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SERIES Q: SWITCHING AND SIGNALLING

Specifications of Signalling System No. 7 – ISDN user part

Signalling system No. 7 – Application transport mechanism: Bearer Independent Call Control (BICC)

ITU-T Recommendation Q.765.5

(Formerly CCITT Recommendation)

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

ITU-T Recommendation Q.765.5

Signalling system No. 7 – Application transport mechanism: Bearer Independent Call Control (BICC)

Summary

This Recommendation describes the extensions required for the transport of bearer-related information associated with the Bearer Independent Call Control (BICC) as defined in ITU-T Q.1901. The BICC is used to manage the call control instance that has been separated from the bearer control instance. The BICC needs to transport bearer-related information between call control instances. The Application Transport Mechanism (APM, see ITU-T Q.765) will be used for this purpose. This Recommendation specifies the APM-user to support the transport of the bearer-related information for the BICC.

Source

ITU-T Recommendation Q.765.5 was prepared by ITU-T Study Group 11 (1997-2000) and approved under the WTSC Resolution 1 procedure on 15 June 2000.

FOREWORD

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The World Telecommunication Standardization Conference (WTSC), 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 WTSC 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 Recommendation, the expression "Administration" is used for conciseness to indicate both a telecommunication administration and a recognized operating agency.

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CONTENTS

ITU-T Recommendation Q.765.5

Signalling system No. 7 – Application transport mechanism: Bearer Independent Call Control (BICC)

1 Scope

This Recommendation describes the extensions required for the transport of bearer-related information associated with the Bearer Independent Call Control (BICC) [3]. The BICC is used to manage the call control instance that has been separated from the bearer control instance. The BICC needs to transport bearer-related information between call control instances. The Application Transport Mechanism (see [1] and [3]) will be used for this purpose. This Recommendation specifies the APM-user to support the transport of the bearer-related information for the BICC.

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] ITU-T Recommendation Q.765 (2000), *Signalling System No. 7 – Application transport mechanism.*

[2] ITU-T Recommendation Q.1400 (1993), *Architecture framework for the development of signalling and OA&M protocols using OSI concepts.*

[3] ITU-T Recommendation Q.1901 (2000), *Bearer independent call control protocol*.

[4] ITU-T Recommendation X.213 (1995) | ISO/IEC 8348:1996, *Information technology – Open Systems Interconnection – Network service definition,* plus Amendment 1 (1997): *Addition of the Internet protocol address format identifier*.

3 Definitions

This Recommendation defines the following terms:

3.1 bearer independent call control (BICC): The term Bearer Independent Call Control is used to refer to the application of the narrow-band ISDN User Part as defined in the Scope of ITU-T Q.1901 [3].

3.2 call mediation node (CMN): A functional entity which provides call service functionality without an associated bearer control function entity.

3.3 gateway serving node (GSN): A functional entity which provides gateway functionality between two network domains. This functional entity contains the call service gateway function, and one or more bearer interworking functions. GSNs interact with other GSNs, in other backbone network domains, and other ISNs and TSNs within its own backbone network domain.

3.4 interface serving node (ISN): A functional entity which provides the interface with SCNs. This functional entity contains the call service nodal function, and one or more bearer interworking functions which interact with the SCN and its peers within the backbone network.

3.5 serving node (SN): A functional entity that is either an ISN, a GSN or a TSN.

3.6 switched circuit network (SCN): Generic term for any network that uses circuit switching technology, i.e. ISDN, PSTN, PLMN, etc.

3.7 transit serving node (TSN): A functional entity which provides transit functionality between two SNs. This functional entity contains the call service transit function, and supports one or more bearer interworking functions. TSNs interact with other TSNs, GSNs and ISNs within their own backbone network domain.

4 Abbreviations

This Recommendation uses the following abbreviations:

AE	Application Entity
AEI	Application Entity Invocation
AP	Application Process
APM	Application Transport Mechanism
APM-user	Application Transport Mechanism User Application
APP	Application Transport Parameter
ASE	Application Service Element
ATII	Application Transport Instruction Indicator
BAT	Bearer Association Transport
BICC	Bearer Independent Call Control
CMN	Call Mediation Node
EH	Errors Handling
GSN	Gateway Serving Node
IAM	Initial Address Message
ISDN	Integrated Services Digital Network
ISN	Interface Serving Node
ISUP	ISDN User Part
LE	Local Exchange
LSB	Least Significant Bit
M/O	Mandatory/Optional
MACF	Multiple Association Control Function
MSB	Most Significant Bit
NI	Network Interface
NNI	Network Node Interface
PAN	Public Addressed Node
PIN	Public Initiating Node
SACF	Single Association Control Function
SAO	Single Association Object

SCN Switched Circuit Network

SN Serving Node

TE Transit Exchange

TSN Transit Serving Node

5 Conventions

For the purpose of this Recommendation, the following conventions apply:

1) The name of each element of the following classes of terms is capitalized:
   - indicators;
   - parameters;
   - identifiers;
   - information elements;
   - methods/functions.

   Example: Backbone Network Connection Identifier information element.

2) For the name and the type of a service primitive, the following applies:
   - the name is capitalized;
   - the type is separated from the name by "."

   Example: BICC_Data.request primitive.

3) The definition of a parameter value is written in *italics* and is put between quotation marks.

   Example: "*BAT ASE*".

6 Recommendation structure

The description of the BICC procedures in this Recommendation is structured according to the model described in 7.2. The description is thus divided into two main parts:

- Protocol functions.
- Non-protocol functions, i.e. exchange nodal functions; this is referred to as the "Application Process".

