

# **COMMON-ISDN-API**

**Version 2.0**

**Part V**

Broadband ISDN

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## 10 BROADBAND ISDN

### 10.1 Overview

To access the extended parameters of broadband ISDN connections, the following **COMMON-ISDN-API** messages (see Part I) have been extended:

Message	Value	Description
<b>CONNECT_REQ</b>	0x02 / 0x80	initiates an outgoing physical connection
<b>CONNECT_IND</b>	0x02 / 0x82	indicates an incoming physical connection
<b>CONNECT_RESP</b>	0x02 / 0x83	response to the indication
<b>CONNECT_ACTIVE_IND</b>	0x03 / 0x82	indicates the activation of a physical connection
<b>ALERT_REQ</b>	0x01 / 0x80	initiates sending of ALERT, i.e. compatibility with call

Table 1: Messages concerning the signaling protocol

Message	Value	Description
<b>LISTEN_REQ</b>	0x05 / 0x80	activates call and info indications
<b>LISTEN_CONF</b>	0x05 / 0x81	local confirmation of the request
<b>FACILITY_REQ</b>	0x80 / 0x80	requests additional facilities (e.g. ext. equipment)
<b>FACILITY_CONF</b>	0x80 / 0x81	local confirmation of the request

Table 3: Administrative and other messages

The extending parameters and structs of these **COMMON-ISDN-API** messages are described below.

## 10.2 Broadband ISDN Parameters

Note:

All **COMMON-ISDN-API** structs coded in accordance with Q.2931/UNI 4.0 start with octet 5 of the Q.2931/UNI4.0 information element.

### Broadband Alert Info (struct)

The parameter has the following structure:

```
struct    Narrowband Bearer Capability (coded in accordance with Q.2931/UNI 4.0)
struct    Narrowband High Layer Compatibility (coded in accordance with Q.2931/UNI 4.0)
```

This information element appears in:

**ALERT\_REQ**

### Broadband Connect Info (struct)

The parameter has the following structure:

```
struct    Broadband Compatibility Information Profile BCIP
struct    AAL Parameters (coded in accordance with Q.2931/UNI 4.0)
struct    ATM Traffic Descriptor (coded in accordance with Q.2931/UNI 4.0)
struct    Broadband Bearer Capability (coded in accordance with Q.2931/UNI 4.0)
struct    Broadband High Layer Information (coded in accordance with Q.2931/UNI 4.0)
struct    Broadband Low Layer Information (coded in accordance with Q.2931/UNI 4.0)
struct    End-to-end Transit Delay (coded in accordance with Q.2931/UNI 4.0)
struct    QOS Parameter (coded in accordance with Q.2931/UNI 4.0)
struct    Transit Network Selection (coded in accordance with Q.2931/UNI 4.0)
```

This information element appears in:

**CONNECT\_REQ**  
**CONNECT\_IND**

Note:

The Transit Network Selection IE doesn't occur in **CONNECT\_IND** because it is only defined in user to network direction. In absence of an application specific QOS Parameter IE the default QOS Parameter IE will be inserted by the CAPI driver because this IE is mandatory.

## Broadband Compatibility Information Profile BCIP (struct)

<a href="#">BCIP AAL value</a>	dword	BCIP, part for ATM adaptation layer
<a href="#">BCIP Bearer value</a>	dword	BCIP, part for broadband bearer capability
<a href="#">BCIP AAL Additional Parameter</a>	struct	Parameters for ATM adaptation layer
<a href="#">BCIP Bearer Additional Parameter</a>	struct	Parameters for broadband bearer capability

This sub-parameter appears in information element:

[Broadband Connect Info](#)

## BCIP AAL Value (dword)

The following AAL values are defined:

