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Information processing systems — Data communications — Use of X.25 to provide the OSI connection-mode network service

ADDENDUM 1: Priority

Systèmes de traitement de l'information — Communication de données — Utilisation du protocole X.25 pour fournir le service de réseau OSI en mode connexion

ADDITIF 1: Priorité

Reference number
ISO 8878 : 1987/Add.1 : 1990 (E)

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. Draft International Standards adopted by the joint technical committee are circulated to national bodies for voting. Publication as an International Standard requires approval by at least 75 % of the national bodies casting a vote.

Addendum 1 to ISO 8878:1987 was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information technology.*

Information processing systems — Data communications — Use of X.25 to provide the OSI connection-mode network service

ADDENDUM 1: Priority

Introduction

ISO 8878 specifies how to map between the elements of the Network Service Definition (ISO 8348) and the X.25 Packet Layer Protocol (PLP). ISO 8348/Add. 3 specifies that Quality of Service (QOS) parameters for priority are to be added to those parameters subject to a three-party negotiation/indication mechanism involving the Network Service provider and the two Network Service users. This addendum to ISO 8878 specifies how to map between these parameters and the corresponding elements of the X.25/PLP. It assumes the use of the Priority Facility to be included in the second edition of ISO 8208 (corresponding to X.25-1988).

This Addendum is structured as a set of changes to ISO 8878. Several miscellaneous changes are specified to alter the existing text in ISO 8878. The principal additions are new subclause 6.2.5.3 for priority and a new Annex H.

1 Changes to ISO 8878:1987

1.1 Page 1, Clause 0, Paragraph 1:

- Lines 3-4: Change "elements of the 1984...(X.25/PLP-1984)" to "elements of the 1984 or later versions of the X.25/PLP (referred to as X.25/PLP-1984)"
- Line 4: After "OSI CONS.", add a new sentence as follows: "Features associated with versions of X.25 later than 1984 are identified as to which version they relate."
- Line 6: Change "the 1980 version of the X.25/PLP." to "the 1980 or earlier versions of the X.25/PLP (referred to as X.25/PLP-1980)."

1.2 Page 3: Add to the list of references:

ISO 8348/Add. 3, *Information processing systems — Data communications — Network Service Definition — Addendum 3: Additional features of the network service*

1.3 Page 7, Item b above Clause 5.2:

- Bullet 4: delete "and"
- Bullet 5: change the period to a comma followed by "and"
- Add Bullet 6 as follows:
  - Priority (facility used, with 1988 or later versions of the X.25/PLP).

1.4 Page 9, Table 2: Add the following to the X.25/PLP-1984 column on the row dealing with QOS-Parameter set:

Priority Facility

1.5 Page 11, Clause 6.2.5:

- Line 1: change "three" to "the following"
- First Item b: delete "and"
- First Item c: change the period to a semi-colon
- Add items d through f as follows:

  d) the priority of the data transferred on the NC (with respect to data transferred on other NCs);

e) the priority of gaining an NC; and
f) the priority of keeping this NC.

— Line 6: Delete "three"

1.6 Page 11, Clause 6.2.5.1:

— Paragraph 2, Line 2: Change "48000" to "64000[1]"
— Paragraph 2, Line 3: Change "and 48000" to "48000, and 64000"
— Add a Footnote 1 at the bottom of the page as follows:

1. A throughput of 64000 bits per second is available only for 1988 or later versions of the X.25/PLP. For earlier versions, the highest throughput available is 48000 bits per second.

2 Addition of new clause and annex

2.1 New subclause 6.2.5.3, page 2

6.2.5.3 Priority QOS parameters

The Priority Facility of the X.25/PLP is mapped to/from the three Priority QOS parameters of N-CONNECT primitives.

The set of values that can be specified for each Priority subparameter ranges from 0 (lowest priority) to 14 (highest priority). An NL entity supports all of these values. The value "unspecified" is also allowed (encoded as 255 in the X.25/PLP).

6.2.5.3.1 Processing an N-CONNECT Request primitive

An NL entity that supports a choice of priority levels shall proceed as specified in 6.2.5.4.1.1. An NL entity that does not support a choice of levels shall proceed as specified in 6.2.5.4.1.2.

