|  |
| --- |
|  |

|  |  |
| --- | --- |
| CHANGE REQUEST | |
| Meeting ID:\* | SDS#45 |
| Source:\* | JaeSeung Song, KETI, jssong@sejong.ac.kr  Sherzod Elamanov, KETI, [selamanov@gmail.com](mailto:selamanov@gmail.com)  Minbyeong Lee, Hyundai Motors, [minbyeong.lee@hyundai.com](mailto:minbyeong.lee@hyundai.com) |
| Date:\* |  |
| Reason for Change/s:\* | Add deleteCnt to TS-0004 |
| CR against: Release\* | Release 4 |
| CR against: WI\* | Active WI-0080  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-0004 v4.0.0 |
| Clauses \* | 7.4.7.1 / 7.4.7.2.2 / 8.2.3 |
| 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 |  |
| 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 2019 (do not modify) | |

**oneM2M Notice**

The document to which this cover statement is attached is submitted to oneM2M. Participation in, or attendance at, any activity of oneM2M, constitutes acceptance of and agreement to be bound by terms of the Working Procedures and the Partnership Agreement, including the Intellectual Property Rights (IPR) Principles Governing oneM2M Work found in Annex 1 of the Partnership Agreement.

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

In TP #40, the RDM group agreed the following two requirements to support a volatile feature in the oneM2M system:

|  |  |  |
| --- | --- | --- |
| OSR-187  See RDM-2019-0046R01 | The oneM2M System shall be able to enable mechanisms for access control and resource lifecycle management based on number and types of operations on oneM2M resources. | Rel-4 |
| OSR-188  See RDM-2019-0046R01 | The oneM2M System shall be able to operate (e.g., delete) a resource based on resource operation policy (e.g., delete a resource when the resource is read by a specific application) | Rel-4 |

The main purpose of this contribution is to propose a solution to these requirements.

With the proposed solution, the oneM2M system can support new IoT services enabling self-deleting feature. Several examples are listed below:

* *“Snapchat” similar IoT applications*: if received data is read by user, the data is deleted within 10 sec. if not read by the user, data is deleted after 24 hours.
* *Security & Privacy related IoT services*: any data associated with personal information shouldn’t be shared by others. Data shouldn’t be stored in a platform.
* *Medical and wearable IoT services*: only a dedicated doctor can read medical data from the platform. Then the data should be removed.

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

### 7.4.7 Resource Type <contentInstance>

#### 7.4.7.1 Introduction

The <contentInstance> resource represents a data instance in the container.

The detailed description can be found in clause 9.6.7 in oneM2M TS-0001 [6].

Table 7.4.7.1‑1: Data type definition of <contentInstance> resource

|  |  |  |
| --- | --- | --- |
| **Data Type ID** | **File Name** | **Note** |
| contentInstance | CDT-contentInstance-v4\_0\_0.xsd |  |

Table 7.4.7.1‑2: Universal/Common Attributes of <contentInstance> resource

|  |  |
| --- | --- |
| Attribute Name | Request Optionality |
| Create |
| *@resourceName* | O |
| *resourceType* | NP |
| *resourceID* | NP |
| *parentID* | NP |
| *expirationTime* | O |
| *creationTime* | NP |
| *lastModifiedTime* | NP |
| *stateTag* | NP |
| *labels* | O |
| *announceTo* | O |
| *announcedAttribute* | O |
| *creator* | O |

Table 7.4.7.1‑3: Resource Specific Attributes of <contentInstance> resource

|  |  |  |  |
| --- | --- | --- | --- |
| Attribute Name | Request Optionality | Data Type | Default Value and Constraints |
| Create |
| *contentInfo* | O | m2m:contentInfo | No default |
| *contentSize* | NP | xs:nonNegativeInteger | No default |
| *contentRef* | O | m2m:contentRef | No default |
| *ontologyRef* | O | xs:anyURI | No default |
| *content* | M | xs:anyType | No default (Transfer encoding may be applied, and indicated applied encoding as part of the *contentInfo* attribute) |
| *deletionCnt* | O | xs:positiveInteger | No default |

Table 7.4.7.1‑4: Child resources of <contentInstance> resource

|  |  |  |  |
| --- | --- | --- | --- |
| **Child Resource Type** | **Child Resource Name** | **Multiplicity** | **Ref. to in Resource Type Definition** |
| <semanticDescriptor> | [variable] | 0..n | Clause 7.4.34 |
| <transaction> | [variable] | 0..n | Clause 7.4.61 |

The *contentInfo* attribute shall provide meta information about the stored data in *content* and is optional. See the definition of m2m:contentInfo in Table 6.3.3‑1: oneM2M Simple Data Types for details

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

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

##### 7.4.7.2.2 Retrieve

***Originator:***

No change from the generic procedures in clause 7.2.2.1.

***Receiver:***

Same as the generic procedures in clause 7.2.2.2 except following conditions:

* If the value of *disableRetrieval* attribute of the parent <container> resource is true, then the Hosting CSE shall return a response primitive with a ***Response Status Code*** indicating "OPERATION\_NOT\_ALLOWED" error.
* If the *deletionCnt* attribute is present, then the Hosting CSE shall decrement the attribute by 1. If the counter becomes 0, the Hosting CSE shall delete the resource and update *currentNrOfInstanes* and *currentByteSize* of direct parent <container> resource.

