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| CHANGE REQUEST |
| Meeting ID:\* |  SDS #57 |
| Source:\* | Siddharth Trikha, C-DOT, strikha@cdot.inPoornima Shandilya, C-DOT, poornima@cdot.in Jagan Singh Choudhari, C-DOT jagan@cdot.in |
| Date:\* | 2022-11-29 |
| Reason for Change/s:\* | See the introduction |
| CR against: Release\* | Release 4 |
| CR against: WI\* | [ ]  Active WI-xxxx[x]  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-0026 4\_6\_0 |
| Clauses \* | 7.5.1 |
| Type of change: \* | [ ]  Editorial change[x]  Bug Fix or Correction[ ]  Change to existing feature or functionality[ ]  New feature or functionalityOnly ONE of the above shall be ticked |
| Impacted other TS/TR(s) |  |
| Post Freeze checking:\* | This CR contains only essential changes and corrections? YES [x]  NO [ ] This CR may break backwards compatibility with the last approved version of the TS? YES [ ]  NO [x]  |
| Template Version: January 2017 (Do not modify) |

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GUIDELINES for Change Requests:

Provide an informative introduction containing the problem(s) being solved, and a summary list of proposals.

Each CR should contain changes related to only one particular issue/problem.

In case of a correction, and the change apply to previous releases, a separate “mirror CR” should be posted at the same time of this CR

Mirror CR: applies only when the text, including clause numbering are exactly the same.

Companion CR: applies when the change means the same but the baselines differ in some way (e.g. clause number).

Follow the principle of completeness, where all changes related to the issue or problem within a deliverable are simultaneously proposed to be made E.g. A change impacting 5 tables should not only include a proposal to change only 3 tables. Includes any changes to references, definitions, and acronyms in the same deliverable.

Follow the drafting rules.

All pictures must be editable.

Check spelling and grammar to the extent practicable.

Use Change bars for modifications.

The change should include the current and surrounding clauses to clearly show where a change is located and to provide technical context of the proposed change. Additions of complete clauses need not show surrounding clauses as long as the proposed clause number clearly shows where the new clause is proposed to be located.

Multiple changes in a single CR shall be clearly separated by horizontal lines with embedded text such as, start of change 1, end of change 1, start of new clause, end of new clause.

When subsequent changes are made to content of a CR, then the accepted version should not show changes over changes. The accepted version of the CR should only show changes relative to the baseline approved text.

Introduction

This CR proposes to align the *triggerStatus* attribute values as per the mappings in TS-0026.

TRIGGER-FAILED to be replaced by TRIGGERED-REPLACED

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

### 7.5.1 General Procedure for 3GPP Based Device Triggering

An IN-CSE may initiate a device trigger to an ASN/MN-CSE or ADN-AE hosted on a 3GPP UE to cause it to establish a connection to the IN-CSE, enrol to a MEF, register to the IN-CSE, update its PoA, or perform a CRUD operation on a specified resource. The IN-CSE may initiate the device trigger itself (implicit) or it may be initiated by a request that the IN-CSE receives from an AE (explicit).

Whenever the IN-CSE sends a device trigger to an ASN/MN-CSE or ADN-AE hosted on a 3GPP UE, the device triggering procedure as described in 3GPP TS 29.122 [4] shall be used as the basis for the procedures defined below.

This procedure supports an ASN/MN-CSE or ADN-AE that is hosted on a 3GPP UE that is directly connected to an underlying 3GPP network.



Figure 7.5.1-1: General Procedure for Device Triggering

**Pre-conditions**

The UE that hosts the ASN/MN-CSE or ADN-AE is available to receive the Device Trigger Request using one of the connectivity establishment methods described in clause 6.

**Step 1 (Optional): Request targeted to ASN/MN-CSE** **or ADN-AE**

An AE may initiate a device trigger to an ASN/MN-CSE or ADN-AE explicitly by creating or updating a <*triggerRequest*> resource as specified in clause 9.6.49 of oneM2M TS-0001[1]. Alternatively, an AE may initiate a device trigger to an ASN/MN-CSE or ADN-AE implicitly by issuing a request to an IN-CSE that requires device triggering. For example, if an IN-CSE receives a request to perform a CRUD operationtargeting an ASN/MN-CSE or ADN-AE hosted on a 3GPP UE that is not reachable by the IN-CSE, the IN-CSE may generate a trigger request.

