INTERNATIONAL STANDARDIZED PROFILE

# ISO/IEC ISP 10613-1

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

## Part 1:
Subnetwork-independent requirements

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

*Partie 1: Spécifications indépendantes du sous-réseau*

Reference number
ISO/IEC ISP 10613-1:1994(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 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 10613-1 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 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 1. This part of ISO/IEC ISP 10613 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 1:
Subnetwork-independent 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 requirements which are applicable to interworking units operating the connectionless-mode Network Service regardless of the type 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 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.

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).*



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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.*

# 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 that are referenced in clause 2.

# 5 Requirements

## 5.1 Introduction

The requirements in this clause apply to all interworking units within the scope of ISO/IEC ISP 10613, and are to be implemented for all the subnetwork attachments to which this part of ISO/IEC ISP 10613 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 10613.

## 5.2 Static Conformance Requirements

### 5.2.1 Overall Requirements

An implementation conforming to this part of ISO/IEC ISP 10613 shall meet the ISO 8473 requirements specified in 5.2.2 below and the ISO 9542 requirements specified in 5.2.3 below, and shall implement all the features identified as requirements in the ISPICS Requirements List in annex A.

### 5.2.2 ISO 8473

The implementation shall:



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a) implement the functions required for conformance to ISO 8473 by a system of type "forward" as specified in clause 9 of ISO 8473;

b) be capable of forwarding PDUs from any subnetwork attachment to the same or any other subnetwork attachment;

c) if the Reassembly function is implemented, provide a means to disable its use;

NOTE - If provided, reassembly in intermediate systems may be either partial or full, depending on the reassembly scheme in use, as indicated in subclause 6.8 of ISO 8473.

d) provide a mechanism capable of configuring specific entries into the Routing Information Base used by the ISO 8473 Route PDU function;

NOTE - Although it is required that this method of routing can be selected for any given Network Address regardless of its format or value, the number of different Network Addresses for which such information can simultaneously be held is an implementation-dependent matter. Implementations are permitted to provide the capability of overriding the configured route by means of information obtained from a dynamic routing protocol, since there are circumstances in which such information, if it becomes available, may be more accurate than the pre-configured information.

e) implement the Partial Route Recording function.

#### 5.2.3 ISO 9542

The implementation shall:

a) implement the static conformance requirements for intermediate systems specified in ISO 9542;

b) if configuration information is implemented, provide a means to disable its use on each subnetwork independently.

### 5.3 Dynamic Conformance Requirements

#### 5.3.1 Overall Requirements

An implementation conforming to this part of ISO/IEC ISP 10613 shall carry out the supported functions of ISO 8473 as specified in 5.3.2 below, and the supported functions of ISO 9542 as specified in 5.3.3 below. It shall behave in accordance with the requirements of the ISPICS Requirements List in annex A.

#### 5.3.2 ISO 8473

The implementation shall:

a) execute the supported functions as required by clause 9 of ISO 8473;

b) on receipt of a PDU whose first octet identifies the inactive subset of the protocol, neither forward it nor generate an error report.



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### 5.3.3 ISO 9542

The implementation shall implement the dynamic conformance requirements specified in ISO 9542.



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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

### 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 this part of ISO/IEC ISP 10613 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 |
| i | out of scope, not relevant to this profile |

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



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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

| | |
|---|---|
| c<*n*> | conditional (see below) |
| <item>:<status> | conditional (see below) |

Symbols of the form c<*n*> are used when the status of an item is dependent on the support of other items. In this case, <*n*> is a number which refers to a definition at the end of the subclause in which it is used. That definition specifies the conditional status, which may, for example, be in a form such as "if ABC then m else x", which would indicate that the status is mandatory if the item in the PICS proforma with reference ABC is supported, and otherwise is prohibited.

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 -".

