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OF ITU

I.330

INTERGRATED SERVICES DIGITAL NETWORK (ISDN)

OVERALL NETWORK ASPECTS AND FUNCTIONS

ISDN NUMBERING AND ADDRESSING PRINCIPLES

ITU-T Recommendation I.330

(Extract from the *Blue Book*)

NOTES

1 ITU-T Recommendation I.330 was published in Fascicle III.8 of the *Blue Book*. This file is an extract from the *Blue Book*. While the presentation and layout of the text might be slightly different from the *Blue Book* version, the contents of the file are identical to the *Blue Book* version and copyright conditions remain unchanged (see below).

2 In this Recommendation, the expression "Administration" is used for conciseness to indicate both a telecommunication administration and a recognized operating agency.

Recommendation I.330

ISDN NUMBERING AND ADDRESSING PRINCIPLES

(Malaga-Torremolinos, 1984; amended at Melbourne 1988)

1 Introduction

1.1 This Recommendation provides the general concepts, principles, and requirements for addressing reference points located at subscriber premises, for addressing other functions, and for allowing communications with terminals.

1.2 Recommendation I.331 (E.164) describes the numbering plan for the ISDN era. Closely related information is contained in Recommendation I.332 on numbering principles for interworking between ISDNs and dedicated networks with different numbering plans. Recommendation I.333 on terminal selection and Recommendation I.334 on principles relating ISDN numbers/subaddresses to the OSI reference model network layer addresses represent additional sources of information having direct application to Recommendation I.330.

1.3 The following understanding of relevant nomenclature is established:

a) an ISDN number is one which relates to an ISDN network and ISDN numbering plan;

b) an ISDN address comprises the ISDN number and the mandatory and/or optional additional addressing information;

c) private communications facilities are communication capabilities confined to use by one or more particular subscribers, as opposed to facilities which are shared by subscribers of public networks. Examples of private communications facilities include local area networks (LANs), PABXs, and other private network arrangements.

1.4 Depending on the different cases and stages identifiable within an addressing process, an ISDN number may be (see Figure 10/I.330):

a) an international ISDN number;

b) a national ISDN number;

c) an ISDN subscriber number.

An ISDN address comprises:

i) the ISDN number;

ii) mandatory and/or optional additional addressing information.

1.5 As an objective, all ISDNs should evolve towards a single numbering plan, namely the ISDN numbering plan. Considering the wide penetration of the telephone network in the world and existing telephone network resources, the ISDN numbering plan has been developed by building from Recommendation E.163. Therefore, it is recommended that the telephone country code (TCC) be used to identify a particular country.[1)]

1.6 An existing numbering plan may interwork and thus co-exist with the ISDN numbering plan. A framework for interworking between an ISDN and existing numbering plans is given in Recommendation I.332. Recommendations E.166 and X.122 provide information describing selected interworking situations which have been considered by appropriate Study Groups. Preference should be given to single stage selection methods whenever possible.

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1) Country or geographical area.

1.6.1 It is recognized that some of the present data networks, for instance, could retain the X.121 numbering structure and interwork with ISDNs. A critical element of such interworking is numbering plan identification. Two approaches have been recommended:

1) the escape code method, now recognized within the format structures of Recommendations E.164 and X.121;

2) the NPI (Numbering Plan Identifier) method which applies distinct protocol provisions to distinguish numbering plan identity from address content.

Method 1) is intended for near-term applications while method 2) may be applied to both near-term and long-term interworking, with a view to general use of method 2) after year-end 1996.

1.6.2 It should be understood that call routing at each switching system is guided by reference to a destination numbering plan which is identified by either method 1) or method 2), not both. Method 1) interprets numbers in terms of the numbering plan incorporated into the basic operation of the switching system, unless incoming circuit class logic or an escape code explicitly overrides that interpretation, substituting a different numbering plan. Under method 2) an explicit numbering plan identifier is presented on each call.

