|  |  |
| --- | --- |
| INPUT CONTRIBUTION | |
| Group Name:\* | TDE |
| Title:\* | Interop Test Cases for 3GPP Interworking |
| Source:\* | KETI and EGM |
| Contact: | JaeSeung Song, KETI, [jssong@sejong.ac.kr](mailto:jssong@sejong.ac.kr)  Sherzod Elamanov, KETI, [selamanov@gmail.com](mailto:selamanov@gmail.com)  Franck Le-Gall, EGM, [franck.le-gall@eglobalmark.com](mailto:franck.le-gall@eglobalmark.com)  Ahmed ABID, EGM, [ahmed.abid@eglobalmark.com](mailto:ahmed.abid@eglobalmark.com) |
| Date:\* | 2020-10-06 |
| Abstract:\* | The contribution proposes some Interoperability Test Descriptions for the 3GPP interworking features to be added to TS-0013 |
| Agenda Item:\* | TBD |
| Work item(s): |  |
| Document(s)  Impacted\* | TS-0013 |
| Intended purpose of  document:\* | Decision  Discussion  Information  Other <specify> |
| Decision requested or recommendation:\* | Incorporate the proposed text into TS-0013 |

**oneM2M Notice**

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

1. **Introduction**

This contribution consists of some test descriptions about 3GPP Interworking to be included into the TS-0013.

The clause numbers and the TD identifier names in the following proposal may change when included in to TS-0013.

1. **Proposal**

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

### 2.1 Normative references

References are either specific (identified by date of publication and/or edition number or version number) or non‑specific. For specific references, only the cited version applies. For non-specific references, the latest version of the referenced document (including any amendments) applies.

The following referenced documents are necessary for the application of the present document.

[1] oneM2M TS-0001: "Functional Architecture- Release 3".

[2] oneM2M TS-0004 "Service Layer Core protocol Specification - Release 3".

[3] oneM2M TS-0008: "CoAP Protocol Binding Release 3".

[4] oneM2M TS-0009: "HTTP Protocol Binding - Release 3".

[5] oneM2M TS-001: "MQTT Protocol Binding - Release 3".

[6] oneM2M TS-0015: "Testing Framework".

[7] oneM2M TS-0011: "Common Terminology".

[8] IETF RFC 3986: "Uniform Resource Identifier (URI): Generic Syntax".

[9] IETF RFC 7230: "Hypertext Transfer Protocol (HTTP/1.1): Message Syntax and Routing".

[10] oneM2M TS-0005: "Management Enablement (OMA) - Release 3".

[11] oneM2M TS-0006: "Management Enablement (BBF) - Release 3".

[12] oneM2M TS-0003: "Security Solutions - Release 3".

[13] oneM2M TS-0034: "Semantics Support - Release 3".

[14] oneM2M TS-0023: " Home Appliances Information Model and Mapping – Release 3".

[15] oneM2M TS-0026: " 3GPP interworking – Release 4".

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

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

7 Configuration

7.1 Test Configuration

7.1.2 Single hop

7.1.2.6 M2M\_CFG\_11

This configuration concerns device management using 3GPP network.



7.1.2.7 M2M\_CFG\_12

This configuration concerns group management when the IN-AE is using a group to fan out requests to multiple members in 3GPP interworking scenraios. The connection between the IN-AE and the Group Hosting CSE, the Group Hosting CSE and the Member Hosting CSE may be a multi hop connection following the definition in clause 7.1.3.

This configuration is mapped to cases including:

* IN-AE sends a request addressing <group>/fanOutPoint in the Group Hosting CSE, the Group Hosting CSE then further fans out the request to each Member Hosting CSE through 3GPP network.



