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TECHNICAL SPECIFICATION

oneM2M; Interoperability Testing
(oneM2M TS-0013 version 3.3.1 Release 3)

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Foreword

This Technical Specification (TS) has been produced by ETSI Partnership Project oneM2M (oneM2M).

1 Scope

The present document specifies Interoperability Test Descriptions (TDs) for the oneM2M Primitives as specified in ETSI TS 118 101 [1], oneM2M TS-0004 [2], the bindings ETSI TS 118 108 [3], ETSI TS 118 109 [4] and ETSI TS 118 110 [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.

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

[1] ETSI TS 118 101: "oneM2M; Functional ArchitectureFunctional Architecture (oneM2M TS-0001 Release 3)".

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

[3] ETSI TS 118 108: "oneM2M; CoAP Protocol Binding (oneM2M TS-0008 Release 3)".

[4] ETSI TS 118 109: "oneM2M; HTTP Protocol Binding (oneM2M TS-0009 Release 3)".

[5] ETSI TS 118 110: "oneM2M; MQTT Protocol Binding (oneM2M TS-0010 Release 3)".

[6] ETSI TS 118 115: "oneM2M; Testing Framework (oneM2M TS-0015)".

[7] ETSI TS 118 111: "oneM2M; Common Terminology (oneM2M TS-0011)".

[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] ETSI TS 118 105: "oneM2M; Management Enablement (OMA) (oneM2M Release 3)".

[11] ETSI TS 118 106: "oneM2M; Management Enablement (BBF) (oneM2M TS-0006 Release 3)".

[12] ETSI TS 118 103: "oneM2M; Security solutions (oneM2M TS-0003 Release 3)".

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

[14] ETSI TS 118 123: "oneM2M; Home Appliances Information Model and Mapping (oneM2M TS-0023 Release 3)".

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

[16] oneM2M TS-0040: "Modbus Interworking - Release 4".

2.2 Informative references

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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.

[i.2] BBF TR-069: "CPE WAN Management Protocol".

3 Definitions of terms, symbols and abbreviations

3.1 Terms

For the purposes of the present document, the terms given in ETSI TS 118 111 [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 ETSI TS 118 111 [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 [i.2], OMA DM [10], etc.

receiver CSE: any CSE that receives a request

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

registree: AE or CSE that registers with another CSE

resource: uniquely addressable entity in oneM2M architecture

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

3.2 Symbols

Void.

3.3 Abbreviations

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

ACP	Access Control Policy
ACP-SD	Access Control Policy-Semantic Descriptor
ADN-AE	AE which resides in the Application Dedicated Node
AE	Application Entity
AE-ID	Application Entity Identifier
APP-ID	Application Identifier
BBF	BroadBand Forum
CFG	Configuration
CoAP	Constrained Application Protocol

CP	Communication Patterns
CSE	Common Services Entity
CSE-ID	Common Service Entity Identifier
DAS	Dynamic Authorization System
DDN	Downlink Data Notification
DM	Device Management
DTLS	Datagram Transport Layer Security
DUT	Device Under Test
ECDHE	Elliptic-curve Diffie–Hellman
FQDN	Fully Qualified Domain Name
HAIM	Home Appliances Information Model
HSS	Home Subscriber Serve
HTTP	HyperText Transfer Protocol
IN	Infrastructure Node
IN-AE	Application Entity that is registered with the CSE in the Infrastructure Node
IN-CSE	CSE which resides in the Infrastructure Node
IOP	Interoperability
IP	Internet Protocol
IPE	Interworking Proxy Entity
JSON	JavaScript Object Notation
LWM2M	Lightweight M2M
M2M	Machine to Machine
MA	Mandatory Announced
MBMS	Multimedia Broadcast Multicast Service
Mca	Reference Point for M2M Communication with AE
Mcc	Reference Point for M2M Communication with CSE
MEF	M2M Enrolment Function
MH	Multi Hop
MNO	Mobile Network Operator
MO	Management Object
MQTT	Message Queuing Telemetry Transport
MT	Mobile Terminated
NB	Non-Blocking
NH	No Hop
NIDD	non-IP Data Delivery
NODN	Non oneM2M Device Node
OMA	Open Mobile Alliance
PDN	Packet Data Network
PRO	Protocol
PSK	Pre-Shared Key
PSM	Power Savings Mode
RDS	Reliable Data Service
RFC	Request for Comments
RP	Reference Point
RPC	Remote Procedure Calls
RQI	Request-ID
SCEF	Service Capability Exposure Function
SD	Semantic Descriptor
SE	Security
SGS	Semantic Graph Store
SH	Single Hop
SP	Service Provider
SPARQL	SPARQL Protocol and RDF Query Language
SUID	Security Usage Identifier
SUT	System Under Test
TCP	Transmission Control Protocol
TD	Test Description
TLS	Transport Layer Security
TMGI	Temporary Mobile Group Identity
TP	Traffic Pattern
UDP	User Datagram Protocol
URI	Uniform Resource Identifier

XML eXtensible Markup Language

4 Conventions

The key words "Shall", "Shall not", "May", "Need not", "Should", "Should not" in the present 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 methodology used in the present document is specified in the ETSI TS 118 115 [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 5.1-1.

Table 5.1-1: 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 Test Purposes 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 resources on Mca + Mcc
	MH	Multi Hop
	SE	Security
<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 prerequisites, 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 (ETSI TS 118 108 [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 oneM2M TS-0004 [2].

Host Address: refers to the authority part of a target URI as defined in IETF RFC 3986 [8] and IETF 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 requested resource.

5.4.3 Service Subscription

Service subscription means that the originator 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 acquired 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> represents 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 oneM2M 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 ETSI TS 118 110 [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	Category	Procedure/Resource	TD ID	TD Description
1	Resource management	CSEBase Management	TD_M2M_NH_01	AE retrieves the CSEBase resource
2		RemoteCSE	TD_M2M_NH_02	Registree CSE registers to Registrar CSE
3	Single Hop		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

Nb	Category	Procedure/Resource	TD ID	TD Description
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 and the registrar CSE updates the parent <container> resource with *stateTag,* and *currentNrOfInstances, CurrentByteSize* attributes correspondingly
15			TD_M2M_NH_15	AE retrieves information of a contentInstance resource via a contentInstance Retrieve Request
16			TD_M2M_NH_17	AE deletes contentInstance resource via a Delete Request and the registrar CSE updates the parent <container> resource with *currentNrOfInstances,* and *CurrentByteSize* attribute correspondingly
17			TD_M2M_NH_49	AE deletes a <latest> resource in a <container> and the Registrar CSE points a latest <contentInstance> among the existing contentInstances to the <latest> resource of the <container>
18			TD_M2M_NH_50	AE deletes a <oldest> resource in a <container> resource and the Registrar CSE points an oldest <contentInstance> among the existing contentInstances to the <oldest> resource of the <container>
19			TD_M2M_NH_51	AE sends a <contentInstance> CREATE request to a <container> which contains attribute *currentNrOfInstances* whose value equals to that of *maxNrOfInstances* and Registrar CSE deletes the oldest <contentInstance> from the parent <container> and then creates the requested <contentInstance> resource
20			TD_M2M_NH_102	AE retrieves a <latest> resource of a <container> for which attribute *locationID* is configured, value of *locationUpdatePeriod* is marked '0' or not defined and *locationSource* attribute is 'Network Based'
21			TD_M2M_NH_71	AE retrieves a <latest> resource of a <container> and the Registrar CSE points a latest <contentInstance> among the existing contentInstances to the <latest> resource of the <container>
22			TD_M2M_NH_72	AE retrieves a <oldest> resource of a <container> and the Registrar CSE points a oldest <contentInstance> among the existing contentInstances to the <oldest> resource of the <container>
23		Discovery	TD_M2M_NH_18	AE discovers resources residing in Registrar CSE
24			TD_M2M_NH_19	AE discovers accessible resources residing in Registrar CSE using the label filter criteria
25			TD_M2M_NH_20	AE discovers accessible resources residing in Registrar CSE limiting the number of matching resources to the specified value
26			TD_M2M_NH_21	AE discovers accessible resources residing in Registrar CSE using multiple Filter Criteria
27			TD_M2M_NH_58	AE discovers accessible resources residing in Registrar CSE using the level filter criteria value set to 1
28			TD_M2M_NH_59	AE discovers accessible resources residing in Registrar CSE using the level filter criteria value set to 2
29			TD_M2M_NH_60	AE1 discovers accessible resources residing in Registrar CSE using the level filter criteria value set to 3
30			TD_M2M_NH_61	AE discovers accessible resources residing in Registrar CSE using the offset filter criteria value set to 3
31			TD_M2M_NH_62	AE discovers all the accessible resources residing in Registrar CSE using the offset filter criteria
32		Subscription	TD_M2M_NH_22	AE creates a subscription to Application Entity resource via subscription Create Request
33			TD_M2M_NH_23	AE retrieves information about a subscription via subscription Retrieve Request such as expirationTime, labels, etc.
34			TD_M2M_NH_24	AE updates information about a subscription via subscription Retrieve Request
35			TD_M2M_NH_25	AE cancels subscription via an subscription Delete Request
36		AccessControlPolicy	TD_M2M_NH_26	AE creates an accessControlPolicy resource
37			TD_M2M_NH_27	AE retrieves accessControlPolicy resource
38			TD_M2M_NH_28	AE updates attribute in accessControlPolicy resource

