
**Information technology — Open Systems
Interconnection — Systems Management:
Management knowledge management
function**

**AMENDMENT 1: Extension for General
Relationship Model**

*Technologies de l'information — Interconnexion de systèmes ouverts
(OSI) — Gestion-systèmes: Fonction de gestion de connaissance de
gestion*

AMENDEMENT 1: Extension pour modèle général de relation

Foreword

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[ISO/IEC 10164-16:1997/Amd 1:1998](https://standards.iteh.ai/catalog/standards/sist/351d5142-4cc3-4332-a684-cc8deddadfaa/iso-iec-10164-16-1997-amd-1-1998)

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INTERNATIONAL STANDARD

ITU-T RECOMMENDATION

**INFORMATION TECHNOLOGY – OPEN SYSTEMS INTERCONNECTION –
SYSTEMS MANAGEMENT: MANAGEMENT KNOWLEDGE
MANAGEMENT FUNCTION**

AMENDMENT 1

Extension for General Relationship Model

1) Subclause 3.6

Add references to these SMO-defined terms inserted among existing terms in alphabetical order:

- e) managed object class

and renumber the list as from the existing e) which becomes f), to the end.

2) Subclause 3.11

Add references to these GRM-defined terms inserted before and after existing term in alphabetical order:

- binding;
- binding support;
- managed relationship class;
- relationship cardinality;
- relationship management notification;
- relationship management operation;
- role cardinality;
- relationship mapping specification;
- relationship class specification;
- role;
- unbinding;
- unbinding support.

3) Clause 4

Insert the following abbreviation by alphabetical order:

- GRM General relationship model

4) Clause 6

In this clause change:

- *Definition knowledge:* Information on the formal specification of managed object classes, name bindings, etc., e.g. templates for classes, name bindings.

to:

- *Definition knowledge:* Information on the formal specification of managed object classes and managed relationship classes and related specifications, e.g. templates for classes, attributes, name bindings.

Add an X in the Table 1 cell in the Definition knowledge column in the Relationship knowledge row.

5) Subclause 6.3

In the 2nd item:

relationship role bindings

to:

relationship mapping specifications

6) Subclauses 6.3, 6.5, 7.1.1.1, 8.1.1.2, Table 8, A.2.1 and A.2.3

In subclauses 6.3, 6.5, 7.1.1.1, 8.1.1.2, Table 8, and in behaviour text in A.2.1 and A.2.3, replace each occurrence of the term relationship class that is not preceded by managed with the term defined in GRM managed relationship class but do not change the label supportedRelationshipClassList.

7) Subclause 7.1.2

In this subclause change GDMO and ASN.1 specifications to GDMO, GRM and ASN.1 specifications.

8) Subclauses 7.1.2, 8.1.2.12, 8.6.2 and A.3.3

In subclauses 7.1.2, 8.1.2.12, 8.6.2 and A.3.3, change all occurrences of GDMO template(s) to template(s).

9) Subclause 7.3

Add an X in the four Table 2 cells that are in either the Definition managed objects or Definition Directory objects columns and that are in either the Managed object class knowledge or Relationship knowledge rows. Change both occurrences of X (Note 7) to X and eliminate Note 7.

10) New subclauses 8.1.2.12 and 8.1.2.13

Renumber subclause 8.1.2.12 as 8.1.2.14 and insert two new subclauses before it:

8.1.2.12 Relationship class template managed object

The relationship class template managed object represents a GRM relationship class specification.

The relationship class template managed object class is defined as a subclass of the template managed object class. Its mandatory, read-only attributes are:

- a) derived from;
- b) behaviour.

Its optional, read-only attributes are:

- a) supports;
- b) qualified by;
- c) role specifier.

8.1.2.13 Relationship mapping template managed object

The relationship mapping template managed object represents a GRM relationship mapping specification.

The relationship mapping template managed object class is defined as a subclass of the template managed object class. Its mandatory, read-only attributes are:

- a) mapped relationship class;
- b) behaviour;
- c) role mapping specification;
- d) registered as.

Its optional, read-only attributes are:

- a) relationship object;
- b) operations mapping.

11) Subclause 8.6.2

In this subclause, change the two occurrences of GDMO specifications to GDMO, GRM or ASN.1 specifications.

Append to this subclause the following paragraphs:

The Directory auxiliary class relationship class template is defined for inclusion in Directory entries of Directory structural class Registered information and represents a GRM relationship class specification. It must contain the attributes Derived from and Behaviour. It may contain the attributes Supports, Qualified by, and Role specifier.

