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SERIES X: DATA NETWORKS AND OPEN SYSTEM COMMUNICATION

OSI management – Structure of Management Information

Information technology – Open Systems Interconnection – Structure of management information: Requirements and guidelines for implementation conformance statement proformas associated with OSI management

ITU-T Recommendation X.724

(Previously "CCITT Recommendation")

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FOREWORD

ITU (International Telecommunication Union) is the United Nations Specialized Agency in the field of telecommunications. The ITU Telecommunication Standardization Sector (ITU-T) is a permanent organ of the ITU. Some 179 member countries, 84 telecom operating entities, 145 scientific and industrial organizations and 38 international organizations participate in ITU-T which is the body which sets world telecommunications standards (Recommendations).

The approval of Recommendations by the Members of ITU-T is covered by the procedure laid down in WTSC Resolution No. 1 (Helsinki, 1993). In addition, the World Telecommunication Standardization Conference (WTSC), which meets every four years, approves Recommendations submitted to it and establishes the study programme for the following period.

In some areas of information technology which fall within ITU-T's purview, the necessary standards are prepared on a collaborative basis with ISO and IEC. The text of ITU-T Recommendation X.724 was approved on 5th of October 1996. The identical text is also published as ISO/IEC International Standard 10165-6.

NOTE

In this Recommendation, the expression "Administration" is used for conciseness to indicate both a telecommunication administration and a recognized operating agency.

CONTENTS

Summary

ITU-T Rec. X.724 (1993) | ISO/IEC 10165-6:1994 defines a standard method for specifying the agent and message conformance in a manager-agent Operations System (OS) interaction that uses OSI systems management-based messages. This revision extends ITU-T Rec. X.724 | ISO/IEC 10165-6 to cover the manager end of the interaction. The result of this extension is that the time to carry out interoperability tests between a manager OS from one vendor and an agent OS from another vendor may be reduced because product developers can be provided with more explicit message specification for the manager OS.

Introduction

This Recommendation | International Standard includes the modifications necessary to 10165-6 to cover all types of conformance claims associated with management information and an overview of the situation related to ICS proformas. The major part of the modifications are necessary for claims of conformance for systems supporting management information in the manager role. This Recommendation | International Standard also includes an issues list related to manager role ICS proformas.

The modifications are an attempt to satisfy the following requirements:

- the addition of manager role proformas should have minimal impact on existing ICS proformas;
- the proformas must be flexible enough for all possible conforming implementations;
- the proformas should be as compact as possible;
- the proformas should be easy to reference from Profile Requirements Lists;

Related work

The following related work is being performed to provide the complete framework for manager role ICS proformas:

- Guidance are given in 10040 – SMO on how specifications defining management information should define conformance requirements in the conformance clause.
- The basis for all claims of conformance to a specification are defined in the conformance clause of this Specification. For Specifications defining management information (including SMFs), which can be supported by a system in the manager role, the conformance clauses are being amended to contain a requirement that an implementation identifies the management information it supports in the manager role.
- Standards defining management information include or reference an MCS proforma. A supplier of an implementation should be able to use the MCS proforma to provide a summary of the management information supported in the agent role and/or the manager role.
- Standards defining management information are being amended to provide MICS proformas for all management information defined in those standards.

Current situation

Guidelines for the definition of proformas for conformance claims are defined in this Recommendation | International Standard. These guidelines are currently restricted to agent role conformance claims. Guidelines are given for MCS, MOCS and MRCS proformas.

The MIDS proforma defined in this Recommendation | International Standard cannot be used for conformance claims, it is only used as a building block in the construction of a MOCS proforma.

ICS proformas following these guidelines are currently being developed as amendments to standards defining management information. New standards are expected to include the proformas as they are developed.

Conformance claims for systems supporting the manager role cannot be made using the current MCS, MOCS and MRCS proformas. Manager role proformas are being added in the current standards to allow claims of conformance in the manager role. These proformas and guidelines to use them should be documented in this Recommendation | International Standard to ensure consistent use of manager role ICS proformas in all systems management standards.

Structure for ICS proformas related to OSI Management

A conformance claim for a system supporting management information can be structured in two levels. The first level is a summary of the implemented management information. This information is given in the MCS. The second level is the support of individual management information. This is given in MOCS, MICS and MRCS.

A MICS proforma (Management Information Conformance Statement) must be defined together with any definition of management information if claims in the manager role should be possible. The proforma can be used by an implementation to provide information on the options implemented. It can also be used as the basis for Profile Requirements Lists used in the definition of profiles.

For a system implementing agent role, the claim should include MCS, MOCS and MRCS. For a system implementing manager role, the claim should include MCS and MICS.

The conformance clause of a Specification defining management information should reference an MCS proforma where all requirements for support are explicitly defined. The conformance clause must identify the mandatory requirements and any optional requirements.

Proformas for conformance claims must in general be sufficiently flexible to enable all possible conformance claims allowed by this Specification. For standards defining management information some guidelines for the structure should be given in this Recommendation | International Standard (and in CCITT Rec. X.701 | ISO/IEC 10040).

The MICS proformas include an Additional Information column, that could be used to give information about how the management information is supported. The use of the Additional Information column is described in 5.2.

INTERNATIONAL STANDARD

ITU-T RECOMMENDATION

INFORMATION TECHNOLOGY – OPEN SYSTEMS INTERCONNECTION – STRUCTURE OF MANAGEMENT INFORMATION: REQUIREMENTS AND GUIDELINES FOR IMPLEMENTATION CONFORMANCE STATEMENT PROFORMAS ASSOCIATED WITH OSI MANAGEMENT

1 Scope

This Recommendation | International Standard provides requirements and guidelines for Management Conformance Summary (MCS) proformas, Management Information Conformance Statement (MICS) proformas, Managed Object Conformance Statement (MOCS) proformas, Management Information Definition Statement (MIDS) proformas, and Managed Relationship Conformance Statement (MRCS) proformas and for the specification of these proformas. These proformas are applicable to standards for OSI management including definitions of managed objects. The MCS proforma provides a summary of PICS proforma, MICS proforma, MOCS proforma and MRCS proforma. The PICS is a statement made by an implementor to claim conformance to a protocol specification. The MICS is a statement made by an implementor to claim conformance to management information in the manager role. The MOCS is a statement made by an implementor to claim conformance to a managed object class definition. The MRCS is a statement made by an implementor to claim conformance to a managed relationship definition, such as a name binding definition.

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 International 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 International Standards listed below. Members of IEC and ISO maintain registers of currently valid International Standards. The Telecommunication Standardization Bureau of the ITU maintains a list of currently valid ITU-T Recommendations.

2.1 Identical Recommendations | International Standards

– 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.722 (1992) | ISO/IEC 10165-4:1992, *Information technology – Open Systems Interconnection – Structure of management information: Guidelines for the definition of managed objects.*

2.2 Paired ITU-T Recommendations | International Standards equivalent in technical content

– CCITT Recommendation X.208 (1988), *Specification of Abstract Syntax Notation One (ASN.1).*

ISO/IEC 8824:1990, *Information technology – Open Systems Interconnection – Specification of Abstract Syntax Notation One (ASN.1).*

– CCITT Recommendation X.290 (1992), *OSI conformance testing methodology and framework for protocol Recommendations for CCITT applications – General concepts.*

  ISO/IEC 9646-1:1994, *Information technology – Open Systems Interconnection – Conformance testing methodology and framework – Part 1: General concepts.*

– CCITT Recommendation X.291 (1992), *OSI conformance testing methodology and framework for protocol Recommendations for CCITT applications – Abstract test suite specification.*

  ISO/IEC 9646-2:1994, *Information technology – Open Systems Interconnection – Conformance testing methodology and framework – Part 2: Abstract Test Suite specification.*

– ITU-T Recommendation X.296 (1995), *OSI conformance testing methodology and framework for protocol Recommendations for ITU-T applications – Implementation conformance statements.*

  ISO/IEC 9646-7:1995, *Information technology – Open Systems Interconnection – Conformance testing methodology and framework – Part 7: Implementation Conformance Statements*.

– 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*.

– CCITT Recommendation X.710 (1991), *Common management information service definition for CCITT applications*.

  ISO/IEC 9595:1991, *Information technology – Open Systems Interconnection – Common management information service definition.*

3 Definitions

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

3.1 ASN.1 definitions

This Recommendation | International Standard makes use of the following term defined in CCITT Rec. X.208 and ISO/IEC 8824:

– object identifier.

3.2 Management framework definitions

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

– managed object.

3.3 Conformance testing methodology definitions

This Recommendation | International Standard makes use of the following terms defined in CCITT Rec. X.290 and ISO/IEC 9646-1:

a) Protocol Implementation Conformance Statement (PICS);

b) PICS proforma;

c) system conformance statement.

3.4 Systems management overview definitions

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

a) managed object class;

b) managed object conformance statement;

c) Management Information Conformance Statement (MICS);

d) MICS proforma;

e) MOCS proforma;

f) notification.

3.5 CMIS definitions

This Recommendation | International Standard makes use of the following term defined in CCITT Rec. X.710 and ISO/IEC 9595:

– attribute.

3.6 Management information model definitions

This Recommendation | International Standard makes use of the following terms defined in CCITT Rec. X.720 | ISO/IEC 10165-1:

a) action;

b) actual class;

c) attribute group;

d) behaviour;

e) characteristic;

f) conditional package;

g) instantiation;

h) name binding;

i) package;

j) parameter;

k) superclass;

l) uninstantiable managed object class.

3.7 Guidelines for the definition of managed objects definitions

This Recommendation | International Standard makes use of the following term defined in CCITT Rec. X.722 | ISO/IEC 10165-4:

– template.

3.8 Implementation conformance statements definitions

This Recommendation | International Standard makes use of the following terms defined in ITU-T Rec. X.296 and ISO/IEC 9646-7:

a) (ICS) item;

b) (ICS) question;

c) status (value);

d) (support) answer.

3.9 Additional definitions

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

3.9.1 managed relationship conformance summary (MRCS): A statement by a supplier of a managed relationship implementation, stating the capabilities and options which have been implemented, and any features which have been omitted.

3.9.2 management conformance statement (MCS): A statement by a supplier that identifies an implementation and provides information on whether the implementation claims conformance to any of the listed set of documents that specify conformance requirements to OSI management.

3.9.3 management information definition statement (MIDS) proforma: A document, in the form of a questionnaire which is used in the construction of a MOCS proforma.

3.9.4 MCS proforma: A document, in the form of a questionnaire that when completed by the supplier of an implementation becomes the MCS.

3.9.5 MRCS proforma: A document, in the form of a questionnaire that when completed by the supplier of an implementation becomes the MRCS.

3.9.6 proforma specification: Standardized procedures for constructing a questionnaire that when completed by the supplier of an implementation becomes an implementation conformance statement.

4 Abbreviations

GDMO	Guidelines for the Definition of Managed Objects
ICS	Implementation Conformance Statement
MCS	Management Conformance Summary
MICS	Management Information Conformance Statement
MIDS	Management Information Definition Statement
MOCS	Managed Object Conformance Statement
MRCS	Managed Relationship Conformance Statement
PICS	Protocol Implementation Conformance Statement

5 Requirements and guidelines for specification and completion of proformas

Proforma specifications shall follow the style as documented in the annexes of this Recommendation | International Standard. Proforma specifications shall provide the information required by this Recommendation | International Standard. Additional tables may be included for other information, if needed.

5.1 Structure of proformas

The annexes of this Recommendation | International Standard specify the formats for MCS proforma, MICS proforma, MOCS proforma, MIDS proforma and MRCS proforma for name bindings. Thus, proforma specifications are provided by the annexes of this Recommendation | International Standard. MIDS proforma is used to construct MOCS proforma. The supplier of an implementation then fills in the blanks in the proforma to produce MCS, MICS, MOCS and MRCS for name bindings. Also, this Recommendation | International Standard specifies the format of MRCS proforma for name binding and that are summarized in an MCS proforma.

There are three levels of documentation pertaining to MCS, namely:

a) guidelines or Recommendation | International Standard tools for the production of MCS proformas;

b) an MCS proforma, associated with a standard related to OSI management, which is to be filled in by a supplier of the implementation and when filled in is an MCS – see c) below;

c) an MCS prepared by a supplier of the implementation as part of a conformance claim to a standard related to OSI management.

It is a) that is the subject of this Recommendation | International Standard. MCS proformas b) will be expected to be produced in accordance with the MCS proforma specification in this Recommendation | International Standard.

