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SERIES M: TELECOMMUNICATION MANAGEMENT,
INCLUDING TMN AND NETWORK MAINTENANCE

Integrated services digital networks

**Common management services – Object
management – Protocol neutral requirements
and analysis**

Recommendation ITU-T M.3700



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Recommendation ITU-T M.3700

Common management services – Object management – Protocol neutral requirements and analysis

Summary

Recommendation ITU-T M.3700 provides the requirements and analysis for one of the common management services – object management. The object management capabilities are intended for re-use by specific information object classes (IOCs).

History

Edition	Recommendation	Approval	Study Group
1.0	ITU-T M.3700	2010-01-13	2

Keywords

Common management service, object management.

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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Recommendation ITU-T M.3700

Common management services – Object management – Protocol neutral requirements and analysis

1 Scope

This Recommendation defines the requirements for basic object management, including retrieve object information, create object, delete object, modify object attribute, cancel operation, subscribe notification, receive notification, generate attribute value change notification, generate state change notification, generate object create notification, generate object delete notification.

The operations and notifications specified in this document shall be used, where applicable, in information object class (IOC) definitions of other management interface specifications.

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.

- [ITU-T M.3020] Recommendation ITU-T M.3020 (2009), *Management interface specification methodology*.
- [ITU-T M.3060] Recommendation ITU-T M.3060/Y.2401 (2006), *Principles for the Management of the Next Generation Networks*.
- [ITU-T M.3701] Recommendation ITU-T M.3701 (2010), *Common management services – State management – Protocol neutral requirements and analysis*.
- [ITU-T M.3702] Recommendation ITU-T M.3702 (2010), *Common management services – Notification management – Protocol neutral requirements and analysis*.
- [ITU-T X.680] Recommendation ITU-T X.680 (2008) | ISO/IEC 8824-1:2008, *Information technology – Abstract Syntax Notation One (ASN.1): Specification of basic notation*.

3 Definitions

For the purposes of this Recommendation, the following terms and definitions apply.

This Recommendation uses the following terms from [ITU-T M.3020]:

- agent;
- association;
- data;
- manager;
- information object class (IOC).

4 Abbreviations and acronyms

This Recommendation uses the following abbreviations and acronyms:

EM	Element Manager
IOC	Information Object Class
IRP	Integration Reference Point
NE	Network Element
NM	Network Manager
OS	Operations System
UML	Unified Modelling Language

5 Conventions

This Recommendation uses the conventions defined in [ITU-T M.3020] for requirements capture and analysis.

6 Requirements

6.1 Business level requirements

6.1.1 Requirements

6.1.1.1 General requirements

This service uses the following services and thus implicitly imports all the requirements defined therein:

- notification management [ITU-T M.3702];
- state management [ITU-T M.3701].

In addition, the following specific requirements apply for object management as specified in this and subsequent clauses.

Identifier	Definition
REQ-OM-FUN-01	The object management functions shall be able to operate on any information object.
REQ-OM-NON-01	The definitions of new object types may specify which object management functions are applicable.
REQ-OM-FUN-02	The object management capabilities shall be independent of any specific definitions of information objects, attributes, etc.

6.1.1.2 Information retrieval

Identifier	Definition
REQ-OM-FUN-03	The agent will provide an operation to retrieve the value of attributes from one or more IOC instances.
REQ-OM-FUN-04	An operation to retrieve the containment relationships between the IOC instances of a containment tree of information objects shall be provided.
REQ-OM-FUN-05	An operation to retrieve the interface versions that are supported by the agent may be provided.

REQ-OM-FUN-06 An operation to cancel a previously initiated operation if it has not completed may be provided. This operation shall, as a minimum, be able to cancel the operation that retrieves attributes. It may be specified to cancel any operation.

6.1.1.3 Life cycle operations

Life cycle operations are not intended to be implemented without implementation of the information retrieval requirements.

Identifier	Definition
REQ-OM-FUN-07	An operation to create an instance of a information object shall be provided.
REQ-OM-FUN-08	An operation to delete one or more instances of information objects shall be provided.
REQ-OM-FUN-09	An operation to modify one or more attributes of one or more instances of information objects shall be provided.
REQ-OM-FUN-10	A manager may subscribe to notifications about a set of object management operations: object creation, object deletion, object modification and when part or the whole configuration information should be synchronized.

