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| INPUT CONTRIBUTION | |
| Group Name:\* | TDE |
| Title:\* | Interop Test Cases for 3GPP Interworking |
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| 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 |

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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 ADN-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 Response:   * 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 * ADN-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, data (containing onem2m primitive) |
| 4 |  | IOP Check | Check if possible that the SCEF has successfully processes the NIDD Downlink Data Transfer Request |
| 5 | (T8) Mcn | PRO Check HTTP | SCEF responds for the NIDD Downlink Data Transfer 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 with 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 Acknowledgement:   * 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 | (Optional) SCEF sends for the NIDD Uplink Data Notification:   * 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 with MO NIDD Uplink Data Acknowledgement and sends oneM2M response primitive to IN-AE   * Status code = 204 (NO CONTENT) |
| 14 |  | IOP Check | (Optional) Check that IN-AE received a corresponding oneM2M response primitive. |
| IOP Verdict | |  | |
| PRO Verdict | |  | |

8.7.1.3 SCEF-based Mobile Originated NIDD

| **Interoperability Test Description** | | | |
| --- | --- | --- | --- |
| **Identifier:** | | | TD\_M2M\_SH\_23 |
| **Objective:** | | | IN-AE sends a downlink non-IP data to a UE hosting ADN-AE |
| **Configuration:** | | | M2M\_CFG\_11 |
| **References:** | | | oneM2M TS-0026 [], clause 7.1.1.3 |
|  | | | |
| **Pre-test conditions:** | | | * IN-AE has created an Application Entity resource <AE> on IN-CSE * ADN-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 * RDS source and destination port numbers are pre-provisioned in ADN-AE |
| **Test Sequence** | | | |
| **Step** | **RP** | **Type** | **Description** |
| 1 |  | Stimulus | AND-AE issues MO NIDD Uplink Data Notification to deliver an arbitrary primitive to the IN-CSE |
| 2 | (T8) Mcn | PRO Check HTTP | SCEF triggers a MO NIDD Uplink Data Notification carrying request primitive   * Method = POST * URI = *notification\_uri}* * Payload shall include NiddUplinkDataNotification data structure with the following attributes included in the request: niddConfiguration, externalId, reliableDataService, rdsPort, data (containing onem2m primitive) |
| 3 | (T8) Mcn | PRO Check HTTP | IN-CSE responds with MO NIDD Uplink Data Acknowledgement   * Status code = 204 (NO CONTENT) |
| 4 |  | IOP Check | Check if possible that SCEF has processed the MO NIDD Uplink Data Acknowledgement from the IN-CSE |
| 5 |  | PRO Check | SCEF sends an RDS acknowledgment to the UE   * Status code = 204 (NO CONTENT) |
| 6 |  | IOP Check | Check if possible that IN-CSE processes the oneM2M request primitive |
| 7 | (T8) Mcn | PRO Check HTTP | (Optional) If a response is required, IN-CSE generates a oneM2M response and sends a MT NIDD Downlink Data Transfer Request   * 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, (optional) reliableDataService, rdsPort, data (containing response to oneM2M primitive) |
| 8 | (T8) Mcn | PRO Check HTTP | (Optional) Scef returns MT NIDD Downlink Data Transfer Response to IN-CSE   * Status code = 200 (OK) / 201 (Created) * URI = *{apiRoot}/3gpp-nidd/v1/{scsAsId}/configurations/{configurationId}/downlink-data-deliveries/{downlinkDataDeliveryId}*   Payload may include *NiddDownlinkDataTransfer* data structure with the following attributes included in the response:deliveryStatus, self, requestedRetransmissionTime |
| 9 |  | IOP Check | (Optional) Check if possible that SCEF has processed the request and delivered it to the targeted UE  (Optional) Check if possible that UE has responded with an RDS acknowledgment |
| 10 | (T8) Mcn | PRO Check HTTP | (Optional) SCEF returns MT NIDD Downlink Data Delivery Status Notification to IN-CSE   * Method = POST * URI = *{notification\_uri}* * Payload shall include *NiddDownlinkDataDeliveryStatusNotification* data structure with the following attributes included in the request:niddDownlinkDataTransfer, deliveryStatus, requestedRetransmissionTime |
| 11 | (T8) Mcn | PRO Check HTTP | (Optional) IN-CSE responds to SCEF   * Status code = 204 (NO CONTENT) |
| 12 |  | IOP Check | (Optional) Check if possible that ADN-AE has processed the 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\_24 |
| **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 receive notifications (monitoringType = UE\_REACHABILITY). * 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 UE for\_REACHABILITY 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 (externalIDs, monitoringType, idleStatusInfo, reachabilityType) |
| 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\_25 |
| **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 (externalIDs, monitoringType, idleStatusInfo) |
| 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 (externalIDs, monitoringType, idleStatusInfo). |
| 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\_26 |
| **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 (externalIDs, monitoringType, failureCause). |
| 4 | (T8) Mcn | PRO Check HTTP | IN-CSE responds to the Monitoring Notification Report request:  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 | (T8) Mcn | PRO Check HTTP | SCEF sends a UE Communication Failure 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 (externalIDs, monitoringType, failureCause). |
| 7 | (T8) Mcn | PRO Check HTTP | IN-CSE responds to the UE Communication Failure Monitoring Notification:  Status code = 204 (NO CONTENT) |
| 8 |  | 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\_27 |
| **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 * 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 (externalIDs, monitoringType, plmnId, roamingStatus). |
| 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 updating triggered by retrieval