1.6.3 When transmission of the calling party's number is appropriate, the numbering plan of the calling party is established in a comparable manner. For a given direction of transmission, either method 1) is used for both called and calling numbers or method 2) is applied in both cases.

1.6.4 After a switching system selects an outgoing route, the logical needs of the next switching system must be considered. Interworking between numbering plans may occur. The method used to inform the subsequent switch about applicable numbering plans may need to be adjusted, but numbering content should not be altered. Preference should be given to method 2) when it is practicable to introduce it since method 1) places constraints on maximum number length in some circumstances.

2 Principles for relating an ISDN number to ISDN user-network reference configurations

2.1 An ISDN number shall be able unambiguously to identify (a) particular:

a) physical interface at reference point T (see Figure 1/I.330);

b) virtual interface at reference point T; i.e., for an NT2 + NT1 configuration (see Figure 2/I.330);

c) multiple interfaces (physical or virtual) at reference point T (see Figure 3/I.330);

d) for point-to-point configurations, physical interface at reference point S (see Figure 4/I.330);

e) for point-to-point configurations, virtual interface at reference point S (see Figure 5/I.330);

f) for point-to-point configurations, multiple interfaces (physical or virtual) at reference point S (see Figure 6/I.330);

g) for multi-point configurations (e.g. passive bus), all of the interfaces at reference point S (see Figure 7/I.330).

As a result, from the viewpoint of the network side of the interface, an ISDN number is associated with one (or a multiple of) D-channels used to signal to the user.

2.2 A particular interface, or multiple of interfaces, may be assigned more than one ISDN number. An example is shown in Figure 8/I.330.

2.3 All ISDNs shall be able to assign an ISDN number to an interface at reference point T or S. However, a particular ISDN number fulfills only one of the functions identified in § 2.1.

2.4 For mobile services an ISDN number shall be capable of unambiguously identifying an interface in the mobile subscriber's premises, as defined in § 2.1 (see Figure 9/I.330).

2.5 The ISDN number is not required to identify a particular connection where, on a particular interface, more than one connection may be present at a given instant.

2.6 The ISDN number is not required to identify directly a particular channel, where, within a particular interface, there may be more than one channel. Indirect identification of particular channels may occur: e.g. when the ISDN number identifies a particular interface and there is a one-to-one correspondence between that interface and particular channels.

3 Relationships between ISDN number, transit network/RPOA selection (when permitted), service indication, and quality of service indication

The establishment of an ISDN connection will require an ISDN address. In addition separate non-address related information may be necessary for completing a connection.

3.1 Routing of ISDN connections shall take into account the following information, when supplied by the user:

a) ISDN numbers, including destination network identification and digits for direct dialling-in (DDI) where applicable;

b) service identification, possibly including requested quality of service parameters such as transit delay, throughput, and security;

c) multiple transit RPOA/network selection, when permitted by the originating ISDN.

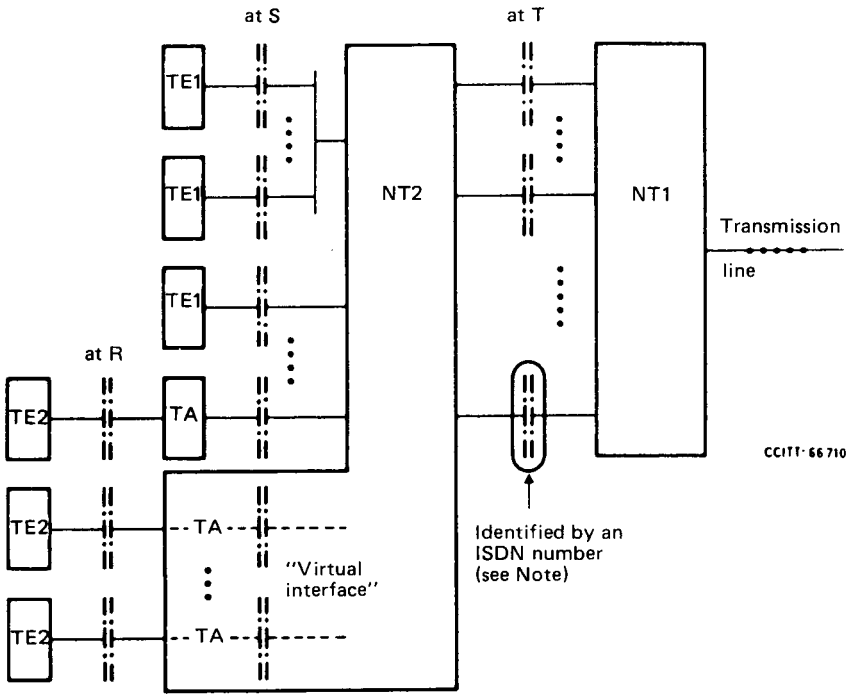
Note - The need for remote transit RPOA/network selection by the user of an ISDN which has no local transit RPOA/network selection is for further study.