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

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

# Test Descriptions

8.7 3GPP Interworking

### 8.7.1 Cellular IoT non-IP data delivery (NIDD)

#### 8.7.1.1 SCEF Configuration for NIDD

| **Interoperability Test Description** | | | |
| --- | --- | --- | --- |
| **Identifier:** | | | TD\_M2M\_SH\_21 |
| **Objective:** | | | IN-CSE establishes SCEF Configuration for NIDD |
| **Configuration:** | | | M2M\_CFG\_09 |
| **References:** | | | oneM2M TS-0026 [15], clause 7.1.1.1 |
|  | | | |
| **Pre-test conditions:** | | | * UE hosts an ADN-AE node * IN-CSE has a <m2mServiceSubscriptionProfile> resource created as a child of <CSEBase> resource * <serviceSubscribedNode> resource is created as a child of <m2mServiceSubscriptionProfile> * Node-ID attribute of <serviceSubscribedNode> resource is set to M2M-Ext-ID of UE and niddRequired attribute is set to TRUE * SCEF identifier is pre-provisioned to IN-CSE |
| **Test Sequence** | | | |
| **Step** | **RP** | **Type** | **Description** |
| 1 |  | Stimulus | IN-CSE issues a NIDD Configuration Request to SCEF for AND-AE hosted on a UE |
| 2 | (T8) Mcn | PRO Check HTTP | * Method = POST * URI = {apiRoot}/3gpp-nidd/v1/{scsAsId}/configurations/   The *{apiRoot}* and *{scsAsId}* segments are configured based on Service Provider and MNO policies.   * Payload shall include *NiddConfiguration* data structure with the following attributes included in the request: externalId, notificationDestination, duration, pdnEstablishmentOption, duration, pdnEstablishmentOption, reliableDataService, rdsPorts, supportedFeatures |
| 3 |  | IOP Check | Check if possible that the SCEF has successfully processes the NIDD Configuration Request |
| 4 | (T8) Mcn | PRO Check HTTP | SCEF responds for the NIDD Configuration Request:   * Status code = 201 (CREATED) * Location header = *{apiRoot}/3gpp-nidd/v1/{scsAsId}/configurations/{configurationId}* * Payload shall include *NiddConfiguration* data structure with the following attributes included in the request: maximumPacketSize, status, self |
| 5 |  | IOP Check | IN-CSE indicates successful operation. |
| IOP Verdict | |  | |
| PRO Verdict | |  | |

8.7.1.2 SCEF-based Mobile Terminated NIDD

| **Interoperability Test Description** | | | |
| --- | --- | --- | --- |
| **Identifier:** | | | TD\_M2M\_SH\_22 |
| **Objective:** | | | IN-AE sends a downlink non-IP data to a UE hosting ADN-AE |
| **Configuration:** | | | M2M\_CFG\_11 |
| **References:** | | | oneM2M TS-0026 [], clause 7.1.1.2 |
|  | | | |
| **Pre-test conditions:** | | | * IN-AE has created an Application Entity resource <AE> on IN-CSE * AND-AE has created an Application Entity resource <AE> on IN-CSE * IN-CSE has a <m2mServiceSubscriptionProfile> resource created as a child of <CSEBase> resource * <serviceSubscribedNode> resource is created as a child of <m2mServiceSubscriptionProfile> * Node-ID attribute of <serviceSubscribedNode> resource is set to M2M-Ext-ID of UE and niddRequired attribute is set to TRUE * SCEF identifier is pre-provisioned to IN-CSE * NIDD configuration procedure is competed successfully |
| **Test Sequence** | | | |
| **Step** | **RP** | **Type** | **Description** |
| 1 |  | Stimulus | (Optional) IN-AE issues an arbitrary oneM2M request targeting an ADN-AE. |
| 2 |  | Stimulus | IN-CSE issues a SCEF-based Mobile Terminated (MT) NIDD Downlink Data Transfer Request |
| 3 | (T8) Mcn | PRO Check HTTP | * Method = POST * URI = *{apiRoot}/3gpp-nidd/v1/{scsAsId}/configurations/{configurationId}/downlink-data-deliveries* * Payload shall include NiddDownlinkDataTransfer data structure with the following attributes included in the request: externalId, maximumLatency, priority, pdnEstablishmentOption, pdnEstablishmentOption, reliableDataService, rdsPorts. |
| 4 |  | IOP Check | Check if possible that the SCEF has successfully processes the NIDD Configuration Request |
| 5 | (T8) Mcn | PRO Check HTTP | SCEF responds for the NIDD Configuration Request:   * Status code = 201 (CREATED) * Location header = *{apiRoot}/3gpp-nidd/v1/{scsAsId}/configurations/{configurationId}* * Payload shall include *NiddConfiguration* data structure with the following attributes included in the request: maximumPacketSize, status, self |
| 6 |  | IOP Check | In case the UE does not have an active NIDD PDN connection to the SCEF, check that SCEF buffered the request until the UE establishes the connection |
| 7 | (T8) Mcn | PRO Check HTTP | SCEF responds for the NIDD Downlink Data Transfer Response   * Status code = 200 (OK) / 201 (CREATED, Buffered request) * Location header = *{apiRoot}/3gpp-nidd/v1/{scsAsId}/configurations/{configurationId}/downlink-data-deliveries/{downlinkDataDeliveryId}* * Payload shall include NiddDownlinkDataTransfer data structure with the following attributes included in the request: deliviryStatus, self, requestedRetransmissionTime. |
| 8 | (T8) Mcn | PRO Check HTTP | (Optional) SCEF returns a MT NIDD Downlink Data Delivery Status Notification to IN-CSE:   * Method = POST * URI = *{notification\_uri}* * Payload shall include a NiddDownlinkDataDeliveryStatusNotification data structure with the following attributes included in the request:niddDownlinkDataTransfer, deliveryStatus, requestedRetransmissionTime |
| 9 | (T8) Mcn | PRO Check HTTP | IN-CSE responds to the MT NIDD Downlink Data Delivery Status Notification:   * Status code = 204 (NO CONTENT) |
| 10 |  | IOP Check | Check that ADN-AE on UE has executed the oneM2M request primitive accordingly |
| 11 |  | Stimulus | (Optional) ADN-AE hosted on the UE issues a MO NIDD Uplink Data Notification to deliver a oneM2M response primitive back to the Originator |
| 12 | (T8) Mcn | PRO Check HTTP | * Method = POST * URI = *{notification\_uri}* * Payload shall include NiddUplinkDataNotification data structure with the following attributes included in the request: niddConfiguration, externalId, reliableDataService, rdsPort, data |
| 13 | (T8) Mcn | PRO Check HTTP | (Optional) IN-CSE responds to the MT NIDD Uplink Data Delivery Notification:   * Status code = 204 (NO CONTENT) |
| 14 |  | IOP Check | (Optional) Check that IN-AE received a corresponding oneM2M response primitive. |
| IOP Verdict | |  | |
| PRO Verdict | |  | |

