INTERNATIONAL STANDARDIZED PROFILE

ISO/IEC ISP 10612-1

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Information technology — International Standardized Profile RD — Relaying the MAC service using transparent bridging —

Part 1:
Subnetwork-independent requirements

Technologies de l'information — Profil normalisé international RD — Transmission du service MAC utilisant un pontage transparent —

Partie 1: Prescriptions indépendantes du sous-réseau

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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. In addition to developing International Standards, ISO/IEC JTC 1 has created a Special Group on Functional Standardization for the processing 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 10612-1 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 10612 consists of several parts, under the general title *Information technology - International Standardized Profile RD - Relaying the MAC service using transparent bridging:*

- *Part 1: Subnetwork-independent requirements*
- *Part 2: CSMA/CD LAN subnetwork-dependent, media-dependent requirements*
- *Part 3: Token Ring LAN subnetwork-dependent, media-dependent requirements*
- *Part 4: Profile RD51.51 (CSMA/CD LAN - CSMA/CD LAN)*

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- *Part 5: Profile RD51.54 (CSMA/CD LAN - FDDI LAN)*
- *Part 6: Profile RD54.54 (FDDI LAN - FDDI LAN)*
- *Part 7: Profile RD51.53 (CSMA/CD LAN - Token Ring LAN)*
- *Part 8: Profile RD53.53 (Token Ring LAN - Token Ring LAN)*
- *Part 9: Profile RD53.54 (Token Ring LAN - FDDI LAN)*

Annex A forms an integral part of this part of ISO/IEC ISP 10612. Annex B is for information only.

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Introduction

ISO/IEC ISP 10612 is defined in accordance with the principles specified by ISO/IEC TR 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 test methods. 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 10612 consists of several parts, of which this is part 1. ISO/IEC ISP 10612-1 specifies the profile requirements which are independent of the subnetwork and media. 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 10612 which identifies the specific requirements of that profile, making reference to appropriate material from part 1 and from the subnetwork-dependent parts.

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Information technology — International Standardized Profile RD — Relaying the MAC service using transparent bridging —

Part 1:
Subnetwork-independent requirements

1 Scope

ISO/IEC ISP 10612 is applicable to interworking units concerned with operating in the Open Systems Interconnection (OSI) Local Area Network environment. It specifies a combination of OSI standards that collectively provide a MAC relay function.

This part of ISO/IEC ISP 10612 specifies requirements which are applicable to interworking units operating the MAC Service regardless of the types of subnetworks to which they are attached.

2 Normative references

The following documents contain provisions which, through reference in this text, constitute provisions of this part of ISO/IEC ISP 10612. At the time of publication, the editions indicated were valid. All documents are subject to revision and parties to agreements based on this part of ISO/IEC ISP 10612 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 ITU-T maintains published editions of its current Recommendations.

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 10038:1993, *Information technology - Telecommunications and information exchange between systems - Local area networks - Media access control (MAC) bridges.*

3 Definitions

The terms used in this part of ISO/IEC ISP 10612 are defined in the documents that are referenced in clause 2.

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4 Abbreviations

The abbreviations used in this part of ISO/IEC ISP 10612 as defined in the documents that are referenced in clause 2.

5 Requirements

The requirements in this clause apply to all interworking units within the scope of ISO/IEC ISP 10612 and are to be implemented for all subnetwork attachments to which ISO/IEC ISP 10612 applies. Additional specific requirements apply with respect to attachments to certain types of subnetwork; these requirements are specified in other parts of ISO/IEC ISP 10612.

5.1 Static conformance requirements

An implementation conforming to this part of ISO/IEC ISP 10612 shall implement the functions required in subclause 1.5 of ISO/IEC 10038 and shall meet the constraints of the ISPICS Requirements List in Annex A of this part of ISO/IEC ISP 10612.

5.2 Dynamic conformance requirements

An implementation conforming to this part of ISO/IEC ISP 10612 shall carry out the supported functions of ISO/IEC 10038 as required in that subclause 1.5 of ISO/IEC 10038. 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 3 items to be included in an ISPICS Requirements List (IPRL). These are

- general options of the profile;
- list of base standards selected by the profile;
- constraints on the allowable answers in the PICS proforma of each 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 10612 which are specific to individual profiles. But each part of ISO/IEC ISP 10612 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 standard PICS proforma. In this part of ISO/IEC ISP 10612, the former method is used. Additional questions have also been included in this IPRL as permitted by ISO/IEC TR 10000-1.

A.2 Notation and conventions

A.2.1 Introduction

In many cases the constraints imposed by the IPRL are expressed in the form of symbols indicating the status in the context of ISO/IEC ISP 10612 of those base standard PICS proforma items to which the constraints apply. The symbols used are defined in the following two subclauses.

A.2.2 Notation for static conformance

The following symbols are used to identify constraints on the capabilities to be supported by a conforming implementation:

a) *Symbols directly specifying status*

Symbol	*Meaning*
m	mandatory
o	optional
x	prohibited
-	not applicable

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i	outside the scope of ISO/IEC ISP 10612

It should be noted that, in the context of received PDUs or fields or parameters of received PDUs, the capability to support them is the ability to interpret the significance of the PDU or field and act on it in accordance with the dynamic conformance requirements of the protocol (which may, in some cases, mean generating an error report). PDUs or fields which are not supported are those whose receipt is ignored and has no impact on the protocol operation.

b) *Other associated notation*

Symbol	*Meaning*
(n/c)	Where it is desired to keep the format in which constraints are specified parallel to that of the corresponding item within a PICS proforma, but the IPRL imposes extra constraints only on a subset of the entries covered by that item, this symbol (meaning "no constraint") is used for those entries on which constraints are not imposed.
<item>:<status>	conditional (see below)
o.<*n*>	mutually exclusive or selectable option (see below)
¬	logical negation

Symbols of the form <item>:<status> are used as an abbreviated way of expressing a condition wherein the status is as identified if the specified item is supported, and otherwise the status is not applicable. So, for example, "ABC:m" would be equivalent to a conditional status "if ABC then m else -".

