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

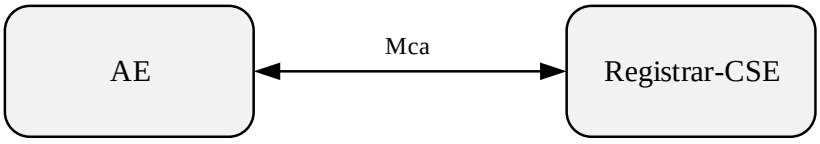
7.1 Test Configuration

7.1.1 No hop

7.1.1.1 M2M_CFG_01

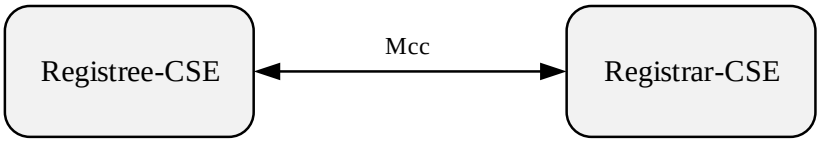
The AE manages resources on the registrar CSE (Hosting CSE)

oneM2M entities model



7.1.1.2 M2M_CFG_02

oneM2M entities model



7.1.2 Single hop

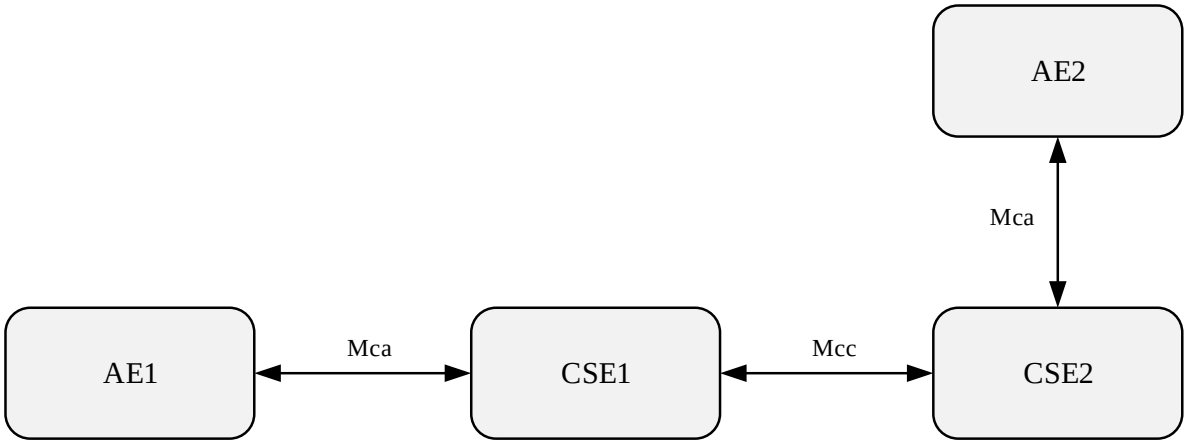
7.1.1.1 M2M_CFG_03

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.

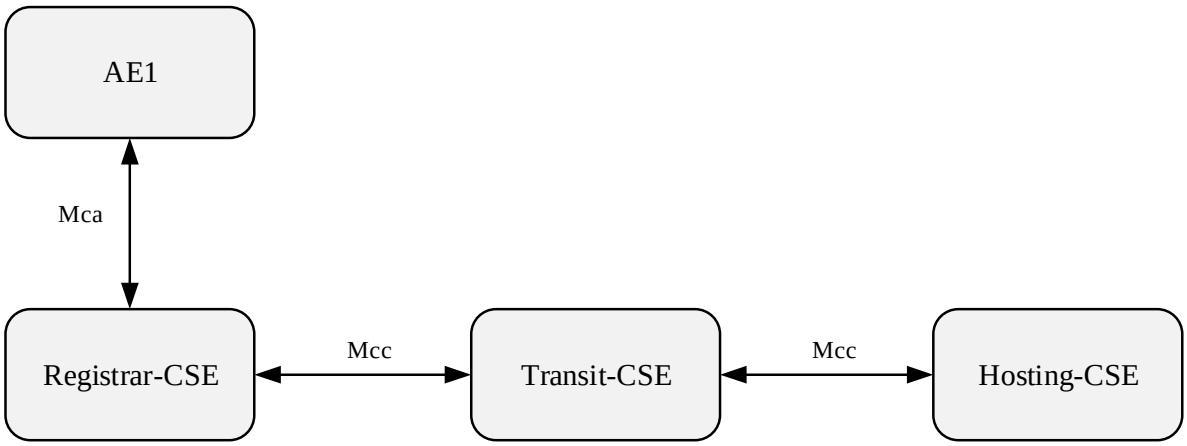
This configuration is mapped to cases including:

- 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

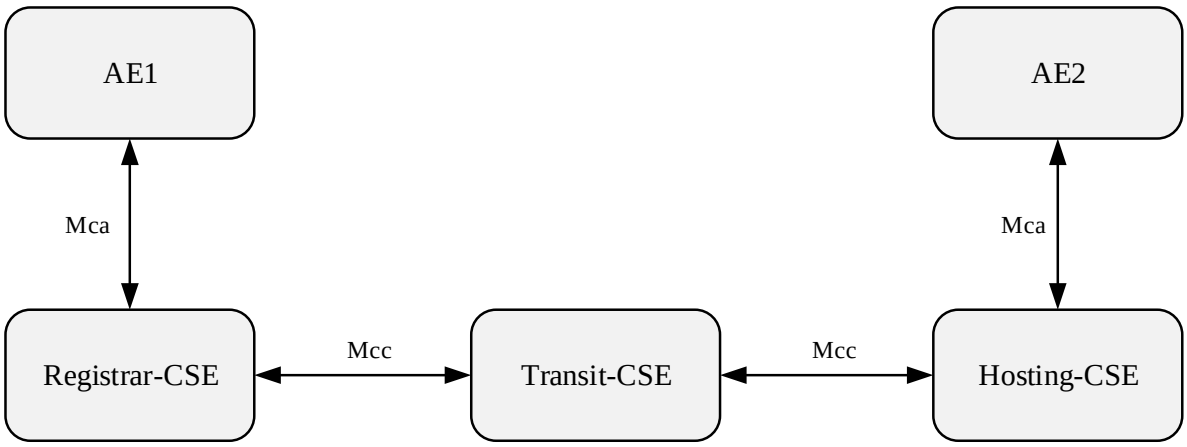
7.1.3.1 M2M_CFG_06

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 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) • To (to) = Resource-ID of requested <CSEBase> resource, assumed CSE-relative here • From (from) = AE-ID of request originator • Request Identifier (rqi) = (token-string)
		PRO Check HTTP	Sent GET request contains • Request method = GET • Request-Target:{CSEBaseName} • Host: Host Address of registrar CSE • X-M2M-RI: value of rqi primitive parameter • X-M2M-Origin: AE-ID • Payload: empty
		PRO Check CoAP	Sent GET request contains • Method: 0.01 (GET) • Uri-Host: Registrar CSE host • Uri-Port: Registrar CSE port • 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>" Payload: • op = 2 • to = <CSEBase> • fr = <AE-ID> • rqi = <Request ID>
3	Mca	PRO Check Primitive	• Response Status Code (rsc) = 2000 (OK) • Request Identifier (rqi) = same string as received in request message Content (pc) = Serialized Representation of <CSEBase> resource
		PRO Check HTTP	Registrar CSE sends response containing: • Status Code = 200 • X-M2M-RSC: 2000 • X-M2M-RI: value of rqi primitive parameter • Content-Type; application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json • Content-Length = size of payload in the message body in bytes • Payload: Serialized Representation of <CSEBase> resource
		PRO Check CoAP	Registrar sends response containing: • Response Code = 2.05 • 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>" Payload: • to = <SP-Relative-AE-ID> • fr = <Registrar CSE-ID>

Interoperability Test Description			
			• rqi = <Request ID> • rsc = <Response Status Code(2000)> • 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 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) • to = {CSEBaseName} • fr = Registree CSE-ID • rqi = (token-string) • ty = 16 (RemoteCSE) • pc = Serialized representation of <RemoteCSE> resource
		PRO Check HTTP	Sent request contains • Request method = POST • Request-Target:{CSEBaseName} • Host: IP address or the FQDN of Registrar CSE • X-M2M-RI: (token-string) • X-M2M-Origin: Registree CSE-ID • Content-Type: application/vnd.onem2m-res+xml; ty=16 or application/vnd.onem2m-res+json; ty=16 • Message-body: Serialized representation of <RemoteCSE> resource
		PRO Check CoAP	Sent request contains • Method: 0.02 (POST) • Uri-Host: IP address or the FQDN of Registrar CSE • Uri-Path: {CSEBaseName} • Content-type: application/vnd.onem2m-res+xmlor application/vnd.onem2m-res+json • oneM2M-TY: 16 • oneM2M-FR: Registree CSE-ID • oneM2M-RQI: (token-string) • Payload: Serialized representation of <RemoteCSE> resource
		PRO Check MQTT	Sent MQTT PUBLISH message: Topic: "/oneM2M/req/< Registree CSE-ID>/<Registrar CSE-ID>" Payload: • op = 1 (Create) • to = {CSEBaseName} • fr = Registree CSE-ID • rqi = (token-string) • ty = 16 (RemoteCSE) • pc = Serialized representation of <RemoteCSE> resource

Interoperability Test Description			
3	Mcc	PRO Check Primitive	• rsc = 2001 (CREATED) • rqi = (token-string) same as received in request message • pc = Serialized representation of <RemoteCSE> resource
		PRO Check HTTP	Registrar CSE sends response containing: • Status Code = 201 (Created) • X-M2M-RSC: 2001 • X-M2M-RI: (token-string) same as received in request message • Content-Location: URI of the created RemoteCSE resource. • Content-Type: application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json • Message-body: Serialized representation of <RemoteCSE> resource
		PRO Check CoAP	Registrar sends response containing: • Response Code = 2.01 • oneM2M-RSC: 2001 • oneM2M-RQI: (token-string) same as received in request message • Location-Path: URI of the created RemoteCSE resource • Content-format: application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json • Payload: Serialized representation of <RemoteCSE> resource
		PRO Check MQTT	Sent MQTT PUBLISH message: Topic: "/oneM2M/resp/< AE-ID>/<Registrar CSE-ID>" Payload: • to = Registree CSE-ID • fr = Registrar CSE-ID • rsc = 2001 (CREATED) • rqi = (token-string) same as received in request message • 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 TS-0004 [2], clause 7.3.3.2.2
Pre-test conditions:			• CSEBase resource has been created in registrar CSE with name {CSEBaseName} • 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) • to = {CSEBaseName}/{remoteCSEName} • fr = Registree CSE-ID • rqi = (token-string) • pc = empty
		PRO Check HTTP	Sent request contains • Request method = GET • Request-Target: {CSEBaseName}/{remoteCSEName} • Host: IP address or the FQDN of Registrar CSE • X-M2M-RI: (token-string) • X-M2M-Origin: Registree CSE-ID • Message-body: empty
		PRO Check CoAP	Sent request contains • Method: 0.01 (GET) • Uri-Host: IP address or the FQDN of Registrar CSE

Interoperability Test Description			
			• Uri-Path: {CSEBaseName}/{remoteCSEName} • oneM2M-FR: Registree CSE-ID • oneM2M-RQI: (token-string) • Payload: empty
		PRO Check MQTT	Sent MQTT PUBLISH message: Topic: "/oneM2M/req/< Registree CSE-ID>/<Registrar CSE-ID>" Payload: • op = 2 (Retrieve) • to = {CSEBaseName}/{remoteCSEName} • fr = Registree CSE-ID • rqi = (token-string) • pc = empty
3	Mcc	PRO Check Primitive	Registrar CSE sends response containing: • rsc = 2000 (OK) • rqi = (token-string) same as received in request message • pc = Serialized representation of <RemoteCSE> resource
		PRO Check HTTP	Registrar CSE sends response containing: • Status Code = 200 (OK) • X-M2M-RSC: 2000 • X-M2M-RI: (token-string) same as received in request message • Content-Type: application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json • Message-body: Serialized representation of <RemoteCSE> resource
		PRO Check CoAP	Registrar sends response containing: • Response Code = 2.05 (OK) • oneM2M-RSC: 2000 • oneM2M-RQI: (token-string) same as received in request message • Content-format: application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json • Payload: Serialized representation of <RemoteCSE> resource
		PRO Check MQTT	Sent MQTT PUBLISH message: Topic: "/oneM2M/resp/<Registree CSE-ID>/<Registrar CSE-ID>" Payload: • to = Registree CSE-ID • fr = Registrar CSE-ID • rsc = 2000 (OK) • rqi = (token-string) same as received in request message • 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 TS-0004 [2], clause 7.3.3.2.3
Pre-test conditions:			• CSEBase resource has been created in registrar CSE with name {CSEBaseName} • 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) • to = {CSEBaseName}/{remoteCSEName} • fr = Registree CSE-ID • rqi = (token-string) • pc = Serialized representation of updated <RemoteCSE> resource
		PRO Check HTTP	Sent request contains • Request method = PUT

Interoperability Test Description			
			• Request-Target: {CSEBaseName}/{remoteCSEName} • Host: IP address or the FQDN of Registrar CSE • X-M2M-RI: (token-string) • X-M2M-Origin: Registree CSE-ID • Content-Type: application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json • Message-body: Serialized representation of updated <RemoteCSE> resource
		PRO Check CoAP	Sent request contains • Method: 0.03 (PUT) • Uri-Host: IP address or the FQDN of Registrar CSE • Uri-Path: {CSEBaseName}/{remoteCSEName} • oneM2M-FR: Registree CSE-ID • oneM2M-RQI: (token-string) • Content-format: application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json • Payload: Serialized representation of updated <RemoteCSE> resource
		PRO Check MQTT	Sent MQTT PUBLISH message: Topic: "/oneM2M/req/< Registree CSE-ID>/<Registrar CSE-ID>" Payload: • op = 3 (Update) • to = {CSEBaseName}/{remoteCSEName} • fr = Registree CSE-ID • rqi = (token-string) • 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: • rsc = 2004 (UPDATED) • rqi = (token-string) same as received in request message • pc = Serialized representation of <RemoteCSE> resource
		PRO Check HTTP	Registrar CSE sends response containing: • Status Code = 200 (OK) • X-M2M-RSC: 2004 • X-M2M-RI: (token-string) same as received in request message • Content-Type: application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json • Message-body: Serialized representation of <RemoteCSE> resource
		PRO Check CoAP	Registrar sends response containing: • Response Code = 2.04 (UPDATED) • oneM2M-RSC: 2004 • oneM2M-RQI: (token-string) same as received in request message • Content-format: application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json • Payload: Serialized representation of <RemoteCSE> resource
		PRO Check MQTT	Sent MQTT PUBLISH message: Topic: "/oneM2M/resp/<Registree CSE-ID>/<Registrar CSE-ID>" Payload: • to = Registree CSE-ID • fr = Registrar CSE-ID • rsc = 2004 (Updated) • rqi = (token-string) same as received in request message • 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 TS-0004 [2], clause 7.3.3.2.4
Pre-test conditions:			• CSEBase resource has been created in registrar CSE with name {CSEBaseName} • 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) • to = {CSEBaseName}/{remoteCSEName} • fr = Registree CSE-ID • rqi = (token-string) • pc = empty
		PRO Check HTTP	Sent request contains • Request method = DELETE • Request-Target: {CSEBaseName}/{remoteCSEName} • Host: IP address or the FQDN of Registrar CSE • X-M2M-RI: (token-string) • X-M2M-Origin: Registree CSE-ID • Message-body: empty
		PRO Check CoAP	Sent request contains • Method: 0.04 (DELETE) • Uri-Host: IP address or the FQDN of Registrar CSE • Uri-Path: {CSEBaseName}/{remoteCSEName} • oneM2M-FR: Registree CSE-ID • oneM2M-RQI: (token-string) • Payload: empty
		PRO Check MQTT	Sent MQTT PUBLISH message: Topic: "/oneM2M/req/<Registree CSE-ID>/<Registrar CSE-ID>" Payload: • op = 4 (Delete) • to = {CSEBaseName}/{remoteCSEName} • fr = Registree CSE-ID • rqi = (token-string) • pc = empty
3	Mcc	PRO Check Primitive	Registrar CSE sends response containing: • rsc = 2002 (DELETED) • rqi = (token-string) same as received in request message • pc = empty
		PRO Check HTTP	Registrar CSE sends response containing: • Status Code = 200 (OK) • X-M2M-RSC: 2002 • X-M2M-RI: (token-string) same as received in request message • Message-body: empty
		PRO Check CoAP	Registrar sends response containing: • Response Code = 2.01 (OK) • oneM2M-RSC: 2002 • oneM2M-RQI: (token-string) same as received in request message • Payload: empty
		PRO Check MQTT	Sent MQTT PUBLISH message: Topic: "/oneM2M/resp/<Registree CSE-ID>/<Registrar CSE-ID>" Payload: • to = Registree CSE-ID • fr = Registrar CSE-ID • rsc = 2002 • rqi = (token-string) same as received in request message • 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 TS-0004 [2], clause 7.3.5.2.1	
Pre-test conditions:		• CSEBase resource has been created in CSE with name {CSEBaseName} • 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) • to = {CSEBaseName} • fr = AE-ID • rqi = (token-string) • ty = 2 (AE) • pc = Serialized representation of <AE> resource
		PRO Check HTTP	Sent request contains • Request method = POST • Request-Target:{CSEBaseName} • Host: IP address or the FQDN of Registrar CSE • X-M2M-RI: (token-string) • X-M2M-Origin: AE-ID • Content-Type: application/vnd.onem2m-res+xml; ty=2 or application/vnd.onem2m-res+json; ty=2 • Message-body: Serialized representation of <AE> resource
		PRO Check CoAP	Sent request contains • Method: 0.02 (POST) • Uri-Host: IP address or the FQDN of Registrar CSE • Uri-Path: {CSEBaseName} • Content-type: application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json • oneM2M-TY: 2 • oneM2M-FR: AE-ID • oneM2M-RQI: (token-string) • Payload: Serialized representation of <AE> resource
		PRO Check MQTT	Sent MQTT PUBLISH message: Topic: "/oneM2M/req/<AE-ID>/<Registrar CSE-ID>" Payload: • op = 1 (Create) • to = {CSEBaseName} • fr = AE-ID • rqi = (token-string) • ty = 2 (AE) • 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) • rqi = (token-string) same as received in request message • pc = Serialized representation of <AE> resource
		PRO Check HTTP	Registrar CSE sends response containing: • Status Code = 201 (OK) • X-M2M-RSC: 2001

Interoperability Test Description			
			• X-M2M-RI: (token-string) same as received in request message • Content-Location: URI of the created AE resource. • Content-Type: application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json • Message-body: Serialized representation of <AE> resource
		PRO Check CoAP	Registrar sends response containing: • Response Code = 2.01 • oneM2M-RSC: 2001 • oneM2M-RQI: (token-string) same as received in request message • Location-Path: URI of the created AE resource • Payload: Serialized representation of <AE> resource
		PRO Check MQTT	Sent MQTT PUBLISH message: Topic: "/oneM2M/resp/<AE-ID>/<Registrar CSE-ID>" Payload: • to = AE-ID • fr = Registrar CSE-ID • rsc = 2001 (CREATED) • rqi = (token-string) same as received in request message • 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 TS-0004 [2], clause 7.3.5.2.2	
Pre-test conditions:		• CSEBase resource has been created in registrar CSE with name {CSEBaseName} • 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) • to = {CSEBaseName}/{AE} • fr = AE-ID of request originator • rqi = (token-string)
		PRO Check HTTP	Sent request contains • Request method = GET • Request-Target: {CSEBaseName}/{{AE} • Host: IP address or the FQDN of Registrar CSE • X-M2M-RI: (token-string) • X-M2M-Origin: AE-ID • Message-body: empty
		PRO Check CoAP	Sent request contains • Method: 0.01 (GET) • Uri-Host: IP address or the FQDN of Registrar CSE • Uri-Path: {CSEBaseName}/{AE} } • oneM2M-FR: AE-ID • oneM2M-RQI: (token-string) • Payload: empty
		PRO Check MQTT	Sent MQTT PUBLISH message: Topic: "/oneM2M/req/< AE-ID>/<Registrar CSE-ID>" Payload: • op = 2 (Retrieve) • to = {CSEBaseName}/{AE} • fr = AE-ID • rqi = (token-string)