There are three levels of documentation pertaining to MICS, namely:

a) guidelines or Recommendation | International Standard tools for the production of MICS proformas;

b) a MICS proforma, associated with a standard related to OSI management, which is to be filled in by a supplier of the implementation and when filled in is an MICS – see c) below;

c) a MICS prepared by a supplier of the implementation as part of a conformance claim to a standard related to OSI management.

It is a) that is the subject of this Recommendation | International Standard. MICS proformas b) will be expected to be produced in accordance with the MICS proforma specification in this Recommendation | International Standard.

Similarly, there are three levels of documentation pertaining to MOCS, namely:

a) guidelines or Recommendation | International Standard tools for the production of MOCS proformas;

b) a MOCS proforma, associated with a managed object class definition, which is to be filled in by a supplier of the implementation and when filled in is a MOCS – see c) below;

c) a MOCS prepared by a supplier of the implementation as part of a conformance claim to a managed object definition.

It is a) that is the subject of this Recommendation | International Standard. MOCS proformas b) will be expected to be produced in accordance with the MOCS proforma specification in this Recommendation | International Standard. Uninstantiable managed object classes do not require MOCS proformas.

In addition, there are two levels of documentation pertaining to MIDS, namely:

a) guidelines or Recommendation | International Standard tools for the production of MIDS proformas;

b) a MIDS proforma, which is used to construct a MOCS proforma.

It is a) that is the subject of this Recommendation | International Standard. MIDS proformas b) will be expected to be produced in accordance with the MIDS proforma specification in this Recommendation | International Standard.

In addition, there are three levels of documentation pertaining to MRCS for name bindings, namely:

a) guidelines or Recommendation | International Standard tools for the production of MRCS proformas for name bindings;

b) an MRCS proforma for name bindings, associated with a name binding definition, which is to be filled in by a supplier of the implementation and when filled in is an MRCS – see c) below;

c) an MRCS for name bindings prepared by a supplier of the implementation as part of a conformance claim to a name binding definition.

It is a) that is the subject of this Recommendation | International Standard. MRCS proformas for name bindings b) will be expected to be produced in accordance with the MRCS proforma specification for name bindings in this Recommendation | International Standard.

5.2 General instructions

This Recommendation | International Standard provides instructions to construct MCS proforma specification, MICS proforma specification, MOCS proforma specification, MIDS proforma specification and MRCS proforma specification for name bindings. The annexes of this Recommendation | International Standard contain specification for the MCS proforma, MICS proforma, MOCS proforma, MIDS proforma, and MRCS proforma for name bindings in a tabular form, which uses the status and support columns as well as the notation used for filling in these columns introduced in CCITT Rec. X.291 and ISO/IEC 9646-2.

The purpose of the MCS proforma, MICS proforma, MOCS proforma, MIDS proforma, and MRCS proforma for name bindings is to provide a mechanism whereby a supplier of an implementation including OSI management may provide conformance information in a standard form. The purpose of the Annexes A to R is to provide guidance for proforma specifications.

Annex A contains a proforma for the MCS proforma. Annex B contains a proforma for the MOCS proforma. Annexes C, D, E and F contain proformas for the MIDS proforma for attributes, attribute groups, actions, and notifications, respectively. Annex G contains a proforma for the MRCS proforma for name bindings. Annexes H, I, J, K and L contain proformas for the MICS proforma for attributes, attribute groups, actions, notifications and create and delete, respectively. Annex M contains additional informative guidelines for proforma specification. Annex N contains additional informative guidelines for completion of proformas. Annex O provides an example of a MCS proforma specification, which is to be filled in by a supplier of an implementation. Annex P provides an example of MICS proforma specifications. Annex Q provides an example of a MOCS proforma specification, which is to be filled in by a supplier of an implementation. Annex R provides an example of a MRCS proforma specification for name binding, which is to be filled in by a supplier of an implementation.

The following common notations, defined in CCITT Rec. X.291 and ISO/IEC 9646-2 and ITU-T Rec. X.296 and ISO/IEC 9646-7 are used for the status value column:

m Mandatory

o Optional

c Conditional

x Prohibited

– Not applicable or out of scope

NOTES

1 The notations "c", "m", "o" and "x" are prefixed by a "c:" when nested under a conditional or optional item of the same table.

2 The notation "o" may be suffixed by ".n" (where "n" is a unique number) for mutually exclusive or selectable options among a set of status values. The requirement for this numbered set shall be explicitly stated, preferably in a footnote to the relevant table.

The following common notations, defined in CCITT Rec. X.291 and ISO/IEC 9646-2 and ITU-T Rec. X.296 and ISO/IEC 9646-7 are used for the support answer column:

Y Implemented

N Not implemented

– No answer required

Ig The item is ignored (i.e. processed syntactically but not semantically)

In the status column, the static requirements shall be stated. The status will be as follows:

m For characteristics contained in mandatory packages or in conditional packages if the GDMO condition is always true.

o For characteristics of conditional packages with GDMO conditions that indicate static optionality, e.g. "if instance supports it".

cn For all other conditions, where "n" is a unique integer and "cn" is a reference to a conditional status expression as defined in CCITT Rec. X.291 and ISO/IEC 9646-2 and ITU-T Rec. X.296 and ISO/IEC 9646-7. (One possible form of this conditional status expression uses the answer to a textual question, such as "Does the implementation permit instantiation when {GDMO condition}?". However, when more precise notation can be used, the use of such a textual question is not recommended.).

x For characteristic explicitly prohibited in the definition.

– For characteristics that are not mentioned in the definition.

When the status for a conditional package is or resolves to "m", then the characteristics of the package shall be implemented; and the characteristics are instantiated according to the dynamic rules specified in the GDMO condition associated with the package.

The "Constraints and values" columns of the tables in the annexes (which are to be filled in in the proforma specification if applicable) contain the constraints and values of the specific management information (e.g. name binding, attribute, attribute group, action, action field, notification, and notification field).

The "Additional information" columns of the tables in the annexes (which are to be filled in by the supplier of the implementation if applicable) contain additional information that is necessary for the use of the tables regarding support of the specific management information (e.g. name binding, attribute, attribute group, action, action field, notification, and notification field). This information may include, **if applicable**:

a) any constraints regarding support of the management information;

b) specific values which are supported;

c) index information to reference an attribute, attribute group, action or notification of another MOCS, completed by the supplier of the implementation;

d) mapping of the values of the management information (available at the managed object boundary) to values visible at other interfaces to the underlying resource (of which the management information is an abstraction);

e) clarification of how constraints are met;

f) supported parameters;

g) sufficient information to reference the details of parameter(s), if a particular parameter or parameters are carried in a field of an action or notification;

h) implementation specific constraints of permitted, required, default values and matching rules for attributes;

i) implementation specific constraints of permitted and required values for action and notification arguments;

j) identify the object classes for which the management operation is supported (relevant in MICS proformas);

k) any restrictions in the support for the mapping of management operations to protocol interactions (relevant in MICS proformas);

l) the conditions under which operations are issued and action taken on receipt of the notifications (relevant for MICS proformas).

When management information available at a managed object boundary is claimed to correspond to information available via another interface, then how the value of a piece of management information available at the managed object boundary is related to the information available at the other interface shall be specified in one of the following ways:

a) specified by the standards and referenced as a footnote to the entry in the proforma, and therefore be part of what the supplier of the implementation indicates support of by filling in the support column;

b) required/recommended by the standards to be specified by the supplier of the implementation; in such cases the proforma includes a footnote to the entry that the supplier of the implementation shall/may state the details of availability in the "Additional information" column;

c) left unspecified in the proforma specification and by the supplier of the implementation.

Terminology, notation and concepts for conformance statements are described in CCITT Rec. X.290 and ISO/IEC 9646-1, CCITT Rec. X.291 and ISO/IEC 9646-2, and ITU-T Rec. X.296 and ISO/IEC 9646-7. The tables need to provide details of composite parameters to the level of detail that will remove ambiguity for the support of the subparameters. When the size of a proforma table exceeds the size of a page, the table can be either presented in landscape or split into a number of parts. Guidelines on how to split a table are given in the informative Annex H.

5.3 Instructions for MCS proforma specification

An MCS identifies an implementation and summarizes the PICS, MOCS and MRCS for which conformance is stated. The MCS proforma is formed by copying the MCS proforma specification in Annex A, and extending the tables of A.4, as required; this may include merging information from multiple other MCS proformas. Multiple MCS proformas can be merged into a single MCS (e.g. when combining proforma from more than one document). It is recommended to include additional tables in an MCS proforma to cover any general conformance requirements in a specification. Guidelines on the use of additional tables can be found in Annex O.

The proforma specification shall have the "Status" columns of all the summary tables filled in according to the base specification requirements. The Status column in these support summary tables is used to indicate whether the supplier of an implementation is required to complete the referenced tables or referenced items. Detailed conformance requirements are specified in the referenced tables or referenced items and are not changed by the value of the support summary Status column. To form an MCS from an MCS proforma a supplier of the implementation shall provide appropriate information in the boxes provided and also fill in the "Support" and, if appropriate, the "Additional

information" column of all the summary tables in the MCS proforma. The supplier of the implementation shall also fill in the table numbers of the completed tables which correspond to the table numbers of the identified source document, if the table numbers are different.

Refer to CCITT Rec. X.291 and ISO/IEC 9646-2 for instructions for PICS proforma specification. Refer to 5.4 for instructions for MOCS proforma specification. Also, 5.6 provides instructions for MRCS proforma for name bindings.

5.4 Instructions for MOCS proforma specification

The MOCS proforma specification is formed by copying Annex B, completing the tables except for the "Support" and "Additional information" columns, and extending the remaining tables to meet the requirements of the specification. MOCS for multiple managed object classes do not have to be documented in the same annex as long as the tables for each class are contiguous and separated from the tables for other classes. MOCS proforma shall provide tables for all the attributes, attribute groups, actions, notifications and parameters which are included in the managed object class definition whether derived from superclasses or added by refinement. The information in a MOCS proforma is obtained from base standards, MIDS proforma and other MOCS proforma. Refer to 5.5 for instructions for MIDS proforma specification.

To form a MOCS from a MOCS proforma, the supplier of the implementation shall fill in the "Support" and, if appropriate, "Additional information" columns of all the tables in the MOCS proforma.

a) *Managed object class support table* – The proforma specification shall have filled in Columns 1 (Index), 2 (Managed object class template label), and 3 (Value of object identifier for class). The supplier of the implementation shall state whether or not all the mandatory features of the identified managed object class are supported in Column 4 (Support of all mandatory features), and shall state whether or not the actual class is the same as the managed object class to which conformance is claimed in Column 5. If the answer to the actual class question is no, the supplier of the implementation shall fill in the actual class support table provided.

b) *Attribute support table* – The proforma specification shall have filled in Columns 1 (Index), 2 (Attribute template label), 3 (Value of object identifier for attribute), 5 (Status-Set by create), 7 (Status-Get), 9 (Status-Replace), 11 (Status-Add), 13 (Status-Remove), 15 (Status-Set to default) and, if applicable, 4 (Constraints and values). If the behaviour of the managed object specifies that a Create cannot set the value of the attribute or if a mandatory initial value is specified, then the proforma specification shall specify "x" for the status of the "Status-Set by create" column. Otherwise, if the attribute is replaceable or the behaviour of the managed object class specifies that the attribute is settable by Create, then the proforma specification shall specify "m" for the status of the "Status-Set by create" column. Otherwise, if the managed object class definition does not mention whether the attribute is settable by Create, the proforma shall specify "–" for the status of the "Status-Set by create" column. Otherwise, the proforma shall specify "o" or "cn" for the status of the "Status-Set by create" column as appropriate for the managed object class definition. The supplier of the implementation shall state whether or not the attributes specified by all the packages instantiated in a managed object class definition are supported and shall indicate support for each of the operations for each attribute supported by filling in Columns 6 (Support-Set by create), 8 (Support-Get), 10 (Support-Replace), 12 (Support-Add), 14 (Support-Remove), 16 (Support-Set to default), and, if appropriate, 17 (Additional information).

c) *Attribute group support table* – The proforma specification shall have filled in Columns 1 (Index), 2 (Attribute group template label), 3 (Value of object identifier for attribute group), 5 (Status-Get), 7 (Status-Set to default) and, if applicable, 4 (Constraints and values). The supplier of the implementation shall state whether or not the attribute groups specified by all the packages instantiated in a managed object class definition are supported and shall indicate support for each of the operations for each attribute group supported by filling in Columns 6 (Support-Get), 8 (Support-Set to default), and, if appropriate, 9 (Additional information).

d) *Action support table* – The proforma specification shall have filled in Columns 1 (Index), 2 (Action template label), 3 (Value of object identifier for action type), 5 (Status), 8 (Subindex), 9 (Action field name label), 11 (Status) and, if applicable, 4 (Constraints and values) and 10 (Constraints and values). For each action, the proforma specification shall specify the requirements for each action argument in the subindex rows. The supplier of the implementation shall state whether or not the actions specified by all packages instantiated in a managed object of this class are supported by filling in Columns 6 (Support), 12 (Support), and if appropriate, 7 (Additional information) and 13 (Additional information).

e) *Notification support table* – The proforma specification shall have filled in Columns 1 (Index), 2 (Notification template label), 3 (Value of object identifier for notification type), 5 (Status), 9 (Subindex), 10 (Notification field name label), 11 (Value of object identifier of attribute type associated with field), 13 (Status) and, if applicable, 4 (Constraints and values) and 12 (Constraints and values). For each notification, the proforma specification shall specify the requirements for each notification argument in the subindex rows. The supplier of the implementation shall state whether or not the notifications specified by all packages instantiated in a managed object of this class are supported by filling in Columns 6 (Support-Confirmed), 7 (Support-Non-confirmed), 12 (Support) and, if appropriate, 8 (Additional information) and 13 (Additional information).

f) *Parameter support table* – The proforma specification shall have filled in Columns 1 (Index), 2 (Parameter template label), 3 (Value of object identifier for parameter), 5 (Status) and, if applicable, 4 (Constraints and values). The supplier of the implementation shall state whether or not the parameters specified by all the packages instantiated in a managed object of this class are supported by filling in Columns 6 (Support) and, if appropriate, 7 (Additional information).

