INTERNATIONAL STANDARD

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Information technology — Open Systems Interconnection — Presentation service definition

Technologies de l'information — Interconnexion de systèmes ouverts — Définition du service de présentation

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Foreword

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

In the field of information technology, ISO and IEC have established a joint technical committee, ISO/IEC JTC 1. Draft International Standards adopted by the joint technical committee are circulated to national bodies for voting. Publication as an International Standard requires approval by at least 75% of the national bodies casting a vote.

International Standard ISO/IEC 8822 was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information technology,* Subcommittee SC 21, *Open systems interconnection, data management and open distributed processing,* in collaboration with ITU-T. The identical text is published as ITU-T Recommendation X.216.

This second edition cancels and replaces the first edition (ISO 8822:1988), and is a consolidation of the first edition, Amendment 1:1991 and Amendment 5:1992.

Annexes A and B form an integral part of this International Standard. Annex C is for information only.

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Introduction

This ITU-T Recommendation | International Standard is one of a set of ITU-T Recommendations | International Standards, produced to facilitate the interconnection of information processing systems. It is related to other ITU-T Recommendations | International Standards in the set as defined by the Reference Model for Open Systems Interconnection (ITU-T Rec. X.200 | ISO/IEC 7498). The Reference Model subdivides the area of standardization for interconnection into a series of layers of specification, each of manageable size.

The aim of Open Systems Interconnection is to allow, with a minimum of technical agreement outside the interconnection standards, the interconnection of information processing systems

- from different manufacturers;
- under different managements;
- of different levels of complexity;
- of different ages.

This ITU-T Recommendation | International Standard defines the service available to entities within the Application Layer of the Reference Model.

This ITU-T Recommendation | International Standard recognizes that application-entities may wish to intercommunicate for a wide variety of reasons. While not all systems will share a common method of representing the information they wish to intercommunicate, they will be agreed about the subject matter of their communication and the meanings to be assigned to that information. The presentation-service provides the proper means of transferring information so that the semantics are preserved during the transfer.

It is recognized that, with respect to presentation quality of service (QOS) described in clause 9, work is still in progress to provide an integrated treatment of QOS across all of the layers of the OSI Reference Model and to ensure that the individual treatments in each layer satisfy overall QOS objectives in a consistent manner. As a consequence, an addendum may be added to this ITU-T Recommendation | International Standard at a later time which reflects further QOS developments and integration.

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INTERNATIONAL STANDARD

ITU-T RECOMMENDATION

INFORMATION TECHNOLOGY – OPEN SYSTEMS INTERCONNECTION – PRESENTATION SERVICE DEFINITION

1 Scope

1.1 This ITU-T Recommendation | International Standard defines (in an abstract way) the externally visible service provided by the OSI Presentation Layer in terms of

a) the primitive actions and events at the user/service boundary;

b) the parameter data associated with each primitive action and event;

c) the relationship between, and the valid sequences of, those actions and events.

1.2 The service defined in this ITU-T Recommendation | International Standard is the connection-oriented service which is provided by the OSI connection-oriented presentation protocol and the the connectionless service which is provided by the OSI connectionless presentation protocol, each in conjunction with the OSI session-service.

The connection-oriented presentation service defined in this ITU-T Recommendation | International Standard may be used by an OSI application protocol defined for connection-oriented transmission. The connectionless presentation service defined in this ITU-T Recommendation | International Standard may be used by an OSI application protocol defined for connectionless transmission.

1.3 This ITU-T Recommendation | International Standard does not specify individual implementations or products, nor does it constrain the implementation of entities and interfaces within a computer system. There is, therefore, no conformance to this ITU-T Recommendation | International Standard.

2 Normative references

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

2.1 Identical Recommendations | International Standards

- ITU-T Recommendation X.215 (1994) | ISO/IEC 8326:—[2], *Information technology – Open Systems Interconnection – Session service definition.*
- ITU-T Recommendation X.680 (1994) | ISO/IEC 8824-1:—[1], *Information technology – Open Systems Interconnection – Abstract Syntax Notation One (ASN.1): Specification of basic notation.*
- ITU-T Recommendation X.226 (1994) | ISO/IEC 8823:1994, *Information technology – Open Systems Interconnection – Connection oriented presentation protocol: Protocol specification.*
- ITU-T Recommendation X.200 (1994) | ISO/IEC 7498-1:1994, *Information technology – Open Systems Interconnection – Basic Reference Model: The basic model.*
- ITU-T Recommendation X.236 | ISO/IEC 9576-1: ...[1], *Information technology – Open Systems Interconnection – Connectionless presentation protocol specification.*
- ITU-T Recommendation X.660 (1992) | ISO/IEC 9834-1:1993, *Information technology – Open Systems Interconnection – Procedures for the operation of OSI registration authorities: General procedures.*

1) Presently at the stage of draft.

