INTERNATIONAL STANDARDIZED PROFILE

ISO/IEC ISP 11188-1

First edition
1995-04-15

Information technology — International Standardized Profile — Common upper layer requirements —

Part 1:
Basic connection oriented requirements

Technologies de l'information — Profil normalisé international — Prescriptions communes pour la couche supérieure —

Partie 1: Prescriptions orientées vers la connexion de base

Reference number
ISO/IEC ISP 11188-1:1995(E)

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Contents

Page

1 Scope 1

2 Compliance 1

3 Normative references 2

4 Definitions 3

5 Abbreviations 4

6 Association Control Service Element (ACSE) 4

7 Presentation layer 5

8 Transfer syntax 6

9 Session layer 7

Annex A: Profile Requirements Lists for ACSE, Presentation and Session ..10

Annex B: Profile ICS Proforma 13

Annex C: Recommended Practices 14

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Foreword

ISO (the International Organization for Standardization) and IEC (the International Electrotechnical Commission) form a 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 or 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 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.

This part of ISO/IEC ISP 11 188 was prepared with the collaboration of

- Asia-Oceania Workshop (AOW);
- European Workshop for Open Systems (EWOS);
- OSE Implementors Workshop (OIW).

ISO/IEC ISP 11188 consists of the following parts, under the general title *Information technology - International Standardized Profile - Common upper layers requirements :*

- *Part 1 : Basic connection oriented requirements*
- *Part 2 : Basic connection oriented requirements for ROSE-based Profiles*
- *Part 3 : Minimal OSI upper layer facilities*

Annexes A and B form an integral part of this part of ISO/IEC ISP 11188. Annex C is for information only.

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Introduction

This part of ISO/IEC ISP 11188 is defined within the context of Functional Standardization, in accordance with the principles specified by ISO/IEC TR 10000, "Framework and Taxonomy of International Standardized Profiles". 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 standards, and provide a basis for the development of uniform, internationally recognized system tests.

ISO/IEC ISP 11188 as a multi-part ISP specifies general requirements on the use of OSI connection-mode protocols by A-profiles. These are identified as "Common Upper Layer Requirements".

The parts of this multi-part ISP can be referenced normatively by other ISPs or referencing specifications. In addition, a referencing ISP may specify further requirements on the protocols, provided it does not contradict this ISP.

The purpose of this multi-part ISP is to provide common text for ISPs or other referencing specifications which specify A-profiles. In addition to simplifying their drafting, it also facilitates the common implementation of the protocols for use in different A-profile contexts.

This part of ISO/IEC 11188 specifies the use of the connection-mode protocols of the ACSE, Presentation and Session layers of OSI.

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Information technology - International Standardized Profile - Common upper layers requirements - Part 1:

Basic connection oriented requirements

1 Scope

1.1 General

This part of ISO/IEC ISP 11188 specifies the common upper layers elements of A-profiles (see TR 10000-2, 5.5.3). The common elements are specified by reference to OSI connection-mode standards for the ACSE protocol, the presentation layer protocol, and the session layer protocol.

A specification defining an A-profile (see TR 10000-2, 5.5.3) may reference this part of ISO/IEC ISP 11188 as a common basis for the selection of elements of the upper layers protocols (ACSE, presentation and session) that it uses.

The use of this part of ISO/IEC ISP 11188 is supplemented by a statement of the specific upper layers requirements of the referencing specification for the use of ACSE, presentation and session protocol standards.

The rest of the A-profile definition, including, for instance, its use of standards for Application Service Elements (ASE, see also figure 1), follows the general rules of TR 10000-1.

1.2 Position within the taxonomy

This part of ISO/IEC ISP 11188 does not specify a full A-profile, and therefore has no place within the taxonomy of TR 10000-2.

1.3 Scenario

The model used is one of two end systems running an end-to-end association using the ACSE, presentation and session services and protocols (see figure 1).

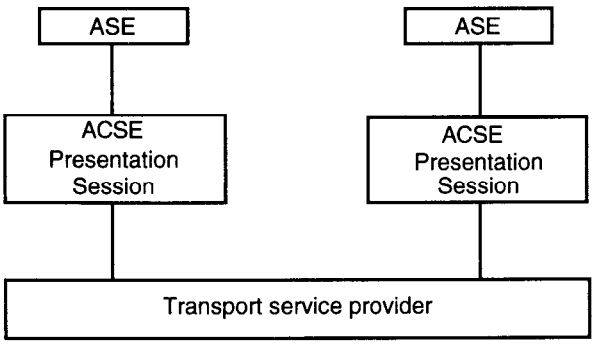

Figure 1 - Model of the supportive layers

2 Compliance

2.1 Compliance statement

A referencing specification may use the requirements in this part of ISO/IEC ISP 11188 and claim compliance to them, in one of the following ways:

a) The referencing specification does not duplicate any of the requirements of this part of ISO/IEC ISP 11188 within its own specifications and instead requires the implementation to conform to the requirements of this part of ISO/IEC ISP 11188. This is the preferred method.

b) The referencing specification replicates all of the requirements of this part of ISO/IEC ISP 11188 as part of its requirements and related conformance statements.

In the case of (b), a reference to this part of ISO/IEC ISP 11188 shall be included in clause 1 (Scope) as well as in clause 3 (Normative references) of the referencing specification.

2.1.1 A referencing specification that replicates all of the requirements of this part of ISO/IEC ISP 11188 complies if the specific upper layers requirements of the referencing specification do not conflict with the requirements of this part of ISO/IEC ISP 11188.

2.1.2 A specification that requires an implementation to conform to the requirements contained within this part of ISO/IEC ISP 11188 complies if

a) the conformance requirement of the referencing specification states that an implementation shall conform to the requirements of this part of ISO/IEC ISP 11188; and

b) the specific upper layers requirements of the referencing specification do not conflict with the requirements of this part of ISO/IEC ISP 11188.

2.1.3 This part of ISO/IEC ISP 11188 states requirements upon implementations to achieve interworking.

A claim of compliance is a claim that all requirements in the relevant base standards are satisfied, and that all requirements in this part of ISO/IEC ISP 11188 are satisfied. Annex A states the relationship between these requirements and those of the base standards.

