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Information technology — Open Systems Interconnection — Connection-oriented Session protocol: Protocol specification

AMENDMENT 1: Efficiency enhancements

Technologies de l'information — Interconnexion de systèmes ouverts (OSI) — Protocole de session en mode connexion: Spécification du protocole

AMENDEMENT 1: Améliorations d'efficacité

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Foreword

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

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INTERNATIONAL STANDARD

ITU-T RECOMMENDATION

INFORMATION TECHNOLOGY – OPEN SYSTEMS INTERCONNECTION – CONNECTION-ORIENTED SESSION PROTOCOL: PROTOCOL SPECIFICATION

AMENDMENT 1
Efficiency enhancements

1)   Subclause 2.1

Add the following reference by numerical order:

> – ITU-T Recommendation X.215 (1995)/Amd.1 (1997) | ISO/IEC 8326:1996/Amd.1:1997, *Information technology – Open Systems Interconnection – Session service definition – Amendment 1: Efficiency enhancements*.

2)   Subclause 2.3

Add the following reference after Recommendation T.62:

> – ITU-T Recommendation X.215 (1995)/Addendum 1 (1995), *Service definition for Session Layer efficiency enhancement*.

3)   Subclause 3.4

Add the following definitions:

3.4.a   long-form SPDU: An SPDU that has the long-form structure defined in 8.2.

3.4.b   null-encoding protocol option: An option of the session protocol, negotiated during connection establishment, that permits a data transfer phase with zero session protocol control information and without the ability to signal the orderly release of the session-connection.

3.4.c   parameter indication: A field in the low-order bits of the first octet of a short-form SPDU (the high-order bits will contain the SPDU identifier).

3.4.d   short-connect protocol option: An option of the session protocol that permits an efficient negotiation, during connection establishment, of the fast associate mechanism (of which the null-encoding protocol defined in ITU-T Rec. X.225 *bis* is a special case) by defining more compact encodings for the connection establishment SPDUs than those defined in ITU-T Rec. X.225 | ISO/IEC 8327-1.

3.4.e   short-encoding protocol option: An option of the session protocol that permits the use of smaller protocol control information of some of the more commonly occurring Session SPDUs in the data transfer and release phases.

3.4.f   short-form SPDU: An SPDU that has the short-form structure defined in 8.5. All short-form SPDUs have names that begin with the word SHORT and abbreviations beginning with the letter S.

4)   Subclause 4.2

Add at the end of the abbreviations list:

> SI&P   SPDU Identifier (for short-form SPDUs) and Parameter indication

5)   Subclause 5.2

In Table 1, referenced in this subclause, add the following items to the cell identified by Session Connection, Associated SPDUs:

Service	Primitives	Associated SPDUs
Session Connection	S-CONNECT request S-CONNECT indication S-CONNECT (accept) response S-CONNECT (accept) confirm S-CONNECT (reject) response S-CONNECT (reject) confirm	CONNECT SPDU or SHORT CONNECT SPDU CONNECT SPDU or SHORT CONNECT SPDU ACCEPT SPDU, SHORT ACCEPT SPDU or SHORT ACCEPT CONTINUE SPDU ACCEPT SPDU, SHORT ACCEPT SPDU or SHORT ACCEPT CONTINUE SPDU REFUSE SPDU, SHORT REFUSE SPDU or SHORT REFUSE CONTINUE SPDU REFUSE SPDU, SHORT REFUSE SPDU or SHORT REFUSE CONTINUE SPDU
Normal Data Transfer	S-DATA request S-DATA indication	DATA TRANSFER SPDU or SHORT DATA TRANSFER SPDU or NULL SPDU DATA TRANSFER SPDU or SHORT DATA TRANSFER SPDU or NULL SPDU
Orderly Release	S-RELEASE request S-RELEASE indication S-RELEASE(accept) response S-RELEASE(accept)indication S-RELEASE(reject) response S-RELEASE(reject)indication	FINISH SPDU or SHORT FINISH SPDU FINISH SPDU or SHORT FINISH SPDU DISCONNECT SPDU or SHORT DISCONNECT SPDU DISCONNECT SPDU or SHORT DISCONNECT SPDU NOT FINISHED SPDU NOT FINISHED SPDU

6)   Subclause 5.4.2

Add at the end of the list and before the Note, the following new items:

   h)   to negotiate the null-encoding protocol option (see 5.8.7);

   i)   to negotiate the upper layer context specification.

7)   Subclause 5.6

Add a new subclause as follows:

5.6.2 *bis* No orderly release functional unit

This functional unit removes the orderly release function from the kernel functional unit.

8) Subclause 5.6.10

Modify Table 3 referenced in this subclause:

Functional Unit	SPDU code	SPDU name	Reference
Kernel	CN	CONNECT (see Note 1)	7.1
	OA	OVERFLOW ACCEPT (see Note 2)	7.2
	CDO	CONNECT DATA OVERFLOW (see Note 2)	7.3
	AC	ACCEPT (see Note 1)	7.4
	RF	REFUSE (see Note 1)	7.5
	FN	FINISH (see Note 10)	7.6
	DN	DISCONNECT (see Note 10)	7.7
	AB	ABORT (see Note 11)	7.9
	AA	ABORT ACCEPT (see Note 3)	7.10
	DT	DATA TRANSFER (see Note 11)	7.11
	PR	PREPARE (see Note 7)	7.26
	SCN	SHORT CONNECT (see Note 14)	7.38
	SAC	SHORT ACCEPT (see Note 14)	7.39
	SRF	SHORT REFUSE (see Note 14)	7.42
	NL	NULL (see Note 13)	7.49
	SCNC	SHORT CONNECT CONTINUE (see Note 14)	7.40
	SACC	SHORT ACCEPT CONTINUE (see Note 14)	7.41
	SRFC	SHORT REFUSE CONTINUE (see Note 14)	7.43
	SFN	SHORT FINISH (see Note 12)	7.44
	SDN	SHORT DISCONNECT (see Note 12)	7.45
	SDT	SHORT DATA TRANSFER (see Note 12)	7.46
	SAB	SHORT ABORT (see Note 12)	7.47
No orderly release		No additional associated SPDUs	

After Note 9 of this table, add the following Notes:

10   Not used if the no orderly release functional unit is selected.

11   Not used if the null-encoding protocol option is selected.

12   Used only if the short-encoding protocol option is supported.

13   Used only if the null-encoding protocol option is supported.

14   Used only if the short-connect protocol option is selected.

9) Subclause 5.8

Add the new subclauses (at the end of 5.8.6):

5.8.7   Negotiation of short-encoding

Each SPM indicates whether it wishes to use the short-encoding option on the connection. The protocol option is selected only if both SPMs propose use of the option. If the option is selected, the SHORT DATA TRANSFER, SHORT FINISH, SHORT DISCONNECT and SHORT ABORT SPDUs may be used on the connection.

The use of the other short-form SPDUs (SHORT CONNECT, SHORT ACCEPT, SHORT CONNECT CONTINUE, SHORT REFUSE CONTINUE, SHORT ACCEPT CONTINUE and SHORT REFUSE SPDUs) is not affected by the short-encoding protocol option.

5.8.8   Negotiation using short-connect mechanism and Upper-layer context specification

An initiating SPM receiving an S-CONNECT request that includes a Session-user-summary parameter may use the short-connect mechanism. Conceptually, the SPM creates the CONNECT SPDU that would be used to establish the connection. The SPM then uses an Upper-layer context specification to summarize the parameters of this CONNECT SPDU, including the semantic content of the User-data as represented in the User-summary parameter of the S-CONNECT request.

The Upper-layer context specification is identified in the session protocol by either a global-form identifier (an ASN.1 Object Identifier) or a restricted-form identifier (a 16-bit quantity that is unambiguous within the scope of some community of interconnecting systems).

The Upper-layer context specification may or may not define parameters that reflect values of the parameters of the CONNECT SPDU, or, via the Session-user-summary parameter, values contained within the SS-userdata of the S-CONNECT request. The Upper-layer context specification will define that each parameter is either:

   a) immediate: always sent with the identifier; or

   b) compressible: a compressed form can be sent with the identifier, and the original form sent on a subsequent SPDU if the receiver is unable to reverse the compression.

   NOTE 1 – The Upper-layer context specification will define the compression algorithm.

The SPM will send the identifier for the Upper-layer context specification and any immediate or compressed parameters in the Connection summary parameter of a SHORT CONNECT SPDU. This SPDU may be sent on the User-data of a T-CONNECT request or on the normal transport flow, using T-DATA.

The SHORT CONNECT SPDU shall only be sent on the T-CONNECT request if the size limitations of the Transport layer permit. How the SPM is made aware of these limits is a local matter.

One of the following will then occur:

   a) The responding SPM is able to reference the Upper-layer context specification and expand any compressed parameters to their original form, and is thus able to reconstruct the CONNECT SPDU that would have been sent. If acceptable to the SPM, an S-CONNECT indication is issued to the SS-user, with no User-data parameter but with the User Summary parameter representing the semantic content of the User-data that would have been sent.

   If the SS-user replies with an S-CONNECT (accept) response, the SPM uses the Upper-layer context specification identified on the SHORT CONNECT SPDU to determine the identification of the Summary-response. Again this may have immediate and compressed parameters. The identification and any immediate or compressed parameters are sent in the Summary-response parameter of a SHORT ACCEPT SPDU, which also indicates that connection establishment is complete.

   The receipt of the SHORT ACCEPT SPDU at the initiator completes the connection establishment.

      NOTE 2 – It is expected that the Upper-layer context identifier together with the short connect PCI will be designed to fit within the size limitation of the T-CONNECT User-data.

   b) The responding SPM is able to reference the Upper-layer context specification but there are compressed parameters that the SPM cannot expand to their original form. The SPM asks for the uncompressed forms to be sent, by sending a SHORT ACCEPT SPDU indicating an incomplete connection establishment.

