INTERNATIONAL STANDARDIZED PROFILE

ISO/IEC ISP 10613-3

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Information technology — International Standardized Profile RA — Relaying the Connectionless-mode Network Service —

Part 3:
CSMA/CD LAN subnetwork-dependent, media-dependent requirements

Technologies de l'information — Profil normalisé international RA — Relais de service de réseau en mode sans connexion —

Partie 3: Prescriptions dépendantes du milieu, dépendantes du sous-réseau CSMA/CD LAN

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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 JTC1. In addition to developing International Standards, ISO/IEC JTC1 has created a Special Group on Functional Standardization for the elaboration of International Standardized Profiles.

An International Standardized Profile is an internationally agreed, harmonized document which identifies a standard or group of standards, together with options and parameters, necessary to accomplish a function or a set of functions.

Draft International Standardized Profiles are circulated to national bodies for voting. Publication as an International Standardized Profile requires approval by at least 75 % of the national bodies casting a vote.

International Standardized Profile ISO/IEC ISP 10613-3 was prepared with the collaboration of

- Asia-Oceania Workshop (AOW);
- European Workshop for Open Systems (EWOS);
- Open Systems Environment Implementors' Workshop (OIW).

ISO/IEC ISP 10613 consists of several parts, under the general title *Information technology - International Standardized Profile RA - Relaying the Connectionless-mode Network Service:*

- *Part 1: Subnetwork-independent requirements*
- *Part 2: LAN subnetwork-dependent, media-independent requirements*
- *Part 3: CSMA/CD LAN subnetwork-dependent, media-dependent requirements*
- *Part 4: FDDI LAN subnetwork-dependent, media-dependent requirements*
- *Part 5: Definition of profile RA51.51, relaying the Connectionless-mode Network Service between CSMA/CD LAN subnetworks*
- *Part 6:Definition of profile RA51.54, relaying the Connectionless-mode Network Service between CSMA/CD LAN subnetworks and FDDI LAN subnetworks*
- *Part 7: PSDN subnetwork-dependent, media-dependent requirements for virtual calls over a permanent access*
- *Part 8: Definition of profile RA51.1111, relaying the Connectionless-mode Network Service between CSMA/CD LAN subnetworks and PSDNs using virtual calls over a PSTN leased line permanent access*

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- *Part 9: Definition of profile RA51.1121, relaying the Connectionless-mode Network Service between CSMA/CD LAN subnetworks and PSDNs using virtual calls over a digital data circuit/CSDN leased line permanent access*

- *Part 10: Token Ring LAN subnetwork-dependent, media-dependent requirements*

- *Part 11: Definition of profile RA51.53, relaying the Connectionless-mode Network Service between CSMA/CD LAN subnetworks and Token Ring LAN subnetworks*

- *Part 12: Definition of profile RA53.53, relaying the Connectionless-mode Network Service between Token Ring LAN subnetworks*

- *Part 13: Definition of profile RA53.54, relaying the Connectionless-mode Network Service between Token Ring LAN subnetworks and FDDI LAN subnetworks*

- *Part 14: Definition of profile RA54.54, relaying the Connectionless-mode Network Service between FDDI LAN subnetworks*

- *Part 15: Definition of profile RA53.1111, relaying the Connectionless-mode Network Service between Token Ring LAN subnetworks and PSDNs using virtual calls over a PSTN leased line permanent access*

- *Part 16: Definition of profile RA53.1121, relaying the Connectionless-mode Network Service between Token Ring LAN subnetworks and PSDNs using virtual calls over a digital data circuit/CSDN leased line permanent access*

- *Part 17: Definition of profile RA54.1111, relaying the Connectionless-mode Network Service between FDDI LAN subnetworks and PSDNs using virtual calls over a PSTN leased line permanent access*

- *Part 18: Definition of profile RA54.1121, relaying the Connectionless-mode Network Service between FDDI LAN subnetworks and PSDNs using virtual calls over a digital data circuit/CSDN leased line permanent access*

Annexes A and B form an integral part of this part of ISO/IEC ISP 10613. Annex C is for information only.

