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| CHANGE REQUEST |
| Meeting ID:\* |  SDS #56 |
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| Date:\* | 2022-09-27 |
| Reason for Change/s:\* | Enhancing [dataCollection] mgmtObj Specialization |
| CR against: Release\* | Release 5 |
| 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-0022, V4.3.0 |
| Clauses \* | 7.1.1, 7.1.3, 7.2.3, 8.4, 9.2 |
| 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 |
| 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

This CR proposes an enhancement for the MgmtObj’s [dataCollection] specialization as well as a correction of a contradictory definition of attribute types.

The [dataCollection] specialization provides information for a device about the frequency of taking measurements and sending data to a CSE. Configurations can be made on a per-data-resource basis.

Currently, this configuration is only defined for data that is stored in a <container>/<contentInstance>. **Changes 1-4** propose to extend this configuration mechanism for <timeSeries>/<timeSeriesInstance> and <flexContainer> as well. This proposal does NOT include the <flexContainerInstance> resource type since these resources are created and managed by the CSE, not created by a device.

The second proposed change in **Change 3** updates the *reportingSchedule* and *measurementSchedule* attributes. First, in clause 7.1.3 these attributes are defined as the period in seconds. In clause 7.2.3.1, however, the data type is defined as *m2m:scheduleEntries*, which is a list of *m2m:scheduleEntry* (a string that contains a cron-like pattern). Beside the inconsistency in the definitions there are two problems with this data type:

First, for a constraint device the *m2m:scheduleEntry* is a very complicated data structure with a lot of options to consider. The schedule data types are usually used by the CSE to schedule actions etc. An *m2m:scheduleEntry* also requires a device to know the current exact date and time, something that is not always possible and actually not necessary with periodic intervals. A simple data type would be much easier to handle by the device, that is supposed to send data periodically.
If a device is supposed to perform a measurement or an action at an exact date and time, then it is up to an AE to set the interval accordingly.

Second, the schedule is not suited for some use cases, especially when it comes to millisecond resolutions. This resolution is something the <timeSeries>/<timeSeriesInstance> resource types support. The maximum resolution of *m2m:scheduleEntry*, however, is seconds.

After discussions with other delegates the proposal is to add two new attributes *reportingInterval* and *measurementInterval* that specify intervals instead of schedules and that can be set alternatively to the *reportingSchedule* and *measurementSchedule* attributes. The new attributes specify intervals in milliseconds.

It was also noted that CMDH provides similar functionality for configure reporting schedules / intervals for a node. We considered adding a note in **Change 2** that defines the precedence for CMDH over the configuration of [dataCollection] for reporting if both are configured for a node. However, upon further discussion we concluded that this management object applies to the behaviour of a device (on the device) and CMDH describes processes for the CSE. Therefore, there is no conflict, except that a Registrar CSE might check these values (*reportingInterval, reportingSchedule)* in a CREATE or UPDATE and return an RSC error if there is a schedule conflict.

### \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* Start of Change 1 \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

### 7.1.1 Introduction

The present clause specifies <*mgmtObj*> resource specializations used to configure AEs or CSEs on ADN or ASN/MN nodes in the Field Domain to establish M2M Service Layer operation.

Table 7.1.1-1 shows a summary of <*mgmtObj*> resource specializations defined in the present document.

