

Recommendation

ITU-T M.3186 (08/2024)

SERIES M: Telecommunication management, including
TMN and network maintenance

Telecommunications management network

Shared information and data model (SID) for network operation cost management

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Recommendation ITU-T M.3186

Shared information and data model (SID) for network operation cost management

Summary

Recommendation ITU-T M.3186 provides the "Shared information and data model (SID) for network operation cost management". It covers the following aspects:

- 1) The overall framework of the SID for network operation cost management.
- 2) The specific definition of information object classes and their attributes in the SID for network operation cost management.
- 3) The definition and description of related properties and relationships between information object classes.

History*

Edition	Recommendation	Approval	Study Group	Unique ID
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Recommendation ITU-T M.3186

Shared information and data model (SID) for network operation cost management

1 Scope

This Recommendation builds the shared information and data model (SID) for network operation cost management based on the classification of network operation cost management. The main content includes the definition and description of SID object classes, attributes and the relationship between object classes.

This Recommendation is applicable to the design, development and application of network operation cost management related systems.

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 (2017), *Management interface specification methodology*.
- [ITU-T M.3164] Recommendation ITU-T M.3164 (2020), *Generic information model for on-site telecommunication smart maintenance*.
- [ITU-T M.3386] Recommendation ITU-T M.3386 (2024), *Requirements for the management of network operation cost within AI enhanced Telecom Operation and Management (AITOM) in telecommunication operational aspects*.

3 Definitions

3.1 Terms defined elsewhere

This Recommendation uses the following terms defined elsewhere:

3.1.1 consumable material [ITU-T M.3386]: All supplies used in the performance of maintenance work that are disposable after use and must be replaced regularly to continue with the performance of maintenance work.

NOTE – Some typical consumable materials are patch cords, pigtail, connector, registered jack, etc.

3.1.2 maintenance support service [ITU-T M.3386]: Service provided by the original equipment manufacturer or provider to support the operator's maintenance work according to the maintenance contract.

NOTE – Maintenance support services include technical support in case of operational failures, regular inspection and repairing of the device, etc.

3.1.3 network operation cost [ITU-T M.3386]: Human and other resources spent during operation and maintenance of a network.

3.1.4 on-site overhaul [ITU-T M.3040]: A kind of on-demand preventive maintenance performed at a facility site in the condition of natural disasters or major events.

3.1.5 on-site patrol [b-ITU-T M.3040]: A kind of routine preventive maintenance periodically performed at a facility site.

3.1.6 on-site troubleshooting [b-ITU-T M.3040]: A kind of corrective maintenance performed at a facility site when the quality of equipment degrades.

3.1.7 spare parts [ITU-T M.3386]: Extra components or devices prepared in advance for replacing the ones in use according to maintenance work needs.

NOTE – Some typical consumable materials are patch cords, pigtail, connector, registered jack, etc.

3.1.8 telecommunications managed area [b-ITU-T M.3200]: A set of telecommunications resources, logically and/or physically involved with the telecommunications services, that makes it possible to provide, partly or completely, these services to the customers and is chosen to be managed as a whole.

3.2 Terms defined in this Recommendation

None.

4 Abbreviations and acronyms

This Recommendation uses the following abbreviations and acronyms:

IAT	Installation and Acceptance Testing
ID	IDentifier
IOC	Information Object Class
SID	Shared Information and Data model
TMA	Telecommunications Managed Area

5 Conventions

In this Recommendation:

- For the qualifiers of an operation or a parameter in the analysis template, "M" standards for Mandatory, and "O" standards for Optional.
- Text in the font of Courier New indicates it is an abstract data type as indicated in [ITU-T M.3020] and will be mapped to a protocol-specific data type in the design phase.

6 Overview

The SID for network operation cost management and the information entities provided in this Recommendation follow the [ITU-T M.3020] interface specification methodology, which refer to the related information object classes (IOCs) defined in [ITU-T M.3164].

