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Services and facilities

**INTERNATIONAL USER CLASSES OF SERVICE
IN PUBLIC DATA NETWORKS AND
INTEGRATED SERVICES DIGITAL
NETWORKS (ISDNs)**

Reedition of CCITT Recommendation X.1 published in the
Blue Book, Fascicle VIII.2 (1988)

NOTES

- 1 CCITT Recommendation X.1 was published in Fascicle VIII.2 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 X.1

INTERNATIONAL USER CLASSES OF SERVICE IN PUBLIC DATA NETWORKS AND INTEGRATED SERVICES DIGITAL NETWORKS (ISDNs)

*(Geneva, 1972; amended at Geneva, 1976 and 1980;
Malaga-Torremolinos, 1984 and Melbourne, 1988)*

Preface

The establishment in various countries of public networks for data transmission and ISDNs for integrated services creates a need to standardize user classes of service. An international user class of service is a category of data transmission service in which the data signalling rate, call control signalling rates and data terminal equipment operation modes are standardized.

Recommendations in the V Series already standardize data signalling rates for data transmission in the general telephone network and modulation rates for modems. These rates are, however, not necessarily the most suitable for public networks devoted entirely to data transmissions.

There are three public data transmission services, namely circuit-switched, packet-switched and leased circuit.

There are several methods by which data terminal equipment (DTE) may gain access to the public data transmission services. These methods are direct connections and a variety of switched connections via other public networks. To enable the method of access to be identified in addition to the user class of service, categories of access are defined in Recommendation X.10.

It is not mandatory for Administrations to provide all the user classes of service contained in this Recommendation.

The CCITT,

considering

- (a) the desirability of providing sufficient data signalling rates to meet users' needs;
- (b) the requirement to optimize data terminal equipment (DTE), transmission and switching costs to provide an overall economic service to the user;
- (c) the particular operating modes of users' data terminal equipment (DTE);
- (d) the users' need to transfer information consisting of any bit sequence and of any number of bits up to a certain amount;
- (e) the interaction between users' requirements, technical limitations and tariff structure;
- (f) that Recommendation X.10 defines the categories of access for data terminal equipment (DTE) to public data transmission services,

unanimously declares the view

that users' data transmission requirements via public data networks and ISDNs may best be served by defined international user classes of service.

These international user classes of service are shown in the following tables.

TABLE 1/X.1

International user classes of service in public data networks and ISDNs

- a) *Circuit switched and leased circuit data transmission services for data terminal equipment operating in start-stop mode, using X.20 or X.20 bis interfaces (see Note 1)*

User class of service	Data signalling rate and code structure in the data transfer phase (see Notes 2 and 3)	Call control signals in the call control phase (see Note 4)
1	300 bit/s, 11* units/character start-stop (see Note 5)	300 bit/s, International Alphabet No. 5 (11 units/character) start-stop
2	50 to 200 bit/s, 7,5 to 11* units/character start-stop (see Notes 6 and 7)	200 bit/s, International Alphabet No. 5 (11 units/character) start-stop (see Note 8)

* Usage in accordance with Recommendation X.4.

- b) *Circuit switched and leased circuit data transmission services for data terminal equipment operating in synchronous mode, using X.21 or X.21 bis interfaces*

User class of service	Data signalling rate in the data transfer phase (see Notes 3, 9 and 10)	Call control signals in the call control phase (see Note 11)
3	600 bit/s	600 bit/s, International Alphabet No. 5
4	2 400 bit/s	2 400 bit/s, International Alphabet No. 5
5	4 800 bit/s	4 800 bit/s, International Alphabet No. 5
6	9 600 bit/s	9 600 bit/s, International Alphabet No. 5
7	48 000 bit/s	48 000 bit/s, International Alphabet No. 5
19	64 000 bit/s	64 000 bit/s, International Alphabet No. 5

- c) *Packet switched data transmission service for data terminal equipment operating in synchronous mode, using X.25 or X.32 interface (see Note 12)*

User class of service	Data signalling rate (see Note 13)
8	2 400 bit/s
9	4 800 bit/s
10	9 600 bit/s
11	48 000 bit/s
12	1 200 bit/s (see Note 14)
13	64 000 bit/s

- d) *Packet switched data transmission service for data terminal equipment operating in start-stop mode, using X.28 interface (see Notes 12 and 15)*

User class of service	Data signalling rate and code structure (see Note 3)
20	50-300 bit/s, 10 or 11 units/character
21	75/1200 bit/s, 10 units/character (see Note 16)
22	1200 bit/s, 10 units/character
23	2400 bit/s, 10 units/character

TABLE 2/X.1

International user classes of service specific to ISDN
(see Notes 17 and 18)

User class of service	Data signalling rate	DTE/DCE interface requirements and call control signals
30	64 kbit/s	The call control signals used will be in accordance with those defined for ISDN at reference point S/T. For interface at reference point R, see Table 1/X.1 a) (user class of service 19) and b) (user class of service 13) Reference points S, T and R are defined in Recommendation I.411.