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

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

##### 7.5.1.2.2 Notification for <subscription> resources

When the notification message is forwarded or aggregated by transit CSEs, the Originator or a transit CSE shall check whether there are notification policies to enforce between subscription resource Hosting CSE and the notification target. In that case, the transit CSE as well as the Originator shall process Notify request primitive(s) by using the corresponding policy and send processed Notify request primitive(s) to the next CSE with notification policies related to the enforcement so that the transit CSE is able to enforce the policy defined by the subscriber. The notification policies related to the enforcement at this time is verified by using the subscription reference in the Notify request primitive. In the notification policies, the *latestNotify* attribute is only enforced in the transit CSE as well as the Originator.

If ***Event Category*** parameter is set to "latest" in the notification request primitive, the transit CSE as well as Originator shall cache the most recent Notify request. That is, if a new Notify request is received by the CSE with a subscription reference that has already been buffered for a pending Notify request, the newer Notify request will replace the buffered older Notify request.

***Originator:***

When an event is generated, the Originator shall execute the following steps in order:

Step 1.0 Check the *eventNotificationCriteria* attribute of the <subscription> resource associated with the modified resource:

* If the *eventNotificationCriteria* attribute is set, then the Originator shall check whether the corresponding event matches with the event criteria. If multiple matching conditions of different types (i.e. different condition tags) are present in the *eventNotificationCriteria* attribute, then the combined condition shall be derived by applying the logical operation specified by the *filterOperation* condition. By default the logical AND operation shall be used if the *filterOperation* condition is not present.
* If *notificationEventType* is not set within the *eventNotificationCriteria* attribute and the *operationMonitor* is also not present, the Originator shall use the default setting of "Update\_of\_Resource" to compare against the event.
* If the *notificationEventType* has the value "Create\_of\_Direct\_Child\_Resource" or "Delete of Direct Child Resource" and the *childResourceType* condition is also present, then the matching event shall only be detected if one of the child resource types present in the list has been created or deleted, respectively. If the *childResourceType* condition is not present then a matching event is generated whenever any child resource is created or deleted. If the *deletionCnt* attribute is set, then a successful notification for a new <*contentInstance*> resource creation decrements the counter by one. If the counter meets zero, the <*contentInstance*> resource shall be deleted. A single notification event regardless of the number of subscriptions, possibly generating multiple notifications, is considered as one retrieval.
* If the *notificationEventType* has either an explicit or default value of "Update\_of\_Resource" and the *attribute* condition is also present then the matching event shall only be detected if one of the attributes in the list has been updated. If the *attribute* condition is not present then a matching event is generated whenever any attribute has been updated.
* If the event matches, go to the step 2.0. Otherwise, the Originator shall discard the corresponding event.
* If the *eventNotificationCriteria* attribute is not configured, the Originator shall use the default setting of "Update\_of\_Resource" for the *notificationEventType* and then continue with the step 2.0.

Step 2.0 The Originator shall check the notification policy as described in the below steps, but the notification policy may be checked in different order. After checking the notification policy in step 2.0 (i.e. from step 2.1 to step 2.6), then continue with step 3.0.

Step 2.1 The Originator shall determine the type of the notification per the *notificationContentType* attribute. The possible values of for *notificationContentType* attribute are "Modified Attributes", "All Attributes", "ResourceID" or "Trigger Payload". This attribute may be used jointly with eventType attribute in the eventNotificationCriteria to determine if it is the attributes/resourceID of the subscribed-to resource or the attributes/resourceID of the child resource of the subscribed-to resource that shall be returned in the notification:

* If the value of *notificationContentType* is set to "Modified Attributes", the Notify request primitive shall include the partial resource containing modified attribute(s) only (Refer to clause 7.2.1.2 for response content description).
* If the value of *notificationContentType* is set to "All Attributes", the Notify request primitive shall include the complete resource with all attributes (Refer to clause 7.2.1.2 for response content description).
* If the value of *notificationContentType* is set to "ResourceID", the Notify request primitive shall include the URI of the resource (Refer to clause 7.2.1.2 for response content description).
* If the value of *notificationContentType* is set to "Trigger Payload", the Notify request primitive shall include the trigger payload (Refer to clause 9.2.1 for trigger payload description).

Step 2.2 Check the *notificationEventCat* attribute:

* If the *notificationEventCat* attribute is set, the Notify request primitive shall employ the ***Event Category*** parameter as given in the *notificationEventCat* attribute. Then continue with the step 2.3.
* If the *notificationEventCat* attribute is not configured, then continue with step 2.3.

Step 2.3 Check the *latestNotify* attribute:

* If the *latestNotify* attribute is set, the Originator shall assign ***Event Category*** parameter of value "latest" of the notifications generated pertaining to the subscription created.

Step 2.4 Check the batching notifications policy:

* See details in oneM2M TS-0001 [6], clause 10.2.10.7.

NOTE: The use of some attributes such as *rateLimit* and *preSubscriptionNotify* is not supported in the present document.

Step 2.5 Check the *notificationURI* attribute:

* The Originator shall fetch the *notificationURI* attribute and set the value to the ***To*** parameter of the Notify request. When the *notificationURI* attribute contains more than one target, the Originator shall generate each Notify request per target.
* If the *notificationURI* attribute includes the notification serialization indication, in form of key-value pair, e.g. "ct=json", after the delimiter "?", the Originator shall serialize the notification for the notification target in that serialization type. The delimiter with the serialization indication shall be removed when the target is set to the ***To*** parameter of the Notify request. Then continue with step 3.0.