5.5 Instructions for MIDS proforma specification

The MIDS proforma are specified to ensure consistent use of generic management information that is common to many managed object classes. MIDS proforma provide a means of specifying what a MOCS specification imports in order to comply with the document that specifies the MIDS proforma.

The status values specified within the MIDS proformas indicate what needs to be supported to comply with the generic definition. These requirements can only be made stronger (e.g. optional can be mandated) when imported into a specific MOCS proforma.

MIDS proforma by themselves do not specify a complete implementation conformance statement, and therefore cannot be used by the supplier of the implementation to state conformance.

Instructions for MIDS proforma specifications are given in the following subclauses.

5.5.1 Instructions for MIDS proforma specification for attributes

a) *Attribute support table* – The proforma specification shall have filled in Columns 1 (Index), 2 (Attribute template label), 3 (Value of object identifier for attribute), 5 (Status-Set by create), 7 (Status-Get), 9 (Status-Replace), 11 (Status-Add), 13 (Status-Remove), 15 (Status-Set to default) and, if applicable, 4 (Constraints and values). If the behaviour of the managed object specifies that a Create cannot set the value of the attribute or if a mandatory initial value is specified, then the proforma specification shall specify "x" for the status of the "Status-Set by create" column. Otherwise, if the attribute is replaceable or the behaviour of the managed object class specifies that the attribute is settable by Create, then the proforma specification shall specify "m" for the status of the "Status-Set by create" column. Otherwise, if the managed object class definition does not mention whether the attribute is settable by Create, the proforma shal specify "–" for the status of the "Status-Set by create" column. Otherwise, the proforma shall specify "o" or "cn" for the status of the "Status-Set by create" column as appropriate for the managed object class definition. The remaining columns shall remain blank.

b) *Parameter support table* – The proforma specification shall have filled in Columns 1 (Index), 2 (Parameter template label), 3 (Value of object identifier for parameter), 5 (Status) and, if applicable, 4 (Constraints and values). The remaining columns shall remain blank.

5.5.2 Instructions for MIDS proforma specification for attribute groups

a) *Attribute group support table* – The proforma specification shall have filled in Columns 1 (Index), 2 (Attribute group template label), 3 (Value of object identifier for attribute group), 5 (Status-Get), 7 (Status-Set to default) and, if applicable, 4 (Constraints and values). The remaining columns shall remain blank.

b) *Parameter support table* – The proforma specification shall have filled in Columns 1 (Index), 2 (Parameter template label), 3 (Value of object identifier for parameter), 5 (Status) and, if applicable, 4 (Constraints and values). The remaining columns shall remain blank.

5.5.3 Instructions for MIDS proforma specification for actions

a) *Action support table* – The proforma specification shall have filled in Columns 1 (Index), 2 (Action template label), 3 (Value of object identifier for action type), 5 (Status), 8 (Subindex), 9 (Action field name label), 11 (Status) and, if applicable, 4 (Constraints and values) and 10 (Constraints and values). For each action, the proforma specifier shall specify the requirements for each action argument in the subindex rows. The remaining columns shall remain blank.

b) *Parameter support table* – The proforma specification shall have filled in Columns 1 (Index), 2 (Parameter template label), 3 (Value of object identifier for parameter), 5 (Status) and, if applicable, 4 (Constraints and values). The remaining columns shall remain blank.

5.5.4 Instructions for MIDS proforma specification for notifications

a) *Notification support table* – The proforma specification shall have filled in Columns 1 (Index), 2 (Notification template label), 3 (Value of object identifier for notification type), 5 (Status), 9 (Subindex), 10 (Notification field name label), 11 (Value of object identifier of attribute type associated with field), 13 (Status) and, if applicable, 4 (Constraints and values) and 12 (Constraints and values). For each notification, the proforma specifier shall specify the requirements for each notification argument in the subindex rows. The remaining columns shall remain blank.

b) *Parameter support table* – The proforma specification shall have filled in Columns 1 (Index), 2 (Parameter template label), 3 (Value of object identifier for parameter), 5 (Status) and, if applicable, 4 (Constraints and values). The remaining columns shall remain blank.

5.6 Instructions for MRCS proforma specification for name bindings

The MRCS proforma specification for name bindings is formed by copying Annex G, completing the tables except for the "Support" and "Additional information" columns, and extending the tables to meet the requirements of the specification.

To form an MRCS for name bindings from an MRCS proforma for name bindings, the supplier of the implementation shall fill in the "Support" and, if appropriate, "Additional information" columns of all the tables in the MRCS proforma.

a) *Name binding support table* – The proforma specification shall have filled in Columns 1 (Index), 2 (Name binding template label), 3 (Value of object identifier for name binding), 5 (Status), 8 (Subindex), 11 (Status) and, if applicable, 4 (Constraints and values) and 10 (Constraints and values). The supplier of the implementation shall state which name bindings are supported. The supplier of the implementation shall fill in Columns 6 (Support), 12 (Support) and, if applicable 7 (Additional information) and 13 (Additional information).

b) *Parameter support table* – The proforma specification shall have filled in Columns 1 (Index), 2 (Parameter template label), 3 (Value of object identifier for parameter), 5 (Status) and, if applicable, 4 (Constraints and values) The remaining columns shall remain blank.

5.7 Instructions for MICS proforma specification

The MICS proforma is specified to document the detailed conformance requirements for manager role implementations and to enable a supplier of an implementation to claim conformance to the specification in the manager role.

The status values specified within the MICS proformas indicate what needs to be supported to conform to the specification.

Instructions for MICS proforma specifications are given in the following clauses.

5.7.1 Instructions for MICS proforma specification for attributes

The MICS proforma specification for attributes is formed by copying Annex H, completing the tables except for the "Support" and "Additional information" columns, and extending the tables to meet the requirements of the specification.

To form a MICS for attributes from a MICS proforma for attributes, the supplier of the implementation shall fill in the "Support" and, if appropriate, "Additional information" columns of all the tables in the MICS proforma.

a) *Attribute support table* – The proforma specification shall have filled in Columns:

   – 1 (Index);

   – 2 (Attribute template label);

   – 3 (Value of object identifier for attribute);

   – 5 (Status-Set by create).

     If the behaviour of the attribute specifies that a Create cannot set the value of the attribute or if a mandatory initial value is specified, then the proforma specification shall specify "x" for the status of the "Status-Set by create" column. Otherwise, the proforma shall specify "o", "m" or "cn" for the status of the "Status-Set by create" column as appropriate for the conformance requirements of the specification.

   – 7 (Status-Get);

   – 9 (Status-Replace);

   – 11 (Status-Add);

   – 13 (Status-Remove);

   – 15 (Status-Set to default),

   and, if applicable:

   – 4 (Constraints and values).

   The remaining columns shall remain blank in the MICS proforma.

   The supplier of the implementation (in producing the MICS from the MICS proforma) fill in Columns:

   – 6, 8, 10, 12, 14, 16 (Support),

   and, if applicable:

   – 17 (Additional information) – The additional information shall be used to indicate any restrictions in the claim to support attribute oriented operations.

b) *Parameter support table* – The proforma specification shall have filled in Columns:

   – 1 (Index);

   – 2 (Parameter template label);

   – 3 (Value of object identifier for parameter);

   – 5 (Status),

   and, if applicable:

   – 4 (Constraints and values).

   The remaining columns shall remain blank in the MICS proforma.

   The supplier of the implementation (in producing the MICS from the MICS proforma) fill in Columns:

   – 6 (Support),

   and, if applicable:

   – 7 (Additional information).

5.7.2 Instructions for MICS proforma specification for attribute groups

The MICS proforma specification for attribute groups is formed by copying Annex I, completing the tables except for the "Support" and "Additional information" columns, and extending the tables to meet the requirements of the specification.

To form a MICS for attribute groups from a MICS proforma for attribute groups, the supplier of the implementation shall fill in the "Support" and, if appropriate, "Additional information" columns of all the tables in the MICS proforma.

a) *Attribute group support table* – The proforma specification shall have filled in Columns:

- 1 (Index);
- 2 (Attribute group template label);
- 3 (Value of object identifier for attribute group);
- 5 (Status-Get);
- 7 (Status-Set to default),

and, if applicable:

- 4 (Constraints and values).

The remaining columns shall remain blank in the MICS proforma.

The supplier of the implementation (in producing the MICS from the MICS proforma) fill in Columns:

- 6, 8 (Support),

and, if applicable:

- 9 (Additional information) – The additional information shall be used to indicate any restrictions in the claim to support attribute group related operations.

b) *Parameter support table* – The proforma specification shall have filled in Columns:

- 1 (Index);
- 2 (Parameter template label);
- 3 (Value of object identifier for parameter);
- 5 (Status),

and, if applicable:

- 4 (Constraints and values).

The remaining columns shall remain blank in the MICS proforma.

The supplier of the implementation (in producing the MICS from the MICS proforma) fill in Columns:

- 6 (Support),

and, if applicable:

- 7 (Additional information) – The additional information shall be used to indicate any restrictions in the claim to support attribute group related operations.

5.7.3 Instructions for MICS proforma specification for actions

The MICS proforma specification for actions is formed by copying Annex J, completing the tables except for the "Support" and "Additional information" columns, and extending the tables to meet the requirements of the specification.

To form a MICS for notifications from a MICS proforma for actions, the supplier of the implementation shall fill in the "Support" and, if appropriate, "Additional information" columns of all the tables in the MICS proforma.

a) *Action support table* – The proforma specification shall have filled in Columns:

- 1 (Index);
- 2 (Action template label);
- 3 (Value of object identifier for action type);
- 5 (Status);
- 8 (Subindex);
- 9 (Action field name label);
- 11 (Status),

and, if applicable:

- 4 (Constraints and values); and
- 10 (Constraints and values).

For each action, the proforma specifier shall specify the requirements for each action argument in the subindex rows.

The remaining columns shall remain blank in the MICS proforma.

The supplier of the implementation (in producing the MICS from the MICS proforma) fill in Columns:

– 6, 12 (Support),

and, if applicable:

– 7, 13 (Additional information) – The additional information shall be used to indicate any restrictions in the claim to support the actions.

b) *Parameter support table* – The proforma specification shall have filled in Columns:

– 1 (Index);

– 2 (Parameter template label);

– 3 (Value of object identifier for parameter);

– 5 (Status),

and, if applicable:

– 4 (Constraints and values).

The remaining columns shall remain blank in the MICS proforma.

The supplier of the implementation (in producing the MICS from the MICS proforma) fill in Columns:

– 6 (Support),

and, if applicable:

– 7 (Additional information).

5.7.4 Instructions for MICS proforma specification for notifications

The MICS proforma specification for notifications is formed by copying Annex K, completing the tables except for the "Support" and "Additional information" columns, and extending the tables to meet the requirements of the specification.