Interoperability Test Description			
			• pc = empty
3	Mca	PRO Check Primitive	Registrar CSE sends response containing: • rsc = 2000 (OK) • rqi = (token-string) same as received in request message • pc = Serialized representation of <AE> resource
		PRO Check HTTP	Registrar CSE sends response containing: • Status Code = 200 (OK) • X-M2M-RSC: 2000 • X-M2M-RI: (token-string) same as received in request message • Content-Type: application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json • Message-body: Serialized representation of <AE> resource
		PRO Check CoAP	Registrar sends response containing: • Response Code = 2.05 (OK) • oneM2M-RSC: 2000 • oneM2M-RQI: (token-string) same as received in request message • Content-format: application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json • Payload: Serialized representation of <AE> resource
		PRO Check MQTT	Sent MQTT PUBLISH message: Topic: "/oneM2M/resp/<AE-ID>/<Registrar CSE-ID>" Payload: • to = AE-ID • fr = Registrar CSE-ID • rsc = 2000 (OK) • rqi = (token-string) same as received in request message • 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 TS-0004 [2], clause 7.3.5.2.3	
Pre-test conditions:		• CSEBase resource has been created in registrar CSE with name {CSEBaseName} • 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) • to = {CSEBaseName}/{AE} • fr = AE-ID • rqi = (token-string) • pc = Serialized representation of updated <AE> resource
		PRO Check HTTP	Sent request contains • Request method = PUT • Request-Target: {CSEBaseName}/{AE} • Host: IP address or the FQDN of Registrar CSE • X-M2M-RI: (token-string) • X-M2M-Origin: AE-ID • Content-Type: application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json • Message-body: Serialized representation of updated <AE> resource
		PRO Check CoAP	Sent request contains • Method: 0.03 (PUT) • Uri-Host: IP address or the FQDN of Registrar CSE • Uri-Path: {CSEBaseName}/{AE}

			• oneM2M-FR: AE-ID • oneM2M-RQI: (token-string) • Content-format: application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json • Payload: Serialized representation of updated <AE> resource
		PRO Check MQTT	Sent MQTT PUBLISH message: Topic: "/oneM2M/req/<AE-ID>/<Registrar CSE-ID>" Payload: • op = 3 (Update) • to = {CSEBaseName}/{AE} • fr = AE-ID • rqi = (token-string) • 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: • rsc = 2004 (UPDATED) • rqi = (token-string) same as received in request message • pc = Serialized representation of <AE> resource
		PRO Check HTTP	Registrar CSE sends response containing: • Status Code = 200 (OK) • X-M2M-RSC: 2004 • X-M2M-RI: (token-string) same as received in request message • Content-Type: application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json • Message-body: Serialized representation of <AE> resource
		PRO Check CoAP	Registrar sends response containing: • Response Code = 2.04 (UPDATED) • oneM2M-RSC: 2004 • oneM2M-RQI: (token-string) same as received in request message • Content-format: application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json • Payload: Serialized representation of <AE> resource
		PRO Check MQTT	Sent MQTT PUBLISH message: Topic: "/oneM2M/resp/<AE-ID>/<Registrar CSE-ID>" Payload: • to = AE-ID • fr = Registrar CSE-ID • rsc = 2004 (Updated) • rqi = (token-string) same as received in request message • 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 TS-0004 [2], clause 7.3.5.2.4
Pre-test conditions:	• CSEBase resource has been created in registrar CSE with name {CSEBaseName} • 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) • to = {CSEBaseName}/{AE} • fr = AE-ID • rqi = (token-string) • pc = empty
		PRO Check HTTP	Sent request contains • Request method = DELETE

Interoperability Test Description			
			• Request-Target: {CSEBaseName}/{AE} • Host: IP address or the FQDN of Registrar CSE • X-M2M-RI: (token-string) • X-M2M-Origin: AE-ID • Message-body: empty
		PRO Check CoAP	Sent request contains • Method: 0.04 (DELETE) • Uri-Host: IP address or the FQDN of Registrar CSE • Uri-Path: {CSEBaseName}/{AE] • oneM2M-FR: AE-ID • oneM2M-RQI: (token-string) • Payload: empty
		PRO Check MQTT	Sent MQTT PUBLISH message: Topic: "/oneM2M/req/<AE-ID>/<Registrar CSE-ID>" Payload: • op = 4 (Delete) • to = {CSEBaseName}/{AE} • fr = AE-ID • rqi = (token-string) • pc = empty
3	Mca	PRO Check Primitive	Registrar CSE sends response containing: • rsc = 2002 (DELETED) • rqi = (token-string) same as received in request message • pc = empty
		PRO Check HTTP	Registrar CSE sends response containing: • Status Code = 200 (OK) • X-M2M-RSC: 2002 • X-M2M-RI: (token-string) same as received in request message • Message-body: empty
		PRO Check CoAP	Registrar sends response containing: • Response Code = 2.05 (OK) • oneM2M-RSC: 2002 • oneM2M-RQI: (token-string) same as received in request message • Payload: empty
		PRO Check MQTT	Sent MQTT PUBLISH message: Topic: "/oneM2M/resp/<AE-ID>/<Registrar CSE-ID>" Payload: • to = AE-ID • fr = Registrar CSE-ID • rsc = 2002 • rqi = (token-string) same as received in request message • 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 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) • to = {CSEBaseName}/URI of <AE> resource • fr = AE-ID • rqi = (token-string) • ty = 3 (Container) • pc = Serialized representation of <container> resource
		PRO Check HTTP	Sent request contains • Request method = POST • Request-Target:{CSEBaseName}/URI of <AE> resource • Host: IP address or the FQDN of Registrar CSE • X-M2M-RI: (token-string) • X-M2M-Origin: AE-ID • Content-Type: application/vnd.onem2m-res+xml; ty=3 or application/vnd.onem2m-res+json; ty=3 • Message-body: Serialized representation of <container> resource
		PRO Check CoAP	Sent request contains • Method: 0.02 (POST) • Uri-Host: IP address or the FQDN of Registrar CSE • Uri-Path: {CSEBaseName}/URI of <AE> resource • Content-type: application/vnd.onem2m-res+xml or application/vnd.onem2m res+json • oneM2M-TY: 3 • oneM2M-FR: AE-ID • oneM2M-RQI: (token-string) • Payload: Serialized representation of <container> resource
		PRO Check MQTT	Sent MQTT PUBLISH message: Topic: "/oneM2M/req/< AE-ID>/<Registrar CSE-ID>" Payload: • op = 1 (Create) • to = {CSEBaseName}/URI of <AE> resource • fr = AE-ID • rqi = (token-string) • ty = 3 (Container) • 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) • rqi = (token-string) same as received in request message • pc = Serialized representation of <container> resource
		PRO Check HTTP	Registrar CSE sends response containing: • Status Code = 201 (Created) • X-M2M-RSC: 2001 • X-M2M-RI: (token-string) same as received in request message • Content-Location: URI of the created resource. • Content-Type: application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json • Message-body: Serialized representation of <container> resource
		PRO Check CoAP	Registrar sends response containing: • Response Code = 2.01 • oneM2M-RSC: 2001 • oneM2M-RQI: (token-string) same as received in request message • Location-Path: URI of the created resource • Content-format: application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json • Payload: Serialized representation of <container> resource
		PRO Check MQTT	Sent MQTT PUBLISH message: Topic: "/oneM2M/resp/< AE-ID>/<Registrar CSE-ID>" Payload: • to = AE-ID • fr = Registrar CSE-ID • rsc = 2001 (CREATED) • rqi = (token-string) same as received in request message • 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 TS-0004 [2], clause 7.3.5.2.2
Pre-test conditions:			• AE has created an Application Entity resource <AE> on Registrar CSE • 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) • to = {CSEBaseName}/URI of <container> resource • fr = AE-ID • rqi = (token-string) • pc = empty
		PRO Check HTTP	Sent request contains • Request method = GET • Request-Target: {CSEBaseName}/URI of <container> resource • Host : IP address or the FQDN of Registrar CSE • X-M2M-RI: (token-string) • X-M2M-Origin: AE-ID • Message-body: empty
		PRO Check CoAP	Sent request contains • Method: 0.01 (GET) • Uri-Host: IP address or the FQDN of Registrar CSE • Uri-Path: {CSEBaseName}/URI of <container> resource • oneM2M-FR: AE-ID • oneM2M-RQI: (token-string) • Payload: empty
		PRO Check MQTT	Sent MQTT PUBLISH message: Topic: "/oneM2M/req/< AE-ID>/<Registrar CSE-ID>" Payload: • op = 2 (Retrieve) • to = {CSEBaseName}/URI of <container> resource • fr = AE-ID • rqi = (token-string) • pc = empty
3	Mca	PRO Check Primitive	• rsc =2000 (OK) • rqi = (token-string) same as received in request message • pc = Serialized representation of <container> resource
		PRO Check HTTP	Registrar CSE sends response containing: • Status Code = 200 (OK) • X-M2M-RSC: 2000 • X-M2M-RI: (token-string) same as received in request message • Content-Type: application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json • Message-body: Serialized representation of <container> resource
		PRO Check CoAP	Registrar sends response containing: • Response Code = 2.05 (OK) • oneM2M-RSC: 2000(OK) • oneM2M-RQI: (token-string) same as received in request message • Content-format: application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json • Payload: Serialized representation of <container> resource
		PRO Check MQTT	Sent MQTT PUBLISH message: Topic: "/oneM2M/resp/< AE-ID>/<Registrar CSE-ID>" Payload: • to = AE-ID • fr = Registrar CSE-ID • rsc 2000(OK) • rqi = (token-string) same as received in request message • 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 TS-0004 [2], clause 7.3.5.2.3
Pre-test conditions:			• AE has created an Application Entity resource <AE> on Registrar CSE • 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) • to = {CSEBaseName}/URI of <container> resource • fr = AE-ID • rqi = (token-string) • pc = Serialized representation of updated <container> resource
		PRO Check HTTP	Sent request contains • Request method = PUT • Request-Target:{CSEBaseName}/URI of <container> resource • Host : IP address or the FQDN of Registrar CSE • X-M2M-RI: (token-string) • X-M2M-Origin: AE-ID • Content-Type: application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json • Message-body: Serialized representation of updated <container> resource
		PRO Check CoAP	Sent request contains • Method: 0.03 (PUT) • Uri-Host: IP address or the FQDN of Registrar CSE • Uri-Path: {CSEBaseName}/URI of <container> resource • oneM2M-FR: AE-ID • oneM2M-RQI: (token-string) • Content-format: application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json • Payload: Serialized representation of updated <container> resource
		PRO Check MQTT	Sent MQTT PUBLISH message: Topic: "/oneM2M/ req /< AE-ID>/<Registrar CSE-ID>" Payload: • op = 3 (Update) • to = {CSEBaseName}/URI of <container> resource • fr = AE-ID • rqi = (token-string) • 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) • rqi = (token-string) same as received in request message • pc = Serialized representation of <container> resource
		PRO Check HTTP	Registrar CSE sends response containing: • Code = 200 (Ok) • X-M2M-RSC: 2004 • X-M2M-RI: (token-string) same as received in request message • Content-Type: application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json • Message-body: Serialized representation of <container> resource
		PRO Check CoAP	Registrar sends response containing: • Response Code = 2.04 • oneM2M-RSC: 2004 • oneM2M-RQI: (token-string) same as received in request message • 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: Topic: "/oneM2M/resp/< AE-ID>/<Registrar CSE-ID>" Payload: • to = AE-ID • fr = Registrar CSE-ID • rsc = 2004 (Updated) • rqi = (token-string) same as received in request message • 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 TS-0004 [2], clause 7.3.5.2.4	
Pre-test conditions:		• AE has created an Application Entity resource <AE> on Registrar CSE • 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) • to = {CSEBaseName}/URI of <container> resource • fr = AE-ID • rqi = (token-string) • pc = empty
		PRO Check HTTP	Sent request contains • Request method = DELETE • Request-Target: {CSEBaseName}/URI of <container> resource • Host: IP address or the FQDN of Registrar CSE • X-M2M-RI: (token-string) • X-M2M-Origin: AE-ID • Message-body: Empty
		PRO Check CoAP	Sent request contains • Method: 0.04 (DELETE) • Uri-Host: IP address or the FQDN of Registrar CSE • Uri-Path: {CSEBaseName}/URI of <container> resource • oneM2M-FR: AE-ID • oneM2M-RQI: (token-string) • Payload: empty
		PRO Check MQTT	Sent MQTT PUBLISH message: Topic: "/oneM2M/req/< AE-ID>/<Registrar CSE-ID>" Payload: • op = 4 (Delete) • to = {CSEBaseName}/URI of <container> resource • fr = AE-ID • rqi = (token-string) • 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) • rqi = (token-string) same as received in request message • pc = empty
		PRO Check HTTP	Registrar CSE sends response containing: • Status Code = 200 (OK) • X-M2M-RSC: 2002 • X-M2M-RI: (token-string) same as received in request message

Interoperability Test Description			
			• Message-body: empty
		PRO Check CoAP	Registrar sends response containing: • Response Code = 2.02 • oneM2M-RSC: 2002(DELETED) • oneM2M-RQI: (token-string) same as received in request message • Payload: empty
		PRO Check MQTT	Sent MQTT PUBLISH message: Topic: "/oneM2M/resp/< AE-ID>/<Registrar CSE-ID>" Payload: • to = AE-ID • fr = Registrar CSE-ID • rsc = 2002(DELETED) • 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 TS-0004 [2], clause 7.3.6.2.1
Pre-test conditions:			• AE has created an application resource <AE> on registrar CSE • 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) • to = {CSEBaseName}/URI of < container > resource • fr = AE-ID • rqi = (token-string) • ty = 4 (contentInstance) • pc = Serialized representation of <contentInstance> resource
		PRO Check HTTP	Sent request contains • Request method = POST • Request-Target:{CSEBaseName}/URI of < container > resource • Host: IP address or the FQDN of Registrar CSE • X-M2M-RI: (token-string) • X-M2M-Origin: AE-ID • Content-Type: application/vnd.onem2m-res+xml; ty=4 or application/vnd.onem2m-res+json; ty=4 • Message-body: Serialized representation of <contentInstance> resource
		PRO Check CoAP	Sent request contains • Method: 0.02 (POST) • Uri-Host: IP address or the FQDN of Registrar CSE • Uri-Path: {CSEBaseName}/URI of < container > resource • Content-format: application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json • oneM2M-TY: 4 • oneM2M-FR: AE-ID • oneM2M-RQI: (token-string) • Payload: Serialized representation of <contentInstance> resource
		PRO Check MQTT	Sent MQTT PUBLISH message: Topic: "/oneM2M/req/< AE-ID>/<Registrar CSE-ID>"

Interoperability Test Description			
			Payload: • op = 1 (Create) • to = {CSEBaseName}/URI of < container > resource • fr = AE-ID • rqi = (token-string) • ty = 4 (contentInstance) • 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) • rqi = (token-string) same as received in request message • pc = Serialized representation of <contentInstance> resource
		PRO Check HTTP	Registrar CSE sends response containing: • Status Code = 201 (Created) • X-M2M-RSC: 2001 • X-M2M-RI: (token-string) same as received in request message • Content-Location: URI of the created resource. • Content-Type: application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json • Message-body: Serialized representation of <contentInstance> resource
		PRO Check CoAP	Registrar sends response containing: • Response Code = 2.01 • oneM2M-RSC: 2001 • oneM2M-RQI: (token-string) same as received in request message • Location-Path: URI of the created resource • Content-format: application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json • Payload: Serialized representation of <contentInstance> resource
		PRO Check MQTT	Sent MQTT PUBLISH message: Topic: "/oneM2M/resp/< AE-ID>/<Registrar CSE-ID>" Payload: • to = AE-ID • fr = Registrar CSE-ID • rsc = 2001 (CREATED) • rqi = (token-string) same as received in request message • 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 TS-0004 [2], clause 7.3.6.2.2
Pre-test conditions:			• AE has created an Application Entity resource <AE> on Registrar CSE • 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) • to = {CSEBaseName}/URI of <contentInstance> resource • fr = AE-ID • rqi = (token-string) • pc = empty
		PRO Check HTTP	Sent request contains • Request method = GET • Request-Target: {CSEBaseName}/URI of <contentInstance> resource • Host: IP address or the FQDN of Registrar CSE • X-M2M-RI: (token-string) • X-M2M-Origin: AE-ID

Interoperability Test Description			
			• Message-body: empty
		PRO Check CoAP	Sent request contains • Method: 0.01 (GET) • Uri-Host: IP address or the FQDN of Registrar CSE • Uri-Path: {CSEBaseName}/URI of <contentInstance> resource • oneM2M-FR: AE-ID • oneM2M-RQI: (token-string) • Payload: empty
		PRO Check MQTT	Sent MQTT PUBLISH message: Topic: "/oneM2M/req/< AE-ID>/<Registrar CSE-ID>" Payload: • op = 2 (Retrieve) • to = {CSEBaseName}/URI of <contentInstance> resource • fr = AE-ID • rqi = (token-string) • pc = empty
3	Mca	PRO Check Primitive	• rsc =2000 (OK) • rqi = (token-string) same as received in request message • pc = Serialized representation of <contentInstance> resource
		PRO Check HTTP	Registrar CSE sends response containing: • Status Code = 200 (OK) • X-M2M-RSC: 2000 • X-M2M-RI: (token-string) same as received in request message • Content-Type: application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json • Message-body: Serialized representation of <contentInstance> resource
		PRO Check CoAP	Registrar sends response containing: • Response Code = 2.05 (OK) • oneM2M-RSC: 2000(OK) • oneM2M-RQI: (token-string) same as received in request message • Content-format: application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json • Payload: Serialized representation of <contentInstance> resource
		PRO Check MQTT	Sent MQTT PUBLISH message: Topic: "/oneM2M/resp/< AE-ID>/<Registrar CSE-ID>" Payload: • to = AE-ID • fr = Registrar CSE-ID • rsc 2000(OK) • rqi = (token-string) same as received in request message • 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 TS-0004 [2], clause 7.3.6.2.4
Pre-test conditions:			• AE has created an Application Entity resource <AE> on Registrar CSE • 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) • to = {CSEBaseName}/URI of <contentInstance> resource • fr = AE-ID • rqi = (token-string) • pc = empty

