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Amendment 2

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SERIES M: TMN AND NETWORK MAINTENANCE:
INTERNATIONAL TRANSMISSION SYSTEMS,
TELEPHONE CIRCUITS, TELEGRAPHY, FACSIMILE
AND LEASED CIRCUITS

Telecommunications management network

CORBA generic network and network element level
information model

Amendment 2

ITU-T Recommendation M.3120 (2001) – Amendment 2

ITU-T M-SERIES RECOMMENDATIONS

TMN AND NETWORK MAINTENANCE: INTERNATIONAL TRANSMISSION SYSTEMS, TELEPHONE CIRCUITS, TELEGRAPHY, FACSIMILE AND LEASED CIRCUITS

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ITU-T Recommendation M.3120

CORBA generic network and network element level information model

Amendment 2

Summary

This amendment provides several enhancements to the CORBA generic network and network element level information model. First, it details a mechanism that supports reporting attribute value ranges across the CORBA interface. Second, it defines a new Generic Transport TTP object class which is intended to represent a physical port or endpoints of transport connections. Third, it defines a new object class, ManagedElementR2, a subclass of ManagedElement with three additional attributes added. These attributes include one to hold the "model code" of a piece of equipment. Another new attribute is used to represent network element aliases, or names used by the EMS to refer to Network Elements. Also defined is an attribute to hold the generic "type" of a network element.

Another enhancement included in this amendment relates to expanding the CharacteristicInfo constants module so that it can adequately represent as much of the currently available signal rates as possible.

Source

Amendment 2 to ITU-T Recommendation M.3120 (2001) was prepared by ITU-T Study Group 4 (2001-2004) and approved under the WTSA Resolution 1 procedure on 29 March 2003.

FOREWORD

The International Telecommunication Union (ITU) is the United Nations specialized agency in the field of telecommunications. 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.

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ITU-T Recommendation M.3120

CORBA generic network and network element level information model

Amendment 2

1 Scope

This amendment provides several enhancements to the CORBA generic network and network element level information model. First, it details a mechanism that supports reporting attribute value ranges across the CORBA interface. Second, it defines a new Generic Transport TTP object class which is intended to represent a physical port or endpoints of transport connections. Third, it defines a new object class, *ManagedElementR2*, a subclass of *ManagedElement* with three additional attributes added. These attributes include one to hold the "model code" of a piece of equipment. Another new attribute is used to represent network element aliases, or names used by the EMS to refer to Network Elements. Also defined is an attribute to hold the generic "type" of a network element.

Another enhancement included in this amendment relates to expanding the *CharacteristicInfo* constants module so that it can adequately represent as much of the currently available signal rates as possible.

2 References

The following ITU-T Recommendations and other references contain provisions which, through reference in this text, constitute provisions of this Recommendation. At the time of publication, the editions indicated were valid. All Recommendations and other references are subject to revision; users of this Recommendation are therefore encouraged to investigate the possibility of applying the most recent edition of the Recommendations and other references listed below. A list of the currently valid ITU-T Recommendations is regularly published. The reference to a document within this Recommendation does not give it, as a stand-alone document, the status of a Recommendation.

- [1] ITU-T Recommendation Q.816 (2001), *CORBA-Based TMN Services*.
- [2] ITU-T Recommendation Q.816.1 (2001), *CORBA-Based TMN Services Extensions to Support Coarse-Grained Interfaces*.
- [3] ITU-T Recommendation X.780 (2001), *TMN Guidelines for Defining CORBA Managed Objects*.
- [4] ITU-T Recommendation X.780.1 (2001), *TMN Guidelines for Defining Coarse-Grained CORBA Managed Objects*.
- [5] ITU-T Recommendation M.3120 (2001), *CORBA Generic Network and NE Level Information Model*.
- [6] ITU-T Recommendation M.3100 (1995), *Generic Network Information Model* plus Amendment 1 (1999).
- [7] ITU-T Recommendation Q.822.1 (2001), *Coarse-Grained CORBA Generic Network and NE Level Information Model*.
- [8] ANSI Standard T1.231.1997 (1997), *Digital Hierarchy – Layer 1 In-Service Digital Transmission Performance Monitoring*.