BCIP AAL Value	Service	Relation to AAL Parameter
<b>0</b>		no predefined profile
<b>1</b>	<b>AAL voice / AAL 0</b>	AAL Parameter: AAL type: AAL for voice G.711 Coding of AAL Parameter: <0x58, 0x80, 0x00, 0x01, 0x00>
<b>2</b>	<b>AAL 1</b>	AAL Parameter: AAL type: AAL1 Subtype: depending on <i>BCIP AAL Additional Parameter</i> CBR rate: depending on <i>BCIP AAL Additional Parameter</i> Coding of AAL Parameter: <0x58, 0x80, 0x00, 0x05, 0x01, 0x85, 0xXX, 0x86, 0xYY> where 0xXX and 0xYY are taken from <i>BCIP AAL Additional Parameter</i>
<b>3</b>	<b>AAL 2</b>	AAL Parameter: AAL type: AAL2 Coding of AAL Parameter: <0x58, 0x80, 0x00, 0x01, 0x02>
<b>4</b>	<b>AAL 3 / 4</b>	AAL Parameter: AAL type: AAL3 / 4 Coding of AAL Parameter: <0x58, 0x80, 0x00, 0x01, 0x03>
<b>5</b>	<b>AAL 5</b>	AAL Parameter: AAL type: AAL5 Coding of AAL Parameter: <0x58, 0x80, 0x00, 0x01, 0x05>

This sub-parameter appears in parameter:

[Broadband Compatibility Information Profile BCIP](#)

## BCIP Bearer Value (dword)

The following bearer values are defined:

BCIP Bearer Value	Service	Relation to BBC
0		no predefined profile
1	<b>Constant Bit Rate (CBR)</b>	Broadband Bearer Capability: Bearer class: BCOB-A Susceptibility to clipping: not susceptible to clipping User plane configuration: point to point Coding of BBC: <0x5E, 0x80, 0x00, 0x02, 0x81, 0x80> (according Table 1/Q.2961.2 Note 2)
2	<b>Variable Bit Rate (VBR) real time</b>	Broadband Bearer Capability: Bearer class: BCOB-X Susceptibility to clipping: not susceptible to clipping User plane configuration: point to point Traffic type: variable bit rate Timing requirements: end-to-end timing required Coding of BBC: <0x5E, 0x80, 0x00, 0x03, 0x10, 0x89, 0x80> (according Table 1/Q.2961.2 octet 5a BTC9)
3	<b>Variable Bit Rate (VBR) non real time</b>	Broadband Bearer Capability: Bearer class: BCOB-C Susceptibility to clipping: not susceptible to clipping User plane configuration: point to point Coding of BBC: <0x5E, 0x80, 0x00, 0x02, 0x83, 0x80> (according Table 1/Q.2961.2 Note 5)
4	<b>Unspecified Bit Rate (UBR)</b>	Broadband Bearer Capability: Bearer class: BCOB-C Susceptibility to clipping: not susceptible to clipping User plane configuration: point to point Coding of BBC: <0x5E, 0x80, 0x00, 0x02, 0x83, 0x80>  Note: The UBR traffic contract will be forced via an insertion of the "best effort indicator" in the "ATM traffic descriptor". The "best effort indicator" is coded in accordance to UNI 4.0 or, in case of Q.2931, the following ITU related document: <b>[COM11-D1066] Deutsche Telekom (Q13/11): Considerations on the new codepoint Best Effort Indication as a subfield of the Additional ATM cell rate parameter IE in the Q.2723.1, B-ISUP - Support of additional traffic parameters for Sustainable Cell Rate and QoS</b>
5	<b>Available Bit Rate (ABR)</b>	Broadband Bearer Capability: Bearer class: BCOB-X Susceptibility to clipping: not susceptible to clipping User plane configuration: point to point Broadband transfer capability: ABR Coding of BBC: <0x5E, 0x80, 0x00, 0x03, 0x10, 0x8C, 0x80> (according Q.2961.3)

**Note:**

In accordance to Q.2961 there are a some more different codings for identical traffic contracts. The CAPI driver is responsible to accept all legal variations of these codings and reduce them to the applicable "Bearer Value" codepoints. The octet 6 content "Susceptibility to clipping" is not evaluated for "BCIP Bearer Value" reception. So this contents should be ignored.

