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Network Aspects (NA); Connectionless Broadband Data Service (CBDS) over
Asynchronous Transfer Mode (ATM); Framework and protocol specification at the User-
Network Interface (UNI); Part 1: Specification

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Part 1: Specification**

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Foreword

This European Telecommunication Standard (ETS) has been produced by the Network Aspects (NA) Technical Committee of the European Telecommunications Standards Institute (ETSI).

The present document is part 1 of a multi-part ETS covering the framework and protocol specification at the User-Network Interface (UNI) for the Connectionless Broadband Data Service (CBDS) over Asynchronous Transfer Mode (ATM), as identified below:

Part 1: "**Specification**";

Part 2: "Connectionless Network Access Protocol (CLNAP); Protocol Implementation Conformance Statement (PICS) proforma specification".

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1 Scope

This first part of ETS 300 478 describes the support of connectionless data service on Broadband Integrated Services Digital Network (B-ISDN) in accordance with:

- ETS 300 217 [2], which details the stage 1 aspects for the Connectionless Broadband Data Service (CBDS);
- ITU-T Recommendation I.113 [5], which defines **connectionless service** (vocabulary);
- CCITT Recommendation F.812 [4], which provides a service description of a CBDS. CCITT Recommendation F.812 [4] generally describes the service to include:
 - source address validation;
 - addresses based on CCITT Recommendation E.164 [3] numbering;
 - point-to-point and multicast information transfer;
 - address screening for point-to-point and multicast information transfer;
 - network capabilities for charging;
 - interworking with other ConnectionLess and Connection oriented data services;
 - Quality of Service (QoS) parameters.
- ITU-T Recommendation I.211 [6], which describes connectionless data service aspects. ITU-T Recommendation I.211 [6] identifies two configurations, type (i) and type (ii) to support connectionless data service. In type (i), a Connectionless Service Function (CLSF) is installed outside the B-ISDN. In type (ii), a CLSF, which handles routing of data to be transferred based on connectionless techniques, is installed within the B-ISDN;
- ITU-T Recommendation I.327 [8], which describes "high layer capabilities" for the support of services (e.g. connectionless service) and gives functional architectural models for the cases mentioned in F.812 Recommendation [4];
- ITU-T Recommendation I.362 [9], which specifies the use of ATM Adaptation Layer (AAL) type 3/4 for connectionless data services (although I.362 recognizes that the use of other AAL types is for further study) and identifies that routing and addressing are provided by the layer located above AAL type 3/4;
- ETS 300 349 [10], which specifies AAL type 3/4;
- ITU-T Recommendation I.364 [1], which specifies the support of Broadband Connectionless Data Bearer Service (BCDBS) on B-ISDN.

This ETS relates to type (ii) (direct) provision of connectionless service, using B-ISDN connectionless service. However, aspects of this ETS may be applied to some type (i) provision of connectionless service. This ETS describes the framework for network support of CBDS and the protocol used to support CBDS at the User Network Interface (UNI). The protocol used to support CBDS at the Network Node Interface (NNI) is described in 300 479-1 [14].

2 Normative references

This ETS incorporates by dated and undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this ETS only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

- [1] ITU-T Recommendation I.364 (1993): "Support of broadband connectionless data service on B-ISDN".

