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| **oneM2M**  **Technical Report** | |
| Document Number | oneM2M-TR-0054-V-0.2.0 |
| Document Name: | oneM2M Service Subscribers and Users |
| Date: | 2018-07-09 |
| Abstract: | This document is a study on the definition of oneM2M service subscribers and their authorized users. This study explores use cases which require oneM2M service subscribers and users. The study also analyses different solutions to support oneM2M service subscribers and users. |
| Template Version: January 2017 (Do not modify) | |

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About oneM2M

The purpose and goal of oneM2M is to develop technical specifications which address the need for a common M2M Service Layer that can be readily embedded within various hardware and software, and relied upon to connect the myriad of devices in the field with M2M application servers worldwide.

More information about oneM2M may be found at: http//www.oneM2M.org

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# Scope

The present document studies use cases, requirements and proposed solutions for defining support for oneM2M service subscribers and authorized users.

# References

The following text block applies.

References are either specific (identified by date of publication and/or edition number or version number) or non- specific. For specific references, only the cited version applies. For non-specific references, the latest version of the referenced document (including any amendments) applies.

## Normative references

Normative references are not applicable in the present document.

## Informative references

Clause 2.2 shall only contain informative references which are cited in the document itself.

The following referenced documents are not necessary for the application of the present document but they assist the user with regard to a particular subject area.

[i.1] oneM2M Drafting Rules.

NOTE: Available at <http://www.onem2m.org/images/files/oneM2M-Drafting-Rules.pdf>.

[i.2] oneM2M TS-0001: "Functional Architecture".

[i.3] IETF RFC 3986: "Uniform Resource Identifier (URI): General Syntax".

# Definitions, symbols and abbreviations

Delete from the above heading the word(s) which is/are not applicable.

## Definitions

Clause numbering depends on applicability.

* **A definition shall not take the form of, or contain, a requirement.**
* **The form of a definition shall be such that it can replace the term in context. Additional information shall be given only in the form of examples or notes (see below).**
* **The terms and definitions shall be presented in alphabetical order.**

For the purposes of the present document, the [following] terms and definitions [given in ... and the following] apply:

Definition format

**<defined term>:** <definition>

If a definition is taken from an external source, use the format below where [N] identifies the external document which must be listed in Section 2 References.

**<defined term>**[N]: <definition>

**example 1:** text used to clarify abstract rules by applying them literally

NOTE: This may contain additional information.

## Symbols

Clause numbering depends on applicability.

For the purposes of the present document, the [following] symbols [given in ... and the following] apply:

Symbol format

<symbol> <Explanation>

<2nd symbol> <2nd Explanation>

<3rd symbol> <3rd Explanation>

## Abbreviations

For the purposes of the present document, the [following] abbreviations [given in ... and the following] apply:

Abbreviation format

<ABREVIATION1> <Explanation>

<ABREVIATION2> <Explanation>

<ABREVIATION3> <Explanation>

# Conventions

The key words "Shall", "Shall not", "May", "Need not", "Should", "Should not" in the present document are to be interpreted as described in the oneM2M Drafting Rules [i.1].

# Introduction

*Editor’s Note: This section provides background information as well as motivation and justification for adding support for oneM2M service subscribers and their authorized users.*

# Analysis of oneM2M Service Subscribers and Users

*Editor’s Note: The section analyses and summarizes limitations of the existing oneM2M architecture and security framework with regards to its lack of support and need for oneM2M service subscribers and their authorized users.*

## M2M Service Subscription Limitations

## Description

oneM2M currently define an M2M Service Subscription in clause 6.6 of TS-0001[i.1]. It is defined as the technical part of the contract between an M2M Service Subscriber and an M2M Service Provider. oneM2M defines three resource types in support of the M2M Service Subscription functionality. These resource types are the <*m2mServiceSubscriptionProfile*>, <*serviceSubscribedNode*> and <*serviceSubscribedAppRule*>. The relationship between these resources is shown in Figure 6.1.1-1 as defined in clause 9.6.19 of TS-0001 [i.1].