**Step-2: Determine if Device Triggering is required**

The IN-CSE determines whether to send a device trigger to the targeted ASN/MN-CSE or ADN-AE. Further details are provided in clause 8.3.3.2.1 of oneM2M TS‑0001 [1].

If device trigger was initiated by an AE, initiating AE determines device trigger.

**Step 3a: Request for Device Triggering**

The IN-CSE or AE sends the Device Triggering request that contains information as specified in 3GPP TS 29.122 [4]. Such information includes:

* An HTTP POST method shall be used
* *URI* shall be set to *{apiRoot}/3gpp-device-triggering/v1/{scsAsId}/transactions*. The *{apiRoot}* and *{scsAsId}* segments are configured based on Service Provider and MNO policies.
* The request payload shall include a *DeviceTriggering* data structure as specified in 3GPP TS 29.122 [4] with the following attributes:
	+ *supportedFeatures* shall be set to a string value of “0” indicating that trigger notifications over Websockets or trigger notification test events are not supported.
	+ *validityPeriod* shall be set to either the *triggerValidityTime* attribute of the <*triggerRequest*> resource if the trigger request is initiated by an AE.
	+ *triggerPayload* shall be configured as described in clause 8.3.3.2.1 of oneM2M TS 0001 [1] and clause 9.2.1 of oneM2M TS-0004 [3]. An empty payload indicates that the targeted ASN/MN-CSE or ADN-AE shall re-establish connectivity with the IN-CSE.
	+ *externalId* shall be set to the *M2M-Ext-ID* of the targeted UE hosting an ASN/MN-CSE or ADN-AE.
	+ *applicationPortID* shall be set to *Trigger-Recipient-ID* attribute of the <*triggerRequest*> resource, if specified.
	+ *notificationDestination* shall be configured with a URI that the SCEF can target Device Trigger notifications towards. The value of this URI shall be based on internal IN-CSE policies or IN-CSE identifier.
	+ *priority* may be set to either PRIORITY or NO\_PRIORITY per internal IN-CSE policies and/or agreements between the Service Provider and MNO or the *triggerPriority* attribute of the <*triggerRequest*> resource.
	+ *msisdn, requestTestNotification* and *websockNotifConfig* are not supported by the present document and shall not be included.

General Exceptions:

* The SCEF is not reachable when IN-CSE tries to send DeviceTriggering message. In this case the IN-CSE shall update the *triggerStatus* attribute of the <*triggerRequest*> to ERROR\_NSE\_NOT\_FOUND after a prior timeout period (IN-CSE local policy)

**Step 3b (Optional): Response to Device Triggering request**

The SCEF may send a Device Triggering response to the IN-CSE to acknowledge the successful reception of the Device Trigger request before the request is delivered to the targeted UE as specified in 3GPP TS 29.122 [4]. Otherwise an HTTP error status code as defined in clause 8.3 may be returned. The response includes the following information.

* A response code of 201 CREATED
* The *URI* of the device triggering resource created by the SCEF.The *URI* is returned in the HTTP Location header with a format of *{apiRoot}/3gpp-device-triggering/v1/{scsAsId}/transactions {transactionId}*. The *{apiRoot}* and *{scsAsId}* segments are configured based on Service Provider and MNO policies. The *{transactionId}* segment is configured by the SCEF.
* The response payload will include a *DeviceTriggering* data structure as specified in 3GPP TS 29.122 [4] that includes the attributes present in the request along with the following additional attributes:
	+ *self* is configured with a URI to the resource created by the SCEF for the request
	+ *deliveryResult* configured with one of the following status for confirmation:
		- TRIGGERED: that the request for device triggering has been received and is accepted by the SCEF but has not yet been delivered. In this case the IN-CSE shall update the *triggerStatus* attribute of the <*triggerRequest*> to TRIGGER\_TRIGGERED

General Exceptions:

If the SCEF responds with one of the error response codes defined in clause 8.3, the IN-CSE shall update the *triggerStatus* attribute of the <*triggerRequest*> to TRIGGER\_FAILED.

**Step 4: Device Trigger Delivery procedure**

The device trigger message shall be delivered to the UE hosting the ASN/MN-CSE or ADN-AE.

