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SERIES Q: SWITCHING AND SIGNALLING

Broadband ISDN – B-ISDN application protocols for the
network signalling

Support of number portability information across B-ISUP

ITU-T Recommendation Q.2769.1

(Formerly CCITT Recommendation)

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ITU-T Recommendation Q.2769.1

Support of number portability information across B-ISUP

Summary

This Recommendation provides support for transport of number portability related information across B-ISUP as a transit network.

Source

ITU-T Recommendation Q.2769.1 was prepared by ITU-T Study Group 11 (1997-2000) and approved under the WTSC Resolution 1 procedure on 15 June 2000.

FOREWORD

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ITU-T Recommendation Q.2769.1

Support of number portability information across B-ISUP

1 Scope

This Recommendation provides support for transport of number portability related information across B-ISUP as a transit network for the following scenarios:

- separate directory number addressing method;
- concatenated addressing method; and
- separate network routing number addressing method.

This Recommendation contains the additional message and parameter coding and interworking mapping tables for the support of transport of number portability related information.

NOTE – In B-ISUP the same addressing methods as in N-ISUP shall be used.

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 Q.2761 (1999), *Functional description of the B-ISDN User Part of Signalling System No. 7.*
- [2] ITU-T Q.2762 (1999), *General Functions of messages and signals of the B-ISDN User Part (B-ISUP) of Signalling System No. 7.*
- [3] ITU-T Q.2763 (1999), *Signalling System No. 7 B-ISDN User Part (B-ISUP) – Formats and codes.*
- [4] ITU-T Q.2764 (1999), *Signalling System No. 7 B-ISDN User Part (B-ISUP) – Basic call procedures.*
- [5] ITU-T Q.2660 (1999), *Interworking between signalling system No. 7 broadband ISDN User Part (B-ISUP) and narrow-band ISDN User Part (N-ISUP).*
- [6] ITU-T Q.761 (1999), *Signalling System No. 7 – ISDN User Part functional description.*
- [7] ITU-T Q.762 (1999), *Signalling System No. 7 – ISDN User Part general function of messages and signals.*
- [8] ITU-T Q.763 (1999), *Signalling System No. 7 – ISDN User Part formats and codes.*
- [9] ITU-T Q.764 (1999), *Signalling System No. 7 – ISDN user part signalling procedures.*
- [10] ITU-T Q.769.1 (1999), *Signalling System No. 7 – ISDN user part enhancements for the support of the number portability.*

3 Definitions

This Recommendation defines the following terms:

3.1 subsequent directory number message (SDM) (national use): A message that may be sent in the forward direction following an Initial Address Message, to convey additional called party number information, when the called party number in the Initial Address Message was contained in the Called directory number parameter.

3.2 called directory number (national use): Information to indicate the directory number. The directory number is a number in the national numbering scheme that is allocated to a customer for a telephony service.

3.3 network routing number (national use): Information to indicate the network routing number. The network routing number is a number used by the network to route a call.

3.4 number portability forward information (network option): Information sent in the forward direction concerning treatment of number portability.

4 Abbreviations

This Recommendation uses the following abbreviations:

B-ISDN Broadband Integrated Services Digital Network

B-ISUP Broadband Integrated Services Digital Network User Part

DSS2 Digital Subscriber Signalling System No. 2

IAM Initial Address Message

ISUP Integrated Services Digital Network User Part

ITU-T International Telecommunication Union – Telecommunication Standardization Sector

SDM Subsequent Directory Number Message

5 B-ISUP messages and parameters

5.1 Messages

The Subsequent Directory Number Message (SDM) is required to support number portability. The message name code allocated to the SDM is 0100 0011. Table 1 shows the parameters defined in the SDM.

Table 1/Q.2769.1 – Message type: Subsequent directory number (national use)

Parameter	Reference (clause)	Length (octets)
Destination signalling identifier	7.48/Q.2764	9
Subsequent number	7.88/Q.2764	7-15

5.2 Parameters

Additional parameters and modifications to existing parameters, as described in this clause, are required to support number portability.

5.2.1 Formats and coding

5.2.1.1 Called directory number (national use)

The format of the Called directory number parameter field is shown in Figure 1.

