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| CHANGE REQUEST | |
| Meeting ID:\* | SDS 49.4 |
| Source:\* | Bob Flynn, Exacta, [bob.flynn@exactagss.com](mailto:bob.flynn@exactagss.com)  Miguel Angel Reina Ortega, ETSI, [MiguelAngel.ReinaOrtega@etsi.org](mailto:MiguelAngel.ReinaOrtega@etsi.org) |
| Date:\* | 2021-03-29 |
| Reason for Change/s:\* | Fixes for crossResourceSubscription |
| CR against: Release\* | Rel-3 |
| CR against: WI\* | Active < WI-0077>  MNT maintenance / < Work Item number(optional)>  Is this a mirror CR? Yes  No  mirror CR number:  STE Small Technical Enhancements / < Work Item number (optional)>  Only ONE of the above shall be ticked |
| CR against: TS/TR\* | TS-0001 v3.22.0 |
| Clauses \* | 10.2.10.22, 10.2.10.24, 10.2.10.25, 9.6.58 |
| 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 | None |
| 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) | |

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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

During implementation of test cases for crossResourceSubscription functionality, some misalignments were found between TS-0001 and TS-0004. This CR proposes some fixes for crossResourceSubscription functionality in order to align TS-0001 and TS-0004.

R01 – Added change 4 – Enhancements for timeWindowType and timeWindowSize attributes description.