Optional features of the referenced base standards for which no requirement is specified in clauses 6, 7, 8, 9 or in annex A, are considered as open for referencing specifications (see table 1 for a definition of "open").

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2.2 Relationship with base standards

A compliant referencing specification shall require an implementation that claims conformance to the referencing specification to include the aspects specified in 2.2.1 through 2.2.4.

2.2.1 ACSE conformance

To conform to the Association Control Service Element (ACSE) protocol as constrained by this part of ISO/IEC ISP 11188, either the X.410-1984 mode, or the normal mode, or both shall be implemented.

2.2.2 Presentation layer conformance

To conform to the presentation protocol as constrained by this part of ISO/IEC ISP 11188, implementations shall implement either the normal mode or the X.410-1984 mode or both and shall implement the initiator role, responder role, or both roles, compatible with those in ACSE (identified in clause A.5).

2.2.3 Transfer syntax conformance

An implementation shall support the "Basic Encoding of a single ASN.1 type" (BER) as specified in ITU-T Rec. X.690 | ISO/IEC 8825-1, except where the referencing specification or the associated base standard specifies some other mandatory encoding, together with the additional rules defined in clause 8, for the generation of protocol encoding specified in ASN.1. The referencing specification may require support of this or other transfer syntaxes for any abstract syntaxes which it defines.

NOTE - At the time of publication, the BER was adequate to satisfy all proposed profiles.

2.2.4 Session layer conformance

To conform to the session protocol as constrained by this part of ISO/IEC ISP 11188, implementations shall implement all the features identified in A.6 as required to be implemented.

3 Normative references

The following ITU-T Recommendations and International Standards contain provisions which, through reference in this text, constitute provisions of this part of ISO/IEC ISP 11188. At the time of publication, the editions indicated were valid. All Recommendations and International Standards are subject to revision, and parties to agreements based on this part of ISO/IEC ISP 11188 are encouraged to investigate the possibility of applying the most recent edition of the Recommendations and International Standards indicated below. Members of IEC and ISO maintain registers of currently valid International Standards and ISPs. The ITU-T secretariat maintains a list of currently valid Recommendations.

3.1 Identical Recommendations | International Standards

- ITU-T Recommendation X.200 (1994) | ISO/IEC 7498-1:1994, *Information technology - Open Systems Interconnection - Basic Reference Model: The Basic Model.*
- ITU-T Recommendation X.225 (1994) | ISO/IEC 8327-1:....[2], *Information technology - Open Systems Interconnection - Connection-oriented session protocol : Protocol specification.*
- ITU-T Recommendation X.226 (1994) | ISO/IEC 8823-1:1994, *Information technology - Open Systems Interconnection - Connection-oriented presentation protocol : Protocol specification.*
- ITU-T Recommendation X.227 (1994) | ISO/IEC 8650-1:....[3], *Information technology - Open Systems Interconnection - Connection-oriented protocol for the Association Control Service Element : Protocol specification.*
- ITU-T Recommendation X.245 (1994) | ISO/IEC 8327-2:....[1], *Information technology - Open Systems Interconnection - Connection-oriented session protocol : Protocol Implementation Conformance Statement (PICS) proforma.*
- ITU-T Recommendation X.246 (1994) | ISO/IEC 8823-2:—[1], *Information technology - Open Systems Interconnection - Connection-oriented presentation protocol: Protocol Implementation Conformance Statement (PICS) proforma.*
- ITU-T Recommendation X.247 (1994) | ISO/IEC 8650-2:....[3], *Information technology - Open Systems Interconnection - Connection-oriented protocol for the Association Control Service Element : Protocol Implementation Conformance Statement (PICS) proforma.*
- ITU-T Recommendation X.680 (1994) | ISO/IEC 8824-1:....[4], *Information technology - Abstract Syntax Notation One (ASN.1) : Specification of basic notation.*
- ITU-T Recommendation X.680.1 (1994) | ISO/IEC 8824-1/Amd.1:....[1], *Information technology - Abstract Syntax Notation One (ASN.1) : Specification of basic notation - Amendment 1 : Rules of Extensibility.*
- ITU-T Recommendation X.690 (1994) | ISO/IEC 8825-1:....[5], *Information technology - ASN.1 encoding rules : Specification of Basic Encoding Rules (BER), Canonical Encoding Rules (CER) and Distinguished Encoding Rules (DER).*

3.2 Additional references

- CCITT Recommendation X.650 (1992), *Open Systems Interconnection (OSI) - Reference model for naming and addressing.*

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[1] Currently at stage of draft.

[2] Revision of ISO 8327:1987. To be published.

[3] Revision of ISO 8650:1988. To be published.

[4] Revision of ISO/IEC 8824:1990. To be published.

[5] Revision of ISO/IEC 8825:1990. To be published.

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- ISO 7498-3:1988, *Information processing systems - Open Systems Interconnection - Basic Reference Model - Part 3: Naming and addressing.*
- 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.*

NOTE - This part of ISO/IEC ISP 11188 makes detailed references to subclauses of the specified editions of some of the above references.

4 Definitions

For the purposes of this part of ISO/IEC ISP 11188, the following definitions apply.

Terms used in this part of ISO/IEC ISP 11188 are defined in the referenced base standards.

In addition the following terms are defined.

4.1 General

referencing specification : a specification of an A-profile which includes by reference or by replication, the requirements in this part of ISO/IEC 11188.

4.2 Support level

To specify the support level of protocol features for this part of ISO/IEC ISP 11188, the following terminology is defined :

a) Column 1 of table 1 lists the support level identifiers for a profile used in this part of ISO/IEC ISP 11188;

b) Column 2 of table 1 defines the use of these requirements classifications of column 1 by a referencing specification;

c) Column 3 of table 1 defines the use of the requirements classifications by an implementation.

