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INTERNATIONAL STANDARD

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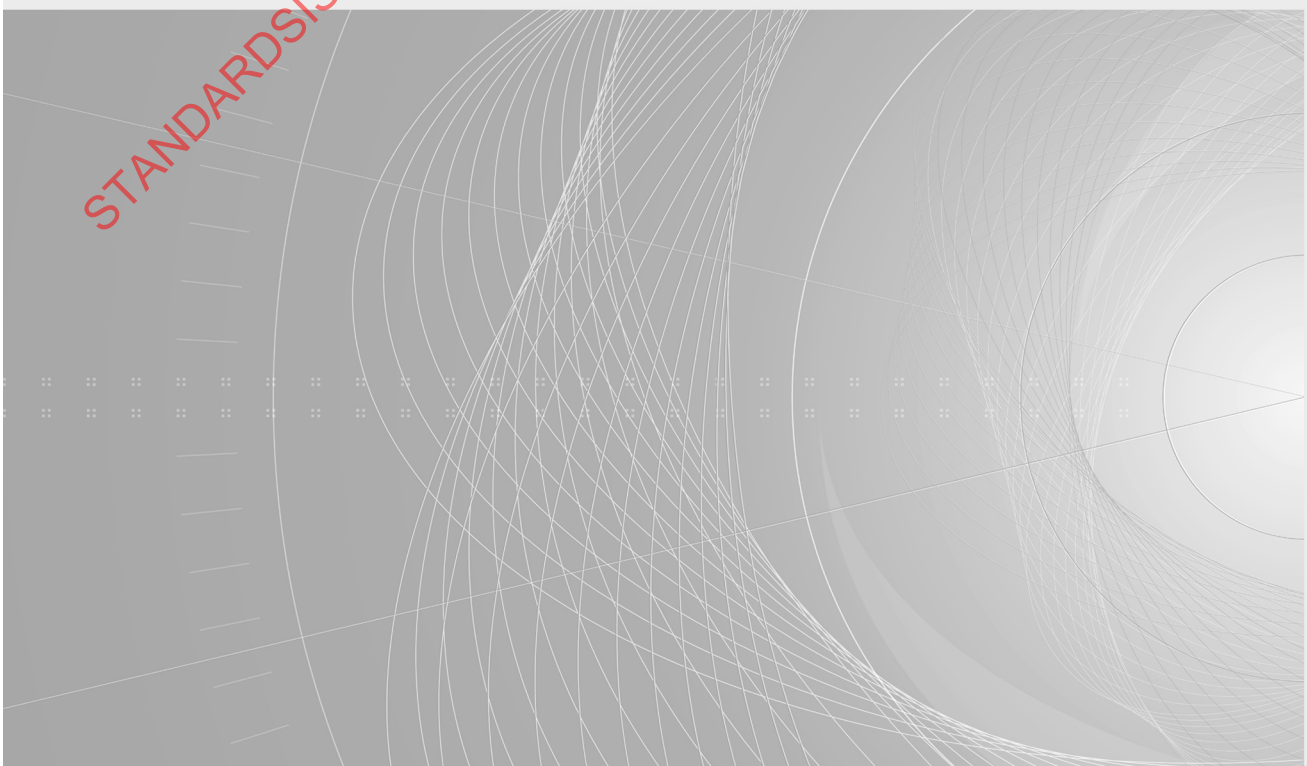
Information technology – Home network resource management – Part 2: Architecture



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INTERNATIONAL STANDARD

Information technology – Home network resource management – Part 2: Architecture

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INFORMATION TECHNOLOGY – HOME NETWORK RESOURCE MANAGEMENT –

Part 2: Architecture

FOREWORD

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International Standard ISO/IEC 30100-2 was prepared by subcommittee 25: Interconnection of information technology equipment, of ISO/IEC joint technical committee 1: Information technology.

A list of all currently available parts of the ISO/IEC 30100 series, published under the general title *Information technology – Home network resource management,* can be found on the IEC website.

This International Standard has been approved by vote of the member bodies, and the voting results may be obtained from the address given on the second title page.

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

IMPORTANT – The 'colour inside' logo on the cover page of this publication indicates that it contains colours which are considered to be useful for the correct understanding of its contents. Users should therefore print this document using a colour printer.

INTRODUCTION

The ISO/IEC 30100 series of standards specifies an abstract model for remote management of home networks conforming to the Home Electronic System (HES) architecture specified in ISO/IEC 14543-2-1. HES consists of a collection of devices that are able to interwork via a common internal network. In a home environment several HESs may operate concurrently, each with separate control and management methods. The Home resource management architecture allows uniform fault processing, diagnostics and configuration management of HES elements in a home environment.

The ISO/IEC 30100 series specifies the home network resource managment architecture and an information model for various home network elements. The information model specifies the minimum requirements of the functionalities that shall be provided by each HES entity. It is specified by the XML-based schema provided in Clause 7. The information consists of the mandatory and optional attributes including user-defined attributes. The user-defined attributes are used for a proprietary purpose or to define attributes that are not specified in the information model. In this part, the information model is specified to cover the physical space, device, network and service information. This information model can be easily extended to accommodate new types of information including user-defined attributes. These functionalities are required to accommodate changes with minimal uploads and restructuring.

Currently, ISO/IEC 30100, *Information technology – Interconnection of information technology equipment –Home Network Resource Management*, consists of the following parts:

Part 1: Requirements

Part 2: Architecture

Part 3: Management application

ISO/IEC 30100 is applicable to:

- a management server located at a home network service provider that manages home networks;
- an apartment complex server, located in an office at the apartment complex;
- a home residential gateway or set top box (STB).

INFORMATION TECHNOLOGY – HOME NETWORK RESOURCE MANAGEMENT –

Part 2: Architecture

1 Scope

This part of ISO/IEC 30100 specifies the general information model and architecture for managing the resources in a home network. Home network resources are managed objects that provide home network services. Essential home resources include device, network and service resources.

The objectives of this standard are to

- define terminology that describes logical resources of devices, networks and services in a home area network;
- specify the logical information model for describing relations among resources;
- describe the basic logical functional procedures of home area networks (e.g., remote maintenance, auto-configuration and fault processing).

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO/IEC 7498-1, *Information technology – Open Systems Interconnection – Basic Reference Model: The Basic Model*

ISO/IEC 14543-2-1, *Information technology – Home electronic system (HES) architecture – Part 2-1: Introduction and device modularity*

ISO/IEC 15944-8, *Information technology – Business Operational View – Part 8: Identification of privacy protection requirements as external constraints on business transactions*

ISO/IEC 18012 (all parts), *Information technology – Home electronic system (HES) – Guidelines for product interoperability*

ISO/IEC 18012-2:2012, *Information technology – Interconnection of information technology equipment – Home Electronic System (HES) – Guidelines for product interoperability – Part 2: Taxonomy and Lexicon*

ISO/IEC 27000, *Information technology – Security techniques – Information security management systems – Overview and vocabulary*

ISO/IEC 27001, *Information technology – Security techniques – Information security management systems – Requirements*

ISO/IEC 27002, *Information technology – Security techniques – Code of practice for information security management*

ISO/IEC 27003, *Information technology – Security techniques – Information security management system implementation guidance*

ISO/IEC 27004, *Information technology – Information security management – Measurement*

ISO/IEC 27005, *Information technology – Security techniques – Information security risk management*

ISO/IEC 27006, *Information technology – Security techniques – Requirements for bodies providing audit and certification of information security management systems*

ISO/IEC 27007, *Information technology – Security techniques – Guidelines for information security management systems auditing*

ISO/IEC TR 27008, *Information technology – Security techniques – Guidelines for auditors on information security controls*

ISO/IEC 27009, *Information technology – Security techniques – Sector-specific application of ISO/IEC 27001 – Requirements*[1]

ISO/IEC 27010, *Information technology – Security techniques – Information security management system implementation guidance*

ISO/IEC 27011, *Information technology – Security techniques – Information security management guidelines for telecommunications organizations based on ISO/IEC 27002*

ISO/IEC 30100-1:2016, *Information technology – Home network resource management – Part 1: Requirements*

3 Terms, definitions and abbreviations

3.1 Terms and definitions

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

3.1.1
apartment complex
group of two or more apartment buildings with a common manager

Note 1 to entry: A common manager provides management services for the apartment buildings. These services may include the management of home networks in the apartments.

3.1.2
application
field of use of the home resource management process

3.1.3
class
set of instances of home resources

[1] To be published.

3.1.4
device
distinct physical unit on a network that performs a (set of) specific function(s) in a particular context

Note 1 to entry: A device can either be an end node on the network, or an intermediate node (as in the case of a network gateway device connecting two distinct physical networks).

3.1.5
domain
range of validity of a resource object

3.1.6
HES entity
logical component that has a defined functionality in the HES architecture

3.1.7
HES interoperability framework
collection of standards defining device and network interoperability for homes

3.1.8
home resource
managed object that can be used for home network services

3.1.9
home resource management interface
data transfer between a management application and a home resource management process

3.1.10
home resource model
abstract, formal representation of resource objects in a home environment

Note 1 to entry: Resource objects include resource properties, relationships and the operations that can be performed on them.

3.1.11
management application
function to be used by an apartment complex manager for suppporting the occupants

3.1.12
management information
set of components used either in a management application or in a resource management process

3.1.13
network
devices interconnected via a common medium for communicating according the reference model specified in ISO/IEC 7498-1

3.1.14
object

3.1.14.1
object
unit of software functionality

Note 1 to entry: This definition is traditionally used in object-oriented programming. It has properties and methods for accessing these properties and/or interacting with other objects.

3.1.14.2
object
collection of related data (attributes) and methods (procedures) for operating on that data

Note 1 to entry: This definition implies a well-defined boundary (interface) and identity that encapsulates state and behaviour

3.1.15
physical space
arbitrary set of reference co-ordinates of a home resource in the real world

3.1.16
resource information provider
functions for home resource management process to control HES entities

Note 1 to entry: Collects data from HES entities and transfers the collected data to the home resource management process.

3.1.17
resource object
unit managed by the resource management process

Note 1 to entry: It has methods for accessing internal properties of the object and/or interacting with other objects. A resource object can contain one or more HES entities.

3.1.18
resource relation object
association between resource objects

3.1.19
service
field of use of an HES

3.2 Abbreviations

AFM Automatic Fault Management
BNF Backus-Naur Form
DM Device Management
HAN Home Area Network
HES Home Electronic System
HNRM Home Network Resource Management
HRMI Home Resource Management Interface
HRPI Home Resource Provider Interface
IFC Industry Foundation Classes
IWF Inter Working Function
IWML Inter Working Markup Language
LSM Layer System Management
NM Network Management
OSI Open System Interconnection
PLC Power Line Carrier
QoS Quality of Service
RM Remote Management
STB Set Top Box
SVC Service object

XSD XML Schema Definitions

3.3 Conventions

Table 1 shows the SI-unit equivalents of the non-SI notations used in the attributes, diagrams and XML Schema Definitions (XSD) in Clause 7. These non-SI notations avoid syntax conflicts with the XSD tag delimiter (“/”).

Table 1 – Notations in ISO/IEC and this standard

Notations in this standard	SI units
bps	bit/s
kbps	kbit/s
mbps	Mbit/s
gbps	Gbit/s
sec	s
usec	µs

4 Conformance

In order to claim conformance to this standard a service provider offering management services for home networks shall provide the following services for each home network device as specified in ISO/IEC 14543-2-1:

- a resource management process that manages each home resource object as specified in 6.2;
- a resource management process that manages each home resource relation object as specified in 6.4;
- a resource management process that provides the mandatory information specified in Clause 7.

5 Home network resource management

5.1 Information resouce categories

To extend the HES interoperability architecture specified in the ISO/IEC 18012 series from products to the management of network resources, several categories of information resources are specified. These categories shall include devices, and may include services, networks and physical spaces, as illustrated in Figure 1. Each category includes elements that shall provide information resources, as described in 6.1 and Figure 2 of ISO/IEC 30100-1:2016. For example, ISO 16739 (IFC) can act as an information resource for the physical elements (floor plan). Also the resource management requires defined representation models for the components of each information category and a mapping method to represent the relations between the categories, which is explained in Clause 6. In this standard, an information category is a synonym for domain information.

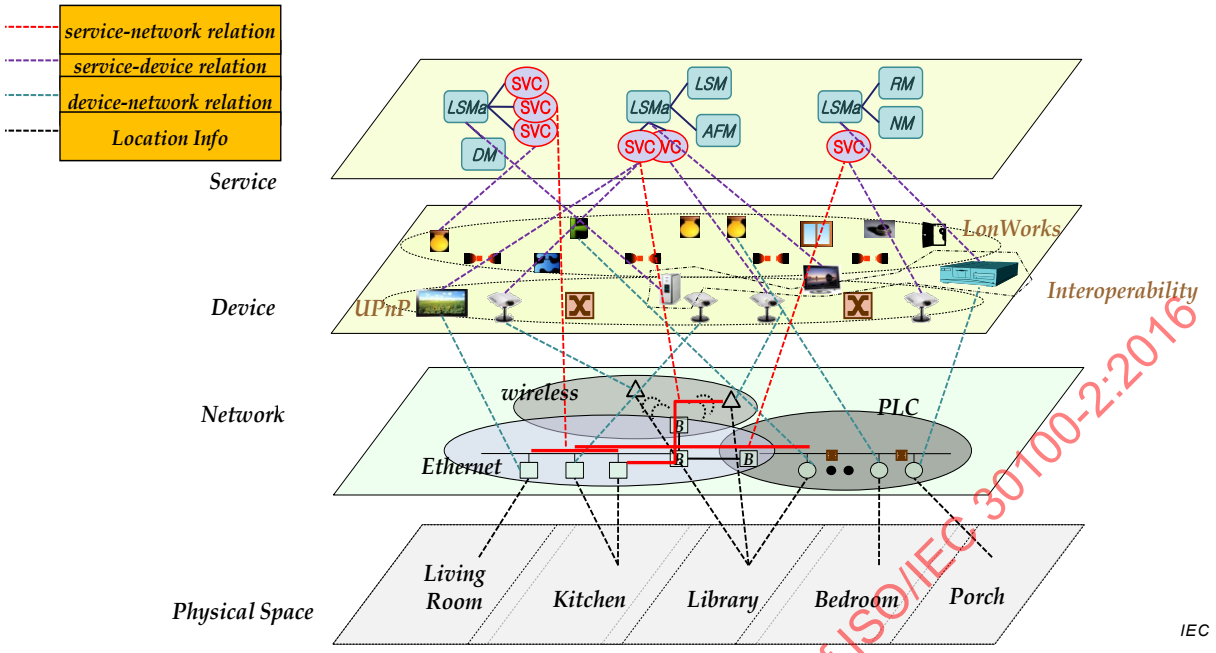


Figure 1 – Logical concept of home resource management architecture

5.2 Architecture

The HNRM system uses the HES interoperability framework (ISO/IEC 18012 series) to integrate resource information from devices, networks and services. This integrated information enables management services such as fault diagnosis and remote management of HES systems.

Figure 2 illustrates the overview of the home network resource management architecture. In Figure 2 the HES interoperability framework applies only to devices (as shown in Figure 1). Because home network resources include more than devices, e.g. network resources or service resources, it is reasonable to expect support in the future for the other elements shown in Figure 1, as are services, networks, and physical spaces. However, the specification of management services for these elements are out of scope for this standard.

The HES interoperability framework in Figure 2 includes an interworking function that translates generic messages of the resource information provider into specific messages of various home network technologies. For example, there is an application for device control or configuration located in the management application in Figure 2. It requests device information about how to control or configure the device for the home resource management process through the HRPI (Home Resource Provider Interface). The home resource management process sends the request from the application to the resource information provider using HRMI (Home Resource Management Interface). The resource information provider relays the request for the device information to the HES interoperability framework via the framework interface. The requested message from the resource information provider to the HES interoperability framework is called a “generic message”.

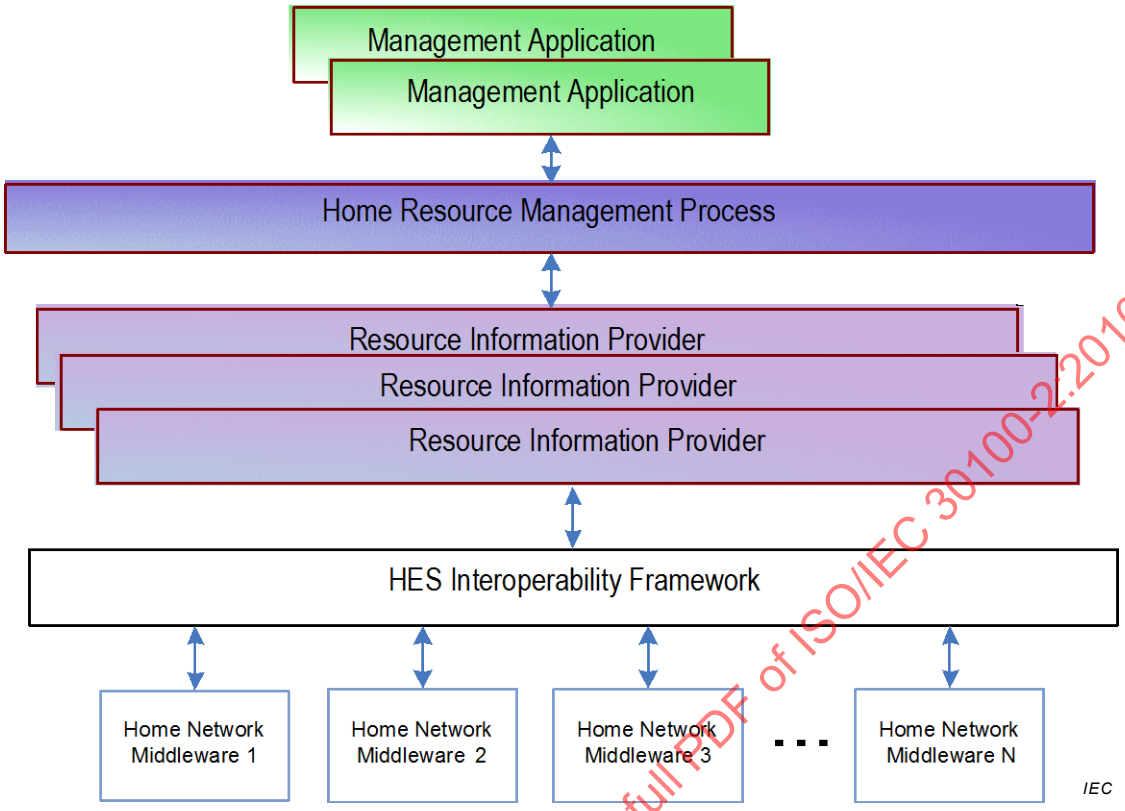


Figure 2 – Overview of the home network resource management architecture

A generic message is sent by the resource information provider to a home application. Devices in a home that implement the application may conform to a variety of home network protocols and applications languages. HES specifies a choice of home network protocols in the ISO/IEC 14543 series. The device developer is responsible for programming the device to translate these generic HNRM messages to device-specific messages conveyed by a home network communications protocol. The tools for this translation are specified by the interworking function in 5.2 of ISO/IEC 18012-2:2012.

ISO/IEC 18012-2 specifies a framework for a common applicaton language using XML structures. A device that is programmed according to ISO/IEC 18012-2 understands this XML-based language in addition to any proprietary application language. This XML language, based on ISO/IEC 18012-2, enables application interoperability among devices. If an application is implemented using a proprietary language, each device or a local proxy for these devices is responsible for translating the XML-based language to any proprietary language. An example of the XML language is provided in Annex A.

The individual device that received the request for device information sends a response message about device information including resource properties, functional capabilities and status to the HES interoperability framework using its specific protocol. When the HES interoperability framework receives the response message from the individual device, it carries out a reverse translation from the specific message to the generic message and sends it to the resource information provider. The translated generic response message in the resource information provider is transmitted to the application through the reverse procedure of that of the request. The application that received device information analyses the information for device control, and then it sends a control request message to the individual device through the same procedure.

An implementation of an application conformant to the HES interoperability framework requires internal management functions to support interoperable application configuration through the interworking function. The internal management functions are described in each device information description. Applications read this device information to determine how to

control the device. The details of internal management functions are specific implementation issues for each application and are outside the scope of this standard.

Thus, interoperability when components from different implementers are combined is achieved with

- a common set of HNRM messages as specified in this standard,
- translation of these HNRM messages using ISO/IEC 18012-2 to a protocol specific for an application that is communicated via a standardised protocol such as one of the HES protocols.

Each implementation depends on the home network protocol and application message set chosen by the developer. A logical connection is established between a remote server and a local device by network management facilities during network configuration, device installation, and service installation. The methods for establishing this connection depend on the home networking protocol chosen.

The overall home resource management architecture consists of four parts, see description in 5.3 to 5.6.

- Resource information provider, see 5.3
- Resource management process, see 5.4
- Management application, see 5.5
- Interface, see 5.6

5.3 Resource information provider

The resource information provider shall collect all data from one or more HES entities on a home network within a single domain (e.g. physical space, service, network and device). The gathered information includes resource properties, functional capabilities and status. Essentially, it requires resource identification, type and name. The information provider transmits collected data to the home resource management process periodically or non-periodically. The communication protocol or exchanging data format follows the standard specifications defined by the HES interoperability framework. In addition, the resource information provider enables direct control of the HES entities, i.e., the home resource management process controls each HES entity via a resource information provider.

As shown in Figure 3, for a single domain, there shall be one or more resource information providers.

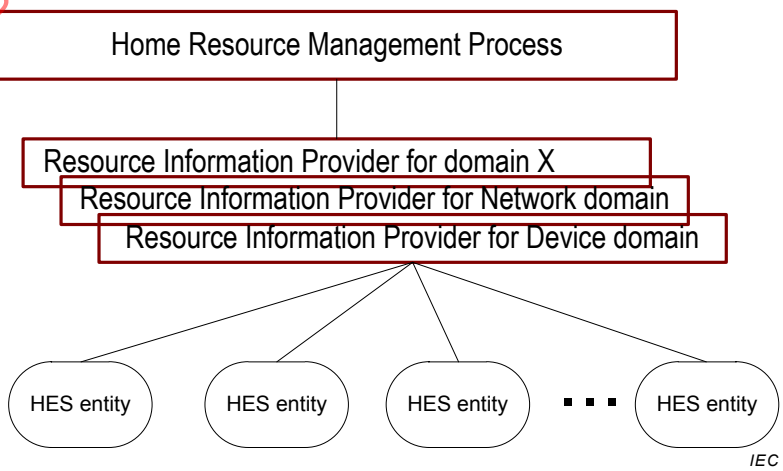


Figure 3 – Resource information provider collects data from one or more HES entities

5.4 Home resource management process

The home resource management process, shown in Figure 4, consists of resource objects and the management information. The home resource management process uses HRPI to collect the resource data from the resource information providers and to transfer control commands back to HES entities via the resource information providers (see 5.6).

As Figure 4 illustrates, the home resource management process creates and maintains resource objects and relation objects based on collected data from resource information providers.

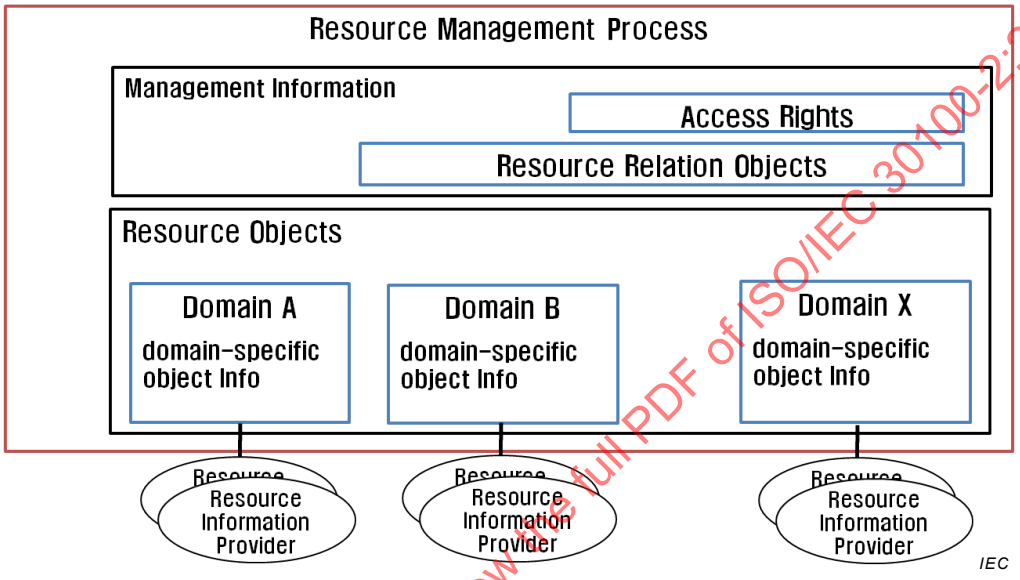


Figure 4 – Resource management process model

The home resource management process categorises resource objects by domain. Each resource object can get an input from one or more resource information providers. Resource objects are mapped to each other with resource relation objects. In this way, it is possible to have one to one or one to many correspondences between the resources in different domains. The resource object and resource relation object are described in Clause 6.

5.5 Management application

A management application is a user process that communicates with a resource management process via HRMI. Through HRMI, a management application can execute diagnostic functions, remote error handling and control of resources by obtaining the information from resource objects and resource relation objects.

The interaction between a management application and the resource management process is presented in Figure 5.

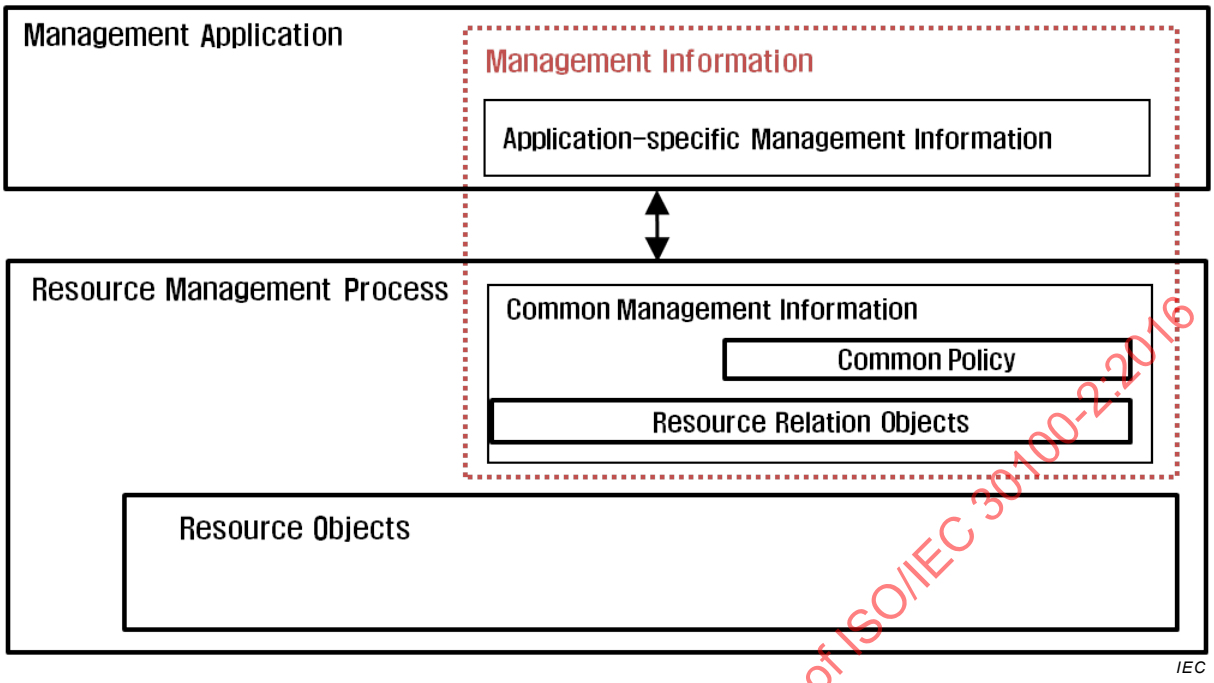


Figure 5 – Management information

As shown in Figure 5, management information comprises the application-specific management information and common management information for resource management process.

Application-specific management information is required by the management application to handle user profiles, policies and application history.

Common management information includes the inter-domain relation information between resource objects and common profile, policy and resource access rights (see 6.5).

5.6 Interface

As illustrated in Figure 6 two different interfaces are required. The first one is HRMI and the second one is HRPI.

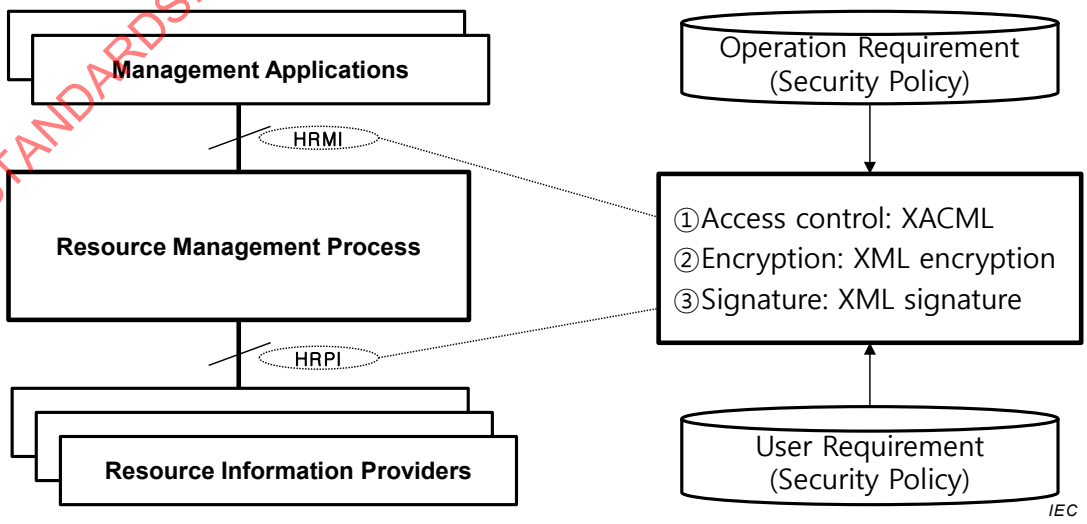


Figure 6 – Interfaces of resource management process

In Figure 6, HRMI and HRPI shall include the data process of access control, encryption and signature as a resource management process, and as a means for security and privacy protection. These processes are the security countermeasures, corresponding to ①, ②, ③, as used in an XML format. Examples of such use cases are shown in Annex B.

These processes are important, because security and privacy resource information is owned by the resource information provider (see Clause 1 of ISO/IEC 30100-1:2016). Also those items represented in XML data to be protected are derived from the operation requirement (security policy) in the management application and from the usage requirement (security policy) in resource information providers. One or more applications for managing privacy information shall include a security standards from the ISO 27000 through ISO 27011 if the management application collects and uses privacy information owned by resource information providers. Also, privacy guidelines, as specified in ISO/IEC 15944-8, which include the OECD privacy guidelines, shall be followed.

HRMI should support the functions that were described in 5.5. HRMI is used for delivering the home resource information including resource objects and resource relation objects to application.

HRPI is used to access resource information providers to obtain data from HES entities as well as to control the HES entities.

6 Home resource model

6.1 Home resource model

The home resource model is an abstract, formal representation of objects in a home that shall include object properties (specified in 6.2), relationships (specified in 6.4) and operations that can be performed on them.

An object is the basic element in the home resource model. There are two types of objects: resource objects and resource relation objects. A resource object represents HES entities in one domain of a home environment. A resource relation object is an object that specifies a relationship among resource objects between the domains.

A home resource model describes home resource information and the relationship among the resource objects. It offers a uniform method for the management of the HES entities. A home resource model shall be represented as a resource description schema consisting of resource objects and resource relation objects. It is used as an input for the HRMI to exchange resource information with other applications or systems.

A home resource model shall accommodate different systems and applications and shall enable distribution of management information among them. Also, home resource information may be utilised by local or remote maintenance, especially for fault diagnosis and resolution. It may also provide means to manage quality of service (QoS) or to automate home control tasks.

6.2 Home resource object

6.2.1 Domain, class and resource object

A home resource object is located within the resource management process in a home environment. A resource object shall contain information from managed elements. It has three levels of hierarchy as shown in Figure 7: (i) domain, (ii) class and (iii) object. An object represents a basic entity in a resource hierarchy. A resource object has a one-to-one relationship with a real-world object. This means that a resource object represents HES. The resource objects are grouped into a class by its common functionality. For example, a light, door lock and gas sensor all belong to the class “Automation” since these objects have a

home automating capability. Finally, the resources are grouped into a domain by the resource type such as device, network, service and physical space. Domain information contains domain-specific resource data of each resource object. Domain information is also utilised for managing the intra-domain relation information of resource object. A home resource model usually has several domains based on the number of resources it manages.

The number of the domains and classes might be added and deleted depending on the characteristics of the resources the application manages. This specification categorises classes by the function of the resources. Annex C illustrates an example of the classes in domains.

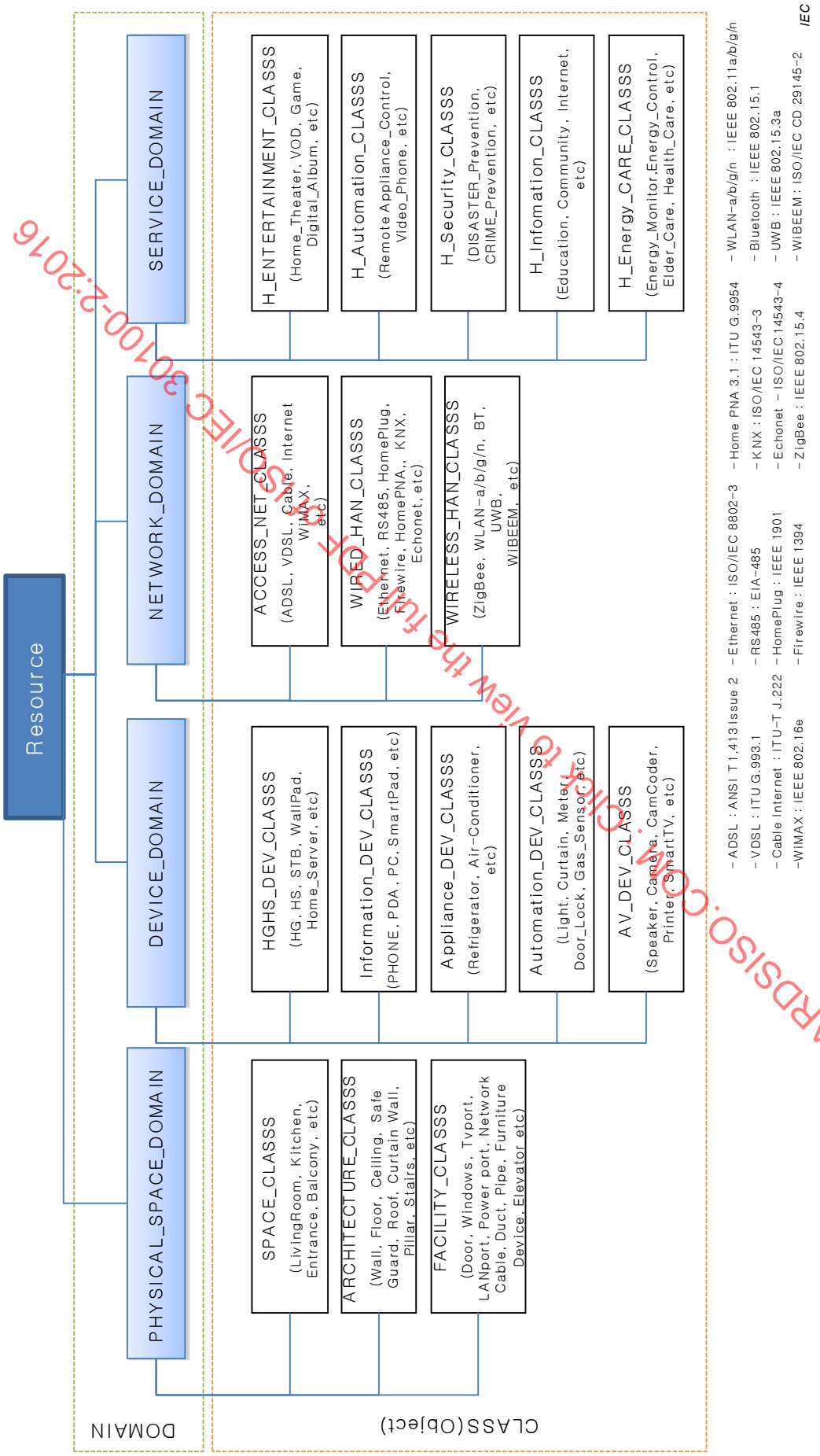


Figure 7 – Resource object hierarchy

6.2.2 Resource object structure

As shown in Figure 8, a resource object consists of common and domain-specific object information.