This sub-parameter appears in parameter:

**Broadband Compatibility Information Profile BCIP**

## BCIP AAL Additional Parameter (struct)

Applicable for AAL 1 (mandatory further contents for AAL 1)

AAL 1 Subtype	byte	Corresponding with octet 6.1 of AAL Parameters IE (Q.2931/UNI 4.0)
AAL 1 CBR rate	byte	Corresponding with octet 7.1 of AAL Parameters IE (Q.2931/UNI 4.0)

**Note:**

Further or "non mandatory" parameters should be coded via native AAL Parameters IE (Q.2931/UNI 4.0).

This sub-parameter appears in parameter:

**Broadband Compatibility Information Profile BCIP**

## BCIP Bearer Additional Parameter (struct)

All additional BCIP speed parameters are represented by the ATM Traffic Descriptor Information Element.

**Applicable for CBR and UBR.**

Forward Peak Cell Rate	dword	Cells per second in transmit direction
Backward Peak Cell Rate	dword	Cells per second in receive direction

The PCR values are coded in conjunction with Cell Loss Priority 0 and 1 (CLP 0+1). For different codings the native ATM Traffic Descriptor IE should be used.

**Applicable for rt-VBR and nrt-VBR.**

Forward Peak Cell Rate	dword	Maximum cells per second in transmit direction
Backward Peak Cell Rate	dword	Maximum cells per second in receive direction
Forward Sustainable Cell Rate	dword	Average cells per second in transmit direction
Backward Sustainable Cell Rate	dword	Average cells per second in receive direction
Forward Max Burst Size	dword	Maximum continuous fast cells in transmit direction
Backward Max Burst Size	dword	Maximum continuous fast cells in receive direction
Traffic Management Options	dword	Bit field, coding as follows: [0]: Tf (tagging forward) [1]: Tb (tagging backward) [2..31]: for further study

If SCR and MBS are coded with 0 (zero) the corresponding octets in the traffic descriptor will be absent. In this case the VBR traffic contracts are specified via PCR only. The PCR values are coded in conjunction with Cell Loss Priority 0 and 1 (CLP 0+1). The SCR and the MBS are coded in conjunction with Cell Loss Priority 0 (CLP 0). For different codings the native ATM Traffic Descriptor IE should be used.



Applicable for ABR.

Forward Peak Cell Rate	dword	Maximum cells per second in transmit direction
Backward Peak Cell Rate	dword	Maximum cells per second in receive direction
Forward Minimum Cell Rate	dword	Minimum cells per second in transmit direction
Backward Minimum Cell Rate	dword	Minimum cells per second in receive direction

The PCR and the MCR values are coded in conjunction with Cell Loss Priority 0 and 1 (CLP 0+1). For different codings the native ATM Traffic Descriptor IE should be used.

**Note:**

The UBR traffic contract will be forced via an insertion of the "best effort indicator" in the "ATM traffic descriptor". The "best effort indicator" is coded in accordance to UNI 4.0 or, in case of Q.2931, the following ITU related document:

[COM11-D1066] Deutsche Telekom (Q13/11): Considerations on the new codepoint Best Effort Indication as a subfield of the Additional ATM cell rate parameter IE in the Q.2723.1, B-ISUP - Support of additional traffic parameters for Sustainable Cell Rate and QoS.

This sub-parameter appears in parameter:

**Broadband Compatibility Information Profile BCIP**

<b>Broadband Activate Info (struct)</b>
---

The parameter has the following structure:

struct	AAL Parameters (coded in accordance with Q.2931/UNI 4.0)
struct	Broadband Low Layer Information (coded in accordance with Q.2931/UNI 4.0)
struct	End-to-end Transit Delay (coded in accordance with Q.2931/UNI 4.0)
struct	Narrowband Bearer Capability (coded in accordance with Q.2931/UNI 4.0)
struct	Narrowband High Layer Compatibility /coded in accordance with Q.2931/UNI 4.0)

This information element appears in:

CONNECT\_RESP  
CONNECT\_ACTIVE\_IND

## Broadband Listen Profile (struct)

The parameter has the following structure:

