



INTERNATIONAL TELECOMMUNICATION UNION

ITU-T

TELECOMMUNICATION
STANDARDIZATION SECTOR
OF ITU

Series Q
Supplement 36
(12/2000)

SERIES Q: SWITCHING AND SIGNALLING

**Technical report TRQ.3030: Operation of the
bearer independent call control (BICC) protocol
(CS-2) with IP bearer control protocol (IPBCP)**

ITU-T Q-series Recommendations – Supplement 36

(Formerly CCITT Recommendations)

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
SPECIFICATIONS 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.799
Q3 INTERFACE	Q.800–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.1699
SIGNALLING REQUIREMENTS AND PROTOCOLS FOR IMT-2000	Q.1700–Q.1799
BROADBAND ISDN	Q.2000–Q.2999

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

Supplement 36 to ITU-T Q-series Recommendations

Technical report TRQ.3030: Operation of the bearer independent call control (BICC) protocol (CS-2) with IP bearer control protocol (IPBCP)

Summary

This Supplement to ITU-T Recommendation Q.1902 describes the general aspects of the operation of the Bearer Independent Call Control (BICC) protocol Capability Set 2 (CS-2) with IP Bearer Control Protocol, used to control IP Bearer Connections.

Source

Supplement 36 to ITU-T Q-series Recommendations was prepared by ITU-T Study Group 11 (2001-2004) and approved under the WTSA Resolution 5 procedure on 6 December 2000.

FOREWORD

The International Telecommunication Union (ITU) is the United Nations specialized agency in the field of telecommunications. The ITU Telecommunication Standardization Sector (ITU-T) is a permanent organ of ITU. 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 Assembly (WTSA), which meets every four years, establishes the topics for study by the ITU-T study groups which, in turn, produce Recommendations on these topics.

The approval of ITU-T Recommendations is covered by the procedure laid down in WTSA Resolution 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 publication, the expression "Administration" is used for conciseness to indicate both a telecommunication administration and a recognized operating agency.

INTELLECTUAL PROPERTY RIGHTS

ITU draws attention to the possibility that the practice or implementation of this publication may involve the use of a claimed Intellectual Property Right. ITU takes no position concerning the evidence, validity or applicability of claimed Intellectual Property Rights, whether asserted by ITU members or others outside of the publication development process.

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

© ITU 2001

All rights reserved. No part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from ITU.

CONTENTS

	Page
1 Scope	1
2 References	1
3 Definitions	2
4 Abbreviations	2
5 Information exchanged between BICC and IPBCP Signalling Entities	3
5.1 Channel Attributes	3
5.1.1 Codec Information	3
5.1.2 Transmission Medium Requirements	4
5.2 Addressing	4
5.3 Binding Information	4
5.4 Cause	4

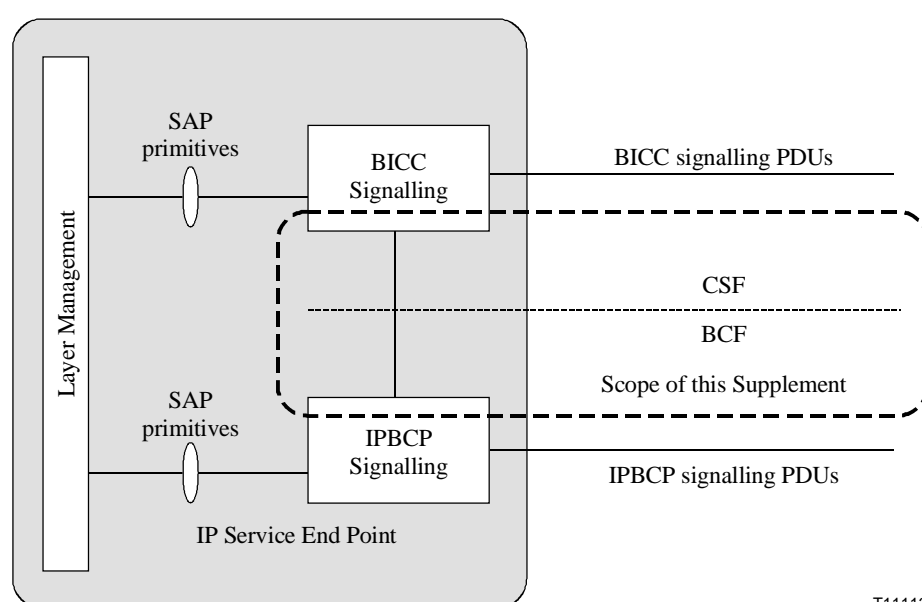
Technical report TRQ.3030: Operation of the bearer independent call control (BICC) protocol (CS-2) with IP bearer control protocol (IPBCP)

1 Scope

This Supplement contains information relevant to the operation of the Bearer Independent Call Control (BICC) Protocol Capability Set 2 (CS-2) [6] and [7], with the IP Bearer Control Protocol [8].

