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| CHANGE REQUEST |
| Meeting ID:\* | Joint RDM/SDS/TDE |
| Source:\* | Cyrille Bareau, Orange, cyrille.bareau@orange.comBob Flynn, Exacta, bob.flynn@exactagss.comAndreas Kraft, Deutsche Telekom, a.kraft@telekom.deMarianne Mohali, Orange, marianne.mohali@orange.com |
| Date:\* | 2022-07-11 |
| Reason for Change/s:\* | See the introduction. |
| CR against: Release\* | Release 5 |
| CR against: WI\* | [x]  Active WI-0109[ ]  MNT maintenance / < Work Item number(optional)>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\* | TS-0023 v5.1.0 |
| Clauses \* | 2, 5.8.1, 5.8.2, 6.2.2, 6.2.5, A.2, A.3, A.4 |
| Type of change: \* | [ ]  Editorial change[ ]  Bug Fix or Correction[x]  Change to existing feature or functionality[ ]  New feature or functionalityOnly ONE of the above shall be ticked |
| Other TS/TR(s) impacted | N/A |
| 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 2020 (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.

If this is a correction, and the change applies to previous releases, a separate “mirror CR” should be posted at the same time as 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. Include any changes to references, definitions, and abbreviations in the same deliverable.

Follow the drafting rules.

All pictures must be editable.

Check spelling and grammar.

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 proposed new clause is 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 the 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 draft is part of a series of CRs related to the Work Item WI-0109: IPE-based Device Management with FlexContainers. For a full introduction, see clause 2 “Justification” in WI-0109-IPE-based\_Device\_Management\_with\_FlexContainers-V0\_0\_1.DOCX.

In this specific draft, the proposed changes are as follows:

1. Add TS-0033 and TR-0035 to the lists of references.
2. Reference these documents in the introduction clause for DM-related moduleClasses.
3. As the [flexNode] specialization is now child of the <node> resource, the *flexNodeLink* attribute (for SDT devices) and *hostedAELinks/hostedServiceLinks* (for flexNode) are removed.

4,5,6. Adapt the mapping rules to this removal.

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

# 2 References

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 reference document (including any amendments) applies.

## 2.1 Normative references

The following referenced documents are necessary, partially or totally, for the application of the present document. Their use in the context of this TS is specified by the normative statements that are referring back to this clause

[1] oneM2M Smart Device Template.

NOTE: Available at https://git.onem2m.org/MAS/SDT

[2] Java coding rule.

[3] oneM2M TS-0001: "Functional Architecture".

[4] oneM2M TS-0004: “Service Layer Core Protocol Specification”

[5] oneM2M TS-0005: ”Management Enablement (OMA)”.

[6] ISO:80000-1: Quantities and units

NOTE: Available at <http://www.oracle.com/technetwork/java/codeconventions-135099.html>.

[7] Open Mobile AllianceTM: “OMA-ER-Device\_WebAPIs-V1\_0-20160419-C”.

NOTE: Available at http://www.openmobilealliance.org/release/DWAPI/V1\_0-20160419-C/OMA-ERELD-DWAPI\_V1\_0-20160419-C.pdf

[8] Open Mobile AllianceTM: “OMA-TS-Blood\_Pressure\_Monitor\_APIs-V1\_0-20160419-C”.

NOTE: Available at http://www.openmobilealliance.org/release/DWAPI/V1\_0-20160419-C/OMA-TS-Blood\_Pressure\_Monitor\_APIs-V1\_0-20160419-C.pdf

[9] Open Mobile AllianceTM: “OMA-TS-Glucometer\_APIs-V1\_0-20160419-C”.

NOTE: Available at http://www.openmobilealliance.org/release/DWAPI/V1\_0-20160419-C/OMA-TS-Glucometer\_APIs-V1\_0-20160419-C.pdf

[10] Open Mobile AllianceTM: “OMA-TS-Heart\_Rate\_Monitor\_APIs-V1\_0-20160419-C”.

NOTE: Available at http://www.openmobilealliance.org/release/DWAPI/V1\_0-20160419-C/OMA-TS-Heart\_Rate\_Monitor\_APIs-V1\_0-20160419-C.pdf

[11] Open Mobile AllianceTM: “OMA-TS-Pulse\_Oximeter\_APIs-V1\_0-20160419-C”.

