



INTERNATIONAL TELECOMMUNICATION UNION

ITU-T

TELECOMMUNICATION
STANDARDIZATION SECTOR
OF ITU

Q.731.1

(07/96)

SERIES Q: SWITCHING AND SIGNALLING

Specifications of Signalling System No. 7 – ISDN
supplementary services

Stage 3 description for numbering identification
supplementary services using SS No. 7:

Direct-Dialling-In (DDI)

ITU-T Recommendation Q.731.1

(Previously CCITT Recommendation)

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ITU-T RECOMMENDATION Q.731.1

STAGE 3 DESCRIPTION FOR NUMBERING IDENTIFICATION SUPPLEMENTARY SERVICES USING SS NO. 7: DIRECT-DIALING-IN (DDI)

Summary

This Recommendation defines the essential functions, procedures and messages required for the transportation of direct-dialling-in information. This Recommendation has been updated due to errors in the Recommendation of 1992.

Source

ITU-T Recommendation Q.731.1 was revised by ITU-T Study Group 11 (1993-1996) and was approved under the WTSC Resolution No. 1 procedure on the 9th of July 1996.

FOREWORD

ITU (International Telecommunication Union) is the United Nations Specialized Agency in the field of telecommunications. The ITU Telecommunication Standardization Sector (ITU-T) is a permanent organ of the 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).

In some areas of information technology which fall within ITU-T's purview, the necessary standards are prepared on a collaborative basis with ISO and IEC.

NOTE

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

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Recommendation Q.731.1

STAGE 3 DESCRIPTION FOR NUMBER IDENTIFICATION SUPPLEMENTARY SERVICES USING SS NO. 7: DIRECT-DIALING-IN

(revised in 1996)

1 Direct-Dialling-In

1.1 Introduction

1.1.1 Scope

This Recommendation describes the Stage 3 of the Direct-Dialling-In supplementary service for the Integrated Services Digital Network (ISDN) by means of the Signalling System No. 7 ISDN User Part (ISUP).

Direct-Dialling-In (DDI) enables a user to call directly another user on an ISPBX or other private system without attendant intervention, the DDI digit(s) being the least significant digit(s) of the called ISDN number.

1.1.2 References

The following Recommendations, and other references contain provisions which, through reference in text, constitute provisions of this Recommendation. At the time of publication, the editions indicated were valid. All Recommendations and other references are subject to revisions; 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.112 (1993), *Vocabulary of terms for ISDNs.*
- [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 I.210 (1993), *Principles of telecommunication services supported by an ISDN and the means to describe them.*
- [4] CCITT Recommendation I.250 (1988), *Definition of supplementary services.*
- [5] CCITT Recommendation I.251.1 (1992), *Number Identification Supplementary Services: Direct-Dialling-In.*
- [6] CCITT Recommendation Q.81.1 (1988), *Stage 2 description for number identification supplementary services: Direct-Dialling-In.*
- [7] ITU-T Recommendation Q.730 (1993), *Signalling System No. 7 – ISDN supplementary services.*
- [8] ITU-T Recommendation Q.761 (1993), *Functional description of the ISDN User Part of Signalling System No. 7.*
- [9] ITU-T Recommendation Q.762 (1993), *General function of messages and signals of the ISDN User Part of Signalling System No. 7.*
- [10] ITU-T Recommendation Q.763 (1993), *Format and codes of the ISDN User Part of Signalling System No. 7.*

- [11] ITU-T Recommendation Q.764 (1993), *Signalling System No. 7 – ISDN User Part Signalling procedures*.
- [12] CCITT Recommendation Q.951.1 (1992), *Stage 3 description for number identification supplementary services using DSS 1: Direct-Dialling-In (DDI)*.

1.1.3 Terms and definitions

No special terms or definitions are used.