In addition, transit RPOA/network selections by the originating ISDN, if provided, shall also be evaluated in the routing of a connection.

In national networks on a particular connection, the user may choose to specify some or all of this information, at either subscription time or connection-establishment time.

The ISDN number does not identify the particular nature of the service, type of connection, or quality of service to be used, nor does it identify a transit RPOA/network.

3.2 In the case where an ISDN number identifies a mobile TE or a TE served by several interfaces or networks, an ISDN may need to map from the ISDN number on to a specific interface designation.



Note – Example case corresponding to Figures 1/I.330 and 3/I.330: The interface at reference point T identified by an ISDN number as shown in Figure 1/I.330 could correspond to a high speed channel and service (e.g. for a video application) and the controlling D-channel, while the remaining interfaces at reference point T as shown in Figure 3/I.330 could correspond to e.g. primary rate interfaces used for B-channels and the corresponding D-channel. In this example, the switching and signalling of the high speed channel would be completely separate from the switching and signalling for the separate primary rate interface channels. The commonality shown in these figures is that these two sets of signals are multiplexed together on the transmission line, e.g. by layer 1 multiplexing in the NT1. Thus it is appropriate for separate ISDN numbers to be assigned to these two sets of interfaces at reference point T.

FIGURE 1/I.330

Example of an ISDN number identifying a particular interface at reference point T

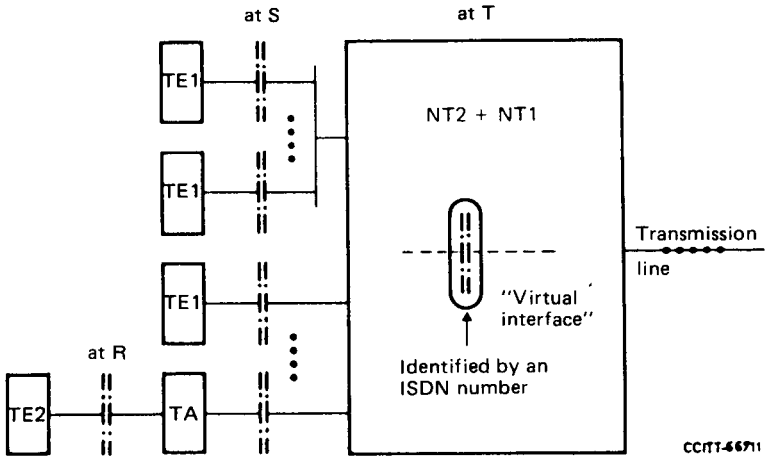


FIGURE 2/I.330

Example of an ISDN number identifying a particular "virtual interface" at reference point T

