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B-ISDN APPLICATION PROTOCOLS FOR ACCESS SIGNALLING

STAGE 3 DESCRIPTION FOR NUMBER IDENTIFICATION SUPPLEMENTARY SERVICES USING B-ISDN DIGITAL SUBSCRIBER SIGNALLING SYSTEM No. 2 (DSS 2) – BASIC CALL

Clause 1 – Direct-Dialling-In (DDI)
Clause 2 – Multiple Subscriber Number (MSN)
Clause 3 – Calling Line Identification Presentation (CLIP)
Clause 4 – Calling Line Identification Restriction (CLIR)
Clause 5 – Connected Line Identification Presentation (COLP)
Clause 6 – Connected Line Identification Restriction (COLR)
Clause 8 – Sub-addressing (SUB)

ITU-T Recommendation Q.2951

(Previously “CCITT Recommendation”)

FOREWORD

The ITU-T (Telecommunication Standardization Sector) is a permanent organ of the International Telecommunication Union (ITU). 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, establishes the topics for study by the ITU-T Study Groups which, in their turn, produce Recommendations on these topics.

The approval of Recommendations by the Members of the ITU-T is covered by the procedure laid down in WTSC Resolution No. 1 (Helsinki, March 1-12, 1993).

ITU-T Recommendation Q.2951, clauses 1, 2, 3, 4, 5, 6 and 8 was prepared by ITU-T Study Group 11 (1993-1996) and was approved under the WTSC Resolution No. 1 procedure on the 7th of February 1995.

NOTE

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

CONTENTS

SUMMARY

1 This Recommendation defines the operation of the Digital Subscriber Signalling System No. 2 (DSS 2) for the support of the following number identification supplementary services:

Clause 1 – Direct-Dialling-In (DDI)

Clause 2 – Multiple Subscriber Number (MSN)

Clause 3 – Calling Line Identification Presentation (CLIP)

Clause 4 – Calling Line Identification Restriction (CLIR)

Clause 5 – Connected Line Identification Presentation (COLP)

Clause 6 – Connected Line Identification Restriction (COLR)

Clause 8 – Sub-addressing (SUB)

The Recommendation defines the operation for the support of the services at the T_B or at the coincident S_B and T_B reference point of the user to network interface of the Broadband Integrated Services Digital Network (B-ISDN).

2 A brief description of the services is the following:

This DDI supplementary enables a user to call directly to another user on a B-ISDN private branch exchange or other private systems, without attendant intervention, based exclusively on the use of the ISDN number.

The MSN supplementary service provides the possibility for assigning multiple ISDN numbers to a single public or private access.

Calling Line Identification Presentation (CLIP) is a supplementary service offered to the called party which provides the calling party's ISDN number, possibly with sub-address information, to the called party.

Calling Line Identification Restriction (CLIR) is a supplementary service offered to the calling party to restrict presentation of the calling party's ISDN number and sub-address to the called party.

Connected Line Identification Presentation (COLP) is a supplementary service offered to the calling party which provides the connected party's ISDN number, possibly with sub-address information, to the calling party.

Connected Line Identification Restriction (COLR) is a supplementary service offered to the called party to restrict presentation of the connected party's ISDN number and sub-address to the calling party.

The sub-addressing supplementary service allows the called (served) user to expand his addressing capacity beyond the one given by the ISDN number.

Recommendation Q.2951

STAGE 3 DESCRIPTION FOR NUMBER IDENTIFICATION SUPPLEMENTARY SERVICES USING B-ISDN DIGITAL SUBSCRIBER SIGNALLING SYSTEM No. 2 (DSS 2) – BASIC CALL

(Geneva, 1995)

1 Direct-Dialling-In (DDI)

1.1 Scope

This Recommendation specifies the stage three of the Direct-Dialling-In (DDI) supplementary service for the Broadband Integrated Services Digital Network (B-ISDN) at the T_B reference point or coincident S_B and T_B reference point (as defined in Recommendation I.413 [1]) by means of the Digital Subscriber Signalling System No. 2 (DSS 2) protocol. Stage three identifies the protocol procedures and switching functions needed to support a telecommunications service (see Recommendation I.130 [2]).

In addition, this Recommendation specifies the protocol requirements at the T_B reference point where the service is provided to the user via an intermediate private B-ISDN.

This Recommendation does not specify the additional protocol requirements where the service is provided to the user via a telecommunications network that is not a B-ISDN.

This DDI supplementary service enables a user to call directly to another user on an ISDN private branch exchange (ISPBX) or other private systems, without attendant intervention. This supplementary service is based on the use of the ISDN number and does not include sub-addressing.

The DDI supplementary service is applicable to all telecommunication services.

This Recommendation is applicable to equipment, supporting the DDI supplementary service, to be attached at either side of a T_B reference point or coincident S_B and T_B reference point when used as an access to the public B-ISDN.

1.2 References

The following ITU-T Recommendations and other references contain provisions which, through reference in this text, constitute provisions of this Recommendation. At the time of publication, the editions indicated were valid. All Recommendations and other references are subject to revision; all users of this Recommendation are therefore encouraged to investigate the possibility of applying the most recent edition of the Recommendations and other references listed below. A list of the currently valid ITU-T Recommendations is regularly published.

[1] ITU-T Recommendation I.413 (1993), *B-ISDN user-network interface*.

[2] CCITT Recommendation I.130 (1988), *Method for the characterization of telecommunication services supported by an ISDN and network capabilities of an ISDN*.

[3] ITU-T Recommendation Q.2931 (1995), *Broadband Integrated Services Digital Network (B-ISDN) – Digital Subscriber Signalling No. 2 (DSS 2) – User network interface layer 3 specification for basic call/connection control*.

[4] CCITT Recommendation E.164 (1991), *Numbering plan for the ISDN era*.

[5] ITU-T Recommendation I.580 (1993) *General arrangements for interworking between B-ISDN and 64 kbit/s based ISDN*.

[6] CCITT Recommendation I.251.1 (1992), *Direct-Dialling-In*.

1.3 Definitions

For the purposes of this Recommendation, the following definitions apply:

1.3.1 DDI number: It is that part of the ISDN number which is significant to an ISPBX or other private system.

1.3.2 user: The DSS 2 protocol entity at the user side of the user-network interface.

1.3.3 network: The DSS 2 protocol entity at the network side of the user-network interface.

1.3.4 ISDN number: A number conforming to the numbering plan and structure specified in Recommendation E.164 [4].

1.3.5 international number: An ISDN number structured as specified in 3.2/E.164 [4] (in the paragraphs relating to international number).

1.3.6 national number; national significant number: An ISDN number structured as specified in 3.2/E.164 [4]. (in the paragraphs relating to national significant number).

1.3.7 subscriber number: An ISDN number structured as specified in 3.2/E.164 [4] (in the paragraphs relating to subscriber number).

1.4 Abbreviations

For the purposes of this Recommendation, the following abbreviations are used:

B-ISDN	Broadband Integrated Services Digital Network
DDI	Direct-Dialling-In
DSS 2	Digital Subscriber Signalling System No. 2
ISDN	Integrated Services Digital Network
ISO	International Organization for Standardization
ISPBX	Integrated Services Private Branch Exchange
N-ISDN	Narrow-band Integrated Services Digital Network

1.5 Description

DDI numbers form part of the international numbering plan according to Recommendation E.164.

This Recommendation provides the flexibility to network operators to use national numbering plans of fixed or variable lengths. This flexibility also applies to DDI numbers, i.e. even within a given ISPBX or other private system, DDI numbers of different lengths may appear.

In networks with an open numbering plan, the length of the DDI number is not necessarily known by the servicing local exchange nor by any other entity of the public network.

DDI is provided when at least a part of the ISDN number which is significant to the called user is passed to that user. These last digits (fixed or variable length) are sent from the exchange and received by the ISPBX or other private system by *en bloc* or overlap receiving, which finally and automatically establish a call to the destination without the assistance of an operator. These last digits are sent in accordance with 5.2/Q.2931, or 6.5/Q.2931.

1.6 Operational requirements

1.6.1 Provision/withdrawal

This service shall be provided after prior arrangement with the network operator and shall be withdrawn on the subscriber's request or for administrative reasons.

1.6.2 Requirements on the originating network side

The basic call control procedures according to 5.1/Q.2931, and 6.5/Q.2931 are applicable.

1.6.3 Requirements in the network

Not applicable.

1.6.4 Requirements on the terminating network side

When the DDI supplementary service is provided to the called user, at least the DDI number shall be passed to the user in the called party number information element. The *en bloc* or overlap receiving procedure is used to transfer the called party number information according to the rules specified in 5.2/Q.2931, (*en bloc* receiving), or 6.5/Q.2931 (overlap receiving).

The destination network side may check the range and the format of the DDI number before it is passed to the called user.

1.7 State definitions

The states associated with basic call control according to Recommendation Q.2931 are applicable.

1.8 Coding requirements

The DDI number is a part of the ISDN number which shall be inserted in the called party number information element coded as in 4.5.11/Q.2931.

1.9 Signalling procedures at the coincident S_B and T_B reference point

Not applicable.

1.10 Procedures for interworking with private ISDNs

1.10.1 DDI number delivery

1.10.1.1 Normal operation

The DDI number is delivered from the network to the called user according to the procedures of 5.2/Q.2931, (*en bloc* receiving), or 6.5/Q.2931 (overlap receiving).

Where the addressing/numbering plan identification equals *ISDN/telephony numbering plan (Recommendation E.164)* the type of number is included in the called party number information element sent to the called user and shall be coded as:

- *unknown* (see Table 4-14/Q.2931, Note 2 against "Type of Number"); or
- *subscriber number*, *national number* or *international number* (see Table 4-14/Q.2931, Note 3 against "Type of Number").

NOTE – This coding is independent of the use of *en bloc* procedures (where the called party number is sent in a single message) or overlap procedures (where the called party number is sent in segments in several messages as it becomes available).

1.10.1.2 Exceptional procedures

No exceptional procedures are required.

1.11 Interworking with other networks

1.11.1 Interworking with N-ISDNs

This subclause specifies the particular features to support access signalling interworking between B-ISDN and N-ISDN. The description of interworking assumes the communication scenario B as defined in Annex A/I.580 [5].

Interworking N-ISDN → B-ISDN

Not applicable.

Interworking B-ISDN → N-ISDN

The DSS 2 called party number information element is mapped to the DSS 1 called party number information element by the terminal adapter or interworking function by removing its second octet and adjusting the length indication without causing other changes to the contents, and by respecting the order of this information element in the DSS 1 message.

1.11.2 Interworking with non-ISDNs

No special requirements for interworking with other networks are necessary.

1.12 Interactions with other supplementary services

1.12.1 Connected Line Identification Presentation

No interaction.

1.12.2 Connected Line Identification Restriction

No interaction.

1.12.3 Calling Line Identification Presentation

No interaction.

1.12.4 Calling Line Identification Restriction

No interaction.

1.12.5 Direct-Dialling-In

Not relevant.

1.12.6 User-to-User Signalling

1.12.6.1 Service 1

No interaction.

1.12.7 Multiple Subscriber Number

In some networks, subscription to the DDI and Multiple Subscriber Number supplementary service is mutually exclusive.

1.12.8 Sub-addressing

No interaction

1.13 Parameter values (timers)

The timers associated with basic call control according to Recommendation Q.2931 are applicable.

1.14 Dynamic description (SDLs)

Recommendation Q.2931 is applicable.

Appendix I

(to clause 1 of Recommendation Q.2951)

Signalling flows

(This appendix does not form an integral part of this Recommendation)

Normal basic call control signalling flows according to Recommendation Q.2931 are applicable.

2 Multiple Subscriber Number (MSN)

2.1 Scope

This Recommendation specifies the stage three of the multiple Subscriber Number (MSN) supplementary service for the Broadband Integrated Services Digital Network (B-ISDN) at the T_B reference point or coincident S_B and T_B reference point (as defined in Recommendation I.413 [1]) by means of the Digital Subscriber Signalling System No. 2 (DSS 2) protocol. Stage three identifies the protocol procedures and switching functions needed to support a telecommunications service (see Recommendation I.130 [2]).

In addition, this Recommendation specifies the protocol requirements at the T_B reference point where the service is provided to the user via an intermediate private B-ISDN.

This Recommendation does not specify the additional protocol requirements where the service is provided to the user via a telecommunications network that is not a B-ISDN.

The Multiple Subscriber Number (MSN) supplementary service provides the possibility for assigning multiple ISDN numbers to a single public or private access. Note that this allows, for example:

1) a calling user to select, via the public network, one or multiple distinct terminals out of a multiple choice;

2) to identify the terminal to the network for the application of other supplementary services.

It is considered:

– that some service providers may not have knowledge or control over what is connected, e.g. private ISDN or a terminal configuration;

– that network operators have differing numbering methods;

– that common international terminal specifications are desired.

The MSN supplementary service is applicable to all telecommunication services.

This Recommendation is applicable to equipment, supporting the MSN supplementary service, to be attached at either side of a T_B reference point or coincident S_B and T_B reference point when used as an access to the public B-ISDN.

2.2 References

The following ITU-T Recommendations and other references contain provisions which, through reference in this text, constitute provisions of this Recommendation. At the time of publication, the editions indicated were valid. All Recommendations and other references are subject to revision; all users of this Recommendation are therefore encouraged to investigate the possibility of applying the most recent edition of the Recommendations and other references listed below. A list of the currently valid ITU-T Recommendations is regularly published.

[1] ITU-T Recommendation I.413 (1993), *B-ISDN user-network interface*.

[2] CCITT Recommendation I.130 (1988), *Method for the characterization of telecommunication services supported by an ISDN and network capabilities of an ISDN*.

[3] ITU-T Recommendation Q.2931 (1995), *Broadcasting Integrated Services Digital Network (B-ISDN) – Digital Subscriber Signalling No. 2 (DSS 2) – User-network interface layer 3 specification for basic call/connection control*.

[4] CCITT Recommendation E.164 (1991), *Numbering plan for the ISDN era*.

[5] ITU-T Recommendation I.580 (1993), *General arrangements for interworking between B-ISDN and 64 kbit/s based ISDN*.

[6] CCITT Recommendation I.251.2 (1992), *Multiple subscriber number*.

2.3 Definitions

For the purposes of this Recommendation, the following definitions apply:

2.3.1 **user**: The DSS 2 protocol entity at the user side of the user-network interface.

2.3.2 **network**: The DSS 2 protocol entity at the network side of the user-network interface.

2.3.3 **ISDN number**: A number conforming to the numbering plan and structure specified in Recommendation E.164 [4].

2.3.4 **international number**: An ISDN number structured as specified in 3.2/E.164 [4] (in the paragraphs relating to international number).

2.3.5 **national number; national significant number**: An ISDN number structured as specified in 3.2/E.164 [4] (in the paragraphs relating to national significant number).