## ----------------------- Start of Change 1--------------------------------------------

**Table 10.2.10.22-1: *<crossResourceSubscription>* CREATE**

| ***<crossResourceSubscription>* CREATE** | | |
| --- | --- | --- |
| Information in Request message | All parameters defined in table 8.1.2-3 apply with the specific details for:  ***Content*:** The resource content shall provide the information as defined in clause 9.6.58 |
| Processing at Originator before sending Request | According to clause 10.1.2 with the following additions:  The Request shall include at least one of the following attributes: *regularResourcesAsTarget*, *subscriptionResourcesAsTarget*.  The Request shall include *timeWindowType* and *timeWindowSize*.  The Request shall include *notificationURI(s)*.  The Request shall include *notificationContentType*.  The Request shall include *eventNotificationCriteriaSet* if *regularResourcesAsTarget* is included in the Request.  If the request includes *notificationURI(s)* which is not the Originator, the Originator should send the request as non-blocking request (see clauses 8.2.2 and 9.6.12) |
| Processing at Receiver | According to clause 10.1.2 with the following additions:  The Hosting CSE shall validate the followings:  Check if the Originator has privileges for creating a child resource in the ***To*** parameter in the Request.  Check if each target resource in *regularResourcesAsTarget* is a subscribable resource.  Check if the Originator has privileges for retrieving the subscribed-to resource  If a notificationURI is not the Originator, the Hosting CSE may send a Notify request to the *notificationURI* to verify this *<crossResourceSubscription>* creation request. If the Hosting CSE initiates the verification, it shall check if the verification result in the Notify response is successful or not. If any *notificationURI* contained in a list fails verification then the *<crossResourceSubscription>* create process fails  If any of the checks above fails, the Hosting CSE shall send an unsuccessful response to the Originator with corresponding error information. Otherwise, the Hosting CSE shall use the following procedure to create the *<crossResourceSubscription>* resource and send a successful or an unsuccessful response to the Originator.   * If *regularResourcesAsTarget* is included, the Hosting CSE shall send a CREATE request message to each target resource host to create a *<subscription>* child resource under each target resource indicated by *regularResourcesAsTarget* using corresponding event notification criteria as included in *eventNotificationCriteriaSet* The *notificationURI* attributefor each *<subscription>* resource shall be configured to the resource identifier of this <crossResourceSubscription> resource being created. The *associatedCrossResourceSub* attribute of each *<subscription>* resource shall be configured with the resource identifier of this *<crossResourceSubscription>* resource. The Hosting CSE shall leave the *notificationStatsEnable* attribute of each <*subscription*> resource with a default value of FALSE regardless of the value of the *notificationStatsEnable* attribute of the <*crossResourceSubscription*> resource. In the ***From*** parameter of each <*subscription*> CREATE request, the Hosting CSE shall include the identifier of the Originator of the *<crossResourceSubscription>* resource CREATE request, which shall be leveraged by the <*subscription*> resource host to verify if the Originator has the privilege to create a *<subscription>* resource; if the Originator has no privilege to create this *<subscription>* resource, this step shall be regarded as a failure. If any *<subscription>* resource cannot be successfully created, the Hosting CSE shall send an unsuccessful response to the Originator and shall delete any *<subscription>* resources that were created during the processing of this *<crossResourceSubscription>* resource CREATE request. * If *subscriptionResourcesAsTarget* is included, the Hosting CSE shall add the resource identifier ofthis *<crossResourceSubscription>* resource to the *associatedCrossResourceSub* and *notificationURI* attributesof each *<subscription>* resource as indicated in *subscriptionResourcesAsTarget* by issuing an UPDATE request to each *<subscription>* resource. In the ***From***parameter of each UPDATE request, the Hosting CSE shall include the identifier of the Originator of the *<crossResourceSubscription>* resource CREATE request, which shall be leveraged by the *<subscription>* resource host to verify if the Originator has the privilege to retrieve the *<subscription>* resource and update the *associatedCrossResourceSub* attribute; if the Originator has no privilege to retrieve the *<subscription>* resource and update the *associatedCrossResourceSub* attribute, this step shall be regarded as a failure. If this step is not successfully performed, the Hosting CSE shall send an unsuccessful response to the Originator and shall also delete the resource identifier ofthis *<crossResourceSubscription>* resource from the *associatedCrossResourceSub* and *notificationURI* attributesof each *<subscription>* resource that was updated during the processing of this *<crossResourceSubscription>* resource CREATE request. * Otherwise, the Hosting CSE shall send a successful response to the Originator.     Once the *<crossResourceSubscription>* resource is created, the Hosting CSE shall start the time window.  If the *notificationStatsEnable* attribute is set to TRUE, the Hosting CSE shall collect and record notification statistics for the *<crossResourceSubscription>* resource as defined in clause 10.2.10.27. |
| Information in Response message | All parameters defined in table 8.1.3-1 apply with the specific details for:  ***Content*:** address of the created *<crossResourceSubscription>* resource, according to clause 10.1.2 |
| Processing at Originator after receiving Response | According to clause 10.1.2 |
| Exceptions | According to clause 10.1.2 |

-------------------------------------------------- End of Change 1---------------------------------------