This Recommendation describes only the part of the total Application Process and Protocol functions in the exchange that relates to NNI enhancements for the support of the transport of bearer-related information for BICC.

The signalling association is subdivided into three parts: Bearer Association Transport (BAT ASE), Application Transport Mechanism (APM ASE) and BICC ASE. These are coordinated by the Single Association Control Function (SACF).

The Application Process (AP) contains all Call Control functions; however, this Recommendation will only describe the enhancements required to support the Bearer Independent Call Control. The Application Process relevant BICC functionality can be found in [3].

The service primitive technique, used to define the ASEs and the SACF specific to the application's signalling needs is a way of describing how the services offered by an ASE, or SACF – the provider of (a set) of service(s) – can be accessed by the user of the service(s) – the SACF or the Application Process (AP), respectively.

The service primitive interface is a conceptual interface and is not a testable or accessible interface. It is a descriptive tool. The use of service primitives at an interface does not imply any particular

implementation of that interface, nor does it imply that an implementation must conform to that particular service primitive interface to provide the stated service. All conformance to the BICC specifications is based on the external behaviour at a node, i.e. on the generation of the correct message structure (as specified in [1] and [3])/operation structure (as specified in this Recommendation) and in the proper sequence (as specified in [3] and in this Recommendation).

The structure and examples of its usage are illustrated in 7.2.

The relationship between the existing ISDN network functionality and the Application Transport Mechanism service provided by the public NNI (BICC) is described as a network model in 7.1.

7 Modelling

The models described in this clause introduce concepts and terminology used in this specification of the BICC use of the capability of the Application Transport Mechanism (APM).

7.1 Network model

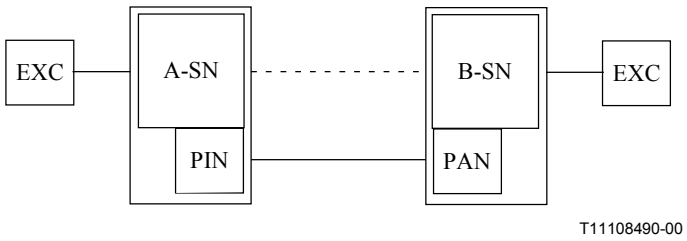

Figure 1/Q.765.5 – BICC Network Topology

This clause provides an illustration of the use of the APM in the support of BICC. The APM provides the means to transport BICC specific information needed for the establishment of bearer connections across a core bearer network and the binding between the call control instance and the bearer control instance(s).

Figure 1 shows an example of a network topology for the BICC (additional configurations are possible that include CMNs). A-SN is the incoming SN and B-SN is the outgoing SN. The SN exchanges are connected to other network exchanges (EXC) which may be ISDN exchanges within the existing narrow-band PSTN network with an ISUP interface to the SN or other SNs with a BICC interface.

The Public Initiating Node (PIN) and Public Addressed Node (PAN) concept is introduced in [1] to assist in the description of the APM. The PIN represents the point in the network where an APM-user, in this case BICC, wishes to initiate communications towards a peer APM-user. Since the APM implicit addressing mechanism (see [1]) is used for the BICC, the Public Addressed Node (PAN) is the next node in the call path supporting the BAT-ASE.

The call flow examples that illustrate the use of the APM may be found in ITU-T Q.1901 [3].

7.2 Specification model

7.2.1 Introduction

The model used to structure the description of BICC application procedures is based on the OSI Application Layer Structure (ALS) model (see [2]). This clause presents the model, gives a general description of its operation and shows the generalized model for the "Exchange Application Process"

for the support of BICC. It shows how the application makes use of the Application Transport Mechanism (APM) which is described in detail in [1] and [3].

7.2.2 General model

The generalized model for the BICC Process is shown in Figure 2. This figure does not represent the situation at any specific point during a call, but instead it shows the full picture of the architecture. The specific application of this model is discussed below. Figure 2 shows the primitive interfaces between the functional blocks, as used in the body of this Recommendation for calls using BICC.

