INTERNATIONAL TELECOMMUNICATION UNION

CCITT

F.812

THE INTERNATIONAL
TELEGRAPH AND TELEPHONE
CONSULTATIVE COMMITTEE

(08/92)

TELEMATIC, DATA TRANSMISSION, ISDN BROADBAND, UNIVERSAL, PERSONAL TELECOMMUNICATIONS AND TELECONFERENCE SERVICES

OPERATIONS AND QUALITY OF SERVICE

BROADBAND CONNECTIONLESS DATA BEARER SERVICE

Recommendation F.812

FOREWORD

The CCITT (the International Telegraph and Telephone Consultative Committee) is a permanent organ of the International Telecommunication Union (ITU). CCITT is responsible for studying technical, operating and tariff questions and issuing Recommendations on them with a view to standardizing telecommunications on a worldwide basis.

The Plenary Assembly of CCITT which meets every four years, establishes the topics for study and approves Recommendations prepared by its Study Groups. The approval of Recommendations by the members of CCITT between Plenary Assemblies is covered by the procedure laid down in CCITT Resolution No. 2 (Melbourne, 1988).

Recommendation F.812 was prepared by Study Group I and was approved under the Resolution No. 2 procedure on the 4th of August 1992.

CCITT NOTES

1) In this Recommendation, the expression “Administration” is used for conciseness to indicate both a telecommunication administration and a recognized private operating agency.

2) A list of abbreviations used in this Recommendation can be found in Annex B.

Recommendation F.812

BROADBAND CONNECTIONLESS DATA BEARER SERVICE

(1992)

1 Definition

A **B-ISDN connectionless data service** is defined as a service which allows the transfer of information among service subscribers without the need for end-to-end call establishment procedures between users.

2 Description

2.1 *General description*

This is a public packet-switched service that provides for the transfer of variable-length data units at high speed without the need for call establishment procedures between users. These data units can be transferred from a single source to a single destination, or from a single source to multiple destinations. Each data unit includes a source address validated by the network. One generic feature of a B-ISDN connectionless bearer service is that it may include broadcasting capabilities.

The B-ISDN connectionless data bearer service uses addresses based on the E.164 ISDN numbering plan.

For multicast communication an address scheme using group addressing is required. Group addressing is a mechanism which allows for the transmission of the same data unit to several intended recipients. A group address is an address used to represent the set of individual addresses that identify the destinations of a group addressed data unit.

The source address used in a group addressed data unit may be one of the individual addresses.

The B-ISDN connectionless data bearer service is designed such that, under normal conditions, subscriber's end-to-end protocols would not require changes. This allows user's communications architectures as well as the applications built on top of the connectionless service to remain intact.

This service is offered on the B-ISDN on ATM connections between the subscriber and a connectionless service node named "connectionless server", as it is defined in Recommendation I.211.

This service will be supported on the B-ISDN user-network interface (UNI) based on asynchronous tranfer mode (ATM).

2.2 *Specific terminology*

2.2.1 *Point-to-point*

Refer to Recommendation I.210.

2.2.2 *Broadcast*

Unidirectional communication from a single source entity to an unlimited number of unspecified destination entities.

2.2.3 *Multicast*

Unidirectional communication from a single source entity to a limited number of specified destination entities.

Note – Examples of communication configurations related to these terms in § 2.2.2 and 2.2.3 can be found in Table 1/F.812.

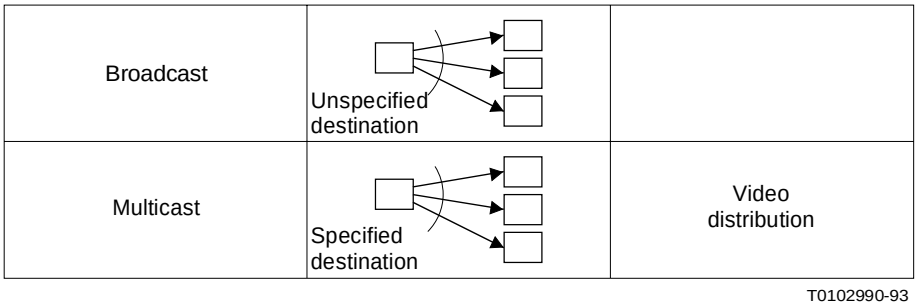

TABLE 1/F.812
Examples of communication configuration

2.2.4 *Protocol data unit (PDU)*

A block of data consisting of all information for end-to-end transmission (user data, addressing information and service parameters).

2.2.5 *CL-PDU*

Connectionless protocol data unit (see § 2.2.4).

2.2.6 *LANs*

Local area networks.

2.3 *Applications*

Some applications that could be supported by B-ISDN connectionless data service are:

a) high speed file transfer with low latency;

b) interconnection of LANs;

c) distributed processing;

d) multi-site interactive computer aided design (CAD).

3 Procedures

3.1 *Provision/withdrawal*

3.1.1 By arrangement with the Administration.

3.1.2 *Normal procedures*

The service may be provided directly accessed by high speed end systems or by means of gateways using permanent, semi-permanent or switched connections between the subscribers' premises and the connectionless service node.

3.2 *Normal procedures*

3.2.1 *Activation/deactivation/registration*

Upon request from the user, the service provider provides all necessary functions for enabling end-to-end transmission.

3.2.2 *Invocation and operation*

In normal operation the user sends data without establishing, releasing or maintaining a connection. All information which is required to route the data from the source to the destination is contained in the connectionless CL-PDU (see § 2.2.4).

3.3 *Exceptional procedures*

Not applicable.

3.4 *Alternate procedures*

Not applicable.

3.5 *Validation*

Each CL-PDU includes a source address validated by the network.