Step 3.0 The Originator shall check the notification and reachability schedules, but the notification schedules may be checked in different order:

* If the <subscription> resource associated with the modified resource includes a <notificationSchedule> child resource, the Originator shall check the time periods given in the scheduleElement attribute of the <notificationSchedule> child resource.
* Also, the Originator shall check the reachability schedule associated with the Receiver by exploring its <schedule> resource. If reachability schedules are not present in a Node then that Entity is considered to be always reachable.
* If notificationSchedule and reachability schedule indicate that message transmission is allowed, then proceed with step 5.0. Otherwise, proceed with step 4.0.
* In particular, if the *notificationEventCat* attribute is set to 'immediate' and the <notificationSchedule> resource does not allow transmission, then go to step 5.0 and send the corresponding Notify request primitive by temporarily ignoring the Originator's notification schedule.

Step 4.0 Check the *pendingNotification* attribute:

* If the *pendingNotification* attribute is set, then the Originator shall cache pending Notify request primitives according to the *pendingNotification* attribute. The possible values are 'sendLatest' and 'sendAllPending'. If the value of pendingNotification is set to 'sendLatest', the most recent Notify request primitive shall be cached by the Originator and it shall set the ***Event Category*** parameter to "latest". If *pendingNotification* is set to 'sendAllPending', all Notify request primitives shall be cached by the Originator. If the *pendingNotification* attribute is not configured, the Originator shall discard the corresponding Notify request primitive. The processed Notify request primitive by the *pendingNotification* attribute is sent to the Receiver once message transmission becomes possible (see the step 6.0).

Step 5.0 Check the *expirationCounter* attribute:

* If the *expirationCounter* attribute is set, then it shall be decreased by one when the Originator successfully sends the Notify request primitive. If the counter equals to zero('0'), the corresponding <subscription> resource shall be deleted. Then end the 'Compose Notify Request Primitive' procedure.
* If the *expirationCounter* attribute is not configured, then end the 'Compose Notify Request Primitive' procedure.

When message transmission becomes possible, the Originator shall execute the following steps in order:

Step 6.0 If the *pendingNotification* attribute is set, the Originator shall send the processed Notify request primitive by the *pendingNotification* attribute and then continue with the step 7.0

Step 7.0 Check the *expirationCounter* attribute:

* If the *expirationCounter* attribute is set, then its value shall be decreased by one when the Originator successfully sends the Notify request primitive. If the counter meets zero, the corresponding <subscription> resource shall be deleted. Then end the 'Compose Notify Request Primitive' procedure.
* If the *expirationCounter* attribute is not configured, then end the 'Compose Notify Request Primitive' procedure.

***Receiver:***

When the Hosting CSE receives a Notify request primitive, the Hosting CSE shall check validity of the primitive parameters. In case the Receiver is a transit CSE which forwards or aggregates Notify request primitives before sending to the subscriber or other transit CSEs, upon receiving the Notify request primitive with the ***Event Category*** parameter set to "latest", the Receiver shall identify the latest Notify request primitive with the same subscription reference while storing Notify request primitives locally. When the Receiver as a transit CSE needs to send pending Notify request primitives, it shall send the latest Notify request primitive. When the Receiver as a transit CSE needs to send Notify request primitives, it shall use one of the serializations specified in the subscriber or other transit CSE *contentSerialization* attribute. If there is no *contentSerialization* value specified the transit CSE may use any serialization format.

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

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

### 8.2.3 Resource attributes

In protocol bindings, resource attributes names shall be translated into short names shown in the following tables.

Table 8.2.3‑1: Resource attribute short names (1/6)

| Attribute Name | Occurs in | Short Name |
| --- | --- | --- |
| *accessControlPolicyIDs* | All except accessControlPolicy, contentInstance | ***acpi*** |
| *announcedAttribute* | accessControlPolicy, AE, container, contentInstance, group, locationPolicy, mgmtObj, node, remoteCSE, schedule, semanticDescriptor | ***aa*** |
| *announceTo* | accessControlPolicy, AE, container, contentInstance, group, locationPolicy, mgmtObj, node, remoteCSE, schedule, semanticDescriptor | ***at*** |
| *creationTime* | All | ***ct*** |
| *expirationTime* | All except contentInstance, CSEBase | ***et*** |
| labels | All (optional) | ***lbl*** |
| *lastModifiedTime* | All | ***lt*** |
| *link* | All | ***lnk*** |
| *parentID* | All | ***pi*** |
| *resourceID* | All | ***ri*** |
| resourceType | All | ***ty\**** |
| *stateTag* | container, contentInstance, delivery, request | ***st*** |
| *resourceName* | All | ***rn*** |
| *privileges* | accessControlPolicy | ***pv*** |
| *selfPrivileges* | accessControlPolicy | ***pvs*** |
| *authorizationDecisionResourceIDs* | accessControlPolicy | ***adri*** |
| *authorizationPolicyResourceIDs* | accessControlPolicy | ***apri*** |
| *authorizationInformationResourceIDs* | accessControlPolicy | ***airi*** |
| *App-ID* | AE | ***api*** |
| *AE-ID* | AE | ***aei*** |
| *AE-IDList* | AEContactListPerCSE | ***ail*** |
| *appName* | AE | ***apn*** |
| *pointOfAccess* | AE, CSEBase, remoteCSE | ***poa*** |
| *ontologyRef* | AE, container, contentInstance, semanticDescriptor. flexContainer, timeSeries | ***or*** |
| *nodeLink* | AE, CSEBase, remoteCSE, flexContainer | ***nl*** |
| contentSerialization | AE | ***csz*** |
| *registrationStatus* | AE | ***regs*** |
| *trackRegistrationPoints* | AE | ***trps*** |
| *sessionCapabilities* | AE | ***scp*** |
| *activityPatternElements* | AE, remoteCSE | ***ape*** |
| *triggerEnable* | AE, remoteCSE | ***tren*** |
| *creator* | container, contentInstance, eventConfig, group, pollingChannel, statsCollect, statsConfig, subscription, semanticDescriptor, notificationTargetPolicy, flexContainer, timeSeries, crossResourceSubscription, backgroundDataTransfer | ***cr*** |
| *maxNrOfInstances* | container, timeSeries, flexContainer | ***mni*** |
| *maxByteSize* | container, timeSeries, flexContainer | ***mbs*** |
| *maxInstanceAge* | container, timeSeries, flexContainer | ***mia*** |
| *currentNrOfInstances* | container, timeSeries, flexContainer | ***cni*** |
| *location* | *CSEBase*, *remoteCSE*, *AE*, *container*, *flexContainer*, *timeSeries, deviceInfo* | ***loc*** |

