Recommendation X.216

PRESENTATION SERVICE DEFINITION FOR OPEN SYSTEMS INTERCONNECTION FOR CCITT APPLICATIONS[1)]

(Melbourne, 1988)

The CCITT,

considering

(a) that Recommendation X.200 defines the Reference Model of Open Systems Interconnection for CCITT applications;

(b) that Recommendation X.210 defines Service Conventions for describing the Services of the layers in the OSI Reference Model;

(c) that Recommendation X.215 defines the Session Service Definition for Open Systems Interconnection for CCITT Applications;

(d) that Recommendation X.220 specifies the use of X.200 series protocols in CCITT applications;

(e) that Recommendation X.410 - 1984 specifies the protocol for Remote Operation and Reliable Transfer Server for Message Handling Systems;

(f) that Recommendation X.226 specifies the Presentation Protocol Specification for Open Systems Interconnection for CCITT applications,

unanimously declares

that this Recommendation defines the Presentation Service of Open Systems Interconnection for CCITT Applications as given in the Scope and Field of Application.

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1) Recommendation X.216 and ISO 8822 [Information processing systems – Open Systems Interconnection – Connection oriented presentation service definition] were developed in close collaboration and are technically aligned.

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0 Introduction

This Recommendation is one of a set of Recommendations, produced to facilitate the interconnection of information processing systems. It is related to other Recommendations in the set as defined by the Reference Model for Open Systems Interconnection (Recommendation X.200). 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 recommendations, the interconnection of information processing systems

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

This Recommendation defines the service available to entities within the Application Layer of the Reference Model.

This Recommendation 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 § 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 tha the individual treatments in each layer satisfy overall QOS objectives in a consistent manner. As a consequence, an annex may be added to this Recommendation at a later time which reflects further QOS developments and integration.

1 Scope and field of application

1.1 This Recommendation 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 Recommendation is that which is provided by an OSI presentation protocol (in conjunction with the OSI session-service) and which may be used by any OSI application protocol.

1.3 This Recommendation 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 Recommendation.

2 References

Recommendation X.200	Reference Model of Open Systems Interconnection for CCITT applications (see also ISO 7498).
Recommendation X.210	OSI Layer Service Definition Conventions (see also ISO 8509).
ISO 7498-3	Information processing systems - Open Systems Interconnection - Basic Reference Model - Part 3 Naming and addressing[2] .
Recommendation X.215	Session Service Definition for Open Systems Interconnection for CCITT applications (see also ISO 8326 and ISO 8326 Addendum 2).
Recommendation X.208	Specification of Abstract Syntax Notation One (ASN.1) for CCITT applications (see also ISO 8824).
Recommendation X.226	Presentation Protocol Specification for Open Systems Interconnection for CCITT application (see also ISO 8823).
Recommendation X.410-1984	Message Handling Systems: Remote Operation and Reliable Transfer Server.

3 Definitions

3.1 *Reference Model definitions*

This Recommendation is based on the concepts developed in Recommendation X.200 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;

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[2] At present at the stage of draft.

l) concrete syntax;

m) real open system.

Note – The abbreviations in § 4 apply to some of these terms.

3.2 *Service conventions definitions*

This Recommendation makes use of the following terms defined in Recommendation X.210 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.

3.3 *Naming and Addressing definitions*

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

a) calling-presentation-address;

b) called-presentation-address;

c) responding-presentation-address.

3.4 *Presentation-service definitions*

For the purpose of this Recommendation 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.

Note 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.

Note 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.

Note 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. 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 Recommendation 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.

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

ASN.1 Abstract Syntax Notation One (see Recommendation X.208)

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 Recommendation uses the descriptive conventions defined in Recommendation X.210.

6 Overview of the Presentation Service

6.1 *Purpose*

The Presentation Layer is concerned with the presentation of information in transit between open systems (see Recommendation X.200).

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.

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.

6.3 *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 Recommendation X.200. 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.

Note 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.

Note 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.

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 two services by which presentation contexts may be defined. These are the P-CONNECT and the P-ALTER-CONTEXT 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.

6.8.2 *Context restoration functional unit*

6.8.2.1 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 rage 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. Subsequently 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/X.216.

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.

TABLE 1/X.216

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	(see Note)
P-TYPED-DATA	Non-confirmed	(see Note)
P-EXPEDITED-DATA	Non-confirmed	(see Note)
P-CAPABILITY-DATA	Confirmed	(see Note)
Dialogue control facility		
P-TOKEN-GIVE	Non-confirmed	(see Note)
P-TOKEN-PLEASE	Non-confirmed	(see Note)
P-CONTROL-GIVE	Non-confirmed	(see Note)
P-SYNC-MINOR	Optionally confirmed	(see Note)
P-SYNC-MAJOR	Confirmed	(see Note)
P-RESYNCHRONIZE	Confirmed	(see Note)
P-U-EXCEPTION-REPORT	Non-confirmed	(see Note)
P-P-EXCEPTION-REPORT	Provider-initiated	(see Note)
P-ACTIVITY-START	Non-confirmed	(see Note)
P-ACTIVITY-RESUME	Non-confirmed	(see Note)
P-ACTIVITE-END	Confirmed	(see Note)
P-ACTIVITY-INTERRUPT	Confirmed	(see Note)
P-ACTIVITY-DISCARD	Confirmed	(see Note)

Note – The purpose of the presentation service follows that of the corresponding session service as specified in Recommendation 215.

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.

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 Recommendation 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 Recommendation X.215).

8 Functional units

8.1 Functional units are used by this Recommendation 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 Recommendation X.215, comprising:

1) the kernel functional unit;
2) the half-duplex functional unit;
3) the duplex functional unit;
4) the expedited data functional unit;
5) the minor synchronize functional unit;
6) the major synchronize functional unit;
7) the resynchronize functional unit;
8) the activity management functional unit;
9) the negotiated release functional unit;
10) the capability data functional unit;
11) the exceptions functional unit;
12) 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 Recommendation X.215.

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:

1) the kernel functional unit;

2) the context management functional unit;

3) 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.

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, Recommendation X.215.

Note–- Future extensions of this Recommendation may establish a use of the quality of service parameters in determining the transfer syntax to be used.

10 Presentation Service Primitives

This Recommendation uses the abstract model for a layer service defined in Recommendation X.210. The model defines the interactions between the PS-user and the presentation-service-provider which take place at the two PSAPs. Information is passed between the PS-user and the presentation-service-provider by service primitives, which may convey parameters.

Table 2/X.216 lists the presentation-service primitives by which information is transferred to and from the PS-user.

The sequencing procedures for all services are specified in § 11.

Note – For all services which carry user data, excluding P-DATA and P-TYPED-DATA, it may not be possible to exchange PS-user data, dependent on the transfer syntax in use and the SS-user data length limitation supported by the underlying session-service. The way in which the PS-user is made aware of this is a local matter.

10.1 *User data parameters*

The information in the User data parameters of the P-EXPEDITED-DATA request and indication service primitives shall always be one or more presentation data values from the default context. The information in the User data parameters of all other presentation-service primitives shall be one or more presentation data values from presentation contexts determined by the rules governining the DCS. Any embedded presentation data values shall be from presentation contexts determined by these rules. These rules are:

a) If the DCS is empty and d) does not apply, then each presentation data value (including any embedded presentation data values) shall be from the default context.

b) If the DCS is not empty and no procedure is in progress which can amend the contents of the DCS, then each presentation data value (including any embedded presentation data values) shall be from a presentation context of the DCS.

c) If the procedure for the service primitive containing the User data parameter amends the DCS, then each presentation data value (including any embedded presentation data values) shall be from a presentation context of the DCS which results from this amendment, or from the default context if this amendment leaves the DCS empty.

d) If a confirm service primitive is awaited which will confirm a proposed amendment to the DCS then each presentation data value (including any embedded presentation data values) shall be from a presentation context of the DCS which was not proposed for deletion from the DCS. If this leaves no presentation contexts available, then there shall be no User data parameter in the service primitive.

