INTERNATIONAL TELECOMMUNICATION UNION

ITU-T

TELECOMMUNICATION
STANDARDIZATION SECTOR
OF ITU

F.600

(09/98)

SERIES F: NON-TELEPHONE TELECOMMUNICATION SERVICES

Data transmission services

Service and operational principles for public data transmission service

ITU-T Recommendation F.600

(Previously CCITT Recommendation)

ITU-T F-SERIES RECOMMENDATIONS

NON-TELEPHONE TELECOMMUNICATION SERVICES

TELEGRAPH SERVICE	
Operating methods for the international public telegram service	F.1–F.19
The gentex network	F.20–F.29
Message switching	F.30–F.39
The international telemessage service	F.40–F.58
The international telex service	F.59–F.89
Statistics and publications on international telegraph services	F.90–F.99
Scheduled and leased communication services	F.100–F.104
Phototelegraph service	F.105–F.109
MOBILE SERVICE	
Mobile services and multidestination satellite services	F.110–F.159
TELEMATIC SERVICES	
Public facsimile service	F.160–F.199
Teletex service	F.200–F.299
Videotex service	F.300–F.349
General provisions for telematic services	F.350–F.399
MESSAGE HANDLING SERVICES	F.400–F.499
DIRECTORY SERVICES	F.500–F.549
DOCUMENT COMMUNICATION	
Document communication	F.550–F.579
Programming communication interfaces	F.580–F.599
DATA TRANSMISSION SERVICES	**F.600–F.699**
AUDIOVISUAL SERVICES	F.700–F.799
ISDN SERVICES	F.800–F.849
UNIVERSAL PERSONAL TELECOMMUNICATION	F.850–F.899
HUMAN FACTORS	F.900–F.999

For further details, please refer to ITU-T List of Recommendations.

ITU-T RECOMMENDATION F.600

SERVICE AND OPERATIONAL PRINCIPLES FOR PUBLIC DATA TRANSMISSION SERVICE

Summary

This Recommendation contains the general service and operational principles to be followed for the international public data transmission service. The general model of international public data transmission service is outlined. This Recommendation includes important aspects of data transmission service – addressing, performance, call progress signals, multicast operation, user classes of service and optional user facilities. The general provisions between Administrations and the general provisions between the Administration and the customer are also described.

The overview of the interrelationship between the relevant Recommendations necessary for offering data transmission service is in the scope of this Recommendation.

Source

ITU-T Recommendation F.600 was revised by ITU-T Study Group 7 (1997-2000) and was approved under the WTSC Resolution No. 1 procedure on the 25th of September 1998.

FOREWORD

ITU (International Telecommunication Union) is the United Nations Specialized Agency in the field of telecommunications. The ITU Telecommunication Standardization Sector (ITU-T) is a permanent organ of the ITU. 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, establishes the topics for study by the ITU-T Study Groups which, in their turn, produce Recommendations on these topics.

The approval of Recommendations by the Members of the ITU-T is covered by the procedure laid down in WTSC Resolution No. 1.

In some areas of information technology which fall within ITU-T's purview, the necessary standards are prepared on a collaborative basis with ISO and IEC.

NOTE

In this Recommendation the term *recognized operating agency (ROA)* includes any individual, company, corporation or governmental organization that operates a public correspondence service. The terms *Administration*, *ROA* and *public correspondence* are defined in the *Constitution of the ITU (Geneva, 1992)*.

INTELLECTUAL PROPERTY RIGHTS

The ITU draws attention to the possibility that the practice or implementation of this Recommendation may involve the use of a claimed Intellectual Property Right. The ITU takes no position concerning the evidence, validity or applicability of claimed Intellectual Property Rights, whether asserted by ITU members or others outside of the Recommendation development process.

As of the date of approval of this Recommendation, the ITU had not received notice of intellectual property, protected by patents, which may be required to implement this Recommendation. However, implementors are cautioned that this may not represent the latest information and are therefore strongly urged to consult the TSB patent database.

