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Part 3: Minimal OSI upper layer facilities

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Contents

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Foreword.....	iv
Introduction.....	v
1 Scope.....	1
1.1 General	1
1.2 Position within the taxonomy	2
2 Compliance and conformance.....	2
2.1 Profile or specification of a basic communications application	2
2.2 OSI upper layer stack implementation	3
2.3 Facilities, roles and options	3
2.4 Relationship to base standards	3
2.4.1 ACSE	3
2.4.2 Presentation Layer.....	4
2.4.3 Session Layer.....	4
2.5 Transport-provider	4
3 Normative references	4
3.1 Identical Recommendations International Standards	4
3.2 Paired Recommendations International Standards equivalent in technical content	5
3.3 Additional references	5
4 Definitions.....	6
4.1 Reference model definitions	6
4.1.1 Basic Reference Model definitions.....	6
4.1.2 Naming and addressing definitions.....	6
4.2 Service conventions definitions	6
4.3 Presentation definitions	7
4.4 Session definitions	7
4.5 Application Layer Structure definitions	7
4.6 ACSE service definitions	7
4.7 Taxonomy of profile definitions	7
4.8 Definitions of this Profile	8
5 Abbreviations.....	9
6 Conventions.....	9
6.1 Support notation	9
6.2 Definitions of variables	12
7 Model.....	12
7.1 Common elements	13
7.2 Standalone applications	14
7.3 Platform-based applications	14
7.3.1 Migrant applications.....	14

7.3.2 Kernel application.....15

Annexes

A	mOSI requirements for ACSE facilities.....	16
B	mOSI requirements for Presentation Layer facilities.....	22
C	mOSI requirements for Session Layer facilities.....	29
D	Profile requirements list proforma	38
E	Implementation conformance statement proforma.....	43
F	Minimal OSI object identifiers.....	46
G	Minimal OSI concepts.....	48
H	Implementation considerations.....	52
I	Bibliography.....	54

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 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/ISP 11188 was prepared with the collaboration of

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

Annexes A , B, C , D, E and F form an integral part of this part of ISO/IEC ISP 11188. Annexes G, H and I are informative.

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.

A profile (e.g. an ISO/IEC ISP) or the specification of a basic communications application may reference this Profile. In addition, a referencing ISP may specify further requirements on the protocols, provided it does not contradict this ISP. A specification of an implementation may also reference 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 a profile of the minimal OSI facilities supporting basic connection-oriented communications applications. These facilities are comprised of a subset of the facilities defined by the ACSE, presentation, and session service definitions.

**Information technology – International Standardized Profile –
Common upper layer requirements –
Part 3: Minimal OSI upper layers facilities**

1 Scope

This part of ISO/IEC ISP 11188¹ introduces the concept of the minimal set of OSI upper layer facilities² for basic communications applications. A **basic communications application** simply requires the ability to open and close communications with a peer and to send and receive messages with the peer. It is expected that a large portion of potential OSI applications will be basic communications applications.

1.1 General

This Profile specifies the minimal set of upper layer facilities required for the support of basic communications applications. The minimal OSI facilities are referred to as **mOSI**.

This Profile defines the mOSI facilities in terms of identified features of the upper layer PICS proformas – the ACSE (ISO/IEC 8650-2), the Presentation Layer (ISO/IEC 8823-2), and the Session Layer (ISO/IEC 8327-2). The identified features of these PICS proformas are specified in annexes A, B, and C, respectively.

This Profile complies with the requirements stated in ISO/IEC ISP 11188-1, Basic connection-oriented requirements.

This Profile may be referenced by two classes of entities: upper layer *users* and upper layer *providers*.

- mOSI *users* represent basic communications applications. mOSI users may be profiles (such as A-profiles defined in ISO/IEC TR 10000-2) or specifications of basic communications applications that are not represented by a formal profile. An API specification is a special case of the latter.
- mOSI *providers* represent implementations of the upper layer facilities that provide (at a minimum) the facilities defined in this Profile.

A profile or the specification of a basic communications application (a mOSI user) may claim compliance³ to this Profile. It may do so if the OSI upper layer facilities that it requires can be expressed by those facilities of this Profile. Subclause 2.1 summarizes the

1 In the remainder of this document, the term "Profile" (with a capital "P") is used to denote this "part of ISO/IEC ISP 11188."

2 The upper layer facilities considered in this Profile are ACSE, Presentation, and Session.

requirements for making such a statement. Annex D provides a proforma for a profile requirements list for a compliant application.

An implementation of the OSI upper layers (a mOSI provider) may claim *conformance*¹ to this Profile. It may do so if the OSI upper layer facilities that it provides include those facilities expressed in this Profile. That is, an implementation may contain more upper layer facilities than those required to be conformant to this Profile. However, they must contain at least those of this Profile. Subclause 2.2 summarizes the requirements for making a conformance statement. Annex E provides a means for identifying the features needed for conformance to this Profile.

Annex F assigns object identifier values for specific generic definitions of application context, abstract syntax, and transfer syntax.

1.2 Position within the taxonomy

This Profile does not specify a full A-profile, and therefore is not included in the taxonomy of ISO/IEC TR 10000-2.

2 Compliance and conformance

2.1 Profile or specification of a basic communications application

A referencing specification, i.e. an application profile (e.g. an ISO/IEC ISP) or the specification of a basic communications application, may reference this Profile to identify its upper layer requirements and may claim compliance to this Profile.

To be compliant, a referencing specification

- a) requires that all of this Profile's mandatory ("m") features are also mandatory for the referencing specification²;
- b) requires that all of this Profile's out of scope ("i") features are also out of scope for the referencing specification³;
- c) requires that all of this Profile's optional ("o") features are kept as optional, or are re-defined as mandatory or out of scope; and
- d) complies with the requirements of ISO/IEC ISP 11188-1 and does not conflict with the requirements of this Profile.

NOTE – It is recommended that a referencing specification use the tables in annex D to specify its profile requirements list.

There are two ways in which a referencing specification may be compliant with this Profile:

- a) The application profile or specification may repeat all of the specifications contained in this Profile. To claim compliance to this

³ **Compliance** deals with one *specification* referencing another specification; **conformance** deals with a *physical implementation* that references another specification.

¹ Ibid.

²the interpretation of the requirements specification by an implementation of such a referencing specification is given in table 1, column 3.

³Ibid.

Profile, a referencing specification shall assure that its specification of the ACSE, presentation, and session features does not violate those in this Profile.

- b) The profile or specification may claim compliance by reference to this Profile instead of repeating the provisions of this Profile.

2.2 OSI upper layer stack implementation

The implementation of an OSI upper layer stack may reference this Profile to claim that it supports some or all of the features specified in this Profile. The implementation may in fact support additional upper layer facilities—without violating any of the facilities of this Profile.

An implementation may claim conformance to this Profile if it

- a) supports all of this Profile's mandatory ("m") features;
- b) follows the guidelines for support of this Profile's out of scope ("i") features outlined in table 1;
- c) follows the guidelines for support of this Profile's optional ("o") features outlined in table 1; and
- d) conforms to the requirements of ISO/IEC ISP 11188-1.

NOTE – It is recommended that a referencing implementation use the tables in annex E to specify its profile implementation conformance statement.

2.3 Facilities, roles and options

This Profile defines **mOSI compliance and conformance** in terms of facilities, roles and options. This Profile has three facilities:

- a) association establishment;
- b) user data transfer; and
- c) association release.

Association establishment includes two optional features:

- a) authentication; and
- b) application context negotiation.

Each facility has roles (Initiator/Responder and Requestor/Acceptor). Within this Profile, each role (or an optional feature) is referenced by a variable (see 6.1). For example, the variable name used to describe the capability to establish an association is *establishment-initiator*.

The referencing specification assigns each variable one of the following values:

- mandatory ("m")
- optional ("o")
- out of scope ("i")

The meanings of these values are defined in table 1.

mOSI compliance and conformance can be determined by specifying values ("m", "o", or "i") for all of these variables.

2.4 Relationship to base standards

2.4.1 ACSE

This Profile specifies the Kernel functional unit. Optionally, the Profile also includes the Authentication functional unit and Application Context Name Negotiation functional unit. The Profile allows the roles for association establishment and release identified in ISO/IEC 8650.

The required facilities of ACSE are specified in annex A. A default value for application context name is defined in annex F. The requirements expressed in ISO/IEC ISP 11188-1 also apply to the ACSE aspects of this Profile.

2.4.2 Presentation Layer

This Profile specifies the presentation Kernel functional unit.

The required facilities of presentation are specified in annex B. Default values for user abstract syntax name and user transfer syntax name are defined in annex F. The requirements expressed in ISO/IEC ISP 11188-1 shall also apply to the Presentation Layer aspects of this Profile.

2.4.3 Session Layer

This Profile specifies the session Kernel and Duplex functional units.

The required facilities of session are specified in annex C. The requirements expressed in ISO/IEC ISP 11188-1 shall also apply to the Session Layer aspects of this Profile.

2.5 Transport-provider

This Profile does not address the lower four OSI layers (Transport, Network, Link, and Physical Layers). They are outside of the scope of this Profile (see also clause 7).

A transport-provider is needed to support the exchange of ACSE, Presentation, and Session PDUs for a conformant mOSI implementation. To meet this requirement, the transport-provider shall supply services equivalent to those defined in the OSI Transport Layer service definition (ITU-T Rec. X.214 | ISO 8072).

3 Normative references

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

3.1 Identical Recommendations | International Standards

- ITU-T Recommendation X.227 (1994) | ISO/IEC 8650: 1994, *Information technology –Open Systems Interconnection –Protocol specification for the Association Control Service Element.*
- ITU-T Recommendation X.217 (1994) | ISO/IEC 8649: 1993, *Information technology –Open Systems Interconnection –Service definition for the Association Control Service Element.*
- ITU-T Recommendation X.200 (1994) | ISO/IEC 7498-1: 1994, *Information technology –Open Systems Interconnection –Part 1: Basic Reference Model.*
- ITU-T Recommendation X.225 (1994) | ISO/IEC 8327-1:1994, *Information technology –Open Systems Interconnection –Part 1: Connection oriented session protocol specification.*
- ITU-T Recommendation X.215 (1994) | ISO/IEC 8326: 1987, *Information technology –Open Systems Interconnection –Basic connection-oriented session service definition.*
- ITU-T Recommendation X.226 (1994) | ISO/IEC 8823-1:1994, *Information technology –Open Systems Interconnection –Part 1: Connection oriented presentation protocol specification.*
- ITU-T Recommendation X.216 (1994) | ISO/IEC 8822-1:1988, *Information technology –Open Systems Interconnection –Basic connection-oriented presentation service definition.*
- ITU-T Recommendation X.690 (1993) | ISO/IEC 8825-1:1993, *Information technology –ASN.1 encoding rules –Specification of Basic Encoding Rules (BER), Canonical Encoding Rules (CER) and Distinguished Encoding Rules (DER).*

3.2 Paired Recommendations | International Standards equivalent in technical content

- CCITT Recommendation X.210 (1988), *OSI Layer Service Definition Conventions for CCITT applications.*
ISO/TR 8509:1986, OSI Layer Service Definition Conventions.
- CCITT Recommendation X.214 (1988), *Transport service definition for Open Systems Interconnection for CCITT applications.*
ISO 8072:1986, Information technology –Open Systems Interconnection –Transport service definition.