1.1.4 Abbreviations

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

DDI Direct-Dialling-In

DSS 1 Digital Subscriber Signalling System No. 1

ISDN Integrated Services Digital Network

ISPBX Integrated Services Private Branch Exchange

ISUP ISDN User Part

PABX Private Automatic Branch Exchange

1.2 Description

1.2.1 General description

The Stage 1 description of DDI is to be found in Recommendation I.251.1. The Stage 2 descriptions is included in Recommendation Q.81.1. The Stage 3 description of DDI complements the ISDN User Part (ISUP) protocol as defined in Recommendations Q.761 to Q.764 and Q.766.

1.2.2 Specific terminology

See 1.1.3, terms and definitions.

1.2.3 Qualification on the applicability to telecommunication services

See 1.2.3/I.251.

1.2.4 State definition

No specific state definitions are required.

1.3 Operational requirements

1.3.1 Provision/withdrawal

This service shall be offered/withdrawn after pre-arrangement with the service provider. The service provider shall allocate a set of ISDN numbers.

1.3.2 Requirements on the originating network side

Not applicable.

1.3.3 Requirements in the network

No specific requirements are needed in the network.

1.4 Coding requirements

None identified.

1.5 Signalling requirements

1.5.1 Activation/deactivation/registration

Activation through subscription.

1.5.2 Invocation and operation

Call initiation procedures are the same as for the basic service.

1.5.2.1 Actions at the originating local exchange

1.5.2.1.1 Normal operation

The procedures to set up a call are in general the same as the basic procedures.

1.5.2.1.2 Exceptional procedures

No exceptional procedures are identified.

1.5.2.2 Actions at the transit exchange

1.5.2.2.1 Normal operation

The procedures to set up a call are in general the same as the basic procedures.

1.5.2.2.2 Exceptional procedures

No exceptional procedures are identified.

1.5.2.3 Actions at the outgoing international gateway exchange

1.5.2.3.1 Normal operation

The procedures to set up a call are in general the same as the basic procedures.

1.5.2.3.2 Exceptional procedures

No exceptional procedures are identified.

1.5.2.4 Actions at the incoming international gateway exchange

1.5.2.4.1 Normal operation

The procedures to set up a call are in general the same as the basic procedures.

1.5.2.4.2 Exceptional procedures

No exceptional procedures are identified.

1.5.2.5 Actions at the destination local exchange

1.5.2.5.1 Normal operation

A distinction is made whether DDI is applied to an analogue or an ISPBX and whether the destination local exchange is aware of the number of DDI digits required by the called PABX.

Besides sending the address complete message and possibly call progress message(s), the subsequent messages will be the same as for a normal call without DDI.

1.5.2.5.1.1 Analogue PABX

An address complete message is sent as soon as the destination local exchange has received the complete called party number and has selected a free circuit to the PABX. The called line status is set to "no indication".

If the destination local exchange has no knowledge about the number of DDI digits required to set up the call, it selects a free circuit, sends the received DDI digits to the PABX and return an address complete message as soon as it has received a signal to that effect from the PABX. The called line status is set to either "no indication" or "subscriber free" according to the signal received from the PABX.

1.5.2.5.1.2 Integrated Services Private Branch Exchange (ISPBX)

An address complete message is sent as soon as the destination local exchange has received the complete called party number with the called line status set to "no indication".

If the destination local exchange has no knowledge about the number of DDI digits required to set up the call, it sends an address complete message as soon as it has received the relevant information (call proceeding) from the PABX. The called line status is set to "no indication".

On receipt of an "alerting" indication from the PABX, the destination local exchange sends a call progress message with the called line status set to "subscriber free".

If tones and/or announcements are provided from the destination local exchange, the transmission path is through connected on receipt of the relevant information (connect) from the PABX before sending the answer message to the preceding exchange. If tones and/or announcements are provided from the PABX, the destination local exchange connects the backward path on receipt of an indication to that effect from the PABX and sends a call progress message to the preceding exchange. The transmission path is fully through connected on receipt of the relevant information (connect) from the PABX.

1.5.2.5.2 Exceptional procedures

No exceptional procedures are identified.