TABLE 2/X.216

Presentation service primitives

PARAMETER	SERVICE PRIMITIVE
F-CONNECT request	Calling-presentation-address Called-presentation-address Presentation context definition list Default context name Quality of service Presentation requirements Mode Session requirements Initial synchronization point serial number Initial assignment of tokens Session connection identifier User data
P-CONNECT indication	Calling-presentation-address Called-presentation-address Presentation context definition list Presentation context definition result list Default context name Quality of service Presentation requirements Mode Session requirements Initial synchronization point serial number Initial assignment of tokens Session connection identifier User data
P-CONNECT response P-CONNECT confirm	Responding-presentation-address Presentation context definition result list Default context result Quality of service Presentation requirements Session requirements Initial synchronization point serial number Initial assignment of tokens Session connection identifier Result User data
P-RELEASE request P-RELEASE indication	User data
P-RELEASE response P-RELEASE confirm	Result User data

TABLE 2/X.216 *(cont.)*

PARAMETER	SERVICE PRIMITIVE
P-U-ABORT request P-U-ABORT indication	User data
P-P ABORT indication	Provider reason
P-ALTER-CONTEXT request	Presentation context addition list Presentation context deletion list User data
P-ALTER-CONTEXT indication	Presentation context addition list Presentation context deletion list Presentation context addition result list User data
P-ALTER-CONTEXT response P-ALTER-CONTEXT confirm	Presentation context addition result list Presentation context deletion result list User data
P-DATA request P-DATA indication	User data
P-TYPED-DATA request P-TYPED-DATA indication	User data
P-EXPEDITED-DATA request P-EXPEDITED-DATA indication	User data
P-CAPABILITY-DATA request P-CAPABILITY-DATA indication	User data
P-CAPABILITY-DATA response P-CAPABILITY-DATA confirm	User data
P-TOKEN-GIVE request P-TOKEN-GIVE indication	Tokens
P-TOKEN-PLEASE request P-TOKEN-PLEASE indication	Tokens User data
P-CONTROL-GIVE request P-CONTROL-GIVE indication	
P-SYNC-MINOR request P-SYNC-MINOR indication	Type Synchronization point serial number User data
P-SYNC-MINOR response P-SYNC-MINOR confirm	Synchronization point serial number User data
P-SYNC-MAJOR request P-SYNC-MAJOR indication	Synchronization point serial number User data
P-SYNC-MAJOR response P-SYNC-MAJOR confirm	User data

TABLE 2/X.216 *(Cont.)*

PARAMETER	SERVICE PRIMITIVE
P-RESYNCHRONIZE request	Resynchronize type Synchronization point serial number Tokens User data
P-RESYNCHRONIZE indication	Resynchronize type Synchronization point serial number Tokens Presentation context identification list User data
P-RESYNCHRONIZE response	Synchronization point serial number Tokens User data
P-RESYNCHRONIZE confirm	Synchronization point serial number Tokens Presentation context identification list User data
P-U-EXCEPTION-REPORT request P-U-EXCEPTION-REPORT indication	Reason User data
P-P-EXCEPTION-REPORT indication	Reason
P-ACTIVITY-START request P-ACTIVITY-START indication	Activity identifier User data
P-ACTIVITY-RESUME request P-ACTIVITY-RESUME indication	Activity identifier Old activity identifier Synchronization point serial number Old session connection identifier User data
P-ACTIVITY-END request P-ACTIVITY-END indication	Synchronization point serial number User data
P-ACTIVITY-END response P-ACTIVITY-END confirm	User data
P-ACTIVITY-INTERRUPT request P-ACTIVITY-INTERRUPT indication	Reason
P-ACTIVITY-INTERRUPT response P-ACTIVITY-INTERRUPT confirm	
P-ACTIVITY-DISCARD request P-ACTIVITY-DISCARD indication	Reason
P-ACTIVITY-DISCARD response P-ACTIVITY-DISCARD confirm	

10.2 *P-CONNECT service*

This service is used to bring two identified PS-users into communication. Its successful use results in a presentation-connection, with an initial DCS, being established between them. This presentation-connection is available for their subsequent communication. This is a non-destructive service.

10.2.1 *Structure*

Note – There may be a session-service data size dependent limitation on this presentation service. This may prevent the delivery of the P-CONNECT indication and/or confirm service primitives.

The structure of the service primitives is shown in Table 3/X.216.

TABLE 3/X.216

P-CONNECT service primitive structure

Parameter name	Request	Indication	Response	Confirm
Calling-presentation-address	M	M		
Called-presentation-address	M	M		
Responding-presentation-address			M	M
Presentation context definition list	U	C(=)		
Presentation context definition result list		C	C	C(=)
Default context name	U	C(=)		
Default context result (Note)			C	C(=)
Quality of service	S	S	S	S
Presentation requirements	U	C	U	C(=)
Mode	M	M(=)		
Session requirements	S	S	S	S
Initial synchronization point serial number	S	S	S	S
Initial assignment of tokens	S	S	S	S
Session connection identifier		S	S	S
User data	U	C(=)	U	C(=)
Result (Note)			M	M(=)

M: presence of the parameter is mandatory;

U: presence of the parameter is a user option;

C: presence of the parameter is conditional;

S: parameter is as required by the session-service primitive which supports this service (see Recommendation X.215);

(=): when appended to one of the above, the value of the parameter is equal to the value of the parameter indicated in the column to the left;

blank: the parameter is not present.

Note – When the presentation-connection establishment request is rejected by the presentation-service-provider, the value of this parameter is provider-generated.

10.2.1.1 *Calling-presentation-address*

This is a presentation-address (see ISO 7498-3).

10.2.1.2 *Called-presentation-address*

This is a presentation-address (see ISO 7498-3).

10.2.1.3 *Responding-presentation-address*

This is a presentation-address (see ISO 7498-3).

10.2.1.4 *Presentation context definition list*

This parameter is present when the PS-user requires to place one or more presentation contexts in the DCS at the time of presentation-connection establishment. It consists of a list containing one or more items; each item contains two components, a presentation context identifiction and an abstract syntax name.

The presentation context identification components of this parameter exist to distinguish presentation contexts in communication between the PS-user and the local presentation-entity. The unambiguous identification of the presentation context to be established is required. The way this is achieved in a real open system is an implementation matter.

Note – A separate presentation context is associated with each abstract syntax name in the list of names in the Presentation context definition list parameter. If the same name occurs more than once, a separate and distinctly identified presentation context is generated for each occurrence.

10.2.1.5 *Presentation context definition result list*

This parameter indicates the acceptance or rejection of each of the presentation context definitions proposed in the Presentation context definition list parameter; it shall be present only if the Presentation context definition list parameter is present on the request and indication service primitives. The parameter takes the form of a list of result values; there is a one-to-one correspondence between these list elements and the contents of the presentation context definition list parameter. Each result value represents either “acceptance”, “user-rejection”, “user-rejection” or “provider-rejection”. The values of the elements in this parameter are assigned by the presentation-service-provider on the indication service primitive and by the PS-user on the response service primitive.

When present in the indication service primitive, this parameter is used to identify to the responding PS-user, those proposed presentation context definitions which cannot be supported by the presentation-service-provider, by assigning the value “provider-rejection” to the appropriate list element. All other elements are assigned the value “acceptance”, and the responding PS-user is restricted to modifying the value of only these accepted elements.

