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INTERNATIONAL STANDARDIZED PROFILE

ISO/IEC ISP 10609-9

First edition
1992-09-15

AMENDMENT 1
1998-08-01

Information technology — International Standardized Profiles TB, TC, TD and TE — Connection-mode Transport Service over connection-mode Network Service —

Part 9:

Subnetwork-type dependent requirements for Network Layer, Data Link Layer and Physical Layer concerning permanent access to a packet switched data network using virtual calls

AMENDMENT 1: Reference Optional Security Requirements — TB/TC/TD/TEnn

Technologies de l'information — Profils normalisés internationaux TB, TC, TD et TE — Service de transport en mode connexion sur service de réseau en mode connexion —

Partie 9: Spécifications de la couche Réseau, de la couche Liaison de données et de la couche physique dépendant du type de sous-réseau, concernant l'accès permanent à un réseau de données à commutation par paquets utilisant des appels virtuels

AMENDEMENT 1: Exigences de sécurité optionnelle de référence — TB/TC/TD/TEnn

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Reference number
ISO/IEC ISP 10609-9:1992/Amd.1:1998(E)

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Foreword

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

In the field of information technology, ISO and IEC have established a joint technical committee, ISO/IEC JTC 1. In addition to developing International Standards, ISO/IEC JTC 1 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.

Amendment 1 to ISO/IEC ISP 10609-9:1992 was prepared with the collaboration of

— Asia-Oceania Workshop (AOW);

— European Workshop for Open Systems (EWOS);

— Open Systems Environment Implementors' Workshop (OIW).

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AMENDMENT 1: Reference Optional Security Requirements - TB/TC/TD/TEnn

Add new Clause:

8 Location of Optional Security Requirements

Additional requirements are specified in subsequent parts of ISO/IEC ISP 10609 for the provision of security services (e.g. confidentiality, integrity, authentication) with the communications services provided by the profiles defined in ISO/IEC ISP 10609. The provision of these security requirements is optional.

Optional requirements for provision of security are specified in:

ISO/IEC ISP 10609-16: [1], *Information technology -- International Standardized Profiles TB, TC, TD and TE -- Connection-mode Transport service over Connection-mode Network Service -- Part 16: Security employing the Network Layer Security Protocol - Connection-mode with No-header, for TB, TC, TD and TE profiles*

or

ISO/IEC ISP 10609-17: [1], *Information technology -- International Standardized Profiles TB, TC, TD and TE -- Connection-mode Transport service over Connection-mode Network Service -- Part 17: Security employing the Network Layer Security Protocol -- Connection-mode with SDT-PDU based protection, for TB, TC, TD and TE profiles*

Note: The strength of the protection provided by these profiles will be dependent on factors outside the scope of the profile (e.g. strength of algorithm). However, all other aspects being equal, profiles implementing ISO/IEC 10609-16 involve less of a protocol overhead whereas profiles implementing ISO/IEC 10609-17 provide more sophisticated protection services.

[1] To be published

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Descriptors: data processing, information interchange, network interconnection, open systems interconnection, data transmission, connected oriented transmission, packet transmission, services, network layer, data link layer, physical layer, specifications.

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Part 9:

Subnetwork-type dependent requirements for Network Layer, Data Link Layer and Physical Layer concerning permanent access to a packet switched data network using virtual calls

Technologies de l'information — Profils normalisés internationaux TB, TC, TD et TE — Service de transport en mode connexion sur service de réseau en mode connexion —

Partie 9: Spécifications dépendantes du type de sous-réseau pour la couche réseau, la couche liaison de données et la couche physique concernant l'accès permanent à un réseau à commutation de paquets employant appel virtuel

Reference number
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International Standardized Profile ISO/IEC ISP 10609-9 was prepared with the collaboration of

— OSI Asia-Oceania Workshop (AOW);

— European Workshop for Open Systems (EWOS);

— OSI Implementors Workshop (OIW).

ISO/IEC ISP 10609 consists of the following parts, under the general title *Information technology — International Standardized Profiles TB, TC, TD and TE — Connection-mode Transport Service over connection-mode Network Service*:

— *Part 1: Subnetwork-type independent requirements for Group TB*

— *Part 2: Subnetwork-type independent requirements for Group TC*

— *Part 3: Subnetwork-type independent requirements for Group TD*

— *Part 4: Subnetwork-type independent requirements for Group TE*

— *Part 5: Definition of profiles TB1111/TB1121*

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— *Part 6: Definition of profiles TC1111/TC1121*

— *Part 7: Definition of profiles TD1111/TD1121*

— *Part 8: Definition of profiles TE1111/TE1121*

— *Part 9: Subnetwork-type dependent requirements for Network Layer, Data Link Layer and Physical Layer concerning permanent access to a packet switched data network using virtual calls*

Annexes A and B form an integral part of this part of ISO/IEC ISP 10609.

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Introduction

This part of ISO/IEC ISP 10609 (International Standardized Profile) is defined within the context of Functional Standardization, in accordance with the principles specified by ISO/IEC TR 10000-1:1990. The context of Functional Standardization is one part of 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 International Standards, and provide a basis for the development of uniform, internationally recognized system tests.

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 and test centres. ISPs are produced not simply to "legitimate" a particular choice of base standards and options, but to promote real system interoperability. 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 10609 consists of several parts, of which this is part 9. ISO/IEC ISP 10609-1, ISO/IEC 10609-2, ISO/IEC 10609-3 and ISO/IEC ISP 10609-4 specify subnetwork-type independent requirements for Group TB, TC, TD and TE profiles, respectively. ISO/IEC ISP 10609-5, ISO/IEC 10609-6, ISO/IEC 10609-7 and ISO/IEC ISP 10609-8 define TB1111/TB1121, TC1111/TB1121, TD1111/TD1121 and TE1111/TE1121, respectively. ISO/IEC ISP 10609-9 specifies subnetwork-type dependent requirements concerning permanent access to packet switched data network using virtual calls.