1.6 Interaction with other supplementary services

The following cases are considered:

- A is a normal call originating user;
- B is a normal call terminating user;
- X is a call originating user who can be called by means of DDI digits;
- Y is a call terminating user who is called by means of DDI digits.

1.6.1 Call Waiting (CW)

No impact on ISUP.

1.6.2 Call Transfer (CT)

No applicable interaction at this time.

1.6.3 Connected Line Identification Presentation (COLP)

A calls Y: The transmission of the extension number of Y depends on whether Y has delivered a valid extension number, i.e. one within the range of numbers allocated to his PABX. If a valid extension number is provided by the calling user, it is transmitted; if not valid, only the network provided default number of the PABX access is transmitted.

X calls B: No impact, i.e. neither supplementary service shall affect the operation of the other supplementary service.

1.6.4 Connected Line Identification Restriction (COLR)

A calls Y: As in COLP with the addition that the restriction extends to the connected party's extension number too.

X calls B: No impact, i.e. neither supplementary service shall affect the operation of the other supplementary service.

1.6.5 Calling Line Identification Presentation (CLIP)

A calls Y: No impact, i.e. neither supplementary service shall affect the operation of the other supplementary service.

X calls B: The transmission of the extension number of X depends on whether X has delivered a valid extension number, i.e. one within the range of numbers allocated to his PABX. If a valid extension number is provided by the called user it is transmitted; if not valid, only the network provided default number of the PABX access is transmitted.

1.6.6 Calling Line Identification Restriction (CLIR)

A calls Y: No impact, i.e. neither supplementary service shall affect the operation of the other supplementary service.

X calls B: As in CLIP with the addition that the restriction extends to the calling party's extension too.

1.6.7 Closed User Group (CUG)

No impact on ISUP.

1.6.8 Conference Calling (CONF)

No impact on ISUP.

1.6.9 Direct-Dialling-In (DDI)

Not applicable.

1.6.10 Call Diversion Services (CDIV)

1.6.10.1 Call Forwarding Busy (CFB)

No impact on ISUP.

1.6.10.2 Call Forwarding No Reply (CFNR)

No impact on ISUP.

1.6.10.3 Call Forwarding Unconditional (CFU)

No impact on ISUP.

1.6.10.4 Call Deflection (CD)

No impact on ISUP.

1.6.11 Line Hunting (LH)

No impact on ISUP.

1.6.12 Three-Party Service (3PTY)

No impact on ISUP.

1.6.13 User-to-User Signalling (UUS)

1.6.13.1 User-to-User Signalling, service 1 (UUS1)

No impact on ISUP.

1.6.13.2 User-to-User Signalling, service 2 (UUS2)

No impact on ISUP.

1.6.13.3 User-to-User Signalling, service 3 (UUS3)

No impact on ISUP.

1.6.14 Multiple Subscriber Number (MSN)

No impact on ISUP.

1.6.15 Call Hold (HOLD)

No impact on ISUP.

1.6.16 Advice of Charge (AOC)

No applicable interaction at this time.

1.6.17 Sub-addressing (SUB)

No impact on ISUP.

1.6.18 Terminal Portability (TP)

No impact on ISUP.

1.6.19 Completion of Calls to Busy Subscriber (CCBS)

No applicable interaction at this time.

1.6.20 Malicious Call Identification (MCID)

No impact on ISUP.

1.6.21 Reverse Charging (REV)

No impact on ISUP.

1.6.22 Multi-Level Precedence and Preemption (MLPP)

No impact on ISUP.

1.6.23 Private Numbering Plan (PNP)

No applicable interaction at this time.

1.6.24 Charge Card

No applicable interaction at this time.

1.7 Interaction with other networks

No problems identified.

1.8 Signalling flows

The signalling flows of the basic call procedures are applicable.

1.9 Parameter value (timers)

No specific timers are required.

1.10 Dynamic description

The dynamic description of the basic call procedures is applicable as described in Recommendation Q.764.

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