- [2] ETS 300 217-2 (1992): "Network Aspects (NA); Connectionless Broadband Data Service (CBDS) Part 2: Basic bearer service definition".
- [3] CCITT Recommendation E.164 (1991): "Numbering plan for the ISDN era".
- [4] CCITT Recommendation F.812 (1992): "Broadband connectionless data bearer service".
- [5] ITU-T Recommendation I.113 (1988): "Vocabulary of terms for broadband aspects of ISDN".
- [6] ITU-T Recommendation I.211 (1993): "B-ISDN Service Aspects".
- [7] ITU-T Recommendation I.324 (1988): "ISDN network architecture".
- [8] ITU-T Recommendation I.327 (1993): "B-ISDN Functional Architecture".
- [9] ITU-T Recommendation I.362 (1993): "B-ISDN ATM Adaptation Layer (AAL) Functional Description".
- [10] ETS 300 349: "Broadband Integrated Services Digital Network (B-ISDN); Asynchronous Transfer Mode (ATM) Adaptation Layer (AAL) specification - type 3/4".
- [11] ISO/IEC IS 8802-6: "Information processing systems - Local Area Networks (LAN) - Part 6: Distributed Queue Dual Bus (DQDB) Subnetwork of a Metropolitan Area Network (MAN)".
- [12] ITU-T Recommendation I.371: "Traffic Control and Congestion Control in B-ISDN".
- [13] ISO/IEC IS 10039: "LAN MAC service definition".
- [14] ETS 300 479-1: "Network Aspects (NA); Connectionless Broadband Data Service (CBDS) over Asynchronous Transfer Mode (ATM); Protocol specification at the Network Node Interface (NNI); Part 1: Specification".

3 Abbreviations

For the purposes of this ETS, the following abbreviations apply:

AAL	ATM Adaptation Layer
AATF	ATM Access Termination Functions
ANTF	ATM Network Termination Functions
ATF	Access Termination Functions
ATM	Asynchronous Transfer Mode
BAsize	Buffer Allocation Size
BCD	Binary Coded Decimal
BCDBS	Broadband Connectionless Data Bearer Service
B-ISDN	Broadband Integrated Services Digital Network
BOM	Beginning Of Message
CBDS	Connectionless Broadband Data Service
CF	Connection Functions
CIB	CRC Indication Bit
CL	Connectionless
CLAI	Connectionless Access Interface
CLATF	CL Access Termination Functions
CLHF	Connectionless service Handling Functions
CLL	Connectionless Layer
CLLR&R	Connectionless Layer Routeing & Relaying
CLMF	Connectionless Mapping Functions
CLNAP	Connectionless Network Access Protocol

CLNI	Connectionless Network Interface
CLNIP	Connectionless Network Interface Protocol
CLNTF	CL Network Termination Functions
CLS	Connectionless Server
CLSF	Connectionless Service Function
CPCS	Common Part Convergence Sublayer
CPE	Customer Premises Equipment
CRC	Cyclic Redundancy Check
CTF	Control Functions
DA	Destination Address
DQDB	Distributed Queue Dual Bus
EI	Encapsulating Indicator
EOM	End Of Message
GA	Group Address
GAHF	Group Address Handling Functions
GAP	Group Addressed PDU
HE	Header Extension
HEL	Header Extension Length
IA	Individual Address
IEC	International Electrotechnical Commission
IM	Initial MAC
IS	International Standard
ISDN	Integrated Services Digital Network
ISO	International Organization for Standardization
LAN	Local Area Network
MAC	Media Access Control
MAN	Metropolitan Area Network
MCL	Connectionless Layer Management
MID	Multiplexing Identification
MIR	Maximum Information Rate
NA	Network Aspects
NGA	Nested Group Address
NNI	Network Node Interface
NPC	Network Parameter Control
NTF	Network Termination Functions
OAM	Operation And Maintenance
PCF	Protocol Conversion Functions
PDU	Protocol Data Unit
PPTU	PDUs per Time Unit
QoS	Quality of Service
SA	Source Address
SAP	Service Access Point
SAR	Segmentation And Reassembly
SDU	Service Data Unit
SIR	Sustained Information Rate
SMDS	Switched Multi-megabit Data Service
SSCS	Service Specific Convergence Sublayer
SSM	Single Segment Message
UNI	User Network Interface
UPC	Usage Parameter Control
VCI	Virtual Channel Identifier
VPI	Virtual Path Identifier

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4 Framework for the provision of CBDS

This definition of CBDS is provided by ETS 300 217 [2] in conjunction with this ETS.

4.1 Group addressing

Group addressing is a mechanism used for multicast communication (CCITT Recommendation F.812 [4], paragraph 2).