Table 1– Profile status identifiers

	Identifier	Meaning when referenced by a specification	Meaning when referenced by an implementation
1	m	mandatory — The feature shall be required for support. The status of the feature shall remain mandatory in a referencing specification (see note).	mandatory — The implementation shall support the feature, i.e. its syntax and procedures shall be implemented as specified in the base standard or in this part of ISO/IEC ISP 11188. However, it is not a requirement that the feature shall be used in all instances of communication unless mandated by the base standard or stated otherwise in this part of ISO/IEC ISP 11188. The feature shall be the subject of an ISP conformance test (see note).
2	o	optional — The choice of whether this feature is supported or it is not supported is made by the implementation. The status of the feature shall remain optional in a referencing specification.	optional — The implementation may decide either to support or to not support the feature. • Supporting a feature means that the feature shall be handled as if it was mandatory. • Not supporting a feature depends on receiving or sending : For sending, the feature's capability is not used; For receiving an optional parameter, the syntax shall be implemented and the parameter may be ignored. The feature shall be the subject of an ISP conformance test.
3	*	open — The status of this feature shall be decided by the referencing specification. The referencing specification shall indicate that the status of the feature is mandatory, optional, or out of scope. Alternately, the referencing specification may keep the feature open.	open — same as optional
4	x	excluded — The feature shall not be used in a referencing specification. The status of the feature shall remain excluded in a referencing specification.	excluded — The implementation shall not support the feature. When completing the associated PICS Proforma table, the answer for the support column shall be that the feature has not been implemented. The implementation shall abort if the feature is received. The exclusion should be the subject of an ISP conformance test.

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5	i	out of scope — The requirement for the support of this feature is not covered by this Profile. The status of the feature shall remain out of scope in a referencing specification.	out of scope — Support for a feature shall follow the guidelines outlined for optional above with the exception that this feature shall not be the subject of an ISP conformance test.
6		not applicable — The feature is not relevant where mentioned in a table. Support for the feature is either meaningless, logically impossible, or physically impossible, after some conditions are evaluated. The status of the feature shall remain not applicable in a referencing specification.	not applicable — The feature is not defined by the base standard in the context where it is mentioned in a table. A support answer is not required from the implementor.
7	c[n]	conditionally supported — Support for the feature is further defined in this this part of ISO/IEC ISP 11188 by condition ("n") annexed to the table. The value evaluated from the condition evaluates to one of the following values defined in this table: "m"; "o"; "i", or "–".	conditionally supported — Support for the feature is further defined by a condition ("n") which is annexed to the table. Depending on the condition, when completing the associated PICS Proforma table, the answer for the support column shall either be: the feature has been implemented; the feature has not been implemented; or not applicable.
	NOTE - The support of a feature can be conditional, depending on the support of a class of features to which it belongs, e.g. a parameter in a PDU, a PDU in a functional unit.		

5 Abbreviations

AARQ	A-Associate Request (APDU)
AC	Accept (SPDU)
ACSE	Association Control Service Element
AE	Application Entity
AP	Application Process
APDU	Application Protocol Data Unit
ARP	Abnormal Release Provider (PPDU)
ARU	Abnormal Release User (PPDU)
ASE	Application Service Element
ASN.1	Abstract Syntax Notation One
BER	Basic Encoding Rules of a single ASN.1 type
CD	Capability Data (SPDU)
CDO	Connect Data Overflow (SPDU)
CN	Connect (SPDU)
CP	Connect Presentation (PPDU)
CPA	Connect Presentation Accept (PPDU)
CPR	Connect Presentation Reject (PPDU)
DT	Data Transfer (SPDU)
ER	Exception Report (SPDU)
FTAM	File Transfer, Access and Management
ICS	Implementation Conformance Statement
ISP	International Standardized Profile
MIA	Minor Sync Ack (SPDU)
OA	Overflow Accept (SPDU)
OSI	Open Systems Interconnection
PCI	Protocol Control Information
PDU	Protocol Data Unit
PDV	Presentation Data Value
PGI	Parameter Group Identifier
PI	Parameter Identifier
PICS	Protocol Implementation Conformance Statement
PPDU	Presentation Protocol Data Unit
PRL	Profile Requirements List
RF	Refuse (SPDU)
RS	Resynchronize (SPDU)
SPDU	Session Protocol Data Unit
SS	Session Service
TD	Typed Data (SPDU)

Support level for protocol features:

m	supported
o	optionally supported
*	open
x	excluded
c	conditionally supported
i	out of scope
-	not applicable

6 Association Control Service Element (ACSE)

The support of functions and parameters for the Association Control Service Element is as specified in A.4 and in the Specific Upper Layer Requirements section of the referencing specification.

6.1 Application entity title

Support of AE-Title-form1, the Name form, or AE-Title-form2, the Object Identifier form for sending, is dependent on the referencing specification.

NOTES

1 AE-Title-form1 is a directory name that has to be allocated by an authorized naming authority. It is part of the responsibilities of the naming authority to determine how this name is built from its two constituents AP-Title-form1 and AE-Qualifier-form1.

2 AE-Title-form2 is an Object Identifier registered by an authorized Registration Authority. It is part of that registration to determine how this Object Identifier is built from its two constituents AP-Title-form2 and AE-Qualifier-form2.

6.2 Abort APDU

When the Abort APDU is used during the association establishment phase, the Presentation layer negotiation is considered complete. Therefore, presentation context identifiers have been assigned and they shall be used in the indirect-reference component of the user

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information parameter. The direct-reference component of EXTERNAL shall not be present.

NOTE - The presentation context negotiation is completed by the presentation context identifier list of the ARU PPDU (see ITU-T Rec. X.226 | ISO/IEC 8823-1, 6.4.2.1).

7 Presentation layer

The support of functions and parameters for the presentation protocol is as specified in A.5 and in the Specific Upper Layer Requirements section of the referencing specification. An implementor's PICS may contain limitations on length or value aspects of a protocol, but it shall not contain limits less severe for sending or more severe for receiving than those specified in this clause. An implementation may abort a connection, if the requirements specified in 7.1 to 7.10 are violated.

NOTE - The complete size of encoding of the CP PPDU, CPA PPDU and CPR PPDU is derived from the SS user-data size restricted to 10 K such as specified in 9.2.2. This limitation applies also to the ARP and ARU PPDUs.

7.1 Presentation context identifier

A conformant implementation shall not encode presentation context identifiers outside the range of 0 to 32 767.

NOTE - For the selection of odd or even values see ITU-T Rec. X.226 | ISO/IEC 8823-1, 6.2.2.7 and 6.5.2.1.

