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SERIES X: DATA NETWORKS AND OPEN SYSTEM
COMMUNICATION

OSI networking and system aspects – Efficiency

**Information technology – Open systems
interconnection – Network Fast Byte Protocol**

ITU-T Recommendation X.633

(Previously “CCITT Recommendation”)



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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. Some 179 member countries, 84 telecom operating entities, 145 scientific and industrial organizations and 38 international organizations participate in ITU-T which is the body which sets world telecommunications standards (Recommendations).

The approval of Recommendations by the Members of ITU-T is covered by the procedure laid down in WTSC Resolution No. 1 (Helsinki, 1993). In addition, the World Telecommunication Standardization Conference (WTSC), which meets every four years, approves Recommendations submitted to it and establishes the study programme for the following period.

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. The text of ITU-T Recommendation X.633 was approved on 5th of October 1996. The identical text is also published as ISO/IEC International Standard 14700.

NOTE

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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Summary

The Network Fast Byte Protocol applies to the provision of the OSI Connection-mode Network Service in end systems, and eliminates the round trip delay associated with the establishment and release of a network connection, and requires very low PCI overhead. The Network Fast Byte Protocol is intended for use in situations in which enhancements to the data link QOS are not required, and efficiency of operation (e.g. reduction of round trip delays on establishment and release) is of primary concern.

Introduction

This Recommendation | International Standard is one of a set of Recommendations | International Standards produced to facilitate the interconnection of information processing systems. This set of Recommendations | International Standards covers the services and protocols required to achieve such interconnection.

The Network Fast Byte Protocol Recommendation | International Standard is positioned with respect to other related Recommendations | International Standards by the layers defined in the Reference Model for Open Systems Interconnection (see ITU-T Rec. X.200 | ISO/IEC 7498-1). It is most closely related to, and lies within the field of application of the Network Service definition (ITU-T Rec. X.213 | ISO/IEC 8348). It also uses and makes reference to the Data Link Service definition (see ITU-T Rec. X.212 | ISO/IEC 8886), whose provisions it assumes in order to accomplish Network Fast Byte's aims. The interrelationship of these Recommendations | International Standards is illustrated in Figure Intro. 1.

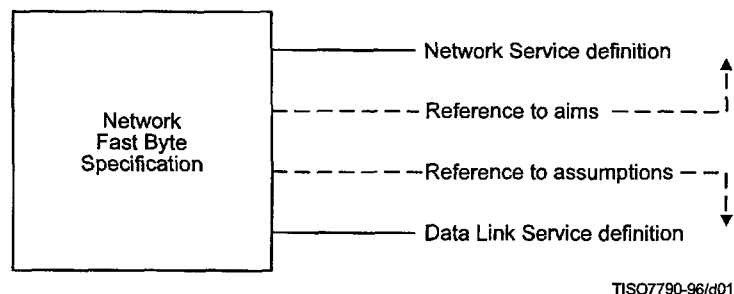


Figure Intro. 1 – Relationship between the Network Fast Byte Protocol and adjacent services

This Recommendation | International Standard specifies a common encoding and protocol procedures. It is intended that the Network Fast Byte should be simple and cater for a specific range of Data Link Service qualities possible. This Recommendation | International Standard does not define mechanisms that can be used to optimize or enhance the quality of the Data Link Service.

The primary aim of this Recommendation | International Standard is to provide a set of rules for communication expressed in terms of the procedures to be carried out by peer entities at the time of communication. These rules for communication are intended to provide a sound basis for development in order to serve a variety of purposes:

- a) as a guide for implementors and designers;
- b) for use in the testing and procurement of equipment;
- c) as part of an agreement for the admittance of systems into the open systems environment;
- d) as a refinement of the understanding of OSI.

As it is expected that the initial users of this Recommendation | International Standard will be designers and implementors of equipment, this contains, in notes or in annexes, guidance on the implementation of the procedures defined herein.

This Recommendation | International Standard contains a clause on conformance of equipment claiming to implement the procedures in this Recommendation | International Standard (see clause 8). To evaluate conformance of a particular implementation, it is necessary to have a statement of which capabilities and options have been implemented for a given OSI protocol. Such a statement is called a Protocol Implementation Conformance Statement (PICS). A PICS proforma is provided in Annex A. Attention is drawn to the fact that this Recommendation | International Standard does not contain any tests to demonstrate this conformance.

It should be noted that it may not be possible with current technology to verify that an implementation will operate the protocol defined in this Recommendation | International Standard correctly under all circumstances. It is possible by means of testing to establish confidence that an implementation correctly operates the protocol in a representative sample of circumstances. It is, however, intended that this Recommendation | International Standard can be used in circumstances where two implementations fail to communicate in order to determine whether one or both have failed to operate the protocol correctly.