CONTENTS

Recommendation F.600

SERVICE AND OPERATIONAL PRINCIPLES FOR PUBLIC DATA TRANSMISSION SERVICE

(revised in 1998)

1 Introduction

The establishment in various countries of public data networks creates the need to produce Recommendations to facilitate the provision of international public data transmission services. This Recommendation lays down the general service and operational principles to be followed for international data transmission services.

This Recommendation provides an overview of interrelationship between the relevant Recommendations necessary for establishing, maintaining and offering the public data transmission service.

2 Scope and field of application

Public Data Transmission Service (PDTS) is a service established by an Administration and provides exchange of data between service users.

NOTE – In this Recommendation, the expression "Administration" is used to indicate both a telecommunication administration and a Recognized Operating Agency.

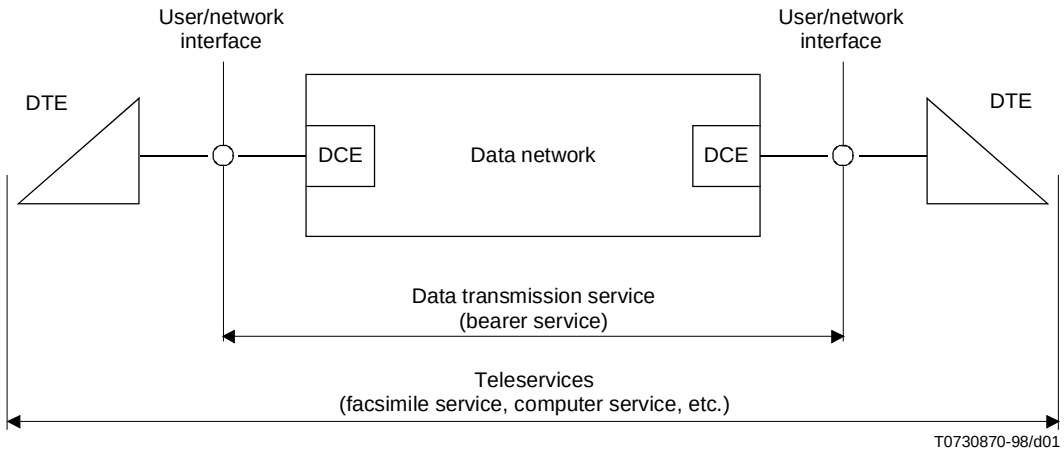
An international PDTS may be provided through the interworking of national Public Data Networks (PDNs) and Integrated Services Digital Networks (ISDNs). Public data networks are established and operated by the Administration for the specific purpose of providing data transmission service.

Public data networks and public data transmission services do not include the Data Terminal Equipment (DTE). Therefore additional capabilities arise because DTEs do not belong to PDNs and PDTSs. This is assumed to be equivalent to the bearer service (see the definition of bearer service in Recommendations I.112 and I.230). Public Data Networks in Open Systems Interconnection (OSI) environments typically provide three lower layers: physical layer, data link layer and network layer (see Recommendations X.200 and X.300).

Various services based on PDTS may be operated by Administrations. Those services are assumed to be equivalent to teleservices (refer to Recommendations I.112 and I.240 for the definition of teleservice). See Figure 1.

Four types of data transmission services are identified: circuit switched, packet switched, frame relay and leased circuit. Those services are based on Circuit-Switched Public Data Networks (CSPDNs), Packet-Switched Public Data Networks (PSPDNs), Frame Relay Public Data Networks (FRPDNs) and leased circuits.

This Recommendation does not cover international leased circuit PDNs. Also, this Recommendation does not cover public data transmission services offered by Integrated Services Digital Networks (ISDNs). Access to PDTS in one country through the Public Switched Telephone Network (PSTN) in another country is also out of the scope of this Recommendation.