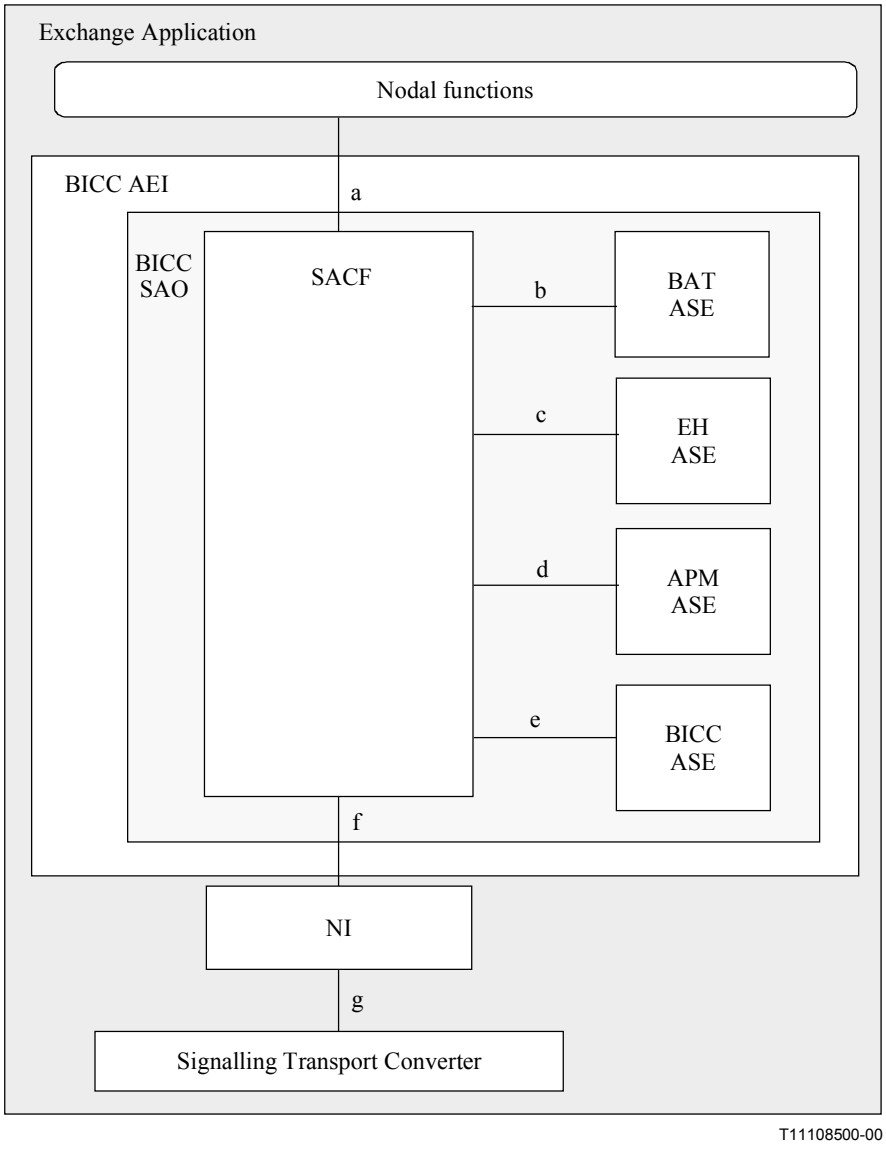

Figure 2/Q.765.5 – BICC specification model

With respect to Figure 2, all functions also have an interface to a "Maintenance application"; this is not defined as a formal primitive interface.

The term "Exchange Application Process" is used to describe all the Application functionality in an exchange. BICC is a part of the Exchange Application Process. Thus the BICC Nodal functions shown on the model are referred to as the BICC Application Process functions in the body of this Recommendation.

The APM ASE, and EH ASE are described in detail in [1] and [3].

The BICC AEI and BICC ASE are similar to the ISUP AEI and ISUP ASE. The ISUP AEI and ISUP ASE are described in detail in [1].

NOTE – Further clarifications about the BICC protocol modelling and relationships between BICC AEI, BICC ASE and ISUP AEI, ISUP ASE are given in [3].

The BAT ASE is a user of the services offered by the APM ASE. It is responsible for preparing the bearer-related information in a form that can be transported by the public Application Transport Mechanism (APM).

The SACF has the responsibility of coordinating the flow of primitives between its interfaces in the appropriate manner.

To handle any particular BICC function, the Exchange Application Process creates an instance of the required BICC Nodal functions. The AP will create instances, as required, of the BICC AEI. The Network Interface (NI) function exists to distribute messages received via the Signalling Transport Converter to the appropriate instance of the BICC AEI. There is only one instance of the NI in an exchange. The NI is described in detail in [1] and [3].

The SAO contained in the BICC AE is one of the following types:

a) *Public Initiating Node*

This contains:

- Outgoing BICC ASE, Initiating APM ASE, Initiating EH ASE, Outgoing BAT ASE and BICC SACF.

b) *Public Addressed Node*

This contains:

- Incoming BICC ASE, Addressed APM ASE, Addressed EH ASE, Incoming BAT ASE and BICC SACF.

7.2.3 Signalling Flows

Figures 3 and 4 illustrate the dynamic primitive flows for a BICC call over the BICC for the case that a call control message is coincident with the application information flow. Figure 3 shows the case when a message is being sent, Figure 4 shows the case when a message is being received.

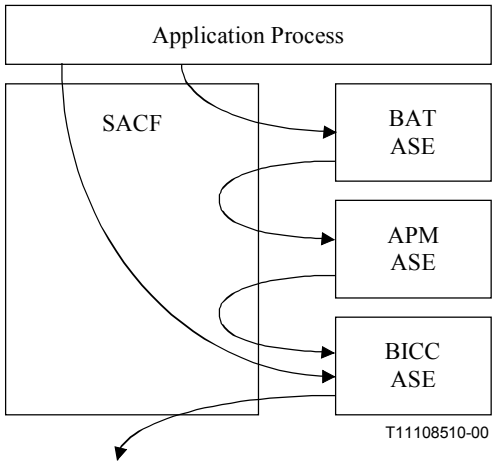

Figure 3/Q.765.5

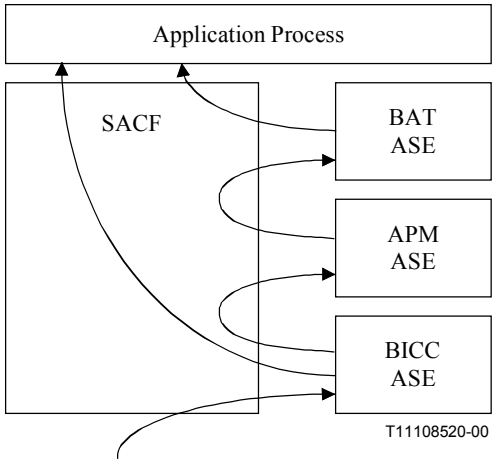

Figure 4/Q.765.5

Figures 5 and 6 illustrate the dynamic primitive flows for the BICC support where no call control messages are sent coincidently. That is, the APM ASE initiates a primitive towards the BICC ASE which in turn sends an APM message which will provide a mechanism for supporting the information flows.

