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## Recommendation X.402

### MESSAGE HANDLING SYSTEMS OVERALL ARCHITECTURE

The establishment in various countries of telematic services and computer-based store-and-forward message services in association with public data networks creates a need to produce standards to facilitate international message exchange between subscribers to such services.

The CCITT,  
considering

- (a) the need for Message Handling Systems;
  - (b) the need to transfer and store messages of different types;
  - (c) that Recommendation X.200 defines the Reference Model of Open Systems Interconnection for CCITT applications;
  - (d) that Recommendations X.208, X.217, X.218, and X.219 provide the foundation for CCITT applications;
  - (e) that the X.500-series Recommendations define Directory Systems;
  - (f) that Message Handling Systems are defined in a series of Recommendations: X.400, X.402, X.403, X.407, X.408, X.411, X.413, and X.419;
  - (g) that Interpersonal Messaging is defined in Recommendations X.420 and T.330,
- unanimously declares
- (1) that the abstract models of a Message Handling System are defined in section two;
  - (2) that the configurations of a Message Handling System are defined in section three;
  - (3) that naming, addressing, and routing within Message Handling Systems are defined in section four.
  - (4) that the use of the Directory by Message Handling Systems is defined in section five.
  - (5) that the OSI realization of a Message Handling System is specified in section six.

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## Section One - Introduction

### 0. Introduction

This Recommendation is one of a set of Recommendations 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 Recommendation specifies the overall architecture of the MHS and serves as a technical introduction to it.

The text of this Recommendation is the subject of joint CCITT-ISO agreement. The corresponding ISO specification is ISO 10021-2.

### 1. Scope

This Recommendation 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. A non-technical overview of Message Handling

No requirements for conformance to this Recommendation are imposed.



## 2. References

This Recommendation and others in the set cite the documents below.

### 2.1 Open Systems Interconnection

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

- X.200 Basic reference model.(see also ISO 7498).
- X.208 Specification of abstract syntax notation one (ASN.1) (see also ISO 8824).
- X.209 Specification of basic encoding rules for abstract syntax notation one (ASN.1) (see also ISO 8825).
- X.217 Association control: Service definition (see also ISO 8649).
- X.218 Reliable transfer: Model and service definition (see also ISO 9066-1).
- X.219 Remote operations: Model, notation and service definition (see also ISO 9072-1).
- X.227 Association control: Protocol specification (see also ISO 8650).
- X.228 Reliable transfer: Protocol specification (see also ISO 9066-2).
- X.229 Remote operations: Protocol specification (see also ISO 9072-2).

### 2.2 Directory Systems

This Recommendation and others in the set cite the following Directory System specifications: of concepts, models, and service.)

- X.500 The directory Overview (see also ISO 9594-1).
- X.501 The directory Models (see also ISO 9594-2).
- X.509 The directory Authentication framework (see also ISO 9594-8).
- X.511 The directory Abstract service definition (see also ISO 9594-3).
- X.518 The directory Procedures for distributed operation (see also ISO 9594-4).
- X.519 The directory Protocol specifications (see also ISO 9495-5).
- X.520 The directory Selected attribute types (see also ISO 9495-6).
- X.521 The directory Selected object classes (see also ISO 9495-7).

### 2.3 Message Handling Systems

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

#### T.330 Telematic access to IPMS.

- X.400 Message handling: Service and system overview (see also ISO 10021-1).
- X.403 Message handling systems: Conformance testing.
- X.407 Message handling systems: Abstract service definition conventions (see also ISO 10021-3).
- X.408 Message handling systems: Encoded information type conversion rules.
- X.411 Message handling systems: Message transfer system: Abstract service definition and procedures (see also ISO 10021-4).
- X.413 Message handling systems: Message store: Abstract service definition (see also ISO 1002105).
- X.419 Message handling systems: Protocol specifications (see also ISO 10021-6).
- X.420 Message handling systems: Interpersonal messaging system (see also ISO 10021-7).

## 3. Definitions

For the purposes of this Recommendation and others in the set, the definitions below apply.