DTE Data Terminal Equipment (subscriber's terminal, teleservice server, etc.)
DCE Data Circuit-terminating Equipment

Figure 1/F.600 – The environment for data transmission service

3 References

The following ITU-T Recommendations and other references contain provisions which, through reference in this text, constitute provisions of this Recommendation. At the time of publication, the editions indicated were valid. All Recommendations and other references are subject to revision; all users of this Recommendation are therefore encouraged to investigate the possibility of applying the most recent edition of the Recommendations and other references listed below. A list of the currently valid ITU-T Recommendations is regularly published.

[1] ITU-T Recommendation X.1 (1996), *International user classes of service in, categories of access to, public data networks and Integrated Services Digital Networks (ISDNs).*

[2] ITU-T Recommendation X.2 (1996), *International data transmission services and optional user facilities in public data networks and ISDNs.*

[3] ITU-T Recommendation X.6 (1997), *Multicast service definition.*

[4] ITU-T Recommendation X.7 (1996), *Technical characteristics of data transmission services.*

[5] CCITT Recommendation X.92 (1988), *Hypothetical reference connections for public synchronous data networks.*

[6] ITU-T Recommendation X.96 (1993), *Call progress signals in public data networks.*

[7] ITU-T Recommendation X.110 (1996), *International routing principles and routing plan for public data networks.*

[8] ITU-T Recommendation X.115 (1995), *Definition of address translation capability in public data networks* plus Amendment 1 (1996): *Refinements.*

[9] ITU-T Recommendation X.121 (1996), *International numbering plan for public data networks.*

[10] CCITT Recommendation X.130 (1988), *Call processing delays in public data networks when providing international synchronous circuit-switched data services.*

[11] CCITT Recommendation X.131 (1988), *Call blocking in public data networks when providing international synchronous circuit-switched data services.*

[12] ITU-T Recommendation X.135 (1997), *Speed of service (delay and throughput) performance values for public data networks when providing international packet-switched services.*

[13] ITU-T Recommendation X.136 (1997), *Accuracy and dependability performance values for public data networks when providing international packet-switched services.*

[14] ITU-T Recommendation X.137 (1997), *Availability performance values for public data networks when providing international packet-switched services.*

[15] ITU-T Recommendation X.144 (1995), *User information transfer performance parameters for data networks providing international frame relay PVC service* plus Amendment 1 (1997): *Annex C – Some relations between frame-level and ATM-level performance parameters.*

[16] ITU-T Recommendation X.145 (1996), *Performance for data networks providing international frame relay SVC service.*

[17] CCITT Recommendation X.180 (1988), *Administrative arrangements for international Closed User Groups (CUGs).*

[18] CCITT Recommendation X.181 (1988), *Administrative arrangements for the provision of international Permanent Virtual Circuits (PVCs).*

[19] ITU-T Recommendation X.200 (1994) | ISO/IEC 7498-1:1994, *Information technology – Open Systems Interconnection – Basic reference model: The basic model.*

[20] ITU-T Recommendation X.300 (1996), *General principles for interworking between public networks and between public networks and other networks for the provision of data transmission services.*

[21] CCITT Recommendation F.17 (1992), *Operational aspects of service communications.*

[22] ITU-T Recommendation I.112 (1993), *Vocabulary of terms for ISDNs.*

[23] CCITT Recommendation I.230 (1988), *Definition of bearer service categories.*

[24] CCITT Recommendation I.240 (1988), *Definition of teleservices.*

[25] ITU-T Recommendation E.116 (1997), *International telecommunication charge card service.*

[26] ITU-T Recommendation E.164 (1997), *The international public telecommunication numbering plan.*

4 Abbreviations

This Recommendation uses the following abbreviations:

CSPDN Circuit-Switched Public Data Network

CUG Closed User Group

DCE Data Circuit-terminating Equipment

DTE Data Terminal Equipment

FRPDN Frame Relay Public Data Network

IDSE International Data Switching Exchange

ISDN Integrated Services Digital Network

ITU International Telecommunication Union

OSI Open Systems Interconnection

PSPDN Packet-Switched Public Data Network

PDN Public Data Network

PDTS Public Data Transmission Service

PSTN Public Switched Telephone Network

PVC Permanent Virtual Circuit

ROA Recognized Operating Agency

5 General model of international PDTS

An international PDTS is based on an interconnection of national PDTSs. Such an interconnection is achieved with the interconnection of International Data Switching Exchanges (IDSEs) in relevant countries. The route for a call consists of three parts (see Figure 2):

- an originating national network part, from calling DTE to originating IDSE through the originating national PDN;
- an international network part, from the originating IDSE to the destination IDSE;
- a destination national network part, from the destination IDSE to the called DTE through the destination national PDN.