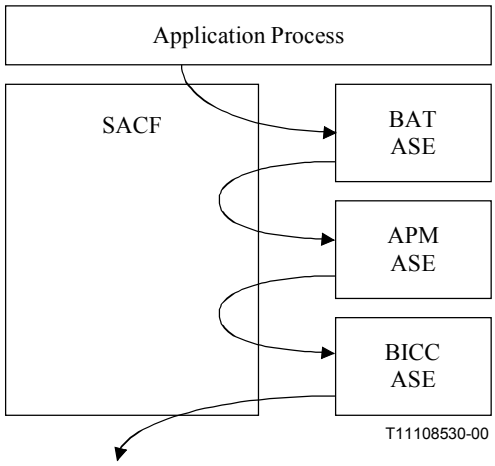

Figure 5/Q.765.5

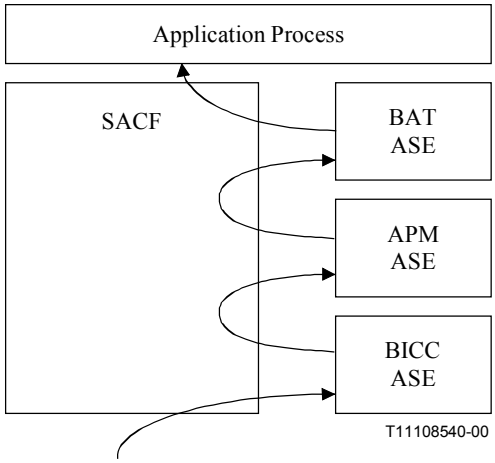

Figure 6/Q.765.5

8 BICC Application Process Functions

8.1 Introduction

The modelling of the Application Process (AP) is outside the scope of this Recommendation. However, in order to appreciate the role of the AP for the purposes of this Recommendation, this clause describes the service primitive interface between the AP and the BICC SACF.

NOTE – This Recommendation specifies the APM-user to support the transport of the bearer-related information for the BICC. The Application Process functions relating to the handling of the bearer are outside the scope of this Recommendation. These AP-functions are specified in [3] and the relevant bearer specific Supplement.

8.2 Primitive interface (AP – BICC SACF)

The primitive interface [interface (a) in Figure 2] between the AP and the BICC SACF consists of primitives required to support the public network basic call functionality, and those to support the BICC functionality. The primitives related to the public network functionality are outside the scope of this Recommendation, although references are made to them through functional inferences within the text. The public basic call (see [3]) is not described using ALS concepts, hence the need for functional inferences to the public basic call functionality rather than specific references to primitives. The primitives related to the BICC functionality providing the interface between this Recommendation and ITU-T Q.1901 [3] are described in this Recommendation, see Table 1 and 8.3.

Table 1/Q.765.5 – Primitives between AP and BICC SACF

Primitive name	Types	Direction (Note)
BICC_Data	Indication/Request	➔/🡐
BICC_Error	Indication	➔
NOTE – Primitive flow from SACF to AP: ➔ Primitive flow from AP to SACF: 🡐		

8.3 Primitive contents

Tables 2 and 3 contain the list of parameters in the primitives of Table 1.

Mandatory/Optional (M/O) indications are provided as well as a reference for a detailed description of the parameters.

Table 2/Q.765.5 – Contents of the BICC_Data Ind/Req primitive

Parameter	Mandatory/Optional	Reference
ATII	M	See [3]
Action Indicator	O	See 11.1
Backbone Network Connection Identifier	O	See 11.1
Interworking Function Address	O	See 11.1
Codec List	O	See 11.1
Single Codec	O	See 11.1
BAT Compatibility Report	O	See 11.1
Bearer Network Connection Characteristics	O	See 11.1

Each parameter (except ATII) is accompanied by compatibility information, see [3] and 11.1.

Table 3/Q.765.5 – Contents of the BICC_Error Ind primitive

Parameter	Mandatory/Optional	Reference
Error Notification	M	See 10.2.1.2 and 10.2.1.3

9 Single Association Control Function (SACF) – BICC SACF

9.1 Introduction

The main objective of BICC SACF is to receive/deliver primitives from/to the appropriate entity and to perform a distribution function where appropriate for the BICC AEI. The flow of information is from the AP [interface (a) in Figure 2] towards NI [interface (f) in Figure 2] or vice versa, therefore the SACF is also responsible to ensure that when multiple primitives are generated by the ASEs towards the AP, they are delivered across the interface together to ensure the correct associations are maintained. The SACF described here only defines the mapping and functions related to the BICC support of BICC aspects of the model. The SACF functionality related to the public APM functionality is outside the scope of this Recommendation. The mapping of primitives in Tables 4 and 7 are in [1] and are included here for informative purposes only.

9.2 Information flows related to messages sent by the node

On receipt of a primitive (request or response) from the Application Process (AP) [interface (a) in Figure 2], the SACF issues appropriate primitive(s) to the ASEs, populating the parameters in the generated primitives from the appropriate subset of the parameters received from the AP. The SACF also performs distribution of the responding primitives received from the ASEs prior to sending the resulting primitive to NI [interface (f) in Figure 2].

Table 4/Q.765.5 – Mapping between BAT ASE and APM ASE primitives

Interface (b), from BAT ASE	Interface (d), APM ASE
APM_U_Data	APM_Data

Table 5/Q.765.5 – Mapping between AP and BAT ASE primitives

Interface (a), from AP	Interface (b), BAT ASE
BICC_Data	BICC_Data

9.3 Information flows related to messages received by the node

These procedures are described in [1] where the APM-user ASE corresponds with the BAT ASE.

