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(09/92)

TERMINAL EQUIPMENT AND PROTOCOLS FOR TELEMATIC SERVICES

DOCUMENT TRANSFER AND MANIPULATION (DTAM) SERVICES AND PROTOCOLS – SERVICE DEFINITION

Recommendation T.432

FOREWORD

The CCITT (the International Telegraph and Telephone Consultative Committee) is a permanent organ of the International Telecommunication Union (ITU). CCITT is responsible for studying technical, operating and tariff questions and issuing Recommendations on them with a view to standardizing telecommunications on a worldwide basis.

The Plenary Assembly of CCITT which meets every four years, establishes the topics for study and approves Recommendations prepared by its Study Groups. The approval of Recommendations by the members of CCITT between Plenary Assemblies is covered by the procedure laid down in CCITT Resolution No. 2 (Melbourne, 1988).

Recommendation T.432 was revised by Study Group VIII and was approved under the Resolution No. 2 procedure on the 18th of September 1992.

CCITT NOTE

In this Recommendation, the expression "Administration" is used for conciseness to indicate both a telecommunication administration and a recognized private operating agency.

CONTENTS

INTRODUCTION

This Recommendation defines the services provided by an application-service-element, the Document Transfer and Manipulation Service Element (DTAM), to support applications in a distributed Telematic systems environment. This Recommendation is one of a set of Recommendations defining the services for sets of application-service-elements specifically used by a number of applications.

Recommendation T.432

DOCUMENT TRANSFER AND MANIPULATION (DTAM) SERVICES AND PROTOCOLS – SERVICE DEFINITION

(revised 1992)

1 Scope and field of application

This Recommendation defines in an abstract way the Document Transfer and Manipulation (DTAM) service within the OSI application layer in terms of

a) the primitive actions and events of the service;

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

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

The DTAM service is provided in conjunction with the Reliable Transfer Service Element (RTSE) service (Recommendation X.218), the Association Control Service Element (ACSE) service (Recommendation X.217), and the Presentation service (Recommendation X.216). In the Transparent mode, DTAM service is provided in conjunction with the Session service (Recommendation X.215) according to the rules of Recommendation T.62 *bis*.

This Recommendation does not specify individual implementations or products, nor does it contain the implementation of entitles and interfaces within a telematic system.

2 References

References are listed in Recommendation T.431.

3 Definitions and abbreviations

Terms and abbreviations are defined in Recommendation T.431.

4 Conventions

This Recommendation defines services for the DTAM following the descriptive conventions defined in Recommendation X.210. In § 9, the definition of each DTAM service includes a table that lists the parameters of its primitives. For a given primitive, the presence of each parameter is described by one of the following values:

blank	not applicable
M	presence mandatory
U	presence is a user option
C	presence is conditional on a successful negotiation of another parameter in previous primitive
D	presence is a DTAM-SE service-provider option
R	presence subject to conditions defined in Recommendation X.218
A	presence subject to conditions defined in Recommendation X.217
P	presence subject to conditions defined in Recommendation X.216

In addition, the notation (=) indicates that a parameter value is semantically equal to the value to its left in the table.

5 Model of the DTAM service

This Recommendation uses the abstract model for a service defined in the OSI service conventions in Recommendation X.210 (see Note 1). The model defines the interactions between the two DTAM-service-users and the DTAM-service-provider that take place between application entities. Information is passed between a DTAM-service-user and the DTAM-service-provider by DTAM service primitives which may carry parameters.

One of the DTAM-service-users is defined as the initiator and the other is defined as the responder.

The model of the DTAM service is illustrated in Figure 1/T.432.

The DTAM service defines a single activity between the initiator and the responder (see Note 2).

Note 1 – Recommendation X.210 defines a model for the service provided by a layer of the OSI Reference Model.

Note 2 – At any one time, an application entity may be involved in more than one instance of the DTAM service activity, and each instance is based on a separate application association.

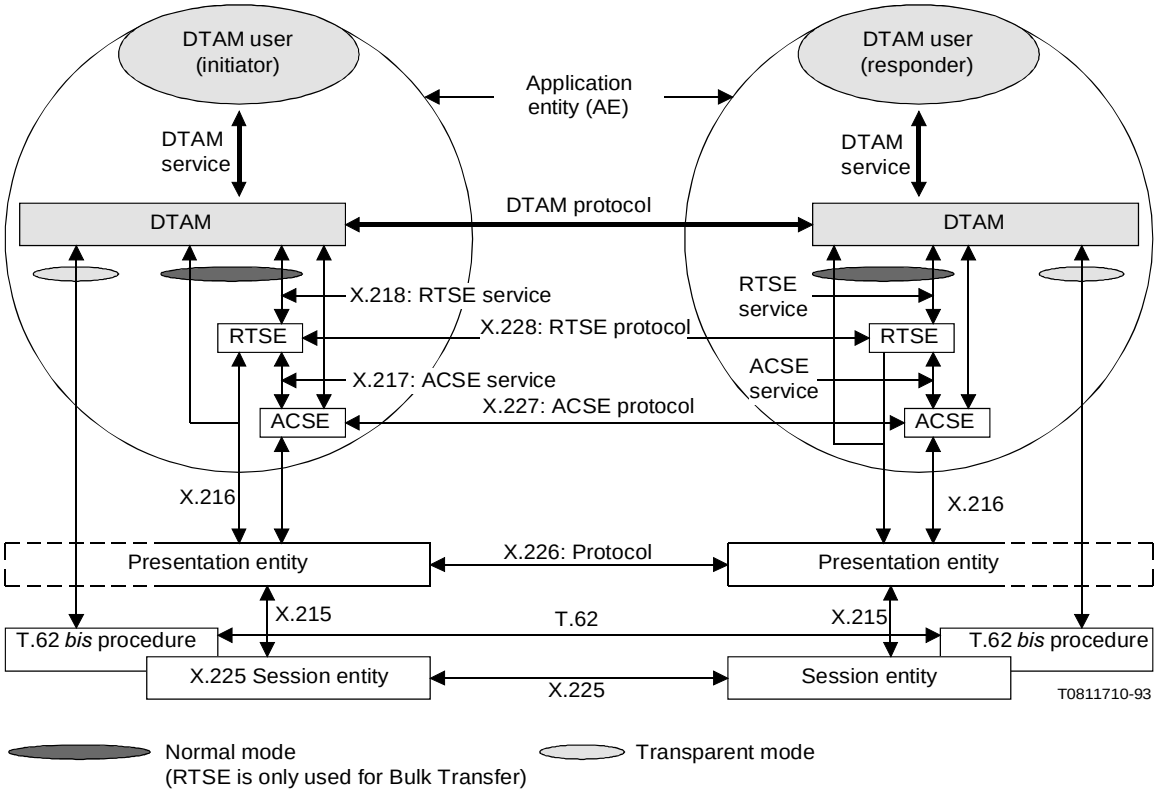

FIGURE 1/T.432

Model of DTAM service

The DTAM is provided in two modes of operations:

a) *Transparent Mode*

This mode is provided solely to allow interworking with older implementations based on Recommendation T.73 - 1984. This mode implies some restriction in use of DTAM services.

b) *Normal Mode*

This mode is provided to allow full use of DTAM services based on the OSI service definition and protocol specification.

Note – It should be taken into account that in some cases the two modes also differ in the means in which the DTAM services are used. An important example is the use of the D-CAPABILITY service (see also § 6.2).

6 DTAM services

This section provides a short description of the services of the DTAM service. The services and the primitives by which they are invoked are defined in § 9. For each service, the user of the service (the application entity that begins the sequence of primitives) is stated.