2) Under revision. To be published.

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2.2 Paired Recommendations | International Standards equivalent in technical content

- CCITT Recommendation X.210 (1988), *Open Systems Interconnection layer service definition conventions.*

  ISO/TR 8509, *Information processing systems – Open Systems Interconnection – Service conventions.*

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

  ISO 7498-3:1989, *Information processing systems – Open Systems Interconnection – Basic Reference Model – Part 3: Naming and addressing.*

2.3 Additional references

- CCITT Recommendation X.410 (1984), *Message Handling Systems: Remote Operations and Reliable Transfer Server.*

3 Definitions

For the purposes of this ITU-T Recommendation | International Standard, the following definitions apply.

3.1 Basic Reference Model definitions

This ITU-T Recommendation | International Standard is based on the concepts developed in ITU-T Rec. X.200 | ISO/IEC 7498 and makes use of the following terms defined in it:

a) application-entity;

b) application-protocol-control-information;

c) presentation-connection;

d) presentation-entity;

e) Presentation Layer;

f) presentation-service;

g) presentation-service-access-point;

h) presentation-service-data-unit;

i) session-connection;

j) session-service;

k) transfer syntax;

l) concrete syntax;

m) real open system;

n) (N)-connectionless-mode transmission.

NOTE – The abbreviations in clause 4 apply to some of these terms.

3.2 Service conventions definitions

This ITU-T Recommendation | International Standard makes use of the following terms defined in CCITT Rec. X.210 | ISO/TR 8509 as they apply in the Presentation Layer:

a) service-user;

b) service-provider;

c) service primitive;

d) request;

e) indication;

f) response;

g) confirm;

h) non-confirmed-service;

i) confirmed-service;

j) provider-initiated-service.

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3.3 Naming and Addressing definitions

This ITU-T Recommendation | International Standard makes use of the following terms defined in ITU-T Rec. X.650 | ISO/IEC 7498-3:

a) calling-presentation-address;

b) called-presentation-address;

c) responding-presentation-address.

3.4 Presentation-service definitions

For the purposes of this ITU-T Recommendation | International Standard, the following definitions apply:

3.4.1 destructive: A service is destructive if its invocation may cause loss of undelivered data of other service primitives.

3.4.2 non-destructive: A service is non-destructive if its invocation does not cause the loss of data.

3.4.3 abstract syntax: The specification of Application Layer data or application-protocol-control-information by using notation rules which are independent of the encoding technique used to represent them.

3.4.4 abstract syntax name: A name which unambiguously identifies an abstract syntax.

3.4.5 transfer syntax name: A name which unambiguously identifies either a transfer syntax or a set of rules for generating a transfer syntax from a given abstract syntax.

3.4.6 presentation data value: The unit of information specified in an abstract syntax, which is transferred by the presentation-service.

3.4.7 presentation context: An association of an abstract syntax with a transfer syntax.

NOTES

1 From the viewpoint of the presentation-service-user, a presentation context represents an environment in which the presentation data values of the abstract syntax can be transferred (as a bitstring) without ambiguity.

2 Where the abstract syntax permits it, a presentation data value may contain embedded fields, each of which carries a presentation data value from a (possibly different) abstract syntax.

3 From the viewpoint of the presentation-service-user, a presentation context represents a specific use of an abstract syntax. Multiple presentation contexts may be defined for the same abstract syntax (with the same or different transfer syntaxes); presentation data values transmitted in these separate presentation contexts are also delivered in these separate presentation contexts.

3.4.8 defined context set: A set of presentation contexts that has been defined by agreement between all three parties to a communication, i.e. the presentation-service-provider and two presentation-service-users.

NOTE – The inclusion of a presentation context in the defined context set implies that its abstract syntax is acceptable to both presentation-service-users and that the cooperating presentation-entities have agreed on an acceptable transfer syntax for that presentation context.

