
**Information technology — Message
Handling Systems (MHS) management:
Logging information**

*Technologies de l'information — Gestion des systèmes de messagerie
(MHS): Informations d'enregistrement chronologique*



Contents

	Page
SECTION 1 – INTRODUCTION	1
1 Scope.....	1
2 Normative references	1
3 Definitions.....	3
4 Abbreviations	4
5 Conventions	5
SECTION 2 – MHS LOGGING PRINCIPLES.....	5
6 Requirements.....	5
7 Service definitions.....	7
8 Logging model	15
9 Creation conditions	16
SECTION 3 – MANAGEMENT INFORMATION MODEL	20
10 Definition of managed object classes.....	20
11 Definitions of packages.....	25
12 Definition of attributes	40
13 Definition of attribute groups.....	60
14 Definition of Notifications	60
15 Definition of actions.....	61
16 Definition of parameters.....	61
17 Name bindings	63
SECTION 4 – CONFORMANCE STATEMENTS.....	65
18 Conformance statements	65
Annex A – ASN.1 definitions	69
Annex B – Relation with ITU-T Rec. X.742 ISO/IEC 10164-10.....	84
Annex C – Examples of use of settlement log information.....	86
Model 1.....	86
Model 2.....	88

© ISO/IEC 1997

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 the publisher.

ISO/IEC Copyright Office • Case postale 56 • CH-1211 Genève 20 • Switzerland
Printed in Switzerland

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 11588-3 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.462.

ISO/IEC 11588 consists of the following parts, under the general title *Information technology — Message Handling Systems (MHS) management*:

- *Part 1: Model and architecture*
- *Part 2: Information*
- *Part 3: Logging information*
- *Part 4: Security management function*
- *Part 5: Configuration management function*
- *Part 6: Fault management function*
- *Part 7: Performance management function*
- *Part 8: Message transfer agent management*

Annex A forms an integral part of this part of ISO/IEC 11588. Annexes B and C are for information only.

INTERNATIONAL STANDARD

ITU-T RECOMMENDATION

INFORMATION TECHNOLOGY – MESSAGE HANDLING SYSTEMS (MHS) MANAGEMENT: LOGGING INFORMATION

SECTION 1 – INTRODUCTION

1 Scope

MHS Logging is the collection of information relating to the use of MHS resources when providing MHS services in an MIS management domain.

Three aspects of MHS Logging are considered in this Recommendation | International Standard:

- a) MHS Events logging management;
- b) MHS Customer accounting management;
- c) MHS Settlement accounting management.

MHS Events logging is the collection of information relating to the use of MHS entities (UA, AU, MTA and MS), within an MIS management domain, when acting upon messages, probes and reports. MHS Events logging information is the basic information that is used to provide others MHS management services, for example Customer accounting management and Settlement accounting management.

MHS Customer accounting is the collection, for the purpose of billing, of information related to the use of MHS resources by a Customer within an MIS management domain.

MHS Settlement accounting is the collection, for the purpose of reconciliation of accounts, of information related to the use of MHS resources by an Interworking MD.

This Specification:

- a) Establishes the requirements for MHS Logging;
- b) Defines the services provided for the purpose of MHS Logging;
- c) Defines relationships with other system management functions;
- d) Establishes models that relate the services to the managed objects;
- e) Defines object classes, packages, attributes types, operations and notifications types;
- f) Specifies conformance requirements.

This Specification does not:

- a) Specify accounting metering;
- b) Specify how Customer accounting and Settlement accounting information can be derived from MHS events logging information.

The information captured relates to open systems resource usage at the Application layer. It does not capture resource usage at lower layers. For example, it does not capture network layer cost between MDs nor between MD and client systems for the transfer of messages.

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 the 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 Identical Recommendations | International Standards

- ITU-T Recommendation X.200 (1994) | ISO/IEC 7498-1:1994, *Information technology – Open Systems Interconnection – Basic Reference Model: The Basic Model*.
- 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 10021-4:1997, *Information technology – Message Handling Systems (MHS): Message transfer system: Abstract service definition and procedures*.
- 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.464¹⁾ | ISO/IEC 11588-4...¹⁾, *Information technology – Message Handling Systems (MHS) management: Security Management Functions*.
- 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*.
- CCITT Recommendation X.701 (1992) | ISO/IEC 10040:1992, *Information technology – Open Systems Interconnection – Systems management overview*.
- CCITT Recommendation X.720 (1992) | ISO/IEC 10165-1:1993, *Information technology – Open Systems Interconnection – Structure of management information: Management information model*.
- CCITT Recommendation X.721 (1992) | ISO/IEC 10165-2:1992, *Information technology – Open Systems Interconnection – Structure of management information: Definition of management information*.
- CCITT Recommendation X.722 (1992) | ISO/IEC 10165-4:1992, *Information technology – Open Systems Interconnection – Structure of management information: Guidelines for the definition of managed objects*.
- CCITT Recommendation X.734 (1992) | ISO/IEC 10164-5:1993, *Information technology – Open Systems Interconnection – Systems management: Event report management function*.
- CCITT Recommendation X.735 (1992) | ISO/IEC 10164-6:1993, *Information technology – Open Systems Interconnection – Systems management – Log control function*.
- ITU-T Recommendation X.742 (1995) | ISO/IEC 10164-10:1995, *Information technology – Open Systems Interconnection – Systems management: Usage metering function for accounting purposes*.

2.2 Paired Recommendations | International Standards equivalent in technical content

- ITU-T Recommendation F. 400/X.400 (1993), *Message handling services: Message handling system and service overview*.
ISO/IEC 10021-1:1990, *Information technology – Text communication – Message-Oriented Text Interchange Systems (MOTIS) – Part 1: System and Service Overview*.
- CCITT Recommendation X.700 (1992), *Management framework for Open Systems Interconnection (OSI) for CCITT applications*.
ISO/IEC 7498-4:1989, *Information processing systems – Open Systems Interconnection – Basic Reference Model – Part 4: Management framework*.

2.3 Additionnal references

- CCITT Recommendation Q.36 (1988), *Customer recognition of foreign tones*.
- ITU-T Recommendation M. 3010 (1996), *Principles for a telecommunications management network*.
- ITU-T Recommendation M. 3100 (1995), *Generic network information model*.

¹⁾ Presently at the stage of draft.

3 Definitions

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

3.1 accounting: The action of collecting information on the operations performed within a system and the effects thereof.

3.2 customer: A Customer is a corporation, organization or individual with telecommunications needs to be satisfied.

3.3 customer accounting: The reconciliation of accounts between MHS service provider and MHS service user. The charging policy used may be subject to a bilateral agreement.

3.4 indirect MIS-user: An indirect MIS-User is a Customer or an interworkingMD. An Indirect MIS-User cannot reach the Management Information System directly. Access to management information is provided through a generic set of services: the Service Request Management Services (SRMS).

3.5 interworkingMD: Interconnected management domain. A MHS management domain that has settlement arrangements with the managed MHS management domain.

An Indirect MIS-user is an entity, like Customer or InterworkingMD.

3.6 MD manager: An MD manager is an MHS system manager who is additionally responsible for the management of an ADMD or a PRMD.

3.7 MHS system manager: An MHS system manager is a corporation, organization or individual which is responsible for the management of the resources of an MHS system.

3.8 processingError Managed object: A Managed object with the processing error flag set to TRUE.

3.9 settlement: The reconciliation of accounts between MHS service providers. The settlement policy used is subject to a bilateral agreement.

This Recommendation | International Standard makes use of the following term defined in ITU-T Rec. X.700 and ISO/IEC 7498-4:

- managed object.

3.10 This Recommendation | International Standard makes use of the following terms defined in ITU-T Rec. X.701 | ISO/IEC 10040:

- a) agent role;
- b) agent;
- c) managed object class;
- d) manager;
- e) manager role;
- f) notification.