3.3 Additional references

- ISO 7498-3:1988, *Information technology –Open Systems Interconnection –Basic Reference Model –Part 3: Naming and Addressing.*
- CCITT Recommendation X.650 (1992), *Open Systems Interconnection (OSI) –Basic Reference Model for naming and addressing.*
- ISO/IEC 8327-2:1994, *Information technology –Open Systems Interconnection –Connection oriented session protocol specification –Part 2: Protocol Implementation Conformance Statement (PICS) Proforma.*
- ISO/IEC 8650-2: 1994, *Information technology –Open Systems Interconnection –Protocol specification for the Association Control Service*

Element –Part 2: Protocol Implementation Conformance Statement (PICS) Proforma .

- ISO/IEC 8823-2:1994, *Information technology –Open Systems Interconnection –Connection-oriented Presentation Protocol Specification –Part 2: Protocol Implementation Conformance Statement (PICS) Proforma.*
- ISO/IEC 9545:1993, *Information technology –Open Systems Interconnection –Application Layer Structure*
- ISO/IEC 9647-7:1993¹, *Information technology –Open Systems Interconnection –Conformance testing methodology and framework –Part 7: Implementation conformance statements - Requirements and guidance on ICS and ICS Proformas.*
- ISO/IEC TR 10000-1:1992, *Information technology –Framework and taxonomy of International Standardized Profiles –Part 1: Framework.*
- ISO/IEC TR 10000-2:1992, *Information technology –Framework and taxonomy of OSI profiles –Part 2: Taxonomy of Profiles.*
- ISO/IEC ISP 11188-1:1994², *Information technology –International Standardized Profile –Common upper layer requirements –Part 1: Basic connection-oriented requirements.*

¹Currently at level of committee draft

²Currently at level of draft international standardized profile

4 Definitions

This Profile makes use of the following definitions.

4.1 Reference model definitions

4.1.1 Basic Reference Model definitions

This Profile is based on the concepts developed in ITU-T Rec. X.200 | ISO/IEC 7498-1. It makes use of the following terms defined in them:

- a) application-entity;
- b) Application Layer;
- c) application-process;
- d) application-protocol-control-information;
- e) application-protocol-data-unit;
- f) application-service-element;
- g) compliance;
- h) presentation-connection;
- i) Presentation Layer;
- j) presentation-service;
- k) session-connection;
- l) Session Layer;
- m) session-protocol;
- n) session-service;
- o) Transport Layer

4.1.2 Naming and addressing definitions

This Profile makes use of the following terms defined in ISO 7498-3:

- a) application-process title;
- b) application-entity qualifier;
- c) application-entity title;
- d) application-process invocation-identifier;
- e) application-entity invocation-identifier; and
- f) presentation address.

4.2 Service conventions definitions

This Profile makes use of the following terms defined in CCITT Rec. X.210 | ISO/TR 8509:

- a) primitive;
- b) request (primitive);
- c) indication (primitive);
- d) response (primitive); and
- e) confirm (primitive).

4.3 Presentation definitions

This Profile makes use of the following terms defined in ITU-T Rec. X.216 | ISO/IEC 8822 and ITU-T Rec. X.226 | ISO/IEC 8823:

- a) abstract syntax;
- b) abstract syntax name;
- c) default context;
- d) defined context set;
- e) functional unit [presentation];
- f) normal mode [presentation];
- g) presentation context;
- h) presentation data value; and
- i) presentation selector

4.4 Session definitions

This Profile makes use of the following terms defined in ITU-T Rec. X.215 | ISO/IEC 8326 and ITU-T Rec. X.225 | ISO/IEC 8327:

- a) session selector

4.5 Application Layer Structure definitions

This Profile makes use of the following terms defined in ISO/IEC 9545:

- a) application-context;
- b) application-entity invocation;
- c) control function; and
- d) application-service object.

4.6 ACSE service definitions

This Profile makes use of the following terms defined in ISO/IEC 8649:

- a) application-association; association
- b) Association Control Service Element
- c) requestor
- d) acceptor
- e) association-initiator
- f) association-responder

4.7 Taxonomy of profile definitions

This Profile makes use of the following terms defined in ISO/IEC TR 10000-1:

- a) A-Profile
- b) profile requirements list
- c) profile implementation conformance statement
- d) PICS Proforma

4.8 Definitions of this Profile

For the purpose of this Profile, the following definitions apply.

basic communications application: An application program that simply requires the ability to open and close communications with a peer and to send and receive messages with that peer.

conformance: The referencing implementation supports an identified and consistent set of dynamic conformance requirements specified in a set of related OSI protocol, profile, abstract syntax, encoding rule and information object specifications.¹

mOSI specification; mOSI stack specification: This specification that defines the minimal facilities of the Session Layer, Presentation Layer, and ACSE.

mOSI stack: An implementation that supports, at a minimum, the facilities defined in the mOSI stack specification.

mOSI platform specification: The functional specification of a formal programmatic interface and a set of supporting local services for the mOSI stack specification.

mOSI platform: An implementation of the mOSI platform specification.

non-basic communications application: An application program that requires the ability to support functions other than those specified in the definition a basic communications application.

platform: An implementation of an identified platform specification.

platform-based application: An application program that conforms to a platform specification.

pdv-processor: part of an implementation which wraps and unwraps the "pdv envelope" around the syntax sent and received in the identified presentation context.

platform specification: The functional specification of a formal programmatic interface and a set of supporting local services for an identified stack specification.

referencing implementation: A specification of an implementation which references mOSI for defining its upper layer requirements.

referencing specification: A specification of an ISO/IEC ISP or the specification of a basic communications application which references mOSI for defining its upper layer requirements.

specific basic communications application: an application that is not referenced by any ISP.

stack; stack implementation: An implementation of an identified stack specification

stack specification: The functional specification of a set of interrelated standards for the purpose of providing a common service (set of facilities).

standalone application: Any application program which is not a platform-based application.

transport-provider: A provider of those transport services which are defined in ISO 8072.

¹ This definition may be removed at such a time when a definition of conformance is made available in the OSI Reference Model, or some other governing specification.

5 Abbreviations

The following abbreviations are used in this Profile.

<i>ACSE</i>	<i>Association Control Service Element</i>
<i>APDU</i>	<i>application-protocol-data-unit</i>
<i>API</i>	<i>application programmatic interface</i>
<i>ASN.1</i>	<i>Abstract Syntax Notation One</i>
<i>BCA</i>	<i>basic communications application</i>
<i>CCITT</i>	<i>International Telegraph and Telephone Consultative Committee</i>
<i>CULR</i>	<i>Common Upper Layers Requirements</i>
<i>ICS</i>	<i>implementation conformance statement</i>
<i>IEC</i>	<i>International Electrotechnical Commission</i>
<i>ISO</i>	<i>International Organization for Standardization</i>
<i>ISP</i>	<i>International Standardized Profile</i>
<i>ITU-T</i>	<i>International Telegraph and Telephone - Telecommunication Systems and Services</i>
<i>mOSI</i>	<i>minimal OSI upper layer facilities</i>
<i>OSI</i>	<i>Open Systems Interconnection</i>
<i>PDU</i>	<i>protocol-data-unit</i>
<i>PDV</i>	<i>protocol data value</i>
<i>PICS</i>	<i>protocol implementation conformance statement</i>
<i>PPDU</i>	<i>presentation-protocol-data-unit</i>
<i>PRL</i>	<i>profile requirements list</i>
<i>SPDU</i>	<i>session-protocol-data-unit</i>
<i>TSDU</i>	<i>transport-service-data-unit</i>

6 Conventions

6.1 Support notation

This Profile states its required minimal functionality by defining

- a) the rules for completing the Profile Requirements List of a compliant referencing specification, and
- b) the rules for completing the PICS Proformas of a conformant implementation.

The requirements for completing the PICS Proformas are contained in annexes A, B, and C. They are specified by a series of tables in these annexes. Each table in an annex refers to one identified table in the respective PICS Proforma. Each row in an annex table refers to a corresponding row in the corresponding PICS Proforma table. Each row specifies how a particular feature shall be supported.

In each table of annexes A, B, and C, the "Profile" column(s) indicates the requirements of this Profile for the support of a given feature:

- column 2 of table 1 defines the use of the requirements classifications of this Profile (see column 1) by a referencing specification;
- column 3 of table 1 defines the use of the requirements classifications of this Profile (see column 1) by a referencing implementation.

Table 1 – Profile compliance/conformance identifiers

Id used by mOSI	Meaning when referenced by a specification	Meaning when referenced by an implementation	
1	m	mandatory – The feature shall be required for support (i.e., it shall be mandatory) in a referencing specification.	mandatory – The implementation shall support the feature, i.e. its syntax and procedures shall be implemented as specified in the base standard or in ISO/IEC ISP 11188-1. However, it is not a requirement that the feature be used in all instances of communication unless mandated by the base standard or stated otherwise in ISO/IEC ISP 11188-1. When completing the associated PICS Proforma table, the answer for the support column shall be "yes", the feature has been implemented.^{1,2}
2	o	optional – The choice of how this feature is supported is left to the implementor, i.e. it shall not be changed by a referencing specification.	optional – The implementation may or may not support the feature. When completing the associated PICS Proforma table, the answer for the support column shall either be: "yes", the feature has been implemented; or "no", the feature has not been implemented. If a parameter is optionally supported for receiving, then the syntax shall be implemented, but it is left to each implementation whether the procedures are implemented or not. If a PDU is not supported, then a receiving implementation may abort the association. The feature shall be the subject of an ISP conformance test.
3	*	open – The choice of whether this feature is required for support or not is left to the referencing specification, i.e. the referencing specification shall indicate that the feature is mandatory, optional, or out of scope.	open – same as optional
4	x	excluded – The feature shall never be used, i.e. it shall be	excluded – The implementation shall not support the feature. When completing the associated PICS

1 For features which are optional in the base standard, conformant implementations shall be able to interwork with other implementations not supporting this feature.

2 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, or a PDU in a functional unit.

	excluded in a referencing specification.	proforma table, the answer for the support column shall be "no", the feature has not been implemented. The implementation shall abort if the value of the feature is received.
5	i	out of scope – The requirement for the support of this feature is not covered by this Profile, i.e., it shall also be out of scope in a referencing specification.
6	-	not applicable – The feature is not defined by the base standard in the context where it is mentioned in a table. Support for the feature is either meaningless, logically impossible, or physically impossible, after some conditions are evaluated.
7	c[n]	conditionally supported – Support for the feature is further defined by a condition ("n") which is annexed to the table. The value of the condition takes on one of the following values as defined in this table: "m"; "o"; or "i".
		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: "yes", the feature has been implemented; "no", the feature has not been implemented; or "-" – not applicable.