To form a MICS for notifications from a MICS proforma for notifications, the supplier of the implementation shall fill in the "Support" and, if appropriate, "Additional information" columns of all the tables in the MICS proforma.

a) *Notification support table* – The proforma specification shall have filled in Columns:

– 1 (Index);

– 2 (Notification template label);

– 3 (Value of object identifier for notification type);

– 5 (Status);

– 9 (Subindex);

– 10 (Notification field name label);

– 11 (Value of object identifier of attribute type associated with field);

– 13 (Status),

and, if applicable:

– 4 (Constraints and values); and

– 12 (Constraints and values).

For each notification, the proforma specifier shall specify the requirements for each notification argument in the subindex rows. The remaining columns shall remain blank in the MICS proforma.

The supplier of the implementation (in producing the MICS from the MICS proforma) fill in Columns:

– 6, 7, 14 (Support),

and, if applicable:

– 8,15 (Additional information) – The additional information shall be used to indicate any restrictions in the claim to support the notifications.

b) *Parameter support table* – The proforma specification shall have filled in Columns:

– 1 (Index);

– 2 (Parameter template label);

– 3 (Value of object identifier for parameter);

– 5 (Status),

and, if applicable:

– 4 (Constraints and values).

The remaining columns shall remain blank in the MICS proforma.

The supplier of the implementation (in producing the MICS from the MICS proforma) fill in Columns:

– 6 (Support),

and, if applicable:

– 7 (Additional information).

5.7.5 Instructions for MICS proforma specification for create and delete support

The MICS proforma specification for create and delete is formed by copying Annex L, completing the tables except for the "Support" and "Additional information" columns, and extending the tables to meet the requirements of the specification.

To form a MICS for create and delete from a MICS proforma for create and delete, the supplier of the implementation shall fill in the "Support" and, if appropriate, "Additional information" columns of all the tables in the MICS proforma.

a) *Create and delete support table* – The proforma specification shall have filled in Columns:

– 1 (Index);

– 2 (Operation) – To be copied from the proforma template in Annex L;

– 4 (Status),

and, if applicable:

– 3 (Constraints and values) – The constraints and values can for example be used to indicate for which object classes support is required.

The supplier of the implementation shall state the create and delete support and fill in Columns:

– 5 (Support),

and, if applicable:

– 6 (Additional information) – The additional information shall be used to indicate any restrictions in the claim to support create or delete operations. The supplier of the implementation can use this column to indicate support for Set by Create for particular attributes, e.g. the nameBinding attribute, and reference to the attribute table where the claim to support Set by Create is made.

b) *Parameter support table* – The proforma specification shall have filled in Columns:

– 1 (Index);

– 2 (Parameter template label);

– 3 (Value of object identifier for parameter);

– 5 (Status),

and, if applicable:

– 4 (Constraints and values).

The remaining columns shall remain blank in the MICS proforma.

The supplier of the implementation (in producing the MICS from the MICS proforma) fill in Columns:

– 6 (Support),

and, if applicable:

– 7 (Additional information).

6 Compliance

To comply with this Recommendation | International Standard, a Recommendation | International Standard which specifies conformance requirements for a managed object class definition shall:

- contain or reference an MCS proforma, constructed as specified in 5.3;
- specify that implementations claiming to conform to a managed object class definition in the MCS shall be accompanied by a MOCS produced by completing a MOCS proforma, constructed as specified in 5.4, for this managed object class.

To comply with this Recommendation | International Standard, a Recommendation | International Standard which specifies conformance requirements for management information shall:

- contain or reference a MIDS proforma, constructed as specified in 5.5;
- specify that specifications of conformance requirements for managed object class definitions that use the management information shall include the requirements of the MIDS proforma in the MOCS proforma for that managed object class.

To comply with this Recommendation | International Standard, a Recommendation | International Standard which specifies conformance requirements for a name binding definition shall:

- contain or reference an MCS proforma, constructed as specified in 5.3;
- specify that implementations claiming to conform to a name binding definition in the MCS shall be accompanied by a MRCS produced by completing a MRCS proforma for name binding, constructed as specified in 5.6, for this name binding definition.

Annex A

MCS proforma[1)]

(This annex forms an integral part of this Recommendation | International Standard)

A.1 Introduction

A.1.1 Purpose and structure

The Management Conformance Summary (MCS) is a statement by a supplier that identifies an implementation and provides information on whether the implementation claims conformance to any of the listed set of documents that specify conformance requirements to OSI management.

The MCS proforma is a document, in the form of a questionnaire that when completed by the supplier of an implementation becomes the MCS.

A.1.2 Instructions for completing the MCS proforma to produce an MCS

The supplier of the implementation shall enter an explicit statement in each of the boxes provided. Specific instruction is provided in the text which precedes each table.

A.2 Identification of the implementation

A.2.1 Date of statement

The supplier of the implementation shall enter the date of this statement in the box below. Use the format DD-MM-YYYY.

Date of statement

A.2.2 Identification of the implementation

The supplier of the implementation shall enter information necessary to uniquely identify the implementation and the system(s) in which it may reside, in the box below.

1) **Copyright release for MCS proforma:**

Users of this Recommendation | International Standard may freely reproduce the MCS proforma in this annex so that it can be used for its intended purpose, and may further publish the completed MCS.

A.2.3 Contact

The supplier of the implementation shall provide information on whom to contact if there are any queries concerning the content of the MCS, in the box below.

A.3 Identification of the document in which the management information is defined

The supplier of the implementation shall enter the title, reference number and date of the publication of the document which specifies the management information to which conformance is claimed, in the box below.

Document to which conformance is claimed

A.3.1 Technical corrigenda implemented

The supplier of the implementation shall enter the reference numbers of implemented technical corrigenda which modify the specification in the identified document, in the box below.

A.3.2 Amendments implemented

The supplier of the implementation shall state the titles and reference numbers of implemented addenda to the identified document, in the box below.

A.4 Management conformance summary

The supplier of the implementation shall provide information on whether the implementation claims conformance to any of the set of documents globally representing the implementation under claim. For each document the supplier of the implementation claims conformance to, the corresponding conformance statement(s) shall be filled in, or referenced by, the MCS. Columns 7 (Support), 8 (Table numbers of PICS/MICS/MOCS/MRCS) and 9 (Additional information) are to be filled in by the supplier of the implementation.

The following common notations, defined in CCITT Rec. X.291 and ISO/IEC 9646-2 and ITU-T Rec. X.296 and ISO/IEC 9646-7 are used for the status value column:

m Mandatory

o Optional

c Conditional

x Prohibited

– Not applicable or out of scope

NOTES

1 The notations "c", "m", "o" and "x" are prefixed by a "c:" when nested under a conditional or optional item of the same table.

2 The notation "o" may be suffixed by ".n" (where "n" is a unique number) for mutually exclusive or selectable options among a set of status values. The requirement for this numbered set shall be explicitly stated, preferably in a footnote to the relevant table.

The following common notations, defined in CCITT Rec. X.291 and ISO/IEC 9646-2 and ITU-T Rec. X.296 and ISO/IEC 9646-7 are used for the support answer column:

Y Implemented

N Not implemented

– No answer required

Ig The item is ignored (i.e. processed syntactically but not semantically)

In Tables A.1 to A.4, the Status column is used to indicate whether the supplier of an implementation is required to complete the referenced tables or referenced items. Conformance requirements are specified in the referenced tables or referenced items and are not changed by the value of the MCS Status column. Similarly, the Support column is used by the supplier of the implementation to indicate completion of the referenced tables or referenced items.

Table A.1 – PICS support summary

Index	Identification of the document that includes the PICS proforma	Table numbers of PICS proforma	Description	Constraints and values	Status	Support	Table numbers of PICS	Additional information

Table A.2 – MOCS support summary

Index	Identification of the document that includes the MOCS proforma	Table numbers of MOCS proforma	Description	Constraints and values	Status	Support	Table numbers of MOCS	Additional information

Table A.3 – MRCS support summary

Index	Identification of the document that includes the MRCS proforma	Table numbers of MRCS proforma	Description	Constraints and values	Status	Support	Table numbers of MRCS	Additional information

Table A.4 – MICS support summary

Index	Identification of the document that includes the MICS proforma	Table numbers of MICS proforma	Description	Constraints and values	Status	Support	Table numbers of MICS	Additional information

The MICS support summary in the MCS gives a summary of all management information that a specification defines for manager role support and identifies the conformance requirements (status) related to this management information.

Annex B

MOCS proforma[2)]

(This annex forms an integral part of this Recommendation | International Standard)

B.1 Introduction

The purpose of this MOCS proforma is to provide a mechanism for a supplier of an implementation which claims conformance to a managed object class to provide conformance information in a standard form.

B.2 Instructions for completing the MOCS proforma to produce a MOCS

The supplier of the implementation shall state which items are supported in the tables below and if necessary provide additional information.

B.3 Statement of conformance to the managed object class

Table B.1 – Managed object class support

Index	Managed object class template label	Value of object identifier for the managed object class	Support of all mandatory features? (Y/N)	Is the actual class the same as the managed object class to which conformance is claimed? (Y/N)

If the answer to the actual class question in Table B.1 is no, the supplier of the implementation shall fill in the actual class support Table B.2.

Table B.2 – Actual class support

Index	Managed object class template label for actual class	Value of object identifier for managed object class definition of actual class	Additional information

B.4 Attributes

Table B.3 – Attribute support

				Set by create		Get		Replace	
Index	Attribute template label	Value of object identifier for attribute	Constraints and values	Status	Support	Status	Support	Status	Support

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Table B.3 *(concluded)* **– Attribute support**

	Add		Remove		Set to default		
Index	Status	Support	Status	Support	Status	Support	Additional information

B.5 Attribute Groups

Table B.4 – Attribute group support

				Get		Set to default		
Index	Attribute group	Value of object identifier for attribute group	Constraints and values	Status	Support	Status	Support	Additional information

B.6 Actions

Table B.5 – Action support

Index	Action type template label	Value of object identifier for action type	Constraints and values	Status	Support	Additional information

Table B.5 *(concluded)* **– Action support**

Index	Subindex	Action field name label	Constraints and values	Status	Support	Additional information

B.7 Notifications

Table B.6 – Notification support

					Support		
Index	Notification type template label	Value of object identifier for notification type	Constraints and values	Status	Confirmed	Non-confirmed	Additional information

Table B.6 *(concluded)* **– Notification support**

Index	Subindex	Notification field name label	Value of object identifier of attribute type associated with field	Constraints and values	Status	Support	Additional information

B.8 Parameters

Table B.7 – Parameter support

Index	Parameter template label	Value of object identifier for parameter	Constraints and values	Status	Support	Additional information

Annex C

MIDS (attribute) proforma[3)]

(This annex forms an integral part of this Recommendation | International Standard)

C.1 Attributes

Table C.1 – Attribute support

				Set by create		Get		Replace	
Index	Attribute template label	Value of object identifier for attribute	Constraints and values	Status	Support	Status	Support	Status	Support

Table C.1 *(concluded)* **– Attribute support**

	Add		Remove		Set to default		
Index	Status	Support	Status	Support	Status	Support	Additional information

C.2 Parameters

Table C.2 – Parameter support

Index	Parameter template label	Value of object identifier for parameter	Constraints and values	Status	Support	Additional information

3) **Copyright release for MIDS proforma:**

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Annex D

MIDS (attribute group) proforma[4)]

(This annex forms an integral part of this Recommendation | International Standard)

D.1 Attribute groups

Table D.1 – Attribute group support

				Get		Set to default		
Index	Attribute group template label	Value of object identifier for attribute group	Constraints and values	Status	Support	Status	Support	Additional information

D.2 Parameters

Table D.2 – Parameter support

Index	Parameter template label	Value of object identifier for parameter	Constraints and values	Status	Support	Additional information

4) **Copyright release for MIDS proforma:**

Users of this Recommendation | International Standard may freely reproduce the MIDS proforma in this annex so that it can be used for its intended purpose.

Annex E

MIDS (action) proforma[5)]

(This annex forms an integral part of this Recommendation | International Standard)

E.1 Actions

Table E.1 – Action support

Index	Action type template label	Value of object identifier for action type	Constraints and values	Status	Support	Additional information

Table E.1 *(concluded)* **– Action support**

Index	Subindex	Action field name label	Constraints and values	Status	Support	Additional information

E.2 Parameters

Table E.2 – Parameter support

Index	Parameter template label	Value of object identifier for parameter	Constraints and values	Status	Support	Additional information

5) **Copyright release for MIDS proforma:**

Users of this Recommendation | International Standard may freely reproduce the MIDS proforma in this annex so that it can be used for its intended purpose.