3.11 This Recommendation | International Standard makes use of the following terms defined in ITU-T Rec. X.400 and ISO/IEC 10021-1:

- a) access unit;
- b) administration management domain;
- c) delivery;
- d) delivery report;
- e) distribution list;
- f) distribution list expansion;
- g) encoded information type;
- h) conversion;
- i) management domain;
- j) message;
- k) message store;
- l) message transfer agent;

- m) O/R name;
- n) originator;
- o) physical delivery access unit;
- p) probe;
- q) recipient;
- r) transfer;
- s) user agent.

3.12 This Recommendation | International Standard makes use of the following terms defined in ITU-T Rec. X.402 | ISO/IEC 10021-2:

- a) Message Administration Service Element;
- b) Message Delivery Service Element;
- c) Message Retrieval Service Element;
- d) Message Submission Service Element;
- e) Message Transfer Service Element.

3.13 This Recommendation | International Standard makes use of the following terms defined in ITU-T Rec. X.460 | ISO/IEC 11588-1:

- a) MHS management domain;
- b) MHS system;
- c) MIS management domain;
- d) MIS-User.

4 Abbreviations

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

ADMD	Administration Management Domain
ASN.1	Abstract Syntax Notation One
AU	Access Unit
CMIP	Common Management Information Protocol
CMIS	Common Management Information Service
DL	Distribution List
DMI	Definition of Management Information
DN	Distinguished Name
EIT	Encoded Information Type
GDMO	Guidelines for the Definition of Managed Objects
MASE	Message Administration Service Element
MD	MHS Management Domain
MDSE	Message Delivery Service Element
MHS	Message Handling System
MIB	Management Information Base
MIS	Management Information System
MO	Managed Object
MRSE	Message Retrieval Service Element
MS	Message Store
MSSE	Message Submission Service Element
MTA	Message Transfer Agent
MTSE	Message Transfer Service Element

PDAU	Physical Delivery Access Unit
PDU	Protocol Data Unit
RDN	Relative Distinguished Name
SMI	Structure of Management Information
SRMS	Service Request Management Service
UA	User Agent

5 Conventions

In clause 10, the managed object class templates are grouped in subclauses according to their logical organization in the naming tree of Figure 4. This may lead to clauses having only one subclause, but this is deemed necessary in order to keep in line with the structure of the MIB. The first two layers of the structure have been kept separate so as not to have only one subclause in clause 10.

In clause 11, the package templates are grouped in subclauses according to their logical organization in their respective managed object class template, as defined in clause 10. The conditional packages are placed in subclauses of the corresponding mandatory packages. This may lead to clauses having only one subclause, but this is deemed necessary in order to keep in line with the structure of the MIB.

SECTION 2 – MHS LOGGING PRINCIPLES

6 Requirements

Three types of users may express requirements on MHS Logging Information:

- a) MHS system manager;
- b) MD manager;
- c) Customer,

Table 1 describes the specific requirements of each type of MHS Accounting Management user.

Table 1 – User requirements

Requirements	Users		
	MHS system manager	MD manager	Customer
MHS events logging	x	x	
Customer accounting data collection	x	x	
Customer access to Customer information			x
Settlement data collection		x	
Exchange of Settlement information		x	

6.1 MHS events logging purposes

MHS events logging services shall enable to store in logs:

- a) interactions between various components within the managed part of the MHS;
- b) actions on messages performed by the MTS-provider within the managed part of the MHS.

The content of MHS events logs shall be available for MHS management functions (e.g. Settlement accounting and Customer accounting).

6.2 Customer accounting purposes

6.2.1 Customer accounting data collection

Customer accounting services shall enable the use of the MHS service by a Customer to be measured. Following facilities shall be offered for the control of Customer accounting data collection:

- a) creation of an accounting data collection;
- b) deletion of an accounting data collection;
- c) modification of data collection characteristics.

NOTE – The content of the Customer Accounting Record is not defined in this Recommendation | International Standard. Such information may be subject to a charging policy agreements between the Customer and the MHS service provider. Such policies are currently under study and the standardization of Customer Accounting Records is therefore left to further study.

6.2.2 Customer access to Customer accounting information

Customer accounting services shall enable a Customer to request access to the accounting information. This information may be constrained to read-only access rights on behalf of the Customer. Condition of availability to the Customer of such information may be subject to negotiation with the MIS provider.

6.3 Settlement purposes

6.3.1 Settlement cost element model

The information collected for Settlement accounting purposes are those cost elements relating to the processing of messages, as identified in Figure 1.

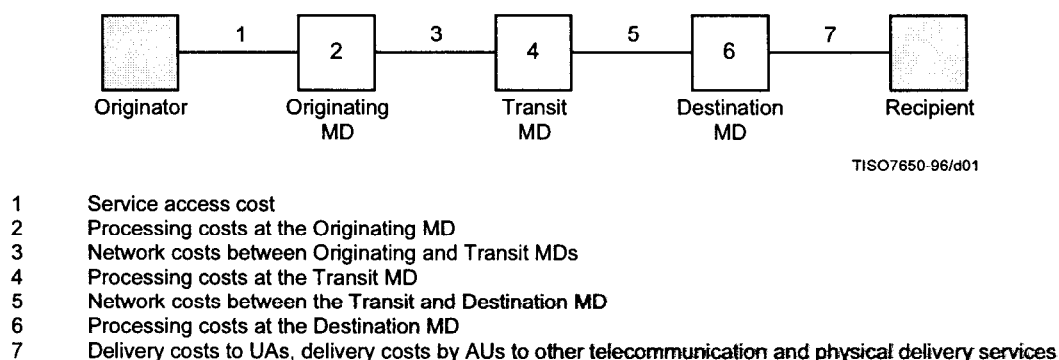


Figure 1 – Cost element model

6.3.2 Settlement data collection

Settlement accounting services enable settlement information to be collected. The following facilities shall be offered for the control of Settlement accounting data collection:

- a) creation of a Settlement data collection;
- b) deletion of a Settlement data collection;
- c) modification of Settlement data collection characteristics.

6.3.3 Exchange of Settlement information

Settlement accounting services shall provide mechanisms for the exchange of settlement information between InterworkingMDs. The condition of availability of such information may be subject to negotiation with each InterworkingMD.

6.3.4 Information collected

The accounting information is collected by MDs that perform service on behalf of the originator/ recipient of a message. The destination MD collects information associated with the delivery of the message to a recipient. The originating MD collects information associated with message submission (e.g. service access charge). Any MD along the path collects informations associated to actions which are subject to accounting, such as distribution list expansion, redirection, and conversion.

Settlement among MDs requires the collection of the following information:

- a) Information related to the message processing at the originating MD:
 - 1) Originating Customer requested;
 - 2) Additional processing.
- b) Information related to the message processing at zero, one, or more transit MDs:
 - 1) Originating Customer requested;
 - 2) Third party requested.
- c) Information related to the message processing, including delivery costs at the destination MD:
 - 1) Originating Customer requested;
 - 2) Recipient requested.

7 Service definitions

Two types of service users are identified in this Recommendation | International Standard: MIS-Users and Indirect MIS-users.

Table 2 describes services and functions provided to these service users.

Table 2 – Services and functions provided to accounting service user

Services	Functions	Provided to MIS-users	Provided to Customers	Provided to interworkingMD
Service request	• Indirect MIS-user Event report • Indirect MIS-user Service request		x x	x x
Settlement account request	• Settlement account request • Settlement log retrieval			x x
Customer account request	• Customer account request • Customer accounting log retrieval		x x	
Settlement accounting	• Settlement accounting log	x		
Customer accounting	• Customer accounting log	x		
MHS event logging	• MHS events log	x		
NOTES 1 The Service request services are generic services which shall not be realized in the generic form but specialized for specific purposes. For instance, the Settlement account request and Customer account request functions defined in this Recommendation International Standard are derived from the Service request services. 2 The exchange of accounting information with Customers may but need not be provided through the Customer account request services. 3 The exchange of settlement information between MDs may but need not be provided through the settlement account request services.				

7.1 Service request management services

The SRMS enable the exchange of information between an Indirect MIS-user and the MIS-provider. The SRMS enable an Indirect MIS-user to request a service, eventually to negotiate request parameters, and to control and monitor the performance of a request, as shown in Figure 2.