### 8.7.2 Monitoring events

#### 8.7.2.1 UE Reachability monitoring

| **Interoperability Test Description** | | | |
| --- | --- | --- | --- |
| **Identifier:** | | | TD\_M2M\_SH\_23 |
| **Objective:** | | | IN-AE monitors UE Reachability status |
| **Configuration:** | | | M2M\_CFG\_10 |
| **References:** | | | oneM2M TS-0026 [15], clause 7.4.1 |
|  | | | |
| **Pre-test conditions:** | | | * UE, SCEF and IN-CSE are attached to the underlying 3GPP network * IN-AE has created an Application Entity resource <AE> on IN-CSE * ADN-AE has created an Application Entity resource <AE> on IN-CSE * ADN-AE has created a Node resource <node> on IN-CSE representing UE * ADN-AE has created a Schedule resource <schedule> on IN-CSE under <node> resource. The networkCoordinatedattribute is set to TRUE. * IN-AE has subscribed to the <schedule> resource by creating a child <subscription> resource. * IN-CSE has subscribed to to the SCEF to monitor the reachability of a UE * UE is in idle mode |
| **Test Sequence** | | | |
| **Step** | **RP** | **Type** | **Description** |
| 1 |  | Stimulus | UE transitions to connected mode |
| 2 |  | IOP Check | Check if possible that the 3GPP network entities (e.g. HSS) has detected the condition and sent a Monitoring Event Report to SCEF |
| 3 | (T8) Mcn | PRO Check HTTP | SCEF receives the report and sends Monitoring Notification to IN-CSE:   * Method = POST * URI = *{notification\_uri}* * Payload shall include MonitoringNotification data structure with the following attributes included in the request: subscription, configResults, cancelInd, monitoringEventReports |
| 4 | (T8) Mcn | PRO Check HTTP | IN-CSE responds to the UE Reachability Monitoring Notification:  Status code = 204 (NO CONTENT) |
| 5 |  | IOP Check | Check if possible that if idleStatusInfoinformation is provided in the report, IN-CSE has updated scheduleElement attribute of the <schedule> resource |
| 6 | (T8) Mcn | PRO Check  Primitive | IN-CSE sends a Notify message to IN-CSE:   * op = 6 (Notify) * pc = serialized representation of the updated <schedule> resource |
| 7 |  | IOP Check | Check if possible that ADN-AE on UE has updated its local <schedule> resource (if applicable) |
| IOP Verdict | |  | |
| PRO Verdict | |  | |