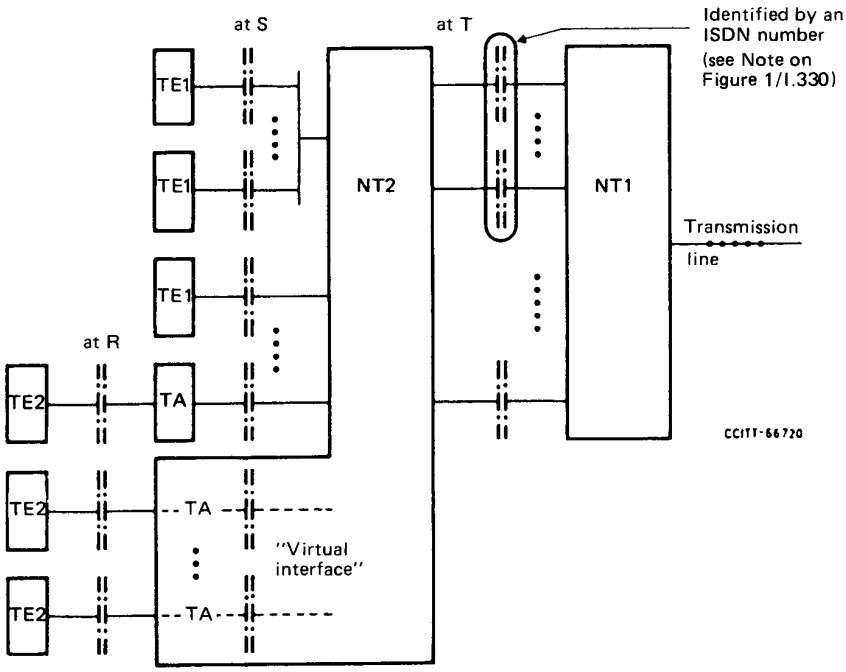


FIGURE 3/I.330

Example of an ISDN number identifying a particular multiple of interfaces at reference point

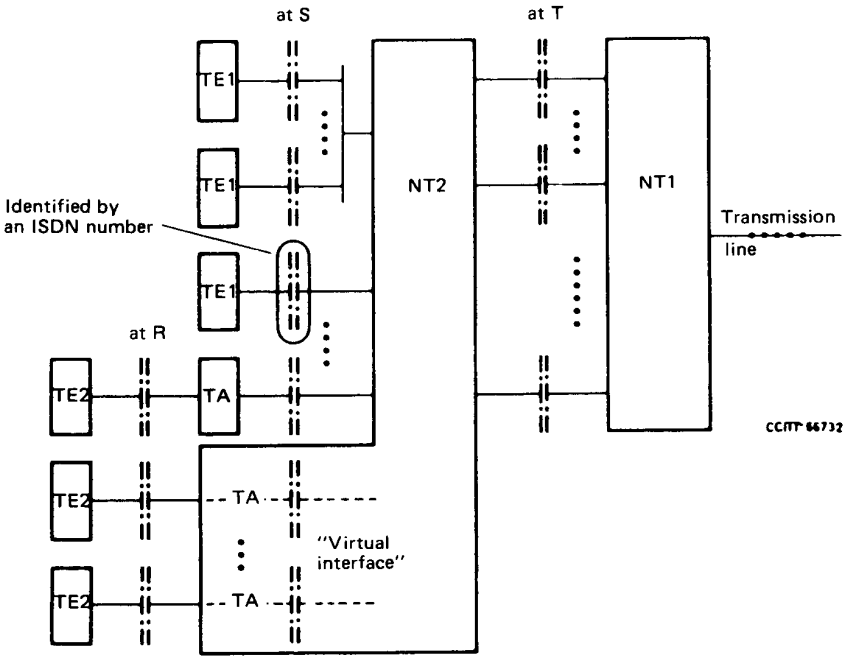


FIGURE 4/I.330

Example of DDI using an ISDN number identifying a particular physical interface at reference point S in a point-to-point configuration