## ----------------------- Start of Change 2--------------------------------------------

**Table 10.2.10.24-1: *<crossResourceSubscription>* UPDATE**

| ***<crossResourceSubscription>* UPDATE** | |
| --- | --- |
| Information in Request message | All parameters defined in table 8.1.2-3 apply with the specific details for:  ***Content:*** attributes of the *<crossResourceSubscription>* resource as defined in clause 9.6.58 which need be updated |
| Processing at Originator before sending Request | According to clause 10.1.4 |
| Processing at Receiver | According to clause 10.1.4  If a *notificationURI* is not the Originator, see table 10.2.10.2-1 in clause 10.2.10.2  If *regularResourcesAsTarget* is updated, the Hosting CSE shall:   * + First, delete the *<subscription>* child resource for each target resource that is deleted from the *regularResourcesAsTarget* attribute . In the ***From*** parameter of each <*subscription*> DELETE request, the Hosting CSE shall include the identifier of the Originator of the *<crossResourceSubscription>* resource UPDATE request, which shall be leveraged by the <*subscription*> resource host to verify if the Originator has the privilege to delete the *<subscription>* resource.   + Second, issue a CREATE request to create a *<subscription>* child resource under each target resource that is added to the *regularResourcesAsTarget* attribute. Each <*subscription*> resource shall be configured with corresponding event notification criteria as defined by the *eventNotificationCriteriaSet* attribute; the *notificationURI* for each *<subscription>* resource shall be configured to the resource identifier of this <crossResourceSubscription> resource being updated. The *associatedCrossResourceSub* attribute of each *<subscription>* resource shall be configured with the resource identifier of this *<crossResourceSubscription>* resource. The Hosting CSE shall leave the *notificationStatsEnable* attribute of the <*subscription*> resource with a default value of FALSE regardless of the value of the *notificationStatsEnable* attribute of the <*crossResourceSubscription*> resource. In the ***From*** parameter of each <*subscription*> CREATE request, the Hosting CSE shall include the identifier of the Originator of the *<crossResourceSubscription>* resource UPDATE request, which shall be leveraged by the <*subscription*> resource host to verify if the Originator has the privilege to create a *<subscription>* resource. If the Originator has no privilege to create this *<subscription>* resource, this step shall be regarded as a failure. If any *<subscription>* resource cannot be successfully created, the Hosting CSE shall send an unsuccessful response to the Originator and shall delete any *<subscription>* resources that were created during the processing of this *<crossResourceSubscription>* resource UPDATE request.   If *subscriptionResourcesAsTarget* is updated, the Hosting CSE shall:   * + First, for each <*subscription*> resource identifier removed from the *subscriptionResourcesAsTarget* attribute, the Hosting CSE shall remove the resource identifier ofthis *<crossResourceSubscription>* resource from the *associatedCrossResourceSub* and notificationURI attributes of that *<subscription>* resource by issuing an UPDATE to the <*subscription*> resource.   + Second, for each <*subscription*> resource identifier added to the *subscriptionResourcesAsTarget* attribute, the Hosting CSE shall issue an UPDATE request to the <*subscription*> resource to add the resource identifier ofthis *<crossResourceSubscription>* resource to the *associatedCrossResourceSub* and *notificationURI* attributes *o*f the *<subscription>* resource.   In the ***From*** parameter of each UPDATE request, the Hosting CSE shall include the identifier of the Originator, which shall be leveraged by the *<subscription>* resource host to verify if the Originator has the privilege to update the *associatedCrossResourceSub*  and *notificationURI* attributes of this *<subscription>* resource; if the Originator has no privilege to update this *<subscription>* resource, this step shall be regarded as a failure. If this step is not successfully performed, the Hosting CSE shall send an unsuccessful response to the Originator and shall update the *associatedCrossResourceSub* and *notificationURI* attributes of any *<subscription>* resources that were updated during the processing of this *<crossResourceSubscription>* resource UPDATE request to return them to the their prior state.  If *eventNotificationCriteriaSet* is updated, the Hosting CSE shall use each new event notification criteria to update the *eventNotificationCriteria* of the corresponding *<subscription>* child resource which has been created previously using the clause 10.2.10.22 for each target resource as included in the *regularResourcesAsTarget* attribute.  If the *notificationStatsEnable* attribute is set to TRUE in the <*crossResourceSubscription*> resource, the Hosting CSE shall collect and record notification statistics for the *<crossResourceSubscription>* resource as defined in clause 10.2.10.27. |
| Information in Response message | According to clause 10.1.4 |
| Processing at Originator after receiving Response | According to clause 10.1.4 |
| Exceptions | According to clause 10.1.4 |

-------------------------------------------------- End of Change 2---------------------------------------