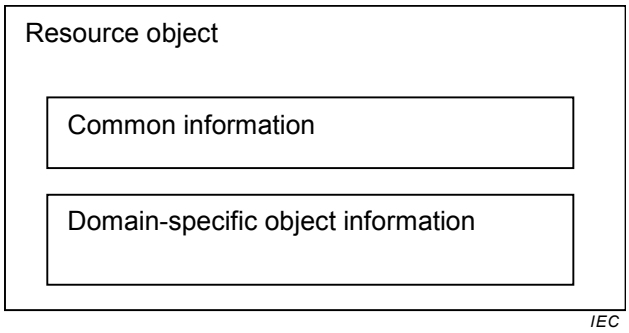


Figure 8 – Resource object structure

Common information of resource object includes the following information.

- Resource identifier

  A resource identifier is a unique identifier to identify an object in a resource management process. It consists of a couple, <domain id, object id>, as shown in Table 2. A domain id is a domain identifier where the resource object belongs. An object id is a unique identifier to identify an object in a domain.

Table 2 – Definition of resource domain ID

Domain name	Domain ID	Description
DEVICE_DOMAIN	0x01	Domain ID for device resources
PHYSICAL_SPACE_DOMAIN	0x02	Domain ID for physical space resources
NETWORK_DOMAIN	0x03	Domain ID for network resources
SERVICE_DOMAIN	0x04	Domain ID for service resources

- Resource name

  A resource name is the name of the resource object based on domain-specific information. It is a character string.

- Resource type

  This is a type of a resource. It is a hexadecimal number. The Resource type is created using the class and the sub-class of the resource object. A resource object can only have one class. The sub-classes are defined on the basis of the classes described in 6.2.1. A sub-class is a more specific description of the resource object. The classification of the resource types for each domain is explained in C.2.

6.3 Domain-specific information

6.3.1 General

Domain-specific information contains domain-related data. Therefore, this information varies depending on the domain type. The format of the domain specific information is determined by the domain ID in the common information. This standard defines only the device domain specific information. The device domain specific information contains the following data.

6.3.2 Device specific information

Device specific information includes type, name, ID, the list of functions supported by the device and the current status of device and device specific elements such as physical address, version, manufacturer, location and distributed data of each device. For clear classification, the device specific information is categorised into five small groups such as basic property, function property, status property, connectivity property and additional property.

“Basic property” means the basic elements to represent the device such as ID, name, type and interface information. The functional property covers the lists of fuctions the device can support, and the status property includes device status, function status and network status. These three properties are mandatory, and the others are optional. The connectivity property covers the lists of neighbors connected to the device, and the additional property includes hardware, software and detail information of the device. The associated elements and attributes are described in 7.2.

6.3.3 Network specific information

Network specific information includes type, name, ID, current status of the network and network specific elements such as topology, link status or throughput information and the number of links. For clear calssification, the network specific information is categorised into four small groups such as basic property, status property, connectivity property and additional property.

The basic property literally means the basic elements needed to represent the device such as ID, name, type and throughput information. The status property provides network status by using traffic, response time or loss rate. These two properties are mandatory, and the others are optional. The connectivity property covers the lists of neighbors or parent/child information connecting the link, and the additional property includes a detailed description of the link. The associated elements and attributes are described in 7.3.

6.3.4 Physical space specific information

Specific information about physical space includes ID, name and type of each physical space element to help the user improve comprehension of architecture information. For clear classification, the physical space specific information is categorised into two small groups such as basic property and additional property.

The basic property means the basic elements needed to represent physical space such as ID, name and type information. The additional properties include project, material, attribute, polygonal mesh and drawing file information of the physical space. The basic property is mandatory, and the others are optional. The associated element and attributes are described in 7.4.

6.3.5 Service specific information

Service specific information includes type, name, ID, the list of functions service support, current status of service and specific elements such as vendor, release number, priority and required specification of each service. For clear classification, the service specific information is categorised into four small groups such as basic property, function property, status property and additional property.

The basic property literally means the basic elements to represent devices such as ID, name, type, user type, priority, version, creation date, release number, size and description information. The status property includes service status, function status and process status. These two properties are mandatory, and the others are optional. The functional property covers the lists of fuctions the service can support, and the additional property includes location URI, starting type, required hardware, required software, required protocol specification and user interface detail about the service. The associated elements and attributes are described in 7.5.

6.4 Home resource relation object

6.4.1 Definition

The home resource relation object is an object that specifies a relationship among resource objects. The home resource relation object only deals with the inter-domain relationships. The intra-domain relationships among resource objects are covered by the domain-specific information stored in resource objects.

A relation object shown in Figure 9 is represented as *<relation_id, relation_name, relation_type, src_resource_id, a list of target resource id>*

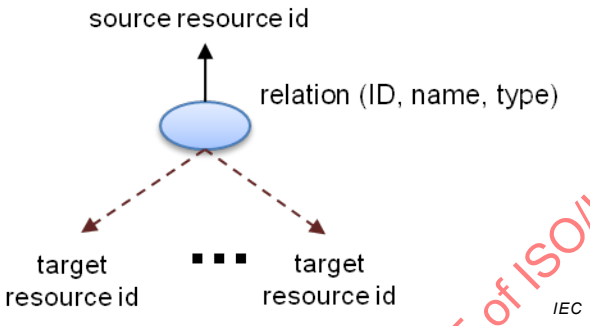


Figure 9 – Home resource relation object

- Relation id

  A unique identifier of the relation in a resource management process.

- Relation name

  Name of the relation. It consists of a character string.

- Relation type

  Type of the relation. This represents the relationship between domains of resource objects. The relation types are summarised in Table 3.

- Source resource object

  The resource identifier of the source object.

- A list of target resource id

  This is a list of target resource id.

Table 3 – Resource relation types

Relation type	Description
RELTYPE_CONTAIN	Hierarchical relation between resource objects. This relation type is used between device-domain and content-domain, device-domain and service-domain, content-domain and content-domain and physical space-domain and physical space-domain. For example, a content resource object can be contained in a device resource object. This relationship is represented RELTYPE_CONTAIN.
RELTYPE_SAMEAS	Equivalent relation between resource objects. This relation type is used between device-domain and physical space-domain, physical space-domain and network-domain, device-domain and device-domain, and network-domain and network-domain. For example, physical space resource objects include physical network line. The relationship between the physical resource object and the network resource object is represented RELTYPE_SAMEAS.
RELTYPE_CONNECT	Network topology relation between resource objects. This relation type is used between device-domain and network-domain.
RELTYPE_LOCATE	Physical spatial relation between resource objects. This relation type is used between device-domain and physical space-domain. For example, a device resource object is in a physical space object. This relationship is represented RELTYPE_LOCATE.
RELTYPE_BIND	Binding relation between resource objects. This relation type is used between device-domain and service-domain.
RELTYPE_CONSUME	Consuming relation between resource objects. This relation type is used between service-domain and content-domain.
RELTYPE_INSTALL	Installing relation between resource objects. This relation type is used between network-domain and physical space-domain. For example, a network link is installed in walls. The relationship between the network resource object, the network link, and the physical space objects, the walls, is represented RELTYPE_INSTALL.
RELTYPE_USE	Using relation between resource objects. This relation type is used between service-domain and service-domain.
RELTYPE_RUN	Running relation between resource objects. This relation type is used between network-domain and service-domain.
RELTYPE_DELIVER	Delivering relation between resource objects. This relation type is used between network-domain and content-domain.

6.4.2 BNF notation of resource relation object

The resource relation object is also represented as a BNF notation. Table 4 illustrates a BNF notation of the relation resource object.

Table 4 – BNF notation of resource relation object

RelationObject::= <relation_id><relation_name><relation_type><src_resource_id> *{<target_resource_id>} +* *<relation_id>::= <identifier>* *<relation_name>::= <string>* *<relation_type>::= <inter_domain_relation>* *<inter_domain_relation>::= <hexadecimal number>* *<src_resource_id>::= <resource_id>* *<target_resource_id>::= < resource_id>* *<string>::= {alpha-numeric}+* *<identifier>::=alpha {<alpha_numeric>}** *<hexadecimal number>::=0{x|X}{<hexadecimal digit> }+* *<integer>::={+ | – } {<numeric> }+* *<alpha_numeric>::=<alpha> | <numeric>* *<hexadecimal digit>::=<numeric>|A|B|C|D|E|F|a|b|c|d|e|f* *<alpha>::=any alphabetic character a through z or A through Z* *<numeric>::=any digit 0 through 0*

6.5 Miscellaneous

6.5.1 Relationship generation methods

The relationships among the home resources shall be defined for the management process. There are three methods for generating relationships between the resource objects. First, users or a home network manager shall input the relationship information explicitly in a pre-defined format. They set some basic relationships for the resource management. Second, the resource information providers shall provide the relationship data. The resource information provider may provide the additional relationships since it is able to gather more detailed resource information using its applications such as a location-positioning agent. Third, an automatic generation method may be used. The automatic method is achieved by the analysis of internal events or messages in the resource management process. In this case, intelligent algorithms may be applied.

6.5.2 Common policy

A home network manager or user may limit the usage of the home resources. A common policy is used in the resource management process. It describes the basic principles of the home resource usage and management. A common policy is applied whenever someone accesses any home resources in a home network environment. A common policy includes at least an administrative policy and a user policy.

An administrative policy specifies the rules for the relationship generation between the home resources. It contains the conditions for the relationship generation and provides the priority of relationship generation rules when relationships, which are generated by 6.5.1, may conflict with each other. Also, it specifies the mapping rules for the generation of inter-domain relationships and conditions.

User policy describes the personal information and preferences of the home network users including account information. It also includes an access rights control. Access rights determine who can access to a home resource and what functions are allowed in a home resource management process.

6.5.3 Privacy

This standard does not impose requirements for dealing with privacy issues when communicating between the home network management process and management applications on the local home area network, as shown in Figure 2.

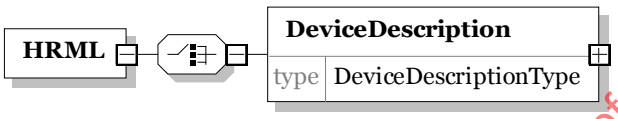
7 Home network resource information modeling

7.1 Overview

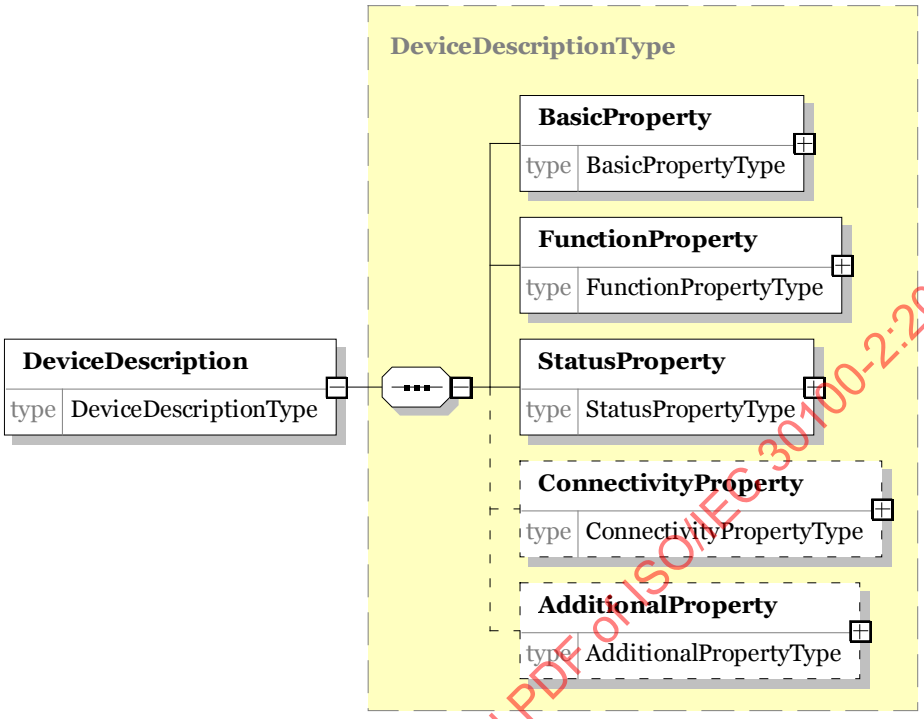
This clause specifies the information model for each information domain. The information in this model can be classified as mandatory and optional. The solid line in the model represents mandatory information. Optional information is represented as a dotted line. The optional information describes additional information for a resource object. User-defined information is defined as optional. The user-defined information consists of three attributes: name, value and description. The user-defined attributes are used to define the proprietary information or the information that is not defined in this data model. The blue coloured text in the diagram means that the value of the field “type” in the XML classes shown in 7.2 is derived from a base “type” to extend or to restrict a “type”.

7.2 Device-specific information modelling

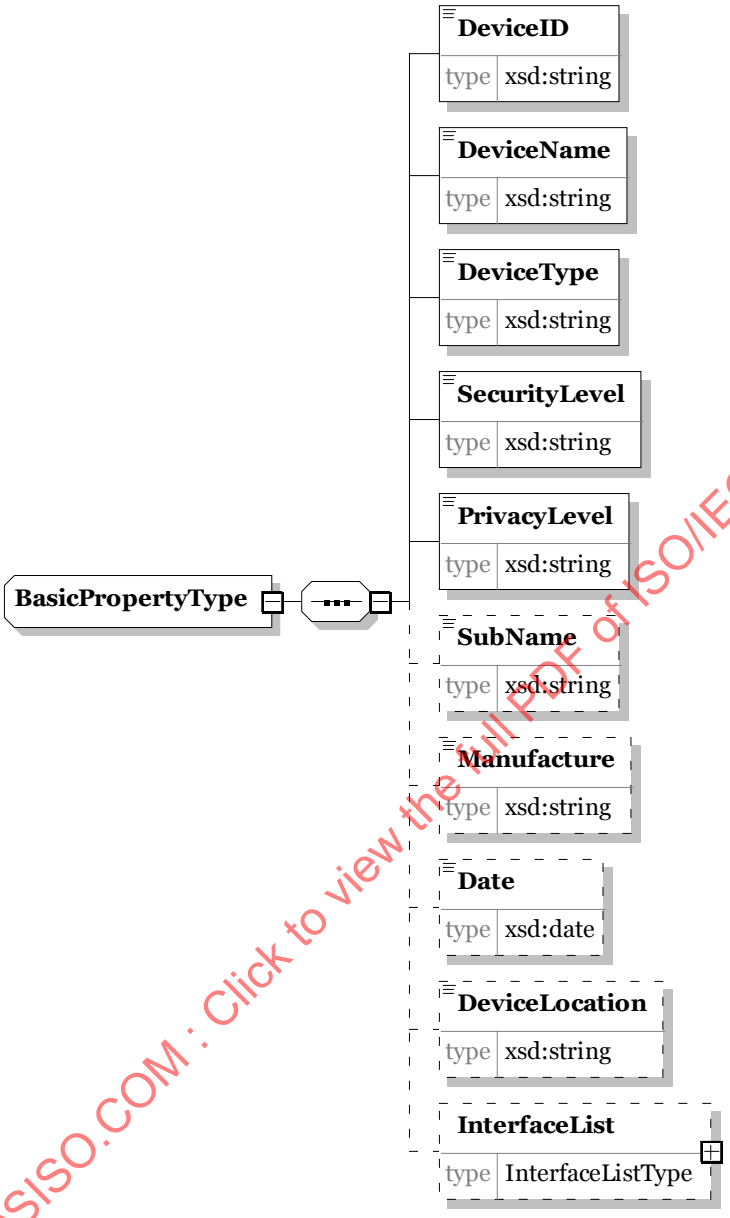
element HRML

diagram	
properties	content complex
children	DeviceDescription
source	<xsd:element name="HRML"> <xsd:complexType> <xsd:choice> <xsd:element name="DeviceDescription" type="DeviceDescriptionType"/> </xsd:choice> </xsd:complexType> </xsd:element>
description	Home resource management markup language. Container for resource information including device, network, physical space, service and so on.

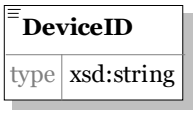
element HRML/DeviceDescription

diagram	
properties	isRef 0 content complex
children	BasicProperty FunctionProperty StatusProperty ConnectivityProperty AdditionalProperty
source	<xsd:element name="DeviceDescription" type="DeviceDescriptionType"/>
description	Container for device description of HRML

element DeviceDescriptionType/BasicPropertyType

diagram	
properties	isRef 0 content complex
children	DeviceID DeviceName DeviceType SecurityLevel PrivacyLevel SubName Manufacture Date DeviceLocation InterfaceList
source	<xsd:element name="BasicProperty" type="BasicPropertyType"/>
description	Basic information of device

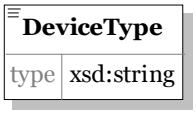
element BasicPropertyType/DeviceID

diagram	
properties	isRef 0 content simple
source	<xsd:element name="DeviceID" type="xsd:string"/>
description	ID of device

element BasicPropertyType/DeviceName

diagram	
properties	isRef 0 content simple
source	<xsd:element name="DeviceName" type="xsd:string"/>
description	Name of device

element BasicPropertyType/DeviceType

diagram	
properties	isRef 0 content simple
source	<xsd:element name="DeviceType" type="xsd:string"/>
description	Type of device

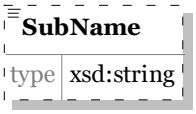
element BasicPropertyType/SecurityLevel

diagram	
properties	isRef 0 content simple
source	<xsd:element name="SecurityLevel" type="string"/>
description	SecurityLevel of device

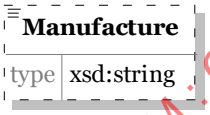
element BasicPropertyType/PrivacyLevel

diagram	
properties	isRef 0 content simple
source	<xsd:element name="PrivacyLevel" type="string"/>
description	PrivacyLevel of device

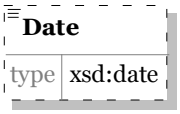
element BasicPropertyType/SubName

diagram	
properties	isRef 0 minOcc 0 maxOcc 1 content simple
source	<xsd:element name="SubName" type="xsd:string" minOccurs="0"/>
description	Subname of device

element BasicPropertyType/Manufacture

diagram	
properties	isRef 0 minOcc 0 maxOcc 1 content simple
source	<xsd:element name="Manufacture" type="xsd:string" minOccurs="0"/>
description	Manufacture name of device

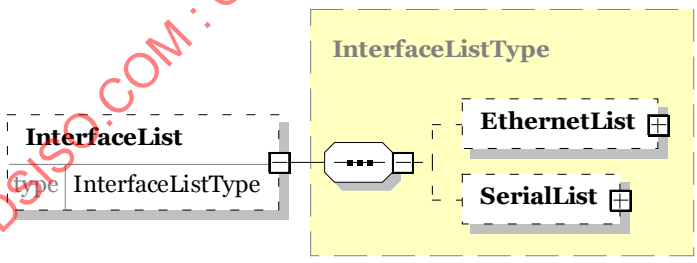
element BasicPropertyType/Date

diagram	
properties	isRef 0 minOcc 0 maxOcc 1 content simple
source	<xsd:element name="Date" type="xsd:date" minOccurs="0"/>
description	Distribution date of device

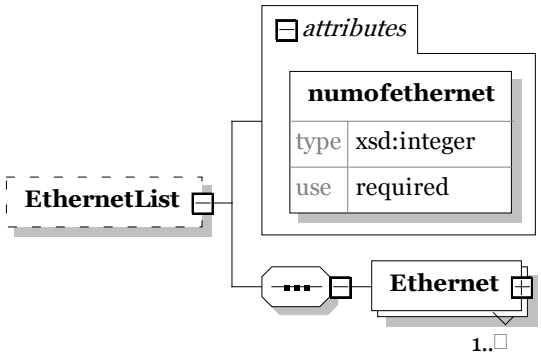
element BasicPropertyType/DeviceLocation

diagram	
properties	isRef 0 minOcc 0 maxOcc 1 content simple
source	<xsd:element name="DeviceLocation" type="xsd:string" minOccurs="0"/>
description	Location of device. It can be defined coordinates or pre-defined physical space.

element BasicPropertyType/InterfaceList

diagram	
properties	isRef 0 minOcc 0 maxOcc 1 content complex
children	EthernetList SerialList
source	<xsd:element name="InterfaceList" type="InterfaceListType" minOccurs="0"/>
description	Lists of interface

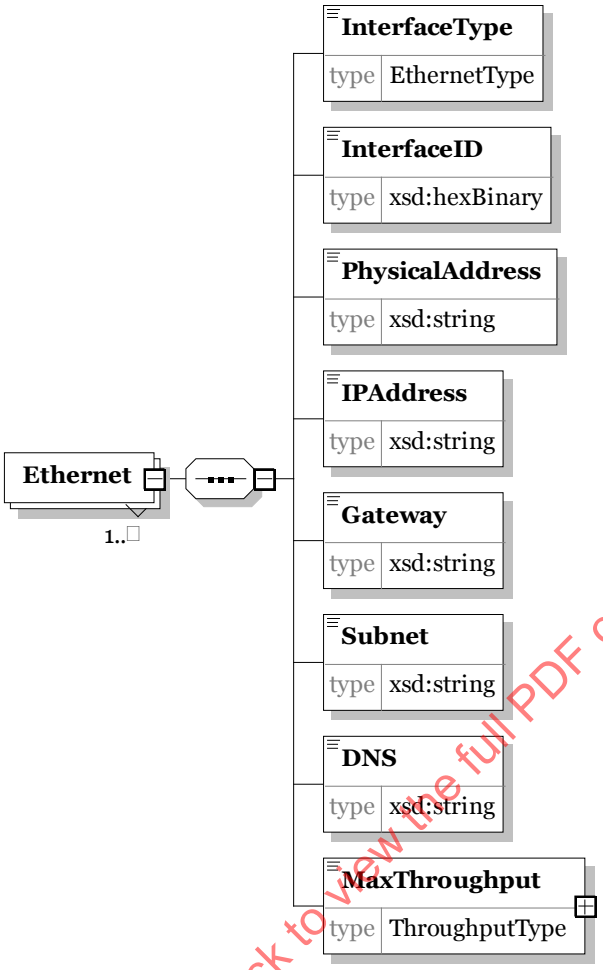
element InterfaceListType/EthernetList

diagram	
properties	isRef 0 minOcc 0 maxOcc 1 content complex
children	Ethernet
attributes	Name numofethernet Type xsd:integer Use required
source	<xsd:element name="EthernetList" minOccurs="0"> <xsd:complexType> <xsd:sequence> <xsd:element name="Ethernet" maxOccurs="unbounded"> <xsd:complexType> <xsd:sequence> <xsd:element name="InterfaceType" type="EthernetType"/> <xsd:element name="InterfaceID" type="xsd:hexBinary"/> <xsd:element name="PhysicalAddress" type="xsd:string"/> <xsd:element name="IPAddress" type="xsd:string"/> <xsd:element name="Gateway" type="xsd:string"/> <xsd:element name="Subnet" type="xsd:string"/> <xsd:element name="DNS" type="xsd:string"/> <xsd:element name="MaxThroughput" type="ThroughputType"/> </xsd:sequence> </xsd:complexType> </xsd:element> </xsd:sequence> <xsd:attribute name="numofethernet" type="xsd:integer" use="required"/> </xsd:complexType> </xsd:element>
description	Lists of Ethernet interface

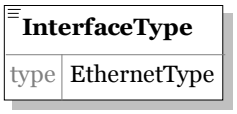
attribute InterfaceListType/EthernetList/@numofethernet

properties	isRef 0 use required
source	<xsd:attribute name="numofethernet" type="xsd:integer" use="required"/>
description	Number of Ethernet interface

element InterfaceListType/EthernetList/Ethernet

diagram	
properties	isRef 0 minOcc 1 maxOcc unbounded content complex
children	InterfaceType InterfaceID PhysicalAddress IPAddress Gateway Subnet DNS MaxThroughput
source	<xsd:element name="Ethernet" maxOccurs="unbounded"> <xsd:complexType> <xsd:sequence> <xsd:element name="InterfaceType" type="EthernetType"/> <xsd:element name="InterfaceID" type="xsd:hexBinary"/> <xsd:element name="PhysicalAddress" type="xsd:string"/> <xsd:element name="IPAddress" type="xsd:string"/> <xsd:element name="Gateway" type="xsd:string"/> <xsd:element name="Subnet" type="xsd:string"/> <xsd:element name="DNS" type="xsd:string"/> <xsd:element name="MaxThroughput" type="ThroughputType"/> </xsd:sequence> </xsd:complexType> </xsd:element>
description	Ethernet interface information of device

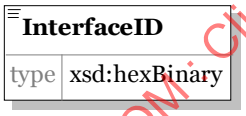
element InterfaceListType/EthernetList/Ethernet/InterfaceType

diagram	
properties	isRef 0 content simple
facets	enumeration IPV4 enumeration IPV6
source	<xsd:element name="InterfaceType" type="EthernetType"/>
description	Information of Ethernet interface type

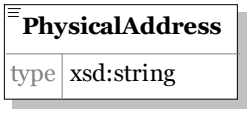
simpleType EthernetType

used by	element InterfaceListType/EthernetList/Ethernet/InterfaceType
facets	enumeration IPV4 enumeration IPV6
source	<xsd:simpleType name="EthernetType"> <xsd:restriction base="xsd:string"> <xsd:enumeration value="IPV4"/> <xsd:enumeration value="IPV6"/> </xsd:restriction> </xsd:simpleType>
description	Type of EthernetType

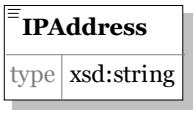
element InterfaceListType/EthernetList/Ethernet/InterfaceID

diagram	
properties	isRef 0 content simple
source	<xsd:element name="InterfaceID" type="xsd:hexBinary"/>
description	ID of Ethernet interface

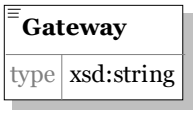
element InterfaceListType/EthernetList/Ethernet/PhysicalAddress

diagram	
properties	isRef 0 content simple
source	<xsd:element name="PhysicalAddress" type="xsd:string"/>
description	Physical address of Ethernet interface

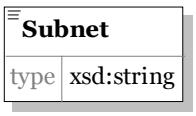
element InterfaceListType/EthernetList/Ethernet/IPAddress

diagram	
properties	isRef 0 content simple
source	<xsd:element name="IPAddress" type="xsd:string"/>
description	IP address of Ethernet interface

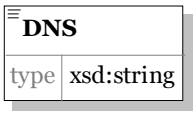
element InterfaceListType/EthernetList/Ethernet/Gateway

diagram	
properties	isRef 0 content simple
source	<xsd:element name="Gateway" type="xsd:string"/>
description	Gateway information of Ethernet interface

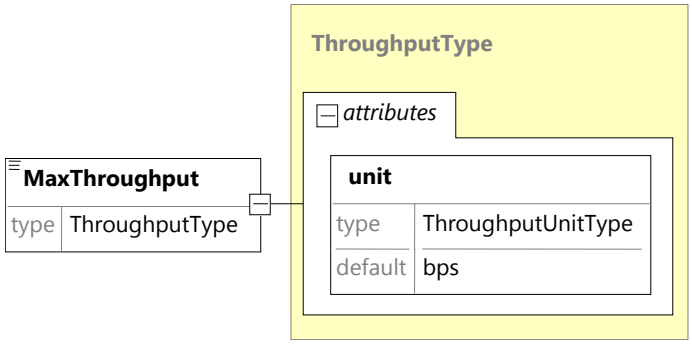
element InterfaceListType/EthernetList/Ethernet/Subnet

diagram	
properties	isRef 0 content simple
source	<xsd:element name="Subnet" type="xsd:string"/>
description	Subnet information of Ethernet interface

element InterfaceListType/EthernetList/Ethernet/DNS

diagram	
properties	isRef 0 content simple
source	<xsd:element name="DNS" type="xsd:string"/>
description	DNS information of Ethernet interface

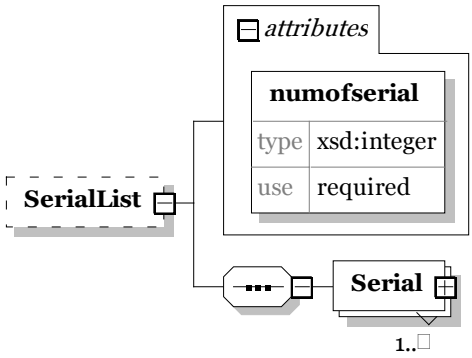
element InterfaceListType/EthernetList/Ethernet/MaxThroughput

diagram	
properties	isRef 0 content complex
Attributes	Name unit Type ThroughputUnitType Default bps
Source	<xsd:element name="MaxThroughput" type="ThroughputType"/>
Description	Maximum throughput of Ethernet interface

simpleType ThroughputUnitType

used by	attribute ThroughputType/@unit
facets	enumeration bps enumeration kbps enumeration mbps enumeration gbps
source	<xsd:simpleType name="ThroughputUnitType"> <xsd:restriction base="xsd:string"> <xsd:enumeration value="bps"/> <xsd:enumeration value="kbps"/> <xsd:enumeration value="mbps"/> <xsd:enumeration value="gbps"/> </xsd:restriction> </xsd:simpleType>
description	Type of throughput unit

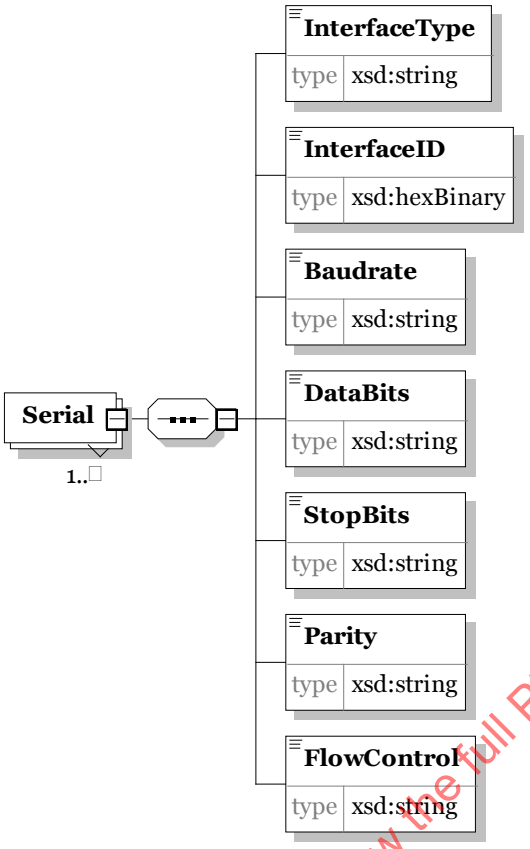
element InterfaceListType/SerialList

diagram	
properties	isRef 0 minOcc 0 maxOcc 1 content complex
children	Serial
attributes	Name numofserial Type xsd:integer Use required
source	<xsd:element name="SerialList" minOccurs="0"> <xsd:complexType> <xsd:sequence> <xsd:element name="Serial" maxOccurs="unbounded"> <xsd:complexType> <xsd:sequence> <xsd:element name="InterfaceType" type="xsd:string"/> <xsd:element name="InterfaceID" type="xsd:hexBinary"/> <xsd:element name="Datarate" type="xsd:string"/> <xsd:element name="DataBits" type="xsd:string"/> <xsd:element name="StopBits" type="xsd:string"/> <xsd:element name="Parity" type="xsd:string"/> <xsd:element name="FlowControl" type="xsd:string"/> </xsd:sequence> </xsd:complexType> </xsd:element> </xsd:sequence> <xsd:attribute name="numofserial" type="xsd:integer" use="required"/> </xsd:complexType> </xsd:element>
description	Lists of serial interface

attribute InterfaceListType/SerialList/@numofserial

properties	isRef 0 use required
source	<xsd:attribute name="numofserial" type="xsd:integer" use="required"/>
description	Number of serial interface

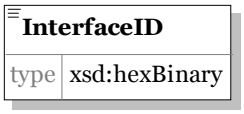
element InterfaceListType/SerialList/Serial

diagram	
properties	isRef 0 minOcc 1 maxOcc unbounded content complex
children	InterfaceType InterfaceID Datarate DataBits StopBits Parity FlowControl
source	<xsd:element name="Serial" maxOccurs="unbounded"> <xsd:complexType> <xsd:sequence> <xsd:element name="InterfaceType" type="xsd:string"/> <xsd:element name="InterfaceID" type="xsd:hexBinary"/> <xsd:element name="Datarate" type="xsd:string"/> <xsd:element name="DataBits" type="xsd:string"/> <xsd:element name="StopBits" type="xsd:string"/> <xsd:element name="Parity" type="xsd:string"/> <xsd:element name="FlowControl" type="xsd:string"/> </xsd:sequence> </xsd:complexType> </xsd:element>
description	Serial interface information of device

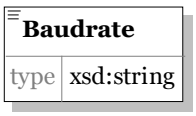
element InterfaceListType/SerialList/Serial/InterfaceType

diagram	
properties	isRef 0 content simple
source	<xsd:element name="InterfaceType" type="xsd:string"/>
description	Type of serial interface

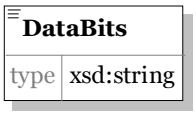
element InterfaceListType/SerialList/Serial/InterfaceID

diagram	
properties	isRef 0 content simple
source	<xsd:element name="InterfaceID" type="xsd:hexBinary"/>
description	ID of serial interface

element InterfaceListType/SerialList/Serial/Datarate

diagram	
properties	isRef 0 content simple
source	<xsd:element name="Datarate" type="xsd:string"/>
description	Datarate of serial interface

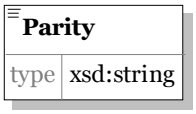
element InterfaceListType/SerialList/Serial/DataBits

diagram	
properties	isRef 0 content simple
source	<xsd:element name="DataBits" type="xsd:string"/>
description	Data bits of serial interface

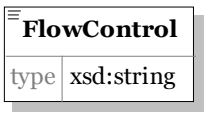
element InterfaceListType/SerialList/Serial/StopBits

diagram	
properties	isRef 0 content simple
source	<xsd:element name="StopBits" type="xsd:string"/>
description	Stop bits of serial interface

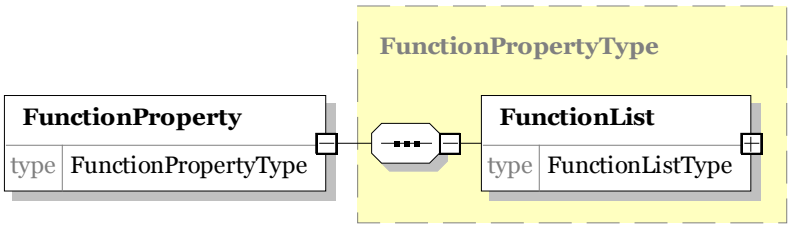
element InterfaceListType/SerialList/Serial/Parity

diagram	
properties	isRef 0 content simple
source	<xsd:element name="Parity" type="xsd:string"/>
description	Parity of serial interface

