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| Input contributionUse case |
| Use Case Title:\* | Use case for automatic recognition of identification schemes for heterogeneous IoT identifiers |
| Group Name:\* | RDM#50 |
| Source:\* | CMCC |
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| Date:\* | 2021-05-18 |
| Abstract:\* | Propose to add the use case for automatic recognition of identification schemes for heterogeneous IoT identifiers. At the present stage, the co-existence of multiple objects tagged by different types of identifiers is becoming the norm. In many IoT scenarios (e.g. commodity source tracing, equipment status management, smart home, etc.), the oneM2M System needs to acquire the detailed description information of multiple objects tagged by different types of identifiers. These heterogeneous identifiers belong to different identification schemes (e.g. EPC, OID, Handle), and these schemes are different in the aspects of encoding lengths, value ranges and structures. It requires different resolution systems to resolve these heterogeneous identifiers respectively. So, if the oneM2M System wants to obtain the profile information about an object, the identification scheme of this object’s identifier should be recognized in advance. |
| Agenda Item:\* |  |
| Work item(s): | WI 0015 - oneM2M Use Case Continuation |
| Document(s) Impacted\* | Technical Specification TR 0001 - oneM2M Use Case Technical Report |
| Intended purpose ofdocument:\* | [x]  Decision[x]  Discussion[ ]  Information[ ]  Other <specify> |
| Decision requested or recommendation:\* | Approval of the Use Case |
| Template Version:23 February 2015 (Dot not modify) |

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## Title

Use case for automatic recognition of identification schemes for heterogeneous IoT identifiers.

### Description

In Internet of Things (IoT), a unique identifier is required for each object to serve as a digital identity. An identifier is represented using a sequence of numbers, characters, or a combination of them, and the detailed description information about the identified object can be indexed and discovered. For example, people can get the price, place of origin and manufacturer information of a commodity by scanning the product barcode, and the serial number on the barcode is the Global Standard 1 (GS1) identifier of this commodity. However, due to political, commercial and other reasons, there are thousands even tens of thousands of types of IoT identifiers co-existing in the IoT ecosystem (e.g. EPC, Handle, OID, etc.). These schemes have different encoding lengths, value ranges and structures, and each scheme has its own customized resolution rules. It requires different resolution systems to resolve these heterogeneous identifiers respectively. So, if we want to obtain the profile information about an object, the identification scheme of this object’s identifier should be known in advance.

Currently, the co-existence of multiple objects tagged by different types of identifiers is becoming the norm. It is unrealistic to require all IoT objects to use the same kind of identifier scheme in IoT applications. Therefore, oneM2M System is required to recognize the identification schemes of IoT identifiers to support the unified resolution of heterogeneous IoT identifiers.

Take commodity source tracing for example. The lifecycle of a commodity is composed of a series of processes including material purchase, manufacturing, storage, transportation, sales, etc. In each process, different manufacturers will choose their conventional identification schemes to identify the commodity. If an application wants to acquire the detailed information about this commodity throughout the chain (of processes), the identification schemes of the identifiers in these processes should be known at first. To satisfy the requirements, the oneM2M System shall be able to recognize the identification schemes of these heterogeneous IoT identifiers from different processes.

### Source

CMCC

###  Actors

* Application: the device or object wants to recognize the identification scheme of an IoT identifier.
* The M2M service platform provided by the M2M service provider.
	+ The M2M service platform has a heterogeneous identification function to automatically recognize the identification scheme of an IoT identifier. It’s a service layer functionality provided by the oneM2M System.

### Pre-conditions

The identifier recognition model is required to be deployed on the M2M service platform.

### Triggers

The identification scheme of an object's identifier is required to be automatically recognized.

### Normal Flow

The normal message flow is described as follows:

Application

M2M service platform

1. Request to recognize the identification scheme of an IoT identifier

2. Inference the identification scheme of the identifier through the identifier recognition model

3. Return the recognition result

Find the most possible type of the identifier through heterogeneous identification function

Figure 1.1.6-1: Message flow for automatic recognition of identification schemes for heterogeneous IoT identifiers

1. An application sends a request to the M2M service platform to recognize the identification scheme of an IoT identifier. The identifier recognition model is deployed on the M2M service platform which manifests as a rule base or a machine learning classification model.

2. After receiving the request, the oneM2M platform inferences the identification scheme of the identifier based on the heterogeneous identification function.

3. The oneM2M platform returns the recognition result to the application.

###  Alternative flow

None.

### Post-conditions

None

### High Level Illustration



###  Potential requirements

The oneM2M System shall be able to support automatic recognition of identification schemes for heterogeneous IoT identifiers.