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OPERATIONS AND QUALITY OF SERVICE

DATA TRANSMISSION SERVICES

SERVICE AND OPERATIONAL PRINCIPLES FOR PUBLIC DATA TRANSMISSION SERVICES

ITU-T Recommendation F.600

(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 F.600 was revised by the ITU-T Study Group I (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 Similarly, in this reform process, the CCIR and the IFRB have been replaced by the Radiocommunication Sector.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.

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SERVICE AND OPERATIONAL PRINCIPLES FOR PUBLIC DATA TRANSMISSION SERVICES

(Melbourne, 1988; revised Helsinki, 1993)

1 Introduction

1.1 Scope

1.1.1 This Recommendation lays down the general service and operational principles to be followed for international public data transmission services. Pursuant to the International Telecommunications Regulations (Melbourne, 1988), such telecommunications services are offered to the public for the carriage of data.

1.1.2 This data transfer mechanism may be provided on packet-switched networks, circuit-switched networks, integrated services digital networks and leased data circuits. Public data transmission service may consists of essential service elements and optional user facilities (see Recommendations X.1 and X.2).

1.1.3 International public data transmission services are widely used to provide a basis for defined telecommunication services, for publicly offered applications and for private applications. To the extent that such derived services and applications go beyond the carriage of data, they do not fall within the scope of this Recommendation.

1.1.4 Issues of an essentially technical nature concerning international data transmission services are dealt with in the X-Series of Recommendations.

1.1.5 Issues of an essentially technical nature concerning compatibility of terminals and connected equipment are dealt with in Recommendations A.20 and A.21 and, as appropriate, in the T-Series Recommendations.

1.1.6 Provisions concerning accounting, charging and refunds, and also certain leased-circuit aspects, may be found in the D-Series Recommendations. Service aspects will also be found in the other F-Series Recommendations.

1.2 Purpose

In general the provisions specified in this Recommendation provide guidance for Administrations to follow in order to offer international public data transmission services. It provides an overview of, and shows the interrelationship between relevant Recommendations necessary for setting up, maintaining and offering an international public data transmission service.

This Recommendation further offers advice and guidance to enhance the services beyond the basic elements necessary to support and sustain the international public data transmission services.

2 Terms

2.1 **data transmission relation**: A data transmission relation between two countries exists when there is between them an exchange of data traffic (and normally a settlement of accounts).

2.2 **data service call**: Those calls that are related to the operation of the international data transmission services.

2.3 Other terms

The following terms, definitions and their interrelationship are defined in A/X.110 – International Routing Principles and Routing Plan for Public Data Networks:

- traffic route;
- alternative traffic route;
- call route;
- call routing;
- call rerouting;
- originating public data network (PDN);
- destination PDN.

Other terms and definitions used in data transmission services are defined in the appropriate Recommendations and publications.

3 Access to the service

3.1 Categories of access

The categories of access are defined in Recommendation X.10 – Categories of Access for Data Terminal Equipment (DTE) to Public Data Transmission Services.

4 International data circuits/routes

4.1 An international route is established and operated between Administrations for the specific purpose of providing international public data transmission services.

4.2 For each data transmission relation the Administrations concerned should, by mutual agreement, decide on the necessity and possibility of alternative routes. In this respect Administrations should conform the principles of Recommendation X.110.

4.3 The networks of the Administrations operating data transmission services should, as far as is reasonable and practicable, be directly connected using appropriate conversion facilities as necessary. If international transit points are used, the total connection should comply with Recommendation X.92 – Hypothetical Reference Connections for Public Synchronous Data Networks.

4.4 In the event of interruption to the data transmission service every effort must be made to restore the service with minimum delay, taking into due account the Recommendations covering the appropriate Quality of Service aspects (see clause 10).

5 Duration of service

5.1 Availability

5.1.1 lnternational public data transmission services are, in principle, continuously available. The data transmission services should be engineered taking into account the applicable Quality of Service parameters defined in the appropriate Recommendations.

5.1.2 Services that are not available continuously are required to extend to a reasonable degree beyond the normal closing hours where necessary to allow calls in progress to terminate in an orderly manner.

5.2 Outages

Administrations may temporarily withdraw a whole or part of the service from operation for the purpose of maintenance, replacement or enhancements necessary to insure that the service is kept in proper working condition. Administrations shall endeavour to make such a withdrawal as least disruptive as is practicable.

Under exceptional circumstances (for example because of force majeure or threat of imminent technical harm from continued operation of the service, or part of it, involved), Administrations may temporarily withdraw a service if this is required in the public interest. Under such circumstances, withdrawal should be made with as much notice as feasible under the circumstances and should be restored in the shortest practicable time.

