INTERNATIONAL TELECOMMUNICATION UNION

CCITT Q.731

THE INTERNATIONAL
TELEGRAPH AND TELEPHONE
CONSULTATIVE COMMITTEE

SPECIFICATIONS OF SIGNALLING SYSTEM No. 7

STAGE 3 DESCRIPTION FOR NUMBER IDENTIFICATION SUPPLEMENTARY SERVICES USING SIGNALLING SYSTEM No. 7

SECTION 1 – DIRECT DIALLING IN (DDI)
SECTION 8 – SUB-ADDRESSING (SUB)

Recommendation Q.731

Geneva, 1991

FOREWORD

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CCITT NOTE

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

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Recommendation Q.731

STAGE 3 DESCRIPTION FOR NUMBER IDENTIFICATION SUPPLEMENTARY SERVICES USING SIGNALLING SYSTEM No. 7

1 Direct-Dialling-In (DDI)

1.1 *Definition*

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.

1.2 *Description*

1.2.1 *General description*

The stage 1 definition of DDI is to be found in Recommendation I.251. The stage 2 description is included in § 1 of Recommendation Q.81. This stage 3 description of DDI compliments the ISDN User Part (ISUP) protocol as defined in Recommendations Q.761 to Q.764 and Q.766.

1.2.2 *Specific terminology*

ISPBX Integrated services private branch exchange

PABX private automatic branch exchange

1.2.3 *Qualification on the applicability to telecommunication services*

See Recommendation I.251, § 1.2.3.

1.2.4 *State definitions*

No specific state definitions are required.

1.3 *Operational requirements*

1.3.1 *Provision/withdrawal*

This service shall be provided/withdrawn after pre-arrangement with the service provider.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.

1.3.4 *Requirements on the terminating network side*

Not applicable.

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 himself 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 calling 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 in 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 (CH)*

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 Pre-emption (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.

8 Sub-addressing (SUB)

8.1 *Definition*

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

The stage 1 service description is given in Recommendation I.251.8 and the stage 2 functional capabilities and information flows are given in Recommendation Q.81, § 8. The stage 3 description of the sub-address supplementary service uses the ISDN user part protocol as defined in Recommendations Q.761 to Q.764 and Q.767.

8.2 *Description*

8.2.1 *General description*

The sub-address information is access significant information which is transported transparent through the network in the access transport parameter in the initial address message (IAM).

8.2.2 *Specific terminology*

None.

8.2.3 *Qualification on the applicability to telecommunication services*

This supplementary service is applicable to all telecommunication services.

8.2.4 *State definitions*

No specific state definitions are required.

8.3 *Operational requirements*

8.3.1 *Provision/withdrawal*

Not applicable.

8.3.2 *Requirements on the originating network side*

Not applicable.

8.3.3 *Requirements in the network*

No specific requirements are needed in the network.

8.3.4 *Requirements on the terminating network side*

Not applicable.

8.4 *Coding requirements*

The sub-address is an information element in the access transport parameter. The coding of the information element is according to Recommendation Q.931, § 4.5.9.

The maximum length of the sub-address information element is 23 octets, allowing for the transport of 20 octets sub-address information.

8.5 *Signalling requirements*

8.5.1 *Activation/deactivation/registration*

Not applicable.

8.5.2 *Invocation and operation*

8.5.2.1 *Actions at the originating local exchange*

8.5.2.1.1 *Normal operations*

The basic call control procedures as described in Recommendation Q.764 are applicable.

The sub-address information is transported in the access transport parameter of the initial address message (even in the case when the overlap sending procedure is used).

8.5.2.1.2 *Exceptional procedures*

No exceptional procedures are identified.

8.5.2.2 *Actions at the transit exchange*

8.5.2.2.1 *Normal operation*

The sub-address information contained in the access transport parameter, is passed on transparently to the succeeding exchange.

8.5.2.2.2 *Exceptional procedures*

No exceptional procedures are identified.