Table 7.1.1-1: Summary of defined <*mgmtObj*> resources

| **mgmtObj** | **mgmtDefinition** | **Intended use** | **Note** |
| --- | --- | --- | --- |
| Registration | 1020 | Service Layer Configuration information needed to register an AE or CSE with a Registrar CSE. | This is M2M Service Provider dependent. |
| dataCollection | 1021 | Application Configuration information needed to establish collection of data within the AE and transmit the data to the Hosting CSE using <container>, <contentInstance>, <flexContainer>, <timeSeries> and <timeSeriesInstance> resource types. | This is M2M Application dependent. |
| authenticationProfile | 1022 | Security information needed to establish mutually-authenticated secure communications |  |
| myCertFileCred | 1023 | Configuring a file containing a certificate and associated information |  |
| trustAnchorCred | 1024 | Identifies a trust anchor certificate and provides a URL from which the certificate can be retrieved. The trust anchor certificate can be used to validate a certificate which the Managed Entity uses to authenticate another entity. |  |
| MAFClientRegCfg | 1025 | Instructions for performing the MAF Client Registration procedure with a MAF. Links to an Authentication Profile instance.  |  |
| MEFClientRegCfg | 1026 | Instructions for performing the MEF Client Registration procedure with a MEF. Links to an Authentication Profile instance.  |  |
| OAuth2Authentication | 1027 | To store access token and refresh token used in OAuth2 security protocol. |  |
| wificlient | 1028 | To store configuration of WiFi connection on the client device. |  |

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

### \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* Start of Change 2 \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

### 7.1.3 Resource [dataCollection]

This specialization of <*mgmtObj*> is used to convey the application configuration information needed by an AE to collect data and then transmit the data to a Hosting CSE.

The[*dataCollection*] resource shall contain the child resource specified in table 7.1.3-1.

Table 7.1.3-1: Child resources of *[dataCollection]* resource

| **Child Resources of *[dataCollection]*** | **Child Resource Type** | **Multiplicity** | **Description** |
| --- | --- | --- | --- |
| *[variable]* | *<subscription>* | 0..n | See clause 9.6.8 of oneM2M TS-0001 [2] |

The [*dataCollection*] resource shall contain the attributes specified in table 7.1.3-2.

Table 7.1.3-2: Attributes of *[dataCollection]* resource

| **Attributes of *[dataCollection]*** | **Multiplicity** | **RW/****RO/****WO** | **Description** |
| --- | --- | --- | --- |
| *resourceType* | 1 | RO | See clause 9.6.1.3 of oneM2M TS-0001 [2]. |
| *resourceID* | 1 | RO | See clause 9.6.1.3 of oneM2M TS-0001 [2]. |
| *resourceName* | 1 | WO | See clause 9.6.1.3 of oneM2M TS-0001 [2]. |
| *parentID* | 1 | RO | See clause 9.6.1.3 of oneM2M TS-0001 [2]. |
| *expirationTime* | 1 | RW | See clause 9.6.1.3 of oneM2M TS-0001 [2]. |
| *accessControlPolicyIDs* | 0..1 (L) | RW | See clause 9.6.1.3 of oneM2M TS-0001 [2]. |
| *creationTime* | 1 | RO | See clause 9.6.1.3 of oneM2M TS-0001 [2]. |
| *lastModifiedTime* | 1 | RO | See clause 9.6.1.3 of oneM2M TS-0001 [2]. |
| *labels* | 0..1(L) | RW | See clause 9.6.1.3 of oneM2M TS-0001 [2]. |
| *mgmtDefinition* | 1 | WO | See clause 9.6.15 of oneM2M TS-0001 [2]. This attribute shall have the fixed value 1021 ("dataCollection"). |
| *objectIDs* | 0..1 (L) | WO | See clause 9.6.15 of oneM2M TS-0001 [2]. |
| *objectPaths* | 0..1 (L) | WO | See clause 9.6.15 of oneM2M TS-0001 [2]. |
| *description* | 0..1 | RW | See clause 9.6.15 of oneM2M TS-0001 [2]. |
| *containerPath* | 1 | RW | The URI of the <container>, <flexContainer> or <timeSeries> resource in the hosting CSE that will be the target of a CREATE or UPDATE request with new data from the device. |
| *reportingSchedule* | 0..1 | RW | A list of schedules that indicate when to transmit the data to the Hosting CSE.Only one of *reportingSchedule* and *reportingInterval* shall be set. |
| *measurementSchedule* | 0..1 | RW | A list of schedules that indicate when the device will collect or measure the data. Only one of *measurementSchedule* and *measurementInterval* shall be set. |
| *reportingInterval* | 0..1 | RW | The frequency interval, in milliseconds, used to transmit the data to the Hosting CSE. A value of 0 ms switches off reporting. Only one of *reportingSchedule* and *reportingInterval* shall be set. |
| *measurementInterval* | 0..1 | RW | The frequency interval, in milliseconds, that the device will use to collect or measure the data. A value of 0 ms switches off measurement or collection of data. Only one of *measurementSchedule* and *measurementInterval* shall be set. |
| *mgmtLink* | 0..1 | RW | A link to a <*mgmtObj*> resource instance containing the information for establishing End-to-End Security of Primitives (ESPrim) between AE and hosting CSE. ESPrim is specified in oneM2M TS-0003 [3]. |
| NOTE: The present specification does not support configuration for End-to-End Security of Data (ESData) specified in oneM2M TS-0003 [3]. |

