**DRAFT**

# EUROPEAN TELECOMMUNICATION STANDARD

pr **ETS 300 821**

**December 1996**

Source: ETSI TC-NA

Reference: DE/NA-052627

ICS: 33.020

**Key words:** ATM, B-ISDN, HDLC

# Broadband Integrated Services Digital Network (B-ISDN); Asynchronous Transfer Mode (ATM); Support of the High Level Data Link Control (HDLC) core service by ATM Adaptation Layer 5 (AAL5)

**[ITU-T Recommendation I.365.4 (1996)]**

**ETSI**

European Telecommunications Standards Institute

**ETSI Secretariat**

**Postal address:** F-06921 Sophia Antipolis CEDEX - FRANCE
**Office address:** 650 Route des Lucioles - Sophia Antipolis - Valbonne - FRANCE
**X.400:** c=fr, a=atlas, p=etsi, s=secretariat - **Internet:** secretariat@etsi.fr

Tel.: +33 4 92 94 42 00 - Fax: +33 4 93 65 47 16

# Contents

Blank page

## Foreword

This draft European Telecommunication Standard (ETS) has been produced by the Network Aspects (NA) Technical Committee of the European Telecommunications Standards Institute (ETSI), and is now submitted for the Public Enquiry phase of the ETSI standards approval procedure.

This ETS reproduces and endorses the ITU-T Recommendation I.365.4 [5].

| **Proposed transposition dates** | |
|---|---|
| Date of latest announcement of this ETS (doa): | 3 months after ETSI publication |
| Date of latest publication of new National Standard or endorsement of this ETS (dop/e): | 6 months after doa |
| Date of withdrawal of any conflicting National Standard (dow): | 6 months after doa |

Blank page

# 1 Scope

This European Telecommunication Standard (ETS) specifies a function that allows data communication applications utilizing protocol stacks which include High Level Data Link Control (HDLC) procedures (ITU-T Recommendation X.25, [2]) also to be deployed in a Broadband Integrated Services Digital Network (B-ISDN) environment.

The required mapping function specified in this ETS is called "Service Specific Convergence Sublayer for HDLC Applications".

This ETS makes use of the fact that the functionality of the HDLC framing, i.e., the flag and abort sequences, the zero-bit insertion, and the Frame Checking Sequence (FCS) can be interpreted as a subset of the services offered by the ATM Adaptation Layer type 5 (AAL 5) as specified in ITU-T Recommendation I.363 [1].

This ETS is applicable to equipment to be attached to a B-ISDN network when protocol stacks developed for an HDLC-based environment are to be deployed.

# 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.363.5: "B-ISDN ATM Adaptation Layer (AAL) specification Type 5 AAL".

[2] ITU-T Recommendation X.25: "Interface between Data Terminal Equipment (DTE) and Data Circuit Terminating Equipment (DCE) for Terminals operating in the Packet Mode and connected to Public Networks".

[3] ITU-T Recommendation X.200: "Reference model of Open Systems Interconnection for CCITT applications".

[4] ITU-T Recommendation X.210: "Open Systems Interconnection layer service definition conventions".

[5] ITU-T Recommendation I.365.4: "B-ISDN ATM adaptation layer sublayers service specific coordination function for HDLC".

# 3 Definitions and abbreviations

## 3.1 Definitions

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

The term "HDLC framing" refers to the framing, transparency, and bit error detection functions of HDLC, i.e., the flag and abort sequences, the zero-bit insertion, and the FCS. Extensive use is also made of the layering concepts defined in ITU-T Recommendation X.200 [3] and the service primitive concepts defined in ITU-T Recommendation X.210 [4].

The HDLC framing usually is not considered as a separate sublayer but integrated into the HDLC Data Link layer; however, as the definition of HDLC procedures is beyond the scope of this Recommendation, a division into an HDLC control procedure sublayer and a HDLC framing sublayer is necessary. The primitives for accessing the services of the HDLC framing sublayer are called "DL-FRAME" primitives.

### 3.2 Abbreviations

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

| | |
|---|---|
| AAL | ATM Adaptation Layer |
| ATM | Asynchronous Transfer Mode |
| CP | Common Part |
| CPCS | Common Part Convergence Sublayer |
| CPCS-CI | CPCS-Congestion Indication |
| CPCS-LP | CPCS-Loss Priority |
| CPCS-UU | CPCS-User-to-User-Indication |
| DL | Data Link |
| DLCI | Data Link Connection Identifier |
| HDLC | High Level Data Link Control |
| FCS | Frame Checking Sequence |
| PCI | Protocol Control Information |
| PDU | Protocol Data Unit |
| SAP | Service Access Point |
| SSCS | Service Specific Convergence Sublayer |
| SDU | Service Data Unit |

## 4 General Description

The Service Specific Convergence Sublayer (SSCS) for HDLC applications provides for the possibility, to deploy applications developed for an HDLC-based environment also in a B-ISDN environment (see figure 1/I.365.4); HDLC framing is replaced by the services of the AAL type 5 (ITU-T Recommendation I.363.5 [1]).