#### 8.7.2.2 UE Availability after DDN Failure

| **Interoperability Test Description** | | | |
| --- | --- | --- | --- |
| **Identifier:** | | | TD\_M2M\_SH\_24 |
| **Objective:** | | | UE Availability after DDN Failure scenario |
| **Configuration:** | | | M2M\_CFG\_11 |
| **References:** | | | oneM2M TS-0026 [15], clause 7.4.2 |
|  | | | |
| **Pre-test conditions:** | | | * UE, SCEF and IN-CSE are attached to the underlying 3GPP network * IN-AE has created an Application Entity resource <AE> on IN-CSE * ADN-AE has created an Application Entity resource <AE> on IN-CSE * ADN-AE has created a Node resource <node> on IN-CSE representing UE * ADN-AE has created a Schedule resource <schedule> on IN-CSE under <node> resource. The networkCoordinatedattribute is set to TRUE. * IN-AE has subscribed to the <schedule> resource by creating a child <subscription> resource. * IN-CSE has subscribed to to the SCEF to receive notifications (monitoringType = AVAILABILITY\_AFTER\_DDN\_FAILURE) * UE is in unreachable for Downlink data and in state that DDN Failure condition can be reproduced |
| **Test Sequence** | | | |
| **Step** | **RP** | **Type** | **Description** |
| 1 |  | Stimulus | IN-AE issues an arbitrary oneM2M request targeting an ADN-AE. |
| 2 |  | IOP Check | Check that no response for UE paging is received.  Check if possible that if UE is in PSM mode, the UE subscription has been updated to reflect that a notification of availability should be sent after this DDN failure |
| 3 |  | Stimulus | UE contacts the network |
| 4 |  | IOP Check | Check if possible that SCEF has received a Monitoring Indication that the UE is available |
| 5 | (T8) Mcn | PRO Check HTTP | SCEF receives the report and sends Monitoring Notification for AVAILABILITY\_AFTER\_DDN\_FAILURE to IN-CSE:   * Method = POST * URI = *{notification\_uri}* * Payload shall include MonitoringNotification data structure with the following attributes included in the request: subscription, configResults, cancelInd, monitoringEventReports |
| 6 | (T8) Mcn | PRO Check HTTP | IN-CSE responds to the DDN Failure Monitoring Notification:  Status code = 204 (NO CONTENT) |
| 7 |  | IOP Check | Check if possible that IN-CSE has updated the <schedule> resource to indicate that UE is available and created new scheduleElement.  Check if possible that notification has been sent to the <schedule> resource subscribed entities. |
| 8 |  | Stimulus | UE transitions to Idle |
| 9 | (T8) Mcn | PRO Check HTTP | SCEF sends a UE Reachability Monitoring Event Notification Request to IN-CSE:   * Method = POST * URI = *{notification\_uri}* * Payload shall include MonitoringNotification data structure with the following attributes included in the request: subscription, configResults, cancelInd, monitoringEventReports |
| 10 | (T8) Mcn | PRO Check HTTP | IN-CSE responds to the UE Reachability Monitoring Notification:  Status code = 204 (NO CONTENT) |
| 11 |  | IOP Check | Check if possible that IN-CSE has updated the <schedule> resource to indicate that UE is idle.  Check if possible that notification has been sent to the <schedule> resource subscribed entities. |
| IOP Verdict | |  | |
| PRO Verdict | |  | |

#### 8.7.2.3 UE Communication Failure

| **Interoperability Test Description** | | | |
| --- | --- | --- | --- |
| **Identifier:** | | | TD\_M2M\_SH\_25 |
| **Objective:** | | | UE Communication Failure scenario |
| **Configuration:** | | | M2M\_CFG\_11 |
| **References:** | | | oneM2M TS-0026 [15], clause 7.4.3 |
|  | | | |
| **Pre-test conditions:** | | | * UE, SCEF and IN-CSE are attached to the underlying 3GPP network * IN-AE has created an Application Entity resource <AE> on IN-CSE * ADN-AE has created an Application Entity resource <AE> on IN-CSE * ADN-AE has created a Node resource <node> on IN-CSE representing UE * ADN-AE has created a Schedule resource <schedule> on IN-CSE under <node> resource. The networkCoordinatedattribute is set to TRUE * IN-AE has subscribed to the <schedule> resource by creating a child <subscription> resource. * IN-CSE has subscribed to to the SCEF to receive notifications (monitoringType = COMMUNICATION\_FAILURE) |
| **Test Sequence** | | | |
| **Step** | **RP** | **Type** | **Description** |
| 1 |  | Stimulus | UE communication failure occurs |
| 2 |  | IOP Check | Check if possible SCEF has received a Monitoring Event Report |
| 3 | (T8) Mcn | PRO Check HTTP | SCEF receives the report and sends Monitoring Notification Report for COMMUNICATION\_FAILURE to IN-CSE:   * Method = POST * URI = *{notification\_uri}* * Payload shall include MonitoringNotification data structure with the following attributes included in the request: subscription, configResults, cancelInd, monitoringEventReports |
| 4 | (T8) Mcn | PRO Check HTTP | IN-CSE responds to the DDN Failure Monitoring Notification:  Status code = 204 (NO CONTENT) |
| 5 |  | IOP Check | Check if possible that IN-CSE has updated the <schedule> resource to indicate that UE is available and created new scheduleElement. |
| 6 |  | Stimulus | UE transitions to Idle |
| 7 | (T8) Mcn | PRO Check HTTP | SCEF sends a UE Reachability Monitoring Event Notification Request to IN-CSE:   * Method = POST * URI = *{notification\_uri}* * Payload shall include MonitoringNotification data structure with the following attributes included in the request: subscription, configResults, cancelInd, monitoringEventReports |
| 8 | (T8) Mcn | PRO Check HTTP | IN-CSE responds to the UE Communication Failure Monitoring Notification:  Status code = 204 (NO CONTENT) |
| 9 |  | IOP Check | Check if possible that IN-CSE has updated the scheduleElementof the <schedule*>* resource to indicate that no communications are currently available.  Check if possible that notification has been sent to the <schedule> resource subscribed entities. |
| IOP Verdict | |  | |
| PRO Verdict | |  | |