Information which is relevant to be passed between the BICC [6] and [7] signalling entity and the IPBCP [8] signalling entity is identified. The dashed box of Figure 1 shows the scope of this Supplement. Interaction with layer management is outside the scope of this Supplement.

NOTE – The handling of reuse of idle bearer connections is outside the scope of the present Supplement.



T11112920-01

Figure 1 – Scope of this Supplement

2 References

- [1] ITU-T H.248 (2000), *Gateway control protocol*.
- [2] IETF RFC 2327 (1998), *SDP: Session Description Protocol*.
- [3] IETF RFC 1890 (1996), *RTP Profile for Audio and Video Conferences with Minimal Control*.
- [4] ITU-T X.200 (1994), *Information technology – Open Systems Interconnection – Basic Reference Model: The basic model*.
- [5] ITU-T X.210 (1993), *Information technology – Open Systems Interconnection – Basic Reference Model: Conventions for the definition of OSI services*.
- [6] ITU-T Q.765.5 (2000), *Signalling system No. 7 – Application transport mechanism: Bearer independent call control (BICC)*.

- [7] ITU-T Q.1902.x, *Bearer Independent Call Control (CS-2)*.
- [8] ITU-T Q.1970 (2001), *BICC IP Bearer Control Protocol*.
- [9] IETF RFC 1889 (1996), *RTP: A Transport Protocol for Real-Time Applications*.
- [10] ITU-T G.711 (1988), *Pulse code modulation (PCM) of voice frequencies*.
- [11] ITU-T G.722 (1988), *7 kHz audio-coding within 64 kbit/s*.
- [12] ITU-T G.723.1 (1996), *Dual rate speech coder for multimedia communications transmitting at 5.3 and 6.3 kbit/s*.
- [13] ITU-T G.726 (1990), *40, 32, 24, 16 kbit/s adaptive differential pulse code modulation (ADPCM)*.
- [14] ITU-T G.727 (1990), *5, 4, 3 and 2-bit sample embedded adaptive differential pulse code modulation (ADPCM)*.
- [15] ITU-T G.728 (1992), *Coding of speech at 16 kbit/s using low-delay code excited linear prediction*.
- [16] ITU-T G.729 (1996), *Coding of speech at 8 kbit/s using conjugate-structure algebraic-code-excited linear-prediction (CS-ACELP)*.
- [17] ITU-T H.221 (1999), *Frame structure for a 64 to 1920 kbit/s channel in audiovisual teleservices*.
- [18] ITU-T Q.763 (1999), *Signalling system No.7 – ISDN user part formats and codes*.
- [19] ITU-T Q.850 (1998), *Usage of cause and location in the digital subscriber signalling system No. 1 and the signalling system No. 7 ISDN user part*.

3 Definitions

No definitions are introduced for the purpose of this Supplement.

4 Abbreviations

This Supplement uses the following abbreviations:

AVP	Audio/Video Profile
BCF	Bearer Control Function
BICC	Bearer Independent Call Control
CSF	Call Server Function
CS-2	Capability Set 2
IP	Internet Protocol
IPBCP	IP Bearer Control Protocol
PDU	Protocol Data Unit
RTP	Real Time Protocol
SAP	Service Access Point
SDP	Session Description Protocol

5 Information exchanged between BICC and IPBCP Signalling Entities

It is assumed that the format of information passed between the BICC [6] and [7] entity and the IPBCP [8] entity is the same as the format of information passed between two peer BICC [6] and [7] entities. No primitives are defined for this interface

The following clauses list the information passed between the BICC [6] and [7] and IPBCP[8] Signalling Entities. The relevant information relates to:

- 1) Channel Attributes;
- 2) Addressing;
- 3) Binding Information; and
- 4) Cause.

5.1 Channel Attributes

Table 1 identifies the Channel Attributes related information passed from the BICC entity to the IPBCP Signalling entity which are applicable to derive the IP Bearer Control Parameters needed to control the establishment of the IPBCP bearer.

Table 1 – Mapping of Channel Attributes

BICC Signalling Entity [6] and [7]	IPBCP Signalling Entity [8]
Codec Information (Note), or Transmission Medium Requirements (User Service Information) (Note)	SDP Payload (m = audio <port number> RTP/AVP <payload type>)
NOTE – Codec Information is used if present, otherwise the Transmission Medium Requirements are used. When Transmission Medium Requirements equals Speech or 3.1 kHz Audio, then the User Service Information, u/A law indication may also be examined	

5.1.1 Codec Information

Table 2 identifies the Codec type information passed from the BICC entity to the IPBCP Signalling entity which are applicable to derive the RTP/AVP Payload Type which may be used to control the establishment of the IPBCP bearer.