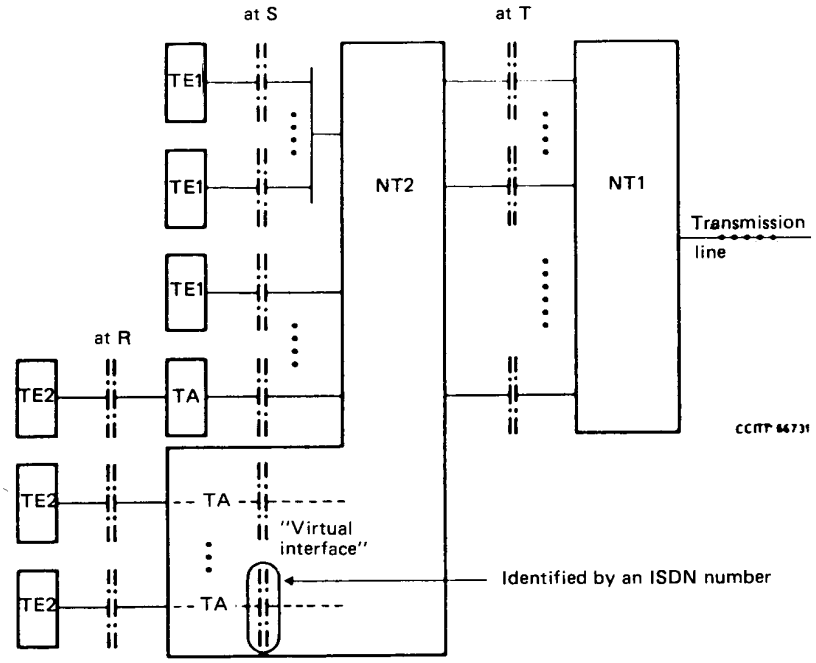


FIGURE 5/I.330

Example of DDI using an ISDN number identifying a particular "virtual interface" at reference point S

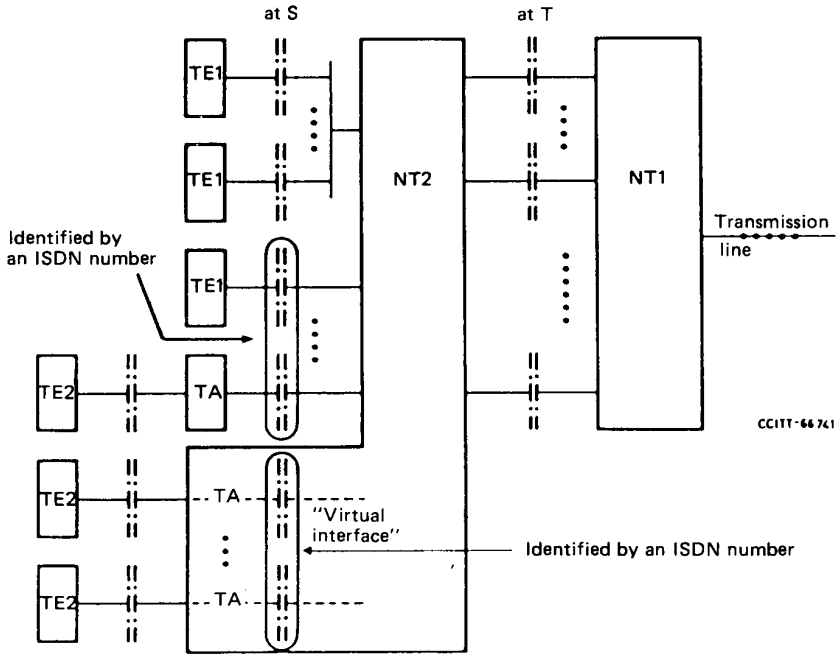


FIGURE 6/I.330

Example of DDI using ISDN numbers, each identifying a particular multiple of interfaces at reference point S in a point-to-point configuration

