This is a preview - click here to buy the full publication

INTERNATIONAL STANDARD

ISO/IEC 8348

Third edition
2002-11-01

Information technology — Open Systems Interconnection — Network service definition

Technologies de l'information — Interconnexion des systèmes ouverts — Définition du service de réseau

Reference number
ISO/IEC 8348:2002(E)

© ISO/IEC 2002

This is a preview - click here to buy the full publication

PDF disclaimer

This PDF file may contain embedded typefaces. In accordance with Adobe's licensing policy, this file may be printed or viewed but shall not be edited unless the typefaces which are embedded are licensed to and installed on the computer performing the editing. In downloading this file, parties accept therein the responsibility of not infringing Adobe's licensing policy. The ISO Central Secretariat accepts no liability in this area.

Adobe is a trademark of Adobe Systems Incorporated.

Details of the software products used to create this PDF file can be found in the General Info relative to the file; the PDF-creation parameters were optimized for printing. Every care has been taken to ensure that the file is suitable for use by ISO member bodies. In the unlikely event that a problem relating to it is found, please inform the Central Secretariat at the address given below.

© ISO/IEC 2002

All rights reserved. Unless otherwise specified, 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 either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
Case postale 56 • CH-1211 Geneva 20
Tel. + 41 22 749 01 11
Fax + 41 22 749 09 47
E-mail copyright@iso.org
Web www.iso.org

