

INTERNATIONAL TELECOMMUNICATION UNION

ITU-T

Annex B
Q.601-Q.695

TELECOMMUNICATION
STANDARDIZATION SECTOR
OF ITU

(03/93)

INTERWORKING OF SIGNALLING SYSTEMS

INTERWORKING OF SIGNALLING SYSTEMS – NARRATIVE PRESENTATION OF INTERWORKING

Annex B to ITU-T Recs. Q.601 to Q.695

(Previously "CCITT Recommendations")

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FOREWORD

The ITU Telecommunication Standardization Sector (ITU-T) is a permanent organ of the International Telecommunication Union. The ITU-T is responsible for studying technical, operating and tariff questions and issuing Recommendations on them with a view to standardizing telecommunications on a worldwide basis.

The World Telecommunication Standardization Conference (WTSC), which meets every four years, established the topics for study by the ITU-T Study Groups which, in their turn, produce Recommendations on these topics.

Annex B to ITU-T Recommendations Q.601 to Q.695 was revised by the ITU-T Study Group XI (1988-1993) and was approved by the WTSC (Helsinki, March 1-12, 1993).

NOTES

1 As a consequence of a reform process within the International Telecommunication Union (ITU), the CCITT ceased to exist as of 28 February 1993. In its place, the ITU Telecommunication Standardization Sector (ITU-T) was created as of 1 March 1993. Similarly, in this reform process, the CCIR and the IFRB have been replaced by the Radiocommunication Sector.

In order not to delay publication of this Recommendation, no change has been made in the text to references containing the acronyms "CCITT, CCIR or IFRB" or their associated entities such as Plenary Assembly, Secretariat, etc. Future editions of this Recommendation will contain the proper terminology related to the new ITU structure.

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

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Annex B

Interworking of signalling systems – Narrative presentation of interworking

(Helsinki, 1993)

(This annex forms an integral part of Recommendations Q.601-Q.695)

B.1 Introduction

B.1.1 Narrative presentation

Recommendation Q.601 explains the change from narrative to SDL presentation and that the SDL method facilitates the specification of interworking with future signalling system.

But, for ISUP, some additional information, that is relevant to interworking, may be useful:

- the coding of the messages;
- taking into account of supplementary services;
- supplementary informations about the call failure handling;
- taking into account of the sequencing of the received messages;
- handling of the access information.

This annex must be read and used as a complement of the CCITT interworking SDL specifications and not as an independent specification.

Only the information being a matter of interworking is described.

Hence, no information is given concerning the:

- national/international call indicator;
- end-to-end method indicator;
- end-to-end information indicator;
- SCCP method indicator;
- continuity check indicator in interworking cases R2, No. 5 to ISUP;
- COT message in interworking cases R2, No. 5 to ISUP;
- handling of the call, if only signalling systems having the capabilities of ISUP shall be used (e.g. ISUP preference indicator received is set to "ISUP required").

B.1.2 Working assumptions

- TUP does not support any supplementary service (e.g. calling line identification). TUP supports the "digital connectivity".
- TUP only supporting IAM is described.

B.1.3 Miscellaneous interworking aspects

B.1.3.1 Interworking handling of the echo control device indicator (or the incoming half echo suppressor indicator) of ISUP ACM (or TUP) of the address complete message (ACM) in ISUP (or TUP)

In order to send more accurate information in the backward direction, the following interworking handling is proposed which can be used independently of the Echo control procedures (described in Recommendation Q.724 or Q.767).

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Interworking ISUP → R2, No. 5

– If the bit E of the echo control device indicator received in the IAM is coded "0" (no outgoing half echo control device is included), then the bit N of the echo control device indicator of the ACM is coded "0".