Values of this parameter in the response service primitive are delivered unchanged in the confirm service primitive.

10.2.1.6 *Default context name*

This parameter is present when the PS-user requires to identify explicitly the abstract syntax supported by the default context. It identifies an abstract syntax name.

10.2.1.7 *Default context result*

This parameter is provided by the responding PS-user or the presentation-service-provider. It indicates acceptance or rejection of a proposed default context, and is present if, and only if, the default context name parameter was present on the request and indication service primitives. On the response service primitive, it shall take the value “acceptance” or “user-rejection” as selected by the PS-user. On the confirm service primitive, it shall take the value from the response service primitive, or the value “provider-rejection” if the proposed default context is refused by the presentation-service-provider.

10.2.1.8 *Quality of Service*

This parameter provides the PS-user with access to the Quality of Service parameter of the session-service and is as described for that parameter in Recommendation X.215.

10.2.1.9 *Presentation requirements*

This parameter is present when the PS-user requires to select optional functional units of the presentation-service.

10.2.1.10 *Mode*

This parameter indicates the mode of operation of the Presentation Layer. It takes the value either "normal" or "X.410-1984". If the value is "normal", the mode of operation of the Presentation Layer is the normal mode. If the value is "X.410-1984", the mode of operation of the Presentation Layer is the X.410-1984 mode. In this mode of operation, the following restrictions apply:

a) the following parameters shall be absent in the P-CONNECT request service primitive: Presentation context definition list, Default context name, and Presentation requirements;

b) restrictions apply to the User data parameters of certain presentation-service primitives; these are listed in annex A.

10.2.1.11 *Session requirements*

This parameter provides the PS-user with access to the Session requirements parameter of the session-service and is as described for that parameter in Recommendation X.215.

10.2.1.12 *Initial synchronization point serial number*

This parameter provides the PS-user with access to the Initial synchronization point serial number parameter of the session-service and is as described for that parameter in Recommendation X.215.

10.2.1.13 *Initial assignment of tokens*

This parameter provides the PS-user with access to the Initial assignment of tokens parameter of the session-service and is as described for that parameter in Recommendation X.215.

10.2.1.14 *Session connection identifier*

This parameter provides the PS-user with access to the Session connection identifier parameter of the session-service and is as described for that parameter in Recommendation X.215.

10.2.1.15 *User data*

On all P-CONNECT service primitives, this parameter is one or more presentation data values (including any embedded presentation data values) from presentation contexts proposed in the Presentation context definition list parameter, if present; if the Presentation context definition list parameter is not present, then the User data parameter is one or more presentation data values from the proposed default context (either implicitly or explicitly defined in the P-CONNECT request).

10.2.1.16 *Result*

This parameter is provided by the responding PS-user or presentation-service-provider. It indicates the result of using the P-CONNECT service. The value of this parameter is one of:

a) "acceptance";

b) "user-rejection";

c) "provider-rejection".

The reasons for rejection of the presentation-connection are to be defined[3)] .

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3) It is recognized that, with respect to reason values, work is still in progress to provide an integrated treatment across all the layers of the OSI Reference Model. As a consequence, an annex may be added to this Recommendation at a later time which reflects further developments and integration.

10.2.2 *Connection procedure*

10.2.2.1 The presentation-service-provider conveys the Calling-presentation-address, Called-presentation-address, Mode, Initial synchronization point serial number, Initial assignment of tokens, Session connection identifier, and User data parameters unchanged from the initiating to the responding PS-user. The presentation-service-provider conveys the Responding-presentation-address, Initial synchronization point serial number, Initial assignment of tokens, Session connection identifier, and User data parameters unchanged from the responding to the initiating PS-user.

10.2.2.2 The connection characteristics specified by the Presentation requirements, Session requirements and Quality of Service parameters are subject to agreement between the PS-users and the presentation-service-provider. This agreement is achieved by a negotiation mechanism in which the presentation-service provider reserves the right to modify the values of these parameters specified in a request service primitive prior to their delivery in an indication service primitive. The values of these parameters in a response service primitive are delivered unchanged in a confirm service primitive and subject to the conditions below:

a) For the Presentation requirements and Session requirements parameters, the PS-user shall not select a functional unit in the response service primitive which was not selected in the indication service primitive.

b) The values of the Quality of Service parameter are subject to the negotiation rules specified in Recommendation X.215.

10.2.2.3 The Presentation context definition list parameter is optional in the P-CONNECT request service primitive; in its absence, the DCS is empty. When this parameter is present, the presentation contexts it specifies are available for use in the User data parameter; in its absence, only the default context is available for use.

If the Presentation context definition list parameter is present in the P-CONNECT request service primitive, then it shall also be present in the P-CONNECT indication service primitive if issued, together with the Presentation context definition result list parameter. In this case, the Presentation context definition result list parameter shall also be present in the P-CONNECT response and confirm service primitives.

10.2.2.4 The Default context name parameter is optional in the P-CONNECT request service primitive; if it is absent then the presentation-service-provider assumes that there is prior agreement on the definition of the default context. When present, this parameter specifies the abstract syntax supported by the default context.

If this parameter is present in the P-CONNECT request service primitive but cannot be supported by the presentation-service-provider, then no indication shall be issued and the initiating PS-user will receive a P-CONNECT confirm service primitive with a Default context result parameter value of “provider-rejection” and a Result parameter value of “provider-rejection”.

If the presentation-service-provider supports the default context, then an indication shall be issued to the responding PS-user. If in the response and confirm service primitives, the Default context result parameter takes the value “User-rejection”, then the Result parameter of these service primitives shall also take the value “user-rejection”.

10.2.2.5 If any part of the User data parameter of the P-CONNECT request service primitive cannot be transferred to the responding PS-user, then no indication shall be issued and the initiating PS-user will receive a P-CONNECT confirm service primitive with a Result parameter value of “provider-rejection”.

10.2.2.6 If the PS-user issues a P-CONNECT response service primitive with a Result parameter value of “acceptance”, then the P-CONNECT confirm service primitive shall be issued with a Result parameter value of “acceptance” and the presentation-connection is established. If the PS-user issues a P-CONNECT response service primitive with a Result parameter value of “user-rejection”, then the P-CONNECT confirm service primitive shall be issued with a Result parameter value of “user-rejection” together with any user data which was present on the response service primitive; the presentation-connection is not established. The responding PS-user shall not issue a P-CONNECT response service primitive with a Result parameter value of “acceptance” and a Default context result parameter value of “user-rejection”.

10.2.2.7 If a P-CONNECT confirm service primitive is not acceptable to a PS-user, the PS-user may subsequently issue a P-U-ABORT request service primitive.

10.3 *P-U-ABORT service*

This service can be used by either PS-user to force the release of a presentation-connection at any time and have the peer PS-user informed of this termination. This service has effects which may not be sequenced with respect to preceding service invocations and its invocation is destructive.

10.3.1 *Structure*

The structure of the component service primitives is shown in Table 4/X.216.

10.3.1.1 *User data*

The presentation data values (including any embedded presentation data values) in this parameter are passed between PS-users and obey the rules of § 10.1; the interpretation of this data is an Application Layer matter. No other significance is attached to this data by the presentation-service. It can therefore be used for passing user reason information.

Note – If presentation data value is received from a proposed but not yet acknowledged presentation context, it is assumed that the P-U-ABORT overtook the acknowledgement. In this case the data is accepted and delivered as though the acknowledgement had been received.

TABLE 4/X.216

P-U-ABORT service

Parameter name	Request	Indication
User data	U	C(=)

U: presence of the parameter is a user option;

C: presence of the parameter is conditional;

(=) when appended to one of the above, the value of the parameter is equal to the value of the parameter indicated in the column to the left.