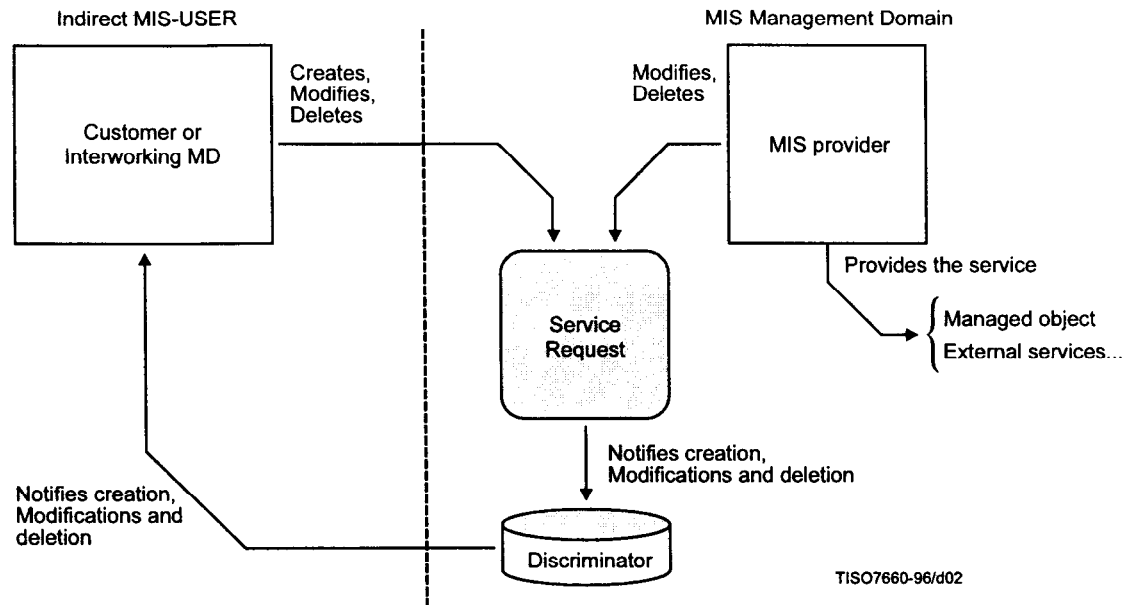


Figure 2 – Model for the service request

NOTE – The use of such services is not limited to accounting management purposes. For instance, it may be used in Performance management to request performance reports.

7.1.1 Indirect MIS-user event report function

7.1.1.1 Function description

This function enables the Indirect MIS-user to receive event reports. The Indirect MIS-user may define the characteristics that a potential event report must have before being sent (discriminator construct).

7.1.1.2 Parameters

Parameters are defined in CCITT Rec. X.734 | ISO/IEC 10164-5, clause 8.1.2: Event forwarding discriminator.

7.1.1.3 Behaviour

The Event forwarding discriminator object (customerEFD or interworkingMD-EFD) is used to represent the criteria that shall be satisfied by potential events reports before the event report is forwarded to the Indirect MIS-user.

Each event that may be reported to the Indirect MIS-user is sent to the Indirect MIS-user if it satisfies the current discriminator construct.

The Indirect MIS-user may modify the discriminator construct and he may suspend or resume the EventForwardingDiscriminator's activity.

7.1.1.4 References

CCITT Rec. X.734 | ISO/IEC10164-5.

7.1.1.5 Service primitives

Table 3 describes services primitives associated with this function.

Table 3 – Indirect MIS-user event report function service primitives

Primitives	Service SMASE	CMISE	Objects
Modification of discrimininator attributes	PT-SET	M-SET	customerEFD, interworkingMD-EFD
Suspension of the discrimininator activity	PT-SET	M-SET	customerEFD, interworkingMD-EFD
Resumption of the discrimininator activity	M-SET	M-SET	customerEFD, interworkingMD-EFD

7.1.2 Indirect MIS-user service request function

7.1.2.1 Function description

The Service request function enables the Indirect MIS-user to control and monitor the performance of a request and eventually to negotiate request parameters.

7.1.2.2 Parameters

The following parameters are defined for this service:

- contactInstance;
- serviceRequestID;
- status;
- limitValidityDate;
- startUpDate.

7.1.2.2.1 contactInstance

This attribute contains the identification of the Indirect MIS-user.

7.1.2.2.2 serviceRequestID

This attribute is used to identify the requested function.

7.1.2.2.3 status

This attribute contains the status of the Service request in progress. A request may have the following status:

- indirect-MIS-User agreement on the request;
- MIS-provider agreement on the request;
- request in progress;
- request processed.

7.1.2.2.4 limitValidityDate

This attribute provides the means to the Indirect MIS-user and MIS-provider to exchange information about the validity period of the Service request.

7.1.2.2.5 startUpDate

This attribute provides the means for the Indirect MIS-user to set the date and time at which he wishes the function to be made available. This attribute provides the means for the MIS-provider to inform the Indirect MIS-user that this date is not acceptable, then giving another date.

7.1.2.3 Behaviour

This function is provided through a serviceRequest managed object class. Specific serviceRequest objects (for instance the acctRequest object defined in this Recommendation | International Standard) are subclasses of the serviceRequest managed object class.

The performance of a Service request can be split into four steps:

- a) creation of a serviceRequest managed object instance;
- b) negotiation of attribute values;
- c) performance of the request;
- d) deletion of the serviceRequest managed object instance.

The Indirect MIS-user exercises control over the notifications that may be forwarded to him with the "Indirect MIS-user Event report function".

7.1.2.3.1 Creation of service request

The Indirect MIS-user requests the creation of an instance of a subclass of the serviceRequest managed object class. The performance of the creation is reported to the Indirect MIS-user as an object creation report. The status attribute is set to: "Customer agreement on the request" at initialization time.

7.1.2.3.2 Negotiation

The MIS-provider modifies, if needed, the values of negotiated attributes (e.g. limitValidityDate, startUpDate) and sets the status attribute to: "provider agreement on the request". All changes on attribute values including the status attribute are reported to the Indirect MIS-user as Attribute change value notifications.

Then, the Indirect MIS-user modify, if needed, the values of negotiated attributes and sets again the status attribute to: "Customer agreement on the request".

This procedure is renewed until a compromise is found. Then the MIS-provider sets the status attribute to: "request in progress". If no compromise is found, the Indirect MIS-user cancels the request by deleting the Service request object.

7.1.2.3.3 Performance of the request

The MIS-provider performs the request and sets the status attribute value to: "request processed". A specific attribute may be used to provide the result to the Indirect MIS-user. All changes on attribute values including the status attribute are reported to the Indirect MIS-user as Attribute change value notifications.

7.1.2.3.4 Normal deletion of the request

The MIS-provider or the Indirect MIS-user may delete the requested service instance after the Service request has been provided. The performance of the deletion is reported to the Indirect MIS-user as an object deletion report.

7.1.2.3.5 Abnormal deletion of the request

At any time between the creation and the normal end of the negotiation, the Indirect MIS-user may cancel the service request by deleting the serviceRequest instance. The performance of the deletion is reported to the Indirect MIS-user as an object deletion report.

7.1.2.4 Service primitives

Table 4 describes services primitives associated with this function.

Table 4 – Indirect MIS-user event report function service primitives

Primitives	Service SMASE	CMISE	Objects
Initiation of a Service request	PT-CREATE	M-CREATE	Subclass of serviceRequest
Modification of a Service request	PT-SET	M-SET	Subclass of serviceRequest
Retrieval of Service request attributes	PT-GET	M-GET	Subclass of serviceRequest
Deletion of a Service request	PT-DELETE	M-DELETE	Subclass of serviceRequest
Event report filtering	Indirect MIS-user event report service	M-EVENT-REPORT	customerEFD or interworkingMD-EFD

7.2 Settlement account request function

7.2.1 Settlement accounting log function

7.2.1.1 Function description

This function enables an MIS-user to:

- a) create, delete, and modify a data collection for settlement accounting;
- b) retrieve settlement records.

7.2.1.2 Parameters

Parameters correspond to the attributes of the settlementAcctLog managed object.

7.2.1.3 References

CCITT Rec. X.735 | ISO/IEC 10164-6.