2.3.6 **subscriber number**: An ISDN number structured as specified in 3.2/E.164 [4] (in the paragraphs relating to subscriber number).

2.4 Abbreviations

For the purposes of this Recommendation, the following abbreviations are used:

DSS 2	Digital Subscriber Signalling System No. 2
B-ISDN	Broadband Integrated Services Digital Network
DDI	Direct-Dialling-In
ISDN	Integrated Services Digital Network
ISO	International Organization for Standardization
ISPBX	Integrated Services Private Branch Exchange
MSN	Multiple Subscriber Number
N-ISDN	Narrow-band Integrated Services Digital Network

2.5 Description

The stage 1 description, i.e. the MSN supplementary service description as seen from the user, can be found in Recommendation I.251.2 [6].

The stage 2 description, i.e. the information flow for the MSN supplementary service, can be found in clause 2/Q.81.

This Recommendation specifies the stage 3 description, i.e. the protocol requirements for the MSN supplementary service at the coincident S_B and T_B reference point or at the T_B reference point (as defined in Recommendation I.413).

The MSN supplementary service enables each individual terminal on one access to have one or more identities, by which one individual terminal can be discriminated from the others.

The multiple subscriber number may be either:

- the whole ISDN number; or
- a part of the ISDN number (the least significant "n" digit(s) where "n" may be a number up to the full length of the ISDN number, and shall be a number large enough to allow all terminals on an access to be assigned an individual number); or
- as a service provider option, a number which can be mapped from the ISDN number by the network at the destination network side.

National or international prefixes cannot form part of the multiple subscriber number.

2.6 Operational requirements

2.6.1 Provision and withdrawal

The service shall be provided after prior arrangement with the service provider and shall be withdrawn on the subscriber's request or for administrative reasons. The service provider shall allocate a proper set of ISDN numbers which shall meet the overall needs of the access concerned.

2.6.2 Requirements on the originating network side

The basic call control procedures according to 5.1/Q.2931, and 6.5/Q.2931 are applicable.

If the access has the MSN supplementary service, the network may use (as a network option) the information in the calling party number information element to identify the calling terminal, and if necessary, assign the appropriate basic or supplementary service profile.

At the option of the service provider, one of the MSN numbers may be designated by the MSN subscriber as the default number for the interface.

2.6.3 Requirements in the network

Not applicable.

2.6.4 Requirements on the destination network side

When the multiple subscriber number is provided to the called user, the network shall send the available part of the called party number or the relating digit(s) to the user en-bloc in the SETUP message according to 5.2/Q.2931.

2.7 State definitions

The states associated with basic call control according to Recommendation Q.2931 apply.

2.8 Coding requirements

The multiple subscriber number of the called user is coded in the called party number information element as specified in 4.5.10/Q.2931.

The multiple subscriber number of the calling user is coded in the calling party number information element as specified in 4.5.12/Q.2931.

2.9 Signalling procedures at the coincident S_B and T_B reference point

2.9.1 Actions at the originating local exchange

2.9.1.1 Normal operation

The multiple subscriber number, if provided by the calling user, shall be delivered from the user to the network according to the procedures of subclause 5.1/Q.2931.

Where the addressing/numbering plan identification equals *ISDN/telephony numbering plan (Recommendation E.164)* or *unknown* the type of number indicated in the calling party number information element sent to the network shall be coded as:

– *unknown* (see Table 4-16/Q.2931, Note 2 of type of number); or

– *subscriber number*, *national number* or *international number* (see Table 4-16/Q.2931, Note 3 of type of number).

If the user sends a multiple subscriber number, then the user shall supply sufficient digits to identify uniquely one ISDN number from the set of ISDN numbers at that access.

2.9.1.2 Exceptional procedures

If a network receives fewer digits in the calling party number information element than is required to identify uniquely one ISDN number from the set of ISDN numbers at that access, then the network shall discard this information element and shall behave as though the calling party number information element had not been received.

2.9.2 Actions at the destination local exchange

2.9.2.1 Normal operation

The multiple subscriber number is delivered from the network to the user according to the procedures of 5.2/Q.2931.

Where the addressing/numbering plan identification field equals *ISDN/telephony numbering plan (Recommendation E.164)* or *unknown*, the type of number indicated in the called party number information element sent to the user shall be coded as:

– *unknown* (see Table 4-14/Q.2931, Note 2 of type of number); or

– *subscriber number*, *national number* or *international number* (see Table 4-14/Q.2931, Note 3 of type of number).

2.9.2.2 Exceptional procedures

If a user with the MSN supplementary service receives fewer digits in the called party number information element than it is programmed to require for terminal selection, then that user shall use the available information in that information element for its terminal selection procedure.

If a terminal which has the MSN supplementary service receives a SETUP message without multiple subscriber number digits, the terminal will handle the call according to 5.2/Q.2931.

If a terminal which does not support the MSN supplementary service receives a SETUP message with multiple subscriber number digits, the terminal will handle the call according to 5.2/Q.2931.

2.10 Procedures for interworking with private ISDNs

When the network knows that a private ISDN is attached to the access, the MSN supplementary service shall not apply.

NOTE – The number digits can be conveyed by the DDI supplementary service.

2.11 Interworking with other networks

2.11.1 Interworking with N-ISDNs

This subclause specifies the particular features to support access signalling interworking between B-ISDN and N-ISDN. The description of interworking assumes the communication scenario B as defined in Annex A/I.580 [5].

Interworking N-ISDN → B-ISDN

Not applicable.

Interworking B-ISDN → N-ISDN

The DSS 2 called party number information element is mapped to the DSS 1 called party number information element by the terminal adapter or interworking function by removing its second octet and adjusting the length indication without causing other changes to the contents, and by respecting the order of this information element in the DSS 1 message.

2.11.2 Interworking with non-ISDNs

No special requirements for interworking with other networks are necessary.

NOTE – The MSN supplementary service may be used to enable successful terminal selection when some compatibility information is absent when a call originates in an analogue PSTN.

2.12 Interactions with other supplementary services

2.12.1 Connected Line Identification Presentation

No interaction.

2.12.2 Connected Line Identification Restriction

No interaction.

2.12.3 Calling Line Identification Presentation

If no calling party number information is provided by the calling user or the number received by the network is incorrect, then the default number stored at the originating network side is used for conveyance through the network.

2.12.4 Calling Line Identification Restriction

No interaction.

2.12.5 Direct-Dialling-In

In some networks, subscription to the Direct-Dialling-In and the MSN supplementary service is mutually exclusive.

The Direct-Dialling-In digits can be used by the private ISDN in the context of the private ISDN's MSN supplementary service.

2.12.6 User-to-User Signalling

2.12.6.1 Service 1

No interaction.

2.12.7 Multiple Subscriber Number

In some networks, subscription to the DDI and Multiple Subscriber Number supplementary service is mutually exclusive.

2.12.8 Sub-addressing

No interaction.

2.13 Parameter values (timers)

The timers associated with basic call control according to clause 9/Q.2931 are applicable.

2.14 Dynamic description (SDLs)

Annex A/Q.2931 is applicable.

Appendix I

(to clause 2 of Recommendation Q.2951)

Signalling flows

(This appendix does not form an integral part of this Recommendation)

No MSN supplementary service specific signalling flow is specified in addition to normal basic call control according to Recommendation Q.2931.

3 Calling Line Identification Presentation (CLIP)

3.1 Scope

This Recommendation specifies the stage three of the Calling Line Identification Presentation (CLIP) supplementary service for the Broadband Integrated Services Digital Network (B-ISDN) at the T_B reference point or coincident S_B and T_B reference point (as defined in Recommendation I.413 [1]) by means of the Digital Subscriber Signalling System No.2 (DSS 2) protocol. Stage three identifies the protocol procedures and switching functions needed to support a telecommunications service (see Recommendation I.130 [2]).

In addition, this Recommendation specifies the protocol requirements at the T_B reference point where the service is provided to the user via an intermediate private B-ISDN.

This Recommendation does not specify the additional protocol requirements where the service is provided to the user via a telecommunications network that is not a B-ISDN.

Calling Line Identification Presentation (CLIP) is a supplementary service offered to the called party which provides the calling party's ISDN number, possibly with sub-address information to the called party.

The CLIP supplementary service is applicable to all telecommunication services.

This Recommendation is applicable to equipment, supporting the CLIP supplementary service, to be attached at either side of a T_B reference point or coincident S_B and T_B reference point when used as an access to the public B-ISDN.

3.2 References

The following ITU-T Recommendations and other references contain provisions which, through reference in this text, constitute provisions of this Recommendation. At the time of publication, the editions indicated were valid. All Recommendations and other references are subject to revision; all users of this Recommendation are therefore encouraged to investigate the possibility of applying the most recent edition of the Recommendations and other references listed below. A list of the currently valid ITU-T Recommendations is regularly published.

[1] ITU-T Recommendation I.413 (1993), *B-ISDN user-network interface*.

[2] CCITT Recommendation I.130 (1988), *Method for the characterization of telecommunication services supported by an ISDN and network capabilities of an ISDN*.

[3] ITU-T Recommendation Q.2931 (1995), *Broadband Integrated Services Digital Network (B-ISDN) – Digital Subscriber Signalling No. 2 (DSS 2) – User-network interface layer 3 specification for basic call/connection control*.

[4] CCITT Recommendation E.164 (1991), *Numbering plan for the ISDN era*.

[5] CCITT Recommendation I.251.3 (1992), *Calling Line Identification Presentation*.

[6] ITU-T Recommendation I.580 (1993), *General arrangements for interworking between B-ISDN and 64 kbit/s based ISDN*.

3.3 Definitions

For the purposes of this Recommendation, the following definitions apply:

3.3.1 user: The DSS 2 protocol entity at the user side of the user-network interface.

3.3.2 network: The DSS 2 protocol entity at the network side of the user-network interface.

3.3.3 served user: The user of a particular ISDN number who has subscribed to the restriction of the calling line identification information (on a permanent or on a per-call basis) in association with outgoing calls. The served user is also known as the calling user.

3.3.4 ISDN number: A number conforming to the numbering plan and structure specified in Recommendation E.164 [4].

3.3.5 address: The number of the calling user (normally ISDN number), and a sub-address if provided by that user.

3.3.6 international number: An ISDN number structured as specified in Recommendation E.164 [4].

3.3.7 national number; national significant number: An ISDN number structured as specified in Recommendation E.164 [4].

3.3.8 subscriber number: An ISDN number structured as specified in Recommendation E.164 [4].

3.3.9 default number: An agreed number between the user at the calling side and the network provider.

3.3.10 special arrangement: An arrangement between a customer and a public network operator whereby customer supplied calling numbers are not screened by the public ISDN.

3.4 Abbreviations

For the purposes of this Recommendation, the following abbreviations are used:

B-ISDN	Broadband Integrated Services Digital Network
CPN	Calling Party Number
CLIP	Calling Line Identification Presentation
CLIR	Calling Line Identification Restriction
DSS 2	Digital Subscriber Signalling System No. 2
IE	Information Element
ISDN	Integrated Services Digital Network
N-ISDN	Narrow-band Integrated Services Digital Network
PI	Presentation Indicator
SI	Screening Indicator

3.5 Description

This supplementary service provides the ability of indicating the ISDN number of the calling line, with possible additional sub-address information (i.e. the calling party sub-address information element), to the called party.

The information provided to the called user consists of the ISDN number of the calling user in a form sufficient to allow the returning of the call (i.e. a subscriber number, a national number or an international number and optionally a sub-address if provided by the calling user).

3.6 Operational requirements

3.6.1 Provision/withdrawal

See Recommendation I.251.3.

NOTE – Annex A contains some additional procedures to support the two calling party number information elements delivery option. This is a network option.

3.6.2 Requirements on the originating network side

All information pertaining to CLIP shall be inserted in the SETUP message sent as part of the basic call procedures according to clause 5/Q.2931.

In the case where no information is provided by the calling user (as part of the basic call procedures), the network shall provide the default number associated with the user access (in which the call was generated) in the originating local exchange.

When the calling party information is provided by the user, the network can only verify that the number is within the range allocated to that user.

Where a special arrangement exists between the network operator and the calling user, no screening of the calling party number supplied shall be performed by the network.

3.6.3 Requirements in the network

This subclause is not applicable to DSS 2.

3.6.4 Requirements on the terminating network side

See 3.9.2.3.

3.7 State definitions

No specific state definitions are required.

3.8 Coding requirements

All information pertaining to CLIP is inserted in the SETUP message. Subclauses 4.5.13/Q.2931 and 4.5.14/Q.2931 give the coding for the calling party number and calling party subaddress information elements which are required to support this service. The purpose of the calling party number information element is to identify the origin of a call. The purpose of the calling party sub-address information element is to identify a sub-address associated with the origin of the call.

3.9 Signalling requirements at the coincident S_B and T_B reference point

3.9.1 Activation/deactivation/registration

Not applicable.

3.9.2 Invocation and operation

3.9.2.1 Actions at the originating local exchange

3.9.2.1.1 Normal operation

3.9.2.1.1.1 Actions at the originating user

These procedures shall be provided as part of the basic service and the calling user need not have subscribed to the CLIP supplementary service.

The addressing/numbering plan identification, to be indicated with the calling party number information element sent by the calling user, shall be either *ISDN/telephony numbering plan (Recommendation E.164)*, or *unknown*.

NOTE – Either coding may be used and the treatment of both by the network is identical.

Where the addressing/numbering plan identification equals *ISDN/telephony numbering plan (Recommendation E.164)* or *unknown* and the calling number included by the calling user is complete the type of number to be indicated within the calling party number information element, sent by the calling user, shall be one of the following:

– *subscriber number*, in the case where the complete subscriber number is sent;

– *national number*, in the case where the complete national number is sent;

– *international number*, in the case where the complete international number is sent.

Where a partial calling number is included by the calling user (e.g., to indicate digits specific to the direct dialling in or the multiple subscriber number supplementary services), the user shall set the type of number to be indicated within the calling party number information element to *unknown*.

3.9.2.1.1.2 Actions at the originating local exchange if a special arrangement does not apply

These procedures shall be provided as part of the basic service and the calling user need not have subscribed to the CLIP supplementary service.

When a SETUP message is received from the calling user, the network shall check to see if the calling party number and calling party sub-address information elements are included.

If the calling party number information element is received with a coding of the addressing/numbering plan identification field other than *ISDN/telephony numbering plan (Recommendation E.164)* or *unknown*, then the network shall discard the calling party number information element and process the call as if that information was not received.

The network shall set the value of the screening indicator based on the outcome of the screening of the calling number. The network shall disregard any value of the screening indicator, if received from the calling user.

If the calling party number information element is included, the network shall perform the screening function.

NOTE 1 – Some networks may accept a full ISDN number in a calling party number information element with the addition of a prefix of escape digits to the number digits field and the type of number field set to "unknown".

If the calling number received from the calling user is determined to be correct, the network shall set the screening indicator to *user-provided, verified and passed*.