### 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 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:

| Symbol | Meaning |
|---|---|
| m | mandatory<br>- the implementation is required to use the capability whenever applicable |
| o | optional<br>- use of the capability is optional |
| x | prohibited<br>- use of the capability is not permitted |
| - | not applicable |
| i | outside the scope of this ISP |
| d | disabling required<br>- 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 PICS proforma 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.



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## 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. 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:

Major Capabilities:

| Base Item | Capability | Constraint |
|---|---|---|
| IS | Intermediate system | m |

Supported Functions:

| Base Item | Function | Constraint |
|---|---|---|
| iReas | Reassemble PDU | od |
| iPRR | <s> Partial route recording | m |
| iSecu | <s> Security | i |

DT Parameters:

| Base Item | Parameter | Constraint |
|---|---|---|
| idSecu-s | <s> Security | i |
| idSecu-r | <r> Security | i |
| idPRR-r | <r> Partial route recording | m |

ER Parameters:

| Base Item | Parameter | Constraint |
|---|---|---|
| idSecu-s | <s> Security | i |
| idSecu-r | <r> Security | i |
| idPRR-r | <r> Partial route recording | m |



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## A.4 IPRL for ISO 9542

The relevant base standard PICS proforma is the PICS proforma given in annex A of ISO 9542 for intermediate systems. This part of ISO/IEC ISP 10613 imposes the following constraints:

Protocol Function - Intermediate System:

| Base Item | Protocol Function | Constraint |
|---|---|---|
| CI | Is configuration information supported | od |

PDU Fields - Intermediate System:

| Base Item | PDU field | Constraint |
|---|---|---|
| Scty-s<br>Scty-r | <s> Security<br><r> Security | i<br>i |



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# Annex B[1)]
(normative)

# Assumed Base Standard PICS Proforma for ISO 8473 Intermediate System Operation

## B.1 Introduction

This annex contains PICS proforma information assumed for ISO 8473 which does not already have an internationally stable PICS proforma. This annex includes only such assumed PICS proforma items which are relevant to the intermediate system operation of ISO 8473.

The supplier of a protocol implementation which is claimed to conform to ISO 8473 intermediate system operation shall complete the following Protocol Implementation Conformance Statement (PICS) proforma.

A completed PICS proforma is the PICS for the implementation in question. The PICS is a statement of which capabilities and options of the protocol have been implemented. The PICS can have a number of uses, including use

- by the protocol implementor, as a check-list to reduce the risk of failure to conform to the standard through oversight;
- by the supplier and acquirer - or potential acquirer - of the implementation, as a detailed indication of the capabilities of the implementation, stated relative to the common basis for understanding provided by the standard PICS proforma;
- by the user - or potential user - of the implementation, as a basis for initially checking the possibility of interworking with another implementation (note that, while interworking can never be guaranteed, failure to interwork can often be predicted from incompatible PICSs);
- by the protocol tester, as the basis for selecting appropriate tests against which to assess the claim for conformance of the implementation.

## B.2 Abbreviations and Special Symbols

### B.2.1 Status Symbols

| | |
|---|---|
| M | mandatory |
| O | optional |
| O.<*n*> | optional, but support of at least one of the group of options labelled by the same numeral <*n*> is required |
| X | prohibited |
| <pred>: | conditional-item symbol, including predicate identification (see B.3.4) |
| ¬ | logical negation, applied to a conditional item's predicate |

1) Copyright release for PICS proformas

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### B.2.2 Other Symbols

<r> receive aspects of an item
<s> send aspects of an item

## B.3 Instructions for Completing the PICS Proforma

### B.3.1 General Structure of the PICS Proforma

The first part of the PICS proforma - Implementation Identification and Protocol Summary - is to be completed as indicated with the information necessary to identify both the supplier and the implementation.

The main part of the PICS proforma is a fixed-format questionnaire divided into a number of major subclauses; these can be divided into further subclauses each containing a group of individual items. Answers to the questionnaire items are to be provided in the rightmost column, either by simply marking an answer to indicate a restricted choice (usually Yes or No), or by entering a value or a set or range of values.