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Introduction

This International Standardized Profile (ISP) is defined in accordance with the principles specified by ISO/IEC Technical Report 10000.

The context of Functional Standardization is one area in the overall field of Information Technology (IT) standardization activities, covering base standards, profiles, and registration mechanisms. A profile defines a combination of base standards that collectively perform a specific well-defined IT function. Profiles standardize the use of options and other variations in the base standards, and provide a basis for the development of uniform, internationally recognized system tests.

ISPs are produced not simply to 'legitimize' a particular choice of base standards and options, but to promote real system interoperability. One of the most important roles for an ISP is to serve as the basis for the development (by organizations other than ISO and IEC) of internationally recognized tests. The development and widespread acceptance of tests based on this and other ISPs is crucial to the successful realization of this goal.

ISO/IEC ISP 10613 consists of several parts of which this is part 3. ISO/IEC ISP 10613-1 specifies the profile requirements that are subnetwork-independent. There are further parts which specify subnetwork-dependent and media-dependent requirements. In addition, for each individual profile there is a part of ISO/IEC ISP 10613 which identifies the specific requirements of that profile, making reference to appropriate material from part 1 and from the subnetwork dependent parts of ISO/IEC ISP 10613.

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Information technology - International Standardized Profile RA - Relaying the Connectionless-mode Network Service -

Part 3:
CSMA/CD LAN subnetwork-dependent, media-dependent requirements

1 Scope

This International Standardized Profile is applicable to interworking units concerned with operating in the Open Systems Interconnection (OSI) environment. It specifies a combination of OSI base standards that collectively provide a Network Relay function for the connectionless-mode Network Service.

This part of ISO/IEC ISP 10613 specifies media-dependent requirements which are applicable to an interworking unit attached to an ISO/IEC 8802-3 CSMA/CD LAN subnetwork. The operation of an interworking unit may involve relaying from one subnetwork to another, and those subnetworks need not be of the same type. This part of ISO/IEC ISP 10613 applies only to communication over those subnetworks which are ISO/IEC 8802-3 CSMA/CD LANs.

2 Normative references

The following documents contain provisions which, through reference in this text, constitute provisions of this International Standardized Profile. At the time of publication, the editions indicated were valid. All documents are subject to revision, and parties to agreements based on this International Standardized Profile are warned against automatically applying any more recent editions of the documents listed below, since the nature of references made by ISPs to such documents is that they may be specific to a particular edition. Members of IEC and ISO maintain registers of currently valid International Standards and ISPs, and CCITT maintains published editions of its current Recommendations.

ISO 8473:1988, *Information processing systems - Data communications - Protocol for providing the Connectionless-mode Network service.*

ISO 8473:1988/Corr.1:1992, *Information processing systems - Data communications - Protocol for providing the Connectionless-mode Network service - Technical Corrigendum 1.*

NOTE - This Technical Corrigendum to ISO 8473 is to apply throughout in this part of ISO/IEC ISP 10613, wherever ISO 8473 itself is referenced.

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ISO 8802-2:1989, *Information processing systems - Local area networks - Part 2: Logical link control.*

ISO/IEC 8802-3:1993, *Information technology - Local and metropolitan area networks - Part 3: Carrier sense multiple access with collision detection (CSMA/CD) access method and physical layer specifications.*

ISO 9542:1988, *Information processing systems - Telecommunications and information exchange between systems - End system to Intermediate system routeing exchange protocol for use in conjunction with the Protocol for providing the connectionless-mode network service (ISO 8473).*

ISO 9542:1988/Corr.1:1991, *Information processing systems - Telecommunications and information exchange between systems - End system to Intermediate system routeing exchange protocol for use in conjunction with the Protocol for providing the connectionless-mode network service (ISO 8473) - Technical Corrigendum 1.*

NOTE - This Technical Corrigendum to ISO 9542 is to apply throughout in this part of ISO/IEC ISP 10613, wherever ISO 9542 itself is referenced.