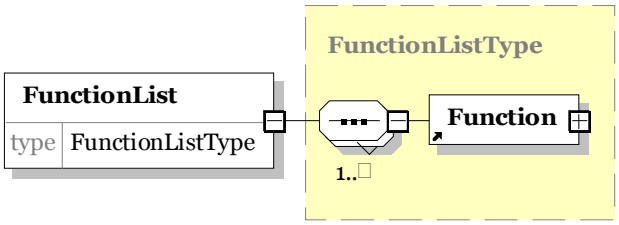
element InterfaceListType/SerialList/Serial/FlowControl

diagram	
properties	isRef 0 content simple
source	<xsd:element name="FlowControl" type="xsd:string"/>
description	Flow control of serial interface

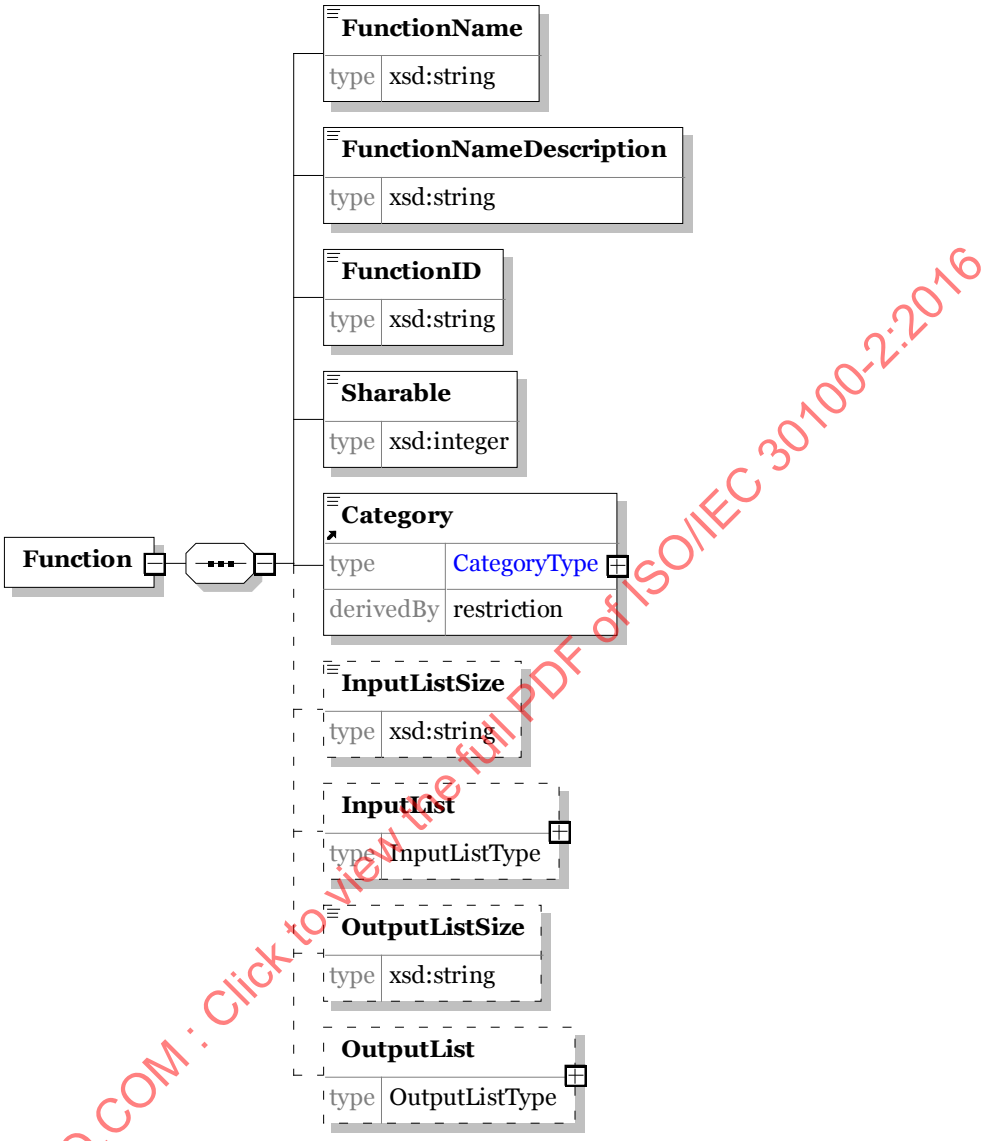
element DeviceDescriptionType/FunctionProperty

diagram	
properties	isRef 0 content complex
children	FunctionList
source	<xsd:element name="FunctionProperty" type="FunctionPropertyType"/>
description	Function information of device

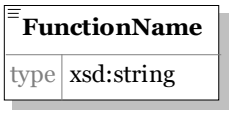
element FunctionPropertyType/FunctionList

diagram	
properties	isRef 0 content complex
children	Function
source	<xsd:element name="FunctionList" type="FunctionListType"/>
description	Lists of Function

element Function

diagram	
properties	content complex
children	FunctionName FunctionNameDescription FunctionID Sharable Category InputListSize InputList OutputListSize OutputList
used by	complexType FunctionListType
source	<xsd:element name="Function"> <xsd:complexType> <xsd:sequence> <xsd:element name="FunctionName" type="xsd:string"/> <xsd:element name="FunctionNameDescription" type="xsd:string"/> <xsd:element name="FunctionID" type="xsd:string"/> <xsd:element name="Sharable" type="xsd:integer"/> <xsd:element ref="Category"/> <xsd:element name="InputListSize" type="xsd:string" minOccurs="0"/> <xsd:element name="InputList" type="InputListType" minOccurs="0"/> <xsd:element name="OutputListSize" type="xsd:string" minOccurs="0"/> <xsd:element name="OutputList" type="OutputListType" minOccurs="0"/> </xsd:sequence> </xsd:complexType> </xsd:element>
description	Specific functions of single device

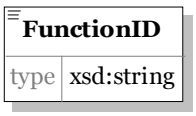
element Function/FunctionName

diagram	
properties	isRef 0 content simple
source	<xsd:element name="FunctionName" type="xsd:string"/>
description	Name of a Function

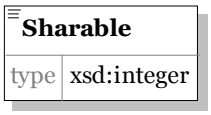
element Function/FunctionNameDescription

diagram	
properties	isRef 0 content simple
source	<xsd:element name="FunctionNameDescription" type="xsd:string"/>
description	Name-description of a Function

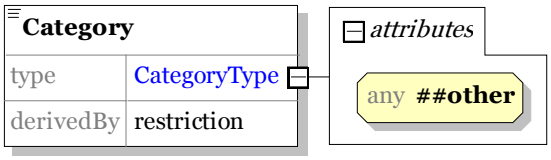
element Function/FunctionID

diagram	
properties	isRef 0 content simple
source	<xsd:element name="FunctionID" type="xsd:string"/>
description	ID of a Function

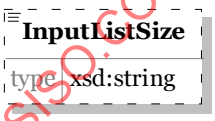
element Function/Sharable

diagram	
properties	isRef 0 content simple
source	<xsd:element name="Sharable" type="xsd:integer"/>
description	Sharable capacity of function. 0 presents unlimited, 1 presents exclusive and another integer number presents the number of capacity

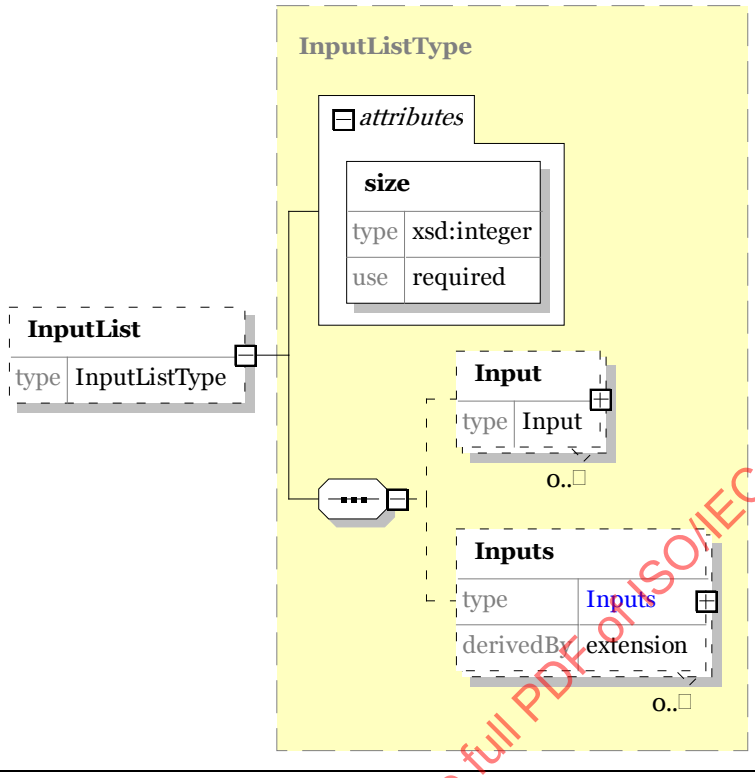
element Category

diagram	
properties	content complex
used by	element
facets	enumeration Sensor enumeration Control enumeration Actuator
attributes	Name Type Use Default Fixed annotation
source	<xsd:element name="Category"> <xsd:complexType> <xsd:simpleContent> <xsd:restriction base="CategoryType"> <xsd:enumeration value="Sensor"/> <xsd:enumeration value="Control"/> <xsd:enumeration value="Actuator"/> </xsd:restriction> </xsd:simpleContent> </xsd:complexType> </xsd:element>
description	Category of message such as Sensor message, Control message, or Actuator message

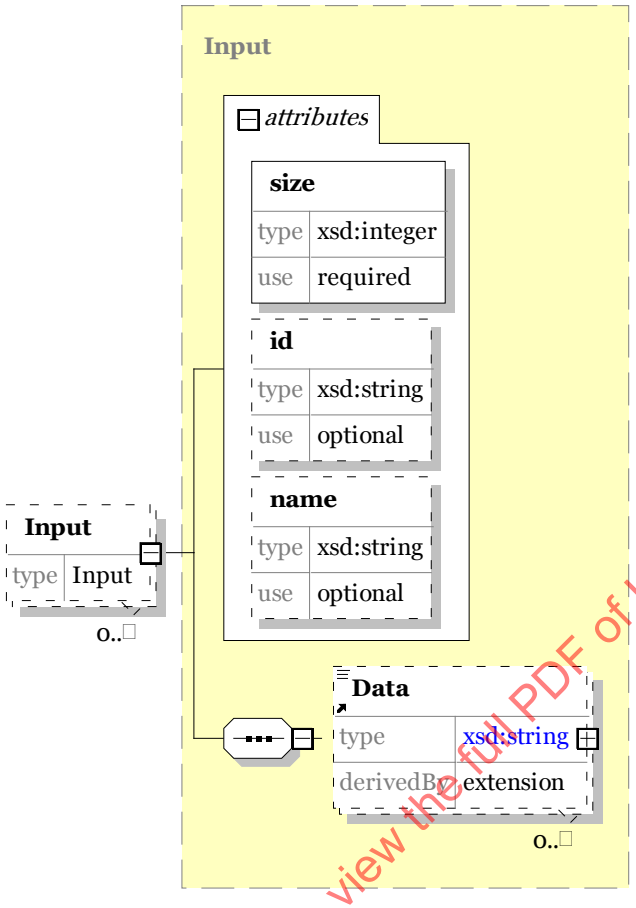
element Function/InputListSize

diagram	
properties	isRef 0 minOcc 0 maxOcc 1 content simple
source	<xsd:element name="InputListSize" type="xsd:string" minOccurs="0"/>
description	Number of Input and Inputs

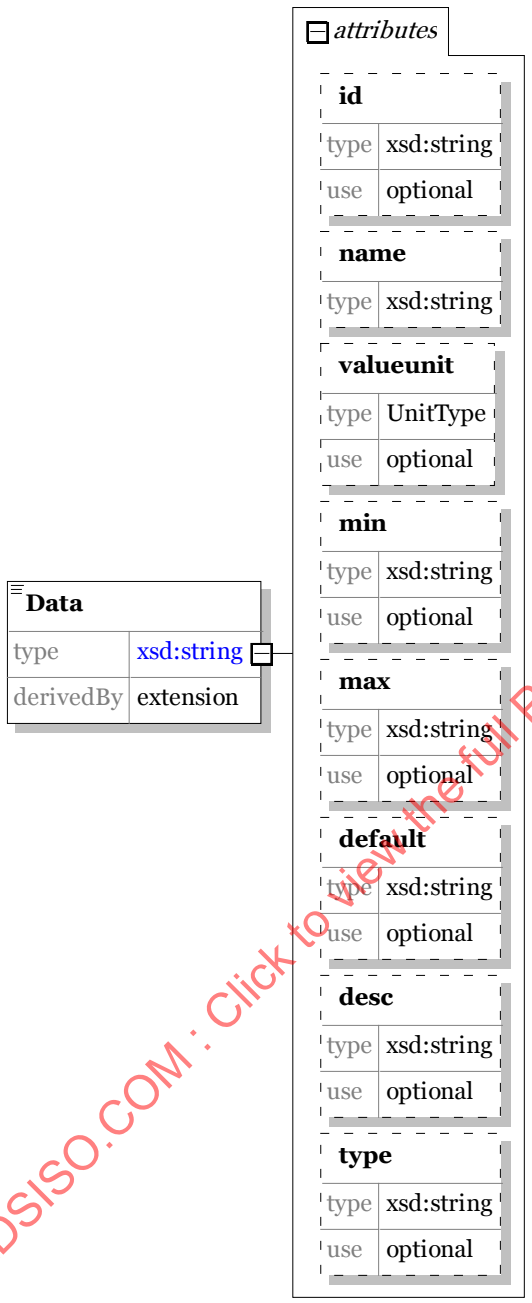
element Function/InputList

diagram	
properties	isRef 0 minOcc 0 maxOcc 1 content complex
children	Input Inputs
attributes	Name size Type xsd:integer Use required
source	<xsd:element name="InputList" type="InputListType" minOccurs="0"/>
description	List of Input and Inputs

element InputListType/Input

diagram	
properties	isRef 0 minOcc 0 maxOcc unbounded content complex
children	Data
attributes	Name size Type xsd:integer Use required Name id Type xsd:string Use optional Name name Type xsd:string Use optional
source	<xsd:element name="Input" type="Input" minOccurs="0" maxOccurs="unbounded"/>
description	Single container of request parameters for control

element Data

diagram	
properties	content complex
used by	complexTypes Input Output

attributes	Name id Type xsd:string Use optional Name name Type xsd:string Use optional Name valueunit Type xsd:string Use optional Name min Type xsd:string Use optional Name max Type xsd:string Use optional Name default Type xsd:string Use optional Name desc Type xsd:string Use optional Name type Type xsd:string Use optional
source	<xsd:element name="Data"> <xsd:complexType> <xsd:simpleContent> <xsd:extension base="xsd:string"> <xsd:attribute name="id" type="xsd:string" use="optional"/> <xsd:attribute name="name" type="xsd:string"/> <xsd:attribute name="valueunit" type="UnitType" use="optional"/> <xsd:attribute name="min" type="xsd:string" use="optional"/> <xsd:attribute name="max" type="xsd:string" use="optional"/> <xsd:attribute name="default" type="xsd:string" use="optional"/> <xsd:attribute name="desc" type="xsd:string" use="optional"/> <xsd:attribute name="type" type="xsd:string" use="optional"/> </xsd:extension> </xsd:simpleContent> </xsd:complexType> </xsd:element>
description	Current value of Input/Output

attribute Data/@id

properties	isRef 0 use optional
source	<xsd:attribute name="id" type="xsd:string" use="optional"/>
description	ID of single Data

attribute Data/@name

properties	isRef 0
source	<xsd:attribute name="name" type="xsd:string"/>
description	Name of single Data

attribute Data/@valueunit

properties	isRef 0 use optional
source	<xsd:attribute name="valueunit" type="UnitType" use="optional"/>
description	Value-Unit of single Data

attribute Data/@min

properties	isRef 0 use optional
source	<xsd:attribute name="min" type="xsd:string" use="optional"/>
description	Minumum-value of single Data

attribute Data/@max

properties	isRef 0 use optional
source	<xsd:attribute name="max" type="xsd:string" use="optional"/>
description	Maximum-value of single Data

attribute Data/@default

properties	isRef 0 use optional
source	<xsd:attribute name="default" type="xsd:string" use="optional"/>
description	Default-value of single Data

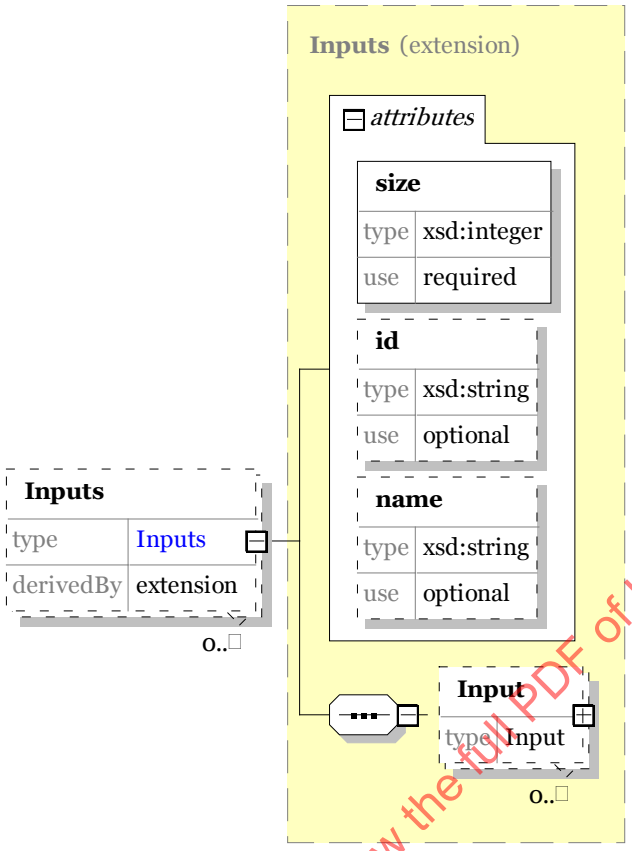
attribute Data/@desc

properties	isRef 0 use optional
source	<xsd:attribute name="desc" type="xsd:string" use="optional"/>
description	Description of single Data

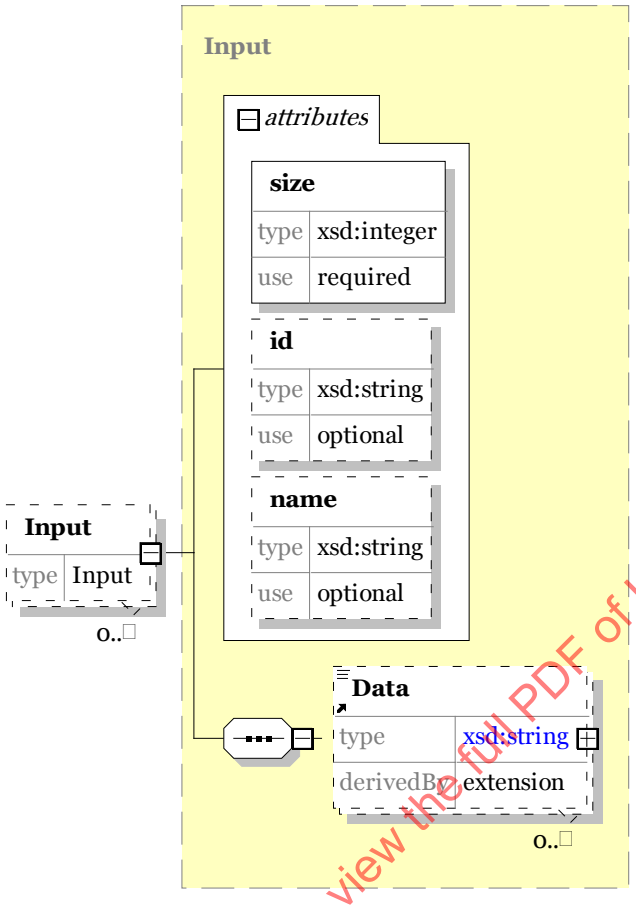
attribute Data/@type

properties	isRef 0 use optional
source	<xsd:attribute name="type" type="xsd:string" use="optional"/>
description	Type of single Data

element InputListType/Inputs

diagram	
properties	isRef 0 minOcc 0 maxOcc unbounded content complex
children	Input
attributes	Name size Type xsd:integer Use required Name id Type xsd:string Use optional Name name Type xsd:string Use optional
source	<xsd:element name="Inputs" minOccurs="0" maxOccurs="unbounded"> <xsd:complexType> <xsd:complexContent> <xsd:extension base="Inputs"/> </xsd:complexContent> </xsd:complexType> </xsd:element>
description	Several containers of request parameters for control

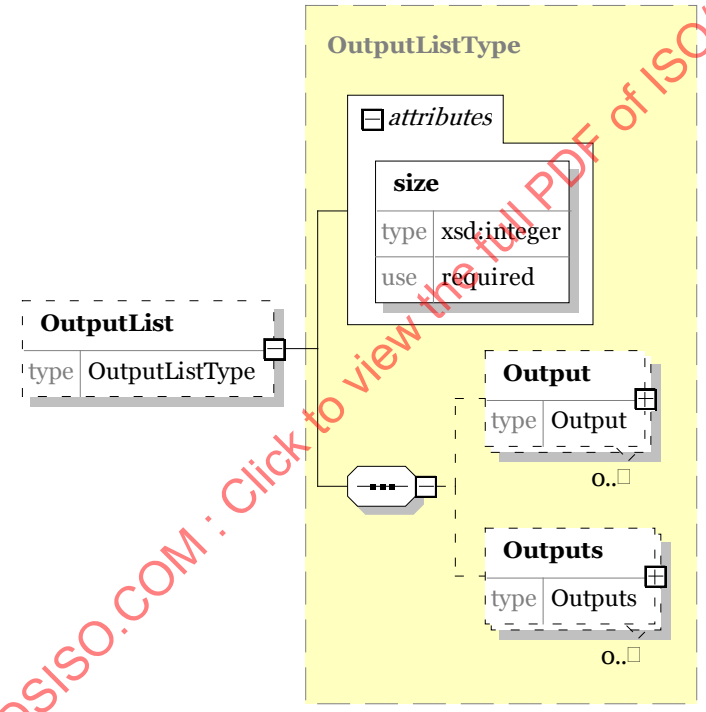
element Inputs/Input

diagram	
properties	isRef 0 minOcc 0 maxOcc unbounded content complex
children	Data
attributes	Name size Type xsd:integer Use required Name id Type xsd:string Use optional Name name Type xsd:string Use optional
source	<xsd:element name="Input" type="Input" minOccurs="0" maxOccurs="unbounded"/>
description	Single container of request parameters for control

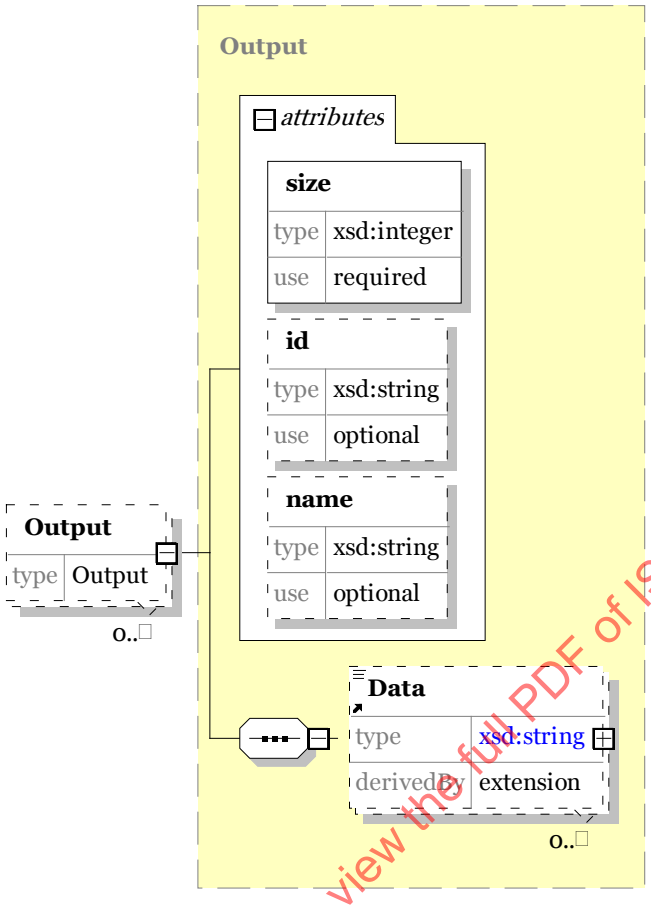
element Function/OutputListSize

diagram	
properties	isRef 0 minOcc 0 maxOcc 1 content simple
source	<xsd:element name="OutputListSize" type="xsd:string" minOccurs="0"/>
description	Number of Output and Outputs

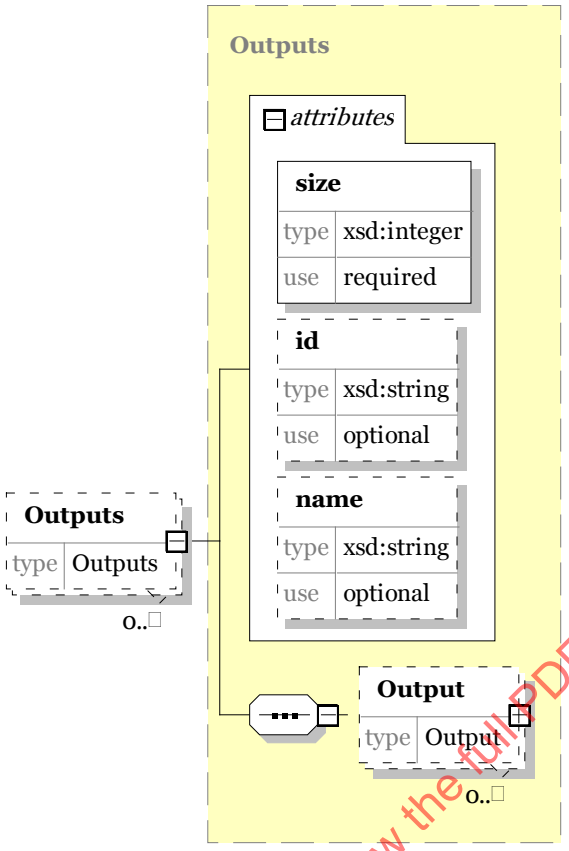
element Function/OutputList

diagram	
properties	isRef 0 minOcc 0 maxOcc 1 content complex
children	Output Outputs
attributes	Name size Type xsd:integer Use required
source	<xsd:element name="OutputList" type="OutputListType" minOccurs="0"/>
description	List of Output and Outputs

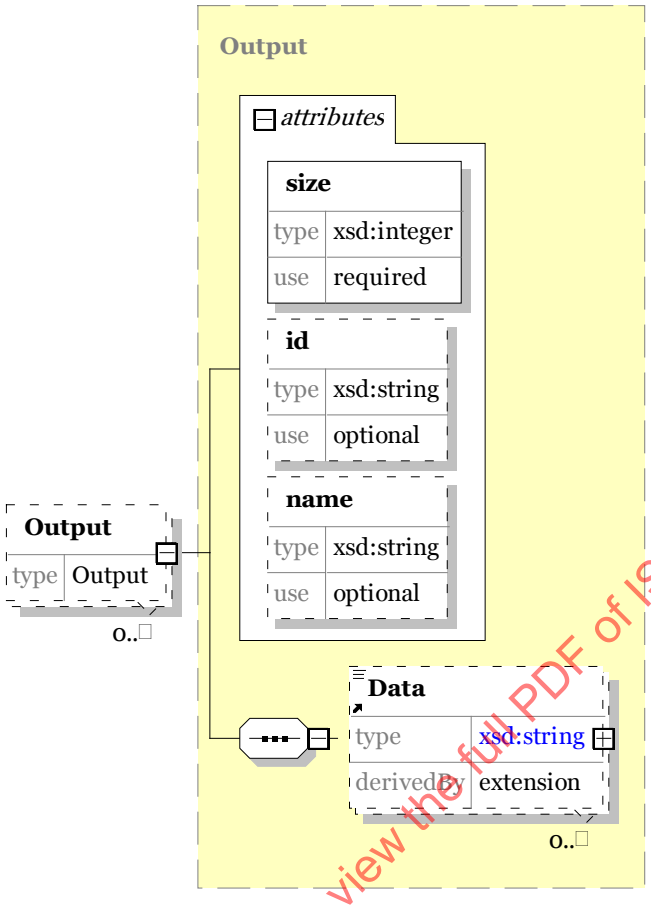
element OutputListType/Output

diagram	
properties	isRef 0 minOcc 0 maxOcc unbounded content complex
children	Data
attributes	Name size Type xsd:integer Use required Name id Type xsd:string Use optional Name name Type xsd:string Use optional
source	<xsd:element name="Output" type="Output" minOccurs="0" maxOccurs="unbounded"/>
description	Single container of response parameters for control response or event

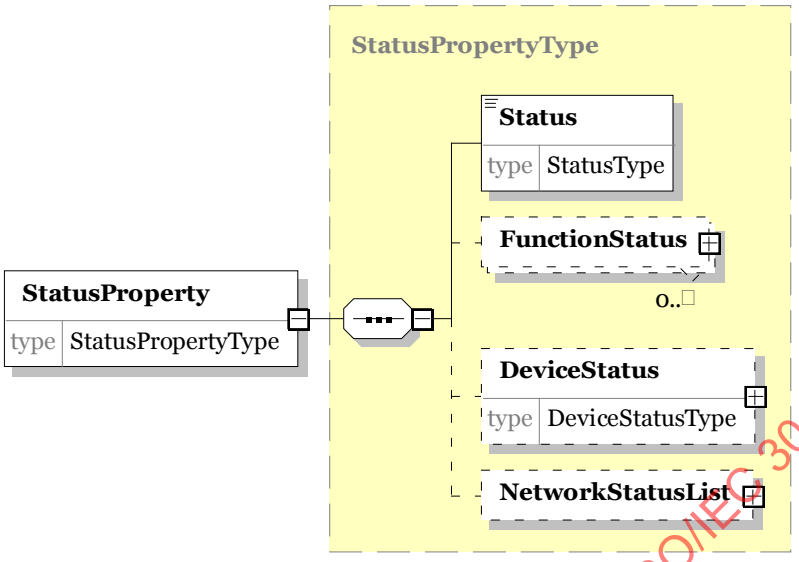
element OutputListType/Outputs

diagram	
properties	isRef 0 minOcc 0 maxOcc unbounded content complex
children	Output
attributes	Name size Type xsd:integer Use required Name id Type xsd:string Use optional Name name Type xsd:string Use optional
source	<xsd:element name="Outputs" type="Outputs" minOccurs="0" maxOccurs="unbounded"/>
description	Containers of response parameters for control response or event

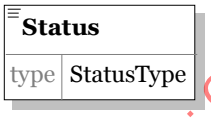
element Outputs/Output

diagram	
properties	isRef 0 minOcc 0 maxOcc unbounded content complex
children	Data
attributes	Name size Type xsd:integer Use required Name id Type xsd:string Use optional Name name Type xsd:string Use optional
source	<xsd:element name="Output" type="Output" minOccurs="0" maxOccurs="unbounded"/>
description	Single container of response parameters for control response or event

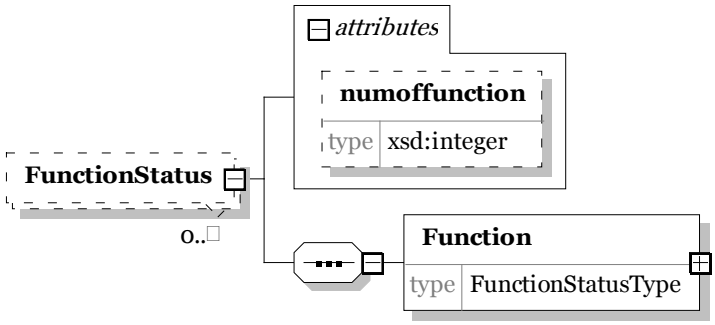
element DeviceDescriptionType/StatusProperty

diagram	
properties	isRef 0 content complex
children	Status FunctionStatus DeviceStatus NetworkStatusList
source	<xsd:element name="StatusProperty" type="StatusPropertyType"/>
description	Status information of device

element StatusPropertyType/Status

diagram	
properties	isRef 0 content complex
facets	enumeration Online enumeration Offline enumeration Error
source	<xsd:element name="Status" type="StatusType"/>
description	Current status of a device such as Online, Offline or Error

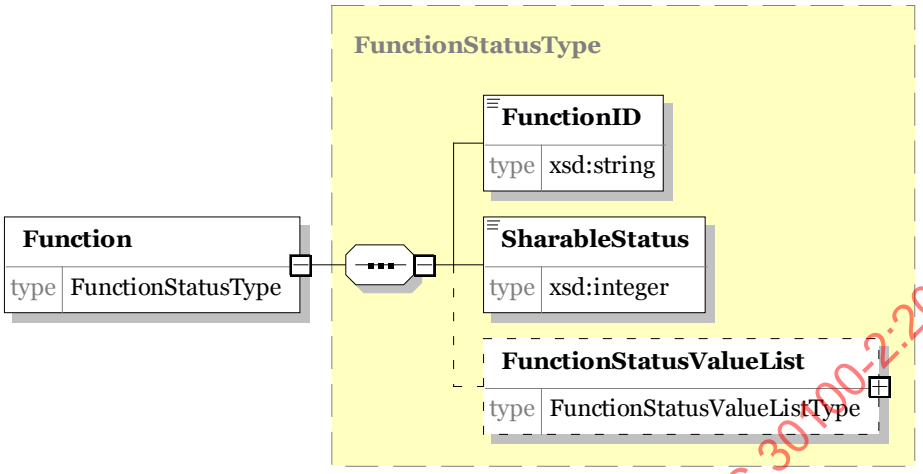
element StatusPropertyType/FunctionStatus

diagram	
properties	isRef 0 minOcc 0 maxOcc unbounded content complex
children	Function
attributes	Name numoffunction Type xsd:integer
source	<xsd:element name="FunctionStatus" minOccurs="0" maxOccurs="unbounded"> <xsd:complexType> <xsd:sequence> <xsd:element name="Function" type="FunctionStatusType"/> </xsd:sequence> <xsd:attribute name="numoffunction" type="xsd:integer"/> </xsd:complexType> </xsd:element>
description	Current detail function status in case of Online status

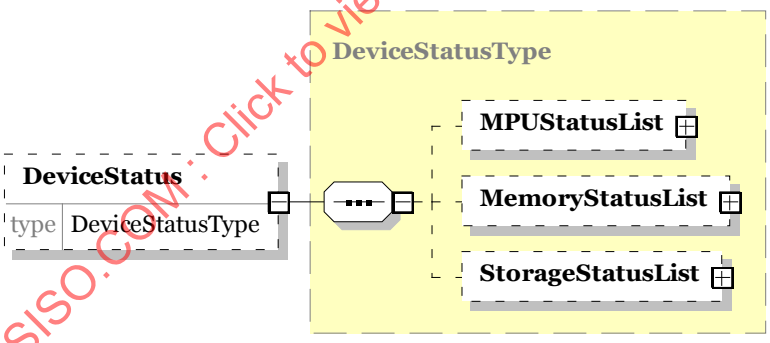
attribute StatusPropertyType/FunctionStatus/@numoffunction

properties	isRef 0
source	<xsd:attribute name="numoffunction" type="xsd:integer"/>
description	Number of function

