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SERIES Q: SWITCHING AND SIGNALLING

Broadband ISDN – B-ISDN application protocols for the network

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B-ISDN user part – Overview of the B-ISDN Network Node Interface Signalling Capability Set 2, Step 1

ITU-T Recommendation Q.2721.1
Superseded by a more recent version

(Previously CCITT Recommendation)

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ITU-T RECOMMENDATION Q.2721.1

B-ISDN USER PART – OVERVIEW OF THE B-ISDN NETWORK NODE INTERFACE SIGNALLING CAPABILITY SET 2, STEP 1

Summary

This Recommendation provides and overview of the capabilities supported by B-ISUP for B-ISDN Capability Set 2, Step 1.

Source

ITU-T Recommendation Q.2721.1 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

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Recommendation Q.2721.1

B-ISDN USER PART – OVERVIEW OF THE B-ISDN NETWORK NODE INTERFACE SIGNALLING CAPABILITY SET 2, STEP 1

(Geneva, 1996)

1 Overview of B-ISDN NNI Signalling Capability Set 2, Step 1

1.1 Scope

This Recommendation provides an overview of the capabilities of the Broadband ISDN Network Node Interface (B-ISDN NNI) for the Broadband ISDN Signalling Capability Set 2, Step 1 (B-ISDN NNI CS-2.1). This Recommendation should thus be seen as an increment to Recommendation Q.2761 which provides an overview of the B-ISUP for Signalling Capability Set 1.

The B-ISDN NNI CS-2.1 builds upon the B-ISUP defined for Signalling Capability Set 1. The B-ISUP for CS-1 provides call control for point-to-point single connection calls using ISDN bearer classes BCOB-A and BCOB-X. B-ISDN NNI CS-2.1 adds further call control capabilities, additional bearer types, additional connection topologies, and some dynamic rearrangement of these.

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.

[1] ITU-T Recommendation Q.2761 (1995), *Functional description of the B-ISDN User Part (B-ISUP) of Signalling System No. 7*.

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

[3] ITU-T Recommendation Q.2722.1 (1996), *B-ISDN user part – Network node interface specification for point-to-multipoint call/connection control*.

[4] ITU-T Recommendation Q.2723.1 (1996), *B-ISDN user part – Support of additional traffic parameters for sustainable cell rate and quality of service*.

[5] ITU-T Recommendation Q.2724.1 (1996*), B-ISDN user part – Look-ahead without state change for the network node interface*.

[6] ITU-T Recommendation Q.2725.1 (1996*), B-ISDN user part – Support of negotiation during connection setup*.

[7] ITU-T Recommendation Q.2725.2 (1996), *B-ISDN user part – Modification procedures*.

[8] ITU-T Recommendation Q.2726.1 (1996), *B-ISDN user part – ATM end system address*.

[9] ITU-T Recommendation Q.2726.2 (1996), *B-ISDN user part – Call priority*.

[10] ITU-T Recommendation Q.2726.3 (1996*), B-ISDN user part – Network generated session identifier*.

[11] ITU-T Recommendation Q.2727 (1996), *B-ISDN user part – Support of frame relay*.

1.3 Definitions and abbreviations

1.3.1 Abbreviations

This Recommendation uses the following abbreviations:

AE Application Entity

ASE Application Service Element

BCC Bearer Connection Control

CC Call Control

CS B-ISDN Signalling Capability Set

E-E Edge-to-Edge

L-L Link-by-Link

LA Look-Ahead

MC Maintenance Control

NI Network Interface

NNI Network Node Interface

SACF Single Association Control Function

SAO Single Association Object

SCCP Signalling Connection Control Part

TCAP Transaction Capabilities Application Part

UI Unrecognized Information

1.4 B-ISDN NNI CS-2.1 content

The following capabilities are added to the capabilities of B-ISUP CS-1:

- point-to-multipoint calls (multi-party calls);
- additional traffic parameters;
- look-ahead capability;
- negotiation of traffic characteristics during call set-up;
- modification of traffic characteristics during the active phase of the call;
- ATM end system address;
- call priority;
- network call correlation ID;
- frame relay.

The following subclauses give a summary of these capabilities.

1.4.1 Point-to-multipoint calls

Procedures are provided for the set-up and release of a call consisting of a single point-to-multipoint (unidirectional) connection. The characteristics of this connection, from the originator (root party) to the destinations (leaf parties) are all identical. Procedures are provided for the addition and removal of leaf parties from the call. Addition of leaf parties can only be done by the root party. Removal of a

leaf can be from either the root or the affected leaf party. Additionally an "en-bloc" release of the whole point-to-multipoint connection from the root party is provided [3].

1.4.2 Additional traffic parameters

Procedures are provided to the support of the sustainable cell rate parameter set.

A procedure for the support of the quality of service parameter is also provided [4].

1.4.3 Look-ahead

Procedures are provided for edge-to-edge look-ahead that allows a network to perform called-terminal availability and compatibility checking without any commitment of network resources. This is an optional capability that can be employed to optimize network resource usage in combination with other CS-2.1 capabilities [5].

1.4.4 Negotiation of traffic characteristics during call set-up

Two cases of negotiation are allowed:

1) Alternative ATM cell rate

   If the bandwidth requirements in the connection request cannot be supported by the network, alternative bandwidth requirements contained in the alternative ATM cell rate may be used instead, provided that these can be supported.

   The alternative bandwidth requirements must be reduced compared to those originally requested.

2) Minimum ATM cell rate

   If the bandwidth requirements in the connection request cannot be supported by the network, a reduced bandwidth allocation may be substituted, provided that this still satisfies a specified minimum ATM cell rate.

   Only negotiation of peak cell rates is supported using the minimum ATM cell rate procedure.

In both cases 1) and 2), the final bandwidth used is returned in the ATM cell rate parameter and additional ATM cell rate parameter (if applicable) in the answer message. If this differs from the bandwidth allocation supported by the network, the network must modify the bandwidth allocation for the connection accordingly. The network passes the final bandwidth information back to the calling user.

1.4.5 Modification of traffic characteristic during the active phase of the call

Procedures are provided for the modification of the peak cell rate (forward, backward or both) of a point-to-point connection. Only the user that originally requested set-up of the connection can request the modification. No rerouting of the connection is attempted during the connection modification [7].

1.4.6 ATM end system address

Procedures are provided for the transport of the ATM End System Address (AESA). The E.164 format of AESA is accepted at the originating exchange, and used to derive E.164 number to be carried within the called party number, and used for routing purposes. The AESA is transferred across the network and delivered to the called user. AESA for calling party is also supported [8].

1.4.7 Call priority

Priority call handling is provided for single connection point-to-point calls [9].

1.4.8 Network call correlation ID

A network generated identifier is provided to enable the network to correlate records at multiple exchanges for non-real-time purposes, e.g. accounting [10].

1.4.9 Frame relay

Procedures are provided for the set-up and release of a call/connection supporting the frame relay service [11].