Symbols of the form o.<*n*> are used when one or more of a set of options may be selected. In this case, <*n*> is a number which groups the set of selectable options together and it definition at the end of the subclause in which it is used. The definition specifies whether the options are mutually exclusive and any other conditions which apply.

A.2.3 Notation for dynamic conformance

In some cases, it is necessary to specify constraints not only on the capabilities which are implemented, but also on whether they are used. When this is necessary, the static conformance status symbol from A.2.2(a) above is followed by an additional symbol to create a two-character status definition. The second symbol specifies the dynamic constraints, and the meanings are as follows:

a) *Symbols directly specifying status*

Symbol	*Meaning*
m	mandatory - the implementation is required to use the capability whenever applicable
o	optional - use of the capability is optional
x	prohibited - use of the capability is not permitted

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-	not applicable
i	outside the scope of ISO/IEC ISP 10612
d	disabling required - use of the capability is not invariably prohibited but the implementation is required to provide a means whereby it can be disabled

Thus, for example, a status of "mm" would mean that it is mandatory to provide the capability indicated by the item and that it is also mandatory to use that capability wherever applicable.

Where only a single status character is used, it specifies the static requirement and indicates that no additional constraint is placed upon the dynamic use of the capability.

b) *Other associated notation*

o.<*n*>	mutually exclusive or selectable option (see below)

Symbols of the form o.<*n*> are used when one or more of a set of options may be selected. In this case, <*n*> is a number which groups the set of selectable options together and it also refers to a definition at the end of the subclause in which it is used. The definition specifies whether the options are mutually exclusive and any other conditions which apply.

A.2.4 Identification of PICS proforma items

In line with ISO/IEC 9646-2, PICS proforma items are identified by using the subclause number followed by a solidus followed by the item reference of the relevant PICS proforma line. When identifying an item within the same subclause, the subclause number and solidus are not necessarily present.

A.2.5 Abbreviations

The following abbreviations are additional to those identified in clause 4 of this part of ISO/IEC ISP 10612:

Tx	Transmission
Rx	Reception
Ref	Reference

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A.3 IPRL for ISO/IEC 10038

IPRL item	Base item	Description	Base reference	Constraint
A1	4/9a	Can the Bridge be configured to use 48-bit Universal Addresses?	3.12	m
A2	4/9b	Can the Bridge be configured to use 48-bit Local Addresses?	3.12	m
A3	4/9c	Can the Bridge be configured to use 16-bit Local Addresses?	3.12	i
A4	5/16	Does the Bridge support management of the Spanning Tree Topology?	4.2	o
A5	5/16a	Can the relative priority of the Bridge be set	4.2, 4.5.3.7, 4.8.4	A4:m
A6		Is the value of the default Bridge Priority the Recommended or Default Value in the base standard?	Table 4-4	m
A7	5/16b	Can the relative priority of the Ports be set?	4.2, 4.5.5.1, 4.8.5	A4:m
A8		Is the value of the default Port Priority the Recommended or Default Value in the base standard?	Table 4-4	m
A9	5/16c	Can the Path Cost for each port be set?	4.2, 4.5.5.3, 4.8.6	A4:m
A10		Is the value of the default Path Cost as recommended in the base standard?	Table 4-5, 4.10.2	m
A11		Is the default Bridge Max Age as specified for the Recommended or Default Value in the base standard?	4.10.2, 4.5.3.8, Table 4-3	m
A12		Is the default Bridge Hello Time as specified for the Recommended or Default Value in the base standard?	4.10.2, 4.5.3.9, Table 4-3	m
A13		Is the default Bridge Forward Delay as specified for the Recommended or Default Value in the base standard?	4.10.2, 4.5.3.10, Table 4-3	m

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Annex B
(informative)

Additional tutorial material

B.1 Introduction

The information in this Annex is tutorial in nature. It does not constitute a normative part of ISO/IEC ISP 10612.

B.2 Spanning tree parameter values

Attention is drawn to ISO/IEC 10038, subclause 4.10 and Annex B, which describe the basis of determining a set of compatible Spanning Tree Parameter values for any cases where Spanning Tree Parameter values, e.g. for maximum bridge diameter, different from those recommended in ISO/IEC 10038 are used.

B.3 Accuracy of timers

In general, the accuracy of the various timers is not an issue for the operation of MAC bridging or for interworking through MAC bridges as there is a margin which will allow implementations of low accuracy. However, the following timer-related issues are of importance in the correct operation of the Spanning Tree Protocol in a subnetwork containing a number of MAC bridges:

a) Bridge Protocol Data Units should be issued promptly;

b) the age of a Bridge Protocol Data Unit should not be underestimated;

c) the age of a Bridge Protocol Data Unit should not be overestimated by more than that allowed by the 'maximum Message Age increment overestimate' parameter.

Guidance on these matters is given in subclause 4.10.1 of ISO/IEC 10038.

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