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| CHANGE REQUEST |
| Meeting ID:\* | ARC#38 |
| Source:\* | Convida WirelessCatalina Mladin, Convida Wireless, Mladin.Catalina@convidawireless.com |
| Date:\* | 2018-11-23 |
| Contact:\* | Catalina Mladin, Convida, Mladin.Catalina@convidawireles.com |
| Reason for Change/s:\* | Provides potential solution to Key Issue for service-aware registration  |
| CR against: Release\* | Release 4 |
| CR against: WI\* | [x]  Active <WI-0046> [ ]  MNT / < Work Item number(optional)>Is this a companion CR? Yes [ ]  No [ ] Companion CR number: (Note to Rapporteur - use latest agreed revision)Is this a mirror CR? Yes [ ]  No [ ] Mirror CR number: (Note to Rapporteur - use latest agreed revision)[ ]  STE Small Technical Enhancements / < Work Item number (optional)>Only ONE of the above shall be ticked |
| CR against: TS/TR\* | TR-0052 |
| Clauses/Sub Clauses \* | Clause 9 |
| Type of change: \* | [ ]  Editorial change[ ]  Bug Fix or Correction[ ]  Change to existing feature or functionality[x]  New feature or functionalityOnly ONE of the above shall be ticked |
| Impacted other TS/TR(s) | <TS/TR number>, <Version Number>, and <Description on which aspect should be reflected in this TS/TR> |
| Post Freeze checking:\* | This CR contains only essential changes and corrections? YES [x]  NO [ ] This CR may break backwards compatibility with the last approved version of the TS? YES [ ]  NO [x]  |
| Template Version: January 2017 (Do not modify) |

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GUIDELINES for Change Requests:

Provide an informative introduction containing the problem(s) being solved, and a summary list of proposals.

Each CR should contain changes related to only one particular issue/problem.

In case of a correction, and the change apply to previous releases, a separate “mirror CR” should be posted at the same time of this CR

Mirror CR: applies only when the text, including clause numbering are exactly the same.

Companion CR: applies when the change means the same but the baselines differ in some way (e.g. clause number).

Follow the principle of completeness, where all changes related to the issue or problem within a deliverable are simultaneously proposed to be made E.g. A change impacting 5 tables should not only include a proposal to change only 3 tables. Includes any changes to references, definitions, and acronyms in the same deliverable.

Follow the drafting rules.

All pictures must be editable.

Check spelling and grammar to the extent practicable.

Use Change bars for modifications.

The change should include the current and surrounding clauses to clearly show where a change is located and to provide technical context of the proposed change. Additions of complete clauses need not show surrounding clauses as long as the proposed clause number clearly shows where the new clause is proposed to be located.

Multiple changes in a single CR shall be clearly separated by horizontal lines with embedded text such as, start of change 1, end of change 1, start of new clause, end of new clause.

When subsequent changes are made to content of a CR, then the accepted version should not show changes over changes. The accepted version of the CR should only show changes relative to the baseline approved text.

## Introduction

This solution addresses aspects of the Key Issue on Simultaneous registrations with multiple registrars in TR-0026 as well as the new Key Issue on service awareness in TR-0052. Specifically, it introduces:

* Proposal to update defintions for M2M Services in order to clarify the relationship between them, M2M Common Services and M2M application Services
* Identifiers for common services
* Updates to resources to provide capabilities to indicate which common services are requested at registration by either CSEs or AEs.
* An overview of impact of registration flows

-----------------------Start of change 1-------------------------------------------

1.

# Proposed Solutions

*Editor’s Note: The section provides solutions to the Key Issues identified for employing Edge and Fog technologies*. *in oneM2M*.

## Solution A: Common Service description and service-awareness

*Editor’s Note: Each Solution section references one or more Key Issues that it addresses and provides a brief solution description.*

### Solution Applicability

*Editor’s Note: The Solution Applicability states which Key Issues are addressed by the solution.*

This solution applies to Key Issue X: “Service” awareness and dependencies.

This solution also applies to TR-0026 [i.38] Key Issue 9: Simultaneous registration with multiple CSEs.

