INTERNATIONAL STANDARD

ISO/IEC
8602

Second edition
1995-04-01

Information technology — Protocol for providing the OSI connectionless-mode transport service

iTeh STANDARD PREVIEW

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Technologies de l'information — Protocole pour la fourniture du service de transport OSI en mode sans connexion

CONTENTS

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 8602 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.234.

This second edition cancels and replaces the first edition (ISO 8602:1987).

Annexes A and B form an integral part of this International Standard. Annex C is for information only.

Introduction

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

This Recommendation | International Standard is positioned with respect to other related Recommendations and International Standards by the layers defined in the Reference Model for Open Systems Interconnection (see ITU-T Rec. X.200 | ISO/IEC 7498-1). In particular, it is a protocol of the Transport Layer. It is most closely related to the transport service definition (see ITU-T Rec. X.214 | ISO/IEC 8072) and the network service definition (see CCITT Rec. X.213 | ISO/IEC 8348). The interrelationship between these Recommendations and International Standards is illustrated in Figure 1.

The structure of this Recommendation | International Standard is similar to the structure of ITU-T Rec. X.224 | ISO/IEC 8073 in order to facilitate cross reference between the two transport protocols.
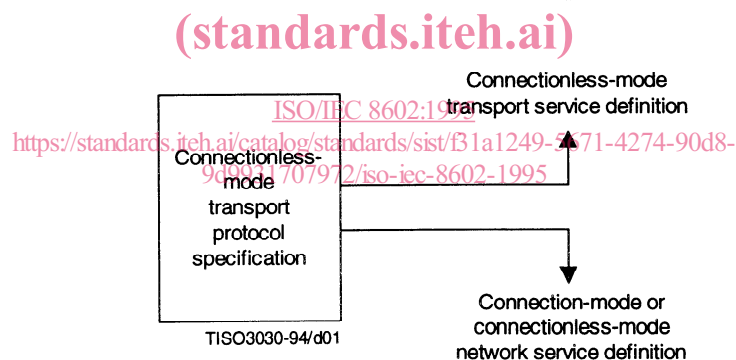

Figure 1 – Relationship between the connectionless-mode
transport protocol and adjacent services

INTERNATIONAL STANDARD

ITU-T RECOMMENDATION

INFORMATION TECHNOLOGY –
PROTOCOL FOR PROVIDING THE OSI CONNECTIONLESS-MODE
TRANSPORT SERVICE

1   Scope

This Recommendation I International Standard specifies

  a)   procedures for the connectionless-mode transmission of data and protocol control information from one transport entity to one peer transport entity;

  b)   the encoding of the transport-protocol-data-units used for the transmission of data and control information;

  c)   procedures for the correct interpretation of transport protocol control information; and

  d)   the functional requirements for implementations claiming conformance to this Recommendation I International Standard.

The procedures are defined in terms of

  a)   the interactions among peer transport entities through the exchange of transport-protocol-data-units;

  b)   the interactions between a transport entity and a transport service user through the exchange of transport service primitives; and

  c)   the interaction between a transport entity and a network service provider through the exchange of network service primitives.

This Recommendation I International Standard specifies the connectionless-mode transport protocol and provides the PICS Proforma in compliance with the relevant requirements, and in accordance with the relevant guideline, given in CCITT Rec. X.291 I ISO/IEC 9646-2. The protocol for providing the connection-mode transport service is specified in ITU-T Rec. X.224 I ISO/IEC 8073.

2   Normative references

The following Recommendations and International Standards contain provisions, which through references in the text, constitute provisions of this Recommendation I 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 I 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.

2.1   Identical Recommendations I International Standards

  –   ITU-T Recommendation X.200 (1994) I ISO/IEC 7498-1:1994, *Information technology – Open Systems Interconnection – Basic Reference Model: The Basic Model.*

  –   CCITT Recommendation X.213 (1992) I ISO/IEC 8348:1993, *Information technology – Open Systems Interconnection – Network Service Definition.*

  –   ITU-T Recommendation X.214 (1993) I ISO/IEC 8072:1994, *Information technology – Open Systems Interconnection – Transport service definition.*

2.2 Paired Recommendations | International Standards equivalent in technical content

- ITU-T Recommendation X.224 (1993), *Protocol for providing the OSI connection-mode transport service.*

  ISO/IEC 8073:1992, Information technology – *Telecommunications and information exchange between systems – Open Systems Interconnection – Protocol for providing the connection-mode transport service.*

- ITU-T Recommendation X.264 (1993), *Transport protocol identification mechanism.*

  ISO/IEC 11570:1992, Information technology – *Telecommunications and information exchange between systems – Open Systems Interconnection – Transport protocol identification mechanism.*

- CCITT Recommendation X.290 (1992), *OSI conformance testing methodology and framework for protocol Recommendations for CCITT applications – General Concepts.*

  ISO/IEC 9646-1:1991, *Information technology – Open Systems Interconnection – Conformance testing methodology and framework – Part 1: General concepts.*

- CCITT Recommendation X.291 (1992), *OSI conformance testing methodology and framework for protocol Recommendations for CCITT applications – Abstract test suite specification.*

  ISO/IEC 9646-2:1991, *Information technology – Open Systems Interconnection – Conformance testing methodology and framework – Part 2: Abstract test suite specification.*

SECTION 1 – GENERAL

3 Definitions

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

3.1 Reference Model definitions

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 therein:

a) Transport layer;

b) transport service;

c) transport-service-access-point;

d) transport-service-access-point-address;

e) transport-service-data-unit;

f) network Layer;

g) network service;

h) network connection;

i) network-service access-point;

j) transport protocol;

k) connectionless-mode transmission.

