SERIES M: TELECOMMUNICATION MANAGEMENT, INCLUDING TMN AND NETWORK MAINTENANCE

Telecommunications management network

Generic, protocol-neutral management information model

Amendment 1

Recommendation ITU-T M.3160 (2008) – Amendment 1

ITU-T M-SERIES RECOMMENDATIONS

TELECOMMUNICATION MANAGEMENT, INCLUDING TMN AND NETWORK MAINTENANCE

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Recommendation ITU-T M.3160

Generic, protocol-neutral management information model

Amendment 1

Summary

In the current in-force Recommendation ITU-T M.3160 *Generic, protocol-neutral management information model*, the "Top" object class and naming rules are not explicitly defined. It is not clear which class the protection group object class is derived from. Although there is a presumption that it may be derived from the Top object class, this is not mentioned specifically in Recommendation ITU-T M.3160. There are no operations to manage the objects defined in Recommendation ITU-T M.3160.

Amendment 1 to Recommendation ITU-T M.3160 adds the "Top" object class definition and modifies the "Protection Group" class definition by adding some figures and the protection switch operations.

History

Edition	Recommendation	Approval	Study Group	Unique ID[*]
1.0	ITU-T M.3160	2008-11-13	2	11.1002/1000/9551
1.1	ITU-T M.3160 (2008) Amd. 1	2016-03-15	2	11.1002/1000/12782

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[*] To access the Recommendation, type the URL http://handle.itu.int/ in the address field of your web browser, followed by the Recommendation's unique ID. For example, http://handle.itu.int/11.1002/1000/11830-en.

FOREWORD

The International Telecommunication Union (ITU) is the United Nations specialized agency in the field of telecommunications, information and communication technologies (ICTs). The ITU Telecommunication Standardization Sector (ITU-T) is a permanent organ of ITU. ITU-T is responsible for studying technical, operating and tariff questions and issuing Recommendations on them with a view to standardizing telecommunications on a worldwide basis.

The World Telecommunication Standardization Assembly (WTSA), which meets every four years, establishes the topics for study by the ITU-T study groups which, in turn, produce Recommendations on these topics.

The approval of ITU-T Recommendations is covered by the procedure laid down in WTSA Resolution 1.

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.

NOTE

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

Compliance with this Recommendation is voluntary. However, the Recommendation may contain certain mandatory provisions (to ensure, e.g., interoperability or applicability) and compliance with the Recommendation is achieved when all of these mandatory provisions are met. The words "shall" or some other obligatory language such as "must" and the negative equivalents are used to express requirements. The use of such words does not suggest that compliance with the Recommendation is required of any party.

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ITU draws attention to the possibility that the practice or implementation of this Recommendation may involve the use of a claimed Intellectual Property Right. ITU takes no position concerning the evidence, validity or applicability of claimed Intellectual Property Rights, whether asserted by ITU members or others outside of the Recommendation development process.

As of the date of approval of this Recommendation, ITU had not received notice of intellectual property, protected by patents, which may be required to implement this Recommendation. However, implementers are cautioned that this may not represent the latest information and are therefore strongly urged to consult the TSB patent database at http://www.itu.int/ITU-T/ipr/.

Recommendation ITU-T M.3160

Generic, protocol-neutral management information model

Amendment 1

Scope

Amendment 1 to Recommendation ITU-T M.3160 adds the "Top" object class definition and modifies the "Protection Group" class definition by adding some figures and the protection switch operations.

1)   Clause 7.3.87, Top

Replace clause 7.3.87 with the following text:

7.3.87   Top

7.3.87.1   Definition

The Top is the basic abstract class in the management information model, and it contains the most basic attributes and operations that can be derived by all management object classes. Derived information object classes from Top should obey the rules for DN and RDN, and in each of the direct and indirect derived IOCs, the naming attributes should be specified explicitly.

7.3.87.2   Attributes

Table 158*bis*

Attribute Name	Support Qualifier	Read Qualifier	Write Qualifier	Create Qualifier	Requirements IDs
objectClass	M	M	–	M	
*objectInstanceName	C^{Note}	Cm	–	Cm	
NOTE – The condition is that when the derived IOC can be instantiated.					

7.3.87.3   Notifications

There is no notification for the Top object class.

2)   Clause 8.1, Table 179

Add the attributes objectClass *and* objectInstanceName *after* numberOfPorts *in Table 179 of clause 8.1 as follows:*

Name	Type	Description
objectClass	String	This attribute is the unique identifier (name) of an information object class.
objectInstanceName	Name	This attribute is the unique identifier of an object instance. It follows the naming constraint of the object class with certain superior class in the containment tree.