The classification of network operation costs is mainly composed of telecommunications managed areas (TMAs) and network operation cost expenditure categories as described in [ITU-T M.3386]. The TMAs include fixed broadband network, radio access network, core network, transport network, infrastructure, etc. The network operation cost expenditure categories include on-site patrol, on-site overhaul, on-site trouble shooting, installation and acceptance testing (IAT), spare parts, consumable material, maintenance support service, etc.

This Recommendation introduces the information entities related to the SID for network operation cost management as shown in Table 1.

Table 1 – Information entities in the SID for network operation cost management

Information entity category	Description
Network operation cost information entities	The information entities about all the network operation cost record information, involved in on-site patrol, on-site overhaul, on-site troubleshooting, IAT, spare parts, consumable material, maintenance support service, etc.
Resource management information entities	The information entities about specific network resources.
Maintenance labour related information entities: – On-site maintenance information entities – Installation and acceptance testing information entities	These information entities are abstraction of the maintenance action information, mainly containing maintenance labour information, involved in on-site patrol work tasks, on-site overhaul work tasks, on-site troubleshooting work tasks, installation and acceptance testing work tasks.
Other maintenance action information entities: – Spare parts usage information entities – Consumable material usage information entities – Maintenance support service information entities	These information entities are abstraction of the maintenance information, mainly containing maintenance non-labour information, involved in spare parts usage, consumable material usage and maintenance support service.
Maintenance price related entities: – Maintenance labour price information entities – Spare parts price information entities – Consumable material price information entities – Maintenance support service price information entities	These information entities are maintenance price information corresponding to the maintenance action.

7 Information model for network operation cost management

7.1 The top-level classes relationship diagram

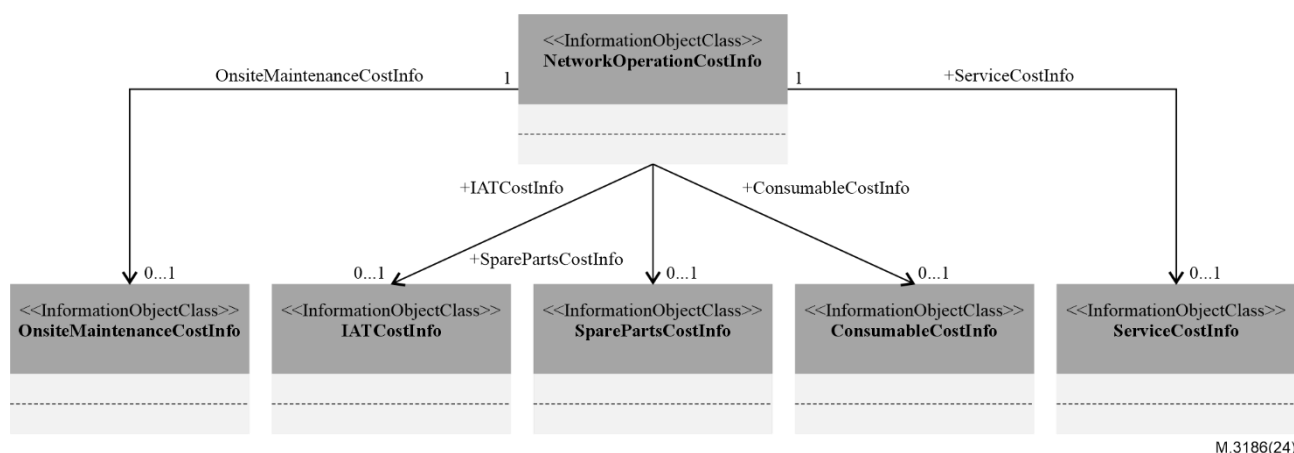


Figure 1 – Entity relationship diagram between the top-level IOCs

As shown in Figure 1, the top-level classes of the information model for network operation include NetworkOperationCostInfo, OnsiteMaintenanceCostInfo, IATCostInfo, SparePartsCostInfo, ConsumableCostInfo and ServiceCostInfo, and these top-level classes contain concrete IOCs.