6.2 Definitions of variables

Variables are used in annexes A, B, C, and D as a method of specifying values for the "Profile" or "Compliant-choice" column(s) of these tables. The variables used are

Establishment-initiator – capability to establish an association or connection

Establishment-responder – capability to respond to an establishment initiation

Establishment-responder-reject – capability to reject an establishment initiation

Release-requestor – capability to release an association or connection

Release-acceptor – capability to accept a release request

Normal-data-requestor – capability to request normal data transfer

Normal-data-acceptor – capability to accept normal data transfer
Authentication – capability to perform authentication
Application-context-negotiation – capability to perform application context negotiation

These variables reflect the roles and options identified in 2.3. The values these variables may take are "m", "o", and "i" as defined in table 1.

7 Model

This clause presents the mOSI model and defines many of the terms used in this Profile. The mOSI model, as shown in figure 1, illustrates the mOSI stack in three different environments which are detailed in 7.2 and 7.3. It can be viewed in two contexts: it can be viewed abstractly – where the various elements represent abstract "specifications;" or it can be viewed concretely – where the elements represent those of an implementation.

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7.1 Common elements

There are common elements in all three environments shown in figure 1. They are:

- basic communications application
- pdv-processor
- mOSI stack;
- transport services and
- transport provider

A **basic communications application (BCA)** simply requires the ability to open and close communications with a peer and to send and receive messages with the peer. This Profile addresses the requirements of basic communications applications.

A stack represents a set of layered, interdependent communication standards (in the abstract sense) and their implementation (in the concrete sense). The **mOSI stack** represents the ACSE, presentation, and session standards (protocol specifications) or their implementation with the features specified in this Profile.

NOTE – A stack does not necessarily represent a layered implementation of the layered standards. On the contrary, it is recommended in annex H that the implementation of a mOSI stack is one protocol engine, not three.

From the perspective of the presentation protocol (ISO/IEC 8823-1), the syntax (encoded data) sent from one application to its peer is a series of one or more presentation-data-values (pdv). The ISO presentation protocol defines the encoding of the outer envelope of a pdv and the encoding for groups of pdv's (if any). The actual contents of a pdv is a function of the mutually agreed upon abstract and transfer syntax of the pdv – its presentation context. While ASN.1 basic encoding rules can be used for encoding abstract and transfer syntax, it is not the only choice.

The negotiation of the transfer syntax is done by the Presentation Layer. However, the actual encoding/decoding of the transfer syntax sent between connected applications is

outside of the scope of the mOSI stack.¹ The **pdv-processor** represents the wrapping and unwrapping of the "pdv envelope" around the syntax sent or received in the identified presentation context. As shown in figure 1, the pdv-processor can be located at a number of different places within the model. The mOSI model assumes that pdv encoding and decoding is done outside of the mOSI stack.

This Profile does not address the four lower OSI layers (Transport, Network, Link, and Physical Layers). They are considered outside of the scope of this Profile. However, a **transport-provider** is needed to transport the ACSE, presentation, and session PDUs of a mOSI implementation. As such, the transport-provider supplies **transport services** equivalent to those defined in the OSI Transport Layer service definition (ISO 8072).

This specification does not place any requirements on the actual transport provider (layer 4 and below) used as long as services equivalent to the OSI transport services are provided.

7.2 Standalone applications

For the purposes of this Profile, a **standalone application** is one that includes the application pdv-processor and the mOSI stack as a single unit application.² For an implementation, the mOSI stack may be a series of separate modules with its own internal programmatic interface or as a single state machine.

7.3 Platform-based applications

A communications platform allows a division between an application program and its communications provider. A **platform** comprises the communication facilities in one system necessary to support a distributed application. A **platform-based application** represents the communication aspects of a distributed application in one system. An **application programmatic interface (API)** is the formal interface between a communication platform and its user [platform-based] applications. It is formal in the sense that the API is specified so as to allow the use of the platform by different types of applications – most often, in parallel. The **programmatic interface** represents the mapping of the API to the internals of the supporting system.

A **mOSI platform** consists of a mOSI API, a mOSI stack in conjunction with the normal facilities provided by a platform (e.g. POSIX services in the case of a UNIX based platform).

A **mOSI API** represents the interface to the mOSI stack. It provides the minimal features of the OSI upper layers as defined in this Profile.

As discussed in annex G, mOSI identifies two types of basic communications applications: migrant applications and kernel applications. Depending on the type of application, the pdv-processor could either be a part of the platform or a part of each platform-based application.

1 It is also out of the scope of the presentation protocol (ISO/IEC 8823-1).

2 Many ISP are written from the point of view of standalone applications. However, the actual implementation of the ISP could result in a platform-based application.

7.3.1 Migrant applications

OSI (and mOSI) has two required features that are not part of other transport providers:

- a) application context¹; and
- b) presentation context² – abstract syntax name and transfer syntax name pair.

An OSI upper layer stack requires that names be provided for application context, abstract syntax, and transfer syntax. These names may be hidden from the API user by having the programmatic interface provide default values (see annex F).

A migrant application running over a stack (see G.2.3.2) is unaware (or at least, not concerned) with formally identifying application context and the presentation context of the data sent and received. Instead, it allows the programmatic interface to provide default values (see annex F). The encoding and decoding of the pdvs are hidden by placing the pdv-processor within the platform.

7.3.2 Kernel application

A kernel application (see G.2.3.1) is an OSI-based application. It is aware of the mandated application context names and presentation context.

Most likely, (but, not necessarily) the application's own protocol will be specified and encoded using ASN.1. For this reason the pdv-processor is shown in figure 1 within the application itself – rather than as part of the platform. It is not expected that a kernel application will use the default values for abstract syntax and transfer syntax defined in annex F.

1 see ISO/IEC 9545 for details

2 see ISO/IEC 8823-1 for details

Annex A

(normative)

mOSI requirements for ACSE facilities

This annex contains the mOSI specifications for completing the ACSE Profile Requirements List (PRL) for the selected features, roles and options (see 2.3).

This annex uses the tables in the ACSE PICS Proforma (ISO/IEC 8650-2). The clause numbers and tables referenced in this annex are those of the PICS Proforma. If a clause number is not included it is out of scope (i).

The specifications of this annex reference the following variables: *Establishment-initiator*, *Establishment-responder*, *Normal-data-requestor*, *Normal-data-acceptor*, *Release-requestor*, and *Release-acceptor*. The values for these variables may be set by a referencing specification using the proforma provided in table D.1. The values for these variables may be set by a referencing implementation using the proforma provided in table E.1.

This annex contains several "open" (*) parameters whose requirements are specified by the referencing specification or the referencing implementation. The requirements are expressed in terms of "m", "o", or "i" as defined in table 1. The parameters have the identifier of "*" in the tables of this annex. A referencing specification may set these "open" parameters by using the proforma provided in table D.2. A referencing implementation may set the "open" parameters by using the proforma provided in table E.2.

NOTE – PICS Proforma clauses A.1-A.4 are outside of the scope of this Profile.

A.1 Global statement of conformance – [PICS Proforma clause A.5]

	Question	Answer	PICS Proforma reference
1	Are all mandatory features supported?	yes	A.5/1

A.2 Supported roles – [PICS Proforma clause A.6]

A.2.1 Association establishment procedure – [PICS Proforma A.6.1]

	Role	Profile	PICS Proforma reference	Constraint / value
1	Initiator	c[1]	A.6.1/1	
2	Responder	c[2]	A.6.1/2	

[1] The value of *Establishment-initiator*

[2] The value of *Establishment-responder*

A.2.2 Normal release procedure – [PICS Proforma A.6.2]

	Role	Profile	PICS Proforma reference	Constraint / value
1	Initiator	c[1]	A.6.2/1	
2	Responder	c[2]	A.6.2/2	

[1] The value of *Release-requestor*

[2] The value of *Release-acceptor*

A.2.3 Abnormal release procedure – [PICS Proforma A.6.3]

	Role	Profile	PICS Proforma reference	Constraint / value
1	Initiator	m	A.6.3/1	
2	Responder	m	A.6.3/2	

A.3 Protocol mechanisms – [PICS Proforma clause A.7]

	Protocol mechanism	Profile	PICS Proforma reference	Constraint / value
1	Normal mode	m	A.7/1	

2	X.410-1984 mode	i	A.7/2
3	Rules of extensibility	m	A.7/3
4	Support of session version 2	m	A.7/4

Not used by BCA

A.4 Functional units – [PICS Proforma clause A.8]

	ACSE functional unit	Profile	PICS Proforma reference	Constraint / value
1	Kernel	m	A.8/1	
2	Authentication	c[1]	A.8/2	
3	AC Name Negotiation	c[2]	not in yet	

[1] Value of *Authentication*

[2] Value of *Application-context-negotiation*

A.5 Supported APDUs – [PICS Proforma clause A.9]

	APDU	Profile: Sender	Profile: Receiver	PICS Proforma reference	Constraint / value
1	AARQ	c[1]	c[2]	A.9/1	
2	AARE	c[2]	c[1]	A.9/2	
3	RLRQ	c[3]	c[4]	A.9/3	
4	RLRE	c[4]	c[3]	A.9/4	
5	ABRT	m	m	A.9/5	

[1] Value of *Establishment-initiator*

[2] Value of *Establishment-responder*

[3] Value of *Release-requestor*

[4] Value of *Release-acceptor*

A.6 Supporting APDU parameters – [PICS Proforma clause A.10]

A.6.1 A-associate-request (AARQ) – [PICS Proforma A.10.1]

	Parameter	Profile: Sender [a]	Profile: Receiver [b]	PICS Proforma reference	Constraint / value
1	Protocol Version	o	m	A.10.1/ 1	If sent, the value shall be "version 1"; the default value is "version 1"
2	Application Context Name	m	m	A.10.1/ 2	
3	Calling AP Title	*	*	A.10.1/ 3	If either is supported, then
4	Calling AE Qualifier	*	*	A.10.1/ 4	both shall be supported.
5	Calling AP Invocation-identifier	*	*	A.10.1/ 5	If either is supported then,
6	Calling AE Invocation-identifier	*	*	A.10.1/ 6	both shall be supported.
7	Called AP Title	*	*	A.10.1/ 7	If either is supported, then
8	Called AE Qualifier	*	*	A.10.1/ 8	both shall be supported.
9	Called AP Invocation-identifier	*	*	A.10.1/ 9	If either is supported, then
10	Called AE Invocation-identifier	*	*	A.10.1/ 10	both shall be supported.

1 1	ACSE Requirements	c[1]	c[1]	A.10.1/ 11
1 2	Authentication- mechanism Name	c[2]	c[2]	A.10.1/ 12
1 3	Authentication-value	c[2]	c[2]	A.10.1/ 13
1 4	Application Context List	c[3]	c[3]	not in yet
1 5	Implementation Information	o	o	A.10.1/ 14
1 6	User Information	*	*	A.10.1/ 15

- [a] This entire column has the value of "-" if the value of *Establishment-initiator* is "i"; otherwise the values are as marked.
- [b] This entire column has the value of "-" if the value of *Establishment-responder* is "i"; otherwise the values are as marked.
- [1] The value of "m" — if either *Authentication* or *Application-context-negotiation* have the value of "m"; the value of "o" — if either *Authentication* or *Application-context-negotiation* have the value of "o"; otherwise — the value of "-"
- [2] The value of *Authentication*.
- [3] The value of *Application-context-negotiation*.