3)   Clause 7.2.1.14

Add the following text as clause 7.2.1.14:

7.2.1.14 Protection fragment

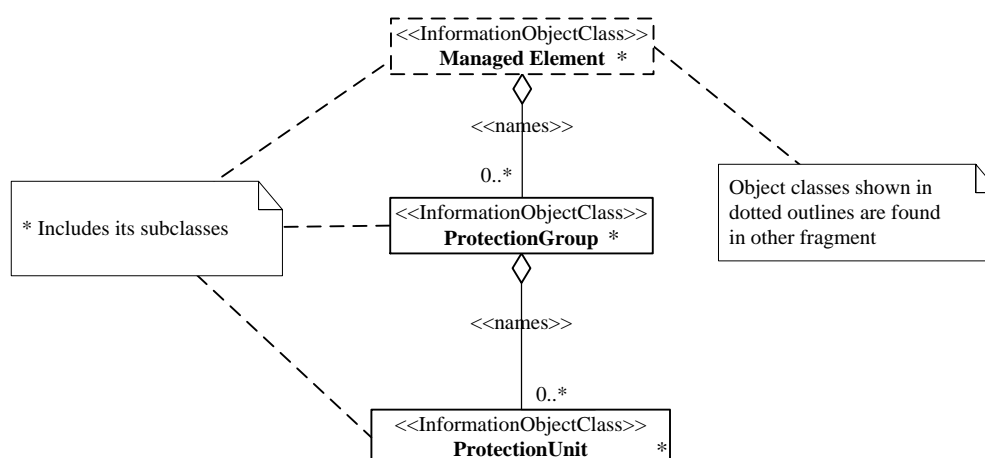IOCs in the protection fragment are presented in Figure 15*bis*.

Figure 15*bis* – Protection fragment

4)   Clause 7.2.2.13

Add the following clause after clause 7.2.2.12:

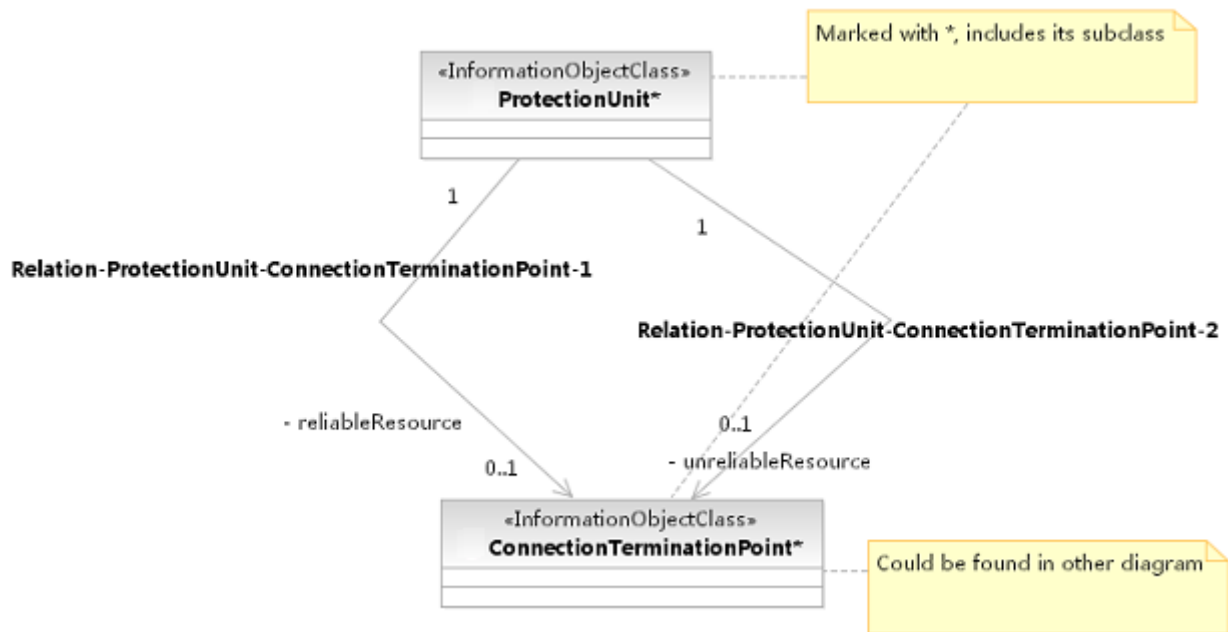### 7.2.2.13 ER diagram of protection fragment

Figure 34*bis* – ER diagram of protection fragment

5)   Clause 7.2.3.14

Add the following clause after clause 7.2.3.13:

7.2.3.14   Inheritance of protection fragment

The inheritance diagram of the protection information objects fragment is presented in Figure *49bis*.
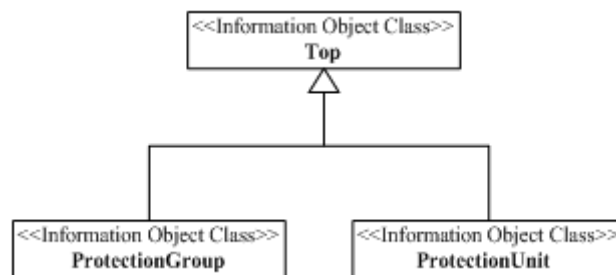

**Figure *49bis* – Inheritance diagram of protection
information objects fragment**

6)   Clause 7.4

Add the following rows after Relation-Position-Position *in clause 7.4 table:*

Relationship	Support Qualifier	Requirement IDs
Relation-ProtectionUnit-ConnectionTerminationPoint-1	O	
Relation-ProtectionUnit-ConnectionTerminationPoint-2	O	

7) Clauses 7.4.115 and 7.4.116

Add the following text as clauses 7.4.115 and 7.4.116 after clause 7.4.114.3:

7.4.115 Relation-ProtectionUnit-ConnectionTerminationPoint-1 (O)

7.4.115.1 Definition

This represents a unidirectional relation from IOC `Protection Unit` to IOC `Connection Termination Point` which will be a reliable resource. The role of the relation shall be mapped to a reference attribute of the IOC. The name of the reference attribute shall be the role name.