Interoperability Test Description			
		PRO Check HTTP	Sent request contains • Request method = DELETE • Request-Target: {CSEBaseName}/URI of <contentInstance> resource • Host: IP address or the FQDN of Registrar CSE • X-M2M-RI: (token-string) • X-M2M-Origin: AE-ID • Message-body: Empty
		PRO Check CoAP	Sent request contains • Method: 0.04 (DELETE) • Uri-Host: IP address or the FQDN of Registrar CSE • Uri-Path: {CSEBaseName}/URI of <contentInstance> resource • oneM2M-FR: AE-ID • oneM2M-RQI: (token-string) • Payload: empty
		PRO Check MQTT	Sent MQTT PUBLISH message: Topic: "/oneM2M/req/< AE-ID>/<Registrar CSE-ID>" Payload: • op = 4 (Delete) • to = {CSEBaseName}/URI of <contentInstance> resource • fr = AE-ID • rqi = (token-string) • 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) • rqi = (token-string) same as received in request message • pc = empty
		PRO Check HTTP	Registrar CSE sends response containing: • Status Code = 200 (OK) • X-M2M-RSC: 2002 • X-M2M-RI: (token-string) same as received in request message • Message-body: empty
		PRO Check CoAP	Registrar sends response containing: • Response Code = 2.02 • oneM2M-RSC: 2002(DELETED) • oneM2M-RQI: (token-string) same as received in request message • Payload: empty
		PRO Check MQTT	Sent MQTT PUBLISH message: Topic: "/oneM2M/resp/< AE-ID>/<Registrar CSE-ID>" Payload: • to = AE-ID • fr = Registrar CSE-ID • rsc = 2002(DELETED) • 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 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 • op = 2 (Retrieve) • to = {CSEBaseName} • fr = AE-ID • rqi = (token-string) • fu=1 • pc = empty
		PRO Check HTTP	Sent request contains • Request method = GET • Request-Target: {CSEBaseName}?fu=1 • Host: IP address or the FQDN of Registrar CSE • X-M2M-RI: (token-string) • X-M2M-Origin: AE-ID • Message-body: empty
		PRO Check CoAP	Sent request contains • Method: 0.01 (GET) • Uri-Host: IP address or the FQDN of Registrar CSE • Uri-Path: {CSEBaseName} • oneM2M-FR: AE-ID • oneM2M-RQI: (token-string) • Uri-Query: fu=1 • Payload: empty
		PRO Check MQTT	Sent MQTT PUBLISH message: Topic: "/oneM2M/req/<AE-ID>/<Registrar CSE-ID>" Payload: • op = 2 (Retrieve) • to = {CSEBaseName} • fr = Registree CSE-ID • rqi = (token-string) • fu = 1 • pc = empty
3	Mca	PRO Check Primitive	Registrar CSE sends response containing: • rsc = 2000 (OK) • rqi = (token-string) same as received in request message • pc = Serialized representation of data object containing addresses of all discovered resources
		PRO Check HTTP	Registrar CSE sends response containing: • Status Code = 200 (OK) • X-M2M-RSC: 2000 • X-M2M-RI: (token-string) same as received in request message • Content-Type: application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json • Message-body: Serialized representation of data object containing addresses of all discovered resources
		PRO Check CoAP	Registrar sends response containing: • Response Code = 2.05 • oneM2M-RSC: 2000 • oneM2M-RQI: (token-string) same as received in request message • 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: Topic: "/oneM2M/resp/<AE-ID>/<Registrar CSE-ID>" Payload: • to = Registree CSE-ID • fr = Registrar CSE-ID • rsc = 2000 (OK) • rqi = (token-string) same as received in request message • 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 TS-0004 [2], clause 7.2.3.13
Pre-test conditions:			• CSEBase resource has been created in registrar CSE with name {CSEBaseName} • 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 • op = 2 (Retrieve) • to = {CSEBaseName} • fr = AE-ID • rqi = (token-string) • fu=1 • lbl=key1 • pc = empty
		PRO Check HTTP	Sent request contains • Request method = GET • Request-Target: {CSEBaseName}?fu=1&lbl=key1 • Host: IP address or the FQDN of Registrar CSE • X-M2M-RI: (token-string) • X-M2M-Origin: AE-ID • Message-body: empty
		PRO Check CoAP	Sent request contains • Method: 0.01 (GET) • Uri-Host: IP address or the FQDN of Registrar CSE • Uri-Path: {CSEBaseName} • oneM2M-FR: AE-ID • oneM2M-RQI: (token-string) • Uri-Query: fu=1 • Uri-Query: lbl=key1 • Payload: empty
		PRO Check MQTT	Sent MQTT PUBLISH message: Topic: "/oneM2M/req/<AE-ID>/<Registrar CSE-ID>" Payload: • op = 2 (Retrieve) • to = {CSEBaseName} • fr = Registree CSE-ID • rqi = (token-string) • fu = 1 • lbl=key1

Interoperability Test Description			
			• pc = empty
3	Mca	PRO Check Primitive	Registrar CSE sends response containing: • rsc = 2000 (OK) • rqi = (token-string) same as received in request message • pc = Serialized representation of data object containing the addresse of the <Container> address
		PRO Check HTTP	Registrar CSE sends response containing: • Status Code = 200 (OK) • X-M2M-RSC: 2000 • X-M2M-RI: (token-string) same as received in request message • Content-Type: application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json • Message-body: Serialized representation of data object containing the address of the <Container> address
		PRO Check CoAP	Registrar sends response containing: • Response Code = 2.05 • oneM2M-RSC: 2000 • oneM2M-RQI: (token-string) same as received in request message • Content-format: application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json • Payload: Serialized representation of data object containing the address of the <Container> address
		PRO Check MQTT	Sent MQTT PUBLISH message: Topic: "/oneM2M/resp/<AE-ID>/<Registrar CSE-ID>" Payload: • to = Registree CSE-ID • fr = Registrar CSE-ID • rsc = 2000 (OK) • rqi = (token-string) same as received in request message • 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 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 • op = 2 (Retrieve) • to = {CSEBaseName} • fr = AE-ID • rqi = (token-string) • fu=1 • lim=2 • pc = empty
		PRO Check HTTP	Sent request contains • Request method = GET • Request-Target: {CSEBaseName}?fu=1&lim=2 • Host: IP address or the FQDN of Registrar CSE • X-M2M-RI: (token-string) • X-M2M-Origin: AE-ID • Message-body: empty

Interoperability Test Description			
		PRO Check CoAP	Sent request contains • Method: 0.01 (GET) • Uri-Host: IP address or the FQDN of Registrar CSE • Uri-Path: {CSEBaseName} • oneM2M-FR: AE-ID • oneM2M-RQI: (token-string) • Uri-Query: fu=1 • Uri-Query: lim=2 • Payload: empty
		PRO Check MQTT	Sent MQTT PUBLISH message: Topic: "/oneM2M/req/<AE-ID>/<Registrar CSE-ID>" Payload: • op = 2 (Retrieve) • to = {CSEBaseName} • fr = Registree CSE-ID • rqi = (token-string) • fu = 1 • lim=2 • pc = empty
3	Mca	PRO Check Primitive	Registrar CSE sends response containing: • rsc = 2000 (OK) • rqi = (token-string) same as received in request message • pc = Serialized representation of data object containing the address of the <Container> address
		PRO Check HTTP	Registrar CSE sends response containing: • Status Code = 200 (OK) • X-M2M-RSC: 2000 • X-M2M-RI: (token-string) same as received in request message • Content-Type: application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json • Message-body: Serialized representation of data object containing at most 2 addresses of discovered resources
		PRO Check CoAP	Registrar sends response containing: • Response Code = 2.05 • oneM2M-RSC: 2000 • oneM2M-RQI: (token-string) same as received in request message • Content-format: application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json • Payload: Serialized representation of data object containing at most 2 addresses of discovered resources
		PRO Check MQTT	Sent MQTT PUBLISH message: Topic: "/oneM2M/resp/<AE-ID>/<Registrar CSE-ID>" Payload: • to = Registree CSE-ID • fr = Registrar CSE-ID • rsc = 2000 (OK) • rqi = (token-string) same as received in request message • 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 TS-0004 [2], clause 7.2.3.13
Pre-test conditions:			• Two <Container> resources with labels "key1" and "key2" are created in Registrar CSE. • 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 • op = 2 (Retrieve) • to = {CSEBaseName} • fr = AE-ID • rqi = (token-string) • fu=1 • lbl=key1 • lbl=key2 • rty=3 • lim=1 • pc = empty
		PRO Check HTTP	Sent request contains • Request method = GET • Request-Target: {CSEBaseName}?fu=1&key=1&key=2&rty=3&lim=1 • Host: IP address or the FQDN of Registrar CSE • X-M2M-RI: (token-string) • X-M2M-Origin: AE-ID • Message-body: empty
		PRO Check CoAP	Sent request contains • Method: 0.01 (GET) • Uri-Host: IP address or the FQDN of Registrar CSE • Uri-Path: {CSEBaseName} • oneM2M-FR: AE-ID • oneM2M-RQI: (token-string) • Uri-Query: fu=1 • Uri-Query: lbl=key1 • Uri-Query: lbl=key2 • Uri-Query: rty=3 • Uri-Query: lim=1 • Payload: empty
		PRO Check MQTT	Sent MQTT PUBLISH message: Topic: "/oneM2M/req/<AE-ID>/<Registrar CSE-ID>" Payload: • op = 2 (Retrieve) • to = {CSEBaseName} • fr = AE-ID • rqi = (token-string) • fu = 1 • lbl=key1 • lbl=key2 • rty=3 • lim=1 • pc = empty
3	Mca	PRO Check Primitive	Registrar CSE sends response containing: • rsc = 2000 (OK) • rqi = (token-string) same as received in request message • 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) • X-M2M-RSC: 2000 • X-M2M-RI: (token-string) same as received in request message • Content-Type: application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json • Message-body: Serialized representation of data object containing the address of one of the <Container> resources
		PRO Check CoAP	Registrar sends response containing: • Response Code = 2.05 • oneM2M-RSC: 2000 • oneM2M-RQI: (token-string) same as received in request message • Content-format: application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json • Payload: Serialized representation of data object containing the address of one of the <Container> resources
		PRO Check MQTT	Sent MQTT PUBLISH message: Topic: "/oneM2M/resp/<AE-ID>/<Registrar CSE-ID>" Payload: • to = Registree CSE-ID • fr = Registrar CSE-ID • rsc = 2000 (OK) • rqi = (token-string) same as received in request message • 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 TS-0004 [2], clause 7.3.7.2
Pre-test conditions:			• AE has created an application resource <AE> on registrar CSE • 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) • to = {CSEBaseName}/URI of <Container> resource • fr = AE-ID • rqi = (token-string) • ty = 23 (Subscription) • pc = Serialized representation of <Subscription> resource
		PRO Check HTTP	Sent request contains • Request method = POST • Request-Target:{CSEBaseName}/URI of <Container> resource • Host: IP address or the FQDN of Registrar CSE • X-M2M-RI: (token-string) • X-M2M-Origin: AE-ID • Content-Type: application/vnd.onem2m-res+xml; ty=23 or application/vnd.onem2m-res+json; ty=23 • Message-body: Serialized representation of <Subscription> resource
		PRO Check CoAP	Sent request contains • Method: 0.02 (POST) • Uri-Host: IP address or the FQDN of Registrar CSE • Uri-Path: {CSEBaseName}/URI of <Container> resource • Content-type: application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json

Interoperability Test Description			
			• oneM2M-TY: 23 • oneM2M-FR: AE-ID • oneM2M-RQI: (token-string) • Payload: Serialized representation of <Subscription> resource
		PRO Check MQTT	Sent MQTT PUBLISH message: Topic: "/oneM2M/req/< AE-ID>/<Registrar CSE-ID>" Payload: • op = 1 (Create) • to = {CSEBaseName}/URI of <Container> resource • fr = AE-ID • rqi = (token-string) • ty = 23 (Subscription) • 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) • rqi = (token-string) same as received in request message • pc = Serialized representation of <Subscription> resource
		PRO Check HTTP	Registrar CSE sends response containing: • Status Code = 201 (Created) • X-M2M-RSC: 2001 • X-M2M-RI: (token-string) same as received in request message • Content-Location: URI of the created resource. • Content-Type: application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json • Message-body: Serialized representation of <Subscription> resource
		PRO Check CoAP	Registrar sends response containing: • Response Code = 2.01 • oneM2M-RSC: 2001 • oneM2M-RQI: (token-string) same as received in request message • Location-Path: URI of the created resource • Content-format: application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json • Payload: Serialized representation of <Subscription> resource
		PRO Check MQTT	Sent MQTT PUBLISH message: Topic: "/oneM2M/resp/< AE-ID>/<Registrar CSE-ID>" Payload: • to = AE-ID • fr = Registrar CSE-ID • rsc = 2001 (CREATED) • rqi = (token-string) same as received in request message • 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 TS-0004 [2], clause 7.3.7.2
Pre-test conditions:			• AE has created an Application Entity resource <AE> on Registrar CSE • AE has created a container resource <container> on Registrar CSE • 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) • to = {CSEBaseName}/URI of <Subscription> resource • fr = AE-ID • rqi = (token-string)

Interoperability Test Description			
			• pc = empty
		PRO Check HTTP	Sent request contains • Request method = GET • Request-Target: {CSEBaseName}/URI of <Subscription> resource • Host: IP address or the FQDN of Registrar CSE • X-M2M-RI: (token-string) • X-M2M-Origin: AE-ID • Message-body: empty
		PRO Check CoAP	Sent request contains • Method: 0.01 (GET) • Uri-Host: IP address or the FQDN of Registrar CSE • Uri-Path: {CSEBaseName}/URI of <Subscription> resource • oneM2M-FR: AE-ID • oneM2M-RQI: (token-string) • Payload: empty
		PRO Check MQTT	Sent MQTT PUBLISH message: Topic: "/oneM2M/req/< AE-ID>/<Registrar CSE-ID>" Payload: • op = 2 (Retrieve) • to = {CSEBaseName}/URI of <Subscription> resource • fr = AE-ID • rqi = (token-string) • pc = empty
3	Mca	PRO Check Primitive	• rsc =2000 (OK) • rqi = (token-string) same as received in request message • pc = Serialized representation of <Subscription> resource
		PRO Check HTTP	Registrar CSE sends response containing: • Status Code = 200 (OK) • X-M2M-RSC: 2000 • X-M2M-RI: (token-string) same as received in request message • Content-Type: application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json • Message-body: Serialized representation of <Subscription> resource
		PRO Check CoAP	Registrar sends response containing: • Response Code = 2.05 • oneM2M-RSC: 2000(OK) • oneM2M-RQI: (token-string) same as received in request message • Content-format: application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json • Payload: Serialized representation of <Subscription> resource
		PRO Check MQTT	Sent MQTT PUBLISH message: Topic: "/oneM2M/resp/< AE-ID>/<Registrar CSE-ID>" Payload: • to = AE-ID • fr = Registrar CSE-ID • rsc 2000(OK) • rqi = (token-string) same as received in request message • 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 TS-0004 [2], clause 7.3.7.2
Pre-test conditions:			• AE has created an Application Entity resource <AE> on Registrar CSE • AE has created a container resource <container> on Registrar CSE • 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) • to = {CSEBaseName}/URI of <Subscription> resource • fr = AE-ID • rqi = (token-string) • pc = Serialized representation of updated <Subscription> resource
		PRO Check HTTP	Sent request contains • Request method = PUT • Request-Target:{CSEBaseName}/URI of <Subscription> resource • Host: IP address or the FQDN of Registrar CSE • X-M2M-RI: (token-string) • X-M2M-Origin: AE-ID • Content-Type: application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json • Message-body: Serialized representation of updated <Subscription> resource
		PRO Check CoAP	Sent request contains • Method: 0.03 (PUT) • Uri-Host: IP address or the FQDN of Registrar CSE • Uri-Path: {CSEBaseName}/URI of <Subscription> resource • oneM2M-FR: AE-ID • oneM2M-RQI: (token-string) • Content-format: application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json • Payload: Serialized representation of updated <Subscription> resource
		PRO Check MQTT	Sent MQTT PUBLISH message: Topic: "/oneM2M/ req /< AE-ID>/<Registrar CSE-ID>" Payload: • op = 3 (Update) • to = {CSEBaseName}/URI of <Subscription> resource • fr = AE-ID • rqi = (token-string) • 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) • rqi = (token-string) same as received in request message • pc = Serialized representation of <Subscription> resource
		PRO Check HTTP	Registrar CSE sends response containing: • Code = 200 (Ok) • X-M2M-RSC: 2004 • X-M2M-RI: (token-string) same as received in request message • Content-Type: application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json • Message-body: Serialized representation of <Subscription> resource
		PRO Check CoAP	Registrar sends response containing: • Response Code = 2.04 • oneM2M-RSC: 2004 • oneM2M-RQI: (token-string) same as received in request message • Content-format: application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json • Payload : Serialized representation of <Subscription> resource
		PRO Check MQTT	Sent MQTT PUBLISH message: Topic: "/oneM2M/resp/< AE-ID>/<Registrar CSE-ID>" Payload: • to = AE-ID

Interoperability Test Description			
			• fr = Registrar CSE-ID • rsc = 2004 (Updated) • rqi = (token-string) same as received in request message • 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 TS-0004 [2], clause 7.3.7.2
Pre-test conditions:			• AE has created an Application Entity resource <AE> on Registrar CSE • AE has created a container resource <container> on Registrar CSE • 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) • to = {CSEBaseName}/URI of <Subscription> resource • fr = AE-ID • rqi = (token-string) • pc = empty
		PRO Check HTTP	Sent request contains • Request method = DELETE • Request-Target: {CSEBaseName}/URI of <Subscription> resource • Host: IP address or the FQDN of Registrar CSE • X-M2M-RI: (token-string) • X-M2M-Origin: AE-ID • Message-body: Empty
		PRO Check CoAP	Sent request contains • Method: 0.04 (DELETE) • Uri-Host: IP address or the FQDN of Registrar CSE • Uri-Path: {CSEBaseName}/URI of <Subscription> resource • oneM2M-FR: AE-ID • oneM2M-RQI: (token-string) • Payload: empty
		PRO Check MQTT	Sent MQTT PUBLISH message: Topic: "/oneM2M/req/< AE-ID>/<Registrar CSE-ID>" Payload: • op = 4 (Delete) • to = {CSEBaseName}/URI of <Subscription> resource • fr = AE-ID • rqi = (token-string) • 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) • rqi = (token-string) same as received in request message • pc = empty
		PRO Check HTTP	Registrar CSE sends response containing: • Status Code = 200 (OK) • X-M2M-RSC: 2002 • X-M2M-RI: (token-string) same as received in request message • Message-body: empty
		PRO Check CoAP	Registrar sends response containing: • Response Code = 2.02 • oneM2M-RSC: 2002(DELETED)

Interoperability Test Description			
			• oneM2M-RQI: (token-string) same as received in request message • Payload: empty
		PRO Check MQTT	Sent MQTT PUBLISH message: Topic: "/oneM2M/resp/< AE-ID>/<Registrar CSE-ID>" Payload: • to = AE-ID • fr = Registrar CSE-ID • rsc = 2002(DELETED) • 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 TS-0004 [2], clause 7.3.1.2
Pre-test conditions:			• CSEBase resource has been created in registrar CSE with name {CSEBaseName} • 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) • to = {CSEBaseName}/{AE} • fr = AE-ID • rqi = (token-string) • ty = 1 (accessControlPolicy) • pc = Serialized representation of <accessControlPolicy > resource
		PRO Check HTTP	Sent request contains • Request method = POST • Request-Target:{CSEBaseName}/{AE} • Host: IP address or the FQDN of Registrar CSE • X-M2M-RI: (token-string) • X-M2M-Origin: AE-ID • Content-Type: application/vnd.onem2m-res+xml; ty=1 or application/vnd.onem2m-res+json; ty=1 • Message-body: Serialized representation of <accessControlPolicy > resource
		PRO Check CoAP	Sent request contains • Method: 0.02 (POST) • Uri-Host: IP address or the FQDN of Registrar CSE • Uri-Path: {CSEBaseName}/{AE} • Content-type: application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json • oneM2M-TY: 1 • oneM2M-FR: AE-ID • oneM2M-RQI: (token-string) • Payload: Serialized representation of <accessControlPolicy> resource
		PRO Check MQTT	Sent MQTT PUBLISH message: Topic: "/oneM2M/req/< AE-ID>/<Registrar CSE-ID>" Payload: • op = 1 (Create) • to = {CSEBaseName}/{AE} • fr = AE-ID • rqi = (token-string)

