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SERIES Q: SWITCHING AND SIGNALLING

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

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B-ISDN User Part – Support of frame relay

ITU-T Recommendation Q.2727

Superseded by a more recent version

(Previously CCITT Recommendation)

ITU-T Q-SERIES RECOMMENDATIONS

SWITCHING AND SIGNALLING

SIGNALLING IN THE INTERNATIONAL MANUAL SERVICE	Q.1–Q.3
INTERNATIONAL AUTOMATIC AND SEMI-AUTOMATIC WORKING	Q.4–Q.59
FUNCTIONS AND INFORMATION FLOWS FOR SERVICES IN THE ISDN	Q.60–Q.99
CLAUSES APPLICABLE TO ITU-T STANDARD SYSTEMS	Q.100–Q.119
SPECIFICATION OF SIGNALLING SYSTEMS No. 4 AND No. 5	Q.120–Q.249
SPECIFICATIONS OF SIGNALLING SYSTEM No. 6	Q.250–Q.309
SPECIFICATIONS OF SIGNALLING SYSTEM R1	Q.310–Q.399
SPECIFICATIONS OF SIGNALLING SYSTEM R2	Q.400–Q.499
DIGITAL EXCHANGES	Q.500–Q.599
INTERWORKING OF SIGNALLING SYSTEMS	Q.600–Q.699
SPECIFICATIONS OF SIGNALLING SYSTEM No. 7	Q.700–Q.849
DIGITAL SUBSCRIBER SIGNALLING SYSTEM No. 1	Q.850–Q.999
PUBLIC LAND MOBILE NETWORK	Q.1000–Q.1099
INTERWORKING WITH SATELLITE MOBILE SYSTEMS	Q.1100–Q.1199
INTELLIGENT NETWORK	Q.1200–Q.1999
BROADBAND ISDN	Q.2000–Q.2999
General aspects	Q.2000–Q.2099
ATM adaptation layer	Q.2100–Q.2199
Signalling network protocols	Q.2200–Q.2599
Common aspects of B-ISDN application protocols for access signalling and network signalling and interworking	Q.2600–Q.2699
B-ISDN application protocols for the network signalling	**Q.2700–Q.2899**
B-ISDN application protocols for access signalling	Q.2900–Q.2999

For further details, please refer to ITU-T List of Recommendations.

ITU-T RECOMMENDATION Q.2727

B-ISDN USER PART – SUPPORT OF FRAME RELAY

Summary

This Recommendation specifies the usage of the Broadband ISDN User Part for the support of switched frame relay connections over ATM virtual channel connections.

Source

ITU-T Recommendation Q.2727 was prepared 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

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The approval of Recommendations by the Members of the ITU-T is covered by the procedure laid down in WTSC Resolution No. 1.

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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As of the date of approval of this Recommendation, the ITU had/had not received notice of intellectual property, protected by patents, which may be required to implement this Recommendation. However, implementors are cautioned that this may not represent the latest information and are therefore strongly urged to consult the TSB patent database.

CONTENTS

Recommendation Q.2727

B-ISDN USER PART – SUPPORT OF FRAME RELAY

(Geneva, 1996)

1 Overview

1.1 Scope

This Recommendation specifies usage of the Broadband ISDN User Part protocol to support the establishment, maintenance and clearing of B-ISDN call/connections which support Frame Relay service at the Network-Node Interface.

It defines:

– specific message and parameter codings needed for Frame Relay call/connections;

– use of primitives and primitive parameters needed to model Frame Relay call/connections according to the specification model for the B-ISDN User Part;

– related Application Process procedures;

– impact on the Application Service Element; and

– interworking with DSS 2, as specified in Recommendation Q.2933.

The case described in this Recommendation is an end-to-end B-ISDN connection between B-ISDN users, where the protocol in use over the user plane connection is the Frame Relay Service Specific Convergence Sublayer (FR-SSCS).

The B-ISDN Frame Relay service has the following characteristics:

1) it provides bidirectional transfer of Service Data Units across the network with order preserved;

2) the U-plane procedures use the service provided by AAL Type 5 common part on a Virtual Channel Connection (VCC) basis and the Frame Relay SSCS above it. Multiplexing of multiple Frame Relay data link connections uniquely identified by the Data Link Connection Identifier may be performed at the FR-SSCS level.

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] CCITT Recommendation I.233.1 (1991), *Frame mode bearer services: ISDN frame relaying bearer service*.

[2] ITU-T Recommendation I.555 (1993), *Frame relaying bearer service interworking*.

[3] ITU-T Recommendation Q.2933 (1996), *Digital Subscriber Signalling System No. 2 (DSS 2) – Signalling specification for Frame Relay service*.

[4] ITU-T Recommendation Q.2761 (1995), *Functional description of the B-ISDN User Part (B-ISUP) of Signalling System No. 7*.

