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STANDARD

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10021-1

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1990-12-01

Information technology — Text Communication
— Message-Oriented Text Interchange Systems
(MOTIS) —

iTeh **STANDARD PREVIEW**
Part 1: System and Service Overview
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ISO/IEC 10021-1:1990
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Technologies de l'information — Communication de texte — Systèmes d'échange de texte en mode message
Partie 1: Présentation générale du système et des services



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 10021-1 was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information technology*.

ISO/IEC 10021-1 consists of the following parts, under the general title: *Information technology — Text Communication — Message-Oriented Text Interchange Systems (MOTIS)* —

- *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 Specifications*
- *Part 7: Interpersonal Messaging System*

Annexes A, B, C and D are for information only.

Introduction

This part of ISO/IEC 10021 is one of a number of parts of ISO/IEC 10021 (the International Standard for Message-Oriented Text Interchange Systems (MOTIS)). ISO/IEC 10021 provides a comprehensive specification for Message Handling comprising any number of cooperating open-systems.

Message Handling Systems and Services enable users to exchange messages on a store-and-forward basis. A message submitted by one user, the originator, is conveyed by the Message Transfer System (MTS), the principal component of a larger Message Handling System (MHS), and is subsequently delivered to one or more additional users, the message's recipients.

An MHS comprises a variety of interconnected functional entities. Message Transfer Agents (MTAs) cooperate to perform the store-and-forward message transfer function. Message Stores (MSs) provide storage for messages and enable their submission, retrieval and management. User Agents (UAs) help users access MHS. Access Units (AUs) provide links to other communication systems and Services of various kinds (e.g., Telematic Services, Postal Services).

This part of ISO/IEC 10021 specifies the overall system and service description of Message Handling capabilities.

This part of ISO/IEC 10021 is technically aligned with CCITT Recommendation X.400 (1988).

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**Information technology -
Text Communication -
Message-Oriented Text Interchange Systems (MOTIS) -
Part 1 : System and Service Overview**

Section one - Introduction

1 Scope

This part of ISO/IEC 10021 defines the overall system and service of an MHS and serves as a general overview of MHS.

Other aspects of Message Handling Systems and Services are defined in other parts of ISO/IEC 10021. The layout of parts of ISO/IEC 10021 defining the Message Handling System and Services is shown in Table 1.

The technical aspects of MHS are defined in other parts of ISO/IEC 10021. The overall system architecture of MHS is defined in ISO/IEC 10021-2.

Table 1
Structure of MHS Standards
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NAME OF STANDARD/RECOMMENDATION	JOINT MHS		JOINT SUPPORT		CCITT ONLY	
	ISO/IEC	CCITT	ISO	CCITT	SYSTEM	SERVICE
MHS: System and Service Overview	10021-1	X.400				F.400
MHS: Overall Architecture	10021-2	X.402				
MHS: Conformance Testing					X.403	
MHS: Abstract Service Definition Conventions	10021-3	X.407				
MHS: Encoded Information Type Conversion Rules					X.408	
MHS: MTS: Abstract Service Definition and Procedures	10021-4	X.411				
MHS: MS: Abstract Service Definition	10021-5	X.413				
MHS: Protocol Specifications	10021-6	X.419				
MHS: Interpersonal Messaging System	10021-7	X.420				
Telematic Access to IPMS					T.330	
MHS: Naming & Addressing for Public MH Services						F.401
MHS: The Public Message Transfer Service						F.410
MHS: Intercommunication with Public Physical Delivery Services						F.415
MHS: The Public IPM Service						F.420
MHS: Intercommunication Between IPM Service and Telex						F.421
MHS: Intercommunication Between IPM Service and Teletex						F.422
OSI: Basic Reference Model			7498	X.200		
OSI: Specification of Abstract Syntax Notation One (ASN.1)			8824	X.208		
OSI: Specification of Basic Encoding Rules for Abstract Syntax Notation One (ASN.1)			8825	X.209		
OSI: Association Control:Service Definition			8649	X.217		
OSI: Association Control: Protocol Specification			8650	X.227		
OSI: Reliable Transfer:Model & Service Definition			9066-1	X.218		
OSI: Reliable Transfer: Protocol Specification			9066-2	X.228		
OSI: Remote Operations:Model, Notation & Service Definition			9072-1	X.219		
OSI: Remote Operations: Protocol Specification			9072-2	X.229		

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this part of ISO/IEC 10021. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this part of ISO/IEC 10021 are encouraged to investigate the possibility of applying the most recent editions of the standards listed below. Members of ISO and IEC maintain registers of currently valid International Standards.