7.2 Presentation selector

7.2.1 The encoding of a presentation selector is restricted to 4 octets.

7.2.2 The absence of the Called or Calling P-Sel parameter of the CP PPDU shall be treated equivalent to a zero length Called or Calling P-Sel parameter value.

The absence of the Responding P-Sel parameter of the CPA PPDU indicates that the Responding P-address is equivalent to the Called P-address of the CP PPDU.

The value of the Responding P-Sel parameter may be different from the value of the Called P-Sel parameter.

Table 2 summarizes the handling of the presentation selector parameters of the CP and CPA PPDUs (see also ITU-T Rec. X.226 | ISO/IEC 8323-1, 6.2.2.3, 6.2.2.5, 6.2.3.3).

Table 2 - Called and Responding P-Selectors

		Responding P-Sel of CPA PPDU		
		not present	length=0	length>0
Called P-Sel of CP PPDU	not present	note 1	note 1	note 2
	length=0	note 1	note 1	note 2
	length>0	note 3	note 1	note 2

NOTES

1 The resulting value is assumed to be a null value.

2 The resulting value is assumed to be the Responding P-Sel value.

3 The resulting value is assumed to be the Called P-Sel value.

7.3 Transfer syntax name in PDV list

The transfer-syntax-name component of a PDV-list value shall be present if and only if more than one transfer syntax name was proposed for the presentation context of the presentation data values.

NOTES

1 The CP PPDU consists of a value of CP-type and zero or more values of CPC-type. A value of a CPC-type in the CP PPDU is present only when more than one transfer syntax was offered for a particular presentation context. Therefore the transfer-syntax-name component of a PDV-list value is always present in a value of CPC-type if such a value is present.

2 If the kernel functional unit only is negotiated, then the transfer-syntax-name component of a PDV-list value appears only in the CP PPDU.

3 Where present in a CP PPDU, each value of a CPC-type represents all of the user data of the CP PPDU, and its abstract value is synonymous with the abstract value of the user data field within the value of the CP-type. Each represents the abstract value of the user data with a unique combination of transfer syntaxes (a single transfer syntax for each presentation context). It is not necessary that all combinations be encoded.

4 For further information see ITU-T Rec. X.226 | ISO/IEC 8823-1, 6.2.5.3.

Where one of the transfer syntaxes proposed for a presentation context is identified as ASN.1 Basic Encoding Rules, and a value from that presentation context is present in the CP PPDU, then the representation of that value in the value of the CP-type shall use ASN.1 Basic Encoding Rules.

7.4 CPR user data parameter

The user data parameter of CPR PPDU shall contain the A-ASSOCIATE response APDU if the provider reason parameter is not present.

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7.5 Presentation context definition result list

The presentation-context-definition-result-list parameter is required if the provider reason is absent in the CPR PPDU. If the provider reason is present, then the presentation-context-definition-result-list parameter is optional.

No semantics are implied by the absence of this optional parameter of the CPR PPDU.

7.6 Default context

If the presentation expedited data service is required, the default-context-name must be explicitly present in the CP PPDU.

7.7 Aborts and session version

The ARP PPDU shall be used regardless of the session version in effect for a given connection. This precludes the use of indefinite length encoding of an ARP PPDU when session version 1 is in effect.

The ARU PPDU is used regardless of the session version in effect for a given connection.

NOTE - If session version 1 is in use, the associated parameters of the ARU PPDU cannot be sent.

7.8 Presentation-context-identifier-list in RS PPDU

The presentation-context-identifier-list parameter shall not be present in the RS PPDU when only the kernel functional unit is in effect.

7.9 Presentation aborts

If a received PPDU contains any improperly encoded data values (including data values embedded within the user data field of a PPDU) and if an Abort is issued, then either an ARU (via an A-Abort) or an ARP shall be issued.

7.10 Use of presentation data values

Fully-encoded-data that is a series of PDVs in the same presentation context (e.g., grouped FTAM PDUs) shall be encoded either as a single PDV-list (using the octet-aligned choice) or as a series of PDV-lists, each encoding either a single PDV (using the single-ASN.1-type choice) or multiple PDVs (using the octet-aligned choice).

In these cases receivers shall be able to receive all of the above encodings.

NOTES

1 A presentation data value (PDV) is a value of a type in an abstract syntax, e.g., a value of an ASN.1 type.

2 A PDV may contain embedded PDVs in different contexts. A change of context within a PDV is indicated by an EXTERNAL. EXTERNAL implies an embedded PDV.

3 A PDV cannot be split across PDV-lists in fully-encoded user data.

8 Transfer syntax

8.1 Transfer syntaxes using ASN.1 Basic Encoding Rules

Subclauses 8.1.1 through 8.1.7 specify rules which limit the encoding of data defined in this part of ISO/IEC ISP 11188 or in a referencing specification. A decoder shall accept encodings that are within these limits. Other behaviours of the decoder when these limits are exceeded are outside the scope of this part of ISO/IEC ISP 11188.

8.1.1 Tag values

The maximum value of an ASN.1 tag shall be 16 383. Since this is the largest unsigned number that can be represented in 14 bits, the encoding of a tag occupies at most 3 octets.

8.1.2 ASN.1 length fields

Values of an ASN.1 length octets component greater than 4 294 967 295 are out of scope of this part of ISO/IEC ISP 11188. This is the maximum unsigned integer that can be represented in 32 bits.

More than 5 octets for the length octets component are out of scope of this part of ISO/IEC ISP 11188.

NOTES

1 This requirement does not apply to indefinite length encoding.

2 A referencing specification may impose a limit which is lower, and all constructs exceeding this lower limit up to 4 294 967 295, should be considered out of scope of the referencing specification.

3 The maximum of 5 octets for the length octets component places a restriction to the use of ITU-T Rec. X.690 | ISO/IEC 8825-1, 8.1.3.5 2nd note.

8.1.3 Integer type values

For any value of the ASN.1 type INTEGER defined in any of the referencing specification's abstract syntaxes, in ACSE's abstract syntax, or in the presentation protocol PDU definitions, a sender shall not encode values of greater than 2**31 - 1 or less than -2**31. A receiver shall be able to decode at least values in the range -2**31 to 2**31 - 1. Any exceptions shall be listed in the referencing specification's specific upper layer requirements.

