INTERNATIONAL TELECOMMUNICATION UNION

ITU-T X.220

TELECOMMUNICATION
STANDARDIZATION SECTOR
OF ITU

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OPEN SYSTEMS INTERCONNECTION – GENERAL CONNECTION MODE PROTOCOL SPECIFICATIONS

USE OF X.200-SERIES PROTOCOLS IN CCITT APPLICATIONS

ITU-T Recommendation X.220

(Previously “CCITT Recommendation”)

FOREWORD

The ITU Telecommunication Standardization Sector (ITU-T) is a permanent organ of the International Telecommunication Union. The ITU-T is responsible for studying technical, operating and tariff questions and issuing Recommendations on them with a view to standardizing telecommunications on a worldwide basis.

The World Telecommunication Standardization Conference (WTSC), which meets every four years, established the topics for study by the ITU-T Study Groups which, in their turn, produce Recommendations on these topics.

ITU-T Recommendation X.220 was prepared by the ITU-T Study Group VII (1988-1993) and was approved by the WTSC (Helsinki, March 1-12, 1993).

NOTES

1 As a consequence of a reform process within the International Telecommunication Union (ITU), the CCITT ceased to exist as of 28 February 1993. In its place, the ITU Telecommunication Standardization Sector (ITU-T) was created as of 1 March 1993. Similarly, in this reform process, the CCIR and the IFRB have been replaced by the Radiocommunication Sector.

In order not to delay publication of this Recommendation, no change has been made in the text to references containing the acronyms "CCITT, CCIR, or IFRB" or their associated entities such as Plenary Assembly, Secretariat, etc. Future editions of this Recommendation will contain the proper terminology related to the new ITU structure.

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; revised Helsinki, 1993*)

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;

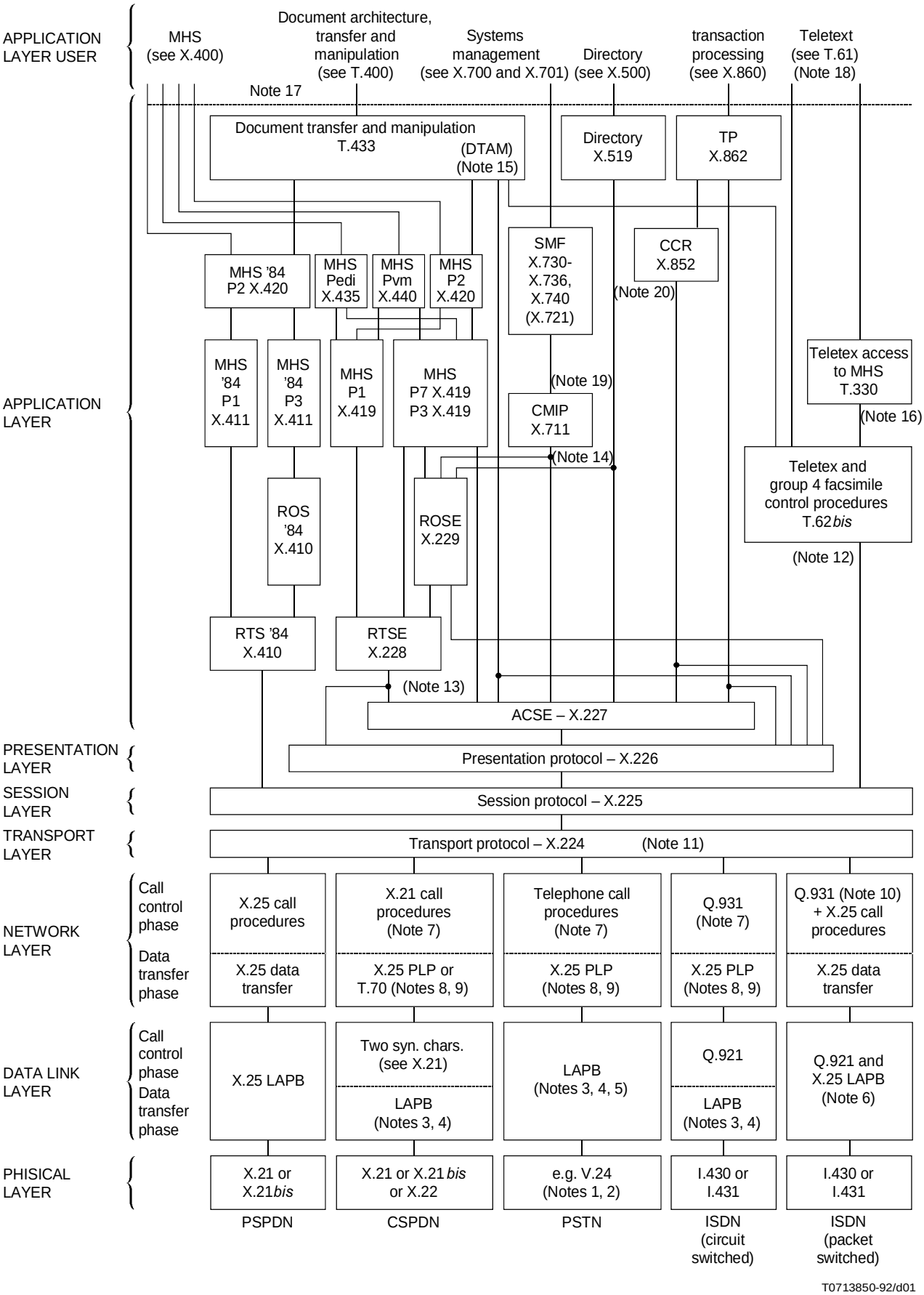
(e) that a number of protocols conforming to this architecture are defined in the X.200-Series of Recommendations and in other Recommendations,