Nb	Category	Procedure/Resource	TD ID	TD Description
39			TD_M2M_NH_29	AE deletes accessControlPolicy resource
40			TD_M2M_NH_30	AE delete request is rejected due to accessControlPolicy
41			TD_M2M_NH_73	AE delete request is rejected due to accessControlPolicy (accessControlOriginators)
42			TD_M2M_NH_74	AE delete request is allowed due to accessControlPolicy
43		Group	TD_M2M_NH_31	AE creates a group resource
44			TD_M2M_NH_32	AE retrieves group resource
45			TD_M2M_NH_33	AE updates attribute in group resource
46			TD_M2M_NH_34	AE deletes group resource
47		Node	TD_M2M_NH_35	AE creates a node resource
48			TD_M2M_NH_36	AE retrieves node resource
49			TD_M2M_NH_37	AE updates attribute in node resource
50			TD_M2M_NH_38	AE deletes node resource
51		PollingChannel	TD_M2M_NH_39	AE creates a <pollingChannel> resource in registrar CSE via a Create Request
52			TD_M2M_NH_40	AE retrieves information of a pollingChannel resource via a Retrieve Request
53			TD_M2M_NH_41	AE updates attribute in pollingChannel resource via a Update Request
54			TD_M2M_NH_42	AE deletes a pollingChannel resource via a Delete Request
55			TD_M2M_NH_43	AE retrieves information of a pollingChannel resource via a Retrieve Request
56		FanoutPoint	TD_M2M_NH_44	AE creates a <contentInstance> resource in each group member
57			TD_M2M_NH_45	AE retrieves the <container> resource from in each group member
58			TD_M2M_NH_46	AE updates an <container> resource of each member resource
59			TD_M2M_NH_47	AE deletes a <container> of each member
60		Notification	TD_M2M_NH_48	AE receives a notification request from the HOST CSE
61			TD_M2M_NH_80	AE2 sends maxNrOfInstances UPDATE request to <container> which has been set to subscribed-to resource. Since <subscription> resource has specific setting in eventNotificationCriteria, Hosting CSE send notification to AE1
62			TD_M2M_NH_81	AE2 sends DELETE request to <container> which has been set to subscribed-to resource. Since <subscription> resource has notificationEventType with 'Delete of Resource', Hosting CSE send notification to AE1
63			TD_M2M_NH_82	AE2 sends <contentInstance> CREATE request to <container> which has been set to subscribed-to resource. Since <subscription> resource has notificationEventType with "Create of Direct Child 'Resource', Hosting CSE send notification to AE1
64			TD_M2M_NH_83	AE2 sends DELETE request to the <contentInstance> which located under the subscribed-to resource. Since <subscription> resource has notificationEventType with 'Delete of Direct Child Resource', Hosting CSE send notification to AE1
65			TD_M2M_NH_89	AE creates <subscription> resources by sending Create Request to the fanOutPoint. Since AE has set notifyAggregation to 2, Hosting CSE aggregate notification and send aggregated notification to AE
66		FlexContainer	TD_M2M_NH_52	AE creates a flexcontainer resource in Registrar CSE via a flexcontainer Create Request
67			TD_M2M_NH_53	AE retrieves information of a flexContainer resource via a flexContainer Retrieve Request
68			TD_M2M_NH_54	AE updates attribute in application resource via a flexContainer Update Request
69			TD_M2M_NH_55	AE deletes a specific container resource via a container Delete Request
70			TD_M2M_NH_56	AE receives a notification request on flexContainer update from the HOST CSE
71			TD_M2M_NH_57	AE discovers accessible resources residing in Registrar CSE using attribute filter criteria which has a customAttribute name and value assigned to it

Nb	Category	Procedure/Resource	TD ID	TD Description
72		External Management Operations	TD_M2M_NH_63	AE creates a mgmtCmd resource
73			TD_M2M_NH_64	AE retrieves mgmtCmd resource
74			TD_M2M_NH_65	AE updates attribute (not with 'true' in execEnable attribute) in mgmtCmd resource
75			TD_M2M_NH_66	AE updates attribute (with 'true' in execEnable attribute) in mgmtCmd resource
76			TD_M2M_NH_67	AE deletes mgmtCmd resource
77			TD_M2M_NH_68	AE retrieves execInstance resource
78			TD_M2M_NH_69	AE updates attribute 'execDisable' to true in execInstance resource to cancel pending management command
79			TD_M2M_NH_70	AE deletes execInstance resource
80		SemanticDescriptor Management	TD_M2M_NH_75	AE creates a SemanticDescriptor resource in Registrar CSE via a SemanticDescriptor Create Request
81			TD_M2M_NH_76	AE retrieves information of a semanticDescriptor resource via a semanticDescriptor Retrieve Request
82			TD_M2M_NH_77	AE updates attribute in <semanticDescriptor> resource via a semanticDescriptor Update Request
83			TD_M2M_NH_78	AE deletes SemanticDescriptor resource via a SemanticDescriptor Delete Request
84		Semantic Resource Discovery	TD_M2M_NH_79	AE discovers accessible resources residing in Registrar CSE using the semanticFilter filter criteria
85		ResultContent	TD_M2M_NH_84	Check creation of <container> resource with result content set to 0(nothing)
86			TD_M2M_NH_85	Check creation of <container> resource with result content set to 1(attributes)
87			TD_M2M_NH_86	Check creation of <container> resource with result content set to 2(hierarchical address)
88			TD_M2M_NH_87	Check creation of <container> resource with result content set to 3(hierarchical address and attributes)
89			TD_M2M_NH_88	Check retrievability of <container> resource with result content set to 4(attributes and child resources)
90		timeSeries	TD_M2M_NH_90	AE creates a <timeSeries> resource in registrar CSE via a Create Request
91			TD_M2M_NH_91	AE retrieves information of a <timeSeries> resource via a Retrieve Request
92			TD_M2M_NH_92	AE updates attribute in <timeSeries> resource via a Update Request
93			TD_M2M_NH_93	AE deletes a <timeSeries> resource via a Delete Request
94		timeSeriesInstance	TD_M2M_NH_94	AE sends Create Request of a <timeSeriesInstance> resource to a <timeSeries> resource in Registrar CSE. Registrar CSE creates the <timeSeriesInstance> resource and updates the parent <timeSeries> resource with *currentNrOfInstances* and *currentByteSize* attributes correspondingly
95			TD_M2M_NH_95	AE retrieves information of a <timeSeriesInstance> resource via a Retrieve Request
96			TD_M2M_NH_96	AE sends Delete Request of a <timeSeriesInstance> resource in Registrar CSE. Registrar CSE delete the <timeSeriesInstance> resource and updates the parent <timeSeries> resource with *currentNrOfInstances* and *currentByteSize* attributes correspondingly
97			TD_M2M_NH_97	AE sends a <timeSeriesInstance> resource Create Request to a <timeSeries> resource which contains *currentNrOfInstances* value equals to that of *maxNrOfInstances* and Registrar CSE deletes the oldest <timeSeriesInstance> resource from the <timeSeries> resource and then creates the requested <timeSeriesInstance> resource
98		LocationPolicy	TD_M2M_NH_98	AE creates a <locationPolicy> resource in registrar CSE via a locationPolicy Create Request
99			TD_M2M_NH_99	AE retrieves information of a <locationPolicy> resource via a locationPolicy Retrieve Request
100			TD_M2M_NH_100	AE updates attribute in <locationPolicy> resource via a locationPolicy Update Request
101			TD_M2M_NH_101	AE deletes a specific <locationPolicy> resource via a locationPolicy Delete Request