Interoperability Test Description			
			• ty = 1 (RemoteCSE) • 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) • rqi = (token-string) same as received in request message • pc = Serialized representation of <accessControlPolicy> resource
		PRO Check HTTP	Registrar CSE sends response containing: • Status Code = 201 (Created) • X-M2M-RSC: 2001 • X-M2M-RI: (token-string) same as received in request message • Content-Location: URI of the created <accessControlPolicy> resource. • Content-Type: application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json • Message-body: Serialized representation of <accessControlPolicy> resource
		PRO Check CoAP	Registrar sends response containing: • Response Code = 2.01 • oneM2M-RSC: 2001 • oneM2M-RQI: (token-string) same as received in request message • Location-Path: URI of the created <accessControlPolicy> resource • Content-format: application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json • Payload: Serialized representation of <accessControlPolicy> resource
		PRO Check MQTT	Sent MQTT PUBLISH message: Topic: "/oneM2M/resp/< AE-ID>/<Registrar CSE-ID>" Payload: • to = AE-ID • fr = Registrar CSE-ID • rsc = 2001 (CREATED) • rqi = (token-string) same as received in request message • 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 TS-0004 [2], clause 7.3.1.2
Pre-test conditions:			• CSEBase resource has been created in registrar CSE with name {CSEBaseName} • AE has created a <AE> resource on registrar CSE with name {AE} • 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) • to = {CSEBaseName}/{AE}/{accessControlPolicyName} • fr = AE-ID • rqi = (token-string) • pc = empty
		PRO Check HTTP	Sent request contains • Request method = GET • Request-Target: {CSEBaseName}/{{AE}/{accessControlPolicyName} • Host: IP address or the FQDN of Registrar CSE • X-M2M-RI: (token-string) • X-M2M-Origin: AE-ID • Message-body: empty
		PRO Check CoAP	Sent request contains • Method: 0.01 (GET)

Interoperability Test Description			
			• Uri-Host: IP address or the FQDN of Registrar CSE • Uri-Path: {CSEBaseName}/{AE}/{accessControlPolicyName} • oneM2M-FR: AE-ID • oneM2M-RQI: (token-string) • Payload: empty
		PRO Check MQTT	Sent MQTT PUBLISH message: Topic: "/oneM2M/req/< AE-ID>/<Registrar CSE-ID>" Payload: • op = 2 (Retrieve) • to = {CSEBaseName}/{AE}/{accessControlPolicyName} • fr = AE-ID • rqi = (token-string) • pc = empty
3	Mca	PRO Check Primitive	Registrar CSE sends response containing: • rsc = 2000 (OK) • rqi = (token-string) same as received in request message • pc = Serialized representation of <accessControlPolicy> resource
		PRO Check HTTP	Registrar CSE sends response containing: • Status Code = 200 (OK) • X-M2M-RSC: 2000 • X-M2M-RI: (token-string) same as received in request message • Content-Type: application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json • Message-body: Serialized representation of <accessControlPolicy> resource
		PRO Check CoAP	Registrar sends response containing: • Response Code = 2.05 (OK) • oneM2M-RSC: 2000 • oneM2M-RQI: (token-string) same as received in request message • Content-format: application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json • Payload: Serialized representation of <accessControlPolicy> resource
		PRO Check MQTT	Sent MQTT PUBLISH message: Topic: "/oneM2M/resp/<AE-ID>/<Registrar CSE-ID>" Payload: • to = AE-ID • fr = Registrar CSE-ID • rsc = 2000 (OK) • rqi = (token-string) same as received in request message • 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 TS-0004 [2], clause 7.3.1.2
Pre-test conditions:			• CSEBase resource has been created in registrar CSE with name {CSEBaseName} • AE has created a <AE> resource on registrar CSE with name {AE} • 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) • to = {CSEBaseName}/{AE}/{accessControlPolicyName} • fr = AE-ID • rqi = (token-string) • pc = Serialized representation of updated <accessControlPolicy > resource

Interoperability Test Description			
		PRO Check HTTP	Sent request contains • Request method = PUT • Request-Target: {CSEBaseName}/{AE}/{accessControlPolicyName} • Host: IP address or the FQDN of Registrar CSE • X-M2M-RI: (token-string) • X-M2M-Origin: AE-ID • Content-Type: application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json • Message-body: Serialized representation of updated <accessControlPolicy> resource
		PRO Check CoAP	Sent request contains • Method: 0.03 (PUT) • Uri-Host: IP address or the FQDN of Registrar CSE • Uri-Path: {CSEBaseName}/{AE}/{accessControlPolicyName} • oneM2M-FR: AE-ID • oneM2M-RQI: (token-string) • Content-format: application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json • Payload: Serialized representation of updated <accessControlPolicy> resource
		PRO Check MQTT	Sent MQTT PUBLISH message: Topic: "/oneM2M/req/<AE-ID>/<Registrar CSE-ID>" Payload: • op = 3 (Update) • to = {CSEBaseName}/{AE}/{accessControlPolicyName} • fr = AE-ID • rqi = (token-string) • 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: • rsc = 2004 (UPDATED) • rqi = (token-string) same as received in request message • pc = Serialized representation of <accessControlPolicy> resource
		PRO Check HTTP	Registrar CSE sends response containing: • Status Code = 200 (OK) • X-M2M-RSC: 2004 • X-M2M-RI: (token-string) same as received in request message • Content-Type: application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json • Message-body: Serialized representation of <accessControlPolicy> resource
		PRO Check CoAP	Registrar sends response containing: • Response Code = 2.04 (UPDATED) • oneM2M-RSC: 2004 • oneM2M-RQI: (token-string) same as received in request message • Content-format: application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json • Payload: Serialized representation of <accessControlPolicy> resource
		PRO Check MQTT	Sent MQTT PUBLISH message: Topic: "/oneM2M/resp/<AE-ID>/<Registrar CSE-ID>" Payload: • to = AE-ID • fr = Registrar CSE-ID • rsc = 2004 (Updated) • rqi = (token-string) same as received in request message • 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 TS-0004 [2], clause 7.3.1.2
Pre-test conditions:			• CSEBase resource has been created in registrar CSE with name {CSEBaseName} • AE has created a <AE> resource on registrar CSE with name {AE} • 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) • to = {CSEBaseName}/{AE}/{accessControlPolicyName} • fr = AE-ID • rqi = (token-string) • pc = empty
		PRO Check HTTP	Sent request contains • Request method = DELETE • Request-Target: {CSEBaseName}/{AE}/{accessControlPolicyName} • Host: IP address or the FQDN of Registrar CSE • X-M2M-RI: (token-string) • X-M2M-Origin: AE-ID • Message-body: empty
		PRO Check CoAP	Sent request contains • Method: 0.04 (DELETE) • Uri-Host: IP address or the FQDN of Registrar CSE • Uri-Path: {CSEBaseName}/{AE}/{accessControlPolicyName} • oneM2M-FR: AE-ID • oneM2M-RQI: (token-string) • Payload: empty
		PRO Check MQTT	Sent MQTT PUBLISH message: Topic: "/oneM2M/req/<AE-ID>/<Registrar CSE-ID>" Payload: • op = 4 (Delete) • to = {CSEBaseName}/{AE}/{accessControlPolicyName} • fr = AE-ID • rqi = (token-string) • pc = empty
3	Mca	PRO Check Primitive	Registrar CSE sends response containing: • rsc = 2002 (DELETED) • rqi = (token-string) same as received in request message • pc = empty
		PRO Check HTTP	Registrar CSE sends response containing: • Status Code = 200 (OK) • X-M2M-RSC: 2002 • X-M2M-RI: (token-string) same as received in request message • Message-body: empty
		PRO Check CoAP	Registrar sends response containing: • Response Code = 2.05 (OK) • oneM2M-RSC: 2002 • oneM2M-RQI: (token-string) same as received in request message • Payload: empty
		PRO Check MQTT	Sent MQTT PUBLISH message: Topic: "/oneM2M/resp/<AE-ID>/<Registrar CSE-ID>" Payload: • to = AE-ID • fr = Registrar CSE-ID • rsc = 2002 • rqi = (token-string) same as received in request message • 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} • AE has created a <AE> resource on registrar CSE with name {AE} • accessControlPolicy resource has been created in registrar CSE under <AE> resource with name {accessControlPolicyName}, which forbids to delete container • 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) • to = {CSEBaseName}/{AE}/{containerName} • fr = AE-ID • rqi = (token-string) • pc = empty
		PRO Check HTTP	Sent request contains • Request method = DELETE • Request-Target: {CSEBaseName}/{AE}/{containerName} • Host: IP address or the FQDN of Registrar CSE • X-M2M-RI: (token-string) • X-M2M-Origin: AE-ID • Message-body: empty
		PRO Check CoAP	Sent request contains • Method: 0.04 (DELETE) • Uri-Host: IP address or the FQDN of Registrar CSE • Uri-Path: {CSEBaseName}/{AE}/{containerName} • oneM2M-FR: AE-ID • oneM2M-RQI: (token-string) • Payload: empty
		PRO Check MQTT	Sent MQTT PUBLISH message: Topic: "/oneM2M/req/<AE-ID>/<Registrar CSE-ID>" Payload: • op = 4 (Delete) • to = {CSEBaseName}/{AE}/{containerName} • fr = AE-ID • rqi = (token-string) • pc = empty
3	Mca	PRO Check Primitive	Registrar CSE sends response containing: • rsc = 4103 (ACCESS_DENIED) • rqi = (token-string) same as received in request message pc = empty
		PRO Check HTTP	Registrar CSE sends response containing: • Status Code = 403 (Forbidden) • X-M2M-RSC: 4103 • X-M2M-RI: (token-string) same as received in request message • Message-body: empty
		PRO Check CoAP	Registrar sends response containing: • Response Code = 4.03 (Forbidden) • oneM2M-RSC: 4103 • oneM2M-RQI: (token-string) same as received in request message

Interoperability Test Description			
			• Payload: empty
		PRO Check MQTT	Sent MQTT PUBLISH message: Topic: "/oneM2M/resp/<AE-ID>/<Registrar CSE-ID>" Payload: • to = AE-ID • fr = Registrar CSE-ID • rsc = <Response Status Code(4103, ACCESS_DENIED> • rqi = (token-string) same as received in request message • 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 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) • to = {CSEBaseName}/{group} • fr = AE-ID • rqi = (token-string)
		PRO Check HTTP	Sent request contains • Request method = GET • Request-Target: {CSEBaseName}/{group} • Host: IP address or the FQDN of Registrar CSE • X-M2M-RI: (token-string) • X-M2M-Origin: AE-ID • Content-Type: application/vnd.onem2m-res+xml; or application/vnd.onem2m-res+json;
		PRO Check CoAP	Sent request contains • Method: 0.01 (GET) • Uri-Host: IP address or the FQDN of Registrar CSE • Uri-Path: {CSEBaseName}/{group} • Content-format: application/vnd.onem2m-res+xml; or application/vnd.onem2m-res+json; • oneM2M-FR: AE-ID • oneM2M-RQI: (token-string)
		PRO Check MQTT	Sent a MQTT PUBLISH message: Topic: "/oneM2M/req/<AE-ID>/<Registrar CSE-ID>" Payload: • op = 2 (Retrieve) • to = {CSEBaseName}/{group} • fr = <AE-ID> • rqi = (token-string)
3	Mca	PRO Check Primitive	• rsc = 2000 (OK) • rqi = (token-string) same as received in request message • pc = Serialized representation of <group> resource
		PRO Check HTTP	Registrar CSE sends response containing: • Status Code =200 (OK)

Interoperability Test Description			
			• X-M2M-RSC: 2000 • X-M2M-RI: (token-string) same as received in request message • Message-body: Serialized representation of <group> resource
		PRO Check CoAP	Registrar CSE sends response containing: • Response Code = 2.05 • oneM2M-RSC: 2000 • oneM2M-RQI: (token-string) same as received in request message • Payload: Serialized representation of <group> resource
		PRO Check MQTT	Sent a MQTT PUBLISH message: Topic: "/oneM2M/resp/<AE-ID>/<Registrar CSE-ID>" Payload: • to = AE-ID • fr = Registrar CSE-ID • rsc = 2000 • rqi = (token-string) same as received in request message • 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 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) • to = {CSEBaseName} • fr = AE-ID • rqi = (token-string) • ty = 9 (group) • pc = Serialized representation of <group> resource
		PRO Check HTTP	Sent request contains • Request method = POST • Request-Target: {CSEBaseName} • Host: IP address or the FQDN of Registrar CSE • X-M2M-RI: (token-string) • X-M2M-Origin: AE-ID • Content-Type: application/vnd.onem2m-res+xml; ty=9 or application/vnd.onem2m-res+json; ty=9 • Message-body: Serialized representation of <group> resource
		PRO Check CoAP	Sent request contains • Method: 0.02 (POST) • Uri-Host: IP address or the FQDN of Registrar CSE • Uri-Path: {CSEBaseName} • Content-type: application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json • oneM2M-TY: 9 • oneM2M-FR: AE-ID • oneM2M-RQI: (token-string) • Payload: Serialized representation of <group> resource
		PRO Check MQTT	Sent MQTT PUBLISH message: Topic: "/oneM2M/req/<AE-ID>/<Registrar CSE-ID>" Payload: • op = 1 (Create) • to = {CSEBaseName}

Interoperability Test Description			
			• fr = AE-ID • rqi = (token-string) • ty = 9 (group) • pc = Serialized representation of <group> resource
3		IOP Check	Check if possible that the <group> resource is created in Registrar CSE.
4	Mca	PRO Check Primitive	• rsc = 2001 (CREATED) • rqi = (token-string) same as received in request message • pc = Serialized representation of <group> resource
		PRO Check HTTP	Registrar CSE sends response containing: • Status Code = 201 (OK) • X-M2M-RSC: 2001 • X-M2M-RI: (token-string) same as received in request message • Content-Location : URI of the created <group> resource • Content-Type: application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json • Message-body: Serialized representation of <group> resource
		PRO Check CoAP	Registrar CSE sends response containing: • Response Code = 2.01 • oneM2M-RSC: 2001 • oneM2M-RQI: (token-string) same as received in request message • Location-Path: URI of the created <group> resource • Payload: Serialized representation of <group> resource
		PRO Check MQTT	Sent a MQTT PUBLISH message: Topic: "/oneM2M/resp/<AE-ID>/<Registrar CSE-ID>" Payload: • to = AE-ID • fr = Registrar CSE-ID • rsc = 2001 (CREATED) • rqi = (token-string) same as received in request message • 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 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) • to = {CSEBaseName}/{group} • fr = AE-ID • rqi = (token-string) • pc = Serialized representation of <group> resource
		PRO Check HTTP	Sent request contains • Request method = PUT • Request-Target: {CSEBaseName}/{group} • Host: IP address or the FQDN of Registrar CSE • X-M2M-RI: (token-string) • X-M2M-Origin: AE-ID • Content-Type: application/vnd.onem2m-res+xml; or application/vnd.onem2m-res+json; • Message-body: Serialized representation of <group> resource
		PRO Check CoAP	Sent request contains • Method: 0.03 (PUT)

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

Interoperability Test Description			
			• Host: IP address or the FQDN of Registrar CSE • X-M2M-RI: (token-string) • X-M2M-Origin: AE-ID
		PRO Check CoAP	Sent DELETE request contains • Method: 0.04 (DELETE) • Uri-Host: IP address or the FQDN of Registrar CSE • Uri-Path: {CSEBaseName}/{group} • oneM2M-FR: AE-ID • oneM2M-RQI: (token-string)
		PRO Check MQTT	Sent a MQTT PUBLISH message Topic: "/oneM2M/req/< AE-ID>/<Registrar CSE-ID>" Payload: • op = 4 • to = {CSEBaseName}/{group} • fr = AE-ID • rqi = (token-string)
3	Mca	PRO Check Primitive	• rsc = 2002 (DELETED) • rqi = (token-string) same as received in request message
		PRO Check HTTP	Registrar CSE sends response containing: • Status Code = 200 • X-M2M-RSC: 2002 • X-M2M-RI: (token-string) same as received in request message
		PRO Check CoAP	Registrar sends response containing: • Response Code = 2.05 • oneM2M-RSC: 2002 • oneM2M-RQI: (token-string) same as received in request message
		PRO Check MQTT	Sent a MQTT PUBLISH message Topic: "/oneM2M/resp/<AE-ID>/<Registrar CSE-ID>" Payload: • to = AE-ID • fr = Registrar CSE-ID • rqi = (token-string) same as received in request message • 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 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) • to = {CSEBaseName} • fr = AE-ID • rqi = (token-string) • ty = 14 (node) • pc = Serialized representation of <node> resource
		PRO Check HTTP	Sent request contains • Request method = POST • Request-Target: {CSEBaseName}

Interoperability Test Description			
			• Host: IP address or the FQDN of Registrar CSE • X-M2M-RI: (token-string) • X-M2M-Origin: AE-ID • Content-Type: application/vnd.onem2m-res+xml; ty=14 or application/vnd.onem2m-res+json; ty=14 • Message-body: Serialized representation of <node> resource
		PRO Check CoAP	Sent request contains • Method: 0.02 (POST) • Uri-Host: IP address or the FQDN of Registrar CSE • Uri-Path: {CSEBaseName} • Content-type: application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json • oneM2M-TY: 14 • oneM2M-FR: AE-ID • oneM2M-RQI: (token-string) • Payload: Serialized representation of <node> resource
		PRO Check MQTT	Sent MQTT PUBLISH message: Topic: "/oneM2M/req/<AE-ID>/<Registrar CSE-ID>" Payload: • op = 1 (Create) • to = {CSEBaseName} • fr = AE-ID • rqi = (token-string) • ty = 14 (node) • 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) • rqi = (token-string) same as received in request message • pc = Serialized representation of <node> resource
		PRO Check HTTP	Registrar CSE sends response containing: • Status Code = 201 (OK) • X-M2M-RSC: 2001 • X-M2M-RI: (token-string) same as received in request message • Content-Location : URI of the created <node> resource • Content-Type: application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json • Message-body: Serialized representation of <node> resource
		PRO Check CoAP	Registrar CSE sends response containing: • Response Code = 2.01 • oneM2M-RSC: 2001 • oneM2M-RQI: (token-string) same as received in request message • Location-Path: URI of the created <node> resource • Payload: Serialized representation of <node> resource
		PRO Check MQTT	Sent a MQTT PUBLISH message: Topic: "/oneM2M/resp/<AE-ID>/<Registrar CSE-ID>" Payload: • to = AE-ID • fr = Registrar CSE-ID • rsc = 2001 (CREATED) • rqi = (token-string) same as received in request message • 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 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) • to = {CSEBaseName}/{node} • fr = AE-ID • rqi = (token-string)
		PRO Check HTTP	Sent request contains • Request method = GET • Request-Target: {CSEBaseName}/{node} • Host: IP address or the FQDN of Registrar CSE • X-M2M-RI: (token-string) • X-M2M-Origin: AE-ID • Content-Type: application/vnd.onem2m-res+xml; or application/vnd.onem2m-res+json;
		PRO Check CoAP	Sent request contains • Method: 0.01 (GET) • Uri-Host: IP address or the FQDN of Registrar CSE • Uri-Path: {CSEBaseName}/{node} • Content-format: application/vnd.onem2m-res+xml; or application/vnd.onem2m-res+json; • oneM2M-FR: AE-ID • oneM2M-RQI: (token-string)
		PRO Check MQTT	Sent a MQTT PUBLISH message: Topic: "/oneM2M/req/<AE-ID>/<Registrar CSE-ID>" Payload: • op = 2 (Retrieve) • to = {CSEBaseName}/{node} • fr = <AE-ID> • rqi = (token-string)
3	Mca	PRO Check Primitive	• rsc = 2000 (OK) • rqi = (token-string) same as received in request message • pc = Serialized representation of <node> resource
		PRO Check HTTP	Registrar CSE sends response containing: • Status Code =200 (OK) • X-M2M-RSC: 2000 • X-M2M-RI: (token-string) same as received in request message • Message-body: Serialized representation of <node> resource
		PRO Check CoAP	Registrar CSE sends response containing: • Response Code = 2.05 • oneM2M-RSC: 2000 • oneM2M-RQI: (token-string) same as received in request message • Payload: Serialized representation of <node> resource
		PRO Check MQTT	Sent a MQTT PUBLISH message: Topic: "/oneM2M/resp/<AE-ID>/<Registrar CSE-ID>" Payload: • to = AE-ID • fr = Registrar CSE-ID • rsc = 2000 • rqi = (token-string) same as received in request message • 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 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) • to = {CSEBaseName}/{node} • fr = AE-ID • rqi = (token-string) • pc = Serialized representation of <node> resource
		PRO Check HTTP	Sent request contains • Request method = PUT • Request-Target: {CSEBaseName}/{node} • Host: IP address or the FQDN of Registrar CSE • X-M2M-RI: (token-string) • X-M2M-Origin: AE-ID • Content-Type: application/vnd.onem2m-res+xml; or application/vnd.onem2m-res+json; • Message-body: Serialized representation of <node> resource
		PRO Check CoAP	Sent request contains • Method: 0.03 (PUT) • Uri-Host: IP address or the FQDN of Registrar CSE • Uri-Path: {CSEBaseName}/{node} • Content-format: application/vnd.onem2m-res+xml; or application/vnd.onem2m-res+json; • oneM2M-FR: AE-ID • oneM2M-RQI: (token-string) • Payload: Serialized representation of <node> resource
		PRO Check MQTT	Sent MQTT PUBLISH message Topic: "/oneM2M/req/<AE-ID>/<Registrar CSE-ID>" Payload: • op = 3 (Update) • to = {CSEBaseName}/{node} • fr = AE-ID • rqi = (token-string) • 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) • rqi = (token-string) same as received in request message • pc = Serialized representation of <node> resource
		PRO Check HTTP	Registrar CSE sends response containing: • Code = 200 • X-M2M-RSC: 2004 • X-M2M-RI: (token-string) same as received in request message • Content-Type: application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json • Message-body: Serialized representation of <node> resource
		PRO Check CoAP	Registrar CSE sends response containing: • Response Code = 2.05 • oneM2M-RSC: 2004 • oneM2M-RQI: (token-string) same as received in request message • Payload: Serialized representation of <node> resource
		PRO Check MQTT	Sent a MQTT PUBLISH message Topic: "/oneM2M/resp/<AE-ID>/<Registrar CSE-ID>" Payload: • to = AE-ID

