



SLOVENSKI STANDARD

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Information technology - Open Systems Interconnection - Conformance testing methodology and framework - Part 2: Abstract Test Suite specification (ISO/IEC 9646-2:1994)

Information technology - Open Systems Interconnection - Conformance testing methodology and framework - Part 2: Abstract Test Suite specification (ISO/IEC 9646-2:1994)

Informationstechnik - Kommunikation offener Systeme - Methodik der Konformitätsprüfung - Teil 2: Spezifikation der Abstrakten Prüfreihe (ISO/IEC 9646-2:1994)

Technologies de l'information - Interconnexion de systemes ouverts - Cadre général et méthodologie des tests de conformité OSI - Partie 2: Spécification des suites de tests abstraites (ISO/IEC 9646-2:1994)

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35.100.01	Medsebojno povezovanje odprtih sistemov na splošno	Open systems interconnection in general
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Interconnection - Conformance testing
methodology and framework - Part 2: Abstract
Test Suite specification (ISO/IEC 9646-2:1994)**

Technologies de l'information - Interconnexion
de systèmes ouverts - Cadre général et
méthodologie des tests de conformité OSI
Partie 2: Spécification des suites de tests
abstraites (ISO/IEC 9646-2:1994)

Informationstechnik - Kommunikation Offene
Systeme - Methodik der Konformitätsprüfung
Teil 2: Spezifikation der abstrakten Prüfreih
(ISO/IEC 9646-2:1994)

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PREVZET PO METODI RAZGLASITVE

-12- 1997

This European Standard was approved by CEN on 1996-01-25. CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CEN member.

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European Committee for Standardization
Comité Européen de Normalisation
Europäisches Komitee für Normung

Central Secretariat: rue de Stassart, 36 B-1050 Brussels

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EN ISO/IEC 9646-2:1996

Foreword

The text of the International Standard from ISO/IEC/JTC 1 "Information Technology" of the International Organization for Standardization (ISO) and the International Electrotechnical Commission (IEC) has been taken over as a European Standard by CEN Technical Board.

This European Standard replaces EN 29646-2:1992.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by August 1996, and conflicting national standards shall be withdrawn at the latest by August 1996.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

Endorsement notice

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INTERNATIONAL
STANDARD

ISO/IEC
9646-2

Second edition
1994-12-15

**Information technology — Open Systems
Interconnection — Conformance testing
methodology and framework —**

Part 2:

(Abstract Test Suite) specification

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*Technologies de l'information — Interconnexion de systèmes ouverts —
Cadre général et méthodologie des tests de conformité OSI —*

Partie 2: Spécification des suites de tests abstraites



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ISO/IEC 9646-2:1994(E)

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Foreword

ISO (the International Organization for Standardization) and IEC (the International Electrotechnical Commission) form the specialized system for worldwide standardization. National bodies that are members of ISO or IEC participate in the development of International Standards through technical committees established by the respective organization to deal with particular fields of technical activity. ISO and IEC technical committees collaborate in fields of mutual interest. Other international organizations, governmental and non-governmental, in liaison with ISO and IEC, also take part in the work.

In the field of information technology, ISO and IEC have established a joint technical committee, ISO/IEC JTC 1. Draft International Standards adopted by the joint technical committee are circulated to national bodies for voting. Publication as an International Standard requires approval by at least 75 % of the national bodies casting a vote.

International Standard ISO/IEC 9646-2 was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information technology*, Subcommittee 21, *Open Systems Interconnection, data management and open distributed processing*.

This second edition cancels and replaces the first edition (ISO/IEC 9646-2:1991) which has been technically revised.

ISO/IEC 9646 consists of the following parts, under the general title *Information technology — Open Systems Interconnection — Conformance testing methodology and framework*:

- *Part 1: General concepts*
- *Part 2: Abstract Test Suite specification*
- *Part 3: The Tree and Tabular Combined Notation*
- *Part 4: Test realization*
- *Part 5: Requirements on test laboratories and clients for the conformance assessment process*
- *Part 6: Protocol profile test specification*
- *Part 7: Implementation conformance statements*

Annexes A, B and C of this part of ISO/IEC 9646 are for information only.

Introduction

This part of ISO/IEC 9646 provides a common approach to the specification of OSI conformance test suites at a level which is independent of the means of executing those test suites (hereafter called "Abstract Test Suites"). This level of abstraction is suitable for standardization and facilitates the comparison of results produced by different organizations which run the corresponding Executable Test Suites.

