

# ETSI EN 300 009-1 V1.4.3 (2001-02)

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*European Standard (Telecommunications series)*

**Integrated Services Digital Network (ISDN);  
Signalling System No.7;  
Signalling Connection Control Part (SCCP)  
(connectionless and connection-oriented)  
to support international interconnection;  
Part 1: Protocol specification**

[ITU-T Recommendations Q.711 to Q.716 (1996), modified]

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**Reference**

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REN/SPAN-01063-1

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**Keywords**

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CL, CO, endorsement, ISDN, SCCP, SS7**ETSI**

650 Route des Lucioles  
F-06921 Sophia Antipolis Cedex - FRANCE

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Tel.: +33 4 92 94 42 00 Fax: +33 4 93 65 47 16

Siret N° 348 623 562 00017 - NAF 742 C  
Association à but non lucratif enregistrée à la  
Sous-Préfecture de Grasse (06) N° 7803/88

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## Foreword

This European Standard (Telecommunications series) has been produced by ETSI Technical Committee Services and Protocols for Advanced Networks (SPAN).

The present document is part 1 of a multi-part deliverable covering the Integrated Services Digital Network (ISDN); Signalling System No.7; Signalling Connection Control Part (SCCP) (connectionless and connection-oriented) to support international interconnection, as identified below:

**Part 1:** "Protocol specification [ITU-T Recommendations Q.711 to Q.716 (1996), modified]";

**Part 2:** "Protocol Implementation Conformance Statement (PICS) proforma specification";

**Part 3:** "Abstract Test Suite (ATS) and partial Protocol Implementation eXtra Information for Testing (PIXIT) proforma specification".

The present document implies the existence of a number of functional subsets of the SCCP protocol without, however, explicitly identifying them. Depending on their functional requirements, conforming implementations would probably only implement a subset of the overall functions, e.g. a switch might only implement class 2 embedded, or a GSM base station might not handle Global Titles. The possibility of having such implementations is reflected by the option of the corresponding capabilities in the PICS proforma specification EN 300 009-2 [4].

The present document also incorporates agreements made at ITU-T since the last formal issue of the Q.71x recommendations.

National transposition dates	
Date of adoption of this EN:	2 February 2001
Date of latest announcement of this EN (doa):	31 May 2001
Date of latest publication of new National Standard or endorsement of this EN (dop/e):	30 November 2001
Date of withdrawal of any conflicting National Standard (dow):	30 November 2001

## Endorsement notice

The elements of ITU-T Recommendations Q.711 to Q.716 apply, with the following modifications:

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# Global modifications to ITU-T Recommendations Q.711 to Q.716

Insert the following three clauses (Scope, References and Abbreviations):

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## 1 Scope

The present document defines the Signalling Connection Control Part (SCCP) signalling protocol of Signalling System No.7 for use in and between international relay points and gateways and, optionally, in public networks.

The present document covers the use of connectionless functions (class 0 and class 1) and connection-oriented functions (class 2, excluding embedded connection set-up).

NOTE: The SCCP gateway functions are relay functions that bridge two Message Transfer Part (MTP) networks.

The present document is applicable to the international network and does not intend to restrict national networks. However, to facilitate SCCP interworking, its adoption within national networks is recommended.

Concerning the interconnection of SCCPs, the present document is based on the assumption that the Message Transfer Part (MTP) specified in EN 300 008-1 [1] and EN 301 004-1 [2] support the SCCP.

LUDT(S) messages and associated procedures need not be provided. If they are provided they shall be provided according to the ITU-T recommendations endorsed by the present document, unless modified herein.

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## 2 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication and/or edition number or version number) or non-specific.
- For a specific reference, subsequent revisions do not apply.
- For a non-specific reference, the latest version applies.

