TTC仕様書
Technical Specification

# TS-M2M-0013v1.0.0

# oneM2M 技術仕様書
# 相互接続テスト

# oneM2M Technical Specification
# Interopetability Testing

2016 年 3 月 31 日制定

一般社団法人
情報通信技術委員会

THE TELECOMMUNICATION TECHNOLOGY COMMITTEE

TS-M2M-0013v1.0.0

oneM2M 技術仕様書－相互接続テスト [oneM2M Technical Specification – Interoperability Testing]

＜参考＞ [Remarks]

１．英文記述の適用レベル [Application level of English description]

適用レベル [Application level]：E2

本標準の本文、付属資料および付録の文章および図に英文記述を含んでいる。

[English description is included in the text and figures of main body, annexes and appendices.]

２．国際勧告等の関連 [Relationship with international recommendations and standards]

本標準は、oneM2M で承認された Technical Specification 0013V1.0.0 に準拠している。

[This standard is standardized based on the Technical Specification 0013V1.0.0 approved by oneM2M.]

３．上記国際勧告等に対する追加項目等 [Departures from international recommendations]

原標準に対する変更項目 [Changes to original standard]

原標準が参照する標準のうち、TTC 標準に置き換える項目。[Standards referred to in the original standard, which are replaced by TTC standards.]

原標準が参照する標準のうち、それらに準拠した TTC 標準等が制定されている場合は自動的に最新版 TTC 標準等に置き換え参照するものとする。 [Standards referred to in the original standard should be replaced by derived TTC standards.]

４．工業所有権 [IPR]

本標準に関わる「工業所有権等の実施の権利に係る確認書」の提出状況は、ＴＴＣホームページによる。

[Status of “Confirmation of IPR Licensing Condition” submitted is provided in the TTC web site.]

５．作成専門委員会 [Working Group]

oneM2M 専門委員会 [oneM2M Working Group]

# ONEM2M TECHNICAL SPECIFICATION

| | |
|---|---|
| Document Number | TS-0013-V.1.0.0 |
| Document Name: | Interoperability Testing |
| Date: | 2016-February-29 |
| Abstract: | The specification address the testing of the primitives on the oneM2M interfaces as specified in TS-0001 [1] and TS-0004 [2]. The purpose of the interoperability testing is to prove end-to-end functionality between Application Entities and Common Service Entities over the Mca and Mcc reference points |

About oneM2M

The purpose and goal of oneM2M is to develop technical specifications which address the need for a common M2M Service Layer that can be readily embedded within various hardware and software, and relied upon to connect the myriad of devices in the field with M2M application servers worldwide.

More information about oneM2M may be found at: http//www.oneM2M.org

# Contents

# 1 Scope

The present document specifies Interoperability Test Descriptions (TDs) for the oneM2M Primitives as specified in oneM2M TS-0001 [1], oneM2M TS-0004 [2], the bindings TS-0008 [3], TS-0009 [4] and TS-0010 [5].

# 2 References

## 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" V1.6.1.

[2] oneM2M TS-0004: "Service Layer Core protocol Specification" V1.3.0.

[3] oneM2M TS-0008: "CoAP Protocol Binding" V1.1.0.

[4] oneM2M TS-0009: "HTTP Protocol Binding" V1.2.0.

[5] oneM2M TS-0010: "MQTT Protocol Binding" V1.2.0.

[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)".

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

## 2.2 Informative 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 reference document (including any amendments) applies.

The following referenced documents are not necessary for the application of the present document but they assist the user with regard to a particular subject area.

[i.1] oneM2M Drafting Rules

NOTE: Available at (http://www.onem2m.org/images/files/oneM2M-Drafting-Rules.pdf)

# 3 Definitions and abbreviations

## 3.1 Definitions

For the purposes of the present document, the terms and definitions given in oneM2M TS-0011 [7] and the following apply.

NOTE: A term defined in the present document takes precedence over the definition of the same term, if any, in oneM2M TS-0011 [7].

**hosting CSE:** CSE where the addressed resource is hosted

**M2M service provider domain:** part of the M2M System that is associated with a specific M2M Service Provider

**mc:** interface between the management server and the management client

**NOTE:** This interface can be realized by the existing device management technologies such as BBF TR-069, OMA DM, etc.

**receiver CSE:** any CSE that receives a request

**registree:** AE or CSE that registers with another CSE

**registrar CSE:** CSE where an Application or another CSE has registered

**resource:** uniquely addressable entity in oneM2M architecture

**transit CSE:** any receiver CSE that is not a Hosting CSE

## 3.2 Abbreviations

For the purposes of the present document, the following abbreviations apply:

| | |
|---|---|
| ACP | Access Control Policy |
| AE | Application Entity |
| AE-ID | Application Entity Identifier |
| BBF | BroadBand Forum |
| CoAP | Constrained Application Protocol |
| CSE | Common Services Entity |
| CSE-ID | Common Service Entity Identifier |
| DM | Device Management |
| DUT | Device Under Test |
| FQDN | Fully Qualified Domain Name |
| HTTP | HyperText Transfer Protocol |
| IN | Infrastructure Node |
| IN-CSE | CSE which resides in the Infrastructure Node |
| JSON | JavaScript Object Notation |
| LWM2M | Lightweight M2M |
| M2M | Machine to Machine |
| Mca | Reference Point for M2M Communication with AE |
| Mcc | Reference Point for M2M Communication with CSE |
| MQTT | Message Queuing Telemetry Transport |
| OMA | Open Mobile Alliance |
| SP | Service Provider |
| SUT | System Under Test |
| TD | Test Description |
| URI | Uniform Resource Identifier |
| XML | eXtensible Markup Language |

# 4 Conventions

The key words "Shall", "Shall not", "May", "Need not", "Should", "Should not" in this document are to be interpreted as described in the oneM2M Drafting Rules [i.1].

# 5 Testing conventions

## 5.1 The Test Description proforma

The testing methodogy used in the present document is specified in the oneM2M TS-0015: Testing framework [6].

A Test Description (TD) is a well detailed description of a process that aims to test one or more functionalities of an implementation. Applying to interoperability testing, these testing objectives address the interoperable functionalities between two or more vendor implementations.

In order to ensure the correct execution of an interoperability test, the following information should be provided by the test description:

- The proper configuration of the vendor implementations.
- The availability of additional equipment (protocol monitors, functional equipment, …) required to achieve the correct behaviour of the vendor implementations.
- The correct initial conditions.
- The correct sequence of the test events and test results.

In order to facilitate the specification of test cases an interoperability test description should include, at a minimum, the following fields as indicated table **Error! Reference source not found.**.

**Table 1: Interoperability test description**

| | |
|---|---|
| **Identifier** | A unique test description ID. |
| **Objective** | A concise summary of the test which should reflect the purpose of the test and enable readers to easily distinguish this test from any other test in the document. |
| **References** | A list of references to the base specification section(s), use case(s), requirement(s) and TP(s) which are either used in the test or define the functionality being tested. |
| **Applicability** | A list of features and capabilities which are required to be supported by the SUT in order to execute this test (e.g. if this list contains an optional feature to be supported, then the test is optional). |
| **Configuration or Architecture** | A list of all required equipment for testing and possibly also including a reference to an illustration of a test architecture or test configuration. |
| **Pre-Test Conditions** | A list of test specific pre-conditions that need to be met by the SUT including information about equipment configuration, i.e. precise description of the initial state of the SUT required to start executing the test sequence. |
| **Test Sequence** | An ordered list of equipment operation and observations. The test sequence may also contain the conformance checks as part of the observations. |

The test descriptions are provided in proforma tables. In order to ensure the correct execution of an interoperability test, the following information is provided in the test description:

- The configuration applied for the test.
- The need of additional equipment (protocol monitors, functional equipment, etc.) required to achieve the correct behaviour of the implementations.
- The initial conditions.
- The sequence of the test events and test results.

The following different types of test operator actions are considered during the test execution:

- A **stimulus** corresponds to an event that enforces a DUT to proceed with a specific protocol action, such as sending a message.
- A **configure** corresponds to an action to modify the DUT configuration.
- An **IOP check** consists of observing that one DUT behaves as described in the standard: i.e. resource creation, update, deletion, etc. For each IOP check in the Test Sequence, a result can be recorded. The overall **IOP Verdict** will be considered OK if all the IOP checks in the sequence are OK.
- In the context of Interoperability Testing with Conformance Checks, an additional step type, **PRO checks** can be used to verify the appropriate sequence and contents of protocol messages, this is helpful for debugging purposes. **PRO Verdict** will be PASS if all the PRO checks are PASS.

## 5.2 Test Description naming convention

| TD/<root>/<gr>/<nn> | | |
|---|---|---|
| <root> = root | M2M | oneM2M |
| | | |
| <gr> = group | NH | No Hop : Testing on Mca reference point |
| | NB | Non Blocking scenario |
| | SH | Single Hop: management of remote ressources on Mca + Mcc |
| | MH | Multi Hop |
| | | |
| | | |
| <nn> = sequential number | | 01 to 99 |

## 5.3 Test Settings

This clause contains some test requirements applied to the testing, some constraints, restrictions for executions or some recommendations.

In order to ease test setup and execution, the CSE and AE are requested to support the following settings:

- Security shall be disable as it is out of scope of this interoperability testing.
- Resource names are pre-provisioned, except for content instance resources that are automatically assigned by the hosting CSE.
- After each "Delete" primitive on a resource, the user shall check the resource is effectively deleted.
- Unless it is indicated in the test cases prequisites, by default, all the applications shall have the required access rights to manage resources on the CSE.

In order to address the TBDs in the oneM2M CoAP binding specification (TS-0008 [3]), basic XML and JSON media-type numbers shall be used in the contentFormat option.

In the test descriptions specified below, the following definitions of terms used for short-hand notation apply:

Serialized Representation : refers to either an XML or a JSON representation of data in text-string format as defined in clauses 8.3 and 8.4 of TS-0004 [2].

Host Address: refers to the authority part of a target URI as defined in RFC 3986 [8] and RFC 7230 [9] which can be represented as an IP literal encapsulated within square brackets, an IPv4 address in dotted decimal form, or a registered name, and optionally extended by a port identifier.

## 5.4 Pre-conditions

### 5.4.1 Registration

The AE or CSE that originates the request has been successfully registered to its corresponding CSE. The registration of the AE includes the creation of <AE> resource under the <CSEBase> of its registrar CSE. The registration of the CSE includes the creation of <remoteCSE> resource representing itself under the <CSEBase> of its registrar CSE as well as the creation of <remoteCSE> resource representing the registrar CSE under its own <CSEBase> resource. The creation of <remoteCSE> resource representing the registrar CSE can be achieved by remotely retrieving the <CSEBase> resource of the registrar CSE.

### 5.4.2 Security

The Originator and the receiver have successfully established security association between each other. This may involve the exchange of key and the establishment of a security connection.

The security pre-condition also assumes that the originator has the appropriate access control privilege towards the reqeusted resource.

### 5.4.3 Service Subscription

Service subscription means that the orginator is allowed to be connected with the oneM2M system by contract between the owner of the application and the service provider of the oneM2M system. This may require a corresponding information record in the <m2mServiceSubscriptionProfile> resource.

### 5.4.4 ID allocation

ID allocation means that the Originator has already aquired usable identity, either from its registrar CSE or the IN-CSE of the oneM2M system. The ID may be CSE relative or SP relative. The ID is then further used as the identity of the Originator to perform access control, charging, etc.

### 5.4.5 Existence of resource

Existence of resource means the resource been addressed and has already been created.

### 5.4.6 Management Session between Management Server and Management Client

Before the device management using external technologies is executed, it is required that a management session has already been established between the Management Server and Management Client. If there is no existing management session, the IN-CSE shall request the establishment of a management session between the Management Server and Management Client.

## 5.5 Binding message convention

In HTTP/CoAP/MQTT binding messages, the present document defines the convention for <variable>:

- <resourceType> represesents a resource name (i.e., *resourceName* attribute) of a resource instance in that resourceType. For example, <CSEBase>/<AE> can represent "CSE1base/AE1" in structured resource ID format.
- <parameter> represents a value of a oneM2M request/response parameter. For example, <Request ID> can represent "0001" value of the Request ID parameter. Parameter names are case sensitive and in long names as specified in TS-0004 [2].
- <ID> represents an AE-ID or CSE-ID in MQTT Topic names.

The value will be given at an interoperability test event.

In TS-0010 [5], all oneM2M request/response parameters are carried in the MQTT message payload since it has no message header concept. Therefore, the MQTT message payload needs to be described more than HTTP and CoAP messages to describe those parameters in clause 8. In HTTP and CoAP binding messages, payloads are described as "empty" or "<container> resource to be created" in a very abstract way.

Since the representation can be XML or JSON, payload should be abstract to support XML and JSON. The following example is an XML representation and its abstraction for creating a <container> resource.

| | |
|---|---|
| XML payload example for MQTT binding | <?xml version="1.0" encoding="UTF-8"?><br>  <m2m:req xmlns:m2m="http://www.onem2m.org/xml/protocols"<br>xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"<br>xsi:schemaLocation="http://www.onem2m.org/xml/protocols CDT-requestPrimitive-v1_0_0.xsd"><br>  <op>1</op><br>  <to>CSE1Base</to><br>  <fr>/CSE1/C_AE1</fr><br>  <rqi>2001</rqi><br>  <ty>3</ty><br>  <nm>cont1</nm><br>  <rti><rt>3</rt></rti><br>  <pc><br>  <cnt><br>  <lbl>SmartMeter</lbl><br>  <et>20141003T112033</et><br>  </cnt><br>  </pc><br></m2m:req> |
| Abstracted payload example for MQTT binding | op = 1<br>to = CSE1Base<br>fr = /CSE1/C_AE01<br>rqi = 3001<br>ty = 3<br>name = cont1<br>rti.rt = 3<br>pc.cnt.lbl = SmartMeter<br>pc.cnt.et = 20141003T112033 |
| Abstracted payload example for MQTT binding adopting the payload convention | op = 1<br>to = <CSEBase><br>fr = <From><br>rqi = <Request ID><br>ty = 3<br>name = <Name><br>rti.rt = 3<br>pc = <Content> |

# 6 Test Description Summary

## 6.1 Tests list

| Nb | Procedure/Resource | TD ID | TD Description |
|---|---|---|---|
| 1 | CSEBase Management | TD_M2M_NH_01 | AE retrieves the CSEBase resource |
| 2 | RemoteCSE | TD_M2M_NH_02 | Registree CSE registers to Registrar CSE |
| 3 | | TD_M2M_NH_03 | Registree CSE retrieves RemoteCSE from Registrar CSE |
| 4 | | TD_M2M_NH_04 | Registree CSE updates RemoteCSE from Registrar CSE |
| 5 | | TD_M2M_NH_05 | Registree CSE deletes RemoteCSE from Registrar CSE |
| 6 | Application Entity | TD_M2M_NH_06 | AE registers to its registrar CSE via an AE Create Request |
| 7 | | TD_M2M_NH_07 | AE retrieves <AE> resource via an AE Retrieve Request |
| 8 | | TD_M2M_NH_08 | AE updates attribute in <AE> resource via an AE Update Request |
| 9 | | TD_M2M_NH_09 | AE de-registers by deleting <AE> resource via an AE Delete Request |
| 10 | Container | TD_M2M_NH_10 | AE creates a container resource in registrar CSE via a container Create Request |
| 11 | | TD_M2M_NH_11 | AE retrieves information of a container resource via a container Retrieve Request |
| 12 | | TD_M2M_NH_12 | AE updates attribute in application resource via a container Update Request |
| 13 | | TD_M2M_NH_13 | AE deletes a specific container resource via a container Delete Request |
| 14 | ContentInstance | TD_M2M_NH_14 | AE adds a contentInstance resource <contentInstance> to a specific container in Registrar CSE via a contentInstance Create Request |
| 15 | | TD_M2M_NH_15 | AE retrieves information of a contentInstance resource via a container Retrieve Request |
| 17 | | TD_M2M_NH_17 | AE deletes contentInstance resource via a container Delete Request |
| 18 | Discovery | TD_M2M_NH_18 | AE discovers resources residing in Registrar CSE |
| 19 | | TD_M2M_NH_19 | AE discovers accessible resources residing in Registrar CSE using the label filter criteria |
| 20 | | TD_M2M_NH_20 | AE discovers accessible resources residing in Registrar CSE limiting the number of matching resources to the specified value. |
| 21 | | TD_M2M_NH_21 | AE discovers accessible resources residing in Registrar CSE using multiple Filter Criteria |
| 22 | Subscription | TD_M2M_NH_22 | AE creates a subscription to Application Entity resource via subscription Create Request |
| 23 | | TD_M2M_NH_23 | AE retrieves information about a subscription via subscription Retrieve Request such as expirationTime, labels, etc. |
| 24 | | TD_M2M_NH_24 | AE updates information about a subscription via subscription Retrieve Request |
| 25 | | TD_M2M_NH_25 | AE cancels subscription via an subscription Delete Request |
| 26 | AccessControlPolicy | TD_M2M_NH_26 | AE creates an accessControlPolicy resource |
| 27 | | TD_M2M_NH_27 | AE retrieves accessControlPolicy resource |
| 28 | | TD_M2M_NH_28 | AE updates attribute in accessControlPolicy resource |
| 29 | | TD_M2M_NH_29 | AE deletes accessControlPolicy resource |
| 30 | | TD_M2M_NH_30 | AE delete request is rejected due to accessControlPolicy |
| 31 | Group | TD_M2M_NH_31 | AE creates a group resource |
| 32 | | TD_M2M_NH_32 | AE retrieves group resource |
| 33 | | TD_M2M_NH_33 | AE updates attribute in group resource |
| 34 | | TD_M2M_NH_34 | AE deletes group resource |
| 35 | Node | TD_M2M_NH_35 | AE creates a node resource |
| 36 | | TD_M2M_NH_36 | AE retrieves node resource |
| 37 | | TD_M2M_NH_37 | AE updates attribute in node resource |
| 38 | | TD_M2M_NH_38 | AE deletes node resource |
| 39 | PollingChannel | TD_M2M_NH_39 | AE creates a <pollingChannel> resource in registrar CSE via a Create Request |
| 40 | | TD_M2M_NH_40 | AE retrieves information of a pollingChannel resource via a Retrieve Request |
| 41 | | TD_M2M_NH_41 | AE updates attribute in pollingChannel resource via a Update Request |
| 42 | | TD_M2M_NH_42 | AE deletes a pollingChannel resource via a Delete Request |

| Nb | Procedure/Resource | TD ID | TD Description |
|---|---|---|---|
| 43 | | TD_M2M_NH_43 | AE retrieves information of a pollingChannel resource via a Retrieve Request |
| 44 | FanoutPoint | TD_M2M_NH_44 | AE creates a <contentInstance> resource in each group member |
| 45 | | TD_M2M_NH_45 | AE retrieves the <container> resource from in each group member |
| 46 | | TD_M2M_NH_46 | AE updates an <container> resource of each member resource |
| 47 | | TD_M2M_NH_47 | AE deletes a <container> ofeach member |
| 48 | Notification | TD_M2M_NH_48 | AE receives a notification request from the HOST CSE |
| 49 | Synchronous request | TD_M2M_NB_01 | AE creates a container resource using non blocking synchronous request in registrar CSE |
| 50 | | TD_M2M_NB_02 | AE retrieves a Container resource using non blocking synchronous request in registrar CSE |
| 51 | | TD_M2M_NB_03 | AE updates a Container resource using non blocking synchronous request in registrar CSE |
| 52 | | TD_M2M_NB_04 | AE deletes a Container resource using non blocking synchronous request |
| 53 | Asynchronous request | TD_M2M_NB_05 | AE creates a container resource using non blocking asynchronous request |
| 54 | | TD_M2M_NB_06 | AE retrieves a Container resource using non blocking asynchronous request |
| 55 | | TD_M2M_NB_07 | AE updates a Container resource using non blocking asynchronous request |
| 56 | | TD_M2M_NB_08 | AE deletes a Container resource using non blocking asynchronous request |
| 57 | Retargeting | TD_M2M_SH_01 | AE creates a remote <Resource> resource |
| 58 | | TD_M2M_SH_02 | AE retrieves a remote <Resource> resource |
| 59 | | TD_M2M_SH_03 | AE updates a remote <Resource> resource |
| 60 | | TD_M2M_SH_04 | AE delete a remote <Resource> resource |
| 61 | Discovery | TD_M2M_SH_09 | AE discovers accessible resources residing in the remote Hosting CSE using multiple Filter Criteria |
| 62 | Unauthorized operation | TD_M2M_SH_10 | AE delete request is rejected after access rights verification using retargeting. |
| 63 | Notification | TD_M2M_SH_11 | AE receives a notification request from the remote hosting CSE |
| 64 | <mgmtObj> | TD_M2M_SH_05 | AE creates a <mgmtObj> resource |
| 65 | | TD_M2M_SH_06 | AE updates a <mgmtObj> resource |
| 66 | | TD_M2M_SH_07 | AE retrieves a <mgmtObj> resource |
| 67 | | TD_M2M_SH_08 | AE deletes a <mgmtObj> resource |

# 7 Configuration

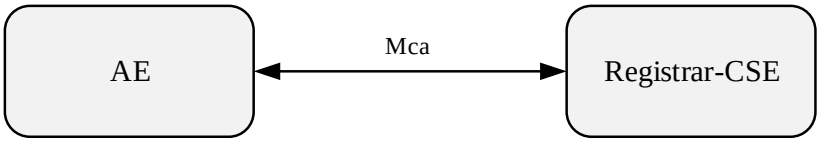
## 7.1 Test Configuration

### 7.1.1 No hop

#### 7.1.1.1 M2M_CFG_01

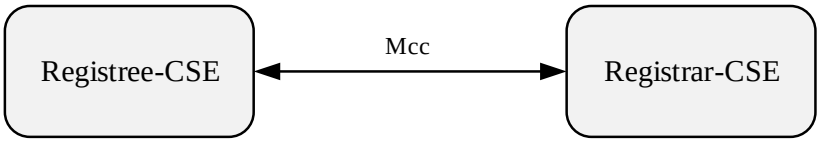
The AE manages resources on the registrar CSE (Hosting CSE)

oneM2M entities model



#### 7.1.1.2 M2M_CFG_02

oneM2M entities model




### 7.1.2 Single hop

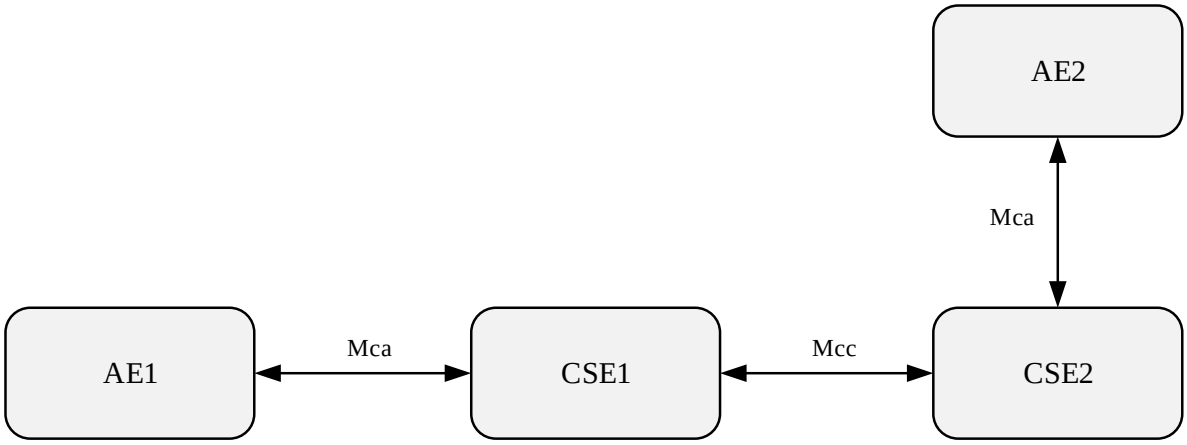
#### 7.1.1.1 M2M_CFG_03

The AE manages resources on the remote CSE

oneM2M entities model


#### 7.1.2.2 M2M_CFG_04

oneM2M entities model




#### 7.1.2.3 M2M_CFG_05

oneM2M entities model

#### 7.1.2.4 M2M_CFG_08

This configuration concerns group management when the AE is using a group to fan out requests to multiple members. The connection between the 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 7.1.3.

This configuration is mapped to cases including:

- 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.
- The Member Hosting CSE sends a notification to the Group Hosting CSE pertaining to the subscription made through the Group Hosting CSE. The Group Hosting CSE then further aggregates the notification and sends it back to the AE.


#### 7.1.2.5 M2M_CFG_09

This configuration concerns device management using external technologies.

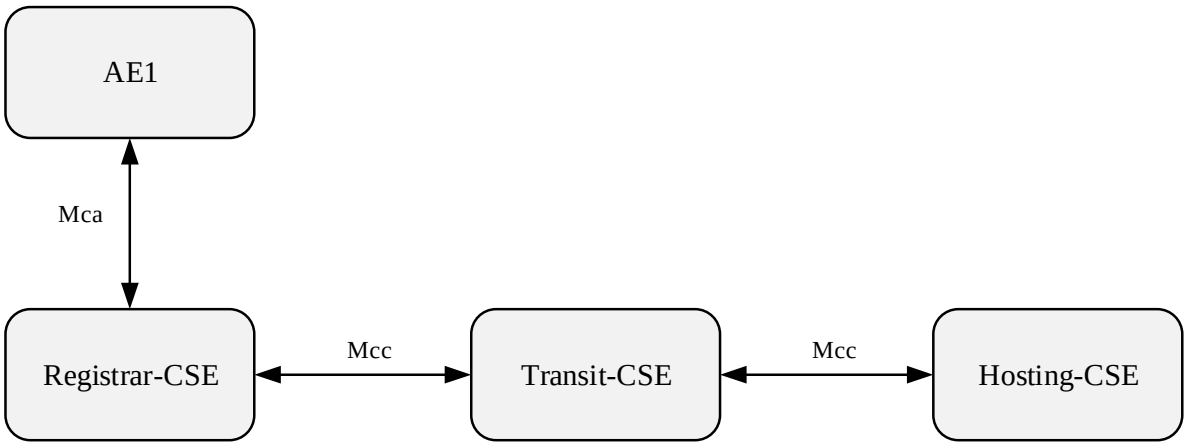
This configuration is mapped to cases including:

- The AE sends a request addressing <mgmtObj> to IN-CSE. IN-CSE then further acts as a Management Server to send management commands to Managed Entity over the mc interface. The management command is defined in OMA DM, BBF TR069 or LWM2M.

### 7.1.3 Multi hops

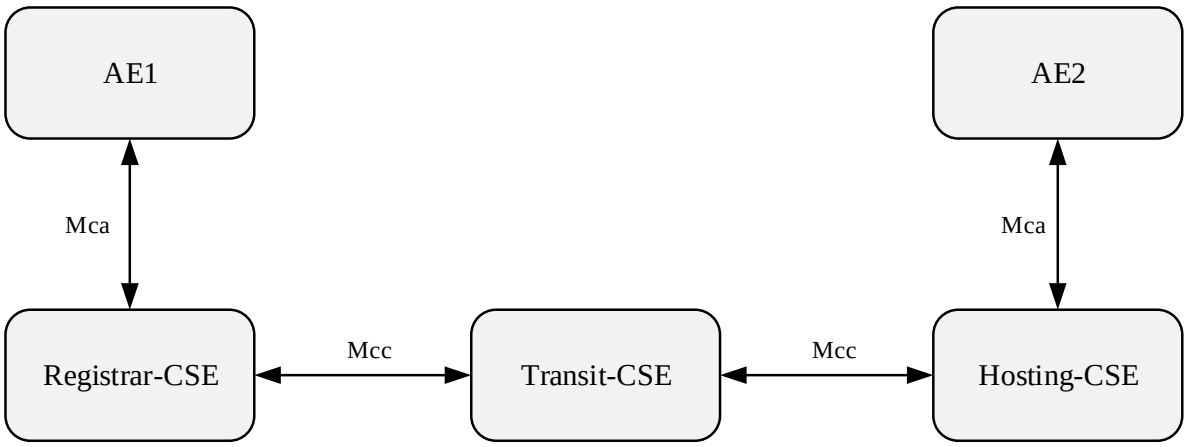
#### 7.1.3.1 M2M_CFG_06

oneM2M entities model




#### 7.1.3.2 M2M_CFG_07

oneM2M entities model



# 8 Test Descriptions

## 8.1 No Hop configuration testing

### 8.1.1 CSEBase Management

#### 8.1.1.1 CSEBase Retrieve on Mca

| Interoperability Test Description | | | |
|---|---|---|---|
| **Identifier:** | | | TD_M2M_NH_01 |
| **Objective:** | | | AE retrieves the CSEBase resource |
| **Configuration:** | | | M2M_CFG_01 |
| **References:** | | | TS-0001 [1], clause 10.2.3.2<br>TS-0004 [2], clause 7.3.2 |
| | | | |
| **Pre-test conditions:** | | | • CSEBase resource has been automatically created in CSE |
| **Test Sequence** | | | |
| **Step** | **RP** | **Type** | **Description** |
| 1 | | Stimulus | AE is requested to send a retrieve Request to CSE CSE with name {CSEBaseName} |
| 2 | Mca | PRO Check Primitive | • Operation (op) = 2 (Retrieve)<br>• To (to) = Resource-ID of requested <CSEBase> resource, assumed CSE-relative here<br>• From (from) = AE-ID of request originator<br>• Request Identifier (rqi) = (token-string) |
| | | PRO Check HTTP | Sent GET request contains<br>• Request method = GET<br>• Request-Target:{CSEBaseName}<br>• Host: Host Address of registrar CSE<br>• X-M2M-RI: value of rqi primitive parameter<br>• X-M2M-Origin: AE-ID<br>• Payload: empty |
| | | PRO Check CoAP | Sent GET request contains<br>• Method: 0.01 (GET)<br>• Uri-Host: Registrar CSE host<br>• Uri-Port: Registrar CSE port<br>• Uri-Path: <CSEBase> |
| | | PRO Check MQTT | Sent a MQTT PUBLISH protocol packet to the request topic "/oneM2M/req/<SP-Relative-AE-ID>/<Registrar CSE-ID>"<br>Payload:<br>• op = 2<br>• to = <CSEBase><br>• fr = <AE-ID><br>• rqi = <Request ID> |
| 3 | Mca | PRO Check Primitive | • Response Status Code (rsc) = 2000 (OK)<br>• Request Identifier (rqi) = same string as received in request message<br>Content (pc) = Serialized Representation of <CSEBase> resource |
| | | PRO Check HTTP | Registrar CSE sends response containing:<br>• Status Code = 200<br>• X-M2M-RSC: 2000<br>• X-M2M-RI: value of rqi primitive parameter<br>• Content-Type; application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json<br>• Content-Length = size of payload in the message body in bytes<br>• Payload: Serialized Representation of <CSEBase> resource |
| | | PRO Check CoAP | Registrar sends response containing:<br>• Response Code = 2.05<br>• Payload: <CSEBase> resource |
| | | PRO Check MQTT | Sent a MQTT PUBLISH protocol packet to the response topic "/oneM2M/resp/<SP-Relative-AE-ID>/<Registrar CSE-ID>"<br>Payload:<br>• to = <SP-Relative-AE-ID><br>• fr = <Registrar CSE-ID> |

| Interoperability Test Description | | | |
|---|---|---|---|
| | | | • rqi = <Request ID><br>• rsc = <Response Status Code(2000)><br>• pc = <Content(<CSEBase> resource representation)> |
| 4 | | IOP Check | AE indicates successful operation |
| IOP Verdict | | | |
| PRO Verdict | | | |

## 8.1.2 RemoteCSE Management

### 8.1.2.1 RemoteCSE Create

| Interoperability Test Description | | | |
|---|---|---|---|
| **Identifier:** | | | TD_M2M_NH_02 |
| **Objective:** | | | Registree CSE registers to Registrar CSE |
| **Configuration:** | | | M2M_CFG_02 |
| **References:** | | | TS-0001 [1], clause 10.2.2.1<br>TS-0004 [2], clause 7.3.3.2.1 |
| | | | |
| **Pre-test conditions:** | | | • CSEBase resource has been created in registrar CSE with name {CSEBaseName} |
| **Test Sequence** | | | |
| **Step** | **RP** | **Type** | **Description** |
| 1 | | Stimulus | Registree CSE is requested to send a RemoteCSE Create request to Registrar CSE |
| 2 | Mcc | PRO Check Primitive | • op = 1 (Create)<br>• to = {CSEBaseName}<br>• fr = Registree CSE-ID<br>• rqi = (token-string)<br>• ty = 16 (RemoteCSE)<br>• pc = Serialized representation of <RemoteCSE> resource |
| | | PRO Check HTTP | Sent request contains<br>• Request method = POST<br>• Request-Target:{CSEBaseName}<br>• Host: IP address or the FQDN of Registrar CSE<br>• X-M2M-RI: (token-string)<br>• X-M2M-Origin: Registree CSE-ID<br>• Content-Type: application/vnd.onem2m-res+xml; ty=16 or application/vnd.onem2m-res+json; ty=16<br>• Message-body: Serialized representation of <RemoteCSE> resource |
| | | PRO Check CoAP | Sent request contains<br>• Method: 0.02 (POST)<br>• Uri-Host: IP address or the FQDN of Registrar CSE<br>• Uri-Path: {CSEBaseName}<br>• Content-type: application/vnd.onem2m-res+xmlor application/vnd.onem2m-res+json<br>• oneM2M-TY: 16<br>• oneM2M-FR: Registree CSE-ID<br>• oneM2M-RQI: (token-string)<br>• Payload: Serialized representation of <RemoteCSE> resource |
| | | PRO Check MQTT | Sent MQTT PUBLISH message:<br>Topic: "/oneM2M/req/< Registree CSE-ID>/<Registrar CSE-ID>"<br>Payload:<br>• op = 1 (Create)<br>• to = {CSEBaseName}<br>• fr = Registree CSE-ID<br>• rqi = (token-string)<br>• ty = 16 (RemoteCSE)<br>• pc = Serialized representation of <RemoteCSE> resource |

| Interoperability Test Description | | | |
|---|---|---|---|
| 3 | Mcc | PRO Check Primitive | • rsc = 2001 (CREATED)<br>• rqi = (token-string) same as received in request message<br>• pc = Serialized representation of <RemoteCSE> resource |
| | | PRO Check HTTP | Registrar CSE sends response containing:<br>• Status Code = 201 (Created)<br>• X-M2M-RSC: 2001<br>• X-M2M-RI: (token-string) same as received in request message<br>• Content-Location: URI of the created RemoteCSE resource.<br>• Content-Type: application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json<br>• Message-body: Serialized representation of <RemoteCSE> resource |
| | | PRO Check CoAP | Registrar sends response containing:<br>• Response Code = 2.01<br>• oneM2M-RSC: 2001<br>• oneM2M-RQI: (token-string) same as received in request message<br>• Location-Path: URI of the created RemoteCSE resource<br>• Content-format: application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json<br>• Payload: Serialized representation of <RemoteCSE> resource |
| | | PRO Check MQTT | Sent MQTT PUBLISH message:<br>Topic: "/oneM2M/resp/< AE-ID>/<Registrar CSE-ID>"<br>Payload:<br>• to = Registree CSE-ID<br>• fr = Registrar CSE-ID<br>• rsc = 2001 (CREATED)<br>• rqi = (token-string) same as received in request message<br>• pc = Serialized representation of <RemoteCSE> resource |
| 4 | | IOP Check | Check if possible that the <remoteCSE> resource has been created in registrar CSE. |
| 5 | | IOP Check | Check if possible that the corresponding <remoteCSE> resource has been also created in registree CSE. |
| 6 | | IOP Check | Registree CSE indicates successful operation. |
| IOP Verdict | | | |
| PRO Verdict | | | |

### 8.1.2.2 remoteCSE Retrieve

| Interoperability Test Description | | | |
|---|---|---|---|
| **Identifier:** | | | TD_M2M_NH_03 |
| **Objective:** | | | Registree CSE retrieves RemoteCSE from Registrar CSE |
| **Configuration:** | | | M2M_CFG_02 |
| **References:** | | | TS-0001 [1], clause 10.2.2.2<br>TS-0004 [2], clause 7.3.3.2.2 |
| | | | |
| **Pre-test conditions:** | | | • CSEBase resource has been created in registrar CSE with name {CSEBaseName}<br>• Registree CSE has created a remoteCSE resource on registrar CSE with name {RemoteCSEName} |
| **Test Sequence** | | | |
| **Step** | **RP** | **Type** | **Description** |
| 1 | | Stimulus | Registree CSE is requested to send a RemoteCSE retrieve request to Registrar CSE |
| 2 | Mcc | PRO Check Primitive | • op = 2 (Retrieve)<br>• to = {CSEBaseName}/{remoteCSEName}<br>• fr = Registree CSE-ID<br>• rqi = (token-string)<br>• pc = empty |
| | | PRO Check HTTP | Sent request contains<br>• Request method = GET<br>• Request-Target: {CSEBaseName}/{remoteCSEName}<br>• Host: IP address or the FQDN of Registrar CSE<br>• X-M2M-RI: (token-string)<br>• X-M2M-Origin: Registree CSE-ID<br>• Message-body: empty |
| | | PRO Check CoAP | Sent request contains<br>• Method: 0.01 (GET)<br>• Uri-Host: IP address or the FQDN of Registrar CSE |

| Interoperability Test Description | | | |
|---|---|---|---|
| | | | • Uri-Path: {CSEBaseName}/{remoteCSEName}<br>• oneM2M-FR: Registree CSE-ID<br>• oneM2M-RQI: (token-string)<br>• Payload: empty |
| | | PRO Check MQTT | Sent MQTT PUBLISH message:<br>Topic: "/oneM2M/req/< Registree CSE-ID>/<Registrar CSE-ID>"<br>Payload:<br>• op = 2 (Retrieve)<br>• to = {CSEBaseName}/{remoteCSEName}<br>• fr = Registree CSE-ID<br>• rqi = (token-string)<br>• pc = empty |
| 3 | Mcc | PRO Check Primitive | Registrar CSE sends response containing:<br>• rsc = 2000 (OK)<br>• rqi = (token-string) same as received in request message<br>• pc = Serialized representation of <RemoteCSE> resource |
| | | PRO Check HTTP | Registrar CSE sends response containing:<br>• Status Code = 200 (OK)<br>• X-M2M-RSC: 2000<br>• X-M2M-RI: (token-string) same as received in request message<br>• Content-Type: application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json<br>• Message-body: Serialized representation of <RemoteCSE> resource |
| | | PRO Check CoAP | Registrar sends response containing:<br>• Response Code = 2.05 (OK)<br>• oneM2M-RSC: 2000<br>• oneM2M-RQI: (token-string) same as received in request message<br>• Content-format: application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json<br>• Payload: Serialized representation of <RemoteCSE> resource |
| | | PRO Check MQTT | Sent MQTT PUBLISH message:<br>Topic: "/oneM2M/resp/<Registree CSE-ID>/<Registrar CSE-ID>"<br>Payload:<br>• to = Registree CSE-ID<br>• fr = Registrar CSE-ID<br>• rsc = 2000 (OK)<br>• rqi = (token-string) same as received in request message<br>• pc = Serialized representation of <RemoteCSE> resource |
| 4 | | IOP Check | Registree CSE indicates successful operation |
| IOP Verdict | | | |
| PRO Verdict | | | |