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Information technology — International Standardized Profiles TB, TC, TD and TE — Connection-mode Transport Service over connection-mode Network Service —

Part 9:

Subnetwork-type dependent requirements for Network Layer, Data Link Layer and Physical Layer concerning permanent access to a packet switched data network using virtual calls

1 Scope

This part of ISO/IEC ISP 10609 is applicable to end systems concerned with operating in the Open Systems Interconnection(OSI) environment. It specifies a combination of OSI standards, which collectively provide the connection-mode Transport Service using the connection-mode Network Service.

This part of ISO/IEC ISP 10609 is applicable to the provision of the connection-mode Transport Service in end systems attached to any type of subnetwork from which the standardized connection-mode Network service can be made available.

This part of ISO/IEC ISP 10609 specifies the requirements for Network Layer, Data Link Layer and Physical Layer that apply specifically to configurations involving permanent access to a packet switched data network using virtual calls.

2 Normative references

The following documents contain provisions which, through reference in this text, constitute provisions of this part of ISO/IEC ISP 10609. 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 10609 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 2110:1989, *Information technology - Data communication - 25-pole DTE/DCE interface connector and contact number assignments.*

ISO 2593:1984, *Information Processing Systems - Data communication - 34-pin DTE/DCE interface connector and pin assignments.*

ISO 4902:1989, *Information technology - Data communication - 37-pole DTE/DCE interface connector and contact number assignments.*

ISO 4903:1989, *Information technology - Data communication - 15-pole DTE/DCE interface connector and contact number assignments.*

ISO 7776:1986, *Information processing systems - Data communications - High-level data link control procedures - Description of the X.25 LAPB - compatible DTE data link procedures.*

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ISO 7776/Cor.1:1989, *Information processing systems - Data communications - High-level data link control procedures - Description of the X.25 LAPB - compatible DTE data link procedures - Technical corrigendum1.*

ISO 7776/Cor.2:1989, *Information processing systems - Data communications - High-level data link control procedures - Description of the X.25 LAPB - compatible DTE data link procedures - Technical corrigendum 2.*

ISO 7776/Cor.3:1991, *Information processing systems - Data communications - High-level data link control procedures - Description of the X.25 LAPB - compatible DTE data link procedures - Technical corrigendum 3.*

ISO/IEC 8208:1990, *Information technology - Data communications - X.25 Packet Layer Protocol for Data Terminal Equipment.* (See also CCITT Recommendation X.25-1988)

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

ISO 8348:1987, *Information processing systems - Data communications - Network service definition.* (See also CCITT Recommendation X.213-1988)

ISO 8348 /Add.2:1988, *Information processing systems - Data communications - Network service definition - Addendum 2 : Network layer addressing .* (See also CCITT Recommendation X.213-1988)

ISO 8878:1987, *Information processing systems - Data communications - Use of X.25 to provide the OSI connection-mode network service.* (See also CCITT Recommendation X.223-1988)

ISO 8878/Add.1:1990, *Information processing systems - Data communications - Use of X.25 to provide the OSI connection-mode network service - Addendum 1:Priority.*

ISO 8878/Amd.3: 1991 , *Information processing systems - Data communications - Use of X.25 to provide the OSI connection-mode network service - Amendment 3:Conformance.*

ISO 8878/Cor.1:1990, *Information processing systems - Data communications - Use of X.25 to provide the OSI connection-mode network service - Technical corrigendum 1.*

ISO 8878/Cor.2:1990, *Information processing systems - Data Communications - Use of X.25 to provide the OSI Connection-mode Network Service - Technical corrigendum 2.*

ISO 8878/Cor.3:1990, *Information processing systems - Data Communications - Use of X.25 to provide the OSI Connection-mode Network Service - Technical corrigendum 3.*

ISO 8878/Cor.4:1991, *Information processing systems - Data Communications - Use of X.25 to provide the OSI Connection-mode Network Service - Technical corrigendum 4.*

CCITT V.10-1988, *Electrical characteristics for unbalanced double-current interchange circuits for general use with integrated circuit equipment in the field of data communications.*

CCITT V.11-1988, *Electrical characteristics for balanced double-current interchange circuits for general use with integrated circuit equipment in the field of data communications.*

CCITT V.24-1988, *List of definitions for interchange circuits between data terminal equipment(DTE) and data circuit-terminating equipment (DCE).*

CCITT V.27-1988, *4800 bits per second modem with manual equalizer standardized for use on leased telephone-type circuits.*

CCITT V.28-1988, *Electrical characteristics for unbalanced double-current interchange circuits.*

CCITT V.35-1988, *Data transmission at 48 kilobits per second using 60-108 kHz group band circuits.*

CCITT V.36-1988, *Modems for synchronous data transmission using 60-108 kHz group band circuits.*

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CCITT X.1-1988, *International User Classes of Service in Public Data Networks and Integrated Services Digital Networks(ISDNs).*

CCITT X.21-1988, *Interface Between Data Terminal Equipment (DTE) and Data Circuit-Terminating Equipment (DCE) for Synchronous Operation on Public Data Networks.*

CCITT X.21bis - 1988, *Use on Public Data Networks of Data Terminal Equipment (DTE) which is Designed for Interfacing to Synchronous V-Series Modems.*

CCITT X.24 - 1988, *List of Definitions for Interchange Circuits Between Data Terminal Equipment (DTE) and Data Circuit-Terminating Equipment (DCE) on Public Data Networks.*

CCITT X.26 - 1988, *Electrical Characteristics for Unbalanced Double-Current Interchange Circuits for General Use with Integrated Circuit Equipment in the Field of Data Communications.*

CCITT X.27 - 1988, *Electrical Characteristics for Balanced Double-Current Interchange Circuits for General Use with Integrated Circuit Equipment in the Field of Data Communications.*

3 Definitions

All of the terms used in this part of ISO/IEC ISP 10609 are defined in the referenced base standards (see clause 2).

4 Abbreviations

All of the abbreviations and acronyms used in this part of ISO/IEC ISP 10609 are defined in the referenced base standards (see clause 2).