Nb	Category	Procedure/Resource	TD ID	TD Description
102		Schedule	TD_M2M_NH_155	AE creates a <schedule> resource in Registrar CSE via a Schedule Create Request
103			TD_M2M_NH_156	AE retrieves information of a <schedule> resource via a schedule Retrieve Request
104			TD_M2M_NH_157	AE updates attribute in <schedule> resource via a schedule Update Request
105			TD_M2M_NH_158	AE deletes Schedule resource via a Schedule Delete Request
106			TD_M2M_NH_159	CSE sends a notification request to the AE when Schedule resource is configured
107	Non-Blocking	Synchronous request	TD_M2M_NB_01	AE creates a container resource using non-blocking synchronous request in registrar CSE
108			TD_M2M_NB_02	AE retrieves a Container resource using non-blocking synchronous request in registrar CSE
109			TD_M2M_NB_03	AE updates a Container resource using non-blocking synchronous request in registrar CSE
110			TD_M2M_NB_04	AE deletes a Container resource using non-blocking synchronous request
111		Asynchronous request	TD_M2M_NB_05	AE creates a container resource using non-blocking asynchronous request
112			TD_M2M_NB_06	AE retrieves a Container resource using non-blocking asynchronous request
113			TD_M2M_NB_07	AE updates a Container resource using non-blocking asynchronous request
114			TD_M2M_NB_08	AE deletes a Container resource using non-blocking asynchronous request
115	Single Hop	Retargeting	TD_M2M_SH_01	AE creates a remote <Resource> resource
116			TD_M2M_SH_02	AE retrieves a remote <Resource> resource
117			TD_M2M_SH_03	AE updates a remote <Resource> resource
118			TD_M2M_SH_04	AE delete a remote <Resource> resource
119		Discovery	TD_M2M_SH_09	AE discovers accessible resources residing in the remote Hosting CSE using multiple Filter Criteria
120		Unauthorized operation	TD_M2M_SH_10	AE delete request is rejected after access rights verification using retargeting
121		Notification	TD_M2M_SH_11	AE receives a notification request from the remote hosting CSE
122		mgmtObj	TD_M2M_SH_05	AE creates a <mgmtObj> resource
123			TD_M2M_SH_06	AE updates a <mgmtObj> resource
124			TD_M2M_SH_07	AE retrieves a <mgmtObj> resource
125			TD_M2M_SH_08	AE deletes a <mgmtObj> resource
126		Announcement	TD_M2M_SH_12	AE1 announces itself to CSE2
127			TD_M2M_SH_13	AE1 announces a child container to CSE2
128			TD_M2M_SH_14	AE1 announces an Optional Announce attribute to CSE2
129			TD_M2M_SH_15	AE2 retrieves an Announced Resource
130			TD_M2M_SH_16	AE2 retrieves the original resource representation of an announced resource
131			TD_M2M_SH_21	ContainerAnnc Delete by updating announceTo attribute. AE1 deletes its announced child container from CSE2
132			TD_M2M_SH_22	ContainerAnnc Delete by deleting original resource. AE1 deletes its announced child container from CSE2
133			TD_M2M_SH_23	Announced attribute Create by addition to announcedAttribute attribute AE1 announces an announcable attribute of its child container to CSE2
134			TD_M2M_SH_24	Announced attribute Create by creation of a MA attribute at the original resource. AE1 announces an MA attribute of its child container to CSE2
135			TD_M2M_SH_25	Announced attribute Delete by deletion from announcedAttribute attribute. AE1 de-announces an announcable attribute of its child container to CSE2
136			TD_M2M_SH_26	Announced attribute Delete by deletion of a MA attribute at the original resource. AE1 de-announces an MA attribute (conditionally mandatory) of its child container to CSE2
137		fanOut	TD_M2M_SH_17	AE creates a <contentInstance> resource in each group member, where some memberIDs are on a remoteCSE

Nb	Category	Procedure/Resource	TD ID	TD Description
138			TD_M2M_SH_18	AE retrieves a <contentInstance> resource from each group member, where some memberIDs are on a remoteCSE
139			TD_M2M_SH_19	AE updates a <container> resource in each group member, where some memberIDs are on a remoteCSE
140			TD_M2M_SH_20	AE deletes a <contentInstance> resource from each group member, where some memberIDs are on a remoteCSE
141	Security	Secure AE Registration	TD_M2M_SE_01	AE uses Provisioned Symmetric Key Security Association Establishment Framework to enable mutual authentication with the Registrar CSE. Registrar CSE performs AE authorization check on incoming AE registration request
142		Authentication	TD_M2M_SE_02	AE establishes mutual authentication with the Registrar CSE using Provisioned Symmetric Key Security Association Establishment Framework
143			TD_M2M_SE_03	AE establishes mutual authentication with the Registrar CSE using Certificate-Based Security Association Establishment Framework
144		Authorization	TD_M2M_SE_04	AE accesses <accessControlPolicy> resource using its selfPrivileges credentials
145			TD_M2M_SE_05	AE accesses <AE> resource using its accessControlPolicyIDs attribute
146			TD_M2M_SE_06	AE accesses <AE> resource using default access privileges
147			TD_M2M_SE_07	AE accesses <AE> resource using default access privileges
148			TD_M2M_SE_08	AE accesses <AE> resource using Direct Dynamic Authorization
149			TD_M2M_SE_09	AE accesses <AE> resource using Indirect Dynamic Authorization
150		Key provisioning management	TD_M2M_SE_10	A MEF Handshake procedure establishes a mutually authenticated TLS session for protecting the communication between an MEF Client and MEF using pre-provisioned certificates
151			TD_M2M_SE_11	A MEF Handshake procedure establishes a mutually authenticated TLS or DTLS session for protecting the communication between an MEF Client and MEF using pre-provisioned Master Credentials
152			TD_M2M_SE_12	The MEF Client registers with the MEF to confirm that it is willing to use the services of the MEF, under the authorization of the administrating stakeholder
153			TD_M2M_SE_13	The MEF Client retrieves MEF Client Configurations provided by the administrating stakeholder to the MEF
154			TD_M2M_SE_14	MEF Client updates the MEF Client registration by any combination of extending the *expirationTime* of the MEF Client Registration record or updating the *labels*
155			TD_M2M_SE_15	The MEF Client registers with the MEF to confirm that it is willing to use the services of the MEF, under the authorization of the administrating stakeholder
156			TD_M2M_SE_16	Source MEF Client establishes a symmetric key with the MEF which can be retrieved for use by one or more Target MEF Clients
157			TD_M2M_SE_17	The Target MEF Client to retrieve the Key Value from a MEF corresponding to a RelativeKeyID received by the Target MEF Client
158			TD_M2M_SE_18	MEF Client updates the MEF Client registration by any combination of extending the *expirationTime* of the MEF Client Registration record or updating the *labels*
159			TD_M2M_SE_19	Source MEF Client requests the MEF to stop distributing the registered key
160		End-to-End security management	TD_M2M_SE_20	AE sends an arbitrary request primitive inside of ESPrim Object to CSE
161			TD_M2M_SE_21	AE establishes a connection with the Registrar CSE using pairwiseE2EKey
163	HAIM	HAIM Device Model	TD_M2M_NH_102	AE1 creates a HAIM Light Device Model
164			TD_M2M_NH_103	AE2 reads the status of a HAIM Light Device Model
165			TD_M2M_NH_104	AE2 turns the binarySwitch of a HAIM Light Device Model "ON" or "OFF"
166			TD_M2M_NH_105	AE2 toggles the state of a HAIM Light Device Model
167			TD_M2M_NH_160	AE1 creates a Power Outlet SubDevice Model
168			TD_M2M_NH_161	AE1 creates a Toggle Action Model
169			TD_M2M_NH_162	AE1 creates Device Properties Model