A.6.2 A-associate-response (AARE) – [PICS Proforma A.10.2]

	Parameter	Profile: Sender [a]	Profile: Receiver [b]	PICS Proforma reference	Constraint / value
1	Protocol Version	o	m	A.10.2/ 1	Value shall be "version 1"; not required to be sent because the default value is "version 1"
2	Application Context Name	m	m	A.10.2/ 2	
3	Responding AP Title	*	*	A.10.2/ 3	If either is supported, then
4	Responding AE Qualifier	*	*	A.10.2/ 4	both shall be supported.
5	Responding AP Invocation-identifier	*	*	A.10.2/ 5	If either is supported, then
6	Responding AE Invocation-identifier	*	*	A.10.2/ 6	both shall be supported.
7	Result	m	m	A.10.2/ 7	
8	Result Source-diagnostic	m	m	A.10.2/ 8	
9	ACSE Requirements	c[1]	c[1]	A.10.2/ 9	
10	Authentication-mechanism Name	c[2]	c[2]	A.10.2/ 10	

1 1	Authentication-value	c[2]	c[2]	A.10.2/ 11
1 2	Application Context List	c[3]	c[3]	
1 2	Implementation Information	o	o	A.10.2/ 12
1 3	User Information	*	*	A.10.2/ 13

[a] This entire column has the value of "-" if the value of *Establishment-responder* is "i"; otherwise the values are as marked.

[b] This entire column has the value "-" if the value of *Establishment-initiator* has the value "i"; otherwise the values are as marked.

[1] The value of "m" — if either *Authentication* or *Application-context-negotiation* have the value of "m"; the value of "o" — if either *Authentication* or *Application-context-negotiation* have the value of "o"; otherwise — the value of "-"

[2] The value of *Authentication*.

[3] The value of *Application-context-negotiation*.

A.6.3 A-release-request (RLRQ) – [PICS Proforma A.10.3]

	Parameter	Profile: Sender [a]	Profile: Receiver [b]	PICS Proforma reference	Constraint / value
1	Reason	*	*	A.10.3/1	
2	User Information	*	*	A.10.3/2	

[a] This entire column has the value of "-" if *Release-requestor* has the value "i"; otherwise the values are as marked.

[b] This entire column has the value of "-" if *Release-acceptor* has the value "i"; otherwise the values are as marked.

A.6.4 A-release-response (RLRE) – [PICS Proforma A.10.4]

	Parameter	Profile: Sender [a]	Profile: Receiver [b]	PICS Proforma reference	Constraint / value
1	Reason	*	*	A.10.4/1	
2	User Information	*	*	A.10.4/2	

[a] This entire column has the value of "-" if *Release-acceptor* has the value "i"; otherwise the values are as marked.

[b] This entire column has the value of "i" if *Release-requestor* has the value "i"; otherwise the values are as marked.

A.6.5 A-abort (ABRT) – [PICS Proforma A.10.5]

	Parameter	Profile: Sender	Profile: Receiver	PICS Proforma reference	Constraint / value
1	Abort Source	m	m	A.10.5/1	
2	Diagnostic	m	m	A.10.5/2	
3	User Information	*	*	A.10.5/3	

A.7 Supported parameter forms – [PICS Proforma clause A.11]

A.7.1 AE Title name form – [PICS Proforma A.11.1]

	Syntax form	Profile: Sender	Profile: Receiver	PICS Proforma reference	Constraint / value
1	Form 1 (Directory name)	*	m	A.11.1/1	
2	Form 2 (Object identifier and integer)	*	m	A.11.1/2	

A.7.2 Authentication value form – [PICS Proforma A.11.2]

	Syntax form	Profile: Sender	Profile: Receiver	PICS Proforma reference	Constraint / value
1	Graphic string	0	0	A.11.1/1	
2	BIT STRING	0	0	A.11.1/2	
3	EXTERNAL	0	0	A.11.1/3	
4	Other	0	0	A.11.1/4	

Annex B

(normative)

mOSI requirements for Presentation Layer facilities

This annex contains the mOSI specifications for completing the Presentation Layer Profile Requirements List (PRL) for the selected features, roles and options (see 2.3).

This annex uses the tables in the Presentation Layer PICS Proforma (ISO/IEC 8823-2). The clause numbers and tables referenced in this annex are those of the PICS Proforma. If a clause number is not included it is out of scope (i).

The specifications of this annex reference the following variables: *Establishment-initiator*, *Establishment-responder*, *Establishment-responder-reject*, *Normal-data-requestor*, *Normal-data-acceptor*, *Release-requestor*, and *Release-acceptor*. The values for these variables may be set by a referencing specification using the proforma provided in table D.1. The values for these variables may be set by a referencing implementation using the proforma provided in table E.1.

This annex contains several "open" (*) parameters whose requirements are specified by the referencing specification or the referencing implementation. The requirements are expressed in terms of "m", "o", or "i" as defined in table 1. The parameters have the identifier of "*" in the tables of this annex. A referencing specification may set these "open" parameters by using the proforma provided in table D.2. A referencing implementation may set the "open" parameters by using the proforma provided in table E.2.

NOTE – PICS Proforma clauses A.1-A.4 are outside of the scope of this Profile.

B.1 Global statement of conformance – [PICS Proforma clause A.5]

	Question	Answer	PICS Proforma reference
1	Are all mandatory features supported?	yes	A.5/1

B.2 Protocol mechanisms and functional units – [PICS Proforma clause A.6]

B.2.1 Protocol mechanisms – [PICS Proforma A.6.1]

	Protocol mechanism	Profile	PICS Proforma reference	Constraint / value
1	X.410 (1984)	i	A.6.1/1	Not used by BCA
2	Normal mode	m	A.6.1/2	

B.2.2 Functional units – [PICS Proforma A.6.2]

	Presentation functional units	Profile	PICS Proforma reference	Constraint / value
1	Kernel	m	A.6.2/1	
2	Presentation Context management	i	A.6.2/2	Not used by BCA
3	Presentation Context Restoration	i	A.6.2/3	Not used by BCA

	Pass-through to Session functional units	Profile	PICS Proforma reference	Constraint / value
4	Negotiated Release	i	A.6.2/4	Not used by BCA
5	Half Duplex	i	A.6.2/5	Not used by BCA
6	Duplex	m	A.6.2/6	

7	Expedited Data	i	A.6.2/7	Not used by BCA
8	Typed Data	i	A.6.2/8	Not used by BCA
9	Capability Data Exchange	i	A.6.2/9	Not used by BCA
1 0	Minor Synchronize	i	A.6.2/10	Not used by BCA
1 1	Symmetric Synchronize	i	A.6.2/11	Not used by BCA
1 2	Major Synchronize	i	A.6.2/12	Not used by BCA
1 3	Resynchronize	i	A.6.2/13	Not used by BCA
1 4	Exceptions	i	A.6.2/14	Not used by BCA
1 5	Activity Management	i	A.6.2/15	Not used by BCA

B.3 Elements of procedure related to the PICS Proforma – [PICS Proforma clause A.7]

B.3.1 Kernel functional unit – [PICS Proforma A.7.1]

B.3.1.1 Supported roles – [PICS Proforma A.7.1.1]

B.3.1.1.1 Presentation-connection – [PICS Proforma A.7.1.1.1]

	Role	Profile	PICS Proforma reference	Constraint / value
1	Initiator	c[1]	A.7.1.1.1/1	
2	Responder	c[2]	A.7.1.1.1/2	

[1] The value of *Establishment-initiator*.

[2] The value of *Establishment-responder*.

B.3.1.1.2 Normal data – [PICS Proforma A.7.1.1.2]

	Role	Profile	PICS Proforma reference	Constraint / value
1	Requestor	c[1]	A.7.1.1.2/1	
2	Acceptor	c[2]	A.7.1.1.2/2	

[1] The value of *Normal-data-requestor*.

[2] The value of *Normal-data-acceptor*.

B.3.1.1.3 Orderly release – [PICS Proforma A.7.1.1.3]

	Role	Profile	PICS Proforma reference	Constraint / value
1	Requestor	c[1]	A.7.1.1.3/1	
2	Acceptor	c[2]	A.7.1.1.3/2	

[1] The value of *Release-requestor*.

[2] The value of *Release-acceptor*.

B.3.1.2 Supported PPDU associated with the kernel service – [PICS Proforma A.7.1.2]

	PPDU	Profile: sender	Profile: receiver	PICS Proforma reference	Constraint / value
1	CP	c[1]	c[2]	A.7.1.2/1	
2	CPA	c[2]	c[1]	A.7.1.2/2	
3	CPR	c[3]	c[1]	A.7.1.2/3	
4	ARP	m	m	A.7.1.2/4	
5	ARU	m	m	A.7.1.2/5	
6	TD	c[4]	c[5]	A.7.1.2/6	

- [1] The value of *Establishment-initiator*.
- [2] The value of *Establishment-responder*.
- [3] The value of *Establishment-responder-reject*.
- [4] The value of *Normal-data-requestor*.
- [5] The value of *Normal-data-acceptor*.

NOTE – The remainder of the subclauses in A.7 are out of the scope (i) of this Profile.

B.4 Supported PPDU parameters – [PICS Proforma clause A.8]

B.4.1 Connect presentation (CP) parameters – [PICS Proforma A.8.1]

	Parameter	Profile: Sender [a]	Profile: Receiver [b]	PICS Proforma reference	Constraint / value
1	Calling presentation selector	*	*	A.8.1/1	

2	Called presentation selector	o	o	A.8.1/2	
3	Mode selector	m	m	A.8.1/3	Value shall be "Normal mode"
4	Presentation context definition list	m	m	A.8.1/4	
5	Default context name	*	*	A.8.1/5	May be used for simple encoding
6	Protocol version	o	m	A.8.1/5	If sent, the value shall be "version 1"; the default value is "version 1"
7	Presentation requirements	i	m	A.8.1/7	Not used by BCA
8	User session requirements	m	m	A.8.1/8	Value shall be "Duplex" functional unit
9	User data	m	m	A.8.1/9	Contains an AARQ APDU

[a] This entire column has the value of "-" if the value of *Establishment-responder* is "i"; otherwise the value is as marked.

[b] This entire column has the value of "-" if the value of *Establishment-initiator* is "i"; otherwise the value is as marked.

NOTE – The X.410 (1984) parameters are out of the scope (i) of this Profile.

B.4.2 Connect presentation accept (CPA) PPDU – [PICS Proforma A.8.2]

	Parameter	Profile: Sender [a]	Profile: Receiver [b]	PICS Proforma reference	Constraint / value
1	Responding presentation selector	*	*	A.8.2/1	

2	Mode selector	m	m	A.8.2/2	Value shall be "Normal"
3	Presentation context definition result list	m	m	A.8.2/3	
4	Protocol version	o	m	A.8.2/4	Value shall be "version 1"; not required to be sent because the default value is "version 1"
5	Presentation requirements	i	m	A.8.2/5	Not used by BCA
6	User session requirements	m	m	A.8.2/6	Value shall be "Duplex" functional unit
7	User data	m	m	A.8.2/7	Contains an AARE+ APDU

[a] This entire column has the value of "-" if *Establishment-initiator* is "i"; otherwise the value is as marked.