The Derived from attribute identifies the immediate superclasses of a managed relationship class. The Behaviour attribute specifies the behaviour associated with the managed relationship class. The Supports attribute defines the relationship management operations and notifications that a managed relationship supports. The Qualified by attribute specifies the attributes that are associated with the managed relationship as a whole. The Role specifier attribute identifies the roles associated with the managed relationship class.

The Directory auxiliary class Relationship mapping template is defined for inclusion in Directory entries of Directory structural class Registered information and represents a GRM relationship mapping specification. It must contain the attributes Behaviour, Mapped relationship class, Role mapping specification set, and Registered as. It may contain the attributes Relationship object and Operations mapping.

The Behaviour attribute defines the behaviour associated with the relationship mapping. The Mapped relationship class attribute specifies the managed relationship class to which the represented relationship mapping is related. The Role mapping specification set attribute identifies candidate managed object classes that may fulfil a given role. The Registered as attribute contains the object identifier of the represented relation mapping. The Relationship object attribute indicates the class of a relationship object that shall represent the managed relationship. The Operations mapping attribute specifies the mapping of a relationship management operation to one or more systems management operations.

12) Subclause 11.1.1.2

Add entries to Table 6 for relationship class template and relationship mapping template (inserting before the entry for the template class).

13) Subclause 11.1.5.1

Add entries to Table 9 for the new attributes mentioned in the new subclauses 8.1.2.12 and 8.1.2.13.

14) Subclause 11.1.5.2

Insert in Table 14 the following entries before the entry for the template class:

Relationship class template	managementRelationshipClass
Relationship mapping template	managementRelationshipMapping

15) Subclause 11.1.6.1

Insert in Table 15 the following entries before the entry for the template class:

relationshipClassTemplate	managementRelationshipClass
relationshipMappingTemplate	managementRelationshipMapping

16) Subclause 11.2.1.2

Add to Table 17 the following entries (inserting in alphabetical order):

Mapped relationship class	mappedRelationshipClass
Operations mapping	operationsMapping
Qualified by	qualifiedBy
Relationship object	relationshipObject
Role mapping specification set	roleMappingSpecificationSet
Role specifier	roleSpecifier
Supports	supports

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17) Subclause A.1

In this subclause change:

[ISO/IEC 10164-16:1997/Amd 1:1998](https://standards.iteh.ai/catalog/standards/sist/351d5142-4cc3-4332-a684-cc8deddadfaa/iso-iec-10164-16-1997-amd-1-1998)

--%PRAGMA version BIT STRING {v1990(0), v1994(1)} ::= {v1990, v1994}

to:

--<ASN1.Version 1990, 1994 MKMD >--

18) Subclause A.2.4

In this subclause change:

--%PRAGMA version BIT STRING {v1990(0), v1994(1)} ::= v1990

to:

--<ASN1.Version 1990 RepertoireASN1Module >--

Also in this subclause change:

FROM Attribute-ASN1Module {joint-iso-ccitt(2) ms(9) smi(3) part2(2) asn1Module(2)}

to:

FROM Attribute-ASN1Module {joint-iso-itu-t(2) ms(9) smi(3) part2(2) asn1Module(2) 1}

19) Subclause A.3.1

Add to this subclause these managed object class definitions (inserting in alphabetical order):

relationshipClassTemplate MANAGED OBJECT CLASS

DERIVED FROM template;

CHARACTERIZED BY relationshipClassPackage PACKAGE

BEHAVIOUR relationshipClassBehaviour **BEHAVIOUR DEFINED AS !**

A managed object with this behaviour represents a **RELATIONSHIP CLASS** template.

!;;

ATTRIBUTES

derivedFrom GET,

behaviour GET;;;

CONDITIONAL PACKAGES

relationshipClassSupportsPackage PACKAGE

BEHAVIOUR relationshipClassSupportsBehaviour **BEHAVIOUR DEFINED AS !**

A managed object with this behaviour represents a template that was defined with the **SUPPORTS** construct.

!;;

ATTRIBUTES

supports GET;

REGISTERED AS {MKMD.mkmPackage 5}; **PRESENT IF** "managed object represents a template that was defined with the **SUPPORTS** construct",

relationshipClassQualifiedByPackage PACKAGE

BEHAVIOUR relationshipClassQualifiedByBehaviour **BEHAVIOUR DEFINED AS !**

A managed object with this behaviour represents a template that was defined with the **QUALIFIED BY** construct.