Nb	Category	Procedure/Resource	TD ID	TD Description
170	Semantics	Semantic Access Control Policy	TD_M2M_NH_106	ACP triples are created when a new *<accessControlPolicy>* resource is created
171			TD_M2M_NH_107	ACP triples are updated when an existing <accessControlPolicy> resource is updated
172			TD_M2M_NH_108	ACP triples are deleted when an existing <accessControlPolicy> resource is deleted
173			TD_M2M_NH_109	ACP-SD Binding Triples and SD relationship in SGS are created when AE creates a <semanticDescriptor> resource in Registrar CSE
174			TD_M2M_NH_110	ACP-SD Binding Triples are updated when the accessControlPolicyIDs attribute of a <semanticDescriptor> resource is updated
175			TD_M2M_NH_111	SD Relationship Triples are updated when the descriptor attribute of a <semanticDescriptor> resource is changed
176			TD_M2M_NH_112	SD Relationship Triples are deleted when the descriptor attribute of a <semanticDescriptor> resource is deleted
177		Semantic Filtering and discovery	TD_M2M_NH_113	AE discovers accessible resources residing in Registrar CSE using the <semanticFanOutPoint>
178			TD_M2M_NH_114	AE discovers accessible resources residing in Registrar CSE using the resource link-based Semantic Discovery
179			TD_M2M_NH_115	AE performs a Semantic Query request in Registrar CSE using the semanticFilter filter criteria
180		Semantic Mashup	TD_M2M_NH_116	AE creates a SemanticMashupJobProfile resource in Registrar CSE via a SemanticMashupJobProfile Create Request
181			TD_M2M_NH_117	AE retrieves information of a semanticMashupJobProfile resource via a semanticMashupJobProfile Retrieve Request
182			TD_M2M_NH_118	AE updates attribute in <semanticMashupJobProfile> resource via a semanticMashupJobProfile Update Request
183			TD_M2M_NH_119	AE deletes semanticMashupJobProfile resource via a semanticMashupJobProfile Delete Request
184			TD_M2M_NH_120	AE creates a semanticMashupInstance resource in Registrar CSE via a semanticMashupInstance Create Request
185			TD_M2M_NH_121	AE retrieves information of a semanticMashupInstance resource via a semanticMashupInstance Retrieve Request
186			TD_M2M_NH_122	AE updates attribute in <semanticMashupInstance> resource via a semanticMashupInstance Update Request
187			TD_M2M_NH_123	AE deletes semanticMashupInstance resource via a semanticMashupInstance Delete Request
188			TD_M2M_NH_124	AE retrieves information of a semanticMashupResult resource via a semanticMashupResult Retrieve Request
189			TD_M2M_NH_125	AE deletes semanticMashupResult resource via a semanticMashupResult Delete Request
190			TD_M2M_NH_126	AE triggers a calculation and generation of the mashup result by sending a <semanticMashupInstance>/<mashup> Retrieve Request
191		Ontology Repository	TD_M2M_NH_127	AE creates a OntologyRepository resource in Registrar CSE via a OntologyRepository Create Request
192			TD_M2M_NH_128	AE retrieves information of a ontologyRepository resource via a ontologyRepository Retrieve Request
193			TD_M2M_NH_129	AE updates attribute in <ontologyRepository> resource via a ontologyRepository Update Request
194			TD_M2M_NH_130	AE deletes OntologyRepository resource via a OntologyRepository Delete Request
195		Semantic validation	TD_M2M_NH_131	AE checks the validity of the <semanticDescriptor> resource via a <semanticValidation> Update Request
196			TD_M2M_NH_132	AE creates a <semanticDescriptor> resource visa SemanticDescriptor Create Request and Registrar CSE checks the validity of the created <semanticDescriptor> resource
197		Ontology Mapping	TD_M2M_NH_133	AE creates an OntologyMapping resource in Registrar CSE via an OntologyMapping Create Request
198			TD_M2M_NH_134	AE retrieves information of an ontology mapping result via a ontologyMapping Retrieve Request
199			TD_M2M_NH_135	AE updates attribute in <ontologyMapping> resource via a ontologyMapping Update Request
200			TD_M2M_NH_136	AE deletes OntologyMapping resource via a OntologyMapping Delete Request

Nb	Category	Procedure/Resource	TD ID	TD Description
201	3GPP Interworking	Cellular IoT non-IP data delivery (NIDD)	TD_M2M_SH_27	IN-CSE establishes SCEF Configuration for NIDD
202			TD_M2M_SH_28	IN-AE sends a downlink non-IP data to a UE hosting ADN-AE
203			TD_M2M_SH_29	IN-AE sends a downlink non-IP data to a UE hosting ADN-AE
204		Monitoring events	TD_M2M_SH_30	IN-AE monitors UE Reachability status
205			TD_M2M_SH_31	UE Availability after DDN Failure scenario
206			TD_M2M_SH_32	UE Communication Failure scenario
207			TD_M2M_SH_33	Roaming status scenario
208			TD_M2M_SH_34	Location Reporting scenario
209		3GPP Based Device triggering	TD_M2M_SH_35	IN-AE triggers ADN-AE hosted on UE
210			TD_M2M_SH_36	IN-AE recalls/replaces a trigger request targeting ADN-AE hosted on UE that has been already created in IN-CSE
211		Configuration of traffic patterns	TD_M2M_SH_37	IN-CSE translates the oneM2M Node Traffic Pattern (TP) into a 3GPP Device Communication Pattern
212		Group message delivery using MBMS	TD_M2M_SH_38	IN-AE creates a MBMS Group for handling group related requests
213			TD_M2M_SH_39	IN-AE sends a request for accessing member resources to the Group Hosting CSE
214	Advanced Subscriptions & Notifications	Notification Target removal	TD_M2M_NH_137	AE removes notificationTargetMgmtPolicyRef via a notificationTargetMgmtPolicyRef Delete Request
215		NotificationTargetMgmtPolicyRef	TD_M2M_NH_138	AE creates a notificationTargetMgmtPolicyRef resource in registrar CSE via a notificationTargetMgmtPolicyRef Create Request
216			TD_M2M_NH_139	AE retrieves notificationTargetMgmtPolicyRef resource from Registrar CSE
217			TD_M2M_NH_140	AE updates information about a notificationTargetMgmtPolicyRef via notificationTargetMgmtPolicyRef>Update Request
218			TD_M2M_NH_141	AE removes notificationTargetMgmtPolicyRef via a notificationTargetMgmtPolicyRef Delete Request
219		NotificationTargetPolicy	TD_M2M_NH_142	AE creates a notificationTargetPolicy resource in registrar CSE via a notificationTargetPolicy Create Request
220			TD_M2M_NH_143	AE retrieves notificationTargetPolicy resource from Registrar CSE
221			TD_M2M_NH_144	AE updates information about a notificationTargetPolicy via <notificationTargetPolicy> Update Request
222			TD_M2M_NH_145	AE removes notificationTargetPolicy via a <notificationTargetPolicy> Delete Request
223		PolicyDeletionRules	TD_M2M_NH_146	AE creates a policyDeletionRules resource in registrar CSE via a policyDeletionRules Create Request
224			TD_M2M_NH_147	AE retrieves policyDeletionRules resource from Registrar CSE
225			TD_M2M_NH_148	AE updates information about a policyDeletionRules via <policyDeletionRules> Update Request
226			TD_M2M_NH_149	AE removes policyDeletionRules via a <policyDeletionRules> Delete Request
227		CrossResourceSubscription	TD_M2M_NH_150	AE creates a crossResourceSubscription resource in registrar CSE via a crossResourceSubscription Create Request
228			TD_M2M_NH_151	AE retrieves crossResourceSubscription resource from Registrar CSE
229			TD_M2M_NH_152	AE updates information about a crossResourceSubscription via <crossResourceSubscription> Update Request
230			TD_M2M_NH_153	AE removes crossResourceSubscription via a <crossResourceSubscription> Delete Request
231			TD_M2M_NH_154	AE receives a notification request from the HOST CSE
232	Modbus Interworking	Modbus Thermometer device	TD_M2M_NH_163	AE1 creates Device Model for Modbus device
233			TD_M2M_NH_164	Modbus IPE reads data from Modbus device and updates Registrar CSE with the read data
234			TD_M2M_NH_165	AE writes data into a Modbus device by updating <flexContainer> resource in Registrar CSE
235	NoDN Interworking	Generic IPE	TD_M2M_NH_166	NoDN IPE reads data from a NoDN device and updates Registrar CSE with the read data
236			TD_M2M_NH_167	AE writes data into a NoDN device by updating <flexContainer> resource in Registrar CSE