- [1] ETSI EN 300 008-1 (V1.3.1): "Integrated Services Digital Network (ISDN); Signalling System No.7; Message Transfer Part (MTP) to support international interconnection; Part 1: Protocol specification [ITU-T Recommendations Q.701, Q.702, Q.703, Q.704, Q.705, Q.706, Q.707 and Q.708 modified]".
- [2] ETSI EN 301 004-1 (V1.1.3): "Broadband Integrated Services Digital Network (B-ISDN); Signalling System No.7; Message Transfer Part (MTP) level 3 functions and messages to support international interconnection; Part 1: Protocol specification [ITU-T Recommendation Q.2210 (1996), modified]".
- [3] ETSI EG 201 693 (V1.1.3): "Integrated Services Digital Network (ISDN); Signalling System No.7; Master list of codepoints".
- [4] ETSI EN 300 009-2 (V1.3.2): "Integrated Services Digital Network (ISDN); Signalling System No.7; Signalling Connection Control Part (SCCP) (connectionless and connection-oriented class 2) to support international interconnection; Part 2: Protocol Implementation Conformance Statement (PICS) proforma specification".
- [5] ITU-T Recommendation X.650 (1996): "Information technology - Open Systems Interconnection - Basic Reference Model: Naming and addressing".

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## 3 Abbreviations

For the purposes of the present document, the following abbreviations apply:

CC	Connection Confirm message
CR	Connection Request message
CREF	Connection Refused message
DPC	Destination Point Code
ERR	protocol data unit Error message
GT	Global Title
ISDN	Integrated Services Digital Network
ISUP	ISDN User Part
IT	Inactivity Test message
LUDT	Long Unitdata message
LUDTS	Long Unitdata Service message
MTP	Message Transfer Part
OPC	Originating Point Code
RI	Routing Indicator
RLC	Release Complete message
RLSD	Released message
SCCP	Signalling Connection Control Part
SLS	Signalling Link Selection
SPC	Signalling Point Code
SS	Subsystem
SSN	Subsystem Number
UDT	Unitdata message
UDTS	Unitdata Service message
XUDT	Extended Unitdata message
XUDTS	Extended Unitdata Service message

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## Modifications to ITU-T Recommendation Q.711

### Page 7, clause 6

Class 3 is not in the scope of the present document.

### Page 8, clause 6.1

Permanent signalling connections are not in the scope of the present document.

### Page 8, clause 6.1.1.1.2

Sequence control and flow control are not in the scope of the present document.

### Page 10, clause 6.1.1.2.1

N-EXPEDITED DATA and N-RESET are not in the scope of the present document.

### Page 11, figure 8/Q.711

REQUEST type 1, REQUEST type 2, REPLY, N-EXPEDITED DATA and N-RESET are not in the scope of the present document.

## Page 11, clause 6.1.1.2.2

Negotiation of expedited data is not in the scope of the present document.

## Page 13, clause 6.1.1.2.3

N-EXPEDITED DATA and N-RESET are not in the scope of the present document.

## Page 17, clause 6.1.1.3.2

Delete clause 6.1.1.3.2. User part type A interface is not in the scope of the present document.

## Page 17, clause 6.1.2

Delete clause 6.1.2. Permanent signalling connections are not in the scope of the present document.

## Page 18, clause 6.2.1

If the in-sequence delivery is not required (Protocol Class 0), the SCCP shall insert Signalling Link Selection (SLS) codes with respect to the appropriate load sharing within the signalling network. If the in-sequence delivery is required (Protocol Class 1), the SCCP, at the originating node, while adhering to the sequence control instruction from the user, shall allocate SLS codes between sequence streams with respect to appropriate load sharing within the signalling network.

As in relay nodes user sequence control is not available, there shall be a fixed mapping between incoming and outgoing SLS code values for Class 1. This mapping may be different for different signalling relations.

## Page 22, clause 6.3.2.1

N-COORD is only needed in nodes that contain replicated subsystems.

## Page 24, clause 6.3.2.3.1

N-COORD is only needed in nodes that contain replicated subsystems.

## Page 31, clause 8.1

Class 3 functions are not in the scope of the present document.

## Page 31, clause 8.1.1.2

Flow control is not in the scope of the present document.

Expedited data support is not in the scope of the present document.

