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| CHANGE REQUEST | |
| Meeting ID:\* | RDM#50 |
| Source:\* | Cyrille Bareau, Orange, [cyrille.bareau@orange.com](mailto:cyrille.bareau@orange.com)  Marianne Mohali, Orange, [marianne.mohali@orange.com](mailto:marianne.mohali@orange.com) |
| Date:\* | 2021-05-27 |
| Reason for Change/s:\* | See the introduction. |
| CR against: Release\* | Release 4 |
| CR against: WI\* | Active WI-0099  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\* | TR-0067 v0.1.0 |
| Clauses \* | Annex H |
| Type of change: \* | Editorial change  Bug Fix or Correction  Change to existing feature or functionality  New feature or functionality  Only 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  NO  This CR may break backwards compatibility with the last approved version of the TS? YES  NO |
| 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 CR updates Annex H (for TS-0023) of TR-0067.

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

Annex H : Proposal for update of TS-0023

In this Annex, are presented the proposed changes to the TS-0023 [1] specification for flexContainer introduction for device management operations.

*Note: the clause 5.8 of TS-0023 specifies the [flexNode] specialization and its DM-related child <flexContainer> resources.*

*Maybe it should be entirely moved to TS-0001?*

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

### 5.8.2 flexNode

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

It is a <flexContainer> child of the <node> resource targeted by the *nodeLink* attribute of *<flexContainer>* SDT devices (see in 0 the rule 1-7).

Table 5.8.2‑1: Subdevice of flexNode model

|  |  |  |  |
| --- | --- | --- | --- |
| Subdevice Instance Name | Subdevice Name | Multiplicity | Description |
| dmAreaNwkInfo | dmAreaNwkInfo | 0..N | See clause 5.8.10 |

The word ‘SubDevice’ refers to the SDT structure as defined in clause 5.2.1, i.e. a resource that is the child of the root resource (Device, of flexNode here), and that can be the parent of Property and/or Module resources. It is mapped as a <flexContainer> resource (see clause 6.2.7).

Table 5.8.2‑2: Modules of flexNode model

|  |  |  |  |
| --- | --- | --- | --- |
| Module Instance Name | Module Class Name | Multiplicity | Description |
| dmAgent | dmAgent | 0..1 | See clause 0 |
| dmDeviceInfo | dmDeviceInfo | 1 | See clause 0 |
| dmDataModelIO | dmDataModelIO | 0..N | See clause 0 |
| dmFirmware | dmFirmware | 1..N | See clause 0. |
| dmSoftware | dmSoftware | 0..N | See clause 0 |
| dmEventLog | dmEventLog | 0..N | See clause 0 |
| dmPackage | dmPackage | 0..N | See clause 5.8.9 |
| battery | battery | 0..N | See clause **Erreur ! Source du renvoi introuvable.** |
| dmCapability | dmCapability | 0..N | See clause 5.8.12 |
| dmStorage | dmStorage | 0..N | See clause 5.8.13 |

NOTE: The current list of modules for Device Management is not fixed and can evolve with new optional features.

All children of the [flexNode] are modules that extend the [dmBaseModule] <flexContainer> specialization defined in table 5.8.2-3:

**Table 5.8.2-3 DataPoints of dmBaseModule ModuleClass**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Name** | **Type** | **R/W** | **Optional** | **Unit** | **Description** |
| flexSchema | xs:anyURI | R | true |  | Contains a URI to the <*flexContainer*> schema definition which shall be used by the Hosting CSE to validate the syntax of incoming primitives targeting this <*flexContainer*> resource.  This URI may refer to a oneM2M specified <*flexContainer*> definition as well as other <*flexContainer*> definitions. |
| objectIDs | xs:string | R | true |  | Contains the list URNs that uniquely identify the technology specific data model objects used for this *<flexContainer>* resource as well as the managed function and version it represents. This attribute shall be provided during the creation of the *<flexContainer>* resource and shall not be modifiable afterwards.  If the *<flexContainer>* resource is mapped to multiple technology specific data model objects, this attribute shall list all URNs for each mapped technology specific data model objects. This is mandatory for the *<flexContainer>*, for which the data model is not specified by oneM2M but mapped from technology specific data model. |
| objectPaths | xs:string | R | true |  | Contains the list of local paths of the technology specific data model objects on the managed entity which is represented by the *<flexContainer>* resource in the Hosting CSE.  This attribute shall be provided during the creation of the *<flexContainer>*, so that the Hosting CSE can correlate the created *<flexContainer>* with the technology specific data model object on the managed entity for further management operations. It shall not be modifiable after creation.  The format of this attribute shall be a local technology specific data model object path in the form as specified by technology specific protocol. (e.g. "./anyPath/Fw1" in OMA DM, "Device.USBHosts.Host.3." in BBF TR‑069).  The combination of the *objectPaths* and the *objectIDs* attribute, allows to address the technology specific data model. |
| objectDesc | xs:string | R | true |  | Text format description of the resource. |

The SDT modules that extend this [dmBaseModule] are mapped as specific oneM2M <flexContainer> resources that are called *DM <flexContainer>*.

The *DM <flexContainer>* resource contains management data which represents individual M2M management functions. It represents a general structure to map to technology specific data model, e.g. OMA DM, BBF TR-069 or LWM2M. Each instance of *DM <flexContainer>* resource shall be mapped to single technology specific protocol.

When mapping objects from technology specific protocol to a corresponding *DM <flexContainer>* resource, the following rules shall apply:

* The root object of technology specific data model objects maps to the *DM <flexContainer>* resource.
* For the child of the root of technology specific data model objects:
* **Rule1:** If the child technology specific data model object cannot have another child technology specific data model object, the technology specific data model object maps to the *[customAttribute]* attribute of the *DM <flexContainer>* resource with the same resource name.
* **Rule2:** If the child technology specific data model object can have another child technology specific data model object, the technology specific data model object maps to a new *DM <flexContainer>* resource that is a child of the *DM <flexContainer>* resource which is mapped from the parent technology specific data model object.



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

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

### 5.8.3 dmAgent

Extends: dmBaseModule

<…>

### 5.8.4 dmDeviceInfo

Extends: dmBaseModule

<…>

### 5.8.5 dmDataModelIO

Extends: dmBaseModule

<…>

### 5.8.6 dmFirmware

Extends: dmBaseModule

<…>

### 5.8.7 dmSoftware

Extends: dmBaseModule

<…>

### 5.8.8 dmEventLog

Extends: dmBaseModule

<…>

### 5.8.9 dmPackage

Extends: dmBaseModule

<…>

### 5.8.10 dmAreaNwkInfo

Extends: dmBaseModule

<…>

### 5.8.11 dmAreaNwkDeviceInfo

Extends: dmBaseModule

<…>

### 5.8.12 dmCapability

Extends: dmBaseModule

<…>

### 5.8.13 dmStorage

Extends: dmBaseModule

<…>

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

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

### 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 shall contain an 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.
* 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.
* Void.
* Rule 1-7: The <node> resource targeted by the nodeLink attribute may contain a [flexNode] specialization of a <flexContainer> 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.
* 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.

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

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

### 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 contain a [flexNode] child, 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 4 -------------------------------------------

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

* 1. 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 **Erreur ! Source du renvoi introuvable.**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* | 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. |
|  |  |  |  |

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

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

* 1. 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 |

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

### \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* End of change 1 \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*