[b] This entire column has the value of "-" if *Establishment-responder* is "i"; otherwise the value is as marked.

NOTE – The X.410 (1984) parameters are out of the scope (i) of this Profile.

B.4.3 Connect presentation reject (CPR) PPDU – [PICS Proforma A.8.3]

	Parameter	Profile: Sender [a]	Profile: Receiver [b]	PICS Proforma reference	Constraint / value
1	Responding presentation selector	*	*	A.8.3/1	
2	Presentation context definition result list	m	m	A.8.3/2	

3	Protocol version	o	m	A.8.3/3
4	Default context result	*	*	A.8.3/4
5	Provider reason	o	m	A.8.3/5
6	User data	m	m	A.8.3/6

Contains an AARE-APDU

[a] This entire column has the value of "-" if the value of *Establishment-initiator* role is "i"; otherwise the value is as marked.

[b] This entire column has the value of "-" if the value of *Establishment-responder* is "i"; otherwise the value is as marked.

NOTE—The X.410 (1984) parameter is out of the scope (i) of this Profile.

B.4.4 Abnormal release user (ARU) PPDU – [PICS Proforma A.8.4]

	Parameter	Profile: Sender	Profile: Receiver	PICS Proforma reference	Constraint / value
1	Presentation context identifier list	m	m	A.8.4/1	
2	User data	m	m	A.8.4/2	Contains an ABRT APDU

NOTE—The X.410 (1984) parameters are out of the scope (i) of this Profile.

B.4.5 Abnormal release provider (ARP) PPDU – [PICS Proforma A.8.5]

	Parameter	Profile: Sender	Profile: Receiver	PICS Proforma reference	Constraint / value
1	Provider reason	o	m	A.8.5/1	
2	Event identifier	o	m	A.8.5/2	

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NOTE – PICS Proforma subclauses A.8.6 through A.8.15 are out of the scope (i) of this Profile.

B.5 Support of syntaxes – [PICS Proforma clause A.9]

B.5.1 Transfer syntaxes supported – [PICS Proforma A.9.1]

	Type	Detail	Profile	Reference to definition	Reference to restriction
1	Object identifier	{joint-iso-ccitt asn1(1) basic-encoding(1)}	m	ISO/IEC 8825	ISO/IEC ISP 11188-1, clause 8
2	Object identifier	{iso(1) standard(0) culr(11188) mosi(3) default-transfer-syntax(2) version(1)}	*	ISO/IEC ISP 11188-3, clause F.2	none

NOTE – Other transfer syntaxes may be added to the above table based on the application(s) supported.

B.5.2 Abstract syntaxes supported – [PICS Proforma A.9.2]

	Type	Detail	Profile
1	Object identifier	{joint-iso-ccitt association-control(2) abstract-syntax(1) apdus(0) version1(1)}	m
2	Object identifier	{iso(1) standard(0) culr(11188) mosi(3) default-abstract-syntax(1) version(1)} (see annex F)	*

NOTE – Other abstract syntaxes may be added to the above table based on the application(s) supported.

B.5.3 Use of ASN.1 encoding – [PICS Proforma A.9.3]

The following table is used to indicate any coding restrictions for sending **all** ACSE APDUs, PPDUs and User Information on ACSE APDUs (see PICS Proforma A.9.3).

	Restriction	Profile	Constraint / value
1	Only definite form of length encoding used	*	See ISO/IEC 11188-1, 8.1.2
2	Indefinite form of length encoding used for all constructed types	*	
3	Only minimal number of octets used for definite form of length encoding	*	
4	Only primitive encoding used for OCTET STRING	*	
5	Only primitive encoding used for BITSTRING	*	

NOTE – PICS Proforma subclause A.9.4 is out of the scope (i) of this Profile.

Annex C

(normative)

mOSI requirements for Session Layer facilities

This annex contains the mOSI specifications for completing the Session Layer Profile Requirements List (PRL) for the selected features, roles and options (see 2.3).

This annex uses the tables in the Session Layer PICS Proforma (ISO/IEC 8327-2). The clause numbers and tables referenced in this annex are those of the PICS Proforma. If a clause number is not included it is out of scope (i).

The specifications of this annex reference the following variables: *Establishment-initiator*, *Establishment-responder*, *Establishment-responder-reject*, *Normal-data-requestor*, *Normal-data-acceptor*, *Release-requestor*, and *Release-acceptor*. The values for these variables may be set by a referencing specification using the proforma provided in table D.1. The values for these variables may be set by a referencing implementation using the proforma provided in table E.1.

This annex contains several "open" (*) parameters whose requirements are specified by the referencing specification or the referencing implementation. The requirements are expressed in terms of "m", "o", or "i" as defined in table 1. The parameters have the identifier of "*" in the tables of this annex. A referencing specification may set these "open" parameters by using the proforma provided in table D.2. A referencing implementation may set the "open" parameters by using the proforma provided in table E.2.

NOTE – PICS Proforma clauses A.1-A.4 are outside of the scope of this Profile.

C.1 Global statement of conformance – [PICS Proforma clause A.5]

	Question	Answer	PICS Proforma reference
1	Are all mandatory features supported?	yes	A.5/1

C.2 Supported functional units and protocol mechanisms – [PICS Proforma clause A.6]

C.2.1 Functional units – [PICS Proforma A.6.1]

	Functional unit	Profile	PICS Proforma reference	Constraint / value
1	Kernel	m	A.6.1/1	
2	Negotiated Release	i	A.6.1/2	Not used by BCA
3	Half Duplex	i	A.6.1/3	Not used by BCA
4	Duplex	m	A.6.1/4	
5	Expedited Data	i	A.6.1/5	Not used by BCA
6	Typed Data	i	A.6.1/6	Not used by BCA
7	Capability Data	i	A.6.1/7	Not used by BCA
8	Minor Synchronize	i	A.6.1/8	Not used by BCA
9	Symmetric Synchronize	i	A.6.1/9	Not used by BCA
10	Major Synchronize	i	A.6.1/10	Not used by BCA

1 1	Resynchronize	i	A.6.1/11
1 2	Exceptions	i	A.6.1/12
1 3	Activity Management	i	A.6.1/13

Not used by BCA

Not used by BCA

Not used by BCA

C.2.2 Protocol mechanism – [PICS Proforma A.6.2]

	Mechanism	Profile	PICS Proforma reference	Constraint / value
1	Use of transport expedited data (Extended control Quality Of Service)	o	A.6.2/1	
2	Reuse of transport-connection	i	A.6.2/2	
3	Basic concatenation	m	A.6.2/3	
4	Extended concatenation (sending)	i	A.6.2/4	
5	Extended concatenation (receiving)	i	A.6.2/5	Not used by BCA
6	Segmenting (sending)	i	A.6.2/6	Not used by BCA

7	Segmenting (receiving)	i	A.6.2/7	Not used by BCA	
8	Max size of SS-user data ≤ 512	i	A.6.2/8		
9	Max size of SS-user data ≤ 10240	m	A.6.2/9		Allows approximately 10K of user information in the AARQ and AARE APDUs
10	Max size of SS-user data ≤ 9	i	A.6.2/10		

C.3 Elements of procedures related to the PICS Proforma – [PICS Proforma clause A.7]

C.3.1 Kernel functional unit – [PICS Proforma A.7.1]

C.3.1.1 Supported roles for the Kernel functional unit services – [PICS Proforma A.7.1.1]

C.3.1.1.1 Session-connection – [PICS Proforma A.7.1.1.1]

	Role	Profile	PICS Proforma reference	Constraint / value
1	Initiator	c[1]	A.7.1.1.1/1	
2	Responder	c[2]	A.7.1.1.1/2	

[1] The value of *Establishment-initiator*.

[2] The value of *Establishment-responder*.

C.3.1.1.2 Orderly release – [PICS Proforma A.7.1.1.2]

	Role	Profile	PICS Proforma reference	Constraint / value
1	Requestor	c[1]	A.7.1.1.2/1	
2	Acceptor	c[2]	A.7.1.1.2/2	

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[1] The value of *Release-requestor*.

[2] The value of *Release-acceptor*.

C.3.1.1.3 Normal data transfer – [PICS Proforma A.7.1.1.3]

	Role	Profile	PICS Proforma reference	Constraint / value
1	Requestor	c[1]	A.7.1.1.3/1	
2	Acceptor	c[2]	A.7.1.1.3/2	

[1] The value of *Normal-data-requestor*.

[2] The value of *Normal-data-acceptor*.

C.3.1.2 Support for the SPDUs associated with the Kernel services – [PICS Proforma A.7.1.2]

	SPDU	Profile: Sender	Profile: Receiver	PICS Proforma reference	Constraint / value
1	Connect (CN)	c[1]	c[2]	A.7.1.2/1	
2	Overflow accept (OA)	i	i	A.7.1.2/2	Not used by BCA
3	Connect Data Overflow (CDO)	i	i	A.7.1.2/3	Not used by BCA. This provides a maximum of 10K of session user data.
4	Accept (AC)	c[2]	c[1]	A.7.1.2/4	
5	Refuse (RF)	c[3]	c[1]	A.7.1.2/5	
6	Finish (FN)	c[4]	c[5]	A.7.1.2/6	
7	Disconnect (DN)	c[5]	c[4]	A.7.1.2/7	
8	Abort (AB)	m	m	A.7.1.2/8	
9	Abort Accept (AA)	o	m	A.7.1.2/9	
10	Data Transfer (DT)	c[6]	c[7]	A.7.1.2/10	

1	Prepare (PR)	i	i	A.7.1.2/11
1				

The use of PR with the AB SPDU is out of scope.

- [1] The value of *Establishment-initiator*.
- [2] The value of *Establishment-responder*.
- [3] The value of *Establishment-responder*.
- [4] The value of *Release-requestor*.
- [5] The value of *Release-acceptor*.
- [6] The value of *Normal-data-requestor*.
- [7] The value of *Normal-data-acceptor*.

C.3.1.3 Support for the SPDUs associated with Token Exchange – [PICS Proforma A.7.1.3]

	Profile: Sender	Profile: Receiver	PICS Proforma reference	Constraint / value
1	c[1]	c[2]	A.7.1.3/1	Give Token is only used in conjunction with the Data SPDU for mOSI
2	i	i	A.7.1.3/2	

- c[1] The value of *Normal-data-requestor*.
- c[1] The value of *Normal-data-acceptor*.

NOTE – The remainder of the subclauses in A.7 is out of the scope (i) of this Profile.

