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SERIES Q: SWITCHING AND SIGNALLING

Broadband ISDN – B-ISDN application protocols of the network

B-ISDN User Part – Support of additional traffic parameters for Sustainable Cell Rate and Quality of Service

ITU-T Recommendation Q.2723.1
Superseded by a more recent version

(Previously CCITT Recommendation)

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ITU-T RECOMMENDATION Q.2723.1

B-ISDN USER PART – SUPPORT OF ADDITIONAL TRAFFIC PARAMETERS FOR SUSTAINABLE CELL RATE AND QUALITY OF SERVICE

Summary

This Recommendation specifies extensions to the Broadband ISDN User Part protocol to support additional traffic parameters for sustainable bit rate services and quality of service indications.

Source

ITU-T Recommendation Q.2723.1 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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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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B-ISDN USER PART – SUPPORT OF ADDITIONAL TRAFFIC PARAMETERS FOR SUSTAINABLE CELL RATE AND QUALITY OF SERVICE

(Geneva, 1996)

1 Support of additional traffic parameters for sustainable cell rate and quality of service

1.1 Overview

1.1.1 Scope

This Recommendation specifies extensions to the Broadband ISDN User Part protocol to support additional traffic parameters for the sustainable cell rate parameter set and quality of service indications. These specifications allow for the use of additional traffic parameters beyond the ones already specified by Recommendations Q.2761 to Q.2764 for the B-ISDN basic call at the NNI, in order to support the Broadband Connection-Oriented Bearer services (BCOB) as specified in Recommendation F.811.

It defines:

– new message and parameter coding needed;

– additional primitives and primitive parameters needed to model the new capabilities according to the specification model for the B-ISDN user part defined in Recommendation Q.2764;

– enhancements to the application process procedures; and

– enhancements to the description of the application service element.

1.1.2 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.

– ITU-T Recommendation F.811 (1996), *Broadband connection-oriented bearer service*.

– ITU-T Recommendation I.371 (1996), *Traffic control and congestion control in B-ISDN*.

– ITU-T Recommendation Q.2650 (1995), *Interworking between Signalling System No. 7 Broadband ISDN User Part (B-ISDN) and Digital subscriber Signalling System No. 2 (DSS 2)*.

– ITU-T Recommendation Q.2764 (1995), *Signalling System No. 7 B-ISDN User Part (B-ISUP) – Basic call procedures*.

– ITU-T Recommendation Q.2961 (1995), *Digital subscriber Signalling System No. 2 – Additional traffic parameters*.

1.1.3 Abbreviations

This Recommendation uses the following abbreviations:

AAL	ATM Adaptation Layer
IAM	Initial Address Message
QOS	Quality of Service
SCR	Sustainable Cell Rate
VPCI/VCI	Virtual Path Connection Identifier/Virtual Channel Identifier

1.2 B-ISDN user part messages and parameters

1.2.1 Parameters and parameter subfields

The following new parameters and parameter subfields are required in B-ISUP.

1.2.1.1 Additional ATM cell rate

The format of the Additional ATM cell rate parameter field as used by the procedures of this Recommendation is shown in Figure 1.

The parameter name code allocated to the Additional ATM cell rate parameter is 0101 1010.

	8	7	6	5	4	3	2	1
1	ext.	Forward sustainable cell rate Id. (CLP = 0)						
	1	0	0	0	1	0	0	0
2								
3		Forward sustainable cell rate (CLP = 0)						
4								
5	ext.	Backward sustainable cell rate Id. (CLP = 0)						
	1	0	0	0	1	0	0	1
6								
7		Backward sustainable cell rate (CLP = 0)						
8								
...	ext.	Forward sustainable cell rate Id. (CLP = 0 + 1)						
	1	0	0	1	0	0	0	0
		Forward sustainable cell rate (CLP = 0 + 1)						
i	ext.	Backward sustainable cell rate Id. (CLP = 0 + 1)						
	1	0	0	1	0	0	0	1
i + 1								
i + 2		Backward sustainable cell rate (CLP = 0 + 1)						
i + 3								
m	ext.	Forward maximum burst size Id. (CLP = 0)						
	1	0	1	0	0	0	0	0
m + 1								
m + 2		Forward maximum burst size (CLP = 0)						
m + 3								
	ext.	Backward maximum burst size Id. (CLP = 0)						
	1	0	1	0	0	0	0	1
		Backward maximum burst size (CLP = 0)						
	ext.	Forward maximum burst size Id. (CLP = 0 + 1)						
	1	0	1	1	0	0	0	0
		Forward maximum burst size (CLP = 0 + 1)						
	ext.	Backward maximum burst size Id. (CLP = 0 + 1)						
	1	0	1	1	0	0	0	1
		Backward maximum burst size (CLP = 0 + 1)						