3.4.9 inter-activity defined context set: A set of presentation contexts which is defined for a presentation-connection when the (session) activity management functional unit is selected. It initially takes the value of the defined context set at presentation-connection establishment, and is further modified only by P-ALTER-CONTEXT service primitives issued outside of activities.

3.4.10 default context: The default context is a presentation context which is always known to the presentation-service-provider and two presentation-service-users for a given presentation-connection or p-connectionless-mode transmission. It is the presentation context which always applies to the User data parameter of the P-EXPEDITED-DATA service primitives. It applies to the User data parameters of other service primitives only when the defined context set is empty.

NOTE – The use of an implied default context can arise when no name for default context is specified.

3.4.11 functional unit: A logical grouping of services defined by this ITU-T Recommendation | International Standard for the purpose of

– negotiation during the presentation-connection establishment, for use on the presentation-connection;

– referencing by other standards.

3.4.12 disrupt: A service procedure is disrupted by another service if the second service results in service primitives of the first service not being used as specified for the procedure of the first service.

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3.4.13 X.410-1984 mode: A restricted mode of operation of the Presentation Layer, which is used to allow interworking with a system that conforms to CCITT Recommendation X.410 (1984).

3.4.14 normal mode: The mode of operation of the Presentation Layer, which provides the full facilities of the presentation-service.

3.4.15 initiator: The presentation-entity or presentation-service-user that initiates the presentation-connection establishment.

3.4.16 responder: The presentation-entity or presentation-service-user that responds to a presentation-connection establishment proposal.

3.4.17 requestor: The presentation-entity or presentation-service-user that initiates a particular action.

3.4.18 acceptor: The presentation-entity or presentation-service-user that accepts a particular action.

3.4.19 presentation context identification: The identification of a specific presentation context at the conceptual service boundary.

4 Abbreviations

For the purposes of this ITU-T Recommendation | International Standard, the following abbreviations apply:

ASN.1	Abstract Syntax Notation One (see ITU-T Rec. X.680 | ISO/IEC 8824)
DCS	Defined Context Set
PCEP	Presentation-connection-end-point
PS	Presentation-service
PSAP	Presentation-service-access-point
PS-user	Presentation-service-user
SS	Session-service

5 Conventions

This ITU-T Recommendation | International Standard uses the descriptive conventions defined in CCITT Rec. X.210 | ISO/TR 8509.

SECTION 1 – GENERAL

6 Overview of the presentation service

6.1 Purpose

The Presentation Layer is concerned with the representation of information in transit between open systems (see ITU-T Rec. X.200 | ISO/IEC 7498) using connection-oriented or connectionless-mode transmission.

6.2 Relationship to Application Layer

NOTE – The Presentation Layer view of the Application Layer is described below.

6.2.1 An application protocol is specified in terms of the transfer of presentation data values between application-entities (PS-users), using the User data parameter of presentation-service primitives.

6.2.2 A set of presentation data value definitions associated with an application protocol constitutes an abstract syntax. For two application-entities to communicate successfully they must have an agreement on the set of abstract syntaxes they intend to use. During the course of communication they may decide to modify this agreement. As a consequence, the set of abstract syntaxes in use may be changed.

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6.2.3 The abstract syntax specification identifies the information content of the set of presentation data values. It does not identify the transfer syntax to be used while presentation data values are transferred between presentation-entities, nor is it concerned with the local representation of presentation data values.

6.2.4 The Presentation Layer exists to ensure that the information content of presentation data values is preserved during transfer. It is the responsibility of cooperating application-entities to determine the set of abstract syntaxes they employ in their communication and inform the presentation-entities of this agreement. Knowing the set of abstract syntaxes to be used by the application-entities, the presentation-entities are responsible for selecting mutually acceptable transfer syntaxes that preserve the information content of presentation data values.

NOTE – Presentation-entities have no role in determining the set of abstract syntaxes to be used by application-entities.

6.2.5 For connectionless-mode transmission, the abstract syntaxes used are determined by the sending application-entity. For successful communication to take place, these must be acceptable to the receiving application-entity.

6.2.6 For connectionless-mode transmission, the presentation-entities do not negotiate transfer syntaxes. The transfer syntaxes used are determined by the sending application-entity. For successful communication to take place, these must be acceptable to the receiving application-entity. The abstract syntaxes and the associated transfer syntaxes may be explicitly stated in the "Presentation context definition list" parameter as a user option.