If the screening function fails the network shall note that the screening is failed and shall use a default number associated with the calling user. The network shall set the screening indicator to *network provided*.

If the SETUP message does not contain the calling party number information element the network shall use a default number associated with the calling user. The network shall set the screening indicator to *network provided*.

In the case where the calling user provides only partial calling number information and the number is a valid digit sequence for the user access arrangement, the network shall complete the number as appropriate. The network shall set the screening indicator to *user-provided, verified and passed*.

NOTE 2 –In some cases the network cannot guarantee that the completed number identifies an end user.

The information determined by the procedures above shall be forwarded to the destination local exchange in association with the basic call request.

The presentation indicator, as determined by the procedures of the CLIR supplementary service (see clause 4), shall be forwarded to the destination local exchange, in association with the basic call request.

If the calling party sub-address information element is available, it shall be passed transparently through the network.

The actions at the originating local exchange when special arrangement does not apply are summarized in Table 3-1.

TABLE 3-1/Q.2951

Information provided by the calling user and by the network when special arrangement does not apply

Information provided by the calling user		Information provided by the network to the called user		
Calling number received from the calling user (octet 6)	Type of number (octet 5)	Calling number forwarded [if CLIR is not activated (octet 6)]	Screening indicator forwarded (octet 5a)	Type of number forwarded (octet 5)
No calling party number information element is provided by the calling user		Default number stored at the network side sufficient for returning the call	Network provided	"International number" or "national number" (Notes 1 and 7)
Valid part of the number not sufficient for returning the call (Note 2)	"Unknown"	Completion of the number (Note 3)	User-provided verified and passed (Note 4)	"International number" or "national number" (Notes 1 and 7)
Correct complete calling party number (Note 5)	"Subscriber number" or "national number" or "international number"	Complete calling party number	User-provided verified and passed	"International number" or "national number" (Notes 1and 7)
Incorrect number (Note 6)	Any type of number	Default number stored at the network side sufficient for returning the call	Network-provided	"International number" or "national number" (Notes 1 and 7)

NOTES

1 A national number shall be converted to an international number at some point in the public network path where the destination is in a different country.

2 This assumes that the user's equipment provides that part of the number pertaining to its own (private) domain. This may be multiple subscriber number digits provided by a terminal equipment or an extension line number provided by a private ISDN. The network shall interpret the number digits and check if it is a valid digit sequence according to the agreements existing between the calling user and the network provider.

3 Completion means that the remaining part of the ISDN number associated with the appropriate access is added to the user provided part of the number.

4 The term "verified" implies matching the user provided number or part of this number with the range(s) of numbers stored at the network side and it implies at least a valid format of user provided number information.

5 The term "correct" implies, from the network point of view, matching the subscriber number provided by the user with one of the numbers in the set of numbers stored at the network side.

6 The number provided by the user is discarded.

7 As a network option the type of number forwarded to the called user may be coded *unknown* when a prefix is added to the number, in which case the number is organized according to the network dialling plan, i.e. prefixes or the absence of a prefix, shall be used to distinguish international numbers and national numbers from each other.

3.9.2.1.1.3 Actions at the originating local exchange if a special arrangement applies

These procedures shall be provided as part of the basic service and the calling user need not have subscribed to the CLIP supplementary service.

When a SETUP message is received from the calling user, the network shall check to see if the calling party number and calling party sub-address information elements are included.

If the calling party number information element is received with a coding of the addressing/numbering plan identification field other than *ISDN/telephony numbering plan (Recommendation E.164)* or *unknown*, then the network shall discard the calling party number information element and process the call as if that information element was not received.

If the calling party number information element is received with the coding of the type of number field other than *national number* or *international number* when the addressing/numbering plan identification field equals *ISDN/telephony numbering plan (Recommendation E.164)*, then the network shall discard the calling party number information element and process the call as if that information element was not received.

The network shall disregard any value of the screening indicator, if received from the calling user.

If the SETUP message does not contain the calling party number information element, the network shall use a default number associated with the calling user. The network shall set the screening indicator to *network provided*.

If the calling party number information element is included, the network shall set the screening indicator to *user-provided, not screened*.

NOTE – For the above condition, the procedures of basic call will provide for another calling number to be transported through the network. This other calling number will contain the default number, with an associated screening indicator set to *network provided*.

The information determined by the procedures above shall be forwarded to the destination local exchange in association with the basic call request.

The presentation indicator, as determined by the procedures of the CLIR supplementary service (see clause 4) shall be forwarded to the destination local exchange in association with the basic call request.

If the calling party sub-address information element is available, it shall be passed transparently through the network.

The actions at the originating local exchange when special arrangement applies are summarized in Table 3-2.

TABLE 3-2/Q.2951

Information provided by the calling user and by the network when special arrangement applies (E.164 numbers)

Information provided by the calling user		Information provided by the network to the called user		
Calling number received from the calling user (octet 6)	Type of number (octet 5)	Calling party number forwarded if CLIR is not activated (octet 6)	Screening indicator forwarded (octet 5a)	Type of number forwarded (octet 5)
No calling party number information element is provided by the calling user		Default number stored at the network side sufficient for returning the call	Network provided	"International number" or "national number" (Notes 1 and 2)
Any digit sequence conforming to Rec. E.164	"National number" or "international number"	Number provided by the user (Note 1)	User-provided, not screened	"International number" or "national number" (Notes 1 and 2)

NOTES

1 A national number shall be converted to an international number at some point in the public network path where the destination is in a different country.

2 As a network option the type of number forwarded to the called user may be coded "unknown" when a prefix is added to the number, in which case the number is organized according to the network dialling plan, i.e. prefixes or the absence of prefixes, shall be used to distinguish international numbers and national numbers from each other.

3.9.2.1.2 Exceptional procedures

Not applicable.

3.9.2.2 Actions at the transit exchange

This subclause is not applicable to DSS 2.

3.9.2.3 Actions at the destination local exchange

3.9.2.3.1 Normal operation

When the network sends a SETUP message to the called user and if the called user is provided with the CLIP supplementary service, the network shall check to see if the calling number is available.

If the calling number is available and presentation is allowed according to the presentation indicator supplied together with the calling number, the network shall include the calling party number information element in the SETUP message sent to the called user. If provided, the network shall also include the calling party sub-address information element in the SETUP message. The presentation and screening indicators associated with the calling number, and the calling sub-address, received at the destination exchange, shall be passed transparently to the called user.

The addressing/numbering plan identification field shall be coded either *ISDN/telephony numbering plan (Recommendation E.164)* or *unknown*.

If presentation is not allowed according to the presentation indicator supplied together with the calling number, the network shall include the calling party number information element in the SETUP message sent to the called user. The presentation indicator in the calling party number information element shall indicate *presentation restricted*. The network shall encode the screening indicator, addressing/numbering plan identification and the type of number according to one of the following options:

i) the screening indicator shall indicate *network provided*. The type of number and addressing/numbering plan identification shall be set to *unknown*;

ii) the screening indicator, addressing/numbering plan identification and the type of number shall be as received at the destination network.

The network shall not include digits field. The network shall not include the calling party sub-address information element in the SETUP message.

If neither the calling number nor an indication that presentation is restricted is available at the destination local exchange, the network shall include the calling party number information element in the SETUP message sent to the called user. The presentation indicator shall be set to *number not available due to interworking*, and the screening indicator shall be set to *network provided*, the type of number and the addressing/numbering plan identification shall be set to *unknown* and the number digits field shall not be included. The network shall not include the calling party sub-address information element, if provided, in the SETUP message.

If the called user is not provided with the CLIP supplementary service, then neither the calling party number nor the calling party sub-address information elements shall be included in the SETUP message sent to the called user.

If presentation is restricted but as a national network option the called user has the “override” category (e.g., police or emergency service) marked in the destination local exchange, the network shall include the calling party number information element, and calling party sub-address information element if the sub-address was supplied by the calling party in the SETUP message. In this case, the presentation and screening indicators shall be passed transparently to the called user.

NOTE – If the presentation indicator in the calling party number information element received by the user is set to *number not available due to interworking* or *presentation restricted*, the remaining information in the calling party number information element should be ignored by the user.

3.9.2.3.2 Exceptional procedures

Not applicable.

3.10 Procedures for interworking with private ISDNs

The procedures specified in 3.9.2 shall be used.

NOTE – The provision of the special arrangement where an access is used by a private network is especially appropriate.

3.11 Interworking with other networks

3.11.1 Interworking with N-ISDNs

This subclause specifies the particular features to support access signalling interworking between B-ISDN and N-ISDN. The description of interworking assumes the communication scenario B as defined in Annex A/I.580 [6].

Interworking N-ISDN → B-ISDN

Not applicable.

Interworking B-ISDN → N-ISDN

The DSS 2 calling party number information element is mapped to the DSS 1 called party number information element by the terminal adapter or interworking function by removing its second octet and adjusting the length indication without causing other changes to the contents, and by respecting the order of this information element in the DSS 1 message.

The DSS 2 calling party sub-address information element (if present) is mapped to the DSS 1 calling party sub-address information element by the terminal adapter or interworking function by removing its second octet and adjusting the length indication without causing other changes to the contents, and by respecting the order of this information element in the DSS 1 message.

3.11.2 Interworking with non-ISDNs

On calls incoming from some non-ISDNs, the calling number may be delivered to the destination ISDN without an indication of calling line identity restriction. In this case, a number of options exist and the selection of the following is according to the network rules and regulations:

- the network shall send the calling party number information element according to 3.9.2.3.1, sixth paragraph and shall include no calling party sub-address information element;
- the network shall send the calling party number information element according to 3.9.2.3.1, fourth paragraph and shall include no calling party sub-address information element;
- the network shall send the calling party number information element according to 3.9.2.3.1, second paragraph and shall include the calling party subaddress information element if the calling sub-address is available.

For some other non-ISDNs, no complete calling number may be available to the ISDN and therefore the full number of the calling user cannot be given to the called user who has been provided with the CLIP supplementary service. In this case the network shall send the calling party number information element according to 3.9.2.3.1, sixth paragraph and shall include no calling party sub-address information element.

On calls incoming from some non-ISDNs, the calling number may be delivered to the destination ISDN with an indication of calling line identity restriction. In this case the network shall send the calling party number information element according to 3.9.2.3.1, second paragraph and shall include the calling party sub-address information element if the calling sub-address is available.

As a network option, the originating network may restrict any address information identifying the calling user from being forwarded to another network.

3.12 Interaction with other supplementary services

3.12.1 Connected Line Identification Presentation

No interaction.

3.12.2 Connected line identification restriction

No interaction.

3.12.3 Calling Line Identification Presentation

No interaction.

3.12.4 Calling Line Identification Restriction

The calling line identification will not be presented if the calling user has an arrangement to inhibit the presentation of his number(s) to the called party (calling user subscribes to the supplementary service "Calling Line Identification Restriction"). The only occasion when a user subscribing to CLIP can take precedence over CLIR is when the CLIP served user has an override category. This is a national option.

3.12.5 Direct-Dialling-In

No interaction.

3.12.6 User-to-User Signalling

3.12.6.1 Service 1

No interaction.

3.12.7 Multiple Subscriber Number

Upon call initiation, if the ISDN number indicated by the MSN user terminal is not subscribed to for the interface, or if no numbering information is indicated, a default number or a number unavailable indication is provided to the CLIP user.

3.12.8 Sub-addressing

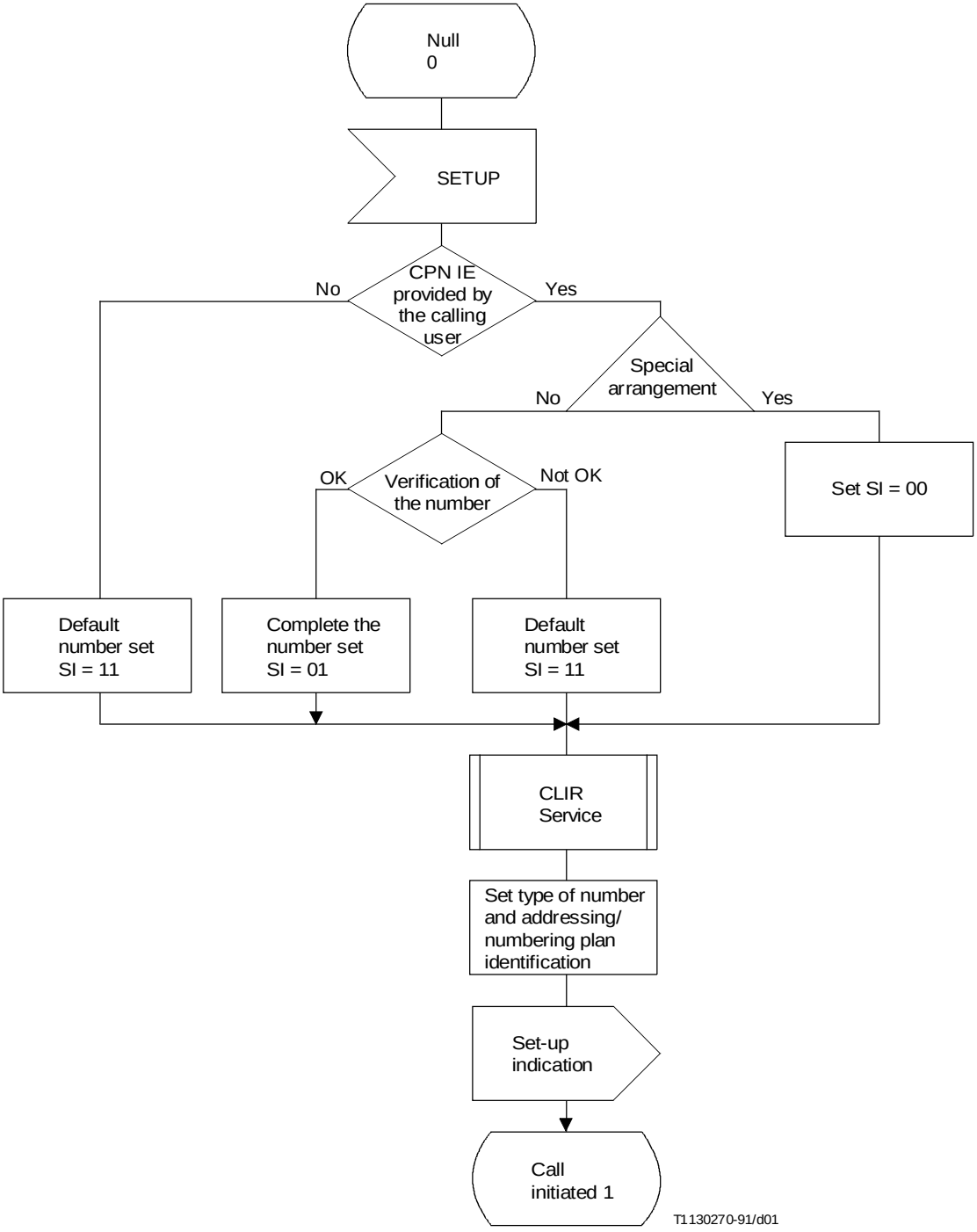
No interaction.