AAL mask	dword	Bit field, coding as follows: [0]: any match [1]: AAL voice / AAL 0 [2]: AAL 1 [3]: AAL 2 [4]: AAL 3 / 4 [5]: AAL 5 [6..31]: for further study
Bearer mask	dword	Bit field, coding as follows [0]: any match [1]: Constant Bit Rate (CBR) [2]: Variable Bit Rate (VBR) real time [3]: Variable Bit Rate (VBR) non real time [4]: Unspecified Bit Rate (UBR) [5]: Available Bit Rate (ABR) [6..31]: for further study

This structure appears in:

**LISTEN\_REQ**  
**LISTEN\_CONF**

**Note:**

The ATM Traffic Descriptor IE will not impact the compatibility checking except for the UBR “best effort indicator”.

## Broadband Configuration Request (struct)

Broadband configuration type provided:

- 0**                    **Parameter does not apply (coded as structure with a length of 0)**
- 1**                    **Segmentation and reassembly speed calibration:**

Type of value request	dword	0: Peak Cell Rate (PCR) 1: Sustainable Cell Rate (SCR) 2: Maximum Burst Size (MBS) 3: Minimum Cell Rate (MCR)
Direction	dword	0: Transmit (segmentation) 1: Receive (reassembly)
Requested Value	dword	

This sub-parameter appears in parameter:

**Facility Request Parameter**

## Broadband Configuration Information (struct)

Broadband configuration type provided:

### 0 Network and line capabilities:

Broadband Configuration Info	word	0x0000: Success 0x3801: Information not available
Forward speed	dword	Maximum forward speed in cells per second
Backward speed	dword	Maximum backward speed in cells per second
Bearer classes supported	dword	Bit field, coding as follows: [0]: CBR [1]: rt-VBR [2]: nrt-VBR [3]: UBR [4]: ABR [5..31]: for further study

### 1 Segmentation and reassembly speed calibration:

Broadband Configuration Info	word	0x0000: Success 0x3802: Requested speed not supported
Provided nearest lower value	Dword	The nearest lower value which is applicable
Provided nearest higher value	Dword	The nearest higher value which is applicable

If the requested value is exactly capable to the send or receive cell rate, both values are equal.

This sub-parameter appears in parameter:

**Facility Confirmation Parameter**

## 10.3 Extended parameters for Broadband ISDN

### 10.3.1 Usage of Q.931 / ETS 300 102 mapped structures

In many cases broadband ISDN will use structures from the basic CAPI 2.0 architecture which are mapped to information elements of ETS 300 102 / Q.931. This is applicable for all information elements where ETS 300 102 / Q.931 and Q.2931 / ATM Forum UNI 4.0 standards are fully compatible with all codings and codepoints.

### 10.3.2 Extended codepoints and codings for structures defined in Part I

#### B Channel Information (struct)

For Broadband ISDN the parameter *Channel* can also have the following values:

- 5: use broadband extension VPI/VCI allocation (PVC's only)
- 6: use broadband extension connection identifier information element

The struct *B channel information* is coded as follows:

use broadband extension VPI/VCI allocation (PVC's only):

Channel	Word	5: use broadband extension VPI/VCI allocation (PVC's only)
Operation	Word	0: DTE (originate) mode (default value) 1: DCE (answer) mode
VPI	Word	Virtual Path Identifier (for user to network configurations only bits 0..7 are supported)
VCI	Word	Virtual Channel Identifier

The parameter *Operation* defines the mode (DTE or DCE) in which the user-channel protocols (e.g. Q.2110, X.75 or X.25, etc.) are operated.

All needed information like bandwidth, adaptation layer and the traffic descriptor are taken from the BCIP and Q.2931/UNI 4.0 information elements included in the CONNECT\_REQ.

VPI/VCI allocation can be used for PVC's only.

use broadband extension connection identifier information element:

Channel	word	6: use broadband extension <i>connection identifier</i> information element
Connection Identifier	struct	coded in accordance with Q.2931/UNI 4.0

The purpose of the parameter *Connection Identifier* is to identify a VPI/VCI within the interface(s) controlled by these signaling procedures.