NOTE - There are some items for which two or more choices from a set of possible answers can apply. All relevant choices are to be marked in these cases.

Each item is identified by an item reference in the first column; the second column contains the question to be answered; and the third column contains the reference or references to the material that specifies the item in the main body of ISO 8473. The remaining columns record the status of the item - whether support is mandatory, optional, prohibited or conditional - and provide the space for answers (see also B.3.4).

A supplier may also provide further information, categorized as either Additional Information or Exception Information. When present, each kind of further information is to be provided in a further subclause of items labelled A<i> or E<i>, respectively, for cross-referencing purposes, where <i> is any unambiguous identification for the item (e.g., a number); there are no other restrictions on its format or presentation.

A completed PICS proforma, including any Additional Information or Exception Information, is the Protocol Implementation Conformance Statement for the implementation in question.

NOTE - Where an implementation is capable of being configured in more than one way, a single PICS may be able to describe all such configurations. However, the supplier has the choice of providing more than one PICS, each covering some subset of the implementation's configuration capabilities, in cases where this makes for easier and clearer presentation of the information.

### B.3.2 Additional Information

Items of Additional Information allow a supplier to provide further information intended to assist the interpretation of the PICS. It is not intended or expected that a large quantity will be supplied, and a PICS may be considered complete without any such information. Examples might be an outline of the ways in which a (single) implementation can be set up to operate in a variety of environments and configurations; or a brief rationale - based perhaps upon specific application needs - for the exclusion of features which, although optional, are nonetheless commonly present in implementations of this protocol.

References to items of Additional Information may be entered next to any answer in the questionnaire, and may be included in items of Exception Information.



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### B.3.3 Exception Information

It may occasionally happen that a supplier will wish to answer an item with mandatory or prohibited status (after any conditions have been applied) in a way that conflicts with the indicated requirement. No pre-printed answer will be found in the support column for this; instead, the supplier shall write the missing answer into the support column, together with an X<i> reference to an item of Exception Information, and shall provide the appropriate rationale in the Exception Information item itself.

An implementation for which an Exception Information item is required in this way does not conform to ISO 8473.

NOTE - A possible reason for the situation described above is that a defect in the standard has been reported, a correction for which is expected to change the requirement not met by the implementation.

### B.3.4 Conditional Status

#### B.3.4.1 Conditional Items

The PICS proforma contains a number of conditional items. These are items for which the status - mandatory, optional or prohibited - that applies is dependent upon whether or not certain other items are supported, or upon the values supported for other items.

In many cases, whether or not the item applies at all is conditional in this way, as well as the status when the item does apply.

Where a group of items is subject to the same condition for applicability, a separate preliminary question about the condition appears at the head of the group, with an instruction to skip to a later point in the questionnaire if the "Not Applicable" answer is selected. Otherwise, individual conditional items are indicated by one or more conditional symbols (on separate lines) in the status column.

A conditional item is of the form "<pred>:<x>" where "<pred>" is a predicate as described in B.3.4.2, and "<x>" is one of the status symbols M, O, O.<*n*>, or X.

If the value of the predicate in any line of a conditional item is true (see B.3.4.2), then the conditional item is applicable, and its status is that indicated by the status symbol following the predicate; the answer column is to be marked in the usual way. If the value of the predicate is false, the Not Applicable (N/A) answer is to be marked in the relevant line. Each line in a multi-line conditional item should be marked: at most one line will require an answer other than N/A.

#### B.3.4.2 Predicates

A predicate is one of the following:

a) an item-reference for an item in the PICS proforma: the value of the predicate is true if the item is marked as supported, and is false otherwise;

b) a predicate name, for a predicate defined elsewhere in the PICS proforma (usually in the Major Capabilities section or at the end of the section containing the conditional item): see below; or



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c) the logical negation symbol "¬" prefixed to an item-reference or predicate name: the value of the predicate is true if the value of the predicate formed by omitting the "¬" is false, and vice versa.