5.3 Time

When an international data service crosses one or more time zones, Universal Time (UTC), as defined in Recommendation B.11, should be used between the Administrations involved.

6 Types of calls

6.1 Data calls on switched data transmission services

6.1.1 Data calls may originate on one data transmission service and terminate on the same type of data transmission service. In addition, data calls may originate on one type of data transmission service and terminate on another type of data transmission service. Possible routes include, but are not restricted to:

- PSPDN to/from PSPDN;
- PSTN to/from PSPDN;
- Telex to/from PSPDN;
- CSPDN to/from PSPDN;
- ISDN to/from PSPDN.

6.1.2 Implementation of the possible routes is subject to bilateral agreement between Administrations. When implemented, the methods of interworking should conform to Recommendation X.10 and other appropriate Recommendations.

6.2 Service calls

Service calls between Administrations concerned with the international data transmission services are covered in Recommendation F.17.

7 Modes of operation

NOTE – If more than two Administrations are involved, i.e. there is (at least) one transit network between the Administrations concerned, this clause shall apply as appropriate to all Administrations involved in the setting up of the international data transmission service.

7.1 General provisions between Administrations

7.1.1 The data transmission service should be operated in the automatic mode. It is noted that semi-automatic or manual operation may be necessary.

7.1.2 Administrations should reach mutual agreement on the most appropriate method of operation for the agreed mode of international data transmission service between them.

7.1.3 Administrations should reach mutual agreement on the information needed to be exchanged to sustain the international data transmission service between them and the public services and facilities offered over it by the Administration.

7.1.4 Administrations should reach mutual agreement on the procedures and time scales to review the service, e.g. upgrading of equipment, enhancement of facilities, expansion of service.

7.1.5 Administrations should reach mutual agreement on:

- the service levels to be sustained, bearing in mind possible time zone differences, transit Administrations, the service levels offered to customers, etc.;
- *customer* circuit designation information as defined in Recommendation F.104;
- the fault reporting procedures, including full information of the (International) Help Desks involved;
- the interface of responsibility at the different layers of the data transmission service (e.g. physical layer (satellite service), data link layer, packet layer) insofar this is not already covered by an appropriate Recommendation;
- the interface of responsibility of the different services and/or facilities offered on or over the international data transmission service;
- the escalation procedures;
- the fault clearing report procedures.

7.2 Automatic operation

7.2.1 The data transmission services of each Administration should be interconnected, permitting all subscribers to reach one another either directly or by automatic means.

Call operations may be manual or automatic when initiated by the users from their DTE.

7.2.2 To establish an international data call by automatic means the subscriber shall normally apply the addressing scheme appropriate to the network (e.g. Recommendations X.121, deleted reference to E.163 – consolidated in E.164, E.164 or F.69).

7.2.3 The duration of normal calls in the automatic service should not normally be limited.

7.3 Semi-automatic and manual operation

Semi-automatic and manual operation may be offered, subject to bitateral agreement.

8 Directories – Compilation and supply

Administrations should make available directory services to their customers, taking into account national laws and regulations regarding the suitability of publication of the information and the form in which it is published.

8.1 Electronic directories

Where directory services are provided by electronic means these should be provided in accordance with the relevant Recommendations as appropriate.

8.2 "Manual" directories

8.2.1 Printed directories for international use should be updated at least once a year. Customers may decide to be excluded from the directory. The size should not be larger than 216 × 297 mm (A4 format).

8.2.2 The directories for international use shall, at least, be set in roman letters. The call number published shall be that which the calling subscriber has to transmit in order to obtain the called subscriber after he has followed the procedure prescribed in his own country to gain access to the destination country.

8.2.3 When the directories are written in a language other than a language normally used in that country, they shall be accompanied by an explanatory note to facilitate the use of such directories. This note shall be drawn up in whatever official language of the Union has been agreed upon by the Administrations concerned.

8.2.4 Each Administration will supply to the Administration with which a data transmission services exists, a number of copies of its subscriber directories. The number of such copies shall be fixed in advance by mutual agreement and shall be regarded as applying until a request to change it is received.

9 Call progress signals on public data networks

9.1 Call progress signals are defined in Recommendation X.96 – Call Progress Signals in Public Data Networks – and elaborated on in Recommendations X.21, X.21 *bis*, X.25 and X.75.

