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| --- | --- |
| CHANGE REQUEST | |
| Meeting ID:\* | PRO 34 |
| Source:\* | Bob Flynn, Convida Wireless, [Flynn.Bob@ConvidaWireless.com](mailto:Flynn.Bob@ConvidaWireless.com)  Dale Seed, Convida Wireless, [Seed.Dale@ConvidaWireless.com](mailto:Seed.Dale@ConvidaWireless.com)  Catalina Mladin, Convida Wireless, [Mladin.Catalina@ConvidaWireless.com](mailto:Mladin.Catalina@ConvidaWireless.com) |
| Date:\* | 2018-03-15 |
| Reason for Change/s:\* | See the introduction |
| CR against: Release\* | Release 3 |
| CR against: WI\* | Active - WI-0058 - 3GPP & Cellular IoT Interworking  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 Version 3.6.0 |
| Clauses \* | Various |
| 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 |
| Impacted other TS/TR(s) | <TS/TR number>, <Version Number>, and <Description on which aspect should be reflected in this TS/TR> |
| 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 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

R07 -R05: Address comments and rebaseline to latest version of TS-0004

R04 – comment via email:

1. Change 1.  New sentences say "The trigger will be routed to an application on the targeted UE.   The UE is identified by M2M-Ext-ID and the application on the UE is identified by Trigger-Recipient-ID."  Is this function exclusively for 3GPP?  The preceding sentence says "The successful creation of a <*triggerRequest*> resource results in the IN-CSE initiating a trigger request to a targeted device (e.g. 3GPP UE). " suggesting that the device doesn't have to be a 3GPP UE, but in the new sentences the term UE is used.  Should these not just be "device" instead of "UE"? [BOB] – Agreed – made changes  
  
Also <triggerRequest> is misspelt in the two following sentences: A pending trigger request can be replaced with a new trigger request by updating the <*triggerRequesst*> resource.  A pending trigger request can be recalled by deleting the <*triggerRequesst*> resource.   [BOB] Fixed  
  
2. Change 1.  Table of attributes says there is no default for triggerValidityTime.  But what happens if this value isn't specified? Does it stay valid for ever? Also how does triggerValidityTime relate to the resource's expirationTime? - [BOB] Open for joint ARC/PRO  
  
3. Change 1 - Create procedure.  There's a sentence that says "The Originator shall provide the <triggerRequest> resource representation to the Receiver (i.e. IN-CSE). "  The i.e. implies that the Receiver has to be an IN-CSE, but it would be clearer if this were stated explicitly. Also what RSC is used for the case where someone tries to create this resource on a different kind of CSE? I would have expected to see that case included in the bulleted list of error conditions. While on the topic of that list, I see it says "the Receiver may detect one of the following types of errors..". Why is that a may not a shall?   
  
4. Change 1 - Create procedure. "While processing the <triggerRequest> Create primitive the Receiver shall determine which NSE to forward the request to based on locally provisioned information or based on a DNS lookup of the M2M-Ext-ID of the recipient. ".  We should explain that this is the M2M-Ext-ID attribute that is provided in the <triggerRequest>.  Also "forward the request" makes it look as if the Receiver sends the Create request Primitive to the NSE,  but it isn't (according to the following paragraph). It should say "forward the trigger request"   
  
5. Change 1 - Update procedure. "While processing the <triggerRequest> Update primitive, the Receiver shall forward the trigger replace request to the same NSE that the <triggerRequest> Create primitive was forwarded to. " As above I don't think the Create Primitive was forwarded (as a primitive) to the NSE.  It should say "the same NSE that the trigger request was forwarded to when the <triggerRequest> was created. "   
  
6. Change 1 - Delete procedure. "While processing the <triggerRequest> Delete primitive, the Receiver shall forward the request to the same NSE that the <triggerRequest> Create primitive was forwarded to." See previous comment.   
  
I have an additional question on Delete. It has been re-purposed to be a special Recall thing, and it looks as if it can quite often fail.  How do I get the normal REST operation to delete a <triggerRequest> that has been finished with (I can't use this Delete since it won't work unless the request is still in Processing).

7. Changes 2 and 3 - triggerEnable attribute.  This says there's no default, but what happens if I don't set it? Is triggering enabled or not?

8. Change 6.   Should be "enrolmentRequest" not "enrolementRequest"   
  
  
9. Missing.  There should be an additional change to add NSE and UE to the abbreviations in clause 3.2   
  
10. Missing. No description of what happens when the expiration of the triggerValidityTime is reached. Is the request recalled (if it's still in processing state)?   
  
11. Missing. No description of validating the triggerValidityTime in either Create or Update operations. I assume it's an error to set it to a time in the past. Does it have to be earlier than the expirationTime?

Bob – from TS-0001 triggerValidityTime

The time duration for which the trigger request is valid. After this time expires, the trigger shall be recalled (i.e. cancelled) by the Hosting CSE.

This attribute may be configured by the Originator when the resource is created and may also be updated when performing a trigger replace procedure. See clause 8.3.3.2.2.

R03 – move to PRO 34

Triggering can be used by an IN-CSE to make initial contact with a device hosting an ADN-AE or ASN/MN-CSE. For example, sending a trigger to a cellular device hosting an ADN-AE or ASN/MN-CSE to have it come register with the IN-CSE. The device trigger can contain information such as contact information of the IN-CSE and the types of protocol bindings and serializations supported by the IN-CSE. In response to this trigger, the ADN-AEs or ASN/MN-CSE registers to the IN-CSE. This is especially useful for use cases involving devices that have not been pre-provisioned with information of the IN-CSE.

**Currently in the oneM2M architecture there is no facility that allows an AE to initiate an IN-CSE to trigger an ADN-AE or ASN/MN-CSE. This contribution adds this capability.**

The proposed functionality includes the definition of a new oneM2M <triggerRequest> resource type that enables an AE to initiate (via the IN-CSE) a trigger request, update (i.e. replace) a trigger request, delete (i.e. recall) a trigger request and receive a response indicating the status of the trigger. This new resource type and procedures have been already added to TS-0001 and TS-0026.

**The contribution adds a new type of *triggerPurpose* to trigger the enrollment of a ADN-AE or ASN/MN-CSE to an M2M Enrollment Function (MEF).**

**The contribution also adds error handling of duplicate trigger request and a new attribute triggerDeliveryMethod to specify whether the trigger is delivered via SMS or NIDD.**

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

### 7.4.XX Resource Type <triggerRequest>

#### 7.4.XX.1 Introduction

The *<triggerRequest>* resource is used to initiate a device trigger request. This resource type shall only be instantiated on an IN-CSE.