### 8.1.2.3 remoteCSE Update

| Interoperability Test Description | | | |
|---|---|---|---|
| **Identifier:** | | | TD_M2M_NH_04 |
| **Objective:** | | | Registree CSE updates RemoteCSE from Registrar CSE |
| **Configuration:** | | | M2M_CFG_02 |
| **References:** | | | TS-0001 [1], clause 10.2.2.3<br>TS-0004 [2], clause 7.3.3.2.3 |
| | | | |
| **Pre-test conditions:** | | | • CSEBase resource has been created in registrar CSE with name {CSEBaseName}<br>• Registree CSE has created a remoteCSE resource on registrar CSE with name {RemoteCSEName} |
| **Test Sequence** | | | |
| **Step** | **RP** | **Type** | **Description** |
| 1 | | Stimulus | Registree CSE is requested to send a RemoteCSE update request to Registrar CSE |
| 2 | Mcc | PRO Check Primitive | • op = 3 (Update)<br>• to = {CSEBaseName}/{remoteCSEName}<br>• fr = Registree CSE-ID<br>• rqi = (token-string)<br>• pc = Serialized representation of updated <RemoteCSE> resource |
| | | PRO Check HTTP | Sent request contains<br>• Request method = PUT |

| Interoperability Test Description | | | |
|---|---|---|---|
| | | | • Request-Target: {CSEBaseName}/{remoteCSEName}<br>• Host: IP address or the FQDN of Registrar CSE<br>• X-M2M-RI: (token-string)<br>• X-M2M-Origin: Registree CSE-ID<br>• Content-Type: application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json<br>• Message-body: Serialized representation of updated <RemoteCSE> resource |
| | | PRO Check CoAP | Sent request contains<br>• Method: 0.03 (PUT)<br>• Uri-Host: IP address or the FQDN of Registrar CSE<br>• Uri-Path: {CSEBaseName}/{remoteCSEName}<br>• oneM2M-FR: Registree CSE-ID<br>• oneM2M-RQI: (token-string)<br>• Content-format: application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json<br>• Payload: Serialized representation of updated <RemoteCSE> resource |
| | | PRO Check MQTT | Sent MQTT PUBLISH message:<br>Topic: "/oneM2M/req/< Registree CSE-ID>/<Registrar CSE-ID>"<br>Payload:<br>• op = 3 (Update)<br>• to = {CSEBaseName}/{remoteCSEName}<br>• fr = Registree CSE-ID<br>• rqi = (token-string)<br>• pc = Serialized representation of updated <RemoteCSE> resource |
| 3 | | IOP Check | Check if possible that the <remoteCSE> resource has been updated in registrar CSE. |
| 4 | Mcc | PRO Check Primitive | Registrar CSE sends response containing:<br>• rsc = 2004 (UPDATED)<br>• rqi = (token-string) same as received in request message<br>• pc = Serialized representation of <RemoteCSE> resource |
| | | PRO Check HTTP | Registrar CSE sends response containing:<br>• Status Code = 200 (OK)<br>• X-M2M-RSC: 2004<br>• X-M2M-RI: (token-string) same as received in request message<br>• Content-Type: application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json<br>• Message-body: Serialized representation of <RemoteCSE> resource |
| | | PRO Check CoAP | Registrar sends response containing:<br>• Response Code = 2.04 (UPDATED)<br>• oneM2M-RSC: 2004<br>• oneM2M-RQI: (token-string) same as received in request message<br>• Content-format: application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json<br>• Payload: Serialized representation of <RemoteCSE> resource |
| | | PRO Check MQTT | Sent MQTT PUBLISH message:<br>Topic: "/oneM2M/resp/<Registree CSE-ID>/<Registrar CSE-ID>"<br>Payload:<br>• to = Registree CSE-ID<br>• fr = Registrar CSE-ID<br>• rsc = 2004 (Updated)<br>• rqi = (token-string) same as received in request message<br>• pc = Serialized representation of <RemoteCSE> resource |
| 5 | | IOP Check | Registree CSE indicates successful operation |
| IOP Verdict | | | |
| PRO Verdict | | | |

### 8.1.2.4 remoteCSE Delete

| Interoperability Test Description | | | |
|---|---|---|---|
| **Identifier:** | | | TD_M2M_NH_05 |
| **Objective:** | | | Registree CSE deletes RemoteCSE from Registrar CSE |
| **Configuration:** | | | M2M_CFG_02 |
| **References:** | | | TS-0001 [1], clause 10.2.2.4<br>TS-0004 [2], clause 7.3.3.2.4 |
| | | | |
| **Pre-test conditions:** | | | • CSEBase resource has been created in registrar CSE with name {CSEBaseName}<br>• Registree CSE has created a remoteCSE resource on registrar CSE with name {RemoteCSEName} |
| **Test Sequence** | | | |
| **Step** | **RP** | **Type** | **Description** |
| 1 | | Stimulus | Registree CSE is requested to send a RemoteCSE delete request to Registrar CSE |
| 2 | Mcc | PRO Check Primitive | • op = 4 (Delete)<br>• to = {CSEBaseName}/{remoteCSEName}<br>• fr = Registree CSE-ID<br>• rqi = (token-string)<br>• pc = empty |
| | | PRO Check HTTP | Sent request contains<br>• Request method = DELETE<br>• Request-Target: {CSEBaseName}/{remoteCSEName}<br>• Host: IP address or the FQDN of Registrar CSE<br>• X-M2M-RI: (token-string)<br>• X-M2M-Origin: Registree CSE-ID<br>• Message-body: empty |
| | | PRO Check CoAP | Sent request contains<br>• Method: 0.04 (DELETE)<br>• Uri-Host: IP address or the FQDN of Registrar CSE<br>• Uri-Path: {CSEBaseName}/{remoteCSEName}<br>• oneM2M-FR: Registree CSE-ID<br>• oneM2M-RQI: (token-string)<br>• Payload: empty |
| | | PRO Check MQTT | Sent MQTT PUBLISH message:<br>Topic: "/oneM2M/req/<Registree CSE-ID>/<Registrar CSE-ID>"<br>Payload:<br>• op = 4 (Delete)<br>• to = {CSEBaseName}/{remoteCSEName}<br>• fr = Registree CSE-ID<br>• rqi = (token-string)<br>• pc = empty |
| 3 | Mcc | PRO Check Primitive | Registrar CSE sends response containing:<br>• rsc = 2002 (DELETED)<br>• rqi = (token-string) same as received in request message<br>• pc = empty |
| | | PRO Check HTTP | Registrar CSE sends response containing:<br>• Status Code = 200 (OK)<br>• X-M2M-RSC: 2002<br>• X-M2M-RI: (token-string) same as received in request message<br>• Message-body: empty |
| | | PRO Check CoAP | Registrar sends response containing:<br>• Response Code = 2.01 (OK)<br>• oneM2M-RSC: 2002<br>• oneM2M-RQI: (token-string) same as received in request message<br>• Payload: empty |
| | | PRO Check MQTT | Sent MQTT PUBLISH message:<br>Topic: "/oneM2M/resp/<Registree CSE-ID>/<Registrar CSE-ID>"<br>Payload:<br>• to = Registree CSE-ID<br>• fr = Registrar CSE-ID<br>• rsc = 2002<br>• rqi = (token-string) same as received in request message<br>• pc = empty |

| Interoperability Test Description | | | |
|---|---|---|---|
| 4 | | IOP Check | Check if possible that the <remoteCSE> resource has been removed from registrar CSE. |
| 5 | | IOP Check | Check if possible that the <remoteCSE> resource is also removed from registree CSE. |
| 4 | | IOP Check | Registree CSE indicates successful operation. |
| IOP Verdict | | | |
| PRO Verdict | | | |

## 8.1.3 Application Entity Registration

### 8.1.3.1 AE Create

| Interoperability Test Description | | | |
|---|---|---|---|
| **Identifier:** | | TD_M2M_NH_06 | |
| **Objective:** | | AE registers to its registrar CSE via an AE Create Request | |
| **Configuration:** | | M2M_CFG_01 | |
| **References:** | | TS-0001 [1], clause 10.2.1.1<br>TS-0004 [2], clause 7.3.5.2.1 | |
| | | | |
| **Pre-test conditions:** | | • CSEBase resource has been created in CSE with name {CSEBaseName}<br>• AE does not have an AE-ID, i.e. it registers from scratch | |
| **Test Sequence** | | | |
| **Step** | **RP** | **Type** | **Description** |
| 1 | | Stimulus | AE is requested to send a AE Create request to register to the Registrar CSE |
| 2 | Mca | PRO Check Primitive | • op = 1 (Create)<br>• to = {CSEBaseName}<br>• fr = AE-ID<br>• rqi = (token-string)<br>• ty = 2 (AE)<br>• pc = Serialized representation of <AE> resource |
| | | PRO Check HTTP | Sent request contains<br>• Request method = POST<br>• Request-Target:{CSEBaseName}<br>• Host: IP address or the FQDN of Registrar CSE<br>• X-M2M-RI: (token-string)<br>• X-M2M-Origin: AE-ID<br>• Content-Type: application/vnd.onem2m-res+xml; ty=2 or application/vnd.onem2m-res+json; ty=2<br>• Message-body: Serialized representation of <AE> resource |
| | | PRO Check CoAP | Sent request contains<br>• Method: 0.02 (POST)<br>• Uri-Host: IP address or the FQDN of Registrar CSE<br>• Uri-Path: {CSEBaseName}<br>• Content-type: application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json<br>• oneM2M-TY: 2<br>• oneM2M-FR: AE-ID<br>• oneM2M-RQI: (token-string)<br>• Payload: Serialized representation of <AE> resource |
| | | PRO Check MQTT | Sent MQTT PUBLISH message:<br>Topic: "/oneM2M/req/<AE-ID>/<Registrar CSE-ID>"<br>Payload:<br>• op = 1 (Create)<br>• to = {CSEBaseName}<br>• fr = AE-ID<br>• rqi = (token-string)<br>• ty = 2 (AE)<br>• pc = Serialized representation of <AE> resource |
| 3 | | IOP Check | Check if possible that the <AE> resource is created in registrar CSE. |
| 4 | Mca | PRO Check Primitive | • rsc = 2001 (CREATED)<br>• rqi = (token-string) same as received in request message<br>• pc = Serialized representation of <AE> resource |
| | | PRO Check HTTP | Registrar CSE sends response containing:<br>• Status Code = 201 (OK)<br>• X-M2M-RSC: 2001 |

| Interoperability Test Description | | | |
|---|---|---|---|
| | | | • X-M2M-RI: (token-string) same as received in request message<br>• Content-Location: URI of the created AE resource.<br>• Content-Type: application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json<br>• Message-body: Serialized representation of <AE> resource |
| | | PRO Check CoAP | Registrar sends response containing:<br>• Response Code = 2.01<br>• oneM2M-RSC: 2001<br>• oneM2M-RQI: (token-string) same as received in request message<br>• Location-Path: URI of the created AE resource<br>• Payload: Serialized representation of <AE> resource |
| | | PRO Check MQTT | Sent MQTT PUBLISH message:<br>Topic: "/oneM2M/resp/<AE-ID>/<Registrar CSE-ID>"<br>Payload:<br>• to = AE-ID<br>• fr = Registrar CSE-ID<br>• rsc = 2001 (CREATED)<br>• rqi = (token-string) same as received in request message<br>• pc = Serialized representation of <AE> resource |
| 5 | | IOP Check | AE indicates successful operation |
| IOP Verdict | | | |
| PRO Verdict | | | |

### 8.1.3.2 AE Retrieve

| Interoperability Test Description | | | |
|---|---|---|---|
| **Identifier:** | | | TD_M2M_NH_07 |
| **Objective:** | | | AE retrieves <AE> resource via an AE Retrieve Request |
| **Configuration:** | | | M2M_CFG_01 |
| **References:** | | | TS-0001 [1], clause 10.2.1.2<br>TS-0004 [2], clause 7.3.5.2.2 |
| | | | |
| **Pre-test conditions:** | | | • CSEBase resource has been created in registrar CSE with name {CSEBaseName}<br>• AE has created a <AE> resource on registrar CSE with name {AE}bgf |
| **Test Sequence** | | | |
| **Step** | **RP** | **Type** | **Description** |
| 1 | | Stimulus | AE is requested to send a accessControlPolicy retrieve request to Registrar CSE |
| 2 | Mca | PRO Check Primitive | • op = 2 (Retrieve)<br>• to = {CSEBaseName}/{AE}<br>• fr = AE-ID of request originator<br>• rqi = (token-string) |
| | | PRO Check HTTP | Sent request contains<br>• Request method = GET<br>• Request-Target: {CSEBaseName}/{{AE}<br>• Host: IP address or the FQDN of Registrar CSE<br>• X-M2M-RI: (token-string)<br>• X-M2M-Origin: AE-ID<br>• Message-body: empty |
| | | PRO Check CoAP | Sent request contains<br>• Method: 0.01 (GET)<br>• Uri-Host: IP address or the FQDN of Registrar CSE<br>• Uri-Path: {CSEBaseName}/{AE} }<br>• oneM2M-FR: AE-ID<br>• oneM2M-RQI: (token-string)<br>• Payload: empty |
| | | PRO Check MQTT | Sent MQTT PUBLISH message:<br>Topic: "/oneM2M/req/< AE-ID>/<Registrar CSE-ID>"<br>Payload:<br>• op = 2 (Retrieve)<br>• to = {CSEBaseName}/{AE}<br>• fr = AE-ID<br>• rqi = (token-string) |

| Interoperability Test Description | | | |
|---|---|---|---|
| | | | • pc = empty |
| 3 | Mca | PRO Check Primitive | Registrar CSE sends response containing:<br>• rsc = 2000 (OK)<br>• rqi = (token-string) same as received in request message<br>• pc = Serialized representation of <AE> resource |
| | | PRO Check HTTP | Registrar CSE sends response containing:<br>• Status Code = 200 (OK)<br>• X-M2M-RSC: 2000<br>• X-M2M-RI: (token-string) same as received in request message<br>• Content-Type: application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json<br>• Message-body: Serialized representation of <AE> resource |
| | | PRO Check CoAP | Registrar sends response containing:<br>• Response Code = 2.05 (OK)<br>• oneM2M-RSC: 2000<br>• oneM2M-RQI: (token-string) same as received in request message<br>• Content-format: application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json<br>• Payload: Serialized representation of <AE> resource |
| | | PRO Check MQTT | Sent MQTT PUBLISH message:<br>Topic: "/oneM2M/resp/<AE-ID>/<Registrar CSE-ID>"<br>Payload:<br>• to = AE-ID<br>• fr = Registrar CSE-ID<br>• rsc = 2000 (OK)<br>• rqi = (token-string) same as received in request message<br>• pc = Serialized representation of <AE> resource |
| 4 | | IOP Check | AE indicates successful operation |
| IOP Verdict | | | |
| PRO Verdict | | | |

### 8.1.3.3 AE Update

| Interoperability Test Description | | | |
|---|---|---|---|
| **Identifier:** | | TD_M2M_NH_08 | |
| **Objective:** | | AE updates attribute in <AE> resource | |
| **Configuration:** | | M2M_CFG_01 | |
| **References:** | | TS-0001 [1], clause 10.2.1.3<br>TS-0004 [2], clause 7.3.5.2.3 | |
| | | | |
| **Pre-test conditions:** | | • CSEBase resource has been created in registrar CSE with name {CSEBaseName}<br>• AE has created a <AE> resource on registrar CSE with name {AE} | |
| **Test Sequence** | | | |
| **Step** | **RP** | **Type** | **Description** |
| 1 | | Stimulus | AE is requested to send an AE Update Request |
| 2 | Mca | PRO Check Primitive | • op = 3 (Update)<br>• to = {CSEBaseName}/{AE}<br>• fr = AE-ID<br>• rqi = (token-string)<br>• pc = Serialized representation of updated <AE> resource |
| | | PRO Check HTTP | Sent request contains<br>• Request method = PUT<br>• Request-Target: {CSEBaseName}/{AE}<br>• Host: IP address or the FQDN of Registrar CSE<br>• X-M2M-RI: (token-string)<br>• X-M2M-Origin: AE-ID<br>• Content-Type: application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json<br>• Message-body: Serialized representation of updated <AE> resource |
| | | PRO Check CoAP | Sent request contains<br>• Method: 0.03 (PUT)<br>• Uri-Host: IP address or the FQDN of Registrar CSE<br>• Uri-Path: {CSEBaseName}/{AE} |

| | | | |
|---|---|---|---|
| | | | • oneM2M-FR: AE-ID<br>• oneM2M-RQI: (token-string)<br>• Content-format: application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json<br>• Payload: Serialized representation of updated <AE> resource |
| | | PRO Check MQTT | Sent MQTT PUBLISH message:<br>Topic: "/oneM2M/req/<AE-ID>/<Registrar CSE-ID>"<br>Payload:<br>• op = 3 (Update)<br>• to = {CSEBaseName}/{AE}<br>• fr = AE-ID<br>• rqi = (token-string)<br>• pc = Serialized representation of updated <AE> resource |
| 3 | | IOP Check | Check if possible that the <AE> resource has been updated in registrar CSE. |
| 4 | Mca | PRO Check Primitive | Registrar CSE sends response containing:<br>• rsc = 2004 (UPDATED)<br>• rqi = (token-string) same as received in request message<br>• pc = Serialized representation of <AE> resource |
| | | PRO Check HTTP | Registrar CSE sends response containing:<br>• Status Code = 200 (OK)<br>• X-M2M-RSC: 2004<br>• X-M2M-RI: (token-string) same as received in request message<br>• Content-Type: application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json<br>• Message-body: Serialized representation of <AE> resource |
| | | PRO Check CoAP | Registrar sends response containing:<br>• Response Code = 2.04 (UPDATED)<br>• oneM2M-RSC: 2004<br>• oneM2M-RQI: (token-string) same as received in request message<br>• Content-format: application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json<br>• Payload: Serialized representation of <AE> resource |
| | | PRO Check MQTT | Sent MQTT PUBLISH message:<br>Topic: "/oneM2M/resp/<AE-ID>/<Registrar CSE-ID>"<br>Payload:<br>• to = AE-ID<br>• fr = Registrar CSE-ID<br>• rsc = 2004 (Updated)<br>• rqi = (token-string) same as received in request message<br>• pc = Serialized representation of <AE> resource |
| 5 | | IOP Check | AE indicates successful operation |
| IOP Verdict | | | |
| PRO Verdict | | | |

### 8.1.3.4 AE Delete

| Interoperability Test Description | |
|---|---|
| **Identifier:** | TD_M2M_NH_09 |
| **Objective:** | AE de-registers by deleting <AE> resource via an AE Delete Request |
| **Configuration:** | M2M_CFG_01 |
| **References:** | TS-0001 [1], clause 10.2.1.4<br>TS-0004 [2], clause 7.3.5.2.4 |
| | |
| **Pre-test conditions:** | • CSEBase resource has been created in registrar CSE with name {CSEBaseName}<br>• AE has created a <AE> resource on registrar CSE with name {AE} |

| Test Sequence | | | |
|---|---|---|---|
| **Step** | **RP** | **Type** | **Description** |
| 1 | | Stimulus | AE is requested to send an AE Delete Request |
| 2 | Mca | PRO Check Primitive | • op = 4 (Delete)<br>• to = {CSEBaseName}/{AE}<br>• fr = AE-ID<br>• rqi = (token-string)<br>• pc = empty |
| | | PRO Check HTTP | Sent request contains<br>• Request method = DELETE |

| Interoperability Test Description | | | |
|---|---|---|---|
| | | | • Request-Target: {CSEBaseName}/{AE}<br>• Host: IP address or the FQDN of Registrar CSE<br>• X-M2M-RI: (token-string)<br>• X-M2M-Origin: AE-ID<br>• Message-body: empty |
| | | PRO Check CoAP | Sent request contains<br>• Method: 0.04 (DELETE)<br>• Uri-Host: IP address or the FQDN of Registrar CSE<br>• Uri-Path: {CSEBaseName}/{AE]<br>• oneM2M-FR: AE-ID<br>• oneM2M-RQI: (token-string)<br>• Payload: empty |
| | | PRO Check MQTT | Sent MQTT PUBLISH message:<br>Topic: "/oneM2M/req/<AE-ID>/<Registrar CSE-ID>"<br>Payload:<br>• op = 4 (Delete)<br>• to = {CSEBaseName}/{AE}<br>• fr = AE-ID<br>• rqi = (token-string)<br>• pc = empty |
| 3 | Mca | PRO Check Primitive | Registrar CSE sends response containing:<br>• rsc = 2002 (DELETED)<br>• rqi = (token-string) same as received in request message<br>• pc = empty |
| | | PRO Check HTTP | Registrar CSE sends response containing:<br>• Status Code = 200 (OK)<br>• X-M2M-RSC: 2002<br>• X-M2M-RI: (token-string) same as received in request message<br>• Message-body: empty |
| | | PRO Check CoAP | Registrar sends response containing:<br>• Response Code = 2.05 (OK)<br>• oneM2M-RSC: 2002<br>• oneM2M-RQI: (token-string) same as received in request message<br>• Payload: empty |
| | | PRO Check MQTT | Sent MQTT PUBLISH message:<br>Topic: "/oneM2M/resp/<AE-ID>/<Registrar CSE-ID>"<br>Payload:<br>• to = AE-ID<br>• fr = Registrar CSE-ID<br>• rsc = 2002<br>• rqi = (token-string) same as received in request message<br>• pc = empty |
| 4 | | IOP Check | Check if possible that the <AE> resource has been removed from registrar CSE. |
| 5 | | IOP Check | AE indicates successful operation |
| IOP Verdict | | | |
| PRO Verdict | | | |

## 8.1.4 Container Management

### 8.1.4.1 Container Create

| Interoperability Test Description | | | |
|---|---|---|---|
| **Identifier:** | | | TD_M2M_NH_10 |
| **Objective:** | | | AE creates a container resource in registrar CSE via a container Create Request |
| **Configuration:** | | | M2M_CFG_01 |
| **References:** | | | TS-0001 [1], clause 10.2.4.1<br>TS-0004 [2], clause 7.3.5.2.1 |
| | | | |
| **Pre-test conditions:** | | | • AE has created an application resource <AE> on registrar CSE |
| **Test Sequence** | | | |
| **Step** | **RP** | **Type** | **Description** |
| 1 | | Stimulus | AE sends a request to create a <container> |

| Interoperability Test Description | | | |
|---|---|---|---|
| 2 | Mca | PRO Check Primitive | • op = 1 (Create)<br>• to = {CSEBaseName}/URI of <AE> resource<br>• fr = AE-ID<br>• rqi = (token-string)<br>• ty = 3 (Container)<br>• pc = Serialized representation of <container> resource |
| | | PRO Check HTTP | Sent request contains<br>• Request method = POST<br>• Request-Target:{CSEBaseName}/URI of <AE> resource<br>• Host: IP address or the FQDN of Registrar CSE<br>• X-M2M-RI: (token-string)<br>• X-M2M-Origin: AE-ID<br>• Content-Type: application/vnd.onem2m-res+xml; ty=3 or application/vnd.onem2m-res+json; ty=3<br>• Message-body: Serialized representation of <container> resource |
| | | PRO Check CoAP | Sent request contains<br>• Method: 0.02 (POST)<br>• Uri-Host: IP address or the FQDN of Registrar CSE<br>• Uri-Path: {CSEBaseName}/URI of <AE> resource<br>• Content-type: application/vnd.onem2m-res+xml or application/vnd.onem2m res+json<br>• oneM2M-TY: 3<br>• oneM2M-FR: AE-ID<br>• oneM2M-RQI: (token-string)<br>• Payload: Serialized representation of <container> resource |
| | | PRO Check MQTT | Sent MQTT PUBLISH message:<br>Topic: "/oneM2M/req/< AE-ID>/<Registrar CSE-ID>"<br>Payload:<br>• op = 1 (Create)<br>• to = {CSEBaseName}/URI of <AE> resource<br>• fr = AE-ID<br>• rqi = (token-string)<br>• ty = 3 (Container)<br>• pc = Serialized representation of <container> resource |
| 3 | | IOP Check | Check if possible that the <container> resource is created in registrar CSE. |
| 4 | Mca | PRO Check Primitive | • rsc = 2001 (CREATED)<br>• rqi = (token-string) same as received in request message<br>• pc = Serialized representation of <container> resource |
| | | PRO Check HTTP | Registrar CSE sends response containing:<br>• Status Code = 201 (Created)<br>• X-M2M-RSC: 2001<br>• X-M2M-RI: (token-string) same as received in request message<br>• Content-Location: URI of the created resource.<br>• Content-Type: application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json<br>• Message-body: Serialized representation of <container> resource |
| | | PRO Check CoAP | Registrar sends response containing:<br>• Response Code = 2.01<br>• oneM2M-RSC: 2001<br>• oneM2M-RQI: (token-string) same as received in request message<br>• Location-Path: URI of the created resource<br>• Content-format: application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json<br>• Payload: Serialized representation of <container> resource |
| | | PRO Check MQTT | Sent MQTT PUBLISH message:<br>Topic: "/oneM2M/resp/< AE-ID>/<Registrar CSE-ID>"<br>Payload:<br>• to = AE-ID<br>• fr = Registrar CSE-ID<br>• rsc = 2001 (CREATED)<br>• rqi = (token-string) same as received in request message<br>• pc = Serialized representation of <container> resource |
| 5 | | IOP Check | AE indicates successful operation |
| IOP Verdict | | | |
| PRO Verdict | | | |

### 8.1.4.2 Container Retrieve

| Interoperability Test Description | | | |
|---|---|---|---|
| **Identifier:** | | | TD_M2M_NH_11 |
| **Objective:** | | | AE retrieves information of a container resource via a container Retrieve Request |
| **Configuration:** | | | M2M_CFG_01 |
| **References:** | | | TS-0001 [1], clause 10.2.4.2<br>TS-0004 [2], clause 7.3.5.2.2 |
| | | | |
| **Pre-test conditions:** | | | • AE has created an Application Entity resource <AE> on Registrar CSE<br>• AE has created a container resource <container> on Registrar CSE |
| **Test Sequence** | | | |
| **Step** | **RP** | **Type** | **Description** |
| 1 | | Stimulus | AE is requested to send a Retrieve Request for a <subscription> |
| 2 | Mca | PRO Check Primitive | • op = 2 (Retrieve)<br>• to = {CSEBaseName}/URI of <container> resource<br>• fr = AE-ID<br>• rqi = (token-string)<br>• pc = empty |
| | | PRO Check HTTP | Sent request contains<br>• Request method = GET<br>• Request-Target: {CSEBaseName}/URI of <container> resource<br>• Host : IP address or the FQDN of Registrar CSE<br>• X-M2M-RI: (token-string)<br>• X-M2M-Origin: AE-ID<br>• Message-body: empty |
| | | PRO Check CoAP | Sent request contains<br>• Method: 0.01 (GET)<br>• Uri-Host: IP address or the FQDN of Registrar CSE<br>• Uri-Path: {CSEBaseName}/URI of <container> resource<br>• oneM2M-FR: AE-ID<br>• oneM2M-RQI: (token-string)<br>• Payload: empty |
| | | PRO Check MQTT | Sent MQTT PUBLISH message:<br>Topic: "/oneM2M/req/< AE-ID>/<Registrar CSE-ID>"<br>Payload:<br>• op = 2 (Retrieve)<br>• to = {CSEBaseName}/URI of <container> resource<br>• fr = AE-ID<br>• rqi = (token-string)<br>• pc = empty |
| 3 | Mca | PRO Check Primitive | • rsc =2000 (OK)<br>• rqi = (token-string) same as received in request message<br>• pc = Serialized representation of <container> resource |
| | | PRO Check HTTP | Registrar CSE sends response containing:<br>• Status Code = 200 (OK)<br>• X-M2M-RSC: 2000<br>• X-M2M-RI: (token-string) same as received in request message<br>• Content-Type: application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json<br>• Message-body: Serialized representation of <container> resource |
| | | PRO Check CoAP | Registrar sends response containing:<br>• Response Code = 2.05 (OK)<br>• oneM2M-RSC: 2000(OK)<br>• oneM2M-RQI: (token-string) same as received in request message<br>• Content-format: application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json<br>• Payload: Serialized representation of <container> resource |
| | | PRO Check MQTT | Sent MQTT PUBLISH message:<br>Topic: "/oneM2M/resp/< AE-ID>/<Registrar CSE-ID>"<br>Payload:<br>• to = AE-ID<br>• fr = Registrar CSE-ID<br>• rsc 2000(OK)<br>• rqi = (token-string) same as received in request message<br>• pc = Serialized representation of <container> resource |
| 4 | | IOP Check | AE indicates successful operation |

| Interoperability Test Description | |
|---|---|
| IOP Verdict | |
| PRO Verdict | |

### 8.1.4.3 Container Update

| Interoperability Test Description | | | |
|---|---|---|---|
| **Identifier:** | | | TD_M2M_NH_12 |
| **Objective:** | | | AE updates attribute in application resource via a container Update Request |
| **Configuration:** | | | M2M_CFG_01 |
| **References:** | | | TS-0001 [1], clause 10.2.4.3<br>TS-0004 [2], clause 7.3.5.2.3 |
| | | | |
| **Pre-test conditions:** | | | • AE has created an Application Entity resource <AE> on Registrar CSE<br>• AE has created a container resource <container> on Registrar CSE |
| **Test Sequence** | | | |
| **Step** | **RP** | **Type** | **Description** |
| 1 | | Stimulus | AE is requested to send a subscription Update Request to update the lifetime of the resource. |
| 2 | Mca | PRO Check Primitive | • op = 3 (Update)<br>• to = {CSEBaseName}/URI of <container> resource<br>• fr = AE-ID<br>• rqi = (token-string)<br>• pc = Serialized representation of updated <container> resource |
| | | PRO Check HTTP | Sent request contains<br>• Request method = PUT<br>• Request-Target:{CSEBaseName}/URI of <container> resource<br>• Host : IP address or the FQDN of Registrar CSE<br>• X-M2M-RI: (token-string)<br>• X-M2M-Origin: AE-ID<br>• Content-Type: application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json<br>• Message-body: Serialized representation of updated <container> resource |
| | | PRO Check CoAP | Sent request contains<br>• Method: 0.03 (PUT)<br>• Uri-Host: IP address or the FQDN of Registrar CSE<br>• Uri-Path: {CSEBaseName}/URI of <container> resource<br>• oneM2M-FR: AE-ID<br>• oneM2M-RQI: (token-string)<br>• Content-format: application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json<br>• Payload: Serialized representation of updated <container> resource |
| | | PRO Check MQTT | Sent MQTT PUBLISH message:<br>Topic: "/oneM2M/ req /< AE-ID>/<Registrar CSE-ID>"<br>Payload:<br>• op = 3 (Update)<br>• to = {CSEBaseName}/URI of <container> resource<br>• fr = AE-ID<br>• rqi = (token-string)<br>• pc = Serialized representation of updated <container> resource |
| 3 | | IOP Check | Check if possible that the < container > resource is updated in Registrar CSE. |
| 4 | Mca | PRO Check Primitive | • rsc = 2004 (Updated)<br>• rqi = (token-string) same as received in request message<br>• pc = Serialized representation of <container> resource |
| | | PRO Check HTTP | Registrar CSE sends response containing:<br>• Code = 200 (Ok)<br>• X-M2M-RSC: 2004<br>• X-M2M-RI: (token-string) same as received in request message<br>• Content-Type: application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json<br>• Message-body: Serialized representation of <container> resource |
| | | PRO Check CoAP | Registrar sends response containing:<br>• Response Code = 2.04<br>• oneM2M-RSC: 2004<br>• oneM2M-RQI: (token-string) same as received in request message<br>• Content-format: application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json |

| Interoperability Test Description | | | |
|---|---|---|---|
| | | | • Payload : Serialized representation of <container> resource |
| | | PRO Check MQTT | Sent MQTT PUBLISH message:<br>Topic: "/oneM2M/resp/< AE-ID>/<Registrar CSE-ID>"<br>Payload:<br>• to = AE-ID<br>• fr = Registrar CSE-ID<br>• rsc = 2004 (Updated)<br>• rqi = (token-string) same as received in request message<br>• pc = Serialized representation of modified <container> resource |
| 5 | | IOP Check | AE indicates successful operation |
| IOP Verdict | | | |
| PRO Verdict | | | |

### 8.1.4.4 Container Delete

| Interoperability Test Description | | | |
|---|---|---|---|
| **Identifier:** | | TD_M2M_NH_13 | |
| **Objective:** | | AE deletes a specific container resource via a container Delete Request | |
| **Configuration:** | | M2M_CFG_01 | |
| **References:** | | TS-0001 [1], clause 10.2.4.4<br>TS-0004 [2], clause 7.3.5.2.4 | |
| | | | |
| **Pre-test conditions:** | | • AE has created an Application Entity resource <AE> on Registrar CSE<br>• AE has created a container resource <container> on Registrar CSE | |
| **Test Sequence** | | | |
| **Step** | **RP** | **Type** | **Description** |
| 1 | | Stimulus | AE is requested to send a subscription Delete Request |
| 2 | Mca | PRO Check Primitive | • op = 4 (Delete)<br>• to = {CSEBaseName}/URI of <container> resource<br>• fr = AE-ID<br>• rqi = (token-string)<br>• pc = empty |
| | | PRO Check HTTP | Sent request contains<br>• Request method = DELETE<br>• Request-Target: {CSEBaseName}/URI of <container> resource<br>• Host: IP address or the FQDN of Registrar CSE<br>• X-M2M-RI: (token-string)<br>• X-M2M-Origin: AE-ID<br>• Message-body: Empty |
| | | PRO Check CoAP | Sent request contains<br>• Method: 0.04 (DELETE)<br>• Uri-Host: IP address or the FQDN of Registrar CSE<br>• Uri-Path: {CSEBaseName}/URI of <container> resource<br>• oneM2M-FR: AE-ID<br>• oneM2M-RQI: (token-string)<br>• Payload: empty |
| | | PRO Check MQTT | Sent MQTT PUBLISH message:<br>Topic: "/oneM2M/req/< AE-ID>/<Registrar CSE-ID>"<br>Payload:<br>• op = 4 (Delete)<br>• to = {CSEBaseName}/URI of <container> resource<br>• fr = AE-ID<br>• rqi = (token-string)<br>• pc = empty |
| 3 | | IOP Check | Check if possible that the <container> resource is deleted in registrar CSE. |
| 4 | Mca | PRO Check Primitive | • rsc = 2002 (DELETED)<br>• rqi = (token-string) same as received in request message<br>• pc = empty |
| | | PRO Check HTTP | Registrar CSE sends response containing:<br>• Status Code = 200 (OK)<br>• X-M2M-RSC: 2002<br>• X-M2M-RI: (token-string) same as received in request message |

| Interoperability Test Description | | | |
|---|---|---|---|
| | | | • Message-body: empty |
| | | PRO Check CoAP | Registrar sends response containing:<br>• Response Code = 2.02<br>• oneM2M-RSC: 2002(DELETED)<br>• oneM2M-RQI: (token-string) same as received in request message<br>• Payload: empty |
| | | PRO Check MQTT | Sent MQTT PUBLISH message:<br>Topic: "/oneM2M/resp/< AE-ID>/<Registrar CSE-ID>"<br>Payload:<br>• to = AE-ID<br>• fr = Registrar CSE-ID<br>• rsc = 2002(DELETED)<br>• rqi = (token-string) same as received in request message |
| 5 | | IOP Check | Check if possible that the <container> resource has been removed in registrar CSE. |
| 6 | | IOP Check | AE indicates successful operation. |
| IOP Verdict | | | |
| PRO Verdict | | | |

## 8.1.5 ContentInstance Management

### 8.1.5.1 ContentInstance Create

| Interoperability Test Description | | | |
|---|---|---|---|
| **Identifier:** | | | TD_M2M_NH_14 |
| **Objective:** | | | AE adds a contentInstance resource <contentInstance> to a specific container in Registrar CSE via a contentInstance Create Request |
| **Configuration:** | | | M2M_CFG_01 |
| **References:** | | | TS-0001 [1], clause 10.2.19.2<br>TS-0004 [2], clause 7.3.6.2.1 |
| | | | |
| **Pre-test conditions:** | | | • AE has created an application resource <AE> on registrar CSE<br>• AE has created a container resource <container> on registrar CSE |
| **Test Sequence** | | | |
| **Step** | **RP** | **Type** | **Description** |
| 1 | | Stimulus | AE sends a request to create a <container> |
| 2 | Mca | PRO Check Primitive | • op = 1 (Create)<br>• to = {CSEBaseName}/URI of < container > resource<br>• fr = AE-ID<br>• rqi = (token-string)<br>• ty = 4 (contentInstance)<br>• pc = Serialized representation of <contentInstance> resource |
| | | PRO Check HTTP | Sent request contains<br>• Request method = POST<br>• Request-Target:{CSEBaseName}/URI of < container > resource<br>• Host: IP address or the FQDN of Registrar CSE<br>• X-M2M-RI: (token-string)<br>• X-M2M-Origin: AE-ID<br>• Content-Type: application/vnd.onem2m-res+xml; ty=4 or application/vnd.onem2m-res+json; ty=4<br>• Message-body: Serialized representation of <contentInstance> resource |
| | | PRO Check CoAP | Sent request contains<br>• Method: 0.02 (POST)<br>• Uri-Host: IP address or the FQDN of Registrar CSE<br>• Uri-Path: {CSEBaseName}/URI of < container > resource<br>• Content-format: application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json<br>• oneM2M-TY: 4<br>• oneM2M-FR: AE-ID<br>• oneM2M-RQI: (token-string)<br>• Payload: Serialized representation of <contentInstance> resource |
| | | PRO Check MQTT | Sent MQTT PUBLISH message:<br>Topic: "/oneM2M/req/< AE-ID>/<Registrar CSE-ID>" |

| Interoperability Test Description | | | |
|---|---|---|---|
| | | | Payload:<br>• op = 1 (Create)<br>• to = {CSEBaseName}/URI of < container > resource<br>• fr = AE-ID<br>• rqi = (token-string)<br>• ty = 4 (contentInstance)<br>• pc = Serialized representation of <contentInstance> resource |
| 3 | | IOP Check | Check if possible that the <container> resource is created in registrar CSE. |
| 4 | Mca | PRO Check Primitive | • rsc = 2001 (CREATED)<br>• rqi = (token-string) same as received in request message<br>• pc = Serialized representation of <contentInstance> resource |
| | | PRO Check HTTP | Registrar CSE sends response containing:<br>• Status Code = 201 (Created)<br>• X-M2M-RSC: 2001<br>• X-M2M-RI: (token-string) same as received in request message<br>• Content-Location: URI of the created resource.<br>• Content-Type: application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json<br>• Message-body: Serialized representation of <contentInstance> resource |
| | | PRO Check CoAP | Registrar sends response containing:<br>• Response Code = 2.01<br>• oneM2M-RSC: 2001<br>• oneM2M-RQI: (token-string) same as received in request message<br>• Location-Path: URI of the created resource<br>• Content-format: application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json<br>• Payload: Serialized representation of <contentInstance> resource |
| | | PRO Check MQTT | Sent MQTT PUBLISH message:<br>Topic: "/oneM2M/resp/< AE-ID>/<Registrar CSE-ID>"<br>Payload:<br>• to = AE-ID<br>• fr = Registrar CSE-ID<br>• rsc = 2001 (CREATED)<br>• rqi = (token-string) same as received in request message<br>• pc = Serialized representation of <contentInstance> resource |
| 5 | | IOP Check | AE indicates successful operation |
| IOP Verdict | | | |
| PRO Verdict | | | |

