1992 and 1993 by ETSI. These ETSs will provide a reference library of rules and guidance on how to standardize telecommunications conformance testing specifications in Europe. These rules and guidance take into account the state of the art, the international and European standards and reports already published on that matter, the specifics of test suite editing, and the practices of the ETSI and CEN secretariats for the production of European standards.

Although this ETS has been produced in order to become a reference document for ETSI, it is designed to be used in a wider European context, for example, as a technical basis for accreditation and specification purposes, as well as for European Commission initiated conformance testing programmes, e.g. the Conformance Testing Services (CTS) programme.

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1 Scope

This European Telecommunication Standard (ETS) specifies a methodology for developing telecommunications conformance testing specifications with the final objective to standardize them.

This ETS defines the components to be produced when specifying a European conformance Testing Standard (TS) in the domain of telecommunications.

The methodology specified in this ETS is, in principle, applicable to domains other than telecommunications, e.g. Open Systems Interconnection (OSI). However, the limits of such an application of the methodology outside telecommunications testing are not defined, and each group defining test specifications are responsible for deciding if any part of this methodology is applicable.

This methodology applies to conformance TSs for protocols, for profiles, for information objects, for interfaces, and for services.

> NOTE 1: The methodology of this ETS is generic, in the sense that it applies to protocols, to profiles, to information objects, etc. Following the example of ISO/IEC 9646 (references [5] to [12]), the terminology employed is also generic, e.g. Implementation Conformance Statement (ICS), Implementation eXtra Information for Testing (IXIT). However, in order to avoid confusing the readers who are familiar with the protocol-related terminology, the non-generic terms (Protocol Implementation Conformance Statement (PICS), Protocol Implementation eXtra Information for Testing (PIXIT), etc.) have been kept in the titles of clauses and subclauses.

The test of physical aspects, such as "layer 1", analogue measurements, Electro-Magnetic Compatibility (EMC), is not covered by this ETS. However, part of the methodology may be still be applied, e.g. the concepts of ICS, IXIT, Test Purposes (TPs), and Test Suite Structure (TSS).

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This ETS provides the rules for standardization bodies developing telecommunications conformance TSs.

> NOTE 2: One objective of this ETS is the use, when relevant, within standardization bodies. For this purpose, within ETSI, it has the same value as an internal Technical Committee Reference Technical Report (TCR-TR).

This ETS is applicable to organizations such as Conformance Testing Services (CTS) programmes, pre-standardization institutions, private institutions, which develop conformance testing specifications with the objective of contributing them for the purposes of European telecommunications standardization.

This ETS contains two types of information, following a twofold objective:

- it **clarifies** the principles of the ISO/IEC 9646 (references [5] to [12]) testing framework and methodology, as well as the concept of profile;
- it **defines additional criteria** for European telecommunications TSs, whereby it constitutes a "European telecommunications profile" of the ISO/IEC 9646 (references [5] to [12]) methodology, containing its own recommendations.

This ETS is consistent with the normative references listed in clause 2. This ETS extends the current principles contained in ISO/IEC 9646 (references [5] to [12]), in particular in the field of the combination of TPs, and concerning the choice of a single Abstract Test Suite (ATS).

For conformance testing in the "voluntary domain" (i.e. outside the regulatory domain), for instance by the suppliers to support their commercial claims for conformance, TSs are normally published as I-ETS, or ETS, depending on their role and their maturity.

This ETS addresses telecommunications TS methodology for the voluntary domain.

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]   ETR 153: "Methods for Testing and Specification (MTS); Guidance on the production and completion of System Conformance Test Report (SCTR) and Protocol Conformance Test Report (PCTR) proformas".

[2]   ETR 141: "Methods for Testing and Specification (MTS); Protocol and profile conformance testing specifications; The Tree and Tabular Combined Notation (TTCN) style guide".

[3]   PNE-Rules (1991): "CEN/CENELEC Internal Regulations - IR; Part 3: Rules for the drafting and presentation of European Standards (PNE-Rules)".

