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**Information technology — International
Standardized Profile RC — X.25 protocol
relaying —**

Part 2:

LAN subnetwork-dependent,
media-independent requirements

*Technologies de l'information — Profil normalisé international RC —
Transmission du protocole X.25 —*

*Partie 2: Prescriptions dépendantes du sous-réseau du LAN,
indépendantes des supports*



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Contents	Page
Foreword	iii
Introduction	iv
1 Scope	1
2 Normative references	1
3 Definitions	2
4 Abbreviations	2
5 Requirements	2
5.1 Introduction	2
5.2 Static conformance requirements	2
5.3 Dynamic conformance requirements	3
Annex A: ISPICS requirements list	7
A.1 Introduction	7
A.2 Notation and conventions	7
A.3 IPRL for ISO/IEC 8208	7
A.4 IPRL for ISO 8802-2	8
Annex B: Assumed base standard PICS proforma for ISO 8802-2 LLC	10
B.1 Introduction	10
B.2 Abbreviations and special symbols	10
B.3 Instructions for completing the PICS proforma	12
B.4 PICS proforma - ISO 8802-2:1989 and Amd.1, Amd.2, Amd.4, and Amd 5: Identifica- tion	15
B.5 Major capabilities	17
B.6 LLC Type 1 operation - Unacknowledged connectionless-mode	18
B.7 LLC Type 2 operation - Connection-mode	24
B.8 LLC Type 3 operation - Acknowledged connectionless-mode	29
B.9 Route Determination Entity	36
Annex C: Recommendations	37
C.1 Introduction	37
C.2 ISO 8802-2 recommendations	37

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Foreword

ISO (the International Organization for Standardization) and IEC (the International Electrotechnical Commission) together form a system for worldwide standardization as a whole. 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 (ISO/IEC JTC 1/SGFS) 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 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 10614-2 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 10614 consists of several parts, under the general title *Information technology - International Standardized Profile RC - X.25 protocol relaying*:

- *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: PSDN subnetwork-dependent, media-dependent requirements for virtual calls over a permanent access*
- *Part 5: Definition of profile RC51.1111, X.25 protocol relaying between CSMA/CD LAN subnetworks and PSDNs using virtual calls over a PSTN leased line permanent access*
- *Part 6: Definition of profile RC51.1121, X.25 protocol relaying between CSMA/CD 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 10614. Annex C is for information only.

Introduction

This International Standardized Profile (ISP) is defined in accordance with the principles specified by ISO/IEC Technical Report 10000, "Information technology - Framework and taxonomy of International Standardized Profiles".

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 base 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 10614 consists of several parts, of which this is part 2. Part 1 of ISO/IEC ISP 10614 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 10614 which identifies the specific requirements of that profile, making reference to appropriate material from part 1 and from the subnetwork-dependent parts.

Information technology — International Standardized Profile RC — X.25 protocol relaying —

Part 2:

LAN subnetwork-dependent, media-independent requirements

1 Scope

This part of ISO/IEC ISP 10614 specifies subnetwork-type dependent requirements applicable to an interworking unit attached to a LAN and using the ISO 8802-2 LLC type 2 protocol, irrespective of the LAN medium. The operation of an interworking unit may involve relaying from one subnetwork to another, and those subnetworks may not be of the same type. This part of ISO/IEC ISP 10614 applies only to communication over those subnetworks which are LANs using ISO 8802-2 LLC type 2.

2 Normative references

The following documents contain provisions which, through reference in this text, constitute provisions of this part of ISO/IEC ISP 10614. 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 10614 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 8208 : 1990, *Information technology - Data communications - X.25 Packet Layer Protocol for Data Terminal Equipment*.

ISO/IEC 8208 : 1990/Amd.3 : 1991, *Information technology - Data communications - X.25 Packet Layer Protocol for Data Terminal Equipment - Amendment 3: Conformance requirements*.

ISO/IEC 8208 : 1990/Amd.3 : 1991/Cor.1 : 1993, *Information technology - Data communications - X.25 Packet Layer Protocol for Data Terminal Equipment - Amendment 3: Conformance requirements - Technical Corrigendum 1*.

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

ISO/IEC 8881 : 1989, *Information processing systems - Data communications - Use of the X.25 packet level protocol in local area networks*.

ISO/IEC 8881 : 1989/Cor.1 : 1991, *Information processing systems - Data communications - Use of the X.25 packet level protocol in local area networks - Technical Corrigendum 1.*

NOTE - This Technical Corrigendum to ISO/IEC 8881 is to apply throughout in this part of ISO/IEC ISP 10614, wherever ISO/IEC 8881 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 : 1994, *Information technology - Framework and taxonomy of International Standardized Profiles - Part 2: Principles and taxonomy for OSI Profiles.*

ISO/IEC ISP 10614-1 : 1995, *Information technology - International Standardized Profile RC - X.25 protocol relaying - Part 1: Subnetwork-independent requirements.*

3 Definitions

The terms used in this part of ISO/IEC ISP 10614 are defined in the referenced base standards (see clause 2).