Annex F

MIDS (notification) proforma[6)]

(This annex forms an integral part of this Recommendation | International Standard)

F.1 Notifications

Table F.1 – Notification support

					Support		
Index	Notification type template label	Value of object identifier for notification type	Constraints and values	Status	Confirmed	Non-confirmed	Additional information

Table F.1 *(concluded)* **– Notification support**

Index	Subindex	Notification field name label	Value of object identifier of attribute type associated with field	Constraints and values	Status	Support	Additional information

F.2 Parameters

Table F.2 – Parameter support

Index	Label	Value of object identifier for parameter	Constraints and values	Status	Support	Additional information

6) **Copyright release for MIDS proforma:**

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Annex G

MRCS proforma for name bindings[7)]

(This annex forms an integral part of this Recommendation | International Standard)

G.1 Introduction

The purpose of this MRCS proforma for name bindings is to provide a mechanism for a supplier which claims conformance to a name binding to provide conformance information in a standard form.

G.2 Instructions for completing the MRCS proforma for name bindings to produce an MRCS for name bindings

The supplier of the implementation shall state which items are supported in Tables G.1 and G.2 and if necessary provide additional information.

G.3 Statement of conformance to the name binding

Table G.1 – Name binding support

Index	Name binding template label	Value of object identifier for name binding	Constraints and values	Status	Support	Additional information

Table G.1 *(concluded)* **– Name binding support**

Index	Subindex	Operation	Constraints and values	Status	Support	Additional information
		Create support				
		Create with reference object				
		Create with automatic instance naming				
		Delete support				
		Delete only if no contained objects				
		Delete contained objects				

G.4 Parameters

Table G.2 – Parameter support

Index	Parameter template label	Value of object identifier for parameter	Constraints and values	Status	Support	Additional information

7) **Copyright release for MRCS proforma:**

Users of this Recommendation | International Standard may freely reproduce the MRCS proforma for name bindings in this annex so that it can be used for its intended purpose, and may further publish the completed MRCS for name bindings.

Annex H

MICS (attribute) proforma

(This annex forms an integral part of this Recommendation | International Standard)

H.1 Attributes

Table H.1 – Attribute support

				Set by create		Get		Replace	
Index	Attribute template label	Value of object identifier for attribute	Constraints and values	Status	Support	Status	Support	Status	Support

Table H.1 *(concluded)* **– Attribute support**

	Add		Remove		Set to Default		
Index	Status	Support	Status	Support	Status	Support	Additional information

H.2 Parameters

Table H.2 – Parameter support

Index	Parameter template label	Value of object identifier for parameter	Constraints and values	Status	Support	Additional information

Annex I

MICS (attribute group) proforma

(This annex forms an integral part of this Recommendation | International Standard)

I.1 Attribute groups

Table I.1 – Attribute group support

				Get		Set to default		
Index	Attribute group template label	Value of object identifier for attribute group	Constraints and values	Status	Support	Status	Support	Additional information

I.2 Parameters

Table I.2 – Parameter support

Index	Parameter template label	Value of object identifier for parameter	Constraints and values	Status	Support	Additional information

Annex J

MICS (action) proforma

(This annex forms an integral part of this Recommendation | International Standard)

J.1 Actions

Table J.1 – Action support

Index	Action type template label	Value of object identifier for action type	Constraints and values	Status	Support	Additional information

Table J.1 *(concluded)* **– Action support**

Index	Subindex	Action field name label	Constraints and values	Status	Support	Additional information

J.2 Parameters

Table J.2 – Parameter support

Index	Parameter template label	Value of object identifier for parameter	Constraints and values	Status	Support	Additional information

Annex K

MICS (notification) proforma

(This annex forms an integral part of this Recommendation | International Standard)

K.1 Notifications

Table K.1 – Notification support

					Support		
Index	Notification type template label	Value of object identifier for notification type	Constraints and values	Status	Confirmed	Non-confirmed	Additional information

Table K.1 *(concluded)* **– Notification support**

Index	Subindex	Notification field name label	Value of object identifier of attribute type associated with field	Constraints and values	Status	Support	Additional information

K.2 Parameters

Table K.2 – Parameter support

Index	Parameter template label	Value of object identifier for parameter	Constraints and values	Status	Support	Additional information

Annex L

MICS (create and delete) proforma

(This annex forms an integral part of this Recommendation | International Standard)

L.1 Create and Delete support

Table L.1 – MICS (create and delete) proforma

Index	Description	Constraints and values	Status	Support	Additional information
1	Create				
1.1	With reference object				
2	Delete				

L.2 Parameters

Table L.2 – Parameter support

Index	Parameter template label	Value of object identifier for parameter	Constraints and values	Status	Support	Additional information

Annex M

Additional informative guidelines for proforma specification

(This annex does not form an integral part of this Recommendation | International Standard)

M.1 Introduction

The purpose of this annex is to provide additional informative guidelines for proforma specification. The guidelines presented here are in compliance with the conventions in CCITT Rec. X.290 and ISO/IEC 9646-1, CCITT Rec. X.291 and ISO/IEC 9646-2 and ITU-T Rec. X.296 and ISO/IEC 9646-7 and are repeated here for convenience.

M.2 Table labels and indexing

Tables in a document are labelled with consecutive numbers beginning with '1', such as Table 1, Table 2 to Table n. Tables in an annex are labelled with the annex label as the prefix followed by a '.', followed by consecutive numbers. For example, Tables in Annex X are labelled Table X.1, Table X.2, etc.

Index and subindex numbers for the rows of the tables are labelled according to the guidelines in CCITT Rec. X.291 and ISO/IEC 9646-2, that is, with consecutive numbers. For example Table M.1 has rows 1, 2, 3, etc.

Table M.1 – Example of index

Index	Information
1	
2	
3	

The index for sub-rows (rows within rows) the row label followed by consecutive numbers. For example in Table M.2, Row 1 has sub-rows 1.1, 1.2, 1.3, etc.

Table M.2 – Example of subindex

Index	Information for row	Information for sub-row
1		–
1.1	–	
1.2	–	
1.3	–	
2		–

M.3 Extending tables

There is a problem when the width of the information in a table will not fit on a sheet of paper. For example, suppose Table M.3 does not fit on a sheet of paper.

Table M.3 – Example of wide table

Index	Column 1	Column 2	Column 3	...	Column 9
1.1				...	
1.2				...	

One solution is to print the table using landscape mode instead of portrait mode. Another solution is to split the table into two or more blocks of columns, each of which will fit on a page. The index numbers of the rows of the first block of columns have index numbers identical to the index numbers of the same rows in the continuation tables. Immediately following the end of the first portion of the table that spans multiple pages, add the text "*continued on next page*".

NOTE – The title of an extended table that spans multiple pages is "Table X *(continued)* – title", and the title of the last portion of the table is "Table X *(concluded)* – title".

An example of Table M.3 as an extented table is seen in Table M.4:

Table M.4 – Example of extended table

Index	Column 1	Column 2	Column 3
1.1			
1.2			

(continued below)

Table M.4 *(continued)* – **Example of extended table**

Index	Column 4	Column 5	Column 6
1.1			
1.2			

Table M.4 *(concluded)* – **Example of extended table**

Index	Column 7	Column 8	Column 9
1.1			
1.2			

Comments may be added in the up front material to give instructions on how to reconstitute the table. For example, the following is suggested to insert in the up front material:

x.x Table format

Some of the tables have been split because the information is too wide to fit on the page. Where this occurs, the index number of the first block of columns are the index numbers of the corresponding rows of the remaining blocks of columns. A complete table reconstructed from the constituent parts should have the following layout:

Index	First block of columns	Second block of columns	Etc.

In the document, the constituent parts of the table will appear consecutively starting with the first block of columns.

If a table is too long to fit on a page, the table is continued on the following page(s). The index numbers continue to increase. The labels for the last part of the table is "Table X *(concluded)* – title", while the parts of the table in between the first and last parts is "Table X *(continued)* – title".

If a table is too long and too wide, the first block of columns is completed in length before the second block of columns begins, and so on. A table which is too long and too wide appears in the document with the following order of its constituent parts:

a)	first block of columns, rows 1 – n
b)	first block of columns, rows (n + 1) – last row
c)	second block of columns, rows 1 – n
d)	second block of columns, rows (n + 1) – last row

The table is reconstructed from the constituent parts as follows:

a)	first block of columns, rows 1 – n	c)	second block of columns, rows 1 – n
b)	first block of columns, rows (n + 1) – last row	d)	second block of columns, rows (n + 1) – last row

Alternatively, if a table with sub-rows is too wide to fit on a page, it may be reduced in width by partitioning the information to be filled in the columns. That is, information for rows appears in the same column as the information for sub-rows and the index indicates whether the information is row or sub-row information. For example, the above table may be reduced in width by the following format:

Index	Info for row/ Info for sub-row
1	
1.1	
1.2	
1.3	
2	

M.4 Condition statements

Conditions in the tables are referred to by conditional notation (cn), such as c1, c2, etc., where "n" is a unique integer and the condition label is followed by a colon ":". The conditional must be followed by a predicate (if then else clause). For example:

c1: if predicate then m else –

In this case, if the predicate is true, what follows the "then" (in this case 'm') is the status; and if the predicate is false, what follows the 'else' (in this case "–") is the status.

A predicate shall be one of the following:

a) an explicit reference to a support answer (in the Support column); if the entry is "Y" then the predicate is True, otherwise it is False;

b) a Boolean expression involving other predicates, e.g. p1 AND NOT p2.

Conditionals may be placed in the up front matter of the MOCS proforma if used throughout. For this case, the following is suggested:

x.x Symbols, abbreviations and terms

The following requirements are commonly used throughout the MOCS proforma:

c1: if A/10a then m else –

c2: if B/3 then m else –

If the conditionals are used for only one table, they are placed after the end of the table. For example:

Table M.5 – Example of conditions

Index	Status	Support
1	c1	
2	c2	
c1: if D/10a then m else – c2: if B/3 then m else –		

NOTE 1 – For the status column, "c", "m", "o" and "x" are prefixed by a "c:" when nested under a conditional or optional item of the same table. For example:

Table M.6 – Example of nested conditions

Index	Status
1	o
1.1	c:m
1.2	c:o
1.2.1	c:o

NOTE 2 – For the status column, "o" may be suffixed by ".n" (where "n" is a unique number) for mutually exclusive or selectable options among a set of status values. The requirement for this numbered set shall be explicitly stated, preferably in a footnote to the relevant table. For example, the following example table depicts a set of related options.

Table M.7 – Example of group of related options

Index	Status
1	o.5
2	o.5
3	o.5
4	o.5
o.5: support of at least one of these options is required	

In the predicate, the explicit reference to a support answer (in the Support column) is specified using the following sequence:

a) a reference to the table containing the relevant item, e.g. C;

b) a solidus character, "/";

c) the index or subindex of the row in which the response appears;

d) if, and only if, more than one response support answer occurs in the row identified by the reference number, then each possible support answer is implicitly labelled a, b, c, etc., from left to right, and this letter is appended to the sequence.

For example, the referenced support answer "A/10c" references an individual support answer that corresponds to the index 10 in Table A in the tenth row in the third support answer column of that row.

M.5 No such characteristics in the managed object class definition

If a managed object class definition contains no such characteristics, the proforma specifier shall state so, rather than omitting the section. This averts possible confusion arising from characteristic support tables which are not in the document.

For example, if a managed object class supports no attribute groups, the following should be placed instead of the Attribute group support table:

X.4 Attribute group support

There are no attribute groups specified for this managed object class.

M.6 Abbreviations for object identifiers

Object identifiers may be abbreviated in the proforma tables. These abbreviations should be specified within the MCS proforma if used in more than one proforma (i.e. MCS, MOCS, MIDS) or within the proforma where it is used if only used in one proforma. The abbreviations should be specified in a separate clause before it is used. The following is an example of how an object identifier for attributes could be abbreviated:

dmi-att joint-iso-ccitt ms(9) smi(3) part2(2) attribute(7)

When used in the table, the object identifier for an attribute that has the value 22 could be specified as "dmi-att 22".

