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WORKING PAPER

CONFIRMED DATA SERVICE ELEMENT

Summary

This working paper presents an update to the Confirmed Data Service Element presented in the current ULA SARPs. It is recommended that this text be substituted for the text curently in the ULA SARPs.

1. Confirmed Data Service Element Specification (CDSE)

1.1 Introduction

This service element specification is one of a set of specifications used to facilitate the communication between ATM applications.

Within the scope of the ATN, each Service Element describes a portion of an overall ATM Application. The Confirmed Data Service Element provides a service in support of ATM Applications and can only be used in conjunction with other Service Elements. In particular, CDSE requires the use of another ASE to establish and release the uderlying association.

1.2 CDSE Service Overview

The CDSE implements the Dialogure Service confirmed data service. The CDSE-service consists of one confirmed service:

- CD-DATA.

The CD-DATA service provides a means for the service user to pass data to its peer which is identified by a reference number. The CDSE-service provider does not apply any semantics to the reference number or provide any validation or association of reference numbers between service invocations.

The CD-DATA service cannot be utilitized until after the successful completion of the D-START service .

1.3 Relationship with other ASEs and Lower Layer Services

1.3.1 Other Application Service Elements

The CDSE is intended to be used with other ASEs in order to support a specific ATM application.

The CDSE requires the services of other ASEs to estalish, release, and manage the association(s).

The CDSE shall use the facilities of the presentation-service as defined in section y.y.

1.3.1.1 Relationship with ACSE

CDSE may use the services of ACSE in order to open and release the underlying association. Before CDSE services may be invoked, the successful completion of the D-START service must occur. As specified in

section xx, the D-START service is supported through the procedures found in ACSE.

CDSE requires the services of ACSE in order to provide an orderly release service. The interactions with the A-Release service is as follows:

Upon receipt of an A-Release request from the CDSE/ACSE service-user, the service-user may issue CD-CONFIRMED-DATA responses and receive any CD-CONFIRMED-DATA primitives until the service-user receives an A-Release confirm. Upon receiving the A-Release confirm, no further CD-CONFIRMED-DATA primitives may be either sent or received.

Upon receipt of an A-Release indication from the service-provider, the service-user may send CD-CONFIRMED-DATA requests and may receive CD-CONFIRMED-DATA confirm primitivs until it receives an A-Release response from the service-user.

1.4 CDSE Service Definition

The CDSE service is discussed below.

1.4.1 CD-CONFIRMED-DATA Service

The CD-CONFIRMED-DATA service is used to send data to the peer user, along with an identifying reference; and requesting that a confirmantion be returned from the peer user. This service is a confirmed service.

1.4.1.1 CD-CONFIRMED-DATA parameters

Table xx.xx-1 lists the CD-CONFIRMED-DATA parameters.

Parameter Name	Req	Ind	Rsp	Cnf
Reference	M	M(=)	M	M(=)
Result			M	M(=)
User-data	M	M(=)	U	C(=)

1.4.1.1.1 Reference

This parameter allows the CDSE-User which issued the CD-CONFIRMED-DATA request primitive to relate a CD-CONFIRMED-DATA confirm primitive to the request primitive, and allows the CDSE-User which receives the CD-CONFIRMED-DATA indication primitive to issue a CD-CONFIRMED-DATA response primitive for this indication primitive.

The CDSE-User which issues the request primitive has the responsibility to manage the value of reference number to ensure that there is no ambiguity between different invocations of this service between the same peer CDSE-Users.

1.4.1.1.2 Result

This parameter indicates whether the receiving CDSE-user either accepts or rejects the data.

1.4.1.1.3 User-data

This parameter contains the data to be transferred from a CDSE-User to its peer, using an existing association. Its presence in the confirmation primitive is conditional upon it being specified by the CDSE-User in the response primitive.

1.4.1.2 CD-CONFIRMED-DATA Service Procedure

A CDSE service user that desires to send confirmed data issues a CD-CONFIREMED-DATA request primitive. The peer CDSE service user is identified by the association onto which the request is made.

There are no restrictions on other services primitives which can be issued by the CDSE-user after issuing a CD-CONFIREMED-DATA request primitive.

The CDSE service-provider issues a CD-CONFIRMED-DATA indication primitive to the called CDSE-user.

The called CDSE-user accepts or rejects the user data contained in the indication by sending a CD-CONFIRMED-DATA response primitive with an appropriate Result parameter. The CDSE service-provider issues a CD-CONFIRMED-DATA confirm primitive having the same Result parameter.

1.5 CDSE Protocol Specification

1.5.1 Procedures

1.5.1.1 Binding to an Association

The successful completion of the D-Start service, as embodied in an association established by ACSE is made available to the CDSE through the Control Function (CF) procedures. It is assumed that the binding of the CDSE protocol state machine to a particular association is accomplished through the CF and local means.

1.5.1.2 Data Transfer Procedures

Upon receipt of a CD-CONFIRMED-DATA request, the CDSE protocol forms a CDRQ apdu from the parameters in the service request; and passes it to the lower layer service provider.

Upon receipt of a CDRQ apdu, the CDSE protocol forms a CD-CONFIRMED-DATA indication primitive from the fields in the apdu and passes it to the user.

Upon receipt of a CD-CONFIRMED-DATA response primitive from the service-user, the CDSE protocol forms a CDRE apdu from the parameters in the service request and passes the apdu to the lower layer service provider.