3.6 *Quality of service*

3.6.1 *General*

This section covers user oriented aspects of quality of service (QOS) specific to the broadband connectionless data bearer service. Overall principles for QOS for B-ISDN are contained in Recommendation I.350.

User oriented QOS issues are focused on end-to-end perceivable effects and not on their causes within the network.

Parameters for user QOS could be measured at the UNI.

3.6.2 *Categories of user defined QOS*

3.6.2.1 *Lost PDU ratio*

This parameter defines the ratio of total number of PDU's sent by the originator and not delivered at the destination UNI to the total number of PDU's sent.

$$\frac{\text{Total PDU's not delivered}}{\text{Total PDU's sent}} \times 100 = \% \text{ lost PDU}$$

3.6.2.2 *Maximum transfer delay*

This parameter defines the maximum PDU transfer delay between the source UNI and the destination UNI. If the transfer of a PDU exceeds the time limit, the PDU is assumed lost to the user.

This time delay includes, in a B-ISDN environment, the sum of the cell delays per switch and per transmission system, and the PDU disassembly and reassembly at the source and destination nodes.

3.6.2.3 *PDU, integrity*

This parameter defines the frequency of corrupted and/or duplicated PDU's.

4 Network capabilities for charging

This Recommendation does not cover charging principles. Future Recommendations in the D-Series are expected to contain that information.

However, charging for the service may be offered under tariffs containing usage sensitive rate elements (e.g. volume of data or transmission distance).

5 Interworking requirements

The broadband connectionless data bearer service should provide interworking to other connectionless services in private and/or public networks.

To support interworking the B-ISDN should provide the appropriate interface, bit rate and protocol conversion facilities when necessary.

Also, interworking between the connectionless (CL) and connection oriented (CO) data services should be assumed.

6 Possible supplementary services examples include:

– Closed User Group;

– Address Screening.

ANNEX A

(to Recommendation F.812)

Broadband connectionless data bearer service category

Sub-categories	D
Bearer service attributes	Value of attributes
Information transferred attributes	
1 Information transfer mode	PDU (Note 1)
1.1 Connection mode	Connectionless (CL)
1.2 Traffic type	Variable bit rate (VBR)
1.3 Timing end-to-end	Not required
2 Information transfer rate (bit/s)	
2.1 Peak bit rate	(Note 2)
2.2 Mean bit rate	(Note 2)
3 Information transfer capability	Unrestricted
4 Structure	Protocol data unit integrity
4.1 Maximum CL-PDU size	(Note 3)
5 Establishment of communication (ATM access connection)	Demand, reserved, permanent

Sub-categories	D	
Bearer service attributes	Value of attributes	
Information transferred attributes (cont.)		
6 Symmetry	Unidirectional	
7 Communication configuration	Point-to-point, multicast	
Access attributes		
8 Access channel and rate (bit/s)		
8.1 User information	The medium service bit rate at 155.52 Mbit/s, 622.08 Mbit/s interfaces is for further study (Note 2)	
8.2 Signalling	Signalling virtual channel for signalling for ATM access connection	
9 Access protocols		For establishment of switched connections between the B-ISDN subscriber and the CL service node. Connectionless protocols above the ATM adaptation layer are for further study
9.1 Signalling access protocol – Physical layer	Rec. I.432	
9.2 Signalling access protocol – ATM layer	Recs. I.150, I.361	
9.3 Signalling access protocol – ATM adaptation layer [AAL]	Rec. I.363, type 3	
9.4 Signalling access protocol layer 3 (above AAL) (Here "layer 3" corresponds to signalling terminology, not B-ISDN PRM.)	Recs. Q.930, Q.931 (Note 3)	
9.5 Information access protocol – Physical layer	Rec. I.432	
9.6 Information access protocol – ATM layer	Recs. I.150, I.361	
9.7 Information access protocol – ATM adaptation layer [AAL]	Recs. I.362, I.363, type 4 (Note 3)	
9.8 Information access protocols – Layers above AAL	(Note 3)	
General attributes		
10 Supplementary services provided	Closed User Group Address Screening	
11 Quality of Service	Lost PDU ratio Maximum transfer delay PDU integrity	

Sub-categories	D
Bearer service attributes	Value of attributes
General attributes (cont.) 12 Interworking possibilities	 With other CL services and data services
13 Operational and commercial aspects	

Note 1 – The PDU provides for the transfer of the service information. However, this is transported in the B-ISDN via the payload of the ATM cells.

Note 2 – As described in Recommendations I.432 and I.211, the maximum service bit rate at the 155.52 Mbit/s interface will be less than 135.631 Mbit/s. The maximum bit rate at the 622.08 Mbit/s is for further study. The actual value depends on the capacity required by signalling, operation, administration and maintenance (OAM), and ATM adaptation overheads (for further study). Also, granularity of the actual service bit rates offered by the network is contained in the appropriate I-Series Recommendations.

Variable bit rate means that the peak bit rate as information transfer rate attribute value is not necessarily equal to the mean bit rate at the S/T reference point. Actual rate may be lower than peak bit rate. The characteristics are determined by the ATM connection.

Note 3 – Exact values for these attributes are contained in appropriate Q- and I-Series Recommendations.

ANNEX B

(to Recommendation F.812)

Alphabetical list of abbreviations used in this Recommendation

AAL	ATM adaptation layer
ATM	Asynchronous transfer mode
B-ISDN	Broadband aspects of integrated services digital network
CAD	Computer aided design
CL	Connectionless
CL-PDU	Connectionless protocol data unit
CO	Connection oriented
LAN	Local area network
PDU	Protocol data unit
PRM	Protocol reference model
QOS	Quality of service
UNI	User-network interface