### Solution Description

*Editor’s Note: This section provides a concise description of the solution which provides enough detail for further stage 2 development.*

#### Definitions and concepts

This solution proposes that the concept of oneM2M Service is changed to the following:

**M2M Service:** consists of one or more M2M Common Services and may include zero or more M2M Application Services.

Note that the following existing TS-0011 definitions apply:

**M2M Application Service:** realized through the service logic of an M2M Application and is operated by the User or an M2M Application Service Provider

**M2M Common Services:** set of oneM2M specified functionalities that are widely applicable to different application domains made available through the set of oneM2M specified interfaces

This solution also proposes the introduction of a Common Service Identifier (CServ-ID) as follows

Common Services are identified by a unique identifier (CSserv-ID) which uniquely identifies an M2M Common Service on a given CSE. Similarly to the App-ID, there are two types of Cserv-ID: registration authority defined Cserv-ID (registered Cserv-ID) and non-registered Cserv-ID. The establishment of the registered Cserv-ID is globally unique, while the non-registered Cserv‑ID is not guaranteed to be globally unique.

It is proposed that Cserv-ID is different than App-ID, e.g. a registered Cserv-IDs may be in the format: CR{authority‑ID}.{reverseDNS}.{commonServiceName}

Conversely, a non-registered Cserv-IDs may be in the format: CN{non-registered-Cserv-ID}

Note: The possibility of including a Group field to be able to group common Services or Common and Applications Services is FFS.

#### Impacted Resources and Attributes

##### Overview

To implement this solution, several resources need to be modified, and some new resource types need to be defined These are further detailed in the following clauses.

##### Modified <*CSEBase*> resource

New attributes for the <CSEBase> resource are proposed as shown in the table below.

**Table 9.1.2.2.2-1: New attributes of *<CSEBase>* resource**

| **Attributes of *<remoteCSE>*** | **Multiplicity** | **RW/****RO/****WO** | **Description** |
| --- | --- | --- | --- |
| *requieredCServices* | 0..1 | RW | List of *Cserv-ID*s of services required by the CSE  |
| *CServiceLevelRequirements* | 0..1(L) | RW | This attribute contains a list of service level requirements organized based on each individual service required by the Registree. For example, Service Request Rate Requirement, Service Data Storage Requirement, Service Response Delay Requirement and Service Reliability Requirement. |

##### Modified <*remoteCSE*> resource

New attributes for the <remoteCSE> resource are proposed as shown in the table below.

**Table 9.7.2.2.3-1: New attributes of *<remoteCSE>* resource**

| **Attributes of *<remoteCSE>*** | **Multiplicity** | **RW/****RO/****WO** | **Description** | *<remoteCSEAnnc> Attributes* |
| --- | --- | --- | --- | --- |
| *requestedCServices* | 0..1 | RW | Indicates the list of *Cserv-ID*s of services requested by the registree CSE during or after registration | OA |
| *grantedCServices* | 0..1 | RW | List of *Cserv-IDs* of services granted to the registree CSE during or after registration  | OA |
| *CServiceLevelRequirements* | 0..1(L) | RW | This attribute contains a list of service level requirements organized based on each individual service required by the Registree. For example, Service Request Rate Requirement, Service Data Storage Requirement, Service Response Delay Requirement and Service Reliability Requirement. | OA |

##### Modified <*AE*> resource

New attributes for the <AE> resource are proposed as shown in the table below.

**Table 9.1.2.2.4-1: New attributes of *<AE>* resource**

| **Attributes of *<AE>*** | **Multiplicity** | **RW/****RO/****WO** | **Description** | *<AEAnnc> Attributes* |
| --- | --- | --- | --- | --- |
| *requestedCServices* | 0..1 | RW | Indicates the list of *CServ-IDs* of services requested by the AE during registration and after registration. | OA |
| *grantedCServices* | 0..1 | RW | *CServ-IDs* of services granted to the remoteCSE during or after registration  | OA |
| *CServiceLevelRequirements* | 0..1(L) | RW | This attribute contains a list of service level requirements organized based on each individual service required by the Registree. For example: Service Request Rate Requirement, Service Data Storage Requirement, Service Response Delay Requirement and Service Reliability Requirement. | OA |

##### Modified <*node*> resource

New child resources as shown in the table below.

**Table 9.1.2.2.5-1 New Child Resources of <*node*>**

| **New Child Resources of *<CSEBase>*** | **Child Resource Type** | **Multiplicity** | **Description** |
| --- | --- | --- | --- |
| *[variable]* | <registrationInfo> | 0.. n | This child resource stores the registration information associated with the hosted CSE or AEs. |

##### New Resource Type: <*registrationInfo>*

The <*registrationInfo*> resource is proposed as a child of stores the <node> to store registration information of the CSEs and AEs hosted on the node. One <*registrationInfo*> resource includes all services provided to an entity hosted on the node, i.e. one for each hosting CSE, one for each AE hosted.

