Annex A
(normative)

State tables

A.1 General

This annex provides a more precise description of the protocol. In the event of a discrepancy between the description in these tables and that contained in the text, the text takes precedence.

The state tables also define the mapping between service and protocol events that TS-users can expect.

This annex describes the transport protocol in terms of state tables. The state tables show the state of a transport connection, the events that occur in the protocol, the actions taken and the resultant state.

The state tables describe only the operation of a single transport connection. They do not necessarily describe all possible combinations of sequences of events at transport and network service boundary, nor do they describe the exact mapping between TPDUs and NSDUs.

A.2 Conventions

A.2.1 Incoming events are represented in the state tables by their abbreviated name, as defined in table 10.

A.2.2 States are represented in the tables by their abbreviated name, as defined in table 11.

A.2.3 The intersection of each state and event which is invalid is left blank. The action to be taken in this case shall be one of the following:

a) for an event related to the transport service (i.e. coming from the TS-user), take no action;

b) for an event related to a received TPDU, follow the procedure for treatment of protocol errors (see 6.22) if the state of the supporting network connection makes it possible;

c) for an event falling into neither of the above categories (including those which are impossible by the definition of the behaviour of the transport entity or NS-provider), take no action.

A.2.4 At each intersection of state and event which is valid the state tables specify an action which may include one of the following:

a) one action constituted of a list of any number of outgoing events (none, one, or more) given by their abbreviated name defined in table 12 followed by the abbreviated name of the resultant state (see table 11);

b) conditional actions separated by a semi-colon (;). Each conditional action contains a predicate followed by a colon (:) and by an action as defined in a). The predicates are boolean expressions given by their abbreviated name and defined in the clauses related to the state tables of each class. Only the action corresponding to the predicate which is true shall be taken.

A.2.5 The state tables also include

a) informal comments giving explanatory materials;

b) references to notes using the following notation: (note number);

c) references to other actions defined in separate tables using the following notation: [action number].

A.3 Tables

Table 10 specifies that names and abbreviated names of the incoming events, classified as TS-user events, NS-provider events or TPDU events.

Table 11 specifies the names and abbreviated names of the states.

Table 12 specifies the names and abbreviated names of the outgoing events classified as TS-provider events, NS-user events or TPDU events.

A.4 State tables for classes 0 and 2

This clause provides a more precise description of a transport entity for a transport connection of class 0 or class 2.

The description uses predicates defined in table 13, and specific actions defined in table 14.

The description does not include a complete specification of the data transfer procedures but makes reference to the specification of the classes (see clause 8 and 10). Table 15 gives the state automata for classes 0 and 2.

Table 10 – Incoming events

Abbreviated name	Category	Name
TCONreq	TS-user	T-CONNECT Request primitive
TCONresp	TS-user	T-CONNECT Response primitive
TDTreq	TS-user	T-DATA Request primitive
TEXreq	TS-user	T-EXPEDITED DATA Request primitive
TDISreq	TS-user	T-DISCONNECT Request primitive
NDISind	NS-provider	N-DISCONNECT Indication primitive
NCONconf	NS-provider	N-CONNECT Confirm primitive
NRSTind	NS-provider	N-RESET Indication primitive
CR	TPDU	Connection Request TPDU
CC	TPDU	Connection Confirm TPDU
DR	TPDU	Disconnect Request TPDU
DC	TPDU	Disconnect Confirm TPDU
AK	TPDU	Data Acknowledgement TPDU
EA	TPDU	Expedited Data Acknowledgement TPDU
DT	TPDU	Data TPDU
ED	TPDU	Expedited Data TPDU
ER	TPDU	TPDU Error TPDU
RJ	TPDU	Reject TPDU

Table 11 – States

Abbreviated name	Name
WFNC	Wait for network connection
WFCC	Wait for the CC TPDU
WBCL	Wait before releasing (wait for CC TPDU before sending the TPDU DR)
OPEN	Transport connection is open
CLOSING	Release in progress
WFTRESP	Wait for T-CONNECT response
CLOSED	Transport connection is closed
WFNC-R	Wait for network connection and reassignment in progress
WFCC-R	Wait for CC TPDU and reassignment in progress
WBCL-R	Wait before releasing and reassignment in progress
OPEN-R	Open and reassignment in progress
OPEN-WR	Open and wait for reassignment
CLOSING-R	Release in progress and reassignment in progress
CLOSING-WR	Release in progress and wait for reassignment
WFTRESP-WR	Wait for T-CONNECT response and wait for reassignment
WBCL-WR	Wait before releasing and wait for reassignment
WBOC	Wait before open complete (CC is unacknowledged)
WBOC-WR	Wait before open complete and wait for reassignment
CLOSING BOC	Wait before open complete and release in progress
CLOSING BOC-WR	Idem and wait for reassignment
AKWAIT	Waiting for acknowledgement of CC TPDU
REFWAIT	Waiting for frozen reference time