8.1.4 Bitstring type values

8.1.4.1 Unless otherwise specified, each bit named in a BIT STRING type used in the presentation, ACSE, application PCI and application data abstract syntax definitions shall be explicitly encoded in the associated BIT STRING value, even if it is a part of a string of trailing zero bits.

8.1.4.2 Unused bits beyond the exact number of bits corresponding to the complete list of named bits specified, shall never be encoded. This rule applies to all BIT STRING types unless otherwise specified.

NOTE - 8.1.4.1 and 8.1.4.2 do not affect the rules of extensibility (see 8.1.5) which specify otherwise.

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8.1.5 Extensibility

For data values that are ultimately carried on the user data of the CN SPDU (i.e., Presentation CP, ACSE AARQ and any APDU in the user information field of AARQ), a receiver shall

a) ignore any undefined element,

b) ignore all unknown bit name assignments within a bit string.

NOTES

1 A referencing specification may define a minimum support requirement for the length of a bit string that can be decoded. Such a minimum support requirement should allow for future extensibility.

2 Referencing specifications may apply similar requirements to other protocol elements.

3 For further information see ITU-T Rec. X.680.1 | ISO/IEC DIS 8824-1.3.

8.1.6 External data type

8.1.6.1 If a data value to be encapsulated in an EXTERNAL type is recognized to be an instance of a single ASN.1 type encoded according to the Basic Encoding Rules for ASN.1, then the option single-ASN.1-type shall be chosen as its encoding.

8.1.6.2 If a data value to be encapsulated in an EXTERNAL type is recognized to be encoded as an integral number of octets and 8.1.6.1 does not apply, then the option octet-aligned shall be chosen as its encoding.

8.1.6.3 Presentation layer negotiation of encoding rules is always in effect.

NOTE - 8.1.6.1 and 8.1.6.2 recognize that, in certain cases, e.g., a Message Transfer Agent only relaying data, the application may not be able to determine how a data value was encoded.

8.1.7 Constructed encoding

When encoding PDUs of the referencing specification, ACSE PDUs and Presentation PDUs, the following rule applies.

The contents octets for a constructed encoding of a BIT STRING, OCTET STRING, or character string value consists of the complete encoding of zero, one or more data values, and the encoding of these data values shall be primitive.

8.2 Other transfer syntaxes

It is possible that transfer syntaxes not based upon ASN.1 Basic Encoding Rules will be required to support ASEs which reference this part of ISO/IEC ISP 11188. Such requirements are outside the scope of this part of ISO/IEC ISP 11188.

9 Session layer

The support of functions and parameters for the session protocol is as specified in A.6 and in the Specific Upper Layer Requirements section of the referencing specification. An implementation's PICS may contain limitations on length or value aspects of a protocol, but it shall not contain limits less severe for sending or more severe for receiving than those specified in this clause. An implementation may abort a connection, if the requirements as specified in 9.1 to 9.3 are violated.

9.1 Receipt of invalid SPDUs

Upon receipt of an invalid SPDU, the session protocol machine shall take any action as specified in ITU-T Rec. X.225 | ISO/IEC 8327-1, A.4.3.2, except that an invalid SPDU shall not be ignored.

9.2 Session version

9.2.1 Selection of session version

Session versions 1 and 2 are recognized. The referencing specification shall specify in its specific upper layer requirements section which version of session is required.

NOTE - Session version 2 specifies the use of unlimited user data as specified in ITU-T Rec. X.225 | ISO/IEC 8327-1 (e.g. see clause 7). All session version 1 implementations must be able to negotiate version 1 operation when responding to a CN SPDU proposing both version 1 and 2.

At least session version 2 shall be proposed with ACSE normal mode. With ACSE normal mode, a receiver shall support session version 2, but may reject a proposal requesting only session version 1.

NOTE - Between two conformant implementations supporting ACSE normal mode, session version 2 will be used.

All session version 1 implementations, upon receipt of a CN SPDU proposing only version 2, should respond with an RF SPDU containing a reason code indicating that the proposed version is not supported.

If session version 1 and 2 are both proposed in the CN SPDU, then the maximum length of the user data parameter in the CN SPDU shall be 512 octets.

NOTE - In that case a PGI field of 193 will be associated with this parameter. This implies that an implementation supporting both session version 1 and 2 can establish a connection with an implementation supporting only version 1.

9.2.2 User data in session version 2

If only session version 2 is proposed in the CN SPDU, then a size larger than 10240 octets of the session user data parameter value of the S-CONNECT request primitive is out of scope of this part of ISO/IEC ISP 11188. This implies that the OA and CDO SPDUs are out of scope.

NOTE - If the length of the user data parameter value is not greater than 512 octets, then an associated PGI field of 193 is used. Otherwise, a PGI field of 194 is used.

When session version 2 is negotiated, then in all subsequent SPDUs a data length exceeding 10240 octets of the user data parameter value with an associated PGI field of 193, of the reason code parameter value (PI = 50) for RF SPDU and of the user data parameter value (PI = 46) for MIA SPDU is out of scope of this part of ISO/IEC ISP 11188.

Session version 2 implementations need only support the maximum data lengths specified in the specific upper layer requirements section of the referencing ISP, which may be less than 10240 octets.

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NOTES

1 For session expedited data the limit for user data is 14 octets.

2 This imposes no limitation on the size of the user information parameter of DT, TD and CD SPDUs. Therefore, the user data of P-DATA, P-TYPED-DATA and P-CAPABILITY-DATA is unconstrained in this part of ISO/IEC ISP 11188. A referencing specification may impose limits on the user information parameter.

9.3 Session selector

The absence of the Called or Calling S-Sel parameter of the CN SPDU shall be treated equivalent to a zero length Called or Calling S-Sel parameter value.

The absence of the Responding S-Sel parameter of the AC SPDU indicates that the Responding S-address is equivalent to the Called S-address of the CN SPDU.

The value of the Responding S-Sel parameter may be different from the value of the Called S-Sel parameter.

The absence of the Calling S-Sel parameter of the AC SPDU indicates that its value is assumed to be equivalent to the value of the Calling S-Sel parameter of the CN SPDU.