6.1 *DTAM association use control*

Three services are associated with DTAM association use control:

a) the DTAM establishment service is used by the initiator to create a DTAM association for the application association linking the two DTAM-service-users;

b) the DTAM termination service is used by either the initiator or the responder being subject to owning the data token to dissolve the DTAM association between the DTAM-service-user and the DTAM- service-provider;

Note – The DTAM termination service is not restricted to map into A-RELEASE service provided by ACSE or RT-CLOSE service provided by RTSE.

c) the DTAM abort service is used by either the service users or the service provider to dissolve the DTAM association unconditionally.

6.2 *DTAM negotiation capability*

DTAM negotiation capabilities are expressed by means of the D-INITIATE and D-CAPABILITY services for indication and invocation of application and communication characteristics during an association.

Using the D-INITIATE service, an initial set of characteristics must be indicated, which partially can be modified or invoked by using the D-CAPABILITY service. These characteristics are in effect up to the next subsequent D-CAPABILITY service invocation. A D-CAPABILITY service is used by either the initiator or the responder being subject to owning the data token to indicate or invoke the above characteristics.

Attention is drawn to the fact that the concept of how to use the D-INITIATE and D-CAPABILITY services is different for the two modes defined for the DTAM bulk transfer.

a) Under the DTAM Transparent Mode, one set of application capabilities must be indicated in the D-INITIATE service. This set can be modified during the association. The parameters of the D-CAPABILITY service are mapped to the S-CAPABILITY-DATA service parameters. The invocation of specific characteristics, used in the following document, is achieved by using the S-ACTIVITY-START service element. The service parameters of the S-ACTIVITY-START request are derived from the "document profile" which is not directly transferred to the receiving side under the DTAM Transparent Mode. However, the document profile is generated at the receiving side from the service parameters of S-ACTIVITY-START indication.

b) Under the DTAM Normal Mode, several sets of application capabilities may be indicated (at least one set must be present) in the D-INITIATE service. There are no means to modify these parameters during the association.

One specific set of application capabilities may be invoked by using the D-CAPABILITY service to indicate the specific characteristics of the document which will be subsequently transmitted.

6.3 *Document bulk transfer*

DTAM provides a function to transmit a document in bulk from one DTAM user to a peer under the communications environment defined by the DTAM association use and the DTAM capability functions.

6.4 *Document unconfirmed manipulations*

DTAM provides a function to partially modify a document seen by both users, by generating, revising or deleting structures (pages, blocks, etc.) of an existing document, or to create a new document by generating structure without any confirmation of the manipulation. Five services are associated with document manipulation:

a) the unconfirmed create operation service is used by both sides to add the constituents of ODA and Operational Structure to an existing document or to create constituents of ODA and Operational Structure;

b) the unconfirmed delete operation service is used by both sides to delete the constituents of ODA and Operational Structure of an existing document;

c) the unconfirmed modify operation service is used by both sides to modify the attributes of the constituents of ODA and Operational Structure of an existing document;

d) the unconfirmed call operation service is used by both sides to request to address or to read an object of the Operational Structure which contains a sequence of the DTAM protocol data units. These protocol data units are applicable to the existing document;

e) the unconfirmed rebuild operation service is for further study.

6.5 *Document confirmed manipulations* (for further study)

DTAM provides a function to partially modify a document seen by both users, by generating, revising or deleting structure of an existing document or to create a new document by generating structure with a confirmation of the manipulation.

6.6 *Typed data transmission*

DTAM optionally provides the function of typed data transmission which is independent of the data token control.

6.7 *Token control*

Within DTAM, the right to transfer and manipulate documents is controlled in the following way:

– the control of document transfer is associated with document bulk transfer;

– the data token is associated with document manipulation.

Token control provides services for exchanging the control of document transfer and for exchanging the data token.

6.8 *Exception report*

DTAM optionally provides two exception reporting functions for exceptional error control during the DTAM communication:

– provider exception report (for further study);

– user exception report (for further study).

6.9 *Document selection control* (for further study)

Four services are associated with document selection control:

a) the document selection service is used by the initiator to select an existing document and to bind the specified document to the DTAM application-association;

b) the document deselection service is used by the initiator to release the binding between the DTAM application-association and the specified document;

c) the document creation service is used by the initiator to create a specified document and to select the newly created document;

d) the document deletion service is used by the initiator to release an existing selection in such a way that the previously selected document ceases to exist.

6.10 *Document management* (for further study)

Two services are associated with document management:

a) the read attributes service is used by the initiator to interrogate the document attributes of the selected document;

b) the change attributes service is used by the initiator to modify the document attributes of the selected document.

6.11 *Document open control* (for further study)

Two services are associated with document open control:

a) the document open service is used by the initiator to establish the presentation context and the concurrency and commitment controls for data transfer;

b) the document close service is used by the initiator to release the context established by the document open service.

6.12 *Grouping control* (for further study)

Two services are associated with grouping control:

a) the beginning of grouping service is used by the initiator to indicate the start of a set of grouped primitives which are to be processed and responded to as a group;

b) the end of grouping service is used by the initiator to indicate the end of a set of grouped primitives which are to be processed and responded to as a group.

7 Functional units

DTAM service classes in Recommendation T.431 and in functional units are logical groupings of related services defined in this Recommendation for the purpose of

– negotiation of the DTAM-service-user's requirements during DTAM application-association establishment;

– reference by other CCITT Recommendations.

7.1 *Association use control functional unit*

The DTAM provides the trigger for the establishment and use of the association. The association use control unit supports the basic DTAM services for unique discrimination of both application entities (AEs), selection of functional units, set of an initial DTAM capability, establishment, termination and abort of association use.

7.2 *Capability functional unit*

The DTAM context is the communication environment depending on the document architecture (ODA and Operational Structure) used for data transmission on an association. In addition to the initial DTAM context setting at the start of association use, a context management unit is optionally used to set a more detailed communication environment, such as optional application capabilities.

7.3 *Data transmission functional units*

The DTAM provides document transfer methods, such as bulk document transfer, document manipulation and typed data transmission. The data transmission unit consists of the following four units.

7.3.1 *Document bulk transfer functional unit*

The DTAM has a function to transmit the document in bulk to the other DTAM user under the communication environment defined at the start of the association use and/or the capability control. The documents represented by the Document Interchange Format defined in Recommendations T.415 and T.441 are transmitted using the document bulk transfer unit. Other types of data may be transferred by using the transfer option defined for the DTAM bulk transfer.

Note – The detailed definition of Recommendation T.441 (Interchange Format of Operational Structure) depends on the ongoing work on Operational Structure.

7.3.2 *Document unconfirmed manipulation functional unit*

DTAM provides a function to partially modify a document by generating, revising or deleting structures of an existing document or to create a new document. The DTAM user uses a document manipulation unit to manipulate structures of an existing document or to create a new document.

7.3.3 *Document confirmed manipulation functional unit*

Use of this functional unit is for further study.

7.3.4 *Typed data transmission functional unit*

The DTAM provides a function to pass these units directly to the DTAM user as typed data. User information (e.g. transmission interrupt) can be transported by typed transmission units without being subject to token control.

7.4 *Exception report functional unit*

The DTAM provides exception reporting services for exceptional conditions occurring in the DTAM user or DTAM-service-provider.

7.5 *Session management functional units*

The DTAM manages dialogue control functions provided by the session layer, the following functional units being available for DTAM communication environment.

7.5.1 *Token control functional unit*

Transmission rights required for document transfer and document manipulations are controlled with the token control unit. This functional unit will be selected in the case of the half duplex communication mode.