Interoperability Test Description			
			• fr = Registrar CSE-ID • rqi = (token-string) same as received in request message • rsc = 2004 • 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 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) • to = {CSEBaseName}/{node} • fr = AE-ID • rqi = (token-string)
		PRO Check HTTP	Sent DELETE request contains • Request method = DELETE • Request-Target: {CSEBaseName}/{node} • Host: IP address or the FQDN of Registrar CSE • X-M2M-RI: (token-string) • X-M2M-Origin: AE-ID
		PRO Check CoAP	Sent DELETE request contains • Method: 0.04 (DELETE) • Uri-Host: IP address or the FQDN of Registrar CSE • Uri-Path: {CSEBaseName}/{node} • oneM2M-FR: AE-ID • oneM2M-RQI: (token-string)
		PRO Check MQTT	Sent a MQTT PUBLISH message Topic: "/oneM2M/req/< AE-ID>/<Registrar CSE-ID>" Payload: • op = 4 • to = {CSEBaseName}/{node} • fr = AE-ID • rqi = (token-string)
3	Mca	PRO Check Primitive	• rsc = 2002 (DELETED) • rqi = (token-string) same as received in request message
		PRO Check HTTP	Registrar CSE sends response containing: • Status Code = 200 • X-M2M-RSC: 2002 • X-M2M-RI: (token-string) same as received in request message
		PRO Check CoAP	Registrar sends response containing: • Response Code = 2.05 • oneM2M-RSC: 2002 • oneM2M-RQI: (token-string) same as received in request message
		PRO Check MQTT	Sent a MQTT PUBLISH message Topic: "/oneM2M/resp/<AE-ID>/<Registrar CSE-ID>" Payload: • to = AE-ID • fr = Registrar CSE-ID • rqi = (token-string) same as received in request message • 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 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) • to = {CSEBaseName}/URI of <AE> resource • fr = AE-ID • rqi = (token-string) • ty = 15 (pollingChannel) • pc = Serialized representation of < pollingChannel > resource
		PRO Check HTTP	Sent request contains • Request method = POST • Request-Target:{CSEBaseName}/URI of <AE> resource • Host: IP address or the FQDN of Registrar CSE • X-M2M-RI: (token-string) • X-M2M-Origin: AE-ID • Content-Type: application/vnd.onem2m-res+xml; ty=15 or application/vnd.onem2m-res+json; ty=15 • Message-body: Serialized representation of < pollingChannel > resource
		PRO Check CoAP	Sent request contains • Method: 0.02 (POST) • Uri-Host: IP address or the FQDN of Registrar CSE • Uri-Path: {CSEBaseName}/URI of <AE> resource • Content-type: application/vnd.onem2m-res+xmlor application/vnd.onem2m-res+json • oneM2M-TY: 15 • oneM2M-FR: AE-ID • oneM2M-RQI: (token-string) • Payload: Serialized representation of < pollingChannel > resource
		PRO Check MQTT	Sent MQTT PUBLISH message: Topic: "/oneM2M/req/< AE-ID>/<Registrar CSE-ID>" Payload: • op = 1 (Create) • to = {CSEBaseName}/URI of <AE> resource • fr = AE-ID • rqi = (token-string) • ty = 15 (pollingChannel) • 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) • rqi = (token-string) same as received in request message • pc = Serialized representation of < pollingChannel > resource
		PRO Check HTTP	Registrar CSE sends response containing: • Status Code = 201 (Created) • X-M2M-RSC: 2001 • X-M2M-RI: (token-string) same as received in request message • Content-Location: URI of the created resource. • 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: • Response Code = 2.01 • oneM2M-RSC: 2001 • oneM2M-RQI: (token-string) same as received in request message • Location-Path: URI of the created resource • Content-format: application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json • Payload: Serialized representation of < pollingChannel > resource
		PRO Check MQTT	Sent MQTT PUBLISH message: Topic: "/oneM2M/resp/< AE-ID>/<Registrar CSE-ID>" Payload: • to = AE-ID • fr = Registrar CSE-ID • rsc = 2001 (CREATED) • rqi = (token-string) same as received in request message • 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 TS-0004 [2], clause 7.3.21.2.2
Pre-test conditions:			• AE has created an Application Entity resource <AE> on Registrar CSE • 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) • to = {CSEBaseName}/URI of < pollingChannel > resource • fr = AE-ID • rqi = (token-string) • pc = empty
		PRO Check HTTP	Sent request contains • Request method = GET • Request-Target: {CSEBaseName}/URI of < pollingChannel > resource • Host: IP address or the FQDN of Registrar CSE • X-M2M-RI: (token-string) • X-M2M-Origin: AE-ID • Message-body: empty
		PRO Check CoAP	Sent request contains • Method: 0.01 (GET) • Uri-Host: IP address or the FQDN of Registrar CSE • Uri-Path: {CSEBaseName}/URI of < pollingChannel > resource • oneM2M-FR: AE-ID • oneM2M-RQI: (token-string) • Payload: empty
		PRO Check MQTT	Sent MQTT PUBLISH message: Topic: "/oneM2M/req/< AE-ID>/<Registrar CSE-ID>" Payload: • op = 2 (Retrieve) • to = {CSEBaseName}/URI of < pollingChannel > resource • fr = AE-ID • rqi = (token-string) • pc = empty
3		PRO Check	• rsc =2000 (OK)

Interoperability Test Description			
	Mca	Primitive	• rqi = (token-string) same as received in request message • pc = Serialized representation of < pollingChannel > resource
		PRO Check HTTP	Registrar CSE sends response containing: • Status Code = 200 (OK) • X-M2M-RSC: 2000 • X-M2M-RI: (token-string) same as received in request message • Content-Type: application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json • Message-body: Serialized representation of < pollingChannel > resource
		PRO Check CoAP	Registrar sends response containing: • Response Code = 2.05 (OK) • oneM2M-RSC: 2000(OK) • oneM2M-RQI: (token-string) same as received in request message • Content-format: application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json • Payload: Serialized representation of < pollingChannel > resource
		PRO Check MQTT	Sent MQTT PUBLISH message: Topic: "/oneM2M/resp/< AE-ID>/<Registrar CSE-ID>" Payload: • to = AE-ID • fr = Registrar CSE-ID • rsc 2000(OK) • rqi = (token-string) same as received in request message • 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 TS-0004 [2], clause 7.3.21.2.3	
Pre-test conditions:		• AE has created an Application Entity resource <AE> on Registrar CSE • 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) • to = {CSEBaseName}/URI of < pollingChannel > resource • fr = AE-ID • rqi = (token-string) • pc = Serialized representation of updated < pollingChannel > resource
		PRO Check HTTP	Sent request contains • Request method = PUT • Request-Target:{CSEBaseName}/URI of < pollingChannel > resource • Host: IP address or the FQDN of Registrar CSE • X-M2M-RI: (token-string) • X-M2M-Origin: AE-ID • Content-Type: application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json • Message-body: Serialized representation of updated < pollingChannel > resource
		PRO Check CoAP	Sent request contains • Method: 0.03 (PUT) • Uri-Host: IP address or the FQDN of Registrar CSE • Uri-Path: {CSEBaseName}/URI of < pollingChannel > resource • oneM2M-FR: AE-ID • oneM2M-RQI: (token-string) • 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: Topic: "/oneM2M/ req /< AE-ID>/<Registrar CSE-ID>" Payload: • op = 3 (Update) • to = {CSEBaseName}/URI of < pollingChannel > resource • fr = AE-ID • rqi = (token-string) • 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) • rqi = (token-string) same as received in request message • pc = Serialized representation of < pollingChannel > resource
		PRO Check HTTP	Registrar CSE sends response containing: • Code = 200 (Ok) • X-M2M-RSC: 2004 • X-M2M-RI: (token-string) same as received in request message • Content-Type: application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json • Message-body: Serialized representation of < pollingChannel > resource
		PRO Check CoAP	Registrar sends response containing: • Response Code = 2.04 • oneM2M-RSC: 2004 • oneM2M-RQI: (token-string) same as received in request message • Content-format: application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json • Payload: Serialized representation of < pollingChannel > resource
		PRO Check MQTT	Sent MQTT PUBLISH message: Topic: "/oneM2M/resp/< AE-ID>/<Registrar CSE-ID>" Payload: • to = AE-ID • fr = Registrar CSE-ID • rsc = 2004 (Updated) • rqi = (token-string) same as received in request message • 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 TS-0004 [2], clause 7.3.21.2.4
Pre-test conditions:			• AE has created an Application Entity resource <AE> on Registrar CSE • 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) • to = {CSEBaseName}/URI of < pollingChannel > resource • fr = AE-ID • rqi = (token-string) • pc = empty
		PRO Check HTTP	Sent request contains • Request method = DELETE • Request-Target: {CSEBaseName}/URI of < pollingChannel > resource • Host: IP address or the FQDN of Registrar CSE • X-M2M-RI: (token-string) • X-M2M-Origin: AE-ID

Interoperability Test Description			
			• Message-body: Empty
		PRO Check CoAP	Sent request contains • Method: 0.04 (DELETE) • Uri-Host: IP address or the FQDN of Registrar CSE • Uri-Path: {CSEBaseName}/URI of < pollingChannel > resource • oneM2M-FR: AE-ID • oneM2M-RQI: (token-string) • Payload: empty
		PRO Check MQTT	Sent MQTT PUBLISH message: Topic: "/oneM2M/req/< AE-ID>/<Registrar CSE-ID>" Payload: • op = 4 (Delete) • to = {CSEBaseName}/URI of < pollingChannel > resource • fr = AE-ID • rqi = (token-string) • 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) • rqi = (token-string) same as received in request message • pc = empty
		PRO Check HTTP	Registrar CSE sends response containing: • Status Code = 200 (OK) • X-M2M-RSC: 2002 • X-M2M-RI: (token-string) same as received in request message • Message-body: empty
		PRO Check CoAP	Registrar sends response containing: • Response Code = 2.02 • oneM2M-RSC: 2002(DELETED) • oneM2M-RQI: (token-string) same as received in request message • Payload: empty
		PRO Check MQTT	Sent MQTT PUBLISH message: Topic: "/oneM2M/resp/< AE-ID>/<Registrar CSE-ID>" Payload: • to = AE-ID • fr = Registrar CSE-ID • rsc = 2002(DELETED) • 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 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 • A subscription to a <container> resource has been created using the <pollingChannel> as a notificationURI in the subscription. • 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 • *To*: <CSEBase>/<AE>/<pollingChannel>/pollingChannelURI • *Fr*: AE-ID
		PRO Check HTTP	Sent GET request contains • Request URI <CSEBase>/<AE>/<pollingChannel>/pollingChannelURI • Host: Registar CSE • Payload: empty
		PRO Check CoAP	Sent GET request contains • Method: 0.01 (GET) • Uri-Host: Registrar CSE host • Uri-Port: Registrar CSE port • Uri-Path: <CSEBase> • Uri-Path: <AE> • Uri-Path: < pollingChannel > • URI-Path: pollingChannelURI
		PRO Check MQTT	
3	Mca	PRO Check Primitive	Sent RETRIEVE response contains • *To*: AE-ID • *Fr*: CSE-ID • *Response Statuse Code* : OK • Cn: pending Notification request
		PRO Check HTTP	Registrar CSE sends response containing: • Code = 200 • Payload: Response PRO Check Primitive with Content set with Notification request
		PRO Check CoAP	Registrar sends response containing: • Response Code = 2.05 • 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 • *To*: AE-ID • *Fr*: CSE-ID • *Response Statuse Code* : REQUEST_TIMEOUT
		PRO Check HTTP	Registrar CSE sends response containing: • Code = 408
		PRO Check CoAP	Registrar sends response containing: • Response Code = 4.04 • 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 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) • to = {CSEBaseName}/{group}/fanOutPoint • fr = AE-ID • rqi = (token-string) • ty = 4 (contentInstance) • pc = Serialized representation of <contentInstance> resource
		PRO Check HTTP	Sent request contains • Request method = POST • Request-Target: {CSEBaseName}/{group}/fanOutPoint • Host: IP address or the FQDN of Registrar CSE • X-M2M-RI: (token-string) • X-M2M-Origin: AE-ID • Content-Type: application/vnd.onem2m-res+xml; ty=4 or application/vnd.onem2m-res+json; ty=4 • Message-body: Serialized representation of < contentInstance > resource
		PRO Check CoAP	Sent request contains • Method: 0.02 (POST) • Uri-Host: IP address or the FQDN of Registrar CSE • Uri-Path: {CSEBaseName}/{group}/fanoutPoint • Content-type: application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json • oneM2M-TY: 4 • oneM2M-FR: AE-ID • oneM2M-RQI: (token-string) • Payload: Serialized representation of <contentInstance> resource
		PRO Check MQTT	Sent MQTT PUBLISH message: Topic: "/oneM2M/req/<AE-ID>/<Registrar CSE-ID>" Payload: • op = 1 (Create) • to = {CSEBaseName}/{group}/fanOutPoint • fr = AE-ID • rqi = (token-string) • ty = 4 (contentInstance) • 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) • rqi = (token-string) same as received in request message • pc = aggregated response
		PRO Check HTTP	Registrar CSE sends response containing: • Status Code = 201 (OK) • X-M2M-RSC: 2001 • X-M2M-RI: (token-string) same as received in request message • Content-Type: application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json • Message-body: aggregated response
		PRO Check CoAP	Registrar CSE sends response containing: • Response Code = 2.01 • oneM2M-RSC: 2001 • oneM2M-RQI: (token-string) same as received in request message • Payload: aggregated response
		PRO Check MQTT	Sent a MQTT PUBLISH message: Topic: "/oneM2M/resp/<AE-ID>/<Registrar CSE-ID>" Payload: • to = AE-ID • fr = Registrar CSE-ID • rsc = 2001 (CREATED) • rqi = (token-string) same as received in request message • 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 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) • to = {CSEBaseName}/{group}/fanOutPoint • fr = AE-ID • rqi = (token-string)
		PRO Check HTTP	Sent request contains • Request method = GET • Request-Target: {CSEBaseName}/{group}/fanOutPoint • Host: IP address or the FQDN of Registrar CSE • X-M2M-RI: (token-string) • X-M2M-Origin: AE-ID
		PRO Check CoAP	Sent request contains • Method: 0.01 (GET) • Uri-Host: IP address or the FQDN of Registrar CSE • Uri-Path: {CSEBaseName}/{group}/fanoutPoint • oneM2M-FR: AE-ID • oneM2M-RQI: (token-string)
		PRO Check MQTT	Sent MQTT PUBLISH message: Topic: "/oneM2M/req/<AE-ID>/<Registrar CSE-ID>" Payload: • op = 2 (Retrieve) • to = {CSEBaseName}/{group}/fanOutPoint • fr = AE-ID • rqi = (token-string)
4		IOP Check	
7	Check Mca	PRO Check Primitive	• rsc = 2000 (OK) • rqi = (token-string) same as received in request message • pc = aggregated response
		PRO Check HTTP	Registrar CSE sends response containing: • Status Code = 200 (OK) • X-M2M-RSC: 2000 • X-M2M-RI: (token-string) same as received in request message • Content-Type: application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json • Message-body: aggregated response
		PRO Check CoAP	Registrar CSE sends response containing: • Response Code = 2.05 • oneM2M-RSC: 2000 • oneM2M-RQI: (token-string) same as received in request message • Payload: aggregated response
		PRO Check MQTT	Sent a MQTT PUBLISH message: Topic: "/oneM2M/resp/<AE-ID>/<Registrar CSE-ID>" Payload: • to = AE-ID • fr = Registrar CSE-ID • rsc = 2000 (OK) • rqi = (token-string) same as received in request message • 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 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) • to = {CSEBaseName}/{group}/fanOutPoint • fr = AE-ID • rqi = (token-string) • pc = Serialized representation of <container> resource
		PRO Check HTTP	Sent request contains • Request method = PUT • Request-Target: {CSEBaseName}/{group}/fanOutPoint • Host: IP address or the FQDN of Registrar CSE • X-M2M-RI: (token-string) • X-M2M-Origin: AE-ID • Content-Type: application/vnd.onem2m-res+xml; or application/vnd.onem2m-res+json; • Message-body: Serialized representation of < container > resource
		PRO Check CoAP	Sent request contains • Method: 0.03 (PUT) • Uri-Host: IP address or the FQDN of Registrar CSE • Uri-Path: {CSEBaseName}/{group}/fanoutPoint • Content-format: application/vnd.onem2m-res+xml; or application/vnd.onem2m-res+json; • oneM2M-FR: AE-ID • oneM2M-RQI: (token-string) • Payload: Serialized representation of <container> resource
		PRO Check MQTT	Sent MQTT PUBLISH message: Topic: "/oneM2M/req/<AE-ID>/<Registrar CSE-ID>" Payload: • op = 3 (Update) • to = {CSEBaseName}/{group}/fanOutPoint • fr = AE-ID • rqi = (token-string) • 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) • rqi = (token-string) same as received in request message • pc = aggregated response
		PRO Check HTTP	Registrar CSE sends response containing: • Status Code = 200 (OK) • X-M2M-RSC: 2004 • X-M2M-RI: (token-string) same as received in request message • Content-Type: application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json • Message-body: aggregated response
		PRO Check CoAP	Registrar CSE sends response containing: • Response Code = 2.04 • oneM2M-RSC: 2004 • oneM2M-RQI: (token-string) same as received in request message • Payload: aggregated response
		PRO Check MQTT	Sent a MQTT PUBLISH message: Topic: "/oneM2M/resp/<AE-ID>/<Registrar CSE-ID>" Payload: • to = AE-ID • fr = Registrar CSE-ID