Table 8.2.3‑2: Resource attribute short names (2/6)

| Attribute Name | Occurs in | Short Name |
| --- | --- | --- |
| *currentByteSize* | container,timeSeries, flexContainer | ***cbs*** |
| *locationID* | container | ***li*** |
| *disableRetrieval* | container | ***disr*** |
| *contentInfo* | contentInstance, timeSeries | ***cnf*** |
| *contentSize* | contentInstance, timeSeriesInstance, flexContainer, flexContainerInstance | ***cs*** |
| *contentRef* | contentInstance | ***conr*** |
| *containerDefinition* | flexContainer | ***cnd*** |
| *primitiveContent* | request | ***pc\**** |
| *content* | contentInstance, timeSeriesInstance | ***con*** |
| *deletionCnt* | contentInstance | ***dcnt*** |
| *cseType* | CSEBase, remoteCSE | ***cst*** |
| *CSE-ID* | CSEBase, remoteCSE, service SubscribedNode, AEContactListPerCSE | ***csi*** |
| *supportedResourceType* | CSEBase | ***srt*** |
| *notificationCongestionPolicy* | CSEBase | ***ncp*** |
| *source* | delivery | ***sr*** |
| *target* | delivery, request | ***tg*** |
| *lifespan* | delivery | ***ls*** |
| *eventCat* | delivery | ***ec*** |
| *deliveryMetaData* | delivery | ***dmd*** |
| *aggregatedRequest* | delivery | ***arq*** |
| *eventID* | eventConfig, statsCollect | ***evi*** |
| *eventType* | eventConfig | ***evt*** |
| *evenStart* | eventConfig | ***evs*** |
| *eventEnd* | eventConfig | ***eve*** |
| *operationType* | eventConfig | ***opt*** |
| *dataSize* | eventConfig | ***ds*** |
| *eventResourceTypes* | eventConfig | ***erts*** |
| *eventResourceIDs* | eventConfig | ***eris*** |
| *execStatus* | execInstance | ***exs*** |
| *execResult* | execInstance | ***exr*** |
| *execDisable* | execInstance | ***exd*** |
| *execTarget* | execInstance, mgmtCmd | ***ext*** |
| *execMode* | execInstance, mgmtCmd | ***exm*** |
| *execFrequency* | execInstance, mgmtCmd | ***exf*** |
| *execDelay* | execInstance, mgmtCmd | ***exy*** |
| *execNumber* | execInstance, mgmtCmd | ***exn*** |
| *execReqArgs* | execInstance, mgmtCmd | ***exra*** |
| *execEnable* | mgmtCmd | ***exe*** |
| *memberType* | group | ***mt*** |
| *specializationType* | group | ***spty*** |
| *currentNrOfMembers* | group | ***cnm*** |
| *maxNrOfMembers* | group | ***mnm*** |
| *memberIDs* | group, backgroundDataTransfer | ***mid*** |
| *membersAccessControlPolicyIDs* | group | ***macp*** |
| *memberTypeValidated* | group | ***mtv*** |
| *consistencyStrategy* | group | ***csy*** |
| *semanticSupportIndicator* | group | ***ssi*** |
| *notifyAggregation* | group | ***nar*** |
| *groupName* | group, subscription | ***gn*** |
| *locationSource* | locationPolicy | ***los*** |
| *locationUpdatePeriod* | locationPolicy | ***lou*** |
| *locationTargetID* | locationPolicy | ***lot*** |
| *locationServer* | locationPolicy | ***lor*** |
| *locationContainerID* | locationPolicy | ***loi*** |
| *locationContainerName* | locationPolicy | ***lon*** |
| *locationStatus* | locationPolicy | ***lost*** |
| *authID* | locationPolicy | ***aid*** |
| *retrieveLastKnownLocation* | locationPolicy | ***rlkl*** |
| *locationUpdateEventCriteria* | locationPolicy | ***luec*** |
| *locationInformationType* | locationPolicy | ***lit*** |
| *geographicalTargetArea* | locationPolicy | ***gta*** |
| *geofenceEventCriteria* | locationPolicy | ***gec*** |
| *description* | mgmtCmd, mgmtObj, all management resources from firmware, ontology, ontologyMappingAlgorithm | ***dc*** |
| *cmdType* | mgmtCmd | ***cmt*** |
| *mgmtDefinition* | mgmtObj, all management resources from firmware | ***mgd*** |
| *objectIDs* | mgmtObj | ***obis*** |