**Figure 6.1.1-1: Relationship among M2M Service Subscription related resources**

The current M2M Service Subscription functionality defined thus far in oneM2M is limited to the following:

* Defining which CSEs and AEs are hosted on which Nodes
* Defining which AEs are authorized to register to a particular CSE

Currently, the only oneM2M procedure defined that makes use of the M2M Service Subscription functionality is the AE Registration procedure. When an AE registers, the Registrar CSE can check the applicable <*m2mServiceSubscribedNode*> and <*serviceSubscribedAppRule*> resources to determine if the AE is allowed to register.

The M2M Service Subscription functionality is currently not used by any other oneM2M procedures.

The following are some limitations of the existing M2M Service Subscription functionality:

* Lacks the capability to identify a M2M Service Subscriber (i.e. the entity that establishes a M2M Service Subscription with a M2M Service Provider). This prevents the oneM2M System from supporting M2M service subscriber based functionality such as:
  + M2M Service Subscriber based charging such as defining charging events, collecting statistics and generating charging records per M2M Service Subscribers.
  + M2M Service Subscriber based access control involving access control policy privileges based on M2M Service Subscribers.
  + M2M Service Subscriber based enrolment involving an enrolment of authorized users, devices (i.e. node) and applications (i.e. AEs) associated with a M2M Service Subscriber
  + Support for a profile which defines policies or preferences of the M2M Service Subscriber such as limits on the number and/or types of applications and devices allowed to register, the number of resources that can be created, default access control policies, etc.
* Lacks the capability to identify a M2M Service Subscription (i.e. a unique identifier of the M2M Service Subscription that the M2M Service Subscriber establishes between itself and a M2M Service Provider).

NOTE: oneM2M currently defines a M2M Subscription identifier (M2M-Sub-ID ) which could serve as the identifier of a M2M Service Subscription however this identifier is not linked with the existing M2M Service Subscription functionality (i.e. resources and procedures).

Editor’s Note: It is FFS whether both a M2M Service Subscription Identifier and a M2M Service Subscriber Identifier are required

* Lacks the capability to identify an authorized user of a M2M Service Subscriber (e.g. a family member or friend authorized to use a M2M Service Subscriber’s devices, applications and resources). This prevents the oneM2M System from supporting M2M Service User based functionality such as user based charging, user based access control and user based profiles as defined above for a M2M Service Subscriber.

## Potential Requirements

1. The oneM2M System shall support identification of M2M Service Subscribers and associating a M2M Service Subscriber with a M2M Service Subscription to a M2M Service Provider.
2. The oneM2M System shall support identification of M2M Service Users and associating a M2M Service User with a M2M Service Subscriber.
3. The oneM2M System shall support charging event detection, statistics collection and charging records generation mechanisms based on M2M Service Subscriber and M2M Service User identification.
4. The oneM2M System shall support access control and authorization mechanisms based on M2M Service Subscriber and M2M Service User identification.
5. The oneM2M System shall support M2M Service Subscriber-based enrolment comprised of enrolment of M2M Devices and M2M Applications and M2M Service Users associated with a M2M Service Subscriber.
6. The oneM2M System shall support M2M Service Subscriber and M2M Service User profiles specifying their restrictions (e.g. privacy restrictions, max number and/or types of applications and devices the M2M Service Subscriber and its authorized M2M Service Users are allowed to register to the M2M System, the maximum number of resources or bytes of data that the M2M Service Subscriber can store in the M2M System, etc.) and their default configurations (e.g. access control policies, expiration times, max number of content instances, etc.).

## Limitation X

## Use Case Description

## Potential Requirements

# Potential Solutions

*Editor’s Note: This clause provides solutions to the identified limitations related to lack of support for oneM2M service subscribers and their authorized users.*

## M2M Service Subscriber Identifier

### Solution Applicability

The definition of the M2M Service Subscriber Identifier is applicable to the current limitation that oneM2M lacks the capability to identify a M2M Service Subscriber (i.e. the entity that establishes a M2M Service Subscription with a M2M Service Provider).

### Solution Description

A M2M Service Subscriber is a stakeholder that establishes a M2M Service Subscription with a M2M Service Provider. A M2M-Subscriber-ID uniquely identifies a M2M Service Subscriber and is assigned by a M2M Service Provider. A M2M-Subscriber-ID is globally unique. When used internally within the M2M Service Provider domain that assigned it, a M2M-Subscriber-ID is sufficient to be unique within that M2M Service Provider domain. When used externally outside the M2M Service Provider domain that assigned it, a M2M-Subscriber-ID is extended to make it globally unique. The IN-CSE can perform this task by adding or removing segments (i.e. the M2M Service Provider Identifier) of the M2M-Subscriber-ID.