The successful creation of a <*triggerRequest*> resource results in the IN-CSE initiating a trigger request to a targeted device (e.g. 3GPP UE). The trigger will be routed to an application on the targeted device. The device is identified by M2M-Ext-ID and the application on the device is identified by Trigger-Recipient-ID. A pending trigger request can be replaced with a new trigger request by updating the <*triggerRequest*> resource. A pending trigger request can be recalled by deleting the <*triggerRequest*> resource.

**Table 7.4.XX.1‑1: Data type definition of <triggerRequest> resource**

|  |  |  |
| --- | --- | --- |
| **Data Type ID** | **File Name** | **Note** |
| triggerRequest | CDT-triggerRequest-v3\_4\_0.xsd |  |

Table 7.4.XX.1‑1: Universal/Common Attributes of <triggerRequest> resource

|  |  |  |
| --- | --- | --- |
| **Attribute Name** | **Request Optionality** | |
| **Create** | **Update** |
| @resourceName | O | NP |
| *resourceType* | NP | NP |
| *resourceID* | NP | NP |
| *parentID* | NP | NP |
| *accessControlPolicyIDs* | O | O |
| *creationTime* | NP | NP |
| *expirationTime* | O | O |
| *lastModifiedTime* | NP | NP |
| *labels* | O | O |
| *dynamicAuthorizationConsultationIDs* | O | O |

Table 7.4.XX.1‑2: Resource Specific Attributes of <triggerRequest> resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Attribute Name** | **Request Optionality** | | **Data Type** | **Default Value and Constraints** |
| **Create** | **Update** |
| *M2M-Ext-ID* | M | NP | m2m:externalID | No default |
| *Trigger-Recipient-ID* | M | O | m2m:triggerRecipientID | No default |
| *triggerPurpose* | O | O | m2m:triggerPurpose | establishConnection |
| *triggerPayloadSerialization* | O | O | m2m:serializationTypes | application/json |
| *triggerStatus* | NP | NP | m2m:triggerStatus | No default |
| *triggerValidityTime* | M | NP | m2m:timestamp | No default |
| *triggerInfoAE-ID* | O | O | m2m:ID | No default |
| *triggerInfoAddress* | O | O | xs:anyURI | No default |
| *triggerInfoOperation* | O | O | m2m:operation | No default |
| *targetedResourceType* | O | O | m2m:resourceType | No default |

Table 7.4.XX.1‑3: Child Resources of <triggerRequest> resource

|  |  |  |  |
| --- | --- | --- | --- |
| **Child Resource Type** | **Child Resource Name** | **Multiplicity** | **Ref. to in Resource Type Definition** |
| <subscription> | [variable] | 0..n | Clause 7.4.8 |

#### 7.4.XX.2 <triggerRequest> resource specific procedure on CRUD operations

##### 7.4.XX.2.0 Introduction

This clause describes <triggerRequest> resource specific behaviour for CRUD operations.

##### 7.4.XX.2.1 Create

***Originator****:*

The Originator shall use the steps Orig-1.0, Orig-2.0, and Orig-3.0 as described in clause 7.2.2.1.

***Receiver****:*

The Receiver shall use the steps Recv-1.0 to Recv-10.0 as described in clause 7.2.2.2.

While processing the <triggerRequest> Create primitive, the Receiver shall detect the following types of errors and send a corresponding status code to the Originator.

* If the Originator specifies a *Trigger-Recipient-ID* value in the Create primitive for a Registree AE or CSE, and the *triggerEnable* attribute of the Registree’s <AE> or <remoteCSE> resource has a value of FALSE, the Receiver shall generate a ***Response Status Code*** indicating "TRIGGERING\_DISABLED\_FOR\_RECIPIENT".

While processing the <triggerRequest> Create primitive the Receiver shall determine which NSE to forward the trigger request to based on locally provisioned information or based on a DNS lookup of the M2M-Ext-ID attribute of the <triggerRequest>. If an NSE cannot be determined, the Receiver shall set the *triggerStatus* attribute to ERROR\_NSE\_NOT\_FOUND. Otherwise, the Receiver shall continue to process the trigger request and set the *triggerStatus* attribute to PROCESSING.

To continue processing the request, the Receiver shall submit a trigger request to the NSE via the Mcn triggering procedure as defined in clause 9. The message shall contain information needed by the NSE to generate a trigger request for the corresponding underlying network. For a 3GPP trigger request, the required information within the trigger request message is captured in clause 7.5.1 of TS-0026 [43].

Upon receipt of trigger response(s) from the NSE, the Receiver shall set the *triggerStatus* attribute of the <triggerRequest> resource.

* If the Receiver receives a confirmation from the NSE that the trigger was accepted, the Receiver shall set the *triggerStatus* attribute to TRIGGER\_SUBMITTED.
* If the Receiver receives an indication that the trigger request was successfully delivered, the Receiver shall set the *triggerStatus* attribute to TRIGGER\_DELIVERED.
* If the Receiver receives an indication that the trigger request was not accepted or the delivery was not successful, the Receiver shall set the *triggerStatus* attribute to TRIGGER\_FAILED.
* If the Receiever receives an indication that the trigger request expired before completion the Receiver shall set the *triggerStatus* attribute to TRIGGER\_EXPIRED.

##### 7.4.XX.2.2 Retrieve

***Originator****:*

No change from the generic procedures in clause 7.2.2.1.

***Receiver****:*

No change from the generic procedures in clause 7.2.2.2.

##### 7.4.XX.2.3 Update

The following procedure replaces an outstanding trigger request that is still being processed by an underlying network with an updated trigger request.

***Originator****:*

The Originator shall use the steps Orig-1.0, Orig-2.0, and Orig-3.0 as described in clause 7.2.2.1.

***Receiver****:*

The Receiver shall use the steps Recv-1.0 to Recv-10.0 as described in clause 7.2.2.2.

The Originator shall provide the <triggerRequest> resource representation to the Receiver IN-CSE. While processing the <triggerRequest> Update primitive, the Receiver shall detect the following types of errors and send a corresponding status code to the Originator.

* If the value of *triggerStatus* of the existing <triggerRequest> is PROCESSING, the Receiver shall continue to process the Update request. Otherwise, the Receiver shall generate a ***Response Status Code*** indicating "UNABLE\_TO\_REPLACE\_TRIGGER\_REQUEST".
* If the Originator specifies a *Trigger-Recipient-ID* value in the Update primitive for a Registree AE or CSE, and the *triggerEnable* attribute of the Registree’s <AE> or <remoteCSE> resource has a value of FALSE, the Receiver shall generate a ***Response Status Code*** indicating "TRIGGERING\_DISABLED\_FOR\_RECIPIENT".