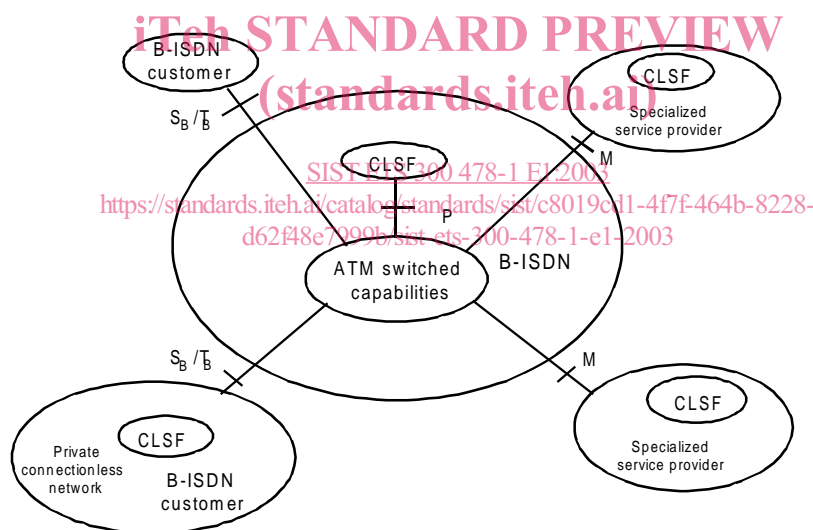
Multicast information transfer allows a subscriber to send an Connectionless Network Access Protocol-Protocol Data Unit (CLNAP-PDU) to the network which delivers the same CLNAP-PDU to several intended recipients. The network shall deliver one and only one copy of the Group Addressed CLNAP-PDU (GAP) across each of the Connectionless Access Interface (CLAI) associated with the individual addresses represented by the group address (i.e. each CLAI associated with multiple destination addresses will receive a single copy from the network). The GAP shall not be copied back to the originating CLAI. Any recipient of a GAP may make use of the destination Group Address carried by that GAP to multicast to the other recipients of the GAP. Non members of a group identified by a group address (GA) may send GAPs to that group.

As a result of address screening, it is possible that some of the copies of the GAP will not be delivered, all other copies are delivered according to the QoS.

The service provider is responsible for assigning group addresses and ensuring that each GA identifies uniquely only one set of individual addresses. GA can be distinguished from individual addresses by the address type.

4.2 Functional architecture

The provision of the connectionless data service in B-ISDNs is realized by means of ATM switched capabilities and Connectionless Service Functions (CLSF). The ATM switched capabilities support the transport of connectionless data units in B-ISDNs between specific functional groups CLSF able to handle the connectionless protocol and to realize the adaptation of the connectionless data units into ATM cells to be transferred in a connection-oriented environment. The CLSF functional groups may be located outside a B-ISDN, in a private connectionless network or in a specialized service provider, or inside a B-ISDN. The relevant reference configuration for the provision of the connectionless data service in a B-ISDN is depicted in figure 1.



CLSF: Connectionless Service Function.

M, P, S_B , T_B : Reference points.

Figure 1: Reference configuration for the provision of the CL data service in B-ISDN

The ATM switched capabilities are performed by the ATM nodes (ATM switch/cross-connect) which realize the ATM transport network. The CLSF functional group terminates the B-ISDN connectionless protocol and includes functions for the adaptation of the connectionless protocol to the intrinsically connection-oriented ATM layer protocol and functions for the adaptation of the CL protocols using up to 9 2766 octets (9 188 user information plus protocol control information), variable size PDUs to the fixed size, 48 octet ATM-SDUs and to the specific error characteristics (possible cell loss, possible burst cell loss) of the ATM networks. These latter functions are those performed by the ATM Adaptation layer type 3/4 (AAL 3/4), while the former ones are those related to the layer directly above the AAL denoted Connectionless Layer (CLL) and performed by the Connectionless Network Access Protocol (CLNAP), Connectionless Network Interface Protocol (CLNIP) and related Connectionless Layer Routing & Relaying (CLLR&R) functions, respectively.