NOTE: Available at http://www.openmobilealliance.org/release/DWAPI/V1\_0-20160419-C/OMA-TS-Pulse\_Oximeter\_APIs-V1\_0-20160419-C.pdf

[12] Open Mobile AllianceTM: “OMA-TS-Thermometer\_APIs-V1\_0-20160419-C”.

NOTE: Available at http://www.openmobilealliance.org/release/DWAPI/V1\_0-20160419-C/OMA-TS-Thermometer\_APIs-V1\_0-20160419-C.pdf

[13] Open Mobile AllianceTM: “OMA-TS-Weight\_Scale\_Body\_Composition\_Analyzer\_APIs-V1\_0-20160419-C”.

NOTE: Available at http://www.openmobilealliance.org/release/DWAPI/V1\_0-20160419-C/OMA-TS-Weight\_Scale\_Body\_Composition\_Analyzer\_APIs-V1\_0-20160419-C.pdf

[14] W3C Recommendation: “XML Schema Part 2: Datatypes”, 02 May 2001.

NOTE: Available at <http://www.w3.org/XML/Schema/>.

[15] NIST standard FIPS PUB 180-2

[16] IETF RFC 4566: "SDP: Session Description Protocol".

[17] IANA Time Zone Database

NOTE: Available at <https://www.iana.org/time-zones>

[18] Void

[19] Open Mobile AllianceTM: “OMA-ER-GotAPI-V1\_1-20151215-C”.

[20] NIST SP 330:2019: “Special Publication 330 - The International System of Units (SI) 2019 Edition“

NOTE: Available at <https://www.nist.gov/pml/special-publication-330>

[21] oneM2M TS-0033: "Interworking Framework"

## 2.2 Informative references

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 TR-0017: "Home Domain Abstract Information Model".

[i.3] Void.

[i.4] IEEE 802.15.4: "IEEE Standard for Local and metropolitan area networks--Part 15.4: Low-Rate Wireless Personal Area Networks (LR-WPANs)".

[i.5] oneM2M TS-0012: "Base Ontology".

[i.6] <https://en.wikipedia.org/wiki/Multiple_inheritance>

[i.7] <https://www.me.go.kr/home/web/index.do?menuId=10272&condition.code1=007>

[i.8] OCF DEVICE SPECIFICATION V1.3.0

NOTE: Available at <https://openconnectivity.org/specs/OCF_Device_Specification_v1.3.0.pdf>

[i.9] Ju-Hun Park, Hui Sik Kim, Sang-A Hong, Sun Young Jang, “A Study on the Definition of Terms for Domestic Train Control System”, Korean Society for Railway, 2015, http://railway.or.kr/Papers\_Conference/201502/pdf/KSR2015A114.pdf

[i.10] CTCS-3级列控系统总体技术方案 (Overall technology plan Train Control System), 中国铁道出版社(Chinese Railway Press), 2008, ISBN: 9787113091590

[i.11] oneM2M TR-0035: "Developer guide of device management"

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

### ----------------------- Start of change 2 -------------------------------------------

### 5.8.1 Introduction

The entities that are specified in this section allow performing classical Device Management (DM) functions: rebooting a device, upgrading it, reading / setting its configuration, monitoring its logs, checking its memory or battery status, managing its firmware or its software modules, etc. They belong to the "management" domain.

In the case of a NoDN, it is the IPE in charge of exposing the device to oneM2M that creates / implements these modules. It may rely on external Device Management techniques like e.g. LwM2M (from OMA) or USP (from BBF), or any other technique, proprietary or standardized, that allows performing at least some DM functions, for instance a reboot.

The architecture of IPE-based Device Management is presented in oneM2M TS-0001 [3] clause 6.2.4.1, and the details of CRUD operations on the resources defined here are defined in oneM2M TS-0033 [21] clause 8. A developer’s guide on Device Management can be found in oneM2M TR-0035 [i.11].

### ----------------------- End of change 2 -------------------------------------------

### ----------------------- Start of change 3 -------------------------------------------

### 5.8.2 flexNode

This <flexContainer> specialization is the root for SDT-based Device Management modules.

The containerDefinition attribute of this specialization shall be “org.onem2m.management.device.flexNode”.

This resource is a <flexContainer> child of the <node> resource targeted by the *nodeLink* attribute of *<flexContainer>* SDT devices (see in 6.2.2 the rule 1.7).