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
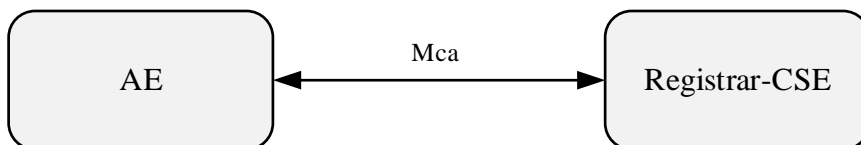
Figure 7.1.1.1-1

7.1.1.2 M2M_CFG_02

oneM2M entities model
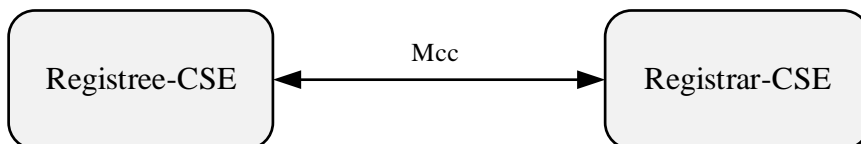
Figure 7.1.1.2-1

7.1.1.3 M2M_CFG_10

oneM2M entities model

Figure 7.1.1.3-1

NOTE: For HAIM Model tests, clause 8.5, AE1 represents a native oneM2M device that implements the HAIM models or a combined IPE(AE) plus a non-oneM2M device node (nodn).

7.1.2 Single hop

7.1.2.1 M2M_CFG_03

The AE manages resources on the remote CSE.

oneM2M entities model

Figure 7.1.2.1-1

7.1.2.2 M2M_CFG_04

oneM2M entities model
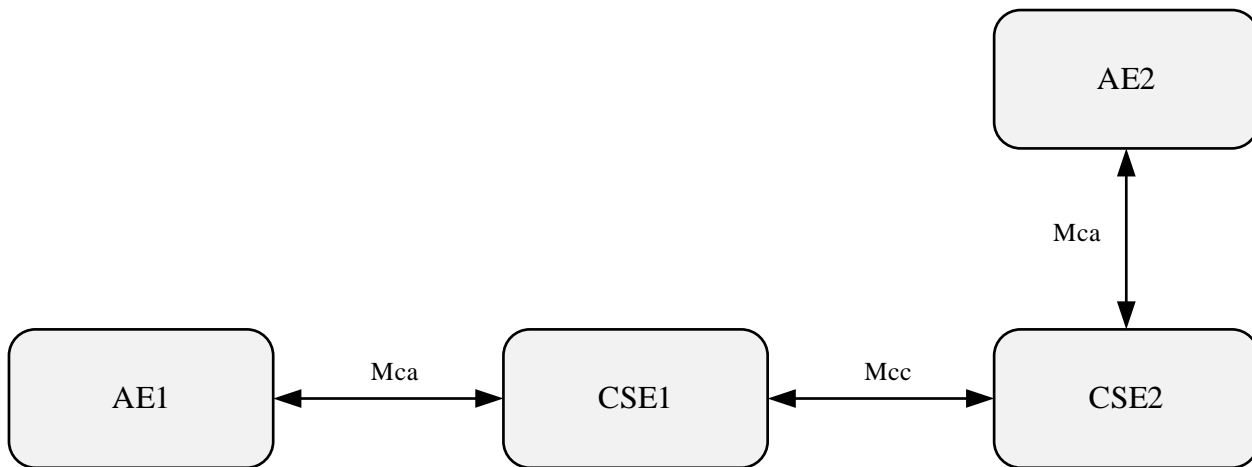
Figure 7.1.2.2-1

7.1.2.3 M2M_CFG_05

oneM2M entities model

Figure 7.1.2.3-1

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 clause 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.

Figure 7.1.2.4-1

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.

Figure 7.1.2.5-1

7.1.2.6 M2M_CFG_11

This configuration concerns device management using 3GPP network.
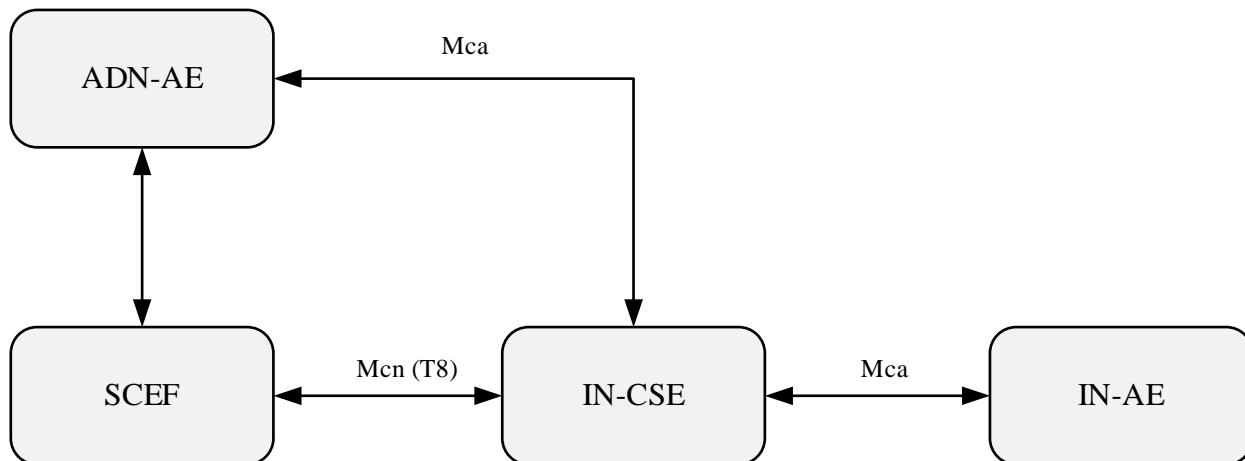
7.1.2.7 M2M_CFG_12

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

This configuration is mapped to cases including:

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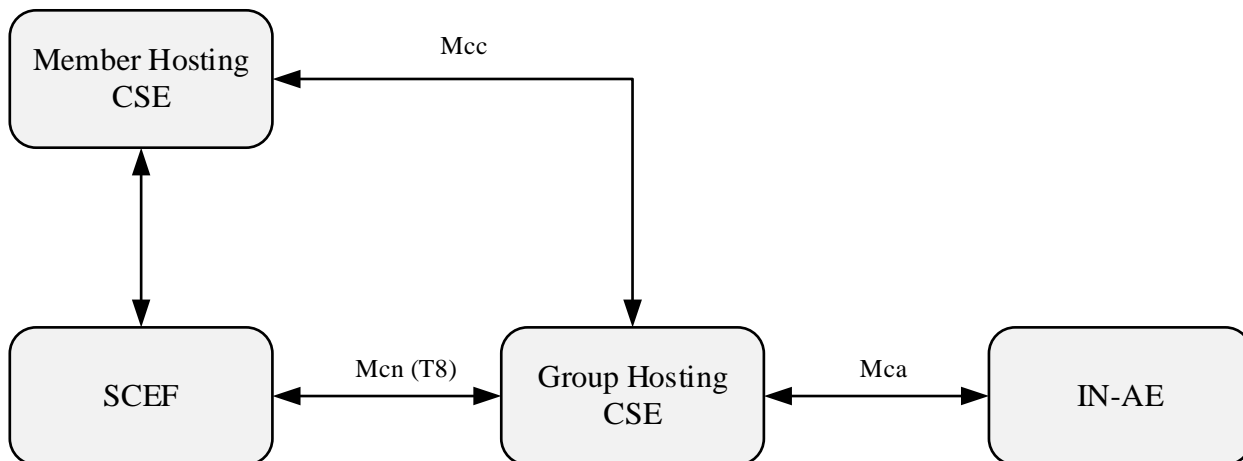
7.1.3   Multi hops