For the Document manipulation functional unit, only the "data token" is required in nature. However, the right to use the Document manipulation is handled as follows:

- when the Document bulk transfer functional unit is selected in addition to the Document manipulation, D-CONTROL-GIVE service is used;
- when only the Document manipulation functional unit is selected, D-TOKEN-GIVE service is used.

7.6 *Other functional units*

The DTAM will provide a document selection control, a document management, an open control and a grouping control. These DTAM functions are left for further study.

8 Service overview

This Recommendation defines the following services for the management of document transfer and manipulation facilities:

a) D-INITIATE;

b) D-TERMINATE;

c) D-P-ABORT;

d) D-U-ABORT;

e) D-CAPABILITY;

f) D-TRANSFER;

g) D-TYPED-DATA;

h) D-CREATE;

i) D-DELETE;

j) D-MODIFY;

k) D-CALL;

l) D-REBUILD;

m) D-TOKEN-GIVE;

n) D-CONTROL-GIVE;

o) D-TOKEN-PLEASE;

p) D-U-EXCEPTION-REPORT; and

q) D-P-EXCEPTION-REPORT.

8.1 D-INITIATE service

Enables a DTAM-service-user to request the establishment of a DTAM application-association with another AE.

8.2 D-TERMINATE service

Enables the association initiating or responding DTAM-service-user to request the termination of the established application-association. It may do so only if it possesses the data token.

8.3 D-P-ABORT service

Enables a DTAM-service-provider to abort the application-association.

8.4 D-U-ABORT service

Enables a DTAM-service-user to abort the application- association.

8.5 D-CAPABILITY service

Enables the DTAM service user to invoke or negotiate some applications and communication characteristics during the life-time of the association.

8.6 D-TRANSFER service

Enables a DTAM-service-user that possesses the data token to request the bulk document transfer over an application-association.

8.7 D-TYPED-DATA service

Enables a DTAM-service-user to request the data transmission without being subject to token control, which is different from the document transfer service.

8.8 **D-CREATE, D-DELETE and D-MODIFY services**

Enable a DTAM service user that possesses the data token to request the creation, deletion and modification of the architectural objects and content-portions of a document.

8.9 **D-CALL service**

Enables a DTAM-service-user that possesses the data token to request to address or to read an object of the Operational Structure which contains a sequence of DTAM protocol data units (with some restrictions, i.e. that only D-CREATE, D-DELETE and D-MODIFY can appear in this sequence). These protocol data units are applicable to the existing document.

8.10 **D-REBUILD service** is for further study.

8.11 **D-TOKEN-GIVE service**

Enables a DTAM-service-user to relinquish the data token to its peer. It may do so only if it possesses the data token.

8.12 **D-CONTROL-GIVE service**

Enables a DTAM-service-user to relinquish all the tokens (control) to its peer. It may do so only if it possesses all the tokens.

8.13 **D-TOKEN-PLEASE service**

Enables a DTAM-service-user to request the data token. It may do so only if it does not already possess the data token. The data token is requested by either DTAM-service-user to allow the DTAM-service-user to transfer documents.

8.14 **D-U-EXCEPTION-REPORT service**

Provides an exception reporting service for exceptional conditions occurring in either DTAM-service-user. This service is for further study.

8.15 **D-P-EXCEPTION-REPORT service**

Provides an exception reporting service for exceptional conditions occurring in the DTAM-service-provider. This service is for further study.

9 Service definition

9.0 **DTAM service**

Is a logical interface for data handling between the DTAM user and DTAM service provider. The DTAM services are listed in Table 1/T.432.

9.1 *D-INITIATE service*

The DTAM user notifies the DTAM-service-provider of the start of association use with the D-INITIATE service primitive. This service primitive includes parameter sets for

- unique discrimination of both AEs;
- selection of functional units for the DTAM service used; and
- establishment of a common communication environment in both systems.

The related service structure consists of four events, as illustrated in Figure 2/T.432.

TABLE 1/T.432

DTAM services summary

Service	Type
D-INITIATE	Confirmed
D-TERMINATE	Confirmed
D-P-ABORT	Provider-initiated
D-U-ABORT	Unconfirmed
D-CAPABILITY	Confirmed
D-TRANSFER	Provider-confirmed
D-TYPED-DATA	Unconfirmed
D-CREATE	Unconfirmed
D-DELETE	Unconfirmed
D-MODIFY	Unconfirmed
D-CALL	Unconfirmed
D-REBUILD (Note)	Unconfirmed
D-TOKEN-GIVE	Unconfirmed
D-CONTROL-GIVE	Unconfirmed
D-TOKEN-PLEASE	Unconfirmed
D-P-EXCEPTION-REPORT (Note)	Provider-initiated
D-U-EXCEPTION-REPORT (Note)	Unconfirmed

Note – D-REBUILD, D-P-EXCEPTION-REPORT and D-U-EXCEPTION-REPORT services are for further study.

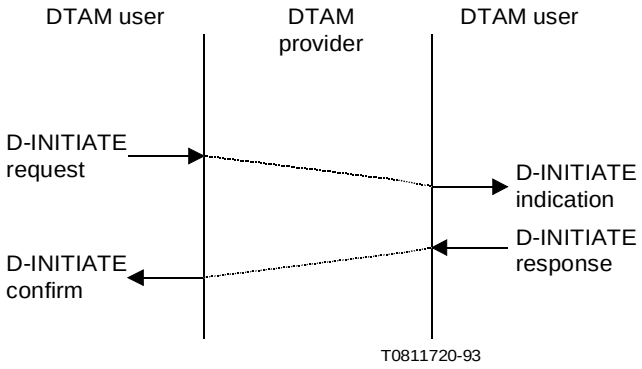

FIGURE 2/T.432

D-INITIATE service events

9.1.1 *D-INITIATE service parameters*

Table 2/T.432 lists the D-INITIATE service parameters.

TABLE 2/T.432
D-INITIATE service parameters
(Note 1)

Parameter	D-INITIATE request	D-INITIATE indication	D-INITIATE response	D-INITIATE confirm
Transparent Mode	U			
Telematic requirements	M	M(=)	C*	C(=)
Application capabilities	M	M(=)	C*	C(=)
• DTAM-QOS (Note 2)	U	C(=)	U	C(=)
• Account	U	C(=)	U	C(=)
Service classes (Note 2)				
Result			M	M(=)
• User information	U	C(=)	U	C(=)
• Application context name	A	A(=)	A	A(=)
• Calling AP title	A	A(=)		
• Calling AP invocation-identifier	A	A(=)		
• Calling AE qualifier	A	A(=)		
• Calling AE invocation-identifier	A	A(=)		
• Called AP title	A	A(=)		
• Called AP invocation-identifier	A	A(=)		
• Called AE qualifier	A	A(=)		
• Called AE invocation-identifier	A	A(=)		
• Responding AP title			A	A(=)
• Responding AP invocation-identifier			A	A(=)
• Responding AE qualifier			A	A(=)
• Responding AE invocation-identifier			A	A(=)
• Calling presentation address	P	P(=)		
• Called presentation address	P	P(=)		
• Responding presentation address			P	P(=)
• Presentation context definition list	P	P(=)		
• Presentation context definition result list			P	P(=)
• Presentation requirements	P	P(=)	P	P(=)
• Initial assignment of token	P or R	P(=) or R(=)	P or R	P(=) or R(=)
• Quality of service (Note 3)	P	P(=)	P	P(=)
• Result source				A

* This parameter is mandatory in case the responder returns the "accepted" result parameter to the proposed requirements.