The definition for a predicate name is one of the following:

a) an item-reference, evaluated as (a) above;

b) a relation containing a comparison operator ( = , < , etc) with at least one of its operands being an item-reference for an item taking numerical values as its answer; the predicate is true if the relation holds when each item-reference is replaced by the value entered in the support column as an answer to the item referred to; or

c) a boolean expression constructed by combining simple predicates, as in (a) and (b), using the boolean operators AND, OR and NOT, and parentheses, in the usual way; the value of such a predicate is true if the boolean expression evaluates to true when the simple predicates are interpreted as described above.

Each item whose reference is used in a predicate or predicate definition is indicated by an asterisk in the Item column.

## B.4 Identification

### B.4.1 Implementation Identification

| | |
|---|---|
| Supplier | |
| Contact point for queries about the PICS | |
| Implementation name(s) and version(s) | |
| Other information necessary for full identification (e.g. , name(s) and version(s) of machines and/or operating systems, system name(s)) | |

NOTES

1 Only the first three items are required for all implementations; other information may be completed as appropriate in meeting the requirement for full identification.

2 The terms Name and Version should be interpreted appropriately to correspond with a supplier's terminology (e.g., Type, Series, Model).



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### B.4.2 Protocol Summary

| | |
|---|---|
| Identification of protocol specification | ISO 8473 : 1988 |
| Identification of corrigenda and amendments to the PICS proforma | |
| Protocol version(s) supported | |
| Have any Exception Information items been required (see B.3.3)? YES ☐ NO ☐<br>(The answer YES means that the implementation does not conform to this International Standard) | |

| | |
|---|---|
| Date of statement | |

## B.5 Major Capabilities

| | Item | Capability | Reference | Status | Support | | |
|---|---|---|---|---|---|---|---|
| * | ES | End system | | O.1 | | YES ☐ | NO ☐ |
| * | IS | Intermediate system | | O.1 | | YES ☐ | NO ☐ |
| | FL-r | <r> Full protocol | 6 | M | | YES ☐ | |
| | FL-s | <s> Full protocol | 6 | M | | YES ☐ | |
| | NSS-r | <r> Non-segmenting subset | 5.2 | M | | YES ☐ | |
| * | NSS-s | <s> Non-segmenting subset | 5.2 | IS:M | N/A ☐ | YES ☐ | |
| | | | | ¬IS:O | N/A ☐ | YES ☐ | NO ☐ |
| * | IAS-r | <r> Inactive subset | 5.2 | ES:O | N/A ☐ | YES ☐ | NO ☐ |
| * | IAS-s | <s> Inactive subset | 5.2 | IAS-r:M | N/A ☐ | YES ☐ | |
| | | | | ¬IAS-r:X | N/A ☐ | | NO ☐ |

## B.6 End Systems

Not applicable to this part of ISO/IEC ISP 10613.



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## B.7 Intermediate Systems

### B.7.1 Applicability

The PICS proforma items in clause B.7 are applicable only to intermediate system implementations; i.e. those in which item IS in clause B.5 is supported.