6.3 Relationship to Session Layer

Presentation-entities support protocols that enhance the OSI session-service in order to provide a presentation-service with the facilities described in ITU-T Rec. X.200 | ISO/IEC 7498. The PS-user is provided with access to the session-service which permits full use to be made of that service. This includes negotiation of and access to the session functional units. The role of the Presentation Layer in providing this access includes representation of presentation data values in the User data parameters of session-service primitives.

NOTE – It is not the function of the Presentation Layer to provide dialogue control and data transfer functions additional to those provided by the session-service.

6.4 Features of the Presentation Layer

The Presentation Layer has two functions it carries out on behalf of PS-users:

a) negotiation of transfer syntaxes;

b) transformation to and from transfer syntax.

The function of transfer syntax negotiation is supported by presentation protocols; it provides presentation context definition facilities. Transformation of syntax is a function contained within a presentation-entity and has no impact on presentation protocol design. For connectionless-mode transmission, the sending presentation-entity selects the transfer syntaxes. No transfer syntax negotiation occurs.

NOTES

1 It is outside the scope of the presentation-service and presentation protocol standards to constrain or specify the abstract and transfer syntaxes supported by a particular open system. The syntaxes supported by an open system depend upon the nature of the applications in which it is involved.

2 In any real open system, presentation data values will have a local concrete syntax. Transformation to and from transfer syntax is from and to that local concrete syntax.

6.5 Negotiation of syntax

Negotiation of transfer syntax takes place between two presentation-entities when a PS-user provides the name of an abstract syntax for which a transfer syntax is required. The result of a successful negotiation is the association of the named abstract syntax with a compatible transfer syntax; such an association constitutes a presentation context. From the viewpoint of the PS-user, a presentation context represents a specific distinct use of an abstract syntax.

In general, there need not be a unique combination of abstract syntax and transfer syntax. It may be possible to represent a specific abstract syntax by one or more transfer syntaxes; also it may be possible to use one transfer syntax to represent more than one abstract syntax.

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6.6 Information transfer

6.6.1 User information is carried in User data parameters of presentation-service primitives. Each User data parameter contains one or more presentation data values. The order of these presentation data values is retained in transfer.

6.6.2 A presentation data value may be structured such that it contains nested presentation data values from other presentation contexts if this is supported by the abstract syntax in use for the presentation context.

NOTE – The structure of User data parameters of presentation-service primitives cannot be more explicitly defined at the service level. Any interface in a real open system (if such an interface exists) will define a concrete form.

6.7 Presentation context definition

6.7.1 The presentation-service provides facilities for the definition of presentation contexts that match the information transfer requirements of its users. One or more presentation context definitions fully describe the information transfer requirements of users of a presentation-connection.

6.7.2 There are three services by which presentation contexts may be defined. These are the P-CONNECT, P-ALTER-CONTEXT and the P-UNIT-DATA services. The P-ALTER-CONTEXT service also provides for the deletion of presentation contexts which are no longer required.

6.7.3 As presentation contexts are defined they are added to the DCS. The action of presentation context definition makes a presentation context available for immediate use. This enables a PS-user to identify a set of presentation contexts that are required to describe fully the flow of information between PS-users.

6.7.4 If the DCS is empty, then it is still possible to transfer presentation data values in presentation-service User data parameters; in this case all presentation data values are from the default context. Presentation data values are transferred in the default context only when the DCS is empty, or in a P-EXPEDITED-DATA service primitive. The default context may be defined using the presentation-connection establishment service (but may not be redefined by any other presentation service), or may be established by prior agreement. Presentation data values which are transferred using the P-EXPEDITED-DATA service are always from the default context.

6.8 Management of the DCS

If the context management functional unit is not selected, then the DCS will not change during the presentation-connection and the remainder of 6.8 does not apply.

6.8.1 Context management functional unit

6.8.1.1 If the context management functional unit is selected, the DCS may change during the presentation-connection. This is accomplished by using the P-ALTER-CONTEXT service. The Presentation Layer is responsible for ensuring that the DCS is identical at both ends of a presentation-connection; therefore, P-ALTER-CONTEXT is a confirmed-service. However, it is possible for certain destructive services to collide with or overtake the P-ALTER-CONTEXT service.