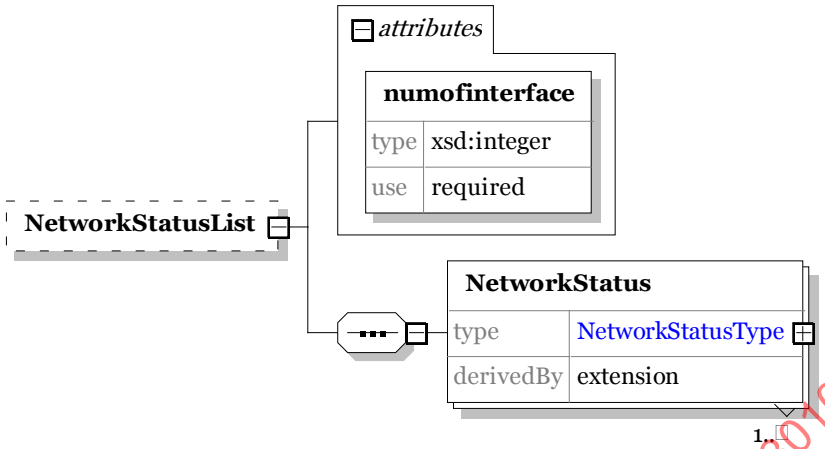
element StatusPropertyType/FunctionStatus/Function

diagram	
properties	isRef 0 content complex
children	FunctionID FunctionStatusValueList
used by	complexType FunctionListType
source	<xsd:element name="Function" type="FunctionStatusType"/>
description	Function status of a device

element StatusPropertyType/DeviceStatus

diagram	
properties	isRef 0 minOcc 0 maxOcc 1 content complex
children	MPUStatusList MemoryStatusList StorageStatusList
source	<xsd:element name="DeviceStatus" type="DeviceStatusType" minOccurs="0"/>
description	Current device status of hardware

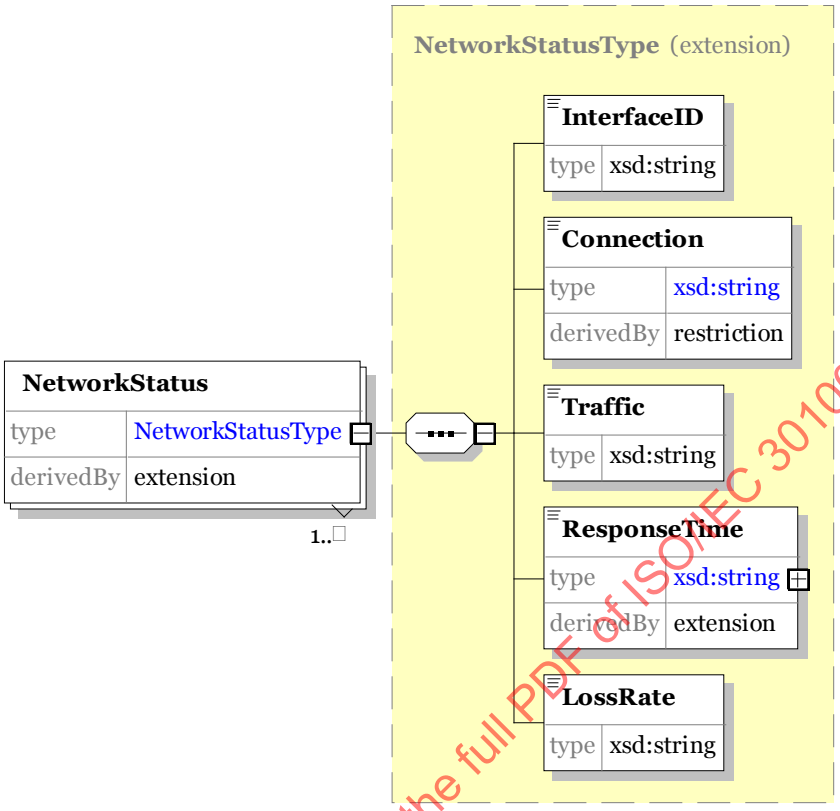
element StatusPropertyType/NetworkStatusList

diagram	
properties	isRef 0 minOcc 0 maxOcc 1 content complex
children	NetworkStatus
attributes	Name numofinterface Type xsd:integer Use required
source	<xsd:element name="NetworkStatusList" minOccurs="0"> <xsd:complexType> <xsd:sequence> <xsd:element name="NetworkStatus" maxOccurs="unbounded"> <xsd:complexType> <xsd:complexContent> <xsd:extension base="NetworkStatusType"/> </xsd:complexContent> </xsd:complexType> </xsd:element> </xsd:sequence> <xsd:attribute name="numofinterface" type="xsd:integer" use="required"/> </xsd:complexType> </xsd:element>
description	Lists of current network status

attribute StatusPropertyType/NetworkStatusList/@numofinterface

properties	isRef 0 use required
source	<xsd:attribute name="numofinterface" type="xsd:integer" use="required"/>
description	Number of interface of single device

element StatusPropertyType/NetworkStatusList/NetworkStatus

diagram	
properties	isRef 0 minOcc 1 maxOcc unbounded content complex
children	InterfaceID ResponseTime LossRate Connection Traffic
source	<xsd:element name="NetworkStatus" maxOccurs="unbounded"> <xsd:complexType> <xsd:complexContent> <xsd:extension base="NetworkStatusType"/> </xsd:complexContent> </xsd:complexType> </xsd:element>
description	Current network status of single interface in case of Online status

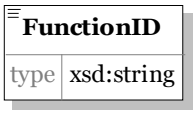
simpleType StatusType

used by	element
facets	enumeration Online enumeration Offline enumeration Error
source	<xsd:simpleType name="StatusType"> <xsd:restriction base="xsd:string"> <xsd:enumeration value="Online"/> <xsd:enumeration value="Offline"/> <xsd:enumeration value="Error"/> </xsd:restriction> </xsd:simpleType>
description	Type of status

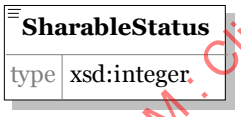
simpleType TimeUnitType

used by	attribute
facets	enumeration sec enumeration msec enumeration usec
source	<xsd:simpleType name="TimeUnitType"> <xsd:restriction base="xsd:string"> <xsd:enumeration value="sec"/> <xsd:enumeration value="msec"/> <xsd:enumeration value="usec"/> </xsd:restriction> </xsd:simpleType>
description	Type of response-time unit

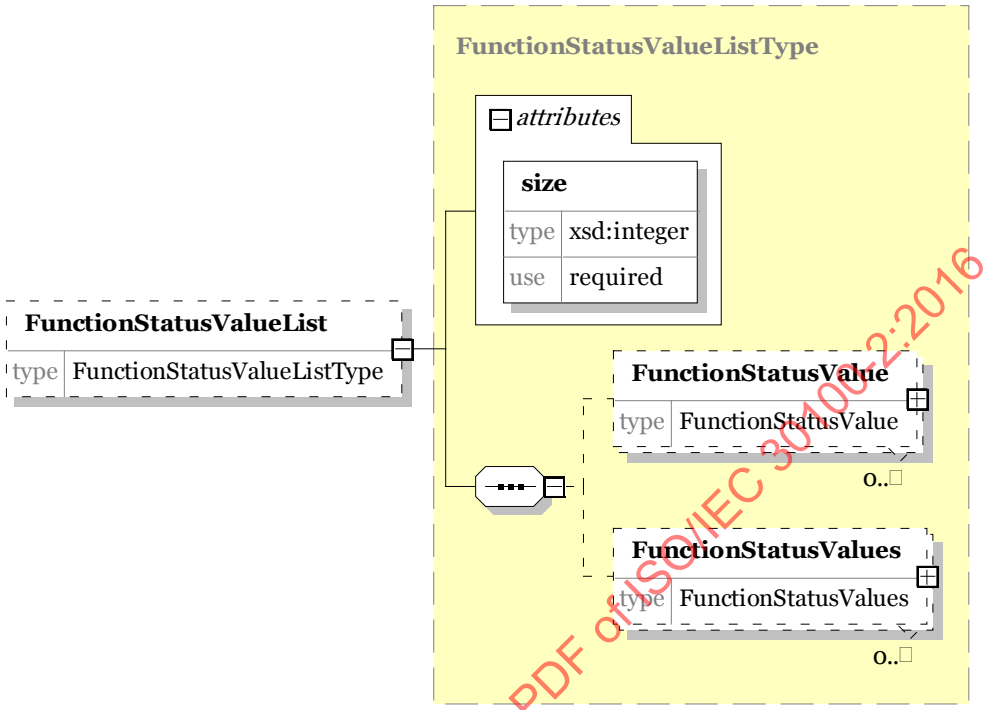
element FunctionStatusType/FunctionID

diagram	
properties	isRef 0 content simple
source	<xsd:element name="FunctionID" type="xsd:string"/>
description	ID of a Function

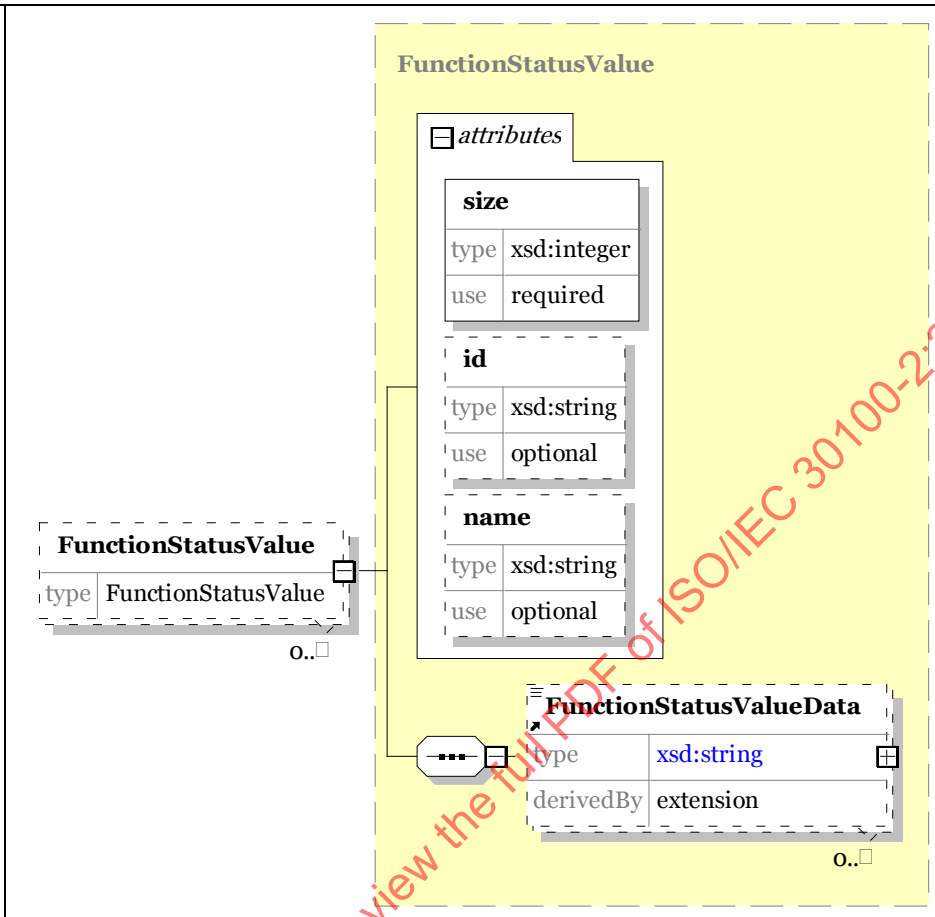
element FunctionStatusType/SharableStatus

diagram	
properties	isRef 0 content simple
source	<xsd:element name="SharableStatus" type="xsd:integer"/>
description	Sharable status of a Function

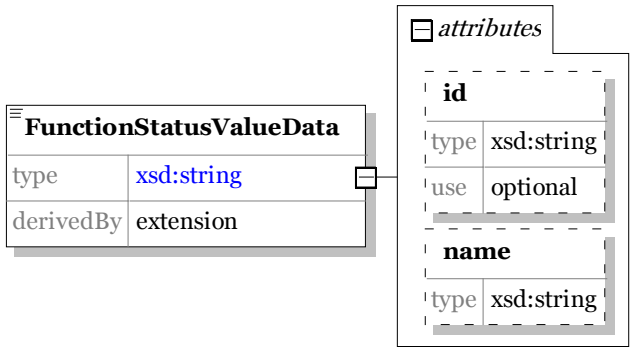
element FunctionStatusType/FunctionStatusValueList

diagram	
properties	isRef 0 minOcc 0 maxOcc 1 content complex
children	FunctionStatusValue FunctionStatusValues
attributes	Name size Type xsd:integer Use required
source	<xsd:element name="FunctionStatusValueList" type="FunctionStatusValueListType" minOccurs="0"/>
description	Lists of FunctionStatusValue

element FunctionStatusValueListType/FunctionStatusValue

diagram	
properties	isRef 0 minOcc 0 maxOcc unbounded content complex
children	FunctionStatusValueData
attributes	Name size Type xsd:integer Use required Name id Type xsd:string Use optional Name name Type xsd:string Use optional
source	<xsd:element name="FunctionStatusValue" type="FunctionStatusValue" minOccurs="0" maxOccurs="unbounded"/>
description	Single value of a FunctionStatus

element FunctionStatusValueData

diagram	
properties	content complex
used by	complexType
attributes	Name id Type xsd:string Use optional Name name Type xsd:string
source	<xsd:element name="FunctionStatusValueData"> <xsd:complexType> <xsd:simpleContent> <xsd:extension base="xsd:string"> <xsd:attribute name="id" type="xsd:string" use="optional"/> <xsd:attribute name="name" type="xsd:string"/> </xsd:extension> </xsd:simpleContent> </xsd:complexType> </xsd:element>
description	Current value of FunctionStatusValue

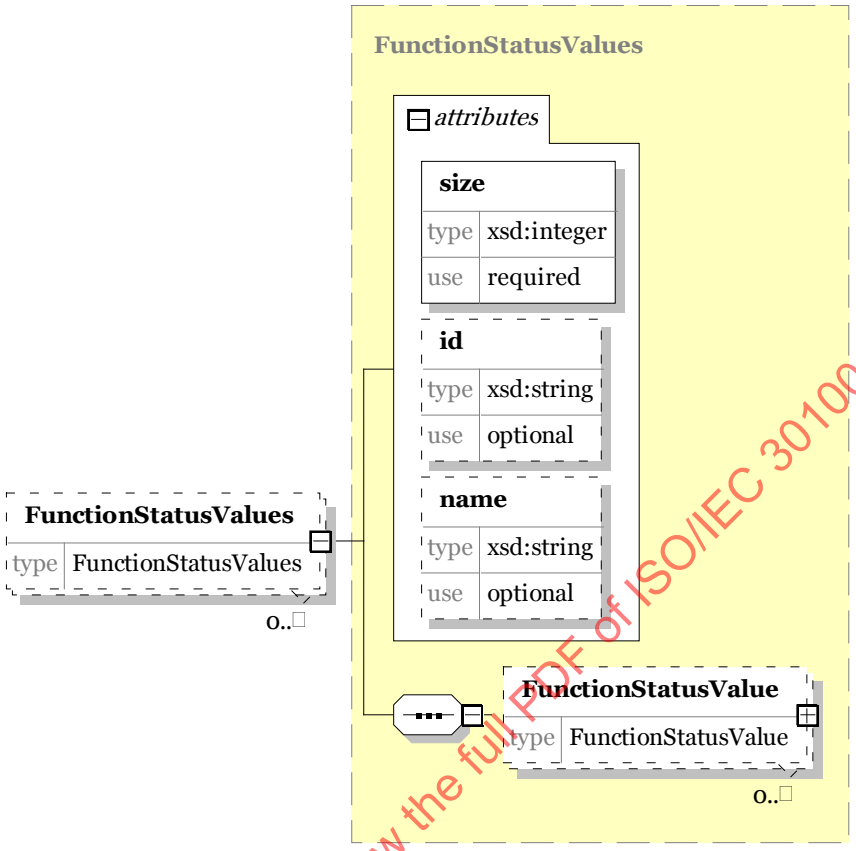
attribute FunctionStatusValueData/@id

properties	isRef 0 use optional
source	<xsd:attribute name="id" type="xsd:string" use="optional"/>
description	ID of a FunctionStatusValueData

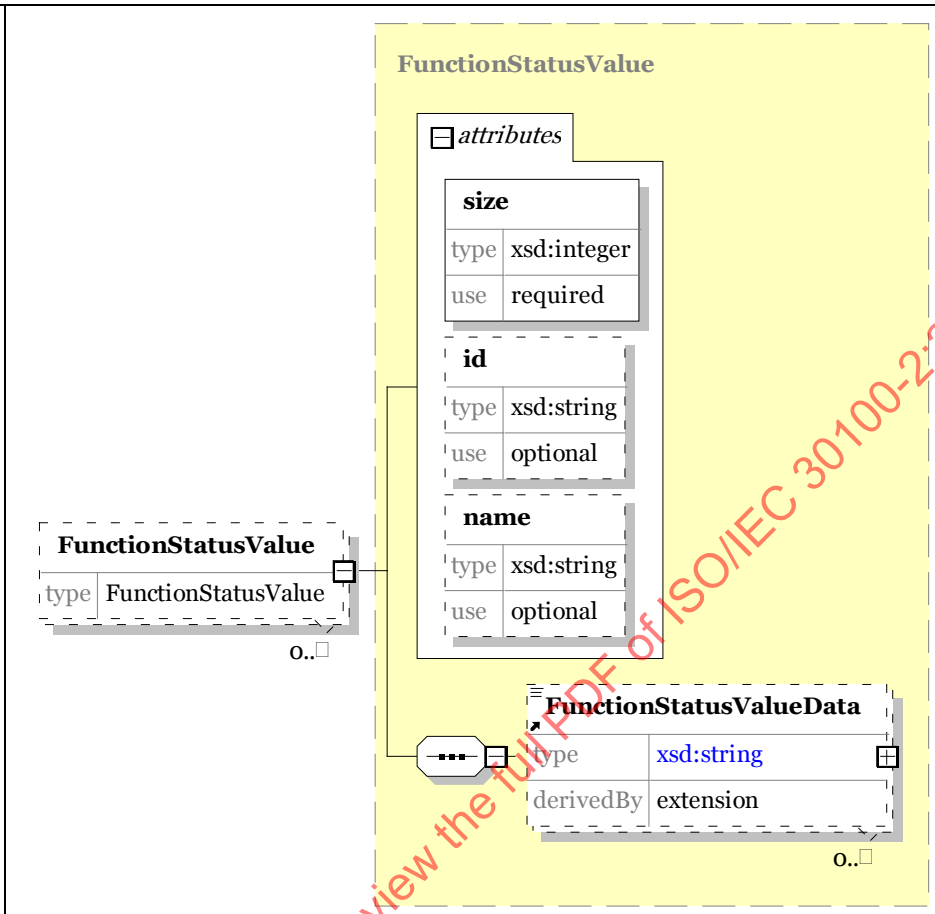
attribute FunctionStatusValueData/@name

properties	isRef 0
source	<xsd:attribute name="name" type="xsd:string"/>
description	Name of a FunctionStatusValueData

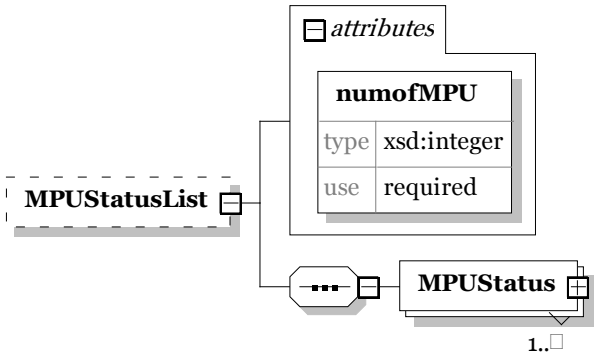
element FunctionStatusValueListType/FunctionStatusValues

diagram	
properties	isRef 0 minOcc 0 maxOcc unbounded content complex
children	FunctionStatusValue
attributes	Name size Type xsd:integer Use required Name id Type xsd:string Use optional Name name Type xsd:string Use optional
source	<xsd:element name="FunctionStatusValues" type="FunctionStatusValues" minOccurs="0" maxOccurs="unbounded"/>
description	Several values of FunctionStatus

element FunctionStatusValues/FunctionStatusValue

diagram	
properties	isRef 0 minOcc 0 maxOcc unbounded content complex
children	FunctionStatusValueData
attributes	Name size Type xsd:integer Use required Name id Type xsd:string Use optional Name name Type xsd:string Use optional
source	<xsd:element name="FunctionStatusValue" type="FunctionStatusValue" minOccurs="0" maxOccurs="unbounded"/>
description	Single value of a FunctionStatus

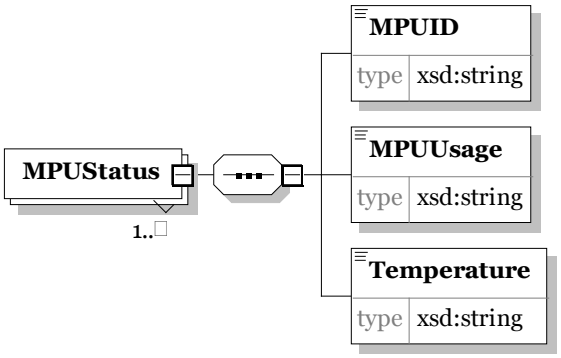
element DeviceStatusType/MPUStatusList

diagram	
properties	isRef 0 minOcc 0 maxOcc 1 content complex
children	MPUStatus
attributes	Name numofMPU Type xsd:integer Use required
source	<xsd:element name="MPUStatusList" minOccurs="0"> <xsd:complexType> <xsd:sequence> <xsd:element name="MPUStatus" maxOccurs="unbounded"> <xsd:complexType> <xsd:sequence> <xsd:element name="MPUID" type="xsd:string"/> <xsd:element name="MPUUsage" type="xsd:string"/> <xsd:element name="Temperature" type="xsd:string"/> </xsd:sequence> </xsd:complexType> </xsd:element> </xsd:sequence> <xsd:attribute name="numofMPU" type="xsd:integer" use="required"/> </xsd:complexType> </xsd:element>
description	MPU status lists of device

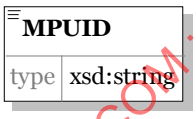
attribute DeviceStatusType/MPUStatusList/@numofMPU

properties	isRef 0 use required
source	<xsd:attribute name="numofMPU" type="xsd:integer" use="required"/>
description	Number of MPU of device

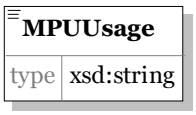
element DeviceStatusType/MPUStatusList/MPUStatus

diagram	
properties	isRef 0 minOcc 1 maxOcc unbounded content complex
children	MPUID MPUUsage Temperature
source	<xsd:element name="MPUStatus" maxOccurs="unbounded"> <xsd:complexType> <xsd:sequence> <xsd:element name="MPUID" type="xsd:string"/> <xsd:element name="MPUUsage" type="xsd:string"/> <xsd:element name="Temperature" type="xsd:string"/> </xsd:sequence> </xsd:complexType> </xsd:element>
description	MPU status of device

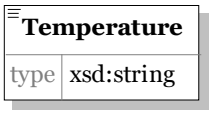
element DeviceStatusType/MPUStatusList/MPUStatus/MPUID

diagram	
properties	isRef 0 content simple
source	<xsd:element name="MPUID" type="xsd:string"/>
description	MPU ID of device

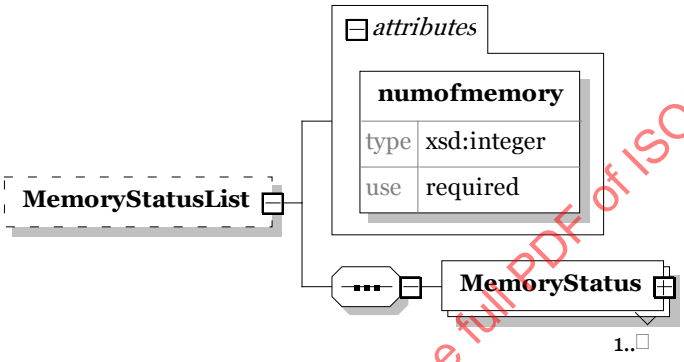
element DeviceStatusType/MPUStatusList/MPUStatus/MPUUsage

diagram	
properties	isRef 0 content simple
source	<xsd:element name="MPUUsage" type="xsd:string"/>
description	MPU usage of device

element DeviceStatusType/MPUStatusList/MPUStatus/Temperature

diagram	
properties	isRef 0 content simple
source	<xsd:element name="Temperature" type="xsd:string"/>
description	MPU temperature of device

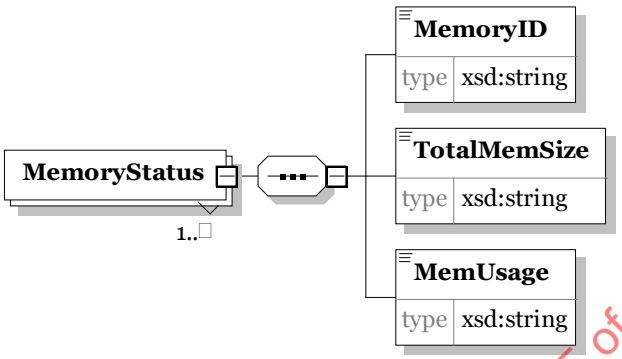
element DeviceStatusType/MemoryStatusList

diagram	
properties	isRef 0 minOcc 0 maxOcc 1 content complex
children	MemoryStatus
attributes	Name numofmemory Type xsd:integer Use required
source	<xsd:element name="MemoryStatusList" minOccurs="0"> <xsd:complexType> <xsd:sequence> <xsd:element name="MemoryStatus" maxOccurs="unbounded"> <xsd:complexType> <xsd:sequence> <xsd:element name="MemoryID" type="xsd:string"/> <xsd:element name="TotalMemSize" type="xsd:string"/> <xsd:element name="MemUsage" type="xsd:string"/> </xsd:sequence> </xsd:complexType> </xsd:element> </xsd:sequence> <xsd:attribute name="numofmemory" type="xsd:integer" use="required"/> </xsd:complexType> </xsd:element>
description	Memory status lists of device

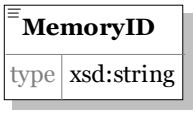
attribute DeviceStatusType/MemoryStatusList/@numofmemory

properties	isRef 0 use required
source	<xsd:attribute name="numofmemory" type="xsd:integer" use="required"/>
description	Number of memory

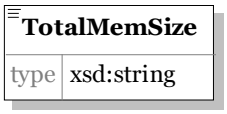
element DeviceStatusType/MemoryStatusList/MemoryStatus

diagram	
properties	isRef 0 minOcc 1 maxOcc unbounded content complex
children	MemoryID TotalMemSize MemUsage
source	<xsd:element name="MemoryStatus" maxOccurs="unbounded"> <xsd:complexType> <xsd:sequence> <xsd:element name="MemoryID" type="xsd:string"/> <xsd:element name="TotalMemSize" type="xsd:string"/> <xsd:element name="MemUsage" type="xsd:string"/> </xsd:sequence> </xsd:complexType> </xsd:element>
description	Status of memory

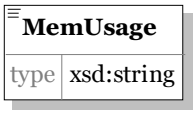
element DeviceStatusType/MemoryStatusList/MemoryStatus/MemoryID

diagram	
properties	isRef 0 content simple
source	<xsd:element name="MemoryID" type="xsd:string"/>
description	ID of memory

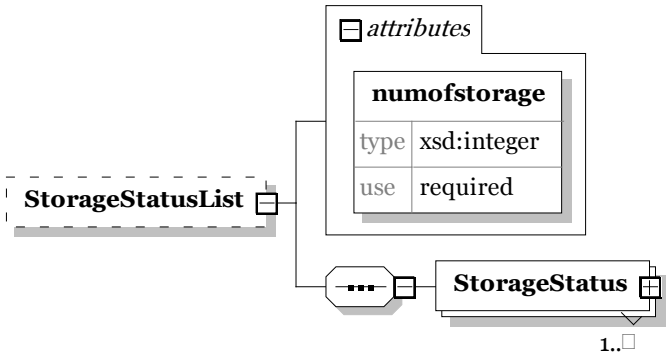
element DeviceStatusType/MemoryStatusList/MemoryStatus/TotalMemSize

diagram	
properties	isRef 0 content simple
source	<xsd:element name="TotalMemSize" type="xsd:string"/>
description	Total size of memory

element DeviceStatusType/MemoryStatusList/MemoryStatus/MemUsage

diagram	
properties	isRef 0 content simple
source	<xsd:element name="MemUsage" type="xsd:string"/>
description	Using size of memory

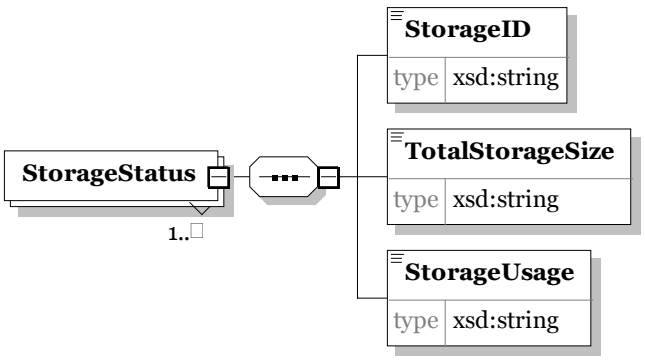
element DeviceStatusType/StorageStatusList

diagram	
properties	isRef 0 minOcc 0 maxOcc 1 content complex
children	StorageStatus
attributes	Name numofstorage Type xsd:integer Use required
source	<xsd:element name="StorageStatusList" minOccurs="0"> <xsd:complexType> <xsd:sequence> <xsd:element name="StorageStatus" maxOccurs="unbounded"> <xsd:complexType> <xsd:sequence> <xsd:element name="StorageID" type="xsd:string"/> <xsd:element name="TotalStorageSize" type="xsd:string"/> <xsd:element name="StorageUsage" type="xsd:string"/> </xsd:sequence> </xsd:complexType> </xsd:element> </xsd:sequence> <xsd:attribute name="numofstorage" type="xsd:integer" use="required"/> </xsd:complexType> </xsd:element>
description	Storage status lists of a device

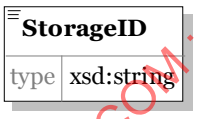
attribute DeviceStatusType/StorageStatusList/@numofstorage

properties	isRef 0 use required
source	<xsd:attribute name="numofstorage" type="xsd:integer" use="required"/>
description	Number of storage

element DeviceStatusType/StorageStatusList/StorageStatus

diagram	
properties	isRef 0 minOcc 1 maxOcc unbounded content complex
children	StorageID TotalStorageSize StorageUsage
source	<xsd:element name="StorageStatus" maxOccurs="unbounded"> <xsd:complexType> <xsd:sequence> <xsd:element name="StorageID" type="xsd:string"/> <xsd:element name="TotalStorageSize" type="xsd:string"/> <xsd:element name="StorageUsage" type="xsd:string"/> </xsd:sequence> </xsd:complexType> </xsd:element>
description	Storage status of a device

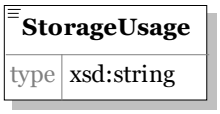
element DeviceStatusType/StorageStatusList/StorageStatus/StorageID

diagram	
properties	isRef 0 content simple
source	<xsd:element name="StorageID" type="xsd:string"/>
description	ID of a storage

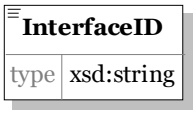
element DeviceStatusType/StorageStatusList/StorageStatus/TotalStorageSize

diagram	
properties	isRef 0 content simple
source	<xsd:element name="TotalStorageSize" type="xsd:string"/>
description	Total size of a storage

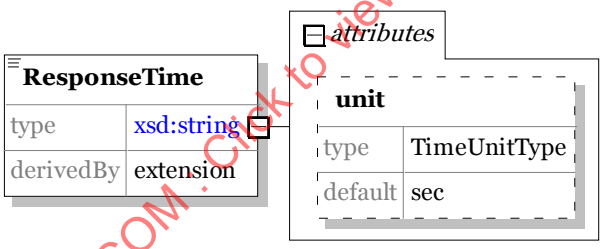
element DeviceStatusType/StorageStatusList/StorageStatus/StorageUsage

diagram	
properties	isRef 0 content simple
source	<xsd:element name="StorageUsage" type="xsd:string"/>
description	Using size of a storage

element NetworkStatusType/InterfaceID

diagram	
properties	isRef 0 content simple
source	<xsd:element name="InterfaceID" type="xsd:string"/>
description	One's own interface ID

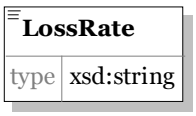
element NetworkStatusType/ResponseTime

diagram	
properties	isRef 0 content simple
attributes	Name unit Type TimeUnitType Use sec
source	<xsd:element name="ResponseTime"> <xsd:complexType> <xsd:simpleContent> <xsd:extension base="xsd:string"> <xsd:attribute name="unit" type="TimeUnitType" default="sec"/> </xsd:extension> </xsd:simpleContent> </xsd:complexType> </xsd:element>
description	Current response time of single interface

attribute NetworkStatusType/ResponseTime/@unit

properties	isRef 0 default sec
facets	enumeration sec enumeration msec enumeration usec
source	<xsd:attribute name="unit" type="TimeUnitType" default="sec"/>
description	Unit of response time

element NetworkStatusType/LossRate

diagram	
properties	isRef 0 content simple
source	<xsd:element name="LossRate" type="xsd:string"/>
description	Current loss rate of single interface

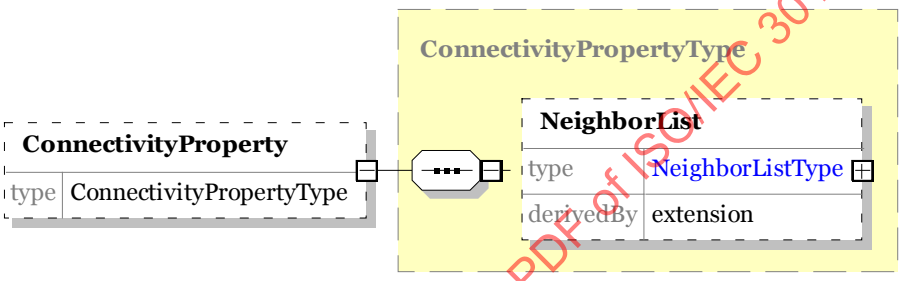
element NetworkStatusType/Connection

diagram	
properties	isRef 0 content simple
facets	enumeration Online enumeration Offline
source	<xsd:element name="Connection"> <xsd:simpleType> <xsd:restriction base="xsd:string"> <xsd:enumeration value="Online"/> <xsd:enumeration value="Offline"/> </xsd:restriction> </xsd:simpleType> </xsd:element>
description	Current connection status, online or offline of single interface

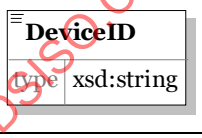
element NetworkStatusType/Traffic

diagram	
properties	isRef 0 content simple
source	<xsd:element name="Traffic" type="xsd:string"/>
description	Current network traffic(kbps) of single interface

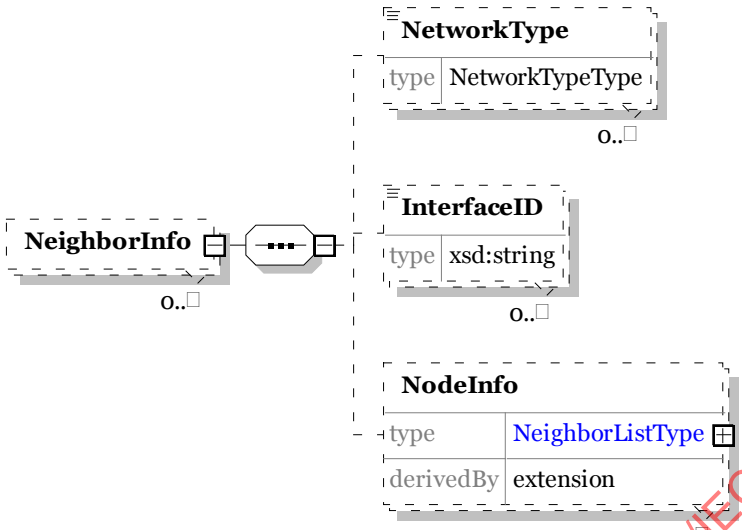
element DeviceDescriptionType/ConnectivityProperty

diagram	
properties	isRef 0 minOcc 0 maxOcc 1 content complex
children	NeighborList
source	<xsd:element name="ConnectivityProperty" type="ConnectivityPropertyType" minOccurs="0"/>
description	Connection information of device