7.4.115.2 Roles

Name	Definition
reliableResource	This role (when present) represents the associated `Connection Termination Point` which eventually the traffic goes to, no matter traffic carried by protected or protecting CTP.

7.4.115.3 Constraint

Name	Definition
–	–

7.4.116 Relation-ProtectionUnit-ConnectionTerminationPoint-2 (O)

7.4.116.1 Definition

This represents a unidirectional relation from IOC `Protection Unit` to IOC `Connection Termination Point` which will be an unreliable resource. The role of the relation shall be mapped to a reference attribute of the IOC. The name of the reference attribute shall be the role name.

7.4.116.2 Roles

Name	Definition
unreliableResource	This role (when present) represents the associated `Connection Termination Point` either carrying working traffic or awaiting for backup purpose. This `Connection Termination Point` is considered as unreliable because in case of fault in one CTP, the traffic will switch to the other.

7.4.116.3 Constraint

Name	Definition
–	–

8) Clause 9

Add the following text as clause 9 after clause 8.2:

9 Interface definition

9.1 Class diagram of interfaces

9.2 Generic rules

Rule 1: Each operation with at least one input parameter supports a pre-condition valid_input_parameter which indicates that all input parameters shall be valid with regard to their information type. Additionally, each such operation supports an exception operation_failed_invalid_input_parameter which is raised when pre-condition valid_input_parameter is false. The exception has the same entry and exit state.

Rule 2: Each operation with at least one optional input parameter supports a set of pre-conditions supported_optional_input_parameter_xxx where "xxx" is the name of the optional input parameter and there-condition indicates that the operation supports the named optional input parameter. Additionally, each such operation supports an exception operation_failed_unsupported_optional_input_parameter_xxx which is raised when (a) the pre-condition supported_optional_input_parameter_xxx is false and (b) the named optional input parameter is carrying information. The exception has the same entry and exit state.

Rule 3: each operation shall support a generic exception operation_failed_internal_problem which is raised when an internal problem occurs and that the operation cannot be completed. The exception has the same entry and exit state.

9.3 Protection management interface

This interface represents a group of operations that will do a series of actions on objects defined in clause 7.

9.3.1 Operation protectionSwitch (M)

9.3.1.1 Definition

ProtectionSwitch is an operation used to switch from the protected (i.e., working, regular, or preferred) unit to a protecting (i.e., backup or standby) unit, or vice versa. The switch style includes force switch, manual switch, exercise, etc. A technical specific protection switch may need more parameters and it can be derived from this operation with extended technical specific parameters.

9.3.1.2 Input parameters

Parameter Name	Qualifier	Information type	Comment
prtGroup	M	Name	The name of Protection Group instance to execute the operation.
from	C^{Note}	Name	The protected unit before switching.
to	O	Name	The protecting unit to be used. After switch it will be the protected unit.

switchStyle	M	SwitchStypeType ::= ENUMERATED {
		ManualSwitch,
		"ForceSwitch"
		"ExerciseSwitch"
		"Lock"
		"Unlock"
		"Clear",
		}
			The style of switching:
			"ManualSwitch"
			"ForceSwitch"
			"ExerciseSwitch"
			"Lock"
			"Unlock"
			"Clear"

NOTE – This parameter shall exist in M:N protection switch, because there will be more than one protected unit in the M:N protection.

9.3.1.3 Output parameters

Parameter Name	Qualifier	Information type	Comment

9.3.1.4 Precondition

Assertion Name	Definition
Pre-protectionswitch	The operationalState of the protection group is enabled.

9.3.1.5 Post condition

Assertion Name	Definition
Post-protectionswitch	The service traffic will switch to the 'to' protection unit. The attributes of protection units in the protection group will be changed according to the switch result.

9.3.1.6 Exceptions

Name	Definition
Object not found	Condition: The specific Protection Group is not exist. Returned Information: The output parameter status. Exit state: Entry state.
Object unavailable	Condition: The specific Protection Group is not available for protection switch, e.g. locked, or in other states. Returned Information: The output parameter status. Exit state: Entry state.
Not supported	Condition: The specific Protection Group does not support the specific switch style, or the specific Protection Group does not support protection switch from the ConnectionTerminationPoint to the ConnectionTerminationPoint specific in the provided parameters. Returned Information: The output parameter status. Exit state: Entry state.

9.3.1.7 Constraints

Name	Definition
ProtectionGroupLocked	When switch status is in lock mode, only unlock switchStyle is supported.

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