5 Subnetwork-type dependent requirements for Network Layer

This clause specifies subnetwork-type dependent requirements for end system operation when the end system is attached by a dedicated (permanent) access line to a packet switched data network using virtual calls, to provide connection-mode Network Service as defined by ISO 8348.

The protocol used is CCITT Recommendation X.25 as described in ISO/IEC 8208 for end systems. A conforming implementation's constraints on functions and parameters for the Network Layer are as specified in clause A.2.

Annex B contains defect reports, if any, related to ISO 8878 along with the statement of any consequential requirements for implementations of these profiles.

5.1 Static conformance requirements

The OSI Network Service shall be provided as described in ISO 8878, excluding annexes A and B, the Expedited Data Transfer Service and the Receipt Confirmation Service.

A conforming implementation shall meet the static conformance requirements specified in ISO/IEC 8208/Amd.3 and ISO 8878/Amd.3.

NOTE - Included in these requirements is implementation of the Address Extension Facility(AEF) to carry up to a 40-digit NSAP Address. Furthermore, for the AEF, "split" NSAP Addresses, previously allowed in ISO 8208, are prohibited whereas non-BCD information, previously prohibited in ISO 8208, is allowed.

5.2 Dynamic conformance requirements

a) NSAP Address

The system shall support all the formats and syntaxes defined in ISO 8348/Add.2. A conforming implementation shall handle NSAP Address as defined in ISO 8878.

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The use of the Called/Calling Address Extension Facilities is preferred for conveying the NSAP Addresses even when the three conditions described in ISO 8878, 6.2.2.1.1 are satisfied.

b) Treatment of use of the Expedited Data

The Expedited Data Transfer Service is not supported. If a conforming implementation receives an INTERRUPT packet during the data transfer phase, it is recommended to transmit a CLEAR REQUEST packet (cause code "DTE Originated" with a diagnostic code 44) across the DTE/DCE interface. If a CLEAR REQUEST packet is transmitted,an N-DISCONNECT indication primitive shall be signalled.

c) "Receipt Confirmation" for "D-bit"

The Receipt Confirmation Service is not supported. The D-bit shall always be set to 0. If a conforming implementation receives a DATA packet with the D-bit set to 1, then it is recommended to clear the logical channel with a cause indicating "DTE Originated" and with the diagnostic "D-bit Procedure Not Supported (code 166)".

d) Facilities agreed to for a period of time

A conforming implementation shall agree to the following facilities for a period of time:

- Fast Select Acceptance;
- Flow Control Parameter Negotiation ; and
- Throughput Class Negotiation.

6. Subnetwork-type dependent Requirements for Data Link Layer

A conforming implementation shall support CCITT Recommendation X.25 LAPB as described in ISO 7776 for end system.
A conforming implementation's constraints on functions and parameters for Data Link Layer are specified in clause A.3.

7. Subnetwork-type dependent Requirements for Physical Layer

A conforming implementation shall support physical interface, data signalling rates, electrical characteristics, connectors and interchange circuits as specified in CCITT X-series or V-series recommendations.

A conforming implementation's constraints on functions and parameters for Physical Layer are specified in clause A.4.

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Annex A
(normative)
International Standardized Profile Implementation Conformance Statement Requirements List (IPRL)

Introduction

These IPRLs in this annex specify requirements for implementation of Network Layer, Data Link Layer and Physical Layer.

Network Layer IPRL in clause A.2 specifies the additional requirements for ISO/IEC 8208/Amd.3. The requirements of ISO/IEC 8208/Amd.3 apply to each item for which there is no entry in the IPRL (clause A.2).

These IPRLs specify subnetwork dependent requirements for an end system attached to a packet switched data network for virtual call service.

A conforming implementation shall satisfy the mandatory conformance requirements of the base standards referenced in this part of ISO/IEC ISP 10609.

A.1 Notation

Clauses A.2 to A.4 define the functions supported for which conformance is claimed, using the following keys.

a) Base Standard Status Notation

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.
[M]	; optional, but support of at least one of a set of requirements for Data Link Layer is required.
–	; not applicable
pred:	; conditional item symbol, including predicate identification.
pred::	; this group predicate symbol applies to the status of each of the items the follows, until another such group predicate occurs or until the next horizontal rule separating groups of items. The items are only completed when the predicate is true.

b) IPRL Status Notation

The Status column of Profile Features is entered up by the one character or the two character notation.
The one character notation indicates the static requirements only. On the two character notation, the first character is the static requirements and the second is the dynamic requirements.

1)Static

m	; Mandatory, mandatory to be implemented.
o	; Optional, optional to be implemented.
o.n	; Optional, but at least one of the group of options labelled by the same numeral n is required.
i	; Out of Scope, not relevant to this Profile.

2)Dynamic

m	; Mandatory, mandatory to be used.
x	; Excluded, prohibited to be used in the context of this Profile.

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A.2 Network Layer ISPICS Requirements List

A.2.1 General DTE characteristics

Base Standard Features				Profile Features	
Item	Protocol Feature	References	Status	ISP References	Status
	Protocol feature				
	Service supported:			clause 5	
Vp	- PVC		O.1		i
Vs	- VC		O.1		mm
	What environment are supported?	clause 3 and 3.2		clause 5	
Ec/0	- DTE/DCE (1980)		O.2		ox
Et/t	- DTE/DTE in fixed role as DTE		O.2		i
Et/c	- DTE/DTE in fixed role as DCE		Vs:O.2		Vs: i
Et/d	- DTE/DTE with dynamic role selection	4.5	Vs:O.2		Vs: i
	What packet sequence numbering is supported?			clause 5	
M8	- Modulo 8	13.2, 12.1.1, table 3	O.3		mm
M128	- Modulo 128 (extended)	13.2, 12.1.1, table 3	O.3		ox

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A.2.2 Procedures, packet types and packet formats