9.2 It should be recognised that call progress signals may be provided to the user by either the public data transmission service or the end-system. In the former case, i.e. provided directly by the public data network (PAD interface), the call progress signals should be presented in an easily understood form, where possible, i.e. in plain text.

l0 Quality of Service

10.1 General principles

The general framework for the concept of Quality of Service, along with terms and definitions related to the quality of telecommunications services may be found in Recommendation E.800 – Quality of Service and Dependability Vocabulary.

l0.2 Specific service aspects

This subclause outlines the different aspects of the data transmission services with respect to Quality of Service.

10.2.1 Leased data circuits

Information on the assessment and maintenance of service availability and performance of international leased data circuits may be found in the following Recommendations:

- Rec. M.1016 – Assessment of the service availability performance of international leased circuits;
- Rec. M.1050 – Lining up an international point-to-point leased circuit;
- Rec. M.1055 – Lining up an international multi-terminal leased circuit;
- Rec. M.1060 – Maintenance of international leased circuits;
- Rec. M.1350 – Setting up, lining up and characteristics of the international data transmission systems operating in the range 2.4 kbit/s to 9.6 kbit/s;
- Rec. M.1370 – Setting up, lining up and characteristics of the international data transmission systems operating at 48 kbit/s and above;
- Rec. G.821 – Error performance of international digital connections forming part of an ISDN;
- Rec. G.822 – Controlled slip rate objectives on an international digital connection.

10.2.2 Packet-switched public data networks

Quality of service and related performance criteria applicable to packetswitched public data networks (PSPDNs) may be found in the following Recommendations:

- Rec. X.140 – General Quality of Service Parameters for Communication between Public Data Networks;
- Rec. X.141 – General Principles for the Detection and Correction of Errors in Public Data Networks;

– Rec. X.134 – Portion Boundaries and Packet Layer Reference Events: Basis for defining Packet-Switched Performance Parameters;

– Rec. X.135 – Speed of Service (Delay and Throughput) Performance Values for Public Data Networks when providing International Packet-Switched Services;

– Rec. X.136 – Accuracy and Dependability Performance Values for Public Data Networks when providing International Packet-Switched Services;

– Rec. X.137 – Availability Performance Values for Public Data Networks when providing International Packet-Switched Services.

10.2.3 Circuit-switched public data networks

Performance criteria applicable to circuit-switched public data networks (CSPDNs) may be found in the following Recommendations:

– Rec. X.130 – Call Processing Delays in Public Networks when providing International Synchronous Circuit-Switched Data Services;

– Rec. X.131 – Call Blocking in Public Data Networks when providing International Synchronous Circuit-Switched Data Services.

10.3 Management of Quality of Service

For further study.

11 General aspects of provision of service

11.1 General terms and conditions

Administrations should advise customers as to the general terms and conditions relating to available data transmission services. This should include advice on:

– services and facilities offered;

– charges;

– service levels to be expected, including any limitations which may affect the use of the service;

– access and log-on procedures;

– level of security offered on the different types of access;

– call progress signals, error messages and their meaning;

– fault reporting procedures;

– procedures for resolving billing disputes;

– directory facilities available.

This list is not exhaustive or limited to the items mentioned above.

11.2 Information relating to service problems

Administrations should provide customers with up-to-date information on procedures for reporting difficulties or faults, including escalation procedures to be used when problems are not resolved in a reasonable period of time.

In the case of international leased circuit services, Administrations may temporarily withdraw a private leased circuit from operation in order to perform such tests, adjustments and routine maintenance as is necessary to insure that the circuit is kept in proper working condition. Administrations shall endeavour to make such a withdrawal only after consultation with the customer and at a time mutually agreeable to both parties.

Under exceptional circumstances (for example because of force majeure or threat of imminent technical harm from continued operation of the circuit involved), Administrations may temporarily withdraw a private leased circuit if this is required in the public interest. Under such circumstances, withdrawal should be made with as much notice as feasible under the circumstances and should be restored in the shortest practicable time.

12 Provisions of customer support

To assist customers with the changing capabilities of services offered, the reporting and timely rectification of problems and with general enquiries about services, Administrations are recommended to provide a Customer Help Facility.

The Customer Help Facility should be the prime point of contact between the customers and the Service Provider. The exact organisational arrangement and the role of the Customer Help Facility is a national matter, but should offer the customer assistance on at least the following:

- status and availability of service offered;
- directory assistance of service offered;
- information and notification of planned outages.

Administrations are recommended that the Customer Help Facility should be adequatedly resourced and have in place procedures that will assist with the timely identification and resolution of customers' problems.