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| Input contribution  Use case | |
| Use Case Title:\* | Use cases for ontology mapping conflict detection and repair |
| Group Name:\* | REQ#36 |
| Source:\* | CMCC, Huawei |
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| Date:\* | 2018-06-13 |
| Abstract:\* | Propose to add the use case for ontology mapping conflict detection and repair of TR 0001. For ontology mapping task, it is required to detect conflicts leading to logical errors among semantic mappings between ontologies and repair them. |
| 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 of  document:\* | Decision  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 cases for ontology mapping conflict detection and repair.

### Description

Ontology mapping is an effective way to reuse existing ontologies to provide semantic support for M2M applications . Whether ontology mapping is implemented by manual approaches or automatic approaches, there are often semantic conflicts among candidate mappings. These conflicts will make the mapped ontology becoming incoherent. So the oneM2M system shall be able to detect these conflicts among mappings and repair them.

### Source

CMCC, Huawei

### Actors

* End User: the user who wants to detect and repair the conflicts among mapping relationships between ontologies.
* The ontology is a vocabulary with a structure. It could capture a shared understanding of a domain of interest and provide a formal and machine interpretable model of the domain. It may be mapped to others with the help of ontology mapping function.
* Ontology Mapping Function is responsible for discovering, creating and saving mappings between the ontologies defined in the context of the oneM2M System and/or other external ontologies. It’s a service layer functionality provided by the oneM2M System.
* The ontology mapping file is a RDF document including the mappings between ontologies. It can be saved and managed in the oneM2M System as a resource.
* Ontology Mapping Conflict Detection & Repair Function is responsible for detecting and repairing conflicts among the mappings between the ontologies defined in the context of the M2M System and/or other external ontologies. It’s a service layer functionality provided by the oneM2M System.
* The repaired ontology mapping file is a RDF document including the mappings without conflicts between ontologies. It can be saved and managed in the oneM2M System as a resource.

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### Pre-conditions

• The conflict among mappings is a kind of logical incoherence.

### Triggers

There is logical inconsistency in the mapped ontology according to the existing mappings.

### Normal Flow

The normal message flow is described as follows:



Figure 1.1.6: Message flow for ontology mapping conflict detection and repair operation

1. An application (representing the End User) sends a request for detecting and repairing the conflicts among mappings between ontology A and ontology B to the ontology mapping conflict detection function in the oneM2M platform.

2. An ontology A is loaded into the ontology mapping conflict detection function.

3. Another ontology B is loaded into the ontology mapping conflict detection function.

4. The ontology mapping file including the mappings between ontology A and ontology B is loaded into the ontology conflict detection function.

5. Conflicts detection and repair is performed from the mappings by the ontology conflict detection and repair function.

6. The repaired mapping result is saved as an ontology mapping resource by ontology mapping conflict detection and repair function.

7. The repaired mapping result (e.g. resource id) is return to the application.

### Alternative flow

None.

### Post-conditions

None

### High Level Illustration



### Potential requirements

The oneM2M system shall be able to detect ontology’s mapping conflicts and repair them.