Base Standard Features				Profile Features	
Item	Protocol Feature	References	Status	ISP References	Status
	Call setup				
	Are outgoing Virtual Calls supported:	5.2.1, 5.2.5, table 33, 5.2.4,		clause 5	
S1a	- Fast Select, no restriction on response?	13.16	O		o.17
S1b	- Fast select with restricted response?	13.16	O		ox
S1c	- non-Fast-Select?	5.2.4	O		ox
SP1b	send CALL REQUEST, basic format	12.2.1.1	S1ab:O.4		S1ab: m
SP1e	send CALL REQUEST, extended format	12.2.1.1, 12.2.1.2	S1ab:O.4		S1ab: m
	Are incoming Virtual Calls supported:	5.2.2,5.2.5, table 33,		clause 5	
S2a	- Fast Select with acceptance possible?	5.2.3,13.7	O		o.17
S2b	- Fast Select, always cleared?	13.17	O		ox
S2c	- non-Fast-Select, acceptance possible?	5.2.3	O		ox
S2d	- non-Fast-Select, always cleared?	5.2.3	O		S2a: mm
SP4b	send CALL ACCEPTED, basic format	12.2.2.1	S2axc:O.5		S2axc: m
SP4e	send CALL ACCEPTED, extended format	12.2.2.1, 12.2.2.2	S2axc:O.5		S2axc: m
	Is D-bit negotiation supported:			5.2 c)	
DN1	- for outgoing Virtual Calls?	6.3	S1ac:O		S1ac: mm [1)]
DN2	- for incoming Virtual Calls?	6.3	S2ac:O		S2ac: mm [1)]

NOTE 1- D–bit shall be always set to 0.

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Base Standard Features				Profile Features	
Item	Protocol Feature	References	Status	ISP References	Status
	Call Clearing				
	Is call clearing supported, as:	5.5.4, table 33,		clause 5	
C1	- response to indication of clearing?	5.5.2	O		mm
C2c	- originating clearing of an established Virtual Call?	5.5.1, 5.5.3	O		S1:mm
CP3b	send CLEAR REQUEST, basic format	12.2.3.1	C2bcxa:O.6		C2bcxa: m
CP3e	send CLEAR REQUEST, extended format	12.2.3.1, 12.2.3.2	C2bcxa:O.6		C2bcxa: m
	Resetting of Logical Channels				
	Is resetting supported:	8,8.4, table 34,		clause 5	
RSi	- as initiator? send RESET REQUEST receive RESET INDICATION/ CONFIRMATION	8.1,8.3, 12.5.1 12.5.2	O		mm
Rsr	- as responder? receive RESET INDICATION send RESET CONFIRMATION	8.2, 12.5.1 12.5.2	O		mm
	Interrupt Transfer				
Is	Is sending interrupts supported? send INTERRUPT REQUEST receive INTERRUPT CONFIRMATION	6.8,6.8.1, 6.8.3, table 35, 12.3.2 13.3.3	O	clause 5	i
Ir	Is receiving interrupts supported? receive INTERRUPT INDICATION send INTERRUPT CONFIRMATION	6.8,6.8.2, 6.8.3, table 35, 12.3.2 12.3.3	O	clause 5	i

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Base Standard Features				Profile Features	
Item	Protocol Feature	References	Status	ISP References	Status
	Normal data transfer and flow control				
DS1	Is sending DATA packets supported?	6,6.1,6.2, 7.1.1,7.1.2, 7.1.3,12.3.1	O	clause 5	mm
DS5a	- Sending Q=0 in DATA packets	6.6	O.10		mm
DS5b	- Sending Q=1 in DATA packets	6.6	O.10		ox
DS7a	- ERROR-R action on expiry	11.2.1(a)	O		ox
DS8	- Discard of over-length flow control packets (instead of ERROR-R)	table 36 Note 2	O		ox
DR1	Receiving DATA packets	6,6.1,6.2, 7.1.1,7.1.2, 7.1.3, 12.3.1	O	clause 5	mm
DR3	- Flow control by sending RECEIVE NOT READY and RECEIVE READY packets	7.1.5,7.1.6, 12.4.1, 12.4.2	O		mm [1)]
DR4b	- Receiving M=1 in DATA packets	6.4,6.5,6.7	O		mm
DR5a	- Receiving Q=0 in DATA packets	6.6	O.11		mm
DR5b	- Receiving Q=1 in DATA packets	6.6	O.11		i
DR7c	- ignoring the packet and waiting for a correct retransmitted packet	11.3(c)	O.12		ox

NOTE 1 - It is only necessary to use this feature if and when the implementation encounters a shortage of buffer space.

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Base Standard Features				Profile Features	
Item	Protocol Feature	References	Status	ISP References	Status
DR8c	- ignoring the packet and waiting for a correct retransmitted packet	11.3(c)	O.13		ox
DR9	- Window Status Transmission Timer procedure	11.2.2	O		ox
DC	Is Delivery Confirmation supported?	6.3,6.5,6.7, 7.1.4	O	clause 5	ox

A.2.3 Miscellaneous features and options

Base Standard Features				Profile Features	
Item	Protocol Feature	References	Status	ISP References	Status
	Values of Cause and Diagnostic Code fields				
Y1d	- Cause = 128, private diagnostic codes	12.6.1.1, 12.6.1.2, tables 24 – 25	O.14	clause 5	ox
Y3d	- Cause = 128, private diagnostic codes	12.3.1.1, 12.3.1.2, tables 24 – 25	O.15	clause 5	ox
Y5d	- Cause = 128, private diagnostic codes	12.5.1, 12.5.2, tables 24 – 25	O.16	clause 5	ox