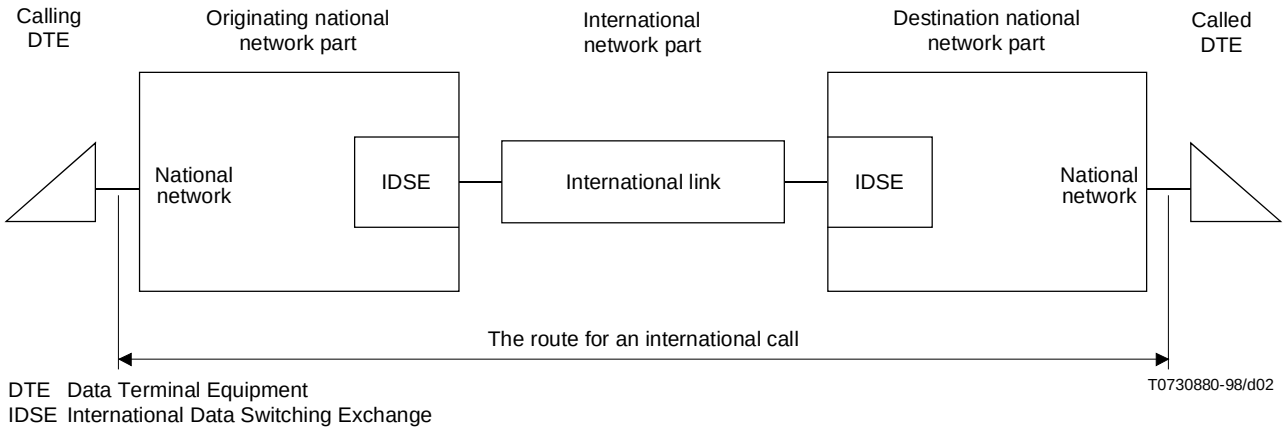


Figure 2/F.600 – Components of an international call

The planning of originating and destination PDNs is a national matter. Planning of originating and destination traffic routes is also a national matter. However, the quality of service of an international PDTS has to be taken into account when planning national PDNs, originating and destination traffic routes.

The planning of international traffic routes is the responsibility of the concerned Administrations and is subject to bilateral agreement.

Interworking national PDNs may be interconnected directly or via intermediate countries. For PSPDNs and CSPDNs, routing principles of international data traffic are outlined in Recommendation X.110. Routing principles for FRPDNs are for further study.

Administrations should compile information concerning service parameters of their networks for dissemination upon the request of the interested Administrations to enable the selection of the PDN for interworking and the planning of such interworking.

The total connection should comply to Recommendation X.92 for PSPDN and CSPDN. Hypothetical Reference Connections for FRPDN are for further study.

Access to a national PDTS may be either direct (without any intermediate switched network) or port (via an intermediate switched network). Planning of access is a national matter. Access to a destination national PDTS via a PSTN or an ISDN of an originating country should be referred to as a port access.

General aspects of PDTSs including technical characteristics of PDTSs in PDNs are outlined in Recommendation X.7.

6 Addressing aspects

Numbering in PDNs should comply to the International Numbering Plan outlined in Recommendation X.121. Some DTEs may be identified by numbers from the E.164 numbering plan. Customers of PSPDN may use alternative addressing, which does not correspond to the requirements of Recommendations X.121 and E.164, for example some kinds of user friendly addresses like mnemonic addresses. In this case, PSPDN should have an address translation service which enables the PSPDNs to route calls to the proper X.121/E.164 address when the called address is out of the scope of X.121/E.164 addressing. Usage of the address translation service within the national PDNs is a national matter. Offering address translation capability in an international PDTS requires special provisions agreed between the Administrations concerned.

