INTERNATIONAL TELECOMMUNICATION UNION

ITU-T

TELECOMMUNICATION
STANDARDIZATION SECTOR
OF ITU

Series Q

Supplement 34

(12/2000)

SERIES Q: SWITCHING AND SIGNALLING

Technical report TRQ.2410: Signalling requirements capability set 1 for support of IP bearer control in BICC networks

ITU-T Q-series Recommendations – Supplement 34

(Formerly CCITT Recommendations)

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Supplement 34 to ITU-T Q-series Recommendations

Technical report TRQ.2410: Signalling requirements capability set 1 for support of IP bearer control in BICC networks

Summary

This Supplement to ITU-T Q-series Recommendations is a technical report on the requirements for the Support of Narrowband Services using IP Bearer Technologies. Its scope is limited to the Capability Set 1 requirements common to the bearer control protocol for IP technology (only) for use in BICC CS-2 Networks.

Source

Supplement 34 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.

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Technical report TRQ.2410: Signalling requirements capability set 1 for support of IP bearer control in BICC networks

1 Scope

This Supplement provides requirements for the support of services via IP bearer technologies. Its scope is limited to the Capability Set 1 (CS-1) requirements common to the bearer control protocol for IP technology (only) in BICC Capability Set 2 (CS-2) Networks.

2 References

[1] IETF RFC 1889 (1996), *RTP: A Transport Protocol for Real-Time Applications.*

[2] IETF RFC 1890 (1996), *Profile for Audio and Video Conferences with Minimal Control.*

[3] ITU-T Q-Series – Supplement 16 (1999), *Technical report TRQ.2140: Signalling requirements for the support of narrowband services via broadband transport technologies.*

[4] IETF RFC 2833 (2000), *RTP Payload for DTMF Digits, Telephony Tones and Telephony Signals.*

[5] ITU-T Q-Series – Supplement 31 (2000), *Technical report TRQ. 2141.0: Signalling requirements for the support of narrowband services over broadband transport technologies – capability set 2 (CS-2).*

[6] IETF RFC 2327 (1998), *SDP: Session Description Protocol.*

3 Abbreviations

This Supplement uses the following abbreviations:

BCF	Bearer Control Function
BICC	Bearer Independent Call Control
BNC	Backbone Network Connection
BNC-ID	Backbone Network Connection Identifier
CBC	Call and Bearer Control
CS	Capability Set
CSF	Call Service Function
DTMF	Dual Tone Multi-Frequency
IP	Internetworking Protocol
MFC	MultiFrequency Compelled
QoS	Quality of Service
RFC	Request For Comment
RTCP	Real Time Control Protocol
RTP	Real Time Protocol
TDM	Time Division Multiplex

TMR Transmission Medium Requirement

USI User Service Information

4 Definitions

See Overall Requirements for BICC [5].

5 General Requirements

The BNC-ID needs to be available at both BCF.

The establishment of a bearer shall be performed by a forward flow and backward flow, bound to the call.

The signalling of information on framing control protocols is not required.

The Bearer Control shall support the modification of the bearer as part of the procedures for codec modification, if required. The Bearer Control shall also support the modification of the bearer as part of the procedures initiated by the underlying bearer transport.

The required bandwidth is not required to be signalled horizontally in the IP bearer control. It is assumed that although the required bandwidth may be derived from information such as the TMR, USI and Codec, this will be dealt with below the IP level.

The IP bearer established for the support of narrowband services shall be capable of providing the quality of service of a TDM trunk.

The transfer of bearer control information consists of one or more flows between peer BCF. This flow shall be achieved by the transparent tunnelling of the information in the CBC (vertical interface) and the call control.

The support for the reuse of idle bearers is not applicable to IP.

6 Detailed Requirements

6.1 General

6.1.1 Bearer Information

The following list of bearer information shall be transferred between BCF as bearer information:

- The indication of the use of a framing protocol (e.g. RTP [1]) and associated information,
- The profile [2].

NOTE – The same profile will be used in both directions.

- Media packetization time (optional), as defined in SDP [6].
- An indication for the support of in-band signalling systems (e.g. DTMF, MFC) [4]. Indications for support for all tones and signals defined in [4] shall be optional.
- Transport end point addresses (including port numbers).

6.1.2 Quality of Service

For connectionless bearer types, more than one method of providing quality of service is supported. The call control signalling interacts with the bearer control supported on a BNC type and remains independent of the underlying QoS mechanism.

6.1.3 Connection Types supported

The backbone network shall support symmetric point-to-point BNC connections. In BICC CS-2 Networks, a call can support only one BNC type.

6.1.4 Multi-Connection Support

Support for multiple streams in BICC CS-2 is limited to a single BNC.

6.1.5 Contention resolution

Bearer control is responsible for contention resolution of bearer resource allocation and collisions during connection establishment and connection modification.

6.1.6 Error reporting

All Types of bearer control protocols shall include mechanisms for detecting and reporting signalling procedural errors or other failures to network management.

The detection of errors in the information carried in the bearer control that prevent the successful establishment of a bearer shall be reported to the call control.

7 Signalling Procedures

7.1 Bearer establishment

7.1.1 Successful Establishment of a new bearer

A bearer establishment can be initiated in either direction. A bearer is established by the exchange of information between peer BCF to open two unidirectional streams. A bearer shall be established once sufficient information is received to identify the media required. Inclusion of an indication of support to receive in-band events is optional. Absence or presence of such information shall not cause failure of bearer establishment.

Information specifying the media packetization time of packets sent in the media streams may optionally be included in the IPBCP messages exchanged. If an entity that receives a media stream cannot accept the media packetization time as indicated in a message, it may abort the connection establishment procedure.

7.1.2 Unsuccessful Establishment of a new bearer

Unsuccessful set-up could be detected by bearer control and reported to the call control. The bearer control is only required to report the failure to establish a bearer. No explicit details on the reasons for failure shall be provided.

7.2 Modification of a Bearer

7.2.1 Successful Modification of a Bearer

The bearer control may modify the characteristics of the bearer, based on a request from the call control to modify the codec or due to bearer information such as RTCP reports. The bearer control protocol shall exchange information on the modified bearer with its peer BCF, by the transparent tunnelling of the information in the CBC (vertical interface) and the call control. Inclusion of an indication of support to receive in-band events is optional. Absence or presence of such information shall not cause failure of bearer establishment.

Information specifying the media packetization time of packets sent in the media streams may optionally be included in the IPBCP messages exchanged.

7.2.2 Unsuccessful Modification of a Bearer

If a request for modification of a bearer cannot be performed (e.g. due to insufficient resources), the connection will be maintained. The requesting entity must therefore maintain its previous configuration. If the procedure was invoked by call control, then it must be informed of the failure.

If an entity that receives a media stream cannot accept the media packetization time as indicated in a message, it may abort the connection modification procedure.

7.3 Release of a Bearer

The bearer control shall release a bearer when requested by call control without any exchange of information with the peer BCF. This requirement supports the simultaneous release of call and bearer.

The release of a bearer by the bearer control protocol will be reported to call control.

7.4 Error Handling

Error handling shall be the responsibility of the bearer control protocol.

7.5 Echo Control Procedure

There are no special requirements on the protocol procedures for echo control at the bearer control level.

7.6 Reset

The reset of bearer resources shall be handled by the bearer control.

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Geneva, 2001