8.5.2.3 *Actions at the outgoing international gateway exchange*

8.5.2.3.1 *Normal operation*

The sub-address information contained in the access transport parameter, is passed on transparently in the international network.

8.5.2.3.2 *Exceptional procedures*

No exceptional procedures are identified.

8.5.2.4 *Actions at the incoming international gateway exchange*

8.5.2.4.1 *Normal operation*

The sub-address information, contained in the access transport parameter, is passed on transparently in the national network.

8.5.2.4.2 *Exceptional procedures*

No exceptional procedures are identified.

8.5.2.5 *Actions at the destination local exchange*

8.5.2.5.1 *Normal operation*

The sub-address information is passed on to the user network interface.

8.5.2.5.2 *Exceptional procedures*

No exceptional procedures are identified.

8.6 *Interaction with other supplementary services*

8.6.1 *Call Waiting (CW)*

No impact on ISUP.

8.6.2 *Call Transfer (CT)*

No applicable interaction at this time.

8.6.3 *Connected Line Identification Presentation (COLP)*

No impact on ISUP.

8.6.4 *Connected Line Identification Restriction (COLR)*

No impact on ISUP.

8.6.5 *Calling Line Identification Presentation (CLIP)*

No impact on ISUP.

8.6.6 *Calling Line Identification Restriction (CLIR)*

No impact on ISUP.

8.6.7 *Closed User Group (CUG)*

No impact on ISUP.

8.6.8 *Conference Calling (CONF)*

No impact on ISUP.

8.6.9 *Direct-Dialling-In (DDI)*

No impact on ISUP.

8.6.10 *Call diversion services (CDIV)*

8.6.10.1 *Call Forwarding Busy (CFB)*

No impact on ISUP.

8.6.10.2 *Call Forwarding No Reply (CFNR)*

No impact on ISUP.

8.6.10.3 *Call Forwarding Unconditional (CFU)*

No impact on ISUP.

8.6.10.4 *Call Deflection (CD)*

No impact on ISUP.

8.6.11 *Line Hunting (LH)*

No impact on ISUP.

8.6.12 *Three-Party-Service (3PTY)*

No impact on ISUP.

8.6.13 *User-to-User Signalling (UUS)*

8.6.13.1 *User-to-User Signalling, service 1 (UUS1)*

No impact on ISUP.

8.6.13.2 *User-to-User Signalling, service 2 (UUS2)*

No impact on ISUP.

8.6.13.3 *User to User Signalling, service 3 (UUS3)*

No impact on ISUP.

8.6.14 *Multiple Subscriber Number (MSN)*

No impact on ISUP.

8.6.15 *Call Hold (CH)*

No impact on ISUP.

8.6.16 *Advice of Charge (AOC)*

No applicable interaction at this time.

8.6.17 *Sub-addressing (SUB)*

Not applicable.

8.6.18 *Terminal Portability (TP)*

No impact on ISUP.

8.6.19 *Completion of Call to Busy Subscriber (CCBS)*

No applicable interaction at this time.

8.6.20 *Malicious Call Identification (MCID)*

No impact on ISUP.

8.6.21 *Reverse Charging (REV)*

No impact on ISUP.

8.6.22 *Multi-Level Precedence and Pre-emption (MLPP)*

No impact on ISUP.

8.6.23 *Private Numbering Plan (PNP)*

No applicable interaction at this time.

8.6.24 *Charge Card*

No applicable interaction at this time.

8.7 *Interaction with other networks*

In the case of interaction with a network which does not support the Sub-address supplementary service or which cannot support the sub-address length supplied, the network shall discard the sub-address information and continue the call establishment procedures without notification to the originating exchange.

8.8 *Signalling flows*

The signalling flows of the basic call procedures are applicable.

8.9 *Parameter values (timers)*

No specific timers are required.

8.10 *Dynamic description*

The specification and description languages (SDLs) of the basic call procedures are applicable as described in Recommendation Q.764.