!;;

ATTRIBUTES

qualifiedBy GET;

REGISTERED AS {MKMD.mkmPackage 6}; **PRESENT IF** "managed object represents a template that was defined with the **QUALIFIED BY** construct",

relationshipClassRoleSpecifierPackage PACKAGE

BEHAVIOUR relationshipClassRoleSpecifierBehaviour **BEHAVIOUR DEFINED AS !**

A managed object with this behaviour represents a template that was defined with the **role-specifier supporting production**.

!;;

ATTRIBUTES

roleSpecifier GET;

REGISTERED AS {MKMD.mkmPackage 7}; **PRESENT IF** "managed object represents a template that was defined with the **role-specifier supporting production**";

REGISTERED AS {MKMD.mkmMOBJECTClass 16};

relationshipMappingTemplate MANAGED OBJECT CLASS

DERIVED FROM template;

CHARACTERIZED BY relationshipMappingPackage PACKAGE

BEHAVIOUR relationshipMappingBehaviour **BEHAVIOUR DEFINED AS !**

A managed object with this behaviour represents a **RELATIONSHIP MAPPING** template.

!;;

ATTRIBUTES

mappedRelationshipClass GET,

behaviour GET,

roleMappingSpecificationSet GET,

registeredAs GET;;;

CONDITIONAL PACKAGES

relationshipMappingRelationshipObjectPackage PACKAGE

BEHAVIOUR relationshipMappingRelationshipObjectBehaviour **BEHAVIOUR DEFINED AS !**

A managed object with this behaviour represents a template that was defined with the **RELATIONSHIP OBJECT** construct.

!;;

ATTRIBUTES

relationshipObject GET;

REGISTERED AS {MKMD.mkmPackage 8}; **PRESENT IF** "managed object represents a template that was defined with the **RELATIONSHIP OBJECT** construct",

relationshipMappingOperationsMappingPackage PACKAGE

BEHAVIOUR relationshipMappingOperationsMappingBehaviour BEHAVIOUR DEFINED AS !

A managed object with this behaviour represents a template that was defined with the OPERATIONS MAPPING construct.

!;;

ATTRIBUTES

operationsMapping GET;

REGISTERED AS {MKMD.mkmPackage 9}; PRESENT IF "managed object represents a template that was defined with the OPERATIONS MAPPING construct";

REGISTERED AS {MKMD.mkmObjectClass 17};

20) Subclause A.3.3

In this subclause change:

BEHAVIOUR derivedFromBehaviour BEHAVIOUR DEFINED AS !

This set-valued attribute identifies the immediate superclasses of a managed object class.

!;;

to:

BEHAVIOUR derivedFromBehaviour BEHAVIOUR DEFINED AS !

This set-valued attribute identifies the immediate superclasses of a managed object class or managed relationship class.

!;;

Add to subclause A.3.3 these attribute definitions (inserting in alphabetical order):

mappedRelationshipClass ATTRIBUTE

WITH ATTRIBUTE SYNTAX GrmAttributeDefinitionModule.MappedRelationshipClass;

MATCHES FOR EQUALITY;

REGISTERED AS {MKMD.mkmAttribute 46};

operationsMapping ATTRIBUTE

WITH ATTRIBUTE SYNTAX GrmAttributeDefinitionModule.OperationsMapping;

MATCHES FOR EQUALITY, SET-COMPARISON, SET-INTERSECTION;

REGISTERED AS {MKMD.mkmAttribute 47};

qualifiedBy ATTRIBUTE

WITH ATTRIBUTE SYNTAX GrmAttributeDefinitionModule.QualifiedBy;

MATCHES FOR EQUALITY, SET-COMPARISON, SET-INTERSECTION;

REGISTERED AS {MKMD.mkmAttribute 48};

relationshipObject ATTRIBUTE

WITH ATTRIBUTE SYNTAX GrmAttributeDefinitionModule.RelationshipObject;

MATCHES FOR EQUALITY;

REGISTERED AS {MKMD.mkmAttribute 49};

roleMappingSpecificationSet ATTRIBUTE

WITH ATTRIBUTE SYNTAX GrmAttributeDefinitionModule.RoleMappingSpecificationSet;

MATCHES FOR EQUALITY, SET-COMPARISON, SET-INTERSECTION;