Missequence detection is not in the scope of the present document.

Reset is not in the scope of the present document.

## Page 31, clause 8.1.2

Delete clause 8.1.2. Functions for permanent signalling connections are not in the scope of the present document.

## Page 32, clause 8.3

Co-ordinated state change is only needed in nodes that contain replicated subsystems.

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## Modifications to ITU-T Recommendation Q.712

### Page 1, clause 1.4

Delete clause 1.4. Data acknowledgement is not in the scope of the present document.

### Page 1, clause 1.6

Delete clause 1.6. Data form 2 is not in the scope of the present document.

### Page 1, clause 1.7

Delete clause 1.7. Expedited data is not in the scope of the present document.

### Page 2, clause 1.8

Delete clause 1.8. Expedited data acknowledgement is not in the scope of the present document.

### Page 2, clause 1.13

Delete clause 1.13. Reset confirm is not in the scope of the present document.

### Page 2, clause 1.14

Delete clause 1.14. Reset request is not in the scope of the present document.

### Page 2, clause 1.16

Subsystem-out-of-service-grant is only needed in nodes that contain replicated subsystems.

### Page 2, clause 1.17

Subsystem-out-of-service-request is only needed in nodes that contain replicated subsystems.

### Page 4, clause 2.4

Delete clause 2.4. Credit is not in the scope of the present document.

### Page 5, clause 2.11

Delete clause 2.11. Receive sequence number is not in the scope of the present document.

### Page 5, clause 2.14

Delete clause 2.14. Reset cause is not in the scope of the present document.

## Page 5, clause 2.17

Delete clause 2.17. Sequencing/segmenting is not in the scope of the present document.

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## Modifications to ITU-T Recommendation Q.713

### Page 8, clause 3.4.1

Insert after the third paragraph, beginning with "A "1" in bit 2 ...":

On transmission of the called or calling party address, the Subsystem Number (SSN) indicator field shall always be included and set to 0 if unknown.

### Page 9, clause 3.4.2.2, list of subsystem numbers

The SSN values recorded in the master list of codepoints [3] apply.

NOTE: Addressing codes not standardized within ITU-T may be exchanged subject to agreement of all concerned operators. It is recommended to allocate SSNs in ETSI and/or ITU for all those SCCP subsystems whose messages may cross network boundaries, so that international agreement is secured for the SSNs used [3].

### Page 10, clause 3.4.2.3.1

Global title indicator = 0001 is not in the scope of the present document.

The NAI values recorded in the master list of codepoints [3] apply.

### Page 11, clause 3.4.2.3.2

Global title indicator = 0010 is not in the scope of the present document.

### Page 12, clause 3.4.2.3.3

Global title indicator = 0011 is not in the scope of the present document.

The NP values recorded in the master list of codepoints [3] apply.

### Page 13, clause 3.4.2.3.4

The TT values recorded in the master list of codepoints [3] apply.

### Page 13, clause 3.5

Insert after the last paragraph:

If segmenting/reassembly of connectionless messages or the return option are used, an unambiguous (note) identification of the originating SCCP user (possibly complemented by additional MTP information) shall be supplied in the calling party address.

NOTE: "unambiguous" is used here as defined in ITU-T Recommendation X.650 [5]: "A name is unambiguous within a given scope when it identifies one and only one object within that scope. Unambiguity does not preclude the existence of synonyms".



## Page 14, clause 3.8

Delete clause 3.8. Receive sequence number is not in the scope of the present document.

## Page 15, clause 3.9

Delete clause 3.9. Sequencing/segmenting is not in the scope of the present document.

## Page 15, clause 3.10

Delete clause 3.10. Credit is not in the scope of the present document.

## Page 16, clause 3.13

Delete clause 3.13. Reset cause is not in the scope of the present document.

## Page 22, clause 4.8

Delete clause 4.8. Data form 2 is not in the scope of the present document.

## Page 22, clause 4.9

Delete clause 4.9. Data acknowledgement is not in the scope of the present document.