### 8.1.5.2 ContentInstance Retrieve

| Interoperability Test Description | | | |
|---|---|---|---|
| **Identifier:** | | | TD_M2M_NH_15 |
| **Objective:** | | | AE retrieves information of a contentInstance resource via a container Retrieve Request |
| **Configuration:** | | | M2M_CFG_01 |
| **References:** | | | TS-0001 [1], clause 10.2.19.3<br>TS-0004 [2], clause 7.3.6.2.2 |
| | | | |
| **Pre-test conditions:** | | | • AE has created an Application Entity resource <AE> on Registrar CSE<br>• AE has created a container resource <container> on Registrar CSE |
| **Test Sequence** | | | |
| **Step** | **RP** | **Type** | **Description** |
| 1 | | Stimulus | AE is requested to send a Retrieve Request for a <contentInstance> |
| 2 | Mca | PRO Check Primitive | • op = 2 (Retrieve)<br>• to = {CSEBaseName}/URI of <contentInstance> resource<br>• fr = AE-ID<br>• rqi = (token-string)<br>• pc = empty |
| | | PRO Check HTTP | Sent request contains<br>• Request method = GET<br>• Request-Target: {CSEBaseName}/URI of <contentInstance> resource<br>• Host: IP address or the FQDN of Registrar CSE<br>• X-M2M-RI: (token-string)<br>• X-M2M-Origin: AE-ID |

| Interoperability Test Description | | | |
|---|---|---|---|
| | | | • Message-body: empty |
| | | PRO Check CoAP | Sent request contains<br>• Method: 0.01 (GET)<br>• Uri-Host: IP address or the FQDN of Registrar CSE<br>• Uri-Path: {CSEBaseName}/URI of <contentInstance> resource<br>• oneM2M-FR: AE-ID<br>• oneM2M-RQI: (token-string)<br>• Payload: empty |
| | | PRO Check MQTT | Sent MQTT PUBLISH message:<br>Topic: "/oneM2M/req/< AE-ID>/<Registrar CSE-ID>"<br>Payload:<br>• op = 2 (Retrieve)<br>• to = {CSEBaseName}/URI of <contentInstance> resource<br>• fr = AE-ID<br>• rqi = (token-string)<br>• pc = empty |
| 3 | Mca | PRO Check Primitive | • rsc =2000 (OK)<br>• rqi = (token-string) same as received in request message<br>• pc = Serialized representation of <contentInstance> resource |
| | | PRO Check HTTP | Registrar CSE sends response containing:<br>• Status Code = 200 (OK)<br>• X-M2M-RSC: 2000<br>• X-M2M-RI: (token-string) same as received in request message<br>• Content-Type: application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json<br>• Message-body: Serialized representation of <contentInstance> resource |
| | | PRO Check CoAP | Registrar sends response containing:<br>• Response Code = 2.05 (OK)<br>• oneM2M-RSC: 2000(OK)<br>• oneM2M-RQI: (token-string) same as received in request message<br>• Content-format: application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json<br>• Payload: Serialized representation of <contentInstance> resource |
| | | PRO Check MQTT | Sent MQTT PUBLISH message:<br>Topic: "/oneM2M/resp/< AE-ID>/<Registrar CSE-ID>"<br>Payload:<br>• to = AE-ID<br>• fr = Registrar CSE-ID<br>• rsc 2000(OK)<br>• rqi = (token-string) same as received in request message<br>• pc = Serialized representation of <contentInstance> resource |
| 4 | | IOP Check | AE indicates successful operation |
| IOP Verdict | | | |
| PRO Verdict | | | |

### 8.1.5.3 ContentInstance Delete

| Interoperability Test Description | | | |
|---|---|---|---|
| **Identifier:** | | | TD_M2M_NH_17 |
| **Objective:** | | | AE deletes contentInstance resource via a container Delete Request |
| **Configuration:** | | | M2M_CFG_01 |
| **References:** | | | TS-0001 [1], clause 10.2.19.5<br>TS-0004 [2], clause 7.3.6.2.4 |
| | | | |
| **Pre-test conditions:** | | | • AE has created an Application Entity resource <AE> on Registrar CSE<br>• AE has created a container resource <container> on Registrar CSE |
| **Test Sequence** | | | |
| **Step** | **RP** | **Type** | **Description** |
| 1 | | Stimulus | AE is requested to send a subscription Delete Request |
| 2 | Mca | PRO Check Primitive | • op = 4 (Delete)<br>• to = {CSEBaseName}/URI of <contentInstance> resource<br>• fr = AE-ID<br>• rqi = (token-string)<br>• pc = empty |

| Interoperability Test Description | | | |
|---|---|---|---|
| | | PRO Check HTTP | Sent request contains<br>• Request method = DELETE<br>• Request-Target: {CSEBaseName}/URI of <contentInstance> resource<br>• Host: IP address or the FQDN of Registrar CSE<br>• X-M2M-RI: (token-string)<br>• X-M2M-Origin: AE-ID<br>• Message-body: Empty |
| | | PRO Check CoAP | Sent request contains<br>• Method: 0.04 (DELETE)<br>• Uri-Host: IP address or the FQDN of Registrar CSE<br>• Uri-Path: {CSEBaseName}/URI of <contentInstance> resource<br>• oneM2M-FR: AE-ID<br>• oneM2M-RQI: (token-string)<br>• Payload: empty |
| | | PRO Check MQTT | Sent MQTT PUBLISH message:<br>Topic: "/oneM2M/req/< AE-ID>/<Registrar CSE-ID>"<br>Payload:<br>• op = 4 (Delete)<br>• to = {CSEBaseName}/URI of <contentInstance> resource<br>• fr = AE-ID<br>• rqi = (token-string)<br>• pc = empty |
| 3 | | IOP Check | Check if possible that the <contentInstance> resource is deleted in registrar CSE. |
| 4 | Mca | PRO Check Primitive | • rsc = 2002 (DELETED)<br>• rqi = (token-string) same as received in request message<br>• pc = empty |
| | | PRO Check HTTP | Registrar CSE sends response containing:<br>• Status Code = 200 (OK)<br>• X-M2M-RSC: 2002<br>• X-M2M-RI: (token-string) same as received in request message<br>• Message-body: empty |
| | | PRO Check CoAP | Registrar sends response containing:<br>• Response Code = 2.02<br>• oneM2M-RSC: 2002(DELETED)<br>• oneM2M-RQI: (token-string) same as received in request message<br>• Payload: empty |
| | | PRO Check MQTT | Sent MQTT PUBLISH message:<br>Topic: "/oneM2M/resp/< AE-ID>/<Registrar CSE-ID>"<br>Payload:<br>• to = AE-ID<br>• fr = Registrar CSE-ID<br>• rsc = 2002(DELETED)<br>• rqi = (token-string) same as received in request message |
| 5 | | IOP Check | Check if possible that the <contentInstance> resource has been removed in registrar CSE. |
| 6 | | IOP Check | AE indicates successful operation. |
| IOP Verdict | | | |
| PRO Verdict | | | |

## 8.1.6 Discovery

### 8.1.6.1 Discovery of all resources

| Interoperability Test Description | | | |
|---|---|---|---|
| **Identifier:** | | | TD_M2M_NH_18 |
| **Objective:** | | | AE discovers all accessible resources from registrar CSE |
| **Configuration:** | | | M2M_CFG_01 |
| **References:** | | | TS-0001 [1], clause 10.2.6<br>TS-0004 [2], clause 7.2.3.13 |
| | | | |
| **Pre-test conditions:** | | | • CSEBase resource has been created in registrar CSE with name {CSEBaseName} |
| **Test Sequence** | | | |
| **Step** | **RP** | **Type** | **Description** |
| 1 | | Stimulus | AE is requested to send a discovery request to registrar CSE |
| 2 | Mca | PRO Check Primitive | Sent request contains<br>• op = 2 (Retrieve)<br>• to = {CSEBaseName}<br>• fr = AE-ID<br>• rqi = (token-string)<br>• fu=1<br>• pc = empty |
| | | PRO Check HTTP | Sent request contains<br>• Request method = GET<br>• Request-Target: {CSEBaseName}?fu=1<br>• Host: IP address or the FQDN of Registrar CSE<br>• X-M2M-RI: (token-string)<br>• X-M2M-Origin: AE-ID<br>• Message-body: empty |
| | | PRO Check CoAP | Sent request contains<br>• Method: 0.01 (GET)<br>• Uri-Host: IP address or the FQDN of Registrar CSE<br>• Uri-Path: {CSEBaseName}<br>• oneM2M-FR: AE-ID<br>• oneM2M-RQI: (token-string)<br>• Uri-Query: fu=1<br>• Payload: empty |
| | | PRO Check MQTT | Sent MQTT PUBLISH message:<br>Topic: "/oneM2M/req/<AE-ID>/<Registrar CSE-ID>"<br>Payload:<br>• op = 2 (Retrieve)<br>• to = {CSEBaseName}<br>• fr = Registree CSE-ID<br>• rqi = (token-string)<br>• fu = 1<br>• pc = empty |
| 3 | Mca | PRO Check Primitive | Registrar CSE sends response containing:<br>• rsc = 2000 (OK)<br>• rqi = (token-string) same as received in request message<br>• pc = Serialized representation of data object containing addresses of all discovered resources |
| | | PRO Check HTTP | Registrar CSE sends response containing:<br>• Status Code = 200 (OK)<br>• X-M2M-RSC: 2000<br>• X-M2M-RI: (token-string) same as received in request message<br>• Content-Type: application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json<br>• Message-body: Serialized representation of data object containing addresses of all discovered resources |
| | | PRO Check CoAP | Registrar sends response containing:<br>• Response Code = 2.05<br>• oneM2M-RSC: 2000<br>• oneM2M-RQI: (token-string) same as received in request message<br>• Content-format: application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json |

| Interoperability Test Description | | | |
|---|---|---|---|
| | | | • Payload: Serialized representation of data object containing addresses of all discovered resources |
| | | PRO Check MQTT | Sent MQTT PUBLISH message:<br>Topic: "/oneM2M/resp/<AE-ID>/<Registrar CSE-ID>"<br>Payload:<br>• to = Registree CSE-ID<br>• fr = Registrar CSE-ID<br>• rsc = 2000 (OK)<br>• rqi = (token-string) same as received in request message<br>• pc = Serialized representation of data object containing addresses of all discovered resources |
| 4 | | IOP Check | AE indicates successful operation |
| IOP Verdict | | | |
| PRO Verdict | | | |

### 8.1.6.2 Discovery with label filter criteria

| Interoperability Test Description | | | |
|---|---|---|---|
| **Identifier:** | | | TD_M2M_NH_19 |
| **Objective:** | | | AE discovers accessible resources residing in Registrar CSE using the label filter criteria |
| **Configuration:** | | | M2M_CFG_01 |
| **References:** | | | TS-0001 [1], clause 10.2.6<br>TS-0004 [2], clause 7.2.3.13 |
| | | | |
| **Pre-test conditions:** | | | • CSEBase resource has been created in registrar CSE with name {CSEBaseName}<br>• A <Container> resource with label "key1" is created on Registrar CSE . |
| **Test Sequence** | | | |
| **Step** | **RP** | **Type** | **Description** |
| 1 | | Stimulus | AE is requested to send a Discovery request in order to discover the <Container> resource using the label filter criteria |
| 2 | Mca | PRO Check Primitive | Sent request contains<br>• op = 2 (Retrieve)<br>• to = {CSEBaseName}<br>• fr = AE-ID<br>• rqi = (token-string)<br>• fu=1<br>• lbl=key1<br>• pc = empty |
| | | PRO Check HTTP | Sent request contains<br>• Request method = GET<br>• Request-Target: {CSEBaseName}?fu=1&lbl=key1<br>• Host: IP address or the FQDN of Registrar CSE<br>• X-M2M-RI: (token-string)<br>• X-M2M-Origin: AE-ID<br>• Message-body: empty |
| | | PRO Check CoAP | Sent request contains<br>• Method: 0.01 (GET)<br>• Uri-Host: IP address or the FQDN of Registrar CSE<br>• Uri-Path: {CSEBaseName}<br>• oneM2M-FR: AE-ID<br>• oneM2M-RQI: (token-string)<br>• Uri-Query: fu=1<br>• Uri-Query: lbl=key1<br>• Payload: empty |
| | | PRO Check MQTT | Sent MQTT PUBLISH message:<br>Topic: "/oneM2M/req/<AE-ID>/<Registrar CSE-ID>"<br>Payload:<br>• op = 2 (Retrieve)<br>• to = {CSEBaseName}<br>• fr = Registree CSE-ID<br>• rqi = (token-string)<br>• fu = 1<br>• lbl=key1 |

| Interoperability Test Description | | | |
|---|---|---|---|
| | | | • pc = empty |
| 3 | Mca | PRO Check Primitive | Registrar CSE sends response containing:<br>• rsc = 2000 (OK)<br>• rqi = (token-string) same as received in request message<br>• pc = Serialized representation of data object containing the addresse of the <Container> address |
| | | PRO Check HTTP | Registrar CSE sends response containing:<br>• Status Code = 200 (OK)<br>• X-M2M-RSC: 2000<br>• X-M2M-RI: (token-string) same as received in request message<br>• Content-Type: application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json<br>• Message-body: Serialized representation of data object containing the address of the <Container> address |
| | | PRO Check CoAP | Registrar sends response containing:<br>• Response Code = 2.05<br>• oneM2M-RSC: 2000<br>• oneM2M-RQI: (token-string) same as received in request message<br>• Content-format: application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json<br>• Payload: Serialized representation of data object containing the address of the <Container> address |
| | | PRO Check MQTT | Sent MQTT PUBLISH message:<br>Topic: "/oneM2M/resp/<AE-ID>/<Registrar CSE-ID>"<br>Payload:<br>• to = Registree CSE-ID<br>• fr = Registrar CSE-ID<br>• rsc = 2000 (OK)<br>• rqi = (token-string) same as received in request message<br>• pc = Serialized representation of data object containing the address of the <Container> address |
| 4 | | IOP Check | AE indicates successful operation |
| IOP Verdict | | | |
| PRO Verdict | | | |

### 8.1.6.3 Discovery with limit filter criteria

| Interoperability Test Description | | | |
|---|---|---|---|
| **Identifier:** | | | TD_M2M_NH_20 |
| **Objective:** | | | AE discovers accessible resources residing in Registrar CSE limiting the number of matching resources to the specified value. |
| **Configuration:** | | | M2M_CFG_01 |
| **References:** | | | TS-0001 [1], clause 10.2.6<br>TS-0004 [2], clause 7.2.3.13 |
| | | | |
| **Pre-test conditions:** | | | • CSEBase resource has been created in registrar CSE with name {CSEBaseName} |
| **Test Sequence** | | | |
| **Step** | **RP** | **Type** | **Description** |
| 1 | | Stimulus | AE is requested to send a Discovery request in order to discover at most 2 resources in registrar CSE. |
| 2 | Mca | PRO Check Primitive | Sent request contains<br>• op = 2 (Retrieve)<br>• to = {CSEBaseName}<br>• fr = AE-ID<br>• rqi = (token-string)<br>• fu=1<br>• lim=2<br>• pc = empty |
| | | PRO Check HTTP | Sent request contains<br>• Request method = GET<br>• Request-Target: {CSEBaseName}?fu=1&lim=2<br>• Host: IP address or the FQDN of Registrar CSE<br>• X-M2M-RI: (token-string)<br>• X-M2M-Origin: AE-ID<br>• Message-body: empty |

| Interoperability Test Description | | | |
|---|---|---|---|
| | | PRO Check CoAP | Sent request contains<br>• Method: 0.01 (GET)<br>• Uri-Host: IP address or the FQDN of Registrar CSE<br>• Uri-Path: {CSEBaseName}<br>• oneM2M-FR: AE-ID<br>• oneM2M-RQI: (token-string)<br>• Uri-Query: fu=1<br>• Uri-Query: lim=2<br>• Payload: empty |
| | | PRO Check MQTT | Sent MQTT PUBLISH message:<br>Topic: "/oneM2M/req/<AE-ID>/<Registrar CSE-ID>"<br>Payload:<br>• op = 2 (Retrieve)<br>• to = {CSEBaseName}<br>• fr = Registree CSE-ID<br>• rqi = (token-string)<br>• fu = 1<br>• lim=2<br>• pc = empty |
| 3 | Mca | PRO Check Primitive | Registrar CSE sends response containing:<br>• rsc = 2000 (OK)<br>• rqi = (token-string) same as received in request message<br>• pc = Serialized representation of data object containing the address of the <Container> address |
| | | PRO Check HTTP | Registrar CSE sends response containing:<br>• Status Code = 200 (OK)<br>• X-M2M-RSC: 2000<br>• X-M2M-RI: (token-string) same as received in request message<br>• Content-Type: application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json<br>• Message-body: Serialized representation of data object containing at most 2 addresses of discovered resources |
| | | PRO Check CoAP | Registrar sends response containing:<br>• Response Code = 2.05<br>• oneM2M-RSC: 2000<br>• oneM2M-RQI: (token-string) same as received in request message<br>• Content-format: application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json<br>• Payload: Serialized representation of data object containing at most 2 addresses of discovered resources |
| | | PRO Check MQTT | Sent MQTT PUBLISH message:<br>Topic: "/oneM2M/resp/<AE-ID>/<Registrar CSE-ID>"<br>Payload:<br>• to = Registree CSE-ID<br>• fr = Registrar CSE-ID<br>• rsc = 2000 (OK)<br>• rqi = (token-string) same as received in request message<br>• pc = Serialized representation of data object containing at most 2 addresses of discovered resources |
| 4 | | IOP Check | AE indicates successful operation |
| IOP Verdict | | | |
| PRO Verdict | | | |

### 8.1.6.4 Discovery with multiple filter criteria

| Interoperability Test Description | | | |
|---|---|---|---|
| **Identifier:** | | | TD_M2M_NH_21 |
| **Objective:** | | | AE discovers accessible resources residing in Registrar CSE using multiple Filter Criteria |
| **Configuration:** | | | M2M_CFG_01 |
| **References:** | | | TS-0001 [1], clause 10.2.6<br>TS-0004 [2], clause 7.2.3.13 |
| | | | |
| **Pre-test conditions:** | | | • Two <Container> resources with labels "key1" and "key2" are created in Registrar CSE.<br>• A <Group> resources with labels "key1" and "key2" is created in Registrar CSE. |
| **Test Sequence** | | | |
| **Step** | **RP** | **Type** | **Description** |
| 1 | | Stimulus | AE is requested to send a Discovery request in order to discover specific resources located in Registrar CSE using multiple filter criteria (label, resource type and limit) |
| 2 | Mca | PRO Check Primitive | Sent request contains<br>• op = 2 (Retrieve)<br>• to = {CSEBaseName}<br>• fr = AE-ID<br>• rqi = (token-string)<br>• fu=1<br>• lbl=key1<br>• lbl=key2<br>• rty=3<br>• lim=1<br>• pc = empty |
| | | PRO Check HTTP | Sent request contains<br>• Request method = GET<br>• Request-Target: {CSEBaseName}?fu=1&key=1&key=2&rty=3&lim=1<br>• Host: IP address or the FQDN of Registrar CSE<br>• X-M2M-RI: (token-string)<br>• X-M2M-Origin: AE-ID<br>• Message-body: empty |
| | | PRO Check CoAP | Sent request contains<br>• Method: 0.01 (GET)<br>• Uri-Host: IP address or the FQDN of Registrar CSE<br>• Uri-Path: {CSEBaseName}<br>• oneM2M-FR: AE-ID<br>• oneM2M-RQI: (token-string)<br>• Uri-Query: fu=1<br>• Uri-Query: lbl=key1<br>• Uri-Query: lbl=key2<br>• Uri-Query: rty=3<br>• Uri-Query: lim=1<br>• Payload: empty |
| | | PRO Check MQTT | Sent MQTT PUBLISH message:<br>Topic: "/oneM2M/req/<AE-ID>/<Registrar CSE-ID>"<br>Payload:<br>• op = 2 (Retrieve)<br>• to = {CSEBaseName}<br>• fr = AE-ID<br>• rqi = (token-string)<br>• fu = 1<br>• lbl=key1<br>• lbl=key2<br>• rty=3<br>• lim=1<br>• pc = empty |
| 3 | Mca | PRO Check Primitive | Registrar CSE sends response containing:<br>• rsc = 2000 (OK)<br>• rqi = (token-string) same as received in request message<br>• pc = Serialized representation of data object containing the address of one of the <Container> resources |
| | | PRO Check | Registrar CSE sends response containing: |

| Interoperability Test Description | | | |
|---|---|---|---|
| | | HTTP | • Status Code = 200 (OK)<br>• X-M2M-RSC: 2000<br>• X-M2M-RI: (token-string) same as received in request message<br>• Content-Type: application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json<br>• Message-body: Serialized representation of data object containing the address of one of the <Container> resources |
| | | PRO Check CoAP | Registrar sends response containing:<br>• Response Code = 2.05<br>• oneM2M-RSC: 2000<br>• oneM2M-RQI: (token-string) same as received in request message<br>• Content-format: application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json<br>• Payload: Serialized representation of data object containing the address of one of the <Container> resources |
| | | PRO Check MQTT | Sent MQTT PUBLISH message:<br>Topic: "/oneM2M/resp/<AE-ID>/<Registrar CSE-ID>"<br>Payload:<br>• to = Registree CSE-ID<br>• fr = Registrar CSE-ID<br>• rsc = 2000 (OK)<br>• rqi = (token-string) same as received in request message<br>• pc = Serialized representation of data object containing the address of one of the <Container> resources |
| 4 | | IOP Check | AE indicates successful operation |
| IOP Verdict | | | |
| PRO Verdict | | | |

## 8.1.7 Subscription Management

### 8.1.7.1 Subscription Create

| Interoperability Test Description | | | |
|---|---|---|---|
| **Identifier:** | | | TD_M2M_NH_22 |
| **Objective:** | | | AE creates a subscription to Application Entity resource via subscription Create Request |
| **Configuration:** | | | M2M_CFG_01 |
| **References:** | | | TS-0001 [1], clause 10.2.11.2<br>TS-0004 [2], clause 7.3.7.2 |
| | | | |
| **Pre-test conditions:** | | | • AE has created an application resource <AE> on registrar CSE<br>• AE has created a container resource <container> on registrar CSE |
| **Test Sequence** | | | |
| **Step** | **RP** | **Type** | **Description** |
| 1 | | Stimulus | AE is requested to send a AE Create request to register to the Registrar CSE |
| 2 | Mca | PRO Check Primitive | • op = 1 (Create)<br>• to = {CSEBaseName}/URI of <Container> resource<br>• fr = AE-ID<br>• rqi = (token-string)<br>• ty = 23 (Subscription)<br>• pc = Serialized representation of <Subscription> resource |
| | | PRO Check HTTP | Sent request contains<br>• Request method = POST<br>• Request-Target:{CSEBaseName}/URI of <Container> resource<br>• Host: IP address or the FQDN of Registrar CSE<br>• X-M2M-RI: (token-string)<br>• X-M2M-Origin: AE-ID<br>• Content-Type: application/vnd.onem2m-res+xml; ty=23 or application/vnd.onem2m-res+json; ty=23<br>• Message-body: Serialized representation of <Subscription> resource |
| | | PRO Check CoAP | Sent request contains<br>• Method: 0.02 (POST)<br>• Uri-Host: IP address or the FQDN of Registrar CSE<br>• Uri-Path: {CSEBaseName}/URI of <Container> resource<br>• Content-type: application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json |

| Interoperability Test Description | | | |
|---|---|---|---|
| | | | • oneM2M-TY: 23<br>• oneM2M-FR: AE-ID<br>• oneM2M-RQI: (token-string)<br>• Payload: Serialized representation of <Subscription> resource |
| | | PRO Check MQTT | Sent MQTT PUBLISH message:<br>Topic: "/oneM2M/req/< AE-ID>/<Registrar CSE-ID>"<br>Payload:<br>• op = 1 (Create)<br>• to = {CSEBaseName}/URI of <Container> resource<br>• fr = AE-ID<br>• rqi = (token-string)<br>• ty = 23 (Subscription)<br>• pc = Serialized representation of <Subscription> resource |
| 3 | | IOP Check | Check if possible that the <Subscription> resource is created in registrar CSE. |
| 4 | Mca | PRO Check Primitive | • rsc = 2001 (CREATED)<br>• rqi = (token-string) same as received in request message<br>• pc = Serialized representation of <Subscription> resource |
| | | PRO Check HTTP | Registrar CSE sends response containing:<br>• Status Code = 201 (Created)<br>• X-M2M-RSC: 2001<br>• X-M2M-RI: (token-string) same as received in request message<br>• Content-Location: URI of the created resource.<br>• Content-Type: application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json<br>• Message-body: Serialized representation of <Subscription> resource |
| | | PRO Check CoAP | Registrar sends response containing:<br>• Response Code = 2.01<br>• oneM2M-RSC: 2001<br>• oneM2M-RQI: (token-string) same as received in request message<br>• Location-Path: URI of the created resource<br>• Content-format: application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json<br>• Payload: Serialized representation of <Subscription> resource |
| | | PRO Check MQTT | Sent MQTT PUBLISH message:<br>Topic: "/oneM2M/resp/< AE-ID>/<Registrar CSE-ID>"<br>Payload:<br>• to = AE-ID<br>• fr = Registrar CSE-ID<br>• rsc = 2001 (CREATED)<br>• rqi = (token-string) same as received in request message<br>• pc = Serialized representation of <Subscription> resource |
| 5 | | IOP Check | AE indicates successful operation |
| IOP Verdict | | | |
| PRO Verdict | | | |

### 8.1.7.2 Subscription Retrieve

| Interoperability Test Description | | | |
|---|---|---|---|
| **Identifier:** | | | TD_M2M_NH_23 |
| **Objective:** | | | AE retrieves subscription resource from Registrar CSE |
| **Configuration:** | | | M2M_CFG_01 |
| **References:** | | | TS-0001 [1], clause 10.2.11.3<br>TS-0004 [2], clause 7.3.7.2 |
| | | | |
| **Pre-test conditions:** | | | • AE has created an Application Entity resource <AE> on Registrar CSE<br>• AE has created a container resource <container> on Registrar CSE<br>• AE has created a subscription resource <subscription> on Registrar CSE |
| **Test Sequence** | | | |
| **Step** | **RP** | **Type** | **Description** |
| 1 | | Stimulus | AE is requested to send a Retrieve Request for a <subscription> |
| 2 | Mca | PRO Check Primitive | • op = 2 (Retrieve)<br>• to = {CSEBaseName}/URI of <Subscription> resource<br>• fr = AE-ID<br>• rqi = (token-string) |

| Interoperability Test Description | | | |
|---|---|---|---|
| | | | • pc = empty |
| | | PRO Check HTTP | Sent request contains<br>• Request method = GET<br>• Request-Target: {CSEBaseName}/URI of <Subscription> resource<br>• Host: IP address or the FQDN of Registrar CSE<br>• X-M2M-RI: (token-string)<br>• X-M2M-Origin: AE-ID<br>• Message-body: empty |
| | | PRO Check CoAP | Sent request contains<br>• Method: 0.01 (GET)<br>• Uri-Host: IP address or the FQDN of Registrar CSE<br>• Uri-Path: {CSEBaseName}/URI of <Subscription> resource<br>• oneM2M-FR: AE-ID<br>• oneM2M-RQI: (token-string)<br>• Payload: empty |
| | | PRO Check MQTT | Sent MQTT PUBLISH message:<br>Topic: "/oneM2M/req/< AE-ID>/<Registrar CSE-ID>"<br>Payload:<br>• op = 2 (Retrieve)<br>• to = {CSEBaseName}/URI of <Subscription> resource<br>• fr = AE-ID<br>• rqi = (token-string)<br>• pc = empty |
| 3 | Mca | PRO Check Primitive | • rsc =2000 (OK)<br>• rqi = (token-string) same as received in request message<br>• pc = Serialized representation of <Subscription> resource |
| | | PRO Check HTTP | Registrar CSE sends response containing:<br>• Status Code = 200 (OK)<br>• X-M2M-RSC: 2000<br>• X-M2M-RI: (token-string) same as received in request message<br>• Content-Type: application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json<br>• Message-body: Serialized representation of <Subscription> resource |
| | | PRO Check CoAP | Registrar sends response containing:<br>• Response Code = 2.05<br>• oneM2M-RSC: 2000(OK)<br>• oneM2M-RQI: (token-string) same as received in request message<br>• Content-format: application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json<br>• Payload: Serialized representation of <Subscription> resource |
| | | PRO Check MQTT | Sent MQTT PUBLISH message:<br>Topic: "/oneM2M/resp/< AE-ID>/<Registrar CSE-ID>"<br>Payload:<br>• to = AE-ID<br>• fr = Registrar CSE-ID<br>• rsc 2000(OK)<br>• rqi = (token-string) same as received in request message<br>• pc = Serialized representation of <Subscription> resource |
| 4 | | IOP Check | AE indicates successful operation |
| IOP Verdict | | | |
| PRO Verdict | | | |

### 8.1.7.3 Subscription Update

| Interoperability Test Description | | | |
|---|---|---|---|
| **Identifier:** | | | TD_M2M_NH_24 |
| **Objective:** | | | AE updates information about a subscription via subscription Update Request |
| **Configuration:** | | | M2M_CFG_01 |
| **References:** | | | TS-0001 [1], clause 10.2.11.4<br>TS-0004 [2], clause 7.3.7.2 |
| | | | |
| **Pre-test conditions:** | | | • AE has created an Application Entity resource <AE> on Registrar CSE<br>• AE has created a container resource <container> on Registrar CSE<br>• AE has created a subscription resource <subscription> on Registrar CSE |
| **Test Sequence** | | | |
| **Step** | **RP** | **Type** | **Description** |
| 1 | | Stimulus | AE is requested to send a subscription Update Request to update the lifetime of the resource. |
| 2 | Mca | PRO Check Primitive | • op = 3 (Update)<br>• to = {CSEBaseName}/URI of <Subscription> resource<br>• fr = AE-ID<br>• rqi = (token-string)<br>• pc = Serialized representation of updated <Subscription> resource |
| | | PRO Check HTTP | Sent request contains<br>• Request method = PUT<br>• Request-Target:{CSEBaseName}/URI of <Subscription> resource<br>• Host: IP address or the FQDN of Registrar CSE<br>• X-M2M-RI: (token-string)<br>• X-M2M-Origin: AE-ID<br>• Content-Type: application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json<br>• Message-body: Serialized representation of updated <Subscription> resource |
| | | PRO Check CoAP | Sent request contains<br>• Method: 0.03 (PUT)<br>• Uri-Host: IP address or the FQDN of Registrar CSE<br>• Uri-Path: {CSEBaseName}/URI of <Subscription> resource<br>• oneM2M-FR: AE-ID<br>• oneM2M-RQI: (token-string)<br>• Content-format: application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json<br>• Payload: Serialized representation of updated <Subscription> resource |
| | | PRO Check MQTT | Sent MQTT PUBLISH message:<br>Topic: "/oneM2M/ req /< AE-ID>/<Registrar CSE-ID>"<br>Payload:<br>• op = 3 (Update)<br>• to = {CSEBaseName}/URI of <Subscription> resource<br>• fr = AE-ID<br>• rqi = (token-string)<br>• pc = Serialized representation of updated <Subscription> resource |
| 3 | | IOP Check | Check if possible that the <subscription> resource is updated in Registrar CSE. |
| 4 | Mca | PRO Check Primitive | • rsc = 2004 (Updated)<br>• rqi = (token-string) same as received in request message<br>• pc = Serialized representation of <Subscription> resource |
| | | PRO Check HTTP | Registrar CSE sends response containing:<br>• Code = 200 (Ok)<br>• X-M2M-RSC: 2004<br>• X-M2M-RI: (token-string) same as received in request message<br>• Content-Type: application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json<br>• Message-body: Serialized representation of <Subscription> resource |
| | | PRO Check CoAP | Registrar sends response containing:<br>• Response Code = 2.04<br>• oneM2M-RSC: 2004<br>• oneM2M-RQI: (token-string) same as received in request message<br>• Content-format: application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json<br>• Payload : Serialized representation of <Subscription> resource |
| | | PRO Check MQTT | Sent MQTT PUBLISH message:<br>Topic: "/oneM2M/resp/< AE-ID>/<Registrar CSE-ID>"<br>Payload:<br>• to = AE-ID |

| Interoperability Test Description | | | |
|---|---|---|---|
| | | | • fr = Registrar CSE-ID<br>• rsc = 2004 (Updated)<br>• rqi = (token-string) same as received in request message<br>• pc = Serialized representation of modified <Subscription> resource |
| 5 | | IOP Check | AE indicates successful operation |
| IOP Verdict | | | |
| PRO Verdict | | | |

### 8.1.7.4 Subscription Delete

| Interoperability Test Description | | | |
|---|---|---|---|
| **Identifier:** | | | TD_M2M_NH_25 |
| **Objective:** | | | AE cancels subscription via an subscription Delete Request |
| **Configuration:** | | | M2M_CFG_01 |
| **References:** | | | TS-0001 [1], clause 10.2.11.5<br>TS-0004 [2], clause 7.3.7.2 |
| | | | |
| **Pre-test conditions:** | | | • AE has created an Application Entity resource <AE> on Registrar CSE<br>• AE has created a container resource <container> on Registrar CSE<br>• AE has created a subscription resource <subscription> on Registrar CSE |
| **Test Sequence** | | | |
| **Step** | **RP** | **Type** | **Description** |
| 1 | | Stimulus | AE is requested to send a subscription Delete Request |
| 2 | Mca | PRO Check Primitive | • op = 4 (Delete)<br>• to = {CSEBaseName}/URI of <Subscription> resource<br>• fr = AE-ID<br>• rqi = (token-string)<br>• pc = empty |
| | | PRO Check HTTP | Sent request contains<br>• Request method = DELETE<br>• Request-Target: {CSEBaseName}/URI of <Subscription> resource<br>• Host: IP address or the FQDN of Registrar CSE<br>• X-M2M-RI: (token-string)<br>• X-M2M-Origin: AE-ID<br>• Message-body: Empty |
| | | PRO Check CoAP | Sent request contains<br>• Method: 0.04 (DELETE)<br>• Uri-Host: IP address or the FQDN of Registrar CSE<br>• Uri-Path: {CSEBaseName}/URI of <Subscription> resource<br>• oneM2M-FR: AE-ID<br>• oneM2M-RQI: (token-string)<br>• Payload: empty |
| | | PRO Check MQTT | Sent MQTT PUBLISH message:<br>Topic: "/oneM2M/req/< AE-ID>/<Registrar CSE-ID>"<br>Payload:<br>• op = 4 (Delete)<br>• to = {CSEBaseName}/URI of <Subscription> resource<br>• fr = AE-ID<br>• rqi = (token-string)<br>• pc = empty |
| 3 | | IOP Check | Check if possible that the <Subscription> resource is deleted in registrar CSE. |
| 4 | Mca | PRO Check Primitive | • rsc = 2002 (DELETED)<br>• rqi = (token-string) same as received in request message<br>• pc = empty |
| | | PRO Check HTTP | Registrar CSE sends response containing:<br>• Status Code = 200 (OK)<br>• X-M2M-RSC: 2002<br>• X-M2M-RI: (token-string) same as received in request message<br>• Message-body: empty |
| | | PRO Check CoAP | Registrar sends response containing:<br>• Response Code = 2.02<br>• oneM2M-RSC: 2002(DELETED) |

| Interoperability Test Description | | | |
|---|---|---|---|
| | | | • oneM2M-RQI: (token-string) same as received in request message<br>• Payload: empty |
| | | PRO Check MQTT | Sent MQTT PUBLISH message:<br>Topic: "/oneM2M/resp/< AE-ID>/<Registrar CSE-ID>"<br>Payload:<br>• to = AE-ID<br>• fr = Registrar CSE-ID<br>• rsc = 2002(DELETED)<br>• rqi = (token-string) same as received in request message |
| 5 | | IOP Check | Check if possible that the <subscription> resource has been removed in registrar CSE. |
| 6 | | IOP Check | AE indicates successful operation |
| IOP Verdict | | | |
| PRO Verdict | | | |

## 8.1.8 accessControlPolicy Management

### 8.1.8.1 accessControlPolicy Create

| Interoperability Test Description | | | |
|---|---|---|---|
| **Identifier:** | | | TD_M2M_NH_26 |
| **Objective:** | | | AE creates an accessControlPolicy resource |
| **Configuration:** | | | M2M_CFG_01 |
| **References:** | | | 1] 10.2.21.1<br>TS-0004 [2], clause 7.3.1.2 |
| | | | |
| **Pre-test conditions:** | | | • CSEBase resource has been created in registrar CSE with name {CSEBaseName}<br>• AE has created a <AE> resource on registrar CSE with name {AE} |
| **Test Sequence** | | | |
| **Step** | **RP** | **Type** | **Description** |
| 1 | | Stimulus | AE is requested to send an accessControlPolicy Create Request |
| 2 | Mca | PRO Check Primitive | • op = 1 (Create)<br>• to = {CSEBaseName}/{AE}<br>• fr = AE-ID<br>• rqi = (token-string)<br>• ty = 1 (accessControlPolicy)<br>• pc = Serialized representation of <accessControlPolicy > resource |
| | | PRO Check HTTP | Sent request contains<br>• Request method = POST<br>• Request-Target:{CSEBaseName}/{AE}<br>• Host: IP address or the FQDN of Registrar CSE<br>• X-M2M-RI: (token-string)<br>• X-M2M-Origin: AE-ID<br>• Content-Type: application/vnd.onem2m-res+xml; ty=1 or application/vnd.onem2m-res+json; ty=1<br>• Message-body: Serialized representation of <accessControlPolicy > resource |
| | | PRO Check CoAP | Sent request contains<br>• Method: 0.02 (POST)<br>• Uri-Host: IP address or the FQDN of Registrar CSE<br>• Uri-Path: {CSEBaseName}/{AE}<br>• Content-type: application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json<br>• oneM2M-TY: 1<br>• oneM2M-FR: AE-ID<br>• oneM2M-RQI: (token-string)<br>• Payload: Serialized representation of <accessControlPolicy> resource |
| | | PRO Check MQTT | Sent MQTT PUBLISH message:<br>Topic: "/oneM2M/req/< AE-ID>/<Registrar CSE-ID>"<br>Payload:<br>• op = 1 (Create)<br>• to = {CSEBaseName}/{AE}<br>• fr = AE-ID<br>• rqi = (token-string) |

| Interoperability Test Description | | | |
|---|---|---|---|
| | | | • ty = 1 (RemoteCSE)<br>• pc = Serialized representation of <accessControlPolicy> resource |
| 3 | | IOP Check | Check if possible that the <container> resource is created in registrar CSE. |
| 4 | Mca | PRO Check Primitive | • rsc = 2001 (CREATED)<br>• rqi = (token-string) same as received in request message<br>• pc = Serialized representation of <accessControlPolicy> resource |
| | | PRO Check HTTP | Registrar CSE sends response containing:<br>• Status Code = 201 (Created)<br>• X-M2M-RSC: 2001<br>• X-M2M-RI: (token-string) same as received in request message<br>• Content-Location: URI of the created <accessControlPolicy> resource.<br>• Content-Type: application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json<br>• Message-body: Serialized representation of <accessControlPolicy> resource |
| | | PRO Check CoAP | Registrar sends response containing:<br>• Response Code = 2.01<br>• oneM2M-RSC: 2001<br>• oneM2M-RQI: (token-string) same as received in request message<br>• Location-Path: URI of the created <accessControlPolicy> resource<br>• Content-format: application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json<br>• Payload: Serialized representation of <accessControlPolicy> resource |
| | | PRO Check MQTT | Sent MQTT PUBLISH message:<br>Topic: "/oneM2M/resp/< AE-ID>/<Registrar CSE-ID>"<br>Payload:<br>• to = AE-ID<br>• fr = Registrar CSE-ID<br>• rsc = 2001 (CREATED)<br>• rqi = (token-string) same as received in request message<br>• pc = Serialized representation of <accessControlPolicy> resource |
| 5 | | IOP Check | AE indicates successful operation |
| IOP Verdict | | | |
| PRO Verdict | | | |