• This parameter does not apply to the Transparent Mode.

Note 1 – The meaning of the characters used in the table is given in § 4.

Note 2 – The use of this parameter is for further study.

Note 3 – When RTSE is used, this parameter is absent and is handled by RTSE.

9.1.1.1 *Transparent Mode*

This non-mandatory parameter is used to indicate to the local DTAM-PM how the DTAM protocol is to be mapped onto the lower layers. Presence of this parameter indicates that the mapping is to be done onto the session service. Absence of this parameter indicates the DTAM Normal Mode.

9.1.1.2 *Telematic requirements*

In this Recommendation, the following functional units are defined for DTAM:

– kernel (association use control);

– capability;

– document bulk transfer;

– typed data transmission;

– document unconfirmed manipulation;

– document confirmed manipulation;

– token control;

– exception report.

Telematic requirements specify the DTAM functional units which should be used during an association. In this case, each DTAM user proposes use or non-use of each functional unit, except for the kernel functional unit, based on the DTAM user requirements. The functional unit is selected only if both the initiator and the responder propose to use the functional unit.

9.1.1.3 *Application capabilities*

The requested application capabilities parameter indicates, for each direction of transmission, the receiving application capabilities of the requestor. Each DTAM user exchanges its own receiving application capabilities with a peer DTAM user through D-INITIATE service. Values of this parameter may be the reason for subsequent termination. The continued progress of the service is only guaranteed if the DTAM user acts as a sender of a document within the requested receiving capabilities by the peer DTAM user (receiver of document). This parameter is stated independently by each DTAM user as the maximum receiving capabilities when that user is the receiving side. There is no negotiation. The stated value from each DTAM user is maintained and considered by the corresponding user for use when it is the sending DTAM user. The values for each direction of document transfer are not necessarily the same.

The application capabilities parameter consists of one or more sets of sub-parameters. Each set, if present, shall contain one Document Application Profile parameter and, optionally, a combination of the four other parameters described hereafter. For the transfer of other types of data, the file transfer capabilities should be indicated.

9.1.1.3.1 *ODA application capabilities*

9.1.1.3.1.1 *Document application profile*

The parameter specifies the document application profile available to the sender of this parameter as the receiving capabilities. The value of this parameter is one of the capabilities to handle the document application profiles defined by the CCITT and/or ISO.

Note – In CCITT applications, document application profiles are defined in the T.500-Series of Recommendations.

9.1.1.3.1.2 *Document architecture class*

This parameter specifies the document architecture class available to the sender of this parameter as the receiving capabilities. The value of this parameter is:

– formatted.

Note – This parameter is only present in the Transparent Mode.

9.1.1.3.1.3 *Non-basic document characteristics*

This parameter specifies the non-basic document characteristics available to the sender of this parameter as the receiving capabilities. The attributes and values that may be specified by this parameter are restricted to those that are permitted by the corresponding document application profile.

The format of this parameter is as described in Recommendation T.414.

9.1.1.3.1.4 *Non-basic structural characteristics*

This parameter specifies the non-basic structural characteristics available to the sender of this parameter as the receiving capabilities. The attributes and values that may be specified by this parameter are restricted to those that are permitted by the corresponding document application profile.

The format of this parameter is as described in Recommendation T.414.

9.1.1.3.1.5 *Operational Application Profile*

Detailed specification of Operational Application Profile is for further study.

9.1.1.3.2 *File transfer capabilities*

9.1.1.3.2.1 *BFT (binary file transfer) capabilities*

This parameter indicates the capability to receive files encoded according to the specifications of Recommendation T.434.

9.1.1.3.2.2 *Transparent data capability*

This parameter indicates that the sender is ready to accept (when acting as a receiver) data that are transferred completely transparently.

9.1.1.4 *DTAM-QOS*

DTAM-QOS is left for further study.

9.1.1.5 *Account*

The account parameter identifies the account to which costs incurred in the application-association which is being established are to be charged.

Note – Further study will be required.

9.1.1.6 *Service classes*

The use of this parameter is for further study.

9.1.1.7 *Result*

If the DINQ APDU was rejected by the responding DTAM-PM (i.e. a D-INITIATE indication primitive was not issued to the responder), this field is supplied by the responding DTAM-PM, otherwise, this field is the Result parameter from the D-INITIATE response primitive. In either situation, it appears as the Result parameter on the D-INITIATE confirm primitive. This field can take one of the following symbolic values:

- accepted;
- rejected by responder (reason-not-specified);
- rejected by responder (protocol Version-not-supported);
- rejected by responder (DTAM-QOS-not-supported);
- rejected by responder (application-context-name-not-supported);
- rejected by responding DTAM-PM.

9.1.1.8 *User information*

This is the User information associated with the initiation of application association.

9.1.1.9 *Application context name*

This parameter is used as defined in Recommendation X.217. The initiator of the application-association shall propose one of the application-context-names for the specific application in the D-INITIATE request primitive.

The responder shall either

– accept the application-context proposed by the initiator and return the same value of this parameter in the D-INITIATE response primitive; or

– return, in the D-INITIATE response primitive, a Result parameter with the value "rejected by responder (application-context-name-not-supported)" and a different application-context-name in the D-INITIATE response primitive.

9.1.1.10 *Presentation Context Definition List*

The Presentation Context Definition List comprises a presentation-context-definition for each abstract-syntax included in the application-context, i.e. at least one for

– ACSE, and

– DTAM.

In the case of document bulk transfer (normal mode), RTSE is used as specified in Recommendation X.218. Due to restrictions imposed by Recommendation X.218, the types of the RTSE APDUs and DTAM APDUs form one single named abstract syntax. This single named abstract syntax also includes the types of the application that make use of DTAM.

A presentation-context definition comprises a presentation-context identifier and an abstract syntax name for each of the single named abstract syntaxes.

9.1.1.11 *Quality of service*

When RTSE is used, this parameter is absent and is handled by RTSE.

9.1.1.12 *Other parameters*

Parameters marked with an "R" in Table 2/T.432 are defined in Recommendation X.218.

Parameters marked with an "A" in Table 2/T.432 are defined in Recommendation X.217.

Parameters marked with a "P" in Table 2/T.432 are defined in Recommendation X.216.

9.2 *D-TERMINATE service*

The D-TERMINATE service is used by either the association-initiator or the association-responder to request the termination of an application-association. It may do so if it possesses the data token and this service is a confirmed service.

The termination of the application-association is without loss of information in transit. This service cannot be rejected by the association-responding DTAM-service-user.

The related service structure consists of four events, as illustrated in Figure 3/T.432.

9.2.1 *D-TERMINATE service parameters*

Table 3/T.432 lists the D-TERMINATE service parameters. These parameters are only present in the Normal Mode for use of the OSI lower layer service. In the case of a Transparent Mode, this service primitive has no parameters.

9.2.1.1 *Charging*

The charging parameter conveys information on the costs attributed to the account during the DTAM application-association which is being released. The use of this parameter is for further study.

9.2.1.2 *User Information*

This is the User Information associated with the termination of application-association.