The parameter name code allocated to the Called directory number parameter is 0111 1101.

8	7	6	5	4	3	2	1	Octets
Odd/ even	Nature of address indicator							1
INN ind.	Numbering plan indicator			Spare				2
2nd address signal				1st address signal				3
								.
								.
Filler (if necessary)				nth address signal				n

Figure 1/Q.2769.1 – Called directory number parameter field

The following codes are used in the subfields of the Called directory number parameter field:

a) *Odd/even indicator*

- 0 even number of address signals
- 1 odd number of address signals

b) *Nature of address indicator*

- 0000000 spare
- 0000001 subscriber number (national use)
- 0000010 unknown (national use)
- 0000011 national (significant) number (national use)
- 0000100 reserved
- 0000101 network-specific number (national use)
- 0000110 reserved
- 0000111 reserved
- 0001000 reserved
- 0001001 }
to } spare
- 1101111 }
- 1110000 }
to } reserved for national use
- 1111110 }
- 1111111 spare

c) *Internal network number indicator (INN ind.)*

- 0 reserved
- 1 routing to internal network number not allowed

d) *Numbering plan indicator*

000	reserved
001	ISDN (Telephony) numbering plan (ITU-T E.164)
010	spare
011	reserved for national use
100	reserved for national use
101	reserved for national use
110	reserved for national use
111	reserved

e) *Address signal*

0000	digit 0
0001	digit 1
0010	digit 2
0011	digit 3
0100	digit 4
0101	digit 5
0110	digit 6
0111	digit 7
1000	digit 8
1001	digit 9
1010	spare
1011	reserved
1100	reserved
1101	spare
1110	spare
1111	ST

The most significant address signal is sent first. Subsequent address signals are sent in successive 4-bit fields.

f) *Filler*

In case of an odd number of address signals, the filler code 0000 is inserted after the last address signal.

5.2.1.2 Network routing number (national use)

The format of the Network routing number parameter field is shown in Figure 2.

The parameter name code allocated to the Network routing number parameter is 1000 0100.

8	7	6	5	4	3	2	1	Octets
Odd/ Even	Numbering plan indicator			Nature of address				1
2nd address signal				1st address signal				2
								.
								.
Filler (if necessary)				nth address signal				n

Figure 2/Q.2769.1 – Network routing number parameter field

The following codes are used in the subfields of the Network routing number parameter field:

a) *Odd/even indicator*

0	even number of address signals
1	odd number of address signals

b) *Numbering plan indicator*

000	spare
001	ISDN (Telephony) numbering plan (ITU-T E.164)
010	spare
011	spare
100	spare
101	spare
110	reserved for national use
111	reserved for national use

c) *Nature of address indicator*

0000	spare
0001	network routing number in national (significant) number format (national use)
0010	network routing number in network specific number format (national use)
0011	} spare
to	
1010	
1011	} reserved for national use
to	
1111	

d) *Address signal*

0000	digit 0
0001	digit 1
0010	digit 2
0011	digit 3
0100	digit 4
0101	digit 5
0110	digit 6
0111	digit 7
1000	digit 8
1001	digit 9
1010	spare
1011	spare
1100	spare
1101	spare
1110	spare
1111	spare

e) *Filler*

In case of an odd number of address signals, the filler code 0000 is inserted after the last address signal.

5.2.1.3 Number portability forward information (network option)

The format of the Number portability forward information parameter field is shown in Figure 3.

The parameter name code allocated to the Number portability forward information parameter is 1000 1101.