Table 8.2.3‑3: Resource attribute short names (3/6)

| Attribute Name | Occurs in | Short Name |
| --- | --- | --- |
| *objectPaths* | mgmtObj | ***obps*** |
| *mgmtSchema* | mgmtObj | ***mgs*** |
| *nodeID* | node | ***ni*** |
| *hostedCSELink* | node | ***hcl*** |
| *mgmtClientAddress* | node | ***mgca*** |
| *hostedAELinks* | node | ***hael*** |
| *hostedServiceLinks* | node | ***hsl*** |
| *networkID* | node | ***nid*** |
| *roamingStatus* | node | ***rms*** |
| *nodeType* | node | ***nty*** |
| *CSEBase* | remoteCSE | ***cb\**** |
| *M2M-Ext-ID* | remoteCSE, AE, locationPolicy, triggerRequest | ***mei*** |
| *Trigger-Recipient-ID* | remoteCSE, triggerRequest | ***tri*** |
| *requestReachability* | remoteCSE | ***rr*** |
| *triggerReferenceNumber* | remoteCSE | ***trn*** |
| *descendantCSEs* | remoteCSE | ***dcse*** |
| *multicastCapability* | remoteCSE | ***mtcc*** |
| *originator* | request | ***org*** |
| *metaInformation* | request | ***mi*** |
| *requestStatus* | request | ***rs*** |
| *operationResult* | request | ***ors*** |
| *operation* | request | ***op\**** |
| *requestID* | request | ***rid*** |
| *scheduleElement* | schedule | ***se*** |
| *networkCoordinated* | schedule | ***nco*** |
| *deviceIdentifier* | serviceSubscribedNode | ***di*** |
| *ruleLinks* | serviceSubscribedNode | ***rlk*** |
| *niddRequired* | serviceSubscribedNode | ***nrq*** |
| *statsCollectID* | statsCollect | ***sci*** |
| *collectingEntityID* | statsCollect | ***cei*** |
| *collectedEntityID* | statsCollect | ***cdi*** |
| *devStatus* | areaNwkDeviceInfo | ***ss*** |
| *statsRuleStatus* | statsCollect | ***srs*** |
| *statModel* | statsCollect | ***sm*** |
| *collectPeriod* | statsCollect | ***cp*** |
| *eventNotificationCriteria* | subscription | ***enc*** |
| *expirationCounter* | subscription, crossResourceSubscription | ***exc*** |
| *notificationURI* | subscription, crossResourceSubscription | ***nu*** |
| *groupID* | subscription | ***gpi*** |
| *notificationForwardingURI* | subscription | ***nfu*** |
| *batchNotify* | subscription | ***bn*** |
| *rateLimit* | subscription | ***rl*** |
| *preSubscriptionNotify* | subscription | ***psn*** |
| *pendingNotification* | subscription | ***pn*** |
| *notificationStoragePriority* | subscription | ***nsp*** |
| *latestNotify* | subscription | ***ln*** |
| *notificationContentType* | subscription | ***nct*** |
| *notificationEventCat* | subscription, crossResourceSubscription | ***nec*** |
| *subscriberURI* | subscription, crossResourceSubscription | ***su*** |
| *version* | firmware, software, token | ***vr*** |
| *URL* | firmware, software | ***url*** |
| *update* | firmware | ***ud*** |
| *updateStatus* | firmware | ***uds*** |
| *install* | software | ***in*** |
| *uninstall* | software | ***un*** |
| *installStatus* | software | ***ins*** |
| *activate* | software | ***act*** |
| *deactivate* | software | ***dea*** |
| *activeStatus* | software, areaNwkInfo | ***acts*** |
| *memAvailable* | memory | ***mma*** |
| *memTotal* | memory | ***mmt*** |

Table 8.2.3‑4: Resource attribute short names (4/6)