### B.7.2 Supported Functions

| | Item | Function | Reference | Status | Support | |
|---|---|---|---|---|---|---|
| | iPDUC | PDU composition | 6.1 | M | YES □ | |
| | iPDUD | PDU decomposition | 6.2 | M | YES □ | |
| | iHFA | Header format analysis | 6.3 | M | YES □ | |
| | iPDUL | <s> PDU lifetime control | 6.4 | M | YES □ | |
| | iRout | Route PDU | 6.5 | M | YES □ | |
| | iForw | Forward PDU | 6.6 | M | YES □ | |
| | iSegm | Segment PDU | 6.7 | iDSNS:M | N/A □ YES □ | |
| * | iReas | Reassemble PDU | 6.8 | O | YES □ | NO □ |
| | iDisc | Discard PDU | 6.9 | M | YES □ | |
| | iErep | Error reporting | 6.10 | M | YES □ | |
| | iEdec | <s> Header error detection | 6.11 | M | YES □ | |
| * | iSecu | <s> Security | 6.13 | O | YES □ | NO □ |
| * | iCRR | <s> Complete route recording | 6.15 | O | YES □ | NO □ |
| * | iPRR | <s> Partial route recording | 6.15 | O | YES □ | NO □ |
| * | iCSR | Complete source routeing | 6.14 | O | YES □ | NO □ |
| * | iPSR | Partial source routeing | 6.14 | O | YES □ | NO □ |
| * | iPri | <s> Priority | 6.17 | O | YES □ | NO □ |
| * | iQOSM | <s> QOS maintenance | 6.16 | O | YES □ | NO □ |
| * | iCong | <s> Congestion notification | 6.18 | O | YES □ | NO □ |
| | iPadd | <s> Padding | 6.12 | M | YES □ | |
| | iSegS | Create segments smaller than necessary | 6.8 | O | YES □ | NO □ |
| * | iDSNS | Simultaneous support of sub-networks with different SN-Userdata sizes | Table 10, note 2 | O | YES □ | NO □ |

### B.7.3 Supported PDUs

| Item | NPDU | Reference | Status | Support |
|---|---|---|---|---|
| iDT-t | DT (full protocol) transmit | 7.7 | M | YES □ |
| iDT-r | DT (full protocol) receive | 7.7 | M | YES □ |
| iDTNS-t | DT (non-segmenting) transmit | 7.7 | M | YES □ |
| iDTNS-r | DT (non-segmenting) receive | 7.7 | M | YES □ |
| iER-t | ER transmit | 7.9 | M | YES □ |
| iER-r | ER receive | 7.9 | M | YES □ |



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### B.7.4 Supported Parameters

#### B.7.4.1 DT Parameters

| Item | Parameter | Reference | Status | Support |
|---|---|---|---|---|
| idFxPt-s | <s> Fixed part | 7.2 | M | YES □ |
| idFxPt-r | <r> Fixed part | 7.2 | M | YES □ |
| idAddr-s | <s> Addresses | 7.3 | M | YES □ |
| idAddr-r | <r> Addresses | 7.3 | M | YES □ |
| idSeg-s | <s> Segmentation part | 7.4 | M | YES □ |
| idSeg-r | <r> Segmentation part | 7.4 | M | YES □ |
| idPadd-s | <s> Padding | 7.5.2 | M | YES □ |
| idPadd-r | <r> Padding | 7.5.2 | M | YES □ |
| idSecu-s | <s> Security | 7.5.3 | iSecu:M | N/A □ YES □ |
| idSecu-r | <r> Security | 7.5.3 | iSecu:M | N/A □ YES □ |
| idCRR-s | <s> Complete route recording | 7.5.5 | iCRR:M | N/A □ YES □ |
| idCRR-r | <r> Complete route recording | 7.5.5 | iCRR:M | N/A □ YES □ |
| idPRR-s | <s> Partial route recording | 7.5.5 | M | YES □ |
| idPRR-r | <r> Partial route recording | 7.5.5 | iPRR:M | N/A □ YES □ |
| idCSR-s | <s> Complete source routeing | 7.5.4 | iCSR:M | N/A □ YES □ |
| idCSR-r | <r> Complete source routeing | 7.5.4 | iCSR:M | N/A □ YES □ |
| idPSR-s | <s> Partial source routeing | 7.5.4 | M | YES □ |
| idPSR-r | <r> Partial source routeing | 7.5.4 | iPSR:M | N/A □ YES □ |
| idQOSM-s | <s> QOS maintenance | 7.5.6 | M | YES □ |
| idQOSM-r | <r> QOS maintenance | 7.5.6 | c1:M | N/A □ YES □ |
| idPri-s | <s> Priority | 7.5.7 | M | YES □ |
| idPri-r | <r> Priority | 7.5.7 | iPri:M | N/A □ YES □ |
| idData-s | <s> Data | 7.6 | M | YES □ |
| idData-r | <r> Data | 7.6 | M | YES □ |
| idUnSup2 | Are received PDUs containing parameters selecting unsupported Type 2 functions discarded and where appropriate an Error Report generated? | 6.19 | M | YES □ |
| idUnSup3 | Are parameters selecting unsupported Type 3 functions ignored? | 6.19 | M | YES □ |