7.1.3.1   M2M_CFG_06

oneM2M entities model
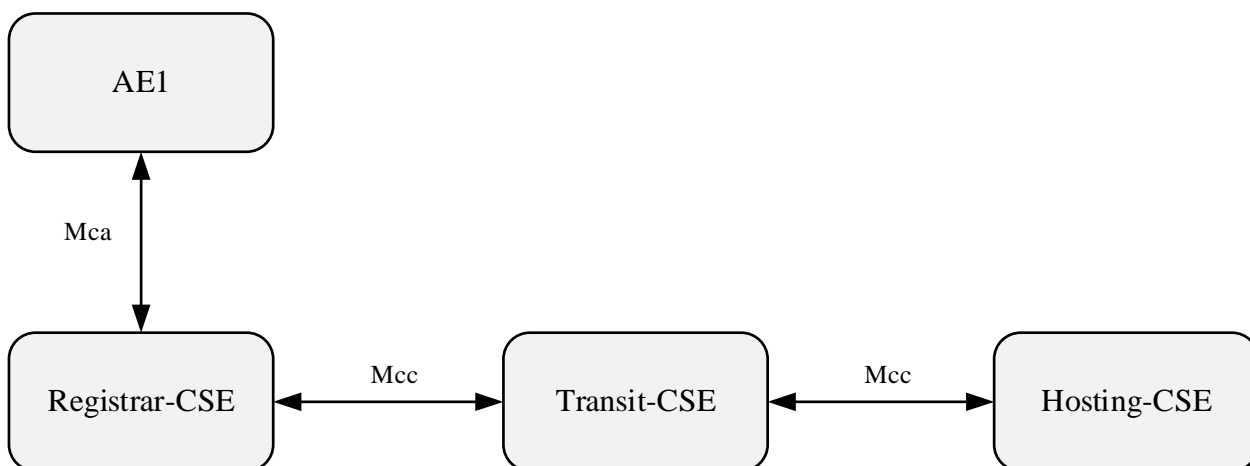
Figure 7.1.3.1-1

7.1.3.2   M2M_CFG_07

oneM2M entities model
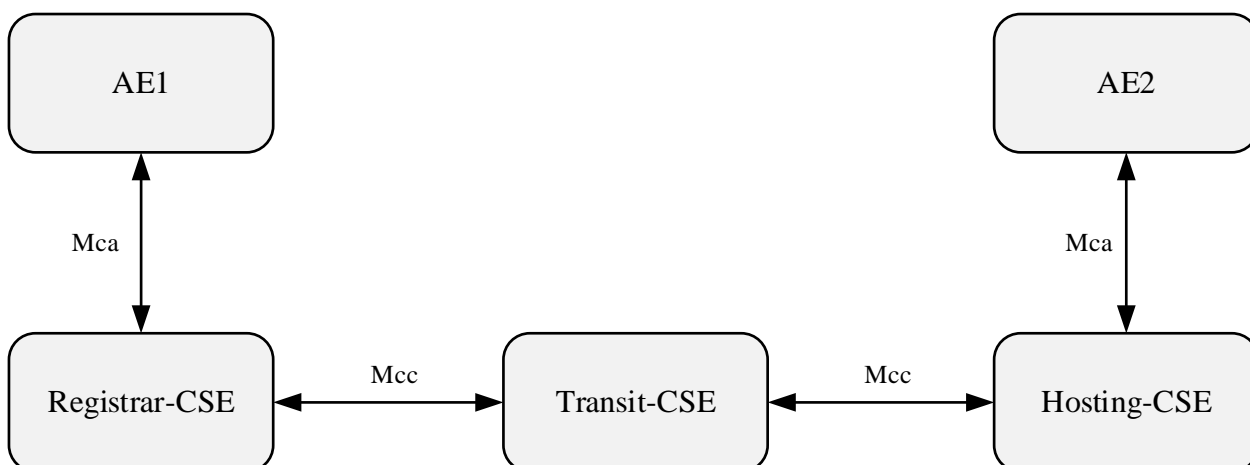
Figure 7.1.3.2-1

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:	ETSI TS 118 101 [1], clause 10.2.2.11 oneM2M 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 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)
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
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:	ETSI TS 118 101 [1], clause 8.1.2.1 oneM2M 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
3	Mcc	PRO Check Primitive	• 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

Interoperability Test Description			
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:		ETSI TS 118 101 [1], clause 8.1.2.2 oneM2M 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
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
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:		ETSI TS 118 101 [1], clause 8.1.2.3 oneM2M 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
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
5		IOP Check	Registree CSE indicates successful operation

Interoperability Test Description	
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:	ETSI TS 118 101 [1], clause 8.1.2.4 oneM2M 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
3	Mcc	PRO Check Primitive	Registrar CSE sends response containing: • rsc = 2002 (DELETED) • rqi = (token-string) same as received in request message • pc = empty
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
6		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:	ETSI TS 118 101 [1], clause 10.2.2.2 oneM2M TS-0004 [2], clause 7.4.5.2.1		
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
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
5		IOP Check	AE indicates successful operation

Interoperability Test Description	
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:	ETSI TS 118 101 [1], clause 10.2.2.3 oneM2M TS-0004 [2], clause 7.4.5.2.2		
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 AE 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)
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
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:	ETSI TS 118 101 [1], clause 10.2.2.4 oneM2M TS-0004 [2], clause 7.4.5.2.3		
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
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
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:	ETSI TS 118 101 [1], clause 10.2.2.5 oneM2M TS-0004 [2], clause 7.4.5.2.4
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
3	Mca	PRO Check Primitive	Registrar CSE sends response containing: • rsc = 2002 (DELETED) • 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:	ETSI TS 118 101 [1], clause 10.2.4.3 oneM2M TS-0004 [2], clause 7.4.6.2.1
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>
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
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
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:	ETSI TS 118 101 [1], clause 10.2.4.4 oneM2M TS-0004 [2], clause 7.4.6.2.2		
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 <container>
2	Mca	PRO Check Primitive	• 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
4		IOP Check	AE indicates successful operation
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:	ETSI TS 118 101 [1], clause 10.2.4.5 oneM2M TS-0004 [2], clause 7.4.6.2.3		
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 container 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
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
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:		ETSI TS 118 101 [1], clause 10.2.4.6 oneM2M TS-0004 [2], clause 7.4.6.2.4	
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 container Delete Request
2	Mca	PRO Check Primitive	• 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
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 and the Registrar CSE updates the parent <container> resource with *stateTag, currentNrOfInstances,* and *CurrentByteSize* attributes correspondingly	
Configuration:		M2M_CFG_01	
References:		ETSI TS 118 101 [1], clause 10.2.4.7 oneM2M TS-0004 [2], clause 7.4.7.1.1	
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 RETRIEVE request with resultContent set to 1 (default value) to retrieve the <container> resource and AE sends a request to create a < contentInstance > resource
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
3		IOP Check	Check if possible that the <contentInstance> resource is created in Registrar CSE and AE sends a RETRIEVE request to the <container> resource to check that if the Registrar CSE has updated stateTag, currentNrOfInstances, and CurrentByteSize attribute correspondingly which is resulted from the successful creation of child <contentInstance> resource
4	Mca	PRO Check Primitive	• rsc = 2001 (CREATED) • rqi = (token-string) same as received in request message • pc = Serialized representation of <contentInstance> resource