Clauses 6 and 7 recall that there are requirements on OSI protocol specifiers which have to be fulfilled before there can be an objective basis for the process of developing an Abstract Test Suite. The need is expressed for consistent conformance clauses and for ICS conformances in relevant base specifications (e.g. International Standards or ITU-T Recommendations which specify OSI protocol standards).

Clauses 8 to 14 describe the process of developing an Abstract Test Suite, including the design criteria to be used and guidance on its structure and coverage. The possible Abstract Test Methods are defined and guidance is given to help the test suite specifier to decide which test method(s) to use in the production of a particular test suite. Requirements and guidance are given on the specification of abstract test cases. These include the subdivision of test cases into test steps and the assignment of test verdicts to test outcomes.

The test suite specifier is also required to provide information to the test realizers (e.g. limitations governing test case selection).

Finally, in clause 15, guidance and requirements are given on test suite maintenance.

This part of ISO/IEC 9646 is also to be published by ITU-T as Recommendation X.291.

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Information technology – Open Systems Interconnection – Conformance testing methodology and framework – Part 2: Abstract Test Suite specification

1 Scope

1.1 This part of ISO/IEC 9646 specifies the requirements and gives guidance for the production of system-independent conformance test suites for one or more OSI specifications. In particular, it is applicable to the production of all OSI conformance testing specifications including all draft versions of such conformance testing specifications.

1.2 This part of ISO/IEC 9646 is applicable to the production of abstract test cases which check the conformance of an implementation to the relevant static and/or dynamic conformance requirements by controlling and observing protocol behaviour. The Abstract Test Methods included in this part of ISO/IEC 9646 are, in fact, capable of being used to specify any test case which can be expressed abstractly in terms of control and observation of Protocol Data Units (PDUs) and Abstract Service Primitives (ASPs). Nevertheless, for some protocols, test cases may be needed which cannot be expressed in these terms. The specification of such test cases is outside the scope of this part of ISO/IEC 9646, although the test cases may themselves need to be included in a conformance testing specification.

NOTE – For example, some static conformance requirements related to an Application service may require testing techniques which are specific to that particular Application.

This part of ISO/IEC 9646 is applicable to the production of test suites for testing implementations of one or more adjacent protocols, whether or not these are embedded under other protocols.

1.3 The following are outside the scope of this part of ISO/IEC 9646:

- a) the relationship between Abstract Test Suite (ATS) specification and Formal Description Techniques;
- b) testing by means of test methods which are specific to particular applications, protocols or systems, including testing by means other than PDU exchange.

NOTE – This part of ISO/IEC 9646 applies fully to some but not all Physical layer protocols. Nevertheless, many of the concepts apply to all protocols.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this part of ISO/IEC 9646. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this part of ISO/IEC 9646 are encouraged to investigate the possibility of applying the most recent editions of the standards listed below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 7498: 1984, *Information processing systems – Open systems – Basic Reference Model*.
(See also CCITT Recommendation X.200 (1984))

ISO/TR 8509: 1987, *Information processing systems – Open Systems Interconnection – Service conventions*.
(See also CCITT Recommendation X.210 (1988))

ISO/IEC 8825: 1990, *Information technology – Open Systems Interconnection – Specification of Basic Encoding Rules for Abstract Syntax Notation One (ASN.1)*.
(See also CCITT Recommendation X.209 (1988))

ISO/IEC 9646-1: 1994, *Information technology – Open Systems Interconnection – Conformance testing methodology and framework – Part 1: General concepts*.
(See also ITU-T Recommendation X.290 ¹⁾)

ISO/IEC 9646-3: 1992, *Information technology - Open Systems Interconnection - Conformance testing methodology and framework - Part 3: The Tree and Tabular Combined Notation (TTCN)*.
(See also ITU-T Recommendation X.292 (1993))

1) To be published.

ISO/IEC 9646-3 Amd 1: -¹⁾, *Information technology – Open Systems Interconnection – Conformance testing methodology and framework – Part 3: The Tree and Tabular Combined Notation - Amendment 1: TTCN extensions*

ISO/IEC 9646- 6:1994, *Information technology – Open Systems Interconnection – Conformance testing methodology and framework – Part 6: Protocol profile test specification.*

(See also ITU-T Recommendation X.295 -¹⁾)

ISO/IEC 9646- 7: -¹⁾, *Information technology – Open Systems Interconnection – Conformance testing methodology and framework – Part 7: Implementation Conformance Statements.*

(See also ITU-T Recommendation X.296 -¹⁾)

3 Definitions

For the purposes of this part of ISO/IEC 9646, all the definitions given in ISO/IEC 9646-1 apply.