| **Interoperability Test Description** | | | |
| --- | --- | --- | --- |
| **Identifier:** | | | TD\_M2M\_SH\_28 |
| **Objective:** | | | Location Reporting scenario |
| **Configuration:** | | | M2M\_CFG\_09 |
| **References:** | | | oneM2M TS-0026 [15], clause 7.4.7.2 |
|  | | | |
| **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 * IN-CSE has subscribed to to the SCEF to receive notifications (monitoringType = LOCATION\_REPORTING) |
| **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   + locationInformationType = position fix   + retrieveLastKnownLocation = TRUE/FALSE |
| 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, accuracy. * locationType = CURRENT\_KNOWNLOCATION |
| 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 (externalID, monitoringType, locatonInfo) |
| 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 (externalID, monitoringType, locatonInfo) * 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 |
| NOTE: Steps: 12-17 are only applicable, if retrieveLastKnownLocation is set to TRUE | | | |
| 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\_29 |
| **Objective:** | | | IN-AE triggers ADN-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\_30 |
| **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\_31 |
| **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\_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:** | | | * Member Hosting CSE, SCEF and Group Hosting CSE are attached to the underlying 3GPP network * Member Hosting CSE on UE has created a <RemoteCSE> resource on Group Hosting CSE * IN-AE has created an Application Entity resource <AE> on Group Hosting 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 | Group Hosting 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 | Group Hosting 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 Group Hosting CSE has stored the tmgi and tmgiExpiration in the local Multicast Group Information  Check that Group Hosting CSE has sent *<*localMulticastGroup*>* creation requests to the Member Hosting CSE  Check that Member Hosting CSE has created *<*localMulticastGroup*>* resource |
| IOP Verdict | |  | |
| PRO Verdict | |  | |

#### 8.7.5.2 Group message delivery using MBMS

| **Interoperability Test Description** | | | |
| --- | --- | --- | --- |
| **Identifier:** | | | TD\_M2M\_SH\_33 |
| **Objective:** | | | IN-AE sends a request for accessing member resources to the Group Hosting CSE |
| **Configuration:** | | | M2M\_CFG\_12 |
| **References:** | | | oneM2M TS-0026 [15], clause 7.7.3.1 |
|  | | | |
| **Pre-test conditions:** | | | * Member Hosting CSE, SCEF and Group Hosting CSE are attached to the underlying 3GPP network * Member Hosting CSE on UE has created a <RemoteCSE> resource on Group Hosting CSE * <node> resource representing UE has been created on Group Hosting CSE * <*schedule*> resource has been created as a child of the <node> resource on Group Hosting CSE * IN-AE has created a <group> resource in Group Hosting CSE * <node> resource is the member of the <group> * Group Hosting CSEhas createda *<*localMulticastGroup*>* in the Member Hosting CSE * Group Hosting CSE stores tmgi and tmgiExpiration in the local Multicast Group Information |
| **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 | (T8) Mcn | PRO Check HTTP | Group Hosting 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 |
| 4 |  | IOP Check | Check that SCEF has responded to the Group Message  Check that SCEF has sent Group Message Delivery Notification to Group Hosting CSE |
| 5 |  | IOP Check | Check that Group Hosting CSE has responded to the Group Message Delivery Notification |
| 6 |  | IOP Check | Check that Member Hosting CSE has sent response message within the scope of responseTimeWindow |
| 7 |  | IOP Check | Check that Group Hosting 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-------------------------------------------