3.13 Parameter values (timers)

No specific timers are required.

3.14 Dynamic description (SDLs)

See Figures 3-1 and 3-2.



NOTES

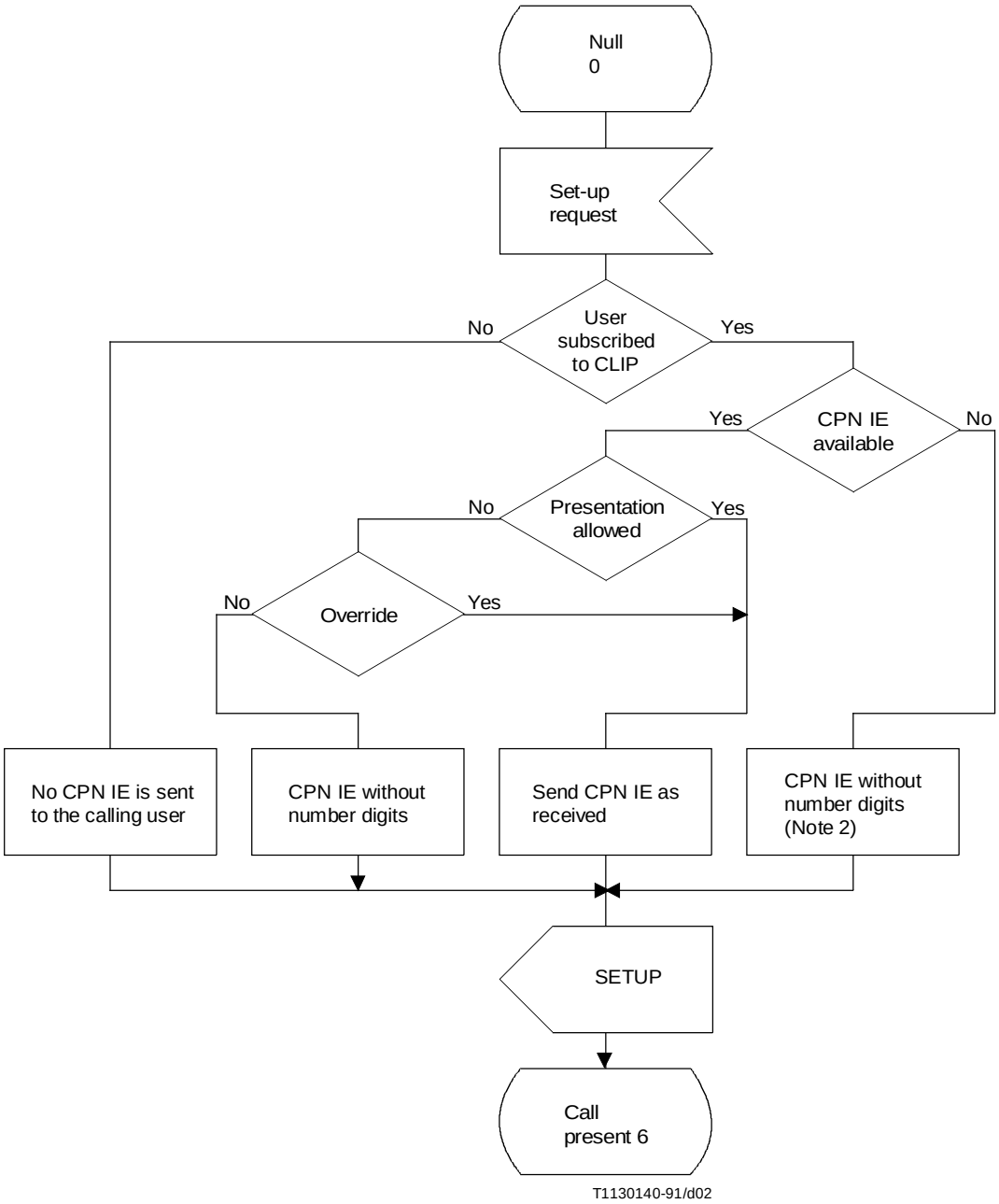
1 The style of this SDL diagram is aligned with those of Recommendation Q.951 rather than with those provided in Annex A/Q.2931 to emphasize the commonality of the supplementary services in N-ISDN and B-ISDN. Accordingly, some details shown in Annex A/Q.2931 (e.g. message verification) are not shown here.

2 This procedure operates independently from any CLIP subscription by the calling user and is provided as part of the basic service.

3 The screening indicator encodings are:
– SI = 11 network provided;
– SI = 01 user provided verified and passed;
– SI = 00 user provided not screened.

FIGURE 3-1/Q.2951

Originating network side dynamic description



NOTES

1 The style of this SDL diagram is aligned with those of Recommendation Q.951 rather than with those provided in Annex A/Q.2931 to emphasize the commonality of the supplementary services in N-ISDN and B-ISDN. Accordingly, some details shown in Annex A/Q.2931 (e.g. message verification) are not shown here.

2 In this case SI = 11 and PI = 10.

FIGURE 3-2/Q.2951

Destination network side dynamic description

Annex A

(to clause 3 of Recommendation Q.2951)

Two-calling party number information elements delivery option

(This annex forms an integral part of this Recommendation)

A.1 Scope

This annex specifies additional procedures to be supported for the delivery of two-calling party number information elements to the served user. The support of these procedures (or of a part of these) is a network option.

These additional features shall have no impact and shall place no requirement whatsoever on the provision and operation of the CLIP supplementary service defined in this Recommendation by public ISDNs that do not support these additional features, nor on the interchangeability of terminals.

A.2 Additional procedures at the destination network side

The procedures described in this annex pertain to networks capable of delivering two numbers to the called user.

A.2.1 Normal operation

The procedures described in 3.9.2.3.1 apply in the following situations:

a) only a single number is available for delivery at the terminating exchange;

b) presentation is restricted;

c) the called user is not provided with the CLIP supplementary service;

d) if the subscription option to two-number delivery exists and the called user has not subscribed to two number delivery.

When two numbers are available at the terminating exchange with screening indicators of one set to *network provided* and the other set to *user provided not screened*, the network shall deliver the information in two-calling party number information elements sent in a SETUP message to the called user.

In addition, for some networks, when two numbers are available at the terminating exchange with screening indicators of one set to "network provided" and the other set to *user-provided, verified and failed*, the network shall deliver the information in two-calling party number information elements sent in a SETUP message to the called user.

The order in which the calling party number information elements appear in the SETUP message is a network option.

If provided, the network shall also include the calling party sub-address information element in the SETUP message. The presentation and screening indicators associated with the calling number, and the calling sub-address, received at the destination exchange, shall be passed transparently to the called user.

A.2.2 Exceptional procedures

Not applicable.

A.3 Actions at the originating user

Actions at the originating user are as described in 3.9.2.1.1.1.

A.4 Additional actions at the originating local exchange

The procedures of 3.9.2.1.1.2 shall apply except in the case where the screening function fails.

When the screening function fails, the network shall set the screening indicator to *user-provided, verified and failed*.

NOTE – For the above condition, the procedures of basic call will provide for another calling number to be transported through the network. This other calling number will contain the default number with an associated screening indicator set to *network provided*.

The information determined by the procedures above shall be forwarded to the destination local exchange in association with the basic call request.

The presentation indicator, as determined by the procedures of the CLIR supplementary service (see clause 4) shall be forwarded to the destination local exchange in association with the basic call request.

If the calling party sub-address information element is available, it shall be passed transparently through the network.

The actions at the originating local exchange when screening fails are summarized in Table 3.A.1.

TABLE 3.A.1/Q.2951

Information provided by the calling user and by the network when screening fails

Information provided by the calling user		Information provided by the network to the called user		
Any digit sequence conforming to Rec. E.164	"Unknown number" "national number" or "international number"	Number provided by the user (Note 1)	User-provided, verified and failed	"Unknown number" "international number" or "national number" (Notes 1 and 2)

NOTES

1 A national number shall be converted to an international number at some point in the public network path where the destination is in a different country.

2 As a network option, the type of number forwarded to the called user may be coded "*unknown*" when a prefix is added to the number, in which case the number is organized according to the network dialling plan, i.e. prefixes or the absence of a prefix, shall be used to distinguish international numbers and national numbers from each other.

Appendix I

(to clause 3 of Recommendation Q.2951)

Signalling flows

(This appendix does not form an integral part of this Recommendation)

The signalling flows are not included as they form an integral part of the basic call control procedures.

4 Calling Line Identification Restriction (CLIR)

4.1 Scope

This Recommendation specifies the stage three of the calling line identification restriction (CLIR) supplementary service for the Broadband Integrated Services Digital Network (B-ISDN) at the T_B reference point or coincident S_B and T_B reference point (as defined in Recommendation I.413 [1]) by means of the Digital Subscriber Signalling System No. 2 (DSS 2) protocol. Stage three identifies the protocol procedures and switching functions needed to support a telecommunications service (see Recommendation I.130 [2]).

In addition this Recommendation specifies the protocol requirements at the T_B reference point where the service is provided to the user via an intermediate private B-ISDN.

This Recommendation does not specify the additional protocol requirements where the service is provided to the user via a telecommunications network that is not a B-ISDN.

Calling line identification restriction (CLIR) is a supplementary service offered to the calling party to restrict presentation of the calling party's ISDN number and subaddress to the called party.

The CLIR supplementary service is applicable to all telecommunication services.

This Recommendation is applicable to equipment, supporting the CLIR supplementary service, to be attached at either side of a T_B reference point or coincident S_B and T_B reference point when used as an access to the public B-ISDN.

4.2 References

The following ITU-T Recommendations and other references contain provisions which, through reference in this text, constitute provisions of this Recommendation. At the time of publication, the editions indicated were valid. All Recommendations and other references are subject to revision; all users of this Recommendation are therefore encouraged to investigate the possibility of applying the most recent edition of the Recommendations and other references listed below. A list of the currently valid ITU-T Recommendations is regularly published.

[1] ITU-T Recommendation I.413 (1993), *B-ISDN user-network interfaces*.

[2] CCITT Recommendation I.130 (1988), *Method for the characterization of telecommunication services supported by an ISDN and network capabilities of an ISDN*.

[3] ITU-T Recommendation Q.2931 (1995), *Broadband Integrated Services Digital Network (B-ISDN) – Digital Subscriber Signalling No. 2 (DSS 2) – User-network interface layer 3 specification for basic call/Connection control*.

[4] CCITT Recommendation E.164 (1991), *Numbering plan for the ISDN era*.

[5] CCITT Recommendation I.251.4 (1992), *Calling Line Identification Restriction*.

[6] ITU-T Recommendation clause 3/Q.2951 (1995), *Calling Line Identification Presentation*.

[7] ITU-T Recommendation I.580 (1993), *General arrangements for interworking between B-ISDN and 64 kbit/s based ISDN*.

4.3 Definitions

For the purposes of this Recommendation, the following definitions apply:

4.3.1 **user**: The DSS 2 protocol entity at the user side of the user-network interface.

4.3.2 **network**: The DSS 2 protocol entity at the network side of the user-network interface.

4.3.3 **served user**: The user of a particular ISDN number who has subscribed to the restriction of the calling line identification information (on a permanent or on a per-call basis) in association with outgoing calls. The served user is also known as the calling user.

4.3.4 **ISDN number**: A number conforming to the numbering plan and structure specified in Recommendation E.164 [4].

4.4 Abbreviations

For the purposes of this Recommendation, the following abbreviations are used:

DSS 2	Digital Subscriber Signalling System No. 2
B-ISDN	Broadband Integrated Services Digital Network
CLIP	Calling Line Identification Presentation
CLIR	Calling Line Identification Restriction
CPN	Calling Party Number
IE	Information Element
ISDN	Integrated Services Digital Network
N-ISDN	Narrow-band Integrated Services Digital Network
PI	Presentation Indicator

4.5 Description

When CLIR is applicable and activated, the originating network shall provide the destination network with an indication that the calling user's ISDN number and sub-address (if provided by the calling user) are not allowed to be presented to the called user. In this case, no calling user number and sub-address shall be included in the call offered to the called user.

The presentation restriction function shall not influence the forwarding of the calling party number within the network as part of the basic service procedures.

4.6 Operational requirements

4.6.1 Provision/withdrawal

See Recommendation I.251.4

4.6.2 Requirements on the originating network side

All information pertaining to CLIR is inserted in the SETUP message sent as part of the basic call procedures according to Recommendation Q.2931.

4.6.3 Requirements in the network

Not applicable.

4.6.4 Requirements on the terminating network side

See 4.9.2.

4.7 State definitions

No specific states are required.

4.8 Coding requirements

The same as for 3.8.

4.9 Signalling procedures at the coincident S_B and T_B reference point

4.9.1 Actions at the originating user

If the calling user wishes to override the default setting in the network, the SETUP message sent by the user shall contain the calling party number information element with the presentation indicator set appropriately.

4.9.2 Actions at the originating local exchange

4.9.2.1 Normal operation

If the calling user has subscribed to the CLIR supplementary service permanent mode, the presentation indicator received in the SETUP message will be ignored. The network shall set the presentation indicator to *presentation restricted*.

If the calling user has subscribed to the CLIR supplementary service on a per-call basis and requests to override the default setting, the originating network shall set the presentation indicator according to that in the received calling party number information element.

The number digits, if included, shall be treated according to Tables 3-1 or 3-2 and 3.9.2.1.1.

If the CLIR is requested by the user on a per-call basis, and no calling party number information element is included in the SETUP message, the originating network shall set the presentation indicator according to the subscribed default value.

The presentation indicator shall be forwarded to the destination in association with the basic call request.

4.9.2.2 Exceptional procedures

Not applicable.

4.9.3 Actions at the destination local exchange

4.9.3.1 Normal operation

The actions to be performed at the destination local exchange are provided as part of the CLIP service, described in 3.9.2.3.1.

4.9.3.2 Exceptional procedures

Not applicable.

4.10 Procedures for interworking with private ISDNs

The procedures specified in 4.9 shall be used.

4.11 Interworking with other networks

4.11.1 Interworking with N-ISDNs

This subclause specifies the particular features to support access signalling interworking between B-ISDN and N-ISDN. The description of interworking assumes the communication scenario B as defined in Annex A/I.580 [7].

Interworking N-ISDN → B-ISDN

Not applicable.

Interworking B-ISDN → N-ISDN

The DSS 2 calling party number information element is mapped to the DSS 1 called party number information element by the terminal adapter or interworking function by removing its second octet and adjusting the length indication without causing other changes to the contents, and by respecting the order of this information element in the DSS 1 message.