### 8.1.8.2 accessControlPolicy Retrieve

| Interoperability Test Description | | | |
|---|---|---|---|
| **Identifier:** | | | TD_M2M_NH_27 |
| **Objective:** | | | AE retrieves accessControlPolicy resource |
| **Configuration:** | | | M2M_CFG_01 |
| **References:** | | | TS-0001 [1], clause 10.2.21.2<br>TS-0004 [2], clause 7.3.1.2 |
| | | | |
| **Pre-test conditions:** | | | • CSEBase resource has been created in registrar CSE with name {CSEBaseName}<br>• AE has created a <AE> resource on registrar CSE with name {AE}<br>• accessControlPolicy resource has been created in registrar CSE under <AE> resource with name {accessControlPolicyName} |
| **Test Sequence** | | | |
| **Step** | **RP** | **Type** | **Description** |
| 1 | | Stimulus | AE is requested to send a accessControlPolicy retrieve request to Registrar CSE |
| 2 | Mca | PRO Check Primitive | • op = 2 (Retrieve)<br>• to = {CSEBaseName}/{AE}/{accessControlPolicyName}<br>• fr = AE-ID<br>• rqi = (token-string)<br>• pc = empty |
| | | PRO Check HTTP | Sent request contains<br>• Request method = GET<br>• Request-Target: {CSEBaseName}/{{AE}/{accessControlPolicyName}<br>• Host: IP address or the FQDN of Registrar CSE<br>• X-M2M-RI: (token-string)<br>• X-M2M-Origin: AE-ID<br>• Message-body: empty |
| | | PRO Check CoAP | Sent request contains<br>• Method: 0.01 (GET) |

| Interoperability Test Description | | | |
|---|---|---|---|
| | | | • Uri-Host: IP address or the FQDN of Registrar CSE<br>• Uri-Path: {CSEBaseName}/{AE}/{accessControlPolicyName}<br>• oneM2M-FR: AE-ID<br>• oneM2M-RQI: (token-string)<br>• Payload: empty |
| | | PRO Check MQTT | Sent MQTT PUBLISH message:<br>Topic: "/oneM2M/req/< AE-ID>/<Registrar CSE-ID>"<br>Payload:<br>• op = 2 (Retrieve)<br>• to = {CSEBaseName}/{AE}/{accessControlPolicyName}<br>• fr = AE-ID<br>• rqi = (token-string)<br>• pc = empty |
| 3 | Mca | PRO Check Primitive | Registrar CSE sends response containing:<br>• rsc = 2000 (OK)<br>• rqi = (token-string) same as received in request message<br>• pc = Serialized representation of <accessControlPolicy> resource |
| | | PRO Check HTTP | Registrar CSE sends response containing:<br>• Status Code = 200 (OK)<br>• X-M2M-RSC: 2000<br>• X-M2M-RI: (token-string) same as received in request message<br>• Content-Type: application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json<br>• Message-body: Serialized representation of <accessControlPolicy> resource |
| | | PRO Check CoAP | Registrar sends response containing:<br>• Response Code = 2.05 (OK)<br>• oneM2M-RSC: 2000<br>• oneM2M-RQI: (token-string) same as received in request message<br>• Content-format: application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json<br>• Payload: Serialized representation of <accessControlPolicy> resource |
| | | PRO Check MQTT | Sent MQTT PUBLISH message:<br>Topic: "/oneM2M/resp/<AE-ID>/<Registrar CSE-ID>"<br>Payload:<br>• to = AE-ID<br>• fr = Registrar CSE-ID<br>• rsc = 2000 (OK)<br>• rqi = (token-string) same as received in request message<br>• pc = Serialized representation of <accessControlPolicy> resource |
| 4 | | IOP Check | AE indicates successful operation |
| IOP Verdict | | | |
| PRO Verdict | | | |

### 8.1.8.3 accessControlPolicy Update

| Interoperability Test Description | | | |
|---|---|---|---|
| **Identifier:** | | | TD_M2M_NH_28 |
| **Objective:** | | | AE updates attribute in accessControlPolicy resource |
| **Configuration:** | | | M2M_CFG_01 |
| **References:** | | | TS-0001 [1], clause 10.2.21.3<br>TS-0004 [2], clause 7.3.1.2 |
| | | | |
| **Pre-test conditions:** | | | • CSEBase resource has been created in registrar CSE with name {CSEBaseName}<br>• AE has created a <AE> resource on registrar CSE with name {AE}<br>• accessControlPolicy resource has been created in registrar CSE under <AE> resource with name {accessControlPolicyName} |
| **Test Sequence** | | | |
| **Step** | **RP** | **Type** | **Description** |
| 1 | | Stimulus | AE is requested to send an accessControlPolicy update request to Registrar CSE |
| 2 | Mca | PRO Check Primitive | • op = 3 (Update)<br>• to = {CSEBaseName}/{AE}/{accessControlPolicyName}<br>• fr = AE-ID<br>• rqi = (token-string)<br>• pc = Serialized representation of updated <accessControlPolicy > resource |

| Interoperability Test Description | | | |
|---|---|---|---|
| | | PRO Check HTTP | Sent request contains<br>• Request method = PUT<br>• Request-Target: {CSEBaseName}/{AE}/{accessControlPolicyName}<br>• Host: IP address or the FQDN of Registrar CSE<br>• X-M2M-RI: (token-string)<br>• X-M2M-Origin: AE-ID<br>• Content-Type: application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json<br>• Message-body: Serialized representation of updated <accessControlPolicy> resource |
| | | PRO Check CoAP | Sent request contains<br>• Method: 0.03 (PUT)<br>• Uri-Host: IP address or the FQDN of Registrar CSE<br>• Uri-Path: {CSEBaseName}/{AE}/{accessControlPolicyName}<br>• oneM2M-FR: AE-ID<br>• oneM2M-RQI: (token-string)<br>• Content-format: application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json<br>• Payload: Serialized representation of updated <accessControlPolicy> resource |
| | | PRO Check MQTT | Sent MQTT PUBLISH message:<br>Topic: "/oneM2M/req/<AE-ID>/<Registrar CSE-ID>"<br>Payload:<br>• op = 3 (Update)<br>• to = {CSEBaseName}/{AE}/{accessControlPolicyName}<br>• fr = AE-ID<br>• rqi = (token-string)<br>• pc = Serialized representation of updated <accessControlPolicy> resource |
| 3 | | IOP Check | Check if possible that the <accessControlPolicy> resource has been updated in registrar CSE. |
| 4 | Mca | PRO Check Primitive | Registrar CSE sends response containing:<br>• rsc = 2004 (UPDATED)<br>• rqi = (token-string) same as received in request message<br>• pc = Serialized representation of <accessControlPolicy> resource |
| | | PRO Check HTTP | Registrar CSE sends response containing:<br>• Status Code = 200 (OK)<br>• X-M2M-RSC: 2004<br>• X-M2M-RI: (token-string) same as received in request message<br>• Content-Type: application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json<br>• Message-body: Serialized representation of <accessControlPolicy> resource |
| | | PRO Check CoAP | Registrar sends response containing:<br>• Response Code = 2.04 (UPDATED)<br>• oneM2M-RSC: 2004<br>• oneM2M-RQI: (token-string) same as received in request message<br>• Content-format: application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json<br>• Payload: Serialized representation of <accessControlPolicy> resource |
| | | PRO Check MQTT | Sent MQTT PUBLISH message:<br>Topic: "/oneM2M/resp/<AE-ID>/<Registrar CSE-ID>"<br>Payload:<br>• to = AE-ID<br>• fr = Registrar CSE-ID<br>• rsc = 2004 (Updated)<br>• rqi = (token-string) same as received in request message<br>• pc = Serialized representation of <accessControlPolicy> resource |
| 5 | | IOP Check | AE indicates successful operation |
| IOP Verdict | | | |
| PRO Verdict | | | |

### 8.1.8.4 accessControlPolicy Delete

| Interoperability Test Description | | | |
|---|---|---|---|
| **Identifier:** | | | TD_M2M_NH_29 |
| **Objective:** | | | AE deletes accessControlPolicy resource |
| **Configuration:** | | | M2M_CFG_01 |
| **References:** | | | TS-0001 [1], clause 10.2.21.4<br>TS-0004 [2], clause 7.3.1.2 |
| | | | |
| **Pre-test conditions:** | | | • CSEBase resource has been created in registrar CSE with name {CSEBaseName}<br>• AE has created a <AE> resource on registrar CSE with name {AE}<br>• accessControlPolicy resource has been created in registrar CSE under <AE> resource with name {accessControlPolicyName} |
| **Test Sequence** | | | |
| **Step** | **RP** | **Type** | **Description** |
| 1 | | Stimulus | AE is requested to send an accessControlPolicy delete request to Registrar CSE |
| 2 | Mca | PRO Check Primitive | • op = 4 (Delete)<br>• to = {CSEBaseName}/{AE}/{accessControlPolicyName}<br>• fr = AE-ID<br>• rqi = (token-string)<br>• pc = empty |
| | | PRO Check HTTP | Sent request contains<br>• Request method = DELETE<br>• Request-Target: {CSEBaseName}/{AE}/{accessControlPolicyName}<br>• Host: IP address or the FQDN of Registrar CSE<br>• X-M2M-RI: (token-string)<br>• X-M2M-Origin: AE-ID<br>• Message-body: empty |
| | | PRO Check CoAP | Sent request contains<br>• Method: 0.04 (DELETE)<br>• Uri-Host: IP address or the FQDN of Registrar CSE<br>• Uri-Path: {CSEBaseName}/{AE}/{accessControlPolicyName}<br>• oneM2M-FR: AE-ID<br>• oneM2M-RQI: (token-string)<br>• Payload: empty |
| | | PRO Check MQTT | Sent MQTT PUBLISH message:<br>Topic: "/oneM2M/req/<AE-ID>/<Registrar CSE-ID>"<br>Payload:<br>• op = 4 (Delete)<br>• to = {CSEBaseName}/{AE}/{accessControlPolicyName}<br>• fr = AE-ID<br>• rqi = (token-string)<br>• pc = empty |
| 3 | Mca | PRO Check Primitive | Registrar CSE sends response containing:<br>• rsc = 2002 (DELETED)<br>• rqi = (token-string) same as received in request message<br>• pc = empty |
| | | PRO Check HTTP | Registrar CSE sends response containing:<br>• Status Code = 200 (OK)<br>• X-M2M-RSC: 2002<br>• X-M2M-RI: (token-string) same as received in request message<br>• Message-body: empty |
| | | PRO Check CoAP | Registrar sends response containing:<br>• Response Code = 2.05 (OK)<br>• oneM2M-RSC: 2002<br>• oneM2M-RQI: (token-string) same as received in request message<br>• Payload: empty |
| | | PRO Check MQTT | Sent MQTT PUBLISH message:<br>Topic: "/oneM2M/resp/<AE-ID>/<Registrar CSE-ID>"<br>Payload:<br>• to = AE-ID<br>• fr = Registrar CSE-ID<br>• rsc = 2002<br>• rqi = (token-string) same as received in request message<br>• pc = empty |

| Interoperability Test Description | | | |
|---|---|---|---|
| 4 | | IOP Check | Check if possible that the <accessControlPolicy> resource has been removed from registrar CSE. |
| 5 | | IOP Check | AE indicates successful operation |
| IOP Verdict | | | |
| PRO Verdict | | | |

### 8.1.8.5 Unauthorized operation (Insufficient Access Rights)

| Interoperability Test Description | | | |
|---|---|---|---|
| **Identifier:** | | | TD_M2M_NH_30 |
| **Objective:** | | | AE delete request is rejected due to accessControlPolicy |
| **Configuration:** | | | M2M_CFG_01 |
| **References:** | | | [2] ] 7.3.1.2 |
| | | | |
| **Pre-test conditions:** | | | • CSEBase resource has been created in registrar CSE with name {CSEBaseName}<br>• AE has created a <AE> resource on registrar CSE with name {AE}<br>• accessControlPolicy resource has been created in registrar CSE under <AE> resource with name {accessControlPolicyName}, which forbids to delete container<br>• AE has created a <container> resource on registrar CSE under <AE>, with name {containerName} |
| **Test Sequence** | | | |
| **Step** | **RP** | **Type** | **Description** |
| 1 | | Stimulus | AE is requested to send a container Delete Request for resource <container> |
| 2 | Mca | PRO Check Primitive | • op = 4 (Delete)<br>• to = {CSEBaseName}/{AE}/{containerName}<br>• fr = AE-ID<br>• rqi = (token-string)<br>• pc = empty |
| | | PRO Check HTTP | Sent request contains<br>• Request method = DELETE<br>• Request-Target: {CSEBaseName}/{AE}/{containerName}<br>• Host: IP address or the FQDN of Registrar CSE<br>• X-M2M-RI: (token-string)<br>• X-M2M-Origin: AE-ID<br>• Message-body: empty |
| | | PRO Check CoAP | Sent request contains<br>• Method: 0.04 (DELETE)<br>• Uri-Host: IP address or the FQDN of Registrar CSE<br>• Uri-Path: {CSEBaseName}/{AE}/{containerName}<br>• oneM2M-FR: AE-ID<br>• oneM2M-RQI: (token-string)<br>• Payload: empty |
| | | PRO Check MQTT | Sent MQTT PUBLISH message:<br>Topic: "/oneM2M/req/<AE-ID>/<Registrar CSE-ID>"<br>Payload:<br>• op = 4 (Delete)<br>• to = {CSEBaseName}/{AE}/{containerName}<br>• fr = AE-ID<br>• rqi = (token-string)<br>• pc = empty |
| 3 | Mca | PRO Check Primitive | Registrar CSE sends response containing:<br>• rsc = 4103 (ACCESS_DENIED)<br>• rqi = (token-string) same as received in request message<br>pc = empty |
| | | PRO Check HTTP | Registrar CSE sends response containing:<br>• Status Code = 403 (Forbidden)<br>• X-M2M-RSC: 4103<br>• X-M2M-RI: (token-string) same as received in request message<br>• Message-body: empty |
| | | PRO Check CoAP | Registrar sends response containing:<br>• Response Code = 4.03 (Forbidden)<br>• oneM2M-RSC: 4103<br>• oneM2M-RQI: (token-string) same as received in request message |

| Interoperability Test Description | | | |
|---|---|---|---|
| | | | • Payload: empty |
| | | PRO Check MQTT | Sent MQTT PUBLISH message:<br>Topic: "/oneM2M/resp/<AE-ID>/<Registrar CSE-ID>"<br>Payload:<br>• to = AE-ID<br>• fr = Registrar CSE-ID<br>• rsc = <Response Status Code(4103, ACCESS_DENIED><br>• rqi = (token-string) same as received in request message<br>• pc = empty |
| 4 | | IOP Check | Check if possible that the <container> resource has not been removed in registrar CSE. |
| 5 | | IOP Check | AE indicates unsuccessful operation (Delete error – no privilege) |
| IOP Verdict | | | |
| PRO Verdict | | | |

## 8.1.9 Group Management

### 8.1.9.1

| Interoperability Test Description | | | |
|---|---|---|---|
| **Identifier:** | | TD_M2M_NH_32 | |
| **Objective:** | | AE retrieves group resource | |
| **Configuration:** | | M2M_CFG_01 | |
| **References:** | | TS-0001 [1], clause 10.2.7.3<br>TS-0004 [2], clause 7.3.12.2.2 | |
| | | | |
| **Pre-test conditions:** | | • AE has created a <group> resource on Registrar CSE | |
| **Test Sequence** | | | |
| **Step** | **RP** | **Type** | **Description** |
| 1 | | Stimulus | AE is requested to send a group Retrieve Request |
| 2 | Mca | PRO Check Primitive | • op = 2 (RETRIEVE)<br>• to = {CSEBaseName}/{group}<br>• fr = AE-ID<br>• rqi = (token-string) |
| | | PRO Check HTTP | Sent request contains<br>• Request method = GET<br>• Request-Target: {CSEBaseName}/{group}<br>• Host: IP address or the FQDN of Registrar CSE<br>• X-M2M-RI: (token-string)<br>• X-M2M-Origin: AE-ID<br>• Content-Type: application/vnd.onem2m-res+xml; or application/vnd.onem2m-res+json; |
| | | PRO Check CoAP | Sent request contains<br>• Method: 0.01 (GET)<br>• Uri-Host: IP address or the FQDN of Registrar CSE<br>• Uri-Path: {CSEBaseName}/{group}<br>• Content-format: application/vnd.onem2m-res+xml; or application/vnd.onem2m-res+json;<br>• oneM2M-FR: AE-ID<br>• oneM2M-RQI: (token-string) |
| | | PRO Check MQTT | Sent a MQTT PUBLISH message:<br>Topic: "/oneM2M/req/<AE-ID>/<Registrar CSE-ID>"<br>Payload:<br>• op = 2 (Retrieve)<br>• to = {CSEBaseName}/{group}<br>• fr = <AE-ID><br>• rqi = (token-string) |
| 3 | Mca | PRO Check Primitive | • rsc = 2000 (OK)<br>• rqi = (token-string) same as received in request message<br>• pc = Serialized representation of <group> resource |
| | | PRO Check HTTP | Registrar CSE sends response containing:<br>• Status Code =200 (OK) |

| Interoperability Test Description | | | |
|---|---|---|---|
| | | | • X-M2M-RSC: 2000<br>• X-M2M-RI: (token-string) same as received in request message<br>• Message-body: Serialized representation of <group> resource |
| | | PRO Check CoAP | Registrar CSE sends response containing:<br>• Response Code = 2.05<br>• oneM2M-RSC: 2000<br>• oneM2M-RQI: (token-string) same as received in request message<br>• Payload: Serialized representation of <group> resource |
| | | PRO Check MQTT | Sent a MQTT PUBLISH message:<br>Topic: "/oneM2M/resp/<AE-ID>/<Registrar CSE-ID>"<br>Payload:<br>• to = AE-ID<br>• fr = Registrar CSE-ID<br>• rsc = 2000<br>• rqi = (token-string) same as received in request message<br>• pc = Serialized representation of <group> resource |
| 4 | | IOP Check | AE indicates successful operation |
| IOP Verdict | | | |
| PRO Verdict | | | |

### 8.1.9.2 Group Create

| Interoperability Test Description | | | |
|---|---|---|---|
| **Identifier:** | | | TD_M2M_NH_31 |
| **Objective:** | | | AE creates a group resource |
| **Configuration:** | | | M2M_CFG_01 |
| **References:** | | | TS-0001 [1], clause 10.2.7.2<br>TS-0004 [2], clause 7.3.12.2.1 |
| | | | |
| **Pre-test conditions:** | | | • void |
| **Test Sequence** | | | |
| **Step** | **RP** | **Type** | **Description** |
| 1 | | Stimulus | AE is requested to send a group Create Request |
| 2 | Mca | PRO Check Primitive | • op = 1 (Create)<br>• to = {CSEBaseName}<br>• fr = AE-ID<br>• rqi = (token-string)<br>• ty = 9 (group)<br>• pc = Serialized representation of <group> resource |
| | | PRO Check HTTP | Sent request contains<br>• Request method = POST<br>• Request-Target: {CSEBaseName}<br>• Host: IP address or the FQDN of Registrar CSE<br>• X-M2M-RI: (token-string)<br>• X-M2M-Origin: AE-ID<br>• Content-Type: application/vnd.onem2m-res+xml; ty=9 or application/vnd.onem2m-res+json; ty=9<br>• Message-body: Serialized representation of <group> resource |
| | | PRO Check CoAP | Sent request contains<br>• Method: 0.02 (POST)<br>• Uri-Host: IP address or the FQDN of Registrar CSE<br>• Uri-Path: {CSEBaseName}<br>• Content-type: application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json<br>• oneM2M-TY: 9<br>• oneM2M-FR: AE-ID<br>• oneM2M-RQI: (token-string)<br>• Payload: Serialized representation of <group> resource |
| | | PRO Check MQTT | Sent MQTT PUBLISH message:<br>Topic: "/oneM2M/req/<AE-ID>/<Registrar CSE-ID>"<br>Payload:<br>• op = 1 (Create)<br>• to = {CSEBaseName} |

| Interoperability Test Description | | | |
|---|---|---|---|
| | | | • fr = AE-ID<br>• rqi = (token-string)<br>• ty = 9 (group)<br>• pc = Serialized representation of <group> resource |
| 3 | | IOP Check | Check if possible that the <group> resource is created in Registrar CSE. |
| 4 | Mca | PRO Check Primitive | • rsc = 2001 (CREATED)<br>• rqi = (token-string) same as received in request message<br>• pc = Serialized representation of <group> resource |
| | | PRO Check HTTP | Registrar CSE sends response containing:<br>• Status Code = 201 (OK)<br>• X-M2M-RSC: 2001<br>• X-M2M-RI: (token-string) same as received in request message<br>• Content-Location : URI of the created <group> resource<br>• Content-Type: application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json<br>• Message-body: Serialized representation of <group> resource |
| | | PRO Check CoAP | Registrar CSE sends response containing:<br>• Response Code = 2.01<br>• oneM2M-RSC: 2001<br>• oneM2M-RQI: (token-string) same as received in request message<br>• Location-Path: URI of the created <group> resource<br>• Payload: Serialized representation of <group> resource |
| | | PRO Check MQTT | Sent a MQTT PUBLISH message:<br>Topic: "/oneM2M/resp/<AE-ID>/<Registrar CSE-ID>"<br>Payload:<br>• to = AE-ID<br>• fr = Registrar CSE-ID<br>• rsc = 2001 (CREATED)<br>• rqi = (token-string) same as received in request message<br>• pc = Serialized representation of <group> resource |
| 5 | | IOP Check | AE indicates successful operation |
| IOP Verdict | | | |
| PRO Verdict | | | |

### 8.1.9.3 Group Update

| Interoperability Test Description | | | |
|---|---|---|---|
| **Identifier:** | | | TD_M2M_NH_33 |
| **Objective:** | | | AE updates attribute in group resource |
| **Configuration:** | | | M2M_CFG_01 |
| **References:** | | | TS-0001 [1], clause 10.2.7.4<br>TS-0004 [2], clause 7.3.12.2.3 |
| | | | |
| **Pre-test conditions:** | | | • AE has created a <group> resource on Registrar CSE |
| **Test Sequence** | | | |
| **Step** | **RP** | **Type** | **Description** |
| 1 | | Stimulus | AE is requested to send a group Update Request |
| 2 | Mca | PRO Check Primitive | • op = 3 (Update)<br>• to = {CSEBaseName}/{group}<br>• fr = AE-ID<br>• rqi = (token-string)<br>• pc = Serialized representation of <group> resource |
| | | PRO Check HTTP | Sent request contains<br>• Request method = PUT<br>• Request-Target: {CSEBaseName}/{group}<br>• Host: IP address or the FQDN of Registrar CSE<br>• X-M2M-RI: (token-string)<br>• X-M2M-Origin: AE-ID<br>• Content-Type: application/vnd.onem2m-res+xml; or application/vnd.onem2m-res+json;<br>• Message-body: Serialized representation of <group> resource |
| | | PRO Check CoAP | Sent request contains<br>• Method: 0.03 (PUT) |

| Interoperability Test Description | | | |
|---|---|---|---|
| | | | • Uri-Host: IP address or the FQDN of Registrar CSE<br>• Uri-Path: {CSEBaseName}/{group}<br>• Content-format: application/vnd.onem2m-res+xml; or application/vnd.onem2m-res+json;<br>• oneM2M-FR: AE-ID<br>• oneM2M-RQI: (token-string)<br>• Payload: Serialized representation of <group> resource |
| | | PRO Check MQTT | Sent MQTT PUBLISH message<br>Topic: "/oneM2M/req/<AE-ID>/<Registrar CSE-ID>"<br>Payload:<br>• op = 3 (Update)<br>• to = {CSEBaseName}/{group}<br>• fr = AE-ID<br>• rqi = (token-string)<br>• pc = Serialized representation of <group> resource |
| 3 | | IOP Check | Check if possible that the <group> resource is updated in Registrar CSE.. |
| 4 | Mca | PRO Check Primitive | • rsc = 2004 (CHANGED)<br>• rqi = (token-string) same as received in request message<br>• pc = Serialized representation of <group> resource |
| | | PRO Check HTTP | Registrar CSE sends response containing:<br>• Code = 200<br>• X-M2M-RSC: 2004<br>• X-M2M-RI: (token-string) same as received in request message<br>• Content-Type: application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json<br>• Message-body: Serialized representation of <group> resource |
| | | PRO Check CoAP | Registrar CSE sends response containing:<br>• Response Code = 2.05<br>• oneM2M-RSC: 2004<br>• oneM2M-RQI: (token-string) same as received in request message<br>• Payload: Serialized representation of <group> resource |
| | | PRO Check MQTT | Sent a MQTT PUBLISH message<br>Topic: "/oneM2M/resp/<AE-ID>/<Registrar CSE-ID>"<br>Payload:<br>• to = AE-ID<br>• fr = Registrar CSE-ID<br>• rqi = (token-string) same as received in request message<br>• rsc = 2004<br>• pc = Serialized representation of <group> resource |
| 5 | | IOP Check | AE indicates successful operation |
| IOP Verdict | | | |
| PRO Verdict | | | |

### 8.1.9.4 Group Delete

| Interoperability Test Description | | | |
|---|---|---|---|
| **Identifier:** | | | TD_M2M_NH_34 |
| **Objective:** | | | AE deletes group resource |
| **Configuration:** | | | M2M_CFG_01 |
| **References:** | | | TS-0001 [1], clause 10.2.7.5<br>TS-0004 [2], clause 7.3.12.2.4 |
| | | | |
| **Pre-test conditions:** | | | • AE has created a <group> resource on Registrar CSE |
| **Test Sequence** | | | |
| **Step** | **RP** | **Type** | **Description** |
| 1 | | Stimulus | AE is requested to send a group Delete Request |
| 2 | Mca | PRO Check Primitive | • op = 4 (DELETE)<br>• to = {CSEBaseName}/{group}<br>• fr = AE-ID<br>• rqi = (token-string) |
| | | PRO Check HTTP | Sent DELETE request contains<br>• Request method = DELETE<br>• Request-Target: {CSEBaseName}/{group} |

| Interoperability Test Description | | | |
|---|---|---|---|
| | | | • Host: IP address or the FQDN of Registrar CSE<br>• X-M2M-RI: (token-string)<br>• X-M2M-Origin: AE-ID |
| | | PRO Check CoAP | Sent DELETE request contains<br>• Method: 0.04 (DELETE)<br>• Uri-Host: IP address or the FQDN of Registrar CSE<br>• Uri-Path: {CSEBaseName}/{group}<br>• oneM2M-FR: AE-ID<br>• oneM2M-RQI: (token-string) |
| | | PRO Check MQTT | Sent a MQTT PUBLISH message<br>Topic: "/oneM2M/req/< AE-ID>/<Registrar CSE-ID>"<br>Payload:<br>• op = 4<br>• to = {CSEBaseName}/{group}<br>• fr = AE-ID<br>• rqi = (token-string) |
| 3 | Mca | PRO Check Primitive | • rsc = 2002 (DELETED)<br>• rqi = (token-string) same as received in request message |
| | | PRO Check HTTP | Registrar CSE sends response containing:<br>• Status Code = 200<br>• X-M2M-RSC: 2002<br>• X-M2M-RI: (token-string) same as received in request message |
| | | PRO Check CoAP | Registrar sends response containing:<br>• Response Code = 2.05<br>• oneM2M-RSC: 2002<br>• oneM2M-RQI: (token-string) same as received in request message |
| | | PRO Check MQTT | Sent a MQTT PUBLISH message<br>Topic: "/oneM2M/resp/<AE-ID>/<Registrar CSE-ID>"<br>Payload:<br>• to = AE-ID<br>• fr = Registrar CSE-ID<br>• rqi = (token-string) same as received in request message<br>• rsc = 2002 |
| 4 | | IOP Check | Check if possible that the <group> resource is deleted in Registrar CSE. |
| 5 | | IOP Check | AE indicates successful operation. |
| IOP Verdict | | | |
| PRO Verdict | | | |

## 8.1.10 Node Management

### 8.1.10.1 Node Create

| Interoperability Test Description | | | |
|---|---|---|---|
| **Identifier:** | | | TD_M2M_NH_35 |
| **Objective:** | | | AE creates a node resource |
| **Configuration:** | | | M2M_CFG_01 |
| **References:** | | | TS-0001 [1], clause 10.2.14.1<br>TS-0004 [2], clause 7.3.18.2.1 |
| | | | |
| **Pre-test conditions:** | | | • void |
| **Test Sequence** | | | |
| **Step** | **RP** | **Type** | **Description** |
| 1 | | Stimulus | AE is requested to send a node Create Request |
| 2 | Mca | PRO Check Primitive | • op = 1 (Create)<br>• to = {CSEBaseName}<br>• fr = AE-ID<br>• rqi = (token-string)<br>• ty = 14 (node)<br>• pc = Serialized representation of <node> resource |
| | | PRO Check HTTP | Sent request contains<br>• Request method = POST<br>• Request-Target: {CSEBaseName} |

| Interoperability Test Description | | | |
|---|---|---|---|
| | | | • Host: IP address or the FQDN of Registrar CSE<br>• X-M2M-RI: (token-string)<br>• X-M2M-Origin: AE-ID<br>• Content-Type: application/vnd.onem2m-res+xml; ty=14 or application/vnd.onem2m-res+json; ty=14<br>• Message-body: Serialized representation of <node> resource |
| | | PRO Check CoAP | Sent request contains<br>• Method: 0.02 (POST)<br>• Uri-Host: IP address or the FQDN of Registrar CSE<br>• Uri-Path: {CSEBaseName}<br>• Content-type: application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json<br>• oneM2M-TY: 14<br>• oneM2M-FR: AE-ID<br>• oneM2M-RQI: (token-string)<br>• Payload: Serialized representation of <node> resource |
| | | PRO Check MQTT | Sent MQTT PUBLISH message:<br>Topic: "/oneM2M/req/<AE-ID>/<Registrar CSE-ID>"<br>Payload:<br>• op = 1 (Create)<br>• to = {CSEBaseName}<br>• fr = AE-ID<br>• rqi = (token-string)<br>• ty = 14 (node)<br>• pc = Serialized representation of <node> resource |
| 3 | | IOP Check | Check if possible that the <node> resource is created in Registrar CSE. |
| 4 | Mca | PRO Check Primitive | • rsc = 2001 (CREATED)<br>• rqi = (token-string) same as received in request message<br>• pc = Serialized representation of <node> resource |
| | | PRO Check HTTP | Registrar CSE sends response containing:<br>• Status Code = 201 (OK)<br>• X-M2M-RSC: 2001<br>• X-M2M-RI: (token-string) same as received in request message<br>• Content-Location : URI of the created <node> resource<br>• Content-Type: application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json<br>• Message-body: Serialized representation of <node> resource |
| | | PRO Check CoAP | Registrar CSE sends response containing:<br>• Response Code = 2.01<br>• oneM2M-RSC: 2001<br>• oneM2M-RQI: (token-string) same as received in request message<br>• Location-Path: URI of the created <node> resource<br>• Payload: Serialized representation of <node> resource |
| | | PRO Check MQTT | Sent a MQTT PUBLISH message:<br>Topic: "/oneM2M/resp/<AE-ID>/<Registrar CSE-ID>"<br>Payload:<br>• to = AE-ID<br>• fr = Registrar CSE-ID<br>• rsc = 2001 (CREATED)<br>• rqi = (token-string) same as received in request message<br>• pc = Serialized representation of <node> resource |
| 5 | | IOP Check | AE indicates successful operation |
| IOP Verdict | | | |
| PRO Verdict | | | |

### 8.1.10.2 Node Retrieve

| Interoperability Test Description | | | |
|---|---|---|---|
| **Identifier:** | | | TD_M2M_NH_36 |
| **Objective:** | | | AE retrieves node resource |
| **Configuration:** | | | M2M_CFG_01 |
| **References:** | | | TS-0001 [1], clause 10.2.14.2<br>TS-0004 [2], clause 7.3.18.2.2 |
| | | | |
| **Pre-test conditions:** | | | • AE has created a <node> resource on Registrar CSE |
| **Test Sequence** | | | |
| **Step** | **RP** | **Type** | **Description** |
| 1 | | Stimulus | AE is requested to send a node Retrieve Request |
| 2 | Mca | PRO Check Primitive | • op = 2 (RETRIEVE)<br>• to = {CSEBaseName}/{node}<br>• fr = AE-ID<br>• rqi = (token-string) |
| | | PRO Check HTTP | Sent request contains<br>• Request method = GET<br>• Request-Target: {CSEBaseName}/{node}<br>• Host: IP address or the FQDN of Registrar CSE<br>• X-M2M-RI: (token-string)<br>• X-M2M-Origin: AE-ID<br>• Content-Type: application/vnd.onem2m-res+xml; or application/vnd.onem2m-res+json; |
| | | PRO Check CoAP | Sent request contains<br>• Method: 0.01 (GET)<br>• Uri-Host: IP address or the FQDN of Registrar CSE<br>• Uri-Path: {CSEBaseName}/{node}<br>• Content-format: application/vnd.onem2m-res+xml; or application/vnd.onem2m-res+json;<br>• oneM2M-FR: AE-ID<br>• oneM2M-RQI: (token-string) |
| | | PRO Check MQTT | Sent a MQTT PUBLISH message:<br>Topic: "/oneM2M/req/<AE-ID>/<Registrar CSE-ID>"<br>Payload:<br>• op = 2 (Retrieve)<br>• to = {CSEBaseName}/{node}<br>• fr = <AE-ID><br>• rqi = (token-string) |
| 3 | Mca | PRO Check Primitive | • rsc = 2000 (OK)<br>• rqi = (token-string) same as received in request message<br>• pc = Serialized representation of <node> resource |
| | | PRO Check HTTP | Registrar CSE sends response containing:<br>• Status Code =200 (OK)<br>• X-M2M-RSC: 2000<br>• X-M2M-RI: (token-string) same as received in request message<br>• Message-body: Serialized representation of <node> resource |
| | | PRO Check CoAP | Registrar CSE sends response containing:<br>• Response Code = 2.05<br>• oneM2M-RSC: 2000<br>• oneM2M-RQI: (token-string) same as received in request message<br>• Payload: Serialized representation of <node> resource |
| | | PRO Check MQTT | Sent a MQTT PUBLISH message:<br>Topic: "/oneM2M/resp/<AE-ID>/<Registrar CSE-ID>"<br>Payload:<br>• to = AE-ID<br>• fr = Registrar CSE-ID<br>• rsc = 2000<br>• rqi = (token-string) same as received in request message<br>• pc = Serialized representation of <node> resource |
| 4 | | IOP Check | AE indicates successful operation |
| IOP Verdict | | | |
| PRO Verdict | | | |

## 8.1.10 Node Update

| Interoperability Test Description | | | |
|---|---|---|---|
| **Identifier:** | | | TD_M2M_NH_37 |
| **Objective:** | | | AE updates attribute in node resource |
| **Configuration:** | | | M2M_CFG_01 |
| **References:** | | | TS-0001 [1], clause 10.2.14.3<br>TS-0004 [2], clause 7.3.18.2.3 |
| | | | |
| **Pre-test conditions:** | | | • AE has created a <node> resource on Registrar CSE |
| **Test Sequence** | | | |
| **Step** | **RP** | **Type** | **Description** |
| 1 | | Stimulus | AE is requested to send a node Update Request |
| 2 | Mca | PRO Check Primitive | • op = 3 (Update)<br>• to = {CSEBaseName}/{node}<br>• fr = AE-ID<br>• rqi = (token-string)<br>• pc = Serialized representation of <node> resource |
| | | PRO Check HTTP | Sent request contains<br>• Request method = PUT<br>• Request-Target: {CSEBaseName}/{node}<br>• Host: IP address or the FQDN of Registrar CSE<br>• X-M2M-RI: (token-string)<br>• X-M2M-Origin: AE-ID<br>• Content-Type: application/vnd.onem2m-res+xml; or application/vnd.onem2m-res+json;<br>• Message-body: Serialized representation of <node> resource |
| | | PRO Check CoAP | Sent request contains<br>• Method: 0.03 (PUT)<br>• Uri-Host: IP address or the FQDN of Registrar CSE<br>• Uri-Path: {CSEBaseName}/{node}<br>• Content-format: application/vnd.onem2m-res+xml; or application/vnd.onem2m-res+json;<br>• oneM2M-FR: AE-ID<br>• oneM2M-RQI: (token-string)<br>• Payload: Serialized representation of <node> resource |
| | | PRO Check MQTT | Sent MQTT PUBLISH message<br>Topic: "/oneM2M/req/<AE-ID>/<Registrar CSE-ID>"<br>Payload:<br>• op = 3 (Update)<br>• to = {CSEBaseName}/{node}<br>• fr = AE-ID<br>• rqi = (token-string)<br>• pc = Serialized representation of <node> resource |
| 3 | | IOP Check | Check if possible that the <node> resource is updated in Registrar CSE.. |
| 4 | Mca | PRO Check Primitive | • rsc = 2004 (CHANGED)<br>• rqi = (token-string) same as received in request message<br>• pc = Serialized representation of <node> resource |
| | | PRO Check HTTP | Registrar CSE sends response containing:<br>• Code = 200<br>• X-M2M-RSC: 2004<br>• X-M2M-RI: (token-string) same as received in request message<br>• Content-Type: application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json<br>• Message-body: Serialized representation of <node> resource |
| | | PRO Check CoAP | Registrar CSE sends response containing:<br>• Response Code = 2.05<br>• oneM2M-RSC: 2004<br>• oneM2M-RQI: (token-string) same as received in request message<br>• Payload: Serialized representation of <node> resource |
| | | PRO Check MQTT | Sent a MQTT PUBLISH message<br>Topic: "/oneM2M/resp/<AE-ID>/<Registrar CSE-ID>"<br>Payload:<br>• to = AE-ID |

| Interoperability Test Description | | | |
|---|---|---|---|
| | | | • fr = Registrar CSE-ID<br>• rqi = (token-string) same as received in request message<br>• rsc = 2004<br>• pc = Serialized representation of <node> resource |
| 5 | | IOP Check | AE indicates successful operation |
| IOP Verdict | | | |
| PRO Verdict | | | |