[4]   EN 45001 (1989): "General criteria for the operation of testing laboratories".

[5]   ISO/IEC 9646-1 Edition 2 (1994): "Information technology - Open Systems Interconnection - Conformance testing methodology and framework - Part 1: General concepts" (including DAM1 and DAM2, to be published).

[6]   ISO/IEC 9646-2 Edition 2 (1994): "Information technology - Open Systems Interconnection - Conformance testing methodology and framework - Part 2: Abstract Test Suite Specification" (including DAM1 and DAM2, to be published).

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

[8]   ISO/IEC 9646-3 AM 1: "Information technology - Open Systems Interconnection - Conformance testing methodology and framework - Part 3: The Tree and Tabular Combined Notation. Amendment 1: TTCN Extensions (concurrent TTCN)".

   NOTE 1:   ISO/IEC 9646-3 AM 1 will be included in the next edition of ISO/IEC 9646-3, which will contain TTCN and concurrent TTCN in the same standard.

[9]   ISO/IEC 9646-4 IS Edition 2: (1994): "Information technology - Open Systems Interconnection - Conformance testing methodology and framework - Part 4: Test Realisation" (including DAM1 and DAM2, to be published).

[10]   ISO/IEC 9646-5 IS Edition 2: (1994): "Information technology - Open Systems Interconnection - Conformance testing methodology and framework - Part 5: Requirements on test laboratories and clients for the Conformance Assessment Process" (including DAM1 and DAM2, to be published).

[11]   ISO/IEC 9646-6 IS (1994): "Information technology - Open Systems Interconnection - Conformance testing methodology and framework - Part 6: Protocol Profile Test Specification".

[12]   ISO/IEC 9646-7 DIS (1993): "Information technology - Open Systems Interconnection - Conformance testing methodology and framework - Part 7: Implementation Conformance Statements".

NOTE 2: The clauses of ISO/IEC 9646 (references [5] to [12]) referenced in this ETS are from edition 2: 1994 (unpublished). Although the contents of ISO/IEC 9646 have changed, it is useful to know the references to edition 1: 1991. The correspondence is as follows:

Edition 1: 1991	Edition 2: 1994
Part 2, clause 12	Part 2, clause 11
Part 1, annex B	Part 2, annex A

3 Definitions and abbreviations

3.1 Definitions

For the purposes of this ETS, all the definitions in ISO/IEC 9646 (references [5] to [12]) apply.

In addition, the following definitions apply, or have been re-formulated for clarification:

Abstract Test Method (ATM) (Abstract Testing Method): Definition of ISO/IEC 9646-1 [5], subclause 3.3.5, applies.

NOTE 1: The ISO definition, complemented with the explanation of ISO/IEC 9646-2 [6], subclause 11.1.7, properly specifies that the ATM contains "enough detail to enable Abstract Test Cases (ATCs) to be specified for this test method". This means that the ATM is a detailed description of the testing architecture. Conversely, the four methods for Single Party Testing (SPyT) context, Remote, Local, Distributed, Coordinated, are called **ATM categories**.

Abstract Test Suite (ATS): Definition of ISO/IEC 9646-1 [5], subclause 3.3.6, applies.

NOTE 2: Confusion should be avoided between the ATS (collection of test cases, written in Tree and Tabular Combined Notation (TTCN)), and the **ATS specification**. The ATS is just one component of the ATS specification.

ATS specification: Definition of ISO/IEC 9646-1 [5], subclause 3.3.7, applies.

NOTE 3: The ATS is just one component of the ATS specification. The list of components of an ATS specification is specified in ISO/IEC 9646-2 [6], clause 14, and in this ETS clause 7.

ATM category: One of the four families of ATM defined in ISO/IEC 9646-2 [6], for SPyT: Remote, Local, Distributed, Coordinated.

NOTE 4: The term ATM category is not an ISO/IEC 9646 term. However, it is in line with ISO/IEC 9646, see ISO/IEC 9646-2 [6] subclause 11.3.1.