**Step 5: Response to DeviceTriggering**

The SCEF may send a Device Trigger response to the IN-CSE to acknowledge the successful delivery of the Device Trigger request to the targeted UE as specified in 3GPP TS 29.122 [4]. Otherwise an HTTP error status code defined in clause 8.3 may be returned. The response includes the following parameters:

* A response code of 201 CREATED
* The *URI* of the device triggering resource created by the SCEF.The *URI* is returned in the HTTP Location header with a format of *{apiRoot}/3gpp-device-triggering/v1/{scsAsId}/transactions {transactionId}*. The *{apiRoot}* and *{scsAsId}* segments are configured based on Service Provider and MNO policies. The *{transactionId}* segment is configured by the SCEF.
* The response payload will include a *DeviceTriggering* data structure as specified in 3GPP TS 29.122 [4] that includes the attributes present in the request along with the following additional attributes:
	+ *self* parameter configured with a URI to the resource created by the SCEF for the Device Trigger request.
	+ *deliveryResult* is included in the HTTP response to indicate one of the following status for delivery of the device trigger:
		- SUCCESS: that the device triggering delivery is successfully completed. In this case the IN-CSE shall update the *triggerStatus* attribute of the <*triggerRequest*> to TRIGGER\_DELIVERED.
		- UNKNOWN: that indicates any unspecified errors. In this case the IN-CSE shall update the *triggerStatus* attribute of the <*triggerRequest*> to TRIGGER\_FAILED
		- FAILURE: that this trigger encountered an error during delivery or processing and is deemed permanently undeliverable. In this case the IN-CSE shall update the *triggerStatus* attribute of the <*triggerRequest*> to TRIGGER\_FAILED
		- EXPIRED: that the validity period expired when processing the device triggering request. In this case the IN-CSE shall update the *triggerStatus* attribute of the <*triggerRequest*> to TRIGGER\_EXPIRED.
		- TERMINATE: that the delivery of the device triggering request is terminated by the IN-CSE. In this case the IN-CSE shall update the *triggerStatus* attribute of the <*triggerRequest*> to TRIGGER\_TERMINATED.

General Exceptions:

If the SCEF responds with one of the error response codes defined in clause 8.3, and the device trigger was initiated by an AE via a <*triggerRequest*> resource, the IN-CSE shall update the *triggerStatus* attribute of the <*triggerRequest*> to TRIGGER\_FAILED.

**Step 6: Device Triggering Delivery Report Notification request**

The SCEF sends a Device Triggering Delivery Report Notification message to the *{notification\_uri}* of the IN-CSE with the results of the trigger delivery outcome. This message is defined in 3GPP TS 29.122 [4] and shall include the following:

* An HTTP POST method is used
* *URI* is set to *{notification\_uri}*. The *{notification\_uri}* is configured by the IN-CSE in the Device Triggering Request.
* *transaction* is configured with a link to the related device triggering transaction resource to which this notification is related to.
* The request payload will include a *deliveryResult* data structure as specified in 3GPP TS 29.122 [4]. The IN-CSE shall process the deliveryResult and update the the *triggerStatus* attribute of the <*triggerRequest*> as defined in Step 5.

**Step 7: Device Triggering Delivery Report Notification response**

After receiving a Device Triggering Delivery Report Notification request, the IN-CSE or AE returns a HTTP response having a response code of 204 NO CONTENT and no payload.

**Steps 8 (optional) and 9: IN-CSE Updates <triggerRequest> and Response to 1a or 1b**

If the device trigger was initiated by an AE via a <*triggerRequest*> resource, then the IN-CSE shall update *triggerStatus* attribute of <*triggerRequest*> resource.

**Step 10: ASN/MN-CSE or ADN-AE performs trigger actions**

If the trigger has no payload, the ASN/MN-CSE or ADN-AE shall re-establish connectivity with the IN-CSE. Otherwise, based on the type of trigger request received, the ASN/MN-CSE or ADN-AE performs the corresponding trigger actions such as establish connectivity with the IN-CSE, enrol with the MEF, register to the IN-CSE, update its PoA, or execute a CRUD request on a specified resource.

Further details are described in clause 8.3.3.2.1 of oneM2M TS‑0001 [1] and clause 9.2.1 of oneM2M TS-0004 [3]

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