Table 12 – Outgoing event

Abbreviated name	Category	Name
TCONind	TS-provider	T-CONNECT Indication primitive
TCONconf	TS-provider	T-CONNECT Confirm primitive
TDTind	TS-provider	T-DATA Indication primitive
TEXind	TS-provider	T-EXPEDITED DATA Indication primitive
TDISind	TS-provider	T-DISCONNECT Indication primitive
NDISreq	NS-user	N-DISCONNECT Request primitive
NRSTresp	NS-user	N-RESET Response primitive
NCONreq	NS-user	N-CONNECT Request primitive
CR	TPDU	Connection Request TPDU
CC	TPDU	Connection Confirm TPDU
DR	TPDU	Disconnect Request TPDU
DC	TPDU	Disconnect Confirm TPDU
AK	TPDU	Data Acknowledgement TPDU
EA	TPDU	Expedited Data Acknowledgement TPDU
DT	TPDU	Data TPDU
ED	TPDU	Expedited Data TPDU
ER	TPDU	TPDU Error TPDU
RJ	TPDU	Reject TPDU

Table 13 – Predicates for classes 0 and 2

Name	Description
P0	T-CONNECT request unacceptable
P1	Unacceptable CR TPDU
P2	No network connection available
P3	Network connection available and open
P4	Network connection available and open in progress
P5	Class in class 0 (class selected in CC)
P6	Unacceptable CC
P7	Class is class 2
P8	Acceptable CC
P9	Class 4 CR
P10	Local choice

Table 14 – Specific actions for classes 0 and 2

Name	Description
[1]	If the network connection is not used by another transport connection assigned to it, it may be disconnected. (See 6.1.3 note 3)
[2]	See 6.22 (receipt of an ER TPDU)
[3]	See data transfer procedures of the class
[4]	See expedited data transfer procedure of the class
[5]	An N-RESET response has to be issued once for the network connection if the network connection has not been released. In class 0, an N-DISCONNECT request has to be issued.
[6]	The DC TPDU contains a SRC-REF field set to zero and a DST-REF field set to the SRC-REF of the DR TPDU received.

Table 15 – State table for classes 0 and 2

State Event	WFNC	WFCC	WBCL (Class 2 only)	OPEN	CLOSING (Class 2 only)	WFTRESP	CLOSED
TCONreq							P0: TDISind CLOSED; P2: NCONreq WFNC; P3: CR WFCC; P4: WFNC
TCONresp						CC OPEN	
TDTreq				[3] OPEN			
TEXreq	DOES NOT EXIST IN CLASS 0						
				[4] OPEN			
TDISreq	[1] CLOSED	not P7: NDISreq CLOSED; P7: WBCL		P5: NDISreq CLOSED; P7: DR CLOSING		DR CLOSED	
NCONconf	CR WFCC						
NRSTind		TDISind [1] [5] CLOSED	[1] [5] CLOSED	TDISind [1] [5] CLOSED	[1] [5] CLOSED	TDISind [1] [5] CLOSED	
NDISind	TDISind CLOSED	TDISind CLOSED	CLOSED	TDISind CLOSED	CLOSED	TDISind CLOSED	
CR				P9: OPEN	P9: CLOSING	P9: WFTRESP	P1: DR (1) CLOSED; not P1: TCONind WFTRESP
DR		TDISind		P5: (2);		P10: DC [6](5)	CLOSED (4);
		[1] CLOSED	[1] CLOSED	P7: DC TDISisd CLOSED	[1] CLOSED	TDISind CLOSED	DC CLOSED
DC	DOES NOT EXIST IN CLASS 0 (2)						CLOSED
					P7: [1] CLOSED		
CC		P8: TCONconf OPEN; P6 and P5: TDISind NDISreq CLOSED; P6 and P7: TDISind DR CLOSING	P5 : (3) NDISreq CLOSED; P7: DR CLOSING		CLOSING		DR CLOSED
AK	DOES NOT EXIST IN CLASS 0 (2)						CLOSED
				[3] OPEN	CLOSING		
EA	DOES NOT EXIST IN CLASS 0 (2)						CLOSED
				[4] OPEN	CLOSING		
ED	DOES NOT EXIST IN CLASS 0 (2)						CLOSED
				[4] OPEN	CLOSING		
DT				[3] OPEN	CLOSING		CLOSED
ER		TDISind [1] CLOSED	[1] CLOSED	(2)	(2)		CLOSED

(1) An ER TPDU should be sent in certain cases (see 6.6)

(2) If received it should be processed as a protocol error (see 6.22).

(3) A CR with class 2 has been sent and a CC class 0 is received.

(4) If DC is not available (i.e. class 0 only implemented) or SRC-REF is zero.

(5) This happens only when the preferred class of the CR TPDU received is class 4.

A.5 State tables for classes 1 and 3

This clause provides a more precise description of a transport entity for a transport connection of class 1 or 3.

The description uses the predicates defined in table 16.

Specific actions are defined in table 17 and specific additional notes are given in table 18.