Table 5.8.2‑1: Child resources of [*flexNode*] resource

| Child Resources of [*flexNode*] | Child Resource Type | Multiplicity | Description |
| --- | --- | --- | --- |
| *dmAreaNwkInfo\_<i>* | *[dmAreaNwkInfo]* | 0..n | See clause 5.8.10 |
| *dmAgent* | *[dmAgent]*  | 0..1 | See clause 5.8.3 |
| *dmDeviceInfo*  | *[dmDeviceInfo]* | 1 | See clause 5.8.4 |
| *dmDataModelIO\_<i>* | *[dmDataModelIO]* | 0..N | See clause 5.8.5 |
| *dmFirmware\_<i>* | *[dmFirmware]* | 1..N | See clause 5.8.6 |
| *dmSoftware\_<i>* | *[dmSoftware]* | 0..N | See clause 5.8.7 |
| *dmEventLog\_<i>* | *[dmEventLog]* | 0..N | See clause 5.8.8 |
| *dmPackage\_<i>* | *[dmPackage]* | 0..N | See clause 5.8.9 |
| *battery\_<i>* | *[battery]* | 0..N | See clause 5.3.10 |
| *dmCapability\_<i>*  | *[dmCapability]* | 0..N | See clause 5.8.12 |
| *dmStorage\_<i>* | *[dmStorage]* | 0..N | See clause 5.8.13 |

NOTES:

* the notation ‘\_<i>’ for child resources indicates that the resource name is the name of the child ModuleClass or SubDevice flexContainer, appended with an underscore ‘\_’ and an incrementing index so that it is unique in the [flexNode] children (e.g. “dmFirmware\_0”, “dmFirmware\_1”, etc.). The index shall not have leading 0’s.
* the current list of modules for Device Management is not fixed and can evolve with new optional features.

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### ----------------------- End of change 3 -------------------------------------------

### ----------------------- Start of change 4 -------------------------------------------

### 6.2.2 Resource mapping for Device model

When the AE exposes a controlling interface for a home domain device which is specified as an information model in clause 5.5, a specialization of the <flexContainer> resource shall be created as the mapping of the model following conversion rules:

* Rule 1-1: Each Device model defined in clause 5.5 shall be mapped to a specialization of <flexContainer>. The *containerDefinition* attribute shall be set according to 6.4.2.
* Rule 1-2: Each entry in the 'Module' table shall be mapped to a child resource(s) which is mapped as a specialised <flexContainer> following the rule in clause 6.2.3.
* Rule 1-3: The specialized <flexContainer> resource of the Device model may contain an optional attribute *nodeLink* (as defined in TS-0001[3] and in TS-0004[4]). The value of *nodeLink* shall be set to the resource identifier of a <node> resource described in Rule 1-5 below. See also Rule 1-8.
* Rule 1-4: XSD file for each Device model shall be named according to 6.5.2.
* Rule 1-5: A <node> resource shall be created on the same hosting CSE as the <flexContainer> representing this Device model. If the <node> resource does not contain a [*flexNode*] child resource (see Rule 1.7), then it contains all the management information as specialized <mgmtObj> resources (e.g. [firmware]) about the Device model instance for device management purposes.
* Rule 1-6: Void.
* Rule 1-7:The <node> resource targeted by the *nodeLink* attribute may have a [*flexNode*] child resource. This [*flexNode*] resource contains all the Device Management information as specialized <flexContainer> resources defined in 5.8 (e.g. [*dmFirmware*]) about the device model instance for Device Management purposes.
* Rule 1-8: Void.
* Rule 1-9: Each entry in the 'SubDevice' table shall be mapped to a child resource(s) which is mapped as a specialised <flexContainer> following the rule in clause 6.2.7.
* Rule 1-10: Each <flexContainer> associated to a Device model may have as child resource any <flexContainer> associated to a ModuleClass model of the Metadata domain defined in clause 5.3.9.