10.4 *P-P-ABORT service*

This service is the means by which the presentation-service-provider may indicate the termination of the presentation-connect for reasons internal to the presentation-service-provider. This service has effects which may not be sequenced with respect to preceding service invocations and its invocation is destructive.

10.4.1 *Structure*

The structure of the component service primitives is shown in Table 5/X.216.

TABLE 5/X.216

P-P-ABORT service

Parameter name	Indication
Provider reason	M

M: presence of the parameter is mandatory.

10.4.1.1 *Provider reason*

This parameter indicates the reason for the termination of the presentation-connection.

10.5 *P-ALTER-CONTEXT service*

Note–- This service is only available when the context management functional unit has been selected during presentation-connection establishment.

This service provides the following presentation context management facilities:

a) the creation of presentation contexts and their addition to the DCS;

b) the deletion of presentation contexts from the DCS.

This service has effects which are sequenced with respect to preceding service invocations and is non-destructive.

10.5.1 *Structure*

The structure of the component service primitives is shown in Table 6/X.216.

TABLE 6/X.216

P-ALTER-CONTEXT service

Parameter name	Request	Indication	Response	Confirm
Presentation context addition list	U	C(=)		
Presentation context deletion list	U	C(=)		
Presentation context addition result list		C	U	C(=)
Presentation context deletion result list			U	C(=)
User data	U	C(=)	U	C(=)

U: presence of the parameter is a user option;

C: presence of the parameter is conditional;

(=): when appended to one of the above, the value of the parameter is equal to the value of the parameter indicated in the column to the left;

blank: the parameter is not present.

10.5.1.1 *Presentation context addition list*

This parameter enables presentation context addition requirements to be specified. It takes the form of a list. Each item of the list represents a specification for a presentation context to be created and added to the DCS. An item contains two components, a presentation context identification and an abstract syntax name; these are both provided by the requestor of the service.

The presentation context identification components of this parameter exist to distinguish identification contexts in communication between the PS-user and the local identification-entry. The unambiguous identification of the identification context to be established is required. The way this is achieved in a real open system is an implementation matter.

Note – A separate presentation component is associated with each abstract syntax name in the list of names in the Presentation context addition list parameter. If the same name occurs more than once, or has been used in an earlier identification context addition, a separate and distinctly identified identification context is generated for each occurrence.

10.5.1.2 *Presentation context deletion list*

This parameter enables presentation context deletion requirements to be specified. It takes the form of a list. Each item in the list is the presentation context identification of a presentation context that is to be removed from the DCS.

10.5.1.3 *Presentation context addition result list*

This parameter indicates the acceptance or rejection of each of the presentation context additions proposed in the Presentation context addition list parameter; it shall be present only if the Presentation context addition list parameter is present on the request and indication service primitives. The parameter takes the form of a list of result values; there is a one-to-one order-preserving correspondence between these list elements and the contents of the presentation context addition list. Each result value represents either "acceptance", "user-rejection" or "provider-rejection". The values of the elements in this parameter are assigned by the presentation-service-provider on the indication service primitive and by the PS-user on the response service primitive.

When present in the indication service primitive, this parameter is used to identify to the accepting PS-user, those proposed presentation context additions which cannot be supported by the presentation-service-provider, by assigning the value "provider-rejection" to the appropriate list element. All other elements are assigned the value "acceptance", and the accepting PS-user is restricted to modifying the value of only these accepted elements.

Absence of this parameter is equivalent to acceptance of all proposed presentation context additions. Values of this parameter in the response service primitive are delivered unchanged in the confirm service primitive.

10.5.1.4 *Presentation context deletion result list*

This parameter indicates the acceptance or rejection of each of the presentation context deletions proposed in the Presentation context deletion list parameter; it shall be present only if the Presentation context deletion list parameter is present on the request and indication service primitives. The parameter takes the form of a list of result values; there is a one-to-one, order-preserving correspondence between these list elements and the contents of the presentation context deletion list. Each result value represents either acceptance or rejection by the PS-user.

Absence of this parameter is equivalent to acceptance of all proposed presentation context deletions. Values of this parameter in the response service primitive are delivered unchanged in the confirm service primitive.

10.5.1.5 *User data*

This parameter contains presentation data values (including any embedded presentation data values) from presentation contexts of the DCS, or from the default context if the DCS is empty. See § 10.5.2.

10.5.2 *Alter context procedure*

10.5.2.1 The accepted modifications to the DCS become effective:

a) for the acceptor when issuing the response service primitive;

b) for the requestor upon receiving the confirm service primitive.

A presentation context added to the DCS may be used for presentation data values of the User data parameter in the P-ALTER-CONTEXT response and confirm service primitives. A presentation context removed from the DCS may not be used for presentation data values of the User data parameter in the P-ALTER-CONTEXT response and confirm service primitives.

10.5.2.2 If the DCS is empty prior to invoking the P-ALTER-CONTEXT request service primitive, then the requestor shall use only the default context for the User data parameter. Moreover, while the P-ALTER-CONTEXT confirm service primitive is awaited, the requestor shall not issue presentation-service primitives containing User data parameters other than P-EXPEDITED, P-U-EXCEPTION-REPORT, P-RESYNCHRONIZE or P-U-ABORT.

10.5.2.3 If the DCS becomes empty as a result of the invocation of this service, then the acceptor shall use only the default context for the User data parameter of response and confirm service primitives.

10.6 *P-TYPED-DATA service*

This service provides the PS-user with access to the S-TYPED-DATA service of the Session Layer as described in the Session Service Definition (Recommendation X.215). This service has effects which are sequenced with respect to preceding service invocations and is non-destructive.

10.6.1 *Structure*

The structure of the component service primitives is shown in Table 7/X.216.

TABLE 7/X.216

P-TYPED-DATA service

Parameter name	Request	Indication
User data	M	M(=)

M: presence of the parameter is mandatory;

(=): when appended to one of the above, the value of the parameter is equal to the value of the parameter indicated in the column to the left.

10.6.1.1 *User data*

The presentation data values (including any embedded presentation data values) in this parameter are passed between PS-users and obey the rules of § 10.1; the interpretation of this data is an Application Layer matter. No other significance is attached to this data by the presentation-service.

10.7 *P-DATA service*

This service provides the PS-user with access to the S-DATA service of the Session Layer as described in the Session Service Definition (Recommendation X.215). This service has effects which are sequenced with respect to preceding service invocations and is non-destructive.

10.7.1 *Structure*

The structure of the component service primitives is shown in Table 8/X.216.

TABLE 8/X.216

P-DATA service

Parameter name	Request	Indication
User data	M	M(=)

M: presence of the parameter is mandatory;

(=): when appended to one of the above, the value of the parameter is equal to the value of the parameter indicated in the column to the left.

10.7.1.1 *User data*

The presentation data values (including any embedded presentation data values) in this parameter are passed between PS-users and obey the rules of § 10.1; the interpretation of this data is an Application Layer matter. No other significance is attached to this data by the presentation-service.

10.8 *P-RESYNCHRONIZE service*

This service provides the PS-user with access to the S-RESYNCHRONIZE session service as described in the Session Service Definition, Recommendation X.215. This service has effects which may not be sequenced with respect to preceding service invocations and is destructive.

10.8.1 *Structure*

The structure of the component service primitives is shown in Table 9//X.216.

TABLE 9/X.216

P-RESYNCHRONIZE service

Parameter name	Request	Indication	Response	Confirm
Resynchornization type	S	S		
Synchronization point serial number	S	S	S	S
Tokens	S	S	S	S
Presentation context identification list		C		C
User data	U	C(=)	U	C(=)

U: presence of the parameter is a user option;

C: presence of the parameter is conditional;

S: parameter is as required by the session-service primitive which supports this service (see Recommendation X.215);

(=): when appended to one of the above, the value of the parameter is equal to the value of the parameter indicated in the column to the left;

blank: the parameter is not present.

