INTERNATIONAL STANDARD

ISO/IEC 10021-2

Third edition
2003-12-15

Information technology — Message Handling Systems (MHS): Overall Architecture

Technologies de l'information — Systèmes de messagerie (MHS): Architecture globale

iTeh STANDARD PREVIEW
(standards.iteh.ai)

ISO/IEC 10021-2:2003
https://standards.iteh.ai/catalog/standards/sist/4085ade1-014a-4221-a756-42ab586a77b4/iso-iec-10021-2-2003

Reference number
ISO/IEC 10021-2:2003(E)

© ISO/IEC 2003

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.

iTeh STANDARD PREVIEW
(standards.iteh.ai)

ISO/IEC 10021-2:2003
https://standards.iteh.ai/catalog/standards/sist/4085ade1-014a-4221-a756-42ab586a77b4/iso-iec-10021-2-2003

© ISO/IEC 2003

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 2003 – All rights reserved

CONTENTS

Page

SECTION 1 – INTRODUCTION 1

1 Scope 1

2 Normative references 3
- 2.1 Open Systems Interconnection 3
- 2.2 Directory Systems 4
- 2.3 Message Handling Systems 4
- 2.4 Country Codes 5
- 2.5 Network Addresses 5
- 2.6 Language Code 5
- 2.7 Character Sets 5

3 Definitions 5
- 3.1 Open Systems Interconnection 5
- 3.2 Directory Systems 6
- 3.3 Message Handling Systems 7

4 Abbreviations 7

5 Conventions 7
- 5.1 ASN.1 7
- 5.2 Grade 7
- 5.3 Terms 7

SECTION 2 – ABSTRACT MODELS 8

6 Overview 8

7 Functional Model 8
- 7.1 Primary Functional Objects 8
  - 7.1.1 The Message Handling System 9
  - 7.1.2 Users 9
  - 7.1.3 Distribution Lists 9
- 7.2 Secondary Functional Objects 9
  - 7.2.1 The Message Transfer System 10
  - 7.2.2 User Agents 10
  - 7.2.3 Message Stores 10
  - 7.2.4 Access Units 10
- 7.3 Tertiary Functional Objects 11
  - 7.3.1 Message Transfer Agents 11
- 7.4 Selected AU Types 11
  - 7.4.1 Physical Delivery 11
  - 7.4.2 Telematic 11
  - 7.4.3 Telex 12

8 Information Model 12
- 8.1 Messages 12
- 8.2 Probes 13
- 8.3 Reports 13

9 Operational Model 13
- 9.1 Transmittal 13
- 9.2 Transmittal Roles 14
- 9.3 Transmittal Steps 15
  - 9.3.1 Origination 15
  - 9.3.2 Submission 16
  - 9.3.3 Import 16
  - 9.3.4 Transfer 16
  - 9.3.5 Export 16
  - 9.3.6 Delivery 16
  - 9.3.7 Retrieval 16
  - 9.3.8 Receipt 17

iTeh STANDARD PREVIEW
(standards.iteh.ai)
ISO/IEC 10021-2:2003
https://standards.iteh.ai/catalog/standards/sist/4085ade1-014a-4221-a756-d3ab586a77b4/iso-iec-10021-2-2003

© ISO/IEC 2003 – All rights reserved

Page

9.4 Transmittal Events ... 17
9.4.1 Splitting ... 17
9.4.2 Joining ... 17
9.4.3 Name Resolution ... 18
9.4.4 DL Expansion ... 18
9.4.5 Redirection ... 18
9.4.6 Conversion ... 18
9.4.7 Non-delivery ... 18
9.4.8 Non-affirmation ... 18
9.4.9 Affirmation ... 18
9.4.10 Routing ... 19