1.5 Functional limitations of B-ISDN NNI CS-2.1

The following limitations of CS-2.1 should be noted:

1) In a point-to-multipoint call, only the root party can add additional parties.
2) Only the user that originally requested set-up of a connection can request modification of that connection.
3) The following capabilities are not applicable for calls employing narrow-band emulation service:
   a) point-to-multipoint calls (multi-party calls);
   b) additional traffic parameters;
   c) negotiation of traffic characteristics during call set-up;
   d) modification of traffic characteristics during the active phase of the call.
4) Priority call handling is provided only for single connection point-to-point calls.
5) Table 1-1 summarizes the allowed combinations of the capabilities that are supported within a single CS-2.1 call.

Table 1-1/Q.2721.1 – CS-2.1 allowed capability combinations

Capability	Network call correlation ID	Frame relay	AESA	Call priority	Modification	Negotiation	Look-ahead	Traffic parameters
Point-multipoint	✓	×	✓	×	×	✓ (Note 2)	✓	✓ (Note 1)
Traffic parameters	✓	✓	✓	✓	×	✓	✓	
Look-ahead	✓	✓	✓	✓	✓ (Note 3)	✓		
Negotiation	✓	✓	✓	✓	✓			
Modification	✓	✓	✓	✓				
Call priority	✓	✓	✓					
AESA	✓	✓						
Frame relay								

× Not allowed

✓ Allowed

NOTE 1 – The traffic parameters for the first party shall apply for all parties.

NOTE 2 – This capability shall apply only for the first leaf.

NOTE 3 – Look-ahead is only applied at call set-up; it is not applied for a modification request.

1.6 Common protocol principles for B-ISDN NNI CS-2.1

The B-ISDN NNI CS-2.1 builds upon the B-ISUP CS-1 in three ways:

1) It enhances the point-to-point call control application process and protocol, for the transfer of additional information, and for additional procedural functions, such as the procedures used during the active phase of the call to effect a modification of the bandwidth being used. This can be seen as an enhanced use of the model defined for B-ISUP CS-1 Annex 1/Q.2764.

2) It enhances the modelling of the functionality within the call control application process: A B-ISUP CS-1 call consists of one incoming, and one outgoing, Application Entity Instance (AEI) protocol machine, coordinated by the call, control application process. For one B-ISDN NNI CS-2.1 call, the call control application process may have to coordinate many AEIs relating to the multiple connections/parties that may exist in the call. Information modelling techniques are used in the description of this complexity.

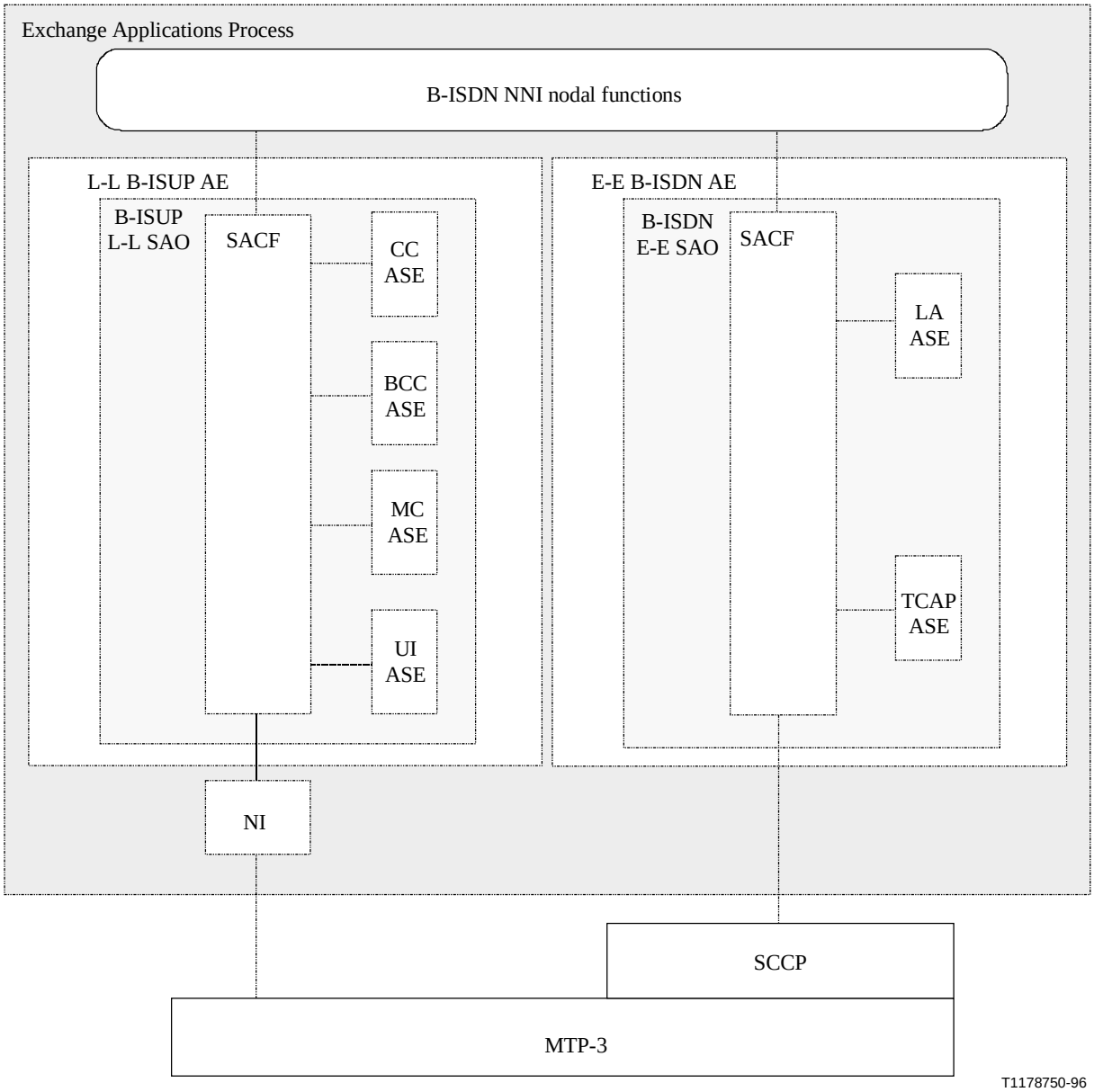
3) It enhances the signalling methods available: B-ISUP CS-1 signalling associations are always Link-by-Link (L-L), following the path of the connection through the network. In B-ISDN NNI CS-2.1, an additional signalling mode is introduced – Edge-to-Edge (E-E). This technique provides direct signalling transactions between the nodes at the edges of the public B-ISDN, typically the originating, destination local and/or gateway exchanges. B-ISDN NNI CS-2.1 makes use of this capability to provide a look-ahead capability, checking the acceptability of the potential call at the called user interface before allocating network resources for the call/connection.

   This uses the TCAP and SCCP capabilities of Signalling System No. 7.