The description does not include a complete specification of the data transfer but makes reference to the specification of the classes (see clauses 9 and 11). Table 19 gives the state automata for classes 1 and 3.

Table 16 – Predicates for classes 1 and 3

Name	Description
P0	T-CONNECT Request unacceptable
P1	No available network connection can be used for assignment or reassignment
P2	A network connection can be used for assignment or reassignment; the network connection opening is in progress
P3	A network connection can be used for assignment or reassignment; the network connection is open
P4	TTR timer has previously run out
P5	Local choice
P6	Initiator of the transport connection
P7	Unacceptable CR TPDU
P8	TWR is running
P9	Class 4 CR
P10	Class selected in CC is class 0 or 2

Table 17 – Specific actions for classes 1 and 3

Name	Description
[1]	The network connection can be disconnected if not used by any transport connection assigned to it
[2]	Retransmit expedited data which are unacknowledged or which have been stored when waiting for reassignment (if any). If a RJ TPDU has been received, enable also data TPDU transmission (if any). If an ED was received, handle according to procedures for class if not a duplicate
[3]	Network connection can be disconnected if not used by any transport connection and was locally opened
[4]	Start TWR timer if not already running. Disable sending DT TPDUs until an RJ TPDU is received (see note 3)
[5]	Stop TWR timer
[6]	Issue an N-RESET response if not already done
[7]	See data transfer procedure for the class
[8]	Start TTR timer if not already running. The sending credit is also set to zero in order not to send DT TPDUs until a RJ TPDU is received.
[9]	Stop TTR timer if running or remove information that TTR timer has run out (see notes 1 and 2)
[10]	Store information that TTR timer has run out (see note 1)
[11]	Store request
[12]	See state table appropriate to the class selected in the CC TPDU
[13]	close the network connection to which the transport connection is currently assigned, apply to all transport connections assigned to this network connection the procedure for processing NDISind and then process the TPDU reassignment.
[14]	The DC TPDU contains a SRC-REF field set to zero and a DST-REF field set to the SRC-REF of the DR TPDU received.

NOTES

1 This information is used by predicate P4.

2 This action is not performed if the transport entity is the responder or if neither reassignment nor resynchronization is in progress.

3 The method of disabling transmission of DT TPDUs is a local matter. In class 3 for example, it may be effected by setting credit to zero. In class 1, this may be effected by setting of a boolean indicator.

Table 18 – Specific notes for classes 1 and 3

name	description
(1)	Any TPDU except DR and CC having an unknown destination reference
(2)	CC TPDU having an unknown destination reference or a mismatched source reference
(3)	CR TPDU which is not duplicated but rejected. If the CR TPDU is duplicated, ignore it
(4)	Or send any DT or ED TPDU waiting for transmission or use N-DATA ACKNOWLEDGE request if available and selected (class 1 only)
(5)	Same as for (9) and issue a T-DISCONNECT indication
(6)	If the resultant state is CLOSED, the reference should be frozen except in the cases described in 6.18
(7)	An ER TPDU should be sent in the cases defined in 6.6
(8)	Receipt of a DC TPDU is a protocol error since DC cannot be used for reassignment. It is recommended to stop the TWR timer ([5]) and to consider the transport connection as released (CLOSED STATE)
(9)	Receipt of one of these TPDUs in this state is a protocol error. It is recommended to stop the TWR timer ([5]), and send a DR TPDU and enter the closing state
(10)	Or a DR with mismatched source reference has been received
(11)	Receipt of CR in this state is only valid if the TPDU is received on a network connection to which the transport connection is not assigned. It is recommended to apply action [13].
(12)	Receipt of this TPDU in this state is possible either on the network connection to which the transport connection is currently assigned or on another network connection (for the responder only). In the former case the action is as stated in the state table. In the latter case it is recommended to apply action [13].
(13)	This happens only when the preferred class of the CR TPDU received is class 4.

Table 19 – State table for classes 1 and 3
(First part: connection - responder side)

State Event	CLOSED	WFTRESP	WFTRESP -WR	WBCL-WR	WBOC	WBOC-WR	CLOSING BOC	CLOSING BOC-WR
TDISreq		DR CLOSED (6)	WBCL-WR		DR CLOSING BOC	CLOSING BOC-WR		
TCONresp		P10: (12); not P10: CC WBOC	WBOC-WR					
NRSTind		[4] [6] WFTRESP -WR	[6] WFTRESP -WR	[6] WBCL-WR	[4] [6] WBOC-WR	[6] WBOC-WR	[4] [6] CLOSING BOC-WR	[6] CLOSING BOC-WR
NDISind		[4] WFTRESP -WR	WFTRESP -WR	WBCL-WR	[4] WBOC-WR	WBOC-WR	[4] CLOSING BOC-WR	CLOSING BOC-WR
CR	P7: DR (3 and 7) CLOSED (6); not P7: TCONind; WFTRESP	P9: WFTRESP; not P9: (11)	[5] WFTRESP	[5] DR CLOSED (6)	P9: WBOC; not P9: (11)	[5] CC WBOC	P9: CLOSING BOC; not P9: (11)	DR [5] CLOSED (6)
DR	DC CLOSED	P5: DC [14] (13) TDISind CLOSED			TDISind DC CLOSED (6) (12)	DC (5) TDISind CLOSED	CLOSED (6) (12)	[5] DC CLOSED (6)
RJ or ED	CLOSED				OPEN [7] (12)	[5] [2] RJ OPEN	CLOSING (12)	[5] DR CLOSING
DC	CLOSED						CLOSED	(8)
First TPDU other than CR, DR, DC, ED, ER or RJ	CLOSED				OPEN [7]		CLOSING	(9)
TWR time-out			TDISind CLOSED (6)	CLOSED (6)		TDISind CLOSED (6)		CLOSED (6)
TDTreq					[7] WBOC	[11] WBOC-WR		
TEXreq					[7] WBOC	[11] WBOC-WR		
ER					TDISind DC CLOSING BOC		CLOSED (6)	