## Page 23, clause 4.12

Delete clause 4.12. Expedited data is not in the scope of the present document.

## Page 24, clause 4.13

Delete clause 4.13. Expedited data acknowledgement is not in the scope of the present document.

## Page 25, clause 4.14

Delete clause 4.14. Reset request is not in the scope of the present document.

## Page 25, clause 4.15

Delete clause 4.15. Reset confirm is not in the scope of the present document.

## Page 31, annex A

Annex A has the status of a normative annex.

## Page 36, annex B.2

Replace items 1 and 2 with:

"1) If SCCP routing is to be performed using the GT and the next SCCP relay node is outside the national network boundary, only the GT with global title indicator (GTI) indicating "4" shall be sent in the SCCP called party address (*CdPA*). In addition, a SSN address element shall always be present in the SCCP called party address, *and shall take one of the following values:*

- if known and internationally standardized, the SSN of the called SCCP user entity; or
- if known and not internationally standardized, the SSN (from the national range) for the called SCCP user entity in the destination network; or
- zero, and coded as "0" (where the identity of the called SCCP user entity is not known).

A PC may be present in the SCCP called party address, but is not evaluated.

If the SSN supplied in the called party address cannot be used by the destination network, the content of the GT at the final translation point needs to be sufficient for the translation to derive an SSN for message distribution from the SCCP at the message's destination SP. The values of address elements of the *CdPA* (including the translation type [TT] and any SSN that is not internationally standard) need to be established between the operators of the end SCCP user entities.

If SCCP routing is based on the SSN and the destination SCCP user is outside the national boundary, an internationally standard Q.713 SSN shall be used and the GT may be optionally included in the SCCP *CdPA* parameter. If the GT is not included, the GT indicator (GTI) should be coded as "0".

2) When the SCCP messages are to be sent across the international network, the calling party address (*CgPA*) parameter, if provided, shall include one of the following set of SCCP address information elements, to identify the originating SCCP *user*, depending on the coding of the RI field:

- standard Q.713 global title and SSN of "0" if the RI is "route on GT", no internationally standard SSN is specified and it is not appropriate to use a national SSN value (it is not appropriate, for example, to use a national SSN value if messages will thereby be discarded);
- standard Q.713 global title and national SSN value if the RI is "route on GT" and no internationally standard SSN is specified;
- standard Q.713 global title and internationally standard SSN if the RI is "route on GT";
- if in addition the message does not cross the international boundary then also Q.708 ISPC and internationally standard Q.713 SSN if the RI is "route on SSN".

If a global title is included in the calling party address parameter, the GTI shall be set to "4".

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## Modifications to ITU-T Recommendation Q.714

### Page 1, clause 1.1.2

Class 3 procedures are not in the scope of the present document.

### Page 2, clause 1.1.2.2

Insert after the last paragraph:

"The in-sequence delivery not only relies on the properties of the MTP network, but also SCCP shall guarantee the sequential processing of SCCP messages. This excludes e.g. arbitrary parallel processing of Global Title translations in relay nodes.

## Page 2, clause 1.1.2.4

Delete clause 1.1.2.4. Protocol Class 3 is not in the scope of the present document.

## Page 4, clause 1.2.2

Flow control is not in the scope of the present document.

Expedited data support is not in the scope of the present document.

Missequence detection is not in the scope of the present document.

Reset is not in the scope of the present document.

## Page 7, clause 2.1

Replace two last sentences of subparagraph 1) by: "This translation function and its associated data are assumed to be part of the SCCP node. Access to an external database during the invocation of this function is not specified and is for further study."

## Page 8, clause 2.2.2

Insert after the last paragraph:

If an SCCP message is routed across network boundaries, a Global Title shall always be provided in the called address. For routing from one network to another, passing through the international network, the Routing Indicator (RI) shall always be set to route on Global Title.

## Page 19, clause 2.7.2

Add to the 1<sup>st</sup> bullet item after the first mnemonic "SSN" the text:

"(in this case the message must be destined to a node in the international network)".