   The initiating SPM, on receiving the SHORT ACCEPT SPDU, sends a SHORT CONNECT CONTINUE SPDU containing the uncompressed forms of the parameters. The responding SPM can now, if the received SPDUs are acceptable, issue an S-CONNECT indication with the semantic content of the missing User-data represented by the User Summary parameter.

   If the SS-user replies with an S-CONNECT (accept) response, the SPM uses the Upper-layer context specification identified on the SHORT CONNECT SPDU to determine the identification of the Summary-response and sends this, with any parameters in their uncompressed form on a SHORT ACCEPT CONTINUE SPDU.

   c) The responding SPM is unable to reference the Upper-layer context specification – the identifier is not recognized – and the SHORT CONNECT SPDU was received on an established connection. The SPM replies with SHORT REFUSE SPDU indicating the connection summary is unknown.

   On receiving the SHORT REFUSE SPDU, the initiating SPM switches to using the long-form SPDUs for connection establishment, sending the original CONNECT SPDU including any User-data.

   d) The responding SPM is unable to reference the Upper-layer context specification – the identifier is not recognized – and the SHORT CONNECT SPDU was received on a T-CONNECT indication. The SPM ignores it, and just completes the establishment of the transport connection.

   On receiving the T-CONNECT confirm with no SPDU in the User-data, the initiating SPM switches to using the long-form SPDUs for connection establishment, sending the original CONNECT SPDU.

   e) The responding SPM does not support the SHORT CONNECT SPDU and the SHORT CONNECT SPDU was received on an established connection. The SPM will perceive this as a protocol error and release the transport connection.

f)   The responding SPM does not support the SHORT CONNECT SPDU and the SHORT CONNECT SPDU was received on a T-CONNECT indication. The SPM ignores it, and just completes the establishment of the transport connection.

On receiving the T-CONNECT confirm with no SPDU in the User-data, the initiating SPM switches to using the long-form SPDUs for connection establishment, sending the original CONNECT SPDU.

5.8.9   Negotiation of null-encoding protocol option

The use of the null-encoding protocol option is negotiated between the peer SPMs at session-connection establishment. It shall only be offered by the initiating SPM if the initiating Session user has requested, and the initiating SPM supports, the no-orderly-release functional unit. In addition, it can only be offered by the initiating SPM if no session layer addressing information is required to be conveyed

The null-encoding protocol option is selected for use on the session connection by the responding SPM. It shall only select the use of the option if:

a)   the null-encoding protocol option was offered by the initiating SPM;

b)   the responding SPM has selected the kernel, full-duplex and no-orderly-release functional units, and no other functional units.

5.8.10   Negotiation using short-connect protocol option with no upper-layer context identifier

The SPMs may use the short-connect protocol option to establish a session connection using the null-encoding option. The short-connect protocol option, as applied to connection establishment, uses the SHORT CONNECT SPDU, SHORT ACCEPT SPDU, SHORT ACCEPT CONTINUE SPDU and (if unsuccessful) the SHORT REFUSE SPDU and SHORT REFUSE CONTINUE SPDU.

The short-connect protocol option can only be used by the initiating SPM if, on the S-CONNECT request primitive:

a)   the Session Connection Identifier parameter is absent;

b)   in the Calling Session Address and Called Session Address, the session selector is absent; and

c)   the Session Requirements parameter specifies the full duplex and no-orderly-release functional unit and no others.

The responding SPM can only issue a SHORT ACCEPT SPDU if, on the S-CONNECT response primitive:

a)   the Session Connection Identifier parameter is absent;

b)   in the Responding Session Address, the session selector is absent;

c)   the Result is "accepted"; and

d)   the Session Requirements parameter specifies the full duplex and no-orderly-release functional unit and no others.

The SHORT CONNECT SPDU, SHORT ACCEPT SPDU and SHORT REFUSE SPDUs can be transferred as User-data on the Transport-layer T-CONNECT primitives or as User-data on T-DATA primitives, if the Transport connection is already established. The mapping to the User-data of the T-CONNECT primitives is only possible if the complete SPDUs, including any User-data, meet any size restrictions of the T-CONNECT User-data. Otherwise procedures are applied to send the SPDUs using the T-DATA primitives.

10)   Subclause 6.1.4

Add the following phrase to the antepenultimate paragraph of this subclause:

Only the initiator of the transport connection is permitted to issue the CONNECT SPDU or the SHORT CONNECT SPDU.

Replace the last paragraph of 6.1.4 with the following new paragraphs:

The TS-user data parameter in the T-CONNECT request and indication is used for the SHORT CONNECT SPDU. The TS-user data parameter in the T-CONNECT response and confirm is used for the SHORT ACCEPT SPDU and SHORT REFUSE SPDU if they fit, or for the SHORT ACCEPT CONTINUE SPDU and the SHORT REFUSE CONTINUE SPDU otherwise. When a T-CONNECT request is issued, the TS-user data parameter shall either contain a SHORT CONNECT SPDU or shall be empty. When a T-CONNECT response is issued, the TS-user data parameter shall be empty, unless the T-CONNECT indication contained a SHORT CONNECT SPDU, in which case it shall contain a SHORT ACCEPT SPDU, SHORT REFUSE SPDU, SHORT ACCEPT CONTINUE SPDU or SHORT REFUSE CONTINUE SPDU.

If the responding session implementation does not support the short-connect protocol option, it shall ignore the TS-user data parameter on the T-CONNECT indication and confirm.

11)   Subclause 6.3.3

Add the following items at the end of the list of SPDUs:

- NULL SPDU (see 7.49);

- SHORT CONNECT (see 7.38);

- SHORT ACCEPT (see 7.39);

- SHORT CONNECT CONTINUE (see 7.40);

- SHORT ACCEPT CONTINUE (see 7.41);

- SHORT REFUSE (see 7.42);

- SHORT REFUSE CONTINUE (see 7.43);

- SHORT FINISH (see 7.44);

- SHORT DISCONNECT (see 7.45);

- SHORT DATA TRANSFER (see 7.46);

- SHORT ABORT (see 7.47).

Consequently, change the period of the last SPDU of the list to semi-colon.

12)   Subclause 6.3.5

Change the first sentence as follows:

Segmenting of SSDUs takes place under the following circumstances, provided the null-encoding option has not been selected.

13)   Subclause 6.3.7

Add the following to the column of Category 1 SPDUs *in Table 6:*

NULL SPDU
SHORT CONNECT
SHORT ACCEPT
SHORT CONNECT CONTINUE
SHORT ACCEPT CONTINUE
SHORT REFUSE
SHORT REFUSE CONTINUE
SHORT FINISH
SHORT DISCONNECT
SHORT DATA TRANSFER
SHORT ABORT

14)   Subclause 6.4.4

Replace item b) with:

b)   ABORT SPDUs are sent on the normal transport flow unless the null-encoding option is selected, in which case the ABORT SPDUs are not sent.

15) Subclause 6.6.4

Change the title of this subclause as follows:

6.6.4 Description (when null-encoding option is not selected)

Add the following new subclause after 6.6.4:

6.6.5 Description (when null-encoding option is selected)

When the null-encoding option is selected, the session connection is terminated by disconnection of the supporting transport connection.

16) Subclause 7.1

Add at the end of the paragraph:

The CONNECT SPDU is transmitted when the initiating SPM has chosen not to use a SHORT CONNECT SPDU, or after a SHORT CONNECT SPDU was transmitted on a T-CONNECT request and no SPDU was received on the T-CONNECT confirm, or after a SHORT REFUSE SPDU has been received with reason code value indicating "unknown connection summary".

17) Subclause 7.1.1

Replace item b) 1) with:

b) A Connect/Accept Item parameter group containing:

1) A Protocol Options parameter which enables the initiator to indicate its ability to receive extended concatenated SPDUs, to use the null encoding option and its ability to receive the following short-form SPDUs – SHORT DATA TRANSFER, SHORT FINISH, SHORT DISCONNECT and SHORT ABORT SPDU.

The initiator is not able to use the null encoding option unless the no-orderly-release functional unit was proposed by the calling SS-user.

18) Subclause 7.1.2

Replace the first two sentences by:

The sending of a CONNECT SPDU results from one of three events:

a) If the initiating SPM chooses not to use a SHORT CONNECT SPDU, an S-CONNECT request results in the assignment of a transport connection. When the transport connection is established, a CONNECT SPDU is sent on the transport normal flow.

b) If the initiating SPM chose to use a SHORT CONNECT SPDU, and sent the SHORT CONNECT SPDU on the User-data of the T-CONNECT request, the receipt of a T-CONNECT confirm with no SPDU in the User-data results in a CONNECT SPDU. This is sent on the transport normal flow.

c) If the initiating SPM chose to use a SHORT CONNECT SPDU (on a new or established transport connection), an incoming SHORT REFUSE SPDU with the reason code value indicating "unknown connection summary" results in a CONNECT SPDU. This is sent on the transport normal flow.

In all cases, if the Data Overflow ... *continue with rest of original paragraph.*

19) Subclause 7.4.1

Replace b) 1) with:

b) A Connect/Accept Item parameter group containing:

1) A Protocol Options parameter which enables the responder to indicate its ability to receive extended concatenated SPDUs whether the null encoding option is selected for use on this session connection, and its ability to receive the following short-form SPDUs – SHORT DATA TRANSFER, SHORT FINISH, SHORT DISCONNECT and SHORT ABORT SPDU.

The responder shall not select the null encoding option unless:

– the initiator indicates on the CONNECT SPDU that it is able to use the null encoding option; and

– the functional units selected for use on the session connection [see d) below] are precisely:

    i) kernel functional unit;

    ii) full-duplex functional unit;

    iii) no-orderly-release functional unit.

20) Subclause 7.11

Add the following text at the end of the first sentence of this subclause:

Normal data is transferred by the DATA TRANSFER SPDU unless the null encoding option is selected, in which case the NULL SPDU is used (see 7.49). If the short encoding option is selected, the SPM may transfer data using the SHORT DATA TRANSFER SPDU (see 7.46).