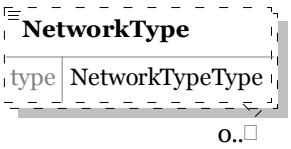
element NeighborListType/DeviceID

diagram	
properties	isRef 0 content simple
source	<xsd:element name="DeviceID" type="xsd:string"/>
description	One's own deviceID

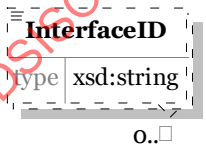
element NeighborListType/NeighborInfo

diagram	
properties	isRef 0 minOcc 0 maxOcc unbounded content complex
children	NetworkType InterfaceID NodeInfo
source	<xsd:element name="NeighborInfo" minOccurs="0" maxOccurs="unbounded"> <xsd:complexType> <xsd:sequence> <xsd:element name="NetworkType" type="NetworkTypeType" minOccurs="0" maxOccurs="unbounded"/> <xsd:element name="InterfaceID" type="xsd:string" minOccurs="0" maxOccurs="unbounded"/> <xsd:element name="NodeInfo" minOccurs="0" maxOccurs="unbounded"> <xsd:complexType> <xsd:complexContent> <xsd:extension base="NeighborListType"> <xsd:attribute name="NumOfNeighbor" type="xsd:integer" use="required"/> </xsd:extension> </xsd:complexContent> </xsd:complexType> </xsd:element> </xsd:sequence> </xsd:complexType> </xsd:element>
description	Neighbor information of the device

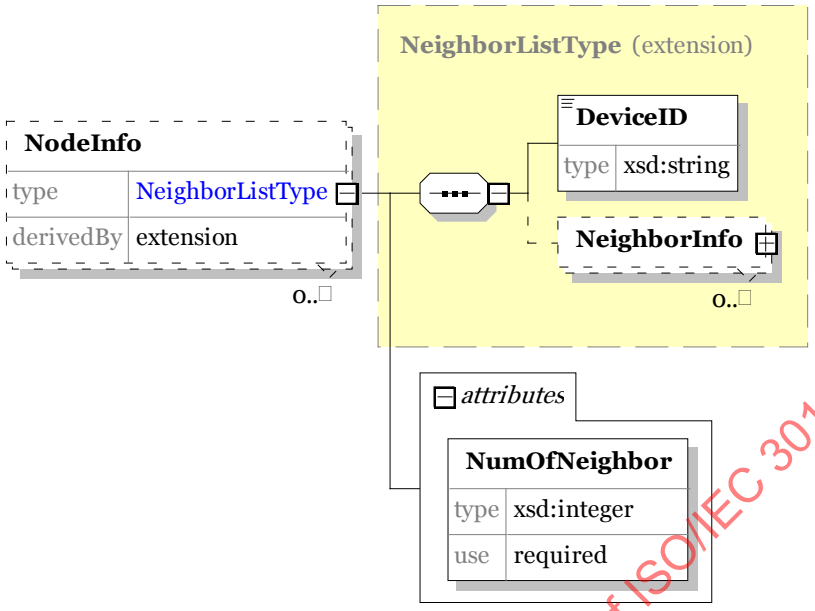
element NeighborListType/NeighborInfo/NetworkType

diagram	
properties	isRef 0 minOcc 0 maxOcc unbounded content simple
facets	enumeration ethernet enumeration ieee1394 enumeration Wibeem enumeration echonet enumeration uwb enumeration usb enumeration plc enumeration 802.11 enumeration bluetooth enumeration zigbee enumeration rfid enumeration rs485 enumeration rs232 enumeration unknown
source	<xsd:element name="NetworkType" type="NetworkTypeType" minOccurs="0" maxOccurs="unbounded"/>
description	Network type of a neighbor device

element NeighborListType/NeighborInfo/InterfaceID

diagram	
properties	isRef 0 minOcc 0 maxOcc unbounded content simple
source	<xsd:element name="InterfaceID" type="xsd:string" minOccurs="0" maxOccurs="unbounded"/>
description	Interface ID of a neighbor device

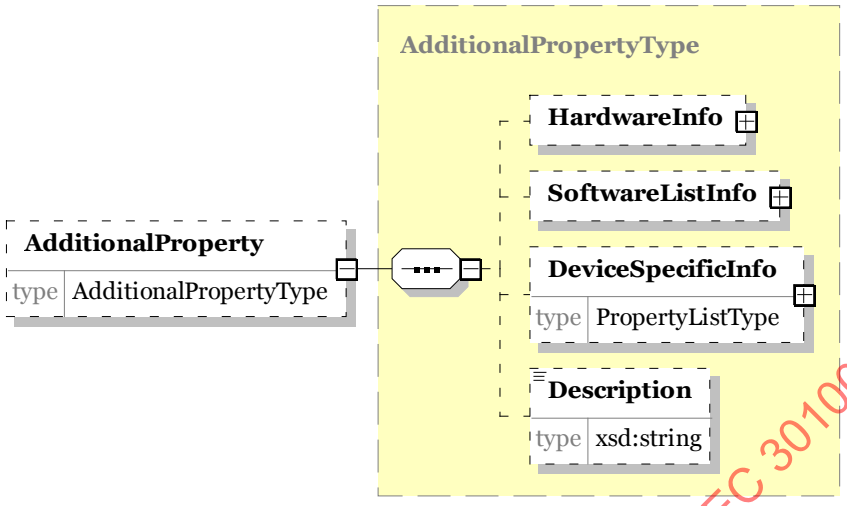
element NeighborListType/NeighborInfo/NodeInfo

diagram	
properties	isRef 0 minOcc 0 maxOcc unbounded content complex
children	DeviceID NeighborInfo
attributes	Name NumOfNeighbor Type xsd:integer Use required
source	<xsd:element name="NodeInfo" minOccurs="0" maxOccurs="unbounded"> <xsd:complexType> <xsd:complexContent> <xsd:extension base="NeighborListType"> <xsd:attribute name="NumOfNeighbor" type="xsd:integer" use="required"/> </xsd:extension> </xsd:complexContent> </xsd:complexType> </xsd:element>
description	Single neighbor-node information

attribute NeighborListType/NeighborInfo/NodeInfo/@NumOfNeighbor

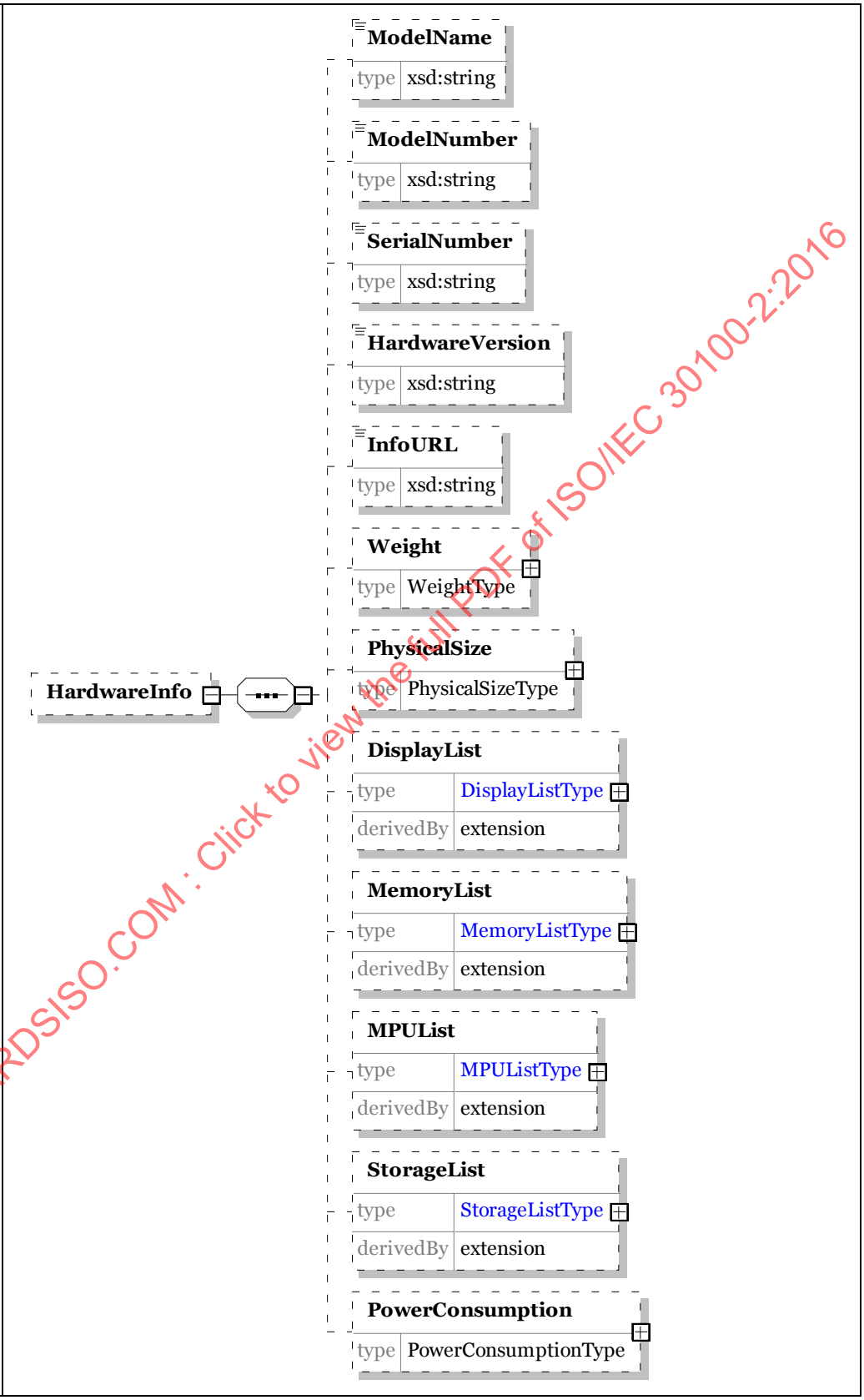
properties	isRef 0 use required
source	<xsd:attribute name="NumOfNeighbor" type="xsd:integer" use="required"/>
description	Number of neighbor devices

element DeviceDescriptionType/AdditionalProperty

diagram	
properties	isRef 0 minOcc 0 maxOcc 1 content complex
children	HardwareInfo SoftwareListInfo DeviceSpecificInfo Description
source	<xsd:element name="AdditionalProperty" type="AdditionalPropertyType" minOccurs="0"/>
description	It presents unclassified properties and undefined properties.

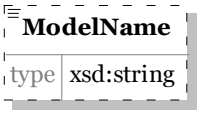
element AdditionalPropertyType/HardwareInfo

diagram

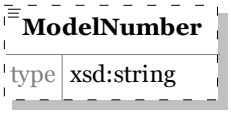


properties	isRef 0 minOcc 0 maxOcc 1 content complex
children	ModelName ModelNumber SerialNumber HardwareVersion InfoURL Weight PhysicalSize DisplayList MemoryList MPUList StorageList PowerConsumption
source	<xsd:element name="HardwareInfo" minOccurs="0"> <xsd:complexType> <xsd:sequence> <xsd:element name="ModelName" type="xsd:string" minOccurs="0"/> <xsd:element name="ModelNumber" type="xsd:string" minOccurs="0"/> <xsd:element name="SerialNumber" type="xsd:string" minOccurs="0"/> <xsd:element name="HardwareVersion" type="xsd:string" minOccurs="0"/> <xsd:element name="InfoURL" type="xsd:string" minOccurs="0"/> <xsd:element name="Weight" type="WeightType" minOccurs="0"/> <xsd:element name="PhysicalSize" type="PhysicalSizeType" minOccurs="0"/> <xsd:element name="DisplayList" minOccurs="0"> <xsd:complexType> <xsd:complexContent> <xsd:extension base="DisplayListType"> <xsd:attribute name="numofdisplay" type="xsd:integer" use="required"/> </xsd:extension> </xsd:complexContent> </xsd:complexType> </xsd:element> <xsd:element name="MemoryList" minOccurs="0"> <xsd:complexType> <xsd:complexContent> <xsd:extension base="MemoryListType"> <xsd:attribute name="numofmemory" type="xsd:integer" use="required"/> </xsd:extension> </xsd:complexContent> </xsd:complexType> </xsd:element> <xsd:element name="MPUList" minOccurs="0"> <xsd:complexType> <xsd:complexContent> <xsd:extension base="MPUListType"> <xsd:attribute name="numofMPU" type="xsd:integer" use="required"/> </xsd:extension> </xsd:complexContent> </xsd:complexType> </xsd:element> <xsd:element name="StorageList" minOccurs="0"> <xsd:complexType> <xsd:complexContent> <xsd:extension base="StorageListType"> <xsd:attribute name="numofstorage" type="xsd:integer" use="required"/> </xsd:extension> </xsd:complexContent> </xsd:complexType> </xsd:element> <xsd:element name="PowerConsumption" type="PowerConsumptionType" minOccurs="0"/> </xsd:sequence> </xsd:complexType> </xsd:element>
description	Hardware specification of device

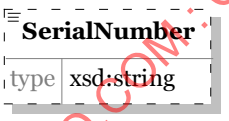
element AdditionalPropertyType/HardwareInfo/ModelName

diagram	
properties	isRef 0 minOcc 0 maxOcc 1 content simple
source	<xsd:element name="ModelName" type="xsd:string" minOccurs="0"/>
description	Model name of device

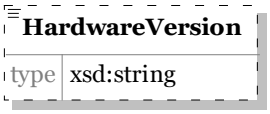
element AdditionalPropertyType/HardwareInfo/ModelNumber

diagram	
properties	isRef 0 minOcc 0 maxOcc 1 content simple
source	<xsd:element name="ModelNumber" type="xsd:string" minOccurs="0"/>
description	Model number of device

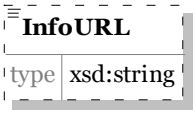
element AdditionalPropertyType/HardwareInfo/SerialNumber

diagram	
properties	isRef 0 minOcc 0 maxOcc 1 content simple
source	<xsd:element name="SerialNumber" type="xsd:string" minOccurs="0"/>
description	Serial number of device

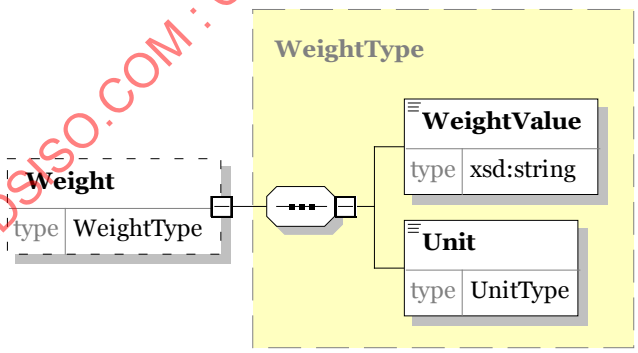
element AdditionalPropertyType/HardwareInfo/HardwareVersion

diagram	
properties	isRef 0 minOcc 0 maxOcc 1 content simple
source	<xsd:element name="HardwareVersion" type="xsd:string" minOccurs="0"/>
description	Hardware version of device

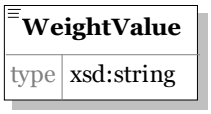
element AdditionalPropertyType/HardwareInfo/InfoURL

diagram	
properties	isRef 0 minOcc 0 maxOcc 1 content simple
source	<xsd:element name="InfoURL" type="xsd:string" minOccurs="0"/>
description	URL of device information

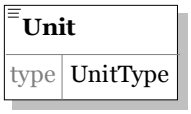
element AdditionalPropertyType/HardwareInfo/Weight

diagram	
properties	isRef 0 minOcc 0 maxOcc 1 content complex
children	WeightValue Unit
source	<xsd:element name="Weight" type="WeightType" minOccurs="0"/>
description	Weight information of device

element WeightType/WeightValue

diagram	
properties	isRef 0 content simple
source	<xsd:element name="WeightValue" type="xsd:string"/>
description	Value of weight

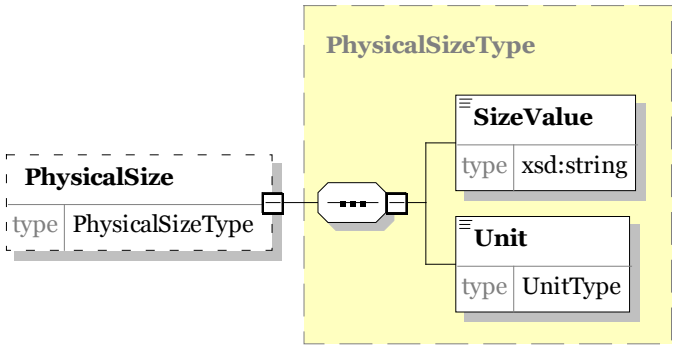
element WeightType/Unit

diagram	
properties	isRef 0 content simple
source	<xsd:element name="Unit" type="UnitType"/>
description	Unit of weight

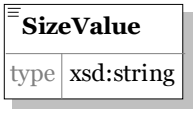
simpleType UnitType

used by	elements WeightType/Unit PhysicalSizeType/Unit PowerConsumptionType/Unit attribute Data/@valueunit
source	<xsd:simpleType name="UnitType"> <xsd:restriction base="xsd:hexBinary"/> </xsd:simpleType>
description	User-defined unit

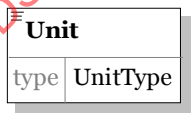
element AdditionalPropertyType/HardwareInfo/PhysicalSize

diagram	
properties	isRef 0 minOcc 0 maxOcc 1 content complex
children	SizeValue Unit
source	<xsd:element name="PhysicalSize" type="PhysicalSizeType" minOccurs="0"/>
description	Physical size information of device

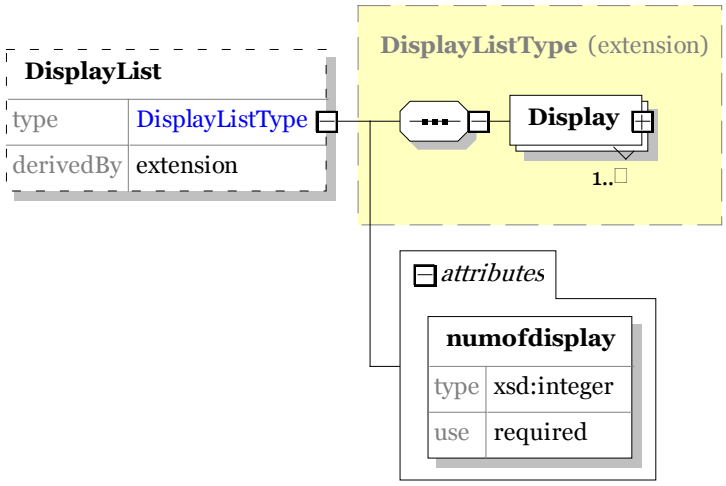
element PhysicalSizeType/SizeValue

diagram	
properties	isRef 0 content simple
source	<xsd:element name="SizeValue" type="xsd:string"/>
description	Value of physical size

element PhysicalSizeType/Unit

diagram	
properties	isRef 0 content simple
source	<xsd:element name="Unit" type="UnitType"/>
description	Unit of physical size

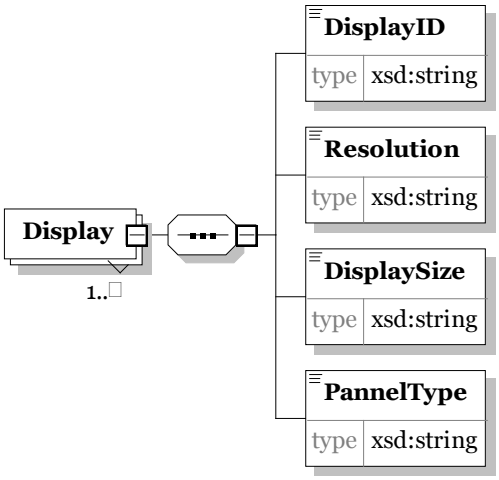
element AdditionalPropertyType/HardwareInfo/DisplayList

diagram	
properties	isRef 0 minOcc 0 maxOcc 1 content complex
children	Display
attributes	Name numofdisplay Type xsd:integer Use required
source	<xsd:element name="DisplayList" minOccurs="0"> <xsd:complexType> <xsd:complexContent> <xsd:extension base="DisplayListType"> <xsd:attribute name="numofdisplay" type="xsd:integer" use="required"/> </xsd:extension> </xsd:complexContent> </xsd:complexType> </xsd:element>
description	Lists of display

attribute AdditionalPropertyType/HardwareInfo/DisplayList/@numofdisplay

properties	isRef 0 use required
source	<xsd:attribute name="numofdisplay" type="xsd:integer" use="required"/>
description	Number of displays

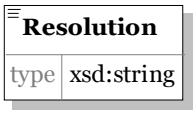
element DisplayListType/Display

diagram	
properties	isRef 0 minOcc 1 maxOcc unbounded content complex
children	DisplayID Resolution DisplaySize PannelType
source	<xsd:element name="Display" maxOccurs="unbounded"> <xsd:complexType> <xsd:sequence> <xsd:element name="DisplayID" type="xsd:string"/> <xsd:element name="Resolution" type="xsd:string"/> <xsd:element name="DisplaySize" type="xsd:string"/> <xsd:element name="PannelType" type="xsd:string"/> </xsd:sequence> </xsd:complexType> </xsd:element>
description	Display information of device

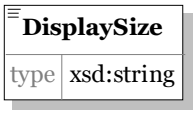
element DisplayListType/Display/DisplayID

diagram	
properties	isRef 0 content simple
source	<xsd:element name="DisplayID" type="xsd:string"/>
description	ID of display

element DisplayListType/Display/Resolution

diagram	
properties	isRef 0 content simple
source	<xsd:element name="Resolution" type="xsd:string"/>
description	Resolution of display

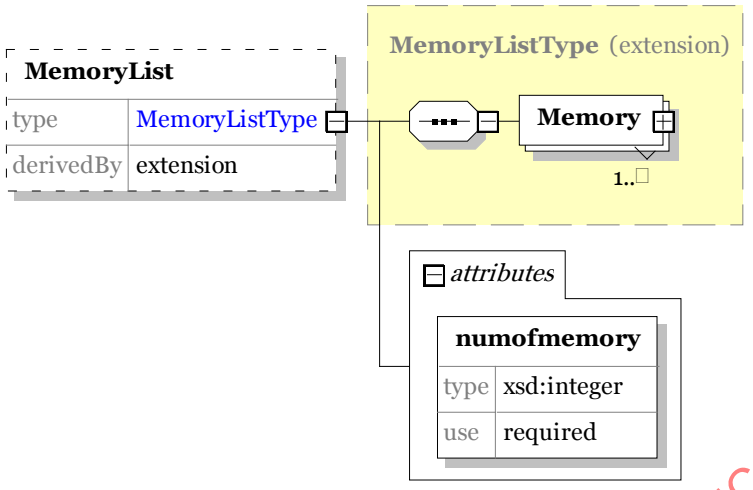
element DisplayListType/Display/DisplaySize

diagram	
properties	isRef 0 content simple
source	<xsd:element name="DisplaySize" type="xsd:string"/>
description	Size of display

element DisplayListType/Display/PannelType

diagram	
properties	isRef 0 content simple
source	<xsd:element name="PannelType" type="xsd:string"/>
description	Panel type of display

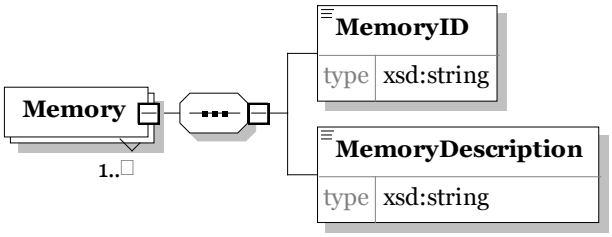
element AdditionalPropertyType/HardwareInfo/MemoryList

diagram	
properties	isRef 0 minOcc 0 maxOcc 1 content complex
children	Memory
attributes	Name numofmemory Type xsd:integer Use required
source	<xsd:element name="MemoryList" minOccurs="0"> <xsd:complexType> <xsd:complexContent> <xsd:extension base="MemoryListType"> <xsd:attribute name="numofmemory" type="xsd:integer" use="required"/> </xsd:extension> </xsd:complexContent> </xsd:complexType> </xsd:element>
description	Lists of memory

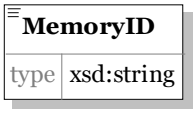
attribute AdditionalPropertyType/HardwareInfo/MemoryList/@numofmemory

properties	isRef 0 use required
source	<xsd:attribute name="numofmemory" type="xsd:integer" use="required"/>
description	Number of memories

element MemoryListType/Memory

diagram	
properties	isRef 0 minOcc 1 maxOcc unbounded content complex
children	MemoryID MemoryDescription
source	<xsd:element name="Memory" maxOccurs="unbounded"> <xsd:complexType> <xsd:sequence> <xsd:element name="MemoryID" type="xsd:string"/> <xsd:element name="MemoryDescription" type="xsd:string"/> </xsd:sequence> </xsd:complexType> </xsd:element>
description	Memory information of device

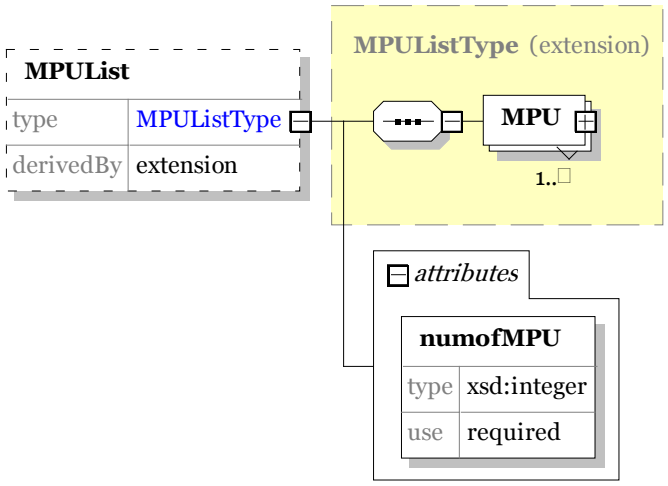
element MemoryListType/Memory/MemoryID

diagram	
properties	isRef 0 content simple
source	<xsd:element name="MemoryID" type="xsd:string"/>
description	ID of memory

element MemoryListType/Memory/MemoryDescription

diagram	
properties	isRef 0 content simple
source	<xsd:element name="MemoryDescription" type="xsd:string"/>
description	Description of memory

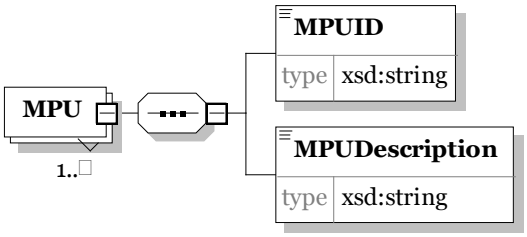
element AdditionalPropertyType/HardwareInfo/MPUList

diagram	
properties	isRef 0 minOcc 0 maxOcc 1 content complex
children	MPU
attributes	Name numofMPU Type xsd:integer Use required
source	<xsd:element name="MPUList" minOccurs="0"> <xsd:complexType> <xsd:complexContent> <xsd:extension base="MPUListType"> <xsd:attribute name="numofMPU" type="xsd:integer" use="required"/> </xsd:extension> </xsd:complexContent> </xsd:complexType> </xsd:element>
description	Lists of MPU

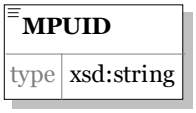
attribute AdditionalPropertyType/HardwareInfo/MPUList/@numofMPU

properties	isRef 0 use required
source	<xsd:attribute name="numofMPU" type="xsd:integer" use="required"/>
description	Number of MPUs

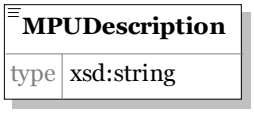
element MPUListType/MPU

diagram	
properties	isRef 0 minOcc 1 maxOcc unbounded content complex
children	MPUID MPUDescription
source	<xsd:element name="MPU" maxOccurs="unbounded"> <xsd:complexType> <xsd:sequence> <xsd:element name="MPUID" type="xsd:string"/> <xsd:element name="MPUDescription" type="xsd:string"/> </xsd:sequence> </xsd:complexType> </xsd:element>
description	MPU information of device

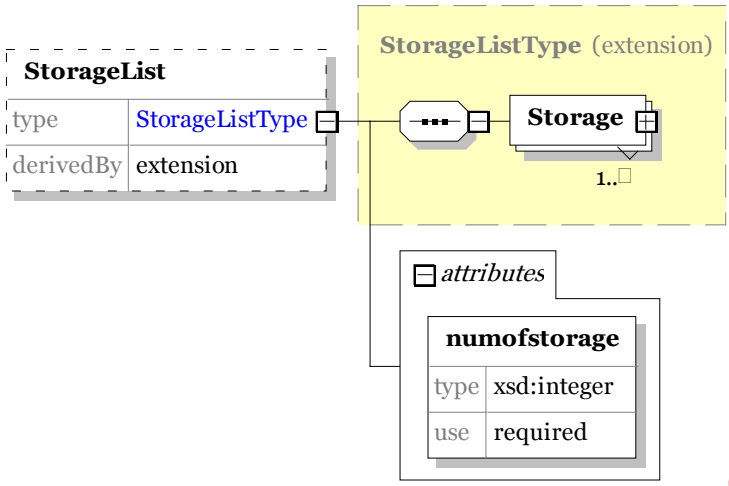
element MPUListType/MPU/MPUID

diagram	
properties	isRef 0 content simple
source	<xsd:element name="MPUID" type="xsd:string"/>
description	ID of MPU

element MPUListType/MPU/MPUDescription

diagram	
properties	isRef 0 content simple
source	<xsd:element name="MPUDescription" type="xsd:string"/>
description	Description of MPU

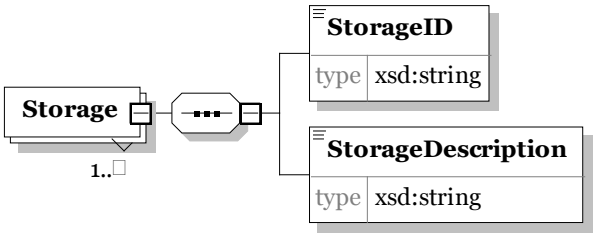
element AdditionalPropertyType/HardwareInfo/StorageList

diagram	
properties	isRef 0 minOcc 0 maxOcc 1 content complex
children	Storage
attributes	Name numofstorage Type xsd:integer Use required
source	<xsd:element name="StorageList" minOccurs="0"> <xsd:complexType> <xsd:complexContent> <xsd:extension base="StorageListType"> <xsd:attribute name="numofstorage" type="xsd:integer" use="required"/> </xsd:extension> </xsd:complexContent> </xsd:complexType> </xsd:element>
description	Lists of storage

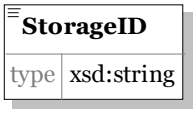
attribute AdditionalPropertyType/HardwareInfo/StorageList/@numofstorage

properties	isRef 0 use required
source	<xsd:attribute name="numofstorage" type="xsd:integer" use="required"/>
description	Number of storages

element StorageListType/Storage

diagram	
properties	isRef 0 minOcc 1 maxOcc unbounded content complex
children	StorageID StorageDescription
source	<xsd:element name="Storage" maxOccurs="unbounded"> <xsd:complexType> <xsd:sequence> <xsd:element name="StorageID" type="xsd:string"/> <xsd:element name="StorageDescription" type="xsd:string"/> </xsd:sequence> </xsd:complexType> </xsd:element>
description	Storage information of device

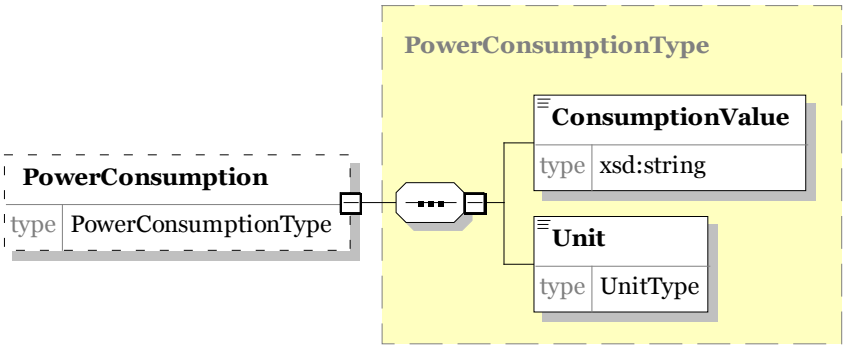
element StorageListType/Storage/StorageID

diagram	
properties	isRef 0 content simple
source	<xsd:element name="StorageID" type="xsd:string"/>
description	ID of storage

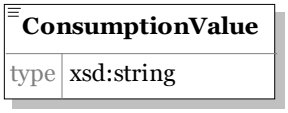
element StorageListType/Storage/StorageDescription

diagram	
properties	isRef 0 content simple
source	<xsd:element name="StorageDescription" type="xsd:string"/>
description	Description of storage

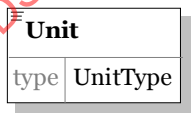
element AdditionalPropertyType/HardwareInfo/PowerConsumption

diagram	
properties	isRef 0 minOcc 1 maxOcc unbounded content complex
children	ConsumptionValue Unit
source	<xsd:element name="PowerConsumption" type="PowerConsumptionType" minOccurs="0"/>
description	Power consumption Information of device

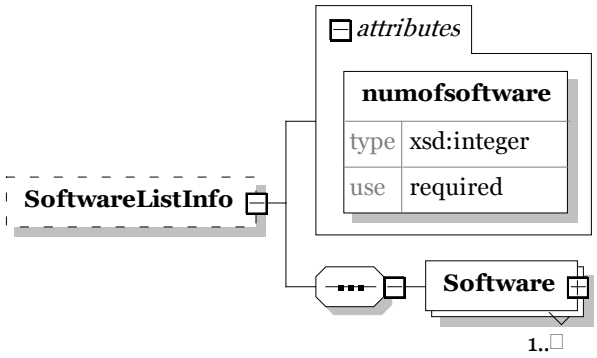
element PowerConsumptionType/ConsumptionValue

diagram	
properties	isRef 0 content simple
source	<xsd:element name="ConsumptionValue" type="xsd:string"/>
description	Value of power consumption

element PowerConsumptionType/Unit

diagram	
properties	isRef 0 content simple
source	<xsd:element name="Unit" type="UnitType"/>
description	Unit of power consumption