Tables 3 and 4 summarize the handling of the session selector parameters of the CN and AC SPDUs (see also ITU-T Rec. X.225 | ISO/IEC 8327-1, 8.3.1.14, 8.3.1.15, 8.3.4.16, 8.3.4.17).

NOTE - The encoding of a session selector is restricted to 16 octets as specified in ITU-T Rec. X.225 | ISO/IEC 8327-1, tables 11 and 14.

Table 3 - Called and Responding S-Selectors

		Responding S-Sel of AC SPDU		
		not present	length=0	length>0
Called S-Sel of CN SPDU	not present	note 1	note 1	note 2
	length=0	note 1	note 1	note 2
	length>0	note 3	note 1	note 2

NOTES

1 The resulting value is assumed to be a null value.

2 The resulting value is assumed to be the Responding S-Sel value.

3 The resulting value is assumed to be the Called S-Sel value.

Table 4 - Calling S-Selectors

		Calling S-Sel of AC SPDU		
		not present	length=0	length>0
Calling S-Sel of CN SPDU	not present	note 4	note 4	note 7
	length=0	note 4	note 4	note 7
	length>0	note 5	note 7	note 6

NOTES

4 The Calling S-Sel has a null value.

5 The Calling S-Sel has the value as indicated in the CN SPDU.

6 Valid if and only if both values are identical.

7 These are invalid situations and the implementation receiving the AC SPDU may choose to ignore the parameter or to abort the connection.

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9.4 Invalid session protocol machine intersections

If the conditions described in ITU-T Rec. X.225 | ISO/IEC 8327-1, A.4.1.2 are satisfied, the session protocol machine shall always take the actions described by A.4.1.2.a. This implies that no ER SPDUs will be sent nor S-P-EXCEPTION-REPORT indications generated due to invalid intersections of the session state table resulting from received SPDUs.

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Annex A
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Profile Requirements Lists for ACSE, Presentation and Session

A.1 General

This annex describes the common ACSE, Presentation and Session requirements. The requirements are presented in terms of tables that reference the base standards PICS proformas. The tables are used when writing a PRL of a referencing specification or when completing the PICS proforma of the base standards. The tables specify the values that shall be used for items within identified tables of the PICS proformas. In case of arbitration or dispute, this annex takes precedence over clauses 5 to 9 of this part of ISO/IEC ISP 11188.

A.2 References

In the PICS proforma reference column of A.4 to A.6, and in the lists of conditional expressions underneath the tables, tables within the base standard PICS proformas are referenced. The first letter identifies the specific PICS proforma:

A: ACSE - ISO/IEC 8650-2

P: Presentation - ISO/IEC 8823-2

S: Session - ISO/IEC 8327-2

The characters from the second character to the solidus (/) form a reference to the specific subclause in annex A of that PICS proforma which contains the table in question. The number after the solidus references the row number in the table.

A.3 Classification of requirements

Throughout this annex, to specify the level of support for each feature, the following classification is used.

A.3.1 Status column

The status column reflects the classification to be found in the base standard PICS proforma:

o: optional

c: conditional

o.n: optional with at least one of the marked items being selected

The definitions of conditional items may be found in the respective PICS proformas.

Where the status entry contains two classifications separated by a comma, these reference the sending and receiving capabilities respectively.

A.3.2 Profile column

The profile column reflects the requirement of this part of ISO/IEC ISP 11188. Each entry in this column is chosen from the following list (for definitions see 4.2):

m: mandatory support

C: conditional support

i: out of scope

Where the profile entry contains two classifications separated by a comma, these reference the sending and receiving capabilities respectively.

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A.4 ACSE PRL

	PICS Proforma Reference	Name of item	Normative reference	Status	Profile
1	A.A.7/4	Support operation of Session version 2	9.2.1	o	C11

C11: if A.A.7/1 then m else i

NOTE - The relation between the initiator/responder roles of ACSE, presentation and session is specified in A.5 and A.6.

A.5 Presentation PRL

	PICS Proforma Reference	Name of item	Normative reference	Status	Profile
1	P.A.6.1/1	X.410 (1984)	2.2.2	o.01	C21
2	P.A.6.1/2	Normal	2.2.2	o.01	C22
3	P.A.7.1.1.1/1	Initiator (presentation connection)		o.03	C23
4	P.A.7.1.1.1/2	Responder (presentation connection)		o.03	C24
5	P.A.7.1.1.3/1	Requestor (orderly release)		o.05	C25
6	P.A.7.1.1.3/2	Acceptor (orderly release)		o.05	C26

C21: if A.A.7/2 then m else i
C22: if A.A.7/1 then m else i
C23: if A.A.6.1/1 then m else i
C24: if A.A.6.1/2 then m else i
C25: if A.A.6.2/1 then m else i
C26: if A.A.6.2/2 then m else i

A.6 Session PRL

	PICS Proforma Reference	Name of item	Normative reference	Status	Profile
1	S.A.6.2/2	Reuse of transport connection		o	i
2	S.A.6.2/4	Extended Concatenation (sending)		o	i
3	S.A.6.2/5	Extended Concatenation (receiving)		o	i
4	S.A.7.1.1.1/1	Initiator (session connection)		o.3	C41
5	S.A.7.1.1.1/2	Responder (session connection)		o.3	C42
6	S.A.7.1.1.2/1	Requestor (orderly release)		o.4	C43
7	S.A.7.1.1.2/2	Acceptor (orderly release)		o.4	C44
8	S.A.7.1.1.3/1	Requestor (normal data transfer)		o.5	C45
9	S.A.7.1.1.3/2	Acceptor (normal data transfer)		o.5	C46
10	S.A.7.1.2/2	Overflow Accept (OA)	9.2.2	c5,c6	i,i
11	S.A.7.1.2/3	Connect Data Overflow (CDO)	9.2.2	c6,c5	i,i
12	S.A.7.5.1/1	Requestor (expedited data)		o.6	C47
13	S.A.7.5.1/2	Acceptor (expedited data)		o.6	C48