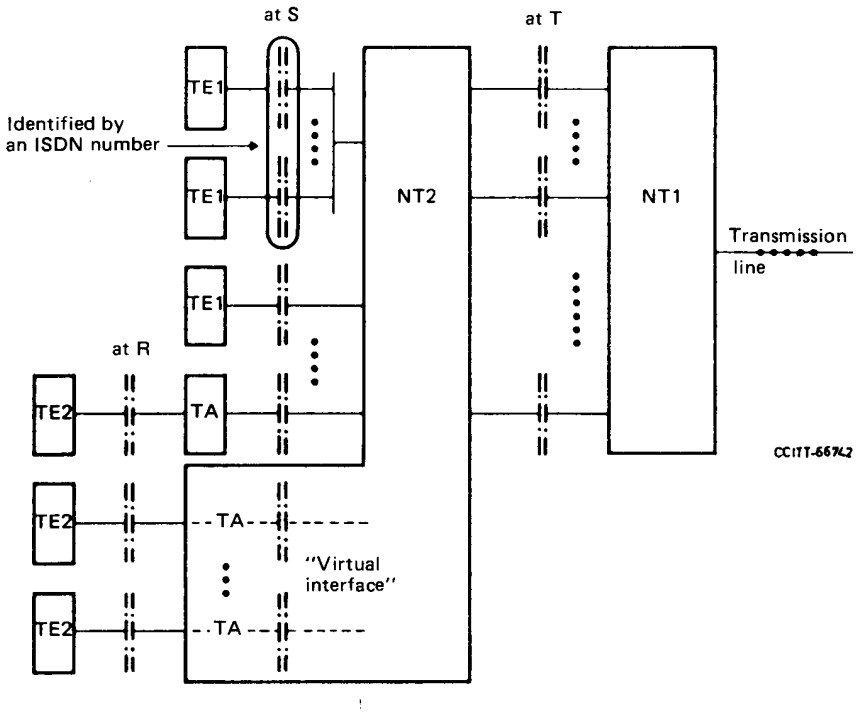
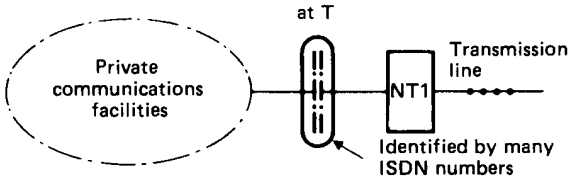


FIGURE 7/I.330

Example of DDI using an ISDN number identifying all of the interfaces at reference point S in a multipoint configuration



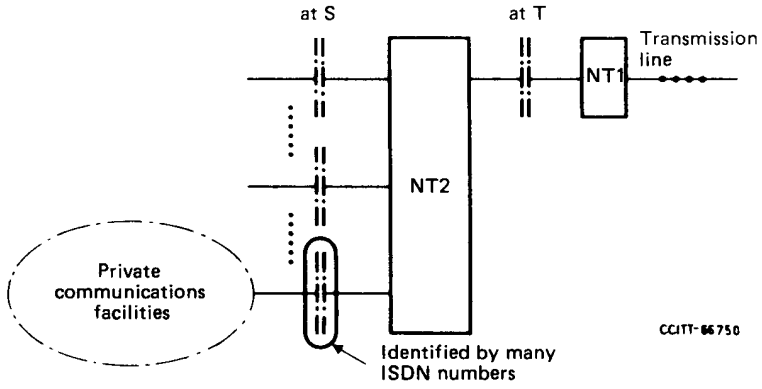


FIGURE 8/I.330

Examples of an interface identified by many ISDN numbers

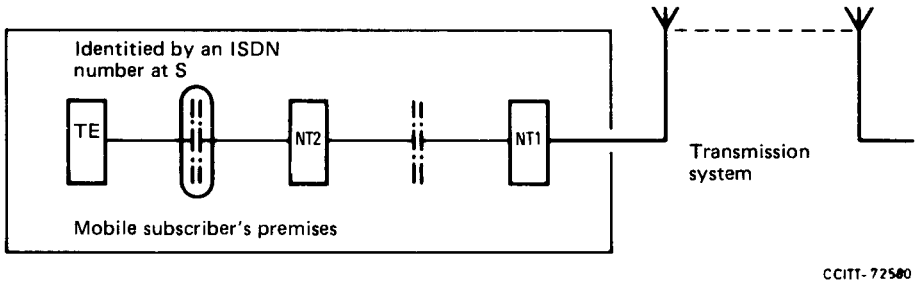


FIGURE 9/I.330

Example of an ISDN number identifying a mobile TE

4 ISDN number design considerations

4.1 Numbering plan design information is covered by Recommendation I.331 (E.164).

4.2 The ISDN number shall include an unambiguous identification of a particular country[2)].

The ISDN number is allowed to include an unambiguous identification of a particular geographic area within a country [2)].