1.6.1 General specification model

Figure 1-1 shows the general protocol architecture model for B-ISDN NNI in CS-2.1. The L-L AE is architecturally the same as the AE used in CS-1; the E-E AE is new for CS-2.1. In addition to this architecture is an information model for the call control application process. Figure 1-2 shows the general information model for B-ISDN NNI in CS-2.1. This figure shows the complete set of all the object classes. For any exchange acting as a particular exchange type, (originating/intermediate/branching/destination exchange), for the support of a specific CS-2.1 capability, the appropriate object instances are created. Objects of all object classes are not necessarily employed in each case.

An illustration of the application of these models for the support of the CS-2.1 capabilities is given in the following subclauses.



AE	Application Entity
ASE	Application Service Element
BCC	Bearer Connection Control
CC	Call Control
LA	Look-Ahead
MC	Maintenance Control
NI	Network Interface
SACF	Single Association Control Function
SAO	Single Association Object
UI	Unrecognized Information

Figure 1-1/Q.2721.1 – B-ISDN NNI protocol architecture model for CS-2.1

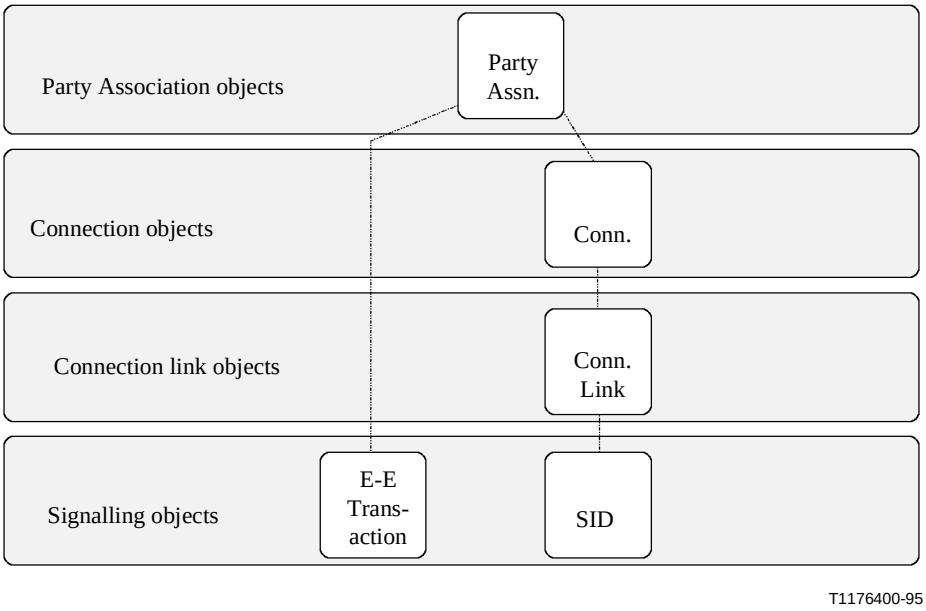


Figure 1-2/Q.2721.1 – B-ISDN NNI application process generalized information model for CS-2.1

Instances of objects from the object classes in this model represent logical entities that are created when a call or connection is set up, referred to during the existence of the call or connection, and deleted when the call or connection is released.

The lines between the objects in this model represent logical associations maintained by the application process logic between these objects.

Signalling objects relate one-to-one to AEIs in the protocol model.

Connection link objects relate one-to-one to the virtual circuits being controlled.

The signalling and connection link objects can be directly addressed with identifier values included in the B-ISUP messages. The connection and party association objects cannot be directly addressed.

Connection objects represent the connection through the exchange, e.g. via a branching function, i.e. via its associations with the incoming and outgoing connection link objects. It is created when a new incoming connection link object is created, and deleted when the last associated connection link object is deleted.

Party objects are used to associate all connections relating to one party. Party objects are only instantiated at nodes where the B-ISDN users are directly connected, i.e. at local exchanges where the call/connection originates/terminates at a coincident T_b/S_b interface. Where the UNI interface is via a T_b interface the party object is in the attached private network.

1.6.2 Modelling examples for CS-2.1

1.6.2.1 A simple point-to-multipoint call

Figure 1-3 shows a simple point-to-multipoint call from node A, via a multi-cast function at node B to two parties on nodes C and D. The following figures show the protocol architecture that apply at the nodes in this example. It should be noted that multiple instances of the B-ISUP L-L AEI are used to set up separate signalling associations to each party. In this case there is no instantiation of the E-E AE as look-ahead is assumed not to be used in this example.

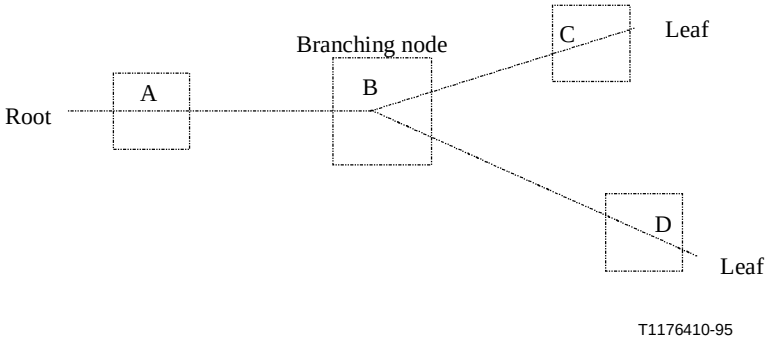


Figure 1-3/Q.2721.1 – Example point-to-multipoint connection configuration

Figure 1-4 shows the protocol architecture at exchange A. Exchange A has one outgoing virtual circuit towards exchange B, and has two signalling associations (B-ISUP AEIs): one for each leaf party.

Figure 1-5 shows the corresponding application process information model.