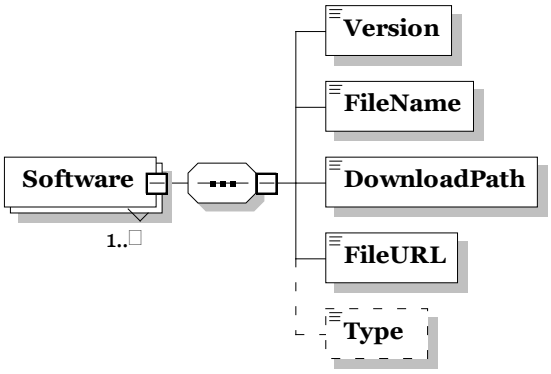
element AdditionalPropertyType/SoftwareListInfo

diagram	
properties	isRef 0 minOcc 0 maxOcc 1 content complex
children	Software
attributes	Name numofsoftware Type xsd:integer Use required
source	<xsd:element name="SoftwareListInfo" minOccurs="0"> <xsd:complexType> <xsd:sequence> <xsd:element name="Software" maxOccurs="unbounded"> <xsd:complexType> <xsd:sequence> <xsd:element name="Version"/> <xsd:element name="FileName"/> <xsd:element name="DownloadPath"/> <xsd:element name="FileURL"/> <xsd:element name="Type" minOccurs="0"/> </xsd:sequence> </xsd:complexType> </xsd:element> </xsd:sequence> <xsd:attribute name="numofsoftware" type="xsd:integer" use="required"/> </xsd:complexType> </xsd:element>
description	Lists of software

attribute AdditionalPropertyType/SoftwareListInfo/@numofsoftware

properties	isRef 0 use required
source	<xsd:attribute name="numofsoftware" type="xsd:integer" use="required"/>
description	Number of softwares

element AdditionalPropertyType/SoftwareListInfo/Software

diagram	
properties	isRef 0 minOcc 1 maxOcc unbounded content complex
children	Version FileName DownloadPath FileURL Type
source	<xsd:element name="Software" maxOccurs="unbounded"> <xsd:complexType> <xsd:sequence> <xsd:element name="Version"/> <xsd:element name="FileName"/> <xsd:element name="DownloadPath"/> <xsd:element name="FileURL"/> <xsd:element name="Type" minOccurs="0"/> </xsd:sequence> </xsd:complexType> </xsd:element>
description	Software information of device. Software includes firmware, embedded software and application.

element AdditionalPropertyType/SoftwareListInfo/Software/Version

diagram	
properties	isRef 0
source	<xsd:element name="Version"/>
description	Version of software

element AdditionalPropertyType/SoftwareListInfo/Software/FileName

diagram	
properties	isRef 0
source	<xsd:element name="FileName"/>
description	File name of software

element AdditionalPropertyType/SoftwareListInfo/Software/DownloadPath

diagram	
properties	isRef 0
source	<xsd:element name="DownloadPath"/>
description	Download path of software

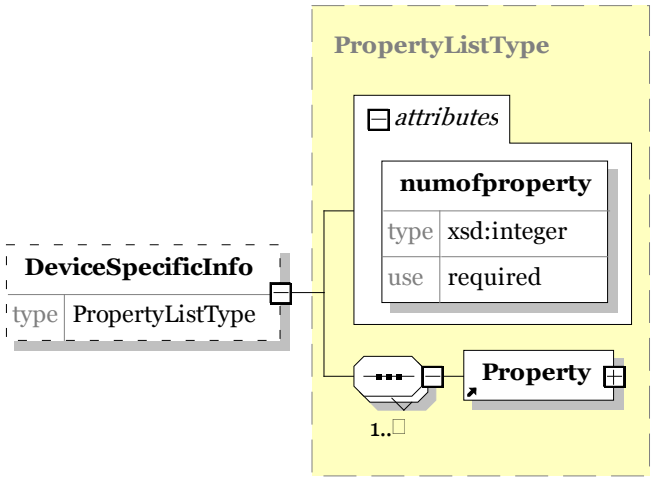
element AdditionalPropertyType/SoftwareListInfo/Software/FileURL

diagram	
properties	isRef 0
source	<xsd:element name="FileURL"/>
description	File URL of software

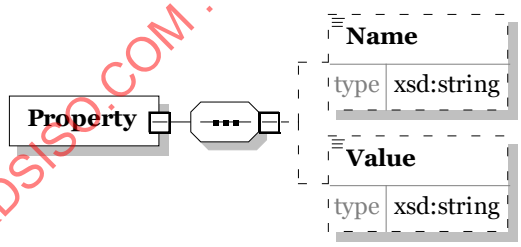
element AdditionalPropertyType/SoftwareListInfo/Software/Type

diagram	
properties	isRef 0 minOcc 0 maxOcc 1
source	<xsd:element name="Type" minOccurs="0"/>
description	Type of software

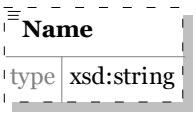
element AdditionalPropertyType/DeviceSpecificInfo

diagram	
properties	isRef 0 minOcc 0 maxOcc 1 content complex
children	Property
attributes	Name numofproperty Type xsd:integer Use required
source	<xsd:element name="DeviceSpecificInfo" type="PropertyListType" minOccurs="0"/>
description	User-defined properties for device specific information

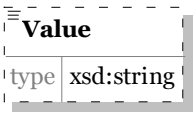
element Property

diagram	
properties	content complex
children	Name Value
used by	complexType PropertyListType
source	<xsd:element name="Property"> <xsd:complexType> <xsd:sequence> <xsd:element name="Name" type="xsd:string" minOccurs="0"/> <xsd:element name="Value" type="xsd:string" minOccurs="0"/> </xsd:sequence> </xsd:complexType> </xsd:element>
description	User-defined property

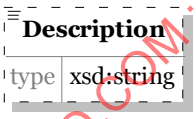
element Property/Name

diagram	
properties	isRef 0 minOcc 0 maxOcc 1 content simple
source	<xsd:element name="Name" type="xsd:string" minOccurs="0"/>
description	Name of property

element Property/Value

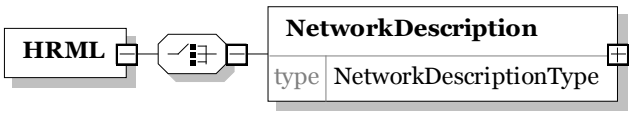
diagram	
properties	isRef 0 minOcc 0 maxOcc 1 content simple
source	<xsd:element name="Value" type="xsd:string" minOccurs="0"/>
description	Value of property

element AdditionalPropertyType/Description

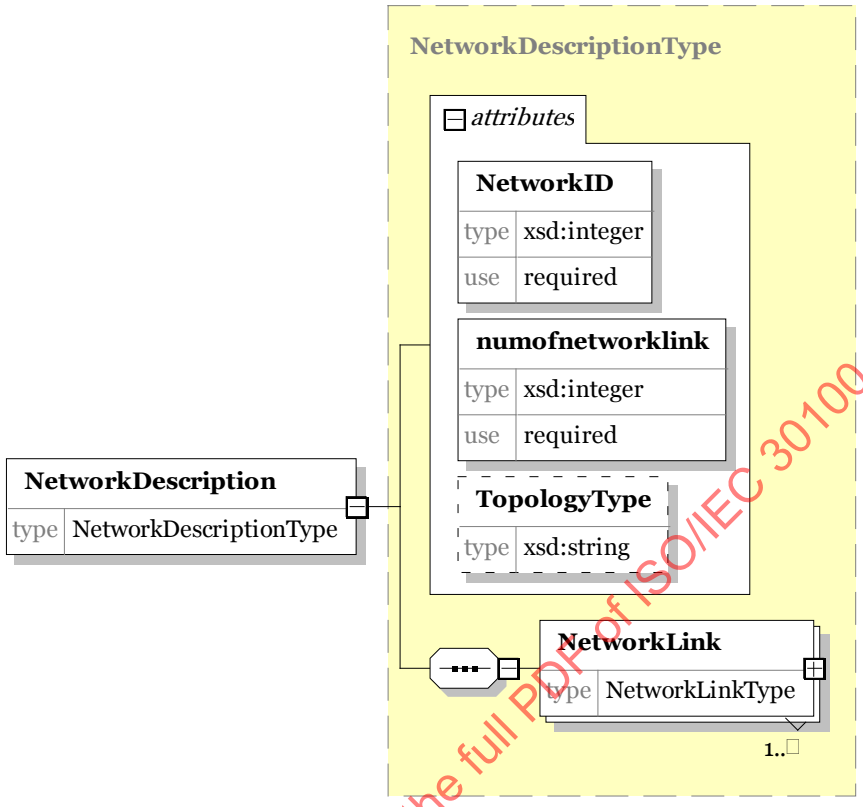
diagram	
properties	isRef 0 minOcc 0 maxOcc 1 content simple
source	<xsd:element name="Description" type="xsd:string" minOccurs="0"/>
description	Description of device

7.3 Network specific information

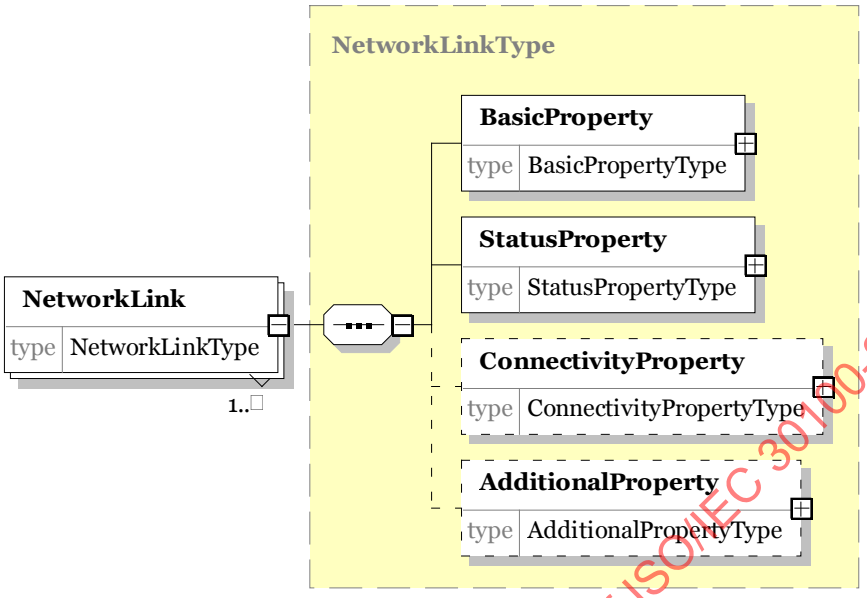
element HRML

diagram	
properties	content complex
children	NetworkDescription
source	<xsd:element name="HRML"> <xsd:complexType> <xsd:choice> <xsd:element name="NetworkDescription" type="NetworkDescriptionType"/> </xsd:choice> </xsd:complexType> </xsd:element>
description	Home Resource management Markup Language, Container for resource information including device, network, physical space, service and so on.

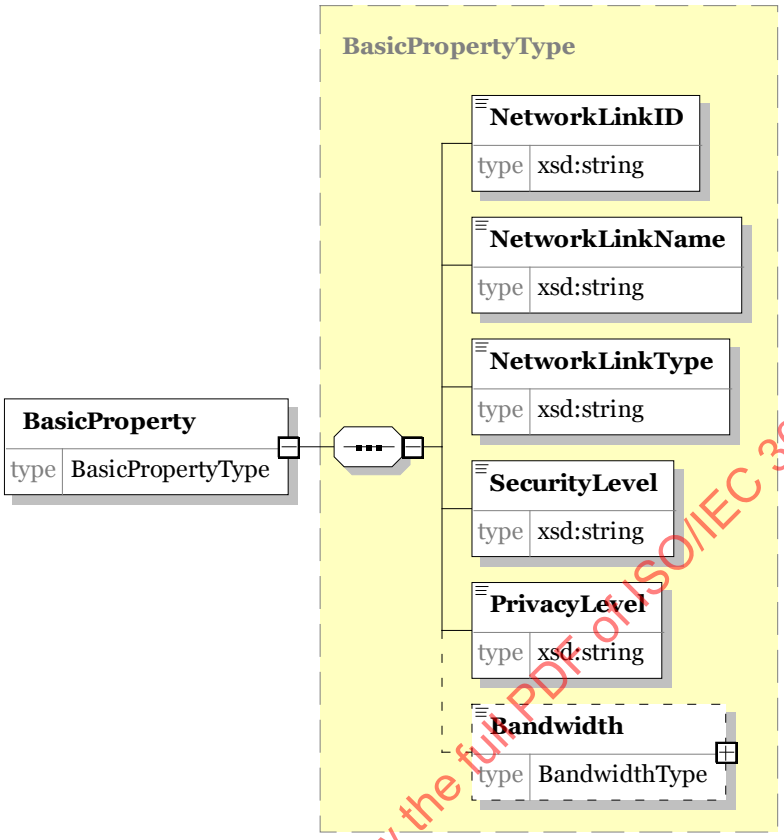
element HRML/NetworkDescription

diagram	
properties	isRef 0 content complex
children	NetworkLink
attributes	Name NetworkID Type xsd:integer Use required Name numofnetworklink Type xsd:integer Use required Name TopologyType Type xsd:string
source	<xsd:element name="NetworkDescription" type="NetworkDescriptionType"/>
description	Description of network domain

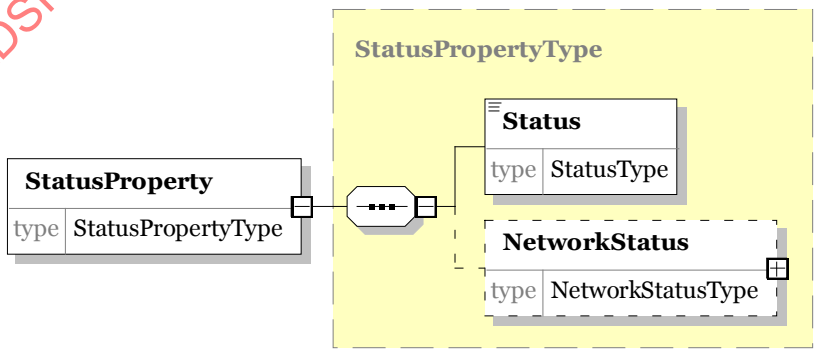
element NetworkDescriptionType/NetworkLink

diagram	
properties	isRef 0 minOcc 1 maxOcc unbounded content complex
children	BasicProperty StatusProperty ConnectivityProperty AdditionalProperty
source	<xsd:element name="NetworkLink" type="NetworkLinkType" maxOccurs="unbounded"/>
description	Container of link information

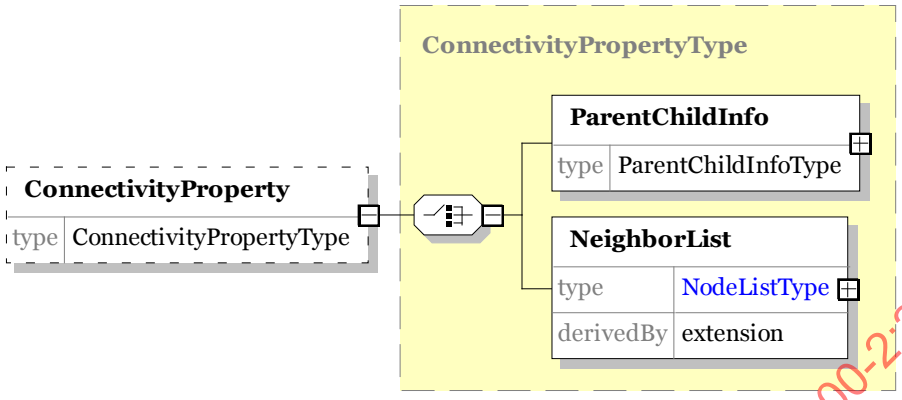
element NetworkLinkType/BasicProperty

diagram	
properties	isRef 0 content complex
children	NetworkLinkID NetworkLinkName NetworkLinkType SecurityLevel PrivacyLevel Throughput
source	<xsd:element name="BasicProperty" type="BasicPropertyType"/>
description	Container for basic properties of NetworkLinkDescription

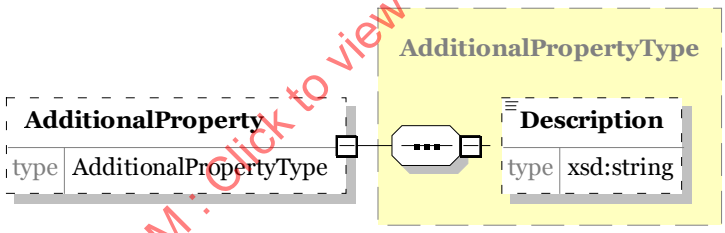
element NetworkLinkType/StatusProperty

diagram	
properties	isRef 0 content complex
children	Status NetworkStatus
source	<xsd:element name="StatusProperty" type="StatusPropertyType"/>
description	Container for status properties of NetworkLinkDescription

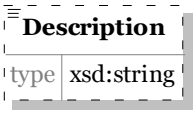
element NetworkLinkType/ConnectivityProperty

diagram	
properties	isRef 0 minOcc 0 maxOcc 1 content complex
children	ParentChildInfo NeighborList
source	<xsd:element name="ConnectivityProperty" type="ConnectivityPropertyType" minOccurs="0"/>
description	Container for connectivity properties of NetworkLinkDescription

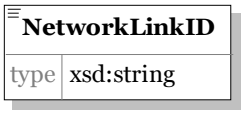
element NetworkLinkType/AdditionalProperty

diagram	
properties	isRef 0 minOcc 0 maxOcc 1 content complex
children	Description
source	<xsd:element name="AdditionalProperty" type="AdditionalPropertyType" minOccurs="0"/>
description	Container for additional properties of NetworkLinkDescription

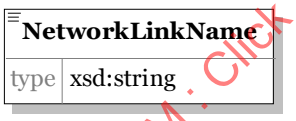
element AdditionalPropertyType/Description

diagram	
properties	isRef 0 minOcc 0 maxOcc 1 content simple
source	<xsd:element name="Description" type="xsd:string" minOccurs="0"/>
description	Additional description of a network link

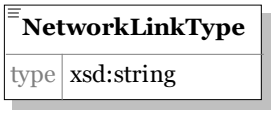
element BasicPropertyType/NetworkLinkID

diagram	
properties	isRef 0 content simple
source	<xsd:element name="NetworkLinkID" type="xsd:string"/>
description	ID of a link

element BasicPropertyType/NetworkLinkName

diagram	
properties	isRef 0 content simple
source	<xsd:element name="NetworkLinkName" type="xsd:string"/>
description	Name of a link

element BasicPropertyType/NetworkLinkType

diagram	
properties	isRef 0 content simple
source	<xsd:element name="NetworkLinkType" type="xsd:string"/>
description	Type of a link

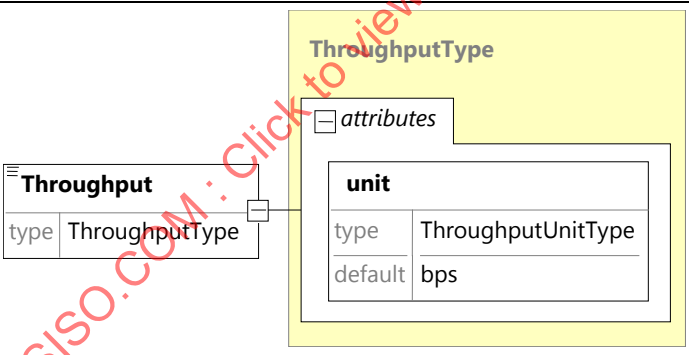
element BasicPropertyType/SecurityLevel

diagram	
properties	isRef 0 content simple
source	<xsd:element name=" SecurityLevel " type="xsd:string"/>
description	Securitylevel of a link

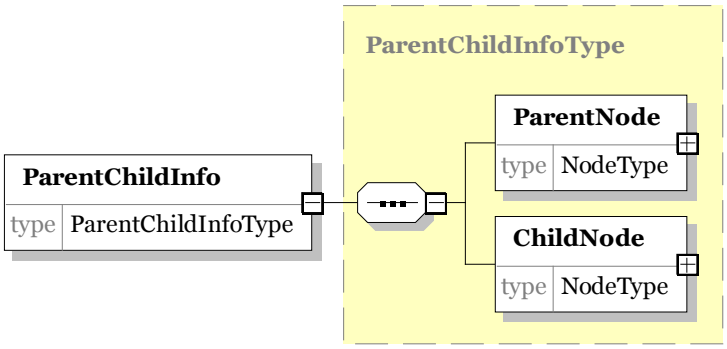
element BasicPropertyType/PrivacyLevel

diagram	
properties	isRef 0 content simple
source	<xsd:element name="PrivacyLevel " type="xsd:string"/>
description	Privacylevel of a link

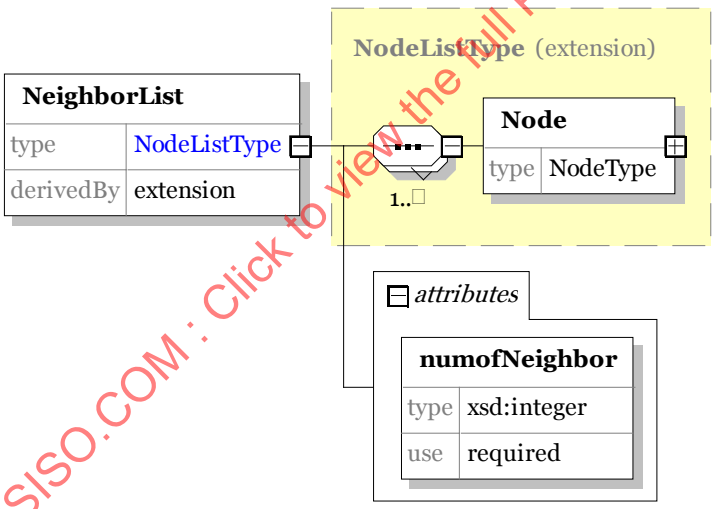
element BasicPropertyType/Throughput

diagram	
properties	isRef 0 minOcc 0 maxOcc 1 content complex
attributes	Name unit Type ThroughputUnitType Default bps
source	<xsd:element name="Throughput" type="ThroughputType" minOccurs="0"/>
description	Total throughput of a link

element ConnectivityPropertyType/ParentChildInfo

diagram	
properties	isRef 0 content complex
children	ParentNode ChildNode
source	<xsd:element name="ParentChildInfo" type="ParentChildInfoType"/>
description	Container of parent or child node information

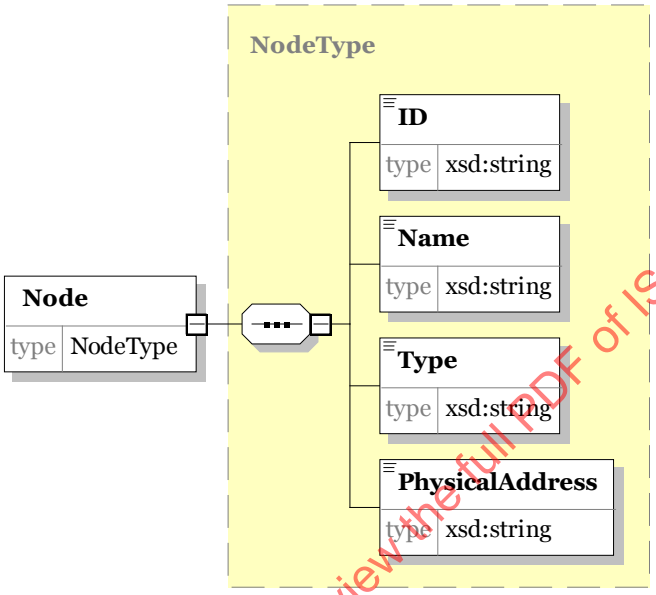
element ConnectivityPropertyType/NeighborList

diagram	
properties	isRef 0 content complex
children	Node
attributes	Name numofNeighbor Type xsd:integer Use required
source	<xsd:element name="NeighborList"> <xsd:complexType> <xsd:complexContent> <xsd:extension base="NodeListType"> <xsd:attribute name="numofNeighbor" type="xsd:integer" use="required"/> </xsd:extension> </xsd:complexContent> </xsd:complexType> </xsd:element>
description	Container of neighbor node information

attribute ConnectivityPropertyType/NeighborList/@numofNeighbor

properties	isRef 0 use required
source	<xsd:attribute name="numofNeighbor" type="xsd:integer" use="required"/>
description	Number of neighbor nodes

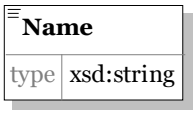
element NodeListType/Node

diagram	
properties	isRef 0 content complex
children	ID Name Type PhysicalAddress
source	<xsd:element name="Node" type="NodeType"/>
description	Container of node information

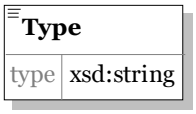
element NodeType/ID

diagram	
properties	isRef 0 content simple
source	<xsd:element name="ID" type="xsd:string"/>
description	ID of a node

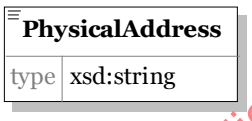
element NodeType/Name

diagram	
properties	isRef 0 content simple
source	<xsd:element name="Name" type="xsd:string"/>
description	Name of a node

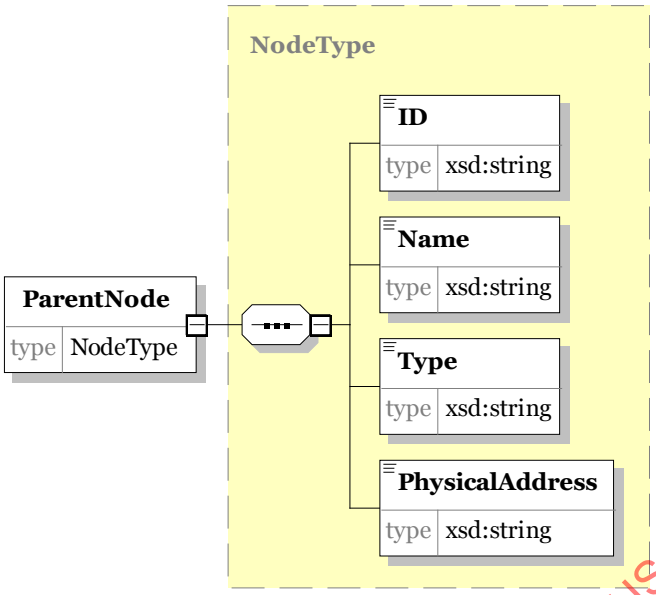
element NodeType/Type

diagram	
properties	isRef 0 content simple
source	<xsd:element name="Type" type="xsd:string"/>
description	Type of a node

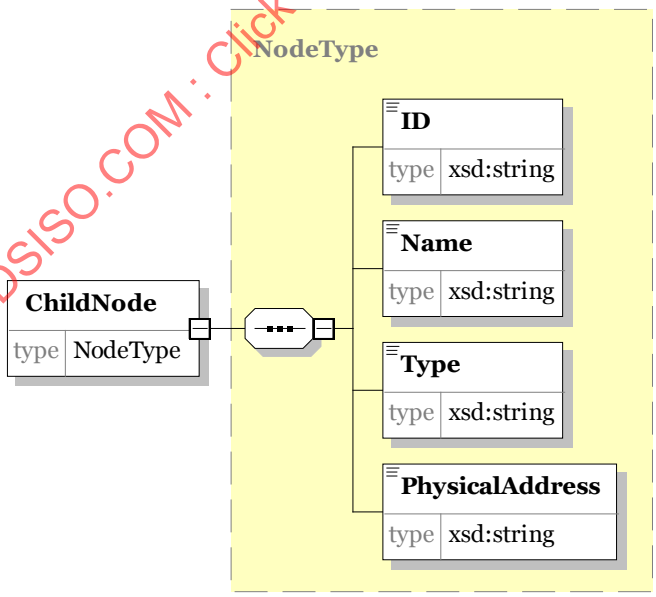
element NodeType/PhysicalAddress

diagram	
properties	isRef 0 content simple
source	<xsd:element name="PhysicalAddress" type="xsd:string"/>
description	Physical address of a node

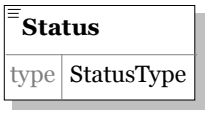
element ParentChildInfoType/ParentNode

diagram	
properties	isRef 0 content complex
children	ID Name Type PhysicalAddress
source	<xsd:element name="ParentNode" type="NodeType"/>
description	Container of a parent node information

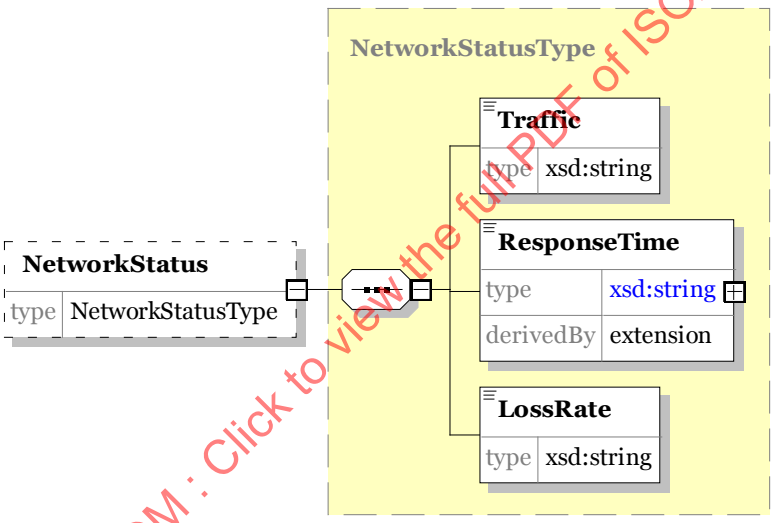
element ParentChildInfoType/ChildNode

diagram	
properties	isRef 0 content complex
children	ID Name Type PhysicalAddress
source	<xsd:element name="ChildNode" type="NodeType"/>
description	Container of a child node information

element StatusPropertyType/Status

diagram	
properties	isRef 0 content simple
facets	enumeration Online enumeration Offline enumeration Error
source	<xsd:element name="Status" type="StatusType"/>
description	Status of link such as online, offline, or error

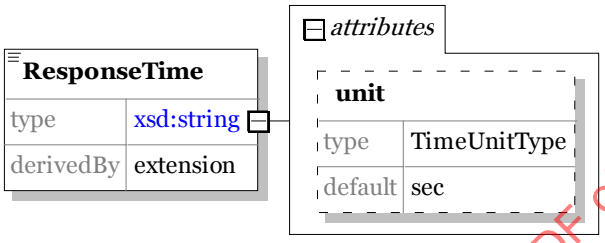
element StatusPropertyType/NetworkStatus

diagram	
properties	isRef 0 minOcc 0 maxOcc 1 content complex
children	Traffic ResponseTime LossRate
source	<xsd:element name="NetworkStatus" type="NetworkStatusType" minOccurs="0"/>
description	Container for detail status information in case of online or error

element NetworkStatusType/Traffic

diagram	
properties	isRef 0 content simple
source	<xsd:element name="Traffic" type="xsd:string"/>
description	Container of current network traffic(kbps)

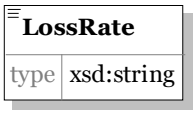
element NetworkStatusType/ResponseTime

diagram	
properties	isRef 0 content complex
attributes	Name unit Type TimeUnitType Default sec
source	<xsd:element name="ResponseTime"> <xsd:complexType> <xsd:simpleContent> <xsd:extension base="xsd:string"> <xsd:attribute name="unit" type="TimeUnitType" default="sec"/> </xsd:extension> </xsd:simpleContent> </xsd:complexType> </xsd:element>
description	Container of current response time

attribute NetworkStatusType/ResponseTime/@unit

properties	isRef 0 default sec
facets	enumeration sec enumeration msec enumeration usec
source	<xsd:attribute name="unit" type="TimeUnitType" default="sec"/>
description	Unit of response time

element NetworkStatusType/LossRate

diagram	
properties	isRef 0 content simple
source	<xsd:element name="LossRate" type="xsd:string"/>
description	Container of current loss rate

simpleType ThroughputUnitType

used by	attribute ThroughputType/@unit
facets	enumeration bps enumeration kbps enumeration mbps enumeration gbps
source	<xsd:simpleType name="ThroughputUnitType"> <xsd:restriction base="xsd:string"> <xsd:enumeration value="bps"/> <xsd:enumeration value="kbps"/> <xsd:enumeration value="mbps"/> <xsd:enumeration value="gbps"/> </xsd:restriction> </xsd:simpleType>
description	Type of throughput unit

simpleType NetworkTypeType

facets	enumeration ethernet enumeration ieee1394 enumeration uwb enumeration usb enumeration plc enumeration 802.11 enumeration bluetooth enumeration zigbee enumeration rfid enumeration rs485 enumeration rs232 enumeration unknown
source	<xsd:simpleType name="NetworkTypeType"> <xsd:restriction base="xsd:string"> <xsd:enumeration value="ethernet"/> <xsd:enumeration value="ieee1394"/> <xsd:enumeration value="uwb"/> <xsd:enumeration value="usb"/> <xsd:enumeration value="plc"/> <xsd:enumeration value="802.11"/> <xsd:enumeration value="bluetooth"/> <xsd:enumeration value="zigbee"/> <xsd:enumeration value="rfid"/> <xsd:enumeration value="rs485"/> <xsd:enumeration value="rs232"/> <xsd:enumeration value="unknown"/> </xsd:restriction> </xsd:simpleType>
description	Type of network

simpleType StatusType

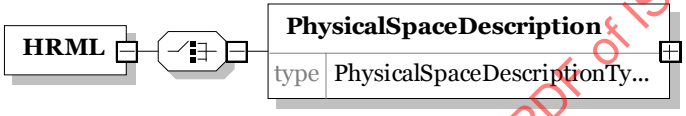
used by	element StatusPropertyType/Status
facets	enumeration Online enumeration Offline enumeration Error
source	<xsd:simpleType name="StatusType"> <xsd:restriction base="xsd:string"> <xsd:enumeration value="Online"/> <xsd:enumeration value="Offline"/> <xsd:enumeration value="Error"/> </xsd:restriction> </xsd:simpleType>
description	Type of network status

simpleType TimeUnitType

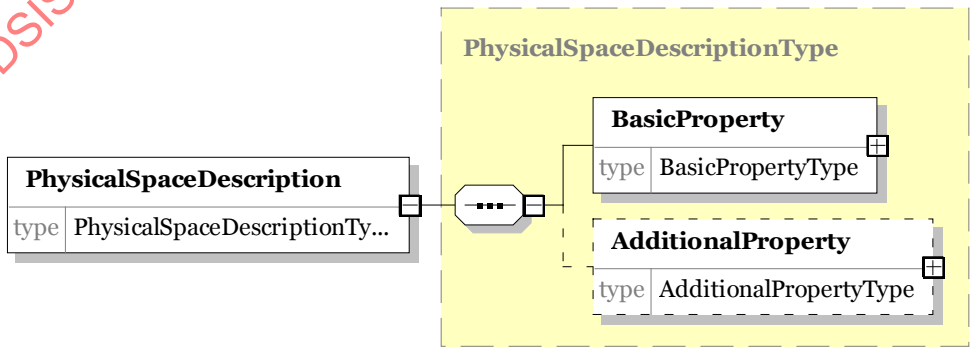
used by	attribute NetworkStatusType/ResponseTime/@unit
facets	enumeration sec enumeration msec enumeration usec
source	<xsd:simpleType name="TimeUnitType"> <xsd:restriction base="xsd:string"> <xsd:enumeration value="sec"/> <xsd:enumeration value="msec"/> <xsd:enumeration value="usec"/> </xsd:restriction> </xsd:simpleType>
description	Type of time unit

7.4 Physical space-specific information modelling

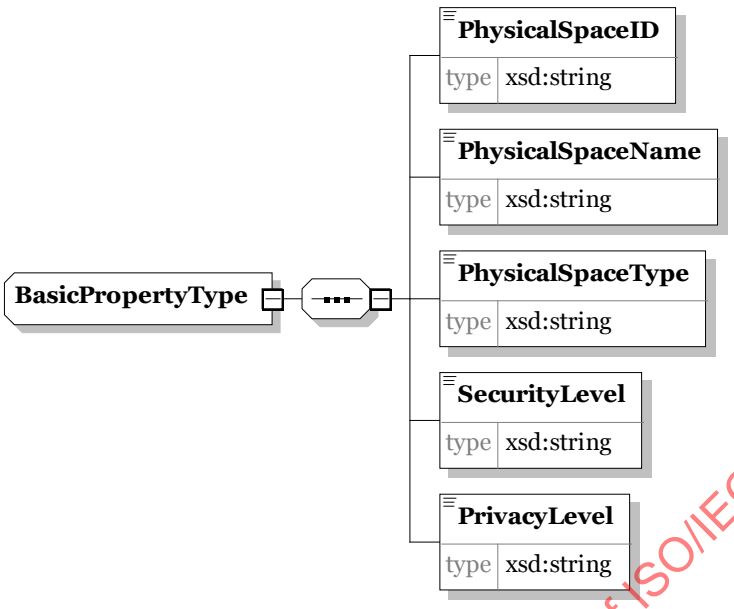
element HRML

diagram	
properties	content complex
children	PhysicalSpaceDescription
source	<xsd:element name="HRML"> <xsd:complexType> <xsd:choice> <xsd:element name="PhysicalSpaceDescription" type="PhysicalSpaceDescriptionType"/> </xsd:choice> </xsd:complexType> </xsd:element>
description	Home Resource management Markup Language. Container for resource information including device, network, physical space, service and so on.