10 Security Model ... 19
10.1 Security Policies ... 19
10.2 Security Services ... 19
10.2.1 Origin Authentication Security Services ... 20
10.2.2 Secure Access Management Security Service ... 21
10.2.3 Data Confidentiality Security Services ... 21
10.2.4 Data Integrity Security Services ... 22
10.2.5 Non-Repudiation Security Services ... 23
10.2.6 Message Security Labelling Security Service ... 23
10.2.7 Security Management Services ... 23
10.3 Security Elements ... 24
10.3.1 Authentication Security Elements ... 24
10.3.2 Secure Access Management Security Elements ... 25
10.3.3 Data Confidentiality Security Elements ... 26
10.3.4 Data Integrity Security Elements ... 26
10.3.5 Non-repudiation Security Elements ... 27
10.3.6 Security Label Security Elements ... 27
10.3.7 Security Management Security Elements ... 27
10.3.8 Double Enveloping Technique ... 27
10.3.9 Encoding for Encryption and Hashing ... 27

SECTION 3 – CONFIGURATIONS ... 27

11 Overview ... 27

12 Functional Configurations ... 28
12.1 Regarding the Directory ... 28
12.2 Regarding the Message Store ... 28

13 Physical Configurations ... 28
13.1 Messaging Systems ... 29
13.1.1 Access Systems ... 30
13.1.2 Storage Systems ... 30
13.1.3 Access and Storage Systems ... 30
13.1.4 Transfer Systems ... 30
13.1.5 Access and Transfer Systems ... 30
13.1.6 Storage and Transfer Systems ... 30
13.1.7 Access, Storage, and Transfer Systems ... 30
13.2 Representative Configurations ... 30
13.2.1 Fully Centralized ... 30
13.2.2 Centralized Message Transfer and Storage ... 31
13.2.3 Centralized Message Transfer ... 31
13.2.4 Fully Distributed ... 31

14 Organizational Configurations ... 31
14.1 Management Domains ... 31
14.1.1 Administration Management Domains ... 32
14.1.2 Private Management Domains ... 32
14.2 Representative Configurations ... 32
14.2.1 Fully Centralized ... 32
14.2.2 Directly Connected ... 32
14.2.3 Indirectly Connected ... 32

iTeh STANDARD PREVIEW
(standards.iteh.ai)
ISO/IEC 10021-2:2003
https://standards.iteh.ai/catalog/standards/sist/4085ade1-014a-4221-a756-42ab586a77b4/iso-iec-10021-2-2003

© ISO/IEC 2003 – All rights reserved

Page

15 The Global MHS ... 32
SECTION 4 – NAMING, ADDRESSING, AND ROUTING ... 33
16 Overview ... 33
17 Naming ... 34
17.1 Directory Names ... 34
17.2 OR-Names ... 34
18 Addressing ... 34
18.1 Attribute Lists ... 35
18.2 Character Sets ... 35
18.3 Standard Attributes ... 36
18.3.1 Administration-domain-name ... 37
18.3.2 Common-name ... 37
18.3.3 Country-name ... 37
18.3.4 Extension-postal-OR-address-components ... 38
18.3.5 Extension-physical-delivery-address-components ... 38
18.3.6 Local-postal-attributes ... 38
18.3.7 Network-address ... 38
18.3.8 Numeric-user-identifier ... 38
18.3.9 Organization-name ... 38
18.3.10 Organizational-unit-names ... 39
18.3.11 Pds-name ... 39
18.3.12 Personal-name ... 39
18.3.13 Physical-delivery-country-name ... 39
18.3.14 Physical-delivery-office-name ... 39
18.3.15 Physical-delivery-office-number ... 39
18.3.16 Physical-delivery-organization-name ... 39
18.3.17 Physical-delivery-personal-name ... 39
18.3.18 Post-office-box-address ... 40
18.3.19 Postal-code ... 40
18.3.20 Poste-restante-address ... 40
18.3.21 Private-domain-name ... 40
18.3.22 Street-address ... 40
18.3.23 Terminal-identifier ... 40
18.3.24 Terminal-type ... 40
18.3.25 Unformatted-postal-address ... 40
18.3.26 Unique-postal-name ... 41
18.4 Attribute List Equivalence ... 41
18.5 OR-Address Forms ... 41
18.5.1 Mnemonic OR-Address ... 42
18.5.2 Numeric OR-Address ... 42
18.5.3 Postal OR-Address ... 43
18.5.4 Terminal OR-Address ... 43
18.5.5 Determination of Address Forms ... 44
18.6 Conditional Attributes ... 44
19 Routing ... 44
SECTION 5 – USE OF THE DIRECTORY ... 45
20 Overview ... 45
21 Authentication ... 45
22 Name Resolution ... 46
23 DL Expansion ... 46
24 Capability Assessment ... 46
SECTION 6 – OSI REALIZATION ... 47
25 Overview ... 47

iTeh STANDARD PREVIEW
(standards.iteh.ai)
ISO/IEC 10021-2:2003
https://standards.iteh.ai/catalog/standards/sist/4085ade1-014a-4221-a756-42a0506a77b4/iso-iec-10021-2-2003