6.2.5.3.1.1 Processing with choice of levels supported

If an NL entity, when receiving an N-CONNECT request primitive, cannot support the Lowest Quality Acceptable priority for any of the three Priority QOS parameters, when specified, then it rejects the request. In this case, the NL entity does not transmit any X.25/PLP packet but it does signal an N-DISCONNECT indication primitive to the Calling NS user. The originator parameter is "NS Provider." The Reason parameter is "Connection Rejection — QOS Not Available/Transient Condition," or "Connection Rejection — QOS Not Available/Permanent Condition" if the NL entity could never support the Lowest Quality Acceptable priority for one or more of the Priority QOS parameters.

If an NL entity, when receiving an N-CONNECT request primitive, can support the Lowest Quality Acceptable priority for all three Priority QOS parameters, when specified, or any of the Lowest Quality Acceptable Priority QOS parameters is unspecified, then the NL entity encodes the Priority Facility as follows:

a) if the Lowest Quality Acceptable priority of a Priority parameter is specified, its value is encoded in the subfield of the X.25/PLP Priority Facility designated to contain this subparameter; otherwise, this subfield of the facility is encoded as 255 (unspecified); and

b) if the Target of a Priority parameter is specified, its value is encoded in the subfield of the X.25/PLP Priority Facility designated to contain this subparameter; otherwise, this subfield of the facility is encoded as 255 (unspecified).

If either the Target or the Lowest Quality Acceptable priority is specified for any of the Priority QOS parameters, then the resulting Priority Facility is transmitted across the DTE/DXE interface in a CALL REQUEST packet. Any subfield of the Priority Facility that contains the "unspecified" value (i.e., 255) may be omitted if, and only if, it is not followed by a subfield containing a value other than "unspecified." If both the Target and Lowest Quality Acceptable priority are unspecified for all Priority QOS parameters, then no Priority Facility is transmitted.

6.2.5.3.1.2 Processing with choice of levels not supported

When an NL entity receives an N-CONNECT request primitive, it shall encode the Lowest Quality Acceptable and Target priority level for each Priority QOS parameter in the X.25/PLP Priority Facility for transmission across the DTE/DXE interface in a CALL REQUEST packet, unless both values of all parameters are unspecified, in which case it shall not transmit a Priority Facility.

6.2.5.3.2 Processing an INCOMING CALL packet

An NL entity that supports a choice of priority levels shall proceed as specified in 6.2.5.4.2.1. An NL entity that does not support a choice of levels shall proceed as specified in 6.2.5.4.2.2.

6.2.5.3.2.1 Processing with choice of levels supported

When receiving an INCOMING CALL packet, an NL entity determines the Available and Lowest Quality Acceptable subparameters to be used in the N-CONNECT indication primitive for each Priority QOS parameter as follows:

a) if the packet contains no Priority Facility, then both subparameters for each Priority QOS parameter are unspecified;

b) if the subfield of the Priority Facility designated to contain the Available subparameter for a Priority QOS parameter is present, then the value of this subparameter is as given in the subfield; otherwise, the value is unspecified;

c) if the subfield of the Priority Facility designated to contain the Lowest Quality Acceptable subparameter for a Priority QOS parameter is present, then the value of this subparameter is as given in the subfield; otherwise, the value is unspecified.

If, for any of the three Priority QOS parameters, the NL entity cannot support the Lowest Quality Acceptable priority, then the NL entity clears the call (i.e., transmits a CLEAR REQUEST packet). The cause is "DTE Originated" and the diagnostic is "Connection Rejection — QOS Not Available/Transient Condition," or "Connection Rejection — QOS Not Available/Permanent Condition" if the NL entity could never support the Lowest Quality Acceptable priority (these diagnostics have values 229 and 230, respectively). Otherwise, the NL entity indicates, for each Priority QOS parameter, the Available and Lowest Quality Acceptable priority values in the Priority QOS parameters of the N-CONNECT indication primitive signaled to the Called NS user.

6.2.5.3.2.2 Processing with choice of levels not supported

When an NL entity receives an INCOMING CALL packet, the values of the Available and Lowest Quality Acceptable priority-level subparameters for use in the N-CONNECT indication primitive for each Priority QOS parameter shall be the values signified by the Priority Facility in the packet, unless there is no Priority Facility, in which case the values of both subparameters shall be "unspecified."