While processing the <triggerRequest> Update primitive, the Receiver shall forward the trigger replace request to the same NSE that the trigger request was forwarded to when the <triggerRequest> was created. If the NSE cannot be reached, the Receiver shall set the *triggerStatus* attribute to ERROR\_NSE\_NOT\_FOUND.

To continue processing the request, the Receiver shall submit the trigger request to the NSE via the Mcn triggering procedure defined in clause 9. The message shall contain information needed by the NSE to replace the trigger request for the corresponding underlying network. For a 3GPP trigger replace request, the required information within the trigger request message is captured in clause 7.5.2 TS-0026 [43].

Upon receipt of a successful trigger replace response from the NSE, the Receiver shall generate a ***Response Status Code*** indicating "UPDATED". Otherwise, the the Receiver shall generate a ***Response Status Code*** indicating "UNABLE\_TO\_REPLACE\_TRIGGER\_REQUEST"

##### 7.4.XX.2.4 Delete

***Originator****:*

The Originator shall issue a request to the Receiver IN-CSE to delete the <triggerRequest> resource. The Originator shall use the steps Orig-1.0, Orig-2.0, and Orig-3.0 as described in clause 7.2.2.1.

***Receiver****:*

The Receiver shall use the steps Recv-1.0 to Recv-10.0 as described in clause 7.2.2.2.

While processing the <triggerRequest> Delete primitive, the Receiver shall detect the following types of errors and send a corresponding status code to the Originator.

* If the value of *triggerStatus* of the existing <triggerRequest> is PROCESSING, the Receiver shall continue to process the Delete request. Otherwise, the Receiver shall generate a ***Response Status Code*** indicating "UNABLE\_TO\_RECALL\_TRIGGER\_REQUEST".

While processing the <triggerRequest> Delete primitive, the Receiver shall send a request to the same NSE that the trigger request was sent to when the <triggerRequest> was created. If the NSE cannot be reached, the Receiver shall set the *triggerStatus* attribute to ERROR\_NSE\_NOT\_FOUND.

To continue processing the request, the Receiver shall submit the trigger recall request to the NSE via the Mcn triggering procedure defined in clause 9. The message shall contain information needed by the NSE to recall the trigger request for the corresponding underlying network. For a 3GPP trigger recall request, the required information within the trigger recall request message is captured in clause 7.5.2 of TS-0026 [43].

Upon receipt of a successful trigger recall response from the NSE, the Receiver shall delete the <triggerRequest> resource and generate a ***Response Status Code*** indicating "DELETED". Otherwise, the the Receiver shall not delete the <triggerRequest> resource and instead generate a ***Response Status Code*** indicating "UNABLE\_TO\_RECALL\_TRIGGER\_REQUEST"

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

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

### Resource Type <AE>

#### Introduction

The <AE> resource represents information about an Application Entity known to a given Common Services Entity.

The detailed description can be found in clause 9.6.5 in TS-0001 [6].

Table 7.4.5.1‑1: Data type definition of <AE> resource

|  |  |  |
| --- | --- | --- |
| Data Type ID | File Name | Note |
| AE | CDT-AE-v3\_6\_0.xsd | XSD schema for AE resource |

Table 7.4.5.1‑2: Universal/Common Attributes of <AE> resource

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

Table 7.4.5.1‑3: Resource Specific Attributes of <AE> resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Attribute Name | Request Optionality | | Data Type | Default Value and Constraints |
| Create | Update |
| *appName* | O | O | xs:string | No default |
| *App-ID* | M | NP | xs:string | No default |
| *AE-ID* | NP | NP | m2m:ID | No default |
| *pointOfAccess* | O | O | m2m:poaList | No default |
| *ontologyRef* | O | O | xs:anyURI | No default |
| *nodeLink* | O | O | xs:anyURI | No default |
| *requestReachability* | M | O | xs:boolean | No default |
| *contentSerialization* | O | O | m2m:serializations | No default |
| *e2eSecInfo* | O | O | m2m:e2eSecInfo | No default |
| *M2M-Ext-ID* | O | O | m2m:externalID | No default |
| *supportedReleaseVersions* | M | O | m2m:supportedReleaseVersions | No default |
| *registrationStatus* | O | O | m2m:AERegistrationStatus | No default |
| *trackRegistrationPoints* | O | O | xs:boolean | No default |
| *sessionCapabilities* | O | O | m2m:sessionCapabilities | No default |
| *triggerEnable* | O | O | xs:boolean | FALSE |

Table 7.4.5.1‑4: Child resources of <AE> resource

|  |  |  |  |
| --- | --- | --- | --- |
| Child Resource Type | Child Resource Name | Multiplicity | Ref. to Resource Type Definition |
| <subscription> | [variable] | 0..n | Clause 7.4.8 |
| <container> | [variable] | 0..n | Clause 7.4.6 |
| <group> | [variable] | 0..n | Clause 7.4.13 |
| <accessControlPolicy> | [variable] | 0..n | Clause 7.4.2 |
| <pollingChannel> | [variable] | 0..n | Clause 7.4.21 |
| <schedule> | [variable] | 0..1 | Clause 7.4.9 |
| <semanticDescriptor> | [variable] | 0..n | Clause 7.4.34 |
| <dynamicAuthorizationConsultation> | [variable] | 0..n | Clause 7.4.36 |
| <flexContainer> | [variable] | 0..n | Clause 7.4.37 |
| <timeSeries> | [variable] | 0..n | Clause 7.4.38 |
| <trafficPattern> | [variable] | 0..n | Clause 7.4.42 |
| <semanticMashupInstance> | [variable] | 0..n | Clause 7.4.50 |
| <multimediaSession> | [variable] | 0..n | Clause 7.4.56 |
| <triggerRequest> | [variable] | 0..n | Clause 7.4.XX |

The <AE> resource represents information about an Application Entity known to a given Common Services Entity.

The detailed description can be found in clause 9.6.5 in TS-0001 [6].