- ISO 7498 : 1984, *Information processing systems - Open Systems Interconnection - Basic Reference Model*
- ISO 8649 : 1988, *Information processing systems - Open Systems Interconnection - Service definition for the Association Control Service Element*
- ISO 8824 : 1990, *Information processing systems - Open Systems Interconnection - Specification of Abstract Syntax Notation One (ASN.1)*
- ISO 8825 : 1990, *Information processing systems - Open Systems Interconnection - Specification of Basic Encoding Rules for Abstract Syntax Notation One (ASN.1)*
- ISO/IEC 9066-1 : 1989, *Information processing systems - Text Communication - Reliable Transfer Part 1: Model and service definition*
- ISO/IEC 9072-1 : 1989, *Information processing systems - Text Communication - Remote Operations Part 1: Model, notation and service definition*
- ISO/IEC 9594 : 1990, *Information technology - The Directory*
Part 1: Overview of concepts, models and service
Part 2: Models
Part 3: Abstract service definition
Part 4: Procedures for distributed operation
Part 5: Protocol specifications
Part 6: Selected attribute types
Part 7: Selected object classes
Part 8: Authentication framework
- ISO/IEC 10021 : 1990, *Information technology - Text Communication - Message-Oriented Text Interchange Systems (MOTIS) -*
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 Specifications
Part 7: Interpersonal Messaging System
- CCITT Recommendation T.330 : 1988, *Telematic Access to IPMS*
- CCITT Recommendation X.408 : 1988,
Message Handling Systems, Encoded Information Type Conversion Rules

3 Definitions

For the purposes of this part of ISO/IEC 10021 the definitions given in Annex A and the following definitions apply.

Definitions of the Elements of Service applicable to MHS are contained in Annex B.

3.1 Open Systems Interconnection

This part of ISO/IEC 10021 makes use of the following terms defined in ISO 7498:

- a) Application Layer
- b) application-process
- c) Open Systems Interconnection
- d) OSI Reference Model

3.2 Directory Systems

This part of ISO/IEC 10021 makes use of the following terms defined in ISO/IEC 9594-1:

- a) directory entry
- b) directory system agent
- c) Directory System
- d) directory user agent

This part of ISO/IEC 10021 makes use of the following terms defined in ISO/IEC 9594-2:

- e) attribute
- f) group
- g) member
- h) name

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4 Abbreviations

A	Additional
ADMD	Administration Management Domain
AU	Access Unit
CA	Contractual Agreement
DL	Distribution List
DSA	Directory System Agent
DUA	Directory User Agent
E	Essential
EIT	Encoded Information Type
I/O	Input/Output
IP	Interpersonal
IPM	Interpersonal Messaging
IPMS	Interpersonal Messaging System
MD	Management Domain
MH	Message Handling
MHS	Message Handling System
MS	Message Store
MT	Message Transfer
MTA	Message Transfer Agent
MTS	Message Transfer System
N/A	Not Applicable
O/R	Originator/Recipient
OSI	Open System Interconnection
PD	Physical Delivery
PDAU	Physical Delivery Access Unit
PDS	Physical Delivery System
PM	Per-message
PR	Per-recipient
PRMD	Private Management Domain
PTLXAU	Public Telex Access Unit
TLMA	Telematic Agent
TLXAU	Telex Access Unit
TTX	Teletex
UA	User Agent

5 Conventions

In this Standard the expression "Administration" is used for shortness to indicate a telecommunication Administration, a recognized private operating agency, and, in the case of intercommunication with Public Delivery Service, a Postal Administration.

Section two - General Description of MHS

6 Purpose

This part of ISO/IEC 10021 is one of a number of parts of ISO/IEC 10021 and describes the system model and Elements of Service of the Message Handling System (MHS) and Services. This part of ISO/IEC 10021 overviews the capabilities of an MHS that are used for the provision of MH Services to enable users to exchange messages on a store-and-forward basis.

The Message Handling System is designed in accordance with the principles of the Reference Model of Open Systems Interconnection(OSI Reference Model) (ISO 7498) and uses the Presentation Layer Services and Services offered by other, more general, Application Service Elements. An MHS can be constructed using any network fitting in the scope of OSI. The Message Transfer Service provided by the MTS is application independent. An example of a standardized application is the IPM Service. End systems can use the MT Service for specific applications that are defined bilaterally.