The definition of address translation capability is outlined in Recommendation X.115.

7 Performance aspects

Quality of service parameters of an international PDTS is a subject of common responsibility of the Administrations concerned. Quality of service of national network part is a subject of responsibility of each relevant Administration. Quality of service of international network part is a subject of responsibility of concerned (including transit) Administrations. Apportioning of quality of service parameters (national and international portions) should comply to Recommendations X.135, X.136 and X.137 for PSPDN; X.130, X.131 for CSPDN; X.144 and X.145 for FRPDN. The objectives of FRPDN are for further study.

Apportioning of quality of service parameters of international network part is subject to agreement between all Administrations involved in the provision of international network part.

8 Call progress signals

Call progress signals inform the caller about the progress of the call indicating the circumstances which have prevented the connection.

Call progress signals for CSPDN and PSPDN are defined in Recommendation X.96. Call progress signals for FRPDN are for further study.

9 Multicast operation

Multicast service facilitates the provision of point-to-multipoint (multicast) data service. Using a multicast service, the customer (sender) must first establish a connection to the entity called multicast server, and after that data units are transferred by multicast server to other participants of the multicast service (receivers) [3]. Establishment of national multicast services and methods of establishing multicast services (inside or outside the national PDN) etc. are a national matter. Establishment of international multicast services (establishing of international multicast groups, principles of interworking of national multicast servers) is subject to agreement between concerned Administrations.

10 User classes of service, categories of access

PDTSs offer to users so-called "basic user facilities". Basic user facilities are defined by user classes of service and categories of access.

User class of service is a category of PDTS in which the DTE operation mode, data signalling rate, call control signalling rates and code structure (in start-stop mode) are standardized.

User classes of service within the national PDTS is a national matter; user classes of service provided internationally are subject to agreement between the concerned Administrations. Nationally and internationally provided user classes of service may not coincide.

Category of access identifies the method by which the DTE gains access to a specific data transmission service. Direct or port access may be used. Usage of category of access is a national matter.

User classes of service and categories of access are outlined in Recommendation X.1.

11 Optional user facilities

Optional user facilities modify or complement basic user facilities. An optional user facility cannot be offered to a user as a stand-alone facility; it may be offered only in association with a basic user facility.

Optional user facilities for international PDTS are outlined in Recommendation X.2.

Concerned Administrations should procure internationally all the essential user facilities (see Recommendation X.2). Additional user facilities may or may not be provided.

12 Closed user groups

Closed User Group (CUG) facilities (example of an optional user facility) enable users for access to/from users having one or more of these facilities. The basic facility enables customers to belong to one or more CUGs and to make/receive calls only to/from other customers in the same CUG. Concerned Administrations should observe the following when managing CUGs:

- For each international CUG, a "responsible subscriber" has to be nominated. Such a nomination is subject to agreement between all participants of the CUG.
- The Administration of the country hosting the "responsible subscriber" (coordinating Administration) shall act as a controlling and coordinating Administration for that CUG and shall carry out discussions with the responsible subscriber about changes to the CUG. The coordinating Administration shall also be responsible for the allocation of international CUG numbers.

Administrative arrangements for international CUGs are defined in Recommendation X.180.

13 Permanent virtual circuit

The international application of the Permanent Virtual Circuit (PVC) service is subject to agreement between the concerned Administrations. Subscribers to be connected to an international PVC shall nominate a "responsible subscriber". That subscriber is responsible for all organizational matters relating to the international PVC. The Administration of the country hosting the responsible subscriber (source Administration) shall act as a controlling and coordinating Administration for that international PVC and shall carry out the discussions with the responsible subscriber about any changes to the international PVC.

Provisions of the international PVC are defined in Recommendation X.181.

14 Duration of service

International PDTSs are, in principle, continuously available. Duration of calls should not be limited, unless this contravenes national law.

