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ITU-T Q2/20 (past) WoT related studies

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ITU-T Q2/20

Requirements, capabilities and architectural frameworks across verticals enhanced by emerging digital technologies

- **(Past) WoT related studies**
  - Y.4111"Semantics based requirements and framework of the Internet of things"
  - Y.4203 "Requirements of things description in the Internet of Things"

Y.4111

Few details on Y.4111 "Semantics based requirements and framework of the Internet of things"

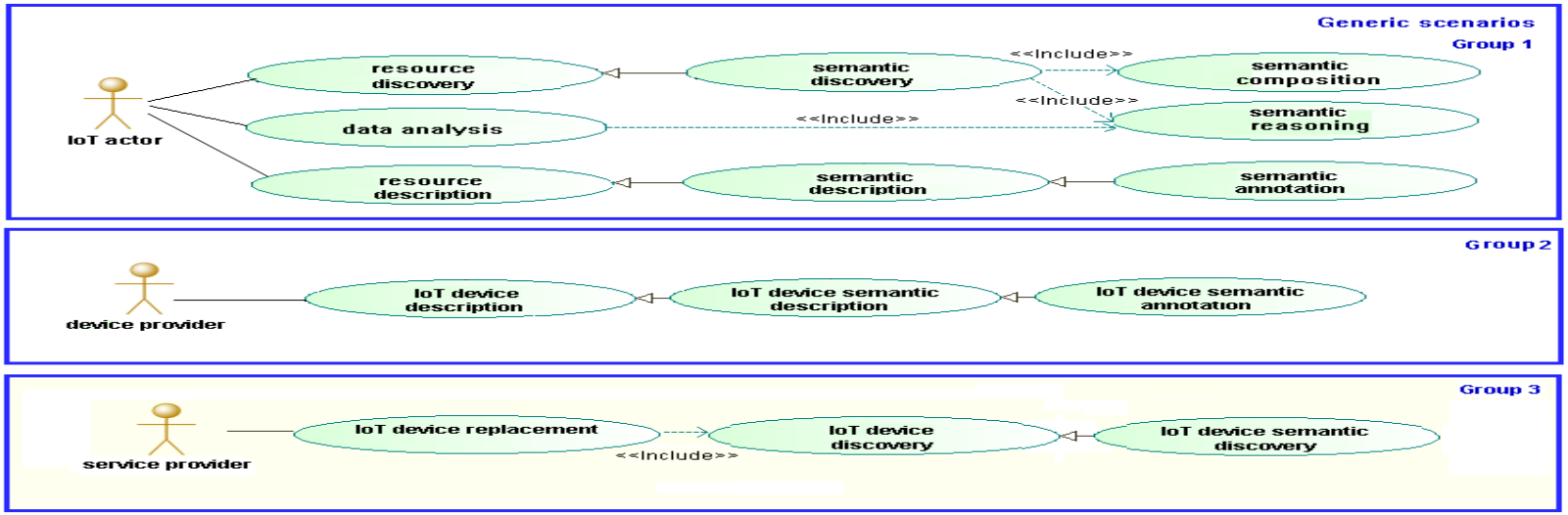
Essential requirements of the IoT infrastructure for data and services:

- interoperability, scalability, discovery, consistency, reusability and composability, analytics and reasoning for actionable intelligence, automatic operations

Some factors driving these requirements: number of interconnected things, variety of devices, types of collected data, number and types of services

The semantics based approaches reveal outstanding features to support these requirements, increasing the level of interoperability of IoT systems

Semantics based scenarios of the IoT (examples)



Semantics based requirements described with respect to the IoT Reference Model [Y.4000]

- Device layer, Network layer, Service and Application Support layer, Application layer, cross-layer security capabilities, cross-layer management capabilities

Y.4203

Few details on Y.4203 "Requirements of things description in the IoT"

Rationale for the study item:

many types of things can be integrated together in an IoT system. Because of the heterogeneity of these different things, their description is provided from different angles via different information models. So, **normally, things descriptions are domain-dependent.**

The identification of common requirements for things description in the IoT aims to enable the usage of a diversity of (existing and under development) metadata and ontologies.

Summary:

The things description is a tool to realise the representation of physical things as virtual things of the information world to facilitate automatization, interoperability and composability for the Internet of things (IoT) applications. Things description specifies a general way for how to map physical things in the physical world to virtual things in the information world to enable things of IoT to be effectively discovered, interpreted and used.

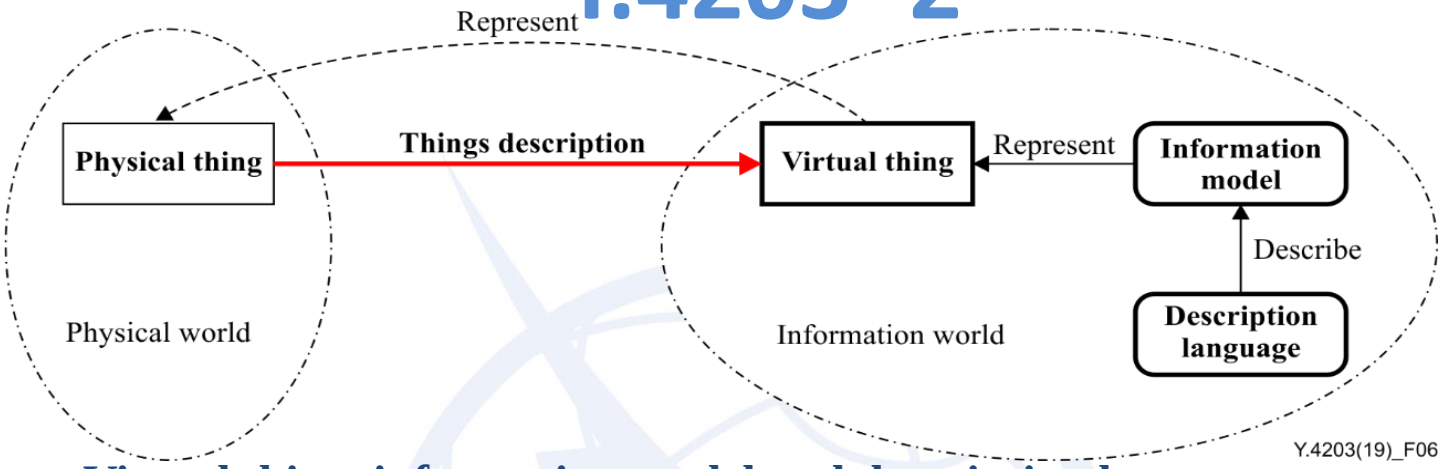
The focus of this Recommendation is on the following two concerns of things description:

- representing physical things as virtual things to map physical things into the information world;
- representing the relationship of virtual things to reflect the relationship of the represented physical things.

The corresponding requirements of things description in the IoT are specified, including:

- **high-level requirements of things description in IoT;**
- **requirements on the characterization aspects of things description in IoT.**

Y.4203 -2



Virtual thing, information model and description language

Types of things description in IoT

- There may be a variety of possible ways to provide things description in practical IoT systems.
- **3 typical ways: semantics based things description (**based on a semantics description methodology), **abstraction based things description (**based on an abstraction methodology that maps individual information models of things into a unified abstract information model) **and hybrid things description based on semantics and abstraction methodologies (**special type of abstraction based things description that embeds the semantics things description or its reference identifier into elements of the template)**.**

For whichever type of things description, the following properties may need to be considered, according to specific requirements, when mapping a physical thing into a virtual thing:

- basic information of the thing;
- usage information of the thing;
- working structure of the thing to support the composition of things;
- physical feature of the thing