7.2.1.4 Service primitives

Table 5 describes services primitives associated with this function.

Table 5 – Settlement accounting log function service primitives

Primitives	Service SMASE	CMISE	Objects
Initiation of data collection	PT-CREATE	M-CREATE	settlementAcctLog
Modification of a data collection	PT-SET	M-SET	settlementAcctLog
Deletion of a data collection	PT-DELETE	M-DELETE	settlementAcctLog
Retrieval of settlement records	PT-GET	M-GET	settlementAcctRecord

7.2.2 Settlement account request function

7.2.2.1 Function description

The Settlement account request function enables an interworkingMD to request the availability of a settlementAcctLog. This function is derived from the generic Service request function defined in this Recommendation | International Standard.

7.2.2.2 Parameters

The following parameters are defined for this service, in addition to those described for the Service request function:

- logStartTime;
- logStopTime;
- logId;
- settlementPolicy.

7.2.2.2.1 logStartTime

This parameter represents the starting time for logging of settlement accounting information.

7.2.2.2.2 logStopTime

This parameter represents the stopping time for logging of settlement accounting information.

7.2.2.2.3 logID

This log identifier is provided by the MIS provider in response to the Settlement account request.

7.2.2.2.4 settlementPolicy

This parameter identifies which policy is used for Settlement accounting purposes. The default value defined for this parameter references "The General Accounting Principles Applicable to Message Handling Services" defined in Recommendation D.36.

7.2.2.3 Behaviour

7.2.2.3.1 Negotiation

The negotiation between the interworking MD and the MIS-provider is as described in the Service request behaviour. Values of limitValidityDate, startUpDate, logStartTime and logStopTime attributes may be negotiated between the InterworkingMD and the MIS-provider:

- logStartTime should be less or equal than startUpDate;
- logStopTime should be greater than logStartTime.

7.2.2.3.2 Performance of the request

When startUpDate is reached, the MIS-provider supplies a logging identifier as follows:

- if logStartTime is equal to startUpDate, the MIS-provider provides the log identifier of an empty settlementAcctLog;

- if logStartTime is less than startUpDate, the MIS-provider provides the log identifier of a settlementAcctLog which contains all settlementAcctRecord logged since logStartTime, up to startUpDate (if this time is less than logStopTime) or logStopTime (if this time is less than the StartUpDate).

No additional settlementAcctRecord shall be added to the log after logStopTime.

7.2.2.4 Service primitives

Table 6 describes services primitives associated with this function.

Table 6 – Settlement accounting log function service primitives

Primitives	Service SMASE	CMISE	Objects
Initiation of a Settlement account request	PT-CREATE	M-CREATE	settlementAcctRequest
Modification of a Settlement account request	PT-SET	M-SET	settlementAcctRequest
Retrieval of Settlement account request attributes	PT-GET	M-GET	settlementAcctRequest
Deletion of a Settlement account request	PT-DELETE	M-DELETE	settlementAcctRequest
Event report filtering	E-MIS-user event report function	M-EVENT-REPORT	interworkingMD-EFD

7.2.3 Settlement log retrieval function

A Settlement account request shall have successfully been performed before a call to this function can be made.

7.2.3.1 Function description

This function enables the interworkingMD to retrieve attributes from a settlementAcctLog object and to retrieve attributes from settlementAcctRecord objects.

7.2.3.2 Parameters

Parameters correspond to the attributes of a settlementAcctLog managed object.

7.2.3.3 References

CCITT Rec. X.735 | ISO/IEC 10164-6.

7.2.3.4 Service primitives

Table 7 describes services primitives associated with this function.

Table 7 – Settlement log retrieval function service primitives

Primitives	Service SMASE	CMISE	Objects
Retrieval of Settlement log attributes	PT-GET	M-GET	settlementAcctLog
Retrieval of Settlement log records	PT-GET	M-GET	settlementAcctRecord

7.3 Customer accounting services

7.3.1 Customer accounting log function

7.3.1.1 Function description

This function enables an MIS-user to:

- create, delete, and modify a data collection for Customer accounting;
- retrieve customer acctRecord.

The content of a customerAcctRecord is not defined in this Recommendation | International Standard. Such information may be subject to a Customer accounting policy agreements between the Customer and the MIS-provider and is therefore not subject to standardization.

7.3.1.2 Parameters

Parameters correspond to the attributes of the customerAcctLog managed object.

7.3.1.3 References

CCITT Rec. X.735 | ISO/IEC 10164-6.

7.3.1.4 Service primitives

Table 8 describes services primitives associated with this function.

Table 8 – Customer accounting log function service primitives

Primitives	Service SMASE	CMISE	Objects
Initiation of data collection	PT-CREATE	M-CREATE	customerAcctLog
Modification of a data collection	PT-SET	M-SET	customerAcctLog
Deletion of a data collection	PT-DELETE	M-DELETE	customerAcctLog
Retrieval of customer accounting records	PT-GET	M-GET	customerAcctRecord

7.3.2 Customer account request function

7.3.2.1 Function description

The Customer account request function enables a Customer to request the availability of a customerAcctLog managed object. This function is derived from the generic Service request function defined in this Recommendation | International Standard.

7.3.2.2 Parameters

The following parameters are defined for this service, in addition to those described for the Service request function:

- logStartTime;
- logStopTime;
- logId;
- customerAcctPolicy.

7.3.2.2.1 logStartTime

This parameter represents the starting time for logging of Customer accounting information.

7.3.2.2.2 logStopTime

This parameter represents the stopping time for logging of Customer accounting information.

7.3.2.2.3 logId

This log identifier is provided by the MIS provider in response to the Customer account request.

7.3.2.2.4 customerAcctPolicy

This parameter identifies which policy is used for Customer accounting purposes.

NOTE – The definition of possible values of this parameter is out of the scope of this Recommendation | International Standard.

7.3.2.3 Behaviour

7.3.2.3.1 Negotiation

The negotiation between the Customer and the MIS-user is as described in the Service request behaviour. Values of limitValidityDate, startUpDate, logStartTime and logStopTime attributes may be negotiated between the Customer and the MIS-provider:

- logStartTime should be less or equal than startUpDate;
- logStopTime should be greater than logStartTime.

7.3.2.3.2 Performance of the request

When startUpDate is reached, the MIS-provider supplies a logging identifier as follow:

- if logStartTime is equal to startUpDate, the MIS-provider provides the log identifier of a customerAcctLog object which contains customerAcctRecord objects;
- if logStartTime is less than startUpDate, the MIS-provider provides the log identifier of a customerAcctLog which contains all customerAcctRecord logged since logStartTime up to startUpDate (if this time is less than logStopTime) or logStopTime (if this time is less than StartUpDate).

No additional customerAcctRecord instances shall be added to the customerAcctLog object after logStopTime.

7.3.2.4 Service primitives

Table 9 describes services primitives associated with this function.

Table 9 – Customer account request function service primitives

Primitives	Service SMASE	CMISE	Objects
Initiation of a Customer account request	PT-CREATE	M-CREATE	customerAcctRequest
Modification of a Customer account request	PT-SET	M-SET	customerAcctRequest
Retrieval of Customer account request attributes	PT-GET	M-GET	customerAcctRequest
Deletion of a Customer account request	PT-DELETE	M-DELETE	customerAcctRequest
Event report filtering	E-MIS-user event report function	M-EVENT-REPORT	interworkingMD-EFD

7.3.3 Customer log retrieval function

The Customer account request function must have successfully been used before a call to this function can be made.

7.3.3.1 Function description

This function enables a Customer to retrieve attributes from a customerAcctLog object and to retrieve attributes from a number of customerAcctRecord objects.

7.3.3.2 Parameters

Parameters correspond to the attributes of a customerAccountLog managed object.

7.3.3.3 References

CCITT Rec. X.735 | ISO/IEC 10164-6.

7.3.3.4 Service primitives

Table 10 describes services primitives associated with this function.