REGISTERED AS {MKMD.mkmAttribute 50};

roleSpecifier ATTRIBUTE

WITH ATTRIBUTE SYNTAX GrmAttributeDefinitionModule.RoleSpecifier;

MATCHES FOR EQUALITY;

REGISTERED AS {MKMD.mkmAttribute 51};

supports ATTRIBUTE

WITH ATTRIBUTE SYNTAX GrmAttributeDefinitionModule.Supports;

MATCHES FOR EQUALITY, SET-COMPARISON, SET-INTERSECTION;

REGISTERED AS {MKMD.mkmAttribute 52};

21) Subclause A.3.5

In this subclause change:

```
--%PRAGMA version BIT STRING {v1990(0), v1994(1)} ::= {v1990, v1994}
```

to:

```
--<ASN1.Version 1990, 1994 DefinitionASN1Module >--
```

Also in subclause A.3.5 change:

```
FROM Attribute-ASN1Module {joint-iso-ccitt(2) ms(9) smi(3) part2(2) asn1Module(2)}
```

to:

```
FROM Attribute-ASN1Module {joint-iso-itu-t(2) ms(9) smi(3) part2(2) asn1Module(2) 1}
```

Add to the same subclause this new ASN.1 module (after END of DefinitionASN1Module):

```
-- <ASN1.Version 1990, 1994 GrmAttributeDefinitionModule >--
```

```
GrmAttributeDefinitionModule {joint-iso-itu-t(2) ms(9) function(2) part16(16) asn1Modules(2) 6}
```

```
DEFINITIONS IMPLICIT TAGS ::=
```

```
BEGIN
```

```
-- EXPORTS everything;
```

```
IMPORTS
```

```
DefinedType, Identifier, OptionallyRegisteredAs, TemplateLabel, TemplateList
```

```
FROM DefinitionASN1Module {joint-iso-itu-t(2) ms(9) function(2) part16(16) asn1Modules(2) 1}
```

```
-- this Recommendation | International Standard
```

```
;
```

```
LabelAndParameters ::= SEQUENCE {
    label TemplateLabel,
    parameters TemplateList OPTIONAL}
MappedRelationshipClass ::= TemplateLabel
MappingPair ::= SEQUENCE {
    relationshipOperation RelationshipOperation,
    mapsTo MapsTo}
MapsTo ::= SET OF MapsToPair
MapsToPair ::= SEQUENCE {
    systemsMgtOperation SystemsMgtOperation,
    roleOrRelationshipObject RoleOrRelationshipObject}
OperationsMapping ::= SET OF MappingPair
OptionalIdentifier ::= CHOICE {
    present Identifier,
    absent NULL}
OptionalIdentifierAndRole ::= SEQUENCE {
    optionalOperationName OptionalIdentifier,
    optionalRoleName Identifier OPTIONAL}
OptionalLabelAndParameters ::= SEQUENCE {
    label TemplateLabel OPTIONAL,
    parameters TemplateList OPTIONAL}
QualifiedBy ::= TemplateList
RelationshipObject ::= SEQUENCE {
    class TemplateLabel,
    qualifies TemplateList OPTIONAL}
RelationshipOperation ::= CHOICE {
    establish [0] EXPLICIT OptionalIdentifier,
    terminate [1] EXPLICIT OptionalIdentifier,
    query [2] OptionalIdentifierAndRole,
    notify [3] EXPLICIT OptionalIdentifier,
    userDefined [4] EXPLICIT OptionalIdentifier,
    bind [5] OptionalIdentifierAndRole,
    unbind [6] OptionalIdentifierAndRole}
```

Representation	::= CHOICE { nameBindingSuperior nameBindingSubordinate attribute relationshipObjectPointer operation	[0] TemplateLabel, [1] TemplateLabel, [2] TemplateLabel, [3] TemplateLabel, NULL}
RoleMappingSpecification	::= SEQUENCE { role relatedClasses representedBy qualifies	Identifier, TemplateList, [0] EXPLICIT Representation OPTIONAL, [1] TemplateList OPTIONAL}
RoleMappingSpecificationSet	::= SET OF RoleMappingSpecification	
RoleOrRelationshipObject	::= CHOICE { role relationshipObject	Identifier, NULL}
RoleSpecifier	::= SEQUENCE { role compatibleWith permittedRoleCardinality requiredRoleCardinality bindingSupport unbindingSupport permittedRelationshipCardinality optionalRegisteredAs	Identifier, [0] TemplateLabel OPTIONAL, [1] DefinedType OPTIONAL, [2] DefinedType OPTIONAL, [3] EXPLICIT OptionalIdentifier OPTIONAL, [4] EXPLICIT OptionalIdentifier OPTIONAL, [5] DefinedType OPTIONAL, OptionallyRegisteredAs}
SupportedChoice	::= CHOICE { establish terminate query notify userDefined	[0] EXPLICIT OptionalIdentifier, [1] EXPLICIT OptionalIdentifier, [2] EXPLICIT OptionalIdentifier, [3] EXPLICIT OptionalIdentifier, [4] EXPLICIT OptionalIdentifier}
Supports	::= SET OF SupportedChoice	
SystemsMgtOperation	::= CHOICE { get replace add remove create delete action notification	[0] LabelAndParameters, [1] LabelAndParameters, [2] LabelAndParameters, [3] LabelAndParameters, [4] OptionalLabelAndParameters, [5] TemplateList, [6] LabelAndParameters, [7] LabelAndParameters}