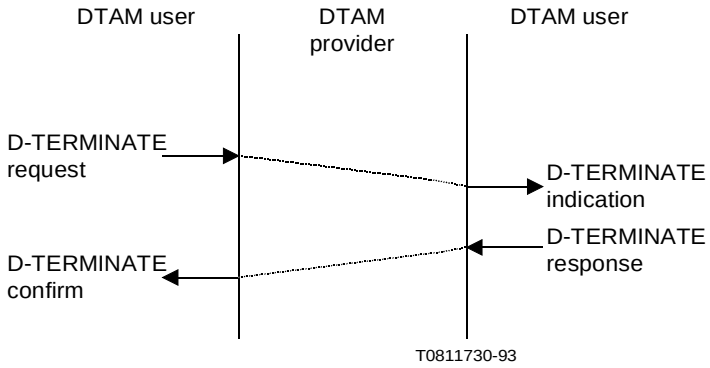

FIGURE 3/T.432

D-TERMINATE service events

TABLE 3/T.432

D-TERMINATE service parameters

Parameter	D-TERMINATE request	D-TERMINATE indication	D-TERMINATE response	D-TERMINATE confirm
• Charging			C	C
• User Information	U	C(=)	U	C(=)

- This parameter does not apply to the Transparent Mode.

Note – The meaning of the characters used in the table is given in § 4.

9.3 *D-P-ABORT service*

The D-P-ABORT service provides an indication to both of the DTAM users that the application-association cannot be maintained (e.g. because retransmission is not possible). If it is the sender, the DTAM provider first issues a negative D-TRANSFER confirm primitive for the document information not yet transferred. This service is applicable for Document manipulation as well as Bulk transfer. In the case of Bulk transfer, if it is the receiver, the DTAM provider deletes any partially received document information prior to issuing the D-P-ABORT indication. This service is a provider-initiated service.

The related service structure consists of two events, as illustrated in Figure 4/T.432.

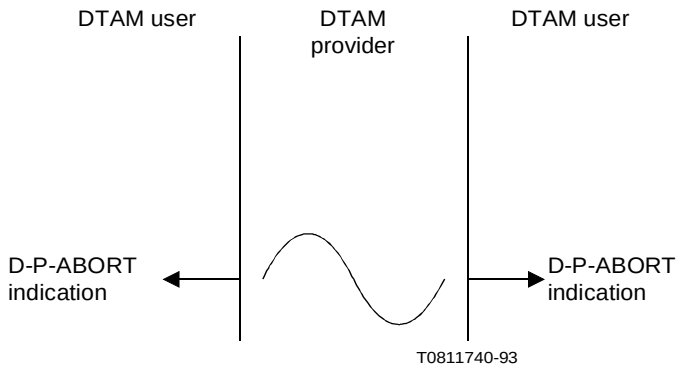

FIGURE 4/T.432

D-P-ABORT service events

9.3.1 *D-P-ABORT service parameters*

The D-P-ABORT service has no parameters.

9.4 *D-U-ABORT service*

The D-U-ABORT service enables a DTAM user to abort the application-association. The abort may be requested by either DTAM user. This service is an unconfirmed service.

The related service structure consists of two events, as illustrated in Figure 5/T.432.

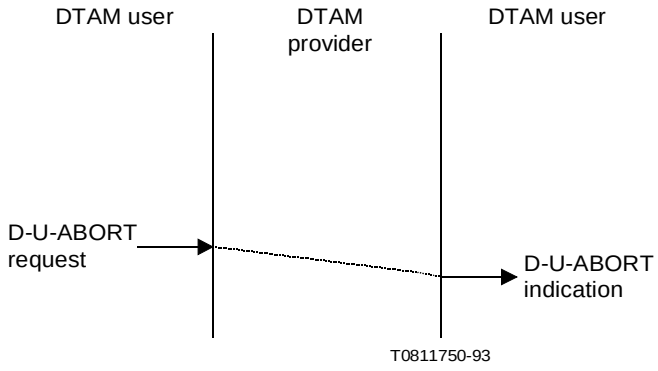

FIGURE 5/T.432

D-U-ABORT service events

9.4.1 *D-U-ABORT service parameters*

Table 4/T.432 lists the parameter of D-U-ABORT.

TABLE 4/T.432

D-U-ABORT service parameters

Parameter	D-U-ABORT request	D-U-ABORT indication
• User Information	U	C(=)

- This parameter does not apply to the Transparent Mode.

Note – The meaning of the characters used in the table is given in § 4.

9.4.1.1 *User Information*

This is the User Information associated with the abort of application-association.

9.5 *D-CAPABILITY service*

This service should be used outside the document transmission procedure. The multiple use of the D-CAPABILITY service within a single association may be permitted.

The related service structure consists of four events as illustrated in Figure 6/T.432.

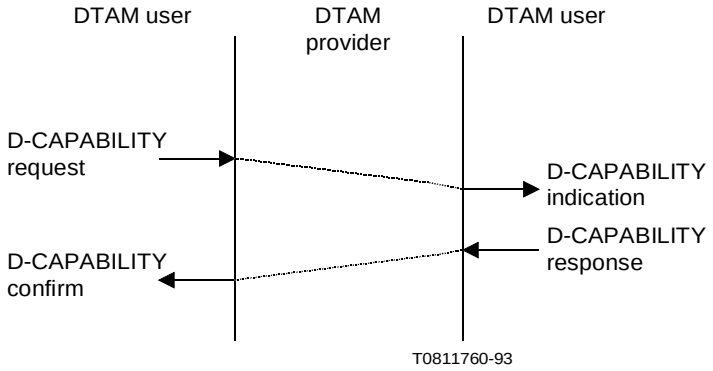

FIGURE 6/T.432

D-CAPABILITY service events

9.5.1 *D-CAPABILITY service parameters*

Table 5/T.432 lists the D-CAPABILITY service parameters.

TABLE 5/T.432

D-CAPABILITY service parameters

Parameter CAPABILITY	D-CAPABILITY request	D-CAPABILITY indication	D-CAPABILITY response	D-CAPABILITY confirm
Application capabilities				
ODA application capabilities				
Document application profile	U	C(=)	U	C(=)
* Document architecture class	U	C(=)	U	C(=)
Non-basic structural characteristics	U	C(=)	U	C(=)
Non-basic document characteristics	U	C(=)	U	C(=)
• Operational application profile	U	C(=)	U	C(=)
File transfer capabilities				
• BFT capabilities	U	C(=)	U	C(=)
• Transparent capability	U	C(=)	U	C(=)
• Capability result			M	M(=)
• User information	U	C(=)	U	C(=)

• This parameter is absent in the Transparent Mode.

* This parameter is only present in the Transparent Mode.

Note – The meaning of the characters used in the table is given in § 4.

9.5.1.1 *Application capabilities*

The application capabilities parameter requested by the requesting DTAM user (requestor: sender of documents or other data) indicates a list of receiving application capabilities that may be required at the responding DTAM user by the requesting DTAM user. Application capabilities consist of the following two groups of parameters.

9.5.1.1.1 *ODA application capabilities*

9.5.1.1.1.1 *Document application profile*

The parameter specifies the document application profile that may be required at the responding DTAM user by the requesting DTAM user. The values of this parameter are any combination of the capabilities to handle the document application profiles defined by the CCITT and/or ISO.

Note – In CCITT applications, document application profiles are defined in the T.500-Series of Recommendations.

9.5.1.1.1.2 *Document architecture class*

This parameter specifies the document architecture classes that may be required at the responding DTAM user by the requesting DTAM user. This parameter is only present in the DTAM Transparent Mode. The value of this parameter is:

– formatted.

9.5.1.1.1.3 *Non-basic document characteristics*

This parameter specifies the non-basic document characteristics that may be required at the responding DTAM user by the requesting DTAM user. The attributes and values that may be specified by this parameter are restricted to those that are permitted by the corresponding document application profile.

The format of this parameter is as described in Recommendation T.414.