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14	S.A.7.6.1/1	Requestor (typed data)		o.7	C49
15	S.A.7.6.1/2	Acceptor (typed data)		o.7	C50
16	S.A.7.7.1/1	Requestor (capability data)		o.8	C51
17	S.A.7.7.1/2	Acceptor (capability data)		o.8	C52
18	S.A.7.8.1/1	Requestor (minor synchronize)		o.9	C53
19	S.A.7.8.1/2	Acceptor (minor synchronize)		o.9	C54
20	S.A.7.11.1/1	Requestor (major synchronize)		o.10	C55
21	S.A.7.11.1/2	Acceptor (major synchronize)		o.10	C56
22	S.A.7.14.1.1/1	Requestor (activity start)		o.12	C57
23	S.A.7.14.1.1/2	Acceptor (activity start)		o.12	C58
24	S.A.7.14.1.2/1	Requestor (activity resume)		o.13	C59
25	S.A.7.14.1.2/2	Acceptor (activity resume)		o.13	C60
26	S.A.7.14.1.3/1	Requestor (activity interrupt)		o.14	C61
27	S.A.7.14.1.3/2	Acceptor (activity interrupt)		o.14	C62
28	S.A.7.14.1.4/1	Requestor (activity discard)		o.15	C63
29	S.A.7.14.1.4/2	Acceptor (activity discard)		o.15	C64
30	S.A.7.14.1.5/1	Requestor (activity end)		o.16	C65
31	S.A.7.14.1.5/2	Acceptor (activity end)		o.16	C66
32	S.A.7.14.1.6/1	Requestor (give tokens confirm)		o	C67
33	S.A.7.14.1.6/2	Acceptor (give tokens confirm)		o	C68
34	S.A.8.1.3/4	Data Overflow Item (CN)	9.2.2	c6,c5	i,i

C41: if A.A.6.1/1 then m else i
C42: if A.A.6.1/2 then m else i
C43: if A.A.6.2/1 then m else i
C44: if A.A.6.2/2 then m else i
C45: if P.A.7.1.1.2/1 then m else i
C46: if P.A.7.1.1.2/2 then m else i
C47: if P.A.7.4.4/1 then m else i
C48: if P.A.7.4.4/2 then m else i
C49: if P.A.7.4.5/1 then m else i
C50: if P.A.7.4.5/2 then m else i
C51: if P.A.7.4.6/1 then m else i
C52: if P.A.7.4.6/2 then m else i
C53: if P.A.7.4.7/1 then m else i
C54: if P.A.7.4.7/2 then m else i
C55: if P.A.7.4.10/1 then m else i
C56: if P.A.7.4.10/2 then m else i
C57: if P.A.7.4.13.1/1 then m else i
C58: if P.A.7.4.13.1/2 then m else i
C59: if P.A.7.4.13.2/1 then m else i
C60: if P.A.7.4.13.2/2 then m else i
C61: if P.A.7.4.13.3/1 then m else i
C62: if P.A.7.4.13.3/2 then m else i
C63: if P.A.7.4.13.4/1 then m else i
C64: if P.A.7.4.13.4/2 then m else i
C65: if P.A.7.4.13.5/1 then m else i
C66: if P.A.7.4.13.5/2 then m else i
C67: if P.A.7.4.13.6/1 then m else i
C68: if P.A.7.4.13.6/2 then m else i

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Annex B
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Profile ICS Proforma

This annex summarizes value constraints and requirements on the use of parameters in PDUs specified in clauses 7, 8 and 9 of this part of ISO/IEC ISP 11188. It defines Profile ICS Proforma tables which may be used by a referencing specification for inclusion in its own specific ICS proforma in order to state its compliance to this part of ISO/IEC ISP 11188.

B.1 Notation

When filling in the answers to this ICS proforma, the following notation shall be used:

a) For table B.2, the value or value range corresponding to the question

b) For table B.3, Y for support of the requirements on the use of the parameter in PDUs
N for non-support of the requirements on the use of the parameter in PDUs

B.2 Requirements on values of parameters in PDUs

	Description	Normative Reference	Value/Range
1	Range of presentation context identifier values	7.1	
2	Maximum number of octets for presentation selector	7.2.1	
3	Maximum value of an ASN.1 tag	8.1.1	
4	Maximum supported value of ASN.1 length field	8.1.2	
5	Maximum range of INTEGER type values (sender)	8.1.3	
6	Maximum range of INTEGER type values (receiver)	8.1.3	

B.3 Requirements on the use of parameters in PDUs

	Description	Normative Reference	Support
1	Presentation selector	7.2.2	
2	Transfer syntax name in PDV list	7.3	
3	User data parameter in CPR PPDU	7.4	
4	Presentation context definition result list	7.5	
5	Default context name parameter in CP PPDU	7.6	
6	Presentation context identifier list in RS PPDU	7.8	
7	Presentation data values	7.10	
8	External data type	8.1.5	
9	Constructed encoding	8.1.6	
10	Session selector	9.3	

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Annex C
(informative)

Recommended practices

The agreements in this annex are not required for implementations conformant to this part of ISO/ IEC ISP 11188.

C.1 Use of Session Reflect Parameter Values parameter

It is recommended that the optional Reflect Parameter Values parameter in the AB SPDU be encoded to represent the session connection's state, the incoming event, and the first invalid SPDU field at exactly the moment a protocol error was detected.

The first octet in this parameter encodes the session state as a number relative to 0 as detailed in table C.1. The second octet encodes the incoming event as a number relative to 0 as detailed in table C.2. The third octet contains the SI, PGI, or PI code of any SI field, PGI unit, or PI unit in error. The remaining six octets of the Reflect Parameter Values parameter are not defined by this annex.

