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**Information technology — Message  
Handling Systems (MHS): Message store:  
Abstract service definition**

**iTeh STANDARD PREVIEW**

*Technologies de l'information — Systèmes de messagerie (MHS): Dépôt  
de message: Définition de service abstrait*

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Reference number  
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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. 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 10021-5 was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information technology*, Subcommittee SC 18, *Document processing and related communication*, in collaboration with ITU-T. The identical text is published as ITU-T Recommendation X.413.

This third edition is a revision of the second edition (ISO/IEC 10021-5:1994).

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 3: Abstract Service Definition Conventions*
- *Part 4: Message Transfer System: Abstract Service Definition and Procedures*
- *Part 5: Message Store: Abstract Service Definition*
- *Part 6: Protocol Specification*
- *Part 7: Interpersonal Messaging System*
- *Part 8: Electronic Data Interchange Messaging Service*
- *Part 9: Electronic Data Interchange Messaging System*

Annexes A to F form an integral part of this part of ISO/IEC 10021. Annexes G to J are for information only.

## Introduction

This Recommendation | International Standard is one of a series 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).

This Recommendation | International Standard defines the Message Store abstract-service (MS abstract-service) which supports message-retrieval from a Message Store (MS) and message-submission through the MS in a Message Handling System (MHS). The MS abstract-service also provides message-administration services, as defined by the Message Transfer System (MTS) abstract-service.

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## INTERNATIONAL STANDARD

## ITU-T RECOMMENDATION

**INFORMATION TECHNOLOGY – MESSAGE HANDLING SYSTEMS (MHS):  
MESSAGE STORE: ABSTRACT SERVICE DEFINITION**

## SECTION 1 – GENERAL

**1 Scope**

This Recommendation | International Standard defines the Message Store abstract-service. This abstract-service is provided by the Message Store access protocol (specified in ITU-T Rec. X.419 | ISO/IEC 10021-6) in conjunction with the MTS abstract-service (defined in ITU-T Rec. X.411 | ISO/IEC 10021-4), together with the Remote Operations Service Element (ROSE) services (defined in ITU-T Rec. X.219 | ISO/IEC 9072-1). The abstract-syntax for the application-layer protocols used in this Recommendation | International Standard is defined in ITU-T Rec. X.680 | ISO/IEC 8824-1.

Other Recommendations | parts of ISO/IEC 10021 define other aspects of the MHS. ITU-T Rec. F.400/X.400 | ISO/IEC 10021-1 defines the user-oriented services provided by the MHS. ITU-T Rec. X.402 | ISO/IEC 10021-2 provides an architectural overview of the MHS. ITU-T Rec. X.420 | ISO/IEC 10021-7 defines the abstract-service for Interpersonal Messaging and defines the format of Interpersonal Messages.

Section 2 of this Recommendation | International Standard contains the Message Store abstract-service definition. Clause 6 describes the MS model. Clause 7 defines the semantics and abstract-syntax of the MS-bind and the MS-unbind abstract-operations. Clause 8 defines the semantics and abstract-syntax of the operations of the MS abstract-service. Clause 9 defines the semantics and abstract-syntax of the errors of the abstract-service.

Section 3 of this Recommendation | International Standard defines the general-attribute-types, general-matching-rules, and general-auto-action-types related to the MS. Clause 10 contains an overview. Clause 11 defines the semantics and abstract-syntax of the general-attribute-types. Clause 12 defines the semantics and abstract-syntax of the general-matching-rules. Clause 13 defines the semantics and abstract-syntax of the general-auto-action-types.

Section 4 of this Recommendation | International Standard describes the procedures for Message Store and the ports realization. Clause 14 contains an overview. Clause 15 describes how the Message Transfer System abstract-service is consumed. Clause 16 describes how the Message Store abstract-service is supplied. Clause 17 describes how the MS ports are realized.

The requirements for conformance to this Recommendation | International Standard are stated in clause 10 of ITU-T Rec. X.419 | ISO/IEC 10021-6.