Interoperability Test Description			
			• rsc = 2004 (CHANGED) • rqi = (token-string) same as received in request message • 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 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) • to = {CSEBaseName}/{group}/fanOutPoint • fr = AE-ID • rqi = (token-string)
		PRO Check HTTP	Sent request contains • Request method = DELETE • Request-Target: {CSEBaseName}/{group}/fanOutPoint • Host: IP address or the FQDN of Registrar CSE • X-M2M-RI: (token-string) • X-M2M-Origin: AE-ID
		PRO Check CoAP	Sent request contains • Method: 0.04 (DELETE) • Uri-Host: IP address or the FQDN of Registrar CSE • Uri-Path: {CSEBaseName}/{group}/fanoutPoint • oneM2M-FR: AE-ID • oneM2M-RQI: (token-string)
		PRO Check MQTT	Sent MQTT PUBLISH message: Topic: "/oneM2M/req/<AE-ID>/<Registrar CSE-ID>" Payload: • op = 4 (Delete) • to = {CSEBaseName}/{group}/fanOutPoint • fr = AE-ID • rqi = (token-string)
3	Check Mca	PRO Check Primitive	• rsc = 2002 (DELETED) • rqi = (token-string) same as received in request message • pc = aggregated response
		PRO Check HTTP	Registrar CSE sends response containing: • Status Code = 200 (OK) • X-M2M-RSC: 2002 • X-M2M-RI: (token-string) same as received in request message • Content-Type: application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json • Message-body: aggregated response
		PRO Check CoAP	Registrar CSE sends response containing: • Response Code = 2.02 • oneM2M-RSC: 2002 • oneM2M-RQI: (token-string) same as received in request message • Payload: aggregated response
		PRO Check MQTT	Sent a MQTT PUBLISH message: Topic: "/oneM2M/resp/<AE-ID>/<Registrar CSE-ID>" Payload:

Interoperability Test Description			
			• to = AE-ID • fr = Registrar CSE-ID • rsc = 2002 (DELETED) • rqi = (token-string) same as received in request message • 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 TS-0004 [2], clause 7.4.1	
Pre-test conditions:		• AE1 has created an application resource <AE> on registrar CSE • AE1 has created a container resource <container> on registrar CSE • AE1 has created a <subscription> as a child resource of a <container> • AE2 has created an application resource <AE> on registrar CSE • 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) • to = notificationURI of subscription resource • from = Registrar CSE-ID • rqi = (token-string) • pc = Serialized representation of Notification data object
		PRO Check HTTP	Sent request contains • Request method = POST • Request-Target: notificationURI of subscription resource • Host: IP address or FQDN of notificationURI • X-M2M-RI: (token-string) • X-M2M-Origin: {CSEBaseName} • Content-Type: application/vnd.onem2m-ntfy+xml; or application/vnd.onem2m-ntfy+json; • Message-body: Serialized Representation of Notification data object
		PRO Check CoAP	Sent request contains • Method: 0.02 (POST) • Uri-Host: notificationURI host • Uri-Port: notificationURI port • Uri-Path: AE1 AE-ID • oneM2M-FR: Registrar CSE-ID • oneM2M-RQI: (token-string) • Content-Format: application/vnd.onem2m-ntfy+xml; or application/vnd.onem2m-ntfy+json; • Payload: Serialized Representation of Notification data object
		PRO Check MQTT	Sent MQTT PUBLISH message: Topic: "/oneM2M/req/<Registrar CSE-ID>/<AE-ID>" Payload: • op = 5 (Notify) • to = notificationURI of subscription resource

Interoperability Test Description			
			• fr = Registrar CSE-ID • rqi = (token-string) • pc = empty
4		IOP Check	Check if the notification representation
7	Check Mca	PRO Check Primitive	Sent response contains • rsc = 2000 (OK) • rqi = (token-string) same as received in request message
		PRO Check HTTP	Sent response contains: • Status Code = 200 (OK) • X-M2M-RSC: 2000 • X-M2M-RI: (token-string) same as received in request message
		PRO Check CoAP	Sent response contains: • Response Code = 2.01 • oneM2M-RSC: 2000(OK) • oneM2M-RQI: (token-string) same as received in request message
		PRO Check MQTT	Sent MQTT PUBLISH message: Topic: "/oneM2M/resp/<Registrar CSE-ID>/<AE-ID>" Payload: • to = Registrar CSE-ID • fr = AE1 AE-ID • rsc = 2000(OK) • 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 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 • op = 1 (Create) • to = {CSEBaseName} • fr= AE-ID • rqi = (token-string) • rt = 1 (non blocking synchronous) • ty = 3 (container) • pc = Serialized Representationof the <Container> resource
		PRO Check HTTP	Sent request contains • Request method = POST • Reques-Target: {CSEBaseName}?rt=1 • Host: IP address or the FQDN of Registrar CSE • X-M2M-RI: (token-string)

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

Interoperability Test Description			
		PRO Check CoAP	Sent GET request contains • Method: 0.01 (GET) • Uri-Host: IP address or the FQDN of Registrar CSE • Uri-Path: <Request> reference • oneM2M-FR: AE-ID • oneM2M-RQI: (token-string) • Payload: empty
		PRO Check MQTT	Sent MQTT PUBLISH message: Topic: "/oneM2M/req/< AE-ID>/<Registrar CSE-ID>" Payload: • op = 2 • to = <Request> reference • fr = AE-ID • rqi = (token-string) • pc = empty
7	Mca	PRO Check Primitive	• rsc = 2000 (OK) • rqi = (token-string) same as received in request message • 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: • Status Code = 200 • X-M2M-RSC: 2000 • X-M2M-RI= (token-string) same as received in request message • Content-Type; application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json • 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: • Response Code= 2.05 • oneM2M-RSC: 2000 • oneM2M-RQI: (token-string) same as received in request message • Content-format; application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json • 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: Topic: "/oneM2M/resp/< AE-ID>/<Registrar CSE-ID>" Payload: • to = AE-ID • fr = Registrar CSE-ID • rqi = (token-string) same as received in request message • rsc = 2000 (OK) • 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 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 • op = 2 (Retrieve) • to = {CSEBaseName}/URI of <container> resource • fr= AE-ID • rqi = (token-string) • rt = 1 (non blocking synchronous) • pc = empty
		PRO Check HTTP	Sent request contains • Request method = POST • Reques-Target: {CSEBaseName}/URI of <Container> resource ?rt=1 • Host: IP address or the FQDN of Registrar CSE • X-M2M-RI: (token-string) • X-M2M-Origin: AE-ID • Message-Body: empty
		PRO Check CoAP	Sent request contains • Method: 0.01 (GET) • Uri-Host: IP address or the FQDN of Registrar CSE • Uri-Path: {CSEBaseName}/URI of <Container> resource • Uri-Query: rt=1 • oneM2M-FR: AE-ID • oneM2M-RQI: (token-string) • Payload: empty
		PRO Check MQTT	Sent MQTT PUBLISH message: Topic: "/oneM2M/req/< AE-ID>/<Registrar CSE-ID>" Payload: • op = 2 (Retrieve) • to = {CSEBaseName}/URI of <Container> resource • fr= AE-ID • rqi = (token-string) • rt = 1 (non blocking synchronous) • pc = empty
3	Mca	PRO Check Primitive	Registrar CSE creates an internal <Request> resource and sends acknowledgement response containing: • rsc = 1000 (Accepted) • rqi = token-string) same as received in request message • pc = Reference to the created <Request> resource
		PRO Check HTTP	Registrar CSE creates an internal <Request> resource and sends acknowledgement response containing: • Status Code = 202 • X-M2M-RSC: 1000 • X-M2M-RI= token-string) same as received in request message • Message-Body: Reference to the created <Request> resource
		PRO Check CoAP	Registrar CSE creates an internal <Request> resource and sends acknowledgement response containing: • Response Code = None • oneM2M-RSC=1000 • oneM2M-RQI = (token-string) same as received in request message • Payload: Reference to the created <Request> resource
		PRO Check MQTT	Sent MQTT PUBLISH message: Topic: "/oneM2M/resp/< AE-ID>/<Registrar CSE-ID>" Payload: • to = AE-ID • fr = Registrar CSE-ID • rqi = token-string) same as received in request message • rsc = 1000 (Accepted) • 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 • op = 2 (Retrieve) • to = <Request> reference • fr = AE-ID • rqi = (token-string) • pc = empty

Interoperability Test Description			
		PRO Check HTTP	Sent GET request contains • Request method = GET • Request URI: <Request> reference • Host: IP address or the FQDN of Registrar CSE • X-M2M-RI: (token-string) • X-M2M-Origin: AE-ID • Message-Body: empty
		PRO Check CoAP	Sent GET request contains • Method: 0.01 (GET) • Uri-Host: IP address or the FQDN of Registrar CSE • Uri-Path: <Request> reference • oneM2M-FR: AE-ID • oneM2M-RQI: (token-string) • Payload: empty
		PRO Check MQTT	Sent MQTT PUBLISH message: Topic: "/oneM2M/req/< AE-ID>/<Registrar CSE-ID>" Payload: • op = 2 • to = <Request> reference • fr = AE-ID • rqi = (token-string) • pc = empty
7	Mca	PRO Check Primitive	• rsc = 2000 (OK) • rqi = (token-string) same as received in request message • 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: • Status Code = 200 • X-M2M-RSC: 2000 • X-M2M-RI= (token-string) same as received in request message • Content-Type; application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json • 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: • Response Code= 2.05 • oneM2M-RSC: 2000 • oneM2M-RQI: (token-string) same as received in request message • Content-format; application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json • 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: Topic: "/oneM2M/resp/< AE-ID>/<Registrar CSE-ID>" Payload: • to = AE-ID • fr = Registrar CSE-ID • rqi = (token-string) same as received in request message • rsc = 2000 (OK) • 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 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 • op = 3 (Update) • to = {CSEBaseName}/URI of <Container> resource • fr= AE-ID • rqi = (token-string) • rt = 1 (non blocking synchronous) • pc = Serialized Representation of the updated <Container> resource
		PRO Check HTTP	Sent request contains • Request method = UPDATE • Reques-Target: {CSEBaseName}/URI of <Container> resource?rt=1 • Host: IP address or the FQDN of Registrar CSE • X-M2M-RI: (token-string) • X-M2M-Origin: AE-ID • Content Type = application/vnd.onem2m-res+xml; or application/vnd.onem2m-res+json; • Message-Body: Serialized Representation of updated <Container> resource
		PRO Check CoAP	Sent request contains • Method: 0.03 (UPDATE) • Uri-Host: IP address or the FQDN of Registrar CSE • Uri-Path: {CSEBaseName}/URI of <Container> resource • Uri-Query: rt=1 • oneM2M-FR: AE-ID • oneM2M-RQI: (token-string) • Content Type = application/vnd.onem2m-res+xml; or application/vnd.onem2m-res+json; • Payload: Serialized Representation of updated <Container> resource
		PRO Check MQTT	Sent MQTT PUBLISH message: Topic: "/oneM2M/req/< AE-ID>/<Registrar CSE-ID>" Payload: • op = 3 (Update) • to = {CSEBaseName}/URI of <Container> resource • fr= AE-ID • rqi = (token-string) • rt = 1 (non blocking synchronous) • pc = Serialized Representation of updated <Container> resource
3	Mca	PRO Check Primitive	Registrar CSE creates an internal <Request> resource and sends acknowledgement response containing: • rsc = 1000 (Accepted) • rqi = token-string) same as received in request message • pc = Reference to the created <Request> resource
		PRO Check HTTP	Registrar CSE creates an internal <Request> resource and sends acknowledgement response containing: • Status Code = 202 • X-M2M-RSC: 1000 • X-M2M-RI= token-string) same as received in request message • Message-Body: Reference to the created <Request> resource
		PRO Check CoAP	Registrar CSE creates an internal <Request> resource and sends acknowledgement response containing: • Response Code = None • oneM2M-RSC=1000

Interoperability Test Description			
			• oneM2M-RQI = token-string) same as received in request message • Payload: Reference to the created <Request> resource
		PRO Check MQTT	Sent MQTT PUBLISH message: Topic: "/oneM2M/resp/< AE-ID>/<Registrar CSE-ID>" Payload: • to = AE-ID • fr = Registrar CSE-ID • rqi = token-string) same as received in request message • rsc = 1000 (Accepted) • 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 • op = 2 (Retrieve) • to = <Request> reference • fr = AE-ID • rqi = (token-string) • pc = empty
		PRO Check HTTP	Sent GET request contains • Request method = GET • Request URI: <Request> reference • Host: IP address or the FQDN of Registrar CSE • X-M2M-RI: (token-string) • X-M2M-Origin: AE-ID • Message-Body: empty
		PRO Check CoAP	Sent GET request contains • Method: 0.01 (GET) • Uri-Host: IP address or the FQDN of Registrar CSE • Uri-Path: <Request> reference • oneM2M-FR: AE-ID • oneM2M-RQI: (token-string) • Payload: empty
		PRO Check MQTT	Sent MQTT PUBLISH message: Topic: "/oneM2M/req/< AE-ID>/<Registrar CSE-ID>" Payload: • op = 2 • to = <Request> reference • fr = AE-ID • rqi = (token-string) • pc = empty
7	Mca	PRO Check Primitive	• rsc = 2000 (OK) • rqi = (token-string) same as received in request message • 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: • Status Code = 200 • X-M2M-RSC: 2000 • X-M2M-RI= (token-string) same as received in request message • Content-Type; application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json • 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: • Response Code= 2.05 • oneM2M-RSC: 2000 • oneM2M-RQI: (token-string) same as received in request message • Content-format; application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json • 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: Topic: "/oneM2M/resp/< AE-ID>/<Registrar CSE-ID>" Payload: • to = AE-ID

Interoperability Test Description			
			• fr = Registrar CSE-ID • rqi = (token-string) same as received in request message • rsc = 2000 (OK) • 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 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 • op = 4 (Delete) • to = {CSEBaseName}/URI of <container> resource • fr= AE-ID • rqi = (token-string) • rt = 1 (non blocking synchronous) • pc = empty
		PRO Check HTTP	Sent request contains • Request method = DELETE • Reques-Target: {CSEBaseName}/URI of <Container> resource ?rt=1 • Host: IP address or the FQDN of Registrar CSE • X-M2M-RI: (token-string) • X-M2M-Origin: AE-ID • Message-Body: empty
		PRO Check CoAP	Sent request contains • Method: 0.04 (DELETE) • Uri-Host: IP address or the FQDN of Registrar CSE • Uri-Path: {CSEBaseName}/URI of <Container> resource • Uri-Query: rt=1 • oneM2M-FR: AE-ID • oneM2M-RQI: (token-string) • Payload: empty
		PRO Check MQTT	Sent MQTT PUBLISH message: Topic: "/oneM2M/req/< AE-ID>/<Registrar CSE-ID>" Payload: • op = 4 (Delete) • to = {CSEBaseName}/URI of <Container> resource • fr= AE-ID • rqi = (token-string) • rt = 1 (non blocking synchronous) • pc = empty
3	Mca	PRO Check Primitive	Registrar CSE creates an internal <Request> resource and sends acknowledgement response containing: • rsc = 1000 (Accepted) • rqi = token-string) same as received in request message • pc = Reference to the created <Request> resource
		PRO Check HTTP	Registrar CSE creates an internal <Request> resource and sends acknowledgement response containing: • Status Code = 202 • X-M2M-RSC: 1000

Interoperability Test Description			
			• X-M2M-RI= token-string) same as received in request message • Message-Body: Reference to the created <Request> resource
		PRO Check CoAP	Registrar CSE creates an internal <Request> resource and sends acknowledgement response containing: • Response Code = None • oneM2M-RSC=1000 • oneM2M-RQI = (token-string) same as received in request message • Payload: Reference to the created <Request> resource
		PRO Check MQTT	Sent MQTT PUBLISH message: Topic: "/oneM2M/resp/< AE-ID>/<Registrar CSE-ID>" Payload: • to = AE-ID • fr = Registrar CSE-ID • rqi = token-string) same as received in request message • rsc = 1000 (Accepted) • 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 • op = 2 (Retrieve) • to = <Request> reference • fr = AE-ID • rqi = (token-string) • pc = empty
		PRO Check HTTP	Sent GET request contains • Request method = GET • Request URI: <Request> reference • Host: IP address or the FQDN of Registrar CSE • X-M2M-RI: (token-string) • X-M2M-Origin: AE-ID • Message-Body: empty
		PRO Check CoAP	Sent GET request contains • Method: 0.01 (GET) • Uri-Host: IP address or the FQDN of Registrar CSE • Uri-Path: <Request> reference • oneM2M-FR: AE-ID • oneM2M-RQI: (token-string) • Payload: empty
		PRO Check MQTT	Sent MQTT PUBLISH message: Topic: "/oneM2M/req/< AE-ID>/<Registrar CSE-ID>" Payload: • op = 2 • to = <Request> reference • fr = AE-ID • rqi = (token-string) • pc = empty
7	Mca	PRO Check Primitive	• rsc = 2000 (OK) • rqi = (token-string) same as received in request message • pc = <Request> resource with the parameter "requestStatus" set to 1 (COMPLETED)
		PRO Check HTTP	Registrar CSE sends response to AE containing: • Status Code = 200 • X-M2M-RSC: 2000 • X-M2M-RI= (token-string) same as received in request message • Content-Type; application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json • Message-Body: <Request> resource with the parameter "requestStatus" set to 1 (COMPLETED)
		PRO Check CoAP	Registrar CSE sends response to AE containing: • Response Code= 2.05 • oneM2M-RSC: 2000 • oneM2M-RQI: (token-string) same as received in request message • Content-format; application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json • 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>" Payload: • to = AE-ID • fr = Registrar CSE-ID • rqi = (token-string) same as received in request message • rsc = 2000 (OK) • 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 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 • op = 1 (Create) • to = {CSEBaseName} • fr= AE-ID • rqi = (token-string) • rt = 2 (non blocking asynchronous) • ty = 3 (container) • nu= AE-Notification-URI • oneM2M-RQI: Request-ID • pc = Serialized Representationof the <Container> resource
		PRO Check HTTP	Sent request contains • Request method = POST • Reques-Target: {CSEBaseName}?rt=2 • Host: IP address or the FQDN of Registrar CSE • X-M2M-RI: (token-string) • X-M2M-Origin: AE-ID • X-M2M-RTU: AE-Notification-URI • Content Type = application/vnd.onem2m-res+xml; ty=3 or application/vnd.onem2m-res+json; ty=3 • Message-Body: Serialized Representation of <Container> resource
		PRO Check CoAP	Sent request contains • Method: 0.02 (POST) • Uri-Host: IP address or the FQDN of Registrar CSE • Uri-Path: {CSEBaseName} • Uri-Query: rt=1 • oneM2M-FR: AE-ID • oneM2M-RQI: (token-string) • oneM2M-RTURI: AE-Notification-URI • Content Type = application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json • oneM2M-TY: 3 • Payload: Serialized Representation of <Container> resource
		PRO Check	Sent MQTT PUBLISH message:

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

Interoperability Test Description			
			• pc = empty
7	Mca	PRO Check Primitive	AE sends notify response to Registrar CSE containing: • rsc = 2000 (OK) • rqi = (token-string) same as received in request message
		PRO Check HTTP	AE sends notify response to Registrar CSE containing: • Code = 200 • X-M2M-RSC: 2000 • X-M2M-RI= (token-string) same as received in request message • Message-Body = empty
		PRO Check CoAP	AE sends notify response to Registrar CSE containing: • Response Code= 2.05 • oneM2M-RQI = (token-string) same as received in request message • Payload = empty
		PRO Check MQTT	Sent MQTT PUBLISH message: Topic: "/oneM2M/resp/<Registrar CSE-ID >/<AE-ID>" Payload: • to = AE-ID • fr = Registrar CSE-ID • rqi = (token-string) same as received in request message • 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 TS-0004 [2], clause 7.3.6.2.1	
Pre-test conditions:		• AE has created a <Container> resource on registrar CSE. • 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 • op = 2 (Retrieve) • to = {CSEBaseName}/URI of <container> resource • fr = AE-ID • rqi = (token-string) • rt = 2 (non blocking asynchronous) • nu = AE-Notification-URI • pc = empty
		PRO Check HTTP	Sent request contains • Request method = POST • Reques-Target: {CSEBaseName}/URI of <Container> resource ?rt=2 • Host: IP address or the FQDN of Registrar CSE • X-M2M-RI: (token-string) • X-M2M-Origin: AE-ID • X-M2M-RTU: AE-Notification-URI • Message-Body: empty
		PRO Check CoAP	Sent request contains • Method: 0.01 (GET) • Uri-Host: IP address or the FQDN of Registrar CSE • Uri-Path: {CSEBaseName}/URI of <Container> resource • Uri-Query: rt=2 • oneM2M-FR: AE-ID • oneM2M-RQI: (token-string) • oneM2M-RTURI: AE-Notification-URI