Published in Switzerland

© ISO/IEC 2002 – All rights reserved

This is a preview - click here to buy the full publication

CONTENTS

Page

SECTION 1 – GENERAL 1

1 Scope 1

2 Normative references 1

2.1 Identical Recommendations | International Standards 1

2.2 Additional references 2

3 Definitions 2

3.1 Basic reference model definitions 2

3.2 Service conventions definitions 3

3.3 Network Service definitions 3

3.4 Network addressing definitions 3

3.5 Network layer architecture definitions 4

4 Abbreviations 4

5 Conventions 5

5.1 General conventions 5

5.2 Parameters 5

5.3 NC end-point identification convention 5

6 Overview and general characteristics 5

7 Types and classes of Network Service 6

SECTION 2 – DEFINITION OF THE CONNECTION-MODE SERVICE 6

8 Features of the connection-mode Network Service 6

9 Model of the connection-mode Network Service 7

9.1 Model of the connection-mode Network Layer Service 7

9.2 Model of a Network Connection 7

10 Quality of the connection-mode Network Service 11

10.1 Determination of QOS 11

10.2 Definition of QOS-parameters 12

11 Sequence of primitives 15

11.1 Relation of primitives at the two NC end-points 15

11.2 Sequence of primitives at one NC end-point 15

12 Connection establishment phase 18

12.1 Function 18

12.2 Types of primitives and parameters 18

12.3 Sequence of primitives 26

13 Connection release phase 26

13.1 Function 26

13.2 Types of primitive and parameters 27

13.3 Sequence of primitives when releasing an established NC 28

13.4 Sequence of primitives in an NS user rejection of an NC establishment attempt 29

13.5 Sequence of primitives in an NS provider rejection of an NC establishment attempt 29

14 Data transfer phase 30

14.1 Data transfer 30

14.2 Receipt confirmation service 31

14.3 Expedited data transfer service 32

14.4 Reset service 33

SECTION 3 – DEFINITION OF THE CONNECTIONLESS-MODE SERVICE 36

15 Features of the connectionless-mode Network Service 36

16 Model of the connectionless-mode Network Service 36

16.1 Model of the connectionless-mode Network Layer Service 36

16.2 Model of a network connectionless-mode transmission 36

© ISO/IEC 2002 – All rights reserved

This is a preview - click here to buy the full publication

Page

17 Quality of the connectionless-mode Network Service 38
17.1 Determination of QOS 38
17.2 Definition of network connectionless-mode QOS-parameters 38
17.3 Route selection considerations 39
18 Sequence of primitives 40
19 Data transfer 40
19.1 Function 40
19.2 Types of primitives and parameters 41
19.3 Sequence of primitives 41
Annex A – Network Layer Addressing 43
A.1 General 43
A.2 Scope 43
A.3 Concepts and terminology 43
A.4 Principles for creating the OSI Network addressing scheme 46
A.5 Network address definition 47
A.6 Character based DSP allocation 54
A.7 Reference publication formats 55
A.8 Network entity titles 55
Annex B – Rationales for the material in Annex A 56
B.1 IDI formats (see A.5.2.1.2) 56
B.2 Reservation of AFI values 00-F and FF (see Table A.1) 57
B.3 Derivation of the preferred encodings (see A.5.3) 57
Annex C – Facilities for conveying service characteristics in the connectionless-mode Network Service 58
C.1 Introduction 58
C.2 Function 58
C.3 Types of primitives and parameters 58
C.4 Service characteristics 59
C.5 Types of primitives and parameters 59

© ISO/IEC 2002 – All rights reserved

This is a preview - click here to buy the full publication

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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 3.

The main task of the joint technical committee is to prepare International Standards. 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.

Attention is drawn to the possibility that some of the elements of this International Standard may be the subject of patent rights. ISO and IEC shall not be held responsible for identifying any or all such patent rights.

ISO/IEC 8348 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 Rec. X.213.

This third edition cancels and replaces the second edition (ISO/IEC 8348:1996), which has been technically revised. It also incorporates Amendment 1:1998 and Amendment 2:2002.

Annex A forms a normative part of this International Standard. Annexes B and C are for information only.

© ISO/IEC 2002 – All rights reserved

This is a preview - click here to buy the full publication

Introduction

This Recommendation | International Standard is one of a set of Recommendations and International Standards produced to facilitate the interconnection of computer systems. It is related to other Recommendations and International Standards in the set as defined by the Reference Model of Open Systems Interconnection (OSI). The OSI Reference Model (ITU-T Rec. X.200 | ISO/IEC 7498-1) subdivides the area of standardization for interconnection into a series of layers of specification, each of a manageable size.

This Recommendation | International Standard defines the Service provided by the Network Layer to the Transport Layer at the boundary between the Network and Transport Layers of the Reference Model. It provides for the designers of Transport protocols a definition of the Network Service existing to support the Transport protocol and for the designers of Network protocols a definition of the services to be made available through the action of the Network protocol over the underlying service. This relationship is illustrated in Figure 0.

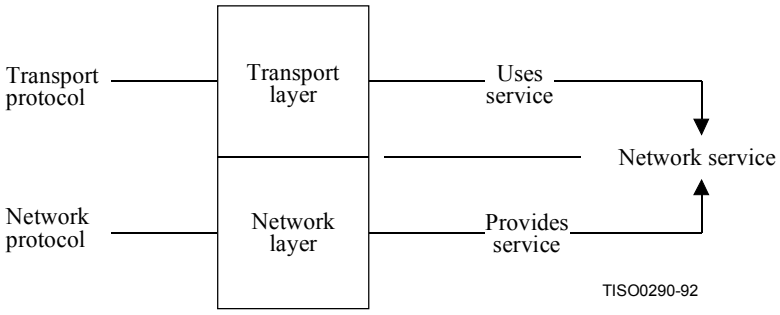

Figure 0 – Relationship of the Network Service to OSI Network and Transport protocols

The use of the word "Network" to name the "Network" Layer of the OSI Reference Model should be distinguished from the use of the word "network" to denote a communications network as conventionally understood. To facilitate this distinction, the term "subnetwork" is used for a collection of physical equipment, commonly called a "network" (see Rec. X.200 | ISO/IEC 7498-1). Subnetworks may be either public networks or privately supplied networks. In the case of public networks, their properties may be determined by separate Recommendations such as CCITT Rec. X.21 for a circuit-switched network or ITU-T Rec. X.25 for a packet-switched network.