### 8.1.10.4 Node Delete

| Interoperability Test Description | | | |
|---|---|---|---|
| **Identifier:** | | | TD_M2M_NH_38 |
| **Objective:** | | | AE deletes node resource |
| **Configuration:** | | | M2M_CFG_01 |
| **References:** | | | TS-0001 [1], clause 10.2.14.4<br>TS-0004 [2], clause 7.3.18.2.4 |
| | | | |
| **Pre-test conditions:** | | | • AE has created a <node> resource on Registrar CSE |
| **Test Sequence** | | | |
| **Step** | **RP** | **Type** | **Description** |
| 1 | | Stimulus | AE is requested to send a node Delete Request |
| 2 | Mca | PRO Check Primitive | • op = 4 (DELETE)<br>• to = {CSEBaseName}/{node}<br>• fr = AE-ID<br>• rqi = (token-string) |
| | | PRO Check HTTP | Sent DELETE request contains<br>• Request method = DELETE<br>• Request-Target: {CSEBaseName}/{node}<br>• Host: IP address or the FQDN of Registrar CSE<br>• X-M2M-RI: (token-string)<br>• X-M2M-Origin: AE-ID |
| | | PRO Check CoAP | Sent DELETE request contains<br>• Method: 0.04 (DELETE)<br>• Uri-Host: IP address or the FQDN of Registrar CSE<br>• Uri-Path: {CSEBaseName}/{node}<br>• oneM2M-FR: AE-ID<br>• oneM2M-RQI: (token-string) |
| | | PRO Check MQTT | Sent a MQTT PUBLISH message<br>Topic: "/oneM2M/req/< AE-ID>/<Registrar CSE-ID>"<br>Payload:<br>• op = 4<br>• to = {CSEBaseName}/{node}<br>• fr = AE-ID<br>• rqi = (token-string) |
| 3 | Mca | PRO Check Primitive | • rsc = 2002 (DELETED)<br>• rqi = (token-string) same as received in request message |
| | | PRO Check HTTP | Registrar CSE sends response containing:<br>• Status Code = 200<br>• X-M2M-RSC: 2002<br>• X-M2M-RI: (token-string) same as received in request message |
| | | PRO Check CoAP | Registrar sends response containing:<br>• Response Code = 2.05<br>• oneM2M-RSC: 2002<br>• oneM2M-RQI: (token-string) same as received in request message |
| | | PRO Check MQTT | Sent a MQTT PUBLISH message<br>Topic: "/oneM2M/resp/<AE-ID>/<Registrar CSE-ID>"<br>Payload:<br>• to = AE-ID<br>• fr = Registrar CSE-ID<br>• rqi = (token-string) same as received in request message<br>• rsc = 2002 |
| 4 | | IOP Check | Check if possible that the <node> resource is deleted in Registrar CSE. |

| Interoperability Test Description | | | |
|---|---|---|---|
| 5 | | IOP Check | AE indicates successful operation |
| IOP Verdict | | | |
| PRO Verdict | | | |

## 8.1.11 PollingChannel Management

### 8.1.11.1 PollingChannel Create

| Interoperability Test Description | | | |
|---|---|---|---|
| **Identifier:** | | | TD_M2M_NH_39 |
| **Objective:** | | | AE creates a <pollingChannel> resource in registrar CSE via a Create Request |
| **Configuration:** | | | M2M_CFG_01 |
| **References:** | | | TS-0001 [1], clause 10.2.13.2<br>TS-0004 [2], clause 7.3.21.2.1 |
| | | | |
| **Pre-test conditions:** | | | • AE has created an application resource <AE> on registrar CSE |
| **Test Sequence** | | | |
| **Step** | **RP** | **Type** | **Description** |
| 1 | | Stimulus | AE sends a request to create a < pollingChannel > |
| 2 | Mca | PRO Check Primitive | • op = 1 (Create)<br>• to = {CSEBaseName}/URI of <AE> resource<br>• fr = AE-ID<br>• rqi = (token-string)<br>• ty = 15 (pollingChannel)<br>• pc = Serialized representation of < pollingChannel > resource |
| | | PRO Check HTTP | Sent request contains<br>• Request method = POST<br>• Request-Target:{CSEBaseName}/URI of <AE> resource<br>• Host: IP address or the FQDN of Registrar CSE<br>• X-M2M-RI: (token-string)<br>• X-M2M-Origin: AE-ID<br>• Content-Type: application/vnd.onem2m-res+xml; ty=15 or application/vnd.onem2m-res+json; ty=15<br>• Message-body: Serialized representation of < pollingChannel > resource |
| | | PRO Check CoAP | Sent request contains<br>• Method: 0.02 (POST)<br>• Uri-Host: IP address or the FQDN of Registrar CSE<br>• Uri-Path: {CSEBaseName}/URI of <AE> resource<br>• Content-type: application/vnd.onem2m-res+xmlor application/vnd.onem2m-res+json<br>• oneM2M-TY: 15<br>• oneM2M-FR: AE-ID<br>• oneM2M-RQI: (token-string)<br>• Payload: Serialized representation of < pollingChannel > resource |
| | | PRO Check MQTT | Sent MQTT PUBLISH message:<br>Topic: "/oneM2M/req/< AE-ID>/<Registrar CSE-ID>"<br>Payload:<br>• op = 1 (Create)<br>• to = {CSEBaseName}/URI of <AE> resource<br>• fr = AE-ID<br>• rqi = (token-string)<br>• ty = 15 (pollingChannel)<br>• pc = Serialized representation of < pollingChannel > resource |
| 3 | | IOP Check | Check if possible that the < pollingChannel > resource is created in registrar CSE. |
| 4 | Mca | PRO Check Primitive | • rsc = 2001 (CREATED)<br>• rqi = (token-string) same as received in request message<br>• pc = Serialized representation of < pollingChannel > resource |
| | | PRO Check HTTP | Registrar CSE sends response containing:<br>• Status Code = 201 (Created)<br>• X-M2M-RSC: 2001<br>• X-M2M-RI: (token-string) same as received in request message<br>• Content-Location: URI of the created resource.<br>• Content-Type: application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json |

| Interoperability Test Description | | | |
|---|---|---|---|
| | | | • Message-body: Serialized representation of < pollingChannel > resource |
| | | PRO Check CoAP | Registrar sends response containing:<br>• Response Code = 2.01<br>• oneM2M-RSC: 2001<br>• oneM2M-RQI: (token-string) same as received in request message<br>• Location-Path: URI of the created resource<br>• Content-format: application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json<br>• Payload: Serialized representation of < pollingChannel > resource |
| | | PRO Check MQTT | Sent MQTT PUBLISH message:<br>Topic: "/oneM2M/resp/< AE-ID>/<Registrar CSE-ID>"<br>Payload:<br>• to = AE-ID<br>• fr = Registrar CSE-ID<br>• rsc = 2001 (CREATED)<br>• rqi = (token-string) same as received in request message<br>• pc = Serialized representation of < pollingChannel > resource |
| 5 | | IOP Check | AE indicates successful operation |
| IOP Verdict | | | |
| PRO Verdict | | | |

### 8.1.11.2 PollingChannel Retrieve

| Interoperability Test Description | | | |
|---|---|---|---|
| **Identifier:** | | | TD_M2M_NH_40 |
| **Objective:** | | | AE retrieves information of a pollingChannel resource via a Retrieve Request |
| **Configuration:** | | | M2M_CFG_01 |
| **References:** | | | TS-0001 [1], clause 10.2.13.3<br>TS-0004 [2], clause 7.3.21.2.2 |
| | | | |
| **Pre-test conditions:** | | | • AE has created an Application Entity resource <AE> on Registrar CSE<br>• AE has created a container resource < pollingChannel > on Registrar CSE |
| **Test Sequence** | | | |
| **Step** | **RP** | **Type** | **Description** |
| 1 | | Stimulus | AE is requested to send a Retrieve Request for a < pollingChannel > |
| 2 | Mca | PRO Check Primitive | • op = 2 (Retrieve)<br>• to = {CSEBaseName}/URI of < pollingChannel > resource<br>• fr = AE-ID<br>• rqi = (token-string)<br>• pc = empty |
| | | PRO Check HTTP | Sent request contains<br>• Request method = GET<br>• Request-Target: {CSEBaseName}/URI of < pollingChannel > resource<br>• Host: IP address or the FQDN of Registrar CSE<br>• X-M2M-RI: (token-string)<br>• X-M2M-Origin: AE-ID<br>• Message-body: empty |
| | | PRO Check CoAP | Sent request contains<br>• Method: 0.01 (GET)<br>• Uri-Host: IP address or the FQDN of Registrar CSE<br>• Uri-Path: {CSEBaseName}/URI of < pollingChannel > resource<br>• oneM2M-FR: AE-ID<br>• oneM2M-RQI: (token-string)<br>• Payload: empty |
| | | PRO Check MQTT | Sent MQTT PUBLISH message:<br>Topic: "/oneM2M/req/< AE-ID>/<Registrar CSE-ID>"<br>Payload:<br>• op = 2 (Retrieve)<br>• to = {CSEBaseName}/URI of < pollingChannel > resource<br>• fr = AE-ID<br>• rqi = (token-string)<br>• pc = empty |
| 3 | | PRO Check | • rsc =2000 (OK) |

| Interoperability Test Description | | | |
|---|---|---|---|
| | Mca | Primitive | • rqi = (token-string) same as received in request message<br>• pc = Serialized representation of < pollingChannel > resource |
| | | PRO Check HTTP | Registrar CSE sends response containing:<br>• Status Code = 200 (OK)<br>• X-M2M-RSC: 2000<br>• X-M2M-RI: (token-string) same as received in request message<br>• Content-Type: application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json<br>• Message-body: Serialized representation of < pollingChannel > resource |
| | | PRO Check CoAP | Registrar sends response containing:<br>• Response Code = 2.05 (OK)<br>• oneM2M-RSC: 2000(OK)<br>• oneM2M-RQI: (token-string) same as received in request message<br>• Content-format: application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json<br>• Payload: Serialized representation of < pollingChannel > resource |
| | | PRO Check MQTT | Sent MQTT PUBLISH message:<br>Topic: "/oneM2M/resp/< AE-ID>/<Registrar CSE-ID>"<br>Payload:<br>• to = AE-ID<br>• fr = Registrar CSE-ID<br>• rsc 2000(OK)<br>• rqi = (token-string) same as received in request message<br>• pc = Serialized representation of < pollingChannel > resource |
| 4 | | IOP Check | AE indicates successful operation |
| IOP Verdict | | | |
| PRO Verdict | | | |

### 8.1.11.3 pollingChannel Update

| Interoperability Test Description | | | |
|---|---|---|---|
| **Identifier:** | | TD_M2M_NH_41 | |
| **Objective:** | | AE updates attribute in pollingChannel resource via a Update Request | |
| **Configuration:** | | M2M_CFG_01 | |
| **References:** | | TS-0001 [1], clause 10.2.13.4<br>TS-0004 [2], clause 7.3.21.2.3 | |
| | | | |
| **Pre-test conditions:** | | • AE has created an Application Entity resource <AE> on Registrar CSE<br>• AE has created a container resource <container> on Registrar CSE | |
| **Test Sequence** | | | |
| **Step** | **RP** | **Type** | **Description** |
| 1 | | Stimulus | AE is requested to send a pollingChannel Update Request to update the lifetime of the resource. |
| 2 | Mca | PRO Check Primitive | • op = 3 (Update)<br>• to = {CSEBaseName}/URI of < pollingChannel > resource<br>• fr = AE-ID<br>• rqi = (token-string)<br>• pc = Serialized representation of updated < pollingChannel > resource |
| | | PRO Check HTTP | Sent request contains<br>• Request method = PUT<br>• Request-Target:{CSEBaseName}/URI of < pollingChannel > resource<br>• Host: IP address or the FQDN of Registrar CSE<br>• X-M2M-RI: (token-string)<br>• X-M2M-Origin: AE-ID<br>• Content-Type: application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json<br>• Message-body: Serialized representation of updated < pollingChannel > resource |
| | | PRO Check CoAP | Sent request contains<br>• Method: 0.03 (PUT)<br>• Uri-Host: IP address or the FQDN of Registrar CSE<br>• Uri-Path: {CSEBaseName}/URI of < pollingChannel > resource<br>• oneM2M-FR: AE-ID<br>• oneM2M-RQI: (token-string)<br>• Content-format: application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json |

| Interoperability Test Description | | | |
|---|---|---|---|
| | | | • Payload: Serialized representation of updated < pollingChannel > resource |
| | | PRO Check MQTT | Sent MQTT PUBLISH message:<br>Topic: "/oneM2M/ req /< AE-ID>/<Registrar CSE-ID>"<br>Payload:<br>• op = 3 (Update)<br>• to = {CSEBaseName}/URI of < pollingChannel > resource<br>• fr = AE-ID<br>• rqi = (token-string)<br>• pc = Serialized representation of updated < pollingChannel > resource |
| 3 | | IOP Check | Check if possible that the < pollingChannel > resource is updated in Registrar CSE. |
| 4 | Mca | PRO Check Primitive | • rsc = 2004 (Updated)<br>• rqi = (token-string) same as received in request message<br>• pc = Serialized representation of < pollingChannel > resource |
| | | PRO Check HTTP | Registrar CSE sends response containing:<br>• Code = 200 (Ok)<br>• X-M2M-RSC: 2004<br>• X-M2M-RI: (token-string) same as received in request message<br>• Content-Type: application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json<br>• Message-body: Serialized representation of < pollingChannel > resource |
| | | PRO Check CoAP | Registrar sends response containing:<br>• Response Code = 2.04<br>• oneM2M-RSC: 2004<br>• oneM2M-RQI: (token-string) same as received in request message<br>• Content-format: application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json<br>• Payload: Serialized representation of < pollingChannel > resource |
| | | PRO Check MQTT | Sent MQTT PUBLISH message:<br>Topic: "/oneM2M/resp/< AE-ID>/<Registrar CSE-ID>"<br>Payload:<br>• to = AE-ID<br>• fr = Registrar CSE-ID<br>• rsc = 2004 (Updated)<br>• rqi = (token-string) same as received in request message<br>• pc = Serialized representation of modified < pollingChannel > resource |
| 5 | | IOP Check | AE indicates successful operation |
| IOP Verdict | | | |
| PRO Verdict | | | |

### 8.1.11.4 pollingChannel Delete

| Interoperability Test Description | | | |
|---|---|---|---|
| **Identifier:** | | | TD_M2M_NH_42 |
| **Objective:** | | | AE deletes a pollingChannel resource via a Delete Request |
| **Configuration:** | | | M2M_CFG_01 |
| **References:** | | | TS-0001 [1], clause 10.2.13.5<br>TS-0004 [2], clause 7.3.21.2.4 |
| | | | |
| **Pre-test conditions:** | | | • AE has created an Application Entity resource <AE> on Registrar CSE<br>• AE has created a container resource <container> on Registrar CSE |
| **Test Sequence** | | | |
| **Step** | **RP** | **Type** | **Description** |
| 1 | | Stimulus | AE is requested to send a subscription Delete Request |
| 2 | Mca | PRO Check Primitive | • op = 4 (Delete)<br>• to = {CSEBaseName}/URI of < pollingChannel > resource<br>• fr = AE-ID<br>• rqi = (token-string)<br>• pc = empty |
| | | PRO Check HTTP | Sent request contains<br>• Request method = DELETE<br>• Request-Target: {CSEBaseName}/URI of < pollingChannel > resource<br>• Host: IP address or the FQDN of Registrar CSE<br>• X-M2M-RI: (token-string)<br>• X-M2M-Origin: AE-ID |

| Interoperability Test Description | | | |
|---|---|---|---|
| | | | • Message-body: Empty |
| | | PRO Check CoAP | Sent request contains<br>• Method: 0.04 (DELETE)<br>• Uri-Host: IP address or the FQDN of Registrar CSE<br>• Uri-Path: {CSEBaseName}/URI of < pollingChannel > resource<br>• oneM2M-FR: AE-ID<br>• oneM2M-RQI: (token-string)<br>• Payload: empty |
| | | PRO Check MQTT | Sent MQTT PUBLISH message:<br>Topic: "/oneM2M/req/< AE-ID>/<Registrar CSE-ID>"<br>Payload:<br>• op = 4 (Delete)<br>• to = {CSEBaseName}/URI of < pollingChannel > resource<br>• fr = AE-ID<br>• rqi = (token-string)<br>• pc = empty |
| 3 | | IOP Check | Check if possible that the < pollingChannel > resource is deleted in registrar CSE. |
| 4 | Mca | PRO Check Primitive | • rsc = 2002 (DELETED)<br>• rqi = (token-string) same as received in request message<br>• pc = empty |
| | | PRO Check HTTP | Registrar CSE sends response containing:<br>• Status Code = 200 (OK)<br>• X-M2M-RSC: 2002<br>• X-M2M-RI: (token-string) same as received in request message<br>• Message-body: empty |
| | | PRO Check CoAP | Registrar sends response containing:<br>• Response Code = 2.02<br>• oneM2M-RSC: 2002(DELETED)<br>• oneM2M-RQI: (token-string) same as received in request message<br>• Payload: empty |
| | | PRO Check MQTT | Sent MQTT PUBLISH message:<br>Topic: "/oneM2M/resp/< AE-ID>/<Registrar CSE-ID>"<br>Payload:<br>• to = AE-ID<br>• fr = Registrar CSE-ID<br>• rsc = 2002(DELETED)<br>• rqi = (token-string) same as received in request message |
| 5 | | IOP Check | Check if possible that the < pollingChannel > resource has been removed in registrar CSE. |
| 6 | | IOP Check | AE indicates successful operation |
| IOP Verdict | | | |
| PRO Verdict | | | |

### 8.1.11.5 Long Polling on a PollingChannel Retrieve

| Interoperability Test Description | | | |
|---|---|---|---|
| **Identifier:** | | | TD_M2M_NH_43 |
| **Objective:** | | | AE retrieves information of a pollingChannel resource via a Retrieve Request |
| **Configuration:** | | | M2M_CFG_01 |
| **References:** | | | TS-0001 [1], clause 10.2.13.7<br>TS-0004 [2], clause 7.3.22.2.2 |
| | | | |
| **Pre-test conditions:** | | | • A pollingChannel resource < pollingChannel > has been created in application <AE> on the Registrar CSE<br>• A subscription to a <container> resource has been created using the <pollingChannel> as a notificationURI in the subscription.<br>• A single <contentInstance> resource is created in the subscribed to resource. |
| **Test Sequence** | | | |
| **Step** | **RP** | **Type** | **Description** |
| 1 | | Stimulus | AE is requested to send a pollingChannelURI Retrieve Request for <pollingChannelURI> |

| Interoperability Test Description | | | |
|---|---|---|---|
| 2 | Mca | PRO Check Primitive | Sent RETRIEVE request contains<br>• *To*: <CSEBase>/<AE>/<pollingChannel>/pollingChannelURI<br>• *Fr*: AE-ID |
| | | PRO Check HTTP | Sent GET request contains<br>• Request URI <CSEBase>/<AE>/<pollingChannel>/pollingChannelURI<br>• Host: Registar CSE<br>• Payload: empty |
| | | PRO Check CoAP | Sent GET request contains<br>• Method: 0.01 (GET)<br>• Uri-Host: Registrar CSE host<br>• Uri-Port: Registrar CSE port<br>• Uri-Path: <CSEBase><br>• Uri-Path: <AE><br>• Uri-Path: < pollingChannel ><br>• URI-Path: pollingChannelURI |
| | | PRO Check MQTT | |
| 3 | Mca | PRO Check Primitive | Sent RETRIEVE response contains<br>• *To*: AE-ID<br>• *Fr*: CSE-ID<br>• *Response Statuse Code* : OK<br>• Cn: pending Notification request |
| | | PRO Check HTTP | Registrar CSE sends response containing:<br>• Code = 200<br>• Payload: Response PRO Check Primitive with Content set with Notification request |
| | | PRO Check CoAP | Registrar sends response containing:<br>• Response Code = 2.05<br>• Payload: Response PRO Check Primitive with Content set with Notification request |
| | | PRO Check MQTT | |
| 4 | | IOP Check | AE indicates successful operation |
| 5 | | | Repeat steps 1-2. There is no pending request. When the Request Expiration Timestamp expires Registrar sends response indicating "REQUEST_TIMEOUT" |
| 6 | Mca | PRO Check Primitive | Sent RETRIEVE response contains<br>• *To*: AE-ID<br>• *Fr*: CSE-ID<br>• *Response Statuse Code* : REQUEST_TIMEOUT |
| | | PRO Check HTTP | Registrar CSE sends response containing:<br>• Code = 408 |
| | | PRO Check CoAP | Registrar sends response containing:<br>• Response Code = 4.04<br>• oneM2M-RSC = 4008 |
| | | PRO Check MQTT | |
| IOP Verdict | | | |
| PRO Verdict | | | |

## 8.1.12 FanoutPoint Management

### 8.1.12.1 FanoutPoint Create

| Interoperability Test Description | | | |
|---|---|---|---|
| **Identifier:** | | | TD_M2M_NH_44 |
| **Objective:** | | | AE creates a <contentInstance> resource in each group member |
| **Configuration:** | | | M2M_CFG_01 |
| **References:** | | | TS-0001 [1], clause 10.2.7.6<br>TS-0004 [2], clause 7.3.14.3.1 |
| | | | |
| **Pre-test conditions:** | | | • A group is created containing 2 members of type <container> |
| **Test Sequence** | | | |
| **Step** | **RP** | **Type** | **Description** |

| Interoperability Test Description | | | |
|---|---|---|---|
| 1 | | Stimulus | AE is requested to send a Create Request to create <contentInstance> in each group member |
| 2 | Check Mca | PRO Check Primitive | • op = 1 (Create)<br>• to = {CSEBaseName}/{group}/fanOutPoint<br>• fr = AE-ID<br>• rqi = (token-string)<br>• ty = 4 (contentInstance)<br>• pc = Serialized representation of <contentInstance> resource |
| | | PRO Check HTTP | Sent request contains<br>• Request method = POST<br>• Request-Target: {CSEBaseName}/{group}/fanOutPoint<br>• Host: IP address or the FQDN of Registrar CSE<br>• X-M2M-RI: (token-string)<br>• X-M2M-Origin: AE-ID<br>• Content-Type: application/vnd.onem2m-res+xml; ty=4 or application/vnd.onem2m-res+json; ty=4<br>• Message-body: Serialized representation of < contentInstance > resource |
| | | PRO Check CoAP | Sent request contains<br>• Method: 0.02 (POST)<br>• Uri-Host: IP address or the FQDN of Registrar CSE<br>• Uri-Path: {CSEBaseName}/{group}/fanoutPoint<br>• Content-type: application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json<br>• oneM2M-TY: 4<br>• oneM2M-FR: AE-ID<br>• oneM2M-RQI: (token-string)<br>• Payload: Serialized representation of <contentInstance> resource |
| | | PRO Check MQTT | Sent MQTT PUBLISH message:<br>Topic: "/oneM2M/req/<AE-ID>/<Registrar CSE-ID>"<br>Payload:<br>• op = 1 (Create)<br>• to = {CSEBaseName}/{group}/fanOutPoint<br>• fr = AE-ID<br>• rqi = (token-string)<br>• ty = 4 (contentInstance)<br>• pc = Serialized representation of <contentInstance> resource |
| 4 | | IOP Check | Check if possible that the <contentInstance> resource is created in each member hosting CSE |
| 7 | Check Mca | PRO Check Primitive | • rsc = 2001 (CREATED)<br>• rqi = (token-string) same as received in request message<br>• pc = aggregated response |
| | | PRO Check HTTP | Registrar CSE sends response containing:<br>• Status Code = 201 (OK)<br>• X-M2M-RSC: 2001<br>• X-M2M-RI: (token-string) same as received in request message<br>• Content-Type: application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json<br>• Message-body: aggregated response |
| | | PRO Check CoAP | Registrar CSE sends response containing:<br>• Response Code = 2.01<br>• oneM2M-RSC: 2001<br>• oneM2M-RQI: (token-string) same as received in request message<br>• Payload: aggregated response |
| | | PRO Check MQTT | Sent a MQTT PUBLISH message:<br>Topic: "/oneM2M/resp/<AE-ID>/<Registrar CSE-ID>"<br>Payload:<br>• to = AE-ID<br>• fr = Registrar CSE-ID<br>• rsc = 2001 (CREATED)<br>• rqi = (token-string) same as received in request message<br>• pc = aggregated response |
| 8 | | IOP Check | AE indicates successful operation |
| IOP Verdict | | Verify that the aggregrate response includes responses from each member of the group | |
| PRO Verdict | | | |

### 8.1.12.2 FanoutPoint Retrieve

| Interoperability Test Description | | | |
|---|---|---|---|
| **Identifier:** | | | TD_M2M_NH_45 |
| **Objective:** | | | AE retrieves the <container> resource from in each group member |
| **Configuration:** | | | M2M_CFG_01 |
| **References:** | | | TS-0001 [1], clause 10.2.7.8<br>TS-0004 [2], clause 7.3.14.3.2 |
| | | | |
| **Pre-test conditions:** | | | • A group is created containing 2 members of type <container> |
| **Test Sequence** | | | |
| **Step** | **RP** | **Type** | **Description** |
| 1 | | Stimulus | AE is requested to send a Retrieve Request to the fanoutPoint of <group> resource |
| 2 | Check Mca | PRO Check Primitive | • op = 2 (Retrieve)<br>• to = {CSEBaseName}/{group}/fanOutPoint<br>• fr = AE-ID<br>• rqi = (token-string) |
| | | PRO Check HTTP | Sent request contains<br>• Request method = GET<br>• Request-Target: {CSEBaseName}/{group}/fanOutPoint<br>• Host: IP address or the FQDN of Registrar CSE<br>• X-M2M-RI: (token-string)<br>• X-M2M-Origin: AE-ID |
| | | PRO Check CoAP | Sent request contains<br>• Method: 0.01 (GET)<br>• Uri-Host: IP address or the FQDN of Registrar CSE<br>• Uri-Path: {CSEBaseName}/{group}/fanoutPoint<br>• oneM2M-FR: AE-ID<br>• oneM2M-RQI: (token-string) |
| | | PRO Check MQTT | Sent MQTT PUBLISH message:<br>Topic: "/oneM2M/req/<AE-ID>/<Registrar CSE-ID>"<br>Payload:<br>• op = 2 (Retrieve)<br>• to = {CSEBaseName}/{group}/fanOutPoint<br>• fr = AE-ID<br>• rqi = (token-string) |
| 4 | | IOP Check | |
| 7 | Check Mca | PRO Check Primitive | • rsc = 2000 (OK)<br>• rqi = (token-string) same as received in request message<br>• pc = aggregated response |
| | | PRO Check HTTP | Registrar CSE sends response containing:<br>• Status Code = 200 (OK)<br>• X-M2M-RSC: 2000<br>• X-M2M-RI: (token-string) same as received in request message<br>• Content-Type: application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json<br>• Message-body: aggregated response |
| | | PRO Check CoAP | Registrar CSE sends response containing:<br>• Response Code = 2.05<br>• oneM2M-RSC: 2000<br>• oneM2M-RQI: (token-string) same as received in request message<br>• Payload: aggregated response |
| | | PRO Check MQTT | Sent a MQTT PUBLISH message:<br>Topic: "/oneM2M/resp/<AE-ID>/<Registrar CSE-ID>"<br>Payload:<br>• to = AE-ID<br>• fr = Registrar CSE-ID<br>• rsc = 2000 (OK)<br>• rqi = (token-string) same as received in request message<br>• pc = aggregated response |
| 8 | | IOP Check | AE indicates successful operation |
| IOP Verdict | | Verify that the aggregrate response includes responses from each member of the group | |
| PRO Verdict | | | |

### 8.1.12.3 FanoutPoint Update

| Interoperability Test Description | | | |
|---|---|---|---|
| **Identifier:** | | | TD_M2M_NH_46 |
| **Objective:** | | | AE updates an <container> resource of each member resource |
| **Configuration:** | | | M2M_CFG_01 |
| **References:** | | | TS-0001 [1], clause 10.2.7.9<br>TS-0004 [2], clause 7.3.14.3.3 |
| | | | |
| **Pre-test conditions:** | | | • A group is created containing 2 members of type <container> |
| **Test Sequence** | | | |
| **Step** | **RP** | **Type** | **Description** |
| 1 | | Stimulus | AE is requested to send a Update Request to the fanoutPoint of <group> resource to lifetime of the resource. |
| 2 | Check Mca | PRO Check Primitive | • op = 3 (Update)<br>• to = {CSEBaseName}/{group}/fanOutPoint<br>• fr = AE-ID<br>• rqi = (token-string)<br>• pc = Serialized representation of <container> resource |
| | | PRO Check HTTP | Sent request contains<br>• Request method = PUT<br>• Request-Target: {CSEBaseName}/{group}/fanOutPoint<br>• Host: IP address or the FQDN of Registrar CSE<br>• X-M2M-RI: (token-string)<br>• X-M2M-Origin: AE-ID<br>• Content-Type: application/vnd.onem2m-res+xml; or application/vnd.onem2m-res+json;<br>• Message-body: Serialized representation of < container > resource |
| | | PRO Check CoAP | Sent request contains<br>• Method: 0.03 (PUT)<br>• Uri-Host: IP address or the FQDN of Registrar CSE<br>• Uri-Path: {CSEBaseName}/{group}/fanoutPoint<br>• Content-format: application/vnd.onem2m-res+xml; or application/vnd.onem2m-res+json;<br>• oneM2M-FR: AE-ID<br>• oneM2M-RQI: (token-string)<br>• Payload: Serialized representation of <container> resource |
| | | PRO Check MQTT | Sent MQTT PUBLISH message:<br>Topic: "/oneM2M/req/<AE-ID>/<Registrar CSE-ID>"<br>Payload:<br>• op = 3 (Update)<br>• to = {CSEBaseName}/{group}/fanOutPoint<br>• fr = AE-ID<br>• rqi = (token-string)<br>• pc = Serialized representation of <container> resource |
| 3 | | IOP Check | Check if possible that both of the <container> resources have been updated in registrar CSE. |
| 4 | Check Mca | PRO Check Primitive | • rsc = 2004 (CHANGED)<br>• rqi = (token-string) same as received in request message<br>• pc = aggregated response |
| | | PRO Check HTTP | Registrar CSE sends response containing:<br>• Status Code = 200 (OK)<br>• X-M2M-RSC: 2004<br>• X-M2M-RI: (token-string) same as received in request message<br>• Content-Type: application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json<br>• Message-body: aggregated response |
| | | PRO Check CoAP | Registrar CSE sends response containing:<br>• Response Code = 2.04<br>• oneM2M-RSC: 2004<br>• oneM2M-RQI: (token-string) same as received in request message<br>• Payload: aggregated response |
| | | PRO Check MQTT | Sent a MQTT PUBLISH message:<br>Topic: "/oneM2M/resp/<AE-ID>/<Registrar CSE-ID>"<br>Payload:<br>• to = AE-ID<br>• fr = Registrar CSE-ID |

| Interoperability Test Description | | | |
|---|---|---|---|
| | | | • rsc = 2004 (CHANGED)<br>• rqi = (token-string) same as received in request message<br>• pc = aggregated response |
| 5 | | IOP Check | AE indicates successful operation |
| IOP Verdict | | Verify that the aggregrate response includes responses from each member of the group | |
| PRO Verdict | | | |

### 8.1.12.4 FanoutPoint Delete

| Interoperability Test Description | | | |
|---|---|---|---|
| **Identifier:** | | TD_M2M_NH_47 | |
| **Objective:** | | AE deletes a <container> ofeach member | |
| **Configuration:** | | M2M_CFG_01 | |
| **References:** | | TS-0001 [1], clause 10.2.7.10<br>TS-0004 [2], clause 7.3.14.3.4 | |
| | | | |
| **Pre-test conditions:** | | • A group is created containing 2 members of type <container> | |
| **Test Sequence** | | | |
| **Step** | **RP** | **Type** | **Description** |
| 1 | | Stimulus | AE is requested to send a Delete 'oldest' Request to the fanoutPoint of <group> resource |
| 2 | Check Mca | PRO Check Primitive | • op = 4 (Delete)<br>• to = {CSEBaseName}/{group}/fanOutPoint<br>• fr = AE-ID<br>• rqi = (token-string) |
| | | PRO Check HTTP | Sent request contains<br>• Request method = DELETE<br>• Request-Target: {CSEBaseName}/{group}/fanOutPoint<br>• Host: IP address or the FQDN of Registrar CSE<br>• X-M2M-RI: (token-string)<br>• X-M2M-Origin: AE-ID |
| | | PRO Check CoAP | Sent request contains<br>• Method: 0.04 (DELETE)<br>• Uri-Host: IP address or the FQDN of Registrar CSE<br>• Uri-Path: {CSEBaseName}/{group}/fanoutPoint<br>• oneM2M-FR: AE-ID<br>• oneM2M-RQI: (token-string) |
| | | PRO Check MQTT | Sent MQTT PUBLISH message:<br>Topic: "/oneM2M/req/<AE-ID>/<Registrar CSE-ID>"<br>Payload:<br>• op = 4 (Delete)<br>• to = {CSEBaseName}/{group}/fanOutPoint<br>• fr = AE-ID<br>• rqi = (token-string) |
| 3 | Check Mca | PRO Check Primitive | • rsc = 2002 (DELETED)<br>• rqi = (token-string) same as received in request message<br>• pc = aggregated response |
| | | PRO Check HTTP | Registrar CSE sends response containing:<br>• Status Code = 200 (OK)<br>• X-M2M-RSC: 2002<br>• X-M2M-RI: (token-string) same as received in request message<br>• Content-Type: application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json<br>• Message-body: aggregated response |
| | | PRO Check CoAP | Registrar CSE sends response containing:<br>• Response Code = 2.02<br>• oneM2M-RSC: 2002<br>• oneM2M-RQI: (token-string) same as received in request message<br>• Payload: aggregated response |
| | | PRO Check MQTT | Sent a MQTT PUBLISH message:<br>Topic: "/oneM2M/resp/<AE-ID>/<Registrar CSE-ID>"<br>Payload: |

| Interoperability Test Description | | | |
|---|---|---|---|
| | | | • to = AE-ID<br>• fr = Registrar CSE-ID<br>• rsc = 2002 (DELETED)<br>• rqi = (token-string) same as received in request message<br>• pc = aggregated response |
| 4 | | Verify | Check if possible that the *oldest* <contentInstance> resource has been removed in registrar CSE. |
| 5 | | Verify | AE indicates successful operation |
| IOP Verdict | | Verify that the aggregrate response includes responses from each member of the group | |
| PRO Verdict | | | |

## 8.1.13 Notifcation Management

### 8.1.13.1 Notification Create

| Interoperability Test Description | | | |
|---|---|---|---|
| **Identifier:** | | TD_M2M_NH_48 | |
| **Objective:** | | AE receives a notification request from the HOST CSE | |
| **Configuration:** | | M2M_CFG_01 | |
| **References:** | | TS-0001 [1], clause 10.2.12<br>TS-0004 [2], clause 7.4.1 | |
| | | | |
| **Pre-test conditions:** | | • AE1 has created an application resource <AE> on registrar CSE<br>• AE1 has created a container resource <container> on registrar CSE<br>• AE1 has created a <subscription> as a child resource of a <container><br>• AE2 has created an application resource <AE> on registrar CSE<br>• AE2 has permisions to CREATE a Content Instance in the container created by AE1 | |
| **Test Sequence** | | | |
| **Step** | **RP** | **Type** | **Description** |
| 1 | | Stimulus | AE2 is requested to send a Create request to create <contentInstance> in the <container> created by AE1. This triggers or causes the HOST CSE to send a notification to AE1. |
| 2 | Check Mca | PRO Check Primitive | • op = 5 (Notify)<br>• to = notificationURI of subscription resource<br>• from = Registrar CSE-ID<br>• rqi = (token-string)<br>• pc = Serialized representation of Notification data object |
| | | PRO Check HTTP | Sent request contains<br>• Request method = POST<br>• Request-Target: notificationURI of subscription resource<br>• Host: IP address or FQDN of notificationURI<br>• X-M2M-RI: (token-string)<br>• X-M2M-Origin: {CSEBaseName}<br>• Content-Type: application/vnd.onem2m-ntfy+xml; or application/vnd.onem2m-ntfy+json;<br>• Message-body: Serialized Representation of Notification data object |
| | | PRO Check CoAP | Sent request contains<br>• Method: 0.02 (POST)<br>• Uri-Host: notificationURI host<br>• Uri-Port: notificationURI port<br>• Uri-Path: AE1 AE-ID<br>• oneM2M-FR: Registrar CSE-ID<br>• oneM2M-RQI: (token-string)<br>• Content-Format: application/vnd.onem2m-ntfy+xml; or application/vnd.onem2m-ntfy+json;<br>• Payload: Serialized Representation of Notification data object |
| | | PRO Check MQTT | Sent MQTT PUBLISH message:<br>Topic: "/oneM2M/req/<Registrar CSE-ID>/<AE-ID>"<br>Payload:<br>• op = 5 (Notify)<br>• to = notificationURI of subscription resource |

| Interoperability Test Description | | | |
|---|---|---|---|
| | | | • fr = Registrar CSE-ID<br>• rqi = (token-string)<br>• pc = empty |
| 4 | | IOP Check | Check if the notification representation |
| 7 | Check Mca | PRO Check Primitive | Sent response contains<br>• rsc = 2000 (OK)<br>• rqi = (token-string) same as received in request message |
| | | PRO Check HTTP | Sent response contains:<br>• Status Code = 200 (OK)<br>• X-M2M-RSC: 2000<br>• X-M2M-RI: (token-string) same as received in request message |
| | | PRO Check CoAP | Sent response contains:<br>• Response Code = 2.01<br>• oneM2M-RSC: 2000(OK)<br>• oneM2M-RQI: (token-string) same as received in request message |
| | | PRO Check MQTT | Sent MQTT PUBLISH message:<br>Topic: "/oneM2M/resp/<Registrar CSE-ID>/<AE-ID>"<br>Payload:<br>• to = Registrar CSE-ID<br>• fr = AE1 AE-ID<br>• rsc = 2000(OK)<br>• rqi = (token-string) same as received in request message |
| 8 | | IOP Check | AE1 indicates notification received |
| IOP Verdict | | | |
| PRO Verdict | | | |