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

Interoperability Test Description			
			• rqi = (token-string) • pc=empty
7	Mca	PRO Check Primitive	AE sends notify response to Registrar CSE containing: • rsc = 2000 (OK) • rqi = (token-string) same as received in request message
		PRO Check HTTP	AE sends notify response to Registrar CSE containing: • Code = 200 • X-M2M-RSC: 2000 • X-M2M-RI= (token-string) same as received in request message • Message-Body = empty
		PRO Check CoAP	AE sends notify response to Registrar CSE containing: • Response Code= 2.05 • oneM2M-RQI = (token-string) same as received in request message • Payload = empty
		PRO Check MQTT	Sent MQTT PUBLISH message: Topic: "/oneM2M/resp/<Registrar CSE-ID >/<AE-ID>" Payload: • to = AE-ID • fr = Registrar CSE-ID • rqi = (token-string) same as received in request message • 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 TS-0004 [2], clause 7.3.6.2.1
Pre-test conditions:			• AE has created a Container resource <Container> on registrar CSE • 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 • op = 3 (Update) • to = {CSEBaseName}/URI of <Container> resource • fr = AE-ID • rqi = (token-string) • rt = 2 (non blocking asynchronous) • nu = AE-Notification-URI • pc = Serialized Representation of the updated <Container> resource
		PRO Check HTTP	Sent request contains • Request method = UPDATE • Reques-Target: {CSEBaseName}/URI of <Container> resource?rt=2 • Host: IP address or the FQDN of Registrar CSE • X-M2M-RI: (token-string) • X-M2M-Origin: AE-ID • X-M2M-RTU: AE-Notification-URI • Content Type = application/vnd.onem2m-res+xml; or application/vnd.onem2m-res+json; • Message-Body: Serialized Representation of updated <Container> resource
		PRO Check CoAP	Sent request contains • Method: 0.03 (UPDATE) • Uri-Host: IP address or the FQDN of Registrar CSE • Uri-Path: {CSEBaseName}/URI of <Container> resource • Uri-Query: rt=2

Interoperability Test Description			
			• oneM2M-FR: AE-ID • oneM2M-RQI: (token-string) • oneM2M-RTURI = AE-Notification-URI • Content Type = application/vnd.onem2m-res+xml; or application/vnd.onem2m-res+json; • Payload: Serialized Representation of updated <Container> resource
		PRO Check MQTT	Sent MQTT PUBLISH message: Topic: "/oneM2M/req/< AE-ID>/<Registrar CSE-ID>" Payload: • op = 3 (Update) • to = {CSEBaseName}/URI of <Container> resource • fr = AE-ID • rqi = (token-string) • rt = 2 (non blocking asynchronous) • nu= AE-Notification-URI • pc = Serialized Representation of updated <Container> resource
3	Mca	PRO Check Primitive	Registrar CSE creates an internal <Request> resource and sends acknowledgement response containing: • rsc = 1000 (Accepted) • rqi = token-string) same as received in request message • pc = Reference to the created <Request> resource
		PRO Check HTTP	Registrar CSE creates an internal <Request> resource and sends acknowledgement response containing: • Status Code = 202 • X-M2M-RSC: 1000 • X-M2M-RI= token-string) same as received in request message • Message-Body: Reference to the created <Request> resource
		PRO Check CoAP	Registrar CSE creates an internal <Request> resource and sends acknowledgement response containing: • Response Code = None • oneM2M-RSC = 1000 • oneM2M-RQI = token-string) same as received in request message • Payload: Reference to the created <Request> resource
		PRO Check MQTT	Sent MQTT PUBLISH message: Topic: "/oneM2M/resp/< AE-ID>/<Registrar CSE-ID>" Payload: • to = AE-ID • fr = Registrar CSE-ID • rqi = (token-string) same as received in request message • rsc = 1000 (Accepted) • 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 • op = 5 (Notify) • to = AE-Notification-URI • fr = registrar CSE-ID • rqi = (token-string) • pc = Serialized representation of notification data object
		PRO Check HTTP	Sent request contains • Request method = POST • Request URI: AE-Notification-URI • Host: IP address or the FQDN of Registrar AE • X-M2M-RI: (token-string) • X-M2M-Origin: Registrar CSE-ID • Message-Body: Serialized representation of notification data object
		PRO Check CoAP	Sent request contains • Method: 0.02 (POST) • Uri-Host: IP address or the FQDN of Registrar AE • Uri-Path: AE-Notification-URI • oneM2M-RQI: (token-string) • oneM2M-FR: Registrar CSE-ID • 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 >" Payload: • op = 5 (Notify) • to = AE-Notification-URI • fr = Registrar CSE-ID • rqi = (token-string) • pc = empty
7	Mca	PRO Check Primitive	AE sends notify response to Registrar CSE containing: • rsc = 2000 (OK) • rqi = (token-string) same as received in request message
		PRO Check HTTP	AE sends notify response to Registrar CSE containing: • Code = 200 • X-M2M-RSC: 2000 • X-M2M-RI = (token-string) same as received in request message • Message-Body = empty
		PRO Check CoAP	AE sends notify response to Registrar CSE containing: • Response Code = 2.05 • oneM2M-RQI = (token-string) same as received in request message • Payload = empty
		PRO Check MQTT	Sent MQTT PUBLISH message: Topic: "/oneM2M/resp/<Registrar CSE-ID >/<AE-ID>" Payload: • to = AE-ID • fr = Registrar CSE-ID • rqi = (token-string) same as received in request message • 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 TS-0004 [2], clause 7.3.6.2.1
Pre-test conditions:			• AE has created a <Container> resource on registrar CSE • 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 • op = 4 (Delete) • to = {CSEBaseName}/URI of <container> resource • fr = AE-ID • rqi = (token-string) • rt = 2 (non blocking asynchronous) • nu = AE-Notification-URI • pc = empty
		PRO Check HTTP	Sent request contains • Request method = DELETE • Reques-Target: {CSEBaseName}/URI of <Container> resource ?rt=2 • Host: IP address or the FQDN of Registrar CSE • X-M2M-RI: (token-string) • X-M2M-Origin: AE-ID • X-M2M-RTU = AE-Notification-URI • Message-Body: empty
		PRO Check CoAP	Sent request contains • Method: 0.04 (DELETE)

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

Interoperability Test Description			
		PRO Check MQTT	Sent MQTT PUBLISH message: Topic: "/oneM2M/req/< Registrar CSE-ID >/<AE-ID >" Payload: • op = 5 (Notify) • to = AE-Notification-URI • fr = Registrar CSE-ID • rqi = (token-string) • pc = empty
7	Mca	PRO Check Primitive	AE sends notify response to Registrar CSE containing: • rsc = 2000 (OK) • rqi = (token-string) same as received in request message
		PRO Check HTTP	AE sends notify response to Registrar CSE containing: • Code = 200 • X-M2M-RSC: 2000 • X-M2M-RI = (token-string) same as received in request message • Message-Body = empty
		PRO Check CoAP	AE sends notify response to Registrar CSE containing: • Response Code = 2.05 • oneM2M-RQI = (token-string) same as received in request message • Payload = empty
		PRO Check MQTT	Sent MQTT PUBLISH message: Topic: "/oneM2M/resp/<Registrar CSE-ID >/<AE-ID>" Payload: • to = AE-ID • fr = Registrar CSE-ID • rqi = (token-string) same as received in request message • 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) • to = URI of the parent resource • fr = AE-ID • rqi = (token-string) • ty = <Resource> type number • pc = Serialized representation of <Resource> resource
		PRO Check HTTP	Sent request contains • Request method = POST • Request-Target: URI of the parent resource • Host: IP address or the FQDN of Registrar CSE • X-M2M-RI: (token-string) • X-M2M-Origin: AE-ID • Content-Type: application/vnd.onem2m-res+xml; ty=<Resource> type number or

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

Interoperability Test Description			
			• X-M2M-RI: (token-string) same as received in request message • Content-Location: URI of the created resource. • Content-Type: application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json • Message-body: Serialized representation of <resource> resource
		PRO Check CoAP	Hosting CSE sends response to Registrar CSE containing: • Response Code = 2.01 • oneM2M-RSC: 2001 • oneM2M-RQI: (token-string) same as received in request message • Location-Path: URI of the created resource • Content-format: application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json • Payload: Serialized representation of < resource > resource
		PRO Check MQTT	Sent MQTT PUBLISH message: Topic: "/oneM2M/resp/< RegistrarCSE -ID>/<Hosting CSE-ID>" Payload: • to = AE-ID • fr = Hosting CSE-ID • rsc = 2001 (CREATED) • rqi = (token-string) same as received in request message • 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) • rqi = (token-string) same as received in request message • pc = Serialized representation of <Resource> resource
		PRO Check HTTP	Registrar CSE sends response to AE containing: • Status Code = 201 (Created) • X-M2M-RSC: 2001 • X-M2M-RI: (token-string) same as received in request message • Content-Location: URI of the created resource. • Content-Type: application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json • Message-body: Serialized representation of <resource> resource
		PRO Check CoAP	Registrar CSE sends response to AE containing: • Response Code = 2.01 • oneM2M-RSC: 2001 • oneM2M-RQI: (token-string) same as received in request message • Location-Path: URI of the created resource • Content-format: application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json • Payload: Serialized representation of < resource > resource
		PRO Check MQTT	Sent MQTT PUBLISH message: Topic: "/oneM2M/resp/< AE-ID>/<Registrar CSE-ID>" Payload: • to = AE-ID • fr = Registrar CSE-ID • rsc = 2001 (CREATED) • rqi = (token-string) same as received in request message • 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 TS-0004 [2], clause 7.3.5.2.1		
<contentInstance>	TD_M2M_SH_01#02	TS-0001 [1], clause 10.2.19.2 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 • 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) • to = URI of the <Resource> resource U • fr = AE-ID • rqi = (token-string)
		PRO Check HTTP	Sent request contains • Request method = GET • Request-Target: URI of the <Resource> resource • Host: IP address or the FQDN of Registrar CSE • X-M2M-RI: (token-string) • X-M2M-Origin: AE-ID • Message-body: empty
		PRO Check CoAP	Sent request contains • Method: 0.01 (GET) • Uri-Host: IP address or the FQDN of Registrar CSE • Uri-Path: URI of the <Resource> resource • oneM2M-FR: AE-ID • oneM2M-RQI: (token-string)

Interoperability Test Description			
			• Payload: empty
		PRO Check MQTT	Sent MQTT PUBLISH message: Topic: "/oneM2M/req/< AE-ID>/<Registrar CSE-ID>" Payload: • op = 2 (Retrieve) • to = URI of the <Resource> resource • fr = AE-ID • rqi = (token-string) • 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) • to URI of the <Resource> resource • fr = AE-ID • rqi = (token-string)
		PRO Check HTTP	Sent request contains • Request method = GET • Request-Target: URI of the <Resource> resource • Host: IP address or the FQDN of Hosting CSE • X-M2M-RI: (token-string) • X-M2M-Origin: AE-ID • Message-body: empty
		PRO Check CoAP	Sent request contains • Method: 0.01 (GET) • Uri-Host: IP address or the FQDN of Hosting CSE • Uri-Path: URI of the <Resource> resource • oneM2M-FR: AE-ID • oneM2M-RQI: (token-string) • Payload: empty
		PRO Check MQTT	Sent MQTT PUBLISH message: Topic: "/oneM2M/req/< Registrar CSE-ID>/<Hosting CSE-ID>" Payload: • op = 2 (Retrieve) • to = URI of the <Resource> resource • fr = AE-ID • rqi = (token-string) • pc = empty
5	Mcc	PRO Check Primitive	• rsc = 2000 (OK) • rqi = (token-string) same as received in request message • pc = Serialized representation of <Resource> resource
		PRO Check HTTP	Hosting CSE sends response containing: • Status Code = 200 (OK) • X-M2M-RSC: 2000 • X-M2M-RI: (token-string) same as received in request message • Content-Type: application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json • Message-body: Serialized representation of <Resource> resource
		PRO Check CoAP	Hosting CSE sends response containing: • Response Code = 2.05 (OK) • oneM2M-RSC: 2000(OK) • oneM2M-RQI: (token-string) same as received in request message • Content-format: application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json • Payload: Serialized representation of <Resource> resource
		PRO Check MQTT	Sent MQTT PUBLISH message: Topic: "/oneM2M/resp/< Registrar CSE-ID>/<Hosting CSE-ID>" Payload: • to = AE-ID • fr = Hosting CSE-ID • rsc 2000(OK) • rqi = (token-string) same as received in request message • 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) • rqi = (token-string) same as received in request message • pc = Serialized representation of <Resource> resource
		PRO Check HTTP	Registrar CSE forwards response containing: • Status Code = 200 (OK) • X-M2M-RSC: 2000 • X-M2M-RI: (token-string) same as received in request message • Content-Type: application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json • Message-body: Serialized representation of <Resource> resource
		PRO Check CoAP	Registrar forwards response containing: • Response Code = 2.05 (OK) • oneM2M-RSC: 2000(OK) • oneM2M-RQI: (token-string) same as received in request message • Content-format: application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json • Payload: Serialized representation of <Resource> resource
		PRO Check MQTT	Sent MQTT PUBLISH message: Topic: "/oneM2M/resp/< AE-ID>/<Hosting CSE-ID>" Payload: • to = AE-ID • fr = Registrar CSE-ID • rsc 2000(OK) • rqi = (token-string) same as received in request message • 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 TS-0004 [2], clause 7.3.5.2.2		
<contentInstance>	TD_M2M_SH_02#02	TS-0001 [1], clause 10.2.19.3 TS-0004 [2], clause 7.3.6.2.2		
<subscription>	TD_M2M_SH_02#03	TS-0001 [1], clause 10.2.11.3 TS-0004 [2], clause 7.3.7.2		
<accessControlPolicy>	TD_M2M_SH_02#04	TS-0001 [1], clause 10.2.21.2 TS-0004 [2], clause 7.3.1.2		
<group>	TD_M2M_SH_02#05	TS-0001 [1], clause 10.2.7.3 TS-0004 [2], clause 7.3.12.2.2		
<pollingChannel>	TD_M2M_SH_02#06	TS-0001 [1], clause 10.2.13.3 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 • 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) • to = URI of the resource <Resource> • fr = AE-ID • rqi = (token-string) • pc = Serialized representation of <Resource> resource
		PRO Check HTTP	Sent request contains • Request method = PUT • Request-Target: URI of the <Resource> resource • Host: IP address or the FQDN of Registrar CSE • X-M2M-RI: (token-string) • X-M2M-Origin: AE-ID • Content-Type: application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json • Message-body: Serialized representation of updated <Resource> resource
		PRO Check CoAP	Sent request contains • Method: 0.03 (PUT) • Uri-Host: IP address or the FQDN of Registrar CSE • Uri-Path: URI of the <Resource> resource • oneM2M-FR: AE-ID • oneM2M-RQI: (token-string) • Content-format: application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json • Payload: Serialized representation of updated <Resource> resource

Interoperability Test Description			
		PRO Check MQTT	Sent MQTT PUBLISH message: Topic: "/oneM2M/ req /< AE-ID>/<Registrar CSE-ID>" Payload: • op = 3 (Update) • to = URI of the <Resource> resource • fr = AE-ID • rqi = (token-string) • 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) • to = URI of the resource <Resource> • fr = AE-ID • rqi = (token-string) • pc = Serialized representation of <Resource> resource
		PRO Check HTTP	Sent request contains • Request method = PUT • Request-Target: URI of the <Resource> resource • Host: IP address or the FQDN of Hosting CSE • X-M2M-RI: (token-string) • X-M2M-Origin: AE-ID • Content-Type: application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json • Message-body: Serialized representation of updated <Resource> resource
		PRO Check CoAP	Sent request contains • Method: 0.03 (PUT) • Uri-Host: IP address or the FQDN of Hosting CSE • Uri-Path: URI of the <Resource> resource • oneM2M-FR: AE-ID • oneM2M-RQI: (token-string) • Content-format: application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json • Payload: Serialized representation of updated <Resource> resource
		PRO Check MQTT	Sent MQTT PUBLISH message: Topic: "/oneM2M/ req /< Registrar CSE-ID>/<Hosting CSE-ID>" Payload: • op = 3 (Update) • to = URI of the <Resource> resource • fr = AE-ID • rqi = (token-string) • 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) • rqi = (token-string) same as received in request message • pc = Serialized representation of <Resource> resource
		PRO Check HTTP	Hosting CSE sends response containing: • Code = 200 (Ok) • X-M2M-RSC: 2004 • X-M2M-RI: (token-string) same as received in request message • Content-Type: application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json • Message-body: Serialized representation of <Resource> resource
		PRO Check CoAP	Hosting sends response containing: • Response Code = 2.04 • oneM2M-RSC: 2004 • oneM2M-RQI: (token-string) same as received in request message • Content-format: application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json • Payload: Serialized representation of <Resource> resource
		PRO Check MQTT	Sent MQTT PUBLISH message: Topic: "/oneM2M/resp/< Registrar CSE-ID>/<Hosting CSE-ID>" Payload: • to = AE-ID • fr = Hosting CSE-ID • rsc = 2004 (Updated) • rqi = (token-string) same as received in request message • 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 • pc = Serialized representation of <Resource> resource
		PRO Check HTTP	Registrar CSE forwards response containing: • Code = 200 (Ok) • X-M2M-RSC: 2004 • X-M2M-RI: (token-string) same as received in request message • Content-Type: application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json • Message-body: Serialized representation of <Resource> resource
		PRO Check CoAP	Registrar forwards response containing: • Response Code = 2.04 • oneM2M-RSC: 2004 • oneM2M-RQI: (token-string) same as received in request message • Content-format: application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json • Payload: Serialized representation of <Resource> resource
		PRO Check MQTT	Sent MQTT PUBLISH message: Topic: "/oneM2M/resp/< AE-ID>/<Registrar CSE-ID>" Payload: • to = AE-ID • fr = Registrar CSE-ID • rsc = 2004 (Updated) • rqi = (token-string) same as received in request message • 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 TS-0004 [2], clause 7.3.5.2.3		
<subscription>	TD_M2M_SH_03#02	TS-0001 [1], clause 10.2.11.4 TS-0004 [2], clause 7.3.7.2		
<accessControlPolicy>	TD_M2M_SH_03#03	TS-0001 [1], clause 10.2.21.3 TS-0004 [2], clause 7.3.1.2		
<group>	TD_M2M_SH_03#04	TS-0001 [1], clause 10.2.7.4 TS-0004 [2], clause 7.3.12.2.3		
<pollingChannel>	TD_M2M_SH_03#05	TS-0001 [1], clause 10.2.13.4 TS-0004 [2], clause 7.3.21.2.3		
<fanOutPoint>	TD_M2M_SH_03#06	TS-0001 [1], clause 10.2.7.9 TS-0004 [2], clause 7.3.14.3.3		
<node>	TD_M2M_SH_03#07	TS-0001 [1], clause 10.2.14.3 TS-0004 [2], clause 7.3.18.2.3		
<remoteCSE>	TD_M2M_SH_03#08	TS-0001 [1], clause 10.2.2.3 TS-0004 [2], clause 7.3.3.2.3		
<ae>	TD_M2M_SH_03#09	TS-0001 [1], clause 10.2.1.3 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 • 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) • to = URI of the resource <Resource> • fr = AE-ID • rqi = (token-string)
		PRO Check HTTP	Sent request contains • Request method = DELETE • Request-Target: URI of the resource <Resource> • Host: IP address or the FQDN of Registrar CSE • X-M2M-RI: (token-string) • X-M2M-Origin: AE-ID • Message-body: Empty
		PRO Check CoAP	Sent request contains • Method: 0.04 (DELETE) • Uri-Host: IP address or the FQDN of Registrar CSE • Uri-Path: URI of the resource <Resource> • oneM2M-FR: AE-ID • oneM2M-RQI: (token-string) • Payload: empty
		PRO Check MQTT	Sent MQTT PUBLISH message: Topic: "/oneM2M/req/< AE-ID>/<Registrar CSE-ID>" Payload: • op = 4 (Delete) • to = URI of the resource <Resource> • fr = AE-ID • rqi = (token-string) • 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) • to = URI of the resource <Resource> • fr = AE-ID • rqi = (token-string)
		PRO Check HTTP	Sent request contains • Request method = DELETE • Request-Target: URI of the resource <Resource> • Host: IP address or the FQDN of Hosting CSE • X-M2M-RI: (token-string) • X-M2M-Origin: AE-ID • Message-body: Empty
		PRO Check CoAP	Sent request contains • Method: 0.04 (DELETE) • Uri-Host: IP address or the FQDN of Hosting CSE • Uri-Path: URI of the resource <Resource> • oneM2M-FR: AE-ID • oneM2M-RQI: (token-string) • Payload: empty
		PRO Check MQTT	Sent MQTT PUBLISH message: Topic: "/oneM2M/req/< Registrar CSE-ID>/<Hosting CSE-ID>" Payload: • op = 4 (Delete) • to = URI of the resource <Resource> • fr = AE-ID • rqi = (token-string) • 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) • rqi = (token-string) same as received in request message
		PRO Check HTTP	Hosting CSE sends response containing: • Status Code = 200 (OK) • X-M2M-RSC: 2002 • X-M2M-RI: (token-string) same as received in request message • Message-body: empty
		PRO Check CoAP	Hosting sends response containing: • Response Code = 2.02