21) Subclauses 7.38 through 7.41

Add the following new subclauses, numbered 7.38 through 7.41.3, after 7.37.3:

7.38 SHORT CONNECT SPDU

The SHORT CONNECT SPDU is sent as a protocol option at the choice of the initiating SPM to establish a session connection if the Session-user Requirements parameter in the S-CONNECT request consists, of only the kernel, full-duplex and no orderly release functional units, and there are no calling and called session selectors.

The SHORT CONNECT SPDU is transmitted by the initiator of the transport connection in order to initiate a session connection when the initiating SPM has chosen to use this SPDU. The SPDU can be transmitted on the User-data of a T-CONNECT request primitive or on a previously assigned, established transport connection.

The initiating SPM can choose to use the SHORT CONNECT SPDU if either:

    a) an Upper-Layer Context Identifier specification is available that, with appropriate parameter values for the Upper-Layer Context Identifier, summarizes the CONNECT SPDU that would be sent if the initiating SPM chose not to use the SHORT CONNECT SPDU; or

    b) in the parameters of the S-CONNECT request:

        i) the Session Requirements parameter requests only the kernel, full-duplex and no-orderly-release function units;

        ii) the Called Session Address and Calling Session Address have NIL values of the Called and Calling Session Selectors;

        iii) the Session Connection Identifier is absent.

7.38.1 Content of SHORT CONNECT SPDU

The SHORT CONNECT SPDU contains:

    a) A Nested Connection Identifier parameter assigned to this connection for a nested session connection only.

    b) A Connection-Summary parameter which identifies an Upper-Layer Context Specification that summarizes the values that would be contained in the parameters of a CONNECT SPDU that could be issued as a result of the S-CONNECT request. The semantic content of the User-data of the S-CONNECT request, if any, shall be included in the Connection-Summary via the Session-user-summary parameter of the S-CONNECT request.

    If the Upper-Layer Context Specification defines its own parameters, these shall be included in the Connection-Summary parameter.

    c) A Special User-data parameter to transfer two bits of transparent data.

    d) A User-information field to transfer transparent data. The User-information field shall not be present if any of the other parameters are present.

7.38.2 Sending the SHORT CONNECT SPDU

If the initiating SPM has chosen to use the SHORT CONNECT SPDU, an S-CONNECT request results in the assignment of a new or already established transport connection.

If the assigned transport connection is not yet established, and the SHORT CONNECT SPDU, including any parameter or User-information encodings, is small enough to be conveyed as User-data on the T-CONNECT request, the initiating SPM shall optionally send the SHORT CONNECT SPDU on the User-data parameter of the T-CONNECT request.

If the assigned transport connection is not yet established and either the SHORT CONNECT SPDU is too large for the User-data of the T-CONNECT request or the initiating SPM chooses, the initiating SPM shall wait until the transport connection is established, and then shall send the SHORT CONNECT SPDU on the transport normal flow.

If the assigned transport connection is already established, the SHORT CONNECT SPDU shall be sent on the transport normal flow.

7.38.3 Receiving the SHORT CONNECT SPDU

A valid incoming SHORT CONNECT SPDU which is acceptable to the receiving SPM results in an S-CONNECT indication to the SS-user. The SPM then waits for an S-CONNECT response from the called SS-user. If the receiving SPM is not able to handle the incoming request for a session connection, it does not issue any service primitive to the SS-user and formats a SHORT REFUSE SPDU (see 7.40.2).

If the receiving SPM does not support the short-connect option and the SHORT CONNECT SPDU is received as User-data on a T-CONNECT indication primitive, it shall ignore the SHORT CONNECT SPDU and shall not use the User-data parameter on the T-CONNECT response primitive.

A valid incoming SHORT CONNECT SPDU containing a Connection Summary parameter that the SPM is able to fully interpret, or containing no Connection Summary parameter, and that is acceptable to the receiving SPM results in an S-CONNECT indication to an SS-user, according to the Called Session Selector parameter that was summarized in the Connection Summary parameter (if present). The SPM then waits for an S-CONNECT response from the called SS-user.

A valid incoming SHORT CONNECT SPDU containing a Connection Summary parameter that identifies an Upper-Layer Context Identifier that is known to the SPM, but which cannot be fully interpreted results in the SPM sending a SHORT ACCEPT SPDU in which the completion field indicates the connection establishment is incomplete. The SPM then waits until it receives a SHORT CONNECT CONTINUE SPDU.

A valid incoming SHORT CONNECT SPDU, received on an established transport connection, and containing a Connection Summary parameter that identifies an Upper-Layer Context Identifier that is not known to the SPM, results in the SPM sending a SHORT REFUSE SPDU in which the reason code value is "unknown connection summary". The SPM then waits until it receives a CONNECT SPDU.

A valid incoming SHORT CONNECT SPDU, received on the User-data of T-CONNECT indication, and containing a Connection Summary parameter that identifies an Upper-Layer Context Identifier that is not known to the SPM, is ignored by the SPM. The T-CONNECT indication itself results in a T-CONNECT response with no SPDU in the User-data. The SPM then waits until it receives a CONNECT SPDU.

7.39 SHORT ACCEPT SPDU

An S-CONNECT (accept) response results in a SHORT ACCEPT SPDU if the responding SS-user selects in the Session user requirements parameter of the S-CONNECT response only the kernel, full-duplex and no orderly release functional units, and there is no responding session selector. A SHORT ACCEPT CONTINUE SPDU is first sent if the size restriction of the transport primitive does not allow to send the SHORT ACCEPT SPDU directly.

After this, the SPM enters the data transfer phase and can receive any session service request or SPDU allowed by the selected functional units.

An SPM receiving a SHORT CONNECT SPDU containing a Connection Summary parameter that the SPM is able to fully interpret, or containing no Connection Summary parameter, may accept a proposal to establish a session connection by transferring a SHORT ACCEPT SPDU (after receiving an S-CONNECT response primitive) to the initiator, on the same transport connection. A SHORT ACCEPT CONTINUE SPDU is first sent if the size restriction of the transport primitive does not allow to send the SHORT ACCEPT SPDU directly.

An SPM receiving a SHORT CONNECT SPDU that identifies an Upper-Layer Context Identifier that is known to the SPM, but which cannot be fully interpreted, results in the SPM sending a SHORT ACCEPT SPDU in which the completion field indicates the connection establishment is incomplete.

7.39.1   Content of SHORT ACCEPT SPDU

The SHORT ACCEPT SPDU contains:

a)   A nested connection identifier parameter assigned to this connection for a nested session connection only.

b)   A completion field that indicates whether the session connection establishment is complete; if it is not complete, a SHORT CONNECT CONTINUE is expected.

c)   A Connection-Summary parameter which identifies an Upper-Layer Context Specification that summarizes the values that would be contained in the parameters of an ACCEPT SPDU that could be issued as a result of the S-CONNECT response. The content of the User-data of the S-CONNECT response, if any, shall be included in the Connection-Summary via the Session-user-summary parameter of the S-CONNECT response.

   If the Upper-Layer Context Specification defines its own parameters, these shall be included in the Connection-Summary parameter.

d)   A Special User-data parameter to transfer two bits of transparent data.

e)   A User-information field to transfer transparent data. The User-information field shall not be present if any of the other parameters are present.

7.39.2   Sending the SHORT ACCEPT SPDU

An S-CONNECT (accept) response results in a SHORT ACCEPT SPDU being sent.

Following an incoming SHORT CONNECT SPDU that resulted in an S-CONNECT indication, an S-CONNECT response results in a SHORT ACCEPT SPDU. If the SHORT CONNECT SPDU was received on the User-data of a T-CONNECT indication, and if the size of the SHORT ACCEPT SPDU meets the size constraint of the T-CONNECT response primitive, the SHORT ACCEPT SPDU is sent on the T-CONNECT response. If the SHORT CONNECT SPDU was received on the User-data of a T-CONNECT indication, and the size of the SHORT ACCEPT SPDU does not meet the size constraint of the T-CONNECT response primitive, a SHORT ACCEPT CONTINUE SPDU is sent on the T-CONNECT response and the SHORT ACCEPT SPDU is then sent on the transport normal flow. If the SHORT CONNECT SPDU was received on an established transport connection, the SHORT ACCEPT SPDU is sent on the transport normal flow of the same connection. In either case, after this successful session connection, the SPM enters the data transfer phase and can receive any service request or SPDU that is allowed by the selected functional units, protocol options and current token positions.

If any of the minor synchronize, major synchronize or resynchronize functional units are selected but the activity management functional unit is not selected, the SPM sets V(A) and V(M) to the Initial Serial Number proposed by the called SS-user, which is the serial number to be used for the first synchronization point. V(R) is set to zero. Vsc is set false.

If the symmetric synchronize functional unit is selected but the activity management functional unit is not selected, the SPM sets V(Ar) and V(Mr) to the Initial Serial Number proposed by the called SS-user, which is the serial number to be used for the first received synchronization point. The SPM sets V(As) and V(Ms) to the Second Initial Serial Number proposed by the called SS-user, which is the serial number to be used for the first synchronization point to be sent. V(Rs) and V(Rr) are set to zero.

If the activity management functional unit has been selected, Vact is set false.

An incoming SHORT CONNECT SPDU that identifies an Upper-Layer Context Identifier that is known to the SPM, but which cannot be fully interpreted, results in a SHORT ACCEPT SPDU in which the completion field indicates the connection establishment is incomplete. If the SHORT CONNECT SPDU was received on the User-data of a T-CONNECT indication, the SHORT ACCEPT SPDU is sent on the T-CONNECT response. If the SHORT CONNECT SPDU was received on an established transport connection, the SHORT ACCEPT SPDU is sent on the transport normal flow of the same connection. In either case, the SPM waits for a SHORT CONNECT CONTINUE SPDU.