3.2 This Recommendation | International Standard uses the following terms defined in CCITT Rec. X.290 | ISO/IEC 9646-1:

a) PICS Proforma;

b) protocol implementation conformance statement (PICS).

3.3 Additional definitions

For the purposes of this Recommendation | International standard, the following definitions apply.

3.3.1 Source-transport-address

Identifies the TSAP through which the transport service user may act as the source of data during a particular instance of transport connectionless-mode transmission.

3.3.2 Destination-transport-address

Identifies the TSAP through which the transport service user may act as the sink of data during a particular instance of transport connectionless-mode transmission.

3.3.3 Connection oriented transport protocol

See 3.1, "transport protocol".

3.3.4 Connection oriented transport service

See 3.1, "transport service".

3.3.5 Connection oriented network service

See 3.1, "network service".

3.3.6 Connectionless-mode transport protocol

Transport protocol for providing the connectionless-mode transport service.

3.3.7 Connectionless-mode transport service

Transport service providing connectionless-mode transmission.

3.3.8 Connectionless-mode network service

Network service providing connectionless-mode transmission.

4   Abbreviations

4.1   Data units

TPDU	Transport-protocol-data-unit
TSDU	Transport-service-data-unit
NSDU	Network-service-data-unit

4.2   Types of transport-protocol-data-units

UD TPDU	Unit data TPDU
UN TPDU	Use of network connection TPDU (defined in ITU-T Rec. 264 I ISO/IEC 11570)

4.3   TPDU fields

LI	Length indicator

4.4   Parameters

Source TSAP-ID

Destination TSAP-ID

Checksum

4.5   Miscellaneous

TS-user	Transport service user
TSAP	Transport-service-access-point
NSAP	Network-service-access-point

5 Overview of the transport protocol

5.1 Service provided by the Transport Layer

The service provided by the protocol described herein is a connectionless-mode transport service. The connectionless-mode transport service is described in ITU-T Rec. X.214 I ISO/IEC 8072. The transport service primitives provided are summarized in Table 1.

Table 1 – Transport service primitives

Primitives	Parameters
T-UNITDATA request	Source address Destination address Quality of service TS-user-data
T-UNITDATA indication	Source address Destination address Quality of service TS-user-data

5.2 Service assumed from the Network Layer

The transport protocol described in this Recommendation I International Standard can operate over the connection oriented network service and over the connectionless-mode network service as defined in CCITT Rec. X.213 I ISO/IEC 8348.

When operating over the connection oriented network service, the network service primitives given in Table 2 are used.

When operating over the connectionless-mode network service, the network service primitives given in Table 3 are used.

5.3 Functions of the Transport Layer

5.3.1 Connectionless-mode transfer functions

The purpose of connectionless-mode transfer is to allow the transfer of data between correspondent TS-users on a connectionless basis. This service provides for single-access data transfer for correspondent TS-users without the overhead of transport connection establishment. This purpose is achieved by using functions specific to the connectionless-mode transport protocol. The connectionless-mode transfer functions are primarily intended to benefit those applications that require one-time, one-way transfer of data, towards one TS-user, taking advantage of mechanisms more simple that the connection oriented ones.

5.3.2 Overview of functions

The functions in the Transport Layer are at least those necessary to bridge the gap between the service available from the Network Layer and the service to be offered to the transport service users.

The functions in the Transport Layer are concerned with the enhancement of the quality of service, including all aspects of cost optimization.

5.3.2.1 Transmission of TPDUs

5.3.2.2 Network service selection

This function selects the network service that best matches the requirements of the TS-user, taking into account charges for various services.

5.3.2.3 Address mapping

This function determines the network address that will be used as the destination address parameter in an N-UNITDATA request or as the called address parameter in an N-CONNECT request by examining the transport address specified by the destination address parameter of a T-UNITDATA request.

Table 2 – Connection-mode network service primitives

Primitives		X/Y/Z	Parameters	X/Y/Z
N-CONNECT	request indication	X X	Called address Calling address Receipt confirmation selection Expedited data selection QOS parameter set NS-user-data	X X Z Z X Y
N-CONNECT	response confirm	X X	Responding address Receipt confirmation selection Expedited data selection QOS parameter set NS-user-data	X Z Z X Z
N-DATA	request indication	X X	N-user-data Confirmation request	X Z
N-RESET	request	X	Reason	Z
	indication	X	Originator Reason	Z Z
N-RESET	response confirm	X X		
N-EXPEDITED DATA	request indication	Z Z		
N-DATA ACKNOWLEDGE	request indication	Z Z		
N-DISCONNECT	request	X	Reason NS-user-data Responding address	Z Z Z
	indication	X	Originator Reason NS-user-data Responding address	Z Z Z Z

X   The Transport Protocol assumes that this facility is provided in all networks.

Y   The Transport Protocol assumes that this facility is provided in some networks and a mechanism is provided to optionally use the facility.

Z   The Transport Protocol does not use this facility and will ignore it when received.

Table 3 – Connectionless-mode network service primitives

Primitives		X/Y/Z	Parameters	X/Y/Z
N-UNITDATA	request	X	Source address Destination address Quality of service NS-user-data	X[a] X X X
	indication	X	Source address Destination address Quality of service NS-user-data	X X[a] X X

[a] This parameter may be implicitly associated with the network-service-access-point at which the primitive is issued.