**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 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 Reference Model references

This Recommendation | International Standard cites the following Reference Model specification:

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

## 2.2 Presentation references

This Recommendation | International Standard cites the following Presentation specifications:

- ITU-T Recommendation X.680 (1994) | ISO/IEC 8824-1:1995, *Information technology – Abstract Syntax Notation One (ASN.1): Specification of basic notation.*
- ITU-T Recommendation X.681 (1994) | ISO/IEC 8824-2:1995, *Information technology – Abstract Syntax Notation One (ASN.1): Information object specification.*
- ITU-T Recommendation X.682 (1994) | ISO/IEC 8824-3:1995, *Information technology – Abstract Syntax Notation One (ASN.1): Constraint specification.*
- ITU-T Recommendation X.690 (1994) | ISO/IEC 8825-1:1995, *Information technology – ASN.1 encoding rules: Specification of Basic Encoding Rules (BER), Canonical Encoding Rules (CER) and Distinguished Encoding Rules (DER).*

## 2.3 Remote Operations references

This Recommendation | International Standard cites the following Remote Operations specification:

- ITU-T Recommendation X.880 (1994) | ISO/IEC 13712-1:1995, *Information technology – Remote Operations: Concepts, model and notation.*

## 2.4 Directory references

This Recommendation | International Standard cites the following Directory specifications:

- ITU-T Recommendation X.501 (1993) | ISO/IEC 9594-2:1995, *Information technology – Open Systems Interconnection – The Directory: Models.*
- ITU-T Recommendation X.509 (1993) | ISO/IEC 9594-8:1995, *Information technology – Open Systems Interconnection – The Directory: Authentication framework.*
- ITU-T Recommendation X.520 (1993) | ISO/IEC 9594-6:1995, *Information technology – Open Systems Interconnection – The Directory: Selected attribute types.*

## 2.5 Message Handling references

This Recommendation | International Standard cites the following Message Handling System specifications:

- ITU-T Recommendation F.400/X.400 (1993), *Message handling services: Message handling system and service overview.*  
ISO/IEC 10021-1:1996, *Information technology – Message Handling Systems (MHS) – Part 1: System and service overview.*
- ITU-T Recommendation X.402 (1995) | ISO/IEC 10021-2:1996, *Information technology – Message Handling Systems (MHS): Overall architecture.*
- ITU-T Recommendation X.411 (1995) | ISO/IEC 10021-4:1996, *Information technology – Message Handling Systems (MHS): Message transfer system: Abstract service definition and procedures.*
- ITU-T Recommendation X.419 (1995) | ISO/IEC 10021-6:1996, *Information technology – Message Handling Systems (MHS): Protocol specifications.*
- ITU-T Recommendation X.420<sup>1)</sup> | ISO/IEC 10021-7...<sup>1)</sup>, *Information technology – Message Handling Systems (MHS): Interpersonal messaging system.*

<sup>1)</sup> Presently at the stage of draft.

### 3 Definitions

#### 3.1 Common Definitions for MHS

For a list of the common definitions for MHS refer to ITU-T Rec. X.402 | ISO/IEC 10021-2.

#### 3.2 Message Store Definitions

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

- 3.2.1 abstract-association:** An abstract binding between two communication partners. In this Service Definition, the binding between an MS-user and an MS for the provision of the MS abstract-service, or between an MS and the MTS for the provision of the MTS abstract-service.
- 3.2.2 Administration Port:** A port which supports the administration services (of the MTS) within the MS abstract-service.
- 3.2.3 Alert abstract-operation:** An abstract-operation which enables the MS to inform the MS-user that a message or report has been delivered to the MS. May be issued only over an existing abstract-association.
- 3.2.4 attribute:** The information of a particular type appearing in an entry.
- 3.2.5 attribute-type:** That component of an attribute which indicates the class of information given by that attribute.
- 3.2.6 attribute-value:** A particular instance of the class of information indicated by an attribute type.
- 3.2.7 attribute-value-assertion:** A proposition, which may be *true*, *false*, or *undefined*, concerning the values of an attribute in an entry.
- 3.2.8 auto-action:** Actions that are performed automatically by the MS according to instructions previously registered by the MS-user.
- 3.2.9 Auto-action-log:** An entry-class (which contains entries that record the performance of certain auto-actions by the MS.
- 3.2.10 auto-action-event:** An entry of the Auto-action-log entry-class which represents an auto-action execution.
- 3.2.11 auto-action-type:** The type of an auto-action, e.g. Auto-alert.
- 3.2.12 Auto-alert:** An auto-action which alerts the MS-user when a message or report is delivered.
- 3.2.13 Auto-correlate-reports:** An auto-action which correlates delivery reports with the originally submitted messages or probes to which they are related.
- 3.2.14 Auto-delete:** An auto-action that deletes messages whose storage period has expired.
- 3.2.15 Auto-forward:** A class of auto-actions which causes the MS to forward a delivered message to one or more recipients. As the definition of Auto-forward is content-specific, it is not defined in this Service Definition. Rather, each type of Auto-forward auto-action is defined in the Specification for the content-type concerned.
- 3.2.16 Auto-modify:** An auto-action which applies modifications to the attributes of newly created entries.
- 3.2.17 child-entry:** An entry immediately subordinate to another entry (its parent-entry) in a tree-structured relationship. An entry which is not a child-entry is a main-entry.
- 3.2.18 child-sequence-number:** A sequence-number in a parent-entry pointing to a child-entry. A parent-entry has one value of child-sequence-number for each child-entry it possesses.
- 3.2.19 constraining set:** An information object set used to constrain the values of related components within a Set or Sequence. See ITU-T Rec. X.682 | ISO/IEC 8824-3.
- 3.2.20 content-specific:** Describes a specification or action whose effect depends on the content-type of the message being handled.
- 3.2.21 creation-time:** An attribute which records the date and time at which the entry was created by the MS.
- 3.2.22 Delete abstract-operation:** An abstract-operation used to delete one or more entries of a specified entry-class.
- 3.2.23 delivered-EITs:** A multi-valued attribute which indicates the encoded-information-types present in the content of a delivered-message.

