INTERNATIONAL STANDARD

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Information technology — Open Systems Interconnection — Protocol for providing the connection-mode transport service

Technologies de l'information — Interconnexion de systèmes ouverts (OSI) — Protocole pour fourniture du service de transport en mode connexion



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Foreword

ISO (the International Organization for Standardization) and IEC (the International Electrotechnical Commission) form the specialized system for worldwide standardization. National bodies that are members of ISO or IEC participate in the development of International Standards through technical committees established by the respective organization to deal with particular fields of technical activity. ISO and IEC technical committees collaborate in fields of mutual interest. Other international organizations, governmental and non-governmental, in liaison with ISO and IEC, also take part in the work.

In the field of information technology, ISO and IEC have established a joint technical committee, ISO/IEC JTC 1. Draft International Standards adopted by the joint technical committee are circulated to national bodies for voting. Publication as an International Standard requires approval by at least 75 % of the national bodies casting a vote.

International Standard ISO/IEC 8073 was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information technology*, Subcommittee SC 6, *Telecommunications and information exchange between systems*, in collaboration with ITU-T. The identical text is published as ITU-T Recommendation X.224.

This fourth edition cancels and replaces the third edition (ISO/IEC 8073:1992), which has been technically revised. It also incorporates Technical Corrigendum 1:1993 and Technical Corrigendum 2:1994.

Annexes A to E form an integral part of this International Standard.

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 Transport Protocol is positioned with respect to other related Recommendations | International Standards by the layers defined in the Reference Model for Open Systems Interconnection (see CCITT Rec. X.200 | ISO 7498). It is most closely related to, and lies within the field of application of the Transport Service (see ITU-T Rec. X.214 | ISO/IEC 8072). It also uses and makes reference to the Network Service Standard (see CCITT Rec. X.213 | ISO/IEC 8348), whose provisions it assumes in order to accomplish the transport protocol's aims. The interrelationship of these Recommendations | International Standards is illustrated in Figure Intro. 1.

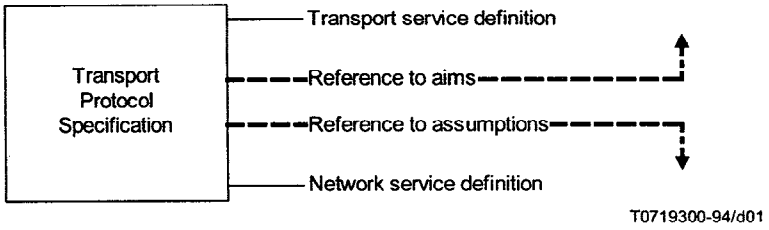


Figure Intro. 1 – Relationship between the Transport Protocol and adjacent services

This Recommendation | International Standard specifies a common encoding and a number of classes of transport protocol procedures to be used with different network qualities of service.

It is intended that the Transport Protocol should be simple but general enough to cater for the total range of Network Service qualities possible, without restricting future extensions.

The protocol is structured to give rise to classes of protocol which are designed to minimize possible incompatibilities and implementation costs.

The classes are selectable with respect to the Transport and Network Services in providing the required quality of service for the interconnection of two session entities (each class provides a different set of functions for enhancement of service qualities).

This Recommendation | International Standard defines mechanisms that can be used to optimize network tariffs and enhance the following qualities of service:

a) different throughput;

b) different error rates;

c) integrity of data requirements;

d) reliability requirements.

It does not require an implementation to use all of these mechanisms, nor does it define methods for measuring achieved quality of service or criteria for deciding when to release transport connections following quality of service degradation.

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, i.e.:

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 Recommendation | International Standard contains, in notes or in annexes, guidance on the implementation of the procedures defined herein.

It should be noted that, as the number of valid protocol sequences is very large, it is not 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.

This Recommendation | International Standard contains a clause on conformance of equipment claiming to implement the procedures in this Recommendation | International Standard. 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 C. Attention is drawn to the fact that this Recommendation | International Standard does not contain any tests to demonstrate this conformance.

The variations and options available within this Recommendation | International Standard are essential as they enable a transport service to be provided for a wide variety of applications over a variety of network qualities. Thus, a minimally conforming implementation will not be suitable for use in all possible circumstances. It is important, therefore, to qualify all references to this Recommendation | International Standard with statements of the options provided or required or with statements of the intended purpose of provision or use.

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INTERNATIONAL STANDARD

ITU-T RECOMMENDATION

INFORMATION TECHNOLOGY – OPEN SYSTEMS INTERCONNECTION – PROTOCOL FOR PROVIDING THE CONNECTION-MODE TRANSPORT SERVICE

(Malaga-Torremolinos, 1984; amended at Melbourne, 1988, and at Geneva, 1993; revised in 1996)

1 Scope

This Recommendation | International Standard specifies:

a) five classes of procedures when operating over the connection-mode network service:

   1) class 0: simple class;

   2) class 1: basic error recovery class;

   3) class 2: multiplexing class;

   4) class 3: error recovery and multiplexing class;

   5) class 4: error detection and recovery class;

   for the connection-mode transfer of data and control information from one transport entity to a peer transport entity;

b) one class (class 4) of procedure when operating over the connectionless-mode network service;

c) the means of negotiating the class of procedures to be used by the transport entities;

d) the structure and encoding of the transport protocol data units used for the transfer of data and control information.

The procedures are defined in terms of:

i) the interactions between peer transport entities through the exchange of transport protocol data units;

ii) the interactions between a transport entity and the transport service user in the same system through the exchange of transport service primitives;

iii) the interactions between a transport entity and the network service provider through the exchange of network service primitives.

These procedures are defined in the main text of this Recommendation | International Standard supplemented by state tables in Annex A.

These procedures are applicable to instances of communication between systems which support the Transport Layer of the OSI Reference Model and which wish to interconnect in an open systems environment.

This Recommendation | International Standard specifies, in clause 14, 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 CCITT Rec. X.291 and ISO/IEC 9646-2. It does not contain tests which can be used to demonstrate this conformance.

2 References

The following Recommendations and International Standards contain provisions which, through references in this text, constitute provisions of this Recommendation | International Standard. At the time of publication, the editions indicated were valid. All Recommendations and 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 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.