



INTERNATIONAL TELECOMMUNICATION UNION

ITU-T

TELECOMMUNICATION
STANDARDIZATION SECTOR
OF ITU

X.263

(09/98)

**SERIES X: DATA NETWORKS AND OPEN SYSTEM
COMMUNICATIONS**

Open Systems Interconnection – Protocol Identification

**Information technology – Protocol identification
in the Network Layer**

ITU-T Recommendation X.263

(Previously CCITT Recommendation)

ITU-T X-SERIES RECOMMENDATIONS
DATA NETWORKS AND OPEN SYSTEM COMMUNICATIONS

PUBLIC DATA NETWORKS

Services and facilities	X.1-X.19
Interfaces	X.20-X.49
Transmission, signalling and switching	X.50-X.89
Network aspects	X.90-X.149
Maintenance	X.150-X.179
Administrative arrangements	X.180-X.199

OPEN SYSTEMS INTERCONNECTION

Model and notation	X.200-X.209
Service definitions	X.210-X.219
Connection-mode protocol specifications	X.220-X.229
Connectionless-mode protocol specifications	X.230-X.239
PICS proformas	X.240-X.259

Protocol Identification X.260-X.269

Security Protocols	X.270-X.279
Layer Managed Objects	X.280-X.289
Conformance testing	X.290-X.299

INTERWORKING BETWEEN NETWORKS

General	X.300-X.349
Satellite data transmission systems	X.350-X.399

MESSAGE HANDLING SYSTEMS X.400-X.499

DIRECTORY X.500-X.599

OSI NETWORKING AND SYSTEM ASPECTS

Networking	X.600-X.629
Efficiency	X.630-X.639
Quality of service	X.640-X.649
Naming, Addressing and Registration	X.650-X.679
Abstract Syntax Notation One (ASN.1)	X.680-X.699

OSI MANAGEMENT

Systems Management framework and architecture	X.700-X.709
Management Communication Service and Protocol	X.710-X.719
Structure of Management Information	X.720-X.729
Management functions and ODMA functions	X.730-X.799

SECURITY X.800-X.849

OSI APPLICATIONS

Commitment, Concurrency and Recovery	X.850-X.859
Transaction processing	X.860-X.879
Remote operations	X.880-X.899

OPEN DISTRIBUTED PROCESSING X.900-X.999

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

TECHNICAL REPORT 9577

ITU-T RECOMMENDATION X.263

**INFORMATION TECHNOLOGY – PROTOCOL IDENTIFICATION
IN THE NETWORK LAYER**

Summary

This Recommendation | Technical Report describes a means to permit protocols at the Network Layer to be identified. In addition, this Recommendation | Technical Report provides a record of the values of protocol identifiers which have been allocated.

Source

The ITU-T Recommendation X.263 was approved on the 25th of September 1998. The identical text is also published as ISO/IEC Technical Report 9577.

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.

© ITU 1999

All rights reserved. No part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from the ITU.

CONTENTS

	<i>Page</i>
1 Scope	1
2 References	1
2.1 Identical Recommendations International Standards.....	2
2.2 Paired Recommendations International Standards equivalent in technical content.....	2
2.3 Additional references	2
3 Abbreviations	4
4 Protocol identifiers	4
5 Initial protocol identifier.....	5
5.1 General	5
5.2 Assignment structure for header-oriented protocols	6
5.3 Values assigned to the IPI for header-oriented protocols.....	6
5.4 Assignment structure for trailer-oriented protocols.....	8
5.5 Values assigned to the IPI for trailer-oriented protocols.....	8
6 Subsequent protocol identifier.....	9
6.1 General	9
6.2 Assignment structure for header-oriented protocols	10
6.3 Values assigned to the SPI for header-oriented protocols.....	10
6.4 Assignment structure for trailer-oriented protocols.....	12
6.5 Values assigned to the SPI for trailer-oriented protocols	12
Annex A The location and use of protocol identifiers in X.25 Packet Layer Protocol	13
Annex B Guidelines on the processing of protocol identifiers	15
B.1 Originating systems.....	15
B.2 Destination systems.....	15
Annex C – Identification of Internet protocols	17
Annex D – Identification of protocols that are discriminated according to the IEEE-defined SNAP convention..	18
Annex E – Identification of protocols specified by the Frame Relay Forum.....	19

Introduction

Identifying protocols by information in a uniform part of the protocol control information fulfils two requirements:

- a) It enables an entity to verify that the protocol received is of the type and kind expected; and
- b) It permits an entity to discriminate among a number of different protocols (both OSI and non-OSI) that might co-exist in a common environment.