Definition of conditional entry:

c1: iQOSM OR iCong



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### B.7.4.2 ER Parameters

| Item | Parameter | Reference | Status | Support |
|---|---|---|---|---|
| idFxPt-s | <s> Fixed part | 7.2 | M | YES □ |
| idFxPt-r | <r> Fixed part | 7.2 | M | YES □ |
| idAddr-s | <s> Addresses | 7.3 | M | YES □ |
| idAddr-r | <r> Addresses | 7.3 | M | YES □ |
| idSeg-s | <s> Segmentation part | 7.4 | M | YES □ |
| idSeg-r | <r> Segmentation part | 7.4 | M | YES □ |
| idPadd-s | <s> Padding | 7.5.2 | M | YES □ |
| idPadd-r | <r> Padding | 7.5.2 | M | YES □ |
| idSecu-s | <s> Security | 7.5.3 | iSecu:M | N/A □ YES □ |
| idSecu-r | <r> Security | 7.5.3 | iSecu:M | N/A □ YES □ |
| idCRR-s | <s> Complete route recording | 7.5.5 | iCRR:M | N/A □ YES □ |
| idCRR-r | <r> Complete route recording | 7.5.5 | iCRR:M | N/A □ YES □ |
| idPRR-s | <s> Partial route recording | 7.5.5 | M | YES □ |
| idPRR-r | <r> Partial route recording | 7.5.5 | iPRR:M | N/A □ YES □ |
| idCSR-s | <s> Complete source routeing | 7.5.4 | iCSR:M | N/A □ YES □ |
| idCSR-r | <r> Complete source routeing | 7.5.4 | iCSR:M | N/A □ YES □ |
| idPSR-s | <s> Partial source routeing | 7.5.4 | M | YES □ |
| idPSR-r | <r> Partial source routeing | 7.5.4 | iPSR:M | N/A □ YES □ |
| idQOSM-s | <s> QOS maintenance | 7.5.6 | M | YES □ |
| idQOSM-r | <r> QOS maintenance | 7.5.6 | c1:M | N/A □ YES □ |
| idPri-s | <s> Priority | 7.5.7 | M | YES □ |
| idPri-r | <r> Priority | 7.5.7 | iPri:M | N/A □ YES □ |
| idData-s | <s> Data | 7.6 | M | YES □ |
| idData-r | <r> Data | 7.6 | M | YES □ |
| idUnSup2 | Are received PDUs containing parameters selecting unsupported Type 2 functions discarded and where appropriate an Error Report generated? | 6.19 | M | YES □ |
| idUnSup3 | Are parameters selecting unsupported Type 3 functions ignored? | 6.19 | M | YES □ |

Definition of conditional entry:

c1: iQOSM OR iCong



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### B.7.5 Timer and Parameter Values

| Item | Timer | Reference | Status | Values | Support | Values supported |
|---|---|---|---|---|---|---|
| iLifReas | Is reassembly timer ≤ received derived PDU lifetime? | 6.8 | iReas:M | | N/A □ YES □ | |
| iReasLim | What values of the reassembly timer are supported? | 6.8 | | 500 ms to 127.5 s | | |

## B.8 Subnetwork-dependent Convergence Functions

### B.8.1 SNDCF Major Capabilities

| Item | Capability | Reference | Status | Support |
|---|---|---|---|---|
| * S802 | SNDCF for ISO 8802-2 | 8.4.2 | O.2 | YES □ NO □ |
| * SX25 | SNDCF for ISO/IEC 8208 | 8.4.3 | O.2 | YES □ NO □ |

### B.8.2 SNDCF for Use with ISO 8802-2 Subnetworks

#### B.8.2.1 Applicability

Subclause B.8.2.2 is applicable only to implementations in which B.8.1/S802 is supported.