Additional instructions for abbreviation and terms also may be specified within the MCS proforma if used in more than one proforma (i.e. MCS, MOCS, MIDS) or within the proforma where it is used if only used in one proforma.

M.7 Parameter tables

One or more parameter support tables could be included in a MOCS proforma. The status of the parameters should always be conditional, with the condition being if the associated management characteristic(s) is supported. The associated management characteristic could be referenced using an index number. If there are more than one associated management characteristics, then the conditions for all the associated management characteristics are combined by the logical 'or' operation to determine the effective condition for the parameter. For example, a condition for support of a specific error parameter associated with two actions (X/1.1 and X/1.2) could be:

c11: if (X/1.1 or X/1.2) then m else –

M.8 Action and notification field name labels

The action field name labels are the labels in the ASN.1 syntax of the action information and reply information of the action. The notification field name labels are the labels in the ASN.1 syntax of the event information and reply information of the notification. These labels are commonly used in the service mapping tables however, in some cases there may not be labels in the syntax which can be used. In these cases, in order to avoid ambiguity, it will be necessary for the proforma specifier to assign labels. Following are some suggestions for assigning labels:

a) use 'field.n' where "n" is an increasing index number; for example, field.1, field.2, field.2.1 (if field.2 is degenerated), etc.

b) use 'TypeReference.n' where TypeReference is the type reference of the information syntax or reply syntax and "n" is an increasing index number; for example for an action information syntax called ActivateReply, the field names could be ActivateReply.1, ActivateReply.2, ActivateReply.2.1 (if ActivateReply.2 is degenerated), etc.

c) use the syntax of the fields, for example: OperationalState, INTEGER, OtherInfo where OperationalState and OtherInfo are type references.

NOTE – It is recommended that managed object definers assign labels in the ASN.1 syntax for action/notification information and reply.

M.9 Guidelines for package support tables

Table M.8 could be included in a MOCS proforma when the status values for certain characteristics of the managed object class can be simplified by making the status value conditional on the support indicated for the conditional packages:

Table M.8 – Package support table

Index	Package template label	Value of object identifier for package	Constraints and values	Status	Support	Additional information

The proforma specification shall have filled in Columns 1 (Index), 2 (Package template label), 3 (Value of object identifier for package) and, if applicable, 4 (Constraints and values). The supplier of the implementation shall state whether or not the packages in a managed object class definition are supported and shall indicate support for each package supported by filling in Columns 6 (Support) and, if applicable 7 (Additional information).

M.10 When different proformas should be included

All specifications that include management information specified in GDMO should provide ICS proformas to specify detailed conformance requirements and to facilitate conformance claims.

The following subclauses give some advice related to different types of proformas.

M.10.1 MCS proforma

One MCS proforma should be included in a document specifying management information.

M.10.2 MICS proforma

MICS proformas are required if the specification contains conformance requirements for manager role implementations. In most cases, a specification with management information includes conformance requirements for manager role implementations. MICS proformas shall be included for all relevant operations and notifications.

M.10.3 MOCS proforma

MOCS proformas are required if the specification defines managed objects (to which conformance can be claimed).

M.10.4 MIDS proforma

MIDS proformas are only included if the specification defines *generic* attributes, attribute groups, actions or notifications. A MIDS proforma is intended for other ICS proforma specifiers, it cannot be used in a conformance claim. It is not required to include a MIDS proforma in a specification.

M.10.5 MRCS proforma

MRCS proformas are required if the specification defines any relationship (including name binding).

M.10.6 PICS proforma

A PICS proforma is required if there are any protocol related definitions in the specification that are not already specified as part of MICS and MOCS proformas. A PICS proforma is normally not required in a Systems Management Standard.

The PICS proforma for Systems Management Application Context Negotiation are provided in CCITT Rec. X.730 | ISO/IEC 10164-1, Annex E.

M.11 Minimum conformance requirement

Any document containing definitions of management information should indicate clearly and explicitly the minimum conformance requirements for each of manager role and agent role. In a standard, this should be stated in the conformance clause and tables should be provided in the MCS proforma that lists the elements of management information defined in the standard to which conformance may be claimed in manager or agent roles. The contents of the minimum conformance requirement tables is determined for each standard depending on the elements of management information defined in that standard (i.e. managed objects, generic attributes, generic notifications, generic actions).

A document containing management information can can be produced to be used in different forms. One possibility is that included management information is intended to be used in other specifications as building blocks. Another possibility is that the specifications are intended for a (more or less) identified application.

Depending on the purpose of the specification, the minimum conformance requirements will vary. The following subclauses give some advice in different situations.

M.11.1 Building block specifications

Documents that are intended to be generic (that is, that are intended to provide basic building blocks for reference by other specifications) should require as little as possible of conforming implementations. Implementation of any subset of the document’s specifications shall be possible (as a conforming implementation). The reason for this is that if a document is intended to have its parts used as building blocks in many different applications, then different subsets of the document’s specifications will be used in different situations. In most cases it is impossible to define a subset that is required in all situations.

For example, in the case of a function standard, such as State management function, that defines generic attributes or notifications to be used in many managed object definitions, minimum conformance (in the agent role) might be simply to any one of the state attributes or notifications. In other cases, minimum conformance might be to one of the objects or packages defined in the function.

This minimum requirement may also vary between manager role and agent role systems. For example, in a manager role system, conformance to a generic attribute (such as a state attribute), the minimum requirement might be limited to at least one operation (e.g. Get) on the attribute whereas in an agent role system, minimum requirement could be support for a managed object including the attribute.

Although the conformance requirement can be very limited, the conformance claim (made by a supplier) may state additional information about how the support provided exceeds the minimum.

M.11.1.1 Generic definitions in agent role

If the specification contains any generic definitions, support of one of the attributes, notifications, attribute groups or actions is enough for a claim of conformance. A claim of conformance to a generic attribute (in the agent role) must be accompanied by a MOCS (for the details of the conformance claim). In the MCS proforma, the table for Agent Role Minimum Conformance Requirements provides a column 'Table Reference' for this purpose.

M.11.1.2 Managed Objects in the agent role

If the specification defines (instantiable) managed objects, support for at least one of these managed objects is enough for a claim of conformance. Any related name bindings can optionally be supported.

If the specification includes both generic definitions and (instantiable) managed objects, the minimum requirement for an agent role implementation can be conformance to either one of the generic definitions or to one of the managed objects.

M.11.1.3 Manager role

Support for at least one operation (including create and delete or at least one notification defined for any managed object (or generic definition) is enough for a claim of conformance. This is a very limited requirement, and other specifications are needed to determine what an implementation actually supports.

M.11.2 Application specifications

If a specification is intended to be used in a specific area (rather than as a basic building block), the minimum conformance requirement is to a large extent controlled by the application itself. The agent role minimum conformance

requirements should in most cases be based completely on the application. Mandatory parts of the application are likely to need mandatory elements of management information.

The Manager role minimum conformance requirements can still be more limited. Any particular manager role implementation might support a subset of the defined operations. It is a judgement on a case by case basis how much of a specification a minimum conformance requirement should include.

M.11.3 Combination specifications

The most complicated case is when a specification is written with the purpose to be both a source of basic management information and as an application specification. The minimum conformance requirement must in this case be expressed for both purposes. This can be considered as providing some useful subsets of the building blocks provided in a specification and is similar to the concept of profiles.

NOTE – Functional units are used for this purpose in many of the initial Systems Management Function standards.

M.12 Compatible classes

The MOCS proforma is indended for use as a claim of conformance to the managed object class defined in the document or any compatible object classes. Care should be taken when specifying the status for operations on attributes of a managed object to ensure that an extended class can claim conformance as a compatible object class using the MOCS proforma. This can be done by specifying conditional statements for the status when the status may be different in a subclass.

For operations that are not specified explicitly as excluded, an ICS proforma should provide a conditional status which specifies, for example, "if A.1/1b then x else –" where A.1/1b refers to the answer to the question: is the class of the implementation the same as the class of managed object for which conformance is claimed. This technique will ensure that the ICS proforma can be used in claims of conformance to a specification when the implementation supports a compatible object class.

M.13 MOCS proforma for non-instantiable classes

The minimum conformance requirements in current system management function standards does not include the possibility to claim conformance to any of the non-instantiable superclasses. As a consequence, no MOCS proformas are defined for non-instantiable superclasses in the ICS proformas related to the system management function standards. In the future, MOCS proformas for non-instantiable superclasses could be added.

Future function standards may allow claims of conformance to non-instantiable classes. In that case, MOCS proformas for those object classes should be provided.

M.14 Attributes inherited from top

The status of the attributes inherited from top should be documented consistently when the subclass has not changed or extended the definitions.

For managed object classes that support create by management operation the status of set by create shall be "m" for the objectClass attribute and "o" for the attributes nameBinding, packages and allomorphs.

For managed object classes that only support create by the agent system (e.g. record objects) the status for set by create for these attributes shall be "x".

M.15 Interpretation of ’m’ in status column

The use of the value 'm' in Status columns of ICS proformas can lead to different interpretations in what is required of the implementation, depending on the type of ICS proforma and whether the ICS proforma is relevant to the implementation as a sender or receiver.

The value of 'm' in the Status column relevant for a receiving implementation is currently used both to indicate a requirement for "full functionality" and as a requirement for the capability to receive the parameter (but no requirement to process it further).

In order to make this difference in meaning of 'm' clear in a ICS proforma, text should be included to explain the use of 'm' in any particular ICS proforma. This text could be added in the "symbols, abbreviations and terms" clause or close to the relevant table.

M.16 Guidelines on conditional expressions

This subclause contains some gudelines on the use of conditional expressions in ICS proformas:

- conditional expressions must all end in '.';
- all o.N numbers must be unique within one annex (and it is recommended to keep the numbers unique within one document);
- all cN numbers must be unique within one annex (and it is recommended to keep the numbers unique within one document);
- avoid, if possible, conditional expressions with references to other annexes;
- when a conditional expression is complex, add a descriptive NOTE with a clarification.

M.17 Multiple MICS proformas of the same type

In some cases, conformance requirements in a specification results in multiple entries in a MICS proforma of a particular type. An example of this situation is the required support for an attribute (in the Manager Role). If the same attribute is included in more than one managed object class, the result can be different requirements for the same attribute depending on the context. This can be expressed in two alternative ways in a MICS proforma:

- Multiple MICS proformas are provided for attribute support. The context for each individual proforma is clearly marked. Items in the MCS proforma (MICS support summary) guides the supplier of an implementation to the correct tables.
- One MICS proforma for attributes is used, but individual attributes are included in multiple rows. The Constraints and Values column is used to indicate the context of the requirement.

The same method can be used for other types of MICS proformas. More information on the completion of MICS proformas is given in Annex N: Additional informative guidelines for completion of proformas.

M.18 Order of ICS proformas

For consistency between different specifications, and to assist the user of these documents, the following order of ICS proformas associated with OSI Management is recommended:

MCS, MICS, MOCS, MIDS, MRCS and PICS

Not all types of ICS proformas are included in all specifications. An MCS proforma is always included, and it is important to have the MCS proforma before the other proforms as it provides a summary of conformance requirements for the complete specification and gives references to other required proformas.

Annex N

Additional informative guidelines for completion of proformas

(This annex does not form an integral part of this Recommendation | International Standard)

N.1 Introduction

The purpose of this annex is to provide additional informative guidelines for completion of proformas. These guidelines are relevant for a supplier of an implementation using an ICS proforma to make a claim of conformance.

N.2 Use support summary tables to map table numbers

The 'support summary' tables in the MCS proforma are intended to give an overview of all ICS proformas included in a particular conformance claim. The column 'Table numbers of ICS' can be used to identify the particular ICS (and tables in the ICS) relevant for the item identified in the 'support summary' table. This column can also be used to reference particular ICS when multiple copies of the same ICS proforma is used.

N.3 Support of set by create in manager role

The detailed specification of how a manager role implementation supports 'set by crate' on different attributes is specified in the attribute MICS proforma. References can be included (in the Additional Information column) in the Create and Delete MICS proforma to indicate any particular limitations in the conformance claim.

N.4 To claim limited support in manager role

In most cases, the MICS proforma specifies the conformance requirements of the specification in terms of operations and notifications without any restrictions in terms of which managed objects a system in manager role can operate on. If a claim of conformance is more limited, there are alternative ways to make this claim:

- The Additional Information column can be used to indicate any restrictions in the support for a given item. For example, support limited to operations on instances of certain object classes can be indicated together with a list of all relevant object classes.
- Multiple copies of the same completed MICS proforma are included in the conformance claim. The context for each completed copy of the MICS proforma must be clearly specified in the claim. Special attention is required if conditional expressions refer to other ICS proformas.

