

ECMA

Standardizing Information and Communication Systems

**Private Integrated Services Network
(PISN) -
Circuit Emulation Specification -
Emulation of Basic Access by ATM
Networks**

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Brief History

This Standard is one of a series of ECMA Standards defining services and signalling protocols applicable to Private Integrated Services Networks (PISNs). The series uses ISDN concepts as developed by ITU-T and the ATM Forum and is also within the framework of International Standards for Open Systems Interconnection as defined by ISO/IEC.

This particular Standard specifies the circuit emulation functions for the emulation of a basic access over ATM. This Standard specifies the static mapping of basic access information to ATM cells. Future enhancements may specify dynamic mapping functions.

The need for circuit emulation within ATM reflects a user demand for carrying certain types of constant bit rate (CBR) or “circuit” traffic over ATM networks. For the support of such types of traffic, ATM networks shall emulate circuit characteristics in order to provide good support for CBR traffic. A critical attribute of a circuit emulation service (CES) is that the performance realised over ATM should be comparable to that experienced with the current PDH/SDH technology.

Initial work on circuit emulation has been carried out by the ATM Forum subworking group VTOA leading to an approved interoperability specification, called CES-IS V2.0 (af-vtoa-0078.000). The CES-IS covers the following types of interfaces:

1. Structure DS1/E1 Nx64 kbit/s (Fractional DS1/E1) Service
2. Unstructured DS1/E1 (1.544 Mbit/s, 2.048 Mbit/s) Service
3. Unstructured DS3/E3 (44.736 Mbit/s, 34.368 Mbit/s) Service
4. Structured J2 Nx64 kbit/s (Fractional J2) Service
5. Unstructured J2 (6.312 Mbit/s) Service

The structured Nx64 and the unstructured DS1/E1/J2 services described in CES-IS V2.0 offer ways to connect DS1/E1/J2 equipment across emulated circuits carried on an ATM network.

Complementing the work of the ATM Forum, this Standard provides for a circuit emulation service also for the N-ISDN basic access, allowing to connect such an access via an ATM connection to a PINX. This Standard therefore follows the basic principles and the structure of the CES-IS of the ATM Forum.

In the same way as the CES-IS, it specifies static mapping functions performed by a CES-interworking function (IWF) between a basic access and an ATM connection, and the corresponding re-mapping between the ATM connection, and the link to the PINX.

This Standard is based upon the practical experience of ECMA member companies and the results of their active and continuous participation in the work of ISO/IEC JTC1, ITU-T, ETSI and other international and national standardisation bodies. It is also closely related to the Circuit Emulation Service Specification, Version 2, of the ATM Forum (af-vtoa-0078.000). It represents a pragmatic and widely based consensus.

This Standard has been adopted by the ECMA General Assembly of June 1998.

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1 Scope

This Standard specifies the functions for the emulation of a basic access over ATM, thus providing an efficient way to connect existing N-ISDN terminal equipment to a PINX over a digital ATM section. Such an ATM connection can be either a (semi-)permanent connection, but might also be a switched virtual connection as defined in related ATM Forum specifications.

The objective of this Standard therefore is to specify a mapping scheme for the three types of basic access information (two B channels: the B1 and B2 channels, the D channel as well as maintenance/control/status information) into ATM cells. Part of the maintenance/control/status information has to be terminated by an IWU and has to be substituted by other information applicable at the ATM connection. A reference configuration lays down that the point of emulation has to be placed at the network side of an extension line.

This Standard specifies the static mapping of basic access information to ATM cells.

This Standard complements the work of the ATM Forum on circuit emulation services for higher bandwidth.

This Standard applies for private networks, however, it is also suitable for public networks.

2 Conformance

In order to conform to this Standard, a circuit emulation functional unit shall satisfy the requirements identified in the Protocol Implementation Conformance Statement (PICS) proforma in annex A.

3 References

The following publications contain provisions which, through reference in this text, constitute provisions of this Standard. All publications are subject to revision, and parties to agreements based on this Standard are encouraged to investigate the possibility of applying the most recent editions of the publications indicated below.

AF UNI 4.0	ATM User-Network Interface (UNI) - Signalling specification (version 4.0)
AF CES-IS V2.0	ATM Forum circuit emulation service interoperability specification, vs. 2.0 (af-vtoa-0078)
ISO/IEC 11579-1	Information technology - Telecommunications and information exchange between systems - Private Integrated Services Network - Part 1: Reference configuration for PISN Exchanges (PINX) (1994)
ISO/IEC 11579-3	Information technology - Telecommunications and information exchange between systems - Private Integrated Services Network - Part 3: Reference configuration for extension lines
ITU-T G.960	Access digital section for ISDN basic rate access (1993)
ITU-T I.363.1	B-ISDN ATM Adaptation Layer specification: Type 1 AAL (1996)
ITU-T I.412	ISDN user-network interfaces – Interface structures and access capabilities (1988)
ITU-T I.430	Basic user-network interface – Layer 1 specification (1995)
ITU-T Q.512	Digital exchange interfaces for subscriber access (1995)

4 Definitions

For the purpose of this Standard the following definitions apply.

4.1 External definitions

This Standard uses the following terms defined in other documents:

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| – Integrated Services Digital Network | CCITT Rec. I.112 |
| – Private Integrated Services Network (PISN) | ISO/IEC 11579-1 |