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| CHANGE REQUEST | |
| Meeting ID:\* | RDM#49 |
| 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:\* | 2021-02-04 |
| 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 v0.0.1 |
| Clauses \* | Clauses 5.1 and 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 the TR with last updates from other pending work and discussions:

* Adding the indication that CMDH policy management is under discussion and so, not addressed yet in this study;
* Updating reference to CR RDM-2020-0077 to TS-0023 which was agreed in the meantime
* Adapting the proposed changes from the study to the latest version of TS-0023 i.e. v4.7.0

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

## 5.1 Analysis Background

The table below lists specializations of <mgmtObj> resources that are currently specified in oneM2M Release 4 (referenced in TS-0001 [2] clause 9.6.1.2.1).

* The first group handles CMDH policy management (Communication Management and Delivery Handling), specified in TS-0001 [2] Annex D.12. As the Work Item WI-0096 is currently working on an evolution of CMDH based on flexContainers, these resources will not be considered in the present document.
* The second group handles Device Configuration in the Field Domain, defined in TS-0003 Security Solutions and specified in TS-0022 Field Device Configuration.
* The third group handles Device Management in the “classical” meaning, i.e. the remote management of devices (reboot, firmware/software management, configuration, logging, etc.) These <mgmtObj> already have been mapped to SDT <flexContainer> specializations in TS-0023 [1].

| Resource specialization | Short Description | Comment |
| --- | --- | --- |
| **CMDH CSF (TS-0001 6.2.2 and Annex D.12)** | | |
| *activeCmdhPolicy* | Provides a link to the currently active set of CMDH policies |  |
| *cmdhBuffer* | Defines CMDH buffer usage limits |  |
| *cmdhDefaults* | Defines CMDH default values |  |
| *cmdhEcDefParamValues* | Represent a specific set of default values for the CMDH related parameters |  |
| *cmdhDefEcValue* | Defines a value for the ***Event Category*** parameter of an incoming request when it is not defined |  |
| *cmdhLimits* | Defines limits for CMDH related parameter values |  |
| *cmdhNetworkAccessRules* | Defines rules for the usage of underlying networks |  |
| *cmdhNwAccessRule* | Defines a rule for the usage of underlying networks |  |
| *cmdhPolicy* | A set of rules defining which CMDH parameters will be used by default |  |
| **Field Device Configuration (TS-0022)** | | |
| *registration* | To convey the service layer configuration information |  |
| *dataCollection* | To convey the application configuration information |  |
| *authenticationProfile* | To convey the configuration information regarding establishing mutually-authenticated secure communications |  |
| *myCertFileCred* | To configure a certificate or certificate chain |  |
| *trustAnchorCred* | To identify a trust anchor certificate for validation of certificates |  |
| *MAFClientRegCfg* | To convey instructions regarding the MAF Client Registration procedure |  |
| *MEFClientRegCfg* | To convey instructions regarding the MEF Client Registration procedure |  |
| *wifiClient* | To set up configuration of WiFi connection on the client device. |  |
| **DMG CSF (TS-0001 6.2.4 and Annex D.1 to D.11 & D.13)** | | |
| *areaNwkDeviceInfo* | Provides information about the Node in the M2M Area Network | TS-0023 “5.8.11 dmAreaNwkDeviceInfo” |
| *areaNwkInfo* | Describes the list of Nodes attached behind the MN node and its physical or underlying relation among the nodes in the M2M Area Network | TS-0023 “5.8.10 dmAreaNwkInfo” |
| *battery* | Provides the power information of the node (e.g. remaining battery charge) | TS-0023 “5.3.1.10 battery”, referenced in TS-0023 “5.8.2 flexNode” |
| *deviceCapability* | Contains information about the capability supported by the Node | TS-0023 “5.8.12 dmDeviceCapability” |
| *deviceInfo* | Contains information about the identity, manufacturer and model number of the device | TS-0023 “5.8.4 dmDeviceInfo” |
| *eventLog* | Contains information about the log of events of the Node | TS-0023 “5.8.8 dmEventLog” |
| *firmware* | Provides information about the firmware of the Node (e.g. name, version) | TS-0023 “5.8.6 dmFirmware” |
| *memory* | Provides the memory (typically RAM) information of the node (e.g. the amount of total volatile memory) | TS-0023 “5.8.3 dmAgent” |
| *reboot* | Used to reboot or reset the Node | TS-0023 “5.8.3 dmAgent” |
| *software* | Provides information about the software of the Node | TS-0023 “5.8.7 dmSoftware” and TS-0023 “5.8.9 dmPackage” |
| *storage* | To manage available storage memory on the device | TS-0023 “5.8.13 dmStorage” |

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

### \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* Start of change 2 \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

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.

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

It is a <flexContainer> child of the <node> resource targeted by the *nodeLink* attribute of *<flexContainer>* SDT devices (see in 6.2.2 the rules 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.



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

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

### 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 2 -------------------------------------------

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

### 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: Each ‘Property’ of a Device model is either mapped to a specialized [objectAttribute] of a [deviceInfo] <mgmtObj> resourcewhen the <node> resource targeted by the *nodeLink* attribute does not contain a [flexNode] child, or to a [customAttribute] of a [dmDeviceInfo] <flexContainer> resource, child of this [flexNode] resource if present.
* 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 3 -------------------------------------------

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

* 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 **.**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 4 -------------------------------------------

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

* 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 2 \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*