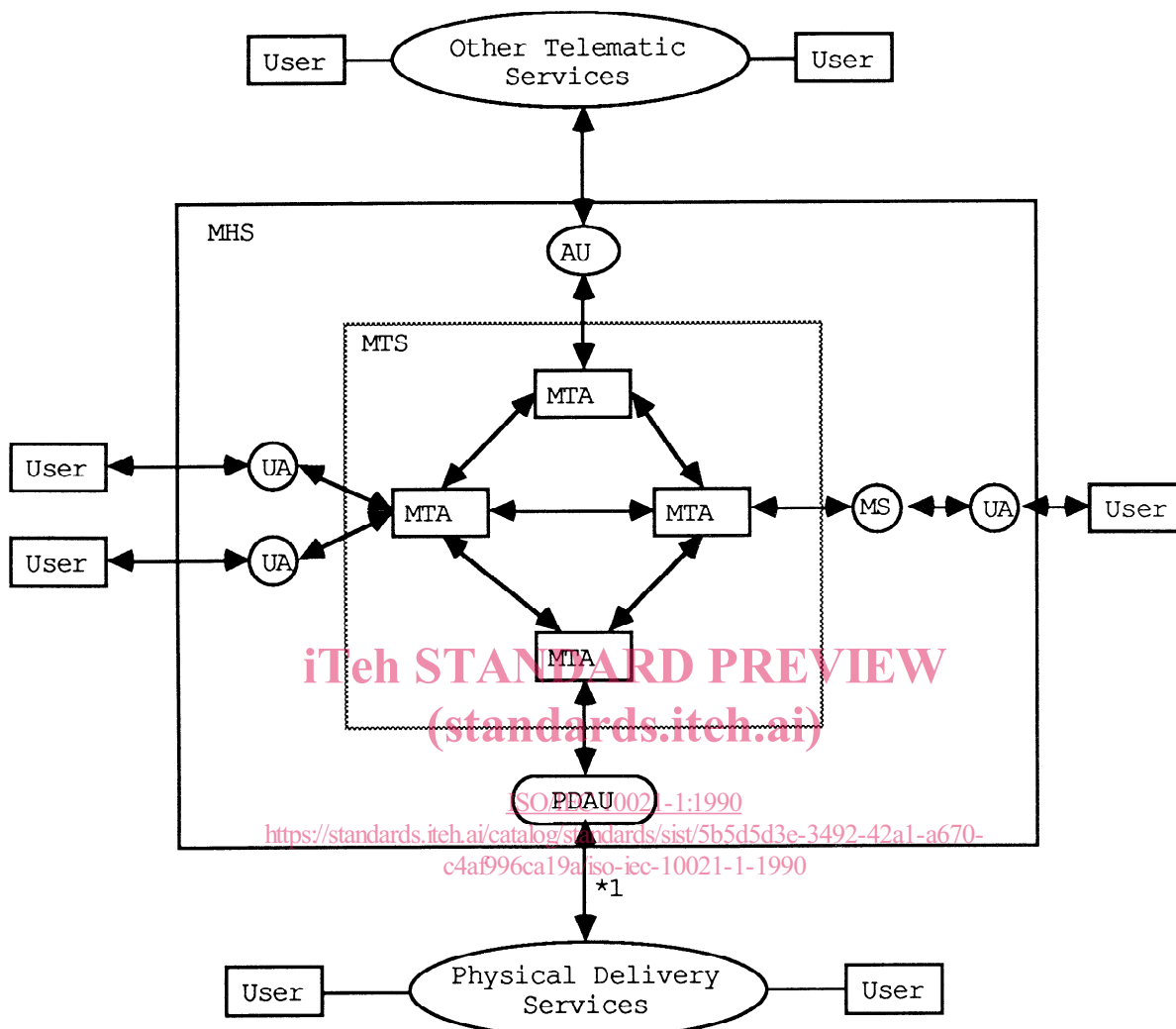
Elements of Service are the service features provided through the Application Processes. The Elements of Service are considered to be components of the services provided to users and are either elements of a basic service or they are *optional user facilities*, classified either as *essential optional user facilities*, or as *additional optional user facilities*.

7 Functional Model of MHS

The MHS functional model serves as a tool to aid in the development of International Standards for MHS, and aids in describing the basic concepts that can be depicted graphically. It comprises several different functional components that work together to provide MH Services. The model can be applied to a number of different physical and organizational configurations.

7.1 Description of the MHS Model

A functional view of the MHS model is shown in Figure 1. In this model, a user is either a person or a computer process. Users are either direct users (i.e. engage in message handling by direct use of MHS), or are indirect users {i.e. engage in message handling through another communication system (e.g. a Physical Delivery System) that is linked to MHS}. A user is referred to as either an originator (when sending a message) or a recipient (when receiving a message). Message Handling Elements of Service define the set of message types and the capabilities that enable an originator to transfer messages of those types to one or more recipients.



