INTERNATIONAL TELECOMMUNICATION UNION

CCITT

THE INTERNATIONAL
TELEGRAPH AND TELEPHONE
CONSULTATIVE COMMITTEE

X.220
(11/1988)

SERIES X: DATA COMMUNICATION NETWORKS:
OPEN SYSTEMS INTERCONNECTION (OSI) –
PROTOCOL SPECIFICATIONS, CONFORMANCE
TESTING

USE OF X.200-SERIES PROTOCOLS IN CCITT APPLICATIONS

Reedition of CCITT Recommendation X.220 published in
the Blue Book, Fascicle VIII.5 (1988)

NOTES

1   CCITT Recommendation X.220 was published in Fascicle VIII.5 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.220

USE OF X.200-SERIES PROTOCOLS IN CCITT APPLICATIONS

(Melbourne, 1988)

The CCITT,

considering

(a) that Administrations in many countries are implementing a variety of telecommunications services;

(b) that these services may be carried on a variety of networks;

(c) that users of these services desire a unifying architecture for the applicable protocols;

(d) that such an architecture is provided by Recommendation X.200 which defines the Reference Model of Open Systems Interconnection for CCITT Applications;

(e) that a number of protocols conforming to this architecture are defined in the X.200 Series of Recommendations and in other Recommendations,

unanimously declares

that for CCITT Applications, the functional suites of protocols, which involve the use of protocols in the X.200 series of Recommendations, are summarized in this Recommendation. Details, as well as any conformance requirements, are contained in the relevant Recommendations.

A growing number of data terminal equipments are being designed to support more than one CCITT service and/or are being designed to be capable of being connected to more than one type of network. In order to facilitate the design of such equipments, the various OSI protocol suites involving use of the X.200 series of Recommendations are documented herein.

These protocol suites are depicted in Figure 1/X.220, which portrays the protocols according to the seven layers defined in Recommendation X.200. The CCITT Applications covered are Message Handling Systems (MHS), Directory, Teletex and Document Architecture Transfer and Manipulation. The networks covered are PSPDN, CSPDN, PSTN and ISDN. The intent is to give a general view of the set of protocol suites in a single figure, while relying on the other Recommendations referenced to provide the necessary additional details.
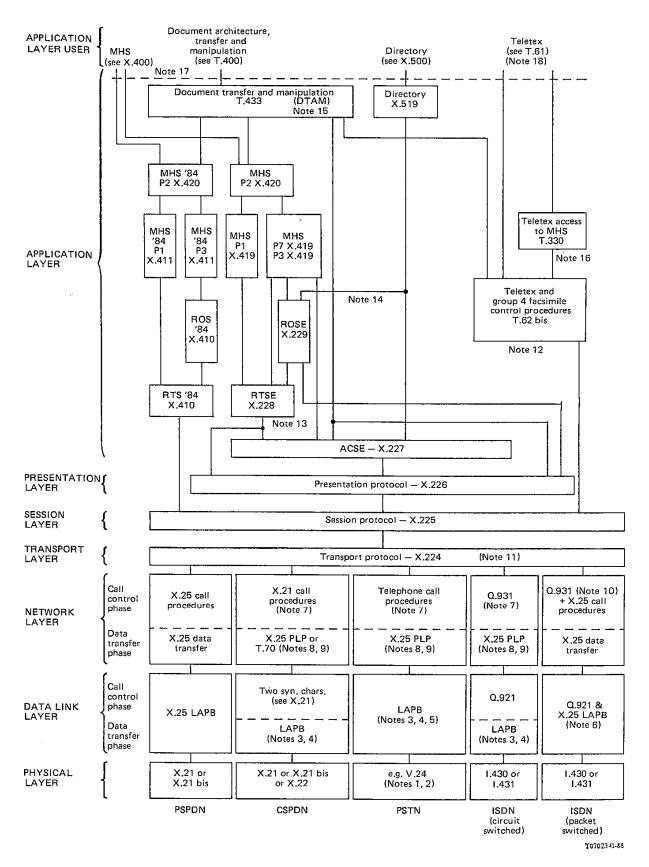
APPLICATION LAYER USER

MHS
(see X.400)

Document architecture, transfer and manipulation (see T.400)

Directory (see X.500)

Teletex (see T.61) (Note 18)

Note 17

Document transfer and manipulation T.433 (DTAM) Note 15

Directory X.519

MHS '84 P2 X.420

MHS P2 X.420

Teletex access to MHS T.330

Note 16

APPLICATION LAYER

MHS '84 P1 X.411

MHS '84 P3 X.411

MHS P1 X.419

MHS P7 X.419 P3 X.419

Note 14

Teletex and group 4 facsimile control procedures T.62 bis

Note 12

ROS '84 X.410

ROSE X.229

RTS '84 X.410

RTSE X.228

Note 13

ACSE — X.227

PRESENTATION LAYER

Presentation protocol — X.226

SESSION LAYER

Session protocol — X.225

TRANSPORT LAYER

Transport protocol — X.224   (Note 11)