Table 7.4.5.1‑1: Data type definition of <AE> resource

|  |  |  |
| --- | --- | --- |
| Data Type ID | File Name | Note |
| AE | CDT-AE-v3\_3\_0.xsd | XSD schema for AE resource |

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

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

Table 7.4.4.1‑3: Resource Specific Attributes of <remoteCSE> resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Attribute Name | Request Optionality | | Data Type | Default Value and Constraints |
| Create | Update |
| *cseType* | O | NP | m2m:cseTypeID | No default |
| *pointOfAccess* | O | O | m2m:poaList | No default |
| *CSEBase* | M | NP | xs:anyURI | No default |
| *CSE-ID* | M | NP | m2m:ID | No default |
| *M2M-Ext-ID* | O | O | m2m:externalID | No default |
| *Trigger-Recipient-ID* | O | O | m2m:triggerRecipientID | No default |
| *requestReachability* | M | O | xs:boolean | No default |
| *nodeLink* | O | O | xs:anyURI | No default |
| *triggerReferenceNumber* | O | O | xs:unsignedInt | No default |
| *contentSerialization* | O | O | m2m:serializations | No default |
| *e2eSecInfo* | O | O | m2m:e2eSecInfo | No default |
| *descendantCSEs* | O | O | m2m:listOfM2MID | No default |
| *supportedReleaseVersions* | M | O | m2m:supportedReleaseVersions | No default |
| *multicastCapability* | O | O | m2m:multicastCapability | No default |
| *externalGroupID* | O | O | m2m:externalID | No default |
| *triggerEnable* | O | O | xs:boolean | FALSE |

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

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

#### Enumeration type definitions

##### m2m:resourceType

Table 6.3.4.2.1‑1: Interpretation of resourceType

|  |  |  |
| --- | --- | --- |
| Value | Interpretation | Note |
| 1 | accessControlPolicy |  |
| 2 | AE |  |
| 3 | container |  |
| 4 | contentInstance |  |
| 5 | CSEBase |  |
| 6 | delivery |  |
| 7 | eventConfig |  |
| 8 | execInstance |  |
| 9 | group |  |
| 10 | locationPolicy |  |
| 11 | m2mServiceSubscriptionProfile |  |
| 12 | mgmtCmd |  |
| 13 | mgmtObj |  |
| 14 | node |  |
| 15 | pollingChannel |  |
| 16 | remoteCSE |  |
| 17 | request |  |
| 18 | schedule |  |
| 19 | serviceSubscribedAppRule |  |
| 20 | serviceSubscribedNode |  |
| 21 | statsCollect |  |
| 22 | statsConfig |  |
| 23 | subscription |  |
| 24 | semanticDescriptor |  |
| 25 | notificationTargetMgmtPolicyRef |  |
| 26 | notificationTargetPolicy |  |
| 27 | policyDeletionRules |  |
| 28 | flexContainer |  |
| 29 | timeSeries |  |
| 30 | timeSeriesInstance |  |
| 31 | role |  |
| 32 | token |  |
| 33 | trafficPattern |  |
| 34 | dynamicAuthorizationConsultation |  |
| 35 | authorizationDecision |  |
| 36 | authorizationPolicy |  |
| 37 | authorizationInformation |  |
| 38 | ontologyRepository |  |
| 39 | ontology |  |
| 40 | semanticMashupJobProfile |  |
| 41 | semanticMashupInstance |  |
| 42 | semanticMashupResult |  |
| 43 | AEContactList |  |
| 44 | AEContactListPerCSE |  |
| 45 | localMulticastGroup |  |
| 46 | multimediaSession |  |
| 47 | triggerRequest |  |
| 10001 | accessControlPolicyAnnc |  |
| 10002 | AEAnnc |  |
| 10003 | containerAnnc |  |
| 10004 | contentInstanceAnnc |  |
| 10009 | groupAnnc |  |
| 10010 | locationPolicyAnnc |  |
| 10013 | mgmtObjAnnc |  |
| 10014 | nodeAnnc |  |
| 10016 | remoteCSEAnnc |  |
| 10018 | scheduleAnnc |  |
| 10024 | semanticDescriptorAnnc |  |
| 10028 | flexContainerAnnc |  |
| 10029 | timeSeriesAnnc |  |
| 10030 | timeSeriesInstanceAnnc |  |
| 10033 | trafficPatternAnnc |  |
| 10034 | dynamicAuthorizationConsultationAnnc |  |
| 10038 | ontologyRepositoryAnnc |  |
| 10039 | ontologyAnnc |  |
| 10040 | semanticMashupJobProfileAnnc |  |
| 10041 | semanticMashupInstanceAnnc |  |
| 10042 | semanticMashupResultAnnc |  |
| 10046 | multimediaSessionAnnc |  |
| NOTE: See clause 6.4.1 "Request message parameter data types". | | |

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

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

##### 6.3.4.2.11 m2m:memberType

Used for ***memberType*** attribute in <group> resource.

Table 6.3.4.2.11‑1: Interpretation of memberType

|  |  |  |
| --- | --- | --- |
| Value | Interpretation | Note |
| 0 | mixed | A mixture of all the resource types (except mixed itself). |
| 1 | accessControlPolicy |  |
| 2 | AE |  |
| 3 | container |  |
| 4 | contentInstance |  |
| 5 | CSEBase |  |
| 6 | delivery |  |
| 7 | eventConfig |  |
| 8 | execInstance |  |
| 9 | group |  |
| 10 | locationPolicy |  |
| 11 | m2mServiceSubscription |  |
| 12 | mgmtCmd |  |
| 13 | mgmtObj |  |
| 14 | node |  |
| 15 | pollingChannel |  |
| 16 | remoteCSE |  |
| 17 | request |  |
| 18 | schedule |  |
| 19 | serviceSubscribedAppRule |  |
| 20 | serviceSubscribedNode |  |
| 21 | statsCollect |  |
| 22 | statsConfig |  |
| 23 | subscription |  |
| 24 | semanticDescriptor |  |
| 25 | notificationTargetMgmtPolicyRef |  |
| 26 | notificationTargetPolicy |  |
| 27 | policyDeletionRules |  |
| 28 | flexContainer |  |
| 29 | timeSeries |  |
| 30 | timeSeriesInstance |  |
| 31 | role |  |
| 32 | token |  |
| 33 | trafficPattern |  |
| 34 | dynamicAuthorizationConsultation |  |
| 35 | authorizationDecision |  |
| 36 | authorizationPolicy |  |
| 37 | authorizationInformation |  |
| 38 | ontologyRepository |  |
| 39 | ontology |  |
| 40 | semanticMashupJobProfile |  |
| 41 | semanticMashupInstance |  |
| 42 | semanticMashupResult |  |
| 43 | AEContactList |  |
| 44 | AEContactListPerCSE |  |
| 46 | multimediaSession |  |
| 47 | triggerRequest |  |
| 10001 | accessControlPolicyAnnc |  |
| 10002 | AEAnnc |  |
| 10003 | containerAnnc |  |
| 10004 | contentInstanceAnnc |  |
| 10009 | groupAnnc |  |
| 10010 | locationPolicyAnnc |  |
| 10013 | mgmtObjAnnc |  |
| 10014 | nodeAnnc |  |
| 10016 | remoteCSEAnnc |  |
| 10018 | scheduleAnnc |  |
| 10024 | semanticDescriptorAnnc |  |
| 10028 | flexContainerAnnc |  |
| 10029 | timeSeriesAnnc |  |
| 10030 | timeSeriesInstanceAnnc |  |
| 10033 | trafficPatternAnnc |  |
| 10034 | dynamicAuthorizationConsultationAnnc |  |
| 10038 | ontologyRepositoryAnnc |  |
| 10039 | ontologyAnnc |  |
| 10040 | semanticMashupJobProfileAnnc |  |
| 10041 | semanticMashupInstanceAnnc |  |
| 10042 | semanticMashupResultAnnc |  |
| 10046 | multimediaSessionAnnc |  |
| 20001 | oldest |  |
| 20002 | latest |  |
| 20003 | mashup |  |
| NOTE: See clause 7.4.13 "Resource Type group". | | |