9.5.1.1.1.4 *Non-basic structural characteristics*

This parameter specifies the non-basic structural characteristics that may be required at the responding DTAM user by the requesting DTAM user. The attributes and values that may be specified by this parameter are restricted to those that are permitted by the corresponding document application profile.

The format of this parameter is as described in Recommendation T.414.

9.5.1.1.1.5 *Operational application profile*

Detailed specifications of operational application profile is for further study.

9.5.1.1.2 *File transfer capabilities*

The file transfer capabilities consist of different options of how a file transfer is supported under DTAM Normal Mode.

Note – File transfer capabilities under DTAM Transparent Mode will be handled as specified in the relevant terminal characteristics.

9.5.1.1.2.1 *BFT (binary file transfer) capabilities*

This parameter invokes the following transfer of files encoded according to the specifications of Recommendation T.434.

9.5.1.1.2.2 *Transparent data capability*

This parameter invokes the following transfer of completely transparent data.

9.5.1.2 *Capability result*

This result parameter contains one of the following:

a) confirmation that all the requested capabilities are available at the DTAM responder;

b) a list of the requested capabilities that are available at the DTAM responder;

c) a complete list of non-basic receiving capabilities;

d) indication that no extended capabilities are available in the DTAM responder, or that none of the capabilities requested by the initiator are available.

9.5.1.3 *User Information*

This parameter is the User Information associated with the capability.

9.6 *D-TRANSFER service*

The D-TRANSFER service supports the document bulk transfer which is used to convey the document which contains ODA and Operational Structure or to convey a file to the remote DTAM user. The requestor who requests the D-TRANSFER service must have the data token.

In the DTAM Normal Mode the reliable transfer is performed by the use of RTSE.

In the DTAM Transparent Mode, the DTAM-service-provider performs the reliable transfer of a document but, in case of a problem, it will interrupt the transfer and indicate to the user that the transfer has not been completed. The user will then have the responsibility to start a new transmission by using the D-TRANSFER request primitive with the appropriate parameters.

The related service structure consists of three events, as illustrated in Figure 7/T.432.

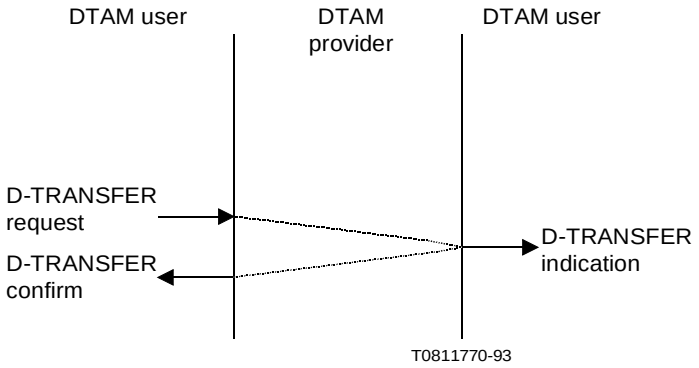

FIGURE 7/T.432

D-TRANSFER service events

9.6.1 *D-TRANSFER service parameters*

Table 6/T.432 lists the D-TRANSFER service parameters.

TABLE 6/T.432

D-TRANSFER service parameters
(Note 1)

Parameter	D-TRANSFER request	D-TRANSFER indication	D-TRANSFER confirm
Document Information	M	C (Note 2)	
• Transfer Time	M		
* Document Information Type	M	C	C(=)
* Document Reference Information	M	M	M
* Synchronization Point	C (Note 3)	(Note 5)	C (Note 4)
Result			M
* Checkpoint Value	M		M

• This parameter does not apply to the Transparent Mode.

* This parameter applies to the Transparent Mode only.

Note 1 – The meaning of the characters used in the table is given in § 4.

Note 2 – Mandatory in the case of successful D-TRANSFER procedure.

Note 3 – Mandatory when the Document Information Type has the value Transfer of a document from a synchronization point.

Note 4 – See § 9.6.1.5 iii).

Note 5 – Use of this parameter in D-TRANSFER indication is for further study.

9.6.1.1 *Document information*

This consists of an ODA document or a file which may contain any other type of data. ODA documents consist of one or more "interchange data elements" of the types defined in Recommendations T.415, T.441 and T.541, in accordance with the document application profile and operational application profile that are in effect.

When RTSE is used, a single ASN.1 data type is required by Recommendation X.218 to convey the document information within an ASN.1 external type.

Note – In the case that ODA documents are transferred by use of RTSE (DTAM Normal Mode), the rules described in Recommendation T.415 § 5.1 apply, and the document information is encoded as an ASN.1 sequence of interchange data elements.

9.6.1.2 *Transfer time*

This parameter defines the time period within which the DTAM-provider must successfully transfer the Document information to the other DTAM-user. This parameter is used only in the DTAM Normal Mode as mandatory parameter and has to be supplied by the requestor of the D-TRANSFER service. The absence of this parameter indicates that the established DTAM application-association is performed under the DTAM Transparent Mode.

9.6.1.3 *Document information type*

This parameter is used only in the DTAM Transparent Mode. It may take different values depending on the primitive where it is used:

a) in a D-TRANSFER request it shall take one of the following values:

   i) "transfer of a document from its beginning";

   ii) "transfer of a document from a synchronization point" when the parameter takes this latter value, the value of the corresponding synchronization point shall be given in the parameter "synchronization point" (see § 9.6.1.5).

b) in a D-TRANSFER indication of confirm, it shall take one of the following values:

   i) "transfer completed";

   ii) "transfer not completed"; when this parameter takes this latter value, the value of the last positively acknowledged synchronization point is given in the parameter "synchronization point" (see § 9.6.1.5).

Note – In a logical interface sense, it is assumed that, for retransmission of document, the complete document is submitted to DTAM Protocol Machine (PM) using the D-TRANSFER service. It is assumed that DTAM-PM locates the checkpoints in the same manner as in the first transmission.

9.6.1.4 *Document reference information*

This parameter uniquely identifies a document in the D-TRANSFER service. The value of this parameter shall be assigned as decimal digits, preferably but not necessarily starting from 001. This value shall then sequentially be incremented by one for each successive document transmission. This parameter shall be assigned to all documents by the DTAM user sending the document.

In order to uniquely identify the documents exchanged, it is recommended that the same value of this parameter should not appear within an application-association. This parameter is used only in the DTAM Transparent Mode.

9.6.1.5 *Synchronization point*

This parameter has different significations depending on the service primitive:

i) in a D-TRANSFER-request it indicates the requested minor synchronization point number from which the initiator tries to retransmit. It is used together with the value "transfer of a document from a synchronization point" of the parameter Document Information Type;

ii) in a D-TRANSFER-indication it indicates the last positively confirmed minor synchronization point number (for further study);

iii) in a D-TRANSFER-confirm it indicates the last positively confirmed minor synchronization point number. It is used together with the value "transfer not completed" of the parameter Document Information Type. If no synchronization point was confirmed during the document transfer, this parameter may be absent.

This parameter is used only in the DTAM Transparent Mode.

9.6.1.6 *Result*

This parameter specifies the result of the transfer as follows:

– Document-Information-transferred: positive confirm; the Document-Information has been transferred to, and secured by the receiving DTAM-provider (used for both DTAM modes);

– Document-information-not-transferred: negative confirm; the Document-Information could not be transferred within the specified transfer time (used for DTAM Normal Mode);

– Document-Information-not-completely-transferred: negative confirm; the Document-Information could not be completely transferred, remaining part of the document as indicated by the value of the parameter "document information type" (used for DTAM Transparent Mode). The indication of this parameter may have as a result to resume the transmission of the remaining part of the document from the requesting DTAM user;

– Document-Information-continue-not-possible: negative confirm; this value is used when the document linking information is not available at the sending or receiving side (used for DTAM Transparent Mode). The indication of this parameter may have as a result to retry the transmission of the entire document again from the requesting DTAM user.