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INTERNATIONAL STANDARD

ITU-T RECOMMENDATION

**INFORMATION TECHNOLOGY
OPEN SYSTEMS INTERCONNECTION –
NETWORK FAST BYTE PROTOCOL****1 Scope**

This Recommendation | International Standard specifies:

- a) procedures when operating over the connection-mode data link service for the connection-mode transfer of data and control information from one network entity to a peer network entity;
- b) the structure and encoding of the NPDUs used for the transfer of data and control information.

The procedures are defined in terms of:

- a) the interactions between peer network entities through the exchange of NPDUs;
- b) the interactions between a network entity and the network service user in the same system through the exchange of network service primitives;
- c) the interactions between a network entity and the data link service provider through the exchange of data link service primitives.

These procedures are applicable to instances of communication between systems which support the Network Layer of the OSI Reference Model and wish to interconnect in the open systems environment using the Network Fast Byte Protocol.

This Recommendation | International Standard specifies, in clause 8, conformance requirements for systems implementing these procedures and provides the PICS proforma in compliance with the relevant requirements, and in accordance with the relevant guidance, given in ITU-T Rec. X.296 and ISO/IEC 9646-7. It does not contain tests which can be used to demonstrate this conformance.

2 Normative references

The following Recommendations and International Standards contain provisions which, through reference in this text, constitute provisions of this Recommendation | International Standard. At the time of publication, the editions indicated were valid. All Recommendations and International Standards are subject to revision and parties to agreements based on this Recommendation | International Standard are encouraged to investigate the possibility of applying the most recent edition of the Recommendations and International Standards listed below. Members of IEC and ISO maintain registers of currently valid International Standards. The Telecommunication Standardization Bureau of the ITU maintains a list of currently valid ITU-T Recommendations.

2.1 Identical Recommendations | International Standards

- ITU-T Recommendation X.200 (1994) | ISO/IEC 7498-1:1994, *Information technology – Open Systems Interconnection – Basic Reference Model: The Basic Model*.
- ITU-T Recommendation X.210 (1993) | ISO/IEC 10731:1994, *Information technology – Open Systems Interconnection – Basic Reference Model: Conventions for the definition of OSI services*.
- ITU-T Recommendation X.212 (1995) | ISO/IEC 8886:1996, *Information technology – Open Systems Interconnection – Data link service definition*.

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- ITU-T Recommendation X.213 (1995) | ISO/IEC 8348:1996, *Information technology – Open Systems Interconnection – Network Service Definition*.
- ITU-T Recommendation X.233 (1993) | ISO/IEC 8473-1:1994, *Information technology – Protocol for providing the connectionless-mode network service: Protocol specification*.
- ITU-T Recommendation X.263 (1995) | ISO/IEC TR 9577...¹⁾, *Information technology – Protocol identification in the Network layer*.

2.2 Paired Recommendations | International Standards equivalent in technical contents

- ITU-T Recommendation X.223 (1993), *Use of X.25 to provide the OSI connection-mode network service for ITU-T applications*.
ISO/IEC 8878:1992, *Information technology – Telecommunications and information exchange between systems – Use of X.25 to provide the OSI Connection-mode Network Service*.
- ITU-T Recommendation X.290 (1995), *OSI conformance testing methodology and framework for protocol Recommendations for ITU-T applications – General concepts*.
ISO/IEC 9646-1:1994, *Information technology – Open Systems Interconnection – Conformance testing methodology and framework – Part 1: General concepts*.
- ITU-T Recommendation X.296 (1995), *OSI conformance testing methodology and framework for protocol Recommendations for ITU-T applications – Implementation conformance statements*.
ISO/IEC 9646-7:1995, *Information technology – Open Systems Interconnection – Conformance testing methodology and framework – Part 7: Implementation Conformance Statements*.

3 Definitions

NOTE – The definitions contained in this clause make use of abbreviations defined in clause 4.

3.1 This Recommendation | International Standard is based on the concepts developed in ITU-T Rec. X.200 | ISO/IEC 7498-1 and makes use of the following terms defined in it:

- a) concatenation and separation;
- b) segmenting and reassembling;
- c) multiplexing and demultiplexing;
- d) splitting and recombining;
- e) flow control;
- f) connection-mode network service;
- g) connection-mode data link service.

3.2 For the purposes of this Recommendation | International Standard, the following definitions apply:

- 3.2.1 **equipment**: Hardware or software or a combination of both; it need not be physically distinct within a computer system.
- 3.2.2 **local matter**: A decision made by a system concerning its behavior in the Network Layer that is not subject to the requirements of this protocol.
- 3.2.3 **initiator**: A network entity that acts on an N-CONNECT request from the NS-user.
- 3.2.4 **responder**: A network entity with whom an initiator wishes to establish a network connection.
- 3.2.5 **sending network entity**: A network entity that sends a given NPDU.
- 3.2.6 **receiving network entity**: A network entity that receives a given NPDU.
- 3.2.7 **error indication**: A DL-RESET indication that a network entity receives from the DLS-provider.
- 3.2.8 **invalid NPDU**: An NPDU that does not comply with the requirements of this Recommendation | International Standard for structure and encoding.

¹⁾ To be published.