| Attribute Name | Occurs in | Short Name |
| --- | --- | --- |
| *areaNwkType* | areaNwkInfo | ***ant*** |
| *listOfDevices* | areaNwkInfo | ***ldv*** |
| *devId* | areaNwkDeviceInfo | ***dvd*** |
| *devType* | areaNwkDeviceInfo | ***dvt*** |
| *areaNwkId* | areaNwkDeviceInfo | ***awi*** |
| *sleepInterval* | areaNwkDeviceInfo | ***sli*** |
| *sleepDuration* | areaNwkDeviceInfo | ***sld*** |
| *listOfNeighbors* | areaNwkDeviceInfo | ***lnh*** |
| *batteryLevel* | battery | ***btl*** |
| *batteryStatus* | battery | ***bts*** |
| *deviceLabel* | deviceInfo | ***dlb*** |
| *manufacturer* | deviceInfo | ***man*** |
| *model* | deviceInfo | ***mod*** |
| *deviceType* | deviceInfo | ***dty*** |
| *fwVersion* | deviceInfo | ***fwv*** |
| *swVersion* | deviceInfo | ***swv*** |
| *hwVersion* | deviceInfo | ***hwv*** |
| *manufacturerDetailsLink* | deviceInfo | ***mfdl*** |
| *manufacturingDate* | deviceInfo | ***mfd*** |
| *subModel* | deviceInfo | ***smod*** |
| *deviceName* | deviceInfo | ***dvnm*** |
| *osVersion* | deviceInfo | ***osv*** |
| *country* | deviceInfo | ***cnty*** |
| *systemTime* | deviceInfo | ***syst*** |
| *supportURL* | deviceInfo | ***spur*** |
| *presentationURL* | deviceInfo | ***purl*** |
| *protocol* | deviceInfo | ***ptl*** |
| *capabilityName* | deviceCapability | ***can*** |
| *attached* | deviceCapability | ***att*** |
| *capabilityActionStatus* | deviceCapability | ***cas*** |
| *enable* | deviceCapability, allJoynSvcObject | ***ena*** |
| *disable* | deviceCapability | ***dis*** |
| *currentState* | deviceCapability | ***cus*** |
| *reboot* | reboot | ***rbo*** |
| *factoryReset* | reboot | ***far*** |
| *logTypeId* | eventLog | ***lgt*** |
| *logData* | eventLog | ***lgd*** |
| *logStatus* | eventLog | ***lgst*** |
| *logStart* | eventLog | ***lga*** |
| *logStop* | eventLog | ***lgo*** |
| *firmwareName* | firmware | ***fwn*** |
| *softwareName* | software | ***swn*** |
| *cmdhPolicyName* | cmdhPolicy | ***cpn*** |
| *mgmtLink* | cmdhPolicy, activeCmdhPolicy, cmdhDefaults, cmdhNetworkAccessRules, cmdhNwAccessRule | ***cmlk*** |
| *activeCmdhPolicyLink* | activeCmdhPolicy | ***acmlk*** |
| *order* | cmdhDefEcValue, cmdhLimits | ***od*** |
| *defEcValue* | cmdhDefEcValue | ***dev*** |
| *requestOrigin* | cmdhDefEcValue, cmdhLimits | ***ror*** |
| *requestContext* | cmdhDefEcValue, cmdhLimits | ***rct*** |
| *requestContextNotification* | cmdhDefEcValue, cmdhLimits | ***rctn*** |
| *requestCharacteristics* | cmdhDefEcValue, cmdhLimits | ***rch*** |
| *applicableEventCategories* | cmdhNetworkAccessRules | ***aecs*** |
| *applicableEventCategory* | cmdhEcDefParamValues, cmdhBuffer | ***aec*** |
| *defaultRequestExpTime* | cmdhEcDefParamValues | ***dqet*** |
| *defaultResultExpTime* | cmdhEcDefParamValues | ***dset*** |
| *defaultOpExecTime* | cmdhEcDefParamValues | ***doet*** |
| *defaultRespPersistence* | cmdhEcDefParamValues | ***drp*** |
| *defaultDelAggregation* | cmdhEcDefParamValues | ***dda*** |
| *limitsEventCategory* | cmdhLimits | ***lec*** |
| *limitsRequestExpTime* | cmdhLimits | ***lqet*** |
| *limitsResultExpTime* | cmdhLimits | ***lset*** |
| *limitsOpExecTime* | cmdhLimits | ***loet*** |
| *limitsRespPersistence* | cmdhLimits | ***lrp*** |
| *limitsDelAggregation* | cmdhLimits | ***lda*** |
| *targetNetwork* | cmdhNwAccessRule | ***ttn*** |

Table 8.2.3‑5: Resource attribute short names (5/6)