* 1): Message input from PDS to MHS is not currently possible. Flow from PD Services to the PDAU shown is for notifications.

Figure 1
MHS Functional Model

An originator prepares messages with the assistance of his User Agent. A User Agent (UA) is an application process that interacts with the Message Transfer System (MTS) or a Message Store (MS), to submit messages on behalf of a single user. The MTS delivers the messages submitted to it, to one or more recipient UAs, Access Units (AUs), or MSs, and can return notifications to the originator. Functions performed solely by the UA and not standardized as part of the message handling Elements of Service are called local functions. A UA can accept delivery of messages directly from the MTS, or it can use the capabilities of a MS to receive delivered messages for subsequent retrieval by the UA.

The MTS comprises a number of Message Transfer Agents (MTAs). Operating together, in a store and forward manner, the MTAs transfer messages and deliver them to the intended recipients.

Access by indirect users of MHS is accomplished by AUs. Delivery to indirect users of MHS is accomplished by AUs, such as in the case of physical delivery, by the Physical Delivery Access Unit (PDAU).

The Message Store (MS) is an optional general purpose capability of MHS that acts as an intermediary between the UA and the MTA. The MS is depicted in the MHS Functional Model shown in Figure 1. The MS is a functional entity whose primary purpose is to store and permit retrieval of delivered messages. The MS also allows for submission from, and alerting to the UA.

The collection of UAs, MSs, AUs and MTAs is called the Message Handling System (MHS).

7.2 Structure of Messages

The basic structure of messages conveyed by the MTS is shown in Figure 2. A message is made up of an envelope and a content. The envelope carries information that is used by the MTS when transferring the message within the MTS. The content is the piece of information that the originating UA wishes delivered to one or more recipient UAs. The MTS neither modifies or examines the content, except for conversion (see clause 16).



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Figure 2
Basic Message Structure

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7.3 Application of the MHS Model

7.3.1 Physical Mapping

Users access UAs for message processing purposes, for example, to create, present, or file messages. A user can interact with a UA via an input/output device or process (e.g., keyboard, display, printer etc.). A UA can be implemented as a (set of) computer process(es) in an intelligent terminal.

A UA and MTA can be co-located in the same system, or a UA/MS can be implemented in physically separate systems. In the first case the UA accesses the MT Elements of Service by interacting directly with the MTA in the same system. In the second case, the UA/MS will communicate with the MTA via standardized protocols specified for MHS. It is also possible for an MTA to be implemented in a system without UAs or MSs.

Some possible physical configurations are shown in Figures 3 and 4. The different physical systems can be connected by means of dedicated lines or switched network connections.

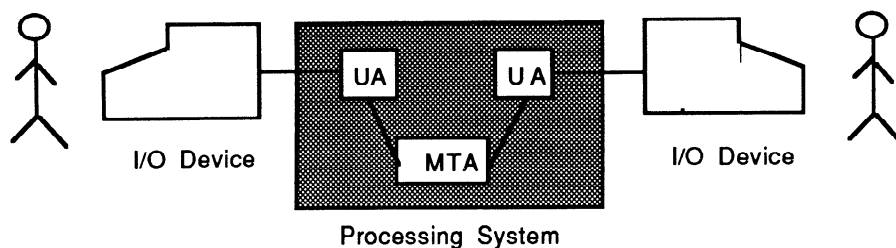
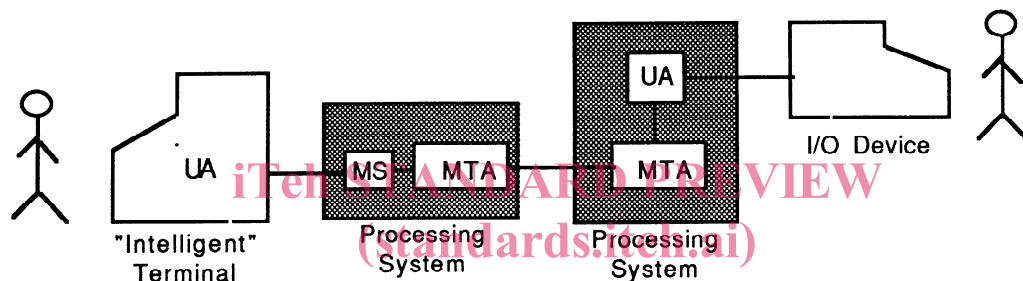


