ETSI TECHNICAL REPORT

ETR 020

March 1991

Source: ETSI TC-NA

Reference: TR/NA-02001

ICS: 33.020

Key words: Telephones

Network Aspects
Numbering and addressing for X.31 services

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

Contents

Foreword 5

1 Introduction 7

2 References 7
2.1 ETSI References 7
2.2 CCITT References 8

3 Overview 8

4 Scenarios 9

History 19

Blank page

Foreword

This ETSI Technical Report (ETR) has been produced by the Network Aspects (NA) Technical Committee of the European Telecommunication Standards Institute (ETSI). It has been published to provide an informative guide, based on examples, of ISDN numbering plan requirements when using X.31 services.

ETSI would welcome comments on any of the issues raised in this document. These should be sent to the Standards Management Department of the ETSI Secretariat at the address on the cover forwarding to the appropriate technical experts.

Blank page

1 Introduction

This ETR has been prepared to provide an informative guide, based on examples, of the numbering plan requirements when using X.31 services within the ISDN.

The examples used are not exhaustive although they have been selected to reflect the majority of implementations.

It must be stressed that the ETR has, where possible, avoided internal network procedures, so as to present the customer end-to-end numbering requirements.

For X.31 case A, only the packet related addressing is considered.

For X.31 case B only the first call is considered showing the essential set-up information to gain access to the packet capability of an ISDN.

2 References

2.1 ETSI References

Relevant ETSI references are the following:

prETS 300 048 Integrated Services Digital Network (ISDN)
ISDN Packet Mode Bearer Service (PMBS)
ISDN Virtual Call (VC) and Permanent Virtual Circuit (PVC) bearer services provided by the B-channel of the user access: basic and primary rate

prETS 300 049 Integrated Services Digital Network (ISDN);
ISDN Packet Mode Bearer Services (PMBS)
ISDN Virtual Call (VC) and Permanent Virtual Circuit (PVC) bearer services provided by the D-channel of the user access: basic and primary rate

prETS 300 099 Integrated Services Digital Network (ISDN)
Specification of the Packet Handler Access Point Interface (PHI)

prETS 300 007 Integrated Services Digital Network (ISDN);
Support of packet mode terminal equipment by an ISDN

These standards are currently undergoing the formal ETSI approval process, and are expected to be adopted during 1991.

2.2 CCITT References

The ETR has been developed using the following CCITT Blue Book Recommendations (1988):

E.164
E.165
E.166
X.121
X.122

NOTE: E.166/X.122 are being extensively revised with a view to their integration into a single Recommendation. This will then be the definitive source of the ISDN/PSPDN number plan interworking.

3 Overview

For packet oriented terminals, the X.25 terminals, use of the protocol implies inband signalling, i.e. the same channel is used for the signalling and transmission of the user data. This is not in line with the ISDN concept, where one of the basic ideas is to separate signalling and user data into different channels.

CCITT has made a recommendation for connection of X.25 terminals to ISDN, namely X.31. X.31 is divided into two main categories of access, "case A" and "case B".

Case A is a simple access, as the ISDN simply acts as a transmission line between the terminal and the packet network. The X.25 terminal is considered as an extension to the PSPDN and, therefore, may use the PSPDN X.121 number.

In case B, a simple packet capability is considered as part of the ISDN. The handling of the X.25 protocol takes place in this packet mode. As this is a part of the ISDN, the X.25 terminal is given a native ISDN subscriber number (E.164) like all other ISDN terminals.

The packet node is functionally considered as a part of the ISDN.

Case B is again divided into two main parts, depending on whether the X.25 terminal uses a B-channel or D-channel for packet communication.

4 Scenarios

The following access possibilities are considered:

1) X.31 case A on ISDN

2) X.31 case B and using B-channel on ISDN

3) X.31 case B and using D-channel on ISDN

Subscribers in these categories can be both A or B subscribers.

It would be too overwhelming to include scenarios for all combinations of one terminal calling another terminal. Below a selection has been made covering the majority of situations.