Replace 2<sup>nd</sup> bullet item, beginning with "If routing is based on GT, ..." with:

"If routing is based on GT, the GTI must be equal to 4, the SSN is either:

- *one of the internationally standardized number; or*
- *national SSN value, if no internationally standard SSN is specified and it is appropriate to use the national SSN value (see ITU-T Recommendation Q.713 clause B.2); or*
- *coded as "0" (i.e. "unknown").*"

Replace 3<sup>rd</sup> bullet item, beginning with "The Global Title must have international significance" with:

The Global Title must have international significance. Within a national network, it is a national option to decide on the scope ("significance") of the calling/responding party addresses. However, when the address is only locally or nationally significant, it may be necessary to change the address in relay or gateway nodes by adding a trunk code or country code *to the Global Title address information*. This is the case whenever the message is routed outside the domain where the address is valid.

## Page 24, clause 3

Class 3 procedures are not in the scope of the present document.

## Page 25, clause 3.1.3.1, last paragraph

Insert after the last paragraph:

If a connection request for Protocol Class 3 is received, and the node only supports Class 2, the class shall be lowered to Class 2 in response.

## Page 25, clause 3.1.3.2

Delete clause 3.1.3.2. Flow control window negotiation is not in the scope of the present document.

## Page 26, clause 3.1.4.1

REQUEST Type 1 is not in the scope of the present document.

## Page 26, clause 3.1.4.2

If the protocol class received in the CC message is higher than the one proposed (i.e. either the class or the window or both are larger), the connection release procedure shall be initiated on the signalling connection, and the Release cause parameter shall indicate "Inconsistent connection data".

## Page 27, clause 3.1.5.1

REQUEST Type 2 is not in the scope of the present document.

If a connection request for Protocol Class 3 is received, and the relay point with coupling does only support Class 2, the class shall be lowered to Class 2 in response.

## Page 28, clause 3.1.5.2

If the protocol class received in the CC message is higher than the one proposed (i.e. either the class or the window or both are larger), the connection refusal procedure shall be initiated (see clauses 3.2.1 and 3.2.1.2 of ITU-T Recommendation Q.714 as modified by the present document).

## Page 28, clause 3.1.6.1

If a connection request for Protocol Class 3 is received, and the destination node supports only Class 2, the class shall be lowered to Class 2 in response.

## Page 29, clause 3.2.1

Insert after 2) c):

d) the reception of a CC message, with a protocol class higher than the one proposed in the associated CR message.

## Page 30, clause 3.2.1.2

Replace last paragraph by:

If the connection refusal procedure is initiated at a relay node due to the reception of a CC message, with a protocol class higher than the one proposed in the associated CR message (see clause 3.1.5.2 of ITU-T Recommendation Q.714 as modified by the present document), then the connection release procedure is initiated on that connection section and a CREF message with refusal cause "Inconsistent connection data" is transferred on the associated connection section.

In either of the three above cases at an intermediate node, if the connection set-up was initiated using a REQUEST interface element, then the SCCP user is informed by invoking the N-DISCONNECT indication primitive.

## Page 33, clause 3.5.1

Only the DT1 message is in the scope of the present document.

## Page 34, clause 3.5.2

Delete clause 3.5.2. Flow control is not in the scope of the present document.

## Page 36, clause 3.6

Delete clause 3.6. Expedited data support is not in the scope of the present document.

## Page 37, clause 3.7

Delete clause 3.7. Reset is not in the scope of the present document

## Page 40, clause 3.8.2.1, item 3)

Delete item 3). Permanent signalling connections are not in the scope of the present document.

## Page 40, clause 3.8.3.1

Permanent signalling connections are not in the scope of the present document.

## Page 44, clause 4.1.1

Insert the following note:

NOTE: The principle of Segmenting/Reassembly of connectionless messages is such that no actions are necessary in relay nodes, except for routing the XUDT and XUDTS messages in the same way as UDT and UDTS messages.

## Page 47, clause 4.1.1.2.3

Insert after the last paragraph:

The timeout of the reassembly timer shall be considered as one of the errors for which this procedure applies.