#### 8.7.2.4 Roaming Status

| **Interoperability Test Description** | | | |
| --- | --- | --- | --- |
| **Identifier:** | | | TD\_M2M\_SH\_26 |
| **Objective:** | | | UE Communication Failure scenario |
| **Configuration:** | | | M2M\_CFG\_09 |
| **References:** | | | oneM2M TS-0026 [15], clause 7.4.6 |
|  | | | |
| **Pre-test conditions:** | | | * UE, SCEF and IN-CSE are attached to the underlying 3GPP network * IN-CSE can make Roaming Status Reports requests * IN-CSE has a <m2mServiceSubscriptionProfile> resource created as a child of <CSEBase> resource * <serviceSubscribedNode> resource is created as a child of <m2mServiceSubscriptionProfile> * Node-ID attribute of <serviceSubscribedNode> resource is set to M2M-Ext-ID of UE * ADN-AE has created an Application Entity resource <AE> on IN-CSE * ADN-AE has created a Node resource <node> on IN-CSE representing UE. roamingStatus and networkID attributes of <node> resource are configured. * IN-CSE has subscribed to to the SCEF to receive notifications (monitoringType = ROAMING\_STATUS) |
| **Test Sequence** | | | |
| **Step** | **RP** | **Type** | **Description** |
| 1 |  | Stimulus | Roaming status of UE has changed |
| 2 |  | IOP Check | Check if possible SCEF has received a Monitoring Event Report |
| 3 | (T8) Mcn | PRO Check HTTP | SCEF receives the report and sends Monitoring Notification Report for ROAMING\_STATUS to IN-CSE:   * Method = POST * URI = *{notification\_uri}* * Payload shall include MonitoringNotification data structure with the following attributes included in the request: subscription, configResults, cancelInd, monitoringEventReports |
| 4 | (T8) Mcn | PRO Check HTTP | IN-CSE responds to the DDN Failure Monitoring Notification:  Status code = 204 (NO CONTENT) |
| 5 |  | IOP Check | Check if possible that IN-CSE has updated roamingStatus and networkID attributes the <node> resource. |
| IOP Verdict | |  | |
| PRO Verdict | |  | |

#### 8.7.2.5 Location Reporting

| **Interoperability Test Description** | | | |
| --- | --- | --- | --- |
| **Identifier:** | | | TD\_M2M\_SH\_27 |
| **Objective:** | | | UE Communication Failure scenario |
| **Configuration:** | | | M2M\_CFG\_09 |
| **References:** | | | oneM2M TS-0026 [15], clause 7.4.7 |
|  | | | |
| **Pre-test conditions:** | | | * UE, SCEF and IN-CSE are attached to the underlying 3GPP network * IN-CSE can make Roaming Status Reports requests * ADN-AE has created an Application Entity resource <AE> on IN-CSE * ADN-AE has created a Node resource <node> on IN-CSE representing UE. roamingStatus and networkID attributes are of <node> resource are configured. * ADN-AE has created a Schedule resource <schedule> on IN-CSE under <node> resource. The networkCoordinatedattribute is set to TRUE * IN-CSE has subscribed to to the SCEF to receive notifications (monitoringType = ROAMING\_STATUS) |
| **Test Sequence** | | | |
| **Step** | **RP** | **Type** | **Description** |
| 1 |  | Stimulus | IN-AE sends a <locationPolicy> CREATE request |
| 2 | (T8) Mcn | PRO Check Primitive | * op = 1 (Create) * to = {CSEBaseName} * fr = IN-AE-ID * rqi = (token-string) * ty = 10 (LocationPolicy) * pc = Serialized representation of <locationPolicy> resource   + locationSource = Netwrork based   + locationUpdatePeriod = 0   + locationTargetID = M2M-Ext-ID of the UE |
| 3 |  | IOP Check | Check if possible that IN-CSE has created <locationPolicy> resource |
| 4 |  | Stimulus | AE is requested to send a Retrieve Request for a <latest> content instance. |
| 5 | (T8) Mcn | PRO Check Primitive | * op = 2 (Retrieve) * to = {CSEBaseName}/URI of <container> resource/la * fr = IN-AE-ID * rqi = (token-string) * pc = empty |
| 6 | (T8) Mcn | PRO Check HTTP | IN-CSE makes Monitoring Event Subscription request to retrieve current location of UE   * Method = POST * URI = *{apiRoot}/3gpp-monitoring-event/v1/{scsAsId}/subscriptions/* * Payload shall include *MonitoringEventSubscription* data structure with the following attributes included in the request: externalId, notificationDestination, monitoringType, supportedFeatures, maximumNumberOfReports, monitorExpireTime, locationType, accuracy. |
| 7 | (T8) Mcn | PRO Check HTTP | SCEF sends a Monitoring Event Subscription Response message to the IN-CSE   * Status code = 201 (CREATED) * Location header = *{apiRoot}/3gpp-monitoring-event/v1/{scsAsId}/subscriptions/{subscriptionId}* * Payload shall include NiddConfiguration data structure with the following attributes included in the request: monitoringEventReport, self |
| 8 |  | IOP Check | Check if possible that SCEF detected and retrieved location of UE. |
| 9 | (T8) Mcn | PRO Check HTTP | SCEF sends a Monitoring Event Report message to the IN-CSE   * Method = POST * URI = *{notification\_uri}* * Payload shall include *MonitoringEventSubscription* data structurewith the following attributes included in the request: subscription, configResults, cancelid,monitoring, EventReports |
| 10 | (T8) Mcn | PRO Check HTTP | IN-CSE responds to the DDN Failure Monitoring Notification:  Status code = 204 (NO CONTENT) |
| 11 |  | IOP Check | Check if possible that IN-CSE has created a new <contentInstance> child resource of the <container>. The <contentInstance> contains the UE’s current location |
| 12 | (T8) Mcn | PRO Check HTTP | IN-CSE sends a Monitoring Event Subscription message to the SCEF   * Method = POST * URI = *{apiRoot}/3gpp-monitoring-event/v1/{scsAsId}/subscriptions/* * Payload shall includeMonitoringEventSubscriptionwith the following attributes included in the request: subscription, configResults, cancelid,monitoringEventReports * locationType = LAST\_KNOWNLOCATION |
| 13 | (T8) Mcn | PRO Check HTTP | SCEF sends a Monitoring Event Report message to the IN-CSE   * Method = POST * Response code = 201 (CREATED) * URI = *{apiRoot}/3gpp-monitoring-vent/v1/{scsAsId}/subscriptions/{subscriptionId}* * Payload shall include *MonitoringEventSubscription* data structure with the following attributes included in the request: self, monitoringEnentReport |
| 14 |  | IOP Check | Check if possible that SCEF receives a last known location information of UE |
| 15 | (T8) Mcn | PRO Check HTTP | SCEF sends a Monitoring Notification Report message to the IN-CSE for LOCATION\_REPORTING:   * Method = POST * URI = *{notification\_uri}* * Payload shall include *MonitoringEventSubscription* data structurewith the following attributes included in the request: subscription, configResults, cancelid,monitoringEventReports |
| 16 | (T8) Mcn | PRO Check HTTP | IN-CSE responds to the Monitoring Notification:  Status code = 204 (NO CONTENT) |
| 17 |  | IOP Check | Check if possible that IN-CSE has created a new *<contentInstance*> child resource of the <*container*> containing the UE’s last known location in this <*contentInstance>* |
| 18 | (T8) Mcn | PRO Check HTTP | * rsc =2000 (OK) * rqi = (token-string) same as received in request message   pc = Serialized representation of latest <contentInstance> resource, created after acquiring location info from SCEF |
| 19 |  | IOP Check | * AE indicates successful operation |
| PRO Verdict | |  | |