10.8.1.1 *Resynchronize type*

This parameter provides the PS-user with access to the Resynchronize type parameter of the resynchronize session service as described in Recommendation X.215.

10.8.1.2 *Synchronization point serial number*

This parameter provides the PS-user with access to the Synchronization point serial number of the resynchronize session service as described in Recommendation X.215.

10.8.1.3 *Tokens*

This parameter provides the PS-user with access to the Tokens parameter of the resynchronize session service as described in Recommendation X.215.

10.8.1.4 *Presentation context identification list*

This parameter consists of a list containing zero, one or more items; each item consists of a presentation context identification. This parameter is provided by the presentation-service-provider, see § 10.8.2.3.

10.8.1.5 *User data*

The presentation data values (including any embedded presentation data values) in this parameter are passed between PS-users and obey the rules of § 10.1; the interpretation of this data is an Application Layer matter. No other significance is attached to this data by the presentation-service.

10.8.2 *Resynchronization procedure*

10.8.2.1 The presentation-service-provider conveys the session defined parameters between the PS-users as specified by the session-service.

10.8.2.2 If the context management functional unit is not selected, then the Presentation context identification list parameter is not present. In this case, the contents of the DCS do not vary during the presentation connection.

10.8.2.3 If the context management functional unit is selected, then the Presentation context identification list parameter is present in the parameter P-RESYNCHRONIZE indication and confirm service primitives. This parameter lists all the presentation contexts that are members of the DCS.

The User data parameter in the P-SYNCHRONIZE service primitives contains presentation data values from presentation contexts which are members of the DCS at the invocation of the request or response service primitive respectively, but if a P-ALTER-CONTEXT confirm service primitive is awaited, then presentation contexts proposed for deletion may not be used.

10.8.2.4 If the context restoration functional unit is selected and the resynchronize type is either “restart” or “set”, then the DCS may be restored when the request, indication, and confirm service primitives are invoked, according to the following rules:

a) If the specified synchronization point serial number is less than or equal to the lowest synchronization point serial number that has been used on the presentation-connection and has not been specified in a P-SYNC-MAJOR or P-SYNC-MINOR request or indication service primitive on the current presentation-connection, then the DCS is restored to that immediately after presentation-connection establishment;

b) If the specified synchronization point serial number minus one has been specified in P-SYNC-MINOR or P-SYNC-MAJOR request or indication service primitive on the current presentation-connection, then the DCS is restored to that which was current at the invocation of the P-SYNC-MINOR or P-SYNC-MAJOR service;

c) If the specified synchronization point serial number is greater than the current synchronization point serial number for either of the PS-users or greater than the lowest synchronization point serial number used on the presentation-connection but is not known to one of the presentation-entities, then the resulting DCS is unchanged.

On completion of this, any previous P-SYNC-MINOR or P-SYNC-MAJOR specifying greater synchronization point serial numbers are disregarded in evaluating future P-RESYNCHRONIZE and P-ACTIVITY-RESUME procedures.

If the activity management functional unit has been selected for use on the presentation-connection, then only the P-SYNC-MAJOR and P-SYNC-MINOR service primitives within the current activity are taken into account. (See also § 10.22.2.)

10.9 *P-ACTIVITY-START service*

This service provides the PS-user with access to the S-ACTIVITY-START session service as described in Recommendation X.215. This service has effects which are sequenced with respect to preceding service invocations and is non-destructive.

10.9.1 *Structure*

The structure of the component service primitives is shown in Table 10/X.216.

TABLE 10/X.216

P-ACTIVITY-START service

Parameter name	Request	Indication
Activity identifier	S	S
User data	U	C(=)

U: presence of the parameter is a user option;

C: presence of the parameter is conditional;

S: parameter is as required by the session-service primitive which supports this service (see Recommendation X.215);

(=): when appended to one of the above, the value of the parameter is equal to the value of the parameter indicated in the column to the left.

10.9.1.1 *Activity identifier*

If the context restoration functional unit is selected, this parameter shall uniquely identify the activity within the set of previously interrupted activities.

Note – If either the PS-user can resume an interrupted activity, the Activity identifier parameter value should be different from the Activity identifier parameter values of all interrupted activities which were started by this PS-user.

10.9.1.2 *User data*

The presentation data values (including any embedded presentation data values) in this parameter are passed between PS-users and obey the rules of § 10.1; the interpretation of this data is an Application Layer matter. No other significance is attached to this data by the presentation-service.

10.10 *P-ACTIVITY-RESUME service*

This service provides the PS-user with access to the S-ACTIVITY-RESUME session service as described in Recommendation X.215. This service has effects which are sequenced with respect to preceding service invocations and is non-destructive.

10.10.1 *Structure*

The structure of the component service primitives is shown in Table 11/X.216.

10.10.1.1 *Activity identifier*

This parameter provides the PS-user with access to the Activity identifier parameter of the session activity resume service as described in Recommendation X.215.

10.10.1.2 *Old activity identifier*

This parameter provides the PS-user with access to the Old activity identifier parameter of the session activity resume service as described in Recommendation X.215. This parameter shall uniquely identify the activity within the set of interrupted activities.

TABLE 11/X.216

P-ACTIVITY-RESUME service

Parameter name	Request	Indication
Activity identifier	S	S
Old activity identifier	S	S
Synchronization point serial number	S	S
Old session connection identifier	S	S
User data	U	C(=)

U: presence of the parameter is a user option;

C: presence of the parameter is conditional;

S: parameter is as required by the session-service primitive which supports this service (see Recommendation X.215);

(=): when appended to one of the above, the value of the parameter is equal to the value of the parameter indicated in the column to the left.

10.10.1.3 *Synchronization point serial number*

This parameter provides the PS-user with access to the Synchronization point serial number parameter of the session activity resume service as described in Recommendation X.215.

10.10.1.4 *Old session connection identifier*

This parameter provides the PS-user with access to the Old session connection identifier parameter of the session activity resume service as described in Recommendation X.215.

10.10.1.5 *User data*

The presentation data values (including any embedded presentation data values) in this parameter are passed between PS-users and obey the rules of § 10.1; the interpretation of this data is an Application Layer matter. No other significance is attached to this data by the presentation-service.

10.10.2 *Activity resume procedure*

10.10.2.1 The presentation-service-provider conveys the session defined parameters between the PS-users as specified by the session-service.

10.10.2.2 If the context restoration functional unit is not selected, then the DCS is unchanged.

10.10.2.3 If the context restoration functional unit is selected, then the DCS is specified as follows:

a) If the Old activity identifier parameter is equal to the Activity identifier parameter of an activity interrupted within the presentation-connection, then the DCS is restored to the one at the time that the value of the Synchronization point serial number parameter was specified in a S-SYNC-MINOR or S-SYNC-MAJOR service within the activity.

b) If the value of the Synchronization point serial number parameter had not been so specified within the activity in this presentation-connection, then the DCS is unchanged.

On completion of this, any previously invoked P-SYNC-MINOR or P-SYNC-MAJOR service, specifying greater synchronization point serial numbers are disregarded in evaluating future P-RESYNCHRONIZE and P-ACTIVITY-RESUME procedures.

Note – When the context restoration functional unit is selected, use of this non-confirmed-service without protection against crossing with P-DATA or P-TYPED-DATA services may result in a P-P-ABORT due to unreadable User-data. Such collisions may be avoided by strict separation of data exchanged outside of activity from that exchanged within an activity.