Table 2 – Mapping of Codec Type to RTP/AVP Payload Type

BICC Signalling Entity [6] and [7] Codec Type	IPBCP Signalling Entity [8] Payload Type [2] and [3]
G.711 64 kbit/s A-law	8
G.711 64 kbit/s μ -law	0
G.711 56 kbit/s A-law	Not supported
G.711 56 kbit/s μ -law	Not supported
G.722 (SB-ADPCM)	9
G.723.1	Not supported
Annex A/G.723.1 (silence suppression)	Not supported
G.726 (ADPCM)	Not supported
G.727 (Embedded ADPCM)	Not supported
G.728	15

Table 2 – Mapping of Codec Type to RTP/AVP Payload Type (*continued*)

BICC Signalling Entity [6] and [7] Codec Type	IPBCP Signalling Entity [8] Payload Type [2] and [3]
G.729 (CS-ACELP)	Not supported
Annex B/G.729 (silence suppression)	Not supported
NOTE – The IETF continues to develop new RTP payload type definitions. Therefore for the codecs indicated as "not supported" in the table above, approved RFC's may exist in the future defining RTP payload types for these codecs.	

5.1.2 Transmission Medium Requirements

Table 3 identifies the Transmission Medium Requirements information passed from the BICC entity to the IPBCP Signalling entity which are applicable to derive the RTP/AVP Payload Type which may be used to control the establishment of the IPBCP bearer. This mapping applies only if Codec type information is not available.

Table 3 – Mapping of Transmission Medium Requirements to RTP/AVP Payload Type

BICC Signalling Entity [6] and [7] Transmission Medium Requirements [19]	IPBCP Signalling Entity [8] Payload Type [2] and [3]
64 kbit/s unrestricted	Not supported
64 kbit/s unrestricted preferred	9
3.1 kHz audio	0 or 8 (Note 1)
Speech	0 or 8 (Note 2)
2 × 64	Not supported
384	Not supported
1536	Not supported
1920	Not supported
Multirate (64 kbit/s base rate) 1 < n < 31	Not supported
NOTE 1 – Knowledge of u/A law PCM (payload types 0/8) is based on User Service Information (if present), otherwise on network configuration data.	
NOTE 2 – Knowledge of u/A law PCM (payload types 0/8) is based on User Service Information.	

5.2 Addressing

Addressing related information is not passed between the BICC entity and the IPBCP Signalling entity, as the IPBCP is tunneled via H.248 [1] (if applicable) and BICC [6] and [7].

5.3 Binding Information

Binding related information is not passed between the BICC entity and the IPBCP Signalling entity, as the IP bearer control protocol is tunneled via H.248 [1] (if applicable) and BICC [6] and [7].

5.4 Cause

Table 4 identifies the Cause related information, derived from the IPBCP signalling, which is passed from the IPBCP Signalling entity to the BICC entity to provide the Cause parameter fields giving details on the circumstances of a call being cleared due to an IPBCP bearer establishment failure.

**Table 4 – Mapping of Cause
(IPBCP Signalling Entity to BICC Signalling Entity)**

IPBCP Signalling Entity [8] – Result = Rejected	BICC Signalling Entity [7] – Cause Indicators
NOTE – Location does not exist in IPBCP signalling.	Location [19] = network beyond interworking point (BI)
NOTE – Coding Standard does not exist in IPBCP signalling.	Coding Standard [19] = ITU-T standardized coding
NOTE – Cause value does not exist in IPBCP signalling	Cause value [19] (refer Table 5)

Table 5 identifies the mapping of information received in the IPBCP Signalling, when the result equals rejected and passed by the IPBCP signalling entity to the BICC signalling entity.

Table 5 – Generation of Cause values (IPBCP Signalling to BICC)

IPBCP Signalling Entity [8]	BICC Signalling Entity [7] – Cause value [19]
Rejected Message	47 Resource unavailable, unspecified
Confused Message	127 Interworking, unspecified

There is no Cause related information passed from the BICC entity to the IPBCP Signalling entity, as there is no explicit IPBCP clearing procedure as a result of the call being cleared.

SERIES OF ITU-T RECOMMENDATIONS

Series A	Organization of the work of ITU-T
Series B	Means of expression: definitions, symbols, classification
Series C	General telecommunication statistics
Series D	General tariff principles
Series E	Overall network operation, telephone service, service operation and human factors
Series F	Non-telephone telecommunication services
Series G	Transmission systems and media, digital systems and networks
Series H	Audiovisual and multimedia systems
Series I	Integrated services digital network
Series J	Cable networks and transmission of television, sound programme and other multimedia signals
Series K	Protection against interference
Series L	Construction, installation and protection of cables and other elements of outside plant
Series M	TMN and network maintenance: international transmission systems, telephone circuits, telegraphy, facsimile and leased circuits
Series N	Maintenance: international sound programme and television transmission circuits
Series O	Specifications of measuring equipment
Series P	Telephone transmission quality, telephone installations, local line networks
Series Q	Switching and signalling
Series R	Telegraph transmission
Series S	Telegraph services terminal equipment
Series T	Terminals for telematic services
Series U	Telegraph switching
Series V	Data communication over the telephone network
Series X	Data networks and open system communications
Series Y	Global information infrastructure and Internet protocol aspects
Series Z	Languages and general software aspects for telecommunication systems