6.1.2 Actor roles

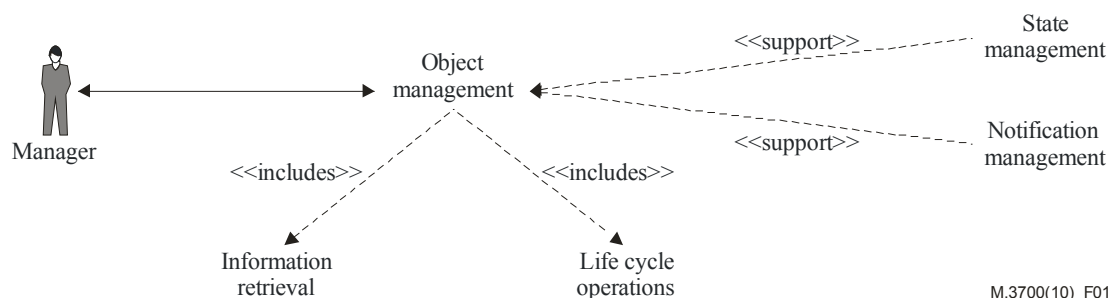
The capabilities described in this Recommendation are available and relevant to all agents and managers.

6.1.3 Telecommunication resources

The object management functionality is applicable to all types of telecommunication resources.

6.1.4 High-level use cases

The first overview use-case diagram in Figure 1 shows the overall interaction of the object management function.



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Figure 1 – High level use case for object management

6.1.4.1 Retrieve object information

Use-case stage	Evolution/Specification	<<Uses>> Related use
Goal	The agent returns to the manager attribute values from one or more information object class instances.	
Actor and roles	The manager invokes operations on the agent.	
Telecom resources	The object management functionality is applicable to all types of telecommunication resources.	
Assumptions	The use case is applicable to any information object class. One or several information objects may be retrieved – based on the containment hierarchy. There is an open communication channel between the manager and the agent. This general service is used to get attributes unless a specific service has been defined by one of the common management services.	
Pre conditions	None.	
Begins when	The manager sends a request to retrieve information on one or more IOC instances.	
Step 1	The manager invokes the information retrieval operation on the agent.	
Ends when	Requested information or an exception is returned to the manager, or the operation is cancelled by the manager.	Cancel pending operation
Exceptions	- operationFailed - duplicateInvocation - resourceLimitation - operationCancelled - complexityLimitation	
Post conditions	None.	
Traceability	REQ-OM-FUN-01, REQ-OM-FUN-03, REQ-OM-FUN-04, REQ-OM-FUN-05	

6.1.4.2 Cancel pending operation

Use-case stage	Evolution/Specification	<<Uses>> Related use
Goal	The manager invokes this operation to cancel an on-going operation it issued before.	
Actor and roles	The manager invokes the cancel operation on the agent.	
Telecom resources	The object management functionality is applicable to all types of telecommunication resources.	

Use-case stage	Evolution/Specification	<<Uses>> Related use
Assumptions	The use case is applicable when specified by the relevant information object, Ref. REQ-OM-FUN-01. The previous operation is either already being processed or waiting for processing by the agent. There is an open communication channel between the manager and the agent.	
Pre conditions	The previous operation invoked by this manager has not been completed.	
Begins when	The manager sends a request to cancel a previously issued operation.	
Step 1	The manager invokes the cancel operation on the agent.	
Ends when	The requested operation is cancelled or an exception is returned to the manager.	
Exceptions	operationFailed	
Post conditions	The operation identified by the operation is cancelled.	
Traceability	REQ-OM-FUN-06	

6.1.4.3 Create object

Use-case stage	Evolution/Specification	<<Uses>> Related use
Goal	This operation is invoked by the manager to request the agent to create a Information object class instance in the MIB maintained by the agent.	
Actor and roles	The manager invokes the operation on the agent.	
Telecom resources	The object management functionality is applicable to all types of telecommunication resources.	
Assumptions	The use case is applicable when specified by the relevant information object, Ref. REQ-OM-FUN-01. This operation will create only one IOC instance. There is an open communication channel between the manager and the agent.	
Pre conditions	A IOC instance with the same distinguished name as the object specified for creation does not exist.	
Begins when	The manager sends a request to create a IOC instance in the MIB maintained by the agent.	
Step 1	The manager invokes the create information object operation on the agent.	
Ends when	The requested IOC instance is created or an exception is returned to the manager.	