- 3.2.24 delivered-message:** An entry of the Delivery or Delivery-log entry-classes which represents a delivered-message.
- 3.2.25 delivered-report:** An entry of the Delivery or Delivery-log entry-classes which represents a delivered-report.
- 3.2.26 Delivery:** An entry-class which contains entries that represent messages and reports delivered by the MTS to the MS.
- 3.2.27 Delivery-log:** An entry-class which contains entries that provide, for logging purposes, a restricted representation of messages and reports delivered by the MTS to the MS.
- 3.2.28 Draft:** An entry-class which contains draft-message entries.
- 3.2.29 draft-message:** An entry of the Draft entry-class which represents a message not yet submitted to the MTS.
- 3.2.30 entry:** An information object stored in the MS. See 3.2.17, 3.2.45, and 3.2.61 for further classification of entries.
- 3.2.31 entry-class:** A category of entry which represents a particular type of information object. The principal entry-classes are the Stored-message, the Message-log and the Auto-action-log entry-classes.
- 3.2.32 entry-information:** A parameter, used in abstract-operations, which conveys selected information from an entry.
- 3.2.33 entry-information-selection:** A parameter, used in abstract-operations, which indicates what information from an entry is being requested.
- 3.2.34 entry-type:** An attribute which indicates whether an entry contains a delivered-message, a delivered-report, a returned-content, a submitted-message, a submitted-probe, a draft-message or an auto-action-event entry.
- 3.2.35 Fetch abstract-operation:** An abstract-operation which allows an unrestricted set of attribute information for one selected entry of a specified entry-class to be fetched from the MS by the MS-user.
- 3.2.36 fetch-restrictions:** Restrictions imposed by the MS-user on the type of information it is prepared to receive as a result of Fetch. The possible restrictions are on attribute-length, content-types and encoded information types.
- 3.2.37 filter:** A parameter, used in abstract-operations, which applies a test to a particular entry and is either satisfied or not by that entry. <https://standards.iteh.ai/catalog/standards/sist/7b38951c-618e-4287-9ee7-fe5e346efa4e/iso-iec-10021-5-1996>
- 3.2.38 filter-item:** An assertion about the presence or value(s) of an attribute of a particular type in an entry under test. Each such assertion is either *true*, *false*, or *undefined*.
- 3.2.39 forwarding-request:** A parameter that may be present in the argument of the MS-message-submission abstract-operation, invoked by the MS-user, to request that a stored message is forwarded from the MS.
- 3.2.40 general-attribute:** An attribute which is valid for all types of messages and reports, independent of content-type. Only attributes of this type are defined in this Service Definition.
- 3.2.41 general-auto-actions:** An auto-action which is valid for all types of messages and reports, independent of content-type. Only auto-actions of this type are defined in this Service Definition.
- 3.2.42 grade:** Defined in 5.2 of ITU-T Rec. X.402 | ISO/IEC 10021-2.
- 3.2.43 limit:** A component of the selector parameter which specifies the maximum number of selected entries to be returned in the result of an abstract-operation.
- 3.2.44 List abstract-operation:** An abstract-operation which allows the selection of entries of a specified entry-class and requests certain attribute information to be returned for those entries.
- 3.2.45 main-entry:** An entry which may form the root of a set of related entries, organized in a tree-structured fashion. Zero or more child-entries may be associated with a main-entry.
- 3.2.46 matching-rule:** A rule which allows entries to be selected by making assertions concerning their attribute-values.
- 3.2.47 message-group:** A set of related entries. An entry's message-group-name attribute indicates the message-groups of which it is a member.
- 3.2.48 Message-log:** An entry-class which incorporates all entries of the Submission-log and Delivery-log entry-classes.