ISO/IEC TR 10000-1:1992, *Information technology - Framework and taxonomy of International Standardized Profiles -Part 1: Framework.*

ISO/IEC TR 10000-2:1992, *Information technology - Framework and taxonomy of International Standardized Profiles - Part 2: Taxonomy of OSI Profiles.*

ISO/IEC 10039:1991, *Information technology - Open Systems Interconnection - Local area networks - Medium Access Control (MAC) service definition.*

ISO/IEC ISP 10613-1:1994, *Information technology - International Standardized Profile RA - Relaying the Connectionless-mode Network Service - Part 1: Subnetwork-independent requirements.*

ISO/IEC ISP 10613-2:1994, *Information technology - International Standardized Profile RA - Relaying the Connectionless-mode Network Service - Part 2: LAN subnetwork-dependent, media-independent requirements.*

3 Definitions

All the terms used in this part of ISO/IEC ISP 10613 are defined in the documents that are referenced in clause 2.

4 Abbreviations

All abbreviations, including acronyms, are used in this part of ISO/IEC ISP 10613 as defined in the documents referenced in clause 2.

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5 Requirements

5.1 Static Conformance Requirements

5.1.1 Overall Requirements

An implementation conforming to this part of ISO/IEC ISP 10613 shall meet the requirements for ISO 8473 in 5.1.2 below, the requirements for ISO 9542 in 5.1.3 below, the requirements for ISO 8802-2 in 5.1.4 below, and the requirements for ISO/IEC 8802-3 in 5.1.5 below. It shall implement all the features identified as requirements in the ISPICS Requirements List in annex A.

5.1.2 ISO 8473

The implementation shall be capable of dealing with receipt of segments up to 1497 octets in length.

5.1.3 ISO 9542

ISO 9542 defines two logical group addresses that are used to identify the group of all end systems and the group of all intermediate systems attached to a given network. The actual value and representation of these addresses are subnetwork specific, and are not specified by ISO 9542.

When operating the ISO 9542 protocol, the implementation shall:

a) use the following as the All End System Network Entities multicast address, in binary:

1001 0000 0000 0000 1101 0100 0000 0000 0000 0000 0010 0000

where the left-most bit is the Individual/Group address bit.

The hexadecimal representation of the above multicast adress, using the encoding of ISO/IEC 10039, is as follows:

09-00-2B-00-00-04

b) use the following as the All Intermediate System Network Entities multicast address, in binary:

1001 0000 0000 0000 1101 0100 0000 0000 0000 0000 1010 0000

where the left-most bit is the Individual/Group address bit.

The hexadecimal representation of the above multicast address, using the encoding of ISO/IEC 10039, is as follows:

09-00-2B-00-00-05

c) use, as the BSNPA field of Redirect PDUs (RD), the MAC address corresponding to the subnetwork point of attachment which it is desired to identify. The octets of the BSNPA field shall correspond to the octets of the MAC address in accordance with the hexadecimal representation described in ISO/IEC 10039.

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5.1.4 ISO 8802-2

The implementation shall be capable of receiving LLC PDUs of any length up to 1500 octets, including the LLC header.

5.1.5 ISO 8802-3

5.1.5.1 General Requirements

The implementation shall:

a) meet either the requirements for 10BASE5 specified in 5.1.5.2 below, or the requirements for 10BASE2 specified in 5.1.5.3 below, or both;

b) support the functions of the Media Access Control protocol defined in ISO/IEC 8802-3;

c) meet the Physical layer requirements defined in ISO/IEC 8802-3, clause 7: Physical Signalling (PLS) and Attachment Unit Interface (AUI) Specification;

d) if an AUI cable is supplied, meet the requirements specified in clause 7 of ISO/IEC 8802-3;

e) if repeaters are supplied, meet the requirements specified in clause 9 of ISO/IEC 8802-3.