4.11.2 Interaction with non-ISDNs

On calls to or via non-ISDNs, it cannot be assured that a restriction indication can be carried to the destination network. As a national network option, the originating network shall have the possibility to restrict any information identifying the calling party being forwarded to the destination network when CLIR is applicable. If a destination network receives a calling party number without any indication of presentation allowed or restricted, the destination network (the host network) will act according to its rules and regulations. For further information see 3.11.2.

4.12 Interactions with other supplementary services

4.12.1 Connected Line Identification Presentation

No interaction.

4.12.2 Connected Line Identification Restriction

No interaction.

4.12.3 Calling Line Identification Presentation

CLIR takes precedence over CLIP. The only occasion when a user subscribing to CLIP can take precedence over CLIR is when the CLIP served user has an override category. This is a national option.

4.12.4 Calling Line Identification Restriction

No interaction.

4.12.5 Direct-Dialling-In

Not relevant.

4.12.6 User-to-User Signalling

4.12.6.1 Service 1

No interaction.

4.12.7 Multiple Subscriber Number

No interaction.

4.12.8 Sub-addressing

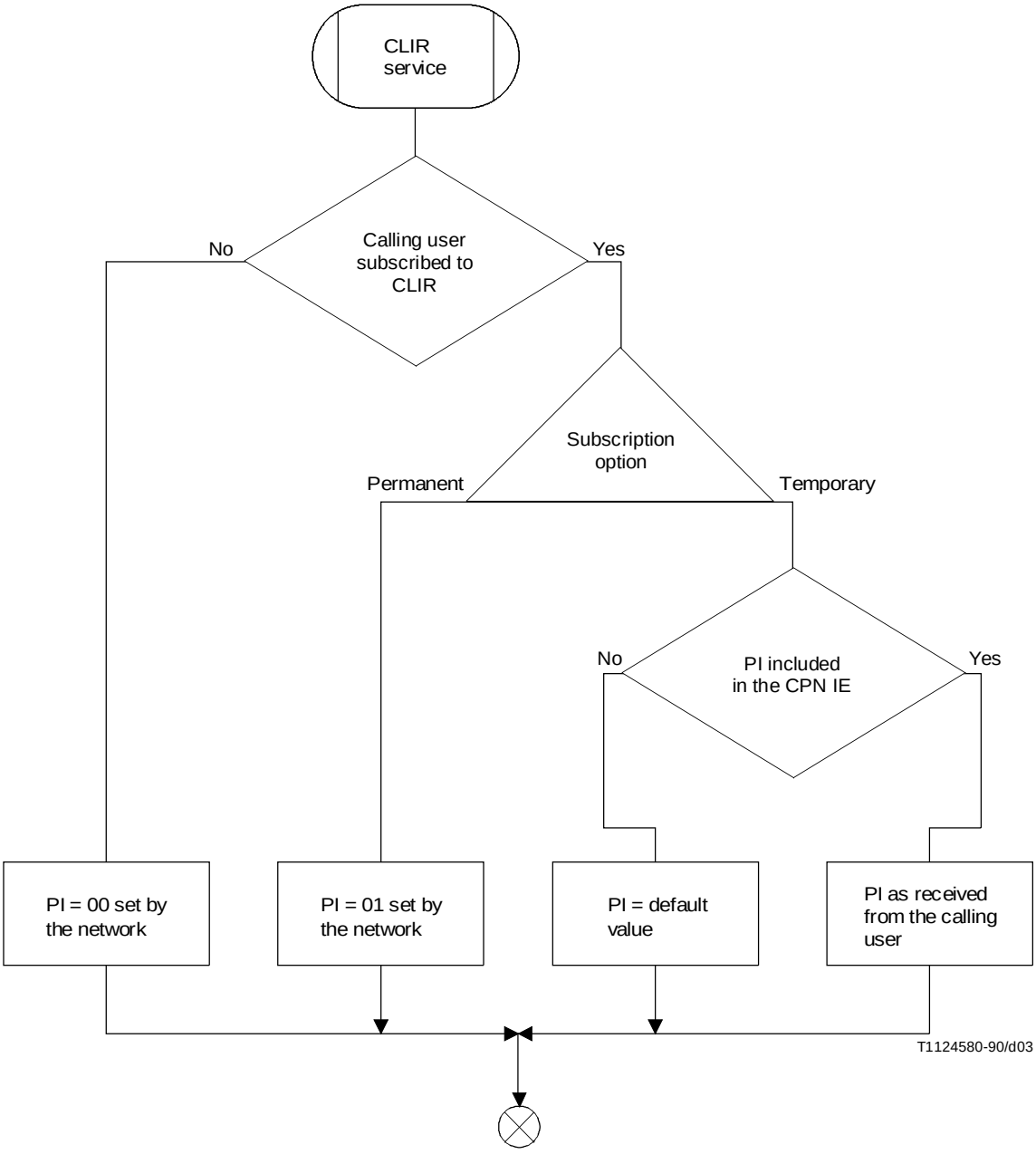
No interaction

4.13 Parameter values (timers)

No specific timers are required.

4.14 Dynamic description (SDLs)

See Figure 4-1.



NOTES

1 The style of this SDL diagram is aligned wtih those of Recommendation Q.951 rather than with those provided in Annex A/Q.2931 to emphasize the commonality of the supplementary services in N-ISDN and B-ISDN. Accordingly, some details shown in Annex A/Q.2931 (e.g. message verification) are not shown here.

2 PI = 00 “presentation allowed”;
PI = 01 “presentation restricted”.

FIGURE 4-1/Q.2951

Originating network side dynamic description

Appendix I

(to clause 4 of Recommendation Q.2951)

Signalling flows

(This appendix does not form an integral part of this Recommendation)

The signalling flows are not included as they form an integral part of the basic call control procedures.

5 Connected Line Identification Presentation (COLP)

5.1 Scope

This Recommendation specifies the stage three of the Connected Line Identification Presentation (COLP) supplementary service for the Broadband Integrated Services Digital Network (B-ISDN) at the T_B reference point or coincident S_B and T_B reference point (as defined in Recommendation I.413 [1]) by means of the Digital Subscriber Signalling System No. 2 (DSS 2) protocol. Stage three identifies the protocol procedures and switching functions needed to support a telecommunications service (see Recommendation I.130 [2]).

In addition, this Recommendation specifies the protocol requirements at the T_B reference point where the service is provided to the user via an intermediate private B-ISDN.

This Recommendation does not specify the additional protocol requirements where the service is provided to the user via a telecommunications network that is not a B-ISDN.

Connected Line Identification Presentation (COLP) is a supplementary service offered to the calling party which provides the connected party's ISDN number, with possible additional sub-address information, to the calling party.

The COLP supplementary service is applicable to all telecommunication services.

This Recommendation is applicable to equipment, supporting the COLP supplementary service, to be attached at either side of a T_B reference point or coincident S_B and T_B reference point when used as an access to the public B-ISDN.

5.2 References

The following ITU-T Recommendations and other references contain provisions which, through reference in this text, constitute provisions of this Recommendation. At the time of publication, the editions indicated were valid. All Recommendations and other references are subject to revision; all users of this Recommendation are therefore encouraged to investigate the possibility of applying the most recent edition of the Recommendations and other references listed below. A list of the currently valid ITU-T Recommendations is regularly published.

[1] ITU-T Recommendation I.413 (1993), *B-ISDN user-network interface*.

[2] CCITT Recommendation I.130 (1988), *Method for the characterization of telecommunication services supported by an ISDN and network capabilities of an ISDN*.

[3] ITU-T Recommendation Q.2931 (1995), *Broadband Integrated Services Digital Network (B-ISDN) – Digital Subscriber Signalling No. 2 (DSS 2) – User-network interface layer 3 specification for basic call/connection control.*

[4] CCITT Recommendation E.164 (1991), *Numbering plan for the ISDN era*.

[5] CCITT Recommendation I.251.6 (1988), *Connected Line Identification Restriction.*

[6] CCITT Recommendation I.251.5 (1988), *Connected Line Identification Presentation*.

[7] ITU-T Recommendation I.580 (1993), *General arrangements for interworking between B-ISDN and 64 kbit/s based ISDN*.

5.3 Definitions

For the purposes of this Recommendation, the following definitions apply:

5.3.1 **user**: The DSS 2 protocol entity at the user side of the user-network interface.

5.3.2 **network**: The DSS 2 protocol entity at the network side of the user-network interface.

5.3.3 **served user**: The user of a particular ISDN number who has subscribed to the presentation of the connected line identification information in association with outgoing calls. The served user is also known as the calling user.

5.3.4 **connected user**: The user that responded to the served user call request at the destination network and has been awarded the call by the network. The connected user need not have subscribed to the COLP supplementary service.

5.3.5 **ISDN number**: A number conforming to the numbering plan and structure specified in Recommendation E.164 [4].

5.4 Abbreviations

For the purposes of this Recommendation, the following abbreviations are used:

B-ISDN	Broadband Integrated Services Digital Network
COLP	Connected Line Identification Presentation
COLR	Connected Line Identification Restriction
CON	Connected Number
DSS 2	Digital Subscriber Signalling System No. 2
IE	Information Element
ISDN	Integrated Services Digital Network
N-ISDN	Narrow-band Integrated Services Digital Network
SI	Screening Indicator

5.5 Description

This supplementary service is not a dialling check but an indication to the calling subscriber of the connected ISDN number. In a full ISDN environment, the connected line identity must include all the information necessary to unambiguously identify the connected line.

Moreover, the information on the connected line identity may include additional sub-address information (i.e. the connected sub-address information element) generated by the connected user and transparently transported by the network. The network is not responsible for the content of this additional sub-address information.

Unless the COLR supplementary service has been subscribed by the connected user, the network delivers the connected line identity to the calling user regardless of the terminal capability to handle the information.

5.6 Operational requirements

5.6.1 Provision/withdrawal

See Recommendation I.251.5.

5.6.2 Requirements on the originating network side

See 5.9.2.1.

5.6.3 Requirements in the network

This subclause is not applicable to DSS 2.

5.6.4 Requirements on the destination network side

All information pertaining to COLP shall be inserted in the CONNECT message sent as part of the basic call procedures according to clause 5/Q.2931.

In the case where no information is provided by the connected user (as part of the basic call procedures), the network shall provide the default number associated with this user's access in the destination local exchange. When the connected number is provided by the connected user, the network can only verify that the number is within the set of numbers allocated to that user. Where a special arrangement exists with the connected user, no verification shall be performed.

5.7 State definitions

No specific states are required.

5.8 Coding requirements

The COLP supplementary service shall make use of the connected number and connected sub-address information elements inserted in the CONNECT message. (See Table 5-1.)

TABLE 5-1/Q.2951

CONNECT message content

Message type: CONNECT
Significance: local
Direction: both

Information element	Reference	Direction	Type	Length
Protocol discriminator	4.2/Q.2931	Both	M	1
Call reference	4.3/Q.2931	Both	M	4
Message type	4.4/Q.2931	Both	M	2
Message length	4.4/Q.2931	Both	M	2
Connected number	5.8.1/Q.2951	Both	O	4-*
Connected sub-address	5.8.1/Q.2951	Both	O	4-25
Other information elements as described in 3.1/Q.2931				

All information elements used in this Recommendation are defined in codeset 0.

5.8.1 Connected number information element

The purpose of the connected number information element is to indicate which number is connected to a call. The connected number may be different from the called party number because of changes (e.g. call redirection, transfer) during the lifetime of a call.

The connected number information element is coded as shown in Figure 5-1. The maximum length of this information element is network dependent.

Bits								Octet
8	7	6	5	4	3	2	1	
Connected number								
0	1	0	0	1	1	0	0	1
Information element identifier								
1 ext.	Coding standard		IE Instruction field					2
			Flag	Res.	Action ind.			
Length of connected number contents								3, 4
0/1 ext.	Type of number			Addressing/Numbering plan identification				5
1 ext.	Presentation indicator		0	0 Spare		0	Screening indicator	5a*
0 ext.	Number digits (IA5 characters)							6, etc.

NOTE – See Table 4-12/Q.2931 for the meaning/coding of the fields in octet 5, 5a, 6, etc.

FIGURE 5-1/Q.2951

Connected number information element

Bits								Octet
8	7	6	5	4	3	2	1	
Connected sub-address								
0	1	0	0	1	1	0	1	1
Information element identifier								
1 ext.	Coding standard		IE Instruction field					2
			Flag	Res.	Action ind.			
Length of connected sub-address contents								3, 4
1 ext.	Type of sub-address			Odd/Even ind.	0	0 Spare	0	5
Sub-address information								6, etc.

NOTE – See Table 4-13/Q.2931 for the meaning/coding of the fields of this information element.

FIGURE 5-2/Q.2951

Connected sub-address information element

5.8.2 Connected sub-address information element

The purpose of the connected sub-address information element is to identify the sub-address of the connected user of a call. The connected sub-address may be different from the called party sub-address because of changes (e.g. call redirection, transfer) during the lifetime of a call.

The connected sub-address information element shall be considered as an access information element (see Annex J/Q.2931).

The connected sub-address information element is coded as shown in Figure 5-2. The maximum length of this information element is 25 octets.

5.9 Signalling procedures at the coincident S_B and T_B reference point

5.9.1 Activation/deactivation/registration

Not applicable.

5.9.2 Invocation and operation

5.9.2.1 Actions at the originating local exchange

5.9.2.1.1 Normal operation

When the network sends a CONNECT message to the calling user and the calling user is provided with the COLP supplementary service, the network shall check to see if the connected number is available.

If the connected number is available and presentation is allowed according to the presentation indicator supplied together with the connected number, the network shall include the connected number information element in the CONNECT message sent to the calling user. If provided, the network shall also include the connected sub-address information element in the CONNECT message. The presentation and screening indicators associated with the connected number and the connected sub-address received at the originating exchange shall be passed transparently to the calling user.

The addressing/numbering plan identification field shall be coded either as *ISDN/telephony numbering plan (Recommendation E.164)* or *unknown*.

If presentation is not allowed according to the presentation indicator supplied together with the connected number, the network shall include the connected number information element in the CONNECT message sent to the calling user. The presentation indicator in the connected number information element shall indicate *presentation restricted*. The network shall encode the screening indicator, addressing/numbering plan identification and the type of number according to one of the following options:

i) the screening indicator shall indicate *network provided*. The type of number and addressing/numbering plan identification shall be set to *unknown*;

ii) the screening indicator, addressing/numbering plan identification and the type of number shall be passed as received at the destination network.

The network shall not include number digits field. The network shall not include the connected sub-address information element in the CONNECT message.

If neither the connected number nor an indication that presentation is restricted is available at the originating local exchange, the network shall include the connected number information element in the CONNECT message sent to the calling user. The presentation indicator shall be set to *number not available due to interworking* and the screening indicator shall be set to *network provided*, the type of number and addressing/numbering plan identification shall be set to *unknown* and the number digits field shall not be included. The network shall not include the connected sub-address information element, if provided, in the CONNECT message.