Upon receipt of a CDRE apdu, a CDSE protocol forms a CD-CONFIRMED-DATA confirm with parameter values from the fields of the CDRE apdu and passes the primiteive to the service-user.

1.5.1.3 Release Procedures

1.5.1.3.1 Abort Procedures

Upon receipt of either a IA-U-Abort or IA-P-Abort from the lower layer service-provider, the CDSE protocol machine shall return to the IDLE state. Note: It is assumed that the IA-U-Abort and IA-P-Abort will be simultaneously passed to all ASEs servicing the association. The termination of the association and associated service primitives are assumed to be processed by ACSE.

1.5.1.3.2 Orderly Release Procedures

Upon the receipt of a D-END request from the service-user, the CDSE protocol shall not send any further CDRQ apdus. The protocl shall process all service requests and received apdus as described in Section 1.5.1.1 until it receives an [ed's note: not sure what it should receive] IA-Release confirm.

Upon the receipt of an IA-Release confirm, the CDSE protocol shall return to the IDLE state. No further protocol exhanges shall be permitted.

Upon receipt of an IA-Release indication, the CDSE protocol shall respond to any subsequently received CDRQ apdus with a U-Abort request. It shall process all other service requests or apdus as descibed in Section 1.5.1.1 until it receives a D-END confirm.

Upon the receipt of a D-END-confirm, the CDSE shall return to the IDLE state. No further protocol exchanges shall be permitted.

1.5.2 Mapping to the Lower Layer Service

The lower layer service is provided by the interal service as specified in IA-primitives. (See ????)

1.5.2.1 IA-Abort Mapping

The IA-U-Abort and IA-P-Abort shall cause the CDSE protocol state machine to immediately return to the IDLE state.

1.5.2.2 Data Transfer Mapping

The CDRQ and CDRE apdus shall be mapped onto the IA-DATA request service primitive with the apdu passed as user data.

1.5.2.3 Release Mapping

The IA-Release indication and confirm are mapped to internal CDSE protocol procedures as specified in Section 1.5.1.2

1.5.3 State Table for the CDSE Protocol

	STA0 IDLE	**STA1 Data transfer**	**STA2 RLS-req pending**	**STA3 RLS-ind pending**
CD-CNF-DATA req		STA1 CDRQ		STA3 CDRQ
CDRQ apdu		STA1 CD-CNF-DATA ind	STA2 CD-CNF-DATA ind	
CD-CNF-DATA rsp		STA1 CDRE	STA2 CDRE	STA2 CDRE
CDRE apdu		STA1 CD-CNF-DATA cnf	STA2 CD-CNF-DATA cnf	STA3 CD-CNF-DATA cnf
IA-U-Abort ind		STA0	STA0	STA0
IA-P-Abort ind		STA0	STA0	STA0
IA-Release ind		STA3	STA0	
IA-Release cfm			STA0	
D-END req		STA2		
D-END cfm				STA0
completionof D-START service	STA1			

States

Abbreviated name	Description
STA0	IDLE - No service is available
STA1	READY - the D-CONFIRMED-DATA service is available.
STA2	RLS-req pending - The CD-user has issued a D-END request and is awaiting the D-END confirm
STA3	RLS-ind pending - the CDSE has received an IA-Release indication and is awaiting the response from the CD-user.

Incoming Event List

Abbreviated name	Source	Description
CD-CNF-DATA req	CD-User	A CD-CONFIRMED-DATA request primitive has been issued by the CD-User.
CDRQ apdu	CD-Peer	An IA-CDATA indication primitive has been received containing a CDRQ in the User-Data field
CD-CNF-DATA rsp	CD-User	A CD-CONFIRMED-DATA response primitive has been issued by the CD-User.
CDRE apdu	CD-Peer	An IA-CDATA indication primitive has been received containing a CDRE in the User-Data field

Outgoing Event List

Abbreviated name	Target	Description
CDRQ	CD-peer	Form a CDRQ apdu and send as the User Data of an IA-CDATA request primitive.
CDRE	CD-peer	Form a CDRE apdu and send as the User Data of an IA-CDATA request primitive.
CD-CNF-DATA ind	CD-User	Map the fields of the received CDRQ apdu to the parameters of a CD-CONFIRMED-DATA indication primitive, and issue the primitive to the CD-User.
CD-CNF-DATA cnf	CD-User	Map the fields of the received CDRE apdu to the parameters of a CD-CONFIRMED-DATA confirm primitive, and issue the primitive to the CD-User.

1.5.4 ASN.1 Specification of the CDSE Protocol Data Units

```
CDSE-1 {  }
DEFINITIONS ::=
BEGIN

CD-apdu ::= CHOICE {
        confirmed-data              CDRQ-apdu,
        confirmed-response CDRE-apdu
}
```

```
CDRQ-apdu ::= [APPLICATION 1] IMPLICIT SEQUENCE {
        reference       [0] IMPLICIT INTEGER,
        user-data       [10] IMPLICIT  User-Data
}

CDRE-apdu ::= [APPLICATION 2] IMPLICIT SEQUENCE {
        reference       [0] IMPLICIT INTEGER,
        result          [1] IMPLICIT CD-result IMPLICIT INTEGER
                                {accepted (0), rejected (1) } DEFAULT
        accepted,
        user-data       [10] IMPLICIT  User-Data OPTIONAL
}

User-Data ::= SEQUENCE OF EXTERNAL


END
```