## 5 Functions of the DL-FRAME SSCS

The purpose of the DL-FRAME SSCS is to map DL-FRAME primitives onto a subset of the AAL type 5 CPCS (Common Part Convergence Sublayer) service. An HDLC frame structure consisting of an Address field, a Control field and possibly an Information field is transported as a CPCS-SDU.

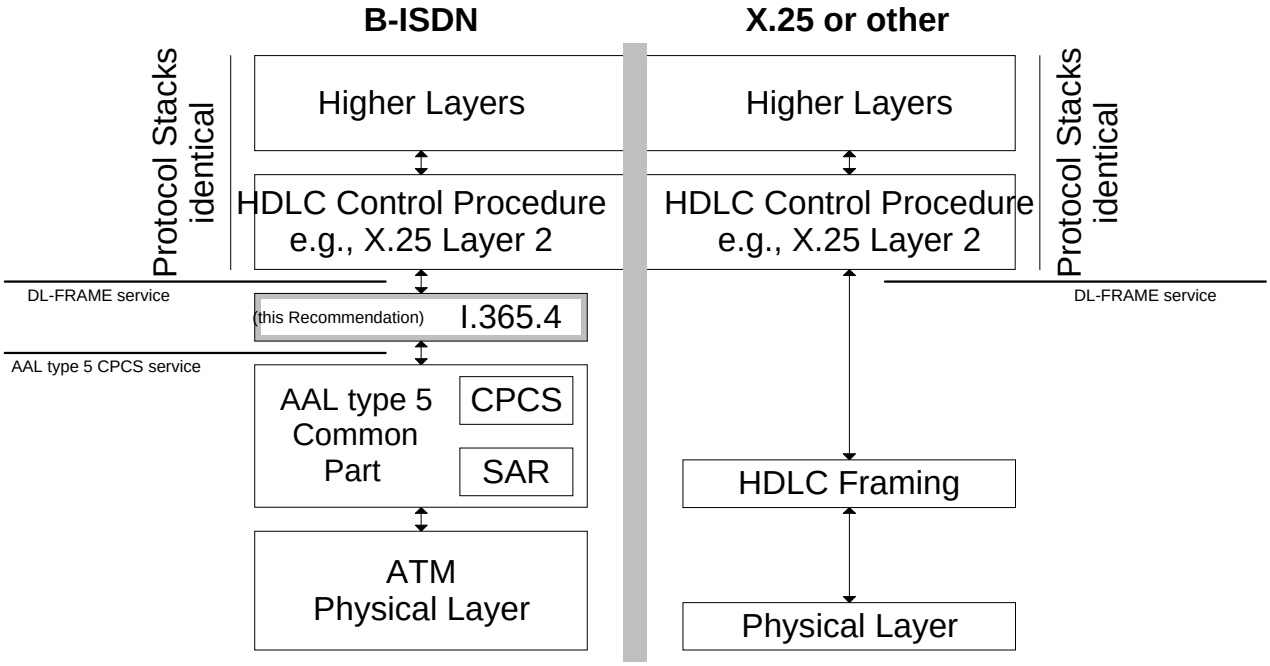


**Figure 1/I.365.4: Environment for the DL-FRAME SSCS for HDLC Applications**

# 6 Specification of the DL-FRAME SSCS

## 6.1 The service of the DL-FRAME SSCS

The DL-FRAME SSCS provides a framing and bit error detection service to its user. The DL-FRAME SSCS sublayer preserves the DL-FRAME-SDU sequence integrity. The primitives across the boundary from the DL-FRAME SSCS user, i.e., the HDLC control procedure sublayer, and the DL-FRAME SSCS are shown in table 1/I.365.4.

**Table 1/ I.365.4: DL-FRAME SSCS service primitives and parameters**

| | DL-FRAME-UNITDATA-request | DL-FRAME-UNITDATA-indication |
|---|---|---|
| Interface Data | X | X |

The length of the Interface Data parameter is an integral number of octets. It carries the HDLC Address, Control, and Information field as a PDU constructed and interpreted by the HDLC control procedure sublayer. The maximum length of this parameter is determined by the capability of the AAL type 5 CPCS.

NOTE: Although the absolute maximum length of a CPCS-PDU is 65 535 octets, the actual maximum CPCS-PDU length deployed depends on the error characteristics of the ATM connection.

## 6.2 The CPCS service of the AAL type 5

The CPCS service of the AAL type 5 is defined in ITU-T Recommendation I.363.5 [1]. Table 2/I.365.4 summarizes the primitives and parameters in the AAL type 5 CPCS service. Where there are differences between the definitions in this ETS and those in ITU-T Recommendation I.363.5, the one in ITU-T Recommendation I.363.5 is definitive.