Table 6/Q.765.5 – Mapping between BAT ASE and AP primitive

Interface (b), BAT ASE	Interface (a), from AP
BICC_Data	BICC_Data
BICC_Error	BICC_Error

Table 7/Q.765.5 – Mapping between APM ASE and BAT ASE primitives

Interface (d), from APM ASE	Interface (b), BAT ASE
APM_Data	APM_U_Data

Table 8/Q.765.5 – Mapping between EH ASE and BAT ASE primitives

Interface (c), from EH ASE	Interface (b), BAT ASE
APM_Error	APM_U_Error

10 BAT ASE

The BAT ASE is responsible for preparing the information in the appropriate form that can be passed to the APM for transportation.

10.1 Primitive interface

Table 9 lists the primitive interface between the BAT ASE and BICC SACF, [interface (b) in Figure 2].

Table 9/Q.765.5 – Primitives between BICC SACF and BAT ASE

Primitive name	Types	Direction (Note)
APM_U_Data	Indication/Request	➔/➔
APM_U_Error	Indication	➔
BICC_Error	Indication	➔
BICC_Data	Indication/Request	➔/➔
NOTE – Primitive flow from SACF to BAT ASE: ➔ Primitive flow from BAT ASE to SACF: ➔		

10.2 Signalling procedures

10.2.1 Public Initiating Node

10.2.1.1 Sending procedures

On reception of the BICC_Data.request primitive, its contents are prepared in the appropriate format and the Context identifier value is set to "*BAT ASE*". The result is sent in the APM_U_Data.request primitive.

10.2.1.2 Receiving procedures

On reception of the APM_U_Data.indication primitive, its contents are checked for correct format and coding.

If an information element passes this check, it is added to the BICC_Data.indication primitive.

If an information element fails this check, the information element and the related problem report (indicating "*unrecognized information*") is added to the BICC_Error.indication primitive.

NOTE – If the top level information element is of "constructor" type, then it is handled as a single entity.

Once all information elements have been analysed, the BICC_Data.indication primitive and/or the BICC_Error.indication primitive shall be sent.

10.2.1.3 APM_U_Error Primitive

On reception of the APM_U_Error.indication primitive, the contents should be passed unchanged in the BICC_Error primitive.

10.2.2 Public Addressed Node

See 10.2.1.

10.2.3 Signalling congestion

In order to avoid congestion in the signalling network, it is necessary that applications that contribute signalling load towards a congested destination limit their signalling traffic in a controlled manner. The congestion control procedures are outside the scope of this Recommendation. Refer to [3].

10.3 Primitive contents

Tables 10 and 11 list the mandatory and optional contents for the BAT ASE service primitives. These primitives are defined in [1] and are included here for informative purposes only.

The contents of the BICC_Error and BICC_Data primitives defined at the AP/SACF interface (Table 1) are described in 8.3.

Mandatory/Optional (M/O) indications are provided.

NOTE – In the context of BAT, implicit addressing is used, see [1] and [3].

Table 10/Q.765.5 – Contents of the APM_U_Data Ind/Req primitive

Parameter	Mandatory/Optional
Application Context Identifier	M
Application Transport Instruction Indicators	M
Application Data	M

Table 11/Q.765.5 – Contents of the APM_U_Error Ind primitive

Parameter	Mandatory/Optional
Notification	M

11 BICC Transport – Formats and codes of application data

11.1 Encapsulated Application Information

11.1.1 General layout

The general layout of the Encapsulated Application Information field of the Application Transport parameter (see [1] and [3]) is shown in Figure 7.

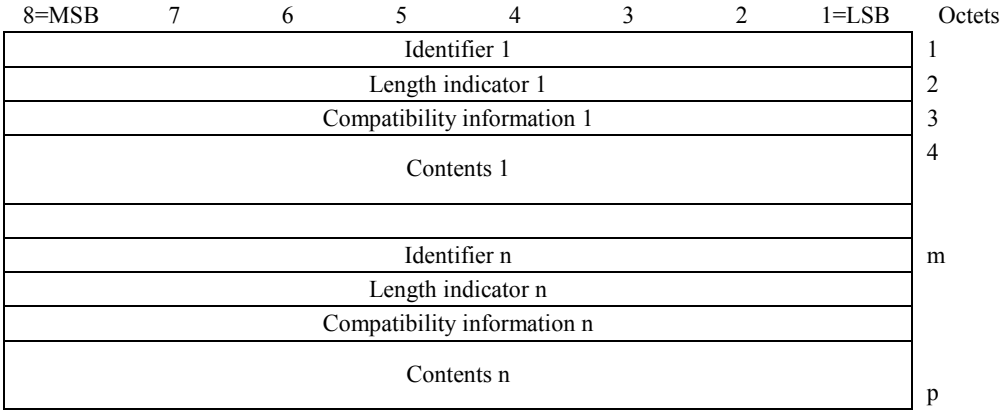

Figure 7/Q.765.5 – Encapsulated Application Information field

Each information element within the Encapsulated Application Information field has the same structure. An information element consists of four fields which always appear in the following order: Identifier (one octet), Length indicator, Compatibility information, Contents.

The Identifier distinguishes one type from another one and governs the interpretation of the contents. There are two types of Identifiers: type "constructor", and type "simple". In case of "constructor", the Contents field shall again consist of one or more information elements, each of which is structured as described above, i.e. Identifier, Length indicator, Compatibility information, Contents. In case of "simple", the Contents field contains one value only.

When passing on an information element of type "constructor", the order of the information elements within this "constructor" shall be maintained.