4 Abbreviations

Abbreviations used in this part of ISO/IEC ISP 10614 are defined in referenced base standards (see clause 2).

5 Requirements

5.1 Introduction

The requirements in this clause specify the subnetwork-type dependent, media independent requirements for relay system operation when the relay system is attached to a Local Area Network (LAN).

5.2 Static conformance requirements

5.2.1 Overall requirements

An implementation conforming to this part of ISO/IEC ISP 10614 shall:

- a) meet the requirements for ISO/IEC 8208 in the subclause 5.2.2 below;
- b) meet the requirements for ISO 8802-2 in the subclause 5.2.3 below;
- c) support all the features identified as requirements in the ISPICS requirements list in annex A.

5.2.2 ISO/IEC 8208

The implementation shall:

- a) meet the requirements for the X.25 Packet Layer Protocol of ISO/IEC 8208, as modified for operation over LLC type 2 in a LAN environment by ISO/IEC 8881;
- b) support the following optional user facilities:
 - Non-standard Default Packet Sizes;
 - Non-standard Default Window Sizes.
- c) support at least the following non-standard default parameter values:
 - all Non-standard Default Packet Sizes (maximum user data field length) from 32 octets to 1024 octets;
 - all Non-standard Default Window Sizes from 1 to 7.The non-standard default values shall be agreed on a LAN-wide basis.

5.2.3 ISO 8802-2

The implementation shall:

- a) support the functions required by ISO 8802-2 for the support of the Logical Link Control Type 2 protocol;
- b) in order to achieve intercommunication, agree the values of N1 and the Ack Timer on a LAN-wide basis;
- c) support an Ack Timer value of 5 ± 1 seconds, and it is recommended that the Ack Timer should be configurable.

5.3 Dynamic conformance requirements

5.3.1 Overall requirements

An implementation conforming to this part of ISO/IEC ISP 10614 shall:

- a) meet the requirements for ISO/IEC 8208 in the subclause 5.3.2 below;
- b) meet the requirements for ISO 8802-2 in the subclause 5.3.3 below;
- c) behave in accordance with the requirements of the ISPICS requirements list in annex A.

5.3.2 ISO/IEC 8208

5.3.2.1 General requirements

The implementation shall:

- a) carry out the supported ISO/IEC 8208 functions in accordance with the procedures for the X.25 Packet Layer Protocol of ISO/IEC 8208, as modified for operation over LLC type 2 in a LAN environment by ISO/IEC 8881;

- b) not make use of the procedures for the operation of ISO/IEC 8208 over LLC type 1 defined in Section 3 of ISO/IEC 8881, as they are prohibited by this International Standardized Profile;

NOTE - This does not apply to the use of the ISO/IEC 10030 routing protocol which can make use of LLC type 1 in a LAN environment.

- c) support the method for determining the range of logical channels detailed in subclause 5.3.2.2 below.

5.3.2.2 Method for the determination of the range of logical channels

The logical channel ranges (LIC, HIC, LTC, HTC, LOC and HOC) to be used are determined by local knowledge. If local knowledge is not available, then by default only a single two-way logical channel will be used (i.e. LTC and HTC will be set to 1, while LIC, HIC, LOC and HOC will be set to zero). If more than one channel is available, a higher value of HTC may be negotiated using the On-line Facility Registration facility.

If a DTE is capable of initiating a REGISTRATION REQUEST packet, then the registration parameter fields shall be set as follows:

- i) The LIC, HIC, LOC and HOC parameters shall be set to zero. The LTC shall be set to the value 1. The value in the total number of logical channels parameter field shall be set equal to the value in the HTC parameter field;
- ii) No other optional user facilities shall be identified in the REGISTRATION REQUEST packet, and may be ignored by a responder if they are present;
- iii) If a DTE is capable of responding with a REGISTRATION CONFIRMATION packet, the maximum number of two-way logical channels allowed between the two DTEs shall be indicated in the HTC parameter field. The value in the HTC parameter field shall be less than or equal to the value requested in the HTC parameter field in the REGISTRATION REQUEST packet;
- iv) Registration of facilities normally applies in one direction only for the DTE/DTE case (i.e. registration of facilities is performed independently for each direction), but for the logical channel range negotiation it applies to both directions.

NOTE - A REGISTRATION REQUEST packet may be ignored by a responder. However, it is recommended that DTEs are capable of responding with a REGISTRATION CONFIRMATION packet even if they support only a single two-way logical channel. This will prevent unnecessary delays for the initiator in transmitting a CALL REQUEST packet. Such delays are determined by the initiator's values for timer T28 and retry counter R28.