Figure 1/Q.2723.1 – Additional ATM cell rate parameter field

The following codes are used in the subfields of the Additional ATM cell rate parameter field:

a) Extension indicator (ext.)

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

1 last octet

b) Cell rate identifier (octet i)

The following codes are specified:

0001000 Forward sustainable cell rate for cell loss priority = 0

0001001 Backward sustainable cell rate for cell loss priority = 0

0010000 Forward sustainable cell rate for cell loss priority = 0 + 1

0010001 Backward sustainable cell rate for cell loss priority = 0 + 1

0100000 Forward maximum burst size for cell loss priority = 0

0100001 Backward maximum burst size for cell loss priority = 0

0110000 Forward maximum burst size for cell loss priority = 0 + 1

0110001 Backward maximum burst size for cell loss priority = 0 + 1

0111111 reserved (used for traffic management options in Recommendation Q.2961)

Other codepoints are reserved.

NOTE – For details on the use of cell loss priority, see Recommendation I.371.

c) Sustainable cell rate (octets i+1 to i+3)

A code expressing in pure 3 octet integer representation the number of cells per second. Bit 8 of the first octet (e.g. i+1) is the most significant and bit 1 of the third octet (e.g. i+3) is the least significant respectively.

d) Maximum burst size (octets m+1 to m+3)

A code expressing in pure 3 octet integer representation the maximum burst size in cells. Bit 8 of the first octet (e.g. m+1) is the most significant and bit 1 of the third octet (e.g. m+3) is the least significant respectively.

1.2.1.2 Quality of service

This parameter indicates the Quality of Service (QOS) class requested by the user for a connection. QOS classes are defined to allow a network provider to optimize resources in supporting various service classes.

The parameter name code allocated to the QOS parameter is 0101 0011.

The format of the QOS parameter field is shown in Figure 2.

	8	7	6	5	4	3	2	1
1	1 ext.	Coding standard		Reserved				
2	Quality of service class forward							
3	Quality of service class backward							

Figure 2/Q.2723.1 – QOS parameter field

The following codepoints are assigned for the QOS parameter field:

– Coding standard

00 ITU standard codes 01 reserved for ISO/IEC standard codes

10 reserved for national use 11 reserved for network specific use

The following codepoints are assigned for coding standard = 00:

i) Quality of service class forward

00000000 unspecified QOS class

11111111 reserved for future indications of parameterized QOS

ii) Quality of service class backward

See i) above.

All other values are reserved for future use.

1.2.2 Messages

Table 1 shows the impact of the new parameters on message coding.

1.2.2.1 IAM

The following new parameters can be carried in the IAM:

Table 1/Q.2723.1 – Additional parameters to be included in the IAM

IAM
Additional ATM cell rate
Quality of service

1.3 Application process procedures

1.3.1 Additional ATM cell rate parameter

When the originating exchange has received complete information from the calling party and has determined that the call is to be routed to another exchange, route and virtual channel selection take place according to the procedures described in 2.2.1.1/Q.2764. The originating exchange will include the Additional ATM cell rate in the setup request primitive.

At intermediate exchanges, and at the destination exchange, the Additional ATM cell rate is analysed in addition to the ATM cell rate. It is passed on unchanged in the setup request primitive issued.