7.39.3   Receiving the SHORT ACCEPT SPDU

A valid incoming SHORT ACCEPT SPDU in which the completion field indicates the connection establishment is complete, results in an S-CONNECT (accept) confirm. After this successful session connection, the SPM enters the data transfer phase and can receive any service request or SPDU that is allowed by the selected functional units, protocol options and current token positions.

If any of the minor synchronize, major synchronize or resynchronize functional units are selected but the activity management functional unit is not selected, the SPM sets V(A) and V(M) to the Initial Serial Number contained in the SHORT ACCEPT SPDU, which is the serial number to be used for the first synchronization point. V(R) is set to zero. Vsc is set false.

If the symmetric synchronize functional unit is selected but the activity management functional unit is not selected, the SPM sets V(As) and V(Ms) to the Initial Serial Number contained in the SHORT ACCEPT SPDU, which is the serial number to be used for the first synchronization point to be sent. The SPM sets V(Ar) and V(Mr) to the Second Initial Serial Number contained in the SHORT ACCEPT SPDU, which is the serial number to be used for the first received synchronization point. V(Rs) and V(Rr) are set to zero.

If the activity management functional unit has been selected, Vact is set false.

A valid incoming SHORT ACCEPT SPDU in which the completion field indicates the connection establishment is not complete, results in the SPM sending a SHORT CONNECT CONTINUE SPDU. The SPM then waits until it receives a SHORT ACCEPT CONTINUE SPDU or a SHORT REFUSE SPDU.

7.40   SHORT CONNECT CONTINUE SPDU

The SHORT CONNECT CONTINUE SPDU is used by the SPM to send the Summary parameters value for an Upper-Layer Context Identifier sent on a previous SHORT CONNECT SPDU.

7.40.1   Content of SHORT CONNECT CONTINUE SPDU

The SHORT CONNECT CONTINUE SPDU contains:

–   Summary parameters containing the uncompressed parameter value as specified in the Upper-Layer Context specification identified by the Connection Summary parameter of the previous SHORT CONNECT SPDU.

7.40.2   Sending the SHORT CONNECT CONTINUE SPDU

A valid incoming SHORT ACCEPT SPDU in which the completion field indicates the connection establishment is not complete, results in the SPM sending a SHORT CONNECT CONTINUE SPDU. The SPM then waits until it receives a SHORT ACCEPT CONTINUE SPDU or a SHORT REFUSE SPDU.

7.40.3   Receiving the SHORT CONNECT CONTINUE SPDU

A valid incoming SHORT CONNECT CONTINUE SPDU which, with the previous SHORT CONNECT SPDU, is acceptable, results in an S-CONNECT indication to an SS-user, according to the Called Session Selector parameter that was summarized in the Connection Summary parameter of the SHORT CONNECT SPDU or the Summary parameter of the SHORT CONNECT CONTINUE SPDU. The SPM then waits for an S-CONNECT response from the called SS-user.

7.41   SHORT ACCEPT CONTINUE SPDU

The SHORT ACCEPT CONTINUE SPDU is used by the SPM to close the connection establishment phase when uncompressed parameters have been received (short-encoding option only) or to inform the sending SPM that the SHORT ACCEPT SPDU will be sent on the transport normal flow.

7.41.1   Content of SHORT ACCEPT CONTINUE SPDU

The SHORT ACCEPT CONTINUE SPDU contains:

a)   A nested connection identifier parameter assigned to this connection for a nested session connection only.

b)   A Connection-Summary parameter which identifies an Upper-Layer Context Specification that summarizes the values that would be contained in the parameters of an ACCEPT SPDU that could be issued as a result of the S-CONNECT response. The content of the User-data of the S-CONNECT response, if any, shall be included in the Connection-Summary via the Session-user-summary parameter of the S-CONNECT response.

If the Upper-Layer Context Specification defines its own parameters, these shall be included in the Connection-Summary parameter.

c)   A Special User-data parameter to transfer two bits of transparent data.

d)   A User-information field to transfer transparent data. The User-information field shall not be present if any of the other parameters are present.

7.41.2 Sending the SHORT ACCEPT CONTINUE SPDU

An S-CONNECT response, following an incoming SHORT CONNECT CONTINUE SPDU that resulted in an S-CONNECT indication, results in a SHORT ACCEPT CONTINUE SPDU. This SPDU is sent to the transport normal flow. After this successful session connection, the SPM enters the data transfer phase and can receive any service request or SPDU that is allowed by the selected functional units, protocol options and current token positions.

An S-CONNECT response, following an incoming SHORT CONNECT SPDU in a T-CONNECT indication, results in a SHORT ACCEPT CONTINUE SPDU if the SHORT ACCEPT SPDU does not fit in the User-data parameter of the T-CONNECT response. The SHORT ACCEPT SPDU is then sent to the transport normal flow.

If any of the minor synchronize, major synchronize or resynchronize functional units are selected but the activity management functional unit is not selected, the SPM sets V(A) and V(M) to the Initial Serial Number proposed by the called SS-user, which is the serial number to be used for the first synchronization point. V(R) is set to zero. Vsc is set false.

If the symmetric synchronize functional unit is selected but the activity management functional unit is not selected, the SPM sets V(Ar) and V(Mr) to the Initial Serial Number proposed by the called SS-user, which is the serial number to be used for the first received synchronization point. The SPM sets V(As) and V(Ms) to the Second Initial Serial Number proposed by the called SS-user, which is the serial number to be used for the first synchronization point to be sent. V(Rs) and V(Rr) are set to zero.

If the activity management functional unit has been selected, Vact is set false.

7.41.3 Receiving the SHORT ACCEPT CONTINUE SPDU

A valid incoming SHORT ACCEPT CONTINUE SPDU following the sending of a SHORT CONNECT CONTINUE SPDU results in an S-CONNECT confirm. After this successful session connection, the SPM enters the data transfer phase and can receive any service request or SPDU that is allowed by the selected functional units, protocol options and current token positions.

On receipt of a valid incoming SHORT ACCEPT CONTINUE SPDU following the sending of a SHORT CONNECT SPDU, the SPM shall wait until it receives a SHORT ACCEPT SPDU on the transport normal flow.

After this successful connection, the SPM enters the data transfer phase and can receive any service request or SPDU that is allowed by the available functional units and current token positions. If any of the minor synchronize, major synchronize or resynchronize functional units are selected but the activity management functional unit is not selected, the SPM sets V(A) and V(M) to the Initial Serial Number contained in the SHORT ACCEPT SPDU, which is the serial number to be used for the first synchronization point. V(R) is set to zero. Vsc is set false.

If the symmetric synchronize functional unit is selected but the activity management functional unit is not selected, the SPM sets V(As) and V(Ms) to the Initial Serial Number contained in the SHORT ACCEPT SPDU, which is the serial number to be used for the first synchronization point to be sent. The SPM sets V(Ar) and V(Mr) to the Second Initial Serial Number contained in the SHORT ACCEPT SPDU, which is the serial number to be used for the first received synchronization point. V(Rs) and V(Rr) are set to zero.

If the activity management functional unit has been selected, Vact is set false.

7.42 SHORT REFUSE SPDU

A SHORT REFUSE SPDU is used by the responder (SS-user or SPM) to reject an attempt to establish a session connection with the SHORT CONNECT SPDU. A SHORT REFUSE CONTINUE SPDU is first sent if the size restriction of the transport primitive does not allow to send the SHORT REFUSE SPDU directly.

7.42.1 Content of SHORT REFUSE SPDU

The SHORT REFUSE SPDU contains, in order, a field that identifies if the transport connection may be retained, followed by zero, one or more parameter fields and, optionally, a User-information field.

The SHORT REFUSE SPDU contains:

    a) A nested connection identifier parameter assigned to this connection for a nested session connection only.

    b) A Transport Disconnect parameter which indicates whether or not the transport connection is to be kept.

    c) A Reason Code parameter giving the reason for refusal of the attempt to establish a session connection.

    d) A Summary-response parameter containing a value defined by the Upper-Layer Context specification identified in the previous SHORT CONNECT SPDU.

    e) A User-information field which allows transparent User-data to be transferred.

7.42.2   Sending the SHORT REFUSE SPDU

An S-CONNECT (reject) response results in a SHORT REFUSE SPDU being sent as User-data on the transport connection T-CONNECT response primitive if the size of the SHORT REFUSE SPDU meets the size constraint of the T-CONNECT response primitive,. Otherwise, a SHORT REFUSE CONTINUE SPDU is sent on the T-CONNECT response and the SHORT REFUSE SPDU is then sent on the transport normal flow. The SHORT REFUSE SPDU may also be sent if the responding SPM is unable to handle the request for a session connection. No session connection is established.

An S-CONNECT (reject) response, following an S-CONNECT indication that resulted from incoming SHORT CONNECT SPDU or SHORT CONNECT CONTINUE SPDU, results in a SHORT REFUSE SPDU. If the SHORT CONNECT was received on the User-data of the T-CONNECT indication and no SHORT CONNECT CONTINUE has been received and if the size of the SHORT REFUSE SPDU meets the size constraint of the T-CONNECT response primitive, the SHORT REFUSE SPDU is sent on the User-data of the T-CONNECT response. If the size does not meet the size constraint of the T-CONNECT response primitive, a SHORT REFUSE CONTINUE SPDU is sent on the T-CONNECT response and the SHORT REFUSE is then sent on the transport normal flow.

If the SHORT CONNECT was received on an established transport connection or a SHORT CONNECT CONTINUE has been received, the SHORT REFUSE SPDU is sent on the transport normal flow.

If the Transport Disconnect parameter indicates that the transport connection can be reused, the SPM waits for a CONNECT SPDU or a SHORT CONNECT SPDU. Otherwise, the SPM starts the timer, TIM, and waits for a T-DISCONNECT indication. If the timer expires before receipt of a T-DISCONNECT indication, the SPM requests transport disconnection with a T-DISCONNECT request. The timer is canceled on receipt of a T-DISCONNECT indication.