10.11 *P-ACTIVITY-INTERRUPT service*

This service provides the PS-user with access to the S-ACTIVITY-INTERRUPT session service as described in Recommendation X.215. This service has effects which may not be sequenced with respect to preceding service invocations and is destructive.

10.11.1 *Structure*

The structure of the component service primitives is shown in Table 12/X.216.

TABLE 12/X.216

P-ACTIVITY-INTERRUPT service

Parameter name	Request	Indication	Response	Confirm
Reason	S	S		

S: parameter is as required by the session-service primitive which supports this service (see Recommendation X.215);

blank: the parameter is not present.

10.11.1.1 *Reason*

This parameter provides the PS-user with access to the Reason parameter of the session activity interrupt service as described in Recommendation X.215.

10.11.2 *Activity interrupt procedure*

10.11.2.1 If the context restoration functional unit is not selected, then no action is taken on the DCS.

10.11.2.2 If the context restoration functional unit is selected, then the DCS is aligned with the inter-activity DCS on the issuing of the response and confirm service primitives for this service.

10.11.2.3 Any P-ACTIVITY-INTERRUPT service primitive issued outside of an activity shall have no effect on the DCS.

10.12 *P-ACTIVITY-DISCARD service*

This service provides the PS-user with access to the S-ACTIVITY-DISCARD session service as described in Recommendation X.215. This service has effects which may not be sequenced with respect to preceding service invocations and is destructive.

10.12.1 *Structure*

The structure of the component service primitives is shown in Table 13/X.216.

TABLE 13/X.216

P-ACTIVITY-DISCARD service

Parameter name	Request	Indication	Response	Confirm
Reason	S	S		

S: parameter is as required by the session-service primitive which supports this service (see Recommendation X.215);

blank: the parameter is not present.

10.12.1.1 *Reason*

This parameter provides the PS-user with access to the Reason parameter of the session activity discard service as described in Recommendation X.215.

10.12.2 *Activity discard procedure*

10.12.2.1 If the context restoration functional unit is not selected, then no action is taken on the DCS.

10.12.2.2 If the context restoration functional unit is selected, then the DCS is aligned with the inter-activity DCS on the issuing of the response and confirm service primitives for this service.

10.13 *P-ACTIVITY-END service*

This service provides the PS-user with access to the S-ACTIVITY-END session service as described in Recommendation X.215. This service has effects which are sequenced with respect to preceding service invocations and is non-destructive.

10.13.1 *Structure*

The structure of the component service primitives is shown in Table 14/X.216.

10.13.1.1 *Synchronization point serial number*

This parameter provides the PS-user with access to the Synchronization point serial number parameter of the session activity end service as described in Recommendation X.215.

10.13.1.2 *User data*

The presentation data values (including any embedded presentation data values) in this parameter are passed between PS-users and obey the rules of § 10.1; the interpretation of this data is an Application Layer matter. No other significance is attached to this data by the presentation-service.

TABLE 14/X.216

P-ACTIVITY-END service

Parameter name	Request	Indication	Response	Confirm
Synchronization point serial number	S	S		
User data	U	C(=)	U	C(=)

U: presence of the parameter is a user option;

C: presence of the parameter is conditional;

S: parameter is as required by the session-service primitive which supports this service (see Recommendation X.215);

(=): when appended to one of the above, the value of the parameter is equal to the value of the parameter indicated in the column to the left;

blank: the parameter is not present.

10.13.2 *Activity-End procedure*

10.13.2.1 The presentation-service-provider conveys the session defined parameters between the PS-users as specified by Recommendation X.215.

10.13.2.2 If the context restoration functional unit is not selected, then no action is taken on the DCS.

10.13.2.3 If the context restoration functional unit is selected, then the DCS is aligned with the inter-activity DCS on the issuing of the response and confirm service primitives for this service.

10.14 *P-CAPABILITY-DATA service*

This service provides the PS-user with access to the S-CAPABILITY-DATA service of the Session Layer as described in Recommendation X.215. This service has effects which are sequenced with respect to preceding service invocations and is non-destructive.

10.14.1 *Structure*

The structure of the component service primitives is shown in Table 15/X.216.

TABLE 15/X.216

P-CAPABITILITY-DATA service

Parameter name	Request	Indication	Response	Confirm
User data	U	C(=)	U	C(=)

U: presence of the parameter is a user option;

C: presence of the parameter is conditional;

(=): when appended to one of the above, the value of the parameter is equal to the value of the parameter indicated in the column to the left.

10.14.1.1 *User data*

The parameter data values (including any embedded presentation data values) in this parameter are passed between PS-users and obey the rules of § 10.1; the interpretation of this data is an Application Layer matter. No other significance is attached to this data by the presentation-service.

10.15 *P-CONTROL-GIVE service*

This service provides the PS-user with access to the S-CONTROL-GIVE service of the Session Layer as described in Recommendation X.215. This service has effects which are sequenced with respect to preceding service invocations and is non-destructive.

10.15.1 *Structure*

This service has no parameters.

10.16 *P-TOKEN-GIVE service*

This service provides the PS-user with access to the S-TOKEN-GIVE service of the Session Layer as described in Recommendation X.215. This service has effects which are sequenced with respect to preceding service indications and is non-destructive.

10.16.1 *Structure*

The structure of the component service primitives is shown in Table 16/X.216.

TABLE 16/X.216

P-TOKEN-GIVE service

Parameter name	Request	Indication
Tokens	S	S

S: parameter is as required by the session-service primitive which supports this service (see Recommendation X.215).

10.16.1.1 *Tokens*

This parameter corresponds to the Tokens parameter of the session-service, see Recommendation X.215.

10.17 *P-TOKEN-PLEASE service*

This service provides the PS-user with access to the S-TOKEN-PLEASE service of the Session Layer as described in Recommendation X.215. This service has effects which are sequenced with respect to preceding service invocations and is non-destructive.

10.17.1 *Structure*

The structure of the component service primitives is shown in Table 17/X.216.

TABLE 17/X.216

P-TOKEN-PLEASE service

Parameter name	Request	Indication
Tokens	S	S
User data	U	C(=)

U: presence of the parameter is a user option;

C: presence of the parameter is conditional;

S: parameter is as required by the session-service primitive which supports this service (see Recommendation X.215);

(=): when appended to one of the above, the value of the parameter is equal to the value of the parameter indicated in the column to the left.

10.17.1.1 *Tokens*

This parameter corresponds to the Tokens parameter of the session-service, see Recommendation X.215.

10.17.1.2 *User data*

The presentation data values (including any embedded presentation data values) in this parameter are passed between PS-users and obey the rules of § 10.1; the interpretation of this data is an Application Layer matter. No other significance is attached to this data by the presentation-service.

10.18 *P-U-EXCEPTION-REPORT service*

This service provides the PS-user with access to the S-U-EXCEPTION-REPORT service of the Session Layer as described in Recommendation X.215. This service has effects which are sequenced with respect to preceding service invocations and is destructive.

10.18.1 *Structure*

The structure of the component service primitives is shown in Table 18/X.216.

10.18.1.1 *Reason*

This parameter corresponds to the Reason parameter of the session-service, see Recommendation X.215.

10.18.1.2*User data*

The presentation data values (including any embedded presentation data values) in this parameter are passed between PS-users and obey the rules of § 10.1; the interpretation of this data is an Application Layer matter. No other significance is attached to this data by the presentation-service.

TABLE 18/X.216

P-U-EXCEPTION-REPORT service

Parameter name	Request	Indication
Reason	S	S
User data	U	C(=)

U: presence of the parameter is a user option;

C: presence of the parameter is conditional;

S: parameter is as required by the session-service primitive which supports this service (see Recommendation X.215);

(=): when appended to one of the above, the value of the parameter is equal to the value of the parameter indicated in the column to the left.