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base specification: A specification of a protocol, telecommunication service, interface, abstract syntax, encoding rules, or information object.

> NOTE 5: This definition extends the definition in ISO/IEC 9646-1 [5], subclause 3.3.10, to telecommunication services and interfaces.

> NOTE 6: A base specification is anything that can be profiled. A base specification is defined by opposition to a **Profile**, which constrains optionalities in one or several base specifications.

> NOTE 7: Confusion should be avoided between base specification (on which a profile can be based), and reference specification, which is the reference to a testing specification.

base specification ICS: An ICS related to a base specification. A PICS is a particular case of base specification ICS, applied to base specifications of protocols.

base specification TS: A base specification TS is a conformance TS specified for a base specification.

base standard: A standardized base specification, e.g. as an ITU-T Recommendation, an ISO standard or an ETS.

component (of a profile): A component of a profile is a single protocol, telecommunication service, or interface, or a combination of one or more protocols, telecommunication services, or interfaces, with zero or more information objects upon which a profile is based and which are to be tested in combination.

> NOTE 8: Definition of ISO/IEC 9646-6 [11], clause 3, is extended to telecommunication services and interfaces.

functional subset (of a protocol): A grouping of protocol features (Protocol Data Units (PDUs), mechanisms), that is specified in a protocol specification, and that realizes a protocol function. The functional subsets of a protocol do not overlap and their sum covers the total function of the protocol. An example of a functional subset is a role, like responder and initiator. As far as testing is concerned, a functional subset can be tested with a single test configuration.

reference specification: It is a standard which specifies a base specification, or a set of base specifications, or a profile, or a set of profiles, and for conformance against which test specifications are written.

reference standard: Synonymous to reference specification.

Testing Standard (TS) or **conformance TS:** A document, or a set of documents, containing a conformance testing specification.

Test Management Protocol (TMP) specification: A document containing the TMP, and a TMP implementation statement proforma.

untestable TP: A TP that cannot generate an ATC for a given ATM.

3.2 Terms which can cause confusion

Derivation: The word **derivation** (and its derivatives) should be used carefully, because it may have several meanings:

a) a TP is **derived** from a conformance requirement;

b) a Test Suite Structure & Test Purposes (TSS&TP) is **derived** from a base specification or from a profile specification;

c) an ATC is **derived** from a TP;

d) an ATS is **derived** from a TSS&TP;

e) an executable test case is **derived** from an ATC;

f) an Executable Test Suite (ExTS) is **derived** from an ATS.

Therefore, the meaning should be determined in accordance with each context.

NOTE: The meanings given in e) and f) are not used in this ETS.

Entry: The term **Entry** (e.g. in a PICS proforma) shall not be used. It is ambiguous and was dropped from ISO/IEC 9646-7 [12]. Instead, the terms **Item**, **Question**, **Status (value)**, **(support) Answer** should be used. Their definition is in ISO/IEC 9646-7 [12], clause 3.

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

ACSE	Association Control Service Element
AOW	Asian Oceanian Workshop
ASP	Abstract Service Primitive
ATC	Abstract Test Case
ATM	Abstract Test Method
ATS	Abstract Test Suite
CMIP	Common Management Information Protocol
CTP	Combined Test Purpose
CTR	Common Technical Regulation
CTS	Conformance Testing Services
DECT	Digital European Cordless Telephone
DIS	Draft International Standard
EG	Expert Group (EWOS term)
EMC	Electro-Magnetic Compatibility
ETS	European Telecommunication Standard

NOTE 1: The acronym for an Executable Test Suite should be avoided, because it introduces a confusion with an ETS in ETSI. However, in this ETS, an Executable Test Suite is abbreviated by "ExTS" (see below).

ETG	EWOS Technical Guide
ETR	ETSI Technical Report
ExTS	Executable Test Suite

NOTE 2: Although possible, the use of "ExTS" is discouraged, and the use of the full expansion "Executable Test Suite" is recommended.