Throughout the set of OSI Recommendations and International Standards the term "Service" refers to the abstract capability provided by one layer of the OSI Reference Model to the layer above it. Thus, the Network Service defined in this Recommendation | International Standard is a conceptual architectural Service, independent of administrative divisions.

NOTE – It is important to distinguish the specialized use of the term "Service" within the set of OSI Recommendations and International Standards from its use elsewhere to describe the provision of a service by an organization (such as the provision of a service, as defined in other Recommendations, by an Administration).

Any particular subnetwork may or may not support the OSI Network Service. The OSI Network Service may be provided by a combination of one or more subnetworks and optional additional functions between or outside these subnetworks.

© ISO/IEC 2002 – All rights reserved

This is a preview - click here to buy the full publication

INTERNATIONAL STANDARD
ITU-T RECOMMENDATION

Information technology – Open Systems Interconnection – Network service definition

SECTION 1 – GENERAL

1 Scope

This Recommendation | International Standard defines the OSI Network Service in terms of:

a) the primitive actions and events of the Service;

b) the parameters associated with each primitive action and event, and the form which they take;

c) the interrelationship between, and the valid sequences of, these actions and events.

The principal objectives of this Recommendation | International Standard are:

1) To specify the characteristics of a conceptual Network Service and thus, supplement the Reference Model in guiding the development of Network Layer protocols.

2) To encourage convergence of the capabilities offered by providers of subnetworks.

3) To provide a basis for the individual enhancement of existing heterogeneous subnetworks to a common subnetwork-independent Network Service to enable them to be concatenated for the purpose of providing global communication. (Such concatenation may involve optional additional functions which are not defined in this Recommendation | International Standard.) A definition of the quality of service is an important element of this Recommendation | International Standard.

4) To provide a basis for the development and implementation of subnetwork-independent Transport Layer protocols decoupled from the variability of underlying public and private subnetworks and their specific interface requirements.

This Recommendation | International Standard does not specify individual implementations or products nor does it constrain the implementation of entities and interfaces within a system.

There is no conformance of equipment to this Recommendation | International Standard. Instead, conformance is achieved through implementation of conforming OSI Network protocols which fulfil the Network Service defined in this Recommendation | International Standard.

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 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 the 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.224 (1995) | ISO/IEC 8073:1997, *Information technology – Open Systems Interconnection – Protocol for providing the connection-mode transport service.*

This is a preview - click here to buy the full publication

2.2 Additional references

- CCITT Recommendation E.163 (1988), *Numbering plan for the international telephone service*.
- ITU-T Recommendation E.164 (1997), *The international public telecommunication numbering plan.*
- ITU-T Recommendation E.191 (2000), *B-ISDN addressing.*
- ITU-T Recommendation E.191.1 (2001), *Criteria and procedures for the allocation of ITU-T International Network Designator Addresses.*
- ITU-T Recommendation F.69 (1994), *The international telex service – Service and operational provisions of telex destination codes and telex network identification codes*.
- CCITT Recommendation T.50 (1992), *International Reference Alphabet (IRA) (Formerly International Alphabet No. 5 or IA5) – Information technology – 7-bit coded character set for information interchange.*
- ITU-T Recommendation X.121 (2000), *International numbering plan for public data networks*.
- ITU-T Recommendation X.300 (1996), *General principles for interworking between public networks and between public networks and other networks for the provision of data transmission services*.
- ISO/IEC 646:1991, *Information technology – ISO 7-bit coded character set for information interchange*.
- ISO 2375:1985, *Data processing – Procedure for registration of escape sequences*.
- ISO 3166-1:1997, *Codes for the representation of names of countries and their subdivisions – Part 1: Country codes*.
- ISO/IEC 6523-1:1998, *Information technology – Structure for the identification of organizations and organization parts – Part 1: Identification of organization identification schemes.*
- ISO 8648:1988, *Information processing systems – Open Systems Interconnection – Internal organization of the Network Layer*.
- Internet Standard 2, Assigned Numbers.
- IETF RFC 1888 (1996), **OSI NSAPs and IPv6**.