7.2 Network operation cost information related entities

7.2.1 Object class information model and attribute description (NetworkOperationCostInfo)

7.2.1.1 Network operation cost information model and attribute description

The information model related to NetworkOperationCostInfo is shown in Figure 2.

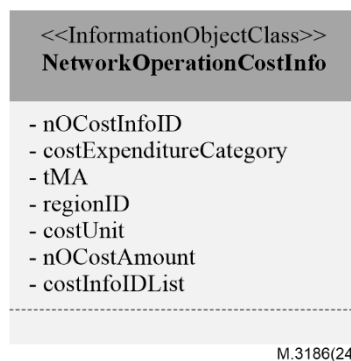


Figure 2 – Information model related to NetworkOperationCostInfo

This Recommendation defines the IOC about network operation cost information as "NetworkOperationCostInfo". NetworkOperationCostInfo is the sum of all subjects of network operation cost, including on-site patrol cost, on-site overhaul cost, on-site troubleshooting cost, installation and acceptance testing cost, spare parts cost, consumable material cost and maintenance support service cost.

7.2.1.1.1 Definition

This management entity describes relevant information related to network operation cost management. The detailed individual attributes are listed below:

- nOCostInfoID: Representing the unique identifier related to network operation cost information.
- costExpenditureCategory: Represents network cost expenditure categories generated by different maintenance action, such as on-site patrol, on-site overhaul, on-site troubleshooting, etc.
- tMA: Represents telecommunications managed areas, such as Fixed broadband network, Radio access network, Core network, etc.
- regionID: Represents the administrative region of the network operation event.
- costUnit: Represents the monetary unit of network operation cost.
- nOCostAmount: Represents the amount of the corresponding network operation costs.
- costInfoIDList: Represents the list of cost information IDs corresponding to the network operation costs, which can be on-site maintenance cost, IAT, spare parts cost, consumable material cost and maintenance support service cost.

7.2.1.1.2 Attributes

Table 2 describes the attribute properties related to NetworkOperationCostInfo:

Table 2 – Attribute properties related to NetworkOperationCostInfo

Attribute name	Support qualifier	Read qualifier	Write qualifier	Invariant qualifier	Note qualifier
nOCostInfoID	M	M	–	–	M
costExpenditureCategory	M	M	M	O	M
tMA	M	M	M	O	M
regionID	M	M	M	O	M
costUnit	M	M	M	O	M
nOCostAmount	M	M	M	O	M
costInfoIDList	M	M	M	O	M

7.3 Resource management information related entities

Referring to [ITU-T M.3020], this Recommendation defines the top-level class about resource management (ResourceInfo) as a proxy class "ProxyClass", which represents all resource entity classes "InformationObjectClass". The proxy class encapsulates the properties, methods (or notifications) that exist in the entity class it represents, and all its behaviour appears in the entity class it represents. Since the proxy class is just a representation of other classes, this class cannot define its behaviour except for the classes that have been defined by the indicated "InformationObjectClass". So, this Recommendation defines properties and methods of the resource proxy class. The information model related to the top-level class about resource management is shown in Figure 3, where the Note is a comment for the proxy class.



Figure 3 – Information model related to ResourceInfo

7.4 On-site maintenance cost related entities

7.4.1 Entity relationship diagram between object classes

On-site maintenance cost related entities are based on the on-site patrol, on-site overhaul and on-site troubleshooting related information entities defined in clauses 6.3, 6.4 and 6.5 of [ITU-T M.3164]. The Relationship class diagram between object classes related to on-site maintenance cost is shown in Figure 4.