Table 19 (continue) **– State table for classes 1 and 3**
(Second part: connection initiator side)

State / Event	CLOSED	WFNC	WFNC-R	WFCC	WFCC-R	WBCL	WBCL-R
TCONreq	P0: TDISind CLOSED; not (P0 and P1) NCONreq WFNC; not (P0 and P2): WFNC; not (P0 and P3): CR WFCC						
NCONconf		CR WFCC	CR WFCC		CR WFCC		CR WBCL
NRSTind				P4: TDISind [6] (6) [1] CLOSED; not P4: CR [6] [8] WFCC		P4: [6] CLOSED [1]; not P4: CR [6] [8] WBCL	
NDISind		P1: NCONreq WFNC-R [8]; P2: [8] WFNC-R; P3: CR [8] WFCC	P1: NCONreq WFNC -R; P2: WFNC-R; P3: CR WFCC	P4: TDISind CLOSED (6); (not P4) and P1: [8] NCONreq WFCC-R; (not P4) and P2: [8] WFCC-R; (not P4) and P3: [8] CR WFCC	P1: NCONreq WFCC-R; P2: WFCC-R; P3: CR WFCC	P4 or P5: [1 and 9] (6) CLOSED; (not (P4 or P5)) and P1: [8] NCONreq WBCL-R; (not (P4 or P5)) and P2: [8] WBCL-R; (not (P4 or P5)) and P3: [8] CR WBCL	P5: CLOSED (6) [9]; (not P5) and P1: NCONreq WBCL-R; (not P5) and P2: WBCL-R; (not P5) and P3: CR WBCL
TDISreq		[1] CLOSED (6)	[1] CLOSED (6) [9]	WBCL	P5: CLOSED (6) [1 and 9]; not P5: WBCL-R		
DR	(10) DC CLOSED (12)			TDISind [1] [9] CLOSED (6)		[1] [9] CLOSED (6)	
CC	DR CLOSED			P10: [12]; not P10: TCONconf AK(4) OPEN [9]		P10: [12]; not P10: DR [9] CLOSING	
(1)	CLOSED						
(2)	DR CLOSED						
TTR time-out			TDISind [1] CLOSED (6)	[10]	TDISind [1] CLOSED (6)	[10]	[1] CLOSED (6)
ER				TDISind [1] [9] CLOSED (6)		[1] [9] CLOSED (6)	

Table 19 (concluded) **– State table for classes 1 and 3**
(Third part: OPEN and CLOSING states)

State Event	OPEN	OPEN-R	OPEN-WR	CLOSING	CLOSING-R	CLOSING-WR
NCONconf		RJ [2] OPEN			DR CLOSING	
TDISreq	P8: CLOSING; not P8: DR CLOSING	CLOSING-R	CLOSING-WR			
NRSTind	P6 and P4: (6) [6] [3] TDISind CLOSED; (P6 and not P4): [6] [2] [8] RJ OPEN; not P6: [4 and 6] OPEN			P6 and P4: (6) [6] [3] CLOSED; P6 and not P4: [6] [8] DR CLOSING; not P6: [4, 6] CLOSING		
NDISind	P6 and P4: TDISind CLOSED (6); (P6 and not P4) and P1: [8] NCONreq OPEN-R; (P6 and not P4) and P2: [8] OPEN-R; (P6 and not P4) and P3: [8] [2] RJ OPEN; not P6: [4] OPEN-WR	P1: NCONreq OPEN-R; P2: OPEN-R; P3: [2] RJ OPEN		P6 and (P5 or P4): CLOSED (6); P6 and not (P4 or P5) and P1: [8] NCONreq CLOSING-R; P6 and not (P4 or P5) and P2: [8] CLOSING-R; P6 and not (P4 or P5) and P3: [8] DR CLOSING; not P6: [4] CLOSING-WR	P5: CLOSED (6); (not P5 and P1): NCONreq CLOSING-R; (not P5) and P2: CLOSING-R; (not P5) and P3: DR CLOSING	
RJ or ED	P8: [5] [2] RJ OPEN; not P8: [7] [9] OPEN (12)		RJ [5 and 2] OPEN	P8: [5] DR CLOSING; not P8: [9] CLOSING (12)		DR [5] CLOSING
TWR time-out	TDISind (6) CLOSED		TDISind (6) CLOSED	CLOSED (6)		CLOSED (6)
DR	P8: TDISind DC (6) [5] CLOSED; not P8: TDISind DC (6) [9] CLOSED (12)		TDISind DC [5] CLOSED (6)	P8: [5] DC (6) CLOSED; not P8: [3] [9] (6) CLOSED (12)		[5] CLOSED (6) DC
DC				P8: (8); not P8: [3] [9] CLOSED (6);		(8)
DT, AK, or EA TPDU	[7] OPEN		(5)	CLOSING		(9)
TTR time-out	[10]	TDISind CLOSED [1] (6)		[10]	CLOSED [1] (6)	
TDTreq	P8: [11] OPEN; not P8: [7] OPEN	[11] OPEN-R	[11] OPEN-WR			
TEXreq	P8: [11] OPEN; not P8: [7] OPEN	[11] OPEN-R	[11] OPEN-WR			
ER	TDISind DR CLOSING		TDISind DR CLOSING	CLOSED (6)		CLOSED (6)