### \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* End of Change 2 \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* Start of Change 3 \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

### 7.2.3 Resource [dataCollection]

#### 7.2.3.1 Introduction

Table 7.2.3.1-1: Data Type Definition of [*dataCollection*]

|  |  |  |
| --- | --- | --- |
| **Data Type ID** | **File Name** | **Note** |
| dataCollection | DCFG-dataCollection.xsd |  |

Table 7.2.3.1-2: Resource specific attributes of [*dataCollection*]

|  |  |  |  |
| --- | --- | --- | --- |
| **Attribute Name** | **Request Optionality**  | **Data Type** | **Default Value and Constraints** |
| **Create** | **Update** |
| mgmtDefinition | M | NP | See clause 7.4.15 of oneM2M TS-0004 [4]. | 1021 (dataCollection) |
| objectIDs | O | NP | See clause 7.4.15 of oneM2M TS-0004 [4]. |  |
| objectPaths | O | NP | See clause 7.4.15 of oneM2M TS-0004 [4]. |  |
| description | O | O | See clause 7.4.15 of oneM2M TS-0004 [4]. |  |
| containerPath | M | O | m2m:ID | The URI of a <container>, <flexContainer>, or <timeSeries> resource in the hosting CSE that will be the target of a CREATE or UPDATE request with new data from the device. |
| reportingSchedule | O | O | m2m:scheduleEntries | A list of schedules used to transmit the measured or collected data to the Hosting CSE. If the entity that reports the data misses a reporting interval, the entity shall wait until the next interval to report the data.  |
| measurementSchedule | O | O | m2m:scheduleEntries | A list of schedules that the device will use to collect or measure the data.If the entity that measures or collects the data misses a measurement interval, the entity shall wait until the next interval to collect or measure the data. |
| *reportingInterval* | O | O | xs:positiveInteger | The periodic interval used to transmit the measured or collected data to the Hosting CSE. If the entity that reports the data misses a reporting interval, the entity shall wait until the next interval to report the data. A value of 0 ms switches off reporting. This is in unit of milliseconds. |
| *measurementInterval* | O | O | xs:positiveInteger | The periodic interval that the device will use to collect or measure the data. If the entity that measures or collects the data misses a measurement interval, the entity shall wait until the next interval to collect or measure the data. A value of 0 ms switches off measurement or collection of data. This is in unit of milliseconds. |
| mgmtLink | O | O | m2m:mgmtLinkRef | 1 link to a [authenticationProfile]. See note. |
| NOTE: The SUID in the linked [*authenticationProfile*] instance constrains the security framework to be used with the Authentication Profile. The security frameworks used with the [*dataCollection*] resource are End-to-End Security of Primitives (ESPrim). The entity composing a [*dataCollection*] instance is expected to confirm that the linked Authentication Profile contains a SUID corresponding to ESPrim. The SUIDs corresponding to ESPrim security frameworks are the values 13, 23, 33 or 43 as defined in oneM2M TS-0004 [4]. |

#### 7.2.3.2 Resource specific procedure on CRUD operations

When management is performed using technology specific protocols, the procedures defined in clause 7.4.15.2 of oneM2M TS-0004, '<*mgmtObj*> specific procedures' shall be used. There is no change from the generic procedures in clause 7.2.2 of oneM2M TS-0004 [4] for operations on this resource, except for the CREATE and UPDATE procedures.