IAM (E = 0)→

←ACM (N = 0)

– If the bit E of the echo control device indicator received in the IAM is coded "1" (an outgoing half echo control device is included):

a) if an incoming half echo control device is locally included or if it is known from the routing data available in the exchange that an incoming half echo control device can be inserted beyond the interworking point, then the bit N of the echo control device indicator of the ACM is coded "1";

b) if it is known from the routing data available in the exchange that no incoming half echo control device can be included beyond the interworking point and no incoming half echo control device is locally available, then the bit N of the echo control device indicator is coded "0".

Interworking ISUP → TUP, ISUP

– If the bit E of the echo control device indicator received in the IAM is coded "0" (no outgoing half echo control device is included), the bit N of the echo control device indicator in the ACM is coded as received in the ACM (TUP: bit D of the incoming half echo suppressor, ISUP: bit N of the echo control device indicator).

– If the bit E of the echo control device indicator received in the IAM is coded "1" (an outgoing half echo control device is included):

a) if the incoming half echo control is locally included, then the bit N of the echo control device indicator of the ACM is coded "1";

b) if no incoming half echo control device is locally included, the bit N of the echo control device indicator in the ACM is coded as received in the ACM (TUP: bit D of the incoming half echo suppressor indicator, ISUP: bit N of the echo control device indicator).

The same principles might be followed when the incoming signalling system is TUP.

Interworking TUP → ISUP

– If the bit G of the message indicators received in the IAM is coded "0" (outgoing half echo suppressor not included), the bit D of the incoming half echo suppressor indicator in the ACM is coded as received in the ACM (bit N of the echo control device indicator).

– If the bit G of the message indicators received in the IAM is coded "1" (outgoing half echo suppressor included):

a) if the incoming half echo control is locally included, then the bit D of the incoming half echo suppressor indicator of the ACM is coded "1";

b) if no incoming half echo control device is locally included, the bit D of the incoming half echo suppressor indicator in the ACM is coded as received in the ACM (bit N of the echo control device indicator).

B.1.3.2 Handling of the called party's category and the charge indicator when interworking TUP to ISUP

When interworking from TUP to ISUP the theoretical number of combinations of the ISUP backward call indicators (charge, called party's category) implies some choices since some information may be lost in TUP.

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It is proposed to transfer the charge and the called party's category indicators as follows:

- payphone + no charge → ADX/AFX
- payphone + charge → ADX/AFX
- ordinary + no charge → ADN/AFN
- ordinary + charge → ADC/AFC
- no indic. + no charge → ADN/AFN
- no indic. + charge → ADC/AFC
- payphone + no indic. → ADX/AFX
- ordinary + no indic. → ADC/AFC
- no indic. + no indic. → ADC/AFC

B.1.3.3 Transfer of no charge or charge information in the Answer message when interworking TUP to ISUP

The charge or no charge information may be received in the backward call indicators in the successive Address complete message (ACM), Call progress message (CPG) and Answer message (ANM).

When interworking from TUP to ISUP, this information is transferred as follows:

- If "charge" is received in the charge indicator in the ANM, ANC is sent.
- If "no charge" is received in the charge indicator in the ANM, ANN is sent.
- If "no indication" is received in the charge indicator in the ANM or no backward call indicators are received in the ANM, ANC is sent. With this proposal, ANC may be sent for a call where an address complete no charge message was previously sent. It is assumed that it does not result in charging the call.

B.2 Narrative presentation of the various interworking cases

B.2.1 Interworking of Signalling System ISUP to No. 5

B.2.1.1 Successful call set-up

B.2.1.1.1 Circuit seizure

The seizure signal is sent when the following conditions are fulfilled:

- if the continuity check indicator received in the IAM indicates that continuity check is not required; or
- if this indicator indicates that it is "required on this circuit" or it is "performed on a previous circuit", on receipt of the Continuity message (continuity check successful); and
- the end-of-pulsing condition is determined:

  by receipt of ST,

  or if the fixed or maximum of number length is reached,

  or at expiry of the timer (4-6 seconds specified in the Recommendation Q.152) if the minimum number of digits has been received.