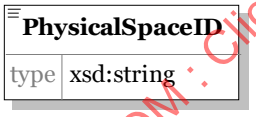
element HRML/PhysicalSpaceDescription

diagram	
properties	isRef 0 content complex
children	BasicProperty AdditionalProperty
source	<xsd:element name="PhysicalSpaceDescription" type="PhysicalSpaceDescriptionType"/>
description	Description of physical space domain

element PhysicalSpaceDescriptionType/BasicProperty

diagram	
properties	isRef 0 content complex
children	PhysicalSpaceID PhysicalSpaceName PhysicalSpaceType SecurityLevel PrivacyLevel
source	<xsd:element name="BasicProperty" type="BasicPropertyType"/>
description	Container for basic properties of PhysicalSpaceDescription

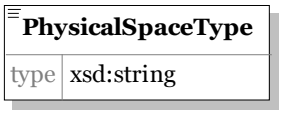
element BasicPropertyType/PhysicalSpaceID

diagram	
properties	isRef 0 content simple
source	<xsd:element name="PhysicalSpaceID" type="xsd:string"/>
description	ID of physical space object

element BasicPropertyType/PhysicalSpaceName

diagram	
properties	isRef 0 content simple
source	<xsd:element name="PhysicalSpaceName" type="xsd:string"/>
description	Name of physical space object

element BasicPropertyType/PhysicalSpaceType

diagram	
properties	isRef 0 content simple
source	<xsd:element name="PhysicalSpaceType" type="xsd:string"/>
description	Type of physical space object

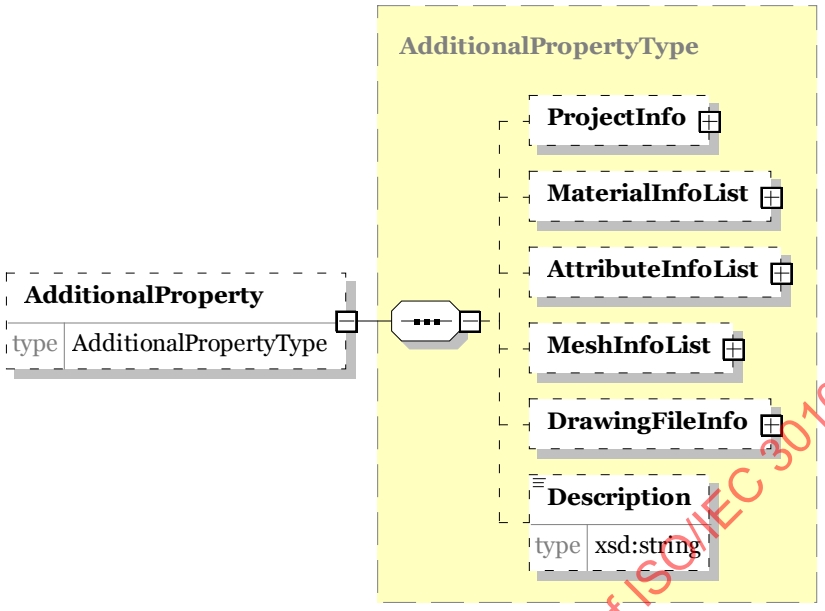
element BasicPropertyType/SecurityLevel

diagram	
properties	isRef 0 content simple
source	<xsd:element name="SecurityLevel" type="xsd:string"/>
description	SecurityLevel of physical space object

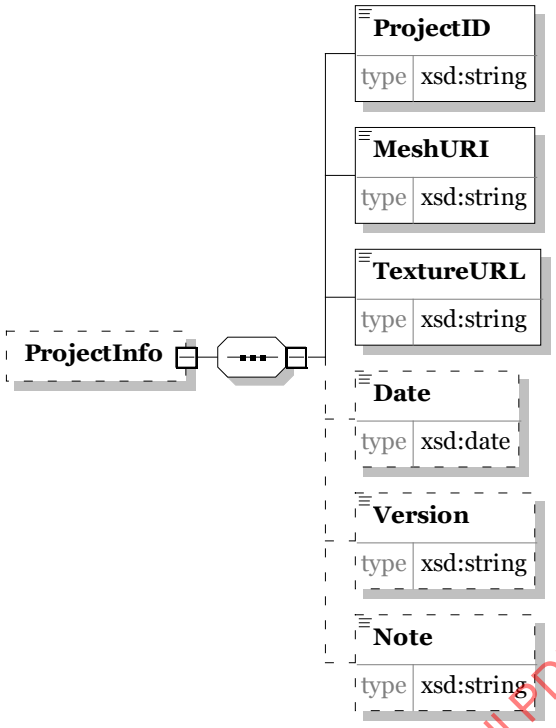
element BasicPropertyType/PrivacyLevel

diagram	
properties	isRef 0 content simple
source	<xsd:element name="PrivacyLevel" type="xsd:string"/>
description	PrivacyLevel of physical space object

element PhysicalSpaceDescriptionType/AdditionalProperty

diagram	
properties	isRef 0 minOcc 0 maxOcc 1 content complex
children	ProjectInfo MaterialInfoList AttributeInfoList MeshInfoList DrawingFileInfo Description
source	<xsd:element name="AdditionalProperty" type="AdditionalPropertyType" minOccurs="0"/>
description	Container of additional properties for physical space description

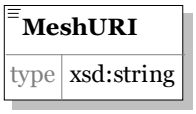
element AdditionalPropertyType/ProjectInfo

diagram	
properties	isRef 0 minOcc 0 maxOcc 1 content complex
children	ProjectID MeshURI TextureURL Date Version Note
source	<xsd:element name="ProjectInfo" minOccurs="0"> <xsd:complexType> <xsd:sequence> <xsd:element name="ProjectID" type="xsd:string"/> <xsd:element name="MeshURI" type="xsd:string"/> <xsd:element name="TextureURL" type="xsd:string"/> <xsd:element name="Date" type="xsd:date" minOccurs="0"/> <xsd:element name="Version" type="xsd:string" minOccurs="0"/> <xsd:element name="Note" type="xsd:string" minOccurs="0"/> </xsd:sequence> </xsd:complexType> </xsd:element>
description	Container of project information

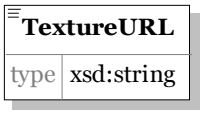
element AdditionalPropertyType/ProjectInfo/ProjectID

diagram	
properties	isRef 0 content simple
source	<xsd:element name="ProjectID" type="xsd:string"/>
description	ID of project

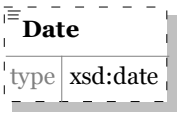
element AdditionalPropertyType/ProjectInfo/MeshURI

diagram	
properties	isRef 0 content simple
source	<xsd:element name="MeshURI" type="xsd:string"/>
description	URI of Mesh File

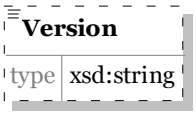
element AdditionalPropertyType/ProjectInfo/TextureURL

diagram	
properties	isRef 0 content simple
source	<xsd:element name="TextureURL" type="xsd:string"/>
description	URI of Texture File

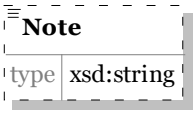
element AdditionalPropertyType/ProjectInfo/Date

diagram	
properties	isRef 0 minOcc 0 maxOcc 1 content simple
source	<xsd:element name="Date" type="xsd:date" minOccurs="0"/>
description	Creation date of the project

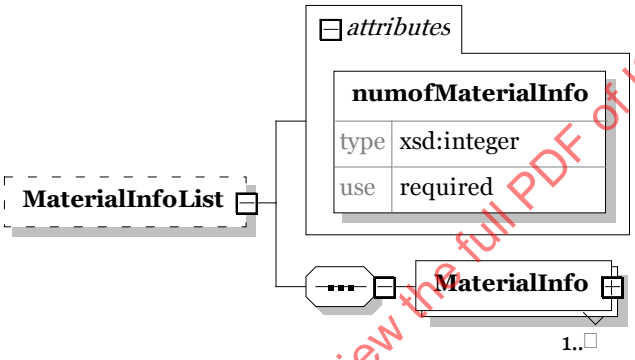
element AdditionalPropertyType/ProjectInfo/Version

diagram	
properties	isRef 0 minOcc 0 maxOcc 1 content simple
source	<xsd:element name="Version" type="xsd:string" minOccurs="0"/>
description	Version of the project

element AdditionalPropertyType/ProjectInfo/Note

diagram	
properties	isRef 0 minOcc 0 maxOcc 1 content simple
source	<xsd:element name="Note" type="xsd:string" minOccurs="0"/>
description	Extra information of the project

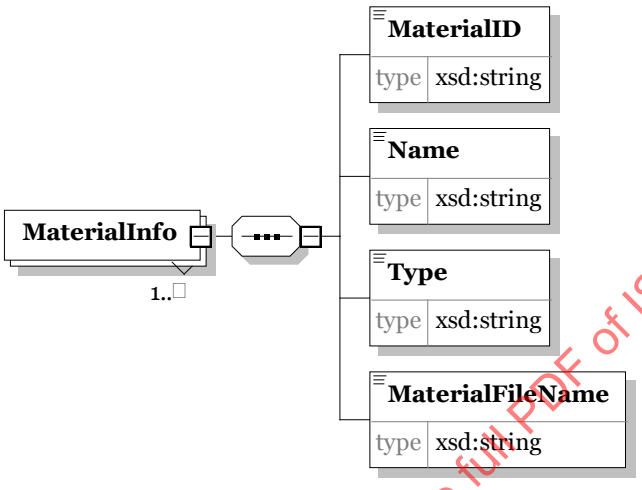
element AdditionalPropertyType/MaterialInfoList

diagram	
properties	isRef 0 minOcc 0 maxOcc 1 content complex
children	MaterialInfo
attributes	Name numofMaterialInfo Type xsd:integer Use required
source	<xsd:element name="MaterialInfoList" minOccurs="0"> <xsd:complexType> <xsd:sequence> <xsd:element name="MaterialInfo" maxOccurs="unbounded"> <xsd:complexType> <xsd:sequence> <xsd:element name="MaterialID" type="xsd:string"/> <xsd:element name="Name" type="xsd:string"/> <xsd:element name="Type" type="xsd:string"/> <xsd:element name="MaterialFileName" type="xsd:string"/> </xsd:sequence> </xsd:complexType> </xsd:element> </xsd:sequence> <xsd:attribute name="numofMaterialInfo" type="xsd:integer" use="required"/> </xsd:complexType> </xsd:element>
description	Container of material information lists

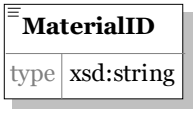
attribute AdditionalPropertyType/MaterialInfoList/@numofMaterialInfo

properties	isRef 0 use required
source	<xsd:attribute name="numofMaterialInfo" type="xsd:integer" use="required"/>
description	Number of MaterialInfo

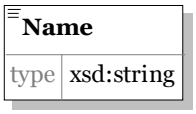
element AdditionalPropertyType/MaterialInfoList/MaterialInfo

diagram	
properties	isRef 0 minOcc 1 maxOcc unbounded content complex
children	MaterialID Name Type MaterialFileName
source	<xsd:element name="MaterialInfo" maxOccurs="unbounded"> <xsd:complexType> <xsd:sequence> <xsd:element name="MaterialID" type="xsd:string"/> <xsd:element name="Name" type="xsd:string"/> <xsd:element name="Type" type="xsd:string"/> <xsd:element name="MaterialFileName" type="xsd:string"/> </xsd:sequence> </xsd:complexType> </xsd:element>
description	Container of material information

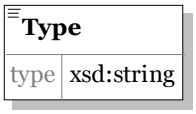
element AdditionalPropertyType/MaterialInfoList/MaterialInfo/MaterialID

diagram	
properties	isRef 0 content simple
source	<xsd:element name="MaterialID" type="xsd:string"/>
description	ID of material

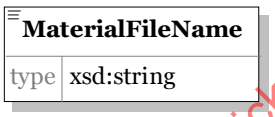
element AdditionalPropertyType/MaterialInfoList/MaterialInfo/Name

diagram	
properties	isRef 0 content simple
source	<xsd:element name="Name" type="xsd:string"/>
description	Name of material

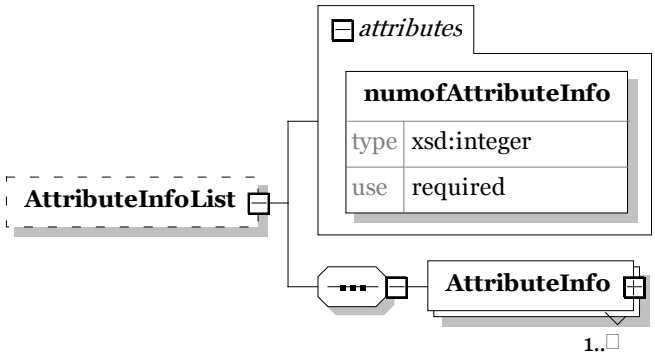
element AdditionalPropertyType/MaterialInfoList/MaterialInfo/Type

diagram	
properties	isRef 0 content simple
source	<xsd:element name="Type" type="xsd:string"/>
description	Type of material

element AdditionalPropertyType/MaterialInfoList/MaterialInfo/MaterialFileName

diagram	
properties	isRef 0 content simple
source	<xsd:element name="MaterialFileName" type="xsd:string"/>
description	File name of material information

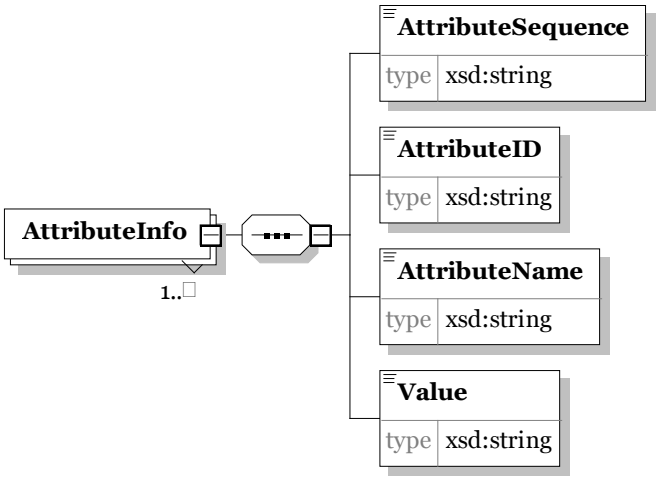
element AdditionalPropertyType/AttributeInfoList

diagram	
properties	isRef 0 minOcc 0 maxOcc 1 content complex
children	AttributeInfo
attributes	Name numofAttributeInfo Type xsd:integer Use required
source	<xsd:element name="AttributeInfoList" minOccurs="0"> <xsd:complexType> <xsd:sequence> <xsd:element name="AttributeInfo" maxOccurs="unbounded"> <xsd:complexType> <xsd:sequence> <xsd:element name="AttributeSequence" type="xsd:string"/> <xsd:element name="AttributeID" type="xsd:string"/> <xsd:element name="AttributeName" type="xsd:string"/> <xsd:element name="Value" type="xsd:string"/> </xsd:sequence> </xsd:complexType> </xsd:element> </xsd:sequence> <xsd:attribute name="numofAttributeInfo" type="xsd:integer" use="required"/> </xsd:complexType> </xsd:element>
description	Container of attribute information lists

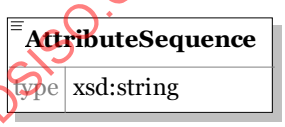
attribute AdditionalPropertyType/AttributeInfoList/@numofAttributeInfo

properties	isRef 0 use required
source	<xsd:attribute name="numofAttributeInfo" type="xsd:integer" use="required"/>
description	Number of AttributeInfo

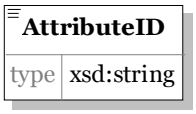
element AdditionalPropertyType/AttributeInfoList/AttributeInfo

diagram	
properties	isRef 0 minOcc 1 maxOcc unbounded content complex
children	AttributeSequence AttributeID AttributeName Value
source	<xsd:element name="AttributeInfo" maxOccurs="unbounded"> <xsd:complexType> <xsd:sequence> <xsd:element name="AttributeSequence" type="xsd:string"/> <xsd:element name="AttributeID" type="xsd:string"/> <xsd:element name="AttributeName" type="xsd:string"/> <xsd:element name="Value" type="xsd:string"/> </xsd:sequence> </xsd:complexType> </xsd:element>
description	Container of attribute information

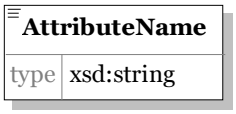
element AdditionalPropertyType/AttributeInfoList/AttributeInfo/AttributeSequence

diagram	
properties	isRef 0 content simple
source	<xsd:element name="AttributeSequence" type="xsd:string"/>
description	Sequence of attribute

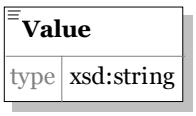
element AdditionalPropertyType/AttributeInfoList/AttributeInfo/AttributeID

diagram	
properties	isRef 0 content simple
source	<xsd:element name="AttributeID" type="xsd:string"/>
description	ID of attribute

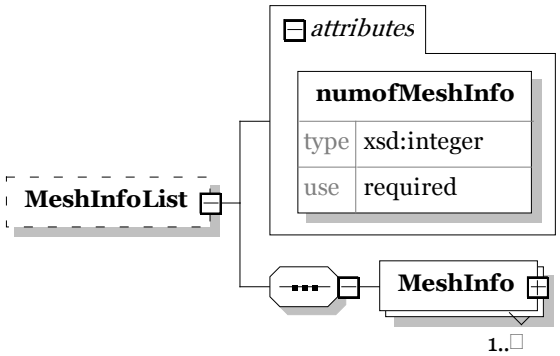
element AdditionalPropertyType/AttributeInfoList/AttributeInfo/AttributeName

diagram	
properties	isRef 0 content simple
source	<xsd:element name="AttributeName" type="xsd:string"/>
description	Name of attribute

element AdditionalPropertyType/AttributeInfoList/AttributeInfo/Value

diagram	
properties	isRef 0 content simple
source	<xsd:element name="Value" type="xsd:string"/>
description	Value of attribute

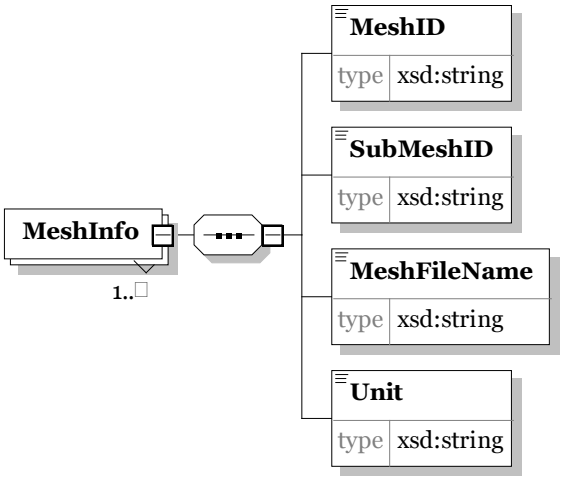
element AdditionalPropertyType/MeshInfoList

diagram	
properties	isRef 0 minOcc 0 maxOcc 1 content complex
children	MeshInfo
attributes	Name numofMeshInfo Type xsd:integer Use required
source	<xsd:element name="MeshInfoList" minOccurs="0"> <xsd:complexType> <xsd:sequence> <xsd:element name="MeshInfo" maxOccurs="unbounded"> <xsd:complexType> <xsd:sequence> <xsd:element name="MeshID" type="xsd:string"/> <xsd:element name="SubMeshID" type="xsd:string"/> <xsd:element name="MeshFileName" type="xsd:string"/> <xsd:element name="Unit" type="xsd:string"/> </xsd:sequence> </xsd:complexType> </xsd:element> </xsd:sequence> <xsd:attribute name="numofMeshInfo" type="xsd:integer" use="required"/> </xsd:complexType> </xsd:element>
description	Container of polygonal mesh information lists

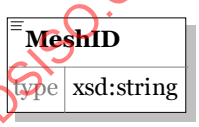
attribute AdditionalPropertyType/MeshInfoList/@numofMeshInfo

properties	isRef 0 use required
source	<xsd:attribute name="numofMeshInfo" type="xsd:integer" use="required"/>
description	Number of MeshInfo

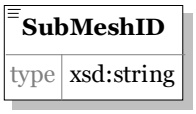
element AdditionalPropertyType/MeshInfoList/MeshInfo

diagram	
properties	isRef 0 minOcc 1 maxOcc unbounded content complex
children	MeshID SubMeshID MeshFileName Unit
source	<xsd:element name="MeshInfo" maxOccurs="unbounded"> <xsd:complexType> <xsd:sequence> <xsd:element name="MeshID" type="xsd:string"/> <xsd:element name="SubMeshID" type="xsd:string"/> <xsd:element name="MeshFileName" type="xsd:string"/> <xsd:element name="Unit" type="xsd:string"/> </xsd:sequence> </xsd:complexType> </xsd:element>
description	Container of polygonal mesh information

element AdditionalPropertyType/MeshInfoList/MeshInfo/MeshID

diagram	
properties	isRef 0 content simple
source	<xsd:element name="MeshID" type="xsd:string"/>
description	ID of mesh information

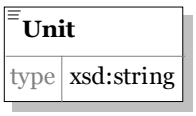
element AdditionalPropertyType/MeshInfoList/MeshInfo/SubMeshID

diagram	
properties	isRef 0 content simple
source	<xsd:element name="SubMeshID" type="xsd:string"/>
description	ID of additional mesh information

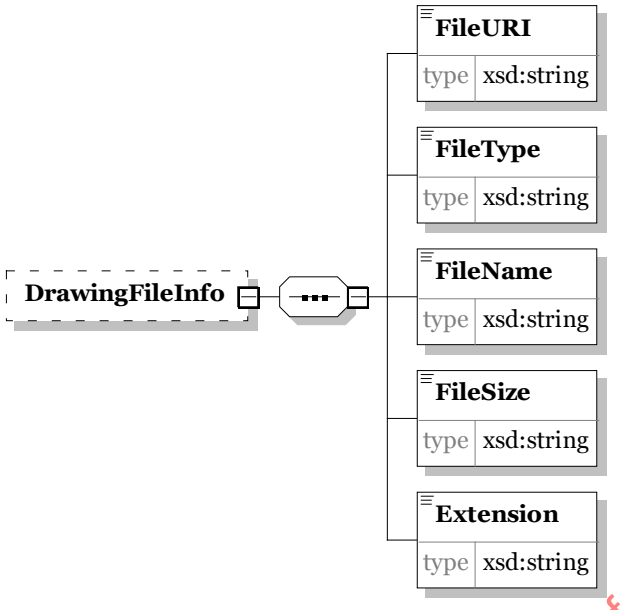
element AdditionalPropertyType/MeshInfoList/MeshInfo/MeshFileName

diagram	
properties	isRef 0 content simple
source	<xsd:element name="MeshFileName" type="xsd:string"/>
description	File name of mesh information

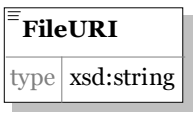
element AdditionalPropertyType/MeshInfoList/MeshInfo/Unit

diagram	
properties	isRef 0 content simple
source	<xsd:element name="Unit" type="xsd:string"/>
description	Unit of mesh information

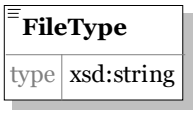
element AdditionalPropertyType/DrawingFileInfo

diagram	
properties	isRef 0 minOcc 0 maxOcc 1 content complex
children	FileURI FileType FileName FileSize Extension
source	<xsd:element name="DrawingFileInfo" minOccurs="0"> <xsd:complexType> <xsd:sequence> <xsd:element name="FileURI" type="xsd:string"/> <xsd:element name="FileType" type="xsd:string"/> <xsd:element name="FileName" type="xsd:string"/> <xsd:element name="FileSize" type="xsd:string"/> <xsd:element name="Extension" type="xsd:string"/> </xsd:sequence> </xsd:complexType> </xsd:element>
description	Container of file information for drawing

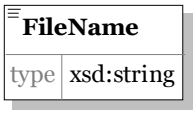
element AdditionalPropertyType/DrawingFileInfo/FileURI

diagram	
properties	isRef 0 content simple
source	<xsd:element name="FileURI" type="xsd:string"/>
description	URI of the file for drawing

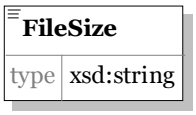
element AdditionalPropertyType/DrawingFileInfo/FileType

diagram	
properties	isRef 0 content simple
source	<xsd:element name="FileType" type="xsd:string"/>
description	Type of the file

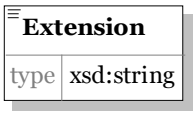
element AdditionalPropertyType/DrawingFileInfo/FileName

diagram	
type	xsd:string
properties	isRef 0 content simple
source	<xsd:element name="FileName" type="xsd:string"/>
description	Name of the file

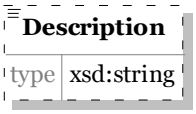
element AdditionalPropertyType/DrawingFileInfo/FileSize

diagram	
properties	isRef 0 content simple
source	<xsd:element name="FileSize" type="xsd:string"/>
description	Size of the file

element AdditionalPropertyType/DrawingFileInfo/Extension

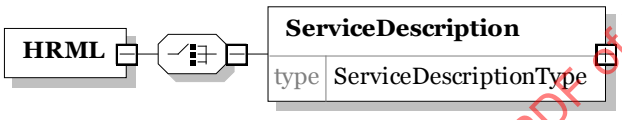
diagram	
properties	isRef 0 content simple
source	<xsd:element name="Extension" type="xsd:string"/>
description	Extension of the file

element AdditionalPropertyType/Description

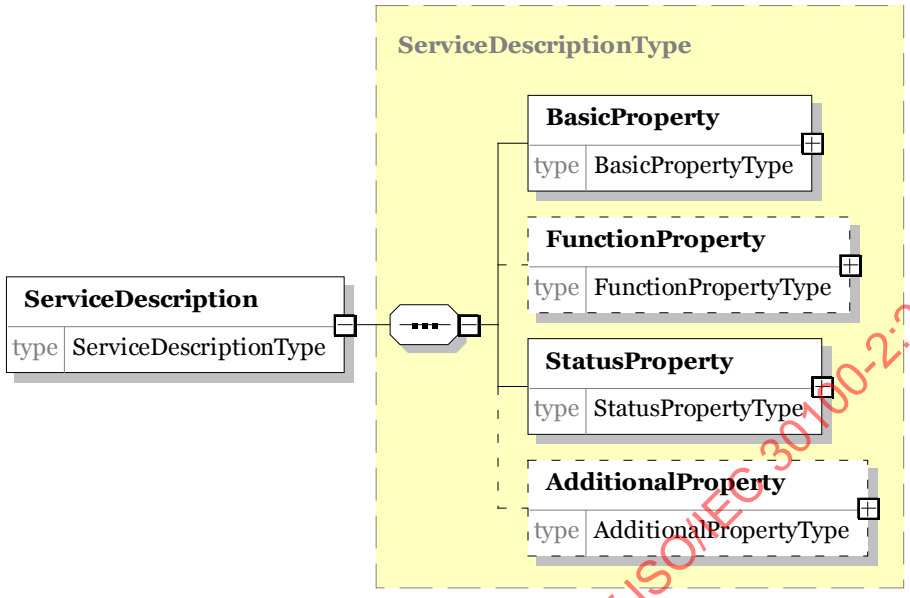
diagram	
properties	isRef 0 minOcc 0 maxOcc 1 content simple
source	<xsd:element name="Description" type="xsd:string" minOccurs="0"/>
description	Description of the file

7.5 Service-Specific Information modelling

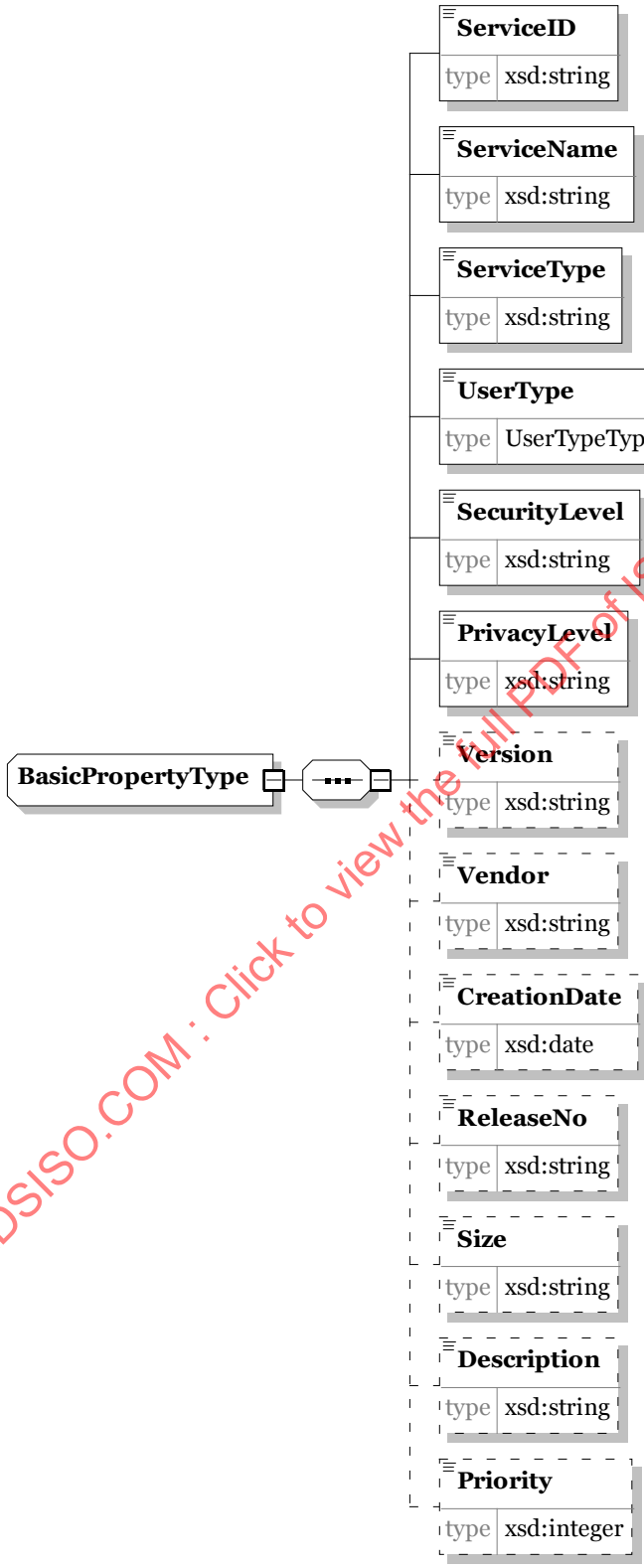
element HRML

diagram	
properties	content complex
children	ServiceDescription
source	<xsd:element name="HRML"> <xsd:complexType> <xsd:choice> <xsd:element name="ServiceDescription" type="ServiceDescriptionType"/> </xsd:choice> </xsd:complexType> </xsd:element>
description	Home Resource management Markup Language. Container for resource information including device, network, physical space, service and so on

element HRML/ServiceDescription

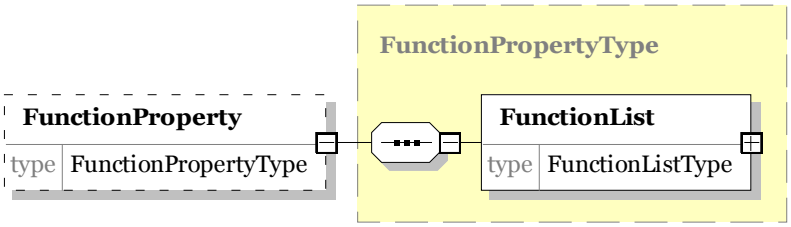
diagram	
properties	isRef 0 content complex
children	BasicProperty FunctionProperty StatusProperty AdditionalProperty
source	<xsd:element name="ServiceDescription" type="ServiceDescriptionType"/>
description	Container for service description of HRML

element ServiceDescriptionType/BasicProperty

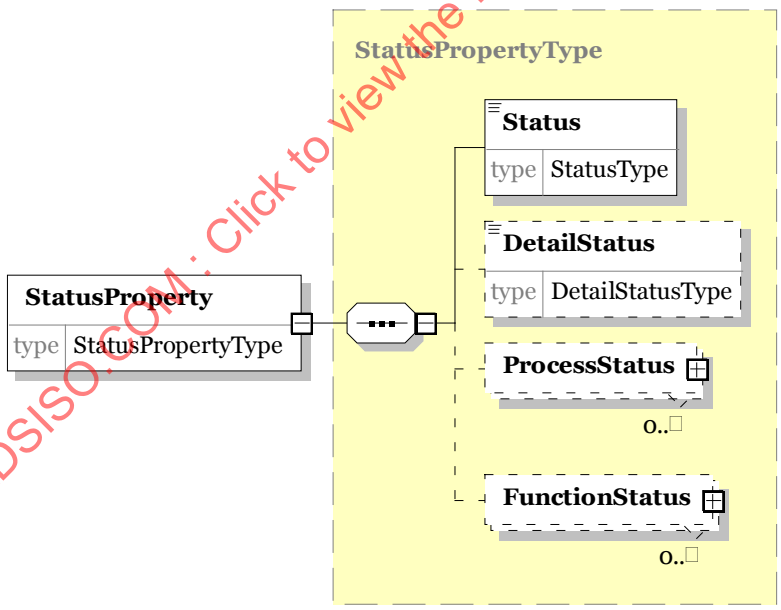
diagram	
properties	isRef 0 content complex
children	ServiceID ServiceName ServiceType UserType SecurityLevel PrivacyLevel Version Vendor CreationDate ReleaseNo Size Description Priority
source	<xsd:element name="BasicProperty" type="BasicPropertyType"/>

description	Basic information of service

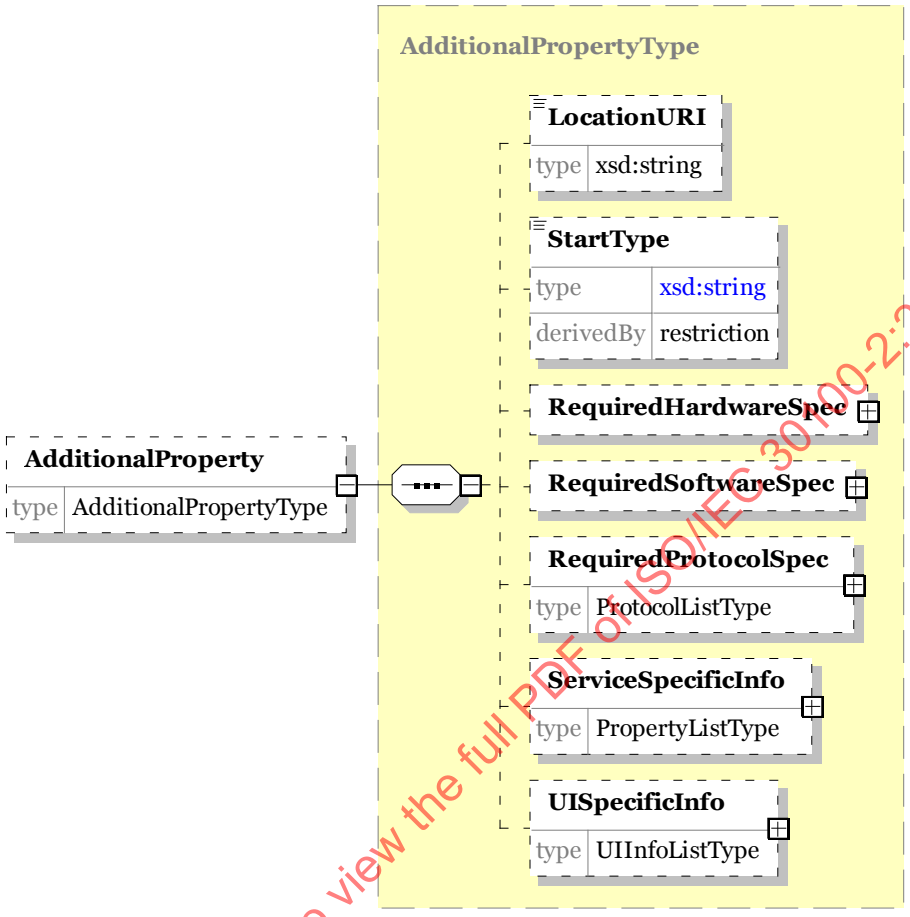
element ServiceDescriptionType/FunctionProperty

diagram	
properties	isRef 0 minOcc 0 maxOcc 1 content complex
children	FunctionList
source	<xsd:element name="FunctionProperty" type="FunctionPropertyType" minOccurs="0"/>
description	Function information of service

element ServiceDescriptionType/StatusProperty

diagram	
properties	isRef 0 content complex
children	Status DetailStatus ProcessStatus FunctionStatus
source	<xsd:element name="StatusProperty" type="StatusPropertyType"/>
description	Status information of service