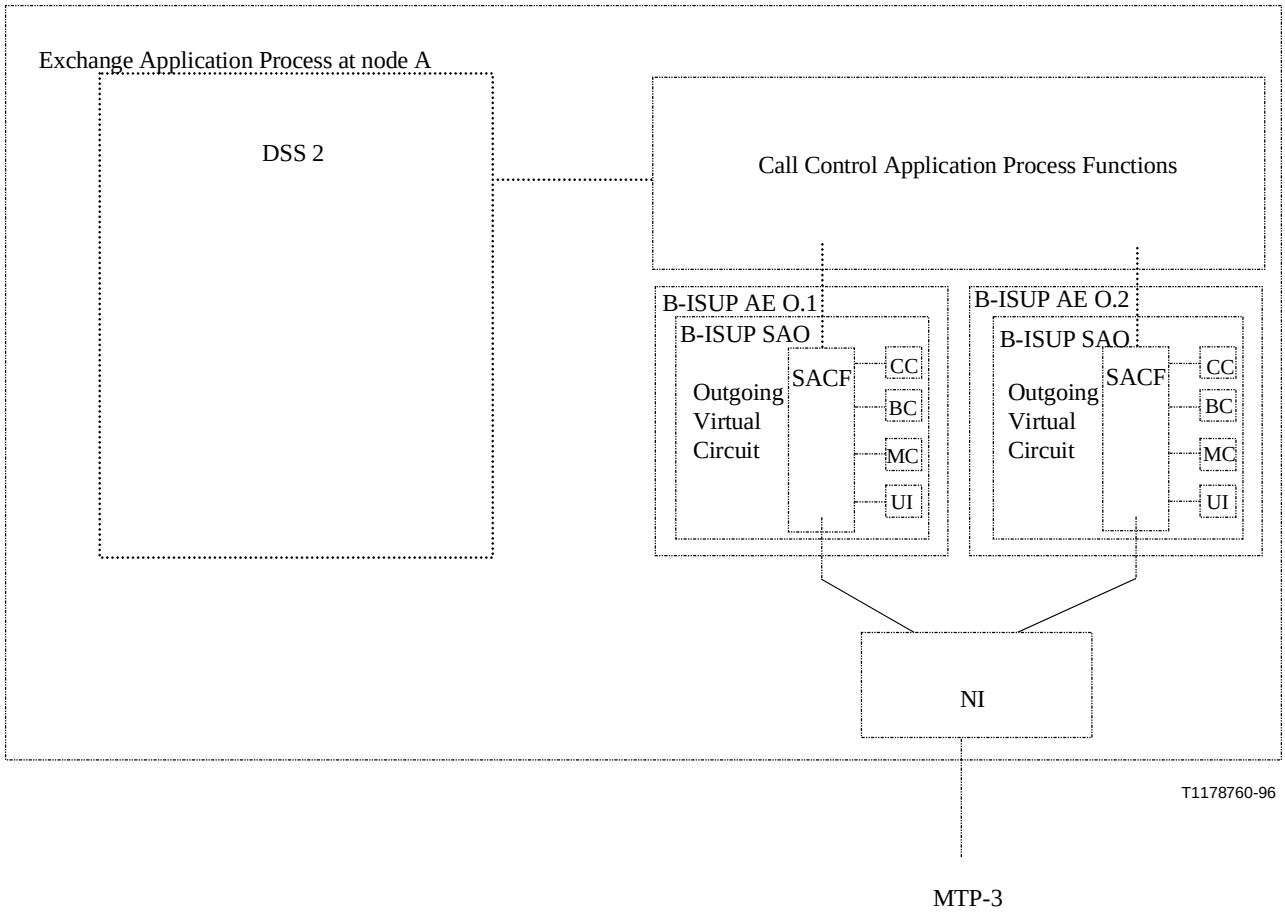


Figure 1-4/Q.2721.1 – Protocol architecture at exchange A

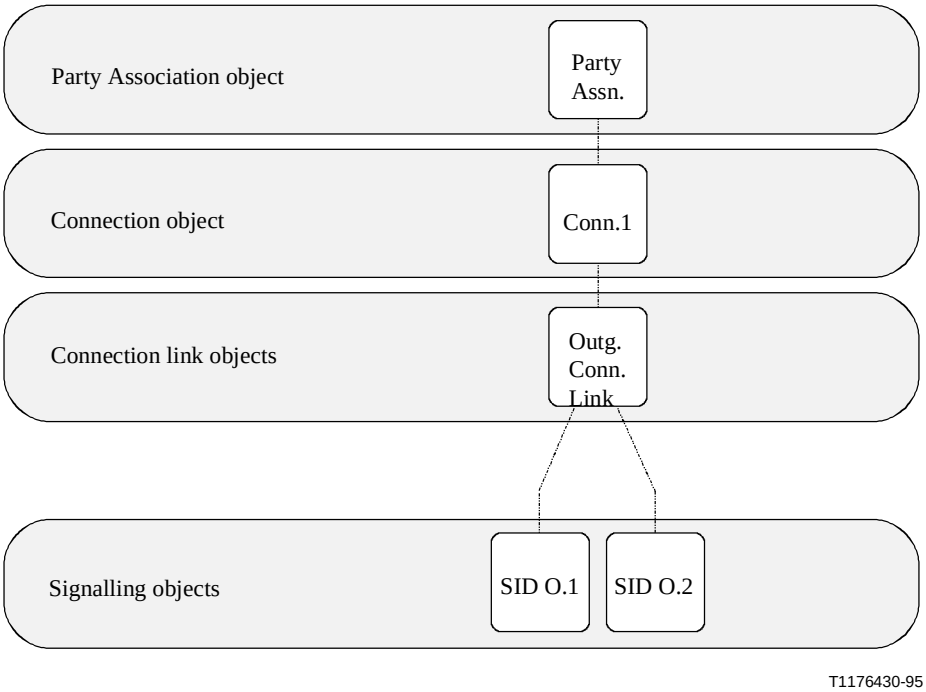


Figure 1-5/Q.2721.1 – Application process information model relating to Figure 1-4

At exchange B there are two B-ISUP AEIs, I.1 and I.2, that relate to the one incoming virtual circuit and two B-ISUP AEIs, O.1 and O.2, that each relate to one of the outgoing virtual circuits (see Figure 1-6). Figure 1-7 shows the information model for this case.