Table 10 – Customer log retrieval function service primitives

Primitives	Service SMASE	CMISE	Objects
Retrieval of Customer accounting log attributes	PT-GET	M-GET	customerAcctLog
Retrieval of Customer accounting log records	PT-GET	M-GET	customerAcctRecord

7.4 MHS events logging services

7.4.1 MHS events log function

7.4.1.1 Function description

This function enables an MIS-user to retrieve attributes from mhsEventLog and to retrieve MHS events records.

7.4.1.2 Parameters

Parameters correspond to the attributes of the mhsEventLog managed object.

7.4.1.3 References

CCITT Rec. X.735 | ISO/IEC 10164-6.

7.4.1.4 Service primitives

Table 11 describes services primitives associated with this function.

Table 11 – MHS events log function service primitives

Primitives	Service SMASE	CMISE	Objects
Retrieval of log attributes	PT-GET	M-GET	mhsEventLog
Retrieval of events	PT-GET	M-GET	bindEventRecord messageEventRecord

8 Logging model

The functional model of MHS logging is based on the OSI managed objects, functions, and services as defined by OSI management information model CCITT Rec. X.700 and ISO/IEC 7498-4.

To provide the MHS Events logging services, each MHS entity (e.g. MTA, MS, AU and UA) maintains at least one instance of object class mhsEventLog. Each log instance records the resources used by individual entities in processing messages. These logs are entity-specific.

To provide the Customer accounting services to a Customer, at least one customerAcctLog instance is maintained for that Customer.

To provide the Settlement accounting services to a MD, at least one settlementAcctLog is maintained for that MD.

Conditions under which a log is created are specified in 9.1.

Conditions under which a record is placed in the logs are specified in 9.2.

8.1 Class hierarchy

The entity-specific and MIS management domain-specific logs are MHS managed object whose class definitions are derived from the log object class defined in CCITT Rec. X.721 | ISO/IEC 10165-2. Information in the logs are organized in log records. These are instances of record object classes whose are derived from the eventRecord object class defined in CCITT Rec. X.721 | ISO/IEC 10165-2.

Figure 3 shows the inheritance tree of the object classes defined in this Recommendation | International Standard.

NOTE – The messageEventRecord subtypes are organized around their respective port type in a MHS system. This is not because the records are tied in any way to the ports, but rather because information in the various MHS reference documents are usually presented according to the port they are related to. In this way, all events occurring at a given port, produce the same object class. The particularities of the event are recorded using conditional packages in the relevant object. In a way, it is as if the last branch of the inheritance process was achieved using conditional packages instead of the usual inheritance mechanisms. This was done so that the information regarding events occurring at a particular port would stay grouped together, like in the other reference documents on MHS.

8.2 Name hierarchy

The containment relationship defined in CCITT Rec. X.720 | ISO/IEC 10165-1 is used for naming instances of logs and records.

The following diagram shows the name hierarchy for log and record instances. Multiple instances of the same class are illustrated by suspension points ("...") following the named object.

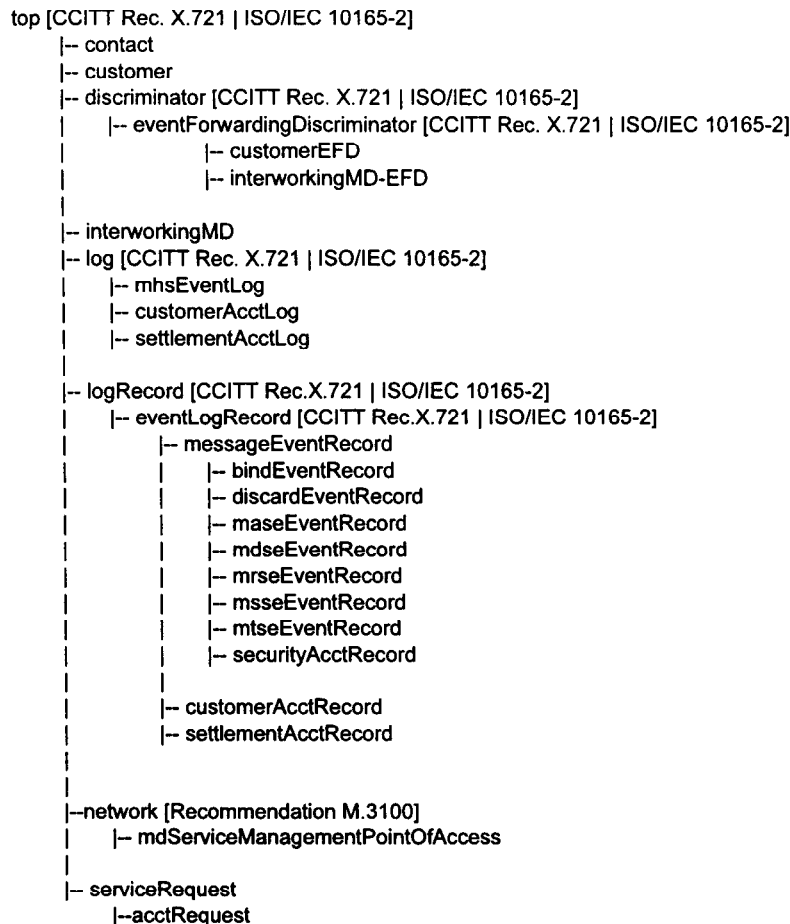


Figure 3 – Object Inheritance Diagram

The name binding in GDMO notation is specified in clause 17 and is shown here in Figure 4.

NOTES

- 1 This naming tree is not complete and should not be taken as normative.
- 2 This specification of the logs and records does not define how these objects are implemented. An implementation may use only one database table to capture all information required by various logs and yet offer standard interfaces through which users can retrieve information as if individual logs existed.
- 3 The logs are designed to provide a view of what is happening in the system from a specific component's point of view. In a co-located entity, there may be only one log with different access functions, depending which part of the co-located entity is looking at it. Or an implementor might decide to provide a separate log for each part of the co-located entity. It is not the intent of this Recommendation | International Standard to dictate which approach should be used, or if one is better than all the others. This is left for the implementor to decide. But the individual integrity of the various views must be preserved. Operations on the log by one part of the co-located entity must not restrict the view from another part without an agreement of the two parts to do so. As an example of this, in a co-located UA-MS where the mhsEventLog is implemented as a single log with two views, the UA part cannot delete the log as this would also destroy the MS's log and therefore violate integrity. Unless, of course, the MS happened to also request deletion of the log, in which case there would be no problem. How such situations are resolved is left for the implementor to decide as it will depend greatly on the way the logs and the views associated with them have been implemented. But in any case, operations on one view must not disturb the other(s).

9 Creation conditions

9.1 Log creation conditions

It is outside the scope of this Recommendation | International Standard to specify the conditions under which settlementAcctLog and customerAcctLog creation/deletion functions are invoked. The mhsEventLog shall be created when conditions demand that MHS events be logged. All these conditions are determined by the accounting policy. Creation or deletion of log managed objects can be the result of a management operation or of a non-standardized operation.

```

misManagementDomain
|-- mdServiceManagementPointOfAccess
|   |-- interworkingMD ...
|   |   |-- acctRequest
|   |   |-- contact
|   |   |-- interworkingMD-EFD
|   |   |-- settlementAcctLog
|   |       |-- settlementAcctRecord ...
|   |-- customer ...
|   |   |-- acctRequest
|   |   |-- contact
|   |   |-- customerEFD
|   |   |-- customerAcctLog
|   |       |-- customerAcctRecord ...
|-- mta ...
|   |-- mhsEventLog
|   |   |-- bindEventRecord ...
|   |   |-- discardEventRecord ...
|   |   |-- maseEventRecord ...
|   |   |-- mdseEventRecord ...
|   |   |-- msseEventRecord ...
|   |   |-- mtseEventRecord ...
|   |   |-- securityAcctRecord ...
|-- ms ...
|   |-- mhsEventLog
|   |   |-- bindEventRecord ...
|   |   |-- maseEventRecord ...
|   |   |-- mdseEventRecord ...
|   |   |-- msseEventRecord ...
|   |   |-- mrseEventRecord ...
|   |   |-- securityAcctRecord ...
|-- ua ...
|   |-- mhsEventLog
|   |   |-- bindEventRecord ...
|   |   |-- maseEventRecord ...
|   |   |-- mdseEventRecord ...
|   |   |-- msseEventRecord ...
|   |   |-- mrseEventRecord ...
|   |   |-- securityAcctRecord ...
|-- au ...
|   |-- mhsEventLog
|   |   |-- bindEventRecord ...
|   |   |-- maseEventRecord ...
|   |   |-- mdseEventRecord ...
|   |   |-- msseEventRecord ...
|   |   |-- mrseEventRecord ...
|   |   |-- securityAcctRecord ...