In other words, all devices implicitly have the following lines in their modules table:

 Table 6.2.2-1: Modules of deviceXXX model

|  |  |  |  |
| --- | --- | --- | --- |
| Module Instance Name | Module Class Name | Multiplicity | Description |
| <any module in mdd domain> | <any module in mdd domain> | 0..N | See clauses 5.3.9. |

### ----------------------- End of change 4 -------------------------------------------

### ----------------------- Start of change 5 -------------------------------------------

### 6.2.5 Resource mapping for Property

When the Device model (in clause 5.5) or the ModuleClass model (in clause 5.3) is mapped to the <flexContainer> resource, and if the device supports a Property, the following rules shall be applied:

* Rule 4-1: Each entry of ‘Property’ table in ModuleClass model, shall be mapped to the [customAttribute] of <flexContainer> resource which is mapped from associated ModuleClass model, with its Property name with prefix 'prop'.
* Rule 4-2: If the <node> resource targeted by the *nodeLink* attribute of a Device model does not have a [*flexNode*] child resource, then each ‘Property’ of the Device model is mapped to a specialized [objectAttribute] of a [deviceInfo] <mgmtObj> resource child of this <node>, otherwise it is mapped to a [customAttribute] of a [dmDeviceInfo] <flexContainer> resource child of this [*flexNode*].
* Rule 4-3: Each entry of ‘Property’ table in SubDevice model, shall be mapped to the [customAttribute] of <flexContainer> resource which is mapped from associated SubDevice model, with its Property name with prefix 'prop'.

### ----------------------- End of change 5 -------------------------------------------

### ----------------------- Start of change 6 -------------------------------------------

A.2 Example for Device model ‘deviceAirConditioner'

The present clause explains the creation process for the device typed 'deviceAirConditioner' (see clause 5.5.1.1 for device model definition of ‘deviceAirConditioner').

Using the definition, 'deviceAirConditioner' model is mapped to [deviceAirConditioner] resource which is a specialization of <flexContainer> resource (See Figure A.2-1).



Figure A.2-1: Structure of [deviceAirConditioner] resource

The AE creates the [deviceAirConditioner] specialization of <flexContainer> resource for the Device model [deviceAirConditioner] resource.

The [deviceAirConditioner] resource contains the child resource specified in Table A.2-2.

Table A.2-2: Child resources of *[deviceAirConditioner]* resource

| Child Resources of *[deviceAirConditioner]* | Child Resource Type | Multiplicity | Description |
| --- | --- | --- | --- |
| *[variable]* | *<flexContainer> as defined in the specialization [binarySwitch]* | 0..1 | This resource is used to map 'binarySwith' ModuleClass defined in clause 5.3.1.12. |
| *[variable]* | *<flexContainer> as defined in the specialization [runState]* | 0..1 | This resource is used to map 'runState' ModuleClass defined in clause 5.3.1.75. |
| *[variable]* | *<flexContainer> as defined in the specialization [airConJobMode]* | 0..1 | This resource is used to map ‘airConJobMode’ ModuleClass defined in clause.Editor’s Note: airConJobMode is not a moduleclass. It is an instance of that. It is needed to fix. |
| *[variable]* | *<flexContainer> as defined in the specialization [airConOperationMode]* | 0..1 | This resource is used to map ‘airConOperationMode’ ModuleClass defined in clause 5.3.1.57. |
| *[variable]* | *<flexContainer> as defined in the specialization [airCleanOperationMode]* | 0..1 | This resource is used to map ‘airCleanOperationMode’ ModuleClass defined in clause 5.3.1.57. |
| *[variable]* | *<flexContainer> as defined in the specialization [temperature]* | 0..1 | This resource is used to map ‘temperature’ ModuleClass defined in clause 5.3.1.87. |
| *[variable]* | *<flexContainer> as defined in the specialization [timer]* | 0..1 | This resource is used to map 'timer' ModuleClass defined in clause 5.3.1.90. |
| *[variable]* | *<flexContainer> as defined in the specialization [sleepTimer]* | 0..1 | This resource is used to map 'sleepTimer' ModuleClass defined in clause 5.3.1.90. |
| *[variable]* | *<flexContainer> as defined in the specialization [turbo]* | 0..1 | This resource is used to map 'turbo' ModuleClass defined in clause 5.3.1.91. |
| *[variable]* | *<flexContainer> as defined in the specialization [airFlow]* | 0..1 | This resource is used to map 'airFlow' ModuleClass defined in clause 5.3.1.4. |
| *[variable]* | *<flexContainer> as defined in the specialization [powerSave]* | 0..1 | This resource is used to map 'powerSave' ModuleClass defined in clause 5.3.1.66. |
| *[variable]* | *<flexContainer> as defined in the specialization [airQualitySensor]* | 0..1 | This resource is used to map 'airQualitySensor' ModuleClass defined in clause 5.3.1.6. |
| *[variable]* | *<flexContainer> as defined in the specialization [filterInfo]* | 0..1 | This resource is used to map 'filterInfo' ModuleClass defined in clause 5.3.1.35. |
| *[variable]* | *<subscription>* | 0..n | See clause 9.6.8 in oneM2M TS-0001 [i.3] |

Editor’s Note: Above table should be updated compliant to present structure of deviceAirConditioner.