#### B.8.2.2 ISO 8802-2 SNDCF Functions

| Item | Function | Reference | Status | Support |
|---|---|---|---|---|
| S802SNUD | Is Subnetwork User Data of at least 512 octets transfered transparently by the SNDCF? | 8.3 | M | YES □ |
| S802SNTD | Is Transit Delay determined by the SNDCF prior to processing of user data? | 8.2.1 | M | YES □ |



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#### B.8.2.3 ISO 8802-2 SNDCF Multilayer Dependencies

| Item | Dependency | Reference | Require-ment | Values supported |
|---|---|---|---|---|
| S802SSg-r<br>S802SSg-t | <r> Maximum SN data unit size (Rx)<br><s> Maximum SN data unit size (Tx) | 8.3<br>8.3 | ≥ 512<br>≥ 512 | |

### B.8.3 SNDCF for Use with ISO/IEC 8208 Subnetworks

#### B.8.3.1 Applicability

Subclause B.8.3.2 is applicable only to implementations in which B.8.1/SX25 is supported.



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### B.8.3.2 ISO/IEC 8208 SNDCF Function

| | Item | Function | Reference | Status | Support | |
|---|---|---|---|---|---|---|
| | XSNUD | Is Subnetwork User Data of at least 512 octets transfered transparently by the SNDCF? | 8.3 | M | YES □ | |
| | XSNTD | Is Transit Delay determined by the SNDCF prior to processing of user data? | 8.2.1 | M | YES □ | |
| | | Call Setup Considerations - Is a new call setup: | 8.4.3.1 | | | |
| | XCalla | a) when no suitable call exists? | 8.4.3.1 a) | O.3 | YES □ | NO □ |
| | XCallb | b) when queue threshold reached? | 8.4.3.1 b) | O.3 | YES □ | NO □ |
| | XCallc | c) by systems management? | 8.4.3.1 c) | O.3 | YES □ | NO □ |
| | XCalld | d) when queue threshold reached and timer expires? | 8.4.3.4 | O.3 | YES □ | NO □ |
| | XCalle | e) by other local means? | 8.4.3.1 | O.3 | YES □ | NO □ |
| | | Call Clearing Considerations - Are calls cleared: | 8.4.3.2 | | | |
| * | XClra | a) when idle timer expires? | 8.4.3.2 a) 8.4.3.4 | O | YES □ | NO □ |
| | XClrb | b) when need to re-use circuit? | 8.4.3.2 b) | O | YES □ | NO □ |
| | XClrc | c) by systems management? | 8.4.3.2 c) | O | YES □ | NO □ |
| | XClrd | d) by provider? | 8.4.3.2 d) | M | YES □ | |
| | XClre | e) by other local means? | 8.4.3.2 | O | YES □ | NO □ |
| | XPD | X.25 Protocol Discrimination | 8.4.3.3 | M | YES □ | |
| | XVCC | Resolution of VC collisions | 8.4.3.5 | M | YES □ | |
| | XMCR | Multiple VCs - responding | 8.4.3.6 | M | YES □ | |
| * | XMCI | Multiple VCs - initiating | 8.4.3.6 | O | YES □ | NO □ |
| | XPri | X.25 Priority procedure | 8.4.3.7 | O | YES □ | NO □ |