C.4 Supported SPDU parameters – [PICS Proforma clause A.8]

C.4.1 Connect (CN) SPDU – [PICS Proforma A.8.1]

C.4.1.1 Connection Identifier – [PICS Proforma A.8.1.1]

	PGI "Connection Identifier"	Profile: Sender [a]	Profile: Receiver [b]	PICS Proforma reference	Constraint / value
1	Calling SS-user Reference	i	i	A.8.1.1/1	Not used by BCA
2	Common Reference	i	i	A.8.1.1/2	Not used by BCA

3	Additional Reference Information	i	i	A.8.1.1/3	Not used by BCA
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C.4.1.2 Connect/Accept Item – [PICS Proforma A.8.1.2]

C.4.1.2.1 Connect/Accept Item parameters – [PICS Proforma A.8.1.2.1]

	PGI "Connect/Accept Item"	Profile: Sender [a]	Profile: Receiver [b]	PICS Proforma reference	Constraint / value
1	Protocol Options	m	m	A.8.1.2.1/1	For BCA, basic concatenation shall be indicated
2	TSDU maximum size	o	m	A.8.1.2.1/2	If sent, the value shall be 0
3	Version Number	m	m	A.8.1.2.1/3	Value shall be "version 2"
4	Initial Serial Number	i	i	A.8.1.2.1/4	Not used by BCA
5	Token Setting Item	i	i	A.8.1.2.1/5	Not used by BCA
6	Second Initial Serial Number	i	i	A.8.1.2.1/6	Not used by BCA

[a] This entire column has the value of "-" if the value of *responder* is "i"; otherwise the value is as marked.

[b] This entire column has the value of "-" if the value of *Establishment-initiator* is "i"; otherwise the value is as marked.

C.4.1.2.2 Presence of Connect/Accept Item – [PICS Proforma A.8.1.2.2]

		Profile: Sender	Profile: Receiver	PICS Proforma reference	Constraint / value
1	Sending	m	–	A.8.1.2.2/1	
2	Receiving	–	m	A.8.1.2.2/2	

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C.4.1.3 Single Items – [PICS Proforma A.8.1.3]

	Single Items	Profile: Sender [a]	Profile: Receiver [b]	PICS Proforma reference	Constraint / value
1	Session User Requirements	m	m	A.8.1.3 /1	Value shall be "duplex". If other requirements (functional units) are received in the CN SPDU, they shall not be included on the AC SPDU. (
2	Calling Session Selector	*	*	A.8.1.3 /2	
3	Called Session Selector	o	o	A.8.1.3 /3	Not changed by the referencing specification.
4	Data Overflow	i	i	A.8.1.3 /4	Not used by BCA
5	User Data	m	m	A.8.1.3 /5	Contains a CP PPDU
6	Extended User Data	m	m	A.8.1.3 /6	

[a] This entire column has the value of "-" if the value of *Establishment-initiator* is "i"; otherwise the value is as marked.

[b] This entire column has the value of "-" if the value of *Establishment-responder* is "i"; otherwise the value is as marked.

C.4.2 Accept (AC) SPDU – [PICS Proforma A.8.4]

C.4.2.1 Connection Identifier – [PICS Proforma A.8.4.1]

	PGI "Connection Identifier"	Profile: Sender	Profile: Receiver [a]	PICS Proforma reference	Constraint / value
1	Calling SS-user Reference	i	i	A.8.4.1/1	Not used by BCA

2	Common Reference	i	i	A.8.4.1/2	Not used by BCA
3	Additional Reference Information	i	i	A.8.4.1/3	Not used by BCA

[a] This entire column has the value of "-" if the value of *Establishment-initiator* is "i"; otherwise the value is as marked.

C.4.2.2 Connect/Accept Item – [PICS Proforma A.8.4.2]

C.4.2.2.1 Connect/Accept Item parameters – [PICS Proforma A.8.4.2.1]

	PGI "Connect/Accept Item"	Profile: Sender [a]	Profile: Receiver [b]	PICS Proforma reference	Constraint / value
1	Protocol Options	m	m	A.8.4.2.1/1	Basic concatenation shall be indicated
2	TSDU maximum size	o	m	A.8.4.2.1/2	If sent, value shall be 0
3	Version Number	m	m	A.8.4.2.1/3	Value shall be version 2
4	Initial Serial Number	i	i	A.8.4.2.1/4	Not used by BCA
5	Token Setting Item	i	i	A.8.4.2.1/5	Not used by BCA
6	Second Initial Serial Number	i	i	A.8.4.2.1/6	Not used by BCA

[a] This entire column has the value of "-" if *Establishment-responder* is "i"; otherwise the value is as marked.

[b] This entire column has the value of "-" if *Establishment-initiator* is "i"; otherwise the value is as marked.

C.4.2.2.2 Presence of Connect/Accept Item – [PICS Proforma A.8.4.2.2]

		Profile: Sender	Profile: Receiver	PICS Proforma reference	Constraint / value
1	Sending	m	–	A.8.4.2.2/1	
2	Receiving	–	m	A.8.4.2.2/2	

C.4.2.3 Single Items – [PICS Proforma A.8.4.3]

Single Items	Profile:	Profile:	PICS	Constraint / value
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	Sender [a]	Receiver [b]	Proforma reference	
1	i	i	A.8.4.3/ 1	
2	m	m	A.8.4.3/ 2	Value shall be "duplex"
3	i	i	A.8.4.3/ 3	
4	i	i	A.8.4.3/ 4	It is recommended that this parameter not be sent; if sent, it shall be identical to the Calling Session Selector on the CN. If received, it is recommended that it be ignored.
5	*	*	A.8.4.3/ 5	
6	m	m	A.8.4.3/ 6	Contains a CPA PPDU

[a] This entire column has the value of "-" if the value of *Establishment-responder* is "i"; otherwise the value is as marked.

[b] This entire column has the value of "-" if the value of *Establishment-initiator* is "i"; otherwise the value is as marked.

C.4.3 Refuse (RF) SPDU – [PICS Proforma A.8.5]

C.4.3.1 Connection Identifier – [PICS Proforma A.8.5.1]

	PGI "Connection Identifier"	Profile: Sender	Profile: Receiver [a]	PICS Proforma reference	Constraint / value
1	Calling SS-user Reference	i	i	A.8.5.1/1	Not used by BCA
2	Common Reference	i	i	A.8.5.1/2	Not used by BCA

3	Additional Reference Information	i	i	A.8.5.1/3

Not used by BCA

[a] This entire column has the value of "-" if the value of *Establishment-initiator* is "i"; otherwise the value is as marked.

C.4.3.2 Single Items – [PICS Proforma A.8.5.2]

	Single Items	Profile: Sender [a]	Profile: Receiver [b]	PICS Proforma reference	Constraint / value
1	Transport Disconnect	i	i	A.8.5.2/1	
2	Session User Requirements	m	m	A.8.5.2/2	Value shall be "duplex"
3	Version Number	m	m	A.8.5.2/3	Value shall be "version 2"
4	Enclosure Item	i	i	A.8.5.2/4	
5	Reason Code	m	m	A.8.5.2/5	

[a] This entire column has the value of "-" if the value of *Establishment-responder-reject* is "i"; otherwise the value is as marked.

[b] This entire column has the value of "-" if the value of *Establishment-initiator* is "i"; otherwise the value is as marked.

C.4.4 Finish (FN) SPDU – [PICS Proforma A.8.6]

	Single Items	Profile: Sender [a]	Profile: Receiver [b]	PICS Proforma reference	Constraint / value
1	Transport Disconnect	i	i	A.8.6/1	

2	Enclosure Item	i	i	A.8.6/2
3	User Data	m	m	A.8.6/3

**Contains a RLRQ
APDU**

- [a] This entire column has the value of "-" if the value of *Release-requestor* is "i"; otherwise the value is as marked.
- [b] This entire column has the value of "-" if the value of *Release-initiator* is "i"; otherwise the value is as marked.

C.4.5 Disconnect (DN) SPDU – [PICS Proforma A.8.7]

	Single Items	Profile: Sender [a]	Profile: Receiver [b]	PICS Proforma reference	Constraint / value
1	Enclosure Item	i	i	A.8.7/1	
2	User Data	m	m	A.8.7/2	Contains a RLRE APDU

[a] This entire column has the value of "-" if the value of *Release-acceptor* is "i"; otherwise the value is as marked.

[b] This entire column has the value of "-" if the value of *Release-requestor* is "i"; otherwise the value is as marked.

C.4.6 Abort (AB) SPDU – [PICS Proforma A.8.9]

	Single Items	Profile: Sender	Profile: Receiver	PICS Proforma reference	Constraint / value
1	Transport Disconnect	i	i	A.8.9/1	
2	Enclosure Item	i	i	A.8.9/2	
3	Reflect Parameter Values	i	i	A.8.9/3	
4	User Data	m	m	A.8.9/4	Contains an ARP or an ARU PDU

C.4.7 Data Transfer (DT) SPDU – [PICS Proforma A.8.11]

	Single Items	Profile: Sender [a]	Profile: Receiver [b]	PICS Proforma reference	Constraint / value
1	Enclosure Item	i	i	A.8.11/ 1	

2	User Data	m	m
			A.8.11/2

[a] This entire column has the value of "-" if the value of *Normal-data-requestor* is "i"; otherwise the value is as marked.

[b] This entire column has the value of "-" if the value of *Normal-data-acceptor* is "i"; otherwise the value is as marked.

Annex D

(normative)

Profile requirements list proforma

D.1 Use of tables D.1 and D.2 by a referencing specification

The tables in annexes A, B, and C define the requirements for the mOSI Profile as a function of a set of variables and a set of "open" parameters (see 2.3). A summary of the mOSI variables and their allowed (compliant) values may be found in table D.1, rows 1–9. A summary of the "open" (*) parameters and their allowed (compliant) values may be found in table D.2.

Once values are selected for the mOSI variables and for the "open" parameters, the tables in annexes A, B, and C form an upper layer PRL based on the values selected by a referencing specification. That is, selecting values for the 9 mOSI variables (table D.1) and the 20 "open" parameters (table D.2) determines the requirements for over 80 tables with over 400 entries in the PICS Proformas of ACSE, Presentation, and Session based on the requirements in annexes A, B, and C.

For example, the mOSI variable *Establishment-initiator* is used in table A.2.1. In line 1 of table A.2.1, the [ACSE] Initiator role is assigned the value ("m", "o", or "i") of the variable *Establishment-initiator*. This variable is used several other places in Annexes A, B, and C.

Tables D.1 and D.2 in this annex provide a proforma for specifying the mOSI variables and "open" parameters. A referencing specification can use these tables to define concisely its upper layer requirements based on the mOSI profile. It may do this by completing the "Specification's statement" columns in tables D.1 and D.2. If the upper layer requirements of the referencing specification are defined by completing tables D.1 and D.2 and if the values selected are compliant, the referencing specification may claim mOSI compliance. Such a claim indicates that upper layer requirements of the referencing specification are identified by the features specified in this Profile as indicated by tables D.1 and D.2.

Table D.1 – Profile requirements list proforma

	Item / variable	Compliant choice	Specification's statement	Constraint / value
1	<i>Establishment-initiator</i>	m; o; i		Both shall not be "i".
2	<i>Establishment-responder</i>	m; o; i		
3	<i>Establishment-responder-reject</i>	m; o; i		The value shall be "i" if <i>Establishment-responder</i> has the value "i"
4	<i>Normal-data-requestor</i>	m; o; i		Both may be "i".
5	<i>Normal-data-acceptor</i>	m; o; i		
6	<i>Release-requestor</i>	m; o; i		Both may be "i".
7	<i>Release-acceptor</i>	m; o; i		
8	<i>Authentication</i>	m; o; i		
9	<i>Application-context-negotiation</i>	m; o; i		
10	Number of presentation-contexts required	1 or more		The value chosen includes the presentation-context used for ACSE PDUs.