```

Figure 4 – Name binding

9.2 Record creation conditions

This clause lists conditions under which records are created in the entity-specific logs (i.e. mhsEvent log) and the MIS management domain-specific logs (i.e. customerAcct log and settlementAcct log).

9.2.1 Entity-specific record creation events

The records in entity-specific logs are created as follows:

- A BindEvent record is created when a Bind is completed (whether successfully or unsuccessfully). The record creation occurs even if the Bind was not realized through OSI protocols. Errors occurring in the underlying communication system shall be dealt with by that system's own MIS.
- An UnBindEvent record is created when an UnBind is completed. The record creation occurs even if the UnBind was not realized through OSI protocols.

- c) A messageEvent record is created when an MHS abstract operation is completed (whether successfully or unsuccessfully). The record creation occurs even if the MHS abstract operation was not realized through OSI protocols. Errors occurring in the underlying communication system shall be dealt with by that system's own MIS.
- d) A discardEvent record is created whenever a MTA determines that the MTS cannot deliver a message or report. The discardEvent record is also created whenever the MTA determines that the MTS cannot affirm a probe.
- e) A securityAcct record is created when a security event is detected as required by the security policy in force.

NOTE 1 – Items c) and d) imply that, for each message, probe, or report, processed by an MTA, at least one of the mtseEvent record, mdseEvent record or a discardEvent record is created. In case of multi-recipients message, probe or report more than one such records may be created.

Tables 12a and 12b specify events that trigger the creation of records in mhsEvent log. Table 12a describes successful interactions, Table 12b describes error events. Tables 12a and 12b specify the events (first column) that trigger the entities (first row) to create log records. An empty table entry shows that no record is created in that entity for that corresponding event. Non-empty table entry shows that one record shall be created. The entry is the clause number in which the class of the created record is defined.

In the case of co-located entities, some situations may not give rise to the generation of MHS Abstract operations, but rather to the activation of some internal mechanism. In such cases the implementation shall record internal activities where they are equivalent to Message Submission, Probe Submission, Message Delivery and Report Delivery operations. Internal activities which correspond to the equivalent of other standardized MHS Abstract operations described in Tables 12a and 12b may but need not to be recorded.

NOTE 2 – Other internal events may be recorded but are not standardized.

If a probe or a message is split (e.g. for transfer out to multiple MTAs), one mhsEventRecord shall be generated for each message-transfer-out event.

Table 12a – Entity-Specific non-error events record creation

The following events are defined in ITU-T Rec. X.411 | ISO/IEC 10021-4 clause 8

Event	mta	ua	ms	au
MTS-bind (from MTS-user or MTS) successful completion	10.6.1	10.6.1	10.6.1	10.6.1
MTS-unbind (from MTS-user or MTS)	10.6.1	10.6.1	10.6.1	10.6.1
Message Submission operation successful completion	10.6.7	10.6.7	10.6.7	10.6.7
Probe Submission operation successful completion	10.6.7	10.6.7	10.6.7	10.6.7
Cancel Deferred Delivery operation successful completion	10.6.7	10.6.7	10.6.7	10.6.7
Submission Control operation successful completion	10.6.7	10.6.7	10.6.7	10.6.7
Message Delivery operation successful completion	10.6.4	10.6.4	10.6.4	10.6.4
Report Delivery operation successful completion	10.6.4	10.6.4	10.6.4	10.6.4
Delivery Control operation successful completion	10.6.4	10.6.4	10.6.4	10.6.4
Register operation successful completion	10.6.3	10.6.3	10.6.3	10.6.3
Change credentials (from MTS-user) operation successful completion	10.6.3	10.6.3	10.6.3	10.6.3

The following events are defined in ITU-T Rec. X.411 | ISO/IEC 10021-4 clause 12

Event	mta	ua	ms	au
MTA-bind (to or from another MTA) operation successful completion	10.6.1			
MTA-unbind (to or from another MTA)	10.6.1			
Message Transfer out (to another MTA) operation successful completion	10.6.8			
Probe Transfer out (to another MTA) operation successful completion	10.6.8			
Report Transfer out (to another MTA) operation successful completion	10.6.8			
Message transfer in (from another MTA) operation successful completion	10.6.8			
Probe Transfer in (from another MTA) operation successful completion	10.6.8			
Report Transfer in (from another MTA) operation successful completion	10.6.8			

The following events are defined in ITU-T Rec. X.413 | ISO/IEC 10021-5 clauses 7 and 8 and also from ITU-T Rec. X.411 | ISO/IEC 10021-4 clause 8

Event	mta	ua	ms	au
MS-bind successful completion		10.6.1	10.6.1	
MS-unbind		10.6.1	10.6.1	
Summarize operation successful completion		10.6.6	10.6.6	
List operation successful completion		10.6.6	10.6.6	
Fetch operation successful completion		10.6.6	10.6.6	
Delete operation successful completion		10.6.6	10.6.6	
Register-MS operation successful completion		10.6.6	10.6.6	
Alert operation successful completion		10.6.6	10.6.6	
Message-Indirect-Submission (to MS) operation successful completion		10.6.7	10.6.7	
Probe-Indirect-Submission (to MS) operation successful completion		10.6.7	10.6.7	
Cancel Deferred Delivery (to MS) operation successful completion		10.6.7	10.6.7	
Submission Control (to MS) operation successful completion		10.6.7	10.6.7	
Delivery Control (to MS) operation successful completion		10.6.4	10.6.4	
Register (to MS) operation successful completion		10.6.3	10.6.3	
Change credentials (from UA) operation successful completion		10.6.3	10.6.3	
Change credentials (from MS) operation successful completion		10.6.3	10.6.3	

Table 12b – Entity-specific errors events record creation

The following events are defined in ITU-T Rec. X.411 | ISO/IEC 10021-4 clause 8

Event	mta	ua	ms	au
MTS-bind (from MTS-user or MTS) error	10.6.1	10.6.1	10.6.1	10.6.1
Message Submission operation error	10.6.7	10.6.7	10.6.7	10.6.7
Probe Submission operation error	10.6.7	10.6.7	10.6.7	10.6.7
Cancel Deferred Delivery operation error	10.6.7	10.6.7	10.6.7	10.6.7
Submission Control operation error	10.6.7	10.6.7	10.6.7	10.6.7
Message Delivery operation error	10.6.4	10.6.4	10.6.4	10.6.4
Report Delivery operation error	10.6.4	10.6.4	10.6.4	10.6.4
Delivery Control operation error	10.6.4	10.6.4	10.6.4	10.6.4
Register operation error	10.6.3	10.6.3	10.6.3	10.6.3
Change Credentials (from MTS-user) operation error	10.6.3	10.6.3	10.6.3	10.6.3

The following events are defined in ITU-T Rec. X.411 | ISO/IEC 10021-4 clause 14

Event	mta	ua	ms	au
MTA-bind (to or from another MTA) error	10.6.1			
Non-delivery decision of a Message or a Report (Discard event)	10.6.2			
Non-affirmation of a Probe decision (Discard event)	10.6.2			

The following events are defined in ITU-T Rec. X.413 | ISO/IEC 10021-5 clauses 7 and 8 and also from ITU-T Rec. X.411 | ISO/IEC 10021-4 clause 8

Event	mta	ua	ms	au
MS-bind error		10.6.1	10.6.1	
Summarize operation error		10.6.6	10.6.6	
List operation error		10.6.6	10.6.6	
Fetch operation error		10.6.6	10.6.6	
Delete operation error		10.6.6	10.6.6	
Register-MS operation error		10.6.6	10.6.6	
Alert operation error		10.6.6	10.6.6	
Message-Indirect-Submission (to MS) operation error		10.6.7	10.6.7	
Probe-Indirect-Submission (to MS) operation error		10.6.7	10.6.7	
Cancel Deferred Delivery (to MS) operation error		10.6.7	10.6.7	
Submission Control (to MS) operation error		10.6.7	10.6.7	
Delivery Control (to MS) operation error		10.6.4	10.6.4	
Register (to MS) operation error		10.6.3	10.6.3	
Change Credentials (from UA) operation error		10.6.3	10.6.3	
Change Credentials (from MS) operation error		10.6.3	10.6.3	
NOTES				
1 On receipt of an event, two objects may be created: one at the MTA and one at either the UA, the MS, or the AU, whichever is most appropriate for the event.				
2 Records of the internal processes of a MS or a UA are for further study.				