> NOTE – The value of TIM is a local implementation dependent matter, related to quality of service.

7.42.3   Receiving the SHORT REFUSE SPDU

A valid incoming SHORT REFUSE SPDU in which the reason code does not indicate "unknown connection summary" results in an S-CONNECT (reject) confirm, with the Responding Session Address parameter set to the value of the Called Session Address provided in the S-CONNECT request. No session connection is established. If the Transport Disconnect parameter indicates that the retention of the transport connection has been requested by the called SPM, and this is acceptable to the calling SPM, the SPM waits for an S-CONNECT request. Otherwise, the SPM releases the transport connection, by making a T-DISCONNECT request.

A valid incoming SHORT REFUSE SPDU in which the reason code indicates "unknown connection summary" results in the SPM sending a CONNECT SPDU.

7.43   SHORT REFUSE CONTINUE SPDU

The SHORT REFUSE CONTINUE SPDU is used by the SPM to inform the sending SPM that the SHORT REFUSE SPDU will be sent on the transport normal flow.

7.43.1   Content of SHORT REFUSE CONTINUE SPDU

The SHORT REFUSE CONTINUE SPDU does not contain any parameter.

7.43.2   Sending the SHORT REFUSE CONTINUE SPDU

An S-CONNECT (reject) response, following an incoming SHORT CONNECT SPDU in a T-CONNECT indication, results in a SHORT REFUSE CONTINUE SPDU if the SHORT REFUSE SPDU does not fit in the User-data parameter of the T-CONNECT response. The SHORT REFUSE SPDU is then sent to the transport normal flow.

7.43.3   Receiving the SHORT ACCEPT CONTINUE SPDU

On receipt of a valid incoming SHORT REFUSE CONTINUE SPDU following the sending of a SHORT CONNECT SPDU, the SPM shall wait until it receives a SHORT REFUSE SPDU on the transport normal flow.

7.44   SHORT FINISH SPDU

If the short-encoding protocol option has been selected, orderly release can be initiated by the transfer of a SHORT FINISH SPDU, which may be transferred during the data transfer phase. It requests as a response one of:

  a)   a SHORT DISCONNECT SPDU to complete the release of the session connection;

  b)   a DISCONNECT SPDU to complete the release of the session connection;

  c)   a NOT FINISHED SPDU to refuse the release of the session connection if the release token is available.

The SHORT FINISH SPDU is transferred in sequence with any normal data being transferred. The right to issue a SHORT FINISH SPDU is restricted to the owner of all available tokens.

7.44.1   Content of SHORT FINISH SPDU

The SHORT FINISH SPDU contains:

   a)   a nested connection identifier parameter assigned to this connection for a nested session connection only;

   b)   a Transport Disconnect parameter which indicates whether or not the transport connection is to be kept, subject to the restrictions specified in 6.2.4;

   c)   a User-information field which allows transparent User-data to be transferred.

7.44.2   Sending SHORT FINISH SPDU

If the short-encoding protocol option is selected, an S-RELEASE request results, at the SPM's option, in a SHORT FINISH SPDU or a FINISH SPDU. The SHORT FINISH SPDU is sent on the transport normal flow.

After transferring a SHORT FINISH SPDU, the SPM may not send any further SPDUs (except SHORT ABORT SPDU or, in the case of collision of SHORT FINISH SPDUs, a SHORT DISCONNECT SPDU) unless a NOT FINISHED SPDU or a RESYNCHRONIZE SPDU is received, after which the data transfer phase may be resumed. Receipt of a SHORT DISCONNECT SPDU signals completion of orderly session release.

7.44.3   Receiving SHORT FINISH SPDU

A valid incoming SHORT FINISH SPDU results in an S-RELEASE indication. The User-information is passed to the SS-user. The SPM waits for an S-RELEASE response.

7.45   SHORT DISCONNECT SPDU

If the short-encoding protocol option has been selected, after receipt of a SHORT FINISH SPDU or a FINISH SPDU, a SHORT DISCONNECT may be transferred. Receipt of a SHORT DISCONNECT SPDU after transferring a SHORT FINISH SPDU or a FINISH SPDU signals the orderly release of the session connection. The SHORT DISCONNECT SPDU is transferred in sequence with any normal data being transferred.

7.45.1   Content of SHORT DISCONNECT SPDU

The SHORT DISCONNECT SPDU contains:

   a)   a Nested Connection Identifier parameter assigned to this connection for a nested session connection only;

   b)   a User-information field which allows transparent User-data to be transferred.

7.45.2   Sending SHORT DISCONNECT SPDU

If the short-encoding protocol option is selected, an S-RELEASE response results, at the SPM's option, in a SHORT DISCONNECT SPDU or a DISCONNECT SPDU. The SHORT DISCONNECT SPDU is sent on the transport normal flow.

If the SHORT FINISH SPDU or FINISH SPDU indicated that the transport connection is to be kept for reuse and this is acceptable, the SPM waits for a CONNECT SPDU or a SHORT CONNECT SPDU. Otherwise, the SPM starts the timer, TIM, and waits for a T-DISCONNECT indication. If the timer expires before receipt of a T-DISCONNECT indication, the SPM requests transport disconnection with a T-DISCONNECT request. The timer is canceled on receipt of a T-DISCONNECT indication.

7.45.3   Receiving SHORT DISCONNECT SPDU

A valid incoming SHORT DISCONNECT SPDU results in an S-RELEASE (accept) confirm. The session connection ceases to exist.

If the transport connection is to be kept for reuse (see 6.2.4) the SPM waits for a suitable S-CONNECT request. Otherwise, a T-DISCONNECT request is issued.

7.46   SHORT DATA TRANSFER SPDU

If the short-encoding protocol option is selected, normal data may be transferred by use of the SHORT DATA TRANSFER SPDU.

The right to issue a SHORT DATA TRANSFER SPDU is subject to the token restrictions specified in Table 5.

7.46.1   Content of SHORT DATA TRANSFER SPDU

The SHORT DATA TRANSFER SPDU contains:

    a)   a User-information field to transfer transparent User-data whose maximum size is unlimited when segmenting has not been selected and whose maximum size is limited by the maximum TSDU size when segmenting has been selected;

    b)   a Special User-data parameter to transfer two bits of data.

7.46.2   Sending the SHORT DATA TRANSFER SPDU

If the short-encoding protocol option is selected, and at the SPM's option, an S-DATA request results in a SHORT DATA TRANSFER SPDU, provided, if segmenting has been selected, the SSDU is small enough for the SPDU to fit in a TSDU.

7.46.3   Receiving the SHORT DATA TRANSFER SPDU

A valid incoming SHORT DATA TRANSFER SPDU results in an S-DATA indication.

7.47   SHORT ABORT SPDU

The SHORT ABORT SPDU is used to cause, at any time, abnormal release of session connection on which the short-encoding protocol option is selected. This SPDU may also be used to release such a session connection when a protocol error is detected. The SHORT ABORT SPDU may or may not request that the transport connection be released by the receiving SPM. Use of the SHORT ABORT SPDU may result in loss of data.

7.47.1   Content of SHORT ABORT SPDU

The SHORT ABORT SPDU contains:

    a)   a nested connection identifier parameter assigned to this connection for a nested session connection only;

    b)   a Transport Disconnect parameter which indicates whether or not the transport connection is to be kept;

    c)   a Reason Code which gives the reason for the abort;

    d)   a User-information field which allows transparent data to be transferred.

7.47.2   Sending the SHORT ABORT SPDU

If the short-encoding protocol option has been selected, an S-U-ABORT request in which the SS-user data does not exceed 9 octets, or the detection of a protocol error in any state of the SPM, results, at the SPM's option, in a SHORT ABORT SPDU or one or more ABORT SPDUs, as specified in 7.9.2.

The SHORT ABORT SPDU is sent on the transport expedited flow, if it is available to the session connection. If the transport expedited flow is not available, the SHORT ABORT SPDU shall be sent on the transport normal flow.

The SPM starts the timer, TIM, and waits for an ABORT ACCEPT SPDU or a T-DISCONNECT indication. Any other SPDUs are discarded. If the timer expires before receipt of an ABORT ACCEPT SPDU or a T-DISCONNECT indication, the SPM requests transport disconnection with a T-DISCONNECT request. The timer is canceled on receipt of a T-DISCONNECT indication.

7.47.3   Receiving the SHORT ABORT SPDU

A valid incoming SHORT ABORT SPDU results in an S-U-ABORT indication or S-P-ABORT indication, depending on whether the abort is user-generated or provider-generated. The session connection ceases to exist. If the Transport Disconnect parameter in the received SHORT ABORT SPDU indicates that the transport connection is to be kept, and this is acceptable to the receiving SPM, an ABORT ACCEPT SPDU is sent. If the Transport Disconnect parameter in the received SHORT ABORT SPDU indicates the transport connection is not to be kept for reuse, or reuse of the transport connection is not acceptable to the receiving SPM, the receiving SPM releases the transport connection by issuing a T-DISCONNECT request.

7.48   Connection release when the null-encoding option is selected

When the null encoding option is selected, the session connection is only terminated by the termination of the supporting transport connection. No ABORT SPDU is transmitted, but the User-data of the S-U-ABORT request is sent in the User-data of the T-DISCONNECT service.

> NOTE – The Transport provider imposes restrictions on the maximum size of the T-DISCONNECT User-data. If the S-U-ABORT request SS-user-data parameter will not fit, it is not transmitted.

7.48.1   Initiating termination

An S-U-ABORT request or the detection of a protocol error results in a T-DISCONNECT request.

In the case of an S-U-ABORT request, the User-data parameter of the T-DISCONNECT User-data shall have a first octet containing the value 1. If the SS-user-data parameter is present on the S-U-ABORT request, this shall be placed in the second and subsequent octets of the T-DISCONNECT request User-data, provided the entire value will fit within the restrictions imposed by the Transport provider. If the value will not fit in the T-DISCONNECT User-data, the T-DISCONNECT User-data parameter shall contain only the single octet of value 1 or shall be empty.