B.2.1.1.2 Address information sending sequence

The sending sequence of address information is specified in the Recommendation Q.107.

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The language or discriminating digit is coded according to the "calling party's category" received in the IAM:

IAM category		No. 5 language or discriminating digit
0001	French	1
0010	English	2
0011	German	3
0100	Russian	4
0101	Spanish	5
0110	*	6
0111	*	(Note 2)
1000	*	8
1010	ordinary	0
1011	priority	0
1100	data	0 (Note 1)
1101	test call	not subject to interworking
1111	payphone	0
< >		0

* Available to Administrations for selecting a particular language by mutual agreement.

NOTES

1 If a bilateral agreement on the use of D/L = 9 exists for the No. 5 section, code 9 should be used.

2 The call is released by sending a Release message with cause 31 on the ISUP signalling section.

B.2.1.1.3 Address complete

As soon as the Proceed to send signal is received, the Address complete message is sent coded as follows:

– backward-call indicators

bits BA: charge indicator
10 (charge)
bits DC: Called party's status indicator
00 (no indication)
bits FE: Called party's category indicator
00 (no indication)
bit I: Interworking indicator
1 (encountered)
bit K: ISUP indicator
0 (not used all the way)
bit M: ISDN access indicator
0 (terminating access non-ISDN)
bit N: Echo control device indicator
see introduction, subclause B.1.3.1

The speech condition is set up when the ST is sent.

B.2.1.1.4 Answer

On receipt of the Answer signal, the Answer message (ANM) is sent (without backward call indicators).

B.2.1.1.5 Clear-back/Re-answer sequence

On receipt of the Clear-back signal, the Suspend (network) message is sent.

After the receipt of the Clear-back signal, on receipt of the Answer signal (re-answer), the Resume (network) message is sent.

The number of Clear-back/Answer (Suspend/Resume) sequences is not limited.

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B.2.1.1.6 Forward transfer

After the sending of the ACM and until the release of the call, on receipt of the Forward transfer message (FOT), the Forward transfer signal is sent (F2).

B.2.1.2 Call release and call failures

B.2.1.2.1 ISUP side

On receipt of a Release message (REL) or a Reset circuit message (RSC) or a Circuit group reset message (GRS) or a Circuit group blocking message (hardware) (CGB), the Clear-forward signal is sent.

In case of failure due to ISUP side, the Clear-forward signal is sent.

B.2.1.2.2 No. 5 side

On receipt of Busy flash signal (F2), the Release message is sent with the cause value 34 and the location "beyond an interworking point".

In case of failure due to the No. 5 side (for example, timer expiry) the Release message is sent with the cause value 127 and the location "international network".

B.2.1.3 Reaction for Supplementary Services

B.2.1.3.1 UUS1 implicit

The "interworking" protocol control information is sent in the ACM.

B.2.1.3.2 CLIP/CLIR

The Calling party number is discarded, if present.

B.2.1.3.3 CUG

If the CUG call indicator in the IAM is:

- CUG with outgoing access, the call is treated as an ordinary call.
- Non-CUG, the call is treated as an ordinary call.

B.2.1.3.4 COLP/COLR

If a request of COLP is included in the received IAM (bit H = 1 of Connected line request indicator), the Answer message (ANM) is sent with the Connected number parameter with indication address not available.

- Connected number parameter
  nature of address indicator
  0000000
  numbering plan indicator
  000
  address presentation restricted
  10 (address not available)
  screening indicator
  11 (network provided)

B.2.1.3.5 Sub-address

The Sub-address is discarded.

B.2.1.3.6 Terminal portability

The Suspend/Resume (User initiated) messages are discarded.

B.2.2 Interworking of Signalling System ISUP to R2

B.2.2.1 Successful call set-up

B.2.2.1.1 Address information sending sequence

The sending sequence of address information is specified in the Recommendation Q.107.

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