## B1 Protocol (word)

For Broadband ISDN the following values are also defined:

- 10: Broadband Extension AAL 1 (also for AAL voice / AAL 0)
- 11: Broadband Extension AAL 2
- 12: Broadband Extension AAL 3 / 4
- 13: Broadband Extension AAL 5

Note 3: For Broadband Extension the default setting is represented by the AAL which is invoked and/or indicated by the Q.2931/UNI 4.0 signalling procedure.

## B2 Protocol (word)

For Broadband ISDN the following value is also defined:

- 13: Q.2110

## B3 Protocol (word)

For Broadband ISDN the following value is also defined:

- 8: Q.2110 extended (see Note 3)

Note 3: Q.2110 is also possible with B3 Protocol 0 (Transparent), but applications must use B3 Protocol 8 (Q.2110 extended) to obtain access to User-User signalling (see parameter NCPI).

## B1 Configuration (struct)

B1 Configuration for B1 protocol 10: Broadband Extension AAL 1 (also for AAL voice / AAL 0):

word	Convergence sublayer protocol	0: Source clock frequency recovery method (default) 1: Structured data transfer method
------	----------------------------------	---

B1 Configuration for B1 protocol 11: Broadband Extension AAL 2:

Coded as an empty struct

B1 Configuration for B1 protocol 12: Broadband Extension AAL 3 / 4:

Coded as an empty struct

B1 Configuration for B1 protocol 13: Broadband Extension AAL 5:

Coded as an empty struct

## B2 Configuration (struct)

B2 Configuration for B2 protocol 13: Q.2110:

Byte	Reserved	Coded as 0
Byte	Reserved	Coded as 0
Byte	Reserved	Coded as 0
Word	Window Size	window size (default: implementation dependent) Note: In accordance to Q.2130 "7.8.1 Credit and peer-to-peer flow control" ... "The process by which a receiver entity determines credit is not subject to standardization, but is related to the buffer availability and the bandwidth/delay of the connection."
Word	Maximum CC	maximum number of BGN,END,ER and RS retransmissions (default: 4 in accordance to Q.2130)
Word	Maximum PD	maximum number of sended SDU's before sender polls the receive state (default: 25 in accordance to Q.2130)
Dword	Maximum SDU size	1..65531 (default: 4096 in accordance to Q.2130)
Dword	Maximum UU size	depends on maximum CAPI message size 1..65527 (default: 4096 in accordance to Q.2130)

## B3 Configuration (struct)

B3 Configuration for B3 protocol 8: Q.2110 extended :

Coded as an empty struct

## Facility Selector (word)

For Broadband ISDN the following value is also defined:

**6                      Broadband Extensions**

## Facility Request Parameter (struct)

Facility selector:

**6                      Broadband Extensions:**

Broadband configuration type request	dword	<b>0:</b> Network and line capabilities <b>1:</b> Segmentation Speed calibration
<a href="#">Broadband Configuration Request</a>	struct	Broadband configuration request

## Facility Confirmation Parameter (struct)

Facility selector:

### 6 Broadband Extensions:

Broadband configuration type provided	dword	<b>0:</b> Network and line capabilities <b>1:</b> Segmentation Speed calibration
Broadband Configuration Information	struct	Broadband configuration information

## Info Mask (dword)

The meaning of bit 8 has changed in case of Broadband ISDN:

Bit 8      Connection Identifier (broadband): identifies the used VPI/VCI of a call. The *info element* parameter of the corresponding INFO\_IND message contains the *connection identifier* information element as defined in Q.2931/UNI 4.0

## NCPI (struct)

NCPI for B3 protocol 8: Q.2110 extended:

UU-Contents	Byte	UU data content of appropriate Q.2110 protocol messages
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## **10.4 Broadband usage for narrowband applications**

Narrowband applications will get legacy support by using the capability's they have requested. While an ISDN channel is represented as CBR 64 kbit/s, all narrowband applications get exact this capability's on the broadband network. Advanced mappings are manufacturer specific.