The Length indicator specifies the length (i.e. integral number of octets in pure binary representation) of the Compatibility information and Contents. The length does not include the Identifier, nor the Length indicator. The format of the Length indicator is shown in Figure 8. Bit 8 is defined as Extension indicator and indicates whether or not the information on the length continues through the next octet. Value "*0*" of the Extension indicator means "*information continues through the next octet*", while value "*1*" means "*last octet*". The Length indicator itself has a maximum length of 2 octets, i.e. if octet 1a is needed, the Extension indicator of octet 1a is always set to value "*1*".

8	7	6	5	4	3	2	1	Octets
ext.							LSB	1
ext. 1	0	0	0	MSB				1a

Figure 8/Q.765.5 – Length indicator

The Compatibility information contains corresponding instructions for the case that the received information element is unrecognized. The format of this field is shown in Figure 9.

8	7	6	5	4	3	2	1	Octet
ext.	pass-on not possible			reserved	general action			1
	send notification indicator	instruction indicator			send notification indicator	instruction indicator		

Figure 9/Q.765.5 – Compatibility information

The following codes are used in the subfields of the Compatibility information field.

a) Bits

2 1 *Instruction indicator for general action*

0 0 Pass on information element

0 1 Discard information element

1 0 Discard BICC data

1 1 Release call

b) Bit

3 *Send notification indicator for general action*

0 Do not send notification

1 Send notification

c) Bit

4 reserved

d) Bits

6 5 *Instruction indicator for pass-on not possible*

0 0 Release call

0 1 Discard information element

1 0 Discard BICC data

1 1 reserved (interpreted as 00)

e) Bit

7 *Send notification indicator for pass-on not possible*

0 Do not send notification

1 Send notification

f) Bit

8 *Extension indicator*

0 Information continues through the next octet

1 Last octet

The Contents field is the substance of the element and contains the information the element is intended to convey.

11.1.2 List of Identifiers

Table 12 contains the list of Identifiers.

Table 12/Q.765.5 – List of Identifiers

Value	Information Element Name	Type	Reference
0000 0000	spare	–	–
0000 0001	Action Indicator	simple	11.1.3
0000 0010	Backbone Network Connection Identifier	simple	11.1.4
0000 0011	Interworking Function Address	simple	11.1.5
0000 0100	Codec List	constructor	11.1.6
0000 0101	Single Codec	simple	11.1.7
0000 0110	BAT Compatibility Report	simple	11.1.8
0000 0111	Bearer Network Connection Characteristics	simple	11.1.9
0000 1000 to 1101 1111	spare	–	–
1110 0000 to 1111 1111	reserved for national use	–	–
NOTE – The use and the meaning of these information elements are bearer specific and are specified in the Supplement 23 to Q-Series Recommendations.			

11.1.3 Action Indicator

The format of the Action Indicator is shown in Figure 10.

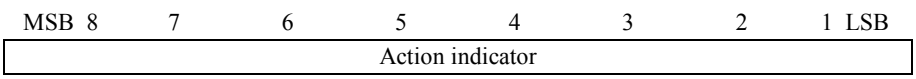

Figure 10/Q.765.5 – Action Indicator

The following codes are used in the Action Indicator field:

0000 0000	no indication
0000 0001	connect backward
0000 0010	connect forward
0000 0011	connect forward, no notification
0000 0100	connect forward, plus notification
0000 0101	connect forward, no notification + selected codec
0000 0110	connect forward, plus notification + selected codec
0000 0111	use idle
0000 1000	connected
0000 1001	switched
0000 1010	selected codec
0000 1011	modify codec
0000 1100	successful codec modification
0000 1101	codec modification failure
0000 1110 to 1101 1111	spare
1110 0000 to 1111 1111	reserved for national use

11.1.4 Backbone Network Connection Identifier

The format of the Backbone Network Connection Identifier is shown in Figure 11.

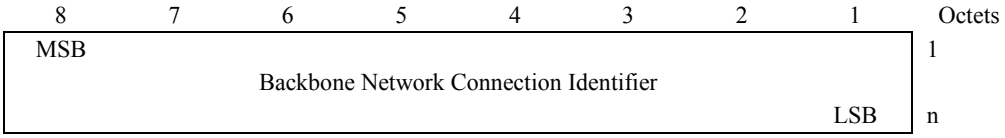

Figure 11/Q.765.5 – Backbone Network Connection Identifier

The contents of the Backbone Network Connection Identifier is bearer specific and is specified in the relevant Supplement 23 to Q-Series Recommendations. The maximum length of this field is 4 octets.

11.1.5 Interworking Function Address

The format of the Interworking Function Address is shown in Figure 12.

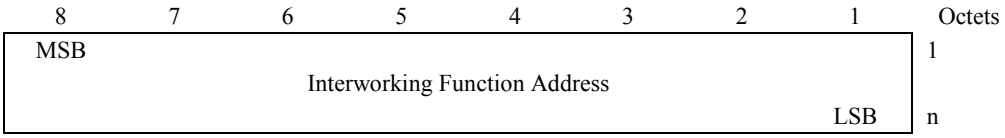

Figure 12/Q.765.5 – Interworking Function Address

The Interworking Function Address is in NSAP format according to Annex A of ITU-T X.213 and its Amendment 1 [4].

NOTE – Other formats may be defined in bearer specific documents in future.

11.1.6 Codec List

11.1.6.1 Format

The format of the Codec List is shown in Figure 13.