- 3.2.49 Message-submission abstract-operation:** An abstract-operation the MS invokes to submit a message to the MTS when the MS-user invokes MS-message-submission, or when certain content-specific auto-actions are performed.
- 3.2.50 Modify abstract-operation:** An abstract-operation used to modify the attributes of one or more entries within an entry-class.
- 3.2.51 MS abstract-service:** The set of capabilities that the MS offers to its users by means of its ports.
- 3.2.52 MS abstract-service-user:** The user of the MS abstract-service. An end-user may employ different UAs, at different times, to act as the MS-abstract-service-user when accessing the MS abstract-service.
- 3.2.53 MS abstract-service-provider:** The MS which provides the MS abstract-service.
- 3.2.54 MS-message-submission abstract-operation:** An abstract-operation which enables the MS-user to submit a message to the MTS (and optionally store a copy), or to store a draft message.
- 3.2.55 MS-probe-submission abstract-operation:** An abstract-operation which enables the MS-user to submit a probe to the MTS, and optionally store a copy.
- 3.2.56 MS-submission Port:** A port which supports the MS-submission services of the MS abstract-service. The MS-submission abstract-service offers the same services as the Message-submission abstract-service (of the MTS abstract-service), and in addition, offers services for the storage of submitted messages, the logging of submitted messages, and the forwarding of messages residing in the MS.
- 3.2.57 MS-submission-options:** A parameter used in abstract-operations and auto-actions to determine whether a message or probe is to be submitted to the MTS, or stored in the MS, or both submitted and stored.
- 3.2.58 MS-user:** A shorter form of "MS abstract-service-user".
- 3.2.59 multi-valued attribute:** An attribute which may have several values associated with it.
- 3.2.60 override:** A component of the selector parameter which indicates that previously registered restrictions for the performance of this Fetch abstract-operation shall not apply in this instance of the abstract-operation.
- 3.2.61 parent-entry:** An entry immediately superior to one or more child-entries. A parent-entry which is not a child-entry of some other entry is a main-entry.
- 3.2.62 parent-sequence-number:** A sequence-number which identifies a child-entry's parent-entry. Each child-entry has one value of parent-sequence-number.
- 3.2.63 partial-attribute-request:** A form of the entry-information-selection parameter which requests the return of selected values only, from a multi-valued attribute. See 3.2.33.
- 3.2.64 range:** A parameter used in abstract-operations to select a contiguous sequence of entries of a specified entry-class.
- 3.2.65 Register-MS abstract-operation:** An abstract-operation which allows the MS-user to register information relevant to its interworking with the MS.
- 3.2.66 registration:** Information which is registered with the MS and stored between abstract-associations (until changed by the Register-MS abstract-operation). See 3.2.65.
- 3.2.67 registration-identifier:** An identifier for one particular set of registration parameters for an auto-action-type.
- 3.2.68 Retrieval Port:** A port which supports the retrieval services of the MS abstract-service.
- 3.2.69 retrieval-status:** An attribute which records whether an entry has been retrieved from the MS by the MS-user. Possible values are *new*, *listed* and *processed*.
- 3.2.70 returned-content:** An entry of the Delivery entry-class which contains the returned content of a previously submitted message.
- 3.2.71 selector:** A parameter used in abstract-operations to select entries of a specified entry-class.
- 3.2.72 sequence-number:** An attribute which unambiguously identifies an entry. Sequence-numbers are allocated in ascending order.
- 3.2.73 single-valued attribute:** An attribute which may have one value only associated with it.
- 3.2.74 Stored-message:** An entry-class which incorporates all entries of the Submission and Delivery entry-classes.

- 3.2.75 Submission:** An entry-class which contains entries that represent messages and probes which have been submitted to the MTS via the MS.
- 3.2.76 Submission-log:** An entry-class which contains entries that provide, for logging purposes, a restricted representation of messages and probes which have been submitted to the MTS.
- 3.2.77 submitted-message:** An entry of the Submission or Submission-log entry-classes which represents a submitted-message.
- 3.2.78 submitted-probe:** An entry of the Submission or Submission-log entry-classes which represents a submitted-probe.
- 3.2.79 subscription:** A long-term agreement between the MS supplier or administrator and the MS customers on the availability and use of optional MS features. This Service Definition assumes that such an agreement can be made, but does not prescribe the method by which it is made.
- 3.2.80 Summarize abstract-operation:** An abstract-operation which provides an overview of the kind and number of entries of some entry-class which are currently stored in the MS.
- 3.2.81 UA-registration:** Information registered with the MS which is specific to one of a user's UAs. See 3.2.66.