Figure 3
Co-resident UA and MTA

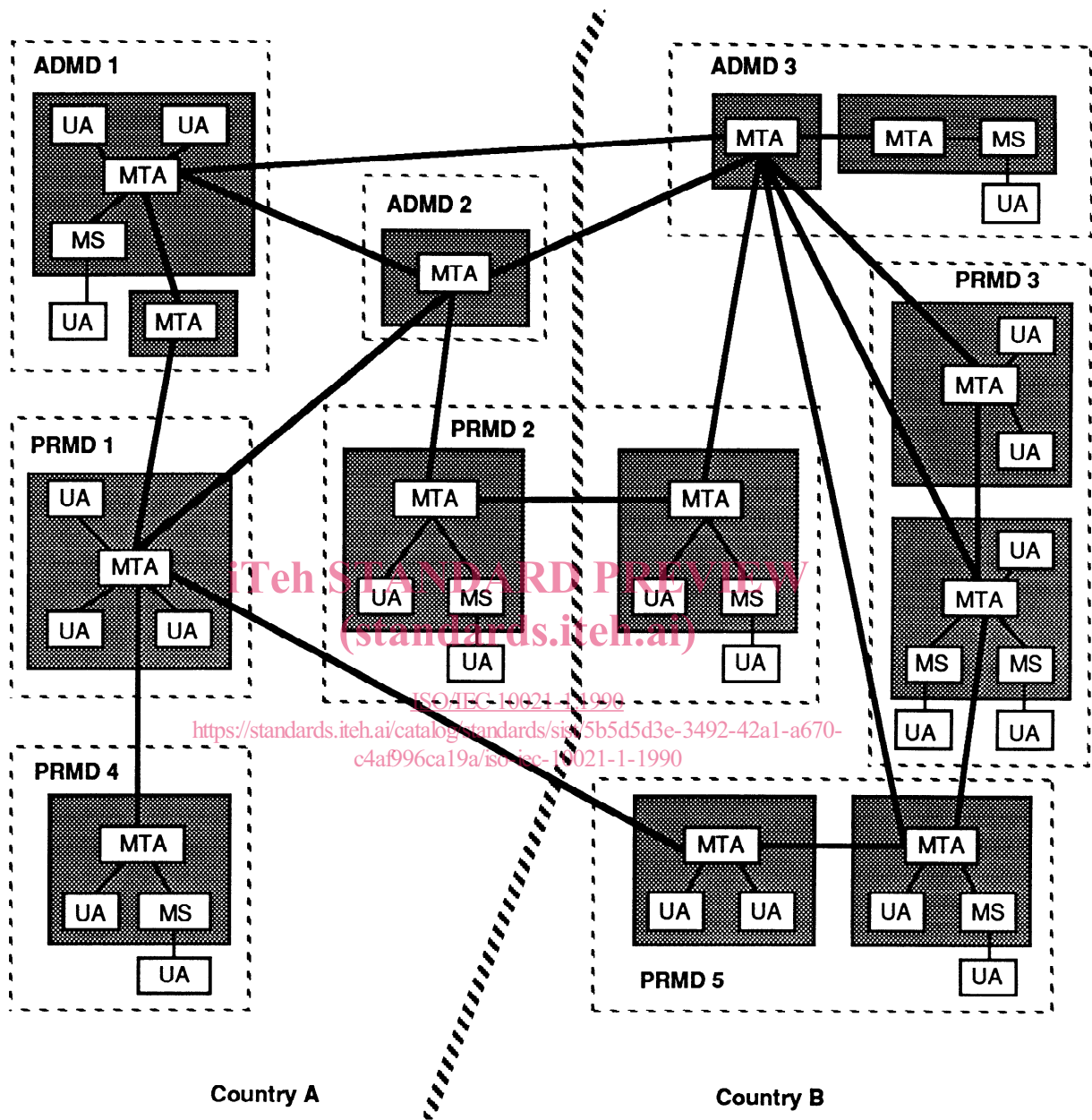


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Figure 4
 Stand-alone UA and Co-resident MS/MTA and UA/MTA

7.3.2 Organizational Mapping

An Administration or organization can play various roles in providing Message Handling Services. An organization in this context can be a company or a non-commercial enterprise.

The collection of at least one MTA, zero or more UAs, zero or more MSs, and zero or more AUs operated by an Administration or organization constitutes a Management Domain (MD). An MD managed by an Administration is called an Administration Management Domain (ADMD). An MD managed by an organization other than an Administration is called a Private Management Domain (PRMD). An MD provides Message Handling Services in accordance with the classification of Elements of Service as described in clause 19. The relationships between Management Domains is shown in Figure 5.



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Figure 5
Relationships between Management Domains

NOTES

1. This diagram gives examples of possible interconnections. It does not attempt to identify all possible configurations. This International Standard places no restrictions on interconnections between MDs, although these may be the subject of regulatory agreements within and between countries.