A.6 State tables for class 4 over CONS

This clause provides a more precise description of a class 4 Transport Connection.

Tables 20, 21, 22 give the predicates, actions and notes for class 4 respectively.

Table 23 is the state table for a class 4 transport connection.

The following assumptions and notations are used:

a) the state of every network connection is known as being open or opening (i.e. a NCONreq has been issued and the NCONconf is awaited);

b) for each transport connection the transport entity maintains the set of network connections to which the transport is assigned. A network connection in this set is either in open or opening state;

c) when an N-CONNECT confirmation, N-RESET indication or N-DISCONNECT indication is received this event is associated with the transport connection if the network connection belongs to the set;

d) when an N-DISCONNECT is received, the network connection becomes unexisting and is therefore withdrawn from the set. When a NCONconf is received the state of the nc becomes "open";

NOTE – This is not shown by an explicit action in the state table. Conversely adding a network connection to a set and setting its state to "opening" is shown by an explicit action.

e) when the state goes back to CLOSED or REFWAIT state, it is assumed that all timers are stopped (if running), the count is set to zero and the set becomes empty;

f) when a TPDU is received the network connection on which it has been received is assumed to be known;

g) the variable "current-nc" is used to designate either the network connection on which a TPDU has been received or the network connection which has been chosen for a new assignment (either an existing one or a new one which is created);

h) the following variables are also used:

local-ref: the reference (local) of the TC is chosen when sending the CR or when accepting a CR;

remote-ref: the reference of remote entity is initially set to zero and initialized when processing the CC except if the CC is ignored;

SRC-REF: designates the corresponding field of the received TPDU;

DST-REF: designates the corresponding field of the received TPDU;

src-ref, dst-ref: designates the corresponding field of the sent TPDU;

count: designates the number of times a TPDU has been sent (retransmissions);

j) the data transfer phase is not completely described in the state table but refers to the main text;

k) a spontaneous event called "new network connection assignment" has been introduced. It may occur at any time provided P1 or P2 are true (see table 20) and the remote ref is not zero (i.e. a CR TPDU has been received or a CC TPDU has been received and processed);

m) when an N-RESET indication is received, an N-RESET response is issued.

Table 20 – Predicates for class 4 over CONS

Name	Description
P0	T-CONNECT Request is acceptable
P1	An assignment can be done to a suitable network connection (either open or opening)
P2	It is possible to open a new network connection
P3	Local choice
P4	A CR TPDU has never been sent
P5	The transport entity is the initiator and the set of network connections is now empty (i.e. a new assignment shall be done) or a new assignment is decided as a local choice
P6	Local choice not to perform a new assignment if the set of network connections is empty (for Closing state only)
P7	Count = maximum
P8	Acceptable CR TPDU
P9	Acceptable class 4 CC TPDU
P10	Unacceptable class 4 CC TPDU
P11	CC TPDU not specifying class 4