This parameter has to be supplied by the DTAM-provider.

9.6.1.7 *Checkpoint value*

Under the DTAM Transparent Mode the places to insert the checkpoints are related to a number of IDEs indicated by the DTAM user. A checkpoint should be set at the end of each segment and a segment should be composed of the number of integral IDE which is indicated by the user. Only the number of IDE of the last segment is equal or inferior to the indicated number.

This parameter specifies the number of IDEs that compose one segment.

Note – Some applications may not count IDEs of Document Profile and Document Root.

9.7 *D-TYPED-DATA service*

Typed data transmission is used independently of the data token and is issued from both DTAM users when required.

The related service structure consists of two events, as illustrated in Figure 8/T.432.

9.7.1 *D-TYPED-DATA service parameter*

The parameters of D-TYPED-DATA are listed in Table 7/T.432.

9.7.1.1 *Typed-Data Information*

Typed-Data Information is chosen from the following strings:

– NumericString;

– PrintableString;

– TeletexString;

– VideotexString;

– VisibleString;

– OctetString;

– IA5String;

– GraphicString.

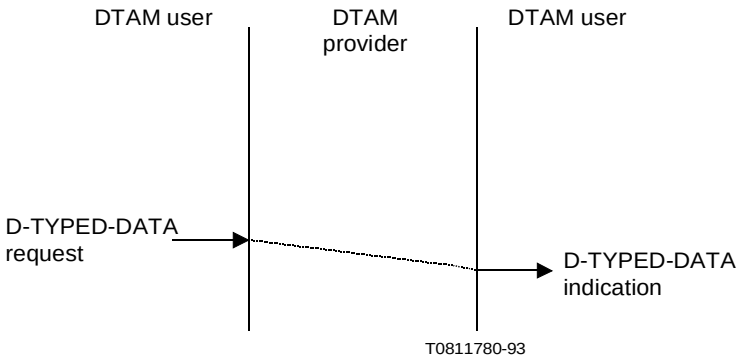

FIGURE 8/T.432

D-TYPED-DATA service events

TABLE 7/T.432

D-TYPED-DATA service parameters

Parameter	D-TYPED-DATA request	D-TYPED-DATA indication
Typed-Data Information	M	M(=)

Note – The meaning of the characters used in the table is given in § 4.

9.8 *D-UNCONFIRMED-CREATE service*

The document create operation procedure is used by the requestor of document manipulation to add the constituents of ODA and/or Operational Structure to a document without any confirmation of the create manipulation.

The related service structure consists of two events, as illustrated in Figure 9/T.432.

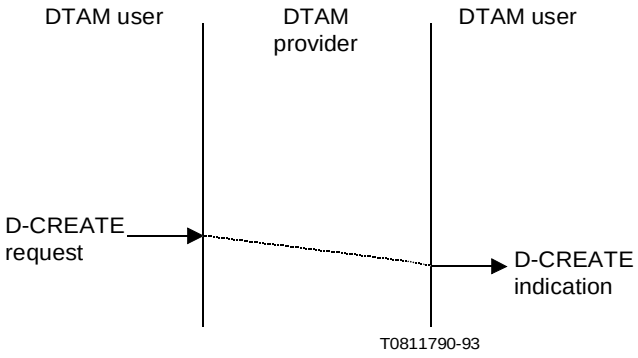

FIGURE 9/T.432

D-UNCONFIRMED-CREATE service events

9.8.1 *D-UNCONFIRMED-CREATE service parameters*

Table 8/T.432 lists the D-CREATE service parameters.

TABLE 8/T.432

D-UNCONFIRMED-CREATE service parameters

Parameter	D-CREATE request	D-CREATE indication
Create Information	M	M(=)

Note – The meaning of the characters used in the table is given in § 4.

9.8.1.1 *Create Information*

This parameter consists of a sequence of sequences of Parent Object or Class Identifiers and Objects which are as defined in Recommendations T.412 and T.441.

9.9 *D-UNCONFIRMED-DELETE service*

The document delete operation procedure is used by the requestor of document manipulation to delete the constituents of ODA and/or Operational Structure of an existing document without any confirmation of the delete operation.

The related service structure consists of two events, as illustrated in Figure 10/T.432.

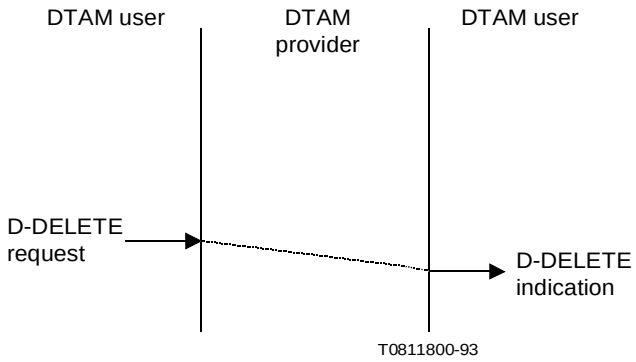

FIGURE 10/T.432

D-UNCONFIRMED-DELETE service events

9.9.1 *D-UNCONFIRMED-DELETE service parameters*

Table 9/T.432 lists the D-DELETE service parameters.

TABLE 9/T.432

D-UNCONFIRMED-DELETE service parameters

Parameter	D-DELETE request	D-DELETE indication
Delete Information	M	M(=)

Note – The meaning of the characters used in the table is given in § 4.

9.9.1.1 *Delete Information*

This parameter consists of a sequence of Object or Class Identifiers, Content Portion Identifiers and Operational Information Identifiers which are as defined in Recommendations T.412 and T.441.

9.10 *D-UNCONFIRMED-MODIFY service*

The document modify operation procedure is used by the requestor of document manipulation to modify the attributes of constituents of ODA and/or Operational Structure of an existing document without any confirmation of the modify operation.

The related service structure consists of two events, as illustrated in Figure 11/T.432.

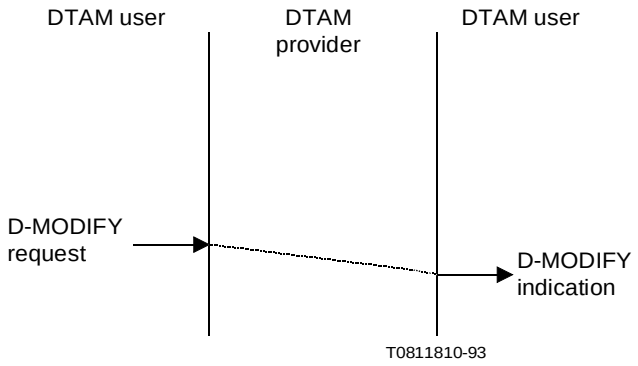

FIGURE 11/T.432

D-UNCONFIRMED-MODIFY service events

9.10.1 *D-UNCONFIRMED-MODIFY service parameters*

Table 10/T.432 lists the D-MODIFY service parameters.

TABLE 10/T.432

D-UNCONFIRMED-MODIFY service parameters

Parameter	D-MODIFY request	D-MODIFY indication
Modify Information	M	M(=)

Note – The meaning of the characters used in the table is given in § 4.

9.10.1.1 *Modify Information*

This parameter is a sequence of sequences of Current Object or Class Identifiers and Objects which are as defined in Recommendations T.412 and T.441.