**Table 2/ I.365.4: AAL type 5 CPCS service primitives and parameters**

| | **CPCS-UNITDATA.invoke** | **CPCS-UNITDATA.signal** |
|---|---|---|
| Interface Data (ID) | X | X |
| More (M) (note 1) | - | - |
| CPCS-Loss Priority (CPCS-LP) | X | X |
| CPCS-Congestion Indication (CPCS-CI) | X | X |
| CPCS-User-to-User-Indication (CPCS-UU) | X | X |
| Reception Status (RS) (note 2) | - | - |
| NOTE 1: Not present in message mode.<br>NOTE 2: Not present as the corrupted data delivery option is not utilized. | | |

## 6.3 PDU format

The AAL type 5 CPCS SDU is equivalent to the Interface Data parameter of the DL-FRAME-UNITDATA primitive; no further PCI is added.

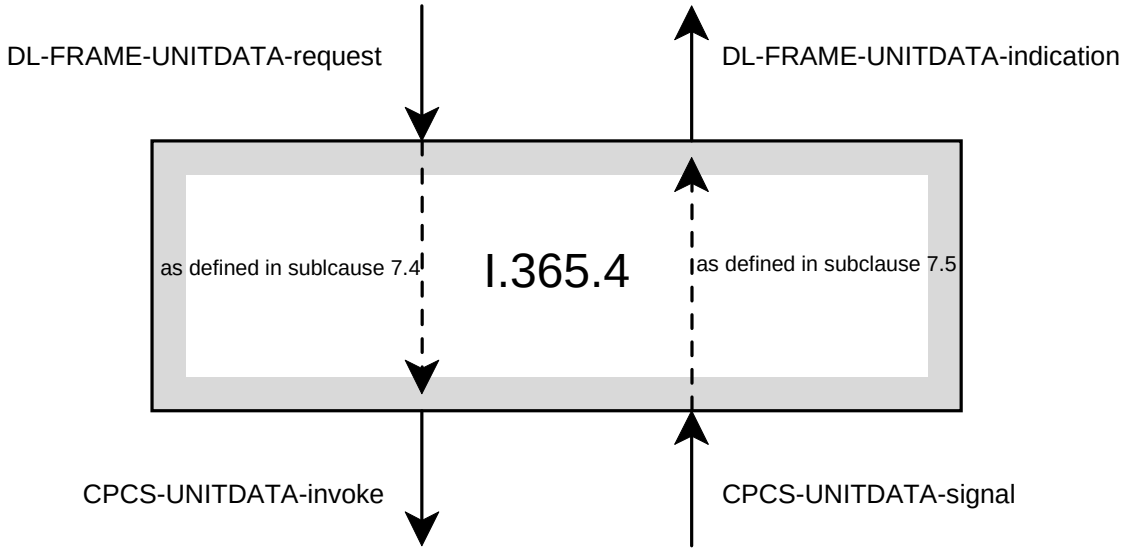


**Figure 2/I.365.4: Relationship of DL-FRAME primitives and AAL type 5 CPCS signals**

### 6.4 Mapping the DL-FRAME primitive into the AAL type 5 CPCS signal (transmitter)

As shown in figure 2/I.365.4, upon receipt of a DL-FRAME-UNITDATA-request from the HDLC control procedure sublayer, a CPCS-UNITDATA-invoke signal is formed with the parameters noted below and submitted to the CPCS (only message mode is utilized):

a) The ID parameter is formed as specified in subclause 6.3;

b) The CPCS-LP parameter is set to "0";

c) The CPCS-CI parameter is set to "0";

d) The CPCS-UU parameter is set to "0".

NOTE 1: The value "0" for the CPCS-LP is the default value; the value "1" may also be used by Layer Management decision.

NOTE 2: Further study on the relationship with ATM layer flow control is required.

### 6.5 Mapping the AAL type 5 CPCS signal into the DL-FRAME primitive (receiver)

As shown in figure 2/I.365.4, upon receipt of a CPCS-UNITDATA-signal from the CPCS, a DL-FRAME-UNITDATA-indication primitive is formed with the parameters noted below and sent to the HDLC control procedure sublayer (only message mode without the corrupted data delivery option is utilized):

a) The Interface Data parameter is set to the ID parameter of the CPCS-UNITDATA-signal (see subclause 6.3);

b) The CPCS-LP parameter is ignored;

c) The CPCS-CI parameter is ignored;

d) The CPCS-UU parameter is ignored.

NOTE: Flow control in HDLC procedures may be activated by Link Layer Management functions on the receipt of congestion indications at the DL-FRAME SSCS entity.

### 6.6 Layer Management

There are no interactions with Layer Management defined. Interactions to report the values of the congestion management parameter of the AAL type 5 CPCS (i.e., the CPCS-CI parameter) are for further study.

## History

| Document history | | | |
|---|---|---|---|
| December 1996 | Public Enquiry | PE 120: | 1996-12-16 to 1997-04-11 |
| | | | |
| | | | |
| | | | |
| | | | |