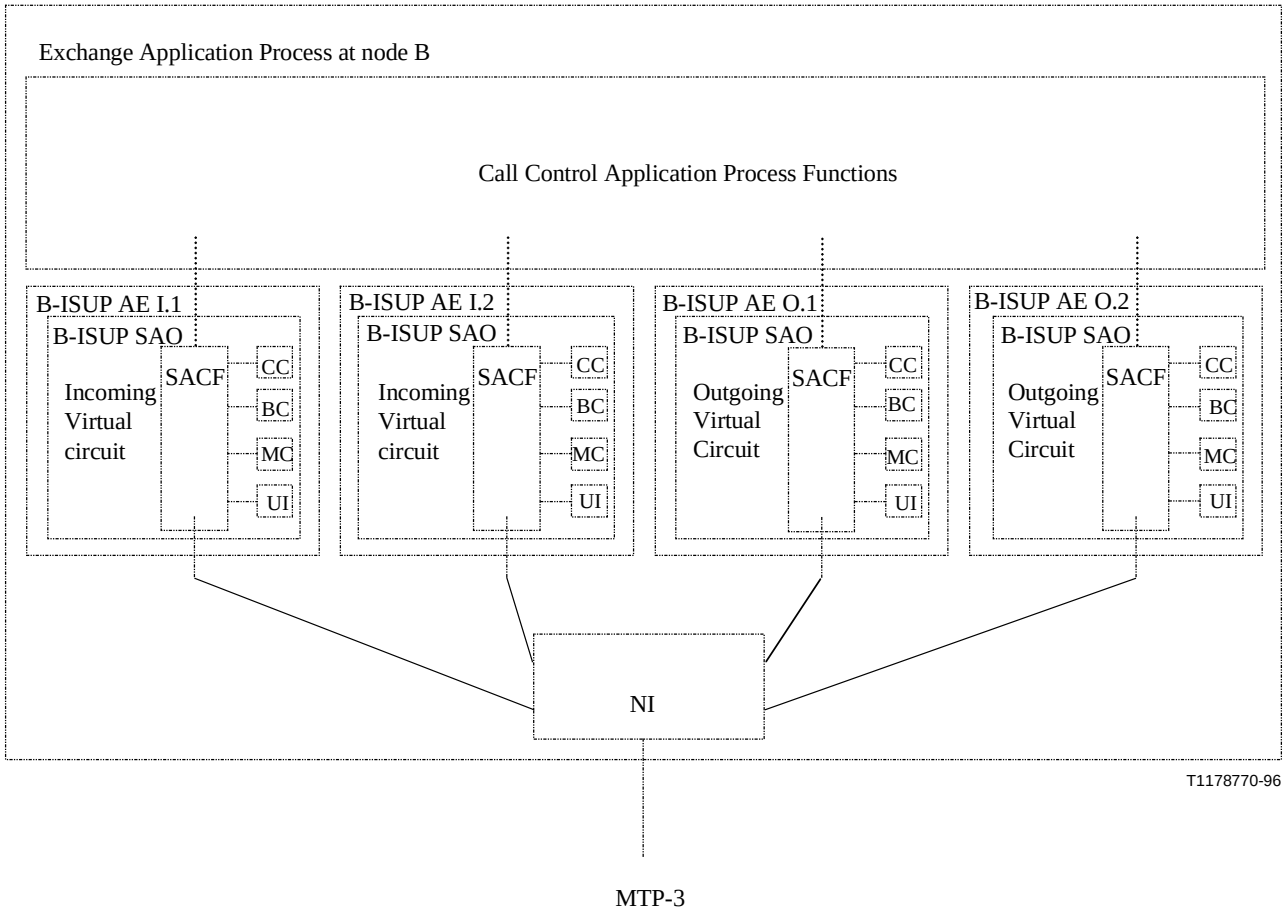


Figure 1-6/Q.2721.1 – Protocol architecture at exchange B

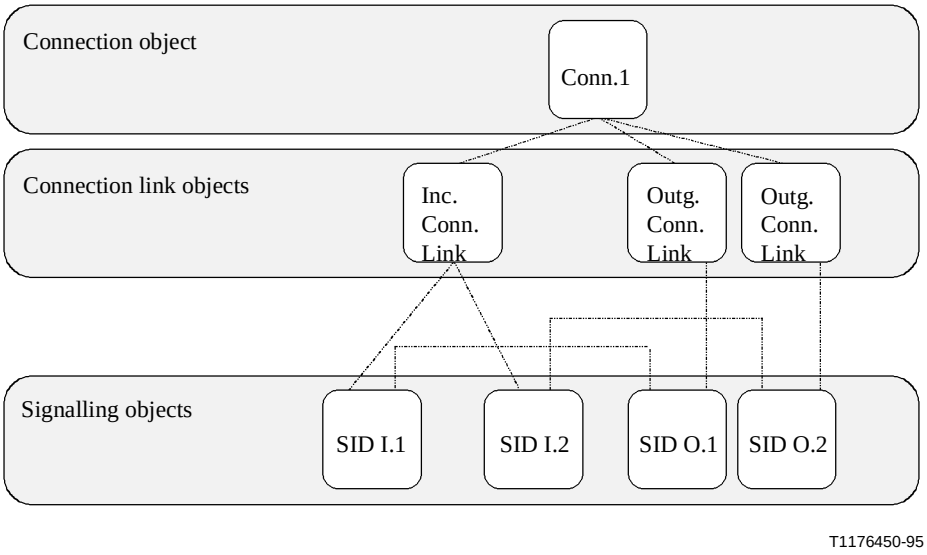


Figure 1-7/Q.2721.1 – Application process information model relating to Figure 1-6

The associations SID I.1 ↔ SID O.1 and SID I.2 ↔ SID O.2 represent the 1:1 relationships between incoming and outgoing signalling associations at an intermediate exchange. This association is used, for example, when the root party sends a release towards one of the leaf parties – it provides the linkage for passing the release on to the correct signalling association towards that leaf party.

At the leaf exchanges a single incoming virtual circuit and a corresponding single signalling association are instantiated.