Annex O

Example of MCS proforma

(This annex does not form an integral part of this Recommendation | International Standard)

O.1 Introduction

The purpose of this annex is to provide an example of a MCS proforma as completed by a proforma specifier, which is to be in by a supplier of an implementation. The corresponding example of a MOCS proforma of the example managed object class definition, called exampleObjectClass, is found in Annex Q.

O.1.1 Explanation

This clause contains some explanations related to the tables included in this example.

1) A table with questions about support for manager and agent role. The answer to this question is used to control conditional expressions in most of the remaining tables.

2) If the specification defines functional units, an indication of support for these is needed. A conditional expression has been be used to relate them to manager or agent role support. This table is only needed if functional units (or equivalent groupings) are defined in the document.

3) Manager role requirements should be listed in one table.

   This table is only a "high level" description of the conformance requirements related to manager role. The tables in the current SMFs include items for individual generic notifications, one item for all generic attributes and attribute groups and one item for "operations on managed objects". It is recommended that this structure of table O.3 is used for all SMF standards. The reason for this is that the minimum conformance requirements can be easily expressed in the MICS proforma if this structure is adopted. Table O.3 should NOT include a list of managed object classes in the standard (since manager role conformance requirements in general are related to operations and notifications rather than managed objects).

   The status of the items in Table O.3 can be quite complex if it has to be related to the support of functional units and some functional units requires the support for certain items in Table O.3.

4) Agent role requirements should be listed in one table. This table should list all items that conformance can be claimed to in the agent role. The items in this table can be of two types:

   – generic management information;

   – instantiable managed object classes.

   Generic management information includes any generic notification, attribute, attribute group or action to which conformance can be claimed (it is a decision to be made in each specification if a definition is to be considered generic or not).

   If the table includes any generic management information, a note is required to indicate that a conformance claim to any of the generic definitions shall include a reference to a MOCS (i.e. completed MOCS proforma) where the detailed claim is contained.

   The document itself does NOT include the MOCS proforma in most cases, since the definition is a generic definition intended to be imported in other specifications. The actual MOCS included in the claim can use a standardized MOCS proforma defined in a standard or be a supplier specific MOCS.

   Managed objects should be a list of all managed object classes to which conformance can be claimed. The "Table reference" column should be "–" for all managed object classes, since the reference to the relevant MOCS proforma in this case will be found in the MOCS support summary table.

   A third type of item in this table can be any non-instantiable superclasses defined in the specification. If claims of conformance to the specification are allowed for superclasses they should be included in this table.

5) A table with a question about support of logging of event records is relevant if the specification defines any log records, generic notifications or other managed object classes emitting notifications. This question is used to determine if support for log record object classes is required.

6) The PICS support summary table is included to give references to all PICS proformas required to complete a conformance claim to the specification. Typically, this is only one item (SM application context). The referenced PICS proformas can be contained in the same document or in other specifications.

7) The MOCS support summary table shall include references to all MOCS proformas relevant for claims of conformance to this Specification. Typically, this includes all (instantiable) managed object classes defined in this Specification and all log records associated with notifications emmited from these managed objects.

   The status column in the MOCS support summary is used to indicate when the referenced MOCS proformas should be included in a conformance claim, i.e. when the supplier of the implementation should complete the referenced MOCS proformas. In most cases, the status is a reference back to the answers in Table O.4.

8) The MRCS support summary table shall include all relevant name bindings. These name bindings can be defined in the specification or referenced from other documents. The status of the name bindings are in most cases conditional on the support of the subordinate managed object class. In most cases the status is "if <MO supported> then o else –". The support of particular name bindings is typically not mandated.

9) The MICS support summary table shall include references to all MICS proformas relevant for claims of conformance to this Specification. The status is in most cases a reference back to the support claimed in Table O.3.

O.1.2 Purpose and structure

The Management Conformance Summary (MCS) is a statement by a supplier that identifies an implementation and provides information on whether the implementation claims conformance to any of the listed set of documents that specify conformance requirements to OSI management.

The MCS proforma is a document, in the form of a questionnaire that when completed by the supplier of an implementation becomes the MCS.

O.1.3 Instructions for completing the MCS proforma to produce an MCS

The supplier of the implementation shall enter an explicit statement in each of the boxes provided. Specific instruction is provided in the text which precedes each table.

O.2 Identification of the implementation

O.2.1 Date of statement

The supplier of the implementation shall enter the date of this statement in the box below. Use the format DD-MM-YYYY.

Date of statement

O.2.2 Identification of the implementation

The supplier of the implementation shall enter information necessary to uniquely identify the implementation and the system(s) in which it may reside, in the box below.

O.2.3 Contact

The supplier of the implementation shall provide information on whom to contact if there are any queries concerning the content of the MCS, in the box below.

O.3 Identification of the document in which the management information is defined

The supplier of the implementation shall enter the title, reference number and date of the publication of the document which specifies the management information to which conformance is claimed, in the box below.

Document to which conformance is claimed

O.3.1 Technical corrigenda implemented

The supplier of the implementation shall enter the reference numbers of implemented technical corrigenda which modify the specification in the identified document, in the box below.

O.3.2 Amendments implemented

The supplier of the implementation shall state the titles and reference numbers of implemented addenda to the identified document, in the box below.

O.4 Management conformance summary

The supplier of the implementation shall provide information on whether the implementation claims conformance to any of the set of documents globally representing the implementation under claim. For each document the supplier of the implementation claims conformance to, the corresponding conformance statement(s) shall be filled in, or referenced by, the MCS. Columns 7 (Support), 8 (Table numbers of PICS/MICS/MOCS/MRCS) and 9 (Additional information) are to be filled in by the supplier of the implementation.

The following common notations, defined in CCITT Rec. X.291 and ISO/IEC 9646-2 and ITU-T Rec. X.296 and ISO/IEC 9646-7 are used for the status value column:

- m Mandatory
- o Optional
- c Conditional
- x Prohibited
- – Not applicable or out of scope

NOTES

1 The notations "c", "m", "o" and "x" are prefixed by a "c:" when nested under a conditional or optional item of the same table.

2 The notation "o" may be suffixed by ".n" (where "n" is a unique number) for mutually exclusive or selectable options among a set of status values. The requirement for this numbered set shall be explicitly stated, preferably in a footnote to the relevant table.

The following common notations, defined in CCITT Rec. X.291 and ISO/IEC 9646-2 and ITU-T Rec. X.296 and ISO/IEC 9646-7 are used for the support answer column:

Y Implemented

N Not implemented

– No answer required

Ig The item is ignored (i.e. processed syntactically but not semantically)

The supplier of the implementation shall specify the roles that are supported, in Table O.1.

Table O.1 – Roles

Index	Roles supported	Status	Support	Additional information
1	Manager role support	o.1		
2	Agent role support	o.1		

The supplier of the implementation shall specify support for the systems management functional units, in Table O.2.

Table O.2 – Systems management functional units

		Manager		Agent		
Index	Systems management functional unit name	Status	Support	Status	Support	Additional information
1	Basic functional unit	c1		c2		
2	Monitor functional unit	c1		c2		
c1: if O.1/1a then o else –. c2: if O.1/2a then o else –.						

The supplier of the implementation shall specify support for management information in the manager role, in Table O.3.

Table O.3 – Manager role minimum conformance requirement

Index	Item	Status	Support	Additional information
1	Operations on managed objects	c3		
2	State change notification	c4		
3	Object creation notification	c4		
4	Object deletion notification	c4		
5	Attribute value change notification	c4		
3	Example notification	c4		
c3: if O.2/1a then m else (if O.1/1a then o.2 else –). c4: if O.2/1a or O.2/2a then m else [if O.2/2a then o else (if O.1/1a then o.2 else –)].				

NOTE – Manager role minimum conformance requires support for at least one of the items identified in Table O.3. Support for either of the functional units identified in Table O.2 mandates support for some of those items. Conditions c3 and c4 express both of these requirements.

The supplier of the implementation shall specify support for management information in the agent role, in Table O.4. If additional subclasses of log records are supported, the supplier of the implementation shall list the classes in the Additional information column.

Table O.4 – Agent role minimum conformance requirement

Index	Item	Status	Support	Table reference	Additional information
1	Example object class	c5		–	
2	Subclasses of log records associated with notifications emitted	c6		–	
3	Example notification	c7			

c5: if O.2/1b then m else (if O.1/2a then o.3 else –).

C6: if O.1/2a and O.5/1a then m else –.

NOTE – Condition c6 makes it mandatory, if logging is supported, to support the event log records associated with the notifications supported.

C7: if O.1/2a then o.3 else –.

NOTE – The Table reference column in this table is the reference to a MOCS provided with the conformance claim for a managed object which imports the notification from this Specification.

Table O.5 – Logging of event records

Index		Status	Support	Additional information
1	Does the implementation support logging of event records in agent role?	c8		

c8: if O.1/2a then o else –.

The supplier of the implementation shall provide information on claims of conformance to any of the documents summarized in Tables O.6 to O.9. For each document that the supplier of the implementation claims conformance to, the corresponding conformance statement(s) shall be completed, or referenced by, the MCS. The supplier of the implementation shall complete the Support, Table numbers and Additional information columns.

In Tables O.6 to O.9, the Status column is used to indicate whether the supplier of the implementation is required to complete the referenced tables or referenced items. Conformance requirements are as specified in the referenced tables or referenced items and are not changed by the value of the MCS Status column. Similarly, the Support column is used by the supplier of the implementation to indicate completion of the referenced tables or referenced items.

Table O.6 – PICS support summary

Index	Identification of the document that includes the PICS proforma	Table numbers of PICS proforma	Description	Constraints and values	Status	Support	Table numbers of PICS	Additional information

Table O.7 – MOCS support summary

Index	Identification of the document that includes the MOCS proforma	Table numbers of MOCS proforma	Description	Constraints and values	Status	Support	Table numbers of MOCS	Additional information
1	CCITT Rec. X.722 (1992) | ISO/IEC 10165-4: 1992	Q.1-Q.7	example ObjectClass		o			

Table O.8 – MRCS support summary

Index	Identification of the document that includes the MRCS proforma	Table numbers of MRCS proforma	Description	Constraints and values	Status	Support	Table numbers of MRCS	Additional information

Table O.9 – MICS support summary

Index	Identification of the document that includes the MICS proforma	Table numbers of MICS proforma	Description	Constraints and values	Status	Support	Table numbers of MICS	Additional information
1	Rec. X.724 | ISO/IEC 10165-6	Tables P.2-P.4	management operations	–	c12			
2	CCITT Rec. X.730 | ISO/IEC 10164-1	Table B.1	objectCreation, objectDeletion and attributeValueChange notifications	–	c13			
3	CCITT Rec. X.731 | ISO/IEC 10164-2	Table B.1	stateChange notification	–	c14			
4	Rec. X.724 | ISO/IEC 10165-6	Table P.1	example notification	–	c15			

c12: if O.3/1a then m else –.

c13: if O.3/3a or O.3/4a or O.3/5a then m else –.

c14: if O.3/2a then m else –.

c15: if O.3/6a then m else –.

Annex P

Example of MICS proforma

(This annex does not form an integral part of this Recommendation | International Standard)

P.1 Introduction

The purpose of this annex is to provide an example of MICS proformas of different types. MICS proformas are intended to be filled in by a supplier of an implementation.

P.2 Instructions

The supplier of the implementation shall state which items are supported in the tables below, and if necessary provide additional information

P.3 Example

P.3.1 Notification

Table P.1 – Notification support

					Support		
Index	Notification type template label	Value of object identifier for notification type	Constraints and values	Status	Confirmed	Non-confirmed	Additional information
1	exampleNotification	{not 1}	–	m			

Table P.1 *(concluded)* **– Notification support**

Index	Subindex	Notification field name label	Value of object identifier of attribute type associated with field	Constraints and values	Status	Support	Additional information
1	1.1	sourceIndicator	{dmi-att 26}	0 to 3	m		
	1.2	attributeIdentifierList	{dmi-att 8}	–	m		
	1.3	stateChangeDefinition	{dmi-att 28}	–	m		
	1.3.1	attributeId	–	–	m		
	1.3.2	oldAttributeValue	–	–	m		
	1.3.3	newAttributeValue	–	–	m		
	1.4	notificationIdentifier	{dmi-att 16}	INTEGER	m		
	1.5	additionalText	{dmi-att 7}	–	m		
	1.6	additionalInformation	{dmi-att 6}	–	m		

P.3.2 Attributes

The specifier of a manager role implementation that claims to support management operations on the attributes specified in this document shall import a copy of Table P.2 and complete it.