5.1.5.2 Requirements for 10BASE5

The implementation shall:

a) if an MAU is supplied, meet the requirements specified in ISO/IEC 8802-3, subclauses 8.1, 8.2, 8.3, 8.5 and 8.7 -

if an MAU is not supplied, then an externally accessible AUI shall be supplied;

b) if components of the media are supplied, meet the requirements specified in ISO/IEC 8802-3, subclauses 8.4, 8.5, 8.6 and 8.7.

5.1.5.3 Requirements for 10BASE2

The implementation shall:

a) if an MAU is supplied, meet the requirements specified in ISO/IEC 8802-3, subclauses 10.1, 10.3, 10.4, 10.6 and 10.8 -

if an MAU is not supplied, then an externally accessible AUI shall be supplied;

b) if components of the media are supplied, meet the requirements specified in ISO/IEC 8802-3, subclauses 10.5, 10.6, 10.7 and 10.8.

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5.2 Dynamic Conformance Requirements

An implementation conforming to this part of ISO/IEC ISP 10613 shall carry out the supported ISO/IEC 8802-3 functions in accordance with the procedures specified in ISO/IEC 8802-3. It shall behave in accordance with the requirements of the ISPICS Requirements List in annex A.

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Annex A
(normative)

ISPICS Requirements List

A.1 Introduction

ISO/IEC TR 10000-1 identifies three items to be included in an ISPICS Requirements List. These are:

- general options of the profile;
- list of base standards selected in the profile;
- constraints on the allowable answers in the PICS proforma of each such base standard.

The first two items relate to the profile as a whole, and so are included only in those parts of ISO/IEC ISP 10613 which are specific to individual profiles. But each part of ISO/IEC ISP 10613 contains the identification of those PICS proforma constraints which are within its scope.

ISO/IEC TR 10000-1 indicates that an ISPICS proforma may consist either of a simple list of constraints or of amended copies of the base PICS proforma. In this part of ISO/IEC ISP 10613 the former method is used.

A.2 Notation and Conventions

The notation and conventions used in this IPRL are the same as those defined for the IPRL in annex A of ISO/IEC ISP 10613-1.

A.3 IPRL for ISO 8473

Since the base standard does not itself have a PICS proforma, interim base standard PICS proforma information for an intermediate system is provided in annex B of ISO/IEC ISP 10613-1. When a standardized base standard PICS proforma is available, this part of ISO/IEC ISP 10613 will be revised to refer to it.

This part of ISO/IEC ISP 10613 imposes the following constraints:

ISO 8802-2 SNDCF Multilayer Dependencies:

Base Item	Dependency	Constraint
S802SSg-r	<r> Maximum SN data unit size (Rx)	≥ 1497

A.4 IPRL for ISO 9542

This part of ISO/IEC ISP 10613 imposes no IPRL constraints beyond those in ISO/IEC ISP 10613-2.

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A.5 IPRL for ISO 8802-2

This part of ISO/IEC ISP 10613 imposes no IPRL constraints beyond those in ISO/IEC ISP 10613-2.

A.6 IPRL for ISO/IEC 8802-3

Since the base standard does not itself have a stable PICS proforma, interim base standard PICS proforma information is provided in clause B.2. When a standardized base standard PICS proforma is available, this part of ISO/IEC ISP 10613 will be revised to refer to it.

This part of ISO/IEC ISP 10613 imposes the following constraints:

Functions and interfaces:

Base Item	Function	Constraint
10BASE5	10BASE5	o.2
10BASE2	10BASE2	o.2
MAUs	Is an MAU supplied?	AUIa:o ¬AUIa:m
AUIa	Is an AUI externally accessible?	MAUs:o ¬MAUs:m

o.2: It is mandatory to support at least one of these options.