This Recommendation | Technical Report contains a description of the means used to identify protocols and where that information is located in a protocol, together with a record of those values of protocol identifiers which have been used by ITU-T and ISO/IEC, and by other authorities. This Recommendation | Technical Report does not attempt to provide any general architectural principles for the functions of protocol identification, nor does it attempt to provide judgements as to whether a protocol might have more than one value of protocol identifier.

By reference to this Recommendation | Technical Report, future protocols can be developed to include a protocol identifier and the values of such protocol identifiers can be chosen on a knowledgeable basis.

TECHNICAL REPORT

ITU-T RECOMMENDATION

INFORMATION TECHNOLOGY – PROTOCOL IDENTIFICATION IN THE NETWORK LAYER

1 Scope

This Recommendation | Technical Report provides:

- a) the description of a means to permit a protocol to be identified;
- b) a record of the structure and allowable ranges of protocol identifier(s) which can be assigned by ITU-T, ISO/IEC and other authorities;
- c) a record of the values of protocol identifiers used by OSI Network layer protocols and non-OSI protocols occupying a similar position: in particular, protocols with protocol control information commencing in octet 1 of the protocol data unit (header-oriented protocols), and protocols with protocol control information commencing in the final octet of the protocol data unit (trailer-oriented protocols), are covered; and
- d) a record of the values that are in use as protocol control information in non-Network layer protocols where they impact on Network layer protocol identification.

The application of this Recommendation | Technical Report is:

- a) in the identification of internationally standardized Network layer protocols operating directly above the Data Link service;
- b) in the identification of protocols used in conjunction with internationally standardized Network layer protocols that operate directly above the Data Link service; and
- c) to distinguish between Internationally standardized Network layer protocols, and other internationally standardized protocols used in conjunction with internationally standardized Network layer protocols.

This Recommendation | Technical Report is for use by ITU-T Study Groups, ISO/IEC Technical Committees and other authorities in applying the principles contained in clause 4, and in selecting an unused value or values from the range of values permitted in clauses 5 or 6, as appropriate. When a new value is selected, that value and its usage should be brought to the attention of ITU-T Study Group 7 or ISO/IEC JTC 1 SC6 so that this Recommendation | Technical Report can be amended.

2 References

The following Recommendations and International Standards contain provisions which, through reference in this text, constitute provisions of this Recommendation | Technical Report. 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 | Technical Report 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 | 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.224 (1995) | ISO/IEC 8073:1997, *Information technology – Open Systems Interconnection – Protocol for providing the connection-mode transport service.*
- 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.260 (1996) | ISO/IEC 14765:1997, *Information technology – Framework for protocol identification and encapsulation.*
- ITU-T Recommendation X.273 (1994) | ISO/IEC 11577:1995, *Information technology – Open Systems Interconnection – Network layer security protocol.*
- ITU-T Recommendation X.633 (1996) | ISO/IEC 14700:1997, *Information technology – Open Systems Interconnection – Network Fast Byte Protocol.*
- ITU-T Recommendation X.634 (1996) | ISO/IEC 14699:1997, *Information technology – Open Systems Interconnection – Transport Fast Byte Protocol.*

2.2 Paired Recommendations | International Standards equivalent in technical content

- 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.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.*

2.3 Additional references

- CCITT Recommendation G.764 (1990), *Voice packetization – Packetized voice protocols.*
- ITU-T Recommendation I.365.2 (1995), *B-ISDN ATM adaptation layer sublayers: Service specific coordination function to provide the connection-oriented network service.*
- ITU-T Recommendation I.365.3 (1995), *B-ISDN ATM adaptation layer sublayers: Service specific coordination function to provide the connection-oriented transport service.*
- ITU-T Recommendation Q.931 (1993), *ISDN user-network interface layer 3 specification for basic call control.*
- ITU-T Recommendation Q.932 (1993), *Generic procedures for the control of ISDN supplementary services.*
- ITU-T Recommendation Q.933 (1995), *Signalling specifications for frame mode switched and permanent virtual connection control and status monitoring.*
- ITU-T Recommendation Q.2119 (1996), *B-ISDN ATM adaptation layer – Convergence function for SSCOP above the frame relay core service.*