### 3.1 Open Systems Interconnection

This Recommendation and others in the set use the following terms defined in Recommendation X.200, as well as the names of the seven layers of the Reference Model:

- a) abstract syntax;
- b) application entity (.I.ab:AE);
- c) application process;
- d) application protocol data unit (.I.ab:APDU);
- e) application service element (.I.ab:ASE);
- f) distributed information processing task;

- g) layer;
- h) open system;
- i) Open Systems Interconnection (.I.ab:OSI);
- j) peer;
- k) presentation context;
- l) protocol;
- m) Reference Model;
- n) transfer syntax; and
- o) user element (.I.ab:UE;).

This Recommendation and others in the set use the following terms defined in Recommendations X.208 and X.209, as well as the names of ASN.1 data types and values:

- a) Abstract Syntax Notation One (.I.ab:ASN.1);
- b) Basic Encoding Rules;
- c) explicit;
- d) export;
- e) implicit;
- f) import;
- g) macro;
- h) module;
- i) tag;
- j) type; and
- k) value.

This Recommendation and others in the set use the following terms defined in Recommendation X.217:

- a) application association; association;
- b) application context (.I.ab:AC;);
- c) Association Control Service Element (.I.ab:ACSE;);
- d) initiator; and
- e) responder.

This Recommendation and others in the set use the following terms defined in Recommendation X.218:

- a) Reliable Transfer (.I.ab:RT;); and
- b) Reliable Transfer Service Element (.I.ab:RTSE;).

This Recommendation and others in the set use the following terms defined in Recommendation X.219:

- a) argument;
- b) asynchronous;
- c) bind;
- d) parameter;
- e) remote error;
- f) remote operation;
- g) Remote Operations (.I.ab:RO;);
- h) Remote Operations Service Element (.I.ab:ROSE;);
- i) result;
- j) synchronous; and
- k) unbind.

### 3.2 Directory Systems

This Recommendation and others in the set use the following terms defined in the X.500-series Recommendations:

- a) attribute;
- b) certificate;
- c) certification authority;
- d) certification path;
- e) directory entry; entry;
- f) directory system agent (.I.ab:DSA;);

- g) Directory;
- h) hash function;
- i) name;
- j) object class;
- k) object;
- l) simple authentication; and
- m) strong authentication.

### 3.3 Message Handling Systems

For the purposes of this Recommendation and others in the set, the definitions indexed in annex G apply.

### 4. Abbreviations

For the purposes of this Recommendation and others in the set, the abbreviations indexed in annex G apply.

### 5. Conventions

This Recommendation uses the descriptive conventions identified below.

#### 5.1 ASN.1

This Recommendation uses several ASN.1-based descriptive conventions in annexes A and C to define the Message Handling-specific information the Directory may hold. In particular, it uses the OBJECT-CLASS, ATTRIBUTE, and ATTRIBUTE-SYNTAX macros of Recommendation X.501 to define Message Handling-specific object classes, attributes, and attribute syntaxes.

ASN.1 appears both in annex A to aid the exposition, and again, largely redundantly, in annex C for reference. If differences are found between the two, a specification error is indicated.

Note that ASN.1 tags are implicit throughout the ASN.1 module that annex C defines; the module is definitive in that respect.

#### 5.2 Grade

Whenever this Recommendation describes a class of data structure (e.g., O/R addresses) having components (e.g., attributes), each component is assigned one of the following .I.gl:grade;s:

- a) .I.gl:mandatory; (.I.ab:M;): A mandatory component shall be present in every instance of the class.
- b) .I.gl:optional; (.I.ab:O;): An optional component shall be present in an instance of the class at the discretion of the object (e.g., user) supplying that instance. There is no default value.
- c) .I.gl:defaultable; (.I.ab:D;): A defaultable component shall be present in an instance of the class at the discretion of the object (e.g., user) supplying that instance. In its absence a default value, specified by this Recommendation, applies.
- d) .I.gl:conditional; (.I.ab:C;): A conditional component shall be present in an instance of the class as dictated by this Recommendation.

#### 5.3 Terms

Throughout the remainder of this Recommendation, terms are rendered in bold when defined, in italic when referenced prior to their definitions, without emphasis upon other occasions.

Terms that are proper nouns are capitalized, generic terms are not.