9.2.2 MIS management domain-specific record creation

All records in MIS management domain-specific logs are created based on accounting policy established among domains involved. As a result, the events that trigger the creation of records in MIS management domain-specific logs is not standardized.

SECTION 3 – MANAGEMENT INFORMATION MODEL

10 Definition of managed object classes

The following definitions are given using the GDMO notation defined in CCITT Rec. X.722 | ISO/IEC 10165-4.

10.1 acctRequest

This managed object is used to represent the generic Service request described in 7.1. Conditional packages provide specific instances with capabilities for either the Settlement account service of 7.2 or the Customer account service of 7.3.

NOTE – In digression with what was stated in clause 5, this subclause has been kept at the upper level of structure within clause 10 because the object is subordinate to more than one other defined in this Recommendation | International Standard (see Figure 4).

acctRequest MANAGED OBJECT CLASS

DERIVED FROM serviceRequest;

CHARACTERIZED BY acctRequestPackage;

CONDITIONAL PACKAGES

customerAcctRequestPackage

PRESENT IF "the object is created to represent a Customer accounting request",

settlementAcctRequestPackage

PRESENT IF "the object is created to represent a Settlement accounting request";

REGISTERED AS { MhsAcctObjectIdentifiers.id-moc-acctRequest };

10.2 contact

The Contact managed object class refers to a person or organization having responsibility for one or more managed object instances.

NOTE – In digression with what was stated in clause 5, this subclause has been kept at the upper level of structure within clause 10 because the object is subordinate to more than one other defined in this Recommendation | International Standard (see Figure 4).

contact MANAGED OBJECT CLASS

DERIVED FROM "Rec. X.721 | ISO/IEC 10165-2":top;

CHARACTERIZED BY

commonCreationDeletionPackage,
contactPackage,
"Rec. M3100":locationNamePackage;

REGISTERED AS {MhsAcctObjectIdentifiers.id-moc-contact};

10.3 customer

The Customer managed object class describes a Customer of an MD.

customer MANAGED OBJECT CLASS

DERIVED FROM "Rec. X.721 | ISO/IEC 10165-2":top;

CHARACTERIZED BY commonCreationDeletionPackage, customerPackage;

REGISTERED AS { MhsAcctObjectIdentifiers.id-moc-customer };

10.3.1 customerAcctLog

This object enables, for each Customer of an MD, to record accounting information. An instance, at least, of this log shall be created for each customer who has subscribed to the Customer Accounting service.

customerAcctLog MANAGED OBJECT CLASS

DERIVED FROM "Rec. X.721 | ISO/IEC 10165-2":log;

CHARACTERIZED BY commonCreationDeletionPackage;

REGISTERED AS { MhsAcctObjectIdentifiers.id-moc-customerAcctLog };

10.3.1.1 customerAcctRecord

This object enables to record customer accounting information. One record shall be created for each transaction with the customer.

NOTE – The structure of the information contained within such records is for further study.

customerAcctRecord MANAGED OBJECT CLASS

DERIVED FROM "Rec. X.721 | ISO/IEC 10165-2":eventLogRecord;

REGISTERED AS { MhsAcctObjectIdentifiers.id-moc-customerAcctRecord };

10.3.2 customerEFD

This managed object is used to represent the criteria that shall be satisfied by potential events reports before the event report is forwarded to a Customer.

customerEFD MANAGED OBJECT CLASS

DERIVED FROM "Rec. X.721 | ISO/IEC 10165-2":eventForwardingDiscriminator;

CHARACTERIZED BY customerEFDPackage;

REGISTERED AS { MhsAcctObjectIdentifiers.id-moc-customerEFD };

10.4 interworkingMD

The interworkingMD managed object class refers to a MHS management domain that has settlement arrangements with the managed MHS management domain.

interworkingMD MANAGED OBJECT CLASS

DERIVED FROM "Rec. X.721 | ISO/IEC 10165-2":top;

CHARACTERIZED BY

commonCreationDeletionPackage,
interworkingMDPackage;

REGISTERED AS { MhsAcctObjectIdentifiers.id-moc-interworkingMD };

10.4.1 interworkingMD-EFD

This managed object is used to represent the criteria that shall be satisfied by potential events reports before the event report is forwarded to an interworkingMD.

interworkingMD-EFD MANAGED OBJECT CLASS

DERIVED FROM "Rec. X.721 | ISO/IEC 10165-2":eventForwardingDiscriminator;

CHARACTERIZED BY

commonCreationDeletionPackage,
interworkingMD-EFDPackage;

REGISTERED AS { MhsAcctObjectIdentifiers.id-moc-interworkingMD-EFD };

10.4.2 settlementAcctLog

This object enables, for each InterworkingMD of an MD, to record accounting information. An instance, at least, of this log shall be created for each InterworkingMD.

settlementAcctLog MANAGED OBJECT CLASS

DERIVED FROM "Rec. X.721|ISO/IEC 10165-2":log;

CHARACTERIZED BY

commonCreationDeletionPackage;

REGISTERED AS { MhsAcctObjectIdentifiers.id-moc-settlementAcctLog };

10.4.2.1 settlementAcctRecord

Information captured in the settlementAcctRecord enables to support the "estimated accounting method" and the "exact accounting method" specified in Recommendation D.36. Information captured is sufficient to produce the "account statement" specified in Annex D/D.36.

NOTE – The comments next to the attributes refer to components of the formulae in 6.1/D.36 and 6.2.2.1/D.36.

settlementAcctRecord MANAGED OBJECT CLASS

DERIVED FROM "Rec. X.721 | ISO/IEC 10165-2":eventLogRecord;

CHARACTERIZED BY settlementAcctRecordPackage;

CONDITIONAL PACKAGES

originatingDomainTransferOutPackage

PRESENT IF "subject message is transferred out by the originating domain",

transitDomainTransferOutPackage

PRESENT IF "subject message is transferred out by the transit domain",

destinationDomainDeliveryPackage

PRESENT IF "subject message is delivered",

d36-commonAttributesPackage

PRESENT IF

"the settlementAcctPolicy attribute references D.36",

d36-deliveryViaAccessUnitPackage

PRESENT IF

"the settlementAcctPolicy attribute references D.36 and the record is created regarding a message being delivered via one or many delivery services (fax, PDS, telex, etc.)";

d36-directDeliveryPackage

PRESENT IF

"the settlementAcctPolicy attribute references D.36 and the record is created regarding a message being delivered to UAs belonging to the ADMD or to PRMDs that are clients of the ADMD.";

REGISTERED AS { MhsAcctObjectIdentifiers.id-moc-settlementAcctRecord };

10.5 mdServiceManagementPointOfAccess

The mdServiceManagementPointOfAccess object class provides a point of access to a subset of MHS management services and MHS management information. Such services and information may be provided to MIS-users, Customers and Interworking management domains of an MD.

mdServiceManagementPointOfAccess MANAGED OBJECT CLASS

DERIVED FROM "Rec. M.3100":Network;

CHARACTERIZED BY mdServiceManagementPointOfAccessPackage;

REGISTERED AS { MhsAcctObjectIdentifiers.id-moc-mdServiceMgtPOA };

10.6 mhsEventLog

This object enables to record bindAcctRecord, MASEAcctRecord, messageAcctRecord, changeAutoRecord, MRSEAcctRecord and alertRecord.