NETWORK LAYER	Call control phase	X.25 call procedures	X.21 call procedures (Note 7)	Telephone call procedures (Note 7)	Q.931 (Note 7)	Q.931 (Note 10) + X.25 call procedures
	Data transfer phase	X.25 data transfer	X.25 PLP or T.70 (Notes 8, 9)	X.25 PLP (Notes 8, 9)	X.25 PLP (Notes 8, 9)	X.25 data transfer
DATA LINK LAYER	Call control phase	X.25 LAPB	Two syn. chars. (see X.21)	LAPB (Notes 3, 4, 5)	Q.921	Q.921 & X.25 LAPB (Note 6)
	Data transfer phase		LAPB (Notes 3, 4)		LAPB (Notes 3, 4)	
PHYSICAL LAYER		X.21 or X.21 bis	X.21 or X.21 bis or X.22	e.g. V.24 (Notes 1, 2)	I.430 or I.431	I.430 or I.431

PSPDN   CSPDN   PSTN   ISDN (circuit switched)   ISDN (packet switched)

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FIGURE 1/X.220

Protocol suites

Notes for Figure 1/X.220

Note 1 — The modem may also be integrated within the terminal and in such cases V.24 need not apply. For telematic terminals, see § 3.2.1 of T.70.

Note 2 — For automatic calling and/or answering, V.25 or V.25 *bis* may be applicable.

Note 3 — For terminals connected to a PSTN, CSPDN or ISDN (circuit switched) and accessing a PSPDN in accordance with X.32 or X.31, the X.25 LAPB procedures are used as set forth in X.32 or X.31.

Note 4 — For DTE-to-DTE connections, telematic terminals employ the X.75 LAPB procedures for single link operation (see § § 3.2.2 and 3.3.2 of T.70 and § 2.1.2.2 of T.90). For other terminals, the ISO 7776 LAPB procedures may apply for DTE-to-DTE connections.

Note 5 — For half duplex operation over the PSTN, the LAPB procedures are extended to include a half duplex transmission module (HDTM) as defined in § 5.6 of X.32 and in T.71.

Note 6 — Terminals obtaining packet access on the D-channel use the LAPD procedures of Q.921 to support both the Q.931 access connection control procedure (if needed) and the X.25 packet layer procedures. Terminals obtaining packet access on the B-channel use the LAPD procedures of Q.921 to support the Q.931 access connection control procedure (if needed) and the X.25 LAPB procedures to support the X.25 packet layer procedures.

Note 7 — For terminals connected to a PSTN, CSPDN or ISDN (circuit switched) and accessing a PSPDN in accordance with X.32 or X.31, the network connection is established by two stage selection; the first stage uses the call control procedures of the attached network (as shown in Figure 1/X.220) and the second stage uses the X.25 call control procedures.

Note 8 — For terminals connected to a PSTN, CSPDN or ISDN (circuit switched) and accessing a PSPDN in accordance with X.32 or X.31, the X.25 packet layer procedures apply during the data transfer phase of the PSTN, CSPDN or ISDN. However, for telematic terminals connected to a CSPDN and accessing a PSPDN, a minimum network layer functionality is required during the data transfer phase of the CSPDN (see § 3.3.3 of T.70).

Note 9 — For DTE-to-DTE connections, telematic terminals connected to a CSPDN use the minimum network layer functionality (see § 3.3.3 of T.70) during the data transfer phase of the CSPDN and telematic terminals connected to a PSTN use the X.25 packet layer procedures (see § 3.2.3 of T.70); telematic terminals connected to an ISDN (circuit switched) use the X.25 packet layer procedures as specified in ISO 8208 (see § 2.1.2.3.2 of T.90) or, in addition as a user option, the minimum network layer functionality (see § 2.1.1 of T.90). For other terminals, the ISO 8208 X.25 packet layer procedures may apply for DTE-to-DTE connections.

Note 10 — The Q.931 access connection control procedures are used if needed.

Note 11 — For telematic terminals, the transport protocol is in accordance with T.70 Section 5 plus Annexes A and B; the use of X.224 class 0 plus application rules is optional but needs further consideration to ensure that there are no discrepancies with T.70. For terminals communicating with network based services such as MHS and Directories, the X.224 procedures apply including the mandatory support of class 0.

Note 12 — T.62 *bis*, together with the relevant service and protocol elements of X.215 and X.225, are intended to be equal to T.62.

Note 13 — To obtain backward compatibility with X.410 (1984), RTSE uses the "X.410-1984 mode" services of ACSE and the Presentation Layer. The "normal mode" is used in all other cases.

Note 14 — Directory uses ROSE but not RTSE.

Note 15 — The use of ROSE and RTSE in the T.400-series is for further study.

Note 16 — T.330 describes Group 4 Facsimile and Teletex access to the MHS Interpersonal Messaging System (IPMS) in the T.62 *bis*/X.225 environment.

Note 17 — The use of MHS to transfer documents conforming to the T.410-series is described in T.411.

Note 18 — Character repertoire definition of T.61 only.

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Series D	General tariff principles
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