1 1	ISO/IEC ISP 11188-1 compliance?¹	yes	If the answer is not "yes", the referencing specification may not claim mOSI compliance
1 2	Requirement for all "open" (*) parameters (see table D.2)	all m; all o; all i; mixed	If the answer is "mixed" (i.e. not all "m" and "-", or not all "o" and "-", or not all "i" and "-"), details shall be given in table D.2

1 See ISO/IEC ISP 11188-1, annex B.

Table D.2 may be used by a referencing specification to specify the "open" (*) parameters in annexes A, B, and C. If the "open" parameters are either all "m" (and "-" for non-supported roles) or all "o" (and "-" for non-supported roles) or all "i" (and "-" for non-supported roles) , this table need not be completed. In this case, line 11 of table D.1 would have the answer "m", or "o", or "i", respectively.

Table D.2 – "Open" parameters (*)

	Reference d table(in annexes A, B and C)	Parameter	Specification's statement — sending [a]	Specification's statement — receiving [a]	Constraint / value
1	A.5.1	Calling AE titles ²			Value shall be "-" if
2	[AARQ]	Called AE titles ²			<i>Establishment-initiator</i> has the
3		Invocation ids			value "i".
4		User Information			
5	A.5.2	Responding AE title			Value shall be "-" if
6	[AARE]	Invocation ids			<i>Establishment-responder</i> has the
7		User Information			value "i".
8	A.5.3	Reason			Value shall be "-" if <i>Release-</i>
9	[RLRQ]	User			<i>requestor</i> has the value

		Information			"i".
1 0	A.5.4	Reason			Value shall be "-" Release-
1 1	[RLRE]	User Information			acceptor has the value "i".
1 2	A.5.5 [ABRT]	User Information			
1 3	A.6.1 [AARQ and	Form 1 (Directory name)			Value shall be "-" if Calling, Called or Responding AE titles
1 4	AARE]	Form 2 (Object id+integer)			are required.
1 5	B.3.1 [CP]	Calling Presentation Selector			Value shall be "-" if Establishment-initiator is "i"
1 6		Default context name			May be used for simple encoding of ACSE and user PCI
1 7	B.3.2 [CPA]	Responding Presentation Selector			Value shall be "-" if Establishment-responder is "i".
1 8	B.3.3 [CPR]	Responding Presentation			Value shall be "-" if Establishment-

		Selector			<i>responder-reject</i> is "i".
1 9	C.4.1.3 [CN]	Calling Session Selector			Value shall be "-" if <i>Establishment-initiator</i> is "i".
2 0	C.4.2.3 [AC]	Responding Session Selector			Value shall be "-" if <i>Establishment-responder</i> is "i".

[a] Compliant answer for each row is "m", "o", "i" or "-".

D.2 Completing a PRL based on tables D.1 and D.2

Several additional pieces of information are needed to complete the definition of the PRL for a referencing specification after completing tables D.1 and D.2:

- a) List of transfer syntaxes supported;
- b) Abstract syntaxes supported; and
- c) Use of ASN.1 encoding.

Each is discussed below.

D.2.1 List of transfer syntaxes supported

Table B.4.1 (Presentation Layer PICS Proforma table A.10.1) lists the object identifiers for the ASN.1 Basic Encoding Rules (BER) and for the Default Abstract Syntax for Minimal OSI defined in F.1.

It is suggested that a referencing specification make a list (based on table B.4.1) of the transfer syntaxes required for its application. This list shall include the object identifier for BER that is used for Presentation and ACSE PCI.

D.2.2 Abstract syntaxes supported; and

Table B.4.2 (Presentation Layer PICS Proforma table A.10.2) lists the object identifiers for ASN.1 and for the Default Transfer Syntax for Minimal OSI defined in F.2.

It is suggested that a referencing specification make a list (based on table B.4.2) of the abstract syntaxes required for its application. This list shall include the object identifier for ASN.1 that is used for ACSE PCI.

D.2.3 Use of ASN.1 encoding.

Table B.4.3 (Presentation Layer PICS Proforma table A.10.3) contains a list of questions used to indicate any coding restrictions for sending **all** ACSE APDUs, PPDUs and User Information on ACSE APDUs.

It is suggested that a referencing specification make a table based on table B.4.3 and add their status values.

D.3 A referencing specification's upper layer PRL

As discussed in 2.3, this mOSI Profile defines its upper layer requirements in terms of features, roles and options. It does this by defining variables and "open" parameters whose values are assigned by a referencing specification.

The referencing specification, itself, may elect to define its upper layer requirements in terms of its own features, roles and options. It could do this by defining its own variables and "open" parameters that map to mOSI variables and "open" parameters. A specification that referenced it (in a recursive sense) would then select values for the referencing specification's variables and "open" parameters. These, in turn, would define values for mOSI variables and "open" parameters producing a completed upper layer requirements list as defined by this Profile.

¹ A **variable** (for the purposes of this Profile) is used as a simple replacement for two or more table entries and/or in a "IF/THEN/ELSE" conditional statement to derive a table entry. A variable's name is presented in *italic*. An **"open" parameter** is a variable that is only referenced in one table entry. An open parameter is assigned the Profile status of "*" (see table 1).

For example, consider a referencing specification that defined roles for *Client* and *Server* to be selected by its referencing specification. The mOSI variables for *Establishment-initiator* and *Release-initiator* would map to the referencing specification's *Client* variable (role); the mOSI variables *Establishment-responder* and *Release-acceptor* would map to the referencing specification's *Server* variable (role). The appropriate answer in table D.1 would be "*" for *Establishment-initiator* under the "Specification's statement" column.

Annex E

(normative)

Implementation conformance statement proforma

The tables in annexes A, B, and C define the requirements for the mOSI Profile as a function of a set of variables and a set of "open" parameters (see 2.3). A summary of the mOSI variables and their allowed (conformant) support answers may be found in table E.1, rows 1–9. A summary of the "open" (*) parameters and their allowed (conformant) support answers may be found in table E.2.

The answers ("yes", "no", "-") selected by a referencing implementation implicitly assign status values ("m", "o", "i", "-") for the mOSI variables and "open" parameters used in the tables of annexes A, B, and C. The implicit assignment is:

- a support answer of "yes" translates to a status value of "m";
- a support answer of "no" translates to a status value of "o"; and
- a support answer of "-" translates to a status value of "i".

Once status values are determined for the mOSI variables and for the "open" parameters, the tables in annexes A, B, and C form an upper layer PRL based on the values selected by the referencing implementation. That is, determining values for the 9 mOSI variables (table E.1) and the 20 open parameters (table E.2) determines the requirements for over 80 tables with over 400 entries in the PICS Proformas of ACSE, Presentation, and Session based on the requirements in annexes A, B, and C.

For example, the mOSI variable *Establishment-initiator* is used in table A.2.1. In line 1 of table A.2.1, the [ACSE] Initiator role is assigned the value ("m", or "i") of the variable *Establishment-initiator*. This variable is used several other places in Annexes A, B, and C. In this example the value of the *Establishment-initiator* variable (and the [ACSE] Initiator role) is :

- "m" — if the implementation's statement is "yes";
- "i" — if the implementation's statement is "no".

An implementation of the upper layers can use tables E.1 and E.2 of this annex to define concisely its upper layer facilities based on the mOSI profile. It may do this by completing the "Implementation's statement" columns in tables E.1 and E.2.

If the upper layer facilities (or a subset thereof) of the implementation are defined by completing tables E.1 and E.2 and if the choices made are conformant, the referencing implementation may claim mOSI conformance. Such a claim indicates that the implementation supports some or all of the features specified in this Profile. The implementation may in fact support more of the upper layer facilities of this Profile—without violating any of the facilities of this Profile.

Table E.1 – Implementation questionnaire

	Item / variable	Conformant answer	Implementation's support answer	Constraint / value
1	<i>Establishment-initiator</i>	yes; no		Both shall not be "no".
2	<i>Establishment-responder</i>	yes; no		If "yes", the associated variable is implicitly assigned the value of "m"; otherwise the variable is "i"
3	<i>Establishment-responder-reject</i>	yes; no; –		Answer shall be "–" if <i>Establishment-responder</i> is "no". If "yes", <i>Establishment-responder-reject</i> is implicitly assigned the value of "m"; otherwise the value is "i"
4	<i>Normal-data-requestor</i>	yes; no		Both may be "no".
5	<i>Normal-data-acceptor</i>	yes; no		If "yes", the associated variable is implicitly assigned the value of "m"; otherwise the value is "i"
6	<i>Release-requestor</i>	Yes; no		Both may be "no".
7	<i>Release-acceptor</i>	yes; no		If "yes", the associated variable is implicitly assigned the value of "m"; otherwise the value is "i"
8	<i>Authentication</i>	yes; no		If "yes", the <i>Authentication</i> is implicitly assigned the value of "m"; otherwise the

			value is "i"
9	Application-context-negotiation	yes; no	If "yes", the <i>Application-context-negotiation</i> is implicitly assigned the value of "m"; otherwise the value is "i"
10	Number of presentation-contexts supported per association	1 or more	The value includes the presentation-context used for ACSE PDUs.
11	All "m" parameters in annexes A, B, and C (send and receive) supported?	yes	If the answer is not "yes", the referencing implementation may not claim mOSI conformance
12	Support for all "*" parameters	yes; no; mixed	If the answer is "mixed" (i.e., not all "yes" and "-", or not all "no" and "-"), details shall be given in table E.2

Table E.2 may be used by a referencing implementation to specify the "open" (*) parameters in annexes A, B, and C. If the "open" parameters are either all "yes" (and "-" for non-supported roles) or all "no" (and "-" for non-supported roles), this table need not be completed. In this case, line 11 of table E.1 would have the answer "yes" or "no", respectively.

Table E.2 – "Open" parameters

	Reference table(in annexes A, B and C)	Parameter	Implementation's statement — sending [a]	Implementation's statement — receiving [a]	Constraint / value
1	A.5.1	Calling AE titles			Answer shall be "-" if
2	[AARQ]	Called AE titles			Establishment-initiator is "no".
3		Invocation ids			
4		User Information			
5	A.5.2	Responding AE title			Answer shall be "-" if
6	[AARE]	Invocation ids			Establishment-responder is "no".
7		User Information			
8	A.5.3	Reason			Answer shall be "-" if Release-
9	[RLRQ]	User Information			requestor is "no".

1 0	A.5.4	Reason		
1 1	[RLRE]	User Information		
1 2	A.5.5 [ABRT]	User Information		
1 3	A.6.1 [AARQ and	Form 1 (Directory name)		
1 4	AARE]	Form 2 (Object id+integer)		
1 5	B.3.1 [CP]	Calling Presentation Selector		
1 6		Default Context Name		
1 7	B.3.2 [CPA]	Responding Presentation Selector		
1 8	B.3.3 [CPR]	Responding Presentation Selector		

Answer shall be "-" if Release-

acceptors "no".