## 4 Abbreviations

The abbreviations used in this Service Definition are defined in clause 5, and in ITU-T Rec. X.402 | ISO/IEC 10021-2, except where noted below.

ASN.1	Abstract Syntax Notation One
DL	distribution-list
EIT	encoded-information-type
MASE-88	Message Administration Service Element 1988
MASE-94	Message Administration Service Element 1994
MHS	Message Handling Systems
MRSE-88	Message Retrieval Service Element 1988
MRSE-94	Message Retrieval Service Element 1994
MS	Message Store
MSSE	Message Submission Service Element
MS-MSSE	MS Message Submission Service Element
MTS	Message Transfer System
ROS	Remote Operations
UA	User Agent
UTC	Universal Coordinated Time (see ITU-T Rec. X.680   ISO/IEC 8824-1)

## 5 Conventions

This Service Definition uses the descriptive conventions listed below.

### 5.1 Conventions for abstract-services

This Service Definition uses the following ASN.1-based descriptive conventions for the indicated purposes:

- To define the information objects of the MS abstract-service, and other data types and values, ASN.1 itself.
- To define the MS abstract-service, the MHS-OBJECT, PORT, ABSTRACT-OPERATION, and ABSTRACT-ERROR information object classes of ITU-T Rec. X.411 | ISO/IEC 10021-4. These are derived directly from the corresponding information object classes defined in ITU-T Rec. X.880 | ISO/IEC 13712-1, which also defines the CONTRACT and CONNECTION-PACKAGE information object classes.
- To define attributes, the ATTRIBUTE information object class of 6.3.3.3.

- d) To define auto-actions, the AUTO-ACTION and AUTO-ACTION-ERROR information object classes of 6.5.
- e) To define matching-rules, the MATCHING-RULE information object class of ITU-T Rec. X.501 | ISO/IEC 9594-2 (see also 6.3.9.3).

Whenever this Service Definition describes a class of data structure having components, each component is categorized as one of the following **grades**:

- a) **Mandatory (M)**: A mandatory component shall be present in every instance of the class.
- b) **Optional (O)**: An optional component may be present in an instance of the class at the discretion of the object (e.g. user) supplying that instance.
- c) **Conditional (C)**: A conditional component shall be present in an instance of the class as specified by this Service Definition.

## 5.2 Conventions for attribute-types used in Tables 2 and 3 of clause 11

This Service Definition uses the conventions listed below in its definition of the attribute-types for the MS abstract-service.

For the column headed "Single/Multi-valued" the following values may occur:

- S Single-valued
- M Multi-valued

In Table 2, for the column headed "Support level by MS", the sub-heading "Stored-message entry-class" refers to the Stored-message (and the Submission, Delivery and Draft) entry-classes, and the sub-heading "Message-log entry-class" refers to the Message-log (and the Submission-log and Delivery-log) entry-classes. The following values may occur in this column in Tables 2 and 3:

- M Mandatory
- O Optional
- Not supported

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For the columns headed "Presence in" any of delivered-message, delivered-report, returned-message, submitted-message, submitted-probe entry, draft-message, and Auto-action-log entries, the presence of each attribute-type is described by one of the following values:

- P Always present in the entry because:
  - it is mandatory for generation by the MS; or
  - it is a mandatory or defaulted parameter in the relevant abstract-operation.
- C Conditionally present in the entry. It is present if:
  - it is supported by the MS and subscribed to by the user, and
  - it is present in an optional parameter in the relevant abstract-operation.
- Always absent, otherwise.

For the columns headed "Available for List", and "Available for Summarize", the following values may occur:

- N No
- Y Yes

## 5.3 Conventions for attribute-types used in Table 4 of clause 11

This Service Definition uses the conventions listed below in its definition of the attribute-types for the MS abstract-service.

For the column headed "Single/Multi-valued", the following values may occur:

- S Single-valued
- M Multi-valued

For the column headed "Source generated by", the following values may occur:

- Amod Auto-modify auto-action
- Md Message-delivery abstract-operation
- Mod Modify abstract-operation