[5] ITU-T Recommendation Q.2762 (1995), *General functions of messages and signals of the B-ISDN User Part (B-ISUP) of Signalling System No. 7.*

[6] ITU-T Recommendation Q.2763 (1995), *Signalling System No. 7 B-ISDN User Part (B-ISUP) – Formats and codes.*

[7] ITU-T Recommendation Q.2764 (1995), *Signalling System No. 7 B-ISDN User Part (B-ISUP) – Basic Call Procedures*.

[8] ITU-T Recommendation Q.2723.1 (1996), *B-ISDN User Part – Support of additional traffic parameters for sustainable cell rate and quality of service*.

1.3 Abbreviations

This Recommendation uses the following abbreviations.

AAL ATM Adaptation Layer

CEI Connection Element Identifier

IAM Initial Address Message

SSCS Service Specific Convergence Sublayer

2 B-ISDN User Part messages and parameters

2.1 Parameters and parameter subfields

In general, the parameters and parameter subfields defined in Recommendation Q.2763 are used to support Frame Relay connection control. In addition new parameters are required to support Frame Relay connection control. The following parameters and parameter subfield codings are specifically associated with support of Frame Relay connections.

2.1.1 ATM adaptation layer parameters

The format of the ATM adaptation layer parameters parameter field as used by the procedures of this Recommendation is shown in Figure 1.

	8	7	6	5	4	3	2	1
1	1 ext.	Coding standard		Reserved				
2	Further contents as in Rec. Q.2933 starting with octet 5							

Figure 1/Q.2727 – AAL Parameters parameter field

The coding of subfields of the ATM Adaptation Layer Parameters parameter field is described in Recommendation Q.2933.

Coding of the AAL Parameters parameter field for Frame Relay will include selection of AAL Type 5, indication of Forward and Backward Maximum CPCS-SDU size, and selection of Frame Relay SSCS.

2.1.2 Broadband bearer capability

The Broadband bearer capability parameter is shown in Figure 2.

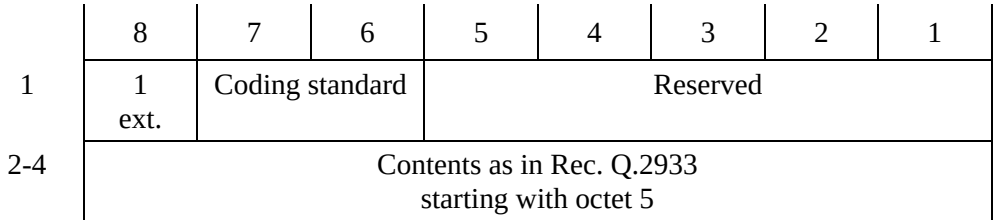

Figure 2/Q.2727 – Broadband bearer capability parameter field

The coding of subfields for Frame Relay call/connections is given in Recommendation Q.2933.

NOTE – An additional octet is included in the Broadband Bearer Capability parameter field for User information layer 2 protocol. A specific bearer class codepoint is allocated for Frame Relay.

2.1.3 Link layer core parameters

The link layer core parameters parameter is coded as shown in Figure 3.

The parameter name code assigned to the link layer core parameters parameter is 01101011.

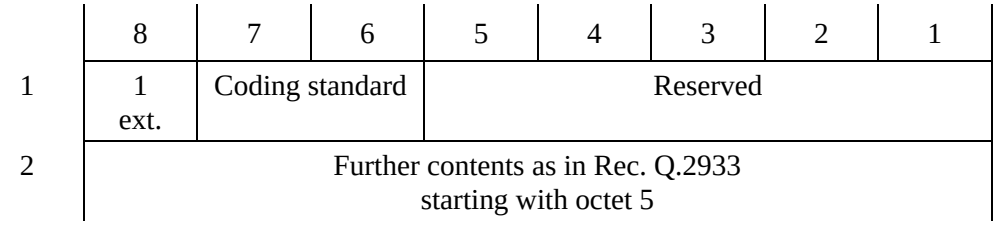

Figure 3/Q.2727 – Link layer core parameters parameter field

The codes to be used in the subfields of the link layer core parameters parameter field are defined in the link layer core parameters information element in Recommendation Q.2933.

2.1.4 Link layer protocol parameters

The link layer protocol parameters parameter is coded as shown in Figure 4.

The parameter name code assigned to the link layer core parameters parameter is 01101100.