6.2.5.3.3 Processing an N-CONNECT Response primitive

When an NL entity receives an N-CONNECT response primitive, it encodes the Selected priority value, if specified, as given for each Priority QOS parameter, in the Priority Facility returned in the CALL ACCEPTED packet. Any subfield of the Priority Facility that contains the "unspecified" value (i.e., 255) may be omitted if, and only if, it is not followed by a subfield containing a value other than "unspecified." If the Selected priority value is unspecified for all Priority QOS parameters, then no Priority Facility is returned in the CALL ACCEPTED packet.

6.2.5.3.4 Processing a CALL CONNECTED packet

When an NL entity receives a CALL CONNECTED packet, it indicates the Selected priority value, as given in the Priority Facility (if present), for each Priority QOS parameter of the N-CONNECT confirm primitive signaled to the Calling NS user. The absence of a subfield in the Priority Facility corresponds to the value "unspecified." If the Priority Facility is not present in the CALL CONNECTED packet, then the Selected value of each Priority QOS parameter is "unspecified."

2.2 New Annex H

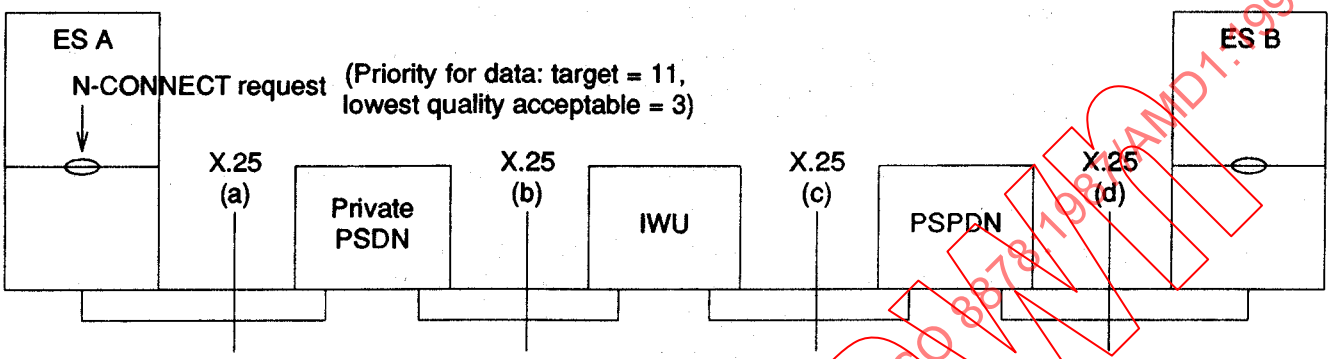
ANNEX H

Example of Priority Negotiation

(informative)

This annex is not an integral part of this International Standard.

The example below is concerned only with the negotiation of priority for data transfer (operation of the negotiation of the other two priority subparameters in ISO 8208 is identical).



LEGEND:

ES	End System
IWU	Interworking Unit
PSDN	Packet-Switched Data Network
PSPDN	Packet-Switched Public Data Network

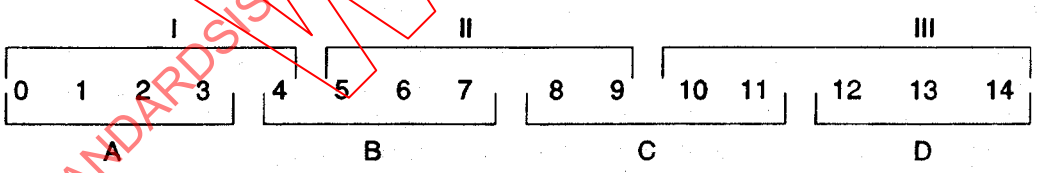
The labels (a), (b), (c), and (d) represent the various points between the entities involved in the scenario shown above at which priority information is visible in protocol control information.

The priority values supported by the Private PSDN and the PSPDN, which are conveyed in a "national" X.25 facility local to the network, are as follows:

— PSPDN: I (lowest), II, III (highest)

— Private PSDN: A (lowest), B, C, D (highest)

The mapping to the 0-14 OSI priority range is as follows



The top mapping is used by the IWU and ES B; the bottom mapping is used by ES A and the IWU.