# 8.2 Non blocking configuration testing

## 8.2.1 Synchronous request

### 8.2.1.1 Container management

#### 8.2.1.1.1 Container Create

| Interoperability Test Description | | | |
|---|---|---|---|
| **Identifier:** | | | TD_M2M_NB_01 |
| **Objective:** | | | AE creates a <Container> resource using non blocking synchronous request in registrar CSE. |
| **Configuration:** | | | M2M_CFG_01 |
| **References:** | | | TS-0001 [1], clause 10.2.4.1<br>TS-0004 [2], clause 7.3.6.2.1 |
| | | | |
| **Pre-test conditions:** | | | |
| **Test Sequence** | | | |
| **Step** | **RP** | **Type** | **Description** |
| 1 | | Stimulus | AE is requested to send a non blocking synchronous request to create a <Container> resource in registrar CSE |
| 2 | Mca | PRO Check Primitive | Sent request contains<br>• op = 1 (Create)<br>• to = {CSEBaseName}<br>• fr= AE-ID<br>• rqi = (token-string)<br>• rt = 1 (non blocking synchronous)<br>• ty = 3 (container)<br>• pc = Serialized Representationof the <Container> resource |
| | | PRO Check HTTP | Sent request contains<br>• Request method = POST<br>• Reques-Target: {CSEBaseName}?rt=1<br>• Host: IP address or the FQDN of Registrar CSE<br>• X-M2M-RI: (token-string) |

| Interoperability Test Description | | | |
|---|---|---|---|
| | | | • X-M2M-Origin: AE-ID<br>• Content Type = application/vnd.onem2m-res+xml; ty=3 or application/vnd.onem2m-res+json; ty=3<br>• Message-Body: Serialized Representation of <Container> resource |
| | | PRO Check CoAP | Sent request contains<br>• Method: 0.02 (POST)<br>• Uri-Host: IP address or the FQDN of Registrar CSE<br>• Uri-Path: {CSEBaseName}<br>• Uri-Query: rt=1<br>• oneM2M-FR: AE-ID<br>• oneM2M-RQI: (token-string)<br>• Content Type = application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json<br>• oneM2M-TY: 3<br>• Payload: Serialized Representation of <Container> resource |
| | | PRO Check MQTT | Sent MQTT PUBLISH message:<br>Topic: "/oneM2M/req/< AE-ID>/<Registrar CSE-ID>"<br>Payload:<br>• op = 1 (Create)<br>• to = {CSEBaseName}<br>• fr= AE-ID<br>• rqi = (token-string)<br>• rt = 1 (non blocking synchronous)<br>• ty = 3 (container)<br>• pc = Serialized Representationof the <Container> resource |
| 3 | Mca | PRO Check Primitive | Registrar CSE creates an internal <Request> resource and sends acknowledgement response containing:<br>• rsc = 1000 (Accepted)<br>• rqi = token-string) same as received in request message<br>• pc = Reference to the created <Request> resource |
| | | PRO Check HTTP | Registrar CSE creates an internal <Request> resource and sends acknowledgement response containing:<br>• Status Code = 202<br>• X-M2M-RSC: 1000<br>• X-M2M-RI= token-string) same as received in request message<br>• Message-Body: Reference to the created <Request> resource |
| | | PRO Check CoAP | Registrar CSE creates an internal <Request> resource and sends acknowledgement response containing:<br>• Response Code = None<br>• oneM2M-RSC=1000<br>• oneM2M-RQI = token-string) same as received in request message<br>• Payload: Reference to the created <Request> resource |
| | | PRO Check MQTT | Sent MQTT PUBLISH message:<br>Topic: "/oneM2M/resp/< AE-ID>/<Registrar CSE-ID>"<br>Payload:<br>• to = AE-ID<br>• fr = Registrar CSE-ID<br>• rqi = (token-string) same as received in request message<br>• rsc = 1000 (Accepted)<br>• pc = Reference to the created <Request> resource |
| 4 | | IOP Check | AE indicates successful operation |
| 5 | | Stimulus | AE is requested to wait then send a retrieve request to <Request> reference |
| 6 | Mca | PRO Check Primitive | Sent Retrieve request contains<br>• op = 2 (Retrieve)<br>• to = <Request> reference<br>• fr = AE-ID<br>• rqi = (token-string)<br>• pc = empty |
| | | PRO Check HTTP | Sent GET request contains<br>• Request method = GET<br>• Request URI: <Request> reference<br>• Host: IP address or the FQDN of Registrar CSE<br>• X-M2M-RI: (token-string)<br>• X-M2M-Origin: AE-ID<br>• Message-Body: empty |

| Interoperability Test Description | | | |
|---|---|---|---|
| | | PRO Check CoAP | Sent GET request contains<br>• Method: 0.01 (GET)<br>• Uri-Host: IP address or the FQDN of Registrar CSE<br>• Uri-Path: <Request> reference<br>• oneM2M-FR: AE-ID<br>• oneM2M-RQI: (token-string)<br>• Payload: empty |
| | | PRO Check MQTT | Sent MQTT PUBLISH message:<br>Topic: "/oneM2M/req/< AE-ID>/<Registrar CSE-ID>"<br>Payload:<br>• op = 2<br>• to = <Request> reference<br>• fr = AE-ID<br>• rqi = (token-string)<br>• pc = empty |
| 7 | Mca | PRO Check Primitive | • rsc = 2000 (OK)<br>• rqi = (token-string) same as received in request message<br>• pc = <Request> resource with the parameter "requestStatus" set to 1 (COMPLETED) and the "operationResult" parameter containing the <Container> resource. |
| | | PRO Check HTTP | Registrar CSE sends response to AE containing:<br>• Status Code = 200<br>• X-M2M-RSC: 2000<br>• X-M2M-RI= (token-string) same as received in request message<br>• Content-Type; application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json<br>• Message-Body: <Request> resource with the parameter "requestStatus" set to 1 (COMPLETED) and the "operationResult" parameter containing the <Container> resource. |
| | | PRO Check CoAP | Registrar CSE sends response to AE containing:<br>• Response Code= 2.05<br>• oneM2M-RSC: 2000<br>• oneM2M-RQI: (token-string) same as received in request message<br>• Content-format; application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json<br>• Payload: <Request> resource with the parameter "requestStatus" set to 1 (COMPLETED) and the "operationResult" parameter containing the <Container> resource. |
| | | PRO Check MQTT | Sent MQTT PUBLISH message:<br>Topic: "/oneM2M/resp/< AE-ID>/<Registrar CSE-ID>"<br>Payload:<br>• to = AE-ID<br>• fr = Registrar CSE-ID<br>• rqi = (token-string) same as received in request message<br>• rsc = 2000 (OK)<br>• pc = <Request> resource with the parameter "requestStatus" set to 1 (COMPLETED) and the "operationResult" parameter containing the <Container> resource. |
| 8 | | IOP Check | AE indicates successful operation |
| IOP Verdict | | | |
| PRO Verdict | | | |

8.2.1.1.2 Container Retrieve

| Interoperability Test Description | | | |
|---|---|---|---|
| **Identifier:** | | | TD_M2M_NB_02 |
| **Objective:** | | | AE retrieves a <container> resource using non blocking synchronous request from registrar CSE. |
| **Configuration:** | | | M2M_CFG_01 |
| **References:** | | | TS-0001 [1], clause 10.2.4.1<br>TS-0004 [2], clause 7.3.6.2.1 |
| | | | |
| **Pre-test conditions:** | | | • AE has created a <Container> resource in registrar CSE. |
| **Test Sequence** | | | |
| **Step** | **RP** | **Type** | **Description** |
| 1 | | Stimulus | AE is requested to send a non blocking synchronous request to retrieve the <Container> resource from registrar CSE. |

| Interoperability Test Description | | | |
|---|---|---|---|
| 2 | Mca | PRO Check Primitive | Sent request contains<br>• op = 2 (Retrieve)<br>• to = {CSEBaseName}/URI of <container> resource<br>• fr= AE-ID<br>• rqi = (token-string)<br>• rt = 1 (non blocking synchronous)<br>• pc = empty |
| | | PRO Check HTTP | Sent request contains<br>• Request method = POST<br>• Reques-Target: {CSEBaseName}/URI of <Container> resource ?rt=1<br>• Host: IP address or the FQDN of Registrar CSE<br>• X-M2M-RI: (token-string)<br>• X-M2M-Origin: AE-ID<br>• Message-Body: empty |
| | | PRO Check CoAP | Sent request contains<br>• Method: 0.01 (GET)<br>• Uri-Host: IP address or the FQDN of Registrar CSE<br>• Uri-Path: {CSEBaseName}/URI of <Container> resource<br>• Uri-Query: rt=1<br>• oneM2M-FR: AE-ID<br>• oneM2M-RQI: (token-string)<br>• Payload: empty |
| | | PRO Check MQTT | Sent MQTT PUBLISH message:<br>Topic: "/oneM2M/req/< AE-ID>/<Registrar CSE-ID>"<br>Payload:<br>• op = 2 (Retrieve)<br>• to = {CSEBaseName}/URI of <Container> resource<br>• fr= AE-ID<br>• rqi = (token-string)<br>• rt = 1 (non blocking synchronous)<br>• pc = empty |
| 3 | Mca | PRO Check Primitive | Registrar CSE creates an internal <Request> resource and sends acknowledgement response containing:<br>• rsc = 1000 (Accepted)<br>• rqi = token-string) same as received in request message<br>• pc = Reference to the created <Request> resource |
| | | PRO Check HTTP | Registrar CSE creates an internal <Request> resource and sends acknowledgement response containing:<br>• Status Code = 202<br>• X-M2M-RSC: 1000<br>• X-M2M-RI= token-string) same as received in request message<br>• Message-Body: Reference to the created <Request> resource |
| | | PRO Check CoAP | Registrar CSE creates an internal <Request> resource and sends acknowledgement response containing:<br>• Response Code = None<br>• oneM2M-RSC=1000<br>• oneM2M-RQI = (token-string) same as received in request message<br>• Payload: Reference to the created <Request> resource |
| | | PRO Check MQTT | Sent MQTT PUBLISH message:<br>Topic: "/oneM2M/resp/< AE-ID>/<Registrar CSE-ID>"<br>Payload:<br>• to = AE-ID<br>• fr = Registrar CSE-ID<br>• rqi = token-string) same as received in request message<br>• rsc = 1000 (Accepted)<br>• pc = Reference to the created <Request> resource |
| 4 | | IOP Check | AE indicates successful operation |
| 5 | | Stimulus | AE is requested to send a retrieve request to <Request> reference |
| 6 | Mca | PRO Check Primitive | Sent Retrieve request contains<br>• op = 2 (Retrieve)<br>• to = <Request> reference<br>• fr = AE-ID<br>• rqi = (token-string)<br>• pc = empty |

| Interoperability Test Description | | | |
|---|---|---|---|
| | | PRO Check HTTP | Sent GET request contains<br>• Request method = GET<br>• Request URI: <Request> reference<br>• Host: IP address or the FQDN of Registrar CSE<br>• X-M2M-RI: (token-string)<br>• X-M2M-Origin: AE-ID<br>• Message-Body: empty |
| | | PRO Check CoAP | Sent GET request contains<br>• Method: 0.01 (GET)<br>• Uri-Host: IP address or the FQDN of Registrar CSE<br>• Uri-Path: <Request> reference<br>• oneM2M-FR: AE-ID<br>• oneM2M-RQI: (token-string)<br>• Payload: empty |
| | | PRO Check MQTT | Sent MQTT PUBLISH message:<br>Topic: "/oneM2M/req/< AE-ID>/<Registrar CSE-ID>"<br>Payload:<br>• op = 2<br>• to = <Request> reference<br>• fr = AE-ID<br>• rqi = (token-string)<br>• pc = empty |
| 7 | Mca | PRO Check Primitive | • rsc = 2000 (OK)<br>• rqi = (token-string) same as received in request message<br>• pc = <Request> resource with the parameter "requestStatus" set to 1 (COMPLETED) and the "operationResult" parameter containing the <Container> resource. |
| | | PRO Check HTTP | Registrar CSE sends response to AE containing:<br>• Status Code = 200<br>• X-M2M-RSC: 2000<br>• X-M2M-RI= (token-string) same as received in request message<br>• Content-Type; application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json<br>• Message-Body: <Request> resource with the parameter "requestStatus" set to 1 (COMPLETED) and the "operationResult" parameter containing the <Container> resource. |
| | | PRO Check CoAP | Registrar CSE sends response to AE containing:<br>• Response Code= 2.05<br>• oneM2M-RSC: 2000<br>• oneM2M-RQI: (token-string) same as received in request message<br>• Content-format; application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json<br>• Payload: <Request> resource with the parameter "requestStatus" set to 1 (COMPLETED) and the "operationResult" parameter containing the <Container> resource. |
| | | PRO Check MQTT | Sent MQTT PUBLISH message:<br>Topic: "/oneM2M/resp/< AE-ID>/<Registrar CSE-ID>"<br>Payload:<br>• to = AE-ID<br>• fr = Registrar CSE-ID<br>• rqi = (token-string) same as received in request message<br>• rsc = 2000 (OK)<br>• pc = <Request> resource with the parameter "requestStatus" set to 1 (COMPLETED) and the "operationResult" parameter containing the <Container> resource. |
| 8 | | IOP Check | AE indicates successful operation |
| IOP Verdict | | | |
| PRO Verdict | | | |

8.2.1.1.3 Container Update

| Interoperability Test Description | | | |
|---|---|---|---|
| **Identifier:** | | | TD_M2M_NB_03 |
| **Objective:** | | | AE updates a <Container> resource using non blocking synchronous request in registrar CSE. |
| **Configuration:** | | | M2M_CFG_01 |
| **References:** | | | TS-0001 [1], clause 10.2.4.1<br>TS-0004 [2], clause 7.3.6.2.1 |
| | | | |
| **Pre-test conditions:** | | | • AE has created a <Container> resource in registrar CSE. |
| **Test Sequence** | | | |
| **Step** | **RP** | **Type** | **Description** |
| 1 | | Stimulus | AE is requested to send a non blocking synchronous request to update the <Container> resource. |
| 2 | Mca | PRO Check Primitive | Sent request contains<br>• op = 3 (Update)<br>• to = {CSEBaseName}/URI of <Container> resource<br>• fr= AE-ID<br>• rqi = (token-string)<br>• rt = 1 (non blocking synchronous)<br>• pc = Serialized Representation of the updated <Container> resource |
| | | PRO Check HTTP | Sent request contains<br>• Request method = UPDATE<br>• Reques-Target: {CSEBaseName}/URI of <Container> resource?rt=1<br>• Host: IP address or the FQDN of Registrar CSE<br>• X-M2M-RI: (token-string)<br>• X-M2M-Origin: AE-ID<br>• Content Type = application/vnd.onem2m-res+xml; or application/vnd.onem2m-res+json;<br>• Message-Body: Serialized Representation of updated <Container> resource |
| | | PRO Check CoAP | Sent request contains<br>• Method: 0.03 (UPDATE)<br>• Uri-Host: IP address or the FQDN of Registrar CSE<br>• Uri-Path: {CSEBaseName}/URI of <Container> resource<br>• Uri-Query: rt=1<br>• oneM2M-FR: AE-ID<br>• oneM2M-RQI: (token-string)<br>• Content Type = application/vnd.onem2m-res+xml; or application/vnd.onem2m-res+json;<br>• Payload: Serialized Representation of updated <Container> resource |
| | | PRO Check MQTT | Sent MQTT PUBLISH message:<br>Topic: "/oneM2M/req/< AE-ID>/<Registrar CSE-ID>"<br>Payload:<br>• op = 3 (Update)<br>• to = {CSEBaseName}/URI of <Container> resource<br>• fr= AE-ID<br>• rqi = (token-string)<br>• rt = 1 (non blocking synchronous)<br>• pc = Serialized Representation of updated <Container> resource |
| 3 | Mca | PRO Check Primitive | Registrar CSE creates an internal <Request> resource and sends acknowledgement response containing:<br>• rsc = 1000 (Accepted)<br>• rqi = token-string) same as received in request message<br>• pc = Reference to the created <Request> resource |
| | | PRO Check HTTP | Registrar CSE creates an internal <Request> resource and sends acknowledgement response containing:<br>• Status Code = 202<br>• X-M2M-RSC: 1000<br>• X-M2M-RI= token-string) same as received in request message<br>• Message-Body: Reference to the created <Request> resource |
| | | PRO Check CoAP | Registrar CSE creates an internal <Request> resource and sends acknowledgement response containing:<br>• Response Code = None<br>• oneM2M-RSC=1000 |

| Interoperability Test Description | | | |
|---|---|---|---|
| | | | • oneM2M-RQI = token-string) same as received in request message<br>• Payload: Reference to the created <Request> resource |
| | | PRO Check MQTT | Sent MQTT PUBLISH message:<br>Topic: "/oneM2M/resp/< AE-ID>/<Registrar CSE-ID>"<br>Payload:<br>• to = AE-ID<br>• fr = Registrar CSE-ID<br>• rqi = token-string) same as received in request message<br>• rsc = 1000 (Accepted)<br>• pc = Reference to the created <Request> resource |
| 4 | | IOP Check | AE indicates successful operation |
| 5 | | Stimulus | AE is requested to wait then send a retrieve request to <Request> reference |
| 6 | Mca | PRO Check Primitive | Sent Retrieve request contains<br>• op = 2 (Retrieve)<br>• to = <Request> reference<br>• fr = AE-ID<br>• rqi = (token-string)<br>• pc = empty |
| | | PRO Check HTTP | Sent GET request contains<br>• Request method = GET<br>• Request URI: <Request> reference<br>• Host: IP address or the FQDN of Registrar CSE<br>• X-M2M-RI: (token-string)<br>• X-M2M-Origin: AE-ID<br>• Message-Body: empty |
| | | PRO Check CoAP | Sent GET request contains<br>• Method: 0.01 (GET)<br>• Uri-Host: IP address or the FQDN of Registrar CSE<br>• Uri-Path: <Request> reference<br>• oneM2M-FR: AE-ID<br>• oneM2M-RQI: (token-string)<br>• Payload: empty |
| | | PRO Check MQTT | Sent MQTT PUBLISH message:<br>Topic: "/oneM2M/req/< AE-ID>/<Registrar CSE-ID>"<br>Payload:<br>• op = 2<br>• to = <Request> reference<br>• fr = AE-ID<br>• rqi = (token-string)<br>• pc = empty |
| 7 | Mca | PRO Check Primitive | • rsc = 2000 (OK)<br>• rqi = (token-string) same as received in request message<br>• pc = <Request> resource with the parameter "requestStatus" set to 1 (COMPLETED) and the "operationResult" parameter containing the <Container> resource. |
| | | PRO Check HTTP | Registrar CSE sends response to AE containing:<br>• Status Code = 200<br>• X-M2M-RSC: 2000<br>• X-M2M-RI= (token-string) same as received in request message<br>• Content-Type; application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json<br>• Message-Body: <Request> resource with the parameter "requestStatus" set to 1 (COMPLETED) and the "operationResult" parameter containing the <Container> resource. |
| | | PRO Check CoAP | Registrar CSE sends response to AE containing:<br>• Response Code= 2.05<br>• oneM2M-RSC: 2000<br>• oneM2M-RQI: (token-string) same as received in request message<br>• Content-format; application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json<br>• Payload: <Request> resource with the parameter "requestStatus" set to 1 (COMPLETED) and the "operationResult" parameter containing the <Container> resource. |
| | | PRO Check MQTT | Sent MQTT PUBLISH message:<br>Topic: "/oneM2M/resp/< AE-ID>/<Registrar CSE-ID>"<br>Payload:<br>• to = AE-ID |

| Interoperability Test Description | | | |
|---|---|---|---|
| | | | • fr = Registrar CSE-ID<br>• rqi = (token-string) same as received in request message<br>• rsc = 2000 (OK)<br>• pc = <Request> resource with the parameter "requestStatus" set to 1 (COMPLETED) and the "operationResult" parameter containing the <Container> resource. |
| 8 | | IOP Check | AE indicates successful operation |
| IOP Verdict | | | |
| PRO Verdict | | | |

8.2.1.1.4 Container Delete

| Interoperability Test Description | | | |
|---|---|---|---|
| **Identifier:** | | | TD_M2M_NB_04 |
| **Objective:** | | | AE deletes a Container resource using non blocking synchronous request. |
| **Configuration:** | | | M2M_CFG_01 |
| **References:** | | | TS-0001 [1], clause 10.2.4.1<br>TS-0004 [2], clause 7.3.6.2.1 |
| | | | |
| **Pre-test conditions:** | | | • AE has created <Container> resource on registrar CSE. |
| **Test Sequence** | | | |
| **Step** | **RP** | **Type** | **Description** |
| 1 | | Stimulus | AE is requested to send a non blocking synchronous request to delete the <Container> resource. |
| 2 | Mca | PRO Check Primitive | Sent request contains<br>• op = 4 (Delete)<br>• to = {CSEBaseName}/URI of <container> resource<br>• fr= AE-ID<br>• rqi = (token-string)<br>• rt = 1 (non blocking synchronous)<br>• pc = empty |
| | | PRO Check HTTP | Sent request contains<br>• Request method = DELETE<br>• Reques-Target: {CSEBaseName}/URI of <Container> resource ?rt=1<br>• Host: IP address or the FQDN of Registrar CSE<br>• X-M2M-RI: (token-string)<br>• X-M2M-Origin: AE-ID<br>• Message-Body: empty |
| | | PRO Check CoAP | Sent request contains<br>• Method: 0.04 (DELETE)<br>• Uri-Host: IP address or the FQDN of Registrar CSE<br>• Uri-Path: {CSEBaseName}/URI of <Container> resource<br>• Uri-Query: rt=1<br>• oneM2M-FR: AE-ID<br>• oneM2M-RQI: (token-string)<br>• Payload: empty |
| | | PRO Check MQTT | Sent MQTT PUBLISH message:<br>Topic: "/oneM2M/req/< AE-ID>/<Registrar CSE-ID>"<br>Payload:<br>• op = 4 (Delete)<br>• to = {CSEBaseName}/URI of <Container> resource<br>• fr= AE-ID<br>• rqi = (token-string)<br>• rt = 1 (non blocking synchronous)<br>• pc = empty |
| 3 | Mca | PRO Check Primitive | Registrar CSE creates an internal <Request> resource and sends acknowledgement response containing:<br>• rsc = 1000 (Accepted)<br>• rqi = token-string) same as received in request message<br>• pc = Reference to the created <Request> resource |
| | | PRO Check HTTP | Registrar CSE creates an internal <Request> resource and sends acknowledgement response containing:<br>• Status Code = 202<br>• X-M2M-RSC: 1000 |

| Interoperability Test Description | | | |
|---|---|---|---|
| | | | • X-M2M-RI= token-string) same as received in request message<br>• Message-Body: Reference to the created <Request> resource |
| | | PRO Check CoAP | Registrar CSE creates an internal <Request> resource and sends acknowledgement response containing:<br>• Response Code = None<br>• oneM2M-RSC=1000<br>• oneM2M-RQI = (token-string) same as received in request message<br>• Payload: Reference to the created <Request> resource |
| | | PRO Check MQTT | Sent MQTT PUBLISH message:<br>Topic: "/oneM2M/resp/< AE-ID>/<Registrar CSE-ID>"<br>Payload:<br>• to = AE-ID<br>• fr = Registrar CSE-ID<br>• rqi = token-string) same as received in request message<br>• rsc = 1000 (Accepted)<br>• pc = Reference to the created <Request> resource |
| 4 | | IOP Check | AE indicates successful operation |
| 5 | | Stimulus | AE is requested to send a retrieve request to <Request> reference |
| 6 | Mca | PRO Check Primitive | Sent Retrieve request contains<br>• op = 2 (Retrieve)<br>• to = <Request> reference<br>• fr = AE-ID<br>• rqi = (token-string)<br>• pc = empty |
| | | PRO Check HTTP | Sent GET request contains<br>• Request method = GET<br>• Request URI: <Request> reference<br>• Host: IP address or the FQDN of Registrar CSE<br>• X-M2M-RI: (token-string)<br>• X-M2M-Origin: AE-ID<br>• Message-Body: empty |
| | | PRO Check CoAP | Sent GET request contains<br>• Method: 0.01 (GET)<br>• Uri-Host: IP address or the FQDN of Registrar CSE<br>• Uri-Path: <Request> reference<br>• oneM2M-FR: AE-ID<br>• oneM2M-RQI: (token-string)<br>• Payload: empty |
| | | PRO Check MQTT | Sent MQTT PUBLISH message:<br>Topic: "/oneM2M/req/< AE-ID>/<Registrar CSE-ID>"<br>Payload:<br>• op = 2<br>• to = <Request> reference<br>• fr = AE-ID<br>• rqi = (token-string)<br>• pc = empty |
| 7 | Mca | PRO Check Primitive | • rsc = 2000 (OK)<br>• rqi = (token-string) same as received in request message<br>• pc = <Request> resource with the parameter "requestStatus" set to 1 (COMPLETED) |
| | | PRO Check HTTP | Registrar CSE sends response to AE containing:<br>• Status Code = 200<br>• X-M2M-RSC: 2000<br>• X-M2M-RI= (token-string) same as received in request message<br>• Content-Type; application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json<br>• Message-Body: <Request> resource with the parameter "requestStatus" set to 1 (COMPLETED) |
| | | PRO Check CoAP | Registrar CSE sends response to AE containing:<br>• Response Code= 2.05<br>• oneM2M-RSC: 2000<br>• oneM2M-RQI: (token-string) same as received in request message<br>• Content-format; application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json<br>• Payload: <Request> resource with the parameter "requestStatus" set to 1 (COMPLETED) |
| | | PRO Check | Sent MQTT PUBLISH message: |

| Interoperability Test Description | | | |
|---|---|---|---|
| | | MQTT | Topic: "/oneM2M/resp/< AE-ID>/<Registrar CSE-ID>"<br>Payload:<br>• to = AE-ID<br>• fr = Registrar CSE-ID<br>• rqi = (token-string) same as received in request message<br>• rsc = 2000 (OK)<br>• pc = <Request> resource with the parameter "requestStatus" set to 1 (COMPLETED) |
| 8 | | IOP Check | AE indicates successful operation |
| IOP Verdict | | | |
| PRO Verdict | | | |

## 8.2.2 Asynchronous request

### 8.2.2.1 Container management

#### 8.2.2.1.1 Container Create

| Interoperability Test Description | | | |
|---|---|---|---|
| **Identifier:** | | TD_M2M_NB_05 | |
| **Objective:** | | AE creates a <Container> resource using non blocking asynchronous request | |
| **Configuration:** | | M2M_CFG_01 | |
| **References:** | | TS-0001 [1], clause 10.2.4.1<br>TS-0004 [2], clause 7.3.6.2.1 | |
| | | | |
| **Pre-test conditions:** | | • AE is reachable on the URI: "AE-Notification-URI" | |
| **Test Sequence** | | | |
| **Step** | **RP** | **Type** | **Description** |
| 1 | | Stimulus | AE is requested to send a non blocking asynchronous request to create the <Container> resource in registrar CSE. |
| 2 | Mca | PRO Check Primitive | Sent request contains<br>• op = 1 (Create)<br>• to = {CSEBaseName}<br>• fr= AE-ID<br>• rqi = (token-string)<br>• rt = 2 (non blocking asynchronous)<br>• ty = 3 (container)<br>• nu= AE-Notification-URI<br>• oneM2M-RQI: Request-ID<br>• pc = Serialized Representationof the <Container> resource |
| | | PRO Check HTTP | Sent request contains<br>• Request method = POST<br>• Reques-Target: {CSEBaseName}?rt=2<br>• Host: IP address or the FQDN of Registrar CSE<br>• X-M2M-RI: (token-string)<br>• X-M2M-Origin: AE-ID<br>• X-M2M-RTU: AE-Notification-URI<br>• Content Type = application/vnd.onem2m-res+xml; ty=3 or application/vnd.onem2m-res+json; ty=3<br>• Message-Body: Serialized Representation of <Container> resource |
| | | PRO Check CoAP | Sent request contains<br>• Method: 0.02 (POST)<br>• Uri-Host: IP address or the FQDN of Registrar CSE<br>• Uri-Path: {CSEBaseName}<br>• Uri-Query: rt=1<br>• oneM2M-FR: AE-ID<br>• oneM2M-RQI: (token-string)<br>• oneM2M-RTURI: AE-Notification-URI<br>• Content Type = application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json<br>• oneM2M-TY: 3<br>• Payload: Serialized Representation of <Container> resource |
| | | PRO Check | Sent MQTT PUBLISH message: |

| Interoperability Test Description | | | |
|---|---|---|---|
| | | MQTT | Topic: "/oneM2M/req/< AE-ID>/<Registrar CSE-ID>"<br>Payload:<br>• op = 1 (Create)<br>• to = {CSEBaseName}<br>• fr = AE-ID<br>• rqi = (token-string)<br>• rt = 2 (non blocking asynchronous)<br>• ty = 3 (container)<br>• nu= AE-Notification-URI<br>• pc = Serialized Representationof the <Container> resource |
| 3 | Mca | PRO Check Primitive | Registrar CSE creates an internal <Request> resource and sends acknowledgement response containing:<br>• rsc = 1000 (Accepted)<br>• rqi = token-string) same as received in request message<br>• pc = Reference to the created <Request> resource |
| | | PRO Check HTTP | Registrar CSE creates an internal <Request> resource and sends acknowledgement response containing:<br>• Status Code = 202<br>• X-M2M-RSC: 1000<br>• X-M2M-RI= token-string) same as received in request message<br>• Message-Body: Reference to the created <Request> resource |
| | | PRO Check CoAP | Registrar CSE creates an internal <Request> resource and sends acknowledgement response containing:<br>• Response Code = None<br>• oneM2M-RSC = 1000<br>• oneM2M-RQI = token-string) same as received in request message<br>• Payload: Reference to the created <Request> resource |
| | | PRO Check MQTT | Sent MQTT PUBLISH message:<br>Topic: "/oneM2M/resp/< AE-ID>/<Registrar CSE-ID>"<br>Payload:<br>• to = AE-ID<br>• fr = Registrar CSE-ID<br>• rqi = (token-string) same as received in request message<br>• rsc = 1000 (Accepted)<br>• pc = Reference to the created <Request> resource |
| 4 | | IOP Check | AE indicates successful operation |
| 5 | | IOP Check | Registrar CSE sends notify request to AE |
| 6 | Mca | PRO Check Primitive | Sent request contains<br>• op = 5 (Notify)<br>• to = AE-Notification-URI<br>• fr = registrar CSE-ID<br>• rqi = (token-string)<br>• pc = Serialized representation of notification data object |
| | | PRO Check HTTP | Sent request contains<br>• Request method = POST<br>• Request URI: AE-Notification-URI<br>• Host: IP address or the FQDN of Registrar AE<br>• X-M2M-RI: (token-string)<br>• X-M2M-Origin: Registrar CSE-ID<br>• Message-Body: Serialized representation of notification data object |
| | | PRO Check CoAP | Sent request contains<br>• Method: 0.02 (POST)<br>• Uri-Host: IP address or the FQDN of Registrar AE<br>• Uri-Path: AE-Notification-URI<br>• oneM2M-RQI: (token-string)<br>• oneM2M-FR: Registrar CSE-ID<br>• Payload: Serialized representation of notification data object |
| | | PRO Check MQTT | Sent MQTT PUBLISH message:<br>Topic: "/oneM2M/req/< Registrar CSE-ID >/<AE-ID >"<br>Payload:<br>• op = 5 (Notify)<br>• to = AE-Notification-URI<br>• fr = Registrar CSE-ID<br>• rqi = (token-string) |

| Interoperability Test Description | | | |
|---|---|---|---|
| | | | • pc = empty |
| 7 | Mca | PRO Check Primitive | AE sends notify response to Registrar CSE containing:<br>• rsc = 2000 (OK)<br>• rqi = (token-string) same as received in request message |
| | | PRO Check HTTP | AE sends notify response to Registrar CSE containing:<br>• Code = 200<br>• X-M2M-RSC: 2000<br>• X-M2M-RI= (token-string) same as received in request message<br>• Message-Body = empty |
| | | PRO Check CoAP | AE sends notify response to Registrar CSE containing:<br>• Response Code= 2.05<br>• oneM2M-RQI = (token-string) same as received in request message<br>• Payload = empty |
| | | PRO Check MQTT | Sent MQTT PUBLISH message:<br>Topic: "/oneM2M/resp/<Registrar CSE-ID >/<AE-ID>"<br>Payload:<br>• to = AE-ID<br>• fr = Registrar CSE-ID<br>• rqi = (token-string) same as received in request message<br>• rsc = 2000 (OK) |
| 8 | | IOP Check | Registrar CSE indicates successful operation |
| IOP Verdict | | | |
| PRO Verdict | | | |

8.2.2.1.2 Container Retrieve

| Interoperability Test Description | | | |
|---|---|---|---|
| **Identifier:** | | | TD_M2M_NB_06 |
| **Objective:** | | | AE retrieves a <container> resource using non blocking asynchronous request |
| **Configuration:** | | | M2M_CFG_01 |
| **References:** | | | TS-0001 [1], clause 10.2.4.1<br>TS-0004 [2], clause 7.3.6.2.1 |
| | | | |
| **Pre-test conditions:** | | | • AE has created a <Container> resource on registrar CSE.<br>• AE is reachable on the URI: "AE-Notification-URI" |
| **Test Sequence** | | | |
| **Step** | **RP** | **Type** | **Description** |
| 1 | | Stimulus | AE is requested to send a non blocking asynchronous request to retrieve the <Container> resource from registrar CSE |
| 2 | Mca | PRO Check Primitive | Sent request contains<br>• op = 2 (Retrieve)<br>• to = {CSEBaseName}/URI of <container> resource<br>• fr = AE-ID<br>• rqi = (token-string)<br>• rt = 2 (non blocking asynchronous)<br>• nu = AE-Notification-URI<br>• pc = empty |
| | | PRO Check HTTP | Sent request contains<br>• Request method = POST<br>• Reques-Target: {CSEBaseName}/URI of <Container> resource ?rt=2<br>• Host: IP address or the FQDN of Registrar CSE<br>• X-M2M-RI: (token-string)<br>• X-M2M-Origin: AE-ID<br>• X-M2M-RTU: AE-Notification-URI<br>• Message-Body: empty |
| | | PRO Check CoAP | Sent request contains<br>• Method: 0.01 (GET)<br>• Uri-Host: IP address or the FQDN of Registrar CSE<br>• Uri-Path: {CSEBaseName}/URI of <Container> resource<br>• Uri-Query: rt=2<br>• oneM2M-FR: AE-ID<br>• oneM2M-RQI: (token-string)<br>• oneM2M-RTURI: AE-Notification-URI |

| Interoperability Test Description | | | |
|---|---|---|---|
| | | | • Payload: empty |
| | | PRO Check MQTT | Sent MQTT PUBLISH message:<br>Topic: "/oneM2M/req/< AE-ID>/<Registrar CSE-ID>"<br>Payload:<br>• op = 2 (Retrieve)<br>• to = {CSEBaseName}/URI of <Container> resource<br>• fr = AE-ID<br>• rqi = (token-string)<br>• rt = 2 (non blocking synchronous)<br>• nu = AE-Notification-URI<br>• pc = empty |
| | Mca | PRO Check Primitive | Registrar CSE creates an internal <Request> resource and sends acknowledgement response containing:<br>• rsc = 1000 (Accepted)<br>• rqi = token-string) same as received in request message<br>• pc = Reference to the created <Request> resource |
| | | PRO Check HTTP | Registrar CSE creates an internal <Request> resource and sends acknowledgement response containing:<br>• Status Code = 202<br>• X-M2M-RSC: 1000<br>• X-M2M-RI= token-string) same as received in request message<br>• Message-Body: Reference to the created <Request> resource |
| | | PRO Check CoAP | Registrar CSE creates an internal <Request> resource and sends acknowledgement response containing:<br>• Response Code = None<br>• oneM2M-RSC = 1000<br>• oneM2M-RQI = token-string) same as received in request message<br>• Payload: Reference to the created <Request> resource |
| | | PRO Check MQTT | Sent MQTT PUBLISH message:<br>Topic: "/oneM2M/resp/< AE-ID>/<Registrar CSE-ID>"<br>Payload:<br>• to = AE-ID<br>• fr = Registrar CSE-ID<br>• rqi = (token-string) same as received in request message<br>• rsc = 1000 (Accepted)<br>• pc = Reference to the created <Request> resource |
| 4 | | IOP Check | AE indicates successful operation |
| 5 | | IOP Check | Registrar CSE sends notify request to AE |
| 6 | Mca | PRO Check Primitive | Sent request contains<br>• op = 5 (Notify)<br>• to = AE-Notification-URI<br>• fr = registrar CSE-ID<br>• rqi = (token-string)<br>• pc = Serialized representation of notification data object |
| | | PRO Check HTTP | Sent request contains<br>• Request method = POST<br>• Request URI: AE-Notification-URI<br>• Host: IP address or the FQDN of Registrar AE<br>• X-M2M-RI: (token-string)<br>• X-M2M-Origin: Registrar CSE-ID<br>• Message-Body: Serialized representation of notification data object |
| | | PRO Check CoAP | Sent request contains<br>• Method: 0.02 (POST)<br>• Uri-Host: IP address or the FQDN of Registrar AE<br>• Uri-Path: AE-Notification-URI<br>• oneM2M-RQI: (token-string)<br>• oneM2M-FR: Registrar CSE-ID<br>• Payload: Serialized representation of notification data object |
| | | PRO Check MQTT | Sent MQTT PUBLISH message:<br>Topic: "/oneM2M/req/< Registrar CSE-ID >/<AE-ID >"<br>Payload:<br>• op = 5 (Notify)<br>• to = AE-Notification-URI<br>• fr = Registrar CSE-ID |

| Interoperability Test Description | | | |
|---|---|---|---|
| | | | • rqi = (token-string)<br>• pc=empty |
| 7 | Mca | PRO Check Primitive | AE sends notify response to Registrar CSE containing:<br>• rsc = 2000 (OK)<br>• rqi = (token-string) same as received in request message |
| | | PRO Check HTTP | AE sends notify response to Registrar CSE containing:<br>• Code = 200<br>• X-M2M-RSC: 2000<br>• X-M2M-RI= (token-string) same as received in request message<br>• Message-Body = empty |
| | | PRO Check CoAP | AE sends notify response to Registrar CSE containing:<br>• Response Code= 2.05<br>• oneM2M-RQI = (token-string) same as received in request message<br>• Payload = empty |
| | | PRO Check MQTT | Sent MQTT PUBLISH message:<br>Topic: "/oneM2M/resp/<Registrar CSE-ID >/<AE-ID>"<br>Payload:<br>• to = AE-ID<br>• fr = Registrar CSE-ID<br>• rqi = (token-string) same as received in request message<br>• rsc = 2000 (OK) |
| 8 | | IOP Check | Registrar CSE indicates successful operation |
| IOP Verdict | | | |
| PRO Verdict | | | |

### 8.2.2.1.3 Container Update

| Interoperability Test Description | | | |
|---|---|---|---|
| **Identifier:** | | | TD_M2M_NB_07 |
| **Objective:** | | | AE updates a <Container> resource using non blocking asynchronous request |
| **Configuration:** | | | M2M_CFG_01 |
| **References:** | | | TS-0001 [1], clause 10.2.4.1<br>TS-0004 [2], clause 7.3.6.2.1 |
| | | | |
| **Pre-test conditions:** | | | • AE has created a Container resource <Container> on registrar CSE<br>• AE is reachable on the URI: "AE-Notification-URI" |
| **Test Sequence** | | | |
| **Step** | **RP** | **Type** | **Description** |
| 1 | | Stimulus | AE is requested to send a non blocking asynchronous request to update the <Container> resource in registrar CSE. |
| 2 | Mca | PRO Check Primitive | Sent request contains<br>• op = 3 (Update)<br>• to = {CSEBaseName}/URI of <Container> resource<br>• fr = AE-ID<br>• rqi = (token-string)<br>• rt = 2 (non blocking asynchronous)<br>• nu = AE-Notification-URI<br>• pc = Serialized Representation of the updated <Container> resource |
| | | PRO Check HTTP | Sent request contains<br>• Request method = UPDATE<br>• Reques-Target: {CSEBaseName}/URI of <Container> resource?rt=2<br>• Host: IP address or the FQDN of Registrar CSE<br>• X-M2M-RI: (token-string)<br>• X-M2M-Origin: AE-ID<br>• X-M2M-RTU: AE-Notification-URI<br>• Content Type = application/vnd.onem2m-res+xml; or application/vnd.onem2m-res+json;<br>• Message-Body: Serialized Representation of updated <Container> resource |
| | | PRO Check CoAP | Sent request contains<br>• Method: 0.03 (UPDATE)<br>• Uri-Host: IP address or the FQDN of Registrar CSE<br>• Uri-Path: {CSEBaseName}/URI of <Container> resource<br>• Uri-Query: rt=2 |

| Interoperability Test Description | | | |
|---|---|---|---|
| | | | • oneM2M-FR: AE-ID<br>• oneM2M-RQI: (token-string)<br>• oneM2M-RTURI = AE-Notification-URI<br>• Content Type = application/vnd.onem2m-res+xml; or application/vnd.onem2m-res+json;<br>• Payload: Serialized Representation of updated <Container> resource |
| | | PRO Check MQTT | Sent MQTT PUBLISH message:<br>Topic: "/oneM2M/req/< AE-ID>/<Registrar CSE-ID>"<br>Payload:<br>• op = 3 (Update)<br>• to = {CSEBaseName}/URI of <Container> resource<br>• fr = AE-ID<br>• rqi = (token-string)<br>• rt = 2 (non blocking asynchronous)<br>• nu= AE-Notification-URI<br>• pc = Serialized Representation of updated <Container> resource |
| 3 | Mca | PRO Check Primitive | Registrar CSE creates an internal <Request> resource and sends acknowledgement response containing:<br>• rsc = 1000 (Accepted)<br>• rqi = token-string) same as received in request message<br>• pc = Reference to the created <Request> resource |
| | | PRO Check HTTP | Registrar CSE creates an internal <Request> resource and sends acknowledgement response containing:<br>• Status Code = 202<br>• X-M2M-RSC: 1000<br>• X-M2M-RI= token-string) same as received in request message<br>• Message-Body: Reference to the created <Request> resource |
| | | PRO Check CoAP | Registrar CSE creates an internal <Request> resource and sends acknowledgement response containing:<br>• Response Code = None<br>• oneM2M-RSC = 1000<br>• oneM2M-RQI = token-string) same as received in request message<br>• Payload: Reference to the created <Request> resource |
| | | PRO Check MQTT | Sent MQTT PUBLISH message:<br>Topic: "/oneM2M/resp/< AE-ID>/<Registrar CSE-ID>"<br>Payload:<br>• to = AE-ID<br>• fr = Registrar CSE-ID<br>• rqi = (token-string) same as received in request message<br>• rsc = 1000 (Accepted)<br>• pc = Reference to the created <Request> resource |
| 4 | | IOP Check | AE indicates successful operation |
| 5 | | IOP Check | Registrar CSE sends notify request to AE |
| 6 | Mca | PRO Check Primitive | Sent request contains<br>• op = 5 (Notify)<br>• to = AE-Notification-URI<br>• fr = registrar CSE-ID<br>• rqi = (token-string)<br>• pc = Serialized representation of notification data object |
| | | PRO Check HTTP | Sent request contains<br>• Request method = POST<br>• Request URI: AE-Notification-URI<br>• Host: IP address or the FQDN of Registrar AE<br>• X-M2M-RI: (token-string)<br>• X-M2M-Origin: Registrar CSE-ID<br>• Message-Body: Serialized representation of notification data object |
| | | PRO Check CoAP | Sent request contains<br>• Method: 0.02 (POST)<br>• Uri-Host: IP address or the FQDN of Registrar AE<br>• Uri-Path: AE-Notification-URI<br>• oneM2M-RQI: (token-string)<br>• oneM2M-FR: Registrar CSE-ID<br>• Payload: Serialized representation of notification data object |
| | | PRO Check | Sent MQTT PUBLISH message: |

| Interoperability Test Description | | | |
|---|---|---|---|
| | | MQTT | Topic: "/oneM2M/req/< Registrar CSE-ID >/<AE-ID >"<br>Payload:<br>• op = 5 (Notify)<br>• to = AE-Notification-URI<br>• fr = Registrar CSE-ID<br>• rqi = (token-string)<br>• pc = empty |
| 7 | Mca | PRO Check Primitive | AE sends notify response to Registrar CSE containing:<br>• rsc = 2000 (OK)<br>• rqi = (token-string) same as received in request message |
| | | PRO Check HTTP | AE sends notify response to Registrar CSE containing:<br>• Code = 200<br>• X-M2M-RSC: 2000<br>• X-M2M-RI = (token-string) same as received in request message<br>• Message-Body = empty |
| | | PRO Check CoAP | AE sends notify response to Registrar CSE containing:<br>• Response Code = 2.05<br>• oneM2M-RQI = (token-string) same as received in request message<br>• Payload = empty |
| | | PRO Check MQTT | Sent MQTT PUBLISH message:<br>Topic: "/oneM2M/resp/<Registrar CSE-ID >/<AE-ID>"<br>Payload:<br>• to = AE-ID<br>• fr = Registrar CSE-ID<br>• rqi = (token-string) same as received in request message<br>• rsc = 2000 (OK) |
| 8 | | IOP Check | Registrar CSE indicates successful operation |
| IOP Verdict | | | |
| PRO Verdict | | | |