## Page 48, clause 4.1.2

Insert after the first paragraph:

Where the message change process fails SCRC should consider this a routing failure condition and invoke the message return procedure (4.2/Q.714). The return cause "SCCP failure" has to be used.

Insert before the last but one paragraph:

To enable white book (1993 and later) SCCP networks to interwork with blue book SCCP networks the following message format conversions are required, if such interworking is necessary:

- XUDT => UDT (message type change);
- LUDT => UDT (message type change);
- XUDTS => UDTs (message type change);
- LUDTS => UDTs (message type change).

## Page 54, clause 5.2.5

Insert in front of the 1<sup>st</sup> paragraph:

*"The SCCP will receive an indication of the end of MTP restart from each restarting local MTP SAP instance (there may be one or more MTP SAP instances in a given node). This indication is by implementation dependent means, see clause 9.2 of ITU-T Recommendation Q.704.*

*The occurrence of the end of MTP restart for a given local MTP SAP instance means that the local MTP network corresponding to that MTP SAP instance has become available to its local users, including SCCP."*

## Page 54, clause 5.2.6

Replace existing text with:

*"Prior to the end of MTP restart for a given local MTP SAP instance, the local MTP network corresponding to that MTP SAP instance is unavailable to its local users, including SCCP. Any action taken by SCCP is implementation dependent."*

## Page 56, clause 5.3.2.1

The response method is only used if SCCP routing control receives a message routed on SSN (Routing indicator = 1) for a prohibited local subsystem. If SCCP routing control receives a message routed on Global Title (Routing indicator = 0), for a prohibited local subsystem, then this message is discarded without invoking subsystem prohibited.

## Page 58, clause 5.3.5

Insert the following note:

NOTE: Co-ordinated state change is only needed in nodes that contain local replicated subsystems.

## Page 62, annex A

Annex A has the status of a normative annex.

## Page 66, annex B

Annex B has the status of a normative annex.

Table B.2/Q.714: on the reception of an IT message with an unassigned destination local reference, an ERR message with error cause equals "local reference number (LRN) mismatch - unassigned destination LRN" has to be returned to the originator.

## Page 71, annex C

Annex C has the status of a normative annex.

## Page 73, clause C.4, Timers

Insert at the end of clause C.4:

The following constraint shall be obeyed for the timers:

$$T(\text{guard}) \geq T(\text{interval}) + T(\text{iar}) + \Delta \text{ (see note)}$$

It may be advantageous to make sure that the inactivity receive timer  $T(\text{iar})$  is at least twice the inactivity send timer  $T(\text{ias})$ , as used in the nodes at the other side of the connection section. This avoids that the loss of one single Inactivity Test (IT) message (e.g. due to short term MTP congestion) causes the inadvertent release of an otherwise inactive SCCP connection. Loss of more messages (e.g. due to SPC failures) will, however, still cause the connection to get released.

$$T(\text{iar}) \geq 2 \times T(\text{ias}) + \Delta \text{ (see note)}$$

NOTE:  $\Delta$  is a margin for the inaccuracy of timers at both ends of the connection and for the transit delay of the IT message. A value of about one minute may be appropriate

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## Modifications to ITU-T Recommendation Q.715

No modifications identified.

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## Modifications to ITU-T Recommendation Q.716

No modifications identified.

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## Annex ZA (normative): Compatibility issues

### ZA.1 Segmenting/Reassembly of connectionless messages

The mechanisms for the connectionless segmenting reassembly are not compatible with the CCITT Blue Book (1988). Two messages (XUDT and XUDTS) had to be introduced in the ITU-T White Book (1993) because the UDT and UDTS messages did not foresee the possibility of adding optional parameters.