© ISO/IEC 2003 – All rights reserved

Page

26 Application Service Elements 47
26.1 The ASE Concept 47
26.2 Symmetric and Asymmetric ASEs 48
26.3 Message Handling ASEs 49
26.3.1 Message Transfer 49
26.3.2 Message Submission 49
26.3.3 Message Delivery 49
26.3.4 Message Retrieval 49
26.3.5 Message Administration 50
26.4 Supporting ASEs 50
26.4.1 Remote Operations 50
26.4.2 Reliable Transfer 50
26.4.3 Association Control 50
27 Application Contexts 50
SECTION 7 – ABSTRACT SERVICE DEFINITION CONVENTIONS 51
28 Overview 51
29 Components of the Abstract Model 51
29.1 Abstract Objects 51
29.2 Abstract Contracts 51
29.3 Connection Packages 52
29.4 Abstract Ports 52
29.5 Abstract Operations and Abstract Errors 52
30 ROS Realization 52
Annex A – Directory Object Classes and Attributes 54
A.1 Object Classes 54
A.1.1 MHS Distribution List 54
A.1.2 MHS Message Store 54
A.1.3 MHS Message Transfer Agent 54
A.1.4 MHS User 55
A.1.5 MHS User Agent 55
A.2 Attributes 55
A.2.1 MHS Acceptable EITs 55
A.2.2 MHS Deliverable Classes 56
A.2.3 MHS Deliverable Content Types 56
A.2.4 MHS DL Archive Service 56
A.2.5 MHS DL Members 56
A.2.6 MHS DL Policy 56
A.2.7 MHS DL Related Lists 57
A.2.8 MHS DL Submit Permissions 57
A.2.9 MHS DL Subscription Service 57
A.2.10 MHS Exclusively Acceptable EITs 57
A.2.11 MHS Maximum Content Length 57
A.2.12 MHS Message Store Directory Name 57
A.2.13 MHS OR-Addresses 58
A.2.14 MHS OR-Addresses with Capabilities 58
A.2.15 MHS Supported Attributes 58
A.2.16 MHS Supported Automatic Actions 58
A.2.17 MHS Supported Content Types 58
A.2.18 MHS Supported Matching Rules 59
A.2.19 MHS Unacceptable EITs 59
A.3 Attribute Syntaxes 59
A.3.1 DL Submit Permission 59
A.3.2 DL Policy 60
A.3.3 OR-Address 62
A.3.4 OR-Address with Capabilities 62
A.3.5 OR-Name 63

iTeh STANDARD PREVIEW
(standards.iteh.ai)
ISO/IEC 10021-2:2003
https://standards.iteh.ai/catalog/standards/sist/4085ade1-014a-4221-a756-42ab586a77b4/iso-iec-10021-2-2003

© ISO/IEC 2003 – All rights reserved

Page

A.4 Contexts 63
A.4.1 DL Administrator Annotation 63
A.4.2 DL Nested DL 64
A.4.3 DL Reset Originator 64
A.5 Certificate Subject Alternative Names 64
A.5.1 MTA Name 64

Annex B – Reference Definition of Object Identifiers 65

Annex C – Reference Definition of Directory Object Classes and Attributes 67

Annex D – Security Threats 74
D.1 Masquerade 74
D.2 Message Sequencing 74
D.3 Modification of Information 75
D.4 Denial of Service 75
D.5 Repudiation 76
D.6 Leakage of Information 76
D.7 Other Threats 76

Annex E – Provision of Security Services in ITU-T Rec. X.411 | ISO/IEC 10021-4 77

Annex F – Representation of OR-Addresses for Human Usage 78
F.1 Purpose 78
F.2 Scope 78
F.3 Format 78
F.3.1 General 78
F.3.2 Labelled format 79
F.3.3 Self-explanatory format 81
F.4 User Interface 81

