
**Information technology — Message
Handling Systems (MHS): Message
transfer system — Abstract service
definition and procedures**

*Technologies de l'information — Systèmes de messagerie (MHS):
Système de transfert de messages — Définition et procédures du
service abstrait*

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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.

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 10021-4 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.411.

This third edition cancels and replaces the second edition (ISO/IEC 10021-4:1997), which has been technically revised. It also incorporates the Technical Corrigendum ISO/IEC 10021-4:1997/Cor. 1:1998.

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

- *Part 1: System and service overview*
- *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]*

Introduction

This Service Definition is one of a set of Recommendations | International Standards defining Message Handling in a distributed open systems environment.

Message Handling provides for the exchange of messages between users on a store-and-forward basis. A message submitted by one user (the *originator*) is transferred through the Message Transfer System (MTS) and delivered to one or more other users (the *recipients*).

The MTS comprises a number of message-transfer-agents (MTAs), which transfer messages and deliver them to their intended recipients.

This Service Definition was developed jointly by ITU-T and ISO/IEC. It is published as common text as ITU-T Rec. X.411 | ISO/IEC 10021-4.

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**INTERNATIONAL STANDARD ISO/IEC 10021-4
ITU-T RECOMMENDATION X.411**

**Information Technology – Message Handling Systems (Mhs) – Message Transfer System:
Abstract Service Definition And Procedures**

SECTION ONE – INTRODUCTION

1 Scope

This Recommendation | International Standard defines the abstract-service provided by the MTS (the MTS Abstract Service), and specifies the procedures to be performed by MTAs to ensure the correct distributed operation of the MTS.

ITU-T Rec. X.402 | ISO/IEC 10021-2 identifies the other Recommendations | International Standards which define other aspects of Message Handling Systems.

Access to the MTS Abstract Service defined in this Recommendation | International Standard may be provided by the MTS Access Protocol (P3) defined in ITU-T Rec. X.419 | ISO/IEC 10021-6. The distributed operation of the MTS defined in this Recommendation | International Standard may be provided by the use of the MTS Transfer Protocol (P1) also defined in ITU-T Rec. X.419 | ISO/IEC 10021-6. The means by which messages may be routed through the MTS is specified in ISO/IEC 10021-10.

Section two of this Recommendation | International Standard defines the MTS Abstract Service. Clause 6 describes the Message Transfer System Model. Clause 7 provides an overview of the MTS Abstract Service. Clause 8 defines the semantics of the parameters of the MTS Abstract Service. Clause 9 defines the abstract-syntax of the MTS Abstract Service.

Section three of this Recommendation | International Standard defines the MTA Abstract Service. Clause 10 refines the model of the MTS, first presented in clause 6, to show that the MTS comprises a number of MTAs that interwork with one another to provide the MTS Abstract Service. Clause 11 provides an overview of the MTA Abstract Service. Clause 12 defines the semantics of the parameters of the MTA Abstract Service. Clause 13 defines the abstract-syntax of the MTA Abstract Service.

Section four of this Recommendation | International Standard specifies the procedures performed by MTAs to ensure the correct distributed operation of the MTS.

Annex A provides a reference definition of the MTS object identifiers cited in the ASN.1 modules in the body of this Recommendation | International Standard.

Annex B provides a reference definition of the upper bounds of the size constraints imposed upon variable length data types defined in ASN.1 modules in ITU-T Rec. X.411.

Annex C identifies the technical differences between the ISO/IEC and ITU-T versions of ITU-T Rec. X.411 and ISO/IEC 10021-4.

Annex D provides an index to this Recommendation | International Standard, categorised into: definitions of the MTS parameters; Abbreviations; Terms; ASN.1 modules; ASN.1 information object classes; ASN.1 types; and ASN.1 values.

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 the ITU maintains a list of currently valid ITU-T Recommendations.

2.1 Open Systems Interconnection

This Service Definition cites the following OSI specifications:

- 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.880 (1994) | ISO/IEC 13712-1:1995, *Information technology – Remote Operations – Concepts, Model and Notation.*

2.2 Message Handling Systems

This Service Definition cites the following Message Handling System specifications:

- ITU-T Recommendation F.400/X.400 (1999), *Message handling: System and service overview.*
ISO/IEC 10021-1:2003, *Information technology – Message Handling Systems (MHS) – Part 1: System and service overview.*
- ITU-T Recommendation X.402 (1999) | ISO/IEC 10021-2:2003, *Information technology – Message Handling Systems (MHS) – Overall architecture.*
- ITU-T Recommendation X.412 (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 X.412 (1999) | ISO/IEC 10021-10:1999, *Information technology – Message Handling Systems (MHS) – MHS Routing.*
- CCITT Recommendation X.408 (1988), *Message handling systems: Encoded information type conversion rules.*

2.3 Directory Systems

This Service Definition cites 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*.

2.4 Country Codes

This Service Definition 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 Telematic Services

This Service Definition cites the following Telematic Service specifications:

- CCITT Recommendation F.170 (1992), *Operational provisions for the international public facsimile service between public bureaux (bureaufax)*.
- ITU-T Recommendation T.30 (1993), *Procedures for document facsimile transmission in the general switched telephone network*.

3 Definitions

For the purposes of this Service Definition the definitions given in ITU-T Rec. X.402 | ISO/IEC 10021-2 apply.

4 Abbreviations

For the purposes of this Service Definition the abbreviations given in ITU-T Rec. X.402 | ISO/IEC 10021-2 apply.

5 Conventions

This Service Definition uses the descriptive conventions described below.

5.1 Terms

Throughout this Service Definition the words of defined terms and the names and values of the parameters of the MTS Abstract Service and the MTA Abstract Service, unless they are proper names, begin with a lower-case letter and are linked by a hyphen thus: defined-term. Proper names begin with an upper-case letter and are not linked by a hyphen thus: Proper Name. The names and values of the parameters of the MTS Abstract Service and the MTA Abstract Service (including components of OR address defined in ISO/IEC 10021-2) are printed in **bold**.

5.2 Presence of Parameters

In the tables of parameters in clauses 8 and 12, the presence of each parameter is qualified as follows:

Mandatory (M): A mandatory parameter shall always be present.

Optional (O): An optional argument shall be present at the discretion of the invoker of the abstract-operation; an optional result shall be present at the discretion of the performer of the abstract-operation.

Conditional (C): A conditional parameter shall be present under the circumstances prescribed by this Service Definition.

Where a conditional parameter shall be present due to some action on the message, probe or report by the MTS, this is explicitly defined. The presence of other conditional parameters is dependent on the presence of those parameters in other abstract-operations (for example, the presence of a conditional argument of the Message-transfer abstract-operation is dependent on the presence of the same optional argument in the related Message-submission abstract-operation).

5.3 Abstract Syntax Definitions

This Service Definition defines the abstract-syntax of the MTS Abstract Service and the MTA Abstract Service using the abstract syntax notation (ASN.1) defined in ITU-T Rec. X.680 | ISO/IEC 8824-1, ITU-T Rec. X.681 |