6.8.1.2 If a P-RESYNCHRONIZE indication service primitive is received while awaiting a P-ALTER-CONTEXT confirm service primitive, then the P-RESYNCHRONIZE service takes precedence and the P-ALTER-CONTEXT service procedure is disrupted. The DCS is indicated to the PS-user. If a P-RESYNCHRONIZE request service primitive is issued while awaiting a P-ALTER-CONTEXT confirm request service primitive, then the P-RESYNCHRONIZE service takes precedence and the P-ALTER-CONTEXT service procedure is disrupted. The DCS is indicated to the PS-user.

6.8.1.3 Interaction of the P-ACTIVITY-INTERRUPT and P-ACTIVITY-DISCARD services with the P-ALTER-CONTEXT service may cause misalignment of the DCS and subsequent transfer of data in a presentation context unknown to one of the PS-users. PS-users can avoid this situation by use of the activity token and appropriate sequencing rules.

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6.8.2 Context restoration functional unit

6.8.2.1 If the PS-user has not selected the session symmetric synchronization functional unit, the PS-user can select the context restoration functional unit. If the context restoration functional unit is not selected, the DCS may only be changed via the P-ALTER-CONTEXT service and the remainder of 6.8 does not apply. If the context restoration functional unit is selected, the presentation-service-provider will remember the DCS at specified points during the presentation-connection. If the PS-user requests a return to one of these points, the DCS will be restored to the one active at that point.

6.8.2.2 A P-RESYNCHRONIZE (restart) or (set) to a point known to the presentation-service-provider will restore the DCS to the one known at that point. If the point specified is lower than those known to the presentation-service-provider, the DCS will be restored to that defined at presentation-connection establishment. If the point specified is higher than the ones known to the presentation-service-provider or if P-RESYNCHRONIZE (abandon) is requested, the DCS will be left unchanged. If an unknown point (i.e. within the range of known points, but not known by the presentation-service-provider) is specified, the presentation-service-provider will indicate this to the PS-user and will not alter the DCS.

6.8.2.3 The DCS outside activities is the inter-activity DCS, which is defined at presentation-connection establishment and modified by any P-ALTER-CONTEXT request service primitive issued outside an activity. When an activity is started, its initial DCS is equal to the inter-activity DCS. Subsequent P-ALTER-CONTEXT request service primitives issued inside the activity alter only the DCS of that activity.

6.8.2.4 A P-ACTIVITY-END, P-ACTIVITY-INTERRUPT or P-ACTIVITY-DISCARD causes the presentation-service-provider to restore the DCS to the inter-activity DCS.

6.8.2.5 A P-ACTIVITY-RESUME will restore the DCS to that of the specified synchronization point in the specified activity (if known by the presentation-service-provider). Since this service is non-confirmed, it is possible to receive data that is in an unknown presentation context. If this happens, a P-P-ABORT indication will be issued to both PS-users.

NOTE – Control of activity identifiers is a concern of the PS-user.

7 Facilities of the service

The presentation-service comprises a number of facilities. Each facility is outlined below and the services which make up each facility are identified in Table 1.

7.1 The connection establishment facility

The connection establishment facility provides a service which allows a PS-user to establish a presentation-connection with another PS-user. The service allows the PS-users to exchange parameters through which they may establish the characteristics of the presentation-connection, in particular:

a) the presentation functional units selected;

b) the initial DCS;

c) the characteristics of the session-connection;

d) the definition of the default context.

7.2 The connection termination facility

The connection termination facility provides services which allow:

a) the orderly release of a presentation-connection by the PS-users in a way which is non-destructive;

b) the termination of a presentation-connection in a way which may be destructive; termination may be initiated by either of the PS-users or by the presentation-service-provider.

7.3 The context management facility

The context management facility provides a service which allows:

a) the addition of presentation contexts to the DCS by agreement among the two PS-users and the presentation-service-provider; an identification is associated with each defined presentation context, but this identification has no significance beyond this presentation-connection;

b) the deletion of presentation contexts from the DCS.