##### 7.2.3.2.1 Create

***Originator:***

The originator shall only set at most one of each of the following attributes in the request:

* *reportingSchedule* or *reportingInterval* (only one of these attributes can be set)
* *measurementSchedule* or *measurementInterval.* (only one of these attributes can be set)

No other change from the generic procedures in clause 7.2.2.1 of oneM2M TS-0004 [4].

***Receiver:***

The following are changes to the receiver procedures described in clause 7.2.2.2 of oneM2M TS-0004 [4]:

1. Recv-6.5: The following steps are in addition to the generic Create procedures defined in clause 7.3.3.5 of oneM2M TS-0004 [4]:
2. The request shall be rejected with a "BAD\_REQUEST" ***Response Status Code*** if both *reportingSchedule* and *reportingInterval* are present in the request.
3. The request shall be rejected with a "BAD\_REQUEST" ***Response Status Code*** if both *measurementSchedule* and *measurementInterval* are present in the request.

No other changes from the generic procedures in clause 7.2.2.2 of oneM2M TS-0004 [4].

##### 7.2.3.2.2 Update

***Originator:***

The originator shall only set at most one of each of the following attributes in the request:

* *reportingSchedule* or *reportingInterval* (only one of these attributes can be set)
* *measurementSchedule* or *measurementInterval.* (only one of these attributes can be set)

No other change from the generic procedures in clause 7.2.2.1 of oneM2M TS-0004 [4].

***Receiver:***

The following are changes to the receiver procedures described in clause 7.2.2.2 of oneM2M TS-0004 [4]:

1. Recv-6.5: The following steps are in addition to the generic Update procedures defined in clause 7.3.3.7 of oneM2M TS-0004 [4]:
2. The request shall be rejected with a "BAD\_REQUEST" ***Response Status Code*** if both *reportingSchedule* and *reportingInterval* are present in the request, or when, as a result of the Update procedure, both attributes are present in the resource.
3. The request shall be rejected with a "BAD\_REQUEST" ***Response Status Code*** if both *measurementSchedule* and *measurementInterval* are present in the request, or when, as a result of the Update procedure, both attributes are present in the resource.

No other changes from the generic procedures in clause 7.2.2.2 of oneM2M TS-0004 [4].

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* End of Change 3 \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* Start of Change 4 \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

## 8.4 Enabling data collection by [dataCollection] resource

When an AE needs to measure or collect data to be later reported to a Hosting CSE, report measured data to a CSE, the ASN/ ADN may be instructed when to measure/collect the data and then when to report the measured/collected data along with where to place the data within the Hosting CSE.

Once the AE is configured with the [*dataCollection*] resource the AE sends new data through CREATE or UPDATE requests to the <container>, <flexContainer>, or <timeSeries> resources that are specified in the 'containerPath' attribute of the [*dataCollection*] resource to report the measured/collected data. The schedules and frequencies of collection/measurement and reporting are accordingly specified as 'reportingSchedule' resp. ‘reportingInterval’, and 'measurementSchedule' resp ‘measurementInterval’ attributes of the [*dataCollection*] resource.

Note: An application must be aware that a device may have more than one [dataCollection] configurations installed and will report data at each scheduled time resp. for each interval.

Note: The reporting schedule may be different from the schedule when a CSE is able to receive requests. It is the responsibility of an infrastructure management system to align these schedules.

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* End of Change 4 \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* Start of Change 5 \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

## 9.2 Common and Field Device Configuration specific oneM2M Resource attributes

In protocol bindings, resource attribute names shall be translated into short names of table 9.2-1 and in table 8.2.3-1 of oneM2M TS-0004 [4].