**Table 9.1.2.2.6-1:**  **Attributes of *<registrationInfo>* resource**

| **Attributes of *< registrationInfo*>** | **Multiplicity** | **RW/****RO/****WO** | **Description** |
| --- | --- | --- | --- |
| *registree* | 0.. n | RW | This attribute contains the identifier of the Registree, i.e. either CSE-ID or AE-ID |
| *registrationList* | 0..1(L) | RW | A list providing information for each registration, using of access control rules that applies to resources referencing this *<accessControlPolicy>* resource using the *accessControlPolicyID* attribute. |

The information represented in the *regitstrationList* comprises of tuples (*registrar*, *grantedServices*) with parameters shown in table 9.1.2.2.6-2

Table 9.1.2.2.6-2: Parameters in registration-tuples

| Name | Description |
| --- | --- |
| *registrar* | CSE-ID of the registrar |
| *grantedCServices* | List of *Cserv-IDs* of services granted  |

#### Impacted Information Flows

To implement this solution, the AE Registration will be affected as follows:

* AE registration procedure (oneM2M TS-0001 [i.3] clause 10.2.2.2):
	+ At AE registration, the AE provides the <AE> resource parameters, including the ones on *requestedServices* and *serviceRequirements*. Based on these parameters, the Registrar CSE determines if the registration is accepted. If the registration request is accepted, the hosting CSE creates the <AE> resource with the given attributes and in addition it populates the *grantedServices* attribute with the Cserv-ID of the granted services.
	+ Upon receiving a successful registration response, if the registration is a first successful registration of the AE, the initiating AE creates a corresponding <*registrationInfo>* resource as child of the <*node*> resource, capturing its AE-ID in the *registree* attribute. The initiating AE also updates the *registrarList* with the CSE-ID of the Registrar and *grantedServices* with the *grantedServices* from thenewly created *<AE>* resource. If the initiating AE has existing successful registrations, it updates the <*registrationInfo>* with its own AE-ID in the *registree* attribute. The initiating AE then updates the *registrarList* and *grantedServices* attributes with new list entities, similarly to the new registration case.
* At CSE registration procedure (oneM2M TS-0001 [i.3], clause 10.2.2.7):
	+ At CSE registration, the CSE provides the <remoteCSE> resource parameters, including the ones on *requestedServices* and *serviceRequirements*. Based on these parameters, the Registrar CSE determines if the registration is accepted. If the registration request is accepted, the hosting CSE creates the <remoteCSE> resource with the given attributes and in addition it populates the *requestedServices* attribute with the Cserv-ID of the granted services.
	+ Upon receiving a successful registration response, if the registration is a first successful registration of the CSE, the initiating CSE creates a corresponding <*registrationInfo>* resource as child of the <*node*> resource, capturing its CSE-ID in the *registree* attribute. The initiating CSE also updates the *registrarList* with the CSE-ID of the Registrar and *grantedServices* with the *grantedServices* from thenewly created *<remoteCSE>* resource. If the initiating CSE has existing successful registrations, it updates the <*registrationInfo>* with its own CSE-ID in the *registree* attribute. The initiating CSE then updates the *registrarList* and *grantedServices* attributes with new list entities, similarly to the new registration case.

-----------------------End of change 1 -------------------------------------------

CHECK LIST

* Does this Change Request include an informative introduction containing the problem(s) being solved, and a summary list of proposals.?
* Does this CR contain changes related to only one particular issue/problem?
* Have any mirror CRs been posted?
* Does this Change Request make **all** the changes necessary to address the issue or problem? E.g. A change impacting 5 tables should not include a proposal to change only 3 tables?Does this Change Request follow the drafting rules?
* Are all pictures editable?
* Have you checked the spelling and grammar?
* Have you used change bars for all modifications?
* Does the change include the current and surrounding clauses to clearly show where a change is located and to provide technical context of the proposed change? (Additions of complete clauses need not show surrounding clauses as long as the proposed clause number clearly shows where the new clause is proposed to be located.)
* Are multiple changes in this CR clearly separated by horizontal lines with embedded text such as, start of change 1, end of change 1, start of new clause, end of new clause.?