The introduction of this feature in the network should therefore be executed in carefully planned stages:

- 1) before the introduction of any implementations using segmenting/reassembly, all relay nodes that will be passed shall be equipped with the ability to accept and route XUDT(S) messages;
- 2) new implementations using segmenting/reassembly are introduced. In this phase, all messages from applications have to be sent as UDT/UDTS messages, as long as they fit within one UDT/UDTS message. For applications according to CCITT Blue Book (1988), there shall not be any change in behaviour of SCCP. This maximizes the chances for successful interworking;
- 3) as soon as the network is completely retrofitted according to the second or later editions of the present document, it is allowed to segment messages that would otherwise fit into an UDT/UDTS message. This may be done e.g. to restrict the mean length of the messages sent over the network. In this case all messages larger than a certain limit (the value "X" from the ITU-T White Book (1993)) are subjected to segmenting;
- 4) the final goal is the complete replacement of UDT/UDTS messages by XUDT/XUDTS messages. For a certain period of time, it is nevertheless required to be able to receive and relay UDT messages;
- 5) if interworking with Blue Book nodes cannot be avoided, there is a limited compatibility mechanism allowing the originating node to fall back if communication is not successful using the XUDT messages. This would require the last intermediate node before the Blue Book node to have the SCCP compatibility capabilities of ITU-T Recommendations Q.713 and Q.714 (07/1996 edition) and the use of the return on error procedure. Even so, there would be some cases where this will fail.

It is out of the scope of the present document to define whether and when each of these stages is to be achieved.

Two other messages (LUDT and LUDTS) had to be introduced in the ITU-T 1996 edition, to allow optimal use of MTP-3b capabilities. Interworking with earlier ITU-T editions requires an intermediate node to have the appropriate SCCP compatibility capabilities. Interworking with ITU-T Blue Book (1988) edition is however not guaranteed.

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### ZA.2 Introduction of SCCP into national networks

The introduction of SCCP into national networks needs to cope with the fact that in other national networks capabilities like Class 3 might be already in place. The following text describes the negotiation procedures that apply in that case to make sure that connections are set-up with the maximum available protocol class and window. It does not introduce any new requirements, since the procedures are fully covered by clause 3 of ITU-T Recommendation Q.714 as modified by the present document.

In the originating node, when a N-CONNECT-req primitive is received with Class 3, window = x, and when SCCP does not support Class 3, SCCP shall lower the class proposed in the outgoing CR message to Class 2 automatically.

In a relay point without coupling, when a CR message is received with Class 3, window = x, it shall be passed transparently (only SCRC routes the message, SCOC procedures are not invoked).

In a relay point with coupling, when a CR message is received with Class 3, window = x, and when SCCP does not support Class 3, SCCP shall lower the class proposed in the outgoing CR message to Class 2 automatically.



In the destination node, when a CR message is received with Class 3, window = x, and when SCCP does not support Class 3, SCCP shall lower the class proposed in the N-CONNECT indication primitive to Class 2 automatically.

When a user in the destination node receives a N-CONNECT indication, it shall check whether the proposed protocol class is still sufficient to service the connection. If not, the connection shall be refused and a N-DISCONNECT indication shall be returned, otherwise the connection shall be completed with N-CONNECT response.

In a relay point with coupling, when a CC message is received, SCCP shall check whether the protocol class is lower than or equal to the one it proposed in its outgoing CR message. If it is not, the connection shall be refused with a Connection Refused (CREF) message in the backward direction, and the already completed connection sections shall be released in the forward direction with a Released (RLSD) message.

In the originating node, when a CC message is received, SCCP shall check whether the protocol class is lower than or equal to the one it proposed in its outgoing CR message. If it is not, the already completed connection sections shall be released in the forward direction with RLSD.

When a user in the originating node receives a N-CONNECT confirmation, it shall check whether the proposed protocol class is still sufficient to service the connection. If not, the connection shall be released and a N-DISCONNECT indication shall be returned, otherwise the connection shall be completed and be now in the active state.

For the window negotiation similar procedures apply. These procedures maximize the protocol class offered to a connection to the maximum available from the participating nodes. In this way, interworking problems are minimized. The procedures are embedded in the protocol and do not require any database set-up or other provisioning.

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## History

Document history		
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