The following scenarios are shown:

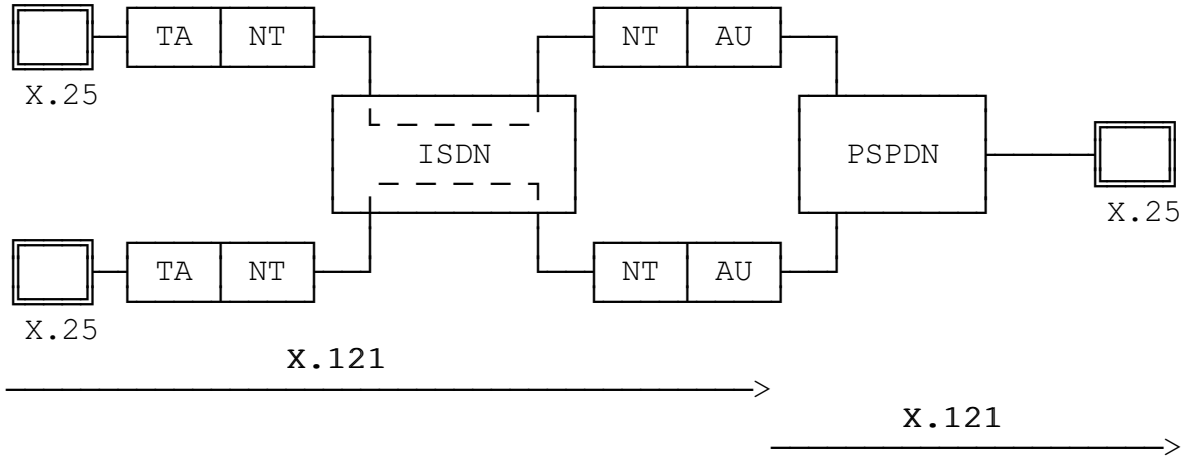
ISDN (X.31 Case A)	->	PSPDN	Figure 1
	<-		Figure 2
ISDN (X.31 case A)	->	ISDN (via PSPDN) (X.31 Case A)	Figure 3
ISDN (X.31 Case B, B-channel)	->	PSPDN	Figure 4
	<-		Figure 5
ISDN (X.31 Case B, B-channel)	->	ISDN (X.31 Case B, B-channel)	Figure 6
ISDN (X.31 Case B, D-channel)	->	PSPDN	Figure 7
	<-		Figure 8
ISDN (X.31 Case B, D-channel)	->	ISDN (X.31 Case B, D-channel)	Figure 9

Call direction: ISDN to PSPDN

Numbering plan for packet mode: A-subscriber: X.121,
B-subscriber: X.121.

Routing: From TA to AU: Semi-permanent connection.
From AU to TE: PSPDN.

Called address: B-subscriber number.



Comments:

Every TA is attached to its own AU. There is a fixed B-channel connection from the NT of the TA to the NT of the AU.

Full drawn line; X.25 protocol.

Semi-permanent connection is considered as set up or a switched connection has been made.

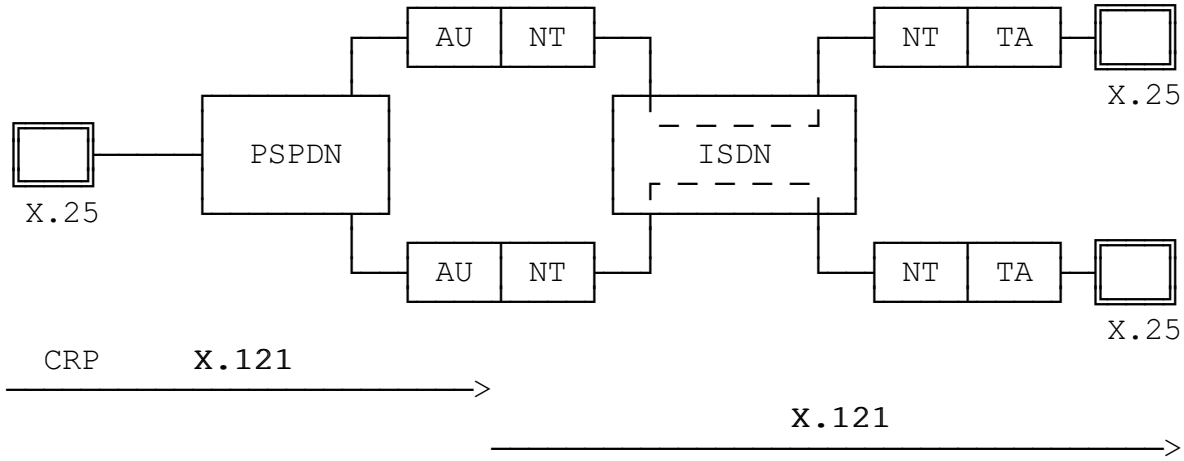
FIGURE 1: Scenario X.31 case A
Semi permanent and/or on demand switched connection, X.25 Phase