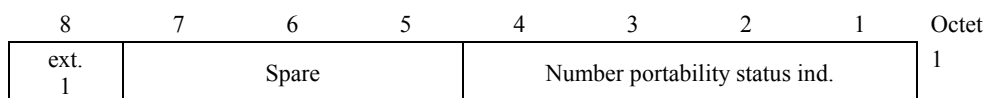


Figure 3/Q.2769.1 – Number portability forward information parameter field

The following codes are used in the subfields of the Number portability forward information parameter field:

a) *Extension indicator*

- 0 information continues through the next octet (e.g. octet 1 to 1a)
- 1 last octet

b) *Number portability status indicator*

- 0000 no indication
- 0001 number portability query not done for the called number
- 0010 number portability query done for the called number, non-ported called subscriber
- 0011 number portability query done for the called number, ported called subscriber
- 0100 }
to } spare
1111 }

5.2.1.4 Called party number

The contents of the Called party number parameter as defined in ITU-T Q.2763 is modified with four additional codepoints as shown below:

Nature of address indicator

- 0000000 spare
- 0000001 subscriber number (national use)
- 0000010 unknown (national use)
- 0000011 national (significant) number
- 0000100 international number
- 0000101 network-specific number (national use)
- 0000110 network routing number in national (significant) number format (national use)
- 0000111 network routing number in network-specific number format (national use)
- 0001000 reserved for network routing number concatenated with Called Directory Number (national use)
- 0001001 }
to } spare
1101111 }

1110000	} reserved for national use
to	
1111110	
1111111	spare

6 Application process procedures

No additional procedures are required to support transport of number portability related information. Procedures defined in ITU-T Q.2764 are applicable.

7 Application service elements and primitives

The following clause identifies impacts on the B-ISUP application service elements, the SACF and the primitives exchanged between ASEs and SACF as shown in ITU-T Q.2764. It should therefore be read in conjunction with ITU-T Q.2764.

7.1 Primitives between SACF and application process

7.1.1 Set_Up request/indication primitive

Table 2 shows additional parameters for the Set_Up request/indication primitive.

Table 2/Q.2769.1 – Parameters for Set_Up request/indication primitive

Set_Up request/indication	B-ISDN	N-ISDN
Called directory number	O	O
Network routing number	O	O
Number portability forward information	O	O

7.1.2 Subsequent_Directory_Number request/indication primitive

Table 3 shows the parameters for the Subsequent_Directory_Number request/indication primitive.

Table 3/Q.2769.1 – Parameters for Subsequent_Directory_Number request/indication primitive

Subsequent_Directory_Number request/indication	B-ISDN	N-ISDN
Message Compatibility Information	O	O
Subsequent number	O	O

7.2 Outgoing Messages

Table 4 shows the additional mapping of primitives received from the AP on interface (d).

Table 4/Q.2769.1 – Mapping between AP and ASE primitives

Interface (d), from AP	Interface (c), to CC ASE	Interface (b), to BCC ASE	Interface (a) to MC ASE
Subsequent_Directory_Number req	Call_Subsequent_Directory_Number req	–	–

The SACF constructs the message type to be sent based upon the primitives issued to the BCC ASE, as shown in Table 5.

Table 5/Q.2769.1 – Mapping from BCC, CC and MC ASE primitives to B-ISUP messages

Interface (c), to CC ASE	Interface (b), to BCC ASE	Interface (a), to MC ASE	Message type
Call_Subsequent_Directory_Number req	–	–	Subsequent Directory Number Message

7.3 Incoming Messages

The Subsequent Directory Number Message is distributed to CC and BCC ASE as shown in Table 6.

Table 6/Q.2769.1 – Distribution of received B-ISUP messages to BCC ASE, CC ASE and MC ASE

Received message	Primitive to BCC ASE	Primitive to CC ASE	Primitive to MC ASE
Subsequent Directory Number Message	No	Yes	No

SACF issues a primitive to the AP, over interface (d), based on the primitives it receives from the ASEs as shown in Table 7.

Table 7/Q.2769.1 – Mapping between BCC, CC and MC ASE primitives and AP primitives

From BCC, interface (b)	From CC, interface (c)	From MC, interface (a)	Sent to the AP, interface (d) (Note)
–	Call_Subsequent_Directory_Number ind	–	Subsequent_Directory_Number ind

7.4 Primitives between CC ASE and SACF

7.4.1 Call_Set_Up request/indication primitive

Table 8 shows additional parameters for the Call_Set_Up request/indication primitive.

Table 8/Q.2769.1 – Parameters for Call_Set_Up request/indication primitive

Called directory number
Network routing number
Number portability forward information

7.4.2 Call_Subsequent_Directory_Number request/indication primitive

Table 9 shows the parameters for the Call_Subsequent_Directory_Number request/indication primitive.