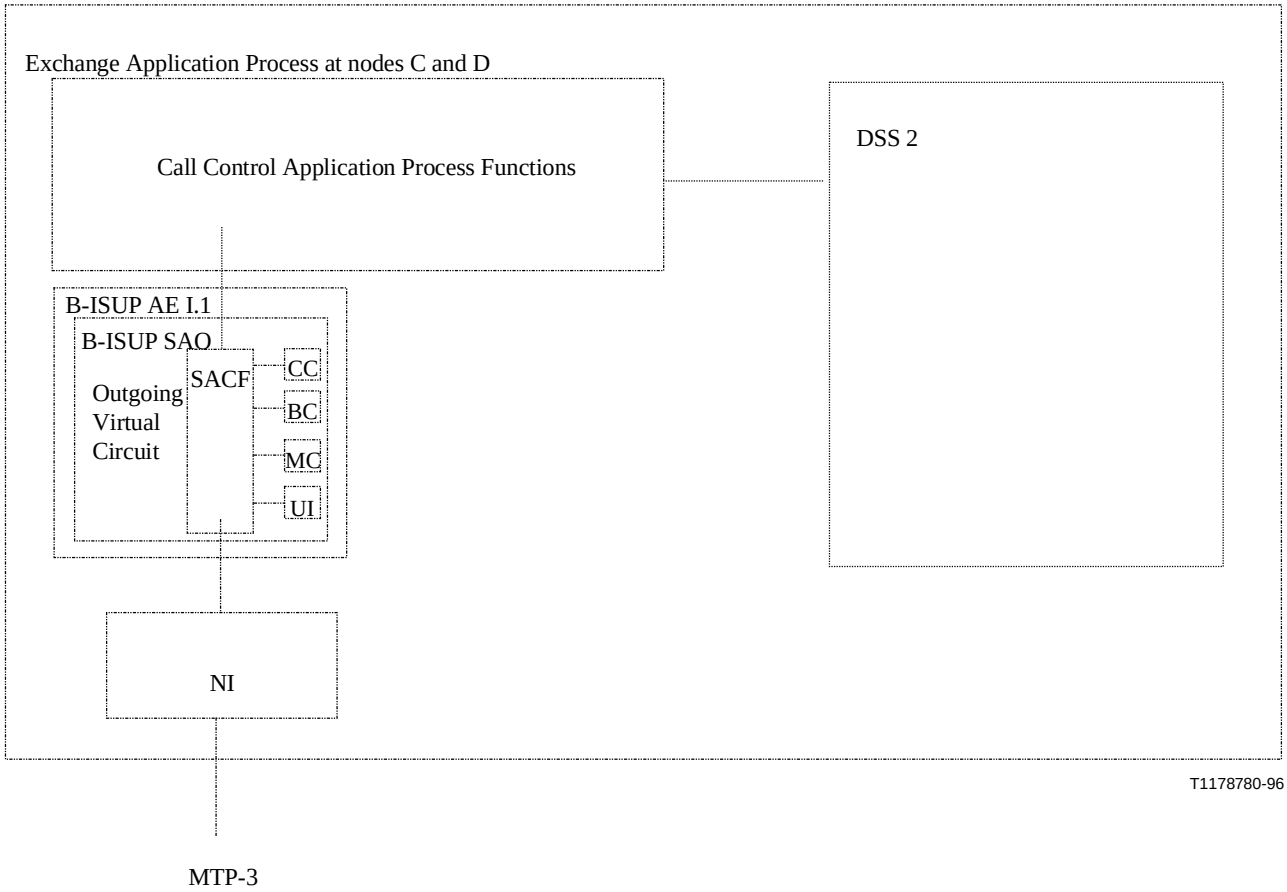


Figure 1-8/Q.2721.1 – Protocol architecture at exchanges C and D

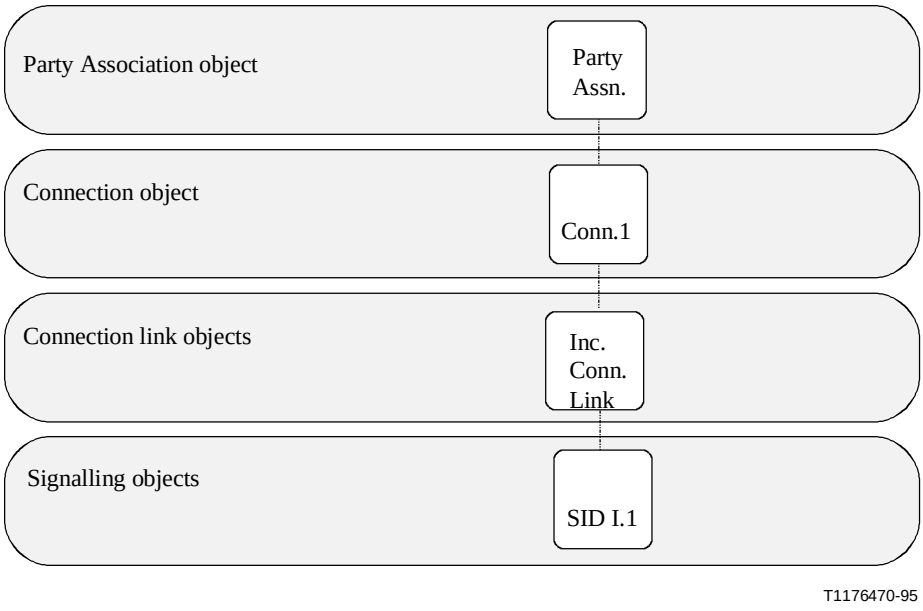


Figure 1-9/Q.2721.1 – Application process information model relating to Figure 1-8

1.6.2.1.1 Dynamic modelling aspects

The "dynamic" aspects of the model are considered to be the mechanisms by which instances of the B-ISUP objects are created, and deleted, as required to provide a particular service.

1.6.2.1.1.1 Object creation initiated by this exchange

When a function in the exchange application process decides that B-ISUP is required, e.g. B-ISUP is selected as the signalling system to be used to support an outgoing point-to-multipoint call/connection, the B-ISUP nodal functions will create an outgoing connection link object instance relating to each of the branching legs of the multicast connection. The application process will also create an instance of B-ISUP AE for each signalling association required.

1.6.2.1.1.2 Object creation initiated by another exchange

The distribution of messages received at the MTP-3 service access point, and the creation of B-ISUP AEIs happens as in B-ISUP CS-1 (see Recommendation Q.2764). Processing in the call control application process continues with an analysis of received connection link identifiers.

- If the message does not contain a destination connection link identifier parameter, but it does contain an origination connection link identifier parameter, a new instance of incoming connection link object will be created by the B-ISUP nodal functions. This new instance is allocated a new connection link identifier value.
- If the message contains a destination connection link identifier that corresponds to an existing connection link object the message is handled by the application process as being related to that object.
- If the destination connection link identifier does not correspond to an existing incoming connection link object instance, an error has occurred.
- If the message contains neither an origination or a destination connection link identifier, then handling shall continue as for a B-ISUP CS-1 exchange.

1.6.2.1.1.3 Object deletion

When a B-ISUP operation is complete, e.g. a connection branch to one remote party is released, the associated AEI is deleted, and the associated connection link object instance will be deleted if it has no remaining associated AEIs. When deletion of a connection link object instance causes its parent connection object instance to have no associated connection link objects the connection object instance is also deleted. Similarly, when a party association object instance has no remaining connection objects it is deleted.

1.7 Interworking with CS-1 exchanges

Exchanges supporting CS-1 procedures can be used for the establishment of calls employing capabilities introduced by CS-2.1 as described in the following subclauses.

1.7.1 Point-to-multipoint calls (multi-party calls)

A CS-1 exchange can act as an intermediate or destination exchange for a point-to-multipoint call.

1.7.2 Additional traffic parameters

A CS-1 exchange can act as an intermediate exchange for a call using additional traffic parameters.

1.7.3 Look-ahead capability

A CS-1 exchange can act as an intermediate exchange for a call using look-ahead.

1.7.4 Negotiation of traffic characteristics during call set-up

A CS-1 exchange can act as an intermediate or destination exchange for a call using negotiation of traffic characteristics during call set-up.

1.7.5 Modification of traffic characteristics during the active phase of the call

If a modification requests reaches a CS-1 exchange, the modification request will be rejected.

1.7.6 ATM end system address

A CS-1 exchange can act as an intermediate exchange for a call using ATM end system address.

1.7.7 Call priority

A CS-1 exchange can act as an intermediate or destination exchange for a call using call priority.

1.7.8 Network call correlation ID

A CS-1 exchange can act as an intermediate or destination exchange for a call using network call correlation ID.

1.7.9 Frame relay

A CS-1 exchange cannot support calls using frame relay.

APPENDIX I

Tables I.1 and I.2 show the B-ISUP message name codes and parameter name codes used in the B-ISUP Recommendations. These tables also show the N-ISUP codes as a reference.

This data is informative; the normative information is in the individual protocol Recommendations.