15 Outages

Administrations may temporarily withdraw the whole or part of the service from operation for the purpose of maintenance and enhancements necessary to ensure that the service is kept in a proper working condition.

Administrations shall endeavour to minimise the impact of such service withdrawals. Concerned Administrations should be notified of the planned withdrawal by the relevant Administration.

16 Service calls

Service telecommunications should be established among the interested Administrations to facilitate the exchange of information necessary to administer and maintain services, network management, accounting, handling of customer complaints, etc.

Administrations are encouraged to make service telecommunications free of charge. Aspects of service telecommunications are laid down in Recommendation F.17.

17 General provisions between Administrations

The international PDTS should be operated in the automatic mode. Administrations should reach a mutual agreement on the information needed to be exchanged to sustain the international PDTS and facilities offered. Administrations are not obliged to offer internationally all facilities available nationally.

Administrations should reach a mutual agreement on the upgrading, enhancement and expansion of the service. Each Administration should supply the concerned Administrations with a number of copies of its subscriber directories (see below).

18 General provisions between Administration and customer

The Administration should inform the customers about the data transmission services available internationally. This should include information on:

- service offered;
- charges;
- quality of service expected;
- call progress signals, error messages, diagnostic codes and their meaning;
- fault reporting procedures;
- procedures for resolving disputes including billing disputes;
- directory facilities;
- other information relating to service problems.

Administrations must assist customers with the changing capabilities of the services offered. Customer Help Facility should be established. The exact organization of Customer Help Facility is a national matter, but at least the following customer assistance should be offered:

- availability of services;
- information and notification on planned outages;
- directory service.

The International Telecommunication Charge Card Service allows the holder of a telecommunication charge card to make use of a variety of services provided by the card acceptor (i.e. the public data network from which services are being obtained) and to have the charges billed to the customer's account by the card issuer. The scope of public data transmission services for which the card applies will be subject to agreements between the card issuer and card acceptor.

This Recommendation specifically entails the use of a telecommunication charge card issued by an ROA in compliance with Recommendation E.116.

The use of the International Telecommunication Charge Card Service in a public data network depends on agreements between the card acceptors and card issuers. Major items to be covered may include:

– types of service for which cards may be used;
– basis for settlement of service charges and surcharges;
– prevention of fraudulent use of cards;
– procedures for uncollectible and unbillable services.

Directory services available to the customers should be in accordance with national laws and regulations regarding the suitability of publication of the information and the form in which it is published. Directories may be issued in form of printed materials. Electronic directories are also recommended.

Printed directories for international use should be updated at least once a year. Customers may decide to be excluded from the directory. The page size should not be larger than an A4 format. The directory for international use should be set in roman letters. The number published shall be the one that the calling customer must transmit to obtain the called customer. The directory normally has to be written in a language used in the country; use of explanatory notes in whatever official ITU language is recommended.

Electronic directories should be accessed from a DTE of the data network providing the PDTS. Access from other DTEs is also encouraged. Principles of electronic directories are for further study.

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Series A	Organization of the work of the ITU-T
Series B	Means of expression: definitions, symbols, classification
Series C	General telecommunication statistics
Series D	General tariff principles
Series E	Overall network operation, telephone service, service operation and human factors
Series F	**Non-telephone telecommunication services**
Series G	Transmission systems and media, digital systems and networks
Series H	Audiovisual and multimedia systems
Series I	Integrated services digital network
Series J	Transmission of television, sound programme and other multimedia signals
Series K	Protection against interference
Series L	Construction, installation and protection of cables and other elements of outside plant
Series M	TMN and network maintenance: international transmission systems, telephone circuits, telegraphy, facsimile and leased circuits
Series N	Maintenance: international sound programme and television transmission circuits
Series O	Specifications of measuring equipment
Series P	Telephone transmission quality, telephone installations, local line networks
Series Q	Switching and signalling
Series R	Telegraph transmission
Series S	Telegraph services terminal equipment
Series T	Terminals for telematic services
Series U	Telegraph switching
Series V	Data communication over the telephone network
Series X	Data networks and open system communications
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