Annex G – Use of OR-Addresses by Multinational Organizations 83
G.1 Addressing principles 83
G.2 Example configurations 84
G.2.1 Multiple Independent PRMDs 84
G.2.2 A single PRMD, named from a "home" country 84
G.2.3 A single PRMD with multiple country and domain names 85
G.3 Alias OR-addresses 86

Annex H – Use of Protected Passwords for Message Store Access 87

Annex I – Differences Between ISO/IEC 10021-2 and ITU-T Rec. X.402 90

Annex J – Summary of Changes to Previous Editions 91
J.1 Differences between ISO/IEC 10021-2:1990 and CCITT Rec. X.402 (1992) 91
J.2 Differences between CCITT Rec. X.402 (1992) and ITU-T Rec. X.402 (1995) | ISO/IEC 10021-2:1996 91
J.3 Differences between ITU-T Rec. X.402 (1995) | ISO/IEC 10021-2:1996 and ITU-T Rec. X.402 (1999) | ISO/IEC 10021-2:1999 91

Annex K – Index 92

iTeh STANDARD PREVIEW
(standards.iteh.ai)
ISO/IEC 10021-2:2003
https://standards.iteh.ai/catalog/standards/sist/4085ade1-014a-4221-a756-42ab586a77b4/iso-iec-10021-2-2003

© ISO/IEC 2003 – All rights reserved

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 2.

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 document 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 10021-2 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.402.

This third edition cancels and replaces the second edition (ISO/IEC 10021-2:1996), which has been technically revised. It also incorporates Technical Corrigendum 1:1998.

ISO/IEC 10021 consists of the following parts, under the general title *Information technology — Message Handling Systems (MHS)*:

iTeh STANDARD PREVIEW
(standards.iteh.ai)

— *Part 1: System and Service Overview*

ISO/IEC 10021-2:2003
https://standards.iteh.ai/catalog/standards/sist/4085ade1-014a-4221-a756-42ab586a77b4/iso-iec-10021-2-2003

— *Part 2: Overall Architecture*

— *Part 4: Message transfer system: Abstract service definition and procedures*

— *Part 5: Message store: Abstract service definition*

— *Part 6: Protocol Specifications*

— *Part 7: Interpersonal messaging system*

— *Part 8: Electronic Data Interchange Messaging Service*

— *Part 9: Electronic Data Interchange Messaging System*

— *Part 10: MHS routing*

— *Part 11: MHS Routing — Guide for messaging systems managers* [Technical Report]

© ISO/IEC 2003 – All rights reserved

Introduction

This Specification is one of a set of Recommendations | International Standards for Message Handling. The entire set provides a comprehensive blueprint for a Message Handling System (MHS) realized by any number of cooperating open systems.

The purpose of an MHS is to enable users to exchange messages on a store-and-forward basis. A message submitted on behalf of one user, the originator, is conveyed by the Message Transfer System (MTS) and subsequently delivered to the agents of one or more additional users, the recipients. Access units (AUs) link the MTS to communication systems of other kinds (e.g., postal systems). A user is assisted in the preparation, storage, and display of messages by a user agent (UA). Optionally, he is assisted in the storage of messages by a message store (MS). The MTS comprises a number of message transfer agents (MTAs) which collectively perform the store-and-forward message transfer function.

This Specification specifies the overall architecture of the MHS and serves as a technical introduction to it.

This Specification was developed jointly by ITU-T and ISO/IEC. It is published as common text as ITU-T Rec. X.402 | ISO/IEC 10021-2.

iTeh STANDARD PREVIEW
(standards.iteh.ai)
ISO/IEC 10021-2:2003
https://standards.iteh.ai/catalog/standards/sist/4085ade1-014a-4221-a756-42ab586a77b4/iso-iec-10021-2-2003

© ISO/IEC 2003 – All rights reserved

iTeh STANDARD PREVIEW
(standards.iteh.ai)

ISO/IEC 10021-2:2003
https://standards.iteh.ai/catalog/standards/sist/4085ade1-014a-4221-a756-42ab586a77b4/iso-iec-10021-2-2003

INTERNATIONAL STANDARD
ITU-T RECOMMENDATION

Information technology – Message Handling Systems (MHS) – Overall Architecture

SECTION 1 – INTRODUCTION

1 Scope

This Recommendation | International Standard defines the overall architecture of the MHS and serves as a technical introduction to it.