Call direction: PSPDN to ISDN.

Numbering plan for packet mode: A-subscriber: X.121,
B-subscriber: X.121.

Routing: From A-TE to AU: X.121,
from AU to B-TE: semi-permanent connection.

Called address: B-subscriber number.



Comments:

Every TA is attached to its own AU. There is a fixed B-channel connection from the NT of the TA to the NT of the AU.

Full drawn line: X.25 protocol.

Semi-permanent connection is considered as set up or a switched connection has been made.

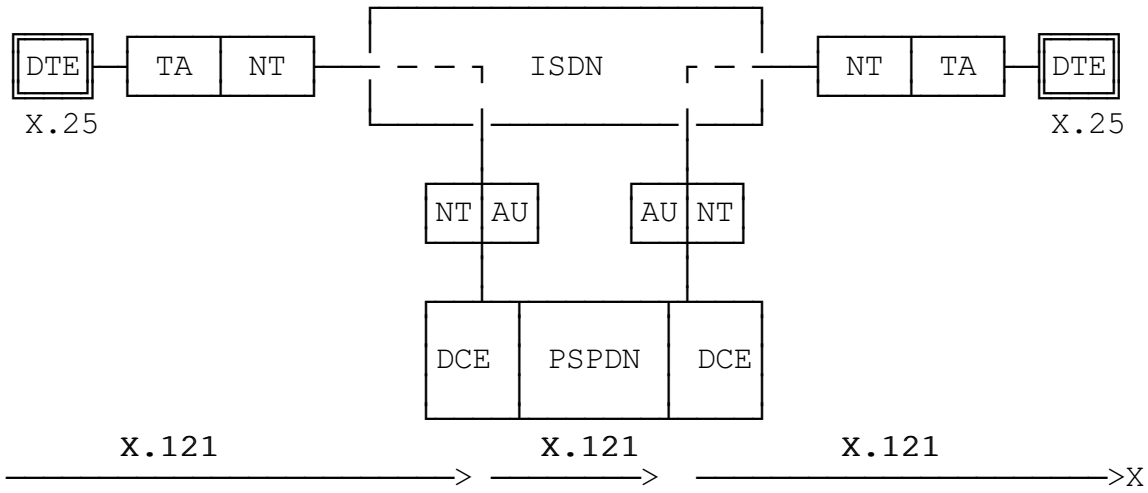
FIGURE 2: Scenario X.31 case A
Semi permanent and/or on demand switched connection, X.25 phase

Call direction: ISDN to ISDN

Numbering plan: X.121.

Routing: B-subsriber number.

Addressing: B-subscriber number.



Comments:

Every AU is attached to its own TA.

Full line: X.25 protocol.

Semi-permanent connection is considered as set up or switched connection has been established.