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, which portrays the protocols according to the seven layers defined in Recommendation X.200. The CCITT applications covered are Message Handling Systems (MHS), Directory, Transaction Processing (TP), Systems Management, 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)
Systems management (see X.700 and X.701)
Directory (see X.500)
transaction processing (see X.860)
Teletext (see T.61) (Note 18)
Note 17
Document transfer and manipulation T.433 (DTAM) (Note 15)
Directory X.519
TP X.862
SMF X.730-X.736, X.740 (X.721)
CCR X.852
(Note 20)
MHS '84 P2 X.420
MHS Pedi X.435
MHS Pvm X.440
MHS P2 X.420
MHS '84 P1 X.411
MHS '84 P3 X.411
MHS P1 X.419
MHS P7 X.419 P3 X.419
(Note 19)
CMIP X.711
(Note 14)
Teletex access to MHS T.330
(Note 16)
Teletex and group 4 facsimile control procedures T.62bis
(Note 12)
APPLICATION LAYER
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
Data transfer phase
X.25 call procedures
X.25 data transfer
X.21 call procedures (Note 7)
X.25 PLP or T.70 (Notes 8, 9)
Telephone call procedures (Note 7)
X.25 PLP (Notes 8, 9)
Q.931 (Note 7)
X.25 PLP (Notes 8, 9)
Q.931 (Note 10) + X.25 call procedures
X.25 data transfer
DATA LINK LAYER
Call control phase
Data transfer phase
X.25 LAPB
Two syn. chars. (see X.21)
LAPB (Notes 3, 4)
LAPB (Notes 3, 4, 5)
Q.921
LAPB (Notes 3, 4)
Q.921 and X.25 LAPB (Note 6)
PHISICAL LAYER
X.21 or X.21bis
X.21 or X.21bis 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)
T0713850-92/d01

NOTES

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/T.70.

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

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.

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

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

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.

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 this figure) and the second stage uses the X.25 call control procedures.

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/T.70).

9 For DTE-to-DTE connections, Telematic terminals connected to a CSPDN use the minimum network layer functionality (see 3.3.3/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/T.70): Telematic terminals connected to an ISDN (circuit switched) use the X.25 packet layer procedures as specified in ISO/IEC 8208 (see 2.2.5/T.90). For other terminals, the ISO/IEC 8208 X.25 packet layer procedures may apply for DTE-to-DTE connections.

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

11 For Telematic terminals, the transport protocol is in accordance with 5/T.70 plus Annexes A/T.70 and B/T.70: 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, CMIP, TP and Directories, the X.224 procedures apply including the mandatory support of class 0.

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.

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.

14 Directory and CMIP use ROSE but not RTSE.

15 The use of ROSE in the T.400-Series is for further study.

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.

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

18 Character repertoire definition of T.61 only.

19 Systems management functions, including protocol specifications (by reference to X.721), are prescribed in X.730-X.736 and X.740. Further study is underway to specify additional systems management functions.

20 X.852, the Commitment, Concurrency and Recovery (CCR) protocol, is currently at the stage of draft Recommendation.

FIGURE 1/X.220

Protocol suites