If the calling user is not provided with the COLP supplementary service, then neither the connected number nor the connected sub-address information elements shall be included in the CONNECT message sent to the calling user.

If presentation is restricted but as a national network option the calling user has the “override” category (e.g. police or emergency service) marked in the originating local exchange, the network shall include the connected number

information element and connected sub-address information element if the sub-address was supplied by the connected user, in the CONNECT message. In this case, the presentation and screening indicators shall be passed transparently to the calling user.

NOTE – If the presentation indicator in the connected number information element received by the user is set to *number not available due to interworking* or *presentation restricted*, the remaining information in the connected number information element should be ignored by the user.

5.9.2.1.2 Exceptional procedures

Not applicable.

5.9.2.2 Actions at the transit exchange

This subclause is not applicable to DSS 2.

5.9.2.3 Actions at the destination local exchange

5.9.2.3.1 Normal operation

5.9.2.3.1.1 Action at the destination user

These procedures shall be provided as part of the basic service and the connected user need not have subscribed to the COLP supplementary service.

The addressing/numbering plan identification to be indicated within the connected number information element, sent by the connected user, shall be either *ISDN/telephony numbering plan (Recommendation E.164)* or *unknown*.

NOTE – Either coding may be used and the treatment of both by the network is identical.

Where the connected number included by the connected user is complete and the addressing/numbering plan identification field equals *ISDN/telephony numbering plan (Recommendation E.164)*, the type of number to be indicated within the connected number information element, sent by the connected user, shall be one of the following:

- *subscriber number*, in the case where the complete subscriber number is sent;
- *national number*, in the case where the complete national number is sent;
- *international number*, in the case where the complete international number is sent.

Where a partial connected number is included by the connected user (e.g. to indicate digits specific to the multiple subscriber number supplementary service), the user shall set the type of number to be indicated within the connected number information element to *unknown*.

5.9.2.3.1.2 Actions at the destination local exchange if a special arrangement does not apply

These procedures shall be provided as part of the basic service and the connected user need not have subscribed to the COLP supplementary service.

If multiple CONNECT messages are received from the called user, the network shall only perform the following procedures when it has decided which CONNECT message to acknowledge.

Where a CONNECT message is received from the connected user, the network shall check to see if the connected number and connected sub-address information elements are included.

If the connected number information element is received with a coding of the addressing/numbering plan identification field other than *ISDN/telephony numbering plan (Recommendation E.164)* or *unknown*, then the network shall discard the connected number information element and process the call as if that information was not received.

The network shall set the value of the screening indicator based on the outcome of the screening of the connected number. The network shall disregard any value of the screening indicator, if received from the connected user.

If the connected number information element is included, the network shall perform the screening function.

NOTE 1 – Some networks may accept a full ISDN number with the addition of a prefix or escape digits to the number digits field and the type of number field set to *unknown*.

If the connected number received from the connected user is determined to be correct, the network shall set the screening indicator to *user-provided, verified and passed*.

If the screening function fails, the network shall note that the screening is failed and shall use a default number associates with the connected user. The network shall set the screening indicator to *network provided*.

If the CONNECT message does not contain the connected number information element, the network shall use a default number associated with the connected user. The network shall set the screening indicator to *network provided*.

In the case where the connected user provides partial connected number information, and the number is a valid digit sequence for the user access arrangement, the network shall complete the number as appropriate. The network shall set the screening indicator to *user-provided, verified and passed*.

NOTE 2 – In some cases, the network cannot guarantee that the completed number identifies an end user.

The information, as determined by the procedures above, shall be forwarded to the originating local exchange in association with the basic call response.

The presentation indicator, as determined by the procedures of the COLR supplementary service (see clause 6), shall be forwarded to the originating local exchange, in association with the basic call response.

If the connected sub-address information element is available, it shall be passed transparently through the network. (See Table 5-2.)

5.9.2.3.1.3 Actions at the destination local exchange if a special arrangement applies

These procedures shall be provided as part of the basic service and the connected user need not have subscribed to the COLP supplementary service.

If multiple CONNECT messages are received from the called user, the network shall only perform the following procedures when it has decided which CONNECT message to acknowledge.

When a CONNECT message is received from the connected user, the network shall check to see if the connected number and connected sub-address information elements are included.

If the connected number information element is received with a coding of the type of number field other than *national number* or *international number*, then the network shall discard the connected number information element and process the call as if that information element was not received.

If the connected number information element is received with a coding of the addressing/numbering plan identification field other than *ISDN/telephony number plan (Recommendation E.164 [4])* or *unknown*, then the network shall discard the connected number information element and process the call as if that information element was not received.

The network shall disregard any value of the screening indicator, if received from the connected user.

If the CONNECT message does not contain the connected number information element, the network shall use a default number associated with the connected user. The network shall set the screening indicator to *network provided*.

The actions at the destination local exchange when special arrangement does not apply are summarized in Table 5-2.

The information, as determined by the procedures above, shall be forwarded to the origination local exchange in association with the basic call response.

If the connected sub-address information element is available, it shall be passed transparently through the network.

The presentation indicator, as determined by the procedures of the COLR supplementary service (see clause 6), shall be forwarded to the originating local exchange, in association with the basic call response.

The actions at the destination local exchange when special arrangement applies are summarized in Table 5-3.

TABLE 5-2/Q.2951

Information provided by the connected user and by the network when special arrangement does not apply (E.164 numbers)

Information provided by the connected user		Information provided by the network to the calling user		
Connected number received from the connected user (octet 6)	Type of number (octet 5)	Connected number forwarded if COLR is not activated (octet 6)	Screening indicator forwarded (octet 5a)	Type of number forwarded (octet 5)
No connected number information element is provided by the connected user		Default number stored at the network side sufficient for returning the call	Network-provided	"International number" or "national number" (Notes 1, 7)
Valid part of the number not sufficient for returning the call (Note 2)	"Unknown"	Completion of the number (Note 3)	User-provided verified and passed (Note 4)	"International number" or "national number" (Notes 1, 7)
Correct complete connected number (Note 5)	"Subscriber number" or "national number" or "international number"	Complete connected number	User-provided verified and passed	"International number" or "national number" (Notes 1, 7)
Incorrect number (Note 6)	Any type of number	Default number stored at the network side sufficient for returning the call	Network-provided	"International number" or "national number" (Notes 1, 7)

NOTES

1 A national number shall be converted to an international number at some point in the public network path where the origination is in a different country.

2 This assumes that the user's equipment provides that part of the number pertaining to its own (private) domain. This may be multiple subscriber number digits provided by a terminal equipment or an extension line number provided by a private ISDN. The network shall interpret the number digits and check if it is a valid digit sequence according to the agreements existing between the connected user and the network provider.

3 Completion means that the remaining part of the ISDN number associated with the appropriate access is added to the user provided part of the number.

4 The term "verified" implies matching the user provided number or part of this number(s) with the range(s) of numbers stored at the network side and it implies at least a valid format of user provided number information.

5 The term "correct" implies, from the network point of view, matching the subscriber number provided by the user with one of the range(s) of subscriber numbers stored at the network side.

6 The number provided by the user is discarded.

7 As a network option, the type of number may be coded *unknown*, in which case the number is organized according to the network dialling plan, i.e. prefixes, or the absence of a prefix, shall be used to distinguish international numbers and national numbers from each other.

TABLE 5-3/Q.2951

Information provided by the connected user and by the network when special arrangement applies (E.164 numbers)

Information provided by the connected user		Information provided by the network to the called user		
Connected number received from the connected user (octet 6)	Type of number (octet 5)	Connected number forwarded if COLR is not activated (octet 6)	Screening indicator forwarded (octet 5a)	Type of number forwarded (octet 5)
No connected number information element is provided by the connected user		Default number stored at the network side sufficient for returning the call	Network provided	"International number" or "national number" (Notes 1, 2)
Any digit sequence conforming to Rec. E.164	"National number" or "international number"	Number provided by the user (Note 1)	User-provided not screened	"International number" or "national number" (Notes 1, 2)

NOTES

1 A national number shall be converted to an international number at some point in the public network path where the origination is in a different country.

2 As a network option, the type of number may be coded *unknown*, in which case the number is organized according to the network dialling plan, i.e. prefixes, or the absence of a prefix, shall be used to distinguish international numbers and national numbers from each other.

If the connected number information element is included, the network shall set the screening indicator forwarded to the calling user-to-*user provided, not screened*.

5.9.2.3.2 Exceptional procedures

Not applicable.

5.10 Procedures for interworking with private ISDNs

These procedures specified in 5.9.2 shall be used.

NOTE – The provision of the special arrangement where an access is used by a private network is especially appropriate.

5.11 Interworking with other networks

5.11.1 Interworking with N-ISDNs

This subclause specifies the particular features to support access signalling interworking between B-ISDN and N-ISDN. The description of interworking assumes the communication scenario B as defined in Annex A/I.580 [7].

Interworking N-ISDN → B-ISDN

The DSS 1 connected number information element is mapped to the DSS 2 connected number information element by the interworking function or terminal adapter by inserting the second octet and changing the length indication from one to two octets.

The DSS 1 connected sub-address information element is mapped to the DSS 2 connected sub-address information element by the interworking function or terminal adapter by inserting the second octet and changing the length indication from one to two octets.

NOTE – It is recommended that the flag bit in octet 2 is set to *instruction field not significant*, i.e. the normal error handling procedures as defined in 5.6/Q.2931 apply.

Interworking B-ISDN → N-ISDN

The DSS 2 connected number information element is mapped to the DSS 1 connected number information element by the terminal adapter or interworking function by removing its second octet and adjusting the length indication without causing other changes to the contents, and by respecting the order of this information element in the DSS 1 message.

The DSS 2 connected sub-address information element (if present) is mapped to the DSS 1 connected sub-address information element by the terminal adapter or interworking function by removing its second octet and adjusting the length indication without causing other changes to the contents, and by respecting the order of this information element in the DSS 1 message.

5.11.2 Interworking with non-ISDNs

On calls destined for some non-ISDNs, the connected number may be delivered to the originating ISDN without an indication of connected line identity restriction. In this case, a number of options exist and the selection of the following options is according to the network rules and regulations:

- the network shall send the connected number information element according to 5.9.2.1.1, sixth paragraph, and shall include no connected sub-address information element;
- the network shall send the connected number information element according to 5.9.2.1.1, fourth paragraph, and shall include no connected sub-address information element;
- the network shall send the connected number information element according to 5.9.2.1.1, second paragraph, and shall include the connected sub-address information element if the connected sub-address is available.

For some other non-ISDNs, no complete connected number may be available to the ISDN and therefore the full number of the connected user cannot be given to the calling user who has been provided with the COLP supplementary service. In this case, the network shall send the connected number information element according to 5.9.2.1.1, sixth paragraph, and shall include no connected sub-address information element.

On calls destined for some non-ISDNs, the connected number may be delivered to the originating ISDN with an indication of connected line identity restriction. In this case, the network shall send the connected number information element according to 5.9.2.1.1, second paragraph, and shall include the connected sub-address information element if the connected sub-address is available.

As a network option, the destination network may restrict any information identifying the connected user from being forwarded to another network.

5.12 Interaction with other supplementary services

5.12.1 Connected Line Identification Presentation

No interaction.

5.12.2 Connected Line Identification Restriction

The connected line identification will not be presented to the calling user if the connected user has subscribed to COLR. The only occasion when a user subscribing to COLP can take precedence over COLR is when the COLP user has an override category. This is a national option.

5.12.3 Calling Line Identification Presentation

No interaction.

5.12.4 Calling Line Identification Restriction

No interaction.

5.12.5 Direct-Dialling-In

No interaction.

5.12.6 User-to-User Signalling

5.12.6.1 Service 1

No interaction.

5.12.7 Multiple Subscriber Number

No interaction.

5.12.8 Sub-addressing

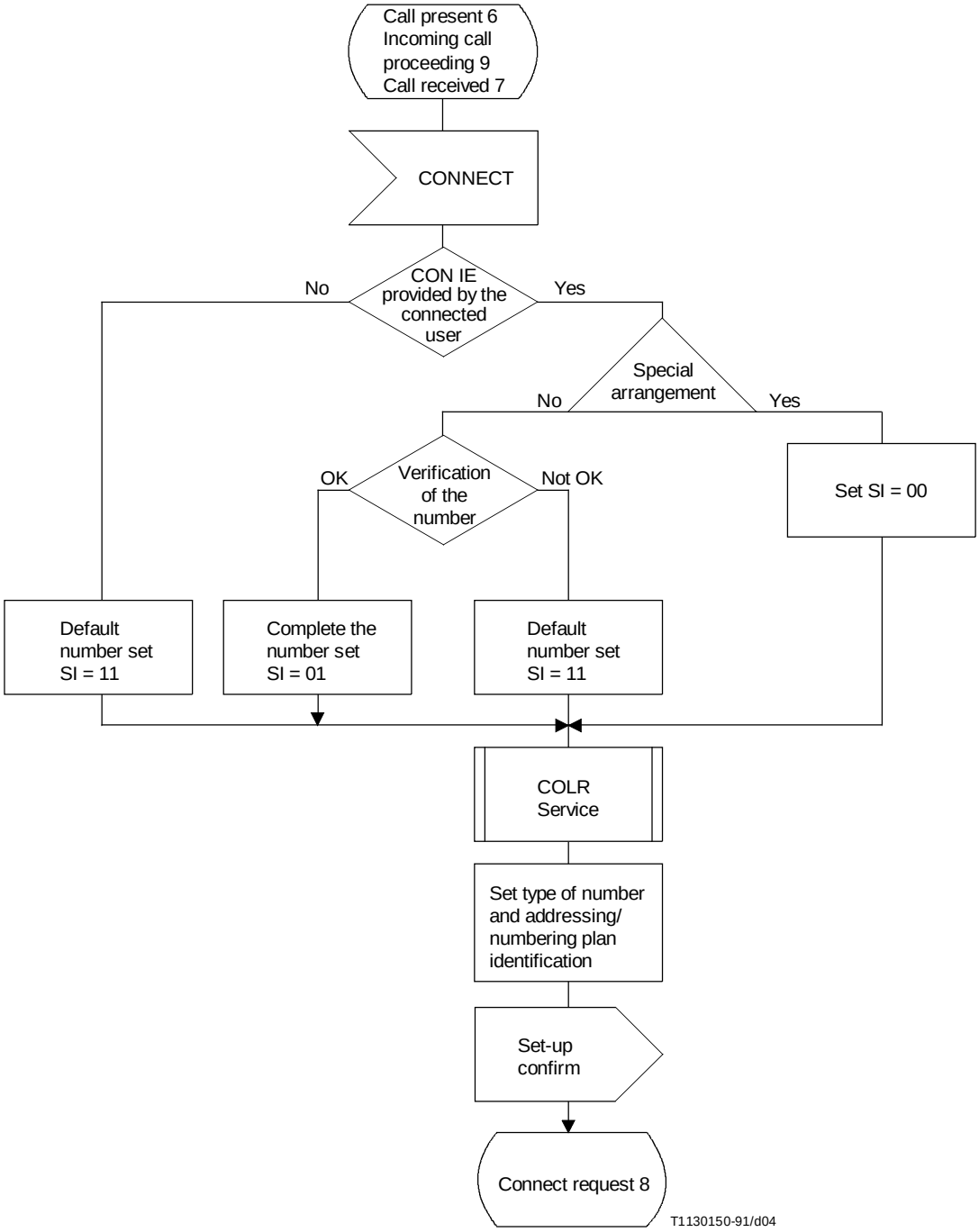
No interaction.