### 8.2.2.1.4 Container Delete

| Interoperability Test Description | | | |
|---|---|---|---|
| **Identifier:** | | | TD_M2M_NB_08 |
| **Objective:** | | | AE deletes a Container resource using non blocking asynchronous request |
| **Configuration:** | | | M2M_CFG_01 |
| **References:** | | | TS-0001 [1], clause 10.2.4.1<br>TS-0004 [2], clause 7.3.6.2.1 |
| | | | |
| **Pre-test conditions:** | | | • AE has created a <Container> resource on registrar CSE<br>• AE is reachable on the URI: "AE-Notification-URI" |
| **Test Sequence** | | | |
| **Step** | **RP** | **Type** | **Description** |
| 1 | | Stimulus | AE is requested to send a non blocking asynchronous request to delete the <Container> resource in registrar CSE. |
| 2 | Mca | PRO Check Primitive | Sent request contains<br>• op = 4 (Delete)<br>• to = {CSEBaseName}/URI of <container> resource<br>• fr = AE-ID<br>• rqi = (token-string)<br>• rt = 2 (non blocking asynchronous)<br>• nu = AE-Notification-URI<br>• pc = empty |
| | | PRO Check HTTP | Sent request contains<br>• Request method = DELETE<br>• Reques-Target: {CSEBaseName}/URI of <Container> resource ?rt=2<br>• Host: IP address or the FQDN of Registrar CSE<br>• X-M2M-RI: (token-string)<br>• X-M2M-Origin: AE-ID<br>• X-M2M-RTU = AE-Notification-URI<br>• Message-Body: empty |
| | | PRO Check CoAP | Sent request contains<br>• Method: 0.04 (DELETE) |

| Interoperability Test Description | | | |
|---|---|---|---|
| | | | • Uri-Host: IP address or the FQDN of Registrar CSE<br>• Uri-Path: {CSEBaseName}/URI of <Container> resource<br>• Uri-Query: rt=2<br>• oneM2M-FR: AE-ID<br>• oneM2M-RQI: (token-string)<br>• oneM2M-RTURI = AE-Notification-URI<br>• Payload: empty |
| | | PRO Check MQTT | Sent MQTT PUBLISH message:<br>Topic: "/oneM2M/req/< AE-ID>/<Registrar CSE-ID>"<br>Payload:<br>• op = 4 (Delete)<br>• to = {CSEBaseName}/URI of <Container> resource<br>• fr = AE-ID<br>• rqi = (token-string)<br>• rt = 2 (non blocking asynchronous)<br>• nu = AE-Notification-URI<br>• pc = empty |
| 3 | Mca | PRO Check Primitive | Registrar CSE creates an internal <Request> resource and sends acknowledgement response containing:<br>• rsc = 1000 (Accepted)<br>• rqi = token-string) same as received in request message<br>• pc = Reference to the created <Request> resource |
| | | PRO Check HTTP | Registrar CSE creates an internal <Request> resource and sends acknowledgement response containing:<br>• Status Code = 202<br>• X-M2M-RSC: 1000<br>• X-M2M-RI= token-string) same as received in request message<br>• Message-Body: Reference to the created <Request> resource |
| | | PRO Check CoAP | Registrar CSE creates an internal <Request> resource and sends acknowledgement response containing:<br>• Response Code = None<br>• oneM2M-RSC = 1000<br>• oneM2M-RQI = token-string) same as received in request message<br>• Payload: Reference to the created <Request> resource |
| | | PRO Check MQTT | Sent MQTT PUBLISH message:<br>Topic: "/oneM2M/resp/< AE-ID>/<Registrar CSE-ID>"<br>Payload:<br>• to = AE-ID<br>• fr = Registrar CSE-ID<br>• rqi = (token-string) same as received in request message<br>• rsc = 1000 (Accepted)<br>• pc = Reference to the created <Request> resource |
| 4 | | IOP Check | AE indicates successful operation |
| 5 | | IOP Check | Registrar CSE sends notify request to AE |
| 6 | Mca | PRO Check Primitive | Sent request contains<br>• op = 5 (Notify)<br>• to = AE-Notification-URI<br>• fr = registrar CSE-ID<br>• rqi = (token-string)<br>• pc = Serialized representation of notification data object |
| | | PRO Check HTTP | Sent request contains<br>• Request method = POST<br>• Request URI: AE-Notification-URI<br>• Host: IP address or the FQDN of Registrar AE<br>• X-M2M-RI: (token-string)<br>• X-M2M-Origin: Registrar CSE-ID<br>• Message-Body: Serialized representation of notification data object |
| | | PRO Check CoAP | Sent request contains<br>• Method: 0.02 (POST)<br>• Uri-Host: IP address or the FQDN of Registrar AE<br>• Uri-Path: AE-Notification-URI<br>• oneM2M-RQI: (token-string)<br>• oneM2M-FR: Registrar CSE-ID<br>• Payload: Serialized representation of notification data object |

| Interoperability Test Description | | | |
|---|---|---|---|
| | | PRO Check MQTT | Sent MQTT PUBLISH message:<br>Topic: "/oneM2M/req/< Registrar CSE-ID >/<AE-ID >"<br>Payload:<br>• op = 5 (Notify)<br>• to = AE-Notification-URI<br>• fr = Registrar CSE-ID<br>• rqi = (token-string)<br>• pc = empty |
| 7 | Mca | PRO Check Primitive | AE sends notify response to Registrar CSE containing:<br>• rsc = 2000 (OK)<br>• rqi = (token-string) same as received in request message |
| | | PRO Check HTTP | AE sends notify response to Registrar CSE containing:<br>• Code = 200<br>• X-M2M-RSC: 2000<br>• X-M2M-RI = (token-string) same as received in request message<br>• Message-Body = empty |
| | | PRO Check CoAP | AE sends notify response to Registrar CSE containing:<br>• Response Code = 2.05<br>• oneM2M-RQI = (token-string) same as received in request message<br>• Payload = empty |
| | | PRO Check MQTT | Sent MQTT PUBLISH message:<br>Topic: "/oneM2M/resp/<Registrar CSE-ID >/<AE-ID>"<br>Payload:<br>• to = AE-ID<br>• fr = Registrar CSE-ID<br>• rqi = (token-string) same as received in request message<br>• rsc = 2000 (OK) |
| 8 | | IOP Check | Registrar CSE indicates successful operation |
| IOP Verdict | | | |
| PRO Verdict | | | |

# 8.3 Single hop configuration testing

## 8.3.1 Retargeting

### 8.3.1.1 RetargetingResource Create (Generic Test Description)

| Interoperability Test Description | | | |
|---|---|---|---|
| **Identifier:** | | | TD_M2M_SH_01 |
| **Objective:** | | | AE creates a remote <Resource> resource |
| **Configuration:** | | | M2M_CFG_03 |
| **References:** | | | |
| | | | |
| **Pre-test conditions** | | | • Parents resources need to be created on the hosting CSE |
| **Test Sequence** | | | |
| **Step** | **RP** | **Type** | **Description** |
| 1 | | Stimulus | AE is requested to send a Create Request to create <Resource> on the Hosting CSE. |
| 2 | Mca | PRO Check Primitive | • op = 1 (Create)<br>• to = URI of the parent resource<br>• fr = AE-ID<br>• rqi = (token-string)<br>• ty = <Resource> type number<br>• pc = Serialized representation of <Resource> resource |
| | | PRO Check HTTP | Sent request contains<br>• Request method = POST<br>• Request-Target: URI of the parent resource<br>• Host: IP address or the FQDN of Registrar CSE<br>• X-M2M-RI: (token-string)<br>• X-M2M-Origin: AE-ID<br>• Content-Type: application/vnd.onem2m-res+xml; ty=<Resource> type number or |

| Interoperability Test Description | | | |
|---|---|---|---|
| | | | application/vnd.onem2m-res+json; ty=<Resource> type number<br>• Message-body: Serialized representation of <Resource> resource |
| | | PRO Check CoAP | Sent request contains<br>• Method: 0.02 (POST)<br>• Uri-Host: IP address or the FQDN of Registrar CSE<br>• Uri-Path: URI of the parent resource<br>• Content-type: application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json<br>• oneM2M-TY: <Resource> type number<br>• oneM2M-FR: AE-ID<br>• oneM2M-RQI: (token-string)<br>• Payload: Serialized representation of <Resource> resource |
| | | PRO Check MQTT | Sent MQTT PUBLISH message:<br>Topic: "/oneM2M/req/< AE-ID>/<Registrar CSE-ID>"<br>Payload:<br>• op = 1 (Create)<br>• to = URI of the parent resource<br>• fr = AE-ID<br>• rqi = (token-string)<br>• ty = <Resource> type number<br>• pc = Serialized representation of <Resource> resource |
| 3 | | IOP Check | Check if possible that the request is forwarded by the registrar CSE to the Hosting CSE. |
| 4 | Mcc | PRO Check Primitive | • op = 1 (Create)<br>• to = URI of the parent resource<br>• fr = AE-ID<br>• rqi = (token-string)<br>• ty = m2m:resourceType<br>• pc = Serialized representation of <Resource> resource |
| | | PRO Check HTTP | Sent request contains<br>• Request method = POST<br>• Request-Target: URI of the parent resource<br>• Host: IP address or the FQDN of Hosting CSE<br>• X-M2M-RI: (token-string)<br>• X-M2M-Origin: AE-ID<br>• Content-Type: application/vnd.onem2m-res+xml; ty=<Resource> type number or application/vnd.onem2m-res+json; ty=<Resource> type number<br>• Message-body: Serialized representation of <Resource> resource |
| | | PRO Check CoAP | Sent request contains<br>• Method: 0.02 (POST)<br>• Uri-Host: IP address or the FQDN of Hosting CSE<br>• Uri-Path: URI of the parent resource<br>• Content-type: application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json<br>• oneM2M-TY: <Resource> type number<br>• oneM2M-FR: AE-ID<br>• oneM2M-RQI: (token-string)<br>• Payload: Serialized representation of <Resource> resource |
| | | PRO Check MQTT | Sent MQTT PUBLISH message:<br>Topic: "/oneM2M/req/< Registrar CSE-ID>/< Hosting CSE-ID>"<br>Payload:<br>• op = 1 (Create)<br>• to = URI of the parent resource<br>• fr = AE-ID<br>• rqi = (token-string)<br>• ty = <Resource> type number<br>• pc = Serialized representation of <Resource> resource |
| 5 | | IOP Check | Check if possible that the <Resource> resource is created in the Hosting CSE. |
| 6 | Mcc | PRO Check Primitive | • rsc = 2001 (CREATED)<br>• rqi = (token-string) same as received in request message<br>• pc = Serialized representation of <Resource> resource |
| | | PRO Check HTTP | Hosting CSE sends response to Registrar CSE containing:<br>• Status Code = 201 (Created)<br>• X-M2M-RSC: 2001 |

| Interoperability Test Description | | | |
|---|---|---|---|
| | | | • X-M2M-RI: (token-string) same as received in request message<br>• Content-Location: URI of the created resource.<br>• Content-Type: application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json<br>• Message-body: Serialized representation of <resource> resource |
| | | PRO Check CoAP | Hosting CSE sends response to Registrar CSE containing:<br>• Response Code = 2.01<br>• oneM2M-RSC: 2001<br>• oneM2M-RQI: (token-string) same as received in request message<br>• Location-Path: URI of the created resource<br>• Content-format: application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json<br>• Payload: Serialized representation of < resource > resource |
| | | PRO Check MQTT | Sent MQTT PUBLISH message:<br>Topic: "/oneM2M/resp/< RegistrarCSE -ID>/<Hosting CSE-ID>"<br>Payload:<br>• to = AE-ID<br>• fr = Hosting CSE-ID<br>• rsc = 2001 (CREATED)<br>• rqi = (token-string) same as received in request message<br>• pc = Serialized representation of < resource > resource |
| 7 | | IOP Check | Check if possible that the response is forwarded by the registrar CSE to the AE. |
| 8 | Mca | PRO Check Primitive | • rsc = 2001 (CREATED)<br>• rqi = (token-string) same as received in request message<br>• pc = Serialized representation of <Resource> resource |
| | | PRO Check HTTP | Registrar CSE sends response to AE containing:<br>• Status Code = 201 (Created)<br>• X-M2M-RSC: 2001<br>• X-M2M-RI: (token-string) same as received in request message<br>• Content-Location: URI of the created resource.<br>• Content-Type: application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json<br>• Message-body: Serialized representation of <resource> resource |
| | | PRO Check CoAP | Registrar CSE sends response to AE containing:<br>• Response Code = 2.01<br>• oneM2M-RSC: 2001<br>• oneM2M-RQI: (token-string) same as received in request message<br>• Location-Path: URI of the created resource<br>• Content-format: application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json<br>• Payload: Serialized representation of < resource > resource |
| | | PRO Check MQTT | Sent MQTT PUBLISH message:<br>Topic: "/oneM2M/resp/< AE-ID>/<Registrar CSE-ID>"<br>Payload:<br>• to = AE-ID<br>• fr = Registrar CSE-ID<br>• rsc = 2001 (CREATED)<br>• rqi = (token-string) same as received in request message<br>• pc = Serialized representation of < resource > resource |
| 9 | | IOP Check | AE indicates successful operation |
| IOP Verdict | | | |
| PRO Verdict | | | |

### 8.3.1.2 <Resource> Create

| <Resource> | Identifier | Refs | IOP Verdict | PRO Verdict |
|---|---|---|---|---|
| <container> | TD_M2M_SH_01#01 | TS-0001 [1], clause 10.2.4.1<br>TS-0004 [2], clause 7.3.5.2.1 | | |
| <contentInstance> | TD_M2M_SH_01#02 | TS-0001 [1], clause 10.2.19.2<br>TS-0004 [2], clause 7.3.7.2 | | |

| | | | | |
|---|---|---|---|---|
| <subscription> | TD_M2M_SH_01#03 | TS-0001 [1], clause 10.2.11.2 TS-0004 [2], clause 7.3.7.2 | | |
| <accessControlPolicy> | TD_M2M_SH_01#04 | TS-0001 [1], clause 10.2.21.1 TS-0004 [2], clause 7.3.1.2 | | |
| <group> | TD_M2M_SH_01#05 | TS-0001 [1], clause 10.2.7.2 TS-0004 [2], clause 7.3.12.2.1 | | |
| <pollingChannel> | TD_M2M_SH_01#06 | TS-0001 [1], clause 10.2.13.2 TS-0004 [2], clause 7.3.21.2.1 | | |
| <fanOutPoint> | TD_M2M_SH_01#07 | TS-0001 [1], clause 10.2.7.6 TS-0004 [2], clause 7.3.14.3.1 | | |
| <node> | TD_M2M_SH_01#08 | TS-0001 [1], clause 10.2.14.1 TS-0004 [2], clause 7.3.18.2.1 | | |

### 8.3.1.3 Resource Retrieve (Generic Test Description)

| **Interoperability Test Description** | | | |
|---|---|---|---|
| **Identifier:** | TD_M2M_SH_02 | | |
| **Objective:** | AE retrieves a remote <Resource> resource | | |
| **Configuration:** | M2M_CFG_03 | | |
| **References:** | | | |
| | | | |
| **Pre-test conditions:** | • Parents resources need to be created on the hosting CSE<br>• Resource <Resource> has been created in Hosting CSE | | |
| **Test Sequence** | | | |
| **Step** | **RP** | **Type** | **Description** |
| 1 | | Stimulus | AE is requested to send a Retrieve Request to retrieve <Resource> on the remote Hosting CSE. |
| 2 | Mca | PRO Check Primitive | • op = 2 (Retrieve)<br>• to = URI of the <Resource> resource U<br>• fr = AE-ID<br>• rqi = (token-string) |
| | | PRO Check HTTP | Sent request contains<br>• Request method = GET<br>• Request-Target: URI of the <Resource> resource<br>• Host: IP address or the FQDN of Registrar CSE<br>• X-M2M-RI: (token-string)<br>• X-M2M-Origin: AE-ID<br>• Message-body: empty |
| | | PRO Check CoAP | Sent request contains<br>• Method: 0.01 (GET)<br>• Uri-Host: IP address or the FQDN of Registrar CSE<br>• Uri-Path: URI of the <Resource> resource<br>• oneM2M-FR: AE-ID<br>• oneM2M-RQI: (token-string) |

| Interoperability Test Description | | | |
|---|---|---|---|
| | | | • Payload: empty |
| | | PRO Check MQTT | Sent MQTT PUBLISH message:<br>Topic: "/oneM2M/req/< AE-ID>/<Registrar CSE-ID>"<br>Payload:<br>• op = 2 (Retrieve)<br>• to = URI of the <Resource> resource<br>• fr = AE-ID<br>• rqi = (token-string)<br>• pc = empty |
| 3 | | IOP Check | Check if possible that the request is forwarded by the registrar CSE to the Hosting CSE. |
| 4 | Mcc | PRO Check Primitive | • op = 2 (Retrieve)<br>• to URI of the <Resource> resource<br>• fr = AE-ID<br>• rqi = (token-string) |
| | | PRO Check HTTP | Sent request contains<br>• Request method = GET<br>• Request-Target: URI of the <Resource> resource<br>• Host: IP address or the FQDN of Hosting CSE<br>• X-M2M-RI: (token-string)<br>• X-M2M-Origin: AE-ID<br>• Message-body: empty |
| | | PRO Check CoAP | Sent request contains<br>• Method: 0.01 (GET)<br>• Uri-Host: IP address or the FQDN of Hosting CSE<br>• Uri-Path: URI of the <Resource> resource<br>• oneM2M-FR: AE-ID<br>• oneM2M-RQI: (token-string)<br>• Payload: empty |
| | | PRO Check MQTT | Sent MQTT PUBLISH message:<br>Topic: "/oneM2M/req/< Registrar CSE-ID>/<Hosting CSE-ID>"<br>Payload:<br>• op = 2 (Retrieve)<br>• to = URI of the <Resource> resource<br>• fr = AE-ID<br>• rqi = (token-string)<br>• pc = empty |
| 5 | Mcc | PRO Check Primitive | • rsc = 2000 (OK)<br>• rqi = (token-string) same as received in request message<br>• pc = Serialized representation of <Resource> resource |
| | | PRO Check HTTP | Hosting CSE sends response containing:<br>• Status Code = 200 (OK)<br>• X-M2M-RSC: 2000<br>• X-M2M-RI: (token-string) same as received in request message<br>• Content-Type: application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json<br>• Message-body: Serialized representation of <Resource> resource |
| | | PRO Check CoAP | Hosting CSE sends response containing:<br>• Response Code = 2.05 (OK)<br>• oneM2M-RSC: 2000(OK)<br>• oneM2M-RQI: (token-string) same as received in request message<br>• Content-format: application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json<br>• Payload: Serialized representation of <Resource> resource |
| | | PRO Check MQTT | Sent MQTT PUBLISH message:<br>Topic: "/oneM2M/resp/< Registrar CSE-ID>/<Hosting CSE-ID>"<br>Payload:<br>• to = AE-ID<br>• fr = Hosting CSE-ID<br>• rsc 2000(OK)<br>• rqi = (token-string) same as received in request message<br>• pc = Serialized representation of <Resource> resource |
| 6 | | IOP Check | Check if possible that the response is forwarded by the registrar CSE to the AE. |

| Interoperability Test Description | | | |
|---|---|---|---|
| 7 | Mca | PRO Check Primitive | • rsc = 2000 (OK)<br>• rqi = (token-string) same as received in request message<br>• pc = Serialized representation of <Resource> resource |
| | | PRO Check HTTP | Registrar CSE forwards response containing:<br>• Status Code = 200 (OK)<br>• X-M2M-RSC: 2000<br>• X-M2M-RI: (token-string) same as received in request message<br>• Content-Type: application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json<br>• Message-body: Serialized representation of <Resource> resource |
| | | PRO Check CoAP | Registrar forwards response containing:<br>• Response Code = 2.05 (OK)<br>• oneM2M-RSC: 2000(OK)<br>• oneM2M-RQI: (token-string) same as received in request message<br>• Content-format: application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json<br>• Payload: Serialized representation of <Resource> resource |
| | | PRO Check MQTT | Sent MQTT PUBLISH message:<br>Topic: "/oneM2M/resp/< AE-ID>/<Hosting CSE-ID>"<br>Payload:<br>• to = AE-ID<br>• fr = Registrar CSE-ID<br>• rsc 2000(OK)<br>• rqi = (token-string) same as received in request message<br>• pc = Serialized representation of <Resource> resource |
| 8 | | IOP Check | AE indicates successful operation |
| IOP Verdict | | | |
| PRO Verdict | | | |

### 8.3.1.4 <Resource> retrieve

| <Resource> | Identifier | Refs | IOP Verdict | PRO Verdict |
|---|---|---|---|---|
| <container> | TD_M2M_SH_02#01 | TS-0001 [1], clause 10.2.4.2<br>TS-0004 [2], clause 7.3.5.2.2 | | |
| <contentInstance> | TD_M2M_SH_02#02 | TS-0001 [1], clause 10.2.19.3<br>TS-0004 [2], clause 7.3.6.2.2 | | |
| <subscription> | TD_M2M_SH_02#03 | TS-0001 [1], clause 10.2.11.3<br>TS-0004 [2], clause 7.3.7.2 | | |
| <accessControlPolicy> | TD_M2M_SH_02#04 | TS-0001 [1], clause 10.2.21.2<br>TS-0004 [2], clause 7.3.1.2 | | |
| <group> | TD_M2M_SH_02#05 | TS-0001 [1], clause 10.2.7.3<br>TS-0004 [2], clause 7.3.12.2.2 | | |
| <pollingChannel> | TD_M2M_SH_02#06 | TS-0001 [1], clause 10.2.13.3<br>TS-0004 [2], clause 7.3.21.2.2 | | |

| | | | | |
|---|---|---|---|---|
| <fanOutPoint> | TD_M2M_SH_02#07 | TS-0001 [1], clause 10.2.7.8 TS-0004 [2], clause 7.3.14.3.2 | | |
| <node> | TD_M2M_SH_02#08 | TS-0001 [1], clause 10.2.14.2 TS-0004 [2], clause 7.3.18.2.2 | | |
| <remoteCSE> | TD_M2M_SH_02#09 | TS-0001 [1], clause 10.2.2.3 TS-0004 [2], clause 7.3.3.2.3 | | |
| <ae> | TD_M2M_SH_02#10 | TS-0001 [1], clause 10.2.1.2 TS-0004 [2], clause 7.3.5.2.2 | | |
| <CSEBase> | TD_M2M_SH_02#11 | TS-0001 [1], clause 10.2.3.2 TS-0004 [2], clause 7.3.2 | | |

### 8.3.1.5 Resource Update (Generic Test Description)

| **Interoperability Test Description** | | | |
|---|---|---|---|
| **Identifier:** | TD_M2M_SH_03 | | |
| **Objective:** | AE updates a remote <Resource> resource | | |
| **Configuration:** | M2M_CFG_03 | | |
| **References:** | | | |
| | | | |
| **Pre-test conditions:** | • Parents resources need to be created on the hosting CSE<br>• Resource <Resource> has been created in Hosting CSE | | |
| **Test Sequence** | | | |
| **Step** | **RP** | **Type** | **Description** |
| 1 | | Stimulus | AE is requested to send an Update Request to update the <Resource> on the Hosting CSE. |
| 2 | Mca | PRO Check Primitive | • op = 3 (Update)<br>• to = URI of the resource <Resource><br>• fr = AE-ID<br>• rqi = (token-string)<br>• pc = Serialized representation of <Resource> resource |
| | | PRO Check HTTP | Sent request contains<br>• Request method = PUT<br>• Request-Target: URI of the <Resource> resource<br>• Host: IP address or the FQDN of Registrar CSE<br>• X-M2M-RI: (token-string)<br>• X-M2M-Origin: AE-ID<br>• Content-Type: application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json<br>• Message-body: Serialized representation of updated <Resource> resource |
| | | PRO Check CoAP | Sent request contains<br>• Method: 0.03 (PUT)<br>• Uri-Host: IP address or the FQDN of Registrar CSE<br>• Uri-Path: URI of the <Resource> resource<br>• oneM2M-FR: AE-ID<br>• oneM2M-RQI: (token-string)<br>• Content-format: application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json<br>• Payload: Serialized representation of updated <Resource> resource |

| Interoperability Test Description | | | |
|---|---|---|---|
| | | PRO Check MQTT | Sent MQTT PUBLISH message:<br>Topic: "/oneM2M/ req /< AE-ID>/<Registrar CSE-ID>"<br>Payload:<br>• op = 3 (Update)<br>• to = URI of the <Resource> resource<br>• fr = AE-ID<br>• rqi = (token-string)<br>• pc = Serialized representation of updated <Resource> resource |
| 3 | | IOP Check | Check if possible that the request is forwarded by the registrar CSE to the Hosting CSE. |
| 4 | Mcc | PRO Check Primitive | • op = 3 (Update)<br>• to = URI of the resource <Resource><br>• fr = AE-ID<br>• rqi = (token-string)<br>• pc = Serialized representation of <Resource> resource |
| | | PRO Check HTTP | Sent request contains<br>• Request method = PUT<br>• Request-Target: URI of the <Resource> resource<br>• Host: IP address or the FQDN of Hosting CSE<br>• X-M2M-RI: (token-string)<br>• X-M2M-Origin: AE-ID<br>• Content-Type: application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json<br>• Message-body: Serialized representation of updated <Resource> resource |
| | | PRO Check CoAP | Sent request contains<br>• Method: 0.03 (PUT)<br>• Uri-Host: IP address or the FQDN of Hosting CSE<br>• Uri-Path: URI of the <Resource> resource<br>• oneM2M-FR: AE-ID<br>• oneM2M-RQI: (token-string)<br>• Content-format: application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json<br>• Payload: Serialized representation of updated <Resource> resource |
| | | PRO Check MQTT | Sent MQTT PUBLISH message:<br>Topic: "/oneM2M/ req /< Registrar CSE-ID>/<Hosting CSE-ID>"<br>Payload:<br>• op = 3 (Update)<br>• to = URI of the <Resource> resource<br>• fr = AE-ID<br>• rqi = (token-string)<br>• pc = Serialized representation of updated <Resource> resource |
| 5 | | IOP Check | Check if possible that the <Resource> resource is updated in the Hosting CSE. |
| 6 | Mcc | PRO Check Primitive | • rsc = 2004 (CHANGED)<br>• rqi = (token-string) same as received in request message<br>• pc = Serialized representation of <Resource> resource |
| | | PRO Check HTTP | Hosting CSE sends response containing:<br>• Code = 200 (Ok)<br>• X-M2M-RSC: 2004<br>• X-M2M-RI: (token-string) same as received in request message<br>• Content-Type: application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json<br>• Message-body: Serialized representation of <Resource> resource |
| | | PRO Check CoAP | Hosting sends response containing:<br>• Response Code = 2.04<br>• oneM2M-RSC: 2004<br>• oneM2M-RQI: (token-string) same as received in request message<br>• Content-format: application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json<br>• Payload: Serialized representation of <Resource> resource |
| | | PRO Check MQTT | Sent MQTT PUBLISH message:<br>Topic: "/oneM2M/resp/< Registrar CSE-ID>/<Hosting CSE-ID>"<br>Payload:<br>• to = AE-ID<br>• fr = Hosting CSE-ID<br>• rsc = 2004 (Updated)<br>• rqi = (token-string) same as received in request message<br>• pc = Serialized representation of modified <Resource> resource |
| 7 | | IOP Check | Check if possible that the response is forwarded by the registrar CSE to the AE. |
| 8 | | PRO Check | • rsc = 2004 (CHANGED) |

| Interoperability Test Description | | | |
|---|---|---|---|
| | Mca | Primitive | • rqi = (token-string) same as received in request message<br>• pc = Serialized representation of <Resource> resource |
| | | PRO Check HTTP | Registrar CSE forwards response containing:<br>• Code = 200 (Ok)<br>• X-M2M-RSC: 2004<br>• X-M2M-RI: (token-string) same as received in request message<br>• Content-Type: application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json<br>• Message-body: Serialized representation of <Resource> resource |
| | | PRO Check CoAP | Registrar forwards response containing:<br>• Response Code = 2.04<br>• oneM2M-RSC: 2004<br>• oneM2M-RQI: (token-string) same as received in request message<br>• Content-format: application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json<br>• Payload: Serialized representation of <Resource> resource |
| | | PRO Check MQTT | Sent MQTT PUBLISH message:<br>Topic: "/oneM2M/resp/< AE-ID>/<Registrar CSE-ID>"<br>Payload:<br>• to = AE-ID<br>• fr = Registrar CSE-ID<br>• rsc = 2004 (Updated)<br>• rqi = (token-string) same as received in request message<br>• pc = Serialized representation of modified <Resource> resource |
| 9 | | IOP Check | AE indicates successful operation |
| IOP Verdict | | | |
| PRO Verdict | | | |

### 8.3.1.6 <Resource> update

| <Resource> | Identifier | Refs | IOP Verdict | PRO Verdict |
|---|---|---|---|---|
| <container> | TD_M2M_SH_03#01 | TS-0001 [1], clause 10.2.4.3<br>TS-0004 [2], clause 7.3.5.2.3 | | |
| <subscription> | TD_M2M_SH_03#02 | TS-0001 [1], clause 10.2.11.4<br>TS-0004 [2], clause 7.3.7.2 | | |
| <accessControlPolicy> | TD_M2M_SH_03#03 | TS-0001 [1], clause 10.2.21.3<br>TS-0004 [2], clause 7.3.1.2 | | |
| <group> | TD_M2M_SH_03#04 | TS-0001 [1], clause 10.2.7.4<br>TS-0004 [2], clause 7.3.12.2.3 | | |
| <pollingChannel> | TD_M2M_SH_03#05 | TS-0001 [1], clause 10.2.13.4<br>TS-0004 [2], clause 7.3.21.2.3 | | |
| <fanOutPoint> | TD_M2M_SH_03#06 | TS-0001 [1], clause 10.2.7.9<br>TS-0004 [2], clause 7.3.14.3.3 | | |
| <node> | TD_M2M_SH_03#07 | TS-0001 [1], clause 10.2.14.3<br>TS-0004 [2], clause 7.3.18.2.3 | | |
| <remoteCSE> | TD_M2M_SH_03#08 | TS-0001 [1], clause 10.2.2.3<br>TS-0004 [2], clause 7.3.3.2.3 | | |
| <ae> | TD_M2M_SH_03#09 | TS-0001 [1], clause 10.2.1.3<br>TS-0004 [2], clause 7.3.5.2.3 | | |

### 8.3.1.7 Resource Delete (Generic Test Description)

| Interoperability Test Description | | | |
|---|---|---|---|
| **Identifier:** | | TD_M2M_SH_04 | |
| **Objective:** | | AE delete a remote <Resource> resource | |
| **Configuration:** | | M2M_CFG_03 | |
| **References:** | | | |
| | | | |
| **Pre-test conditions:** | | • Parents resources need to be created on the hosting CSE<br>• Resource <Resource> has been created in Hosting CSE | |
| **Test Sequence** | | | |
| **Step** | **RP** | **Type** | **Description** |
| 1 | | Stimulus | AE is requested to send a Delete Request to delete <Resource> on the Hosting CSE. |

| Interoperability Test Description | | | |
|---|---|---|---|
| 2 | Mca | PRO Check Primitive | • op = 4 (Delete)<br>• to = URI of the resource <Resource><br>• fr = AE-ID<br>• rqi = (token-string) |
| | | PRO Check HTTP | Sent request contains<br>• Request method = DELETE<br>• Request-Target: URI of the resource <Resource><br>• Host: IP address or the FQDN of Registrar CSE<br>• X-M2M-RI: (token-string)<br>• X-M2M-Origin: AE-ID<br>• Message-body: Empty |
| | | PRO Check CoAP | Sent request contains<br>• Method: 0.04 (DELETE)<br>• Uri-Host: IP address or the FQDN of Registrar CSE<br>• Uri-Path: URI of the resource <Resource><br>• oneM2M-FR: AE-ID<br>• oneM2M-RQI: (token-string)<br>• Payload: empty |
| | | PRO Check MQTT | Sent MQTT PUBLISH message:<br>Topic: "/oneM2M/req/< AE-ID>/<Registrar CSE-ID>"<br>Payload:<br>• op = 4 (Delete)<br>• to = URI of the resource <Resource><br>• fr = AE-ID<br>• rqi = (token-string)<br>• pc = empty |
| 3 | | IOP Check | Check if possible that the request is forwarded by the registrar CSE to the Hosting CSE. |
| 4 | Mcc | PRO Check Primitive | • op = 4 (Delete)<br>• to = URI of the resource <Resource><br>• fr = AE-ID<br>• rqi = (token-string) |
| | | PRO Check HTTP | Sent request contains<br>• Request method = DELETE<br>• Request-Target: URI of the resource <Resource><br>• Host: IP address or the FQDN of Hosting CSE<br>• X-M2M-RI: (token-string)<br>• X-M2M-Origin: AE-ID<br>• Message-body: Empty |
| | | PRO Check CoAP | Sent request contains<br>• Method: 0.04 (DELETE)<br>• Uri-Host: IP address or the FQDN of Hosting CSE<br>• Uri-Path: URI of the resource <Resource><br>• oneM2M-FR: AE-ID<br>• oneM2M-RQI: (token-string)<br>• Payload: empty |
| | | PRO Check MQTT | Sent MQTT PUBLISH message:<br>Topic: "/oneM2M/req/< Registrar CSE-ID>/<Hosting CSE-ID>"<br>Payload:<br>• op = 4 (Delete)<br>• to = URI of the resource <Resource><br>• fr = AE-ID<br>• rqi = (token-string)<br>• pc = empty |
| 5 | | IOP Check | Check if possible that the <Resource> resource is deleted in the Hosting CSE. |
| 6 | Mcc | PRO Check Primitive | • rsc = 2002 (DELETED)<br>• rqi = (token-string) same as received in request message |
| | | PRO Check HTTP | Hosting CSE sends response containing:<br>• Status Code = 200 (OK)<br>• X-M2M-RSC: 2002<br>• X-M2M-RI: (token-string) same as received in request message<br>• Message-body: empty |
| | | PRO Check CoAP | Hosting sends response containing:<br>• Response Code = 2.02 |

| Interoperability Test Description | | | |
|---|---|---|---|
| | | | • oneM2M-RSC: 2002(DELETED)<br>• oneM2M-RQI: (token-string) same as received in request message<br>• Payload: empty |
| | | PRO Check MQTT | Sent MQTT PUBLISH message:<br>Topic: "/oneM2M/resp/< Registrar CSE-ID>/<Hosting CSE-ID>"<br>Payload:<br>• to = AE-ID<br>• fr = Registrar CSE-ID<br>• rsc = 2002(DELETED)<br>• rqi = (token-string) same as received in request message |
| 7 | | IOP Check | Check if possible that the response is forwarded by the registrar CSE to the AE. |
| 8 | Mca | PRO Check Primitive | • rsc = 2002 (DELETED)<br>• rqi = (token-string) same as received in request message |
| | | PRO Check HTTP | Registrar CSE forwards response containing:<br>• Status Code = 200 (OK)<br>• X-M2M-RSC: 2002<br>• X-M2M-RI: (token-string) same as received in request message<br>• Message-body: empty |
| | | PRO Check CoAP | Registrar forwards response containing:<br>• Response Code = 2.02<br>• oneM2M-RSC: 2002(DELETED)<br>• oneM2M-RQI: (token-string) same as received in request message<br>• Payload: empty |
| | | PRO Check MQTT | Sent MQTT PUBLISH message:<br>Topic: "/oneM2M/resp/< AE-ID>/<Registrar CSE-ID>"<br>Payload:<br>• to = AE-ID<br>• fr = Registrar CSE-ID<br>• rsc = 2002(DELETED)<br>• rqi = (token-string) same as received in request message |
| 9 | | IOP Check | AE indicates successful operation |
| IOP Verdict | | | |
| PRO Verdict | | | |