9.11 *D-UNCONFIRMED-CALL service*

This procedure is used to address or to read an object of Operational Structure which contains a sequence of DTAM protocol data units (with some restrictions, i.e. that only D-CREATE, D-DELETE and D-MODIFY can appear in this sequence). These protocol data units are applicable to the existing document.

The related service structure consists of two events, as illustrated in Figure 12/T.432.

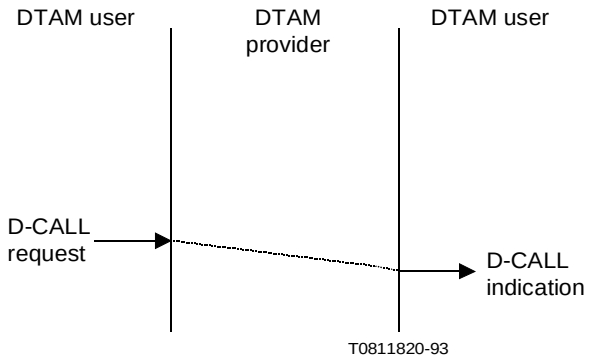

FIGURE 12/T.432

D-UNCONFIRMED-CALL service events

9.11.1 *D-UNCONFIRMED-CALL service parameters*

Table 11/T.432 lists the D-CALL service parameters.

TABLE 11/T.432

D-UNCONFIRMED-CALL service parameters

Parameter	D-CALL request	D-CALL indication
Call Information	M	M(=)

Note – The meaning of the characters used in the table is given in § 4.

9.11.1.1 *Call Information*

This parameter is a sequence of choices of Current Object Identifiers which are defined in Recommendation T.441.

9.12 *D-UNCONFIRMED-REBUILD service*

This procedure is used to delete an object of ODA and/or the Operational Structure (and all the subordinates of this object, if any) and create an object immediately after this particular object, updating the attributes of the object with the values carried by the D-REBUILD operation.

This service is for further study.

9.13 *D-TOKEN-GIVE service*

The token-give procedure is used by a sender (requestor) to give the data token to the receiver (responder), when the sender wants to give the right to manipulate documents.

The requestor becomes the receiver and the responder becomes the sender.

The related service structure consists of two events, as illustrated in Figure 13/T.432.

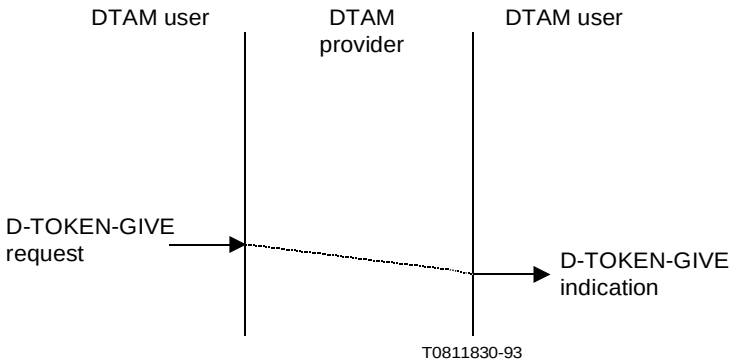

FIGURE 13/T.432

D-TOKEN-GIVE service events

9.13.1 *D-TOKEN-GIVE service parameters*

D-TOKEN-GIVE service has no parameters.

9.14 *D-CONTROL-GIVE service*

The control-give procedure is used by a sender (requestor) to give all the tokens to the receiver (responder). This service can only be requested when the Document bulk transfer functional unit has been selected and the requestor owns all the tokens.

The requestor becomes the receiver and the responder becomes the sender.

The related service structure consists of two events, as illustrated in Figure 14/T.432.

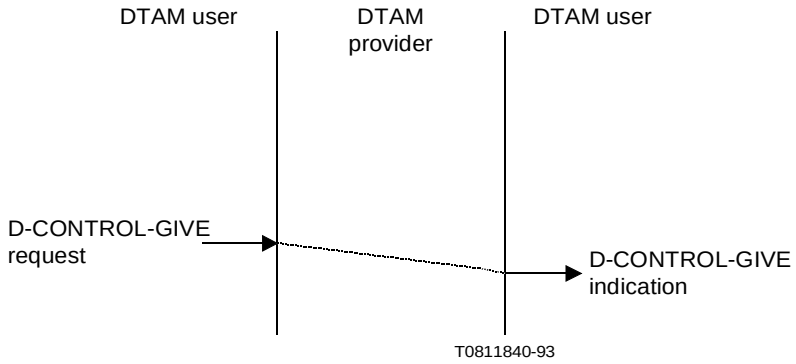

FIGURE 14/T.432

D-CONTROL-GIVE service events

9.14.1 *D-CONTROL-GIVE service parameters*

D-CONTROL-GIVE service has no parameters.

9.15 *D-TOKEN-PLEASE service*

The token-please procedure is used by a receiver (requestor) to request the data token from the sender (responder), when the receiver wants to request the right to transfer or manipulate documents.

Note – The DTAM user, receiving a D-TOKEN-PLEASE indication, is not obliged to surrender the requested token.

The related service structure consists of two events, as illustrated in Figure 15/T.432.

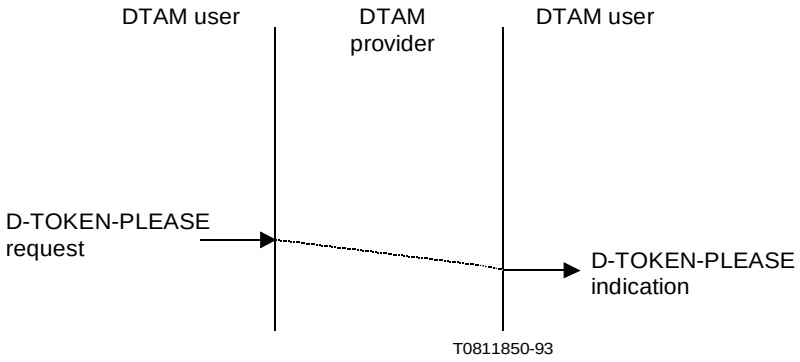

FIGURE 15/T.432

D-TOKEN-PLEASE service events

9.15.1 *D-TOKEN-PLEASE service parameters*

Table 12/T.432 lists the D-TOKEN-PLEASE service parameters.

TABLE 12/T.432

D-TOKEN-PLEASE service parameters

Parameter	D-TOKEN-PLEASE request	D-TOKEN-PLEASE indication
Tokens Priority	U	C(=)

Note – The meaning of the characters used in the table is given in § 4.

9.15.1.1 *Tokens Priority*

This parameter defines the priority of the action, governed by the data token, that the requestor of the D-TOKEN-PLEASE service wishes to carry out. A priority is assigned to each DTAM user action. The supplied value of this parameter reflects the highest priority APDU awaiting transfer. Priority zero is the highest priority, and is reserved for the action of releasing the association by the initiator. Priority one shall be assigned to high priority documents. Priority two shall be assigned to normal priority documents. Priority three shall be assigned to low priority documents. This parameter has to be supplied by the requestor of the D-TOKEN-PLEASE service.

The use of this parameter is mandatory, when RTSE is used (Bulk Transfer Normal Mode).

Note – In the case of DTAM Transparent Mode, this parameter shall not be used.

9.16 *D-P-EXCEPTION-REPORT service*

The provider-exception reporting service permits DTAM users to be notified of unanticipated situations not covered by other services. Details are for further study.

9.17 *D-U-EXCEPTION-REPORT service*

The user-exception reporting service permits a DTAM user to report an exception condition.

The detailed definition of this service is for further study.