10.19 *P-P-EXCEPTION-REPORT service*

This service gives the PS-user visibility to the S-P-EXCEPTION-REPORT service of the Session Layer as described in Recommendation X.215. This service is destructive.

10.19.1 *Structure*

The structure of the component service primitives is shown in Table 19/X.216.

TABLE 19/X.216

P-P-EXCEPTION-REPORT service

Parameter name	Indication
Reason	S

S: parameter is as required by the session-service primitive which supports this service (see Recommendation X.215).

10.19.1.1 *Reason*

This parameter corresponds to the Reason parameter of the session-service, see Recommendation X.215.

10.20 *P-EXPEDITED-DATA service*

This service provides the PS-user with access to the S-EXPEDITED-DATA service of the Session Layer as described in Recommendation X.215. This service has effects which may not be sequenced with respect to preceding service invocations and is non-destructive.

10.20.1 *Structure*

The sructure of the component service primitives is shown in Table 20/X.216.

TABLE 20/X.216

P-EXPEDITED-DATA service

Parameter name	Request	Indication
User data	M	M (=)

M: presence of the parameter is mandatory;

(=): when appended to one of the above, the value of the parameter is equal to the value of the parameter indicated in the column to the left.

10.20.1.1 *User data*

The presentation data values (including any embedded presentation data values) in this parameter are passed between PS-users and are from the default context; the interpretation of this data is an Application Layer matter. No other significance is attached to this data by the presentation-service.

10.21 *P-SYNC-MINOR service*

This service provides the PS-user with access to the S-SYNC-MINOR service of the Session Layer as described in Recommendation X.215. This service has effects which are sequenced with respect to preceding service invocations and is non-destructive.

10.21.1 *Structure*

The structure of the component service primitives is shown in Table 21/X.216.

10.21.1.1 *Type*

This parameter corresponds to the Type parameter of the session service, see Recommendation X.215.

10.21.1.2 *Synchronization point serial number*

This parameter corresponds to the Synchronization point serial number parameter of the session-service, see Recommendation X.215.

10.21.1.3 *User data*

The presentation data values (including any embedded presentation data values) in this parameter are passed between PS-users and obey the rules of § 10.1; the interpretation of this data is an Application Layer matter. No other significance is attached to this data by the presentation-service.

TABLE 21/X.216

P-SYNC-MINOR service

Parameter name	Request	Indication	Response	Confirmation
Type	S	S		
Synchronization point serial number	S	S	S	S
User data	U	C (=)	U	C (=)

U: presence of the parameter is a user option;

C: presence of the parameter is conditional;

S: parameter is as required by the session-service primitive which supports this service (see Recommendation X.215);

(=): when appended to one of the above, the value of the parameter is equal to the value of the parameter indicated in the column to the left;

blank: the parameter is not present.

10.22 *P-SYNC-MAJOR service*

This service provides the PS-user with access to the S-SYNC-MAJOR service of the Session Layer as described in Recommendation X.215. This service has effects which are sequenced with respect to preceding service invocations and is non-destructive.

10.22.1 *Structure*

The structure of the component service primitives is shown in Table 22/X.216.

TABLE 22/X.216

P-SYNC-MAJOR service

Parameter name	Request	Indication	Response	Confirmation
Synchronization point serial number	S	S		
User data	U	C (=)	U	C (=)

U: presence of the parameter is a user option;

C: presence of the parameter is conditional;

S: parameter is as required by the session-service primitive which supports this service (see Recommendation X.215);

(=): when appended to one of the above, the value of the parameter is equal to the value of the parameter indicated in the column to the left;

blank: the parameter is not present.

10.22.1.1 *Synchronization point serial number*

This parameter corresponds to the Synchronization point serial number parameter of the session-service, see Recommendation X.215.

10.22.1.2 *User data*

The presentation data values (including any embedded presentation data values) in this parameter are passed between PS-users and obey the rules of § 10.1; the interpretation of this data is an Application Layer matter. No other signficance is attached to this data by the presentation-service.

10.22.2 *Major-synchronize procedure*

Any previous P-SYN-MINOR and P-SYNC-MAJOR shall be disregarded in evaluating future P-RESYNCHRONIZE and/or P-ACTIVITY-RESUME procedures.

10.23 *P-RELEASE service*

This service provides the PS-user with access to the S-RELEASE service of the Session Layer as described in Recommendation X.215. This service has effects which are sequenced with respect to preceding serivce invocations and is non-destructive.

This service is also used to terminate the presentation-connection in an orderly way.

10.23.1 *Structure*

The structure of the component service primitives is shown in Table 23/X.216.

TABLE 23/X.216

P-RELEASE service

Parameter name	Request	Indication	Response	Confirmation
Result			S	S
User data	U	C (=)	U	C (=)

U: presence of the parameter is a user option;

C: presence of the parameter is conditional;

S: parameter is as required by the session-service primitive which supports this service (see Recommendation X.215);

(=): when appended to one of the above, the value of the parameter is equal to the value of the parameter indicated in the column to the left;

blank: the parameter is not present.

10.23.1.1 *Result*

This parameter corresponds to the Result parameter of the session-service, see Recommendation X.215.

10.23.1.2 *User data*

The presentation data values (including any embedded presentation data values) in this parameter are passed between PS-users and obey the rules of § 10.1; the interpretation of this data is an Application Layer matter. No other significance is attached to this data by the presentation-service.

10.23.2 *Release procedure*

The presentation-connection is released when the session-connection is released, as described in Recommendation X.215.

Note – The procedures governing the behaviour of the P-RELEASE request, indication, response, and confirm presentation-service primitives correspond to those governing the behaviour described in Recommendation X.215 for the S-RELEASE request, indication, response and confirm session-service primitives, respectively.

11 Sequences

This section defines the interrelationships among the facilities and the services of the Presentation Layer.

It specifies for a service (or a group of "similar" services) under which conditions it/they may not be invoked at a particular PCEP, which service procedures are disrupted by the invocation of this/these service and which service invocations will disrupt the procedures of this/these service.

In addition, the following general rules apply:

a) Services may only be invoked if the corresponding functional unit has been selected during presentation-connection establishment. The services of the (session and presentation) kernel functional units are always available.

b) A service invocation is independent of any token unless it is specified otherwise in this section.

Implicitly all sequencing rules of the session-service will apply, i.e. it is dependent on the mapping to the session-service which additional sequencing rules will apply. This Recommendation only specifies those sequencing rules which are not already determined by the session-service.

Note – In particular, this implies that the P-ALTER-CONTEXT, P-TYPED-DATA and P-DATA request service primitives should not be invoked if a P-SYNC-MAJOR, P-RESYNCHRONIZE, P-ACTIVITY-INTERRUPT, P-ACTIVITY-END, P-ACTIVITY-DISCARD or P-RELEASE confirm service primitive is awaited.

All sequences of service invocations which are not explicitly prohibited by this section (and which are not prohibited by the session-service) are permitted and need not be explicitly specified in this section.

Note – The mapping of the presentation-service to the session-service is given in Recommendation X.226. The session-service (see Recommendation X.215) imposes sequencing rules which prevent the invocation of the P-ALTER-CONTEXT request or response service primitive while a P-SYNC-MAJOR, P-ACTIVITY-END, P-CAPABILITY-DATA or P-RELEASE confirm service primitive is awaited. Therefore, to avoid deadlock, the requestor of a P-ALTER-CONTEXT request service primitive should respond to a P-SYNC-MAJOR, P-ACTIVITY-END, P-CAPABILITY-DATA or P-RELEASE indicaiton service primitive without awaiting the P-ALTER-CONTEXT confirm service primitive.