Interoperability Test Description			
			• oneM2M-RSC: 2002(DELETED) • oneM2M-RQI: (token-string) same as received in request message • Payload: empty
		PRO Check MQTT	Sent MQTT PUBLISH message: Topic: "/oneM2M/resp/< Registrar CSE-ID>/<Hosting CSE-ID>" Payload: • to = AE-ID • fr = Registrar CSE-ID • rsc = 2002(DELETED) • 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) • rqi = (token-string) same as received in request message
		PRO Check HTTP	Registrar CSE forwards response containing: • Status Code = 200 (OK) • X-M2M-RSC: 2002 • X-M2M-RI: (token-string) same as received in request message • Message-body: empty
		PRO Check CoAP	Registrar forwards response containing: • Response Code = 2.02 • oneM2M-RSC: 2002(DELETED) • oneM2M-RQI: (token-string) same as received in request message • Payload: empty
		PRO Check MQTT	Sent MQTT PUBLISH message: Topic: "/oneM2M/resp/< AE-ID>/<Registrar CSE-ID>" Payload: • to = AE-ID • fr = Registrar CSE-ID • rsc = 2002(DELETED) • 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 TS-0004 [2], clause 7.3.5.2.4		
<contentInstance>	TD_M2M_SH_04#02	TS-0001 [1], clause 10.2.19.5 TS-0004 [2], clause 7.3.6.2.4		
<subscription>	TD_M2M_SH_05#03	TS-0001 [1], clause 10.2.11.5 TS-0004 [2], clause 7.3.7.2		
<accessControlPolicy>	TD_M2M_SH_05#04	TS-0001 [1], clause 10.2.21.4 TS-0004 [2], clause 7.3.1.2		
<group>	TD_M2M_SH_05#05	TS-0001 [1], clause 10.2.7.5 TS-0004 [2], clause 7.3.12.2.4		
<pollingChannel>	TD_M2M_SH_05#06	TS-0001 [1], clause 10.2.13.5 TS-0004 [2], clause 7.3.21.2.4		
<fanOutPoint>	TD_M2M_SH_05#07	TS-0001 [1], clause 10.2.7.10 TS-0004 [2], clause 7.3.14.3.4		
<node>	TD_M2M_SH_05#08	TS-0001 [1], clause 10.2.14.4 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 TS-0004 [2], clause 7.2.3.13
Pre-test conditions:			• Two <Container> resources with labels "key1" and "key2" are created in Hosting CSE. • 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 • op = 2 (Retrieve) • to = URI of hosting CSEBase • fr = AE-ID • rqi = (token-string) • fu=1 • lbl=key1 • lbl=key2 • rty=3 • lim=1 • pc = empty
		PRO Check HTTP	Sent request contains • Request method = GET • Request-Target: {URI of hosting CSEBase}?fu=1&key=1&key=2&rty=3&lim=1 • Host: IP address or the FQDN of Registrar CSE • X-M2M-RI: (token-string) • X-M2M-Origin: AE-ID • Message-body: empty
		PRO Check CoAP	Sent request contains • Method: 0.01 (GET) • Uri-Host: IP address or the FQDN of Registrar CSE • Uri-Path: URI of hosting CSEBase • oneM2M-FR: AE-ID • oneM2M-RQI: (token-string) • Uri-Query: fu=1 • Uri-Query: lbl=key1 • Uri-Query: lbl=key2 • Uri-Query: rty=3 • Uri-Query: lim=1 • Payload: empty
		PRO Check MQTT	Sent MQTT PUBLISH message: Topic: "/oneM2M/req/<AE-ID>/<Registrar CSE-ID>" Payload: • op = 2 (Retrieve) • to = URI of hosting CSEBase • fr = AE-ID • rqi = (token-string) • fu = 1 • lbl=key1 • lbl=key2 • rty=3 • lim=1 • 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 • op = 2 (Retrieve) • to = hosting CSEBase

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

Interoperability Test Description			
			• fr = Hostring CSE-ID • rsc = 2000 (OK) • rqi = (token-string) same as received in request message • 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: • rsc = 2000 (OK) • rqi = (token-string) same as received in request message • pc = Serialized representation of data object containing the address of one of the <Container> resources
		PRO Check HTTP	Registrar CSE sends response containing: • Status Code = 200 (OK) • X-M2M-RSC: 2000 • X-M2M-RI: (token-string) same as received in request message • Content-Type: application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json • Message-body: Serialized representation of data object containing the address of one of the <Container> resources
		PRO Check CoAP	Registrar sends response containing: • Response Code = 2.05 • oneM2M-RSC: 2000 • oneM2M-RQI: (token-string) same as received in request message • Content-format: application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json • Payload: Serialized representation of data object containing the address of one of the <Container> resources
		PRO Check MQTT	Sent MQTT PUBLISH message: Topic: "/oneM2M/resp/<AE-ID>/<Registrar CSE-ID>" Payload: • to = Registree CSE-ID • fr = Registrar CSE-ID • rsc = 2000 (OK) • rqi = (token-string) same as received in request message • 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. • AE has created an <AE> resource on registrar CSE with name {AEName} • 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) • to = URI of addressed resource • fr = AE-ID • rqi = (token-string) • pc = empty
		PRO Check HTTP	Sent request contains • Request method = DELETE • Request-Target: URI of addressed resource • Host: IP address or the FQDN of Registrar CSE

Interoperability Test Description			
			• X-M2M-RI: (token-string) • X-M2M-Origin: AE-ID • Message-body: empty
		PRO Check CoAP	Sent request contains • Method: 0.04 (DELETE) • Uri-Host: IP address or the FQDN of Registrar CSE • Uri-Path: URI of addressed resource • oneM2M-FR: AE-ID • oneM2M-RQI: (token-string) • Payload: empty
		PRO Check MQTT	Sent MQTT PUBLISH message: Topic: "/oneM2M/req/<AE-ID>/<Registrar CSE-ID>" Payload: • op = 4 (Delete) • to = URI of addressed resource • fr = AE-ID • rqi = (token-string) • 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 • op = 2 (Retrieve) • to = URI of addressed resource • fr = Registrar CSE-ID • rqi = (token-string) • pc = empty
		PRO Check HTTP	Sent request contains • Request method = GET • Request-Target: URI of addressed resource • Host: IP address or the FQDN of Hosting CSE • X-M2M-RI: (token-string) • X-M2M-Origin: Registrar CSE-ID • Message-body: empty
		PRO Check CoAP	Sent request contains • Method: 0.01 (GET) • Uri-Host: IP address or the FQDN of Hosting CSE • Uri-Path: URI of addressed resource • oneM2M-FR: Registrar CSE-ID • oneM2M-RQI: (token-string) • Payload: empty
		PRO Check MQTT	Sent MQTT PUBLISH message: Topic: "/oneM2M/req/<Registrar CSE-ID>/<Hosting CSE-ID>" Payload: • op = 2 (Retrieve) • to = URI of addressed resource • fr = Registrar CSE-ID • rqi = (token-string) • 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: • rsc = 2000 (OK) • rqi = (token-string) same as received in request message • pc = Serialized representation of <accessControlPolicy> resource
		PRO Check HTTP	Hosting CSE sends response containing: • Status Code = 200 (OK) • X-M2M-RSC: 2000 • X-M2M-RI: (token-string) same as received in request message • Content-Type: application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json • Message-body: Serialized representation of <accessControlPolicy> resource
		PRO Check CoAP	Hosting CSE sends response containing: • Response Code = 2.05 • oneM2M-RSC: 2000 • oneM2M-RQI: (token-string) same as received in request message • 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: Topic: "/oneM2M/resp/<Registrar CSE-ID>/<Hosting CSE-ID>" Payload: • to = Registrar CSE-ID • fr = Hosting CSE-ID • rsc = 2000 (OK) • rqi = (token-string) same as received in request message • 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: • rsc = 4103 (ACCESS_DENIED) • rqi = (token-string) same as received in request message • pc = empty
		PRO Check HTTP	Registrar CSE sends response containing: • Status Code = 403 (Forbidden) • X-M2M-RSC: 4103 • X-M2M-RI: (token-string) same as received in request message • Message-body: empty
		PRO Check CoAP	Registrar sends response containing: • Response Code = 4.03 (Forbidden) • oneM2M-RSC: 4103 • oneM2M-RQI: (token-string) same as received in request message • Payload: empty
		PRO Check MQTT	Sent MQTT PUBLISH message: Topic: "/oneM2M/resp/<AE-ID>/<Registrar CSE-ID>" Payload: • to = AE-ID • fr = Registrar CSE-ID • rsc = <Response Status Code(4103, ACCESS_DENIED> • rqi = (token-string) same as received in request message • 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 TS-0004 [2], clause 7.4.1
Pre-test conditions:			• A <container> resource has been created on hosting CSE • AE has created an <AE> resource on registrar CSE • 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) • to = URI of AE resource • from = Hosting CSE-ID • rqi = (token-string) • pc = Serialized representation of Notification data object
		PRO Check HTTP	Sent request contains • Request method = POST • Request-Target: URI of AE resource • Host: IP address or FQDN registrar CSE • X-M2M-RI: (token-string) • X-M2M-Origin: Hosting CSE-ID

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

Interoperability Test Description			
			• Payload: empty
		MQTT	Sent MQTT PUBLISH message: Topic: "/oneM2M/resp/<RegistrarCSE-ID>/<AE-ID>" Payload: • to = Registrar CSE-ID • fr = Hosting CSE-ID • rsc = 2000 (OK) • rqi = (token-string) same as received in request message • 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: • rsc = 2000 (OK) • rqi = (token-string) same as received in request message • pc = empty
		PRO Check HTTP	Registrar CSE sends response containing: • Status Code = 200 (OK) • X-M2M-RSC: 2000 • X-M2M-RI: (token-string) same as received in request message • Message-body: empty
		PRO Check CoAP	Registrar CSE sends response containing: • Response Code = 2.05 • oneM2M-RSC: 2000 • oneM2M-RQI: (token-string) same as received in request message • Payload: empty
		PRO Check MQTT	Sent MQTT PUBLISH message: Topic: "/oneM2M/resp/<Hosting CSE-ID>/<Registrar CSE-ID>" Payload: • to = Registrar CSE-ID • fr = Hosting CSE-ID • rsc = 2000 (OK) • rqi = (token-string) same as received in request message • 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) • fr: AE-ID • to: {CSEBaseName}/{node} • rqi = (token-string) • ty = 13 (mgmtObj) • pc: Serialized representation of the <mgmtObj> resource
		PRO Check HTTP	Sent request contains • Request method = POST • Request-Target: {CSEBaseName}/{node} • Host: IP address or FQDN of the IN-CSE • X-M2M-RI: (token-string) • X-M2M-Origin: AE-ID • 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 • Method: 0.02 (POST) • Uri-Host: IP address or the FQDN of Registrar CSE • Uri-Path: {CSEBaseName}/{node} • Content-type: application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json • oneM2M-TY: 13 • oneM2M-FR: AE-ID • oneM2M-RQI: (token-string) • Payload: Serialized representation of <mgmtObj> resource
		PRO Check MQTT	Sent MQTT PUBLISH message: Topic: "/oneM2M/req/< AE-ID>/<Registrar CSE-ID>" Payload: • op = 1 (Create) • to = {CSEBaseName}/{node} • fr = AE-ID • rqi = (token-string) • ty = 13 (mgmtObj) • 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. 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. 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. 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) • rqi = (token-string) same as received in request message • pc = Serialized representation of <mgmtObj> resource
		PRO Check HTTP	IN-CSE sends response containing: • Status Code = 201 (OK) • X-M2M-RSC: 2001 • X-M2M-RI: (token-string) same as received in request message • Content-Location: URI of the created <mgmtObj> resource • Content-Type: application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json • Message-body: Serialized representation of <mgmtObj> resource
		PRO Check CoAP	IN-CSE sends response containing: • Response Code = 2.01 • oneM2M-RSC: 2001 • oneM2M-RQI: (token-string) same as received in request message • Location-Path: URI of the created <mgmtObj> resource • Payload: Serialized representation of <mgmtObj> resource
		PRO Check MQTT	IN-CSE MQTT PUBLISH message: Topic: "/oneM2M/resp/< AE-ID>/<Registrar CSE-ID>" Payload: • to = AE-ID • fr = Registrar CSE-ID • rsc = 2001 (CREATED) • rqi = (token-string) same as received in request message • 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) • fr: AE-ID • to: {CSEBaseName}/{node}/{mgmtObj} • rqi = (token-string) • pc: Serialized representation of the <mgmtObj> resource
		PRO Check HTTP	Sent request contains • Request method = PUT • Request-Target: {CSEBaseName}/{node}/{mgmtObj} • Host: IP address or FQDN of the IN-CSE • X-M2M-RI: (token-string) • X-M2M-Origin: AE-ID • Content-Type: application/vnd.onem2m-res+xml; or application/vnd.onem2m-res+json; • Message-body: Serialized representation of the <mgmtObj> resource
		PRO Check CoAP	Sent request contains • Method: 0.03 (PUT) • Uri-Host: IP address or the FQDN of Registrar CSE • Uri-Path: {CSEBaseName}/{node}/{mgmtObj} • Content-format: application/vnd.onem2m-res+xml; or application/vnd.onem2m-res+json; • oneM2M-FR: AE-ID • oneM2M-RQI: (token-string) • Payload: Serialized representation of <mgmtObj> resource
		PRO Check MQTT	Sent MQTT PUBLISH message Topic: "/oneM2M/req/<AE-ID>/<Registrar CSE-ID>" Payload: • op = 3 (Update) • to = {CSEBaseName}/{node}/{mgmtObj} • fr = AE-ID • rqi = (token-string) • 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. 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. 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) • rqi = (token-string) same as received in request message • pc = Serialized representation of <mgmtObj> resource
		PRO Check HTTP	IN-CSE sends response containing: • Code = 200 • X-M2M-RSC: 2004 • X-M2M-RI: (token-string) same as received in request message • Content-Type: application/vnd.onem2m-res+xml or application/vnd.onem2m-res+json • Message-body: Serialized representation of <mgmtObj> resource
		PRO Check CoAP	IN-CSE sends response containing: • Response Code = 2.05 • oneM2M-RSC: 2004 • oneM2M-RQI: (token-string) same as received in request message • Payload: Serialized representation of <mgmtObj> resource
		PRO Check MQTT	IN-CSE sends a MQTT PUBLISH message Topic: "/oneM2M/resp/<AE-ID>/<Registrar CSE-ID>" Payload: • to = AE-ID • fr = Registrar CSE-ID • rqi = (token-string) same as received in request message • rsc = 2004 • 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) • to = {CSEBaseName}/{node}/{mgmtObj} • fr = AE-ID • rqi = (token-string)
		PRO Check HTTP	Sent request contains • Request method = GET • Request-Target: {CSEBaseName}/{node}/{mgmtObj} • Host: IP address or the FQDN of Registrar CSE • X-M2M-RI: (token-string) • X-M2M-Origin: AE-ID • Content-Type: application/vnd.onem2m-res+xml; or application/vnd.onem2m-res+json;
		PRO Check CoAP	Sent request contains • Method: 0.01 (GET) • Uri-Host: IP address or the FQDN of Registrar CSE • Uri-Path: {CSEBaseName}/{node}/{mgmtObj} • Content-format: application/vnd.onem2m-res+xml; or application/vnd.onem2m-res+json;

Interoperability Test Description			
			• oneM2M-FR: AE-ID • oneM2M-RQI: (token-string)
		PRO Check MQTT	Sent a MQTT PUBLISH message: Topic: "/oneM2M/req/<AE-ID>/<Registrar CSE-ID>" Payload: • op = 2 (Retrieve) • to = {CSEBaseName}/{node}/{mgmtObj} • fr = <AE-ID> • 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) • rqi = (token-string) same as received in request message • pc = Serialized representation of <mgmtObj> resource
		PRO Check HTTP	IN-CSE sends response containing: • Status Code =200 (OK) • X-M2M-RSC: 2000 • X-M2M-RI: (token-string) same as received in request message • Message-body: Serialized representation of <mgmtObj> resource
		PRO Check CoAP	IN-CSE sends response containing: • Response Code = 2.05 • oneM2M-RSC: 2000 • oneM2M-RQI: (token-string) same as received in request message • Payload: Serialized representation of <mgmtObj> resource
		PRO Check MQTT	IN-CSE sends a MQTT PUBLISH message: Topic: "/oneM2M/resp/<AE-ID>/<Registrar CSE-ID>" Payload: • to = AE-ID • fr = Registrar CSE-ID • rsc = 2000 • rqi = (token-string) same as received in request message • 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) • to = {CSEBaseName}/{node}/{mgmtObj} • fr = AE-ID • rqi = (token string)
		PRO Check HTTP	Sent DELETE request contains • Request method = DELETE • Request-Target: {CSEBaseName}/{node}/{mgmtObj} • Host: IP address or the FQDN of Registrar CSE • X-M2M-RI: (token-string) • X-M2M-Origin: AE-ID
		PRO Check CoAP	Sent DELETE request contains • Method: 0.04 (DELETE) • Uri-Host: IP address or the FQDN of Registrar CSE • Uri-Path: {CSEBaseName}/{node}/{mgmtObj} • oneM2M-FR: AE-ID • oneM2M-RQI: (token-string)
		PRO Check MQTT	Sent a MQTT PUBLISH message Topic: "/oneM2M/req/< AE-ID>/<Registrar CSE-ID>" Payload: • op = 4 • to = {CSEBaseName}/{node}/{mgmtObj} • fr = AE-ID • 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) • rqi = (token-string) same as received in request message
		PRO Check HTTP	IN-CSE sends response containing: • Status Code = 200 • X-M2M-RSC: 2002 • X-M2M-RI: (token-string) same as received in request message
		PRO Check CoAP	IN-CSE sends response containing: • Response Code = 2.05 • oneM2M-RSC: 2002 • oneM2M-RQI: (token-string) same as received in request message
		PRO Check MQTT	IN-CSE sends a MQTT PUBLISH message Topic: "/oneM2M/resp/<AE-ID>/<Registrar CSE-ID>" Payload: • to = AE-ID • fr = Registrar CSE-ID • rqi = (token-string) same as received in request message • 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