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

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

##### 6.3.4.2.46 m2m:triggerPurpose

Used in definining trigger purpose in trigger payload.

Table 6.3.4.2.46‑1: Interpretation of triggerPurpose

|  |  |  |
| --- | --- | --- |
| Value | Interpretation | Note |
| 1 | establishConnection |  |
| 2 | registrationRequest |  |
| 3 | executeCRUD |  |
| 4 | enrolmentRequest |  |

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

### -----------------------Start of change 7 ---------------------------------------------

##### 6.3.4.2.YY m2m:triggerStatus

Used in definining trigger status in the <triggerRequest> resource.

Table 6.3.4.2.YY‑1: Interpretation of triggerStatus

|  |  |  |
| --- | --- | --- |
| Value | Interpretation | Note |
| 1 | PROCESSING |  |
| 2 | ERROR\_NSE\_NOT\_FOUND |  |
| 3 | TRIGGER\_SUBMITTED |  |
| 4 | TRIGGER\_DELIVERED |  |
| 5 | TRIGGER\_EXPIRED |  |
| 6 | TRIGGER\_FAILED |  |

### -----------------------End of change 7 ---------------------------------------------

### -----------------------Start of change 8 ---------------------------------------------

### regularResource

#### 6.5.3.1 Description

This type definition includes the universal and common attributes used by the non-annouceable M2M resources.

#### Reference

See Table 6.3.6‑2.

#### Usage

This type is used by the following resource types:

<delivery>, <eventConfig>, <execInstance>, <m2mServiceSubscriptionProfile>, <mgmtCommand>, <request>, <serviceSubscribedNode>, <statsCollect>, <statsConfig>, <subscription>, <serviceSubscribedAppRule>, <notificationTargetMgmtPolicyRef>, <notificationTargetPolicy>, <policyDeletionRules>, <dynamicAuthorizationConsultation>, <role>, <token>, <authorizationDecision>, <authorizationPolicy> <authorizationInformation>, <AEContactList>, <AEContactListPerCSE>, <localMulticastGroup>, <triggerRequest>

### -----------------------End of change 8 ---------------------------------------------

### -----------------------Start of change 9 ---------------------------------------------

### 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, trafficPattern | ***aa*** |
| *announceTo* | accessControlPolicy, AE, container, contentInstance, group, locationPolicy, mgmtObj, node, remoteCSE, schedule, semanticDescriptor, trafficPattern | ***at*** |
| *creationTime* | All | ***ct*** |
| *expirationTime* | All except contentInstance, CSEBase | ***et*** |
| labels | All (optional) | ***lb***l |
| *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*** |
| *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*** |
| *triggerEnable* | AE, remoteCSE | ***tren*** |
| *registrationStatus* | AE | ***regs*** |
| *trackRegistrationPoints* | AE | ***trps*** |
| *sessionCapabilities* | AE | ***scp*** |
| *creator* | container, contentInstance,eventConfig, group, pollingChannel, statsCollect, statsConfig, subscription, semanticDescriptor, notificationTargetPolicy, flexContainer, timeSeries | ***cr*** |
| *maxNrOfInstances* | container, timeSeries | ***mni*** |
| *maxByteSize* | container, timeSeries | ***mbs*** |
| *maxInstanceAge* | container, timeSeries | ***mia*** |
| *currentNrOfInstances* | container, timeSeries | ***cni*** |

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

|  |  |  |
| --- | --- | --- |
| Attribute Name | Occurs in | Short Name |
| *currentByteSize* | container | ***cbs*** |
| *locationID* | container | ***li*** |
| *disableRetrieval* | container | ***disr*** |
| *contentInfo* | contentInstance, timeSeries | ***cnf*** |
| *contentSize* | contentInstance, timeSeriesInstance | ***cs*** |
| *contentRef* | contentInstance | ***conr*** |
| *containerDefinition* | flexContainer | ***cnd*** |
| primitiveContent | request | ***pc\**** |
| *content* | contentInstance, timeSeriesInstance | ***con*** |
| *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*** |
| *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*** |
| *currentNrOfMembers* | group | ***cnm*** |
| *maxNrOfMembers* | group | ***mnm*** |
| *memberIDs* | group | ***mid*** |
| *membersAccessControlPolicyIDs* | group | ***macp*** |
| *memberTypeValidated* | group | ***mtv*** |
| *consistencyStrategy* | group | ***csy*** |
| *semanticSupportIndicator* | group | ***ssi*** |
| *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*** |
| *description* | mgmtCmd, mgmtObj, all management resources from firmware, ontology | ***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*** |
| *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 | ***exc*** |
| *notificationURI* | subscription | ***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 | ***nec*** |
| *subscriberURI* | subscription | ***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*** |
| *location* | deviceInfo | ***loc*** |
| *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, trafficPattern | ***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*** |
| *notificationlPolicyID* | 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*** |
| *providedToNSE* | trafficPattern | ***ptn*** |
| *periodicIndicator* | trafficPattern | ***pri*** |
| *periodicDurationTime* | trafficPattern | ***pdt*** |
| *periodicIntervalTime* | trafficPattern | ***pit*** |
| *stationaryIndication* | trafficPattern | ***sti*** |
| *dataSizeIndicator* | trafficPattern | ***dsi*** |
| *validityTime* | trafficPattern | ***vdt*** |
| *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*** |
| *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*** |
| *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*** |
| *triggerPayloadSerialization* | triggerRequest | ***tps*** |
| *triggerStatus* | triggerRequest | ***tst*** |
| *triggerValidityTime* | triggerRequest | ***tvt*** |
| *triggerInfoAE-ID* | triggerRequest | ***tiae*** |
| *triggerInfoAddress* | triggerRequest | ***tia*** |
| *triggerInfoOperation* | triggerRequest | ***tio*** |
| *targetedResourceType* | triggerRequest | ***tirt*** |
| NOTE: \* marked short names have been already assigned in Table 8.2.2-1. | | |

### Resource types

In protocol bindings resource type names shall be translated into short names of Table 8.2.4‑1.