| Attribute Name | Occurs in | Short Name |
| --- | --- | --- |
| *minReqVolume* | cmdhNwAccessRule | ***mrv*** |
| *spreadingWaitTime* | cmdhNwAccessRule | ***swt*** |
| *backOffParameters* | cmdhNwAccessRule | ***bop*** |
| *otherConditions* | cmdhNwAccessRule | ***ohc*** |
| *maxBufferSize* | cmdhBuffer | ***mbfs*** |
| *storagePriority* | cmdhBuffer | ***sgp*** |
| *applicableCredIDs* | serviceSubscribedAppRule | ***apci*** |
| *allowedApp-IDs* | serviceSubscribedAppRule | ***aai*** |
| *allowedAEs* | serviceSubscribedAppRule | ***aae*** |
| *allowedRole-IDs* | serviceSubscribedAppRule | ***ari*** |
| *notificationTargetURI* | notificationTargetMgmtPolicyRef | ***ntu*** |
| *notificationPolicyID* | notificationTargetMgmtPolicyRef | ***npi*** |
| *action* | notificationTargetPolicy | ***acn*** |
| *policyLabel* | notificationTargetPolicy | ***plbl*** |
| *rulesRelationship* | notificationTargetPolicy | ***rrs*** |
| *creator* | notificationTargetPolicy | ***cr*** |
| *deletionRules* | policyDeletionRules | ***dr*** |
| *deletionRulesRelation* | policyDeletionRules | ***drr*** |
| *dynamicAuthorizationConsultationIDs* | All resources having an accessControlPolicyID attribute | ***daci*** |
| *dynamicAuthorizationEnabled* | dynamicAuthorizationConsultation | ***dae*** |
| *dynamicAuthorizationPoA* | dynamicAuthorizationConsultation | ***dap*** |
| *dynamicAuthorizationLifetime* | dynamicAuthorizationConsultation | ***dal*** |
| *descriptorRepresentation* | semanticDescriptor | ***dcrp*** |
| *semanticOpExec* | semanticDescriptor | ***soe*** |
| *descriptor* | semanticDescriptor | ***dsp*** |
| *relatedSemantics* | semanticDescriptor | ***rels*** |
| *semanticValidated* | semanticDescriptor | ***svd*** |
| *validationEnable* | semanticDescriptor | ***vlde*** |
| *periodicInterval* | timeSeries | ***pei*** |
| *missingDataDetect* | timeSeries | ***mdd*** |
| *missingDataMaxNr* | timeSeries | ***mdn*** |
| *missingDataList* | timeSeries | ***mdlt*** |
| *missingDataCurrentNr* | timeSeries | ***mdc*** |
| *missingDataDetectTimer* | timeSeries | ***mdt*** |
| *dataGenerationTime* | timeSeriesInstance | ***dgt*** |
| *sequenceNr* | timeSeriesInstance | ***snr*** |
| *roleID* | role | ***rlid*** |
| *roleName* | role | ***rlnm*** |
| *tokenLink* | role | ***rltl*** |
| *tokenID* | token | ***tkid*** |
| *tokenObject* | token | ***tkob*** |
| *issuer* | token, role | ***tkis*** |
| *holder* | token, role | ***tkhd*** |
| *notBefore* | token, role | ***tknb*** |
| *notAfter* | token, role | ***tkna*** |
| *tokenName* | token | ***tknm*** |
| *audience* | token | ***tkau*** |
| *permissions* | token | ***tkps*** |
| *extension* | token | ***tkex*** |
| *e2eSecInfo* | CSEBase, remoteCSE, AE | ***esi*** |
| *supportedReleaseVersions* | CSEBase, remoteCSE, AE | ***srv*** |

Table 8.2.3‑6: Resource attribute short names (6/6)