5.13 Parameter values (timers)

No specific timers are required.

5.14 Dynamic description (SDLs)

See Figures 5-3 and 5-4.



NOTES

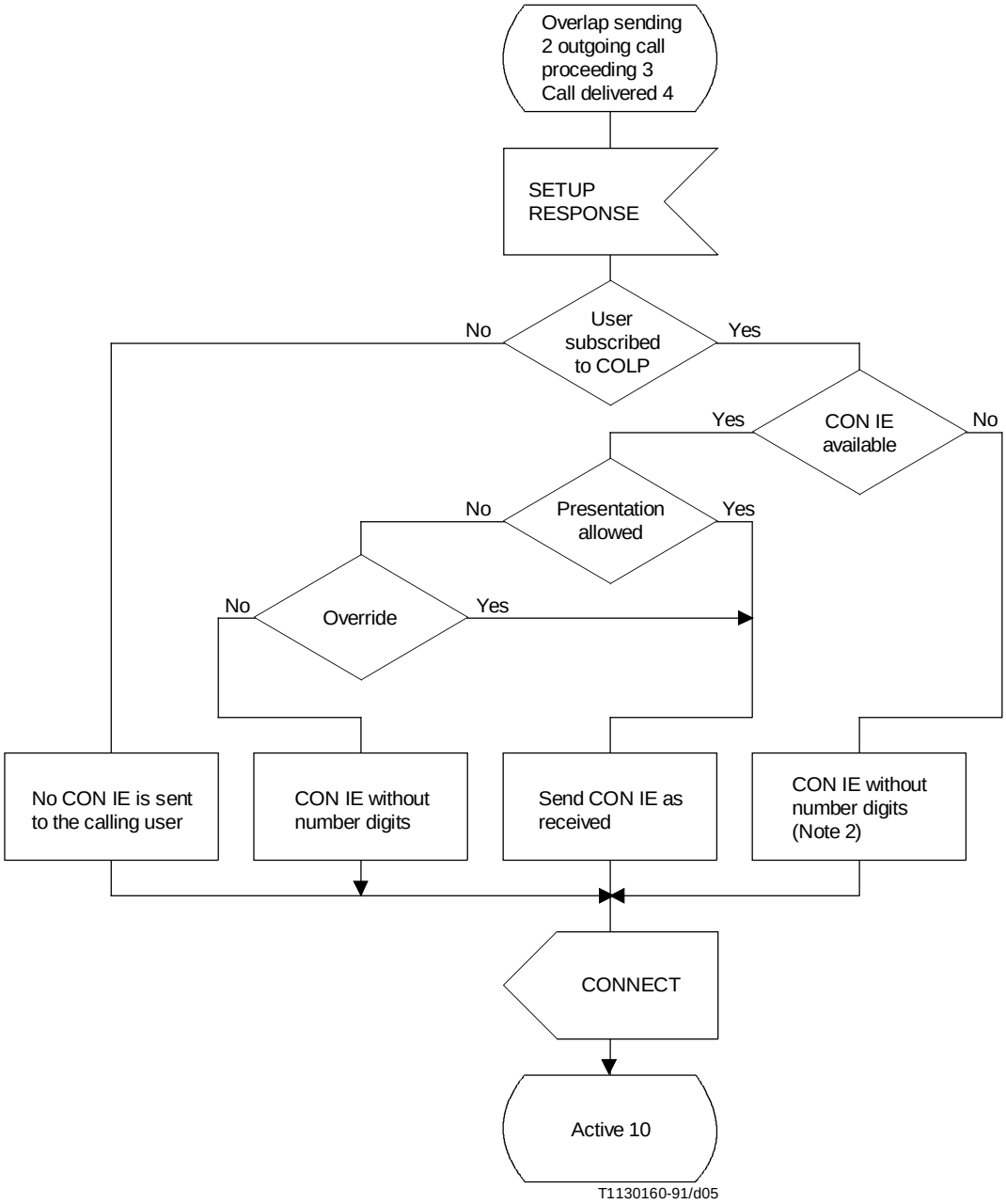
1 The style of this SDL diagram is aligned with those of Recommendation Q.951 rather than with those provided in Annex A/Q.2931 to emphasize the commonality of the supplementary services in N-ISDN and B-ISDN. Accordingly, some details shown in Annex A/Q.2931 (e.g. message verification) are not shown here.

2 This procedure operates independently from any COLP subscription by the connected user and is provided as part of the basic service.

3 The screening indicator encodings are:
- SI = 11 network provided;
- SI = 01 user provided verified and passed;
- SI = 00 user provided verified not screened.

FIGURE 5-3/Q.2951

Destination network side dynamic description



NOTES

1 The style of this SDL diagram is aligned with those of Recommendation Q.951 rather than with those provided in Annex A/Q.2931 to emphasize the commonality of the supplementary services in N-ISDN and B-ISDN. Accordingly, some details shown in Annex A/Q.2931 (e.g. message verification) are not shown here.

2 In this case SI = 11 and PI = 10.

FIGURE 5-4/Q.2951

Originating network side dynamic description

Appendix I

(to clause 5 of Recommendation Q.2951)

Signalling flows

(This appendix does not form an integral part of this Recommendation)

The signalling flows are not included as they are an integral part of the basic call control procedures.

6 Connected Line Identification Restriction (COLR)

6.1 Scope

This Recommendation specifies the stage three of the Connected Line Identification Restriction (COLR) supplementary service for the Broadband Integrated Services Digital Network (B-ISDN) at the T_B reference point or coincident S_B and T_B reference point (as defined in Recommendation I.413 [1]) by means of the Digital Subscriber Signalling System No. 2 (DSS 2) protocol. Stage three identifies the protocol procedures and switching functions needed to support a telecommunications service (see Recommendation I.130 [2]).

In addition, this Recommendation specifies the protocol requirements at the T_B reference point where the service is provided to the user via an intermediate private B-ISDN.

This Recommendation does not specify the additional protocol requirements where the service is provided to the user via a telecommunications network that is not a B-ISDN.

Connected Line Identification Restriction (COLR) is a supplementary service offered to the connected party to restrict presentation of the connected party's ISDN number and sub-address to the calling party.

The COLR supplementary service is applicable to all telecommunication services.

This Recommendation is applicable to equipment, supporting the COLR supplementary service, to be attached at either side of a T_B reference point or coincident S_B and T_B reference point when used as an access to the public B-ISDN.

6.2 References

The following ITU-T Recommendations and other references contain provisions which, through reference in this text, constitute provisions of this Recommendation. At the time of publication, the editions indicated were valid. All Recommendations and other references are subject to revision; all users of this Recommendation are therefore encouraged to investigate the possibility of applying the most recent edition of the Recommendations and other references listed below. A list of the currently valid ITU-T Recommendations is regularly published.

[1] ITU-T Recommendation I.413 (1993), *B-ISDN user-network interface*.

[2] CCITT Recommendation I.130 (1988), *Method for the characterization of telecommunication services supported by an ISDN and network capabilities of an ISDN*.

[3] ITU-T Recommendation Q.2931 (1995), *Broadband Integrated Services Digital Network (B-ISDN) – Digital Subscriber Signalling No. 2 (DSS 2) – User-network interface layer 3 specification for basic call/connection control*.

[4] CCITT Recommendation E.164 (1991), *Numbering plan for the ISDN era*.

[5] CCITT Recommendation I.251.6 (1988), *Connected Line Identification Restriction*.

[6] ITU-T Recommendation clause 5/Q.2951 (1995), *Connected Line Identification Presentation*.

[7] ITU-T Recommendation I.580 (1993), *General arrangements for interworking between B-ISDN and 64 kbit/s based ISDN*.

6.3 Definitions

For the purposes of this Recommendation, the following definitions apply:

6.3.1 **user**: The DSS 2 protocol entity at the user side of the user-network interface.

6.3.2 **network**: The DSS 2 protocol entity at the network side of the user-network interface.

6.3.3 **served user**: The user of a particular ISDN number who has subscribed to the restriction of the connected line identification information (on a permanent or on a per-call basis) in association with incoming calls. The served user may also be known as the connected user.

6.3.4 **calling user**: A calling user is the initiator of a call received by the served user, on which COLR has been activated.

6.3.5 **ISDN number**: A number conforming to the numbering plan and structure specified in Recommendation E.164 [4].

6.4 Abbreviations

For the purposes of this Recommendation, the following abbreviations are used:

B-ISDN	Broadband Integrated Services Digital Network
COLP	Connected Line Identification Presentation
COLR	Connected Line Identification Restriction
CON	Connected Number
DSS 2	Digital Subscriber Signalling System No. 2
IE	Information Element
ISDN	Integrated Services Digital Network
N-ISDN	Narrow-band Integrated Services Digital Network
PI	Presentation Indicator

6.5 Description

When COLR is applicable and activated, the destination network shall provide the originating network with an indication that the connected user's ISDN number and sub-address information (if provided by the connected user) are not allowed to be presented to the calling user. In this case, no connected number and sub-address shall be included in the call connected information provided to the calling user.

The presentation restriction function shall not influence the forwarding of the connected number within the network as part of the basic service procedures.

6.6 Operational requirements

6.6.1 Provision/withdrawal

See Recommendation I.251.6.

6.6.2 Requirements on the originating network side

See 6.9.1.

6.6.3 Requirements in the network

Not applicable.

6.6.4 Requirements on the destination network side

All information pertaining to COLR is inserted in the CONNECT message sent as part of the basic call procedures according to clause 5/Q.2931.

6.7 State definitions

No specific states are required.

6.8 Coding requirements

The same as for 5.8.

6.9 Signalling procedures at the coincident S_B and T_B reference point

6.9.1 Actions at the originating local exchange

6.9.1.1 Normal operation

The actions to be performed at the originating local exchange are provided as part of the COLP supplementary service, described in 5.9.2.1.1.

6.9.1.2 Exceptional procedures

Not applicable.

6.9.2 Actions at the destination user

If the connected user wishes to override the default setting in the network, the CONNECT message sent by the user shall contain the connected number information element with the presentation indicator set appropriately.

6.9.3 Actions at the destination local exchange

6.9.3.1 Normal operation

If the connected user has subscribed to the COLR supplementary service permanent mode, the presentation indicator received in the CONNECT message will be ignored. The network shall set the presentation indicator to *presentation restricted*.

If the connected user has subscribed to the COLR supplementary service on a per-call basis and requests to override the default setting, the destination network shall set the presentation indicator according to that in the received connected number information element.

The digits, if included, shall be treated according to Tables 5-2 or 5-3, and 5.9.2.3.

If COLR is requested by the user on a per-call basis, and no connected number information element is included in the CONNECT message, the destination network shall set the presentation indicator according to the subscriber value.

The presentation indicator shall be forwarded to the originating network in association with the basic call response.

6.9.3.2 Exceptional procedures

Not applicable.

6.10 Procedures for interworking with private ISDNs

The procedures specified in 6.9 shall be used.

6.11 Interworking with other networks

6.11.1 Interworking with N-ISDNs

This subclause specifies the particular features to support access signalling interworking between B-ISDN and N-ISDN. The description of interworking assumes the communication scenario B as defined in Annex A/I.580 [7].

Interworking N-ISDN → B-ISDN

The DSS 1 connected number information element is mapped to the DSS 2 connected number information element by the interworking function or terminal adapter by inserting the second octet and changing the length indication from one to two octets.

NOTE – It is recommended that the flag bit in octet 2 is set to *instruction field not significant*, i.e. the normal error handling procedures as defined in 5.6/Q.2931 apply.

Interworking B-ISDN → N-ISDN

The DSS 2 connected number information element is mapped to the DSS 1 connected number information element by the terminal adapter or interworking function by removing its second octet and adjusting the length indication without causing other changes to the contents, and by respecting the order of this information element in the DSS 1 message.

6.11.2 Interworking with non-ISDNs

On calls to or via non-ISDNs, it cannot be assured that a restriction indication can be carried to the originating network. As a national network option, the destination network shall have the possibility to restrict any information identifying the connected party from being returned to the originating network when COLR is applicable. If an originating network receives a connected party ISDN number without any indication of presentation allowed or restricted, the originating network (the host network) will act according to its rules and regulations. For further information see 5.9.

6.12 Interactions with other supplementary services

6.12.1 Connected Line Identification Presentation

COLR will take precedence over COLP. The only occasion when a user subscribing to COLP can take precedence over COLR is when the user has an override category. This is a national option.

6.12.2 Connected Line Identification Restriction

No interaction.

6.12.3 Calling Line Identification Presentation

No interaction.

6.12.4 Calling Line Identification Restriction

No interaction.

6.12.5 Direct-Dialling-In

Not relevant.

6.12.6 User-to-User Signalling

6.12.6.1 Service 1

No interaction.

6.12.7 Multiple Subscriber Number

No interaction.