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A.2.4 Facilities

Base Standard Features				Profile Features	
Item	Protocol Feature	References	Status	ISP References	Status
	Facilities Sent in CALL REQUEST packets				
FS1pi	Flow Control Parameter Negotiation, packet size	13.12, 15.2.2.1.1, table 11	O	5.2 d)	m
FS1wi	Flow Control Parameter Negotiation, window size	13.12, 15.2.2.1.2, table 11	O	5.2 d)	m
FS2i	Throughput Class Negotiation	13.13, 15.2.2.2, table 18	O	5.2 d)	mm
FS6a	Fast Select	13.16, 15.2.2.6	O	5.2 d)	mm
FS12	Transit Delay Selection and Indication	13.27, 15.2.2.13	O	clause 5	m
FS20i	Facility Marker, CCITT-specified DTE facilities	15.1	O	clause 5	mm
FS21i	Calling Address Extension	14.1, 15.3.2.1	O	5.2 a)	m
FS22i	Called Address Extension	14.2, 15.3.2.2	O	5.2 a)	m
FS23i	Minimum Throughput Class Negotiation	14.3, 15.3.2.3	O	clause 5	mm
FS24i	End-to-End Transit Delay Negotiation	14.4, 15.3.2.4	O	clause 5	mm
FS26i	Priority	14.5, 15.3.2.5	O	clause 5	Ec/8 : mm

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Base Standard Features				Profile Features	
Item	Protocol Feature	References	Status	ISP References	Status
	Facilities sent in CALL ACCEPT packets				
FS1pr	Flow Control Parameter Negotiation, packet size	13.12, 15.2.2.1.1, table 11	O	5.2 d)	m
FS1wr	Flow Control Parameter Negotiation, window size	13.12, 15.2.2.1.2, table 11	O	5.2 d)	m
FS2r	Throughput Class Negotiation	13.13, 15.2.2.2, table 17	O	5.2 d)	mm
FS20r	Facility Marker, CCITT-specified DTE facilities	15.1	O	clause 5	mm
FS22r	Called Address Extension	14.2, 15.3.2.2	O	5.2 a)	m
FS24r	End-to-End Transit Delay Negotiation	14.4, 15.3.2.4	O	clause 5	mm
FS26r	Priority	14.5 15.3.2.5	O	clause 5	Ec/8 : mm
	Facilities sent in CLEAR REQUEST packets				
FS20d	Facility Marker, CCITT-specified DTE facilities	15.1	O	clause 5	mm
FS22d	Called Address Extension	14.2, 15.3.2.2	O	5.2 a)	m

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Base Standard Features				Profile Features	
Item	Protocol Feature	References	Status	ISP References	Status
	Facilities Received in INCOMING CALL packets				
FR1pi	Flow Control Parameter Negotiation, packet size	13.12, 15.2.2.1.1, table 12	O	clause 5	mm
FR1wi	Flow Control Parameter Negotiation, window size	13.12, 15.2.2.1.2, table 12	O		mm
FR2i	Throughput Class Negotiation	13.13, 15.2.2.2, table 18	O	clause 5	mm
FR6a	Fast Select	13.16, 13.17, 15.2.2.6	O	clause 5	mm
FR12i	Transit Delay Selection and Indication	13.27, 15.2.2.13	O	clause 5	mm
FR20i	Facility Marker, CCITT-specified DTE Facilities	15.1	O	clause 5	mm
FR21	Calling Address Extension	14.1, 15.3.2.1	O	clause 5	mm
FR22i	Called Address Extension	14.2, 15.3.2.2	O	clause 5	mm
FR23	Minimum Throughput Class Negotiation	14.3, 15.3.2.3	O	clause 5	mm
FR24i	End-to-End Transit Delay Negotiation	14.4, 15.3.2.4	O	clause 5	mm
FR25i	Expedited Data Negotiation	14.5, 15.3.2.7	O	5.2 b)	mm
FR26i	Priority	14.5, 15.3.2.5	O	clause 5	Ec/8 : mm

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Base Standard Features				Profile Features	
Item	Protocol Feature	References	Status	ISP References	Status
	Facilities received in CALL CONNECTED packets				
FR1pr	Flow Control Parameter Negotiation, packet size	13.12, 15.2.2.1.1, table 12	O	5.2 d)	mm
FR1wr	Flow Control Parameter Negotiation, window size	13.12, 15.2.2.1.2, table 12	O	5.2 d)	mm
FR2r	Throughput Class Negotiation	13.13, 15.2.2.2, table 18	O	5.2 d)	mm
FR12r	Transit Delay Selection and Indication	13.27 15.2.2.13	O	clause 5	i [1)]
FR20r	Facility Marker, CCITT-specified DTE Facilities	15.1	O	clause 5	mm
FR22r	Called Address Extension	14.2, 15.3.2.2	O	5.2 a)	mm
FR24r	End-to-End Transit Delay Negotiation	14.4, 15.3.2.4	O	clause 5	mm
FR25r	Expedited Data Negotiation	14.7, 15.3.2.7	O	5.2 b)	mm
FR26r	Priority	14.5, 15.3.2.5	O	clause 5	Ec/8 : mm
	Facilities received in CLEAR INDICATION packets				
FR20d	Facility Marker, CCITT-specified DTE Facilities	15.1	O	clause 5	mm
FR22d	Called Address Extension	14.2, 15.3.2.2	O	5.2 a)	mm

NOTE 1 - The system shall accept this parameter if it is present and may or may not use it.

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A.2.5 Parameter values and ranges

Base Standard Features				Profile Features	
Item	Parameter	References	Status	ISP References	Status
	Timers, Restranmission Counts and logical channel ranges				
T24	Window Status Transmission Timer		O	clause 5	ox
T25	Window Rotation Timer		O	clause 5	ox
R25	Data Packet Retransmission Count		O	clause 5	ox

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A.3 Data Link Layer ISPICS Requirements List

NOTE - This IPRL includes an interim version of the PICS proforma. When a standardized PICS proforma is published, this IPRL will be revised to refer to it.

A.3.1 Single link and multilink procedure

Base Standard Features						Profile Features	
Item	Protocol Feature		References	Status	Implemented?	ISP References	Status
SL	General	SLP	clauses1 and 5	M	Yes No	clause 6	&
ML		MLP	clauses1,5 and 6	O	Yes No	clause 6	&

A.3.2 Single link procedure

A copy of this clause is to be completed for each type of single link procedure.