### 8.3.1.8 <Resource> delete

| <Resource> | Identifier | Refs | IOP Verdict | PRO Verdict |
|---|---|---|---|---|
| <container> | TD_M2M_SH_04#01 | TS-0001 [1], clause 10.2.4.4<br>TS-0004 [2], clause 7.3.5.2.4 | | |
| <contentInstance> | TD_M2M_SH_04#02 | TS-0001 [1], clause 10.2.19.5<br>TS-0004 [2], clause 7.3.6.2.4 | | |
| <subscription> | TD_M2M_SH_05#03 | TS-0001 [1], clause 10.2.11.5<br>TS-0004 [2], clause 7.3.7.2 | | |
| <accessControlPolicy> | TD_M2M_SH_05#04 | TS-0001 [1], clause 10.2.21.4<br>TS-0004 [2], clause 7.3.1.2 | | |
| <group> | TD_M2M_SH_05#05 | TS-0001 [1], clause 10.2.7.5<br>TS-0004 [2], clause 7.3.12.2.4 | | |
| <pollingChannel> | TD_M2M_SH_05#06 | TS-0001 [1], clause 10.2.13.5<br>TS-0004 [2], clause 7.3.21.2.4 | | |
| <fanOutPoint> | TD_M2M_SH_05#07 | TS-0001 [1], clause 10.2.7.10<br>TS-0004 [2], clause 7.3.14.3.4 | | |
| <node> | TD_M2M_SH_05#08 | TS-0001 [1], clause 10.2.14.4<br>TS-0004 [2], clause 7.3.18.2.4 | | |

### 8.3.1.9 Discovery with multiple filter criteria

| Interoperability Test Description | | | |
|---|---|---|---|
| **Identifier:** | | | TD_M2M_SH_09 |
| **Objective:** | | | AE discovers accessible resources residing in the remote Hosting CSE using multiple Filter Criteria |
| **Configuration:** | | | M2M_CFG_03 |
| **References:** | | | TS-0001 [1], clause 10.2.6<br>TS-0004 [2], clause 7.2.3.13 |
| | | | |
| **Pre-test conditions:** | | | • Two <Container> resources with labels "key1" and "key2" are created in Hosting CSE.<br>• A <Group> resources with labels "key1" and "key2" is created in Hosting CSE. |
| **Test Sequence** | | | |
| **Step** | **RP** | **Type** | **Description** |
| 1 | | Stimulus | AE is requested to send a discovery request to discover specific resources located in hosting CSE using multiple filter critiria (label, resource type and limit) |
| 2 | Mca | PRO Check Primitive | Sent request contains<br>• op = 2 (Retrieve)<br>• to = URI of hosting CSEBase<br>• fr = AE-ID<br>• rqi = (token-string)<br>• fu=1<br>• lbl=key1<br>• lbl=key2<br>• rty=3<br>• lim=1<br>• pc = empty |
| | | PRO Check HTTP | Sent request contains<br>• Request method = GET<br>• Request-Target: {URI of hosting CSEBase}?fu=1&key=1&key=2&rty=3&lim=1<br>• Host: IP address or the FQDN of Registrar CSE<br>• X-M2M-RI: (token-string)<br>• X-M2M-Origin: AE-ID<br>• Message-body: empty |
| | | PRO Check CoAP | Sent request contains<br>• Method: 0.01 (GET)<br>• Uri-Host: IP address or the FQDN of Registrar CSE<br>• Uri-Path: URI of hosting CSEBase<br>• oneM2M-FR: AE-ID<br>• oneM2M-RQI: (token-string)<br>• Uri-Query: fu=1<br>• Uri-Query: lbl=key1<br>• Uri-Query: lbl=key2<br>• Uri-Query: rty=3<br>• Uri-Query: lim=1<br>• Payload: empty |
| | | PRO Check MQTT | Sent MQTT PUBLISH message:<br>Topic: "/oneM2M/req/<AE-ID>/<Registrar CSE-ID>"<br>Payload:<br>• op = 2 (Retrieve)<br>• to = URI of hosting CSEBase<br>• fr = AE-ID<br>• rqi = (token-string)<br>• fu = 1<br>• lbl=key1<br>• lbl=key2<br>• rty=3<br>• lim=1<br>• pc = empty |
| 3 | | IOP Check | - Check if possible that the request is forwarded by the registrar CSE to the Hosting CSE. |
| 4 | Mcc | PRO Check Primitive | Forwarded request contains<br>• op = 2 (Retrieve)<br>• to = hosting CSEBase |

| Interoperability Test Description | | | |
|---|---|---|---|
| | | | • fr = AE-ID<br>• rqi = (token-string)<br>• fu=1<br>• lbl=key1<br>• lbl=key2<br>• rty=3<br>• lim=1<br>• pc = empty |
| | | PRO Check HTTP | Sent request contains<br>• Request method = GET<br>• Request-Target: {URI of hosting CSEBase }?fu=1&key=1&key=2&rty=3&lim=1<br>• Host: IP address or the FQDN of Hosting CSE<br>• X-M2M-RI: (token-string)<br>• X-M2M-Origin: AE-ID<br>• Message-body: empty |
| | | CoAP | Sent request contains<br>• Method: 0.01 (GET)<br>• Uri-Host: IP address or the FQDN of Hosting CSE<br>• Uri-Path: URI of hosting CSEBase<br>• oneM2M-FR: AE-ID<br>• oneM2M-RQI: (token-string)<br>• Uri-Query: fu=1<br>• Uri-Query: lbl=key1<br>• Uri-Query: lbl=key2<br>• Uri-Query: rty=3<br>• Uri-Query: lim=1<br>• Payload: empty |
| | | MQTT | Sent MQTT PUBLISH message:<br>Topic: "/oneM2M/req/<Registrar CSE-ID>/<Hosting CSE-ID>"<br>Payload:<br>• op = 2 (Retrieve)<br>• to = URI of hosting CSEBase<br>• fr = AE-ID<br>• rqi = (token-string)<br>• fu = 1<br>• lbl=key1<br>• lbl=key2<br>• rty=3<br>• lim=1<br>• pc = empty |
| 5 | | IOP Check | Check if possible that the response is sent by the hosting CSE to the registrar CSE. |
| 6 | Mcc | PRO Check Primitive | Hosting CSE sends response containing:<br>• rsc = 2000 (OK)<br>• rqi = (token-string) same as received in request message<br>• pc = Serialized representation of data object containing the address of one of the <Container> resources |
| | | PRO Check HTTP | Hosting CSE sends response containing:<br>• Status Code = 200 (OK)<br>• X-M2M-RSC: 2000<br>• X-M2M-RI: (token-string) same as received in request message<br>• Content-Type: application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json<br>• Message-body: Serialized representation of data object containing the address of one of the <Container> resources |
| | | PRO Check CoAP | Hosting CSE sends response containing:<br>• Response Code = 2.05<br>• oneM2M-RSC: 2000<br>• oneM2M-RQI: (token-string) same as received in request message<br>• Content-format: application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json<br>• Payload: Serialized representation of data object containing the address of one of the <Container> resources |
| | | MQTT | Sent MQTT PUBLISH message:<br>Topic: "/oneM2M/resp/<Registrar CSE-ID>/<Hosting CSE-ID>"<br>Payload:<br>• to = Registrar CSE-ID |

| Interoperability Test Description | | | |
|---|---|---|---|
| | | | • fr = Hostring CSE-ID<br>• rsc = 2000 (OK)<br>• rqi = (token-string) same as received in request message<br>• pc = Serialized representation of data object containing the address of one of the <Container> resources |
| 7 | | IOP Check | • Check if possible that the response is forwarded from the registrar CSE to AE |
| 6 | Mca | PRO Check Primitive | Registrar CSE sends response containing:<br>• rsc = 2000 (OK)<br>• rqi = (token-string) same as received in request message<br>• pc = Serialized representation of data object containing the address of one of the <Container> resources |
| | | PRO Check HTTP | Registrar CSE sends response containing:<br>• Status Code = 200 (OK)<br>• X-M2M-RSC: 2000<br>• X-M2M-RI: (token-string) same as received in request message<br>• Content-Type: application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json<br>• Message-body: Serialized representation of data object containing the address of one of the <Container> resources |
| | | PRO Check CoAP | Registrar sends response containing:<br>• Response Code = 2.05<br>• oneM2M-RSC: 2000<br>• oneM2M-RQI: (token-string) same as received in request message<br>• Content-format: application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json<br>• Payload: Serialized representation of data object containing the address of one of the <Container> resources |
| | | PRO Check MQTT | Sent MQTT PUBLISH message:<br>Topic: "/oneM2M/resp/<AE-ID>/<Registrar CSE-ID>"<br>Payload:<br>• to = Registree CSE-ID<br>• fr = Registrar CSE-ID<br>• rsc = 2000 (OK)<br>• rqi = (token-string) same as received in request message<br>• pc = Serialized representation of data object containing the address of one of the <Container> resources |
| 7 | | IOP Check | AE indicates successful operation |

### 8.3.1.10 Unauthorized operation (Insufficient Access Rights)

| Interoperability Test Description | | | |
|---|---|---|---|
| **Identifier:** | | | TD_M2M_SH_10 |
| **Objective:** | | | AE delete request is rejected after access rights verification using retargeting. |
| **Configuration:** | | | M2M_CFG_03 |
| **References:** | | | TS-0004 [2], clause 7.3.1.2 |
| | | | |
| **Pre-test conditions:** | | | • An <accessControlPolicy> resource with name {ACPName} has been created in remote hosting CSE, not allowing delete operation.<br>• AE has created an <AE> resource on registrar CSE with name {AEName}<br>• AE has created a <container> sub-resource in the <AE> resource with name {containerName} and having as accessControlPolicy-ID the ID of the remote <accessControlPolicy> . |
| **Test Sequence** | | | |
| **Step** | **RP** | **Type** | **Description** |
| 1 | | Stimulus | AE is requested to send a Request to delete the <container> resource from the registrar CSE. |
| 2 | Mca | PRO Check Primitive | • op = 4 (Delete)<br>• to = URI of addressed resource<br>• fr = AE-ID<br>• rqi = (token-string)<br>• pc = empty |
| | | PRO Check HTTP | Sent request contains<br>• Request method = DELETE<br>• Request-Target: URI of addressed resource<br>• Host: IP address or the FQDN of Registrar CSE |

| Interoperability Test Description | | | |
|---|---|---|---|
| | | | • X-M2M-RI: (token-string)<br>• X-M2M-Origin: AE-ID<br>• Message-body: empty |
| | | PRO Check CoAP | Sent request contains<br>• Method: 0.04 (DELETE)<br>• Uri-Host: IP address or the FQDN of Registrar CSE<br>• Uri-Path: URI of addressed resource<br>• oneM2M-FR: AE-ID<br>• oneM2M-RQI: (token-string)<br>• Payload: empty |
| | | PRO Check MQTT | Sent MQTT PUBLISH message:<br>Topic: "/oneM2M/req/<AE-ID>/<Registrar CSE-ID>"<br>Payload:<br>• op = 4 (Delete)<br>• to = URI of addressed resource<br>• fr = AE-ID<br>• rqi = (token-string)<br>• pc = empty |
| 3 | | IOP Check | Check if possible that a request is sent by the registrar CSE to the Hosting CSE to retrive the corresponding remote <accessControlPolicy> resource. |
| 4 | Mcc | PRO Check Primitive | Sent request contains<br>• op = 2 (Retrieve)<br>• to = URI of addressed resource<br>• fr = Registrar CSE-ID<br>• rqi = (token-string)<br>• pc = empty |
| | | PRO Check HTTP | Sent request contains<br>• Request method = GET<br>• Request-Target: URI of addressed resource<br>• Host: IP address or the FQDN of Hosting CSE<br>• X-M2M-RI: (token-string)<br>• X-M2M-Origin: Registrar CSE-ID<br>• Message-body: empty |
| | | PRO Check CoAP | Sent request contains<br>• Method: 0.01 (GET)<br>• Uri-Host: IP address or the FQDN of Hosting CSE<br>• Uri-Path: URI of addressed resource<br>• oneM2M-FR: Registrar CSE-ID<br>• oneM2M-RQI: (token-string)<br>• Payload: empty |
| | | PRO Check MQTT | Sent MQTT PUBLISH message:<br>Topic: "/oneM2M/req/<Registrar CSE-ID>/<Hosting CSE-ID>"<br>Payload:<br>• op = 2 (Retrieve)<br>• to = URI of addressed resource<br>• fr = Registrar CSE-ID<br>• rqi = (token-string)<br>• pc = empty |
| 5 | | IOP Check | Check if possible that the response is sent by the hosting CSE to the registrar CSE. |
| 6 | Mcc | PRO Check Primitive | Hosting CSE sends response containing:<br>• rsc = 2000 (OK)<br>• rqi = (token-string) same as received in request message<br>• pc = Serialized representation of <accessControlPolicy> resource |
| | | PRO Check HTTP | Hosting CSE sends response containing:<br>• Status Code = 200 (OK)<br>• X-M2M-RSC: 2000<br>• X-M2M-RI: (token-string) same as received in request message<br>• Content-Type: application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json<br>• Message-body: Serialized representation of <accessControlPolicy> resource |
| | | PRO Check CoAP | Hosting CSE sends response containing:<br>• Response Code = 2.05<br>• oneM2M-RSC: 2000<br>• oneM2M-RQI: (token-string) same as received in request message<br>• Content-format: application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json |

| Interoperability Test Description | | | |
|---|---|---|---|
| | | | • Payload: Serialized representation of <accessControlPolicy> resource |
| | | MQTT | Sent MQTT PUBLISH message:<br>Topic: "/oneM2M/resp/<Registrar CSE-ID>/<Hosting CSE-ID>"<br>Payload:<br>• to = Registrar CSE-ID<br>• fr = Hosting CSE-ID<br>• rsc = 2000 (OK)<br>• rqi = (token-string) same as received in request message<br>• pc = Serialized representation of <accessControlPolicy> resource |
| 7 | | IOP Check | Check if possible that an access denied error response is sent by registrar CSE to AE |
| 8 | Mca | PRO Check Primitive | Registrar CSE sends response containing:<br>• rsc = 4103 (ACCESS_DENIED)<br>• rqi = (token-string) same as received in request message<br>• pc = empty |
| | | PRO Check HTTP | Registrar CSE sends response containing:<br>• Status Code = 403 (Forbidden)<br>• X-M2M-RSC: 4103<br>• X-M2M-RI: (token-string) same as received in request message<br>• Message-body: empty |
| | | PRO Check CoAP | Registrar sends response containing:<br>• Response Code = 4.03 (Forbidden)<br>• oneM2M-RSC: 4103<br>• oneM2M-RQI: (token-string) same as received in request message<br>• Payload: empty |
| | | PRO Check MQTT | Sent MQTT PUBLISH message:<br>Topic: "/oneM2M/resp/<AE-ID>/<Registrar CSE-ID>"<br>Payload:<br>• to = AE-ID<br>• fr = Registrar CSE-ID<br>• rsc = <Response Status Code(4103, ACCESS_DENIED><br>• rqi = (token-string) same as received in request message<br>• pc = empty |
| 9 | | IOP Check | Check if possible that the <container> resource has not been deleted. |
| 10 | | IOP Check | AE indicates unsuccessful operation (Delete error – no privilege) |

### 8.3.1.11 Notification

| Interoperability Test Description | | | |
|---|---|---|---|
| **Identifier:** | | | TD_M2M_SH_11 |
| **Objective:** | | | AE receives a notification request from the remote hosting CSE |
| **Configuration:** | | | M2M_CFG_03 |
| **References:** | | | TS-0001 [1], clause 10.2.12<br>TS-0004 [2], clause 7.4.1 |
| | | | |
| **Pre-test conditions:** | | | • A <container> resource has been created on hosting CSE<br>• AE has created an <AE> resource on registrar CSE<br>• AE has created a <subscription> resource for the <container> resource on the remote hosting CSE. |
| **Test Sequence** | | | |
| **Step** | **RP** | **Type** | **Description** |
| 1 | | Stimulus | A <contentInstance> sub-resource is created on the the <container> resource. This triggers or causes the hostting CSE to send a notification to AE. |
| 2 | Mca | PRO Check Primitive | • op = 5 (Notify)<br>• to = URI of AE resource<br>• from = Hosting CSE-ID<br>• rqi = (token-string)<br>• pc = Serialized representation of Notification data object |
| | | PRO Check HTTP | Sent request contains<br>• Request method = POST<br>• Request-Target: URI of AE resource<br>• Host: IP address or FQDN registrar CSE<br>• X-M2M-RI: (token-string)<br>• X-M2M-Origin: Hosting CSE-ID |

| Interoperability Test Description | | | |
|---|---|---|---|
| | | | • Content-Type: application/vnd.onem2m-ntfy+xml; or application/vnd.onem2m-ntfy+json;<br>• Message-body: Serialized Representation of Notification data object |
| | | PRO Check CoAP | Sent request contains<br>• Method: 0.02 (POST)<br>• Uri-Host: IP address or FQDN of registrar CSE<br>• Uri-Path: URI of AE resource<br>• oneM2M-FR: Hosting CSE-ID<br>• oneM2M-RQI: (token-string)<br>• Content-Format: application/vnd.onem2m-ntfy+xml; or application/vnd.onem2m-ntfy+json;<br>• Payload: Serialized Representation of Notification data object |
| | | PRO Check MQTT | Sent MQTT PUBLISH message:<br>Topic: "/oneM2M/req/<Hosting CSE-ID>/<Registrar-ID>"<br>Payload:<br>• op = 5 (Notify)<br>• to = URI of AE resource<br>• fr = Hosting CSE-ID<br>• rqi = (token-string)<br>• pc = empty |
| 3 | | IOP Check | Check if possible that the Notify request is forwarded by the registrar CSE to the AE-ID. |
| 4 | Mcc | PRO Check Primitive | • op = 5 (Notify)<br>• to = AE<br>• from = Hosting CSE-ID<br>• rqi = (token-string)<br>• pc = Serialized representation of Notification data object |
| | | PRO Check HTTP | Sent request contains<br>• Request method = POST<br>• Request-Target: AE<br>• Host: IP address or FQDN registrar CSE<br>• X-M2M-RI: (token-string)<br>• X-M2M-Origin: Hosting CSE-ID<br>• Content-Type: application/vnd.onem2m-ntfy+xml; or application/vnd.onem2m-ntfy+json;<br>• Message-body: Serialized Representation of Notification data object |
| | | PRO Check CoAP | Sent request contains<br>• Method: 0.02 (POST)<br>• Uri-Host: IP address or FQDN of registrar CSE<br>• Uri-Path: AE<br>• oneM2M-FR: Hosting CSE-ID<br>• oneM2M-RQI: (token-string)<br>• Content-Format: application/vnd.onem2m-ntfy+xml; or application/vnd.onem2m-ntfy+json;<br>• Payload: Serialized Representation of Notification data object |
| | | PRO Check MQTT | Sent MQTT PUBLISH message:<br>Topic: "/oneM2M/req/<Registrar CSE-ID>/<AE-ID>"<br>Payload:<br>• op = 5 (Notify)<br>• to = AE<br>• fr = Hosting CSE-ID<br>• rqi = (token-string)<br>• pc = empty |
| 5 | | IOP Check | Check if possible that the response is sent by the AE to the registrar CSE. |
| 6 | Mcc | PRO Check Primitive | AE sends response containing:<br>• rsc = 2000 (OK)<br>• rqi = (token-string) same as received in request message<br>• pc = empty |
| | | PRO Check HTTP | AE sends response containing:<br>• Status Code = 200 (OK)<br>• X-M2M-RSC: 2000<br>• X-M2M-RI: (token-string) same as received in request message<br>• Message-body: empty |
| | | PRO Check CoAP | AE sends response containing:<br>• Response Code = 2.05<br>• oneM2M-RSC: 2000<br>• oneM2M-RQI: (token-string) same as received in request message |

| Interoperability Test Description | | | |
|---|---|---|---|
| | | | • Payload: empty |
| | | MQTT | Sent MQTT PUBLISH message:<br>Topic: "/oneM2M/resp/<RegistrarCSE-ID>/<AE-ID>"<br>Payload:<br>• to = Registrar CSE-ID<br>• fr = Hosting CSE-ID<br>• rsc = 2000 (OK)<br>• rqi = (token-string) same as received in request message<br>• pc = empty |
| 7 | | IOP Check | - Check if possible that the response is forwarded by registrar CSE to Hosting CSE |
| 6 | Mca | PRO Check Primitive | Registrar CSE sends response containing:<br>• rsc = 2000 (OK)<br>• rqi = (token-string) same as received in request message<br>• pc = empty |
| | | PRO Check HTTP | Registrar CSE sends response containing:<br>• Status Code = 200 (OK)<br>• X-M2M-RSC: 2000<br>• X-M2M-RI: (token-string) same as received in request message<br>• Message-body: empty |
| | | PRO Check CoAP | Registrar CSE sends response containing:<br>• Response Code = 2.05<br>• oneM2M-RSC: 2000<br>• oneM2M-RQI: (token-string) same as received in request message<br>• Payload: empty |
| | | PRO Check MQTT | Sent MQTT PUBLISH message:<br>Topic: "/oneM2M/resp/<Hosting CSE-ID>/<Registrar CSE-ID>"<br>Payload:<br>• to = Registrar CSE-ID<br>• fr = Hosting CSE-ID<br>• rsc = 2000 (OK)<br>• rqi = (token-string) same as received in request message<br>• pc = empty |
| | | IOP Check | Check if possible that the <container> resource has not been deleted. |
| 7 | | IOP Check | AE indicates unsuccessful operation (Delete error - no privilege). |

## 8.3.2 <mgmtObj> Test Description

### 8.3.2.1 <mgmtObj> Create

| Interoperability Test Description | | | |
|---|---|---|---|
| **Identifier:** | | | TD_M2M_SH_05 |
| **Objective:** | | | AE creates a <mgmtObj> resource |
| **Configuration:** | | | M2M_CFG_03 |
| **References:** | | | TS-0001 [1], clause 10.2.8.2 |
| | | | |
| **Pre-test conditions:** | | | • Management Session between Management Server and Management Client |
| **Test Sequence** | | | |
| **Step** | **RP** | **Type** | **Description** |
| 1 | | Stimulus | AE is requested to send an <mgmtObj> Create Request to create an <mgmtObj> on IN-CSE. |
| 2 | Mca | PRO Check Primitive | • op: 1 (CREATE)<br>• fr: AE-ID<br>• to: {CSEBaseName}/{node}<br>• rqi = (token-string)<br>• ty = 13 (mgmtObj)<br>• pc: Serialized representation of the <mgmtObj> resource |
| | | PRO Check HTTP | Sent request contains<br>• Request method = POST<br>• Request-Target: {CSEBaseName}/{node}<br>• Host: IP address or FQDN of the IN-CSE<br>• X-M2M-RI: (token-string)<br>• X-M2M-Origin: AE-ID<br>• Content-Type: application/vnd.onem2m-res+xml; ty=13 or application/vnd.onem2m-res+json; ty=13 |

| Interoperability Test Description | | | |
|---|---|---|---|
| | | | • Message-body: Serialized representation of the <mgmtObj> resource |
| | | PRO Check CoAP | Sent request contains<br>• Method: 0.02 (POST)<br>• Uri-Host: IP address or the FQDN of Registrar CSE<br>• Uri-Path: {CSEBaseName}/{node}<br>• Content-type: application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json<br>• oneM2M-TY: 13<br>• oneM2M-FR: AE-ID<br>• oneM2M-RQI: (token-string)<br>• Payload: Serialized representation of <mgmtObj> resource |
| | | PRO Check MQTT | Sent MQTT PUBLISH message:<br>Topic: "/oneM2M/req/< AE-ID>/<Registrar CSE-ID>"<br>Payload:<br>• op = 1 (Create)<br>• to = {CSEBaseName}/{node}<br>• fr = AE-ID<br>• rqi = (token-string)<br>• ty = 13 (mgmtObj)<br>• pc = Serialized representation of <AE> resource |
| 3 | | IOP Check | Check if possible that the <mgmtObj> resource is created in IN-CSE |
| 4 | mc | PRO Check Primitive | N/A |
| | | PRO Check OMA DM | Requests to create the corresponding MO using Add DM command.<br>The mapping of <mgmtObj> and MO can be referenced from clause 5.3 of TS-0005 [10]. |
| | | PRO Check BBF TR069 | Requests to create the corresponding information model using AddObject RPC.<br>The mapping of <mgmtObj> and information model or RPC can be referenced from clause 7 of TS-0006 [11]. |
| | | PRO Check OMA LWM2M | Requests to create the corresponding Objects using Create LWM2M Create operations.<br>The mapping of <mgmtObj> and Object can be referenced from clause 6.3 of TS-0005 [10]. |
| 5 | | IOP Check | Check if possible that the corresponding MO for OMA DM, information model for BBF TR069 or Object for OMA LWM2M is created on the Managed Entity. |
| 6 | mc | PRO Check Primitive | N/A |
| | | PRO Check OMA DM | Response with status code (200) OK. Details can be found in clause 5.4 TS-0005 [10]. |
| | | PRO Check BBF TR069 | Successful response of the RPC. Details can be found in clause 8.1 TS-0006 [11]. |
| | | PRO Check OMA LWM2M | Response with status code 2.01 Created. Details can be found in clause 6.4 TS-0005 [10]. |
| 7 | Mca | PRO Check Primitive | • rsc = 2001 (CREATED)<br>• rqi = (token-string) same as received in request message<br>• pc = Serialized representation of <mgmtObj> resource |
| | | PRO Check HTTP | IN-CSE sends response containing:<br>• Status Code = 201 (OK)<br>• X-M2M-RSC: 2001<br>• X-M2M-RI: (token-string) same as received in request message<br>• Content-Location: URI of the created <mgmtObj> resource<br>• Content-Type: application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json<br>• Message-body: Serialized representation of <mgmtObj> resource |
| | | PRO Check CoAP | IN-CSE sends response containing:<br>• Response Code = 2.01<br>• oneM2M-RSC: 2001<br>• oneM2M-RQI: (token-string) same as received in request message<br>• Location-Path: URI of the created <mgmtObj> resource<br>• Payload: Serialized representation of <mgmtObj> resource |
| | | PRO Check MQTT | IN-CSE MQTT PUBLISH message:<br>Topic: "/oneM2M/resp/< AE-ID>/<Registrar CSE-ID>"<br>Payload:<br>• to = AE-ID<br>• fr = Registrar CSE-ID<br>• rsc = 2001 (CREATED)<br>• rqi = (token-string) same as received in request message<br>• pc = Serialized representation of <mgmtObj> resource |

| Interoperability Test Description | | | |
|---|---|---|---|
| 8 | | IOP Check | AE indicates successful operation |
| IOP Verdict | | | |
| PRO Verdict | | | |

### 8.3.10.2 <mgmtObj> Update

| Interoperability Test Description | | | |
|---|---|---|---|
| **Identifier:** | | | TD_M2M_SH_06 |
| **Objective:** | | | AE updates a <mgmtObj> resource |
| **Configuration:** | | | M2M_CFG_03 |
| **References:** | | | TS-0001 [1], clause 10.2.8.4 |
| | | | |
| **Pre-test conditions:** | | | • Management Session between Management Server and Management Client |
| **Test Sequence** | | | |
| **Step** | **RP** | **Type** | **Description** |
| 1 | | Stimulus | AE is requested to send an <mgmtObj> Update Request to update an <mgmtObj> on IN-CSE. |
| 2 | Mca | PRO Check Primitive | • op: 3 (UPDATE)<br>• fr: AE-ID<br>• to: {CSEBaseName}/{node}/{mgmtObj}<br>• rqi = (token-string)<br>• pc: Serialized representation of the <mgmtObj> resource |
| | | PRO Check HTTP | Sent request contains<br>• Request method = PUT<br>• Request-Target: {CSEBaseName}/{node}/{mgmtObj}<br>• Host: IP address or FQDN of the IN-CSE<br>• X-M2M-RI: (token-string)<br>• X-M2M-Origin: AE-ID<br>• Content-Type: application/vnd.onem2m-res+xml; or application/vnd.onem2m-res+json;<br>• Message-body: Serialized representation of the <mgmtObj> resource |
| | | PRO Check CoAP | Sent request contains<br>• Method: 0.03 (PUT)<br>• Uri-Host: IP address or the FQDN of Registrar CSE<br>• Uri-Path: {CSEBaseName}/{node}/{mgmtObj}<br>• Content-format: application/vnd.onem2m-res+xml; or application/vnd.onem2m-res+json;<br>• oneM2M-FR: AE-ID<br>• oneM2M-RQI: (token-string)<br>• Payload: Serialized representation of <mgmtObj> resource |
| | | PRO Check MQTT | Sent MQTT PUBLISH message<br>Topic: "/oneM2M/req/<AE-ID>/<Registrar CSE-ID>"<br>Payload:<br>• op = 3 (Update)<br>• to = {CSEBaseName}/{node}/{mgmtObj}<br>• fr = AE-ID<br>• rqi = (token-string)<br>• pc = Serialized representation of <mgmtObj> resource |
| 3 | | IOP Check | Check if possible that the <mgmtObj> resource is updated in IN-CSE |
| 4 | mc | PRO Check Primitive | N/A |
| | | PRO Check OMA DM | Requests to update the corresponding MO using Replace DM command.<br>The mapping of <mgmtObj> and MO can be referenced from clause 5.3 of TS-0005 [10]. |
| | | PRO Check BBF TR069 | Requests to Update the corresponding information model using SetParameterValues RPC.The mapping of <mgmtObj> and information model or RPC can be referenced from clause 7 of TS-0006 [11]. |
| | | PRO Check OMA LWM2M | Requests to Update the corresponding Objects using LWM2M Write operations.<br>The mapping of <mgmtObj> and Object can be referenced from clause 6.3 of TS-0005 [10]. |
| 5 | | IOP Check | Check if possible that the corresponding MO for OMA DM, information model for BBF TR069 or Object for OMA LWM2M is Updated on the Managed Entity. |
| 6 | mc | PRO Check Primitive | N/A |

| Interoperability Test Description | | | |
|---|---|---|---|
| | | PRO Check OMA DM | Response with status code (200) OK. Details can be found in clause 5.4 TS-0005 [10]. |
| | | PRO Check BBF TR069 | Successful response of the RPC. Details can be found in clause 8.1 TS-0006 [11]. |
| | | PRO Check OMA LWM2M | Response with status code 2.04 Changed. Details can be found in clause 6.4 TS-0005 [10]. |
| 7 | Mca | PRO Check Primitive | • rsc = 2004 (CHANGED)<br>• rqi = (token-string) same as received in request message<br>• pc = Serialized representation of <mgmtObj> resource |
| | | PRO Check HTTP | IN-CSE sends response containing:<br>• Code = 200<br>• X-M2M-RSC: 2004<br>• X-M2M-RI: (token-string) same as received in request message<br>• Content-Type: application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json<br>• Message-body: Serialized representation of <mgmtObj> resource |
| | | PRO Check CoAP | IN-CSE sends response containing:<br>• Response Code = 2.05<br>• oneM2M-RSC: 2004<br>• oneM2M-RQI: (token-string) same as received in request message<br>• Payload: Serialized representation of <mgmtObj> resource |
| | | PRO Check MQTT | IN-CSE sends a MQTT PUBLISH message<br>Topic: "/oneM2M/resp/<AE-ID>/<Registrar CSE-ID>"<br>Payload:<br>• to = AE-ID<br>• fr = Registrar CSE-ID<br>• rqi = (token-string) same as received in request message<br>• rsc = 2004<br>• pc = Serialized representation of <mgmtObj> resource |
| 8 | | IOP Check | AE indicates successful operation |
| IOP Verdict | | | |
| PRO Verdict | | | |

### 8.3.10.3 <mgmtObj> Retrieve

| Interoperability Test Description | | | |
|---|---|---|---|
| **Identifier:** | | TD_M2M_SH_07 | |
| **Objective:** | | AE retrieves a <mgmtObj> resource | |
| **Configuration:** | | M2M_CFG_03 | |
| **References:** | | TS-0001 [1], clause 10.2.8.3 | |
| | | | |
| **Pre-test conditions:** | | • Management Session between Management Server and Management Client | |
| **Test Sequence** | | | |
| **Step** | **RP** | **Type** | **Description** |
| 1 | | Stimulus | AE is requested to send an <mgmtObj> Retrieve Request to retrieve an <mgmtObj> on IN-CSE. |
| 2 | Mca | PRO Check Primitive | • op = 2 (RETRIEVE)<br>• to = {CSEBaseName}/{node}/{mgmtObj}<br>• fr = AE-ID<br>• rqi = (token-string) |
| | | PRO Check HTTP | Sent request contains<br>• Request method = GET<br>• Request-Target: {CSEBaseName}/{node}/{mgmtObj}<br>• Host: IP address or the FQDN of Registrar CSE<br>• X-M2M-RI: (token-string)<br>• X-M2M-Origin: AE-ID<br>• Content-Type: application/vnd.onem2m-res+xml; or application/vnd.onem2m-res+json; |
| | | PRO Check CoAP | Sent request contains<br>• Method: 0.01 (GET)<br>• Uri-Host: IP address or the FQDN of Registrar CSE<br>• Uri-Path: {CSEBaseName}/{node}/{mgmtObj}<br>• Content-format: application/vnd.onem2m-res+xml; or application/vnd.onem2m-res+json; |

| Interoperability Test Description | | | |
|---|---|---|---|
| | | | • oneM2M-FR: AE-ID<br>• oneM2M-RQI: (token-string) |
| | | PRO Check MQTT | Sent a MQTT PUBLISH message:<br>Topic: "/oneM2M/req/<AE-ID>/<Registrar CSE-ID>"<br>Payload:<br>• op = 2 (Retrieve)<br>• to = {CSEBaseName}/{node}/{mgmtObj}<br>• fr = <AE-ID><br>• rqi = (token-string) |
| 3 | | IOP Check | Check if possible that the <mgmtObj> resource is retrieved in IN-CSE |
| 4 | mc | PRO Check Primitive | N/A |
| | | PRO Check OMA DM | Requests to retrieve the corresponding MO using Get DM command. |
| | | PRO Check BBF TR069 | Requests to retrieve the corresponding information model using GetParametersValue RPC. |
| | | PRO Check OMA LWM2M | Requests to retrieve the corresponding Objects using Retrieve LWM2M Read operation. |
| 5 | | IOP Check | |
| 6 | mc | PRO Check Primitive | N/A |
| | | PRO Check OMA DM | Response with status code (200) OK with the information of the MO. Details can be found in clause 5.4 TS-0005 [10]. |
| | | PRO Check BBF TR069 | Successful response of the RPC with the information about the management related information. Details can be found in clause 8.1 TS-0006 [11]. |
| | | PRO Check OMA LWM2M | Response with status code 2.05 Content with the information of the Object. Details can be found in clause 6.4 TS-0005 [10]. |
| 7 | Mca | PRO Check Primitive | • rsc = 2000 (OK)<br>• rqi = (token-string) same as received in request message<br>• pc = Serialized representation of <mgmtObj> resource |
| | | PRO Check HTTP | IN-CSE sends response containing:<br>• Status Code =200 (OK)<br>• X-M2M-RSC: 2000<br>• X-M2M-RI: (token-string) same as received in request message<br>• Message-body: Serialized representation of <mgmtObj> resource |
| | | PRO Check CoAP | IN-CSE sends response containing:<br>• Response Code = 2.05<br>• oneM2M-RSC: 2000<br>• oneM2M-RQI: (token-string) same as received in request message<br>• Payload: Serialized representation of <mgmtObj> resource |
| | | PRO Check MQTT | IN-CSE sends a MQTT PUBLISH message:<br>Topic: "/oneM2M/resp/<AE-ID>/<Registrar CSE-ID>"<br>Payload:<br>• to = AE-ID<br>• fr = Registrar CSE-ID<br>• rsc = 2000<br>• rqi = (token-string) same as received in request message<br>• pc = Serialized representation of <mgmtObj> resource |
| 8 | | IOP Check | AE indicates successful operation |
| IOP Verdict | | | |
| PRO Verdict | | | |

### 8.3.10.4 <mgmtObj> Delete

| Interoperability Test Description | | | |
|---|---|---|---|
| **Identifier:** | | | TD_M2M_SH_08 |
| **Objective:** | | | AE deletes a <mgmtObj> resource |
| **Configuration:** | | | M2M_CFG_03 |
| **References:** | | | TS-0001 [1], clause 10.2.8.5 |
| | | | |
| **Pre-test conditions:** | | | • Management Session between Management Server and Management Client |
| **Test Sequence** | | | |
| **Step** | **RP** | **Type** | **Description** |

| Interoperability Test Description | | | |
|---|---|---|---|
| 1 | | Stimulus | AE is requested to send an <mgmtObj> Delete Request to delete an <mgmtObj> on IN-CSE. |
| 2 | Mca | PRO Check Primitive | • op = 4 (DELETE)<br>• to = {CSEBaseName}/{node}/{mgmtObj}<br>• fr = AE-ID<br>• rqi = (token string) |
| | | PRO Check HTTP | Sent DELETE request contains<br>• Request method = DELETE<br>• Request-Target: {CSEBaseName}/{node}/{mgmtObj}<br>• Host: IP address or the FQDN of Registrar CSE<br>• X-M2M-RI: (token-string)<br>• X-M2M-Origin: AE-ID |
| | | PRO Check CoAP | Sent DELETE request contains<br>• Method: 0.04 (DELETE)<br>• Uri-Host: IP address or the FQDN of Registrar CSE<br>• Uri-Path: {CSEBaseName}/{node}/{mgmtObj}<br>• oneM2M-FR: AE-ID<br>• oneM2M-RQI: (token-string) |
| | | PRO Check MQTT | Sent a MQTT PUBLISH message<br>Topic: "/oneM2M/req/< AE-ID>/<Registrar CSE-ID>"<br>Payload:<br>• op = 4<br>• to = {CSEBaseName}/{node}/{mgmtObj}<br>• fr = AE-ID<br>• rqi = (token-string) |
| 3 | | IOP Check | Check if possible that the <mgmtObj> resource is deleted in IN-CSE |
| 4 | mc | PRO Check Primitive | N/A |
| | | PRO Check OMA DM | Requests to delete the corresponding MO using Delete DM command. |
| | | PRO Check BBF TR069 | Requests to delete the corresponding information model using DeleteObject RPC. |
| | | PRO Check OMA LWM2M | Requests to delete the corresponding Objects using LWM2M Delete operation. |
| 5 | | IOP Check | Check if possible that the corresponding MO for OMA DM, information model for BBF TR069 or Object for OMA LWM2M is deleted on the Managed Entity. |
| 6 | mc | PRO Check Primitive | N/A |
| | | PRO Check OMA DM | Response with status code (200) OK. Details can be found in clause 5.4 TS-0005 [10]. |
| | | PRO Check BBF TR069 | Successful response of the RPC. Details can be found in clause 8.1 TS-0006 [11]. |
| | | PRO Check OMA LWM2M | Response with status code 2.02 Deleted. Details can be found in clause 6.4 TS-0005 [10] |
| 7 | Mca | PRO Check Primitive | • rsc = 2002 (DELETED)<br>• rqi = (token-string) same as received in request message |
| | | PRO Check HTTP | IN-CSE sends response containing:<br>• Status Code = 200<br>• X-M2M-RSC: 2002<br>• X-M2M-RI: (token-string) same as received in request message |
| | | PRO Check CoAP | IN-CSE sends response containing:<br>• Response Code = 2.05<br>• oneM2M-RSC: 2002<br>• oneM2M-RQI: (token-string) same as received in request message |
| | | PRO Check MQTT | IN-CSE sends a MQTT PUBLISH message<br>Topic: "/oneM2M/resp/<AE-ID>/<Registrar CSE-ID>"<br>Payload:<br>• to = AE-ID<br>• fr = Registrar CSE-ID<br>• rqi = (token-string) same as received in request message<br>• rsc = 2002 |
| 8 | | IOP Check | AE indicates successful operation |

| Interoperability Test Description | |
|---|---|
| IOP Verdict | |
| PRO Verdict | |

# History

| Publication history | | |
|---|---|---|
| V1.0.0 | 29- Feb-2016 | Updated Release 1 - Publication |
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