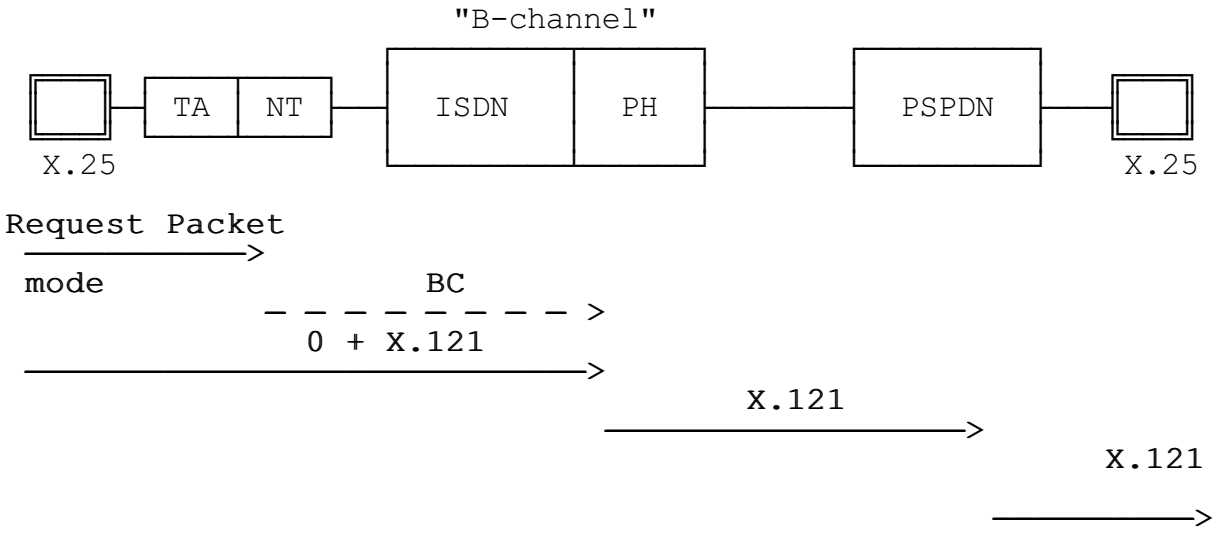
FIGURE 3: Scenario X.31 case A
Semi permanent and/or on demand switched connected B-channels, X.25 phase

Call direction: ISDN to PSPDN.

Numbering plan for packet mode: A-subscriber: E.164,
B-subscriber: X.121.

Routing: From TA to PH: Bearer capability.
From PH to B-TE: X.121.

Called address: B-subscriber number.



Comments:

Dotted line: D-channel signalling.

Full line: X.25 protocol.

First call sequence only.

ISDN may need addressing information in addition to BC for distributed PHs.

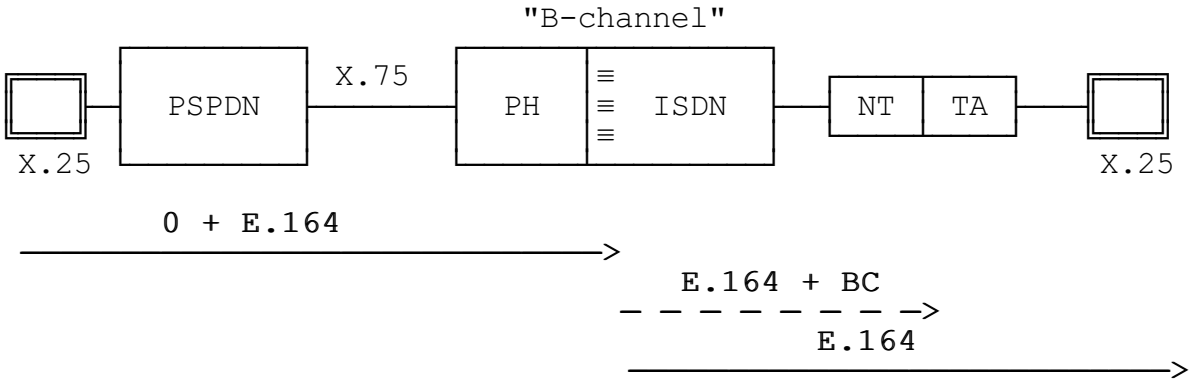
**FIGURE 4: Scenario PSPDN X.31 case B,
B-channel, first call**

Call direction: PSPDN to ISDN.