Table C.1 - First Octet of Reflect Parameter Values parameter

State	Number	Description
1	0	Idle, no transport connection
1B	1	Wait for T-CONNECT confirm
1C	2	Idle, transport connected
2A	3	Wait for the ACCEPT SPDU
3	4	Wait for the DISCONNECT SPDU
8	5	Wait for the S-CONNECT response
9	6	Wait tor the S-RELEASE response
16	7	Wait tor the T-DISCONNECT indication
713	8	Data transfer state
1A	9	Wait for the ABORT ACCEPT SPDU
4A	10	Wait for the MAJOR SYNC ACK SPDU or PREPARE SPDU
4B	11	Wait for the ACTIVITY END ACK SPDU or PREPARE SPDU
5A	12	Wait for the RESYNCHRONIZE ACK SPDU or PREPARE SPDU
5B	13	Wait for the ACTIVITY INTERRUPT SPDU or PREPARE SPDU
5C	14	Wait for the ACTIVITY DISCARD ACK SPDU or PREPARE SPDU
6	15	Wait for the RESYNCHRONIZE SPDU or PREPARE SPDU
10A	16	Wait for the S-SYNC-MAJOR response
10B	17	Wait for the S-ACTIVITY-END response
11A	18	Wait for the S-RESYNCHRONIZE response
11B	19	Wait for the S-ACTIVITY-INTERRUPT response
11C	20	Wait for the S-ACTIVITY-DISCARD response
15A	21	After PREPARE, wait for the MAJOR SYNC ACK SPDU or the ACTIVITY END ACK
15B	22	After PREPARE, wait for the RESYNCHRONIZE SPDU or the ACTIVITY DISCARD SPDU
15C	23	After PREPARE, wait for the RESYNCHRONIZE ACK SPDU or the ACTIVITY INTERRUPT ACK SPDU or the ACTIVITY DISCARD ACK SPDU
18	24	Wait for GIVE TOKENS ACK SPDU
19	25	Wait for a recovery request or SPDU
20	26	Wait for a recovery SPDU or request
21	27	Wait for the CAPABILITY DATA ACK SPDU
22	28	Wait for the S-CAPABILITY-DATA response
1D	29	Wait for the CONNECT DATA OVERFLOW SPDU
2B	30	Wait for the OVERFLOW ACCEPT SPDU
15D	31	After PREPARE, wait for the ABORT SPDU

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Table C.2 - Second Octet of Reflect Parameter Values parameter

Event	Number	Description
SCONreq	0	S-CONNECT request
SCONrsp+	1	S-CONNECT accept response
SCONrsp-	2	S-CONNECT reject response
SDTreq	3	S-DATA request
SRELreq	4	S-RELEASE request
SRELrsp+	5	S-RELEASE accept response
SUABreq	6	S-U-ABORT request
TCONcnf	7	T-CONNECT confirmation
TCONind	8	T-CONNECT indication
TDISind	9	T-DISCONNECT indication
TIM	10	Time out
AA	11	ABORT ACCEPT SPDU
AB-nr	12	ABORT - no reuse SPDU
AC	13	ACCEPT SPDU
CN	14	CONNECT SPDU
DN	15	DISCONNECT SPDU
DT	16	DATA TRANSFER SPDU
FN-nr	17	FINISH - no reuse SPDU
RF-nr	18	REFUSE - no reuse SPDU
SACTDreq	19	S-ACTIVITY-DISCARD request
SACTDrsp	20	S-ACTIVITY-DISCARD response
SACTEreq	21	S-ACTIVITY-END request
SACTErsp	22	S-ACTIVITY-END response
SACTIreq	23	S-ACTIVITY-INTERRUPT request
SACTIrsp	24	S-ACTIVITY-INTERRUPT response
SACTRreq	25	S-ACTIVITY-RESUME request
SACTSreq	26	S-ACTIVITY-START request
SCDreq	27	S-CAPABILITY-DATA request
SCDrsp	28	S-CAPABILITY-DATA response
SCGreq	29	S-CONTROL-GIVE request
SEXreq	30	S-EXPEDITED-DATA request
SGTreq	31	S-TOKEN-GIVE request
SPTreq	32	S-TOKEN-PLEASE request
SRELrsp-	33	S-RELEASE response reject
SRSYNreq(a)	34	S-RESYNCHRONIZE request abandon
SRSYNreq(r)	35	S-RESYNCHRONIZE request restart
SRSYNreq(s)	36	S-RESYNCHRONIZE request set
SRSYNrsp	37	S-RESYNCHRONIZE response
SSYNMreq	38	S-SYNC-MAJOR request
SSYNMrsp	39	S-SYNC-MAJOR response
SSYNmreq	40	S-SYNC-MINOR request
SSYNmrsp	41	S-SYNC-MINOR response
STDreq	42	S-TYPED-DATA request
SUERreq	43	S-U-EXEPTION-REPORT request
AB-r	44	ABORT - reuse SPDU
AD	45	ACTIVITY DISCARD SPDU
ADA	46	ACTIVITY DISCARD ACK SPDU
AE	47	ACTIVITY END SPDU
AEA	48	ACTIVITY END ACK SPDU
AI	49	ACTIVITY INTERRUPT SPDU
AIA	50	ACTIVITY INTERRUPT ACK SPDU
AR	51	ACTIVITY RESUME SPDU
AS	52	ACTIVITY START SPDU
CD	53	CAPABILITY DATA SPDU
CDA	54	CAPABI LITY DATA AC K SPDU
ED	55	EXCEPTION DATA SPDU
ER	56	EXCEPTION REPORT SPDU

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Table C.2 (concluded) - Second Octet of Reflect Parameter Values parameter

Event	Number	Description
EX	57	EXPEDITED DATA SPDU
FN-r	58	FINISH - reuse SPDU
GT	59	GIVE TOKENS SPDU
GTA	60	GIVE TOKENS ACK SPDU
GTC	61	GIVE TOKENS CONFIRM SPDU
MAA	62	MAJOR SYNC ACK SPDU
MAP	63	MAJOR SYNC POINT SPDU
MIA	64	MINOR SYNC ACK SPDU
MIP	65	MINOR SYNC POINT SPDU
NF	66	NOT FINISHED SPDU
PR-MAA	67	PREPARE (MAJOR SYNC ACK) SPDU
PR-RA	68	PREPARE (RESYNCHRONIZE ACK) SPDU
PR-RS	69	PREPARE (RESYNCHRONIZE) SPDU
PT	70	PLEASE TOKENS SPDU with Token item parameter
RA	71	RESYNCHRONIZE ACK SPDU
RF-r	72	REFUSE - reuse SPDU
RS-a	73	RESYNCHRONIZE - abandon SPDU
RS-r	74	RESYNCHRONIZE - restart SPDU
RS-s	75	RESYNCHRONIZE - set SPDU
TD	76	TYPED DATA SPDU
CDO	77	CONNECT DATA OVERFLOW SPDU

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