Table 21 – Specific actions for class 4 over CONS

Name	Description
[0]	Set reference timer
[1]	Count = count + 1
[2]	Count = 0
[3]	Set retransmission timer
[4]	Stop retransmission timer if running
[5]	Set window timer
[6]	Stop window timer if running
[7]	Set inactivity timer
[8]	Stop inactivity timer
[9]	Set initial credit for sending according to the received CR/CC TPDU
[10]	Set initial credit for controlling reception according the the sent CR/CC TPDU
[11]	Send the CR TPDU if there is a network connection in the open state in the set
[12]	Add the current network connection to the set, if not already included
[13]	The current network connection is now in opening state
[14]	Send the CC TPDU if a network connection in the open state is in the set
[15]	Send the DR TPDU if a network connection in the open state is in the set. This DR TPDU is sent with SRC-REF = local-ref and DST-REF = remote-ref (may be zero)
[16]	Send the DR TPDU if a network connection in the open state is in the set. The DR TPDU is sent with SRC-REF = 0 and DST-REF = remote-ref
[17]	Send a TPDU according to data transfer procedure
[18]	See state table of the class specified in the CC TPDU (refer to data transfer)
[19]	See state table of the class (refer to release procedure): send a DR TPDU if the class is not 0, otherwise issue an N-DISCONNECT request
[20]	Store request and exercise flow control to the user
[21]	Send a DR TPDU with SRC-REF field set to zero
[22]	Send a DC TPDU except if the SRC-REF field of the received DR TPDU is equal to zero

Table 22 – Specific notes for class 4 over CONS

Name	Description
(1)	Not possible as no set of Network Connections is associated with this transport connection
(2)	It is also possible to remain in the same state (T1 is still running) until – a CC TPDU is received which performs a new assignment; – a new assignment is tried (spontaneous event); – T1 runs out and the count is equal to the maximal value
(3)	No new assignment was possible: if the set is empty, the transport entity waits until a new assignment is received, or can be locally performed (spontaneous event)
(4)	It is also possible to perform a new assignment. (This may be done in triggering the event "new network connection assignment")
(5)	Not a duplicated CR TPDU. If the CR TPDU is duplicated, ignore it
(6)	Since a new network connection is now assigned, it is recommended that the appropriate TPDU be sent on this network connection (if open) in order to make the remote entity aware of this assignment. It is also possible to allow the normal retransmission procedures to cause the TPDU to be sent; however, the first TPDU available for sending should be sent on the new network connection
(7)	As a local choice it is also possible to apply the following: [0], TDISind, REFWAIT
(8)	Association to this transport connection is carried out regardless of the SRC-REF field. If the SRC-REF is not zero, a DC TPDU is sent back
(9)	At least an AK TPDU shall be sent if the transport entity is in the initiator in order to ensure that the responder will complete its three-way handshake
(10)	If association has been made, and DST-REF is zero, then the DC TPDU contains a SRC-REF field set to zero
(11)	If the CLOSING state has been entered, coming from WFCC state, the remote-ref is zero. The SRC-REF field of the CC TPDU is ignored (i.e. if the DR TPDU is retransmitted, it will be with DST-REF field set to zero)
(12)	If the CLOSING state has been entered, coming from WFCC state, the remote-ref (which is zero) shall be set with SRC-REF in order to comply with the release procedure of the negotiated class
(13)	The DR TPDU may be either repeated immediately or when T1 will run out
(14)	If the set is empty, this event may be used as a criteria for triggering the event "new network connection assignment"
(15)	Previously stored T-DATA or T-EXPEDITED DATA requests are ready for processing according to data transfer procedures
(16)	See data transfer procedures
(17)	When an N-RESET INDICATION is received, an N-RESET RESPONSE has to be issued once independent of the state automata

Table 23 – Class 4 connection/disconnection over CONS

State / Event	REFWAIT	CLOSED	WFCC	WBCL	OPEN	WFTRESP	AKWAIT	CLOSING
TCONreq		not P0: TDISind CLOSED; P0 and P1: [12, 1, 3, 10 and 11] WFCC; P0 and not P1 and P2: [13, 12, 1, 3 and 10] NCONreq WFCC; P0 and not P2: TDISind CLOSED						
TCONresp						[3, 2, 1, 10 and 14] AKWAIT		
TDISreq			P4: CLOSED; (not P4) and P3: WBCL; (not P4) and (not P3) [4, 3, 2, 1 and 15] CLOSING		[6, 8, 4, 3, 2, 1 and 15] CLOSING	[16] CLOSED	[4, 3, 2, 1 and 15] CLOSING	
NDISind	(1)	(1)	P1: [12] WFCC; (not P1) and P2: [13 and 12] NCONreq WFCC; (not P1) and (not P2): [0] [2] TDISind REFWAIT	P3: [0] REFWAIT; (not P3) and P1: [12 and 11] WBCL; (not P3) and (not P1) and P2: [13 and 12] NCONreq WBCL; (not P3) and (not P1) and (not P2): [0] REFWAIT	P5 and P1: [12 and 17] (6) OPEN; P5 and (not P1) and P2: [13 and 12] NCONreq OPEN; P5 and (not P1) and (not P2): OPEN (3); not P5: OPEN	WFTRESP (4)	P5 and P1: [12 and 14] (6) AKWAIT; P5 and (not P1) and P2: [13 and 12] NCONreq AKWAIT; P5 and (not P1) and (not P2): AKWAIT (3); not P5: AKWAIT	P6: [0] REFWAIT; (not P6) and P5 and P1: [12 and 15] CLOSING (6); (not P6) and P5 and (not P1) and P2: [13 and 12] NCONreq CLOSING; (not P6) and P5 and (not P1) and (not P2): CLOSING (3); (not P6) and (not P5): CLOSING
NRSTind			(17)	(17)	(17)	(17)	(17)	(17)
TDTreq TEXreq					(16) OPEN		[20] AKWAIT	
NCONconf	(1)	(1)	CR WFCC (6)	CR WBCL (6)	[17] OPEN (6)	WFTRESP	CC ADWAIT (6)	[15] CLOSING (6)
New network connection assignment					P1: [12 and 17] OPEN (6); (not P1) and P2: [13 and 12] NCONreq OPEN	P1: [12] WFTRESP (6); (not P1) and P2: [13 and 12] NCONreq WFTRESP	P1: [12 and 14] (6) AKWAIT; (not P1) and P2: [13 and 12] NCONreq AKWAIT	P1: [12 and 15] (6) CLOSING ; (not P1) and P2: [13 and 12] NCONreq CLOSING