SLP number____ of ____ . This SLP is used on physical interfaces numbers ____ .

Base Standard Features						Profile Features	
Item	Protocol Feature		References	Status	Implemented?	ISP References	Status
It	General	DTE/DTE operation	clause 0	O.1	Yes No	clause 6	i
Ic		DTE/DCE operation	clause 0	O.1	Yes No	clause 6	mm
	General PDU Structure	General frame structure	clause 3	M	Yes No	clause 6	&
		Control field formats and state variables	4.1	M	Yes No	clause 6	&
		Commands and Responses	4.3	M	Yes No	clause 6	&
		Invalid frames recognized	3.6	M	Yes No	clause 6	&
		Frame abortion	3.9	M	Yes No	clause 6	&
		Interframe time fill	3.10	M	Yes No	clause 6	&
		May send non-octet aligned I frames	3.4	O	Yes No	clause 6	ox
		Receiving non-octet aligned frames causes:	3.8	[M]		clause 6	
		Report error at link layer			Yes No		i
		Discard			Yes No		i
		Restart at packet layer			Yes No		i
		Accept data			Yes No		i

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Base Standard Features						Profile Features	
Item	Protocol Feature		References	Status	Implemented?	ISP References	Status
	General PDU Structure	Detection of idle channel state on reception causes:	3.11.2	[M]		clause 6	
		No action			Yes No		&
		Report a disc. state to hi. lev.			Yes No		&
		Reset the link immediately			Yes No		&
		Reset the link after T3			Yes No		&
		Modulo operation	clause 3 and 4.1.1	[M]		clause 6	
		modulo 8 1)			Yes No		mo
		modulo 128			Yes No		&
		P/F bit on all frames	4.2, 4.1.2.2.5	M	Yes No	clause 6	&
N1	System Parameters	Maximum number of bits in I frame (N1)	5.7.3	M	Yes No	clause 6	&
N2		Maximum number attempts to complete a transmission (N2)	5.7.2	M	Yes No	clause 6	&
K		Maximum number of outstanding I frames (K)	5.7.4	M	Yes No	clause 6	&
T1		Timer T1 procedure 2)	5.7.1.1	M	Yes No	clause 6	&
T2		Parameter T2 procedure 2), 3)	5.7.1.1, 5.7.1.2	O	Yes No	clause 6	&
T3		Timer T3 procedure 2)	5.7.1.3	O	Yes No	clause 6	&
T4		Parameter T4 procedure 2), 4)	5.7.1.4, 5.3.2	O	Yes No	clause 6	&

NOTES

1 - Modulo 8 operation is mandatory for connection to X.25 public data networks.

2 - Timer T1 is the delay after which a frame is retransmitted if no acknowledgement has been received (repeated N2 times: standard LAPB retry procedure).
Parameter T2 is a timer that indicates how long the receiving end can wait prior to sending the acknowledgement.
Timer T3, when it expires, indicates an excessive idle period.
Parameter T4, when it expires, indicates excessive period of no-activity on the data link.

3 - Parameter T2 must take into account propagation delays and frame processing time.

4 - It is strongly recommended to use the parameter T4(see subclause 5.3.2 of ISO 7776).
It is mandatory in practice for connection to X.25 public networks.

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Base Standard Features						Profile Features	
Item	Protocol Feature		References	Status	Implemented?	ISP References	Status
	Procedures	Procedure for addressing	5.1	M	Yes No	clause 6	&
		Procedure for link set-up and disconnection	5.3	M	Yes No	clause 6	&
		Conditions for link resetting or link re-initialization (link set-up)	5.5	M	Yes No	clause 6	&
		Disconnect procedure: Resolves collision	5.3.5	[M]		clause 6	
		After receiving UA	a)		Yes No		&
		After sending UA	b)		Yes No		&
		After timing out, waiting for UA, having sent a UA response	c)		Yes No		&
		Link setup (reset) procedure:	5.3.1	[M]		clause 6	
		Sends SABM			Yes No		&
		Disconnect before sending SABM			Yes No		&
		Sends DM to request SABM			Yes No		&
		Link setup (reset) : Resolves SABM collision	5.3.5	[M]		clause 6	
		After receiving UA	a)		Yes No		&
		After sending UA	b)		Yes No		&
		After timing out, waiting for UA, having sent a UA response	c)		Yes No		&
		After entering disconnected phase on detection of error condition:	5.3.4	[M]		clause 6	
		Sends DISC			Yes No		&
		Sends DM (up to N2 times)			Yes No		&
		Set-up the link			Yes No		&
		Remains in the disconnected phase (until higher level or remote and recovery action)			Yes No		&
		Procedure for information transfer	5.4	M	Yes No	clause 6	&

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Base Standard Features						Profile Features	
Item	Protocol Feature		References	Status	Implemented?	ISP References	Status
	Procedures	Information transfer acknowledgement when not in busy condition:	5.4.2	[M]		clause 6	
		By RR frames only			Yes No		&
		By RR frames or by I frames when available			Yes No		&
		Procedure for the use of the P/F bit	5.2	M	Yes No	clause 6	&
		Information transfer: Sends RNR frame	5.4.8	M	Yes No	clause 6	&
		Information transfer: Can receive RNR frame	5.4.7	M	Yes No	clause 6	&
		Information transfer: Sends REJ frame	5.4.4,5.4.5	M	Yes No	clause 6	&
		Information transfer: Can receive REJ frame	5.4.6	M	Yes No	clause 6	&
		Sends P=1 to solicit response:	5.3.2	[M]		clause 6	
		In I frames			Yes No		&
		In supervisory frames			Yes No		&
		Sends P=1 in DISC	5.3.3,5.3.6	M	Yes No	clause 6	&
		Sends P=1 in SABM	5.3.1,5.3.6	M	Yes No	clause 6	&
		Frame reject condition:	5.6.2	[M]		clause 6	
		Sends FRMR and reset the link			Yes No		&
		Sends FRMR N2 times before resetting the link			Yes No		&
		When receiving FRMR:	5.5	[M]		clause 6	
		Reset the link			Yes No		&
		Return a DM response			Yes No		&
		Timer recovery procedure after sending REJ	4.4.2.2	O	Yes No	clause 6	&
		Exception condition reporting and recovery	4.4	M	Yes No	clause 6	&
		Checkpoint recovery	4.4.2.1	O	Yes No	clause 6	&