### 8.7.3 3GPP Based Device triggering

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

| **Interoperability Test Description** | | | |
| --- | --- | --- | --- |
| **Identifier:** | | | TD\_M2M\_SH\_28 |
| **Objective:** | | | IN-AE triggers AND-AE hosted on UE |
| **Configuration:** | | | M2M\_CFG\_09 |
| **References:** | | | oneM2M TS-0026 [15], clause 7.5.1 |
|  | | | |
| **Pre-test conditions:** | | | * UE, SCEF and IN-CSE are attached to the underlying 3GPP network * ADN-AE has created an Application Entity resource <AE> on IN-CSE * ADN-AE is available to receive the Device Trigger Requests (triggerEnable = “TRUE”) |
| **Test Sequence** | | | |
| **Step** | **RP** | **Type** | **Description** |
| 1 |  | Stimulus | IN-AE sends a request to create a <triggerRequest> |
| 2 | Mca | PRO Check Primitive | * op = 1 (Create) * to = {CSEBaseName}/{AE-ID}/ * fr = AE-ID * rqi = (token-string) * ty = 47 (triggerRequest) * pc = Serialized representation of < triggerRequest > resource |
| 3 |  | IOP Check | Check if possible that IN-CSE has created <triggerRequest> resource |
| 4 | (T8) Mcn | PRO Check HTTP | IN-CSE sends a Device Triggering request to the SCEF   * Method = POST * URI = *{apiRoot}/3gpp-device-triggering/v1/{scsAsId}/transactions* * Payload shall includeDeviceTriggering data structure with the following attributes included in the request: supportedFeatures, validityPeriod, triggerPayload, externalId, *applicationPortID,* notificationDestination, priority |
| 5 |  | IOP Check | Check that SCEF has responded to IN-CSE for Device Triggering request  Check that SCEF has delivered the device trigger message to the UE hosting ADN-AE  Check that SCEF has delivered the Device Triggering Delivery Report Notification request to IN-CSE |
| 6 |  | IOP Check | Check that IN-CSE has responded to SCEF the Device Triggering Delivery Report Notification request  Check if possible that IN-CSE has updated triggerStatus attribute of <triggerRequest> resource  Check that IN-CSE has responded to IN-AE for <triggerRequest> Create request |
| 7 |  | IOP Check | Check that ADN-AE has performed the trigger actions |
| IOP Verdict | |  | |
| PRO Verdict | |  | |