The [deviceAirConditioner] resource contains the attributes specified in Table A.2-3.

Table A.2-3: Attributes of *[deviceAirConditioner]* resource

| Attributes of *[deviceAirConditioner]* | Multiplicity | RW/RO/WO | Description |
| --- | --- | --- | --- |
| *resourceType* | 1 | RO | See clause 9.6.1.3 in oneM2M TS-0001 [i.3].  |
| *resourceID* | 1 | RO | See clause 9.6.1.3 in oneM2M TS-0001 [i.3].  |
| *resourceName* | 1 | RO | See clause 9.6.1.3 in oneM2M TS-0001 [i.3].  |
| *parentID* | 1 | RO | See clause 9.6.1.3 in oneM2M TS-0001 [i.3].  |
| *expirationTime* | 1 | RW | See clause 9.6.1.3 in oneM2M TS-0001 [i.3].  |
| *accessControlPolicyIDs* | 0..1 (L) | RW | See clause 9.6.1.3 in oneM2M TS-0001 [i.3].  |
| *creationTime* | 1 | RO | See clause 9.6.1.3 in oneM2M TS-0001 [i.3].  |
| *lastModifiedTime* | 1 | RO | See clause 9.6.1.3 in oneM2M TS-0001 [i.3].  |
| *labels* | 0..1 | RW | See clause 9.6.1.3 in oneM2M TS-0001 [i.3].  |
| *dynamicAuthorizationConsultationIDs* | 0..1 (L) | RW | See clause 9.6.1.3 in oneM2M TS-0001 [i.3] |
| *stateTag* | 1 | RO | See clause 9.6.1.3 in oneM2M TS-0001 [i.3] |
| *creator* | 0..1 | RW | See clause 9.6.35 in oneM2M TS-0001 [i.3] |
| *containerDefinition* | 1 | WO | The value is "org.onem2m.home.device.airconditioner" |
| *ontologyRef* | 0..1 | RW | See clause 9.6.35 in oneM2M TS-0001 [i.3]. |
| *contentSize* | 1 | RO | See clause 9.6.35 in oneM2M TS-0001 [i.3]. |
| *nodeLink* | 0..1 | RO | nodeLink attribute links to a <node> resource that is hosted on the same hosting CSE of the <flexContainer>. See clause 6.2.2 and 6.2.5 for more details. |
|  |  |  |  |

A.3 Example of ModuleClass 'binarySwitch'

The [*binarySwitch*] resource is used to share information regarding the modeled binary switch module as a ModuleClass. The [*binarySwitch*] resource is a specialization of the <*flexContainer*> resource.



Figure A.3-1: Structure of *[binarySwitch]* resource

The *[binarySwitch]* resource contains the child resource specified in Table A.3-2.

Table A.3-2: Child resources of *[binarySwitch]* resource

| Child Resources of *[binarySwitch]* | Child Resource Type | Multiplicity | Description |
| --- | --- | --- | --- |
| *[variable]* | *<flexContainer> as defined in the specialization [toggle]* | 0..1 | This resource is used to map 'toggle' Action defined in Clause 5.3.1.12. |
| *[variable]* | *<subscription>* | 0..n | See clause 9.6.8 in oneM2M TS-0001 [i.3] |

The *[binarySwitch]* resource contains the attributes specified in Table A.3-3.