			Interoperability Test Description
5		IOP Check	AE indicates successful CREATE operation of <contentInstance> and indicates Registrar CSE has updated stateTag, currentNrOfInstances, and CurrentByteSize attribute correspondingly by checking the response of a <container> request to the <container> resource
IOP Verdict			Set verdict to *pass* if IOP check goal is achieved exactly, otherwise verdict *fail* is set with corresponding error message
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 contentInstance Retrieve Request
Configuration:			M2M_CFG_01
References:			ETSI TS 118 101 [1], clause 10.2.4.8 oneM2M TS-0004 [2], clause 7.4.7.2.2
Pre-test conditions:			• AE has created an Application Entity resource <AE> on Registrar CSE • AE has created a container resource <container> on Registrar CSE • AE has created a contentInstance resource <contentInstance> as child resource of <container> resource
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
3	Mca	PRO Check Primitive	• 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 contentInstance Delete Request and the Registrar CSE updates the parent <container> resource with *currentNrOfInstances,* and *CurrentByteSize* attributes correspondingly
Configuration:			M2M_CFG_01
References:			ETSI TS 118 101 [1], clause 10.2.4.10 oneM2M TS-0004 [2], clause 7.4.7.2.4
Pre-test conditions:			• AE has created an Application Entity resource <AE> on Registrar CSE • AE has created a container resource <container> on Registrar CSE • AE has created a contentInstance resource <contentInstance> as child resource of <container> resource
Test Sequence			
Step	**RP**	**Type**	**Description**
1		Stimulus	AE sends a RETRIEVE request with resultContent set to 1 (default value) to retrieve the <container> resource and AE is requested to send a contentInstance 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
3		IOP Check	Check if possible that the <contentInstance> resource is deleted in Registrar CSE and AE sends a RETRIEVE request to the parent <container> resource to check that if the Registrar CSE has updated *currentNrOfInstances, and CurrentByteSize* attribute correspondingly which is resulted from the successful deletion of child <contentInstance> resource
4	Mca	PRO Check Primitive	• rsc = 2002 (DELETED) • rqi = (token-string) same as received in request message • pc = empty
5		IOP Check	Check if possible that the <contentInstance> resource has been removed in registrar CSE.
6		IOP Check	AE indicates successful DELETE operation of <contentInstance> and indicates Registrar CSE has updated *currentNrOfInstances,* and *CurrentByteSize* attribute correspondingly
IOP Verdict			Set the verdict to *pass* if both the <contentInstance> is deleted and the Registrar CSE updated *currentNrOfInstances,* and *CurrentByteSize* attribute. Otherwise, set the verdict to *fail* with corresponding error message
PRO Verdict			

8.1.5.4 <latest> ContentInstance Delete

			Interoperability Test Description
Identifier:			TD_M2M_NH_49
Objective:			AE deletes a <latest> resource of a <container> and the Registrar CSE points a latest <contentInstance> among the existing contentInstances to the <latest> resource of the <container>
Configuration:			M2M_CFG_01
References:			ETSI TS 118 101 [1], clause 10.2.4.12 oneM2M TS-0004 [2], clause 7.4.27.2.4
Pre-test conditions:			• AE has created an Application Entity resource <AE> on Registrar CSE • AE has created a container resource <container> on Registrar CSE • AE has created more than one contentInstances <contentInstance> as child of <container> on Registrar CSE
Test Sequence			
Step	RP	Type	Description
1		Stimulus	AE retrieves a <latest> resource in a <container> and then sends a DELETE request to the <latest> resource of the <container>
2	Mca	PRO Check Primitive	• op = 4 (Delete) • to = {CSEBaseName}/URI of <latest> resource of a <container> • fr = AE-ID • rqi = (token-string) • pc = empty
3	Mca	PRO Check Primitive	• rsc = 2002 (DELETED) • rqi = (token-string) same as received in request message • pc = representation of deleted <latest> resource of a <container>
4		IOP Check	AE indicates successful DELETE operation of a <latest> resource and AE sends a RETRIEVE request to <latest> resource of a <container> to check if the retrieved <latest> resource in the <container> is different with that one that was retrieved before DELETE request of the <latest> resource in terms of *resourceID* and *resourceName* attribute value
IOP Verdict			Set the verdict to *pass* if IOP check goal is achieved, otherwise set the verdict to *fail* with corresponding error message
PRO Verdict			

8.1.5.5 <oldest> ContentInstance Delete

Interoperability Test Description	
Identifier:	TD_M2M_NH_50
Objective:	AE deletes a <oldest> resource of a <container> and the Registrar CSE points an oldest <contentInstance> among the existing contentInstances to the <oldest> resource of the <container>
Configuration:	M2M_CFG_01
References:	ETSI TS 118 101 [1], clause 10.2.4.14 oneM2M TS-0004 [2], clause 7.4.28.2.4
Pre-test conditions:	• AE has created an Application Entity resource <AE> on Registrar CSE • AE has created a container resource <container> on Registrar CSE • AE has created more than one contentInstances <contentInstance> as child of <container> on Registrar CSE

Test Sequence			
Step	**RP**	**Type**	**Description**
1		Stimulus	AE retrieves a <oldest> resource of a <container> and AE sends a DELETE Request to the <oldest> resource of the <container>
2	Mca	PRO Check Primitive	• op = 4 (Delete) • to = {CSEBaseName}/URI of <oldest> resource of a <container> • fr = AE-ID • rqi = (token-string) • pc = empty
3	Mca	PRO Check Primitive	• rsc = 2002 (DELETED) • rqi = (token-string) same as received in request message • pc = representation of deleted <oldest> resource of a <container>
4		IOP Check	AE indicates successful DELETE operation of a <oldest> resource and AE sends a RETRIEVE request to <oldest> resource of a <container> to check if the retrieved <oldest> resource in the <container> is different with that one that was retrieved before DELETE request of the <oldest> resource in terms of *resourceID* and *resourceName* attribute values
IOP Verdict			Set the verdict to *pass* if IOP check goal is achieved, otherwise set the verdict to *fail* with corresponding error message
PRO Verdict			

8.1.5.6 ContentInstance Create when currentNrOfInstance equals to maxNrOfInstances in parent <container> resource

Interoperability Test Description	
Identifier:	TD_M2M_NH_51
Objective:	AE sends a <contentInstance> CREATE request to a <container> which contains attribute *currentNrOfInstances* whose value equals to that of *maxNrOfInstances* and Registrar CSE deletes the oldest <contentInstance> from the parent <container> and then creates the requested <contentInstance> resource for the originator AE
Configuration:	M2M_CFG_01
References:	ETSI TS 118 101 [1], clause 10.2.4.7 oneM2M TS-0004 [2], clause 7.4.6.2.1
Pre-test conditions:	• AE has created an application resource <AE> on registrar CSE • AE has created a container resource <container> (where the number of contentInstances equals to the value set in maxNrOfInstance) on registrar CSE

Test Sequence			
Step	**RP**	**Type**	**Description**
1		Stimulus	AE sends a RETRIEVE request with resultContent set to 1 (default value) to retrieve the <oldest> contentInstance resource and AE sends a request to create a <contentInstance> resource

			Interoperability Test Description
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
3		IOP Check	Check if possible that the <oldest> resource of a <container> is deleted
4	Mca	PRO Check Primitive	• rsc = 2001 (CREATED) • rqi = (token-string) same as received in request message • pc = Serialized representation of <contentInstance> resource
5		IOP Check	AE indicates successful CREATE operation of <contentInstance> and indicates the representation of the recent <oldest> resource in the <container> is different with that of <oldest> resource retrieved at the beginning of test in terms of *resourceID* and *resourceName* attribute value
IOP Verdict			Set the verdict to *pass* if IOP check goal is achieved, otherwise set the verdict to *fail* with corresponding error message
PRO Verdict			