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Base Standard Features					Profile Features	
Item	Protocol Feature	References	Status	Imple-mented?	ISP Refer-ences	Status
VN1	Values of System para-meters — Maximum number of bits in I frame (N1) supported if:	5.7.3			clause 6	
	— Modulo 8 was checked without MLP		1080-			& [2]
	— Modulo 128 was checked without MLP		1088-			& [2]
VN2	Maximum number attempts to complete a transmissions (N2)	5.7.2	free		clause 6	&
VK	Maximum number of outstanding I frames (K) for:	5.7.4			clause 6	
	— DTE/DTE operation		1-7			i
	— DTE/DTE operation with modulo 128		1-127			i
	— DTE/DCE operation		1-7			&
	— DTE/DCE operation with modulo 128		1-127			&
VT1	Timer T1 [1]	5.7.1.1			clause 6	
	— Range of DTE's T1		free [1]			&
	— Expected range of DCE's T1		free [1]			&
VT2	Parameter T2 [1]	5.7.1.2			clause 6	
	— Range of parameter T2 for DTE		free [1]			&
	— Range of parameter T2 for DCE in case of DTE/DTE operation		free [1]			i
VT3	Timer T3 [1]	5.7.1.3	free [1]		clause 6	&
VT4	Parameter T4 [1]	5.7.1.4	free [1]		clause 6	&

NOTES

1 - The relation among the parameters should be as follows.
T2<T1<<T4<<T3

2 - In order to support the theoretical maximum call set up / clearing packet size (259 octets), an N1 value of 2104 (for modulo 8) or 2112 (for modulo 128) bits would be required.

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A.3.3 Multilink procedure (ML::)

Base Standard Features						Profile Features	
Item	Protocol Feature		References	Status	Imple-mented?	ISP Refer-ences	Status
	Multi-link Proce-dure (MLP)	Multilink frame structure	6.2	M	Yes No	clause 6	&
		Multilink control field format and parameters	6.3	M	Yes No	clause 6	&
		Initialization procedure	6.4.1	M	Yes No	clause 6	&
		Multilink resetting procedure	6.4.2	M	Yes No	clause 6	&
		Multilink frame transmission procedure	6.4.3	M	Yes No	clause 6	&
		Multilink frame reception procedure	6.4.4	M	Yes No	clause 6	&
		Procedure for taking an SLP out of service	6.4.5	M	Yes No	clause 6	&
		Void sequencing bit (V) procedure supported	6.3.2.1	O	Yes No	clause 6	&
		Sequence check option bit (S) procedure supported	6.3.2.2	O	Yes No	clause 6	&
		Cause field with MLP reset request supported	6.3.2.3	O	Yes No	clause 6	&
		Multilink window size MW	6.3.2.9	M	Yes No	clause 6	&
		Receive MLP window guard region MX	6.3.2.10	M	Yes No	clause 6	&
		Initialization procedure according to:		[M]		clause 6	
		§6.4.1 (Initialization)	6.4.1		Yes No		&
		§6.4.2 (Resetting procedure)	6.4.2		Yes No		&
		Lost frame Timer MT1	6.5.1	M	Yes No	clause 6	&
		Group busy Timer MT2	6.5.2	O	Yes No	clause 6	&
		MLP reset confirmation Timer MT3	6.5.3	M	Yes No	clause 6	&
VN1MLP	Values of Multi-link System para-meters	Maximum number of bits in I frame (N1) supported if:	5.7.3			clause 6	
		Modulo 8 was checked with MLP		1096-			&
		Modulo 128 was checked with MLP		1104-			&
		Multilink window size MW	6.3.2.9	-(4095-MX)		clause 6	&
		Receive MLP window guard region MX.	6.3.2.10	free		clause 6	&
		Lost frame Timer MT1	6.5.1	free		clause 6	&
		Group busy Timer MT2	6.5.2	free		clause 6	&
		MLP reset confirmation Timer MT3	6.5.3	free		clause 6	&

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A.4 Physical Layer ISPICS Requirements List

NOTE - This IPRL includes an interim version of the PICS proforma. When a standardized PICS proforma is published, this IPRL will be revised to refer it.

A copy of this table is to be completed for each type of physical interface supported.
Physical interface number _____ of_____ .