### B.8.3.3 X.25 Call User Data

| Item | Parameter | Reference | Status | Support | |
|---|---|---|---|---|---|
| PD-s | <s> Protocol Discrimination | 8.4.3.3 | M | | YES □ |
| PD-r | <r> Protocol Discrimination | 8.4.3.3 | M | | YES □ |
| LI-s | <s> Length Indication | 8.4.3.6 | XMCI:M | N/A □ | YES □ |
| LI-r | <r> Length Indication | 8.4.3.6 | M | | YES □ |
| Ver-s | <s> SNCR Version | 8.4.3.6 | XMCI:M | N/A □ | YES □ |
| Ver-r | <r> SNCR Version | 8.4.3.6 | M | | YES □ |
| SNCR-s | <s> SNCR Value | 8.4.3.6 | XMCI:M | N/A □ | YES □ |
| SNCR-r | <r> SNCR Value | 8.4.3.6 | M | | YES □ |



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### B.8.3.4 ISO/IEC 8208 SNCDF Timers

| Item | Timer | Reference | Status | Values | Support | Values supported |
|---|---|---|---|---|---|---|
| XIDL<br>XNVC | X25 VC idle<br>Additional VC | 8.4.3.4<br>8.4.3.4 | XClra:O<br>O | Any<br>Any | N/A ☐ YES ☐ NO ☐<br>YES ☐ NO ☐ | |

### B.8.3.5 ISO/IEC 8208 SNDCF Multi-layer Dependencies

| Item | Dependency | Reference | Requirement | Values supported |
|---|---|---|---|---|
| XSSg-r<br>XSSg-t | <r> Maximum SN data unit size (Rx)<br><s> Maximum SN data unit size (Tx) | 8.3<br>8.3 | ≥ 512<br>≥ 512 | |

| Item | Dependency | Reference | Status | Support |
|---|---|---|---|---|
| Xvc | X.25 Virtual call service | 8.4.3.8 a) | M | YES ☐ |
| Xdt | X.25 Data transfer | 8.4.3.8 b) | M | YES ☐ |
| Xfc | X.25 flow control procedures | 8.4.3.8 c) | M | YES ☐ |
| Xfrp | X.25 flow control and reset packets | 8.4.3.8 d) | M | YES ☐ |
| Xccp | X.25 call setup and clearing packets | 8.4.3.8 e) | M | YES ☐ |
| Xdp | X.25 DTE and DCE data packets | 8.4.3.8 f) | M | YES ☐ |
| Xrs | X.25 restart procedures | 8.4.3.8 g) | M | YES ☐ |
| Xrp | X.25 restart packets | 8.4.3.8 h) | M | YES ☐ |
| XDcT | X.25 DCE timeouts | 8.4.3.8 i) | M | YES ☐ |
| XDtT | X.25 DTE time limits | 8.4.3.8 j) | M | YES ☐ |
| Xpco | X.25 network packet coding | 8.4.3.8 k) | M | YES ☐ |
| Xfcn | X.25 flow control parameter negotiation | 8.4.3.8 l) | O | YES ☐ NO ☐ |
| Xtd | X.25 transit delay selection and indication | 8.4.3.8 m) | O | YES ☐ NO ☐ |
| Xtc | X.25 throughput class negotiation | 8.4.3.8 n) | O | YES ☐ NO ☐ |
| Xoth | Other X.25 elements | 8.4.3.8 - | 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

1. To facilitate tuning of protocol operation, the holding time used in PDUs, and the configuration time, should be adjustable by the system user over the whole range of values permissible in the PDU fields (0 to 65535 s), individually for each subnetwork.

   Users should configure the IS timers for ISO 9542 in a manner that is consistent with the higher layer timers, if any, used by the ESs. Values of 30 s for the Configuration Timer and 65 s for the RD Holding Timer are suggested, unless more suitable values are apparent from knowledge of the End System profile characteristics.

2. To cater for occasional loss of PDUs, the configuration time should be capable of taking a value slightly less than half the holding timer value.

## C.3 ISO 8473 Recommendations

1. Since error PDUs are just as likely as data PDUs to be corrupted during transmission, PDU Header Error Detection should be selected in an Error Report PDU if it was selected in the Data PDU which gave rise to the error report.



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