Table 8.2.4‑1: Resource and specialization type short names

| Resource Type Name | Short Name |
| --- | --- |
| accessControlPolicy | ***acp*** |
| accessControlPolicyAnnc | ***acpA*** |
| AE | ***ae*** |
| AEAnnc | ***aeA*** |
| container | ***cnt*** |
| containerAnnc | ***cntA*** |
| contentInstance | ***cin*** |
| contentInstanceAnnc | ***cinA*** |
| CSEBase | ***cb*** |
| delivery | ***dlv*** |
| eventConfig | ***evcg*** |
| execInstance | ***exin*** |
| group | ***grp*** |
| groupAnnc | ***grpA*** |
| locationPolicy | ***lcp*** |
| locationPolicyAnnc | ***lcpA*** |
| m2mServiceSubscriptionProfile | ***mssp*** |
| mgmtCmd | ***mgc*** |
| node | ***nod*** |
| nodeAnnc | ***nodA*** |
| pollingChannel | ***pch*** |
| remoteCSE | ***csr*** |
| remoteCSEAnnc | ***csrA*** |
| request | ***req*** |
| schedule | ***sch*** |
| scheduleAnnc | ***schA*** |
| serviceSubscribedAppRule | ***asar*** |
| serviceSubscribedNode | ***svsn*** |
| statsCollect | ***stcl*** |
| statsConfig | ***stcg*** |
| subscription | ***sub*** |
| firmware | ***fwr*** |
| firmwareAnnc | ***fwrA*** |
| software | ***swr*** |
| softwareAnnc | ***swrA*** |
| memory | ***mem*** |
| memoryAnnc | ***memA*** |
| areaNwkInfo | ***ani*** |
| areaNwkInfoAnnc | ***aniA*** |
| areaNwkDeviceInfo | ***andi*** |
| areaNwkDeviceInfoAnnc | ***andiA*** |
| battery | ***bat*** |
| batteryAnnc | ***batA*** |
| deviceInfo | ***dvi*** |
| deviceInfoAnnc | ***dviA*** |
| deviceCapability | ***dvc*** |
| deviceCapabilityAnnc | ***dvcA*** |
| reboot | ***rbo \**** |
| rebootAnnc | ***rboA*** |
| eventLog | ***evl*** |
| eventLogAnnc | ***evlA*** |
| cmdhPolicy | ***cmp*** |
| activeCmdhPolicy | ***acmp*** |
| cmdhDefaults | ***cmdf*** |
| cmdhDefEcValue | ***cmdv*** |
| cmdhEcDefParamValues | ***cmpv*** |
| cmdhLimits | ***cml*** |
| cmdhNetworkAccessRules | ***cmnr*** |
| cmdhNwAccessRule | ***cmwr*** |
| cmdhBuffer | ***cmbf*** |
| notificationTargetMgmtPolicyRef | ***ntpr*** |
| notificationTargetPolicy | ***ntp*** |
| policyDeletionRules | ***pdr*** |
| *dynamicAuthorizationConsultation* | ***dac*** |
| *semanticDescriptor* | ***smd*** |
| *semanticDescriptorAnnc* | ***smdA*** |
| *timeSeries* | ***ts*** |
| *timeSeriesAnnc* | ***tsA*** |
| timeSeriesInstance | ***tsi*** |
| *timeSeriesInstanceAnnc* | ***tsiA*** |
| trafficPattern | ***trpt*** |
| trafficPatternAnnc | ***trptA*** |
| role | ***rol*** |
| token | ***tk*** |
| genericInterworkingService | ***gis*** |
| genericInterworkingService*Annc* | ***gisA*** |
| genericInterworkingOperationInstance | ***gio*** |
| genericInterworkingOperationInstance*Annc* | ***gioA*** |
| svcObjWrapper | ***ajsw*** |
| svcObjWrapper*Annc* | ***ajswA*** |
| svcFwWrapper | ***ajfw*** |
| svcFwWrapper*Annc* | ***ajfwA*** |
| allJoynApp | ***ajap*** |
| allJoynApp*Annc* | ***ajapA*** |
| allJoynSvcObject | ***ajso*** |
| allJoynSvcObject*Annc* | ***ajsoA*** |
| allJoynInterface | ***ajif*** |
| allJoynInterface*Annc* | ***ajifA*** |
| allJoynMethod | ***ajmd*** |
| allJoynMethod*Annc* | ***ajmdA*** |
| allJoynMethodCall | ***ajmc*** |
| allJoynMethodCall*Annc* | ***ajmcA*** |
| allJoynProperty | ***ajpr*** |
| allJoynProperty*Annc* | ***ajprA*** |
| authorizationDecision | ***auds*** |
| authorizationPolicy | ***aupy*** |
| authorizationInformation | ***auif*** |
| ontologyRepository | ***ontr*** |
| ontologyRepositoryAnnc | ***ontrA*** |
| ontology | ***ont*** |
| ontologyAnnc | ***ontA*** |
| semanticMashupJobProfile | ***smjp*** |
| semanticMashupJobProfile*Annc* | ***smjpA*** |
| semanticMashupInstance | ***smi*** |
| semanticMashupInstance*Annc* | ***smiA*** |
| semanticMashupResult | ***smr*** |
| semanticMashupResult*Annc* | ***smrA*** |
| AEContactList | ***alst*** |
| AEContactListPerCSE | ***alpc*** |
| localMulticastGroup | ***lmg*** |
| multimediaSession | ***mms*** |
| multimediaSessionAnnc | ***mmsA*** |
| triggerRequest | ***tgr*** |
| NOTE: \* marked short names have been already assigned in attribute Tables 8.2.3-1 to 8.2.3-5. | |

### -----------------------End of change 9 ---------------------------------------------

### -----------------------Start of change 10 ---------------------------------------------

### 8.2.6 Trigger payload fields

Trigger payload fields shall be translated into short names of Table 8.2.6‑1.