Table I.1/Q.2721.1 – N-ISUP and B-ISUP message name codes

Code	N-ISUP (Rec. Q.763)	B-ISUP (Rec. Q.2763)
0000 0000	*not used*	*not used*
0000 0001	Initial address	Initial address
0000 0010	Subsequent address	Subsequent address
0000 0011	Information request (national use)	*Reserved (used in N-ISUP)*
0000 0100	Information (national use)	*Reserved (used in N-ISUP)*
0000 0101	Continuity	Consistency check request
0000 0110	Address complete	Address complete
0000 0111	Connect	*Reserved (used in N-ISUP)*
0000 1000	Forward transfer	Forward transfer
0000 1001	Answer	Answer
0000 1010	*Reserved (used in 1984 version)*	IAM acknowledgement
0000 1011	*Reserved (used in 1984 version)*	IAM reject
0000 1100	Release	Release
0000 1101	Suspend	Suspend

Table I.1/Q.2721.1 – N-ISUP and B-ISUP message name codes *(continued)*

Code	N-ISUP (Rec. Q.763)	B-ISUP (Rec. Q.2763)
0000 1110	Resume	Resume
0000 1111	*Reserved (used in 1984 version)*	Reset acknowledgement
0001 0000	Release complete	Release complete
0001 0001	Continuity check request	Consistency check request acknowledgement
0001 0010	Reset circuit	Reset
0001 0011	Blocking	Blocking
0001 0100	Unblocking	Unblocking
0001 0101	Blocking acknowledgement	Blocking acknowledgement
0001 0110	Unblocking acknowledgement	Unblocking acknowledgement
0001 0111	Circuit group reset	Consistency check end
0001 1000	Circuit group blocking	Consistency check end acknowledgement
0001 1001	Circuit group unblocking	*Reserved (used in N-ISUP)*
0001 1010	Circuit group blocking acknowledgement	*Reserved (used in N-ISUP)*
0001 1011	Circuit group unblocking acknowledge	*Reserved (used in N-ISUP)*
0001 1100	*Reserved (used in 1988 version)*	*Reserved (used in N-ISUP)*
0001 1101	*Reserved (used in 1988 version)*	*Reserved (used in N-ISUP)*
0001 1110	*Reserved (used in 1988 version)*	*Reserved (used in N-ISUP)*
0001 1111	Facility request	*Reserved (used in N-ISUP)*
0010 0000	Facility accepted	*Reserved (used in N-ISUP)*
0010 0001	Facility reject	*Reserved (used in N-ISUP)*
0010 0010	*Reserved (used in 1984 version)*	*Reserved (used in N-ISUP)*
0010 0011	*Reserved (used in 1984 version)*	*Reserved (used in N-ISUP)*
0010 0100	Loop back acknowledgement (national use)	*Reserved (used in N-ISUP)*
0010 0101	*Reserved (used in 1984 version)*	*Reserved (used in N-ISUP)*
0010 0110	*Reserved (used in 1984 version)*	*Reserved (used in N-ISUP)*
0010 0111	*Reserved (used in 1988 version)*	*Reserved (used in N-ISUP)*
0010 1000	Pass-along (national use)	*Reserved (used in N-ISUP)*
0010 1001	Circuit group reset acknowledgement	*Reserved (used in N-ISUP)*
0010 1010	Circuit group query (national use)	*Reserved (used in N-ISUP)*
0010 1011	Circuit group query response (national use)	*Reserved (used in N-ISUP)*
0010 1100	Call progress	Call progress
0010 1101	User-to-user information	User-to-user information
0010 1110	Unequipped CIC (national use)	*Reserved (used in N-ISUP)*
0010 1111	Confusion	Confusion
0011 0000	Overload (national use)	*Reserved (used in N-ISUP)*
0011 0001	Charge information (national use)	*Reserved (used in N-ISUP)*

Table I.1/Q.2721.1 – N-ISUP and B-ISUP message name codes *(concluded)*

Code	N-ISUP (Rec. Q.763)	B-ISUP (Rec. Q.2763)
0011 0010	Network resource management	Network resource management
0011 0011	Facility	*Reserved (used in N-ISUP)*
0011 0100	User part test	User part test
0011 0101	User part available	User part available
0011 0110	Identification request	*Reserved (used in N-ISUP)*
0011 0111	Identification response	*Reserved (used in N-ISUP)*
0011 1000	Segmentation	Segmentation (national use)
0011 1001	*Reserved (used in B-ISUP)*	Reserved for ECT
0011 1010	*Reserved (used in B-ISUP)*	Modify acknowledge
0011 1011	*Reserved (used in B-ISUP)*	Modify reject
0011 1100	*Reserved (used in B-ISUP)*	Modify request
0011 1101	*Reserved (used in B-ISUP)*	Modify confirm
0011 1110		
0011 1111		
0100 0000	Loop prevention	*Reserved (used in N-ISUP)*
0100 0001		
0100 0010		
0100 0011		
0100 0100		
0100 0101		
to		
0111 1111		
1000 0000	*Reserved for future expansion*	*Reserved (used in N-ISUP)*
1000 0001		
to		
1101 1111		
1110 0000		
to	(national use)	(national use)
1111 1110		
1111 1111	(national use)	*Reserved for extension of name code*

Table I.2/Q.2721.1 – N-ISUP and B-ISUP parameter name codes

Code	N-ISUP (Rec. Q.763)	B-ISUP (Rec. Q.2763)
0000 0000	End of optional parameters	*Reserved (used in N-ISUP)*
0000 0001	Call reference (national use)	*Reserved (used in N-ISUP)*
0000 0010	Transmission medium requirement	Origination signalling identifier

Table I.2/Q.2721.1 – N-ISUP and B-ISUP parameter name codes *(continued)*

Code	N-ISUP (Rec. Q.763)	B-ISUP (Rec. Q.2763)
0000 0011	Access transport	Destination signalling identifier
0000 0100	Called party number	Called party number
0000 0101	Subsequent number	Subsequent number
0000 0110	Nature of connection indicators	Connection element identifier
0000 0111	Forward call indicators	Maximum end-to-end transit delay
0000 1000	Optional forward call indicators	ATM cell rate
0000 1001	Calling party's category	Calling party's category
0000 1010	Calling party number	Calling party number
0000 1011	Redirecting number	Redirecting number
0000 1100	Redirection number	Redirection number
0000 1101	Connection request	*Reserved (used in N-ISUP)*
0000 1110	Information request indicators (national use)	*Reserved (used in N-ISUP)*
0000 1111	Information indicators (national use)	*Reserved (used in N-ISUP)*
0001 0000	Continuity indicators	Additional calling party number
0001 0001	Backward call indicators	Additional connected number
0001 0010	Cause indicators	Cause indicators
0001 0011	Redirection information	Redirection information
0001 0100	*Reserved (used in CCITT Blue Book)*	Backward narrow-band interworking indicator
0001 0101	Circuit group supervision message type indicator	Called party subaddress
0001 0110	Range and status	Calling party subaddress
0001 0111	*Call Modification Indicators (Reserved, used in Blue Book, 1988 version)*	Called party's indicators
0001 1000	Facility indicator	*Reserved (used in N-ISUP)*
0001 1001	*Facility Information Indicators (Reserved, used in Red Book, 1984 version)*	Charge indicator
0001 1010	Closed user group interlock code	Closed user group information
0001 1011	*Index (Reserved, used in Red Book, 1984 version)*	Connected line ID request
0001 1100	*Closed User Group Check Code (Reserved, used in Red Book, 1984 version)*	Forward narrow-band interworking indicator
0001 1101	User service information	Narrow-band bearer capability
0001 1110	Signalling point code (national use)	*Reserved (used in N-ISUP)*
0001 1111	*Reserved (used in Red Book, 1984 version)*	In-band information indicator
0010 0000	User-to-user information	User-to-user information
0010 0001	Connected number	Connected number