#### 8.7.3.2 3GPP Based Device Trigger Recall/Replace Procedure

| **Interoperability Test Description** | | | |
| --- | --- | --- | --- |
| **Identifier:** | | | TD\_M2M\_SH\_29 |
| **Objective:** | | | IN-AE recalls/replaces a trigger request targeting AND-AE hosted on UE that has been already created in IN-CSE |
| **Configuration:** | | | M2M\_CFG\_09 |
| **References:** | | | oneM2M TS-0026 [15], clause 7.5.2 |
|  | | | |
| **Pre-test conditions:** | | | * UE, SCEF and IN-CSE are attached to the underlying 3GPP network * ADN-AE has created an Application Entity resource <AE> on IN-CSE * ADN-AE is available to receive the Device Trigger Requests (triggerEnable = “TRUE”) * <triggerRequest> resource targeting ADN-AE has been created in IN-CSE * IN-CSE has already sent a device trigger request to the underlying 3GPP network |
| **Test Sequence** | | | |
| **Step** | **RP** | **Type** | **Description** |
| 1 |  | Stimulus | IN-AE sends a request to UPDATE/DELETE a <triggerRequest> |
| 2 | Mca | PRO Check Primitive | * op = 3 (Update) / 4 (Delete) * to = {CSEBaseName}/{AE-ID}/{URI of <triggerRequest> resource} * fr = AE-ID * rqi = (token-string) * pc = Serialized representation of < triggerRequest > resource (for UPDATE only) |
| 3 |  | IOP Check | Check if possible that IN-CSE has created <triggerRequest> resource |
| 4 | (T8) Mcn | PRO Check HTTP | IN-CSE sends a Trigger UPDATE (Replace) / DELETE (Recall) Request to the SCEF   * Method = PUT/DELETE * URI = *{apiRoot}/3gpp-device-triggering/v1/{scsAsId}/transactions* * (For Trigger UPDATE only) Payload shall includeDeviceTriggering data structure with the following attributes included in the request: supportedFeatures, validityPeriod, triggerPayload, externalId, applicationPortID*,* notificationDestination, priority |
| 5 |  | IOP Check | Check that SCEF has recalled/replaced the trigger  Check that SCEF responded to IN-CSE for Device Trigger Recall/Replace  Check that SCEF has delivered the device trigger message to the UE hosting ADN-AE  Check that SCEF has delivered the Device Triggering Delivery Report Notification request to IN-CSE |
| 6 |  | IOP Check | Check if possible that IN-CSE has updated triggerStatus attribute of <triggerRequest> resource / deleted <triggerRequest> resource  Check that IN-CSE has responded to IN-AE for <triggerRequest> UPDATE/DELETE request |
| IOP Verdict | |  | |
| PRO Verdict | |  | |

### 8.7.4 Configuration of traffic patterns

| **Interoperability Test Description** | | | |
| --- | --- | --- | --- |
| **Identifier:** | | | TD\_M2M\_SH\_30 |
| **Objective:** | | | IN-CSE translates the oneM2M Node Traffic Pattern (TP) into a 3GPP Device Communication Pattern |
| **Configuration:** | | | M2M\_CFG\_09 |
| **References:** | | | oneM2M TS-0026 [15], clause 7.6 |
|  | | | |
| **Pre-test conditions:** | | | * UE, SCEF and IN-CSE are attached to the underlying 3GPP network * ADN-AE hosted on UE has created an Application Entity resource <AE> on IN-CSE * IN-CSE has established relationship with MNO and is allowed to request Configuration of Device Communication Patterns. |
| **Test Sequence** | | | |
| **Step** | **RP** | **Type** | **Description** |
| 1 |  | Stimulus | ADN-AE sends a request to create an activityPatternElements attribute in <AE> resource |
| 2 | Mca | PRO Check Primitive | * op = 3 (Update) * to = {CSEBaseName}/{AE-ID} * fr = AE-ID * rqi = (token-string) * pc = Serialized representation of <AE> resource |
| 3 |  | IOP Check | Check if possible that IN-CSE has updated <AE > resource |
| 4 | (T8) Mcn | PRO Check HTTP | IN-CSE sends a Communication Patterns Configuration creation request to the SCEF   * Method = POST * URI = *{apiRoot}/3gpp-cp-parameter-provisioning/v1/{scsAsId}/subscriptions* * Payload shall includeDeviceTriggering data structure with the following attributes included in the request: externalId, supportedFeatures, cpParameterSets |
| 5 |  | IOP Check | Check if possible that underlying 3GPP network elements has stored the new/updated CP parameter  Check that SCEF has responded to IN-CSE for Communication Patterns Configuration request |
| IOP Verdict | |  | |
| PRO Verdict | |  | |