Table 8.2.6‑1: Trigger payload field short names

| Member Name | Short Name |
| --- | --- |
| *triggerPurpose* | ***tpe\**** |
| *triggerInfoAddress* | ***tia\**** |
| *triggerInfoOperation* | ***tio\**** |
| *triggerInfoResourceType* | ***tirt\**** |
| *triggerInfoAE-ID* | ***tiae\**** |
| *triggerInfoPoA* | ***tipa*** |
| *triggerInfoSerializationTypes* | ***tist*** |
| NOTE: \* marked short names have been already assigned in attribute Table 8.2.3-1 to Table 8.2.3-6. | |

### -----------------------End of change 10 ---------------------------------------------

### -----------------------Start of change 11 ---------------------------------------------

# 9 Mcn procedure

## 9.1 Introduction

The following clauses describe procedural details and message format bindings for various Mcn procedures.

## Triggering

The following clauses describe procedural details and message format bindings for various Mcn procedures.

### Introduction

A trigger originator (i.e. IN-CSE) may send a trigger request to an underlying network that addresses a trigger recipient (i.e. ASN/MN-CSE or an ADN-AE). A trigger request may include a payload. If the trigger has no payload, the trigger recipient shall just re-establish a network connection, so that the trigger originator can send requests to the trigger recipient. If the request contains a payload, the trigger recipient shall re-establish the network connection and perform additional actions as requested by the payload. The trigger payload fields are described in Table 9.2.1‑1.

Table 9.2.1‑1: Trigger payload short names and field descriptions

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Field Name** | **Request Optionality** | | | **Data Type** | **Default Value and Constraints** |
| **establish**  **Connection** | **registration**  **Request** | **execute**  **CRUD** |
| *triggerPurpose* | M | M | M | m2m:triggerPurpose | If a trigger has a payload then this field is mandatory and shall be specified by the trigger originator. If a trigger does not have a payload then the default *triggerPurpose* is establishConnection |
| *triggerInfoAddress* | O | O | M | xs:anyURI | No default  When the *triggerPurpose* is “establishConnection”, and this field is provided by the trigger originator, then this field shall be configured with an unstructured CSE-Relative-Resource-ID of the <remoteCSE> or <AE> resource of the trigger recipient. The trigger recipient shall update the pointOfAccess attribute of this resource.  When the *triggerPurpose* is “establishConnection”, and this field is not provided by the trigger originator, the trigger recipient shall establish a network connection with its Registrar CSE but not update its pointOfAccess.  When the triggerPurpose is “registrationRequest”, and this field is provided by the trigger originator, then this field is the unstructured CSE-Relative-Resource-ID of the Registrar CSE’s <cseBase> resource that the trigger recipient shall register to.  When the triggerPurpose is “registrationRequest”, and this field is not provided by the trigger origiantor, the trigger recipient shall register to the Registrar CSE using a pre-provisioned address of the Registrar CSE. The pre-provisioning method is outside the scope of this specification.  When the triggerPurpose is “executeCRUD”, this field is mandatory and shall be configured with an unstructured CSE-Relative-Resource-ID by the trigger originator. The trigger originator shall also specify the type of CRUD operation in the *triggerInfoOperation* field and the type of resource in the *targetedResouceType* field. The trigger recipient shall perform the CRUD operation specified by the *triggerInfoOperation* field on this resource.  When the triggerPurpose is “enrolmentRequest”, this field is mandatory and shall be configured with the absolute URI of the <MEFBase> resource of the MEF that the ASN/MN-CSE or ADN-AE shall enrol to. |
| *triggerInfoPoA* | O | O | O | m2m:poaList | No default  List of pointOfAccess of the trigger originator.  When *triggerInfoAddress* is included, the trigger originator shall configure this field with at least one supported pointOfAccess. |
| *triggerInfoOperation* | NP | NP | M | m2m:operation | No default  See clause 6.3.4.2.5  When the triggerPurpose is “executeCRUD”, the trigger originator shall configure this field with the CRUD operation to perform on the targeted resource specified by *triggerInfoAddress*. |
| *triggerInfoResourceType* | NP | NP | M | m2m: resourceType | No default  See clause 6.3.4.2.1  When the triggerPurpose is “executeCRUD”, the trigger originator shall configure this field with the resource type of the targeted resource specified by *triggerInfoAddress*. |
| *triggerInfoAE-ID* | NP | NP | O | m2m:ID | No default  This field is included in the payload by the trigger originator when the purpose of the trigger is to request an ASN/MN-AE of the trigger recipient is to perform a CRUD operation. This field identifies the ASN/MN-AE that should perform the CRUD operation. The type of CRUD operation to perform shall be specified by the trigger originator in the *triggerInfoOperation.* The resource to perform the operation on shall be specified by the trigger originator in the *triggerInfoAddress.* The type of resource shall be specified by the trigger originator in the  *targetedResourceType*. |
| *triggerInfoSerializationTypes* | *O* | *O* | *O* | m2m:serializationTypes | This field may be configured by the trigger originator. The field indicates which types of serializations the triger originator supports in requests from the trigger recipient (i.e. XML, JSON and/or CBOR). The default value is JSON. |

Note: Mandatory payload fields are only mandatory if the trigger payload is present.

The trigger payload may be serialized in XML, JSON or CBOR format. How the trigger originator knows the type of trigger payload serializations supported by the trigger recipient is outside the scope of this document and is assumed to be via pre-provisioning.

### -----------------------End of change 11 ---------------------------------------------

### -----------------------Start of change 13 ---------------------------------------------

#### Originator error response class

Table 6.6.3.5-1 specifies the RSCs for Originator error responses.

41xx codes are oneM2M specific.