## ----------------------- Start of Change 3--------------------------------------------

**Table 10.2.10.25-1: *<crossResourceSubscription>* DELETE**

| ***<crossResourceSubscription>* DELETE** | |
| --- | --- |
| Information in Request message | All parameters defined in table 8.1.2-3 apply |
| Processing at Originator before sending Request | According to clause 10.1.5 |
| Processing at Receiver | According to clause 10.1.5  The Hosting CSE shall check whether the Originator has the privilege to delete the *<crossResourceSubscription>* resource. If this check fails, the Hosting CSE shall send an unsuccessful response to the Originator with corresponding error information; otherwise, the Hosting CSE shall perform the following operations:  If *regularResourcesAsTarget* is included in the *<crossResourceSubscription>* to be deleted, the Hosting CSE shall issue a DELETE request to delete the *<subscription>* child resource of the corresponding target resource as contained in the *regularResourcesAsTarget* attribute which has been created previously using the clause 10.2.10.22. The identifier of the *<crossResourceSubscription>* resource creator (i.e. its *creator* attribute) shall be included in the ***From*** parameter of each DELETE request and shall be leveraged by the target resource host to check the privilege to delete the *<subscription>* resource.  If *subscriptionResourcesAsTarget* is included, the Hosting CSE shall remove the resource identifier ofthis *<crossResourceSubscription>* from the *associatedCrossResourceSub* and *notificationURI* attributesof each *<subscription>* resource as indicated in the *subscriptionResourcesAsTarget* by issuing an UPDATE request to each <*subscription*> resource.  In the ***From*** parameter of each UPDATE request, the Hosting CSE shall include the identifier of the Originator of this DELETE request, which shall be leveraged by the *<subscription>* resource host to verify if the Originator has the privilege to update the *associatedCrossResourceSub*  and *notificationURI* attributes of this *<subscription>* resource; if the Originator has no privilege to update this *<subscription>* resource, this step shall be regarded as a failure. If this step is not successfully performed, the Hosting CSE shall send an unsuccessful response to the Originator and shall update the *associatedCrossResourceSub* and *notificationURI* attributes of any *<subscription>* resources that were updated during the processing of this *<crossResourceSubscription>* resource UPDATE request to return them to the their prior state. |
| Information in Response message | According to clause 10.1.5 |
| Processing at Originator after receiving Response | According to clause 10.1.5 |
| Exceptions | According to clause 10.1.5 |

-------------------------------------------------- End of Change 3---------------------------------------

## ----------------------- Start of Change 4--------------------------------------------

### 9.6.58 Resource Type *crossResourceSubscription*

The <*crossResourceSubscription*> resource represents a cross-resource subscription over a set of target resources which could be existing *<subscription>* and/or other subscribable oneM2M resources. The Hosting CSE shall generate a cross-resource notifications only when expected changes occur on a designated number of target resources concurrently within a time window. The <*crossResourceSubscription*> resource shall specify the involved target resources in order to generate cross-resource notification.

The <*crossResourceSubscription*> resource shall contain the child resources specified in table 9.6.58-1.

Table 9.6.58-1: Child resources of <*crossResourceSubscription*> resource

| Child Resources of <*crossResourceSubscription*> | Child Resource Type | Multiplicity | Description |
| --- | --- | --- | --- |
| *notificationSchedule* | *<schedule>* | 0..1 | See clause 9.6.9. |
| *[variable]* | *<notificationTargetMgmtPolicyRef>* | 0..n | See clause 9.6.31. |
| *nstr* | *<notificationTargetSelfReference>* | 1 | See clause 9.6.34. |
| *[variable]* | *<transaction>* | 0..n | See clause 9.6.48 |

The <*crossResourceSubscription*> resource shall contain the attributes specified in table 9.6.58-2.