Table 23 – Class 4 connection/disconnection over CONS (concluded)

State / Event	REFWAIT	CLOSED	WFCC	WBCL	OPEN	WFTRESP	AKWAIT	CLOSING
Retrans-timer			P7 and P3 [0] TDISind REFWAIT; P7 and (not P3): [3, 2, 1 and 15] TDISind CLOSING (14); not P7: [1, 3 and 11] WFCC	P7 and P3: [0] REFWAIT; P7 and (not P3): [3, 2, 1 and 15] CLOSING (14); not P7: [1, 3, and 11] WBCL	P7: [6, 8, 3, 2, 1 and 15] TDISind CLOSING (14); not P7: (16) (14) OPEN		P7: [3, 2, 1 and 15] TDISind (14) CLOSING; not P7: [1, 3 and 14] (14) AKWAIT	P7: [0] REFWAIT; not P7: [1, 3 and 15] (14) CLOSING
Inactivity-timer					[6, 4, 3, 2, 1 and 15] TDISind CLOSING (7)			
Reference timer	CLOSED							
CR		not P8: [21] CLOSED (5); P8: [9 and 12] TCONind WFTRESP (5)			[12, 8 and 7] OPEN	[12] WFTRESP	[12 and 14] AKWAIT	[12] CLOSING (13)
CC	DR REFWAIT	DR CLOSED	P9: [12, 9, 2, 4, 5, 7 and 17] TCONconf (9) OPEN; P10: [12, 4, 3, 2, 1 and 15] TDISind CLOSING; P11: [18]	P11: [19]; not P11: [12, 2, 4, 3, 1 and 15] CLOSING	[12, 17, 8 and 7] (9) OPEN			P11: [19] (12); not P11: [12] CLOSING (11)
ER	REFWAIT	CLOSED	[0] TDISind REFWAIT	[0] REFWAIT	[12, 6, 8, 4, 3, 2, 1 and 15] TDISind CLOSING		[12, 4, 3, 2, 1 and 15 TDISind CLOSING	[0] REFWAIT
DR	[22] REFWAIT	[22] CLOSED	(8) TDISind [0] REFWAIT	(8) [0] REFWAIT	DC (10) [0] TDISind REFWAIT	DC (10) TDISind CLOSED	DC (10) [0] TDISind REFWAIT	[0] REFWAIT
DC	REFWAIT	CLOSED						[0] REFWAIT
EA	REFWAIT	CLOSED			[12, 8 and 7] OPEN (16)			[12] CLOSING (13)
DT/AK/ED	REFWAIT	CLOSED			[12, 8 and 7] OPEN (16)		[12 and 7] OPEN (15) (16)	[12] CLOSING (13)

A.7 State tables for class 4 over CLNS

This clause provides a more precise description of a class 4 transport connection when operating over CLNS.

Tables 24, 25, 26 give the predicates, actions and notes for class 4 respectively.

Table 27 is the state table for a class 4 transport connection when operating over CLNS.

The following assumption and notations are used

a) local-ref: the reference (local) of the TC is chosen when sending the CR or when accepting a CR;

remote-ref: the reference of the remote entity is initially set to zero and initialized when processing the CC except if the CC is ignored;

SRC-REF: designates the corresponding field of the received TPDU;

DST-REF: designates the corresponding field of the received TPDU;

src-ref, dst-ref: designates the corresponding fields of the sent TPDU;

count: designates the number of times a TPDU has been sent (retransmissions);

b) the data transfer phase is not completely described in the state table but refers to the main text;

c) it is assumed that the network service is continuously available;

The operations resulting from signalled inaccessibility of the network service are a local matter.