Numbering plan: A-subscriber: X.121,
B-subscriber: E.164.

Routing:

Called address: B-subscriber number with Bearer Capability (BC).



Comments:

Dotted line: D-channel signalling.

Full line: X.25 protocol.

First call sequence only.

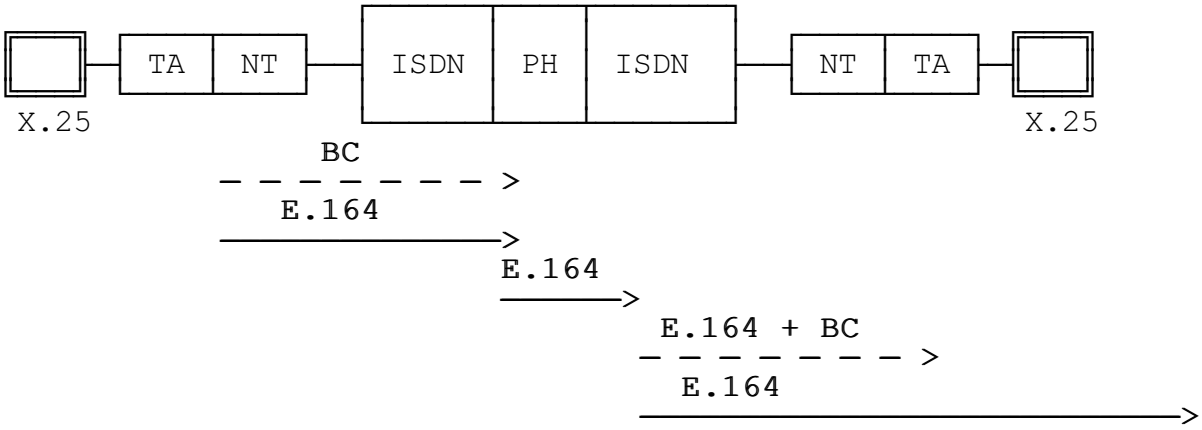
FIGURE 5: Scenario PSPDN X.31, case B
B-channel, first call

Call direction: ISDN to ISDN (CASE B, B-channel to CASE B, B-channel)

Numbering plan: E.164.

Routing: From TA to PH: BC,
from PH to B-subscriber: B-subscriber number (E.164).

Addressing: B-subscriber number.



Comments:

Dotted line: D-channel signalling

Full line: X.25 protocol.

First call sequence only.

The ISDN may need addressing information in addition to BC for distributed PHs.

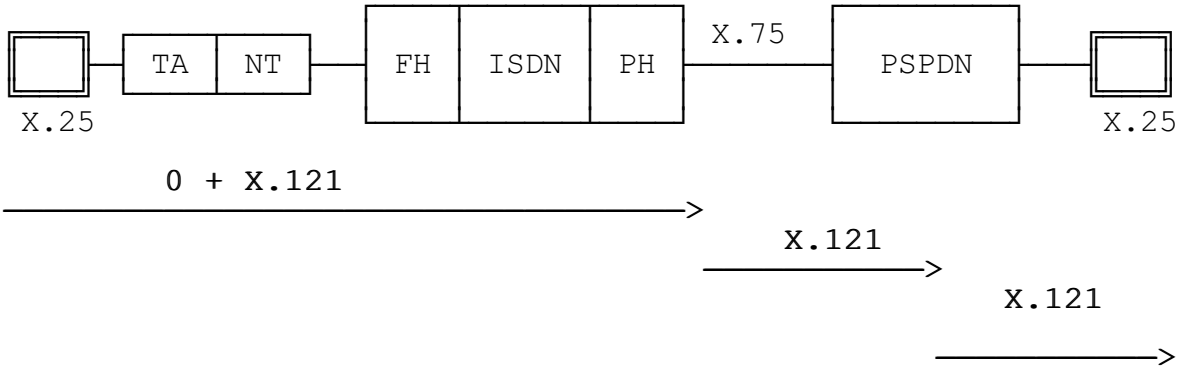
FIGURE 6: Scenario PSPDN X.31 case B
B-channel, switched, first call

Call direction: ISDN to PSPDN.