11.1 *P-CONNECT service*

11.1.1 *Type of service*

This is a confirmed-service.

11.1.2 *Invocation restrictions*

This service cannot be invoked on an established presentation-connection.

11.1.3 *Disrupted service procedures*

This service does not disrupt any presentation-service procedures.

11.1.4 *Disrupting services*

The procedure of this service can be disrupted by the P-U-ABORT service or the P-P-ABORT service.

11.1.5 *Other sequencing information*

Simultaneous attempts by both PS-users to establish a presentation-connection are treated independently by the presentation-service-provider. Dependent on the actions of the PS-users, this may result in zero, one or two presentation-connections being established.

11.2 *P-U-ABORT service*

11.2.1 *Type of service*

This is a non-confirmed-service.

11.2.2 *Invocation restrictions*

This service can be invoked at any time by either PS-user.

11.2.3 *Disrupted service procedures*

This service disrupts all presentation-service procedures. In a collision of the P-P-ABORT service with the invocation of the P-U-ABORT service at one PCEP, the P-P-ABORT indication service primitive is only invoked at the peer PCEP.

In case of a collision between two invocations of the P-U-ABORT service, neither indication service primitive is delivered since the presentation-connection is already terminated at both ends.

11.2.4 *Disrupting services*

In case of a collision between two invocations of the P-U-ABORT service neither indication service primitive is delivered since the presentation-connection is already terminated at both ends.

In case of a collision of the P-P-ABORT service with the invocation of the P-U-ABORT service, the P-U-ABORT service procedure is disrupted.

11.3 *P-P-ABORT service*

11.3.1 *Type of service*

This is a provider-initiated-service.

11.3.2 *Invocation restrictions*

This service can be invoked at any time by the presentation-service-provider.

11.3.3 *Disrupted service procedures*

This service disrupts all presentation-service procedures.

11.3.4 *Disrupting services*

In case of a collision of the P-P-ABORT service with the invocation of the P-U-ABORT service at one PCEP, the P-P-ABORT indication service primitive is only invoked at the peer PCEP.

11.4 *P-ALTER-CONTEXT service*

11.4.1 *Type of service*

This is a confirmed-service.

11.4.2 *Invocation restrictions*

These services may only be invoked on an established presentation-connection.

A P-ALTER-CONTEXT request service primitive shall not be invoked while awaiting a P-ALTER-CONTEXT confirm service primitive.

11.4.3 *Disrupted service procedures*

No presentation-service procedure is disrupted by this service.

11.4.4 *Disrupting services*

The procedure of this service can be disrupted by the P-U-ABORT, P-P-ABORT, P-U-EXCEPTION-REPORT, P-P-EXCEPTION-REPORT, P-RESYNCHRONIZE, P-ACTIVITY-INTERRUPT and P-ACTIVITY-DISCARD services.

If the presentation-connection is released, the P-ALTER-CONTEXT service procedure is disrupted.

11.4.5 *Other sequencing restrictions*

The following collisions of these services may occur:

P-ALTER-CONTEXT/P-ALTER-CONTEXT

These colliding services are treated independently by the presentation-service-provider.

11.5 *P-TYPED-DATA and P-DATA services*

11.5.1 *Type of service*

These are non-confirmed-services.

11.5.2 *Invocation restrictions*

These services may only be invoked on an established presentation-connection.

The P-DATA service may be subject to data token control.

11.5.3 *Disrupted service procedures*

No presentation-service procedure is disrupted by these services.

11.5.4 *Disrupting services*

The procedure of these services may be disrupted by the P-U-ABORT, P-P-ABORT, P-U-EXCEPTION-REPORT, P-RESYNCHRONIZE, P-P-EXCEPTION-REPORT, P-ACTIVITY-INTERRUPT and P-ACTIVITY-DISCARD services.

11.5.5 *Context-dependent restrictions*

If the DCS is empty when P-ALTER-CONTEXT confirm service primitive is awaited, then these services shall not be invoked.

11.6 *P-CAPABILITY-DATA service*

11.6.1 *Type of service*

This is a confirmed-service.

11.6.2 *Invocation restrictions*

This service may only be invoked on an established presentation-connection.

The P-CAPABILITY-DATA service is subject to token control imposed by the session-service.

11.6.3 *Disrupted service procedures*

No presentation-service procedure is disrupted by this service.

11.6.4 *Disrupting services*

The procedure of this service may be disrupted by the P-U-ABORT, P-P-ABORT, P-U-EXCEPTION-REPORT, P-P-EXCEPTION-REPORT, and P-ACTIVITY-INTERRUPT services.

11.6.5 *Context-dependent restrictions*

If the DCS is empty when P-ALTER-CONTEXT confirm service primitive is awaited, then this service shall not be invoked.

11.7 *P-EXPEDITED-DATA service*

11.7.1 *Type of service*

This service is non-confirmed.

11.7.2 *Invocation restrictions*

No invocation restrictions beyond those imposed on this service by the session-service (Recommendation X.215).

11.7.3 *Disrupted service procedures*

No presentation-service procedure is disrupted by this service.

11.7.4 *Disrupting services*

There are no sequencing rules in addition to those described by the session-service.

11.8 P-SYNC-MINOR, P-SYNC-MAJOR, P-RELEASE, P-ACTIVITY-START, P-PLEASE-TOKENS, P-GIVE-TOKENS, P-GIVE-CONTROL, P-ACTIVITY-END and P-ACTIVITY-RESUME services

11.8.1 *Type of services*

The types of these services are descrribed in Recommendation X.215.

11.8.2 *Invocation restrictions*

In addition to the invocation restrictions imposed on these services by the session-service, when the context restoration functional unit has been selected, the following invocation restrictions apply:

P-SYNC-MINOR, P-SYNC-MAJOR, P-ACTIVITY-START, P-ACTIVITY-END and P-ACTIVITY-RESUME request service primitives shall not be invoked if a P-ALTER-CONTEXT confirm service primitive is awaited.

11.8.3 *Disrupted service procedures*

There are no sequencing rules in addition to those imposed by the session-service.

11.8.4 *Disrupting services*

There are no sequencing rules in addition to those described by the session-service.

11.9 P-RESYNCHRONIZE, P-U-EXCEPTION-REPORT, P-P-EXCEPTION-REPORT, P-ACTIVITY-INTERRUPT, AND P-ACTIVITY-DISCARD services

11.9.1 *Type of services*

The types of these services are descrribed in Recommendation X.215.

11.9.2 *Disrupted service procedures*

In addition to the sequencing rules described by the session-service, these services may disrupt the procedures of the context management and information transfer facilities of the presentation-service.

11.9.3 *Disrupting services*

There are no sequencing rules in addition to those described by the session-service.

ANNEX A

(to Recommendation X.216)

Restrictions on the Use of the Presentation-service in X.410-1984 Mode

The use of the X.410-1984 mode of operation of the Presentation Layer imposes some restrictions on the abstract syntax of presentation data values used in the User data parameters of certain presentation-service primitives.

A.1 *P-CONNECT service*

The User data parameters of these presentation-service primitives are restricted to a single presentation data value of ASN.1 type SET.

A.2 *P-U-ABORT service*

The User data parameters of these presentation-service primitives are restricted to a single presentation data value of ASN.1 type SET.

A.3 *P-TOKEN-PLEASE service*

The User data parameters of these presentation-service primitives are restricted to a single presentation data value of ASN.1 type INTEGER.

A.4 *P-DATA service*

The User data parameters of these presentation-service primitives are restricted to a single presentation data value of ASN.1 type OCTET STRING.

Note – The OCTET STRING value may have been produced by local application of the syntax-matching service (see Recommendation X.200, § 7.2.4.1) to a value of some other type. Such application is outside of the scope of this Recommendation.