Table I.2/Q.2721.1 – N-ISUP and B-ISUP parameter name codes *(continued)*

Code	N-ISUP (Rec. Q.763)	B-ISUP (Rec. Q.2763)
0010 0010	Suspend/resume indicators	Suspend/resume indicators
0010 0011	Transit network selection (national use)	Transit network selection (national use)
0010 0100	Event information	Connected subaddress
0010 0101	Circuit assignment map	Narrow-band low layer compatibility
0010 0110	Circuit state indicator (national use)	Call diversion may occur
0010 0111	Automatic congestion level	Automatic congestion level
0010 1000	Original called number	Original called number
0010 1001	Optional backward call indicators	National/international call indicator
0010 1010	User-to-user indicators	User-to-user indicators
0010 1011	Origination ISC point code	Origination ISC point code
0010 1100	Generic notification	Notification
0010 1101	Call history information	Call history information
0010 1110	Access delivery information	Access delivery indicator
0010 1111	Network specific facilities (national use)	*Reserved (used in N-ISUP)*
0011 0000	User service information prime	*Reserved (used in N-ISUP)*
0011 0001	Propagation delay counter	Propagation delay counter
0011 0010	Remote operations (national use)	*Reserved (used in N-ISUP)*
0011 0011	Service activation	*Reserved (used in N-ISUP)*
0011 0100	User teleservice information	Narrow-band high layer compatibility
0011 0101	Transmission medium used	Progress indicator
0011 0110	Call diversion information	Call diversion information
0011 0111	Echo control information	Echo control information
0011 1000	Message compatibility information	*Reserved (used in N-ISUP)*
0011 1001	Parameter compatibility information	Resource identifier
0011 1010	MLPP precedence	MLPP precedence
0011 1011	MCID request indicators	*Reserved (used in N-ISUP)*
0011 1100	MCID response indicators	*Reserved (used in N-ISUP)*
0011 1101	Hop counter (reserved)	*Reserved (used in N-ISUP)*
0011 1110	Transmission medium requirement prime	Segmentation indicator (national use)
0011 1111	Location number	Location number
0100 0000	Redirection number restriction	Redirection number restriction
0100 0001	Freephone indicators (reserved)	*Reserved (used in N-ISUP)*
0100 0010	Generic reference (reserved)	*Reserved (used in N-ISUP)*
0100 0011	Call transfer reference	*Reserved (used in N-ISUP)*
0100 0100	Loop prevention indicators	*Reserved (used in N-ISUP)*

Table I.2/Q.2721.1 – N-ISUP and B-ISUP parameter name codes *(continued)*

Code	N-ISUP (Rec. Q.763)	B-ISUP (Rec. Q.2763)
0100 0101	Call transfer number	*Reserved (used in N-ISUP)*
0100 0110	*Reserved (used in B-ISUP)*	Broadband high layer information
0100 0111	*Reserved (used in B-ISUP)*	AAL parameters
0100 1000	*Reserved (used in B-ISUP)*	OAM Traffic Descriptor
0100 1001	*Reserved (used in B-ISUP)*	MLPP user information
0100 1010	*Reserved (used in B-ISUP)*	Consistency check results information
0100 1011	CCBS	*Reserved (used in N-ISUP)*
0100 1100	Forward GVNS	*Reserved (used in N-ISUP)*
0100 1101	Backward GVNS	*Reserved (used in N-ISUP)*
0100 1110	Re-route indicator	*Reserved (used in N-ISUP)*
0100 1111	*Reserved (used in B-ISUP)*	Broadband low layer information
0101 0000	*Reserved (used in B-ISUP)*	Broadband bearer capability
0101 0001	*Reserved (used in B-ISUP)*	Reserved for Freephone
0101 0010	*Reserved (used in B-ISUP)*	Minimum ATM cell rate
0101 0011	*Reserved (used in B-ISUP)*	Quality of service (national use)
0101 0100	*Reserved (used in B-ISUP)*	Destination connection link identifier
0101 0101	*Reserved (used in B-ISUP)*	Origination connection link identifier
0101 0110	*Reserved (used in B-ISUP)*	Leaf party type
0101 0111	*Reserved (used in B-ISUP)*	Alternative ATM cell rate
0101 1000	*Reserved (used in B-ISUP)*	AESA for called party number
0101 1001	*Reserved (used in B-ISUP)*	AESA for calling party number
0101 1010	*Reserved (used in B-ISUP)*	Additional ATM cell rate
0101 1011	Network management controls	*Reserved (used in N-ISUP)*
0101 1100		
0101 1101		
0101 1110	*Reserved (used in B-ISUP)*	Look result
0101 1111	*Reserved (used in B-ISUP)*	Network look-ahead indicator
0110 0000		
0110 0001		
0110 0010		
0110 0011		
0110 0100	*Reserved (used in B-ISUP)*	Report type
0110 0101	Correlation id	*Reserved (used in N-ISUP)*
0110 0110	SCF id	*Reserved (used in N-ISUP)*
0110 0111	*Reserved (used in B-ISUP)*	Priority

Table I.2/Q.2721.1 – N-ISUP and B-ISUP parameter name codes *(concluded)*

Code	N-ISUP (Rec. Q.763)	B-ISUP (Rec. Q.2763)
0110 1000	*Reserved (used in B-ISUP)*	Network call correlation identifier
0110 1001	*Reserved (used in B-ISUP)*	Connection identifier
0110 1010		
0110 1011	*Reserved (used in B-ISUP)*	Link layer core parameters
0110 1100	*Reserved (used in B-ISUP)*	Link layer protocol parameters
0110 1101		
0110 1110		
0110 1111		
0111 0000		
to		
0111 1111		
1000 0000	*Reserved for future expansion*	*Reserved (used in N-ISUP)*
1000 0001		
to		
1011 1111		
1100 0000	Generic number	*Reserved (used in N-ISUP)*
1100 0001		
to	(national use)	(national use)
1111 1110		
1111 1111	(national use)	*Reserved for extension of name code*

ITU-T RECOMMENDATIONS SERIES

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Series F	Non-telephone telecommunication services
Series G	Transmission systems and media
Series H	Transmission of non-telephone signals
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Series J	Transmission of sound-programme and television signals
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Series L	Construction, installation and protection of cables and other elements of outside plant
Series M	Maintenance: international transmission systems, telephone circuits, telegraphy, facsimile and leased circuits
Series N	Maintenance: international sound-programme and television transmission circuits
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Series P	Telephone transmission quality
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