Table P.2 – Attribute support

				Set by create		Get	
Index	Attribute template label	Identifier for the attribute	Constraints and values	Status	Support	Status	Support
1	objectClass	{dmi-att 65}	–	c1		o.3	
2	nameBinding	{dmi-att 63}	–	c1		o.3	
3	packages	{dmi-att 66}	–	c1		o.3	
4	allomorphs	{dmi-att 50}	–	c1		o.3	
5	logId	{dmi-att 2}	–	c1		o.3	
6	discriminatorConstruct	{dmi-att 56}	–	c1		o.3	
7	administrativeState	{dmi-att 31}	–	c1		o.3	
8	operationalState	{dmi-att 35}	–	–		o.3	
9	availabilityStatus	{dmi-att 33}	–	–		o.3	
10	logFullAction	{dmi-att 58}	–	c1		o.3	
11	maxLogSize	{dmi-att 62}	–	c1		o.3	
12	currentLogSize	{dmi-att 54}	–	–		o.3	
13	numberOfRecords	{dmi-att 64}	–	c1		o.3	
14	capacityAlarmThreshold	{dmi-att 67}	–	c1		o.3	
15	startTime	{dmi-att 68}	–	c1		o.3	
16	stopTime	{dmi-att 69}	–	c1		o.3	
17	intervalsOfDay	{dmi-att 57}	–	c1		o.3	
18	weekMask	{dmi-att 71}	–	c1		o.3	
19	schedulerName	{dmi-att 67}	–	c1		o.3	
c1: if P.4/1a then o else –.							

(continued below)

Table P.2 *(concluded)* **– Attribute support**

	Replace		Add		Remove		Set to default		
Index	Status	Support	Status	Support	Status	Support	Status	Support	Additional information
1	–		–		–		–		
2	–		–		–		–		
3	–		–		–		–		
4	–		–		–		–		
5	–		–		–		–		
6	o.3		–		–		o.3		
7	o.3		–		–		–		
8	–		–		–		–		
9	–		–		–		–		
10	o.3		–		–		–		
11	o.3		–		–		–		
12	–		–		–		–		
13	–		–		–		–		
14	o.3		o.3		o.3		–		
15	o.3		–		–		–		
16	o.3		–		–		o.3		
17	o.3		o.3		o.3		o.3		
18	o.3		o.3		o.3		o.3		
19	–		–		–		–		

P.3.3 Action

The specifier of a manager role implementation that claims to support the actions on the managed objects specified in this document shall import a copy of Table P.3 and complete it.

Table P.3 – Action support

Index	Action type template label	Value of object identifier for action type	Constraints and values	Status	Support	Additional information
1.1	activateDynamicSimpleReport	{summ-act 1}	Information	o		
1.2	activateDynamicSimpleReport	{summ-act 1}	Reply	o		
2.1	activateScanReport	{summ-act 2}	Information (no syntax)	o		
2.2	activateScanReport	{summ-act 2}	Reply	o		

Table P.3 *(concluded)* **– Action support**

Index	Subindex	Action field name label	Constraints and values	Status	Support	Additional information
	1.1.1	scanAttributeIdList	–	c:o		
	1.1.2	scopedSelection	–	c:o		
	1.1.2.1	baseObject	–	c:o.1		
	1.1.2.1	distinguishedName	–	c:o.1		
	1.2.1	scanInitiationTime	–	c:m		
	1.2.2	additionalText	–	c:m		
	1.2.3	additionalInformation	–	c:m		
	2.2.1	scanIntiationTime	–	c:m		
	2.2.2	additionalText	–	c:m		
	2.2.3	additionalInformation	–	c:m		

P.3.4 Create and delete management operations

The specifier of a manager role implementation that claims to support the create or delete management operations on the managed objects specified in this document shall import a copy of Table P.4 and complete it.

Table P.4 – Create and delete support

Index	Operation	Constraints and values	Status	Support	Additional information
1	Create support	–	o.3		
1.1	Create with reference object	–	c:o		
2	Delete support	–	o.3		

Annex Q

Example of MOCS proforma

(This annex does not form an integral part of this Recommendation | International Standard)

Q.1 Introduction

The purpose of this annex is to provide an example of a MOCS proforma as completed by a proforma specifier, which is to be filled in by a supplier of an implementation. The example managed object class definition, called exampleObjectClass, is found in Annex A of CCITT Rec. X.722 | ISO/IEC 10165-4.

The purpose of this MOCS proforma is to provide a mechanism for a supplier of an implementation which claims conformance to a managed object class to provide conformance information in a standard form.

Q.2 Instructions for completing the MOCS proforma to produce a MOCS

The supplier of the implementation shall state which items are supported in the tables below and if necessary provide additional information.

Q.3 Statement of conformance to the managed object class

Table Q.1 – Managed object class support

Index	Managed object class template label	Value of object identifier for for the managed object class	Support of all mandatory features? (Y/N)	Is the actual class the same as the managed object class to which conformance is claimed? (Y/N)
1	exampleObjectClass	{joint-iso-ccitt ms(9) smi(3) part4(4) managedObjectClass(3) exampleclass(0)}		

If the answer to the actual class question in Table Q.1 is no, the supplier of the implementation shall fill in the actual class support Table Q.2.

Table Q.2 – Actual class support

Index	Actual managed object class template label for actual class	Value of object identifier for managed object class definition of actual class	Additional information

Q.4 Attributes

Table Q.3 – Attribute support

				Set by create		Get		Replace	
Index	Attribute template label	Value of object identifier for attribute	Constraints and values	Status	Support	Status	Support	Status	Support
1	objectClass	{joint-iso-ccitt ms(9) smi(3) part2(2) attribute(7) 65}		o		m		–	
2	nameBinding	{joint-iso-ccitt ms(9) smi(3) part2(2) attribute(7) 63}		o		m		–	
3	packages	{joint-iso-ccitt ms(9) smi(3) part2(2) attribute(7) 66}		–		m		–	
4	allomorphs	{joint-iso-ccitt ms(9) smi(3) part2(2) attribute(7) 50}		–		c1		–	
5	objectName	{joint-iso-ccitt ms(9) smi(3) part4(4) attribute(7) objectname(0)}		–		m		–	
6	qOS-Error-Cause	{joint-iso-ccitt ms(9) smi(3) part4(4) attribute(7) qoscause(1)}		–		m		–	
7	qOS-Error-Counter	{joint-iso-ccitt ms(9) smi(3) part4(4) attribute(7) qoscount(2)}		–		m		–	

Table Q.3 *(concluded)* **– Attribute support**

	Add		Remove		Set to default		
Index	Status	Support	Status	Support	Status	Support	Additional information
1	–		–		–		
2	–		–		–		
3	–		–		–		
4	–		–		–		
5	–		–		–		
6	–		–		–		
7	–		–		–		

c1: if (not Q.1/1b) then m else –

Q.5 Attribute Groups

Table Q.4 – Attribute group support

				Get		Set to default		
Index	Attribute group template label	Value of object identifier for attribute group	Constraints and values	Status	Support	Status	Support	Additional information
1	qOS-Group	{joint-iso-ccitt ms(9) smi(3) part4(4) attributeGroup(8) qosgroup(0)}		m		x		

Q.6 Actions

Table Q.5 – Action support

Index	Action type template label	Value of object identifier for action type	Constraints and values	Status	Support	Additional information
1	qOSResetAction	{joint-iso-ccitt ms(9) smi(3) part4(4) action(9) reset(0)}		o		

Table Q.5 *(concluded)* **– Action support**

Index	Subindex	Action field name label	Constraints and values	Status	Support	Additional information
1	1.1	–		–		

Q.7 Notifications

Table Q.6 – Notification support

					Support		
Index	Notification type template label	Value of object identifier for notification type	Constraints and values	Status	Confirmed	Non-confirmed	Additional information
1	protocolError	{joint-iso-ccitt ms(9) smi(3) part4(4) notification(10) protoerror(1)}		m			
2	communicationError	{joint-iso-ccitt ms(9) smi(3) part4(4) notification(10) commerror(0)}		o			

Table Q.6 *(concluded)* **– Notification support**

Index	Subindex	Notification field name label	Value of object identifier of attribute type associated with field	Constraints and values	Status	Support	Additional information
1	1.1	ProtocolError	–		m		
2	2.1	ProbableCause	{joint-iso-ccitt ms(9) smi(3) part2(2) attribute(2) 18)}		o		
	2.1.1	globalValue	–		c:o.1		
	2.1.1	localValue	–		c:o.1		
	2.2	PerceivedSeverity	{joint-iso-ccitt ms(9) smi(3) part2(2) attribute(2) 17)}		o		
	2.3	TrendIndication	{joint-iso-ccitt ms(9) smi(3) part2(2) attribute(2) 30)}		o		
	2.4	BackedUpStatus	{joint-iso-ccitt ms(9) smi(3) part2(2) attribute(2) 11)}		o		
	2.5	ProposedRepair Actions	{joint-iso-ccitt ms(9) smi(3) part2(2) attribute(2) 19)}		o		
	2.6	ThresholdInfo	{joint-iso-ccitt ms(9) smi(3) part2(2) attribute(2) 29)}		o		
	2.6.1	triggeredThreshold	–		c:m		
	2.6.2	observedValue	–		c:m		
	2.6.2.1	integer	–		c:o.2		
	2.6.2.2	real	–		c:o.2		
	2.6.3	thresholdLevel	–		c:o		
	2.6.3.1	up	–		c:o.3		
	2.6.3.1.1	high	–		c:m		
	2.6.3.1.1.1	integer	–		c:o.4		
	2.6.3.1.1.2	real	–		c:o.4		
	2.6.3.1.2	low	–		c:o		
	2.6.3.1.2.1	integer	–		c:o.5		
	2.6.3.1.2.1	real	–		c:o.5		
	2.6.3.2	down	–		c:o.3		
	2.6.3.2.1	high	–		c:m		
	2.6.3.2.1.1	integer	–		c:o.6		
	2.6.3.2.1.2	real	–		c:o.6		
	2.6.3.2.2	low	–		c:m		
	2.6.3.2.2	integer	–		c:o.7		
	2.6.3.2.2	real	–		c:o.7		
	2.6.4	armTime	–		c:o		
	2.7	OtherInfo	–		o		
	2.8	ErrorResult	–		m		

NOTE – Within Table Q.6, the "o.n" notation, e.g. "o.1", means that support of at least one of the options is required.

Q.8 Parameters

Table Q.7 – Parameter support

Index	Parameter template label	Value of object identifier for parameter	Constraints and values	Status	Support	Additional information
1	pDUHeader	{joint-iso-ccitt ms(9) smi(3) part4(4) parameter(5) pduheaderparam(0)}		m		

Annex R

Example of MRCS proforma for name binding

(This annex does not form an integral part of this Recommendation | International Standard)

R.1 Introduction

The purpose of this annex is to provide an example of an MRCS proforma for name binding which is to be filled in by a supplier of an implementation. The example name binding definition, called exampleNameBinding, is found in Annex A of CCITT Rec. X.722 | ISO/IEC 10165-4.

R.2 Instructions for completing the MRCS proforma for name binding to produce a MRCS

The supplier of the implementation shall state which items are supported in the tables below and if necessary provide additional information.

R.3 Statement of conformance to the name binding

Table R.1 – Name binding support

Index	Name binding template label	Value of object identifier for name binding	Constraints and values	Status	Support	Additional information
	exampleNameBinding	{joint-iso-ccitt ms(9) smi(3) part4(4) nameBinding(6) examplenb(0)}		o		

Table R.1 *(concluded)* – **Name binding support**

Index	Subindex	Operation	Constraints and values	Status	Support	Additional information
1	1.1	Create support		m		
	1.2	Create with reference object		–		
	1.3	Create with automatic instance naming		m		
	1.4	Delete support		m		
	1.5	Delete only if no contained objects		x		
	1.6	Delete contained objects		m		

R.4 Parameters

Table R.2 – Parameter support

Index	Parameter template label	Value of parameter identifier	Constraints and values	Status	Support	Additional information
1	createErrorParameter	{joint-iso-ccitt ms(9) smi(3) part4(4) parameter(5)) createerror(1)}		c1		
c1: if R.1/1 then m else –						

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