6.12.8 Sub-addressing

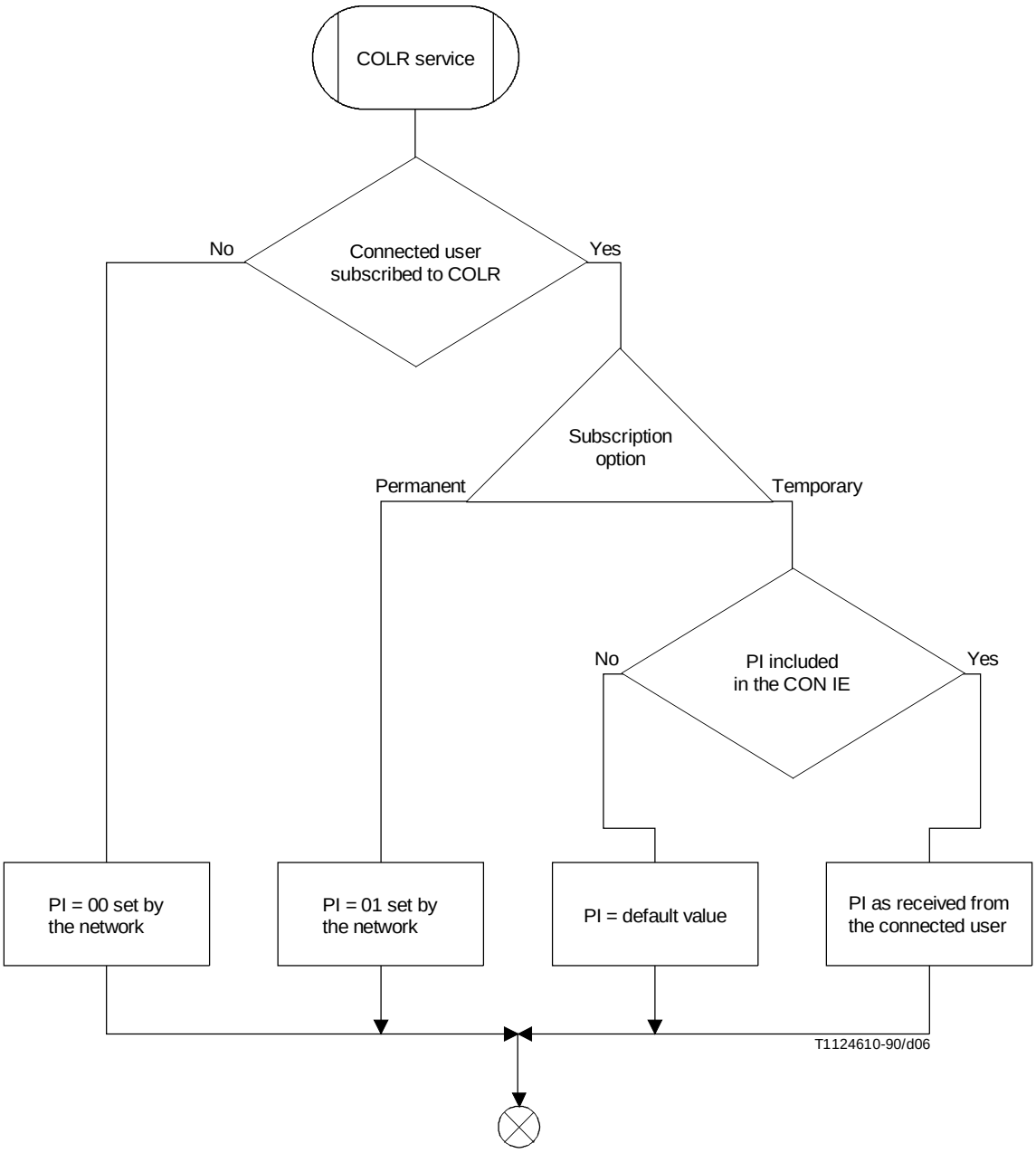
No interaction.

6.13 Parameter values (timers)

No specific timers are required.

6.14 Dynamic description (SDLs)

See Figure 6-1.



NOTES

1 The style of this SDL diagram is aligned with those of Recommendation Q.951 rather than with those provided in Annex A/Q.2931 to emphasize the commonality of the supplementary services in N-ISDN and B-ISDN. Accordingly, some details shown in Annex A/Q.2931 (e.g. message verification) are not shown here.

2 PI = 00 “presentation allowed”;
PI = 01 “presentation restricted”.

FIGURE 6-1/Q.2951

Destination network side dynamic description

Appendix I

(to clause 6 of Recommendation Q.2951)

Signalling flows

(This appendix does not form an integral part of this Recommendation)

The signalling flows are not included as they form an integral part of the basic call control procedures.

8 Sub-addressing (SUB)

8.1 Scope

This Recommendation specifies the stage three of the Sub-addressing (SUB) supplementary service for the Broadband Integrated Services Digital Network (B-ISDN) at the T_B reference point or coincident S_B and T_B reference point (as defined in Recommendation I.413 [1]) by means of the Digital Subscriber Signalling System No. 2 (DSS 2) protocol. Stage three identifies the protocol procedures and switching functions needed to support a telecommunications service (see Recommendation I.130 [2]).

In addition, this Recommendation specifies the protocol requirements at the T_B reference point where the service is provided to the user via an intermediate private B-ISDN.

This Recommendation does not specify the additional protocol requirements where the service is provided to the user via a telecommunications network that is not a B-ISDN.

The SUB supplementary service allows the called (served) user to expand his addressing capacity beyond the one given by the ISDN number.

The applicability of the SUB supplementary service is specified in Recommendation I.251.8.

This Recommendation is applicable to equipment, supporting the SUB supplementary service, to be attached at either side of a T_B reference point or coincident S_B and T_B reference point when used as an access to the public B-ISDN.

8.2 References

The following ITU-T Recommendations and other references contain provisions which, through reference in this text, constitute provisions of this Recommendation. At the time of publication, the editions indicated were valid. All Recommendations and other references are subject to revision; all users of this Recommendation are therefore encouraged to investigate the possibility of applying the most recent edition of the Recommendations and other references listed below. A list of the currently valid ITU-T Recommendations is regularly published.

[1] ITU-T Recommendation I.413 (1993), *B-ISDN user-network interface*.

[2] CCITT Recommendation I.130 (1988), *Method for the characterization of telecommunication services supported by an ISDN and network capabilities of an ISDN*.

[3] ITU-T Recommendation Q.2931 (1995), *Broadband Integrated Services Digital Network (B-ISDN) – Digital Subscriber Signalling No. 2 (DSS 2) – User-network interface layer 3 specification for basic call/connection control*.

[4] CCITT Recommendation E.164 (1991), *Numbering plan for the ISDN era*.

[5] CCITT Recommendation I.251.8 (1992), *Sub-addressing supplementary service*.

[6] ITU-T Recommendation I.580 (1993), *General arrangements for interworking between B-ISDN and 64 kbit/s based ISDN*.

8.3 Definitions

For the purposes of this Recommendation, the following definitions apply:

8.3.1 **user**: The DSS 2 protocol entity at the user side of the user-network interface.

8.3.2 **network**: The DSS 2 protocol entity at the network side of the user-network interface.

8.3.3 **served user**: The served user for the SUB supplementary service is the called user or another private installation on the destination side of the network.

8.4 Abbreviations

For the purposes of this Recommendation, the following abbreviations are used:

B-ISDN	Broadband Integrated Services Digital Network
DSS 2	Digital Subscriber Signalling System No. 2
ISDN	Integrated Services Digital Network
N-ISDN	Narrow-band Integrated Services Digital Network
PSTN	Public Switched Telephone Network
SUB	Sub-addressing

8.5 Description

The sub-addressing possibility offers an additional addressing capacity independent from the ISDN number.

A called party sub-address, if presented by a calling user, is delivered unaffected to the called user. The called party sub-address may form part of the compatibility checking by the called user. Only the served user defines the significance of the sub-address.

The functions offered by the SUB supplementary service can be used to identify a particular endpoint of a call beyond the ISDN access.

If a calling user wants to transfer called party sub-address information to the called user, the calling user shall insert the called party sub-address information into the SETUP message as part of the basic service (see Figure 8.II.1).

The sub-address information is transferred transparently through the network from the originating to the destination user-network interface. At the called user side, the called party sub-address shall be offered to the served user within the SETUP message, if the called user has subscribed to this supplementary service.

NOTE – Other sub-address information elements, e.g. calling party sub-address or connected party sub-address information elements are not the subject of the SUB supplementary service and hence are described in the appropriate supplementary service specifications (e.g. in the Calling Line Identification Presentation and Connected Line Identification Presentation supplementary services specifications).

8.6 Operational requirements

8.6.1 Provision and withdrawal

The SUB supplementary service may be available without prior arrangement or it may be provided after subscription agreement between the user and the service provider.

If the subscription option is required, the user shall subscribe to the SUB supplementary service in order to receive called party sub-address information in incoming SETUP messages.

Withdrawal is done by the service provider at the subscriber's request or for administrative reasons.

8.6.2 Requirements on the originating network side

The normal basic call control procedures according to 5.1/Q.2931 apply.

8.6.3 Requirements in the network

Not applicable.

8.6.4 Requirements on the destination network side

The normal basic call control procedures according to 5.2/Q.2931 apply.

8.7 State definitions

The states associated with basic call control according to Recommendation Q.2931 apply.

8.8 Coding requirements

For the SUB supplementary service, the calling user shall use the called party sub-address information element defined in 4.5.9/Q.2931.

The maximum length of the called party sub-address information element is 25 octets, allowing for the transfer of 20 octets sub-address information.

8.9 Signalling procedures at the coincident S_B and T_B reference point

8.9.1 Actions at the originating local exchange

8.9.1.1 Normal operation

The normal basic call control procedures according to clause 5/Q.2931 apply.

8.9.1.2 Exceptional procedures

If the called party sub-address information element exceeds the maximum length given in clause 3/Q.2931, then this information element will be treated as an information element with content error (see 5.6.8.2/Q.2931).

8.9.2 Actions at the destination local exchange

8.9.2.1 Normal operation

The called party sub-address information element shall be delivered from the network to the served user in the SETUP message according to the procedures of 5.2/Q.2931. This implies that the calling user has provided the sub-address information.

8.9.2.2 Exceptional procedures

If the SUB supplementary service is not provided to the called user or the length of the called party sub-address information element exceeds the maximum length (see clause 8), the network shall discard the called party sub-address information element. No indication shall be given to the calling user.

If the SUB supplementary service is provided to the called user but no sub-address information has been included by the calling user in the called party sub-address information element, the SUB supplementary service cannot be provided and the call shall be offered to the called user without the called party sub-address information element.

If a user supports the SUB supplementary service but the received sub-address information does not match with the user's own sub-address, then the call shall be ignored [see B.3.1 a)/Q.2931].

If a user supports the SUB supplementary service and a SETUP message without sub-address is received, then the user shall handle the call according to 5.2/Q.2931.

NOTE – If a user which does not support the SUB supplementary service receives a SETUP message with called party sub-address information, then the user will handle the call according to 5.2/Q.2931 [see also B.3.1 b)/Q.2931].

8.10 Procedures for interworking with private ISDNs

The procedures specified in 8.9 shall be used.

8.11 Interworking with other networks

8.11.1 Interworking with N-ISDNs

This subclause specifies the particular features to support access signalling interworking between B-ISDN and N-ISDN. The description of interworking assumes the communication scenario B as defined in Annex A/I.580 [6].

Interworking N-ISDN → B-ISDN

Not applicable.

Interworking B-ISDN → N-ISDN

The DSS 2 called party sub-address information element is mapped to the DSS 1 called party sub-address information element by the terminal adapter or interworking function by removing its second octet and adjusting the length indication without causing other changes to the contents, and by respecting the order of this information element in the DSS 1 message.

8.11.2 Interworking with non-ISDNs

If the call is not supported by the ISDN for the whole connection, the SUB supplementary service may not be applicable.

8.12 Interactions with other supplementary services

8.12.1 Connected Line Identification Presentation

No interaction.

8.12.2 Connected Line Identification Restriction

No interaction.

8.12.3 Calling Line Identification Presentation

No interaction.

8.12.4 Calling Line Identification Restriction

No interaction.

8.12.5 Direct-Dialling-In

No interaction.

8.12.6 User-to-User Signalling

8.12.6.1 Service 1

No interaction.

8.12.7 Multiple Subscriber Number

No interaction.

8.12.8 Sub-addressing

Not relevant. The interactions between the different sub-addressing capabilities at the calling or the called user side are shown in Figure 8.II.1.

8.13 Parameter values (timers)

No specific timers are required.

8.14 Dynamic description (SDLs)

See Annex A/Q.2931.

Appendix I

(to clause 8 of Recommendation Q.2951)

Signalling flows

(This appendix does not form an integral part of this Recommendation)

No SUB supplementary service specific signalling flow is specified in addition to normal basic call control according to Recommendation Q.2931.

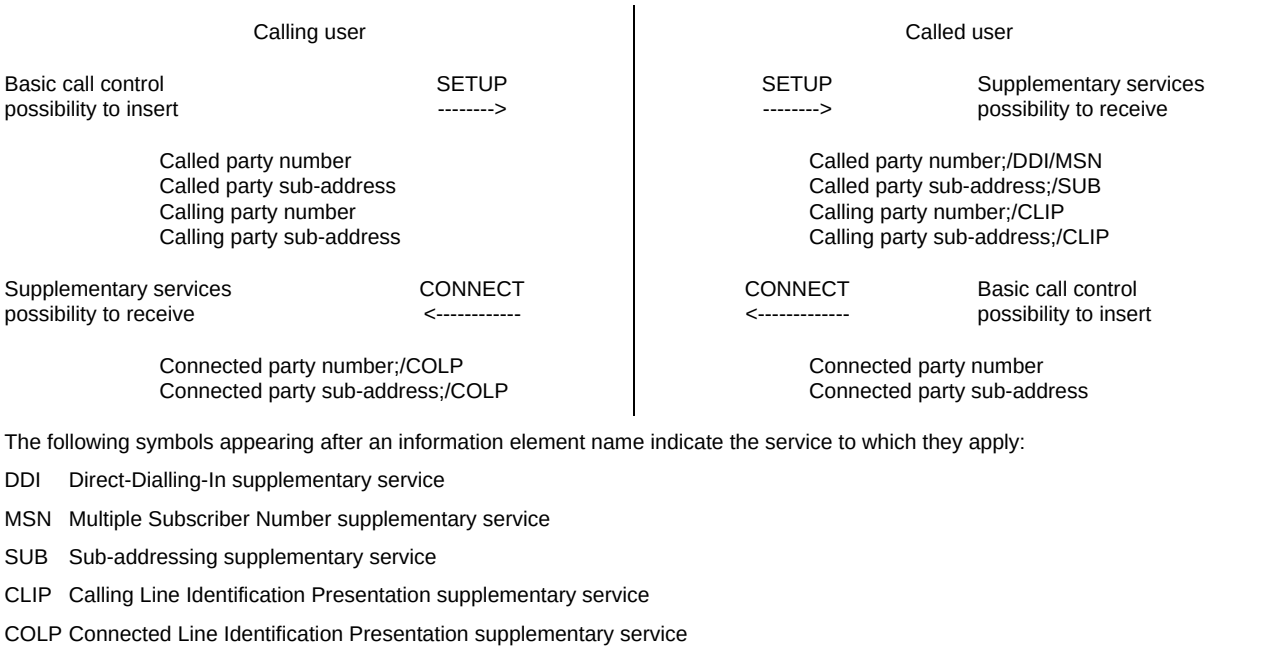
Appendix II

(to clause 8 of Recommendation Q.2951)

Relationship of address information elements and supplementary services

(This appendix does not form an integral part of this Recommendation)

The correlation of address information elements to the basic call control or supplementary service are shown in Figure 8.II.1.



The following symbols appearing after an information element name indicate the service to which they apply:

DDI Direct-Dialling-In supplementary service

MSN Multiple Subscriber Number supplementary service

SUB Sub-addressing supplementary service

CLIP Calling Line Identification Presentation supplementary service

COLP Connected Line Identification Presentation supplementary service

FIGURE 8.II.1/Q.2951

Correlations of address information elements to the basic call control or supplementary services