Other aspects of Message Handling are specified in other Recommendations | parts of ISO/IEC 10021. A non-technical overview of Message Handling is provided by ITU-T Rec. X.400 | ISO/IEC 10021-1. The conformance testing of MHS components is described in Rec. X.403. The detailed rules by which the MTS converts the contents of messages from one EIT to another are defined in Rec. X.408. The abstract service the MTS provides and the procedures that govern its distributed operation are defined in ITU-T Rec. X.411 | ISO/IEC 10021-4. The abstract service the MS provides is defined in ITU-T Rec. X.413 | ISO/IEC 10021-5. The application protocols that govern the interactions of MHS components are specified in ITU-T Rec. X.419 | ISO/IEC 10021-6. The Interpersonal Messaging System, an application of Message Handling, is defined in ITU-T Rec. X.420 | ISO/IEC 10021-7. Telematic access to the Interpersonal Messaging System is specified in Rec. T.330. The EDI Messaging Service is described in CCITT Rec. F.435 | ISO/IEC 10021-8, and the EDI Messaging System, another application of Message Handling, is defined in CCITT Rec. X.435 | ISO/IEC 10021-9. The means by which messages may be routed through the MHS is specified in ISO/IEC 10021-10. Management information for MHS components is defined in the X.460-series Recommendations | ISO/IEC 11588.

iTeh STANDARD PREVIEW
(standards.iteh.ai)
ISO/IEC 10021-2:2003
https://standards.iteh.ai/catalog/standards/sist/4085ade1-014a-4221-a756-42ab586a77b4/iso-iec-10021-2-2003

The ISO/IEC International Standards and ITU-T Recommendations on Message Handling are summarized in Table 1.

Table 1 – Specifications for Message Handling Systems

ISO/IEC	ITU-T	SUBJECT MATTER
Introduction		
10021-1	X.400	Service and system overview
10021-2	X.402	Overall architecture
Various Aspects		
–	X.408	Encoded information type conversion rules
Abstract Services		
10021-4	X.411	MTS Abstract Service definition and procedures for distributed operation
10021-5	X.413	MS Abstract Service definition
Protocols		
10021-6	X.419	Protocol specifications
Interpersonal Messaging System		
10021-7	X.420	Interpersonal Messaging System
–	T.330	Telematic access to IPMS
Electronic Data Interchange Messaging System		
10021-8	F.435	EDI Messaging Service
10021-9	X.435	EDI Messaging System
Routing		
10021-10	X.412	MHS Routing
10021-11	X.404	MHS Routing: Guide for system managers
MHS Management		
11588-1	X.460	Management: Model and Architecture
11588-3	X.462	Logging Information
11588-8	X.467	Message Transfer Agent Management

The Directory, the principal means for disseminating communication-related information among MHS components, is defined in the X.500-series Recommendations | ISO/IEC 9594, as summarized in Table 2.

Table 2 – Specifications for Directories

ISO/IEC	ITU-T	SUBJECT MATTER
9594-1	X.500	Overview
9594-2	X.501	Models
9594-3	X.511	Abstract service definition
9594-4	X.518	Procedures for distributed operation
9594-5	X.519	Protocol specifications
9594-6	X.520	Selected attribute types
9594-7	X.521	Selected object classes
9594-8	X.509	Authentication framework
9594-9	X.525	Replication
9594-10	X.530	System Management for administration