Note 1 – There is no user class of service for the data signalling rate of 50 bit/s, the transmission mode of 7.5 units/character start-stop and address selection and call progress signals at 50 bit/s, International Telegraph Alphabet No. 2. However, several Administrations have indicated that their telex service (50-baud, International Telegraph Alphabet No. 2) will be provided as one of the many services carried by their public data network.

Note 2 – The need to provide user classes 1 and 2 in ISDN is for further study.

Note 3 – Some Administrations are offering a circuit-switched asynchronous services for terminal operating at the data signalling rate of: 600 bit/s, 1200 bit/s, 2400 bit/s, 4800 bit/s, 9600 bit/s. 10 units/character, start-stop in the data transfer phase and respectively 600 bit/s, 1200 bit/s, 2400 bit/s, 4800 bit/s, 9600 bit/s, International Alphabet No. 5, 10 units/character, start-stop in the call control phase. These services are supported by the synchronous network bearer channels with asynchronous to synchronous coding according to Recommendation X.52 for the user classes of service 1 and 2, and for 1200 bit/s. For the data signalling rates 600, 2400, 4800 and 9600 bit/s, the asynchronous to synchronous coding of Recommendation V.14 is used.

Note 4 – Only applicable for the circuit-switched data transmission service.

Note 5 – Taking account of the existence of data terminal equipments operating in the start-stop mode at a data signalling rate of 300 bit/s and with a 10 unit/character code structure, some Administrations have indicated that their public data networks will accommodate such terminals. Other Administrations, however, have indicated that they cannot guarantee acceptable transmission if such terminals are connected to their networks.

Note 6 – Class 2 will provide, in the data transfer phase, for operation at the following data signalling rates and code structures:

50 bit/s (7.5 units/character)
100 bit/s (7.5 units/character)
110 bit/s (11 units/character)
134.5 bit/s (9 units/character)
200 bit/s (11 units/character)

Call control signals would be at 200 bit/s, International Alphabet No. 5 (11 units/character) as indicated in a) of Table 1/X.1.

Note 7 – For international user class of service 2, it should be noted that some public data networks may not be able to prevent two terminals working at different data signalling rates and code structures from being connected together by means of a circuit-switched connection.

Note 8 – Some Administrations have indicated that, for certain of the data signalling rates listed in Note 6 above, they will permit users in class 2 to operate the same signalling rate and code structure for both data transfer and address selection and to receive call progress signals at these signalling rates and code structures. Where International Alphabet No. 5 is used for the call control signals, the appropriate parts of Recommendation X.20 shall apply.

Note 9 – The support of user classes of service 3 to 7 and 19 in the ISDN may be provided by means of a terminal adaptor (in accordance with Recommendation X.30). The concept of terminal adaptor functional grouping is defined in Recommendation I.411.

Note 10 – Some Administrations may offer higher speeds.

Note 11 – Only applicable for the circuit-switched data transmission service, using the Recommendation X.21 interface.

Note 12 – The packet-switched data transmission service allows for communication between Recommendations X.25 and/or X.28 data terminal equipments operating at different data signalling rates.

Note 13 – The support of user classes of service 8 to 11 and 13 in the ISDN may be provided by means of a terminal adaptor (in accordance with Recommendation X.31). The concept of terminal adaptor functional grouping is defined in Recommendation I.411.

Note 14 – The user class of service 12 is only provided via PSTN access. It might also be offered in the maritime satellite data transmission system.

Note 15 – The support of user classes of service 20 to 23 in the ISDN may be provided by means of a terminal adaptor providing PAD functions. Other means to support these user classes of service in the ISDN are for further study.

Note 16 – 75 bit/s from DTE to DCE, 1200 bit/s from DCE to DTE.

Note 17 – Class 30 is valid for both circuit switching and packet switching.

Note 18 – The packet-switched data transmission service allows for communication between ISDN packet mode terminal equipments operating at 64 kbit/s (Terminal Equipment 1 according to Recommendation I.411) and Recommendation X.25 or X.28 data terminal equipments operating at different data signalling rates.

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