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| CHANGE REQUEST |
| Meeting ID:\* |  SDS #46.4 |
| Source:\* | Andreas Kraft, DT, Andreas.Kraft@t-systems.com Andreas Neubacher, DT, Andreas.Neubacher@magenta.at  |
| Date:\* | 2020-0914 |
| Reason for Change/s:\* | Correct mappings of not-unreserved characters in TS-0014 |
| CR against: Release\* | Release 3 |
| CR against: WI\* | [ ]  Active WI-xxxx[ ]  MNT maintenance / < Work Item number(optional)>Is this a mirror CR? Yes [ ]  No [ ] mirror CR number: (Note to Rapporteur - use latest agreed revision)[x]  STE Small Technical Enhancements / < Work Item number (optional)>Only ONE of the above shall be ticked |
| CR against: TS/TR\* | TS-0014 v.3.1.1 |
| Clauses \* | Modified clauses: 6.3.2.1 |
| Type of change: \* | [ ]  Editorial change[x]  Bug Fix or Correction[ ]  Change to existing feature or functionality[ ]  New feature or functionalityOnly ONE of the above shall be ticked |
| Impacted other TS/TR(s) |  |
| 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

The section that is the target of this CR specifies an incompatible encoding for LwM2M paths. The original specification defines the use of the slash (/) character when encoding LWM2MURI and LWM2MPTH in oneM2M’s *resourceName* attribute. Since only characters from the unreserved character set are allowed (see also IETF RFC 3986) in *resourceName* attributes, the specification and the example in TS-0014 is wrong. The example from TS-0014 is:

*For example if the LWM2MURI is "/1/0 and the LWM2MPTH is "/" then the resourceName attribute of the oneM2M resource could be "/1/0".*

As described above the resulting value for *resourceName* “/1/0” is not allowed.

The same problem occurs when mapping LWM2MURI to the <mgmtObj>’s objectPath attribute.

This CR proposes to change the text of 6.3.2.1 as follows.

### \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* Start of change 1 \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

#### 6.3.2.1 Introduction

Through the Registration Interface, the LWM2M Client provides the list of supported LWM2M Objects and existing LWM2M Object Instances. Each element of the list is described by its path, which can be the path of an Object or an Object Instance.

For example the LWM2M Client could provide the following list of paths: </1/0>, </1/1>, </2/0>, </2/1>, </3/0>, </4/0>, </5>. This list of paths is a valid list of LWM2M Objects and LWM2M Object Instances in the CoRE Link Format [RFC6690], specifying that LWM2M Objects with OMNA Identifiers 1, 2, 3,4, and 5 are supported. The respective OMNA references are : urn:oma:lwm2m:oma:1, urn:oma:lwm2m:oma:2, urn:oma:lwm2m:oma:3, urn:oma:lwm2m:oma:4, urn:oma:lwm2m:oma:5.

Additionally, information is provided that LWM2M Object 1 (Server Object) and LWM2M Object 2 (Access Control Object) have 2 instances (Instance Identifiers 0 and 1); LWM2M Object 3 (Device Object) and LWM2M Object 4 (Connectivity Monitoring Object) have 1 instance each (0); LWM2M Object 5 is supported but no instance has been created yet for that LWM2M Object.

Optionally other information can be carried by that list as the capability for all the Objects in the LWM2M Client to support:

* an alternate root path (default root path is '/');
* a specific Content-Format (e.g. LWM2M JSON Content-Format).

For discovery of LWM2M Objects by M2M Applications, the properties carried by LWM2M Objects list (i.e. technology, Objects and LWM2M Object Instances Identifiers, optional alternate rootpath, supported Content-Format) shall be translated into the labels attribute of the Content Sharing Resource as separate entries with the following format:

* Iwked-Technology:LWM2M
* Iwked-Entity-Type:Resource Type
* LWM2M-PATH:Resource Root Path (for LWM2M default rootpath is "/").
* Iwked-Entity-ID:Resource Path Object Identifier and Instance Identifier.
* Iwked-Content-Type: Supported Content Format (LWM2M default Supported ContentFormat is LWM2M TLV other can be LWM2M JSON).

For the case where LWM2M Objects are represented as <mgmtObj> resources in the M2M Service Layer, the properties carried by the LWM2M Objects list shall be translated into the labels attribute of the <node> resource using the above format.

For example if the LWM2M Endpoint provided the following LWM2M Objects as part of the Client Registration Interface: </lwm2m>;rt="oma.lwm2m";ct=LWM2M+JSON,</1/0> would translate into a <container> resource with the following entries in the labels attribute: Iwked-Technology:LWM2M Iwked-Entity-Type:”urn:oma:lwm2m:oma:1” LWM2MPTH:"/lwm2m" Iwked-Entity-ID: "/1/0" Iwked-Content-Type:LWM2M+JSON (see note).

NOTE: LWM2M+JSON is an entry (numerical ID) in the CoAP Content-Format Registry representing the media-type "application/vnd.oma.lwm2m+json" used in LWM2M TS 1.0 enabler and currently engaged in the IANA registration process.

The CoAP Resource Type may also be used as the semantic ontology of the <container> resource by inserting this value in the ontologyRef attribute of the <container> or other translated oneM2M resource.

For the case where LWM2M Objects are represented as <mgmtObj> resources in the M2M Service Layer, the IPE shall use information carried in the LWM2M Objects list to configure not only the *labels* and *description* attributes but also the *objectID* and *objectPath* attributes of the <mgmtObj> resources since *objectID* and *objectPath* can also be helpful for discovery of the supported LWM2M Objects. For the case that 1:1 mapping of LWM2M Object to oneM2M <mgmtObj> is desired, the *objectIDs* attribute shall contain the URN of the corresponding LWM2M Object and the *mgmtSchema* attribute shall contain a URI of the schema file for the new <mgmtObj> specialization as outlined in Clause 6.7 of TS-0005 [4].

LWM2M Object Resources are identified by their URI within the context of the LWM2M Endpoint described in clause 6.2.1 of the LWM2M Technical Specification [3].

As the LWM2M Endpoint is represented as an <AE> resource and a LWM2M Object is represented as a oneM2M resource in the M2M Service Layer, a reference shall be made between the <AE> resource that represents the LWM2M Endpoint and the oneM2M resource which represent the list of LWM2M Objects and Object Instances available in the LWM2M Client.

For the case where a LWM2M Object is represented as a <mgmtObj> resource, this reference is already provided by the AE’s nodeLink attribute.

In addition, oneM2M resources that represents the LWM2M Object or LWM2M Object Instance uses the Hierarchical and Non-Hierarchical mechanisms for Resource Addressing as defined in clause 9.3.1 of oneM2M TS‑0001 [2] where the *resourceName* attribute of the Content Sharing or oneM2M resource shall be the value of the LWM2MURI. All characters that are not in the reserved character set defined in clause 2.3 of the of IETF RFC 3986 must be percent encoded as defined in clause 2.1 of the same IETF RFC, specifically the forward slash (/) character.

For example if the LWM2MURI is "/1/0 and the LWM2MPTH is "/" then the *resourceName* attribute of the oneM2M resource could be "%2F1%sF0".

For the case where <mgmtObj> resources are used, the “/1/0” LWM2MURI is mapped to the <mgmtObj>’s objectPath attribute. All characters that are not in the reserved character (s.a.) must be percent encoded as well.

### \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* End of Change 1 \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*