Numbering plan; PSPDN-subscriber X.121.

Routing: From TA to PH: BC,
from PH to PSPDN: B-subscriber number.

Addressing: B-subscriber number.



Comments:

Full line: X.25 protocol.

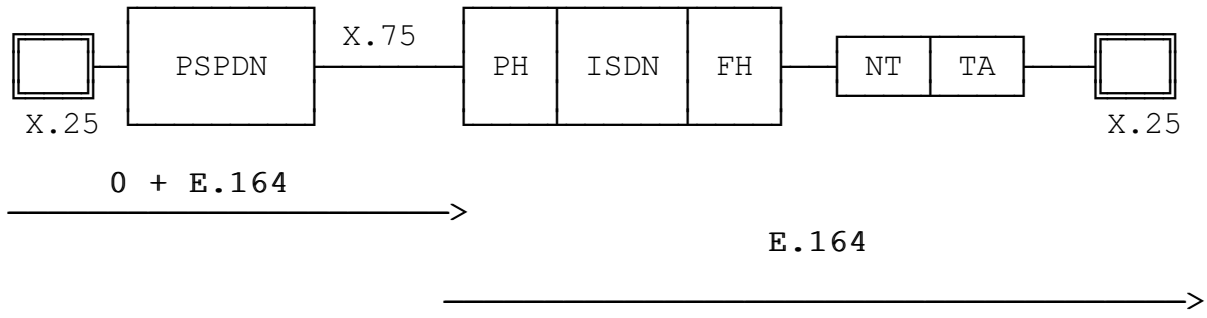
FIGURE 7: Scenario X.31, case B
D-channel, on demand

Call direction: PSPDN to ISDN.

Numbering plan; ISDN subscriber: E.164.

Routing: From PSPDN to ISDN: B-subscriber number.

Addressing: B-subscriber number.



Comments;

Full line: X.25 protocol

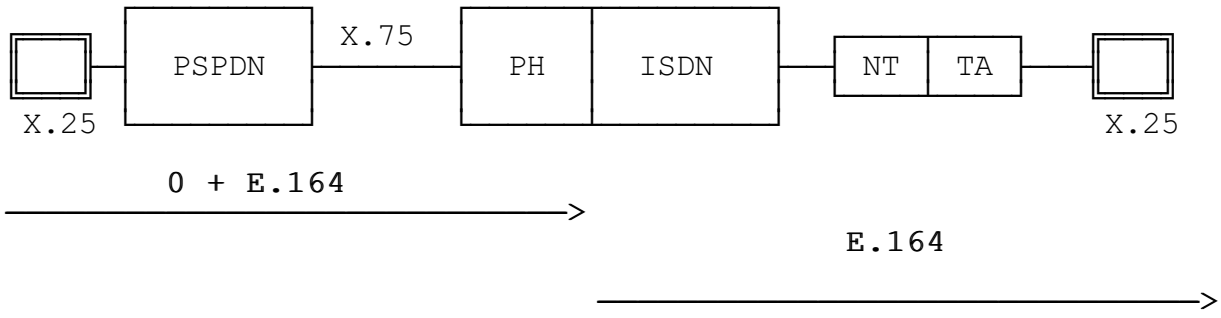
FIGURE 8: Scenario PSPDN X.31 case B
D-channel, notification class

Call direction: PSPDN to ISDN.

Numbering plan; ISDN-subscriber: E.164

Routing: From PSPDN to ISDN: B-subscriber number.

Addressing: B-subscriber number.



Comments

Full line: X.25 protocol.

FIGURE 9: Scenario PSPDN X.31 case B
D-channel, No notification class

History

Document history	
March 1991	First Edition
March 1996	Converted into Adobe Acrobat Portable Document Format (PDF)