The architectural foundation for Message Handling is provided by other Recommendations | International Standards. The OSI Reference Model is defined in ITU-T Rec. X.200 | ISO 7498. The notation for specifying the data structures of abstract services and application protocols, ASN.1, and the associated encoding rules are defined in ITU-T Rec. X.680 | ISO/IEC 8824-1, ITU-T Rec. X.681 | ISO/IEC 8824-2, ITU-T Rec. X.682 | ISO/IEC 8824-3, ITU-T Rec. X.683 | ISO/IEC 8824-4 and ITU-T Rec. X.690 | ISO/IEC 8825-1. The means for establishing and releasing associations, the ACSE, is defined in ITU-T Rec. X.217 | ISO/IEC 8649 and ITU-T Rec. X.227 | ISO 8650-1. The means for reliably conveying APDUs over associations, the RTSE, is defined in ITU-T Rec. X.218 | ISO/IEC 9066-1 and CCITT Rec. X.228 | ISO/IEC 9066-2. The means for making requests of other open systems, the ROSE, is defined in ITU-T Rec. X.880 | ISO/IEC 13712-1, ITU-T Rec. X.881 | ISO/IEC 13712-2 and ITU-T Rec. X.882 | ISO/IEC 13712-3.

iTeh STANDARD PREVIEW
(standards.iteh.ai)

The ISO/IEC International Standards and ITU-T Recommendations which form the foundation for Message Handling are summarized in Table 3.

ISO/IEC 10021-2:2003
https://standards.iteh.ai/catalog/standards/sist/4085ade1-014a-4221-a756-42ab586a77b4/iso-iec-10021-2-2003

Table 3 – Specifications for MHS Foundations

ISO/IEC	ITU-T	SUBJECT MATTER
Model		
7498-1	X.200	OSI Reference Model
ASN.1		
8824-1	X.680	Abstract syntax notation
8824-2	X.681	ASN.1 Information Objects
8824-3	X.682	ASN.1 Constraint Specification
8824-4	X.683	ASN.1 Parameterization
8825-1	X.690	Basic encoding rules
Association Control		
8649	X.217	Service definition
8650	X.227	Protocol specification
Reliable Transfer		
9066-1	X.218	Service definition
9066-2	X.228	Protocol specification
Remote Operations		
13712-1	X.880	Concepts, Model and Notation
13712-2	X.881	Service definition
13712-3	X.882	Protocol specification

This Recommendation | International Standard is structured as follows. Section one gives a general overview. Section two presents abstract models of Message Handling. Section three specifies how one can configure the MHS to satisfy any of a variety of functional, physical, and organizational requirements. Section four describes the naming and addressing of users and distribution lists and the routing of information objects to them. Section five describes the uses the MHS may make of the Directory. Section six describes how the MHS is realized by means of OSI. The conventions used in the definition of the abstract services provided by MHS components are defined in Section seven. Annexes provide important supplemental information.

No requirements for conformance to this Recommendation | International Standard are imposed.

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 editions of the Recommendations and Standards listed below. Members of ISO and IEC maintain registers of currently valid International Standards. The Telecommunication Standardization Bureau of ITU maintains a list of currently valid ITU-T Recommendations.

2.1 Open Systems Interconnection

This Specification and others in the set cite the following OSI specifications:

- ITU-T Recommendation X.200 (1994) | ISO/IEC 7498-1:1994, *Information technology – Open Systems Interconnection – Basic Reference Model: The basic model.*
- CCITT Recommendation X.800 (1991), *Security architecture for Open Systems Interconnection for CCITT applications.*

  ISO 7498-2:1989, *Information processing systems – Open Systems Interconnection – Basic Reference Model – Part 2: Security Architecture.*
- ITU-T Recommendation X.216 (1994) | ISO/IEC 8822:1994, *Information technology – Open Systems Interconnection – Connection-oriented presentation service definition.*
- ITU-T Recommendation X.217 (1995) | ISO/IEC 8649:1996, *Information technology – Open Systems Interconnection – Service Definition for the Association Control Service Element.*
- ITU-T Recommendation X.218 (1993), *Reliable Transfer: Model and service definition.*

  ISO/IEC 9066-1:1989, *Information processing systems – Text communication – Reliable Transfer – Part 1: Model and service definition.*

iTeh STANDARD PREVIEW
(standards.iteh.ai)

- ITU-T Recommendation X.227 (1995), | ISO/IEC 8650-1:1996, *Information technology – Open Systems Interconnection – Connection-oriented protocol for the Association Control Service Element: Protocol specification.*
- CCITT Recommendation X.228 (1988), *Reliable Transfer: Protocol specification.*

  ISO/IEC 9066-2:1989, *Information processing systems – Text communication – Reliable Transfer – Part 2: Protocol specification.*