mhsEventLog MANAGED OBJECT CLASS

DERIVED FROM "Rec. X.721 | ISO/IEC 10165-2":log;
CHARACTERIZED BY commonCreationDeletionPackage;

REGISTERED AS { MhsAcctObjectIdentifiers.id-moc-mhsEventLog };

10.6.1 bindEventRecord

This record enables to capture information related to a Bind or Unbind abstract operation.

bindEventRecord MANAGED OBJECT CLASS

DERIVED FROM messageEventRecord;
CHARACTERIZED BY bindEventRecordPackage;
CONDITIONAL PACKAGES

commonBindArgumentsPackage

PRESENT IF "the record is created following an abstract-bind operation",

mtsBindArgumentsPackage

PRESENT IF "the record is created following a MTSBind abstract-bind operation",

mtaBindArgumentsPackage

PRESENT IF "the record is created following a MTABind abstract-bind operation",

REGISTERED AS { MhsAcctObjectIdentifiers.id-moc-bindEventRecord };

10.6.2 discardEventRecord

This enables to capture information related to one internal operation which causes a message, report, or probe to be discarded. Records of this class are kept in the mhsEventLog.

discardEventRecord MANAGED OBJECT CLASS

DERIVED FROM messageEventRecord;
CHARACTERIZED BY discardEventRecordPackage, processingPackage;
CONDITIONAL PACKAGES

messageTransferPackage

PRESENT IF "the record is created due to a non-delivery operation on a message",

reportTransferPackage

PRESENT IF "the record is created due to a non-delivery operation on a report",

probeTransferPackage

PRESENT IF "the record is created due to an affirmation or non-affirmation operation on a probe";

REGISTERED AS { MhsAcctObjectIdentifiers.id-moc-discardEventRecord };

10.6.3 maseEventRecord

This enables to capture accounting information related to one operation via the administration port of a MS. Records of this class are kept in mhsEventLog.

maseEventRecord MANAGED OBJECT CLASS

DERIVED FROM messageEventRecord;
CHARACTERIZED BY maseEventRecordPackage;
CONDITIONAL PACKAGES

registerPackage

PRESENT IF "the record is created due to register operation",

changeCredentialPackage

PRESENT IF "the record is created due to change credential operation";

REGISTERED AS { MhsAcctObjectIdentifiers.id-moc-maseEventRecord };

10.6.4 mdseEventRecord

This enables to capture accounting information related to one operation via the message-delivery-port of a UA, MTA, MS (, or AU). Records of this class are kept in mhsEventLog.

mdseEventRecord MANAGED OBJECT CLASS

DERIVED FROM messageEventRecord;
CHARACTERIZED BY mdseEventRecordPackage;
CONDITIONAL PACKAGES

messageDeliveryPackage

PRESENT IF "the record is created due to message delivery operation",

messageDeliveryEnvelopePackage
 PRESENT IF "messageDeliveryPackage is present and
 MHS Events Attributes and Envelopes logging function is supported",
reportDeliveryPackage
 PRESENT IF "the record is created due to report delivery operation",
reportDeliveryEnvelopePackage
 PRESENT IF "reportDeliveryPackage is present and
 MHS Events Attributes and Envelopes logging function is supported",
deliveryControlPackage
 PRESENT IF "the record is created due to delivery control operation",
processingPackage
 PRESENT IF "the record is created inside an MTA due to a message delivery or a
 report delivery operation";

REGISTERED AS { MhsAcctObjectIdentifiers.id-moc-mdseEventRecord };

10.6.5 messageEventRecord

This enables to capture information relating to an event, e.g. when an abstract operation defined in X.400-Series of Recommendations is performed. Information captured may be used for, but not limited to, financial accounting management and security management purposes.

messageEventRecord MANAGED OBJECT CLASS
 DERIVED FROM "Rec. X.721|ISO/IEC 10165-2":eventLogRecord;
 CHARACTERIZED BY messageEventRecordPackage;
 CONDITIONAL PACKAGE
tracePackage
 PRESENT IF "it is necessary to record trace information on the message.";

REGISTERED AS { MhsAcctObjectIdentifiers.id-moc-messageEventRecord };

10.6.6 mrseEventRecord

This enables to capture accounting information related to one operation via the message-retrieval-port of a MS. Records of this class are kept in mhsEventLog.

mrseEventRecord MANAGED OBJECT CLASS
 DERIVED FROM messageEventRecord;
 CHARACTERIZED BY mrseEventRecordPackage;
 CONDITIONAL PACKAGES
summarizePackage
 PRESENT IF "the record is created due to summarize operation",
listPackage
 PRESENT IF "the record is created due to list operation",
fetchPackage
 PRESENT IF "the record is created due to fetch operation",
deletePackage
 PRESENT IF "the record is created due to delete operation",
registerMSPackage
 PRESENT IF "the record is created due to register MS operation",
alertPackage
 PRESENT IF "the record is created due to alert operation";

REGISTERED AS { MhsAcctObjectIdentifiers.id-moc-mrseEventRecord };

10.6.7 msseEventRecord

This enables to capture accounting information related to one operation via the message-submission-port of a UA, MTA, MS (, or AU). Records of this class are kept in mhsEventLog.

msseEventRecord MANAGED OBJECT CLASS
 DERIVED FROM messageEventRecord;
 CHARACTERIZED BY msseEventRecordPackage;
 CONDITIONAL PACKAGES
probeSubmissionPackage
 PRESENT IF "the record is created due to probe submission operation",
probeSubmissionEnvelopePackage
 PRESENT IF "probeSubmissionPackage is present and
 MHS Events Attributes and Envelopes logging function is supported",
messageSubmissionPackage
 PRESENT IF "the record is created due to message submission operation",

messageSubmissionEnvelopePackage
PRESENT IF "messageSubmissionPackage is present and
MHS Events Attributes and Envelopes logging function is supported",
cancelDeferredDeliveryPackage
PRESENT IF "the record is created due to cancel deferred-delivery operation",
submissionControlPackage
PRESENT IF "the record is created due to submission control operation";

REGISTERED AS { MhsAcctObjectIdentifiers.id-moc-msseEventRecord };

10.6.8 mtseEventRecord

This enables to capture accounting information related to one operation via the message-transfer-port of a MTA. Records of this class are kept in mhsEventLog.

mtseEventRecord MANAGED OBJECT CLASS
DERIVED FROM messageEventRecord;
CHARACTERIZED BY
mtseEventRecordPackage,
processingPackage;
CONDITIONAL PACKAGES
messageTransferPackage
PRESENT IF "the record is created due to message-transfer operation",
reportTransferPackage
PRESENT IF "the record is created due to report-transfer operation",
probeTransferPackage
PRESENT IF "the record is created due to a probe-transfer operation";

REGISTERED AS { MhsAcctObjectIdentifiers.id-moc-mtseEventRecord };

10.6.9 securityAcctRecord

This managed object enables to record security features of an event that a domain's management policy might want to charge for.

securityAcctRecord MANAGED OBJECT CLASS
DERIVED FROM messageEventRecord;
CHARACTERIZED BY securityAcctRecordPackage;
REGISTERED AS { MhsAcctObjectIdentifiers.id-moc-securityAcctRecord };

10.7 misManagementDomain

The misManagementDomain object class enables to represent an MIS Management Domain.

misManagementDomain MANAGED OBJECT CLASS
DERIVED FROM "Rec. M3010":Network;
REGISTERED AS { MhsAcctObjectIdentifiers.id-moc-misManagementDomain };

10.8 serviceRequest

The serviceRequest managed object provides the mean for an Indirect MIS-user to ask for a special service that is not directly accessible through the interoperable interface. It contains the basic attributes that allow an Indirect MIS-user to request and negotiate dates of application of a requested service.

serviceRequest MANAGED OBJECT CLASS
DERIVED FROM "Rec. X.721 | ISO/IEC 10165-2":top;
CHARACTERIZED BY serviceRequestPackage;
REGISTERED AS { MhsAcctObjectIdentifiers.id-moc-serviceRequest };

11 Definitions of packages

This clause specifies packages definitions for the managed object class definitions of clause 10.