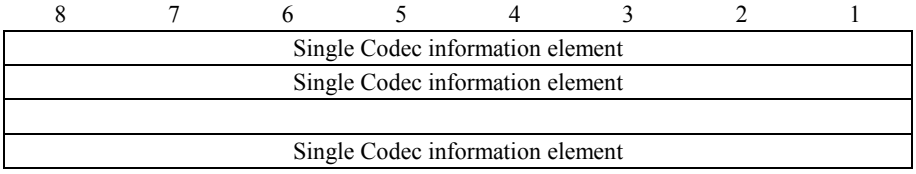

Figure 13/Q.765.5 – Codec List

The Single Codec information element is specified in 11.1.7.

11.1.6.2 List of codecs

Figure 13 shows the layout of the Codec List for codec negotiation. The Single Codec information elements are listed in decreasing order of preference level. The first Single Codec information element has the highest preference level, and the last Single Codec information element is the one with the lowest preference level.

11.1.7 Single Codec

The Single Codec information element for a specific codec is coded as a variable length field with the following subfields:

- OID – Organization identifier subfield – (1 octet): Identifies standardization/private organizations;
- Codec Information subfield.

Figure 14 illustrates the layout of the Single Codec information element.

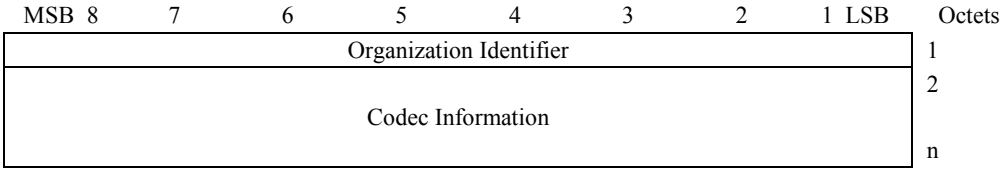

Figure 14/Q.765.5 – Single Codec

11.1.7.1 Organization Identifier subfield

The following codes are used for the Organization Identifier subfield:

0000 0000 no indication
0000 0001 ITU-T
0000 0010 to 0010 0001 reserved for use by IMT-2000 family members
0010 0010 to 1101 1111 spare

1110 0000
to
1111 1111 } reserved for national use

11.1.7.2 Codec Information subfield

11.1.7.2.1 ITU-T

The format of the Codec Information subfield in case of Organization ID = ITU-T is shown in Figure 15.

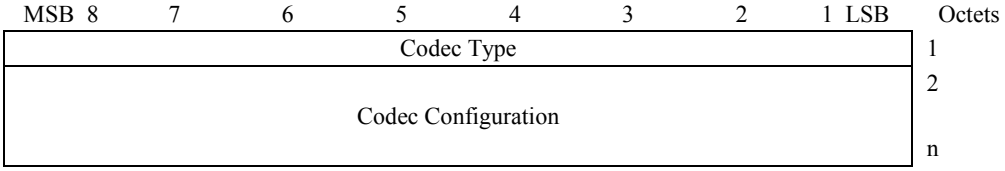

Figure 15/Q.765.5 – Codec Information subfield

11.1.7.2.1.1 Codec Type subfield

The following codes are used for the Codec Type subfield:

0000 0000 no indication
0000 0001 G.711 64 kbit/s A-law
0000 0010 G.711 64 kbit/s μ-law
0000 0011 G.711 56 kbit/s A-law
0000 0100 G.711 56 kbit/s μ-law
0000 0101 G.722 (SB-ADPCM)
0000 0110 G.723.1
0000 0111 G.723.1 Annex A (silence suppression)
0000 1000 G.726 (ADPCM)
0000 1001 G.727 (Embedded ADPCM)
0000 1010 G.728
0000 1011 G.729 (CS-ACELP)
0000 1100 G.729 Annex B (silence suppression)
0000 1101
to
1111 1111 } spare

11.1.7.2.1.2 Codec Configuration subfield

There are no configuration data in the case of ITU-T codec types G.711, G.722 and G.723.1.

ITU-T codecs G.726, G.727, G.728 and G.729 (with and without silence suppression) may operate at different bit rates. Common implementations of these codecs can operate in all the modes (bit rates) and switch from one mode to another upon command in a per frame basis (through in-band signalling). Therefore, the configuration field is optional for all aforementioned codec types. The configuration field is present when it is required to signal that only one or several modes of operation out of the full set are supported. The configuration field is not present if all the modes of operation of the codec are supported (the general case).

Figure 16 and Table 13 show the configuration data coding for each of the aforementioned codecs.

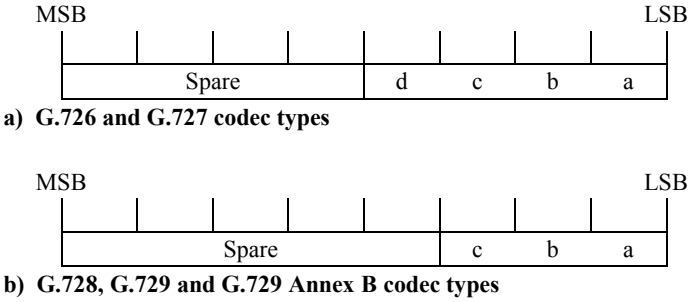

Figure 16/Q.765.5 – Coding for the 1 octet long configuration field

Table 13/Q.765.5 – Coding of configuration fields

Codec Type	Configuration Data	
	d c b a	
0000 1000 G.726	x x x 1	16 kbit/s supported
	x x x 0	16 kbit/s not supported
	x x 1 x	24 kbit/s supported
	x x 0 x	24 kbit/s not supported
	x 1 x x	32 kbit/s supported
	x 0 x x	32 kbit/s not supported
	1 x x x	40 kbit/s supported
	0 x x x	40 kbit/s not supported
0000 1001 G.727	x x x 1	16 kbit/s supported
	x x x 0	16 kbit/s not supported
	x x 1 x	24 kbit/s supported
	x x 0 x	24 kbit/s not supported
	x 1 x x	32 kbit/s supported
	x 0 x x	32 kbit/s not supported
	1 x x x	40 kbit/s supported
	0 x x x	40 kbit/s not supported
0000 1010 G.728	x x 1	9.6 kbit/s supported
	x x 0	9.6 kbit/s not supported
	x 1 x	12.8 kbit/s supported
	x 0 x	12.8 kbit/s not supported
	1 x x	16 kbit/s supported
	0 x x	16 kbit/s not supported