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Annex B[1)]
(normative)

Assumed Base Standard PICS Proforma

B.1 Introduction

This annex contains the PICS proforma information assumed for those base standards which do not already have an internationally agreed and stable PICS proforma.

B.2 ISO/IEC 8802-3

B.2.1 Introduction

Where base standard PICS proformas are not adequate for profile definition purposes, ISO/IEC TR 10000-1 provides for the necessary material to be supplied within the profile definition either by supplying the specific questions needed in addition to whatever may already be available, or by supplying a complete PICS proforma. In the case of ISO/IEC 8802-3, the constraints imposed by this ISP relate only to a very small portion of the total standard, and therefore, in this clause, the approach of supplying only the relevant questions, rather than the whole proforma, has been adopted.

B.2.2 Notation and Conventions

The status of PICS proforma items is indicated by the use of the symbols "M", "O", "X" and "C", which have the same significance as the corresponding lower case symbols defined in subclause A.2.2 of ISO/IEC ISP 10613-1, but are used in upper case in line with common conventions for base standard PICS information in profile definitions. The symbols "-" and "<item>:<status>" are also used with the same meaning as in subclause A.2.2 of ISO/IEC ISP 10613-1.

B.2.3 Instructions for Completion

The PICS proforma consists of a number of tables of labelled items, with information on the requirements applicable to each item (e.g. whether support is mandatory, what ranges of values are permitted, etc., as appropriate). Where necessary to clarify the meaning of an item, references to the relevant clauses of the base standard are given. Note that some items listed may be applicable in more than one context (for example, the requirements for support of a PDU field may differ according to whether the PDU is transmitted or received). In this case, the requirements for each context are identified separately. The tables also contain columns in which the support for each item provided by the implementation is to be recorded. Again, where items cover more than one context, columns for recording support are provided for each context. These columns are to be completed as follows:

---

1) Copyright release for PICS proformas.

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a) In each column headed "Support", an indication is to be given of whether the item is supported or not by marking the answer:

YES to mean it is supported
NO to mean it is not supported

b) Columns for supported values or ranges of values are to be completed by recording the values and ranges supported.

c) Additional information may be attached to the completed proforma to assist in interpretation of the PICS. This should take the form of a numbered list of items of information. Where there is such an item of additional information associated with a PICS proforma item, a reference to it should be included in the columns of the PICS proforma in which support of the item is recorded. This reference should be of the form "An", where "n" is the number of the item of additional information referenced.

d) If for some reason the requirements indicated in the PICS proforma are not met by the implementation (e.g. if a mandatory capability is not implemented), an explanation should be given. Such explanations should be in the form of a numbered list attached to the completed PICS proforma, and referenced from the relevant item in a manner similar to that described above for additional information, but using the notation "Xn" instead of "An".

e) For administrative purposes, a cover page is to be attached to the completed PICS proforma identifying the implementaton and the system in which it resides, the supplier of the system, information on whom to contact if there are any queries concerning the content of the PICS, and the relationship of the PICS to the System Conformance Statement for the system.

B.2.4 Functions and Interfaces

Item	Function	Reference	Status	Support
10BASE5	10BASE5	8	O	YES ☐ NO ☐
10BASE2	10BASE2	10	O	YES ☐ NO ☐
MAUs	Is an MAU supplied?	8, 10	O	YES ☐ NO ☐
AUIa	Is an AUI externally accessible?	7	O	YES ☐ NO ☐

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Annex C
(informative)

Recommendations

C.1 Introduction

The information in this annex is tutorial in nature. It does not constitute a normative section of this part of ISO/IEC ISP 10613.

In the absence of specific applications making alternative behaviour appropriate, it is recommended that the features described in this annex are implemented.

C.2 ISO 9542 Recommendations

Since the LAN subnetworks already provide checksumming, to avoid unnecessary overhead, header checksum generation should not be used.

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