END

22) Subclause A.4.1

In this subclause, in the **DERIVED FROM** section, remove the extraneous blank between the double-quote and CCITT.

Also, in this subclause, in the **ATTRIBUTES** section, change:

discoveryId;

to:

discoveryId GET;

23) Subclause A.4.5

In this subclause change:

--%PRAGMA version BIT STRING {v1990(0), v1994(1)} ::= {v1990, v1994}

to:

--<ASN1.Version 1990, 1994 DiscoveryASN1Module >--

Also in this subclause change:

```
FROM InformationFramework {joint-iso-ccitt(2) ds(5) modules(1) informationFramework(1)}
-- ITU-T Rec.X.501 | ISO/IEC 9594-2
```

to:

```
FROM InformationFramework {joint-iso-itu-t(2) ds(5) modules(1) informationFramework(1) 2}
-- NOTE – This Recommendation | International Standard imports
-- RelativeDistinguishedName from CCITT Rec. X.501 (1988) | ISO/IEC 9594-2:1990.
-- The specification for this syntax can now be found in an informative
-- annex of ITU-T Rec. X.711 (1997) | ISO/IEC 9596-1:1998.
```

In the same subclause, in the production for **MITSearch**, ensure that blank space is apparent between **discoveryScope** and **Scope**.

24) Subclause B.1

In this subclause change:

```
--%PRAGMA version BIT STRING {v1990(0), v1994(1)} ::= v1994
```

to:

```
--< ASN1.Version 1994 RepertoireDirectoryASN1Module >--
```

25) Subclause B.2

In this subclause change:

```
--%PRAGMA version BIT STRING {v1990(0), v1994(1)} ::= v1994
```

to:

```
--< ASN1.Version 1994 DefinitionDirectoryASN1Module >--
```

Add to this subclause this new ASN.1 module (after **END** of **DefinitionDirectoryASN1Module**):

```
--<ASN1.Version 1994 GrmDefinitionDirectoryASN1Module >--
```

```
GrmDefinitionDirectoryASN1Module {joint-iso-itu-t(2) ms(9) function(2) part16(16) asn1Modules(2) 7}
```

```
DEFINITIONS IMPLICIT TAGS ::=
```

```
BEGIN
```

```
-- EXPORTS everything;
```

```
IMPORTS
```

```
ATTRIBUTE, OBJECT-CLASS, CONTENT-RULE
```

```
FROM InformationFramework {joint-iso-itu-t(2) ds(5) modules(1) informationFramework(1) 2}
```

```
-- ITU-T Rec. X.501 | ISO/IEC 9594-2
```

```
behaviour, derivedFrom, managementTemplate, registeredAs, registeredInformation
```

```
FROM DefinitionDirectoryASN1Module
```

```
{joint-iso-itu-t(2) ms(9) function(2) part16(16) asn1Modules(2) 4}
```

```
-- this Recommendation | International Standard
```

```
MappedRelationshipClass, MappingPair, RelationshipObject, RoleMappingSpecification, RoleSpecifier, SupportedChoice
```

```
FROM GrmAttributeDefinitionModule
```

```
{joint-iso-itu-t(2) ms(9) function(2) part16(16) asn1Modules(2) 6}
```

```
-- this Recommendation | International Standard
```

```
mkmDirectoryObjectClass, mkmDirectoryAttributeType
```

```
FROM MKMD {joint-iso-itu-t(2) ms(9) function(2) part16(16) asn1Modules(2) 5}
```

```
-- this Recommendation | International Standard
```

```
;
```