Table 13/Q.765.5 – Coding of configuration fields *(concluded)*

Codec Type	Configuration Data	
	d c b a	
0000 1011 G.729	x x 1	6.4 kbit/s supported
	x x 0	6.4 kbit/s not supported
	x 1 x	8 kbit/s supported
	x 0 x	8 kbit/s not supported
	1 x x	11.8 kbit/s supported
	0 x x	11.8 kbit/s not supported
0000 1100 G.729 Annex B	x x 1	6.4 kbit/s supported
	x x 0	6.4 kbit/s not supported
	x 1 x	8 kbit/s supported
	x 0 x	8 kbit/s not supported
	1 x x	11.8 kbit/s supported
	0 x x	11.8 kbit/s not supported

Each one of the a, b, c and d bits corresponds to one mode of operation (bit rate) for the codec. A value of "1" means that the mode is supported, a value of "0" that the mode is not supported and a value of "x" stands for "irrelevant".

11.1.8 BAT Compatibility Report

The format of the BAT Compatibility Report is shown in Figure 17.

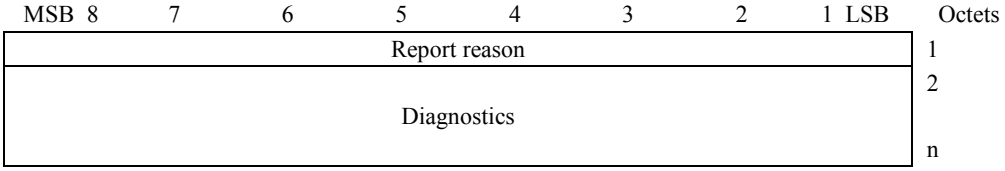

Figure 17/Q.765.5 – BAT Compatibility Report

a) *Report Reason*

The following report reasons are defined:

0000 0000 no indication
0000 0001 information element non-existent or not implemented
0000 0010 BICC data with unrecognized information element, discarded
0000 0011 to 1101 1111 spare
1110 0000 to 1111 1111 reserved for national use

b) *Diagnostics*

Figure 18 shows the format of the diagnostics.

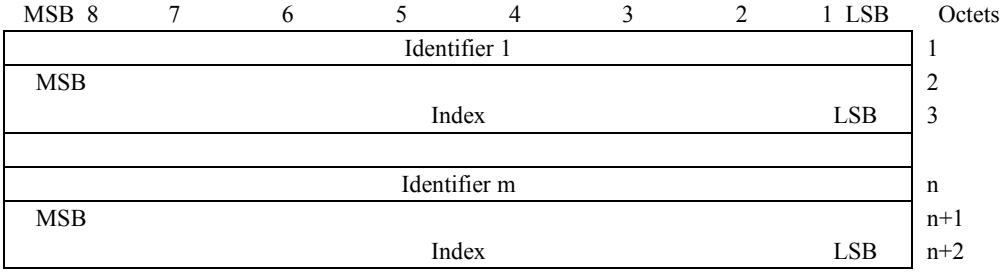

Figure 18/Q.765.5 – Diagnostics

The field "Identifier n" contains the Identifier value of the nth upgraded information element in accordance with Table 12. The field "Index" has a fixed length of 2 octets and is a pointer (integral number of octets in pure binary representation) either to the Identifier value of the information element concerned or to an information element identifier octet within the information element concerned.

If an unrecognized Identifier value x is received, "Identifier n" contains this Identifier value x, and the value of "Index" is "0".

If an information element x of type "simple" is received which is recognized but its contents are unrecognized, the "Identifier n" contains the Identifier value of this information element x, and the value of "Index" is "0".

If an information element x of type "constructor" is received which is recognized but its contents are unrecognized (i.e. either unrecognized Identifier value or unrecognized contents of a recognized information element), the "Identifier n" contains the Identifier value of this information element x, and the value of "Index" is a pointer to the Identifier value octet of the information element which is unrecognized or whose contents are unrecognized. The value of "Index" is "1" plus the number of octets between the Constructor information element identifier octet and the unrecognized information element identifier octet, not including either information element identifier octet.

11.1.9 Bearer Network Connection Characteristics

The format of the Bearer Network Connection Characteristics is shown in Figure 19.

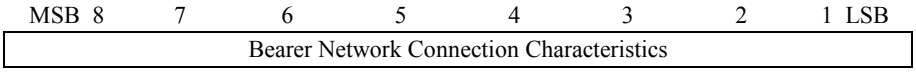

Figure 19/Q.765.5 – Bearer Network Connection Characteristics

The following codes are used in the Bearer Network Connection Characteristics:

0000 0000 no indication
0000 0001 AAL type 1
0000 0010 AAL type 2
0000 0011 to 1101 1111 spare

1110 0000
to
1111 1111
} reserved for national use

11.2 Application Context Identifier

The Application Context Identifier field of the Application Transport parameter (see [3]) shall be coded "*BAT ASE*".

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	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
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Geneva, 2001