Table 7.1.2-1: M2M-Subscriber-ID Identifier Format

|  |  |  |  |
| --- | --- | --- | --- |
| Identifier Name | Format | Format | Rule of use |
| M2M-Subscriber-ID | SP-Relative | The SP-Relative-M2M-Subscriber-ID begins with a slash character '/' and is followed by a sequence of characters that includes any of the unreserved characters defined in the clause 2.3 of the IETF RFC 3986 [i.3].  The SP-Relative-M2M-Subscriber-ID is unique within the context of the M2M-SP Domain to which the M2M Service Subscriber has a service subscription with.  The M2M-SP assigns the SP-Relative-M2M-Subscriber-ID and is responsible for guaranteeing that the SP-Relative-M2M-Subscriber-ID is unique in the context of the M2M-SP Domain.  Examples:   * /SS123ABC * /7689ayx | On the Mca and Mcc reference points: refers to M2M Service Subscribers having service subscriptions in the internal M2M Service Provider Domain |
| Absolute | Concatenation according to the format  {M2M-SP-ID}{SP-Relative-M2M-Subscriber-ID}  where {M2M-SP-ID} and {SP-relative- M2M-Subscriber-ID} are placeholders for the M2M-SP-ID and the SP-relative-M2M-Subscriber-ID format of the M2M-Subscriber-ID respectively. | On the Mca and Mcc reference points: refers to M2M Service Subscribers having service subscriptions in different external M2M Service Provider Domains |

## M2M Service User Identifier

### Solution Applicability

The definition of the M2M Service User Identifier is applicable to the current limitation that oneM2M lacks the capability to identify a M2M Service User (i.e. the entity authorized by a M2M Service Subscriber to use M2M Services offered by the M2M Service Provider which the M2M Service Subscriber has established a M2M Service Subscription with).

### Solution Description

A M2M Service User is a stakeholder that is authorized by a M2M Service Subscriber to use M2M Services offered by the M2M Service Provider which the M2M Service Subscriber has established a M2M Service Subscription with. A M2M-User-ID uniquely identifies a M2M Service User and is assigned by a M2M Service Provider. A M2M-User-ID is globally unique. When used internally within the M2M Service Provider domain that assigned it, a M2M-User-ID is sufficient to be unique within that M2M Service Provider domain. When used externally outside the M2M Service Provider domain that assigned it, a M2M-User-ID is extended to make it globally unique. The IN-CSE can perform this task by adding or removing segments (i.e. the M2M Service Provider Identifier) of the M2M-User-ID.

Table 7.2.2-1: M2M-User-ID Identifier Format

|  |  |  |  |
| --- | --- | --- | --- |
| Identifier Name | Format | Format | Rule of use |
| M2M-User-ID | SP-Relative | The SP-Relative-M2M-User-ID begins with a slash character '/' and is followed by a sequence of characters that includes any of the unreserved characters defined in the clause 2.3 of the IETF RFC 3986 [i.3].  The SP-Relative-M2M-User-ID is unique within the context of the M2M-SP Domain to which the M2M Service User has a service subscription with.  The M2M-SP assigns the SP-Relative-M2M-User-ID and is responsible for guaranteeing that the SP-Relative-M2M-User-ID is unique in the context of the M2M-SP Domain.  Examples:   * /bobjones * /bob123 | On the Mca and Mcc reference points: refers to M2M Service Users from the internal M2M Service Provider Domain |
| Absolute | Concatenation according to the format  {M2M-SP-ID}{SP-Relative-M2M-User-ID}  where {M2M-SP-ID} and {SP-relative- M2M-User-ID} are placeholders for the M2M-SP-ID and the SP-relative-M2M-User-ID format of the M2M-User-ID, respectively. | On the Mca and Mcc reference points: refers to M2M Service Users from external M2M Service Provider Domains |

# Conclusions

*Editor’s Note: This clause provides a summary of the conclusions drawn during the study*

# Annexes

Each annex **shall** start on a new page (insert a page break between annexes A and B, annexes B and C, etc.).

Use the **Heading 9** style for the title and the Normal style for the text.

Annex <A>:  
Title of annex *(style H9)*

<Text>

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# History

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