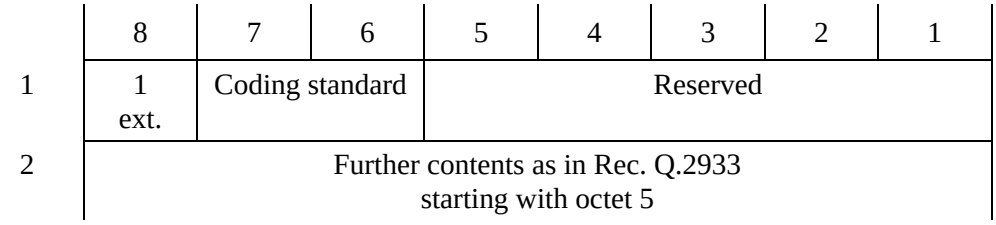

Figure 4/Q.2727 – Link layer protocol parameters parameter field

The codes to be used in the subfields of the link layer protocol parameters parameter field are defined in the link layer protocol parameters information element in Recommendation Q.2933.

2.2 Messages

Messages as in Recommendation Q.2761.4 are used to support Frame Relay call/connections, with the exception of the Subsequent Address Message (SAM), which is not used. In addition, the following tables show the impact of the new parameters on message coding.

2.2.1 IAM

The IAM may contain additional parameters as follows to support Frame Relay. See Table 1.

Table 1/Q.2727 – Additional parameters to be included in the IAM

IAM
Link layer core parameters
Link layer protocol parameters

2.2.2 ANM

The ANM may contain additional parameters as follows to support Frame Relay. See Table 2.

Table 2/Q.2727 – Additional parameters to be included in the ANM

ANM
Link layer core parameters
Link layer protocol parameters

3 Application process procedures

Procedures as in Recommendation Q.2764 apply. In addition, if link layer core parameters parameter or link layer protocol parameters parameter are received, all types of exchanges shall transfer them transparently.

4 Application service elements and primitives

The following primitives of Recommendation Q.2764 are affected by support of frame relay connection control.

4.1 Primitives between SACF and application process

4.1.1 Set_Up request/indication primitive

Table 3 shows parameters that may be added to the Set_Up request/indication primitive.

Table 3/Q.2727 – Parameters for Set_Up request/indication primitive

Set_Up request/indication	B-ISDN
Link layer core parameters	O
Link layer protocol parameters	O

4.1.2 Answer request/indication primitive

Table 4 shows parameters that may be added to the answer request/indication primitive.

Table 4/Q.2727 – Parameters for answer request/indication primitive

Answer request/indication	B-ISDN
Link layer core parameters	O
Link layer protocol parameters	O

4.2 Primitives between CC ASE and SACF

4.2.1 Call_Set_Up request/indication primitive

Table 5 shows new parameters that may be added to the Call_Set_Up request/indication primitive.

Table 5/Q.2727 – Parameters for Call_Set_Up request/indication primitive

Call_Set_Up request/indication
Link layer core parameters
Link layer protocol parameters

4.2.2 Call_Answer request/indication primitive

Table 6 shows parameters that may be added to the Call_Answer request/indication primitive.

Table 6/Q.2727 – Parameters for Call_Answer request/indication primitive

Call_Answer request/indication
Link layer core parameters
Link layer protocol parameters

4.3 ASE descriptions

No changes are required to the ASE descriptions for BCC or CC ASEs.

5 Interworking

5.1 Interworking with CS-1 nodes

CS-1 nodes do not support the Broadband Bearer Capability parameter as defined in this Recommendation and will treat it as unrecognized signalling information. The instruction indicators for the Broadband bearer capability parameter shall be set so as to release the call/connection when interworking with CS-1 nodes.

CS-1 nodes do not support the link layer core parameters parameter and link layer protocol parameters parameter and will treat them as unrecognized signalling information. The instruction indicators for the link layer core parameters parameter and link layer protocol parameters parameter shall be set so as to pass on them when interworking with CS-1 nodes.

The instruction indicators are set as in Recommendation Q.2764 and Appendix I.

5.2 Interworking with ISUP

Frame Relay call/connections are not supported in ISUP and are released at the B-ISUP/ISUP interworking point, with the cause "service not supported".

5.3 Interworking with DSS 2

The following mapping of DSS 2 information elements to B-ISUP parameters is followed in addition to those mappings already shown in Recommendation Q.2650.

SETUP	IAM	SETUP
Link layer core parameters	Link layer core parameters	Link layer core parameters
Link layer protocol parameters	Link layer protocol parameters	Link layer protocol parameters

CONNECT	ANM	CONNECT
Link layer core parameters	Link layer core parameters	Link layer core parameters
Link layer protocol parameters	Link layer protocol parameters	Link layer protocol parameters

APPENDIX I

Setting of instruction indicators

The setting of the instruction indicators for the link layer core parameters parameter is as follows:

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
Discard parameter	Do not discard parameter	Do not discard message	Do not send notification	Do not release call	Transit interpretation	Discard parameter

The setting of the instruction indicators for the link layer protocol parameters parameter is as follows:

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
Discard parameter	Do not discard parameter	Do not discard message	Do not send notification	Do not release call	Transit interpretation	Discard parameter

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