4.3 As an objective, all ISDNs should evolve towards a single numbering plan. However, an existing numbering plan may interwork and thus coexist with the ISDN numbering plan.

4.4 When a number of public or private ISDNs exist in a country[2)], it shall not be mandatory to integrate the numbering plans of the ISDNs. Methods for interworking are for further study, with the objective that connections between the TEs on these various networks can be completed by using only the ISDN address. See also Recommendation I.332.

4.5 The ISDN number shall be capable of containing an identification of the ISDN to which the called user is attached. For a private network which spans more than one country[2)] , the international ISDN number will cause delivery of a call to the particular private network in the country specified by the country code.

4.6 The ISDN number shall be capable of providing for interworking of TEs on ISDNs with "TEs" on other networks. As an objective, with respect to the ISDN number, the procedure for interworking should be the same for all cases. The single-stage method of interworking is the preferred approach.

5 Structure of the ISDN address

5.1 The structure of the ISDN address is illustrated in Figure 10/I.330. A function marking the end of the ISDN number shall always be provided if a subaddress is present. The end of number function may also be provided even if no subaddress is present. When there is no subaddress present, the end of number and end of address functions are coincident, when used.

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2) Country or geographical area.

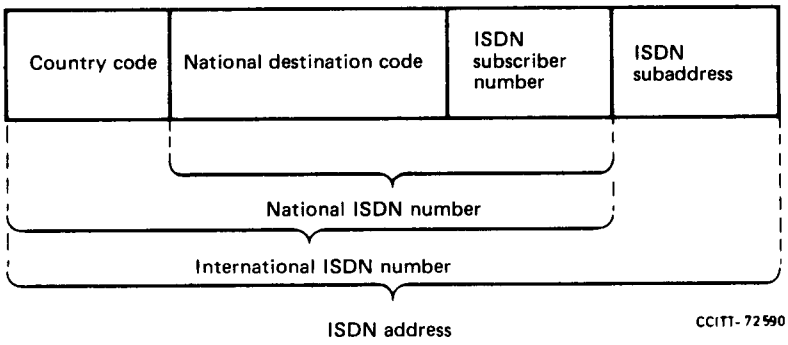

FIGURE 10/I.330

Structure of the ISDN address

5.2 The ISDN address may be of variable length.

5.3 *International ISDN number*

5.3.1 The structure of the international number and the maximum number length are as defined in Recommendation I.331 (E.164).

5.3.2 In a particular international ISDN number, the exact number of digits shall be governed by national and international requirements.

5.3.3 The ISDN numbering plan shall provide substantial spare capacity to accommodate future requirements.

5.3.4 The ISDN number shall be a sequence of decimal digits.

5.3.5 The ISDN number shall include the capability for direct dialling inward where this facility is offered.

5.4 *ISDN subaddress*

5.4.1 The subaddress is a sequence of digits, the maximum length of which shall be 20 octets (40 digits).

5.4.2 All ISDNs shall be capable of conveying the ISDN subaddress transparently and shall not be required to examine or operate on any of the subaddress information.

5.4.3 Special attention is drawn to the fact that subaddressing is not to be considered as part of the numbering plan, but constitutes an intrinsic part of ISDN addressing capabilities. The subaddress shall be conveyed in a transparent way as a separate entity from both ISDN number and user-to-user information. See also Recommendation I.334.

6 Representation of ISDN address

6.1 At the person-machine interface, the objective is to establish one method of distinguishing between abbreviated and complete representations of an ISDN number. This method is for further study. Internationally recommended methods will be chosen.

6.2 The method of distinguishing between an ISDN number and a number from another numbering plan shall be by separate identification of the applicable numbering plan. If such methods are required, internationally recommended procedures will be chosen.