| Attribute Name | Occurs in | Short Name |
| --- | --- | --- |
| *serviceName* | genericInterworkingService | ***gisn*** |
| *operationName* | genericInterworkingOperationInstance | ***gion*** |
| *inputDataPointLinks* | genericInterworkingService, genericInterworkingOperationInstance | ***giip*** |
| *outputDataPointLinks* | genericInterworkingService, genericInterworkingOperationInstance | ***giop*** |
| *inputLinks* | genericInterworkingOperationInstance | ***giil*** |
| *outputLinks* | genericInterworkingOperationInstance | ***giol*** |
| *operationState* | genericInterworkingOperationInstance | ***gios*** |
| *direction* | allJoynApp | ***dir*** |
| *objectPath* | allJoynSvcObject | ***ajop*** |
| *interfaceIntrospectXmlRef* | allJoynInterface | ***ajir*** |
| *input* | allJoynMethodCall | ***inp*** |
| *callStatus* | allJoynMethodCall | ***clst*** |
| *output* | allJoynMethodCall | ***out*** |
| *currentValue* | allJoynProperty | ***crv*** |
| *requestedValue* | allJoynProperty | ***rqv*** |
| *decision* | authorizationDecision | ***dec*** |
| *status* | authorizationDecision, authorizationPolicy, authorizationInformation | ***sus*** |
| *to* | authorizationDecision, authorizationPolicy | ***to\**** |
| *from* | authorizationDecision, authorizationInformation | ***fr\**** |
| *requestedResourceType* | authorizationDecision | ***rrt*** |
| *operation* | authorizationDecision | ***op\**** |
| *filterUsage* | authorizationDecision | ***fu*** |
| *roleIDs* | authorizationDecision, authorizationInformation | ***rids\**** |
| *tokenIDs* | authorizationDecision, authorizationInformation | ***tids\**** |
| *tokens* | authorizationDecision | ***tkns\**** |
| *requestTime* | authorizationDecision | ***rtm*** |
| *originatorLocation* | authorizationDecision | ***olo*** |
| *originatorIP* | authorizationDecision | ***oip*** |
| *policies* | authorizationPolicy | ***ps*** |
| *combiningAlgorithm* | authorizationPolicy | ***ca*** |
| *ontologyFormat* | ontology | ***ontf*** |
| *ontologyContent* | ontology | ***ontc*** |
| *sourceOntology* | ontologyMapping | ***sont*** |
| *targetOntology* | ontologyMapping | ***tont*** |
| *mappingPolicy* | ontologyMapping | ***mpol*** |
| *mappingAlgorithmLinks* | ontologyMapping | ***mpal*** |
| *mappingResultFormat* | ontologyMapping | ***mprf*** |
| *mappingResult* | ontologyMapping | ***mpr*** |
| *executable* | ontologyMappingAlgorithm | ***exec*** |
| *algorithmType* | ontologyMappingAlgorithm | ***algt*** |
| *mappingThreshold* | ontologyMappingAlgorithm | ***mpth*** |
| *memberFilter* | semanticMashupJobProfile | ***mbft*** |
| *smiID* | semanticMashupJobProfile | ***miid*** |
| *inputDescriptor* | semanticMashupJobProfile | ***iptd*** |
| *outputDescriptor* | semanticMashupJobProfile | ***uptd*** |
| *functionDescriptor* | semanticMashupJobProfile | ***fucd*** |
| *smjpID* | semanticMashupInstance | ***mjid*** |
| *smjpInputParameter* | semanticMashupInstance, semanticMashupResult | ***jpin*** |
| *memberStoreType* | semanticMashupInstance | ***mst*** |
| *mashupMember* | semanticMashupInstance | ***msm*** |
| *resultGenType* | semanticMashupInstance | ***rgt*** |
| *periodForResultGen* | semanticMashupInstance | ***prg*** |
| *mashupResultFormat* | semanticMashupResult | ***mrf*** |
| *mashupResult* | semanticMashupResult | ***mrt*** |
| *ruleRepresentation* | reasoningRules | ***rrep*** |
| *ruleRepresentationFormat* | reasoningRules | ***rrepf*** |
| *reasoningType* | reasoningJobInstance | ***rtyp*** |
| *reasoningMode* | reasoningJobInstance | ***rmod*** |
| *reasoningPeriod* | reasoningJobInstance | ***rper*** |
| *factSet* | reasoningJobInstance | ***rfst*** |
| *ruleSet* | reasoningJobInstance | ***rrst*** |
| *resultRepresentation* | reasoningJobInstance | ***rsrp*** |
| *resultRepresentationFormat* | reasoningJobInstance | ***rsrpf*** |
| *numberImpactedCSEs* | AEContactList | ***nic*** |
| *externalGroupID* | LocalMulticastGroup, remoteCSE | ***egid*** |
| *multicastAddress* | LocalMulticastGroup | ***mad*** |
| *multicastGroupFanoutTarget* | LocalMulticastGroup | ***mgft*** |
| *memberList* | LocalMulticastGroup | ***mli*** |
| *responseTarget* | LocalMulticastGroup | ***rstt*** |
| *responseTimeWindow* | LocalMulticastGroup | ***rstw*** |
| *TMGI* | LocalMulticastGroup | ***tmgi*** |
| *sessionOriginatorID* | multimediaSession | ***soi*** |
| *acceptedSessionDescriptions* | multimediaSession | ***asd*** |
| *offeredSessionDescriptions* | multimediaSession | ***osd*** |
| *sessionState* | multimediaSession | ***sst*** |
| *triggerPurpose* | triggerRequest | ***tpe*** |
| *triggerStatus* | triggerRequest | ***tst*** |
| *triggerValidityTime* | triggerRequest | ***tvt*** |
| *triggerInfoAE-ID* | triggerRequest | ***tiae*** |
| *triggerInfoAddress* | triggerRequest | ***tia*** |
| *triggerInfoOperation* | triggerRequest | ***tio*** |
| *targetedResourceType* | triggerRequest | ***tirt*** |
| *triggerReference* | triggerRequest | ***trf*** |
| *regularResourcesAsTarget* | crossResourceSubscription | ***rrat*** |
| *subscriptionResourcesAsTarget* | crossResourceSubscription | ***srat*** |
| *timeWindowType* | crossResourceSubscription | ***twt*** |
| *timeWindowSize* | crossResourceSubscription | ***tws*** |
| *eventNotificationCriteriaSet* | crossResourceSubscription | ***encs*** |
| *associatedCrossResourceSub* | subscription | ***acrs*** |
| *volumePerNode* | backgroundDataTransfer | ***vpn*** |
| *numberOfNodes* | backgroundDataTransfer | ***non*** |
| *desiredTimeWindow* | backgroundDataTransfer | ***dtw*** |
| *transferSelectionGuidance* | backgroundDataTransfer | ***tsg*** |
| *geographicInformation* | backgroundDataTransfer | ***ggi*** |
| *groupLink* | backgroundDataTransfer | ***gli*** |
| *transactionLockTime* | transactionMgmt, transaction | ***tltm*** |
| *transactionExecuteTime* | transactionMgmt, transaction | ***text*** |
| *transactionCommitTime* | transactionMgmt, transaction | ***tct*** |
| *transactionExpirationTime* | transactionMgmt | ***tept*** |
| *transactionMode* | transactionMgmt | ***tmd*** |
| *transactionLockType* | transactionMgmt, transaction | ***tltp*** |
| *transactionControl* | transactionMgmt, transaction | ***tctl*** |
| *transactionState* | transactionMgmt, transaction | ***trst*** |
| *transactionMaxRetries* | transactionMgmt | ***tmr*** |
| *transactionMgmtHandling* | transactionMgmt | ***tmh*** |
| *requestPrimitives* | transactionMgmt | ***rqps*** |
| *responsePrimitives* | transactionMgmt | ***rsps*** |
| *transactionID* | transaction | ***tid*** |
| NOTE: \* marked short names have been already assigned in Table 8.2.2-1. | | |

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

CHECK LIST

* Does this Change Request include an informative introduction containing the problem(s) being solved, and a summary list of proposals.?
* Does this CR contain changes related to only one particular issue/problem?
* Have any mirror CRs been posted?
* Does this Change Request make **all** the changes necessary to address the issue or problem? E.g. A change impacting 5 tables should not include a proposal to change only 3 tables?Does this Change Request follow the drafting rules?
* Are all pictures editable?
* Have you checked the spelling and grammar?
* Have you used change bars for all modifications?
* Does the change 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.)
* Are multiple changes in this CR 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.?