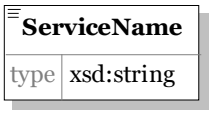
element ServiceDescriptionType/AdditionalProperty

diagram	
properties	isRef 0 minOcc 0 maxOcc 1 content complex
children	LocationURI StartType RequiredHardwareSpec RequiredSoftwareSpec RequiredProtocolSpec ServiceSpecificInfo UISpecificInfo
source	<xsd:element name="AdditionalProperty" type="AdditionalPropertyType" minOccurs="0"/>
description	Additional information of service

element BasicPropertyType/ServiceID

diagram	
properties	isRef 0 content simple
source	<xsd:element name="ServiceID" type="xsd:string"/>
description	ID of service

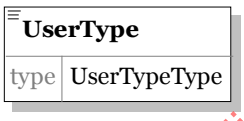
element BasicPropertyType/ServiceName

diagram	
properties	isRef 0 content simple
source	<xsd:element name="ServiceName" type="xsd:string"/>
description	Name of service

element BasicPropertyType/ServiceType

diagram	
properties	isRef 0 content simple
source	<xsd:element name="ServiceType" type="xsd:string"/>
description	Type of service

element BasicPropertyType/UserType

diagram	
properties	isRef 0 content simple
facets	enumeration System enumeration EndUser
source	<xsd:element name="UserType" type="UserTypeType"/>
description	User type of service

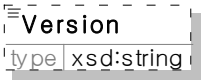
element BasicPropertyType/SecurityLevel

diagram	
properties	isRef 0 content simple
source	<xsd:element name="SecurityLevel" type="string"/>
description	SecurityLevel of service

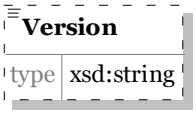
element BasicPropertyType/PrivacyLevel

diagram	
properties	isRef 0 content simple
source	<xsd:element name="PrivacyLevel" type="string"/>
description	PrivacyLevel of service

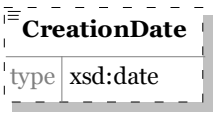
element BasicPropertyType/Version

diagram	
properties	isRef 0 minOcc 0 maxOcc 1 content simple
source	<xsd:element name="Version" type="xsd:string" minOccurs="0"/>
description	Version of service

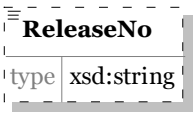
element BasicPropertyType/Vendor

diagram	
properties	isRef 0 minOcc 0 maxOcc 1 content simple
source	<xsd:element name="Vendor" type="xsd:string" minOccurs="0"/>
description	Vendor of service

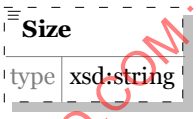
element BasicPropertyType/CreationDate

diagram	
properties	isRef 0 minOcc 0 maxOcc 1 content simple
source	<xsd:element name="CreationDate" type="xsd:date" minOccurs="0"/>
description	Creation date of service

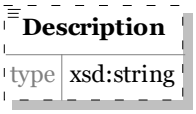
element BasicPropertyType/ReleaseNo

diagram	
properties	isRef 0 minOcc 0 maxOcc 1 content simple
source	<xsd:element name="ReleaseNo" type="xsd:string" minOccurs="0"/>
description	Release number of service

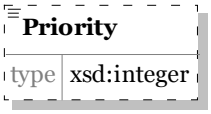
element BasicPropertyType/Size

diagram	
properties	isRef 0 minOcc 0 maxOcc 1 content simple
source	<xsd:element name="Size" type="xsd:string" minOccurs="0"/>
description	Size of service

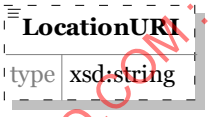
element BasicPropertyType/Description

diagram	
properties	isRef 0 minOcc 0 maxOcc 1 content simple
source	<xsd:element name="Description" type="xsd:string" minOccurs="0"/>
description	Description of service

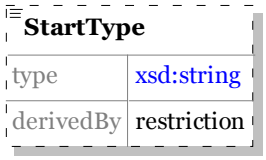
element BasicPropertyType/Priority

diagram	
properties	isRef 0 minOcc 0 maxOcc 1 content simple
source	<xsd:element name="Priority" type="xsd:integer" minOccurs="0"/>
description	Priority of service

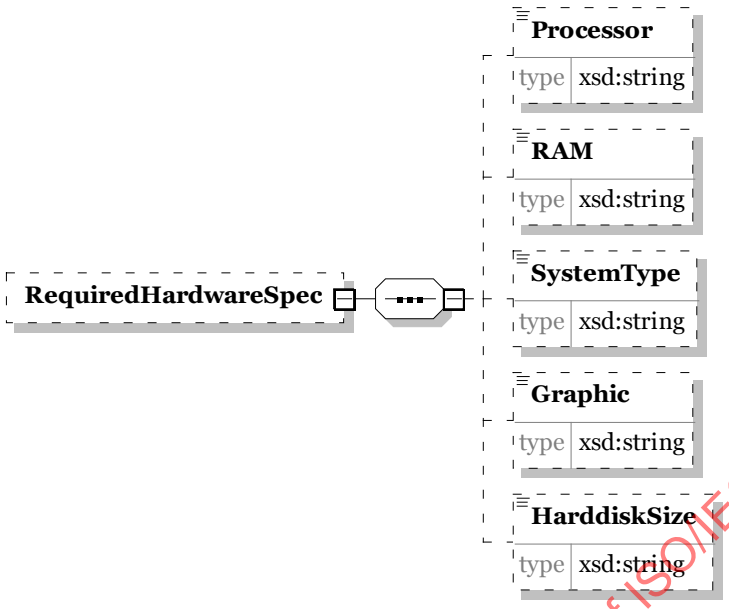
element AdditionalPropertyType/LocationURI

diagram	
properties	isRef 0 minOcc 0 maxOcc 1 content simple
source	<xsd:element name="LocationURI" type="xsd:string" minOccurs="0"/>
description	Location URI of service

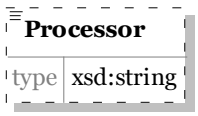
element AdditionalPropertyType/StartType

diagram	
properties	isRef 0 minOcc 0 maxOcc 1 content simple
facets	enumeration Boot enumeration System enumeration Automatic enumeration Manual enumeration Disabled
source	<xsd:element name="StartType" minOccurs="0"> <xsd:simpleType> <xsd:restriction base="xsd:string"> <xsd:enumeration value="Boot"/> <xsd:enumeration value="System"/> <xsd:enumeration value="Automatic"/> <xsd:enumeration value="Manual"/> <xsd:enumeration value="Disabled"/> </xsd:restriction> </xsd:simpleType> </xsd:element>
description	Start type of service

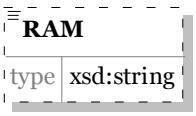
element AdditionalPropertyType/RequiredHardwareSpec

diagram	
properties	isRef 0 minOcc 0 maxOcc 1 content complex
children	Processor RAM SystemType Graphic HarddiskSize
source	<xsd:element name="RequiredHardwareSpec" minOccurs="0"> <xsd:complexType> <xsd:sequence> <xsd:element name="Processor" type="xsd:string" minOccurs="0"/> <xsd:element name="RAM" type="xsd:string" minOccurs="0"/> <xsd:element name="SystemType" type="xsd:string" minOccurs="0"/> <xsd:element name="Graphic" type="xsd:string" minOccurs="0"/> <xsd:element name="HarddiskSize" type="xsd:string" minOccurs="0"/> </xsd:sequence> </xsd:complexType> </xsd:element>
description	Required Hardware specification of service

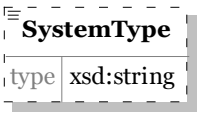
element AdditionalPropertyType/RequiredHardwareSpec/Processor

diagram	
properties	isRef 0 minOcc 0 maxOcc 1 content simple
source	<xsd:element name="Processor" type="xsd:string" minOccurs="0"/>
description	Required processor information of service

element AdditionalPropertyType/RequiredHardwareSpec/RAM

diagram	
properties	isRef 0 minOcc 0 maxOcc 1 content simple
source	<xsd:element name="RAM" type="xsd:string" minOccurs="0"/>
description	Required RAM information of service

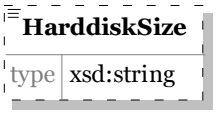
element AdditionalPropertyType/RequiredHardwareSpec/SystemType

diagram	
properties	isRef 0 minOcc 0 maxOcc 1 content simple
source	<xsd:element name="SystemType" type="xsd:string" minOccurs="0"/>
description	Required system type of service

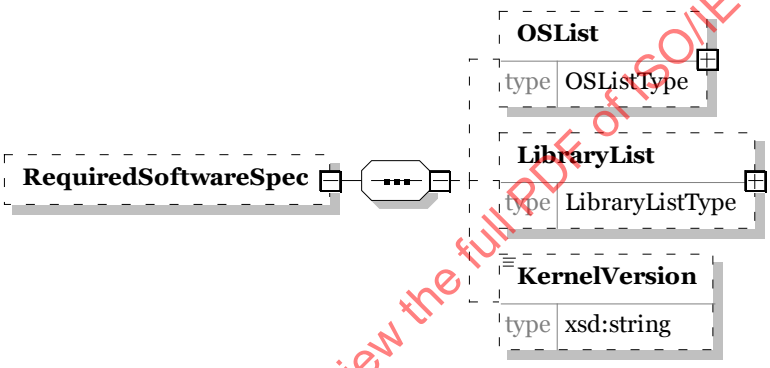
element AdditionalPropertyType/RequiredHardwareSpec/Graphic

diagram	
properties	isRef 0 minOcc 0 maxOcc 1 content simple
source	<xsd:element name="Graphic" type="xsd:string" minOccurs="0"/>
description	Required graphic information of service

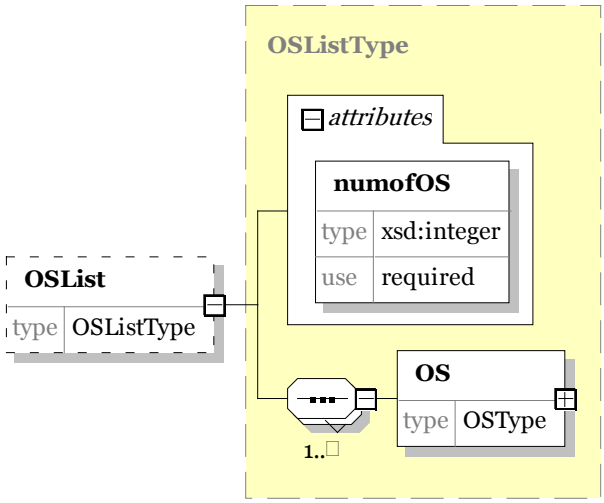
element AdditionalPropertyType/RequiredHardwareSpec/HarddiskSize

diagram	
properties	isRef 0 minOcc 0 maxOcc 1 content simple
source	<xsd:element name="HarddiskSize" type="xsd:string" minOccurs="0"/>
description	Required hard disk size of service

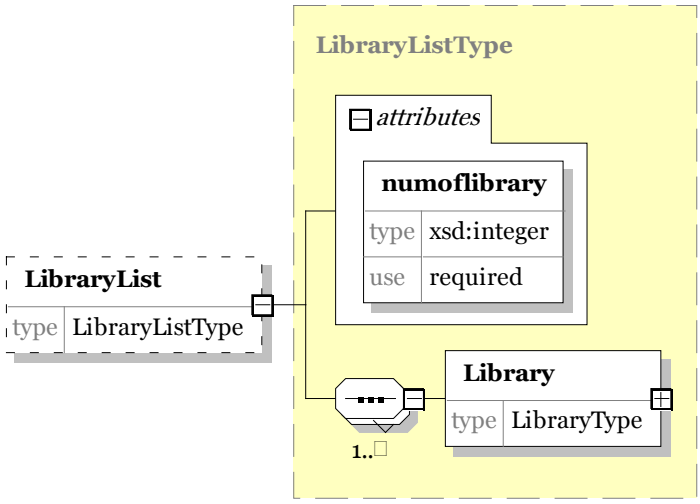
element AdditionalPropertyType/RequiredSoftwareSpec

diagram	
properties	isRef 0 minOcc 0 maxOcc 1 content complex
children	OSList LibraryList KernelVersion
source	<xsd:element name="RequiredSoftwareSpec" minOccurs="0"> <xsd:complexType> <xsd:sequence> <xsd:element name="OSList" type="OSListType" minOccurs="0"/> <xsd:element name="LibraryList" type="LibraryListType" minOccurs="0"/> <xsd:element name="KernelVersion" type="xsd:string" minOccurs="0"/> </xsd:sequence> </xsd:complexType> </xsd:element>
description	Required software information of service

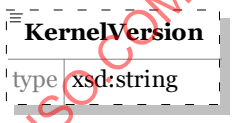
element AdditionalPropertyType/RequiredSoftwareSpec/OSList

diagram	
properties	isRef 0 minOcc 0 maxOcc 1 content complex
children	OS
attributes	Name numofOS Type xsd:integer Use required
source	<xsd:element name="OSList" type="OSListType" minOccurs="0"/>
description	Required OS list of service

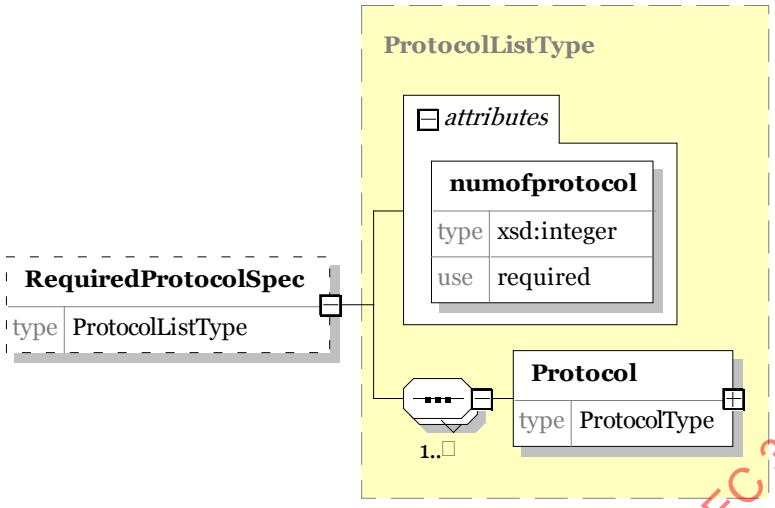
element AdditionalPropertyType/RequiredSoftwareSpec/LibraryList

diagram	
properties	isRef 0 minOcc 0 maxOcc 1 content complex
children	Library
attributes	Name numoflibrary Type xsd:integer Use required
source	<xsd:element name="LibraryList" type="LibraryListType" minOccurs="0"/>
description	Required library list of service

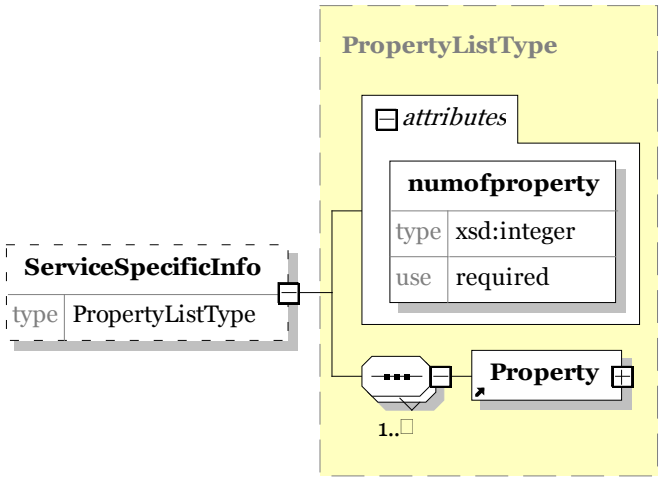
element AdditionalPropertyType/RequiredSoftwareSpec/KernelVersion

diagram	
properties	isRef 0 minOcc 0 maxOcc 1 content simple
source	<xsd:element name="KernelVersion" type="xsd:string" minOccurs="0"/>
description	Required kernel version of service

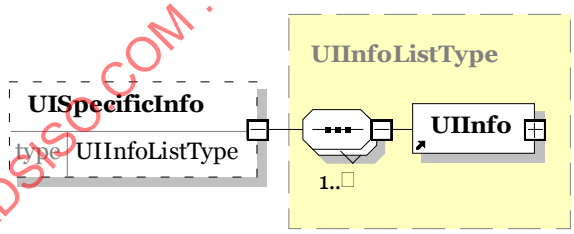
element AdditionalPropertyType/RequiredProtocolSpec

diagram	
properties	isRef 0 minOcc 0 maxOcc 1 content complex
children	Protocol
attributes	Name numofprotocol Type xsd:integer Use required
source	<xsd:element name="RequiredProtocolSpec" type="ProtocolListType" minOccurs="0"/>
description	Required protocol information of service

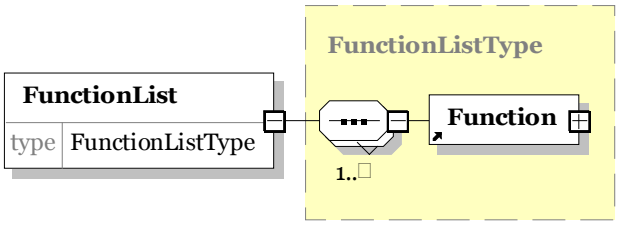
element AdditionalPropertyType/ServiceSpecificInfo

diagram	
properties	isRef 0 minOcc 0 maxOcc 1 content complex
children	Property
attributes	Name numofproperty Type xsd:integer Use required
source	<xsd:element name="ServiceSpecificInfo" type="PropertyListType" minOccurs="0"/>
description	User-defined properties for service specific information

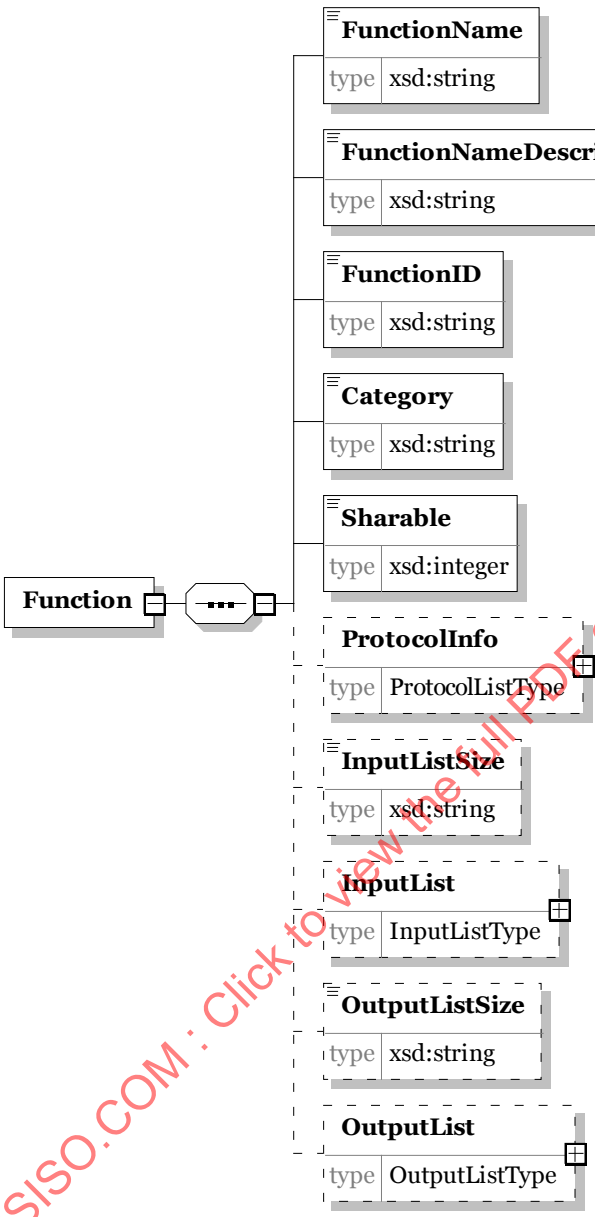
element AdditionalPropertyType/UISpecificInfo

diagram	
properties	isRef 0 minOcc 0 maxOcc 1 content complex
children	UIInfo
source	<xsd:element name="UISpecificInfo" type="UIInfoListType" minOccurs="0"/>
description	User interface specific information of service

element FunctionPropertyType/FunctionList

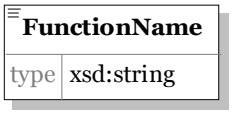
diagram	
properties	isRef 0 content complex
children	Function
source	<xsd:element name="FunctionList" type="FunctionListType"/>
description	Lists of Function

element Function

diagram	
properties	content complex
children	FunctionName FunctionNameDescription FunctionID Category Sharable ProtocolInfo InputListSize InputList OutputListSize OutputList
used by	complexType FunctionListType
source	<xsd:element name="Function"> <xsd:complexType> <xsd:sequence> <xsd:element name="FunctionName" type="xsd:string"/> <xsd:element name="FunctionNameDescription" type="xsd:string"/> <xsd:element name="FunctionID" type="xsd:string"/> <xsd:element name="Category" type="xsd:string"/> <xsd:element name="Sharable" type="xsd:integer"/> <xsd:element name="ProtocolInfo" type="ProtocolListType" minOccurs="0"/> <xsd:element name="InputListSize" type="xsd:string" minOccurs="0"/> <xsd:element name="InputList" type="InputListType" minOccurs="0"/> <xsd:element name="OutputListSize" type="xsd:string" minOccurs="0"/> <xsd:element name="OutputList" type="OutputListType" minOccurs="0"/> </xsd:sequence> </xsd:complexType> </xsd:element>

description	Specific functions of single device

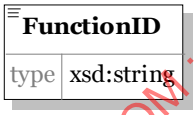
element Function/FunctionName

diagram	
properties	isRef 0 content simple
source	<xsd:element name="FunctionName" type="xsd:string"/>
description	Name of a Function

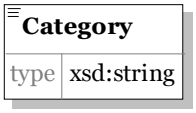
element Function/FunctionNameDescription

diagram	
properties	isRef 0 content simple
source	<xsd:element name="FunctionNameDescription" type="xsd:string"/>
description	Name-description of a Function

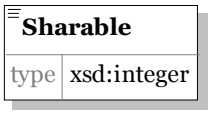
element Function/FunctionID

diagram	
properties	isRef 0 content simple
source	<xsd:element name="FunctionID" type="xsd:string"/>
description	ID of a Function

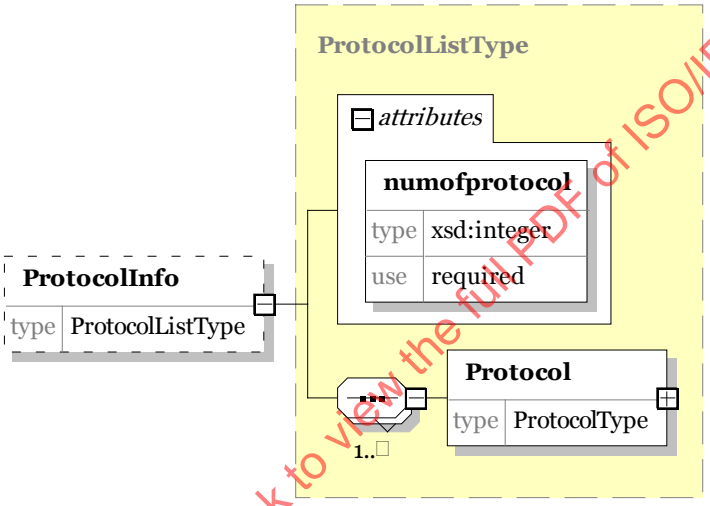
element Function/Category

diagram	
properties	isRef 0 content simple
source	<xsd:element name="Category" type="xsd:string"/>
description	Category of function

element Function/Sharable

diagram	
properties	isRef 0 content simple
source	<xsd:element name="Sharable" type="xsd:integer"/>
description	Sharable capacity of function. 0 presents unlimited, 1 presents exclusive and another integer number presents the number of capacity.

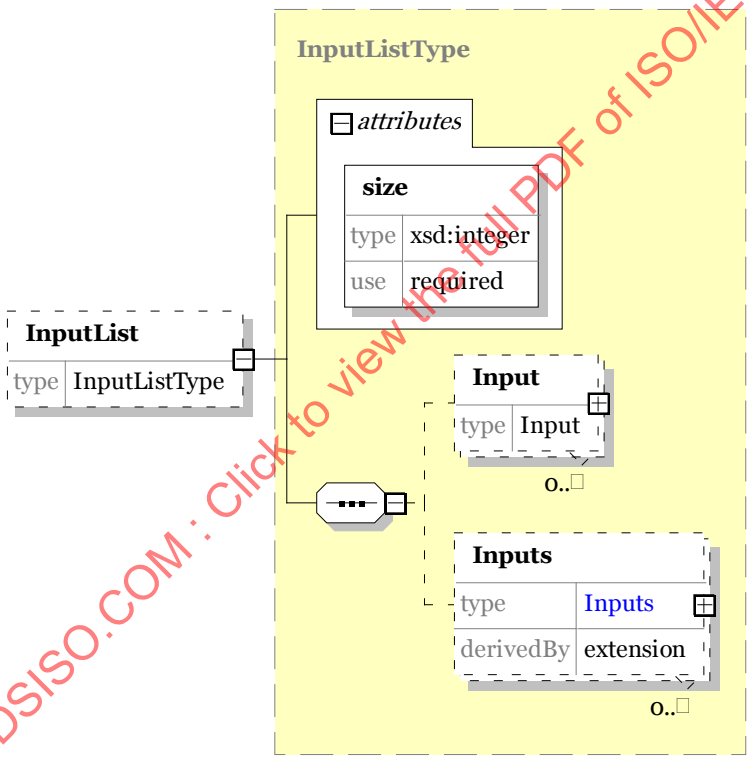
element Function/ProtocolInfo

diagram	
properties	isRef 0 minOcc 0 maxOcc 1 content complex
children	Protocol
attributes	Name numofprotocol Type xsd:integer Use required
source	<xsd:element name="ProtocolInfo" type="ProtocolListType" minOccurs="0"/>
description	Protocol information of function

element Function/InputListSize

diagram	
properties	isRef 0 minOcc 0 maxOcc 1 content simple
source	<xsd:element name="InputListSize" type="xsd:string" minOccurs="0"/>
description	Number of Input and Inputs

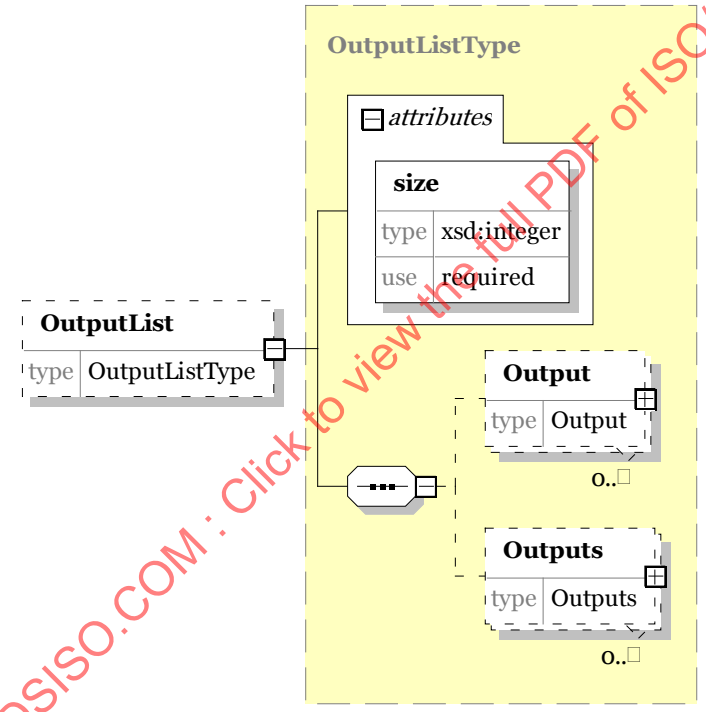
element Function/InputList

diagram	
properties	isRef 0 minOcc 0 maxOcc 1 content complex
children	Input Inputs
attributes	Name size Type xsd:integer Use required
source	<xsd:element name="InputList" type="InputListType" minOccurs="0"/>
description	List of Input and Inputs

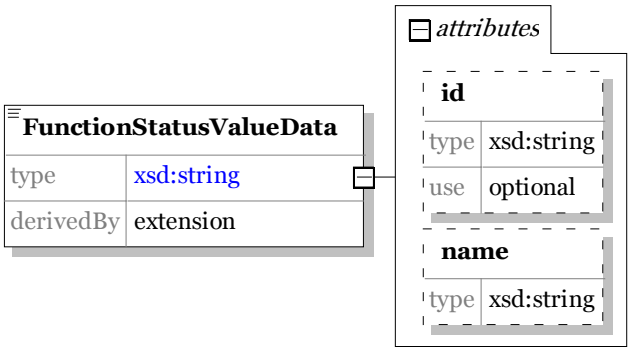
element Function/OutputListSize

diagram	
properties	isRef 0 minOcc 0 maxOcc 1 content simple
source	<xsd:element name="OutputListSize" type="xsd:string" minOccurs="0"/>
description	Number of Output and Outputs

element Function/OutputList

diagram	
properties	isRef 0 minOcc 0 maxOcc 1 content complex
children	Output Outputs
attributes	Name size Type xsd:integer Use required
source	<xsd:element name="OutputList" type="OutputListType" minOccurs="0"/>
description	List of Output and Outputs

element FunctionStatusValueData

diagram	
properties	content complex
used by	complexType FunctionListType
attributes	Name id Type xsd:string Use optional Name name Type xsd:string
source	<xsd:element name="FunctionStatusValueData"> <xsd:complexType> <xsd:simpleContent> <xsd:extension base="xsd:string"> <xsd:attribute name="id" type="xsd:string" use="optional"/> <xsd:attribute name="name" type="xsd:string"/> </xsd:extension> </xsd:simpleContent> </xsd:complexType> </xsd:element>
description	Current value of FunctionStatusValue

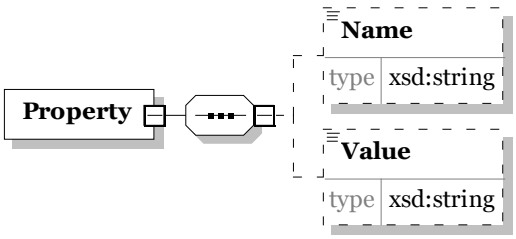
attribute FunctionStatusValueData/@id

properties	isRef 0 use optional
source	<xsd:attribute name="id" type="xsd:string" use="optional"/>
description	ID of a FunctionStatusValueData

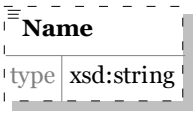
attribute FunctionStatusValueData/@name

properties	isRef 0
source	<xsd:attribute name="name" type="xsd:string"/>
description	Name of a FunctionStatusValueData

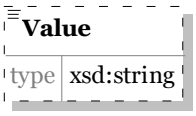
element Property

diagram	
properties	content complex
children	Name Value
used by	complexType FunctionListType
source	<xsd:element name="Property"> <xsd:complexType> <xsd:sequence> <xsd:element name="Name" type="xsd:string" minOccurs="0"/> <xsd:element name="Value" type="xsd:string" minOccurs="0"/> </xsd:sequence> </xsd:complexType> </xsd:element>
description	User-defined property

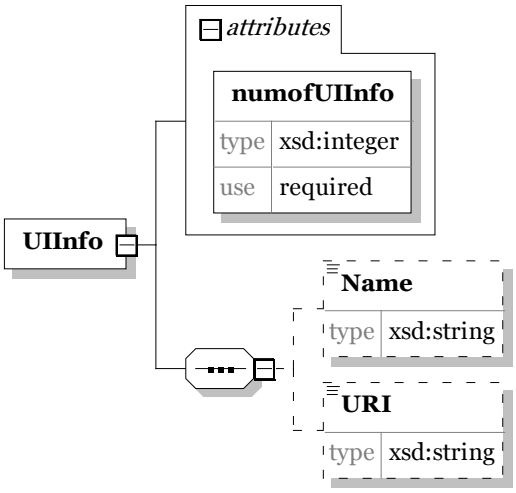
element Property/Name

diagram	
properties	isRef 0 minOcc 0 maxOcc 1 content simple
source	<xsd:element name="Name" type="xsd:string" minOccurs="0"/>
description	Name of property

element Property/Value

diagram	
properties	isRef 0 minOcc 0 maxOcc 1 content simple
source	<xsd:element name="Value" type="xsd:string" minOccurs="0"/>
description	Value of property

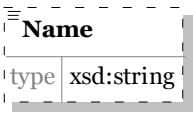
element UIInfo

diagram	
properties	content complex
children	Name URI
used by	complexType UIInfoListType
attributes	Name numofUIInfo Type xsd:integer Use required
source	<xsd:element name="UIInfo"> <xsd:complexType> <xsd:sequence> <xsd:element name="Name" type="xsd:string" minOccurs="0"/> <xsd:element name="URI" type="xsd:string" minOccurs="0"/> </xsd:sequence> <xsd:attribute name="numofUIInfo" type="xsd:integer" use="required"/> </xsd:complexType> </xsd:element>
description	User Interface Information of service

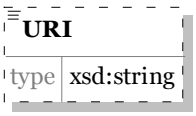
attribute UIInfo/@numofUIInfo

properties	isRef 0 use required
source	<xsd:attribute name="numofUIInfo" type="xsd:integer" use="required"/>
description	Number of User Interface Information

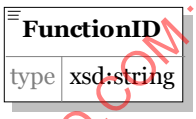
element UIInfo/Name

diagram	
properties	isRef 0 minOcc 0 maxOcc 1 content simple
source	<xsd:element name="Name" type="xsd:string" minOccurs="0"/>
description	Name of User Interface

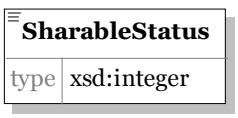
element UIInfo/URI

diagram	
properties	isRef 0 minOcc 0 maxOcc 1 content simple
source	<xsd:element name="URI" type="xsd:string" minOccurs="0"/>
description	URI of User Interface

element FunctionStatusType/FunctionID

diagram	
properties	isRef 0 content simple
source	<xsd:element name="FunctionID" type="xsd:string"/>
description	ID of a Function

element FunctionStatusType/SharableStatus

diagram	
properties	isRef 0 content simple
source	<xsd:element name="SharableStatus" type="xsd:integer"/>
description	Sharable status of a Function