8.1.5.7 <latest> ContentInstance Retrieve

8.1.5.7.1 Attribute *locationID* of the <container> resource configured

	Interoperability Test Description
Identifier:	TD_M2M_NH_102
Objective:	AE retrieves a <latest> resource of a <container> for which attribute *locationID* is configured, value of *locationUpdatePeriod* is marked '0' or not defined and *locationSource* attribute is 'Network Based'
Configuration:	M2M_CFG_01
References:	ETSI TS 118 101 [1], clause 10.2.4.11 oneM2M TS-0004 [2], clause 7.4.27.2.2
Pre-test conditions:	• AE has created an Application Entity resource <AE> on Registrar CSE • AE has created a container resource <container> on Registrar CSE • AE has created a <locationPolicy> resource on Registrar CSE having its *resourceID* and *locationContainerID* attribute set to *locationID* and *resourceID* attribute of the <container> resource respectively • In resource <locationPolicy>, value of *locationUpdatePeriod* is marked '0' or not defined and *locationSource* attribute is 'Network Based'

Step	RP	Type	Description
			Test Sequence
1		Stimulus	AE is requested to send a Retrieve Request for a <latest>
2	Mca	PRO Check Primitive	• op = 2 (Retrieve) • to = {CSEBaseName}/URI of <container> resource/la • 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 latest <contentInstance> resource, created after acquiring location info from Location Server, in response to Location Request made by the CSE, using the attributes stored in the <*locationPolicy*> resource
4		IOP Check	AE indicates successful operation
IOP Verdict			
PRO Verdict			

8.1.5.7.2 Attribute *locationID* of the <container> resource not configured

Interoperability Test Description			
Identifier:			TD_M2M_NH_71
Objective:			AE retrieves a <latest> resource of a <container> and the Registrar CSE points a latest <contentInstance> among the existing contentInstances to the <latest> resource of the <container>
Configuration:			M2M_CFG_01
References:			ETSI TS 118 101 [1], clause 10.2.4.11
			oneM2M TS-0004 [2], clause 7.4.27.2.2
Pre-test conditions:			• AE has created an Application Entity resource <AE> on Registrar CSE
			• AE has created a container resource <container> on Registrar CSE
			• AE has created multiple contentInstance resources <contentInstance> as child resource of <container> resource
Test Sequence			
Step	**RP**	**Type**	**Description**
1		Stimulus	AE is requested to send a Retrieve Request for a <latest>
2	Mca	PRO Check Primitive	• op = 2 (Retrieve) • to = {CSEBaseName}/URI of <container> resource/la • 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 latest <contentInstance> resource
4		IOP Check	AE indicates successful operation
IOP Verdict			
PRO Verdict			

8.1.5.8 <oldest> ContentInstance Retrieve

Interoperability Test Description			
Identifier:			TD_M2M_NH_72
Objective:			AE retrieves a <oldest> resource of a <container> and the Registrar CSE points a oldest <contentInstance> among the existing contentInstances to the <oldest> resource of the <container>
Configuration:			M2M_CFG_01
References:			ETSI TS 118 101 [1], clause 10.2.4.13
			oneM2M TS-0004 [2], clause 7.4.28.2.2
Pre-test conditions:			• AE has created an Application Entity resource <AE> on Registrar CSE
			• AE has created a container resource <container> on Registrar CSE
			• AE has created multiple contentInstance resources <contentInstance> as child resource of <container> resource
Test Sequence			
Step	**RP**	**Type**	**Description**
1		Stimulus	AE is requested to send a Retrieve Request for a <oldest>
2	Mca	PRO Check Primitive	• op = 2 (Retrieve) • to = {CSEBaseName}/URI of <container> resource/ol • 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 oldest <contentInstance> resource
4		IOP Check	AE indicates successful operation

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:	ETSI TS 118 101 [1], clause 10.2.6 oneM2M TS-0004 [2], clause 7.3.3.14		
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
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
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:	ETSI TS 118 101 [1], clause 10.2.6 oneM2M TS-0004 [2], clause 7.3.3.14		
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
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

Interoperability Test Description			
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:			ETSI TS 118 101 [1], clause 10.2.6 oneM2M TS-0004 [2], clause 7.3.3.14
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
3	Mca	PRO Check Primitive	Registrar CSE sends response containing: • rsc = 2000 (OK) • rqi = (token-string) same as received in request message • cnst = 1 • cno t= 2 • pc = Serialized representation of data object containing the address of the <Container> address
4		IOP Check	AE indicates successful operation
IOP Verdict			
PRO Verdict			

8.1.6.4 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:			ETSI TS 118 101 [1], clause 10.2.6 oneM2M TS-0004 [2], clause 7.3.3.14
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)

		Interoperability Test Description	
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 • ty=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
4		IOP Check	AE indicates successful operation
IOP Verdict			
PRO Verdict			

8.1.6.5 Discovery with level filter criteria

	Interoperability Test Description
Identifier:	TD_M2M_NH_58
Objective:	AE discovers accessible resources residing in Registrar CSE using the level filter criteria value set to 1
Configuration:	M2M_CFG_01
References:	ETSI TS 118 101 [1], clause 10.2.6 oneM2M TS-0004 [2], clause 7.3.3.14
Pre-test conditions:	• <AE1> and <AE2> resources are created in Registrar CSE • A <Container> resource is created under both <AE> resources in Registrar CSE • A <ContentInstance> resource is created under both <Container> resources 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 level filter criteria value set to 1
2	Mca	PRO Check Primitive	Sent request contains: • op = 2 (Retrieve) • to = {CSEBaseName} • fr = AE1-ID • rqi = (token-string) • fu=1 • lvl=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 both <AE> resources
4		IOP Check	AE1 indicates successful operation
IOP Verdict			
PRO Verdict			

Interoperability Test Description			
Identifier:		TD_M2M_NH_59	
Objective:		AE discovers accessible resources residing in Registrar CSE using the level filter criteria value set to 2	
Configuration:		M2M_CFG_01	
References:		ETSI TS 118 101 [1], clause 10.2.6 oneM2M TS-0004 [2], clause 7.3.3.14	
Pre-test conditions:		• <AE1> and <AE2> resources are created in Registrar CSE. A <Container> resource is created under both <AE> resources in Registrar CSE • A <ContentInstance> resource is created under both <Container> resources 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 level filter criteria value set to 2
2	Mca	PRO Check Primitive	Sent request contains: • op = 2 (Retrieve) • to = {CSEBaseName} • fr = AE1-ID • rqi = (token-string) • fu = 1 • lvl = 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 all <AE> and <Container> resources
4		IOP Check	AE1 indicates successful operation
IOP Verdict			
PRO Verdict			

Interoperability Test Description			
Identifier:		TD_M2M_NH_60	
Objective:		AE1 discovers accessible resources residing in Registrar CSE using the level filter criteria value set to 3	
Configuration:		M2M_CFG_01	
References:		ETSI TS 118 101 [1], clause 10.2.6 oneM2M TS-0004 [2], clause 7.3.3.14	
Pre-test conditions:		• <AE1> and <AE2> resources are created in Registrar CSE • A <Container> resource is created under both <AE> resources in Registrar CSE • A <ContentInstance> resource is created under both <Container> resources in Registrar CSE	
Test Sequence			
Step	RP	Type	Description
1		Stimulus	AE1 is requested to send a Discovery request in order to discover specific resources located in Registrar CSE using level filter criteria value set to 3
2	Mca	PRO Check Primitive	Sent request contains: • op = 2 (Retrieve) • to = {CSEBaseName} • fr = AE1-ID • rqi = (token-string) • fu=1 • lvl=3 • 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 all <AE>, <Container> and <ContentInstance>resources
4		IOP Check	AE indicates successful operation

Interoperability Test Description	
IOP Verdict	
PRO Verdict	

8.1.6.6 Discovery with offset filter criteria

Interoperability Test Description			
Identifier:		TD_M2M_NH_61	
Objective:		AE discovers accessible resources residing in Registrar CSE using the offset filter criteria value set to 3	
Configuration:		M2M_CFG_01	
References:		ETSI TS 118 101 [1], clause 10.2.6 oneM2M TS-0004 [2], clause 7.3.3.14	
Pre-test conditions:		• <