The ATM cell rate will indicate the peak cell rate of the connection and will always be present. The sustainable cell rate specified in the Additional ATM cell rate parameter must be less than or equal to the peak cell rate specified in the ATM cell rate parameter. Otherwise, the call shall be released.

1.3.2 Quality of service parameter

Additionally, if the QOS information element is present in the SETUP message from the calling party, this is used in the processing of the call. The originating exchange will include the QOS parameter together with other information in the setup request primitive to enable the correct handling of the call at intermediate exchanges. The setup request primitive implicitly confirms that the quality of service requested by the user can be provided.

An intermediate exchange will analyse the QOS parameter in the received setup indication primitive to determine subsequent handling of the call. If the intermediate exchange can process the call, it shall follow the assignment procedure for VPCI/VCI and bandwidth as described in Recommendation Q.2764. It shall pass on unchanged the QOS parameter in the setup request primitive issued.

If the network is not able to provide the requested QOS class, the network shall reject the call. Cause No. 49, "Quality of service unavailable", will be used.

1.4 Application service elements and primitives

The following clause identifies impacts on the B-ISUP application service elements and the primitives exchanged between ASEs as shown in Recommendation Q.2764.

1.4.1 Primitives between SACF and application process

1.4.1.1 Setup request/indication primitive

Table 2 shows new parameters that must be added to the setup request/indication primitive.

Table 2/Q.2723.1 – Parameters for setup request/indication primitive

Setup request/indication	B-ISDN	N-ISDN
Additional ATM cell rate	O	–
Quality of service	O	–

1.4.2 Primitives between BCC, ASE and SACF

1.4.2.1 Link setup request/indication primitive

Table 3 shows new parameters that must be added to the link setup request/indication primitive.

Table 3/Q.2723.1 – Parameters for link setup request/indication primitive

Link setup request/indication
Additional ATM cell rate
Quality of service

1.4.3 ASE descriptions

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

1.5 Interworking

1.5.1 Interworking with CS-1 nodes

CS-1 nodes do not support the Additional traffic parameters defined in this Recommendation and will treat these as unrecognized signalling information. The instruction indicators for the Additional ATM cell rate parameter shall be set so as to cause the call to be processed by a CS-1 intermediate exchange using only the parameters defined in CS-1. The Additional ATM cell rate parameter will be passed transparently at a CS-1 intermediate exchange.

The instruction indicators shall be set so as to cause the call to be released by a CS-1 gateway exchange or destination exchange.

NOTE – The instruction indicators should be set as shown in Appendix I in order to support the correct behaviour.

1.5.2 Interworking with ISUP

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

1.5.3 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.

Table 4/Q.2723.1 – Mapping of DSS 2 information elements to B-ISUP parameters

SETUP	IAM	SETUP
ATM traffic descriptor	Additional ATM cell rate (Note)	ATM traffic descriptor
QOS	QOS	QOS
NOTE – Only the sustained cell rate and maximum burst size subfields of the ATM traffic descriptor information element are mapped to the Additional ATM cell rate parameter. The peak cell rate subfields are mapped to the ATM cell rate parameter as in Recommendation Q.2650.		

APPENDIX I

Setting of instruction indicators

The setting of the instruction indicators for the additional ATM cell rate parameter is as follows:

Parameter	Pass on not possible ind.	Discard parameter ind.	Discard message ind.	Send notification ind.	Release call ind.	Transit at intermed. exchange ind.	Broadband/ narrow-band interworking ind.
Additional ATM cell rate	Release call	Default	Default	Default	Release call	Transit node interpretation	Release call

The setting of the instruction indicators for the QOS parameter is as follows:

Parameter	Pass on not possible ind.	Discard parameter ind.	Discard message ind.	Send notification ind.	Release call ind.	Transit at intermed. exchange ind.	Broadband/ narrow-band interworking ind.
QOS	Discard parameter	Do not discard parameter	Do not discard message	Do not send notification	Do not release call	End node interpretation	Discard parameter

APPENDIX II

Network specific codepoint

The cell rate subfield identifier value "0111110" of the Additional ATM cell rate parameter is reserved for network specific use.

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