Table 9/Q.2769.1 – Parameters for Call_Subsequent_Directory_Number request/indication primitive

Message Compatibility Information
Subsequent number

7.5 Outgoing CC ASE

Table 10 shows the additional mapping of information received in the CC ASE service primitives into the User_data field of Transfer request primitives in the outgoing CC ASE.

Table 10/Q.2769.1 – Outgoing CC ASE mapping between Message types and service primitives

Interface (c)	Map	Message type
Call_Subsequent_Directory_Number req	➔	Subsequent Directory Number Message

7.6 Incoming CC ASE

Table 11 shows the additional mapping of information received in the User_data field of Transfer indication primitives into the CC ASE service primitives in the incoming CC ASE.

Table 11/Q.2769.1 – Incoming CC ASE mapping between Message types and service primitives

Interface (c)	Map	Message type
Call_Subsequent_Directory_Number ind	➔	Subsequent Directory Number Message

8 Instruction indicators and interworking

8.1 Interworking with nodes not supporting this feature

Nodes not recognizing the Network routing parameter or the additional codepoints of the nature of address indicator in the Called party number parameter shall release the call if such information is received. Therefore, the instruction indicators shall be set as shown in Appendix I for the Network routing number parameter and in Appendix II/Q.2764 for the Called party number parameter, respectively.

Other information shall be passed unchanged.

If interworking with a network only supporting the Called party number parameter as defined in ITU-T Q.2764 for routing purposes, the following shall apply:

- The content of the Called party number parameter must be unambiguous so that the call can be routed correctly (network matter).

NOTE 1 – The Network routing number parameter is not used for such a case.

NOTE 2 – Existing B-ISUP procedures may be applied on the interconnection interface between networks. In this case, the Directory number is contained in the Called party number parameter with Nature of Address value 0000011 – "national (significant) number" although in that case no additional routing information is transferred.

8.2 Interworking with DSS2

There is no interworking required with DSS2.

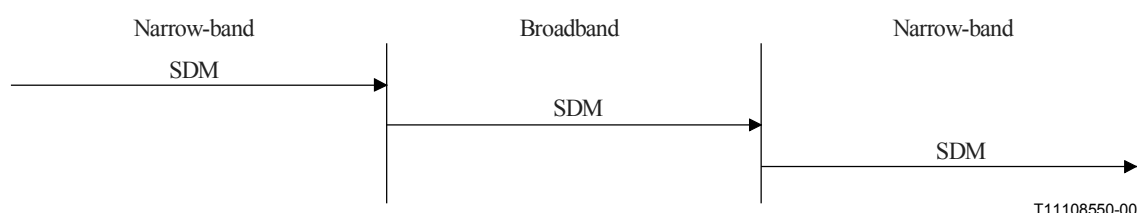
8.3 Interworking with narrow-band ISUP

The following additions are needed to ITU-T Q.2660.

8.3.1 Mapping of initial address message

Incoming narrow-band	Transit broadband	Outgoing narrow-band
Called directory number (national use)	Called directory number (national use)	Called directory number (national use)
Network routing number (national use)	Network routing number (national use)	Network routing number (national use)
Number portability forward information (network option)	Number portability forward information (network option)	Number portability forward information (network option)

8.3.2 Mapping of the subsequent directory number message (national use)



Incoming narrow-band	Transit broadband	Outgoing narrow-band
Subsequent number	Subsequent number	Subsequent number

APPENDIX I

Setting of instruction indicators

Parameter	Pass on not possible indicator	Discard parameter indicator	Discard message indicator	Send notification indicator	Release Call indicator	Transit at intermediate exchange indicator	Broadband/narrow-band interworking indicator
Network routing number	Default	Default	Default	Default	Release call	End node interpretation	Release call
Called directory number	Default	Do not discard parameter	Do not discard message	Do not send notification	Do not release call	Transit node interpretation	Release call
Number portability forward information	Default	Do not discard parameter	Do not discard message	Do not send notification	Do not release call	Transit node interpretation	Release call

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