In the case of detection of a protocol error, or other problem internal to the SPM, the User-data parameter of the T-DISCONNECT shall be empty, or the first octet shall not have the value 1.

7.48.2   Receiving T-DISCONNECT

An incoming T-DISCONNECT indication with a User-data field in which the first octet has the value 1 results in an S-U-ABORT indication. If the T-DISCONNECT User-data field is longer than one octet, the second and subsequent octets shall be the SS-user-data parameter of the S-U-ABORT indication.

An incoming T-DISCONNECT indication with an empty User-data field or a User-data field in which the first octet is any value other than 1, results in an S-P-ABORT indication with no parameters.

7.49   NULL SPDU

When the null encoding option is selected, normal data is transferred by use of the NULL SPDU.

7.49.1   Content of NULL SPDU

The NULL SPDU contains a User-information Field to transfer transparent User-data whose maximum size is unlimited.

> NOTE – Segmentation does not occur with the null-encoding option. Since null-encoding is only used when the kernel, no-orderly-release and full-duplex functional units are the only functional units selected, there is no data token.

7.49.2   Sending the NULL SPDU

An S-DATA request, when the null encoding option has been selected, results in a NULL SPDU.

7.49.3   Receiving the NULL SPDU

When the null encoding option is selected, a received T-DATA indication shall be treated as the receipt of an incoming NULL SPDU, and results in an S-DATA indication.

22)   Subclause 8.2

Change title of 8.2 as shown below:

8.2   SPDU structure (long form SPDUs)

Change, based on the additions, the first sentence of 8.2 as follows:

This subclause specifies the general structure of long-form SPDUs in terms of their constituent fields. Long-form SPDUs are all SPDUs whose names do not begin with "SHORT".

Add "long-form" *in front of* "SPDU" *throughout the rest of 8.2.*

Add the following paragraph after the first paragraph of 8.2:

The NULL SPDU does not use this structure (see 8.2.9).

23) Subclauses 8.2.1 through 8.2.8

No change, except for the addition of the phrase "long-form" *in front the word* "SPDU" *wherever it occurs in these subclauses.*

Add the following new subclause after 8.2.8:

8.2.9 Structure of NULL SPDU

The NULL SPDU consists only of a User-information field. There is no SI or LI field.

NOTE – The NULL SPDU maps an outgoing SSDU unchanged as a TSDU, and maps an incoming TSDU unchanged as an SSDU.

24) Subclauses 8.5 and 8.6

Add two new subclauses after 8.4 to be called 8.5 and 8.6:

8.5 SPDU structure (short-form SPDUs)

This subclause specifies the general structure of short-form SPDUs in terms of their constituent fields. Short-form SPDUs are all SPDUs whose names begin with "SHORT". The general structure for such SPDUs is illustrated in Table 47.

Table 47 – Short-form SPDU structure

Short-form SPDUs	SI&P field	Parameter field	User-information field
SI&P octet	i i i i i p x x		

Short-form SPDUs shall contain, in the following order:

   a) An SI&P field of one octet.

   b) Zero, one or more parameter fields defined for the short-form SPDU.

   c) Either:

   i) one unspecified-length parameter, if defined for the SPDU; or

   ii) the User-information field, if defined for the SPDU and if present.

The SI&P octet contains the following fields:

   d) The SI field in bits 4-8, shown as "i" in Table 47. This identifies the type of short-form SPDU; the high-order bit (bit 8 of the SI&P octet) is 1 for all short-form SPDUs.

   e) The parameter indication in bit 3, shown as "p" in Table 47 indicates whether the first octets following the SI&P octet are SPDU parameters.

   f) The parameters or special data field in bits 1 and 2, shown as "x" in Table 47. These bits have different meanings for different short-form SPDUs.

The overall length of a short-form SPDU is determined by the TSDU length.

8.5.2 Parameter indication

Bit 3 of the SI&P octet indicates whether the octet, if any, immediately following the SI&P octet contains SPDU parameters. If bit 3 indicates there are no parameters in the following octet, and the short-form SPDU has a length greater than one octet, all octets after the first are User-information.

The encoding of this bit shall be:

    a)   bit 3 = 0: octet 2 and any following octets are User-information;

    b)   bit 3 = 1: at least octet 2 contains an SPDU parameter.

If there are no following octets, bit 3 shall be zero.

It is specified for each short-form SPDU, if octet 2 contains an SPDU parameter, how many of the following octets contain parameters and which of the following octets, if any, contain User-information.

8.5.3 Special data

For some short-form SPDUs bits 1 and 2 of the SI&P octet encode a Special User-data value. Subclauses of 8.6 specify which short-form SPDUs use these bits for a Special User-data value.

If the value of the Special User-data parameter has a length of two bits, the high-order bit shall be placed in bit 2 of the SI&P octet and the low-order bit shall be placed in bit 1.

If the value of the Special User-data parameter has a length of one bit, this shall be placed in bit 1 of the SI&P octet and bit 2 of the SI&P octet shall be zero.

If there is no Special User-data parameter on the invoking service, both bit 1 and bit 2 shall be zero.

8.5.4 Parameters in SI&P octet

For some short-form SPDUs, bits 1 and 2 of the SI&P octet encode one or two parameters. The use of these bits is specified in the appropriate subclause of 8.6.

8.5.5 Parameters in following octets

The encoding of parameters in the octets following the SI&P octet is specific to each short-form SPDU.

Parameters of short-form SPDUs are either of fixed length defined in 8.6 for that SPDU, or have an unspecified length.

A parameter with an unspecified length is always the last parameter in the encoding of the SPDU. The end of the parameter is at the end of the SPDU. If a particular short-form SPDU contains a parameter of unspecified length, it will not contain a User-information field.

8.5.6 User-information fields

Following the SI&P octet and any fixed length parameters, the User-information field of the short-form SPDU shall contain the SSDU. The order of the octets and the order of the bits in the SSDU shall be maintained in the SPDU.

8.6 Short-form SPDU identifiers and associated parameter fields

All short-form SPDUs have SI fields of 5 bits, in which the high-order bit (bit 8 of the SI&P field) is 1.

The short-form SPDUs specified in the remainder of this subclause have SI fields of five bits. These are represented in this subclause as bit strings, using the notation:

<p style="text-align:center">"VWXYZ"b</p>

where each of "V", "W", "X", "Y", "Z" is either a "0" or "1". In the SI&P octet of the short-form SPDU:

    –   the value shown in position V represents bit 8 of the SI&P octet;

    –   the value shown in position W represents bit 7 of the SI&P octet;

    –   the value shown in position X represents bit 6 of the SI&P octet;

    –   the value shown in position Y represents bit 5 of the SI&P octet;

    –   the value shown in position Z represents bit 4 of the SI&P octet.

> NOTE – Bit 8 (V) is 1 for all short-form SPDUs (and bit 8 is always zero in the SI octet of a long-form SPDU). For most, but not all, short-form SPDUs, WXYZ is the same as the low-order four bits of the SI of the corresponding long-form SPDU.

8.6.1 SHORT CONNECT (SCN) SPDU

8.6.1.1 The SI field of the SI&P octet shall contain "11101"b.

8.6.1.2   Bit 3 of the SI&P octet shall contain the parameter indication, as specified in 8.5.2.

8.6.1.3   Bits 1 and 2 of the SI&P octet shall contain the Special User-data field. The encoding is specified in 8.5.3.

8.6.1.4   If the parameter indication in bit 3 of the SI&P is one, octet 2 and any following octets shall contain parameters as specified in Table 48.

Table 48 – SCN SPDU Structure

Parameter	m/nm	Presence indication	Length	Reference
Presence and length (P&L)	m	SI&P:3	1	8.6.1.5
Nesting identifier	nm	P&L:8	1	8.6.1.6
Reserved_one	nm	P&L:7	1	8.6.1.7
Reserved_two	nm	P&L:6	1	8.6.1.7
Connection-Summary	nm	SI&P:3	Unspecified	8.6.1.9

8.6.1.5   The Presence and length parameter indicates which of the four non-mandatory parameters are present and the type and length of the identifier portion of the Connection Summary parameter. Bits 6 to 8 shall indicate which of the non-mandatory parameters are present. The encoding shall be:

   a)   bit 8 = 1: the Nesting identifier parameter is present;

   b)   bit 7 = 1: the reserved-one parameter is present;

   c)   bit 6 = 1: the reserved-two parameter is present.

Bit 5 is reserved.

Bits 1-4 shall indicate the type and length of the Upper-Layer Context Identifier in the Connection Summary parameter. The encoding shall be:

   a)   All of bits 1-4 zero: The Upper-Layer Context Identifier is a Restricted-form identifier represented in the first two octets of the Connection Summary parameter.

   b)   At least one bit of 1-4 is non-zero: The Upper-Layer Context Identifier is a Global-form identifier. Bits 1-4 of the P&L parameter represent a binary number. The length of the Upper-Layer Context Identifier is this binary number plus 4, and is represented in the leading octets of the Connection Summary parameter.

   NOTE – This allows the global form of the identifier (a BER-encoded ASN.1 Object Identifier) to have any length in the range 5 to 19.

8.6.1.6   The nested session identifier shall be as defined in ISO/IEC 8327-1/PDAM1. This parameter shall be absent if the nested session identifier is zero.

8.6.1.7   The Reserved_one and Reserved_two parameters are reserved for future use. They shall not be present when the SHORT CONNECT SPDU is sent, and shall be ignored on a SHORT CONNECT SPDU that is received.

8.6.1.9   The Connection Summary parameter shall contain the identifier and parameters of an Upper-Layer Context Specification. The identifier shall be either a Restricted-form identifier or a Global-form identifier.

A Restricted-form identifier shall be an integer in the range 1 to 65535. It shall be encoded as binary number in the first two octets of the Connection Summary parameter.