Table 9.2-1: Common and Field Device Configuration specific oneM2M Attribute Short Names

| **Attribute Name** | **Occurs in** | **Short Name** | **Notes** |
| --- | --- | --- | --- |
| *resourceType* | All | ***ty*** | Defined in oneM2M TS-0004 [4]. |
| *resourceID* | All | ***ri*** | Defined in oneM2M TS-0004 [4]. |
| *resourceName* | All | ***rn*** | Defined in oneM2M TS-0004 [4]. |
| *parentID* | All | ***pi*** | Defined in oneM2M TS-0004 [4]. |
| *expirationTime* | All | ***et*** | Defined in oneM2M TS-0004 [4]. |
| *creationTime* | All | ***ct*** | Defined in oneM2M TS-0004 [4]. |
| *labels* | All | ***lbl*** | Defined in oneM2M TS-0004 [4]. |
| *lastModifiedTime* | All | ***lt*** | Defined in oneM2M TS-0004 [4]. |
| *description* | All | ***dc*** | Defined in oneM2M TS-0004 [4]. |
| *mgmtDefinition* | All | ***mgd*** | Defined in oneM2M TS-0004 [4]. |
| *objectIDs* | All | ***obis*** | Defined in oneM2M TS-0004 [4]. |
| *objectPaths* | All | ***obps*** | Defined in oneM2M TS-0004 [4]. |
| *mgmtLink* | All | ***cmlk*** | Defined in oneM2M TS-0004 [4]. |
| *CSE-ID* | registration | ***csi*** | Defined in oneM2M TS-0004 [4]. |
| *CSEBase* | registration | ***cb*** | Defined in oneM2M TS-0004 [4]. |
| *originatorID* | registration | ***oid*** |  |
| *pointOfAccess* | registration | ***poa*** |  |
| *appID* | registration | ***apid*** |  |
| *externalID* | registration | ***eid*** |  |
| *Trigger-Recipient-ID* | registration | ***tri*** | Defined in oneM2M TS-0004 [4]. |
| *containerPath* | dataCollection | ***cntp*** |  |
| *reportingSchedule* | dataCollection | ***rpsc*** |  |
| *measurementSchedule* | dataCollection | ***mesc*** |  |
| *reportingInterval* | dataCollection | ***rpil*** |  |
| *measurementInterval* | datacollection | ***meil*** |  |
| *SUID* | authenticationProfile | ***suid*** |  |
| *TLSCiphersuites* | authenticationProfile | ***tlcs*** |  |
| *symmKeyID* | authenticationProfile | ***ski*** |  |
| *symmKeyValue* | authenticationProfile | ***skv*** |  |
| *MAFKeyRegLabels* | authenticationProfile | ***mkrl*** |  |
| *MAFKeyRegDuration* | authenticationProfile | ***mkrd*** |  |
| *mycertFingerprint* | authenticationProfile | ***mcfp*** |  |
| *rawPubKeyID* | authenticationProfile | ***rpki*** |  |
| *SUIDs* | myCertFileCred | ***suids*** |  |
| *myCertFileFormat* | myCertFileCred | ***mcff*** |  |
| *myCertFileContent* | myCertFileCred | ***mcfc*** |  |
| *certFingerprint* | trustAnchorCred | ***cfp*** |  |
| *URI* | trustAnchorCred | ***uri*** | Defined in oneM2M TS-0004 [4]. |
| *fqdn* | MEFClientRegCfg,MAFClientRegCfg | ***fq*** | Defined in oneM2M TS-0032 [9]. |
| *adminFQDN* | MEFClientRegCfg, MAFClientRegCfg | ***adfq*** | Defined in oneM2M TS-0032 [9]. |
| *httpPort* | MEFClientRegCfg, MAFClientRegCfg | ***hpt*** | Defined in oneM2M TS-0032 [9]. |
| *coapPort* | MEFClientRegCfg, MAFClientRegCfg | ***copt*** | Defined in oneM2M TS-0032 [9]. |
| *websocketPort* | MEFClientRegCfg, MAFClientRegCfg | ***wpt*** | Defined in oneM2M TS-0032 [9]. |

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* End of Change 5 \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*