Base Standard Features						Profile Features	
Index	Protocol Feature		References	Status	Implemented?	ISP References	Status
SN1	Access line to PSDN	PSTN leased line		O.1	Yes No	clause 7	&
SN2		Digital data circuit		O.1	Yes No	clause 7	&
PI1	Physical interface	X.21		SN2: O.2	Yes N/A No	clause 7	&
PI2		X.21 bis		SN2: O.2	Yes N/A No	clause 7	&
PI3		V-series		SN1::	N/A	clause 7	
PI31		V.24		O.3	Yes No		&
PI32		V.35		O.3	Yes No		&
PI33		V.36		O.3	Yes No		&
SR1	Data Signalling Rates [1]	2400 bps		O.4	Yes No	clause 7	&
SR2		4800		O.4	Yes No	clause 7	&
SR3		9600		O.4 [2]	Yes No	clause 7	&
SR4		48000		O.4	Yes No	clause 7	&
SR5		64000		O.4	Yes No	clause 7	&
	Electrical Characteristics	Data Signalling Rates 2400 – 9600		SR123::	N/A	clause 7	
ECX26L		X.26		PI1: O.5	Yes N/A No		&
				PI2: O.6	Yes N/A No		&
ECX27L		X.27		PI1: O.5	Yes N/A No		&
ECV10L		V.10		PI31: O.7	Yes N/A No		&
ECV11L		V.11		PI31: O.7	Yes N/A No		&
ECV28		V.28		PI2: O.6	Yes N/A No		&
				PI31: O.7	Yes N/A No		&
		Data Signalling Rates 48000–64000		SR45::	N/A	clause 7	
ECX26H		X.26		PI2: O.8	Yes N/A No		&
ECX27H		X.27		PI1: M	Yes N/A No		&
				PI2: O.8	Yes N/A No		
ECV10H		V.10		PI31: O.9	Yes N/A No		&
				PI33: O.10	Yes N/A No		&
ECV11H		V.11		PI31: O.9	Yes N/A No		&
				PI33: O.10	Yes N/A No		&
ECV35		V.35		PI2: O.8	Yes N/A No		&
				PI32: M	Yes N/A No		&
	Connectors	X.21 bis or V-series Physical I/F		(PI2, PI3) ::	N/A	clause 7	
		ISO 2110		ECV28: M	Yes N/A No		&
		ISO 2593		ECV35: M	Yes N/A No		&
		ISO 4902		(ECX26LH, ECX27H, ECV10LH, ECV11LH): M	Yes N/A No		&
		X.21 Physical I/F		PI1::	N/A	clause 7	
		ISO 4903		M	Yes No		&

NOTES

1 - These data signalling rates are those defined in X.1 for a packet switched data transmission service.

2 - It is (strongly) recommended that a conforming implementation should support 9600 bit per second data signalling rate.

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Base Standard Features						Profile Features	
Identi -fier	Feature		Clause of Base Std.	Type or Range	Imple-mented?	Clause of ISP	Type or Range
	Interchange Circuits	X.21 physical I/F		PI1::		clause 7	
		G [1]		M	Yes No		&
		Gs		M	Yes No		&
		Gb		-	Yes No		&
		T		M	Yes No		&
		R		M	Yes No		&
		C		M	Yes No		&
		I		M	Yes No		&
		S		M	Yes No		&
		B		O	Yes No		&
		F		-	Yes No		&
		X		-	Yes No		&
		X.21bis physical I/F or V-series		(PI2, PI3) ::		clause 7	
		No. 102 [2]		M	Yes No		&
		102a		-	Yes No		&
		102b		-	Yes No		&
		102c		-	Yes No		&
		103		M	Yes No		&
		104		M	Yes No		&
		105		M	Yes No		&
		106		M	Yes No		&
		107		M	Yes No		&
		108/1		O	Yes No		&
		108/2		-	Yes No		&
		109		M	Yes No		&
		110		-	Yes No		&
		111		-	Yes No		&
		112		-	Yes No		&
		113		-	Yes No		&
		114		M	Yes No		&
		115		M	Yes No		&
		116		-	Yes No		&
		117		-	Yes No		&
		118		-	Yes No		&
		119		-	Yes No		&
		120		-	Yes No		&
		121		-	Yes No		&
		122		-	Yes No		&
		123		-	Yes No		&
		124		-	Yes No		&
		125		-	Yes No		&

NOTES

1 - These interchange circuits are defined in CCITT Recommendation X.24.
2 - These interchange circuits are defined in CCITT Recommendation V.24.
& : Same as base standard.

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Base Standard Features						Profile Features	
Identi-fier	Feature		Clause of Base Std.	Type or Range	Imple-mented?	Clause of ISP	Type or Range
		X.21bis physical I/F or V-series		(PI2, PI3) ::		clause 7	
		No. 126 [1)]		-	Yes No		&
		127		-	Yes No		&
		128		-	Yes No		&
		129		-	Yes No		&
		130		-	Yes No		&
		131		-	Yes No		&
		132		-	Yes No		&
		133		-	Yes No		&
		134		-	Yes No		&
		136		-	Yes No		&
		140		O	Yes No		&
		141		O	Yes No		&
		142		M	Yes No		&
		191		-	Yes No		&
		192		-	Yes No		&

NOTE 1 - These interchange circuits are defined in CCITT Recommendation V.24.
& : Same as base standard.

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Annex B
(normative)
List of defect reports

Introduction

Defect reports which affect the technical contents of ISO 8878, its amendments and technical corrigenda (see clause 2) are listed in this annex. These defect reports have been approved by ISO/IEC JTC1/SC6, but not yet published as technical corrigenda.

Implementation shall conform to the base standard amended as indicated by the editor's response in the attached defect report.

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DEFECT REPORT FORM

1. Defect Report Number: 8878/013

2. Source: UK

3. Addresses to: ISO/IEC JTC 1/SC 6/WG 2 Editor's Group on ISO 8878

4. WG Secretariat: BSI

5. Date Circulated by WG Secretariat: 1991-01-22

6. Deadline for Response by Editor: 1991-03-22

7. Defect Report Concerning: ISO 8878:1987 - Use of X.25 to provide the OSI connection-mode Network service

8. Qualifier: Error

9. References in Document: subclause 8.2.1

10. Nature of Defect:

Subclause 8.2.1 specifies that when an MBS is received, an N-DATA indication is signalled to the NS user. However, ISO/IEC 8208 allows receipt of an MBS with a total data length of zero, and ISO 8348 does not allow zero-length NSDUs.

11. Solution Proposed by Source:

State that if the MBS length is zero it does not cause an N-DATA indication, but is considered a protocol violation with a clear or reset recommended as in Defect Report 8878/005, second group of errors.

12. Editor's Response:

The nature of the defect, as explained above, is correct. Furthermore, it is agreed that an MBS of zero length should not cause an N-DATA indication primitive and that this needs to be added. What needs to be addressed is whether the action of clear or even reset is appropriate or whether they are too strong. Consideration should be given to ignoring the MBS.

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UDC 831.3:621.39

Descriptors: data processing, information interchange, network interconnection, open systems interconnection, data transmission, communication procedure, control procedures, transport layer, protocols, network layer, data link layer, physical layer.

Price based on 26 pages

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