   NOTE – The Restricted-form is not globally unambiguous. The assignment of an integer identifier to an Upper-Layer Context specification is by bilateral agreement, although this "bilateral" agreement may be administered centrally for some community of Open systems.

A Global-form identifier shall be the encoding, according to the Basic Encoding Rules for ASN.1, of an Object Identifier that identifies the Upper-Layer Context specification.

The parameters of the Upper-Layer Context Specification, if any, are represented in the octets after the identifier.

If the Upper-Layer Context Specification has both compressed and uncompressed forms of its parameters, these may be present in either form, at sender's option.

8.6.1.10 If the parameter indication in bit 3 of the SI&P is zero, octet 2, if present, and any following octets shall contain the User-information field.

8.6.2   SHORT ACCEPT (SAC) SPDU

8.6.2.1   The SI field shall contain "11110"b.

8.6.2.2   Bit 3 of the SI&P octet shall contain the parameter indication, as specified in 8.5.2.

8.6.2.3   Bits 1 and 2 of the SI&P octet shall contain the Special User-data field. The encoding is specified in 8.5.3.

8.6.2.4   If the parameter indication in bit 3 of the SI&P is one, octet 2 and all following octets shall contain parameters as specified in Table 49.

Table 49 – SAC SPDU Structure

Parameter	m/nm	Presence indication	Length	Reference
Presence and length (P&L)	m	SI&P:3	1	8.6.2.5
Nesting identifier	nm	P&L:8	1	8.6.2.6
Connection-Summary	nm	SI&P:3 and SPDU continues after Nesting-identifier (or P&L)	Unspecified	8.6.2.9

8.6.2.5   The Presence and length parameter indicates whether the Nesting identifier parameter is present, whether a SHORT CONNECT CONTINUE SPDU is expected and the type and length of the identifier portion of the Connection Summary parameter, if present.

Bit 8 shall indicate whether the Nesting identifier parameter is present. The encoding shall be:

    a)   bit 8 = 1: the Nesting identifier parameter is present;

    b)   bit 8 = 0: the Nesting identifier parameter is not present.

Bit 7 shall indicate whether responder expects a SHORT CONNECT CONTINUE SPDU or has completed the establishment of the connection. The encoding shall be:

    a)   bit 7 = 1: Connection establishment is not complete; SHORT CONNECT CONTINUE SPDU expected;

    b)   bit 7 = 0: Connection establishment completed; no SHORT CONNECT CONTINUE SPDU expected.

Bits 5 and 6 are reserved.

Bits 1-4 shall indicate the type and length of the Upper-Layer Context Identifier in the Connection Summary parameter, if that parameter is present. The encoding shall be:

    a)   All of bits 1-4 zero: The Upper-Layer Context Identifier is a Restricted-form identifier represented in the first two octets of the Connection Summary parameter.

    b)   At least one bit of 1-4 is non-zero: The Upper-Layer Context Identifier is a Global-form identifier. Bits 1-4 of the P&L parameter represent a binary number. The length of the Upper-Layer Context Identifier is this binary number plus 4, and is represented in the leading octets of the Connection Summary parameter.

NOTE – This allows the global form of the identifier (a BER-encoded ASN.1 Object Identifier) to have any length in the range 5 to 19.

If no Connection Summary parameter is present, bits 1 to 4 of the P&L parameter shall be zero.

8.6.2.6   The nested session identifier shall be as defined in ISO/IEC 8327-1/PDAM1. This parameter shall be absent if the nested session identifier is zero.

8.6.2.7   The presence of the Connection Summary parameter is determined by the length of the SPDU. Any octets after the Nesting identifier (if present), or after the P&L parameter (if bit 8 of that parameter is zero) are the Connection Summary parameter.

If the Connection Summary parameter is present, it shall contain the identifier and parameters of an Upper-Layer Context Specification. The identifier shall be either a Restricted-form identifier or a Global-form identifier.

A Restricted-form identifier shall be an integer in the range 1 to 65535. It shall be encoded as binary number in the first two octets of the Connection Summary parameter.

> NOTE – The Restricted-form used on the SHORT ACCEPT SPDU identifies the response within the scope of the Upper-Layer Context specification referenced by the previous SHORT CONNECT SPDU. It may therefore be globally unambiguous, if the SHORT CONNECT SPDU used a Global-form identifier.

A Global-form identifier shall be the encoding, according to the Basic Encoding Rules for ASN.1, of an Object Identifier that identifies the Upper-Layer Context specification.

The parameters of the Upper-Layer Context Specification, if any, are represented in the octets after the identifier.

If the Upper-Layer Context Specification has both compressed and uncompressed forms of its parameters, these may be present in either form, at sender's option.

8.6.2.8   If the parameter indication in bit 3 of the SI&P is zero, octet 2, if present, and any following octets shall contain the User-information field.

8.6.3   SHORT CONNECT CONTINUE (SCNC) SPDU

8.6.3.1   The SI field of the SI&P octet shall contain "11111"b.

8.6.3.2   Bit 3 of the SI&P octet shall contain the parameter indication, as specified in 8.5.2.

8.6.3.3   Bits 1 and 2 of the SI&P octet are reserved. They shall be zero when the SPDU is sent and shall be ignored when the SPDU is received.

8.6.3.4   If the parameter indication in bit 3 of the SI&P is one, octet 2 and all following octets shall contain parameters as specified in Table 50.

Table 50 – SCNC SPDU Structure

Parameter	Length	Octets	Reference
Summary-Parameters	Unspecified	2-end	8.6.3.5

8.6.3.5   The Summary-Parameters parameter, if present, shall contain the uncompressed parameter specified for the Upper-Layer Context specification identified by the Connection Summary parameter of the previous SHORT CONNECT SPDU.

8.6.3.6   If the parameter indication in bit 3 of the SI&P is zero, octet 2, if present, and any following octets shall contain the User-information field.

8.6.4   SHORT ACCEPT CONTINUE (SACC) SPDU

8.6.4.1   The SI field of the SI&P octet shall contain "11011"b.

8.6.4.2   Bit 3 of the SI&P octet shall contain the parameter indication, as specified in 8.5.2.

8.6.4.3   Bits 1 and 2 of the SI&P octet are reserved. They shall be zero when the SPDU is sent and shall be ignored when the SPDU is received.

8.6.4.4   If the parameter indication in bit 3 of the SI&P is one, octet 2 and all following octets shall contain parameters as specified in Table 51.

Table 51 – SACC SPDU Structure

Parameter	Length	Octets	Reference
Summary-Parameters	Unspecified	2-end	8.6.4.5

8.6.4.5   The Summary-Parameters parameter, if present, shall contain the uncompressed parameter specified for the Upper-Layer Context specification identified by the Connection Summary parameter of the previous SHORT ACCEPT SPDU.

8.6.4.6   If the parameter indication in bit 3 of the SI&P is zero, octet 2, if present, and any following octets shall contain the User-information field.

8.6.5   SHORT REFUSE (SRF) SPDU

8.6.5.1   The SI field shall contain "11100"b.

8.6.5.2   Bit 3 of the SI&P octet shall contain the parameter indication, as specified in 8.5.2.

8.6.5.3   Bit 2 of the SI&P octet shall contain Transport Disconnect field. This shall indicate whether or not the transport connection is to be kept. The encoding of this field shall be:

   a)   bit 2 = 1: transport connection is released;

   b)   bit 2 = 0: transport connection is retained.

8.6.5.4   Bit 1 of the SI&P octet shall indicate whether the refusal is transient or permanent. The encoding of this field shall be:

   a)   bit 1 = 1: rejection may be reported to calling SS-user as persistent;

   b)   bit 1 = 0: rejection may be reported to the calling SS-user as transient.

8.6.5.5   If the parameter indication in bit 3 of the SI&P is one, octet 2 and all following octets shall contain parameters as specified in Table 52.

Table 52 – SRF SPDU Structure

Parameter	m/nm	Presence indication	Length	Reference
Presence and length (P&L)	m	SI&P:3	1	8.6.1.5
Nesting identifier	nm	P&L:8	1	8.6.1.6
Summary-response	nm	SI&P:3 and SPDU continues after Nesting-identifier (or P&L)	Unspecified	8.6.1.9

8.6.5.6   The Presence and length parameter indicates whether the Nesting identifier parameter is present.

Bit 8 shall indicate whether the Nesting identifier parameter is present. The encoding shall be:

   a)   bit 8 = 1: the Nesting identifier parameter is present;

   b)   bit 8 = 0: the Nesting identifier parameter is not present.

Bit 7 shall indicate whether the responder supports (recognizes) the identifier of the Upper-Layer Context specification in the Connection-Summary on the SHORT CONNECT SPDU. The encoding shall be:

   a)   bit 7 = 1: Connection-Summary parameter on the SHORT CONNECT SPDU was recognized;

   b)   bit 7 = 0: Connection-Summary parameter on the SHORT CONNECT SPDU was not recognized.

Bits 1 to 6 are reserved.

8.6.5.7   The Summary-response parameter shall only be present if bit 7 of the P&L parameter is 1. If present, the Summary-response parameter shall contain a value specified by the Upper-Layer Context specification identified by the Connection Summary parameter of the previous SHORT CONNECT SPDU.

8.6.5.8   If the parameter indication in bit 3 of the SI&P is zero, octet 2, if present, and any following octets shall contain the User-information field.

8.6.6   SHORT FINISH (SFN) SPDU

8.6.6.1   The SI field of the SI&P octet shall contain "11001"b.

8.6.6.2   Bit 3 of the SI&P octet shall be zero.

8.6.6.3 Bit 2 of the SI&P octet shall contain the Transport Disconnect field. This shall indicate whether or not the transport connection is to be kept. The encoding for this field shall be:

    a)   bit 2 = 0: transport connection is released;

    b)   bit 2 = 1: transport connection is kept.

8.6.6.4 Bit 1 of the SI&P octet is reserved. It shall be zero when the SPDU is sent and shall be ignored when the SPDU is received.