Table 24 – Predicates for class 4 over CLNS

Name	Description
P0	T-CONNECT request is acceptable.
P3	Local choice.
P7	Count = maximum.
P8	Acceptable CR TPDU.
P9	Acceptable class 4 CC TPDU

Table 25 – Specific actions for class 4 over CLNS

Name	Description
[0]	Set reference timer
[1]	Count = count + 1
[2]	Count = 0
[3]	Set retransmission timer
[4]	Stop retransmission timer if running
[5]	Set window timer
[6]	Stop window timer if running
[7]	Set inactivity timer
[8]	Stop inactivity timer if running
[9]	Set initial credit for sending according to the received CR/CC TPDU
[10]	Set initial credit for controlling reception according to the sent CR/CC TPDU
[15]	Send the DR TPDU. This DR TPDU is sent with src-ref = local-ref and dst-ref = remote-ref (may be zero)
[16]	Send the DR TPDU. The DR TPDU is sent with src-ref = 0 and dst-ref = remote-ref
[17]	Send a TPDU according to data transfer procedure
[20]	Store request and exercise flow control to the user
[21]	Send a DC TPDU except if the SRC-REF field of the received DR TPDU is equal to zero
[22]	Send a DC TPDU except if the SRC-REF field of the received DR TPDU is equal to zero
[23]	Send a DR TPDU with src-ref = local-ref and dst-ref = SRC-REF in CC TPDU

Table 26 – Specific notes for class 4 over CLNS

Name	Description
(5)	Not a duplicated CR TPDU. If the CR TPDU is duplicated, ignore it.
(7)	As a local choice it is also possible to apply the following [0], TDISind, REFWAIT.
(8)	Association to this Transport connection is done regardless of the SRC-REF field. If SRC-REF is not zero, a DC TPDU is set back.
(9)	At least an AK TPDU shall be sent if the transport entity is the initiator in order to ensure that the responder will complete its three-way handshake.
(10)	If association has been made, and DST-REF is zero, then the DC tpDU contains a src-ref field set to zero.
(11)	If the CLOSING state has been entered, coming from WFCC state, the remote-ref is zero. The SRC-REF field of the CC TPDU is ignored (i.e. if the DR TPDU is retransmitted, it will be with the dst-ref field set to zero).
(13)	The DR TPDU may be either repeated immediately or when T1 will run out.
(15)	Previously stored T-DATA or T-EXPEDITED-DATA requests are ready for processing according to data transfer procedures.
(16)	See data transfer procedures.

Table 27 – Class 4 connection/disconnection over CLNS (1 of 2)

STATE EVENT	REFWAIT	CLOSED	WFCC	WBCL	OPEN	WFTRESP	AKWAIT	CLOSING
TCONreq		not P0: TDISind CLOSED; P0: [1,3,10] CR WFCC						
TCONresp						[3,2,1,10] CC AKWAIT		
TDISreq			P3: WBCL; not P3: [4,3,2,1,15] CLOSING		[6,8,4,3,2,1, 15] CLOSING	[16] CLOSED	[4,3,2,1, 15] CLOSING	
TDTreq TEXreq					(16) OPEN		[20] AKWAIT	
Retrans- timer			P7 and P3: [0] TDISind REFWAIT; P7 and (not P3): [3,2,1,15] TDISind CLOSING; not P7: [1,3],CR WFCC;	P7 and P3: [0] REFWAIT; P7 and (not P3): [3,2,1,15] CLOSING; not P7: [1,3],CR WBCL;	P7: [6,8,3,2,1,15] TDISind CLOSING; not P7: (16) OPEN;		P7: [3.2.1.15] TDISind CLOSING; not P7: [1,3],CC AKWAIT;	P7: [0] REFWAIT; not P7: [1,3,15] CLOSING
Inactivity- Timer					[6,4,3,2,1,15] TDISind CLOSING (7)			
Reference- timer	CLOSED							
CR		not P8: [21] CLOSED; P8: [1,9,3] TCONind WFTRESP (5);			[8,7] OPEN	WFTRESP	CC AKWAIT	CLOSING (13)

Table 27 – Class 4 connection/disconnection over CLNS (2 of 2)

STATE EVENT	REFWAIT	CLOSED	WFCC	WBCL	OPEN	WFTRESP	AKWAIT	CLOSING
CC	DR REFWAIT	DR CLOSED	P9: [9,2,4,5,7,17] TCONconf (9) OPEN; not P9: [4,3,2,1,23] TDISind CLOSING;	P9: [2,4,3,1,15] CLOSING;	[17,8,7] (9) OPEN			P9: (11) CLOSING
ER	REFWAIT	CLOSED	[0] TDISind REFWAIT	[0] REFWAIT	[6,8,4,3,2,1,15] TDISind CLOSING		[4,3,2,1,15] TDISind CLOSING	[0] REFWAIT
DR	[22] REFWAIT	[22] CLOSED	(8) [0] TDISind REFWAIT	(8) [0] REFWAIT	DC (10) [0] TDISind REFWAIT	DC (10) TDISind CLOSED	DC (10) [0] TDISind REFWAIT	[0] REFWAIT
DC	REFWAIT	CLOSED						[0] REFWAIT
EA	REFWAIT	CLOSED			[8,7] OPEN (16)			CLOSING (13)
DT/AK/ED	REFWAIT	CLOSED			[8,7] OPEN (16)		[7] OPEN (15) (16)	CLOSING (13)