Table 6.6.3.5‑1: RSCs for Originator error response class

|  |  |
| --- | --- |
| Numeric Code | Description |
| 4000 | BAD\_REQUEST |
| 4001 | RELEASE\_VERSION\_NOT\_SUPPORTED |
| 4004 | NOT\_FOUND |
| 4005 | OPERATION\_NOT\_ALLOWED |
| 4008 | REQUEST\_TIMEOUT |
| 4101 | SUBSCRIPTION\_CREATOR\_HAS\_NO\_PRIVILEGE |
| 4102 | CONTENTS\_UNACCEPTABLE |
| 4103 | ORIGINATOR\_HAS\_NO\_PRIVILEGE |
| 4104 | GROUP\_REQUEST\_IDENTIFIER\_EXISTS |
| 4105 | CONFLICT |
| 4106 | ORIGINATOR\_HAS\_NOT\_REGISTERED |
| 4107 | SECURITY\_ASSOCIATION\_REQUIRED |
| 4108 | INVALID\_CHILD\_RESOURCE\_TYPE |
| 4109 | NO\_MEMBERS |
| 4110 | GROUP\_MEMBER\_TYPE\_INCONSISTENT |
| 4111 | ESPRIM\_UNSUPPORTED\_OPTION |
| 4112 | ESPRIM\_UNKNOWN\_KEY\_ID |
| 4113 | ESPRIM\_UNKNOWN\_ORIG\_RAND\_ID |
| 4114 | ESPRIM\_UNKNOWN\_RECV\_RAND\_ID |
| 4115 | ESPRIM\_BAD\_MAC |
| 4116 | ESPRIM\_IMPERSONATION\_ERROR |
| 4117 | ORIGINATOR\_HAS\_ALREADY\_REGISTERED |
| 4118 | ONTOLOGY\_NOT\_AVAILABLE |
| 4119 | LINKED\_SEMANTICS\_NOT\_AVAILABLE |
| 4120 | INVALID\_SEMANTICS |
| 41XX | INVALID\_TRIGGER\_PURPOSE |

#### Receiver error response class

Table 6.6.3.6-1 specifies the RSCs for Receiver error responses.

51xx codes are oneM2M specific, which are used in generic procedures.

52xx codes are oneM2M specific, which are used in resource specific procedures.

**Table 6.6.3.6‑1: RSCs for Receiver error response class**

|  |  |
| --- | --- |
| Numeric Code | Description |
| 5000 | INTERNAL\_SERVER\_ERROR |
| 5001 | NOT\_IMPLEMENTED |
| 5103 | TARGET\_NOT\_REACHABLE |
| 5105 | RECEIVER\_HAS\_NO\_PRIVILEGE |
| 5106 | ALREADY\_EXISTS |
| 5203 | TARGET\_NOT\_SUBSCRIBABLE |
| 5204 | SUBSCRIPTION\_VERIFICATION\_INITIATION\_FAILED |
| 5205 | SUBSCRIPTION\_HOST\_HAS\_NO\_PRIVILEGE |
| 5206 | NON\_BLOCKING\_REQUEST\_NOT\_SUPPORTED |
| 5207 | NOT\_ACCEPTABLE |
| 5208 | DISCOVERY\_DENIED\_BY\_IPE |
| 5209 | GROUP\_MEMBERS\_NOT\_RESPONDED |
| 5210 | ESPRIM\_DECRYPTION\_ERROR |
| 5211 | ESPRIM\_ENCRYPTION\_ERROR |
| 5212 | SPARQL\_UPDATE\_ERROR |
| 5213 | MASH\_UP\_OPERATION\_FAILED |
| 5214 | TARGET\_HAS\_NO\_SESSION\_CAPABILITY |
| 5215 | SESSION\_IS\_ONLINE |
| 5216 | JOIN\_MULTICAST\_GROUP\_FAILED |
| 5217 | LEAVE\_MULTICAST\_GROUP\_FAILED |
| 52XX | TRIGGERING\_DISABLED\_FOR\_RECIPIENT |
| 52YY | UNABLE\_TO\_REPLACE\_TRIGGER\_REQUEST |
| 52ZZ | UNABLE\_TO\_RECALL\_TRIGGER\_REQUEST |

### -----------------------End of change 13---------------------------------------------

### -----------------------Start of change 14---------------------------------------------

## Abbreviations

For the purposes of the present document, the abbreviations given in TS-0011 Common Terminology [25] and the following apply:

3GPP2 3rd Generation Partnership Project 2

ACP AccessControlPolicy

AD Anno Domini

AE-ID Application Entity Identifier

ARC Architecture

ASN-CSE Application Entity that is registered with the CSE at Application Service Node

BCP best current practices

CDT Common Data Type

CIDR Classless Inter-Domain Routing

CMDH Communication Management and Delivery Handling

CoAP Constrained Application Protocol

CRUD Create Retrieve Update Delete

CRUD+N Create Retrieve Update Delete Notification

CSE-ID Common Service Entity Identifier

CUDN Create Update Delete Notify

DAA Device Action Answer

DAR Device-Action-request

DNA Device Notification Answer

DNR Device Notification Request

DTLS Datagram Transport Layer Security

FFS For Further Study

FQDN Fully Qualified Domain Name

GPS Global Positioning System

HTTP HyperText Transfer Protocol

IANA Internet Assigned Numbers Authority

ID IDentifier

IEEE Institute of Electrical and Electronics Engineers

IETF Internet Engineering Task Force

IN-AE Application Entity that is registered with the CSE in the Infrastructure Node

IN-CSE CSE which resides in the Infrastructure Node

IRI Internationalized Resource Identifier

ISO International Organization for Standardization

JSON JavaScript Object Notation

MA Mandatory Announced

MIME Multipurpose Internet Mail Extension

MN-CSE Reference Point for M2M Communication with CSE of different M2M Service Provider

MR Mashup Requestor

MQTT Message Queue Telemetry Transport

MTC-IWF MachinetType Communications - InterWorking Function

NP Not Present

NSE Network Service Entity

OA Optional Announced

OMA-DM Open Mobile Alliance Device Management

RD Retrieve Delete

RDF Resource Description Framework

RFC Request For Comment

RH Resource Host

RPC Remote Procedure Call

RSC Response Status Codes

RUD Retrieve Update Delete

SCS Services Capability Server

SMF Semantic Mashup Function

SMI Semantic Mashup Instance

SMJP Semantic Mashup Job Profile

SP Service Provider

SPARQL SPARQL Protocol and RDF Query Language

SP-ID Service Provider Identifier

TBD To Be Determined

TCP Transmission Control Protocol

TLS Transport Layer Security

UDP User Datagram Protocol

UE User Equipment

URI Uniform Resource Identifier

URL Uniform Resource Locator

UTC Coordinated Universal Time

UTF UCS Transformation Format

UUID Universally Unique Identifier

WLAN Wireless Local Area Network

XML eXtensible Markup Language

XSD XML Schema Definition

### -----------------------End of change 14---------------------------------------------

### -----------------------Start of change 15---------------------------------------------

### -----------------------End of change 15---------------------------------------------

### ----------------------- Start of change 16---------------------------------------------

### -----------------------End of change 16---------------------------------------------

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.?