8.6.6.5 Octet 2, if present, and any following octets shall contain the User-information field.

8.6.7   **SHORT DISCONNECT (SDN) SPDU**

8.6.7.1 The SI field of the SI&P octet shall contain "11010"b.

8.6.7.2 Bit 3 of the SI&P octet shall be zero.

8.6.7.3 Bit 2 of the SI&P octet shall contain the Transport Disconnect field. This shall indicate whether or not the transport connection is to be kept. The encoding for this field shall be:

    a)   bit 2 = 0: transport connection is released;

    b)   bit 2 = 1: transport connection is kept.

8.6.7.4 Bit 1 of the SI&P octet is reserved. It shall be zero when the SPDU is sent and shall be ignored when the SPDU is received.

8.6.7.5 Octet 2, if present, and any following octets shall contain the User-information field.

8.6.8   **SHORT DATA TRANSFER (SDT) SPDU**

8.6.8.1 The SI field shall contain "10001"b.

8.6.8.2 Bit 3 of the SI&P octet shall be zero.

8.6.8.3 Bits 1 and 2 of the SI&P octet shall contain the Special User-data field. The encoding is specified in 8.5.3.

8.6.8.4 Octet 2 and any following octets shall contain the User-information field.

    NOTE – The SDT always has a length greater than one.

8.6.9   **SHORT ABORT (SAB) SPDU**

8.6.9.1 The SI field of the SI&P octet shall contain "10110"b.

8.6.9.2 Bit 3 of the SI&P octet shall contain the parameter indication, as specified in 8.5.2.

8.6.9.3 Bit 2 of the SI&P octet shall contain the Transport Disconnect field. This shall indicate whether or not the transport connection is to be kept. The encoding for this field shall be:

    a)   bit 2 = 0: transport connection is released;

    b)   bit 2 = 1: transport connection is kept.

8.6.9.4 Bit 1 of the SI&P octet is reserved. It shall be zero when the SPDU is sent and shall be ignored when the SPDU is received.

8.6.9.5 If the parameter indication in bit 3 of the SI&P is one, octet 2 shall contain the parameter specified in Table 53.

Table 53 – SAB SPDU Structure

Parameter	Length	Octets	Reference
Reason code	1	2	8.6.4.5

8.6.9.6 The Reason code parameter, if present, shall indicate the reason for the abort. The encoding of this field shall be:

   a) bit 2 = 1: user abort;

   b) bit 3 = 1: protocol error;

   c) bit 4 = 1: no reason;

   d) bit 5 = 1: implementation restriction stated in the PICS.

Bits 1, 6, 7 and 8 are reserved.

8.6.9.7 If the parameter indication in bit 3 of the SI&P is one and the Reason code field indicates user abort, then octet 3, if present, and any subsequent octets shall contain the User-information field.

8.6.9.8 If the parameter indication in bit 3 of the SI&P is one and the Reason code field does not indicate user abort, there shall be no User-information field.

8.6.9.9 If the parameter indication in bit 3 of the SI&P is zero, then octet 2, if present, and any subsequent octets shall contain the User-information field.

8.6.10   SHORT REFUSE CONTINUE (SRFC) SPDU

8.6.10.1 The SI field of the SI&P octet shall contain "10100"b.

8.6.10.2 Bit 3 of the SI&P octet shall contain the parameter indication, as specified in 8.5.2. As there are no parameters in the SPDU, bit 3 shall be set to zero.

8.6.10.3 Bits 1 and 2 of the SI&P octet are reserved. They shall be zero when the SPDU is sent and shall be ignored when the SPDU is received.

8.6.10.4 Octet 2, if present, and any following octets shall contain the User-information field.

25)   Subclause 9.1.3

Add to the list after item b), as follows:

   c)   whether the null encoding option is supported;

   d)   whether the short-encoding option is supported.

Consequently, the existing item c) becomes item e).

26)   Subclause A.5.1

Add to the right-hand side of the definition of fu-dom*, the additional term* NOR*, as follows:*

   fu-dom   =   {FD, HD, EXCEP, TD, NR, SY, SS, DS, MA, RESYN, EX, ACT, CD, NOR}

Add to the list of functional units immediately following the following definition for NOR*:*

   NOR   No orderly release functional unit

24   **ITU-T Rec. X.225 (1995)/Amd.1 (1997 E)**

27) Subclause A.5.4.20

Add the following rows to Table A.1 and change, as shown by the text, the descriptions of TCONind *and* TCONcnf*:*

Abbreviated name	Category	Name and description
NL	SPDU	NULL SPDU
SAB	SPDU	SHORT ABORT SPDU
SAC-TC-y	SPDU	SHORT ACCEPT (completed) SPDU in User-data of T-CONcnf
SAC-TC-n	SPDU	SHORT ACCEPT (not completed) SPDU in User-data of T-CONcnf
SAC-TD-y	SPDU	SHORT ACCEPT (completed) SPDU on T-DATAind
SAC-TD-n	SPDU	SHORT ACCEPT (not completed) SPDU on T-DATAind
SACC-TD	SPDU	SHORT ACCEPT CONTINUE SPDU on T-DATAind
SACC-TC	SPDU	SHORT ACCEPT CONTINUE SPDU in User-data of T-CONcnf
SRFC-TC	SPDU	SHORT REFUSE CONTINUE SPDU in User-data of T-CONcnf
SCNC	SPDU	SHORT CONNECT CONTINUE SPDU
SCN-TC	SPDU	SHORT CONNECT SPDU on User-data of T-CON ind (see Note 3)
SCN-TD	SPDU	SHORT CONNECT SPDU on T-DATAind
SDN	SPDU	SHORT DISCONNECT SPDU
SDT	SPDU	SHORT DATA TRANSFER SPDU
SFN	SPDU	SHORT FINISH SPDU
SRF-TC-nr	SPDU	SHORT REFUSE SPDU (with no reuse of transport connection) on User-data of T-CONcnf
SRF-TC-r	SPDU	SHORT REFUSE SPDU (with reuse of transport connection) on User-data of T-CONcnf
SRF-TD-nr	SPDU	SHORT REFUSE SPDU (with no reuse of transport connection) on T-DATAind
SRF-TD-r	SPDU	SHORT REFUSE SPDU (with reuse of transport connection) on T-DATAind

Also in Table A.1, change the descriptions of the following events:

TCONind	TS-provider	T-CONNECTind with no SPDU on the User-data
TCONcnf	TS-provider	T-CONNECTcnf with no SPDU on the User-data

Add Note 3:

3   If the short-connect protocol option is not supported, receipt of a T-CONNECT indication with a SHORT CONNECT SPDU in the User-data is treated as event TCONind.

Add the following rows to Table A.2:

Abbreviated Name	Name and description
STA01E	Await SAC in User-data of TCONrsp
STA01F	Await SCONrsp (after receiving SCN in User-data of TCONind)
STA02C	Await SAC on T-DATAind
STA02D	Await SACC
STA07	Await SCNC
STA08B	Await SCONrsp (after receiving SCN in User-data of T-DATAind)
STA700	Data transfer (null-encoding)

Add the following new rows to Table A.3, and change the descriptions of TCONreq *and* TCONrsp*:*

Abbreviated name	Category	Name and description
NL	SPDU	NULL SPDU
SAB	SPDU	SHORT ABORT SPDU
SAC-TC-y	SPDU	SHORT ACCEPT (completed) SPDU in User-data of T-CONrsp
SAC-TC-n	SPDU	SHORT ACCEPT (not completed) SPDU in User-data of T-CONrsp
SAC-TD-y	SPDU	SHORT ACCEPT (completed) SPDU on T-DATAreq
SAC-TD-n	SPDU	SHORT ACCEPT (not completed) SPDU on T-DATAreq
SACC-TD	SPDU	SHORT ACCEPT CONTINUE SPDU on T-DATAreq
SACC-TC	SPDU	SHORT ACCEPT CONTINUE SPDU in User-data of T-CONrsp
SRFC-TC	SPDU	SHORT REFUSE CONTINUE SPDU in User-data of T-CONrsp
SCNC	SPDU	SHORT CONNECT CONTINUE SPDU
SCN-TC	SPDU	SHORT CONNECT SPDU on User-data of T-CONreq
SCN-TD	SPDU	SHORT CONNECT SPDU on T-DATAreq
SDN	SPDU	SHORT DISCONNECT SPDU
SDT	SPDU	SHORT DATA TRANSFER SPDU
SFN	SPDU	SHORT FINISH SPDU
SRF-TC-nr	SPDU	SHORT REFUSE SPDU (with no reuse of transport connection) on User-data of T-CONrsp
SRF-TC-r	SPDU	SHORT REFUSE SPDU (with reuse of transport connection) on User-data of T-CONrsp
SRF-TD-nr	SPDU	SHORT REFUSE SPDU (with no reuse of transport connection) on T-DATAreq
SRF-TD-r	SPDU	SHORT REFUSE SPDU (with reuse of transport connection) on T-DATAreq

In Table A.3, change the descriptions of TCONreq *and* TCONrsp*:*

TCONreq	TS-provider	T-CONNECT request with no SPDU on the User-data
TCONrsp	TS-provider	T-CONNECT response with no SPDU on the User-data

Add the following entries to Table A.7:

p205	Local choice
p206	SCN SPDU (combined with SCNC if received) is not acceptable to SPM for permanent or transient reasons
p207	Local choice and SHORT CONNECT SPDU can be sent in User-data of T-CONNECT request
p208	Null-encoding protocol option has been selected
p209	SPM can fully interpret the Connection Summary parameter or there is no Connection Summary parameter on the received SPDU
p210	SHORT ACCEPT SPDU can be sent in User-data of T-CONNECT response
p211	SHORT REFUSE SPDU can be sent in User-data of T-CONNECT response

Add to list of Notes to Tables A.8 to A.25:

6   SyABind means generate event SUABind if the User-data field of the T-DISCONNECT indication is one octet with the value 1; generate event SPAPind otherwise.