4 Abbreviations

For the purposes of this part of ISO/IEC 9646, the abbreviations given in ISO/IEC 9646-1 apply. The following abbreviations also apply to this part of ISO/IEC 9646.

ACSE: association control service element

ASE: application-service-element

ASN.1: abstract syntax notation one

ASP abstract service primitive

ATM abstract test method

ATS: abstract test suite

FDT formal description techniques

ICS: implementation conformance statement

IUT: implementation under test

IXIT: implementation extra information for testing

LT: lower tester

LTCF: lower tester control function

MPyT: multi-party testing

OSI: open systems interconnection

PCO: point of control and observation

PCTR: protocol conformance test report

PDU: protocol data unit

RTS: remote transfer service

SAP: service-access-point

SPyT: single-party testing

SUT: system under test

TCP: test coordination procedures

TM-PDU: test management PDU

TMP: test management protocol

TSS&TP: test suite structure and test purposes

TTCN: tree and tabular combined notation

UT: upper tester

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¹⁾ To be published.

5 Compliance

5.1 A base specification which complies with this part of ISO/IEC 9646 shall satisfy all the requirements stated in clauses 6 and 7.

NOTE – Such compliance is a precondition for the base specification to be an effective basis for conformance testing of implementations.

5.2 An Abstract Test Suite (ATS) specification which complies with this part of ISO/IEC 9646

- a) shall be a conformance test suite;
- b) shall be specified in a test notation standardized by ISO/IEC or ITU-T;
- c) shall satisfy all the requirements stated in clauses 9 to 15 inclusive;
- d) shall be within an ISO/IEC or ITU-T published specification or, in the absence of such a specification, shall be within a publicly available specification which is in the process of being standardized within ISO/IEC or ITU-T, which has the highest standardization status available, and which has the status of at least a Committee Draft or equivalent.

NOTE - ATSs outside the standardization process need to be submitted for international standardization before they can fully comply with this part of ISO/IEC 9646, in order to ensure that they are subject to public scrutiny, correction and acceptance, internationally.

5.3 It is recommended that the test notation used be the Tree and Tabular Combined Notation (TTCN). If TTCN is used, the ATS shall comply with ISO/IEC 9646-3.

NOTE - X.290 (1988) is considered to be obsolete for this purpose.

6 Conformance requirements in OSI base specifications

6.1 Introduction

The meaning of conformance in OSI is discussed in ISO/IEC 9646-1. It is necessary that there be an unambiguous and objective understanding of the conformance requirements of an OSI base specification, as a prerequisite to the production of an ATS for that specification. Clauses 6 and 7 state the requirements on the relevant specifiers to ensure that there is such an understanding of the conformance requirements.

Additional guidance is given in annex B.

6.2 General requirements

6.2.1 A clear distinction shall be made between static and dynamic conformance requirements. To avoid ambiguity, they should be stated separately from one another.

6.2.2 It shall be clear what conformance to the specification means, in the sense of what is required to be done (*i.e.* mandatory), what is permitted but not mandatory (*i.e.* optional), and what is required not to be done (*i.e.* prohibited), in order to conform to it.

6.2.3 It shall always be decidable whether an instance of communication conforms dynamically or not.

For example, it should be possible to look at a record of Protocol Data Unit (PDU) activity and decide whether or not it is valid with respect to the relevant specification.

6.3 Conformance clauses

6.3.1 Each base specification, which specifies an OSI protocol, abstract syntax, encoding rules, or information object, shall include a conformance clause, which shall be expressed clearly and unambiguously.

6.3.2 Conformance clauses shall distinguish between the following categories of information:

- a) references to clauses which state dynamic conformance requirements;
- b) static conformance requirements concerning the implementation of the base specification itself;
- c) static conformance requirements concerning multi-specification dependencies (see 6.4).

6.3.3 The requirement to produce an Implementation Conformance Statement (ICS), in compliance with the ICS proforma, shall be stated separately from the requirements on the implementation of the specification itself.

6.3.4 The conformance clause of a protocol specification should also include

- a) the requirement to be able to accept all correct sequences of PDUs received from peers, and respond with correct PDU sequences;
- b) the requirement to be able to respond correctly to all incorrect sequences of PDUs received;
- c) in connection oriented protocols, the option to support either the initiation of a connection or the acceptance of a connection, or both;