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Table 1 – Summary of presentation facilities, their services and purpose

Name of service	Type of service	Purpose
Connection establishment facility		
P-CONNECT	Confirmed	Connection establishment
Connection termination facility		
P-RELEASE	Confirmed	Connection release
P-U-ABORT	Non-confirmed	User-initiated abort
P-P-ABORT	Provider-initiated	Provider-initiated abort
Context management facility		
P-ALTER-CONTEXT	Confirmed	Context addition and deletion
Information transfer facility		
P-DATA	Non-confirmed	
P-TYPED-DATA	Non-confirmed	(Note)
P-EXPEDITED-DATA	Non-confirmed	
P-CAPABILITY-DATA	Confirmed	
Dialogue control facility		
P-TOKEN-GIVE	Non-confirmed	
P-TOKEN-PLEASE	Non-confirmed	
P-CONTROL-GIVE	Non-confirmed	
P-SYNC-MINOR	Optionally confirmed	(Note)
P-SYNC-MAJOR	Confirmed	
P-RESYNCHRONIZE	Confirmed	
P-U-EXCEPTION-REPORT	Non-confirmed	
P-P-EXCEPTION-REPORT	Provider-initiated	
P-ACTIVITY-START	Non-confirmed	
P-ACTIVITY-RESUME	Non-confirmed	
P-ACTIVITY-END	Confirmed	
P-ACTIVITY-INTERRUPT	Confirmed	
P-ACTIVITY-DISCARD	Confirmed	
Connectionless information transfer facility		
P-UNIT-DATA	Non-confirmed	(Note)

NOTE – The purpose of the presentation service follows that of the corresponding session serivce as specificd in ITU-T Rec. X.215 | ISO/IEC 8326.

7.4 The information transfer facility

The information transfer facility provides services which allow PS-users to exchange information over a presentation-connection. The services allow data with token control, data without token control, typed data, capability data and expedited data if corresponding session functional units are selected.

7.5 The dialogue control facility

The dialogue control facility provides services which allow token management, synchronization, resynchronization, exception reporting and activity management, if corresponding session functional units are selected. These services are mapped onto the corresponding session services. This ITU-T Recommendation | International Standard describes them only in respect of their relationships to and effects on other presentation services. The presentation-service, in certain cases, imposes additional constraints on the use of the services which directly invoke the session services; the use of these services also affects the states of the presentation-entities. These session services are more fully described in the Session Service Definition (see ITU-T Rec. X.215 | ISO/IEC 8326).

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7.6 Connectionless Information transfer facility

The connectionless-mode information transfer facility provides services which allow a PS-user to transfer a single presentation service data unit to another PS-user without the need for establishing a connection.

8 Functional units

8.1 Functional units are used by this International Standard for the purpose of identification of PS-user requirements during presentation-connection establishment.

8.2 Two categories of functional units exist

a) **session functional units,** as defined in ITU-T Rec. X.215 | ISO/IEC 8326, comprising:

- the kernel functional unit;
- the half-duplex functional unit;
- the duplex functional unit;
- the expedited data functional unit;
- the minor synchronize functional unit;
- the symmetric synchronize functional unit;
- the data separation functional unit;
- the major synchronize functional unit;
- the resynchronize functional unit;
- the activity management functional unit;
- the negotiated release functional unit;
- the capability data functional unit;
- the exceptions functional unit;
- the typed data functional unit.

The selection of session functional units which may be made is subject to the constraints imposed by the session-service, see ITU-T Rec. X.215 | ISO/IEC 8326.

NOTE – The decision of which session functional units are to be used is made during presentation-connection establishment.

b) **presentation functional units,** corresponding to services provided by the Presentation Layer, and comprising:

- the kernel functional unit;
- the context management functional unit;
- the context restoration functional unit.

8.3 The kernel functional unit is always available and supports information transfer in whatever service primitive User data parameters of those functional units which are selected. The context management functional unit and the context restoration functional unit are optional and their use is negotiable. The context restoration functional unit shall not be selected if the context management functional unit is not selected for use on the presentation-connection.

8.4 When a session functional unit is selected by the PS-users, the corresponding presentation services and functions are made available to the PS-users.

8.5 The P-UNIT-DATA service operates independently of all defined presentation functional units.

9 Quality of Service

The definition of the quality of service concept and associated parameters, as well as the way they are negotiated during the presentation-connection establishment are strictly identical with the concepts, parameters and negotiation mechanisms defined in the Session Service Definition, ITU-T Rec. X.215 | ISO/IEC 8326.

NOTE – Future extensions of this ITU-T Recommendation | International Standard may establish a use of the quality of service parameters in determining the transfer syntax to be used.

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