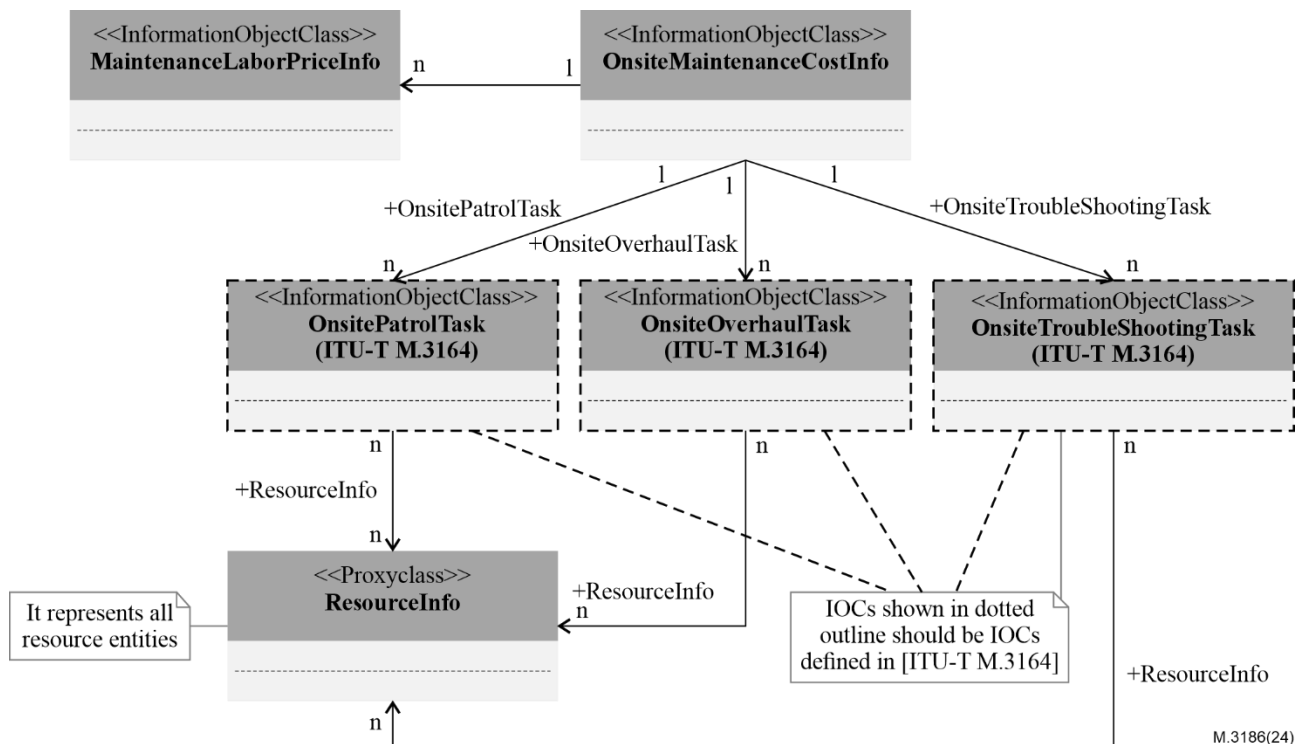


Figure 4 – Entity relationship diagram between object classes related to on-site maintenance

In Figure 4, the IOCs related to on-site maintenance include **OnsiteMaintenanceCostInfo**, **OnsitePatrolTask**, **OnsiteOverhaulTask**, **OnsiteTroubleShootingTask**, **MaintenanceLaborPriceInfo** and **ResourceInfo**. **OnsiteMaintenanceCostInfo** includes multiple cost related information derived from **OnsitePatrolTask**, **OnsiteOverhaulTask** and **OnsiteTroubleShootingTask**, so that **OnsiteMaintenanceCostInfo** has the same relationships with **OnsitePatrolTask**, **OnsiteOverhaulTask** and **OnsiteTroubleShootingTask**, which are one-to-many and one-way association relationships. Onsite maintenance activity is related to different types of maintenance labour cost, so that **OnsiteMaintenanceCostInfo** and **MaintenanceLaborPriceInfo** are one-to-many and one-way association relationships.

7.4.2 Object class information model and attribute description

7.4.2.1 IOC related to On-site maintenance cost (**OnsiteMaintenanceCostInfo**)

The IOC related to on-site maintenance is shown in Figure 5.



Figure 5 – Information model related to OnsiteMaintenanceCostInfo