5.3.3 ISO 8802-2

5.3.3.1 General requirements

The implementation shall:

- a) carry out the supported ISO 8802-2 functions in accordance with the procedures specified in ISO 8802-2;
- b) use the LLC actual address value of '111 1110'. Table 1 illustrates the coding of the DSAP and the SSAP address fields;

Table 1 - LLC address values

	DSAP address field	SSAP address field
Field format	I/G D D D D D D D	C/R S S S S S S S
Value	0 1 1 1 1 1 1 0	C/R 1 1 1 1 1 1 0

- c) if a value of k other than 7 is to be used, negotiate the value to be used by XID frames according to the procedures specified in subclause 5.3.3.2 below.

5.3.3.2 Use of XID

This part of ISO/IEC ISP 10614 does not require an implementation to transmit XID command frames, except for the negotiation of values of k other than 7.

NOTE - ISO 8802-2 requires that the receipt of an XID command frame is responded to with an XID response frame.

An implementation receiving an XID command frame addressed to the individual actual address value specified in clause 5.3.3.1 b) is required to respond with an XID response frame using the individual actual address. The implementation shall act as follows:

- Take note of the initiator's Receive Window Size. If the default value is in use this would be 7. However, if the value is different the implementation shall not use a transmit window size greater than the value indicated in the received XID command. If a transmit window size is used which is greater than the receive window size, it can lead to LLC connection resets. There is no requirement to actually use the full window size indicated in the received XID command;
- The information field in the XID response should contain the responder's receive window size. The default window size (specified in ISO/IEC 8881) is 7;
- The initiator receiving the XID response shall note and act on the receive window size as indicated in (i) above.

An implementation receiving an XID command frame addressed to the null address shall respond with an XID response frame using the null address in both the DSAP and SSAP fields. The implementation shall act as follows:

- The value of received window size shall be ignored;
- It is recommended that the information field in the XID response should contain the value of the LLC Types/Classes set to the value indicating 'Class II LLC', and the receive window size set to '000 0000'.

NOTES

1. The value for 'Class II LLC' is defined in ISO 8802-2 and is '11000'.
2. The receive window size in an XID frame associated with the null address has no meaning. Therefore, its value must be ignored. Whilst any value could be used for this field, the value '000 0000' is suggested.

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

The first two items relate to the profile as a whole, and so are included only in those parts of ISO/IEC ISP 10614 which are specific to individual profiles. Each part of ISO/IEC ISP 10614 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 10614 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 part 1 of ISO/IEC ISP 10614.

A.3 IPRL for ISO/IEC 8208

The relevant base standard PICS proforma is the PICS proforma given in annex C of ISO/IEC 8208/Amd.3. This part of ISO/IEC ISP 10614 imposes the following additional constraints:

C.5 General DTE Characteristics		
Base Item	Description	Constraint
Ec/8	- DTE/DCE (1988)	x
Ec/4	- DTE/DCE (1984)	x
Ec/0	- DTE/DCE (1980)	x

C.10.1 Values for flow control parameters and throughput class		
Base Item	Description	Constraint
	What values are supported for:	
V1s	- Default packet sizes, sending (octets) ?	the values 32, 64, 128, 256, 512 and 1024 shall be supported
V1r	- Default packet sizes, receiving (octets) ?	the values 32, 64, 128, 256, 512 and 1024 shall be supported
V2s	- Default window sizes, sending ?	the values 1 to 7 shall be supported
V2r	- Default window sizes, receiving ?	the values 1 to 7 shall be supported

A.4 IPRL for ISO 8802-2

The relevant base standard PICS proforma is the PICS proforma given in annex B. This part of ISO/IEC ISP 10614 imposes the following additional constraints:

B.6.1 LLC type 1 - supported PDU types		
Base Item	Description	Constraint
UI/1	UI_CMD supported on transmission	i
UI/2	UI_CMD supported on receipt	i
XID/3	XID_CMD supported on transmission	c1
XID/6	XID_RSP supported on receipt	c1
TES/7	TEST_CMD supported on transmission	i

B.6.2 LLC type 1 - supported parameters in PDUs on transmission		
Base Item	Description	Constraint
UIT/13	UI_CMD - P-bit=0	i
XDT/17	XID_CMD - P-bit=1	c2
XDT/18	XID_CMD - P-bit=0	c3
TST/26	TEST_CMD - P-bit=1	i
TST/27	TEST_CMD - P-bit=0	i

B.6.3 LLC type 1 - supported parameters in PDUs on receipt		
Base Item	Description	Constraint
UIR/35	UI_CMD - P-bit=0	i

B.7.5 LLC type 2 - protocol parameters		
Base Item	Description	Constraint
PPA/145	ACK_TIMER range	the value of 5±1 seconds shall be supported
PPA/155	Maximum value of k	the value 7 shall be supported

Definition of conditional status items:

- c1 if a value of k other than 7 is supported then m else o
- c2 if a value of k other than 7 is supported AND NOT XDT/17 then m else x
- c3 if a value of k other than 7 is supported AND NOT XDT/18 then m else x