ISO/IEC 10021-2:2003
https://standards.iteh.ai/catalog/standards/sist/4085ade1-014a-4221-a756-42ab586a77b4/iso-iec-10021-2-2003

- ITU-T Recommendation X.666 (1997) | ISO/IEC 9834-7:1998, *Information technology – Open Systems Interconnection – Procedures for the operation of OSI Registration Authorities: Assignment of international names for use in specific contexts.*
- ITU-T Recommendation X.680 (1997) | ISO/IEC 8824-1:1998, *Information technology – Abstract Syntax Notation One (ASN.1) – Specification of Basic Notation.*
- ITU-T Recommendation X.681 (1997) | ISO/IEC 8824-2:1998, *Information technology – Abstract Syntax Notation One (ASN.1) – Information Object Specification.*
- ITU-T Recommendation X.682 (1997) | ISO/IEC 8824-3:1998, *Information technology – Abstract Syntax Notation One (ASN.1) – Constraint Specification.*
- ITU-T Recommendation X.683 (1997) | ISO/IEC 8824-4:1998, *Information technology – Abstract Syntax Notation One (ASN.1) – Parameterization of ASN.1 Specifications.*
- ITU-T Recommendation X.690 (1997) | ISO/IEC 8825-1:1998, *Information technology – ASN.1 Encoding Rules – Specification of Basic Encoding Rules (BER), Canonical Encoding Rules (CER) and Distinguished Encoding Rules (DER).*
- ITU-T Recommendation X.880 (1994) | ISO/IEC 13712-1:1995, *Information technology – Remote Operations – Concepts, Model and Notation.*
- ITU-T Recommendation X.881 (1994) | ISO/IEC 13712-2:1995, *Information technology – Remote Operations – OSI Realisations: Remote Operations Service Element (ROSE) Service Definition.*
- ITU-T Recommendation X.882 (1994) | ISO/IEC 13712-3:1995, *Information technology – Remote Operations – OSI Realisations: Remote Operations Service Element (ROSE) Protocol Specification.*

2.2 Directory Systems

This Specification and others in the set cite the following Directory System specifications:

- ITU-T Recommendation X.500 (1997) | ISO/IEC 9594-1:1998, *Information technology – Open Systems Interconnection – The Directory – Overview of concepts, models, and services.*
- ITU-T Recommendation X.501 (1997) | ISO/IEC 9594-2:1998, *Information technology – Open Systems Interconnection – The Directory – Models.*
- ITU-T Recommendation X.509 (1997) | ISO/IEC 9594-8:1998, *Information technology – Open Systems Interconnection – The Directory – Authentication framework.*
- ITU-T Recommendation X.511 (1997) | ISO/IEC 9594-3:1998, *Information technology – Open Systems Interconnection – The Directory – Abstract service definition.*
- ITU-T Recommendation X.518 (1997) | ISO/IEC 9594-4:1998, *Information technology – Open Systems Interconnection – The Directory – Procedures for distributed operation.*
- ITU-T Recommendation X.519 (1997) | ISO/IEC 9594-5:1998, *Information technology – Open Systems Interconnection – The Directory – Protocol specifications.*
- ITU-T Recommendation X.520 (1997) | ISO/IEC 9594-6:1998, *Information technology – Open Systems Interconnection – The Directory – Selected attribute types.*
- ITU-T Recommendation X.521 (1997) | ISO/IEC 9594-7:1998, *Information technology – Open Systems Interconnection – The Directory – Selected object classes.*
- ITU-T Recommendation X.525 (1997) | ISO/IEC 9594-9:1998, *Information technology – Open Systems Interconnection – The Directory – Replication.*
- ITU-T Recommendation X.530 (1997) | ISO/IEC 9594-10:1998, *Information Technology – Open Systems Interconnection – The Directory: Use of systems management for administration of the Directory.*

iTeh STANDARD PREVIEW
(standards.iteh.ai)

2.3 Message Handling Systems

This Specification and others in the set cite the following Message Handling System specifications:

ISO/IEC 10021-2:2003
https://standards.iteh.ai/catalog/standards/sist/d0f3e1e1-0b14-4221-a75d-42ab586a77b4/iso-iec-10021-2-2003