Answer shall be "-" if Calling, Called, or Responding AE titles

are supported

Answer shall be "-" if Establishment-initiator is "no".

May be used for simple encoding of ACSE and user PCI.

Answer shall be "-" if Establishment-responder is "no".

Answer shall be "-" if Establishment-responder-reject is "no".

1 9	C.4.1.3 [CN]	Calling Session Selector		Answer shall be "-" if Establishment initiator is "no".
2 0	C.4.2.3 [AC]	Responding Session Selector		Answer shall be "-" if Establishment responder is "no".

[a] Conformant answer for each row is "yes", "no" or "-".

Annex F

(normative)

Minimal OSI Object Identifiers

The following are the object identifiers for the default abstract syntax, default transfer syntax and default application context for use with Minimal OSI. These object identifiers are registered with this Profile.

F.1 Default Abstract Syntax for Minimal OSI

This object identifier can be used as the abstract syntax name when the application protocol (above ACSE) can be treated as single presentation data values (pdv's). Each PDV is a sequence of consecutive octets without regard for semantic or other boundaries. The object identifier may also be used when, for pragmatic reasons, the actual abstract syntax of the application is not identified in Presentation Layer negotiation.

The OBJECT IDENTIFIER for the default abstract syntax is:

```
{iso(1) standard(0) culr(11188) mosi(3) default-abstract-syntax(1) version(1)}
```

NOTES

1. Applications specified using ASN.1 should not use the default abstract syntax.
2. As this OBJECT IDENTIFIER is used by all applications using the default abstract syntax for mOSI, it cannot be used to differentiate between applications. One of the ACSE parameters, e.g. AE-Title, may be used to differentiate between applications.

F.2 Default Transfer Syntax for Minimal OSI

A transfer syntax is the representation of the abstract syntax during data transfer. If an application doesn't make a distinction between the abstract and transfer syntax, the same object identifier should be used to denote both syntaxes.

In the case where:

- a) the abstract and transfer syntax are not the same; and
- b) the default abstract syntax object identifier has been used (see F.1 above)

the following default transfer syntax object identifier may be used:

```
{iso(1) standard(0) culr(11188) mosi(3) default-transfer-syntax(2) version(1)}
```

F.3 Default Application Context for Minimal OSI

The default application context for mOSI is the application context used to denote the application's universe of discourse.

The OBJECT IDENTIFIER for the mOSI default application context is
{iso(1) standard(0) culr(11188) mosi(3) default-application-context(3)}

This application context supports the execution of any application using the default abstract syntax defined in F.1.

Annex G

(informative)

Minimal OSI Concepts

This annex defines concepts used in the Minimal OSI upper layer facilities.

G.1 Definitions of Minimal OSI Upper Layer Facilities

The minimal OSI Profile (**mOSI**) specifies a minimal set of OSI upper layer facilities that support basic communications applications. A **basic communications application (BCA)** simply requires the ability to open and close communications with a peer and to send and receive messages with the peer. The OSI upper layer facilities are defined by the ACSE, presentation and session protocol specifications. When these facilities are specified as a set of interrelated standards for the purpose of providing a common service that functional specification is a **Stack specification**. An implementation of an identified stack specification is a **Stack** or a **stack implementation**. The specification that defines the minimal facilities of the Session Layer, Presentation Layer, and ACSE is the **mOSI specification** or the **mOSI stack specification** – this Profile.

A functional specification of a formal programmatic interface and a set of supporting local services for an identified stack specification is a **Platform specification**. A **Platform** is an implementation of an identified platform specification. The functional specification of a formal programmatic interface and a set of supporting local services for the mOSI stack specification is the **mOSI platform specification** and an implementation of the mOSI platform specification is a **mOSI platform**.

A functional specification of the formal programmatic interface to an identified stack specification is an **API specification**. An **API** is an implementation of an identified API specification. Likewise, a **mOSI API specification** is a functional specification of the formal programmatic interface to the mOSI stack specification.

G.2 Use of the mOSI stack specification

The mOSI stack specification is intended for connection-oriented applications that do not require all of the services of the upper layers, but only the basic communications services. Figure G.1 is a Venn Diagram which represents a classification of the universe of all possible connection-oriented applications. Each subset of the universe applicable to this discussion is supplied below.

μ §

G.2.1 Connection-Oriented Applications

The set of connection-oriented applications consists of

- a) applications needing only basic communications services. A basic communications application requires the ability to open and close communications and to send a receive messages.
- b) applications needing more that basic communications services

G.2.2 Non-Basic Connection-Oriented Applications Needing More than Basic Services

The set of connection-oriented applications needing more than basic communications facilities, from an OSI perspective, includes those applications which use one or more of the following facilities: session major or minor synchronize; resynchronize; activity management. Some examples are

- a) RTSE-based applications, e.g. MTA-MTA transfer of X.400
- b) FTAM with optional recovery
- c) TP with optional two-phase commitment (i.e. CCR)
- d) some optional aspects of VTP

G.2.3 Connection-Oriented Applications Needing Only Basic Services

The set of connection-oriented applications needing only basic communications services include those applications which require the ability to open and close communications and to send and receive messages. Some examples are

- a) Kernel applications, which are written specifically for OSI services.
- b) Migrant applications, which are "non-OSI applications" such as those currently supported by TCP programmatic interfaces. The X Window system (X) and IPS applications are examples of potential migrant applications.

G.2.3.1 Kernel applications

The set of all possible Kernel applications include those which are written specifically for OSI services that only require basic communications services. Some examples are

- a) ISO and ITU-T defined applications which do not use the RTSE, e.g. UA-MS transfer of X.400
- b) FTAM implementations which do not user recovery
- c) TP implementations which do not use two-phase commitment
- d) VTP without destructive interrupt facility
- e) all ROSE based applications

These applications may access the mOSI stack by using either an API or by mapping directly onto mOSI. Applications using an API are considered to be platform applications. Those applications mapping directly onto mOSI are considered to be **stand-alone applications**.

G.2.3.2 Migrant Applications

The set of all possible Migrant applications include those that are either to be migrated from TCP to OSI or they are applications that require the least common denominator communication facility – because they must operate over several "transport" mechanisms. Some examples are:

- a) TCP/IP applications
- b) Connection-Oriented "user written" applications
- c) X-windows and IPS applications

These applications may access the mOSI stack by using either a migrant API or by mapping directly onto mOSI. A migrant API is considered to be a platform for accessing the mOSI stack. Therefore those applications which use a migrant API are considered to be platform applications. Those applications mapping directly onto mOSI are considered to be stand-alone applications.

G.3 Users of the mOSI Stack Specification

Out of the set of all connection-oriented applications, those applications using only basic communications services are possible users of the mOSI stack specification. This specification is intended to address implementors of migrant and kernel applications using either a platform or accessing the mOSI stack directly (stand-alone users). This specification is also intended to be referenced by ISP designers.

G.4 OSI misconceptions

Today's APIs do not efficiently support basic communications applications with a conformant seven-layer stack. However basic communications applications (both migrant and kernel) represent the overwhelming majority of potential OSI applications.

OSI is most often viewed as only being fat and slow. This is because OSI is perceived as the implementation of the full function upper layer stack with a corresponding complex, mostly unneeded, and difficult to use full API. The facilities required by migrant and kernel applications represent approximately 5% of the overall functionality provided by a full stack.

A full function stack and its API are intended for those applications needing more than the basic communications services, such as MTA to MTA transfer of X.400 and TP with CCR. The facilities of the full upper layers simplify the design of sophisticated distributed applications that require check pointing with recovery - applications such as RTSE and CCR.

For a basic communications mapping onto a full stack, the unused 95% of functionality intended for a fuller application, could potentially impact performance. Having an API which only provides mapping onto basic services would make OSI less intimidating.

Another misconception about OSI deals with the use of ASN.1 Some believe that the use of OSI predicates the use of ASN.1 for application semantics. This is not the case. ASN.1 abstract definitions and the use of ASN.1 Basic Encoding Rules is just one of the options available to an applications designer.

Annex H

(informative)

Implementation considerations

This Internationally Standardized Profile is not an implementation specification. However, the size and efficiency of an implementation of OSI (any OSI implementation, not just of mOSI) is significantly affected by the implementation design. The OSI 7-layer model is a protocol specification model and in many cases may not be the best way to implement OSI.

This informative annex is concerned only with the implementation of the upper three layers of OSI. In particular, this annex is concerned with an implementation of the mOSI specified subset of the OSI upper layers facilities. This annex makes several implementation suggestions. Experience has shown that these implementation approaches yield small and fast implementations—especially when compared to some of the well known OSI proof-of-concept implementations.

H.1 Layering for mOSI implementations

The services and protocols for the upper three layers of OSI are specified separately. However, considerable efficiency can be gained if all three protocol machines are combined as one module and not as three separate modules requiring the definition of formal interfaces between them. This is especially true if operating system context switches occur when transferring between different modules.

NOTE—Currently there are no formally defined interfaces for session and presentation.

Combining layer protocol machines applies not only to mOSI implementations, but also to all OSI upper layer implementations. However, combining layers precludes testing them individually. Individual layer testing is not recommended. The three upper layer protocols provide an integrated set of services; these services are not useful individually.

H.2 PDU generation for mOSI implementations

mOSI supports uncomplicated application protocols, i.e., byte stream or simple record oriented data transfer (which probably constitutes 95 to 99% of user application protocols). Therefore, the encoding of embedded PDU headers (PCI) for all three protocols is uniform. Using pre-defined protocol headers allows significant gains in protocol machine efficiency. This is especially true for data PDUs—the PDUs that generally constitute the majority of PDUs exchanged.

Internet RFC xxxxx (ThinOsi Upper Layer Cookbook) is an example of explicit pre-defined PDU encodings for mOSI implementations. The RFC contains a full description of this technique including BER encodings for PDUs.

H.3 Parsing incoming protocol for mOSI

An upper layer protocol machine that only supports the facilities defined in mOSI need only recognize a very limited subset of all potential OSI PDU sequences. In particular, they need not recognize any non-mOSI protocol sequences.

A direct consequence of implementing only the mOSI defined facilities is that non-mOSI

sequences are treated as unrecognized PDUs. The receipt of an unrecognized PDU results in a protocol error and in the release of the association. This does not lessen the utility of the implementation but it does reduce the amount of code needed for error handling.

NOTE—It is always legal for an OSI protocol machine to abort an association.

H.4 Interfaces for mOSI implementations

ISPs currently do not include APIs. However, portability for a mOSI implementation can be significantly enhanced through the use of X/Open's XTI interfaces. The XTI for mOSI interface (appendix H of X/Open's XTI CAE) provides a common interface for networked applications. It simplifies migration of networked applications from one open networking environment to another.

The standard XTI can be used to provide transport services to a mOSI implementation thus making a mOSI implementation easily portable to any network transport supporting XTI, e.g., Internet, NetBIOS, and a number of proprietary networks. Thus, XTI can be used both to interface mOSI to a network transport service and to provide mOSI services to networked applications. The following diagram illustrates the use of the XTI interfaces for mOSI implemented as a single module.

Annex I

(informative)

Bibliography

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