### 8.7.5 Group message delivery using MBMS

#### 8.7.5.1 Create MBMS Group

| **Interoperability Test Description** | | | |
| --- | --- | --- | --- |
| **Identifier:** | | | TD\_M2M\_SH\_31 |
| **Objective:** | | | IN-AE creates a MBMS Group for handling group related requests |
| **Configuration:** | | | M2M\_CFG\_12 |
| **References:** | | | oneM2M TS-0026 [15], clause 7.7.3.1 |
|  | | | |
| **Pre-test conditions:** | | | * UE, SCEF and IN-CSE are attached to the underlying 3GPP network * MN-AE on UE has created a Member Hosting CSE resource <RemoteCSE> on IN-CSE * IN-AE has created an Application Entity resource <AE> on IN-CSE * The MBMS service area information provided by the MNO is configured in the oneM2M System * External Group Identifiers for the devices have been pre-provisioned in the oneM2M System |
| **Test Sequence** | | | |
| **Step** | **RP** | **Type** | **Description** |
| 1 |  | Stimulus | IN-AE is requested to send a group Create Request |
| 2 | Mca | PRO Check Primitive | * op = 1 (Create) * to = {CSEBaseName} * fr = AE-ID * rqi = (token-string) * ty = 9 (group) * pc = Serialized representation of <group> resource |
| 3 |  | IOP Check | Check if possible that the <group> resource is created in Registrar CSE.  Check if possible that multicastTypeattributeof the Multicast Group Information is set to 3GPP\_MBMS\_group |
| 4 | Mca | PRO Check Primitive | IN-CSE responds to IN-AE:   * rsc = 2001 (CREATED) * rqi = (token-string) same as received in request message * pc = Serialized representation of <group> resource |
| 5 | (T8) Mcn | PRO Check HTTP | IN-CSE sends a Allocate TMGI Request to the SCEF   * Method = POST * URI = *{apiRoot}/3gpp-group-message-delivery-mb2 /v1/{scsAsId}/*tmgi-allocation * Payload shall includeTMGIAllocation data structure with the following attributes included in the request: externalGroupId, mbmsLocArea, supportedFeatures |
| 6 |  | IOP Check | Check that SCEF has delivered Allocate TMGI Response to Group Hosting CSE |
| 7 |  | IOP Check | Check if possible that the IN-CSE has stored the tmgi and tmgiExpiration in the local Multicast Group Information  Check that IN-CSE has sent *<*localMulticastGroup*>* creation requests to the Member Hosting CSE |
| IOP Verdict | |  | |
| PRO Verdict | |  | |

#### 8.7.5.2 Group message delivery using MBMS

| **Interoperability Test Description** | | | |
| --- | --- | --- | --- |
| **Identifier:** | | | TD\_M2M\_SH\_32 |
| **Objective:** | | | IN-AE creates a MBMS Group for handling group related requests |
| **Configuration:** | | | M2M\_CFG\_12 |
| **References:** | | | oneM2M TS-0026 [15], clause 7.7.3.1 |
|  | | | |
| **Pre-test conditions:** | | | * UE, SCEF and IN-CSE are attached to the underlying 3GPP network * MN-AE on UE has created a Member Hosting CSE resource <RemoteCSE> on IN-CSE * <node> resource representing UE has been created on IN-CSE * <*schedule*> resource has been created as a child of the <node> resource on IN-CSE * IN-AE has created an Application Entity resource <AE> on IN-CSE * <group> resource is created * <node > is the member of the <group> |
| **Test Sequence** | | | |
| **Step** | **RP** | **Type** | **Description** |
| 1 |  | Stimulus | IN-AE is requested to send a Retrieve Request to the fanoutPoint of <group> resource |
| 2 | Mca | PRO Check Primitive | * op = 2 (Retrieve) * to = {CSEBaseName}/{group}/fopt * fr = AE-ID * rqi = (token-string) |
| 3 |  | IOP Check | Check if possible that the <group> resource is created in Registrar CSE.  Check if possible that multicastTypeattributeof the Multicast Group Information is set to 3GPP\_MBMS\_group |
| 4 | (T8) Mcn | PRO Check HTTP | IN-CSE sends a Group Message Delivery Request to the SCEF   * Method = POST * URI = to *{apiRoot}/3gpp-group-message-delivery-mb2 /v1/{scsAsId}/*tmgi-allocation{*tmgi*}/delivery-via-mbms * Payload shall include GMDViaMBMSByMb2data structure with the following attributes included in the request: externalGroupId, mbmsLocArea, messageDeliveryStartTime, notificationDestination |
| 5 |  | IOP Check | Check that SCEF has responded to the Group Message  Check that SCEF has sent Group Message Delivery Notification to IN-CSE |
| 6 |  | IOP Check | Check that IN-CSE has responded to the Group Message Delivery Notification |
| 7 |  | IOP Check | Check that Member Hosting CSE has sent response message within the scope of responseTimeWindow |
| 8 |  | IOP Check | Check that IN-CSE has received the response messages from Member Hosting CSEs until responseTimeWindow expires and returned the aggregated group member responses to the IN-AE/CSE |
| IOP Verdict | |  | |
| PRO Verdict | |  | |

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