- CCITT Recommendation T.330 (1988), *Telematic access to interpersonal messaging system.*
- ITU-T Recommendation F.400/X.400 (1999), *Message handling: System and service overview.*

  ISO/IEC 10021-1:1999, *Information technology – Message Handling Systems (MHS) – Part 1: System and service overview.*
- CCITT Recommendation X.408 (1988), *Message handling systems: Encoded information type conversion rules.*
- ITU-T Recommendation X.411 (1999) | ISO/IEC 10021-4:2003, *Information technology – Message Handling Systems (MHS) – Message transfer system : Abstract service definition and procedures.*
- ITU-T Recommendation X.413 (1999) | ISO/IEC 10021-5:1999, *Information technology – Message Handling Systems (MHS) – Message store: Abstract service definition.*
- ITU-T Recommendation X.419 (1999) | ISO/IEC 10021-6:2003, *Information technology – Message Handling Systems (MHS) – Protocol specifications.*
- ITU-T Recommendation X.420 (1999) | ISO/IEC 10021-7:2003, *Information technology – Message Handling Systems (MHS) – Interpersonal messaging system.*
- ITU-T Recommendation F.435 (1999), *Message handling: Electronic Data Interchange Messaging Service.*

  ISO/IEC 10021-8:1999, *Information technology – Message Handling Systems (MHS) – Part 8: Electronic Data Interchange Messaging Service.*
- ITU-T Recommendation X.435 (1999) | ISO/IEC 10021-9:1999, *Information technology – Message Handling Systems (MHS) – Electronic Data Interchange Messaging System.*
- ITU-T Recommendation X.412 (1999) | ISO/IEC 10021-10:1999, *Information technology – Message Handling Systems (MHS) – MHS Routing.*
- ITU-T Recommendation X.404 (1999) | ISO/IEC TR 10021-11:1999, *Information technology – Message Handling Systems (MHS) – MHS Routing: Guide for Messaging System Managers.*
- ITU-T Recommendation X.460 (1995) | ISO/IEC 11588-1:1996, *Information technology – Message Handling Systems (MHS) Management – Model and Architecture.*

– ITU-T Recommendation X.462 (1996) | ISO/IEC 11588-3:1997, *Information technology – Message Handling Systems (MHS) Management – Logging Information.*

– ITU-T Recommendation X.467 (1996) | ISO/IEC 11588-8:1997, *Information technology – Message Handling Systems (MHS) Management – Message Transfer Agent Management.*

2.4 Country Codes

This Specification cites the following Country Code specifications:

– ISO 3166-1:1997, *Codes for the representation of names of countries and their subdivisions – Part 1: Country codes.*

– ITU-T Recommendation X.121 (1996), *International numbering plan for public data networks.*

2.5 Network Addresses

This Specification cites the following Network Address specification:

– CCITT Recommendation E.164 (1991), *Numbering plan for the ISDN era.*

2.6 Language Code

This Specification cites the following Language Code specification:

– ISO 639:1988, *Code for the representation of names of languages.*

2.7 Character Sets

This Specification cites the following Character Set specifications:

– ISO 10646-1:1993, *Information technology – Universal Multiple-Octet Coded Character Set (UCS) – Part 1: Architecture and Basic Multilingual Plane.*

iTeh STANDARD PREVIEW
(standards.iteh.ai)

3 Definitions

ISO/IEC 10021-2:2003
https://standards.iteh.ai/catalog/standards/sist/4085adc1-014e-4221-a756-42ab586a77b4/iso-iec-10021-2-2003

For the purposes of this Specification and others in the set, the following definitions apply.

3.1 Open Systems Interconnection

This Specification and others in the set make use of the following terms defined in ITU-T Rec. X.200 | ISO/IEC 7498-1, as well as the names of the seven layers of the Reference Model:

a) abstract syntax;

b) application entity (AE);

c) application process;

d) application protocol data unit (APDU);

e) application service element (ASE);

f) distributed information processing task;

g) layer;

h) open system;

i) Open Systems Interconnection (OSI);

j) peer;

k) presentation context;

l) protocol;

m) Reference Model;

n) transfer syntax; and

o) user element (UE).