Table A.3-3: Attributes of *[binarySwitch]* resource

| Attributes of *[binarySwitch]* | Multiplicity | RW/RO/WO | Description |
| --- | --- | --- | --- |
| *resourceType* | 1 | RO | See clause 9.6.1.3 in oneM2M TS-0001 [i.3]  |
| *resourceID* | 1 | RO | See clause 9.6.1.3 in oneM2M TS-0001 [i.3]  |
| *resourceName* | 1 | RO | See clause 9.6.1.3 in oneM2M TS-0001 [i.3]  |
| *parentID* | 1 | RO | See clause 9.6.1.3 in oneM2M TS-0001 [i.3]  |
| *expirationTime* | 1 | RW | See clause 9.6.1.3 in oneM2M TS-0001 [i.3]  |
| *accessControlPolicyIDs* | 0..1 (L) | RW | See clause 9.6.1.3 in oneM2M TS-0001 [i.3]  |
| *creationTime* | 1 | RO | See clause 9.6.1.3 in oneM2M TS-0001 [i.3]  |
| *lastModifiedTime* | 1 | RO | See clause 9.6.1.3 in oneM2M TS-0001 [i.3]  |
| *labels* | 0..1 | RW | See clause 9.6.1.3 in oneM2M TS-0001 [i.3]  |
| *dynamicAuthorizationConsultationIDs* | 0..1 (L) | RW | See clause 9.6.1.3 in oneM2M TS-0001 [i.3] |
| *stateTag* | 1 | RO | See clause 9.6.1.3 in oneM2M TS-0001 [i.3] |
| *creator* | 0..1 | RW | See clause 9.6.35 in oneM2M TS-0001 [i.3] |
| *containerDefinition* | 1 | WO | The value is "org.onem2m.home.moduleclass.binaryswitch" |
| *ontologyRef* | 0..1 | RW | See clause 9.6.35 in oneM2M TS-0001 [i.3] |
| *contentSize* | 1 | RO | See clause 9.6.35 in oneM2M TS-0001 [i.3]. |
| *nodeLink* | 0..1 | RW | Not applicable to a ModuleClass specialization. This attribute is not present in an instantiation of this resource. |
|  |  |  |  |
| *dataGenerationTime* | 0..1 | RO | See clause 6.2.3 |
| *powerState* | 1 | RW | See clause 5.3.1.12 |

A.4 Example of Action 'toggle'

The [*toggle*] resource is used to share information regarding the modeled toggle as an Action. The [*toggle*] resource is a specialization of the <*flexContainer*> resource.



Figure A.4-1: Structure of *[toggle]* resource

The *[toggle]* resource contains the child resource specified in Table A.4-2.

Table A.4-2: Child resources of *[toggle]* resource

| Child Resources of *[toggle]* | Child Resource Type | Multiplicity | Description |
| --- | --- | --- | --- |
| *[variable]* | *<subscription>* | 0..n | See clause 9.6.8 in oneM2M TS-0001 [i.3] |

The *[toggle]* resource contains the attributes specified in Table A.4-3.

Table A.4-3: Attributes of *[toggle]* resource

| Attributes of *[toggle]* | Multiplicity | RW/RO/WO | Description |
| --- | --- | --- | --- |
| *resourceType* | 1 | RO | See clause 9.6.1.3 in oneM2M TS-0001 [i.3]  |
| *resourceID* | 1 | RO | See clause 9.6.1.3 in oneM2M TS-0001 [i.3]  |
| *resourceName* | 1 | RO | See clause 9.6.1.3 in oneM2M TS-0001 [i.3]  |
| *parentID* | 1 | RO | See clause 9.6.1.3 in oneM2M TS-0001 [i.3]  |
| *expirationTime* | 1 | RW | See clause 9.6.1.3 in oneM2M TS-0001 [i.3]  |
| *accessControlPolicyIDs* | 0..1 (L) | RW | See clause 9.6.1.3 in oneM2M TS-0001 [i.3]  |
| *creationTime* | 1 | RO | See clause 9.6.1.3 in oneM2M TS-0001 [i.3]  |
| *lastModifiedTime* | 1 | RO | See clause 9.6.1.3 in oneM2M TS-0001 [i.3]  |
| *labels* | 0..1 | RW | See clause 9.6.1.3 in oneM2M TS-0001 [i.3]  |
| *dynamicAuthorizationConsultationIDs* | 0..1 (L) | RW | See clause 9.6.1.3 in oneM2M TS-0001 [i.3] |
| *stateTag* | 1 | RO | See clause 9.6.1.3 in oneM2M TS-0001 [i.3] |
| *creator* | 0..1 | RW | See clause 9.6.35 in oneM2M TS-0001 [i.3] |
| *containerDefinition* | 1 | WO | The value is "org.onem2m.home.moduleclass.binaryswitch.toggle" |
| *ontologyRef* | 0..1 | RW | See clause 9.6.35 in oneM2M TS-0001 [i.3] |
| *contentSize* | 1 | RO | See clause 9.6.35 in oneM2M TS-0001 [i.3]. |
| *nodeLink* | 0..1 | RW | Not applicable to an Action specialization. This attribute is not present in an instantiation of this resource. |
|  |  |  |  |

### ----------------------- End of change 6 -------------------------------------------