Table 9.6.58-2: Attributes of <*crossResourceSubscription*> resource

| Attributes of  <*crossResourceSubscription*> | Multiplicity | RW/  RO/  WO | Description |
| --- | --- | --- | --- |
| *resourceType* | 1 | RO | See clause 9.6.1.3. |
| *resourceID* | 1 | RO | See clause 9.6.1.3. |
| *resourceName* | 1 | WO | See clause 9.6.1.3. |
| *parentID* | 1 | RO | See clause 9.6.1.3. |
| *expirationTime* | 1 | RW | See clause 9.6.1.3. |
| *accessControlPolicyIDs* | 0..1 (L) | RW | See clause 9.6.1.3. |
| *labels* | 0..1 (L) | RW | See clause 9.6.1.3. |
| *creationTime* | 1 | RO | See clause 9.6.1.3. |
| *lastModifiedTime* | 1 | RO | See clause 9.6.1.3. |
| *announceTo* | 0..1 (L) | RW | See clause 9.6.1.3. |
| *announcedAttribute* | 0..1 (L) | RW | See clause 9.6.1.3. |
| *announceSyncType* | 0..1 | RW | See clause 9.6.1.3. |
| *dynamicAuthorizationConsultationIDs* | 0..1 (L) | RW | See clause 9.6.1.3. |
| *creator* | 1 | RO | See clause 9.6.1.3. |
| *custodian* | 0..1 | RW | See clause 9.6.1.3. |
| *expirationCounter* | 0..1 | RW | See clause 9.6.8. |
| *notificationURI* | 1 (L) | RW | See clause 9.6.8. |
| *notificationEventCat* | 0..1 | RW | See clause 9.6.8. |
| *subscriberURI* | 0..1 | WO | See clause 9.6.8. |
| *regularResourcesAsTarget* | 0..1 | RW | This attribute indicates a list of regular resources (i.e. normal resources rather than *<subscription>* resources), which shall be used as the target resource for this cross-resource subscription. Here, the regular resource is referred to as any subscribable oneM2M resources. |
| *subscriptionResourcesAsTarget* | 0..1 | RW | This attribute indicates a list of existing *<subscription>* resources, which shall be used as the target resource for this cross-resource subscription. |
| *timeWindowType* | 1 | RW | This attribute indicates the type of time window mechanisms ( *timeWindowType*can stand for periodic time window without any overlapping or forsliding time window where the current time window will be slid to become the next time window when a cross-resource notification is generated) which will be used to determine the generation of a cross-resource notification. |
| *timeWindowSize* | 1 | RW | This attribute indicates the size or time duration of the time window, based on which cross-resource notifications shall be generated. Note that the maximum window size (e.g. 60 seconds) may be enforced by the Hosting CSE for a subscriber; if the *timeWindowSize* indicated or requested by a subscriber is larger than the maximum window size, the Hosting CSE may reject the subscriber's request for cross-resource subscription. |
| *eventNotificationCriteriaSet* | 0..1(L) | RW | This attribute lists *eventNotificationCriteria* for each regular target resource as indicated in *regularResourcesAsTarget* attribute and involved in a cross-resource subscription. If there is only one *eventNotificationCriteria* contained in this attribute, it shall be applied to all target resources as indicated by *regularResourcesAsTarget* attribute. If only *subscriptionResourcesAsTarget* attribute appears (i.e. no *regularResourcesAsTarget* attribute), *eventNotificationCriteriaSet* shall not be needed.  See clause 9.6.8 for the description of *eventNotificationCriteria*. |
| *notificationStatsEnable* | 1 | RW | When set to "TRUE", the Hosting CSE shall clear any statistics that were previously stored in the *notificationStatsInfo* attribute and start recording notification statistics for each notification generated for this resource.  When set to "FALSE", the Hosting CSE shall stop recording notification statistics for this resource and maintain the current value of the *notificationStatsInfo* attribute.  Default is "FALSE" |
| *notificationStatsInfo* | 0..1(L) | RO | A list containing notification statistics recorded by the Hosting CSE for each notification target specified by the *notificationURI* attribute of this resource. The Hosting CSE shall maintain a separate set of notification statistics that include:   * Total number of notification requests sent to a notification target * Total number of notification responses received from a notification target   Refer to oneM2M TS 0004 [3] for further details regarding the format of this attribute. |

-------------------------------------------------- End of Change 4---------------------------------------