3 Definitions

This amendment has no new definitions in addition to those found in the main Recommendation.

4 Abbreviations

This amendment has no new abbreviations in addition to those found in the main Recommendation.

5 Conventions

This amendment has no new conventions in addition to those found in the main Recommendation.

6 Overview of attribute value ranges

This clause provides a mechanism that allows managed systems using the M.3120 paradigm, to automatically report acceptable value ranges for attributes associated with a network element in the model. Such mechanism would be a valuable asset for equipment discovery and configuration, since a managing system would automatically be aware of the acceptable value ranges for each configurable parameter in the network before attempting to set these values.

For this mechanism to be implemented, we define a new `AttributeRanges` object class. The `AttributeRanges` class allows the managed system to report the minimum and maximum values a certain attribute accepts, as well as the granularity, or step increments, of the range. Each `AttributeRanges` instance contains ranges for attributes belonging to one object class. The *"kind"* attribute in `AttributeRanges` denotes the object class for which ranges are being defined. *"attributeName"* specifies the name of the attribute for which a range is being defined. The range is then defined using the *"minimum"*, *"maximum"*, and *"granularity"* attributes. *"granularity"* is not needed for attributes containing floating numbers.

For each `ManagedElement` instance representing a network element, one or more `AttributeRanges` instances may be created. `AttributeRanges` instances are bound to the `ManagedElement` instance via a containment relationship.

Ranges are defined per `ManagedElement` instance. This allows for an attribute to have different ranges when it belongs to different network elements. In other words, the scope of each `AttributeRanges` instance is the relevant objects associated with the `ManagedElement` which contains the `AttributeRanges` instance.

Figure 1 illustrates the scoping concept more clearly. In the figure, we see two different instances of `ManagedElement` (A and B). Contained under `ManagedElement` A are two `AttributeRanges` instances named A and B. Similarly, contained under `ManagedElement` B are two other `AttributeRanges` instances named C and D. `AttributeRanges` A defines ranges for all `AalProfileTypeOne` instances associated with `ManagedElementA`, while `AttributeRanges` C defines ranges for `AalProfileTypeOne` instances associated with `ManagedElement` B. Similarly, `AttributeRanges` B defines ranges for all `CesServiceProfile` instances associated with `ManagedElementA`, and `AttributeRanges` D defines ranges for `CesServiceProfile` instances associated with `ManagedElement` B. In other words, the managed system instantiates one `AttributeRanges` instance (portrayed as a table in the figure) per class per `ManagedElement` instance.

Hence, if the managing system needs to modify the parameters of an `AalProfileTypeOne` instance associated with `ManagedElement` A (such as the instance *ProfileA* in the figure), it can query `AttributeRanges` A before modifying the values.

In order to set ranges for attributes defined inside data structures, the dot notation is used. For instance, consider the following data structure:

```

struct SampleStructureType {
long xyx,
long abc,
float def };

```

In order to set an attribute range on attribute xyz, we may refer to attribute xyz by setting the *attributeName* attribute in *AttributeRangeType* to "*SampleStructureType.xyz*".

Clause 10.2.1 defines a set of CORBA IDL interfaces for the attribute value ranges information model. These interfaces are translated manually from a set of Amendment 7/M.3100 GDMO managed object classes following the TMN CORBA framework and guidelines given in ITU-T Recs Q.816 and X.780 for fine-grained CORBA interface.

In addition to the fine-grained interface in clause 10.2.1, a companion Facade interface is defined in clause 10.3.1. This facade interface is defined according to the coarse-grained framework and guidelines given in Q.816.1 and X.780.1 for supporting coarse-grained CORBA interfaces. The name of this facade interface is the name of the corresponding fine-grained interface appended with "_F" (an underscore followed by a capital "F").

Figure 2 and Figure 3 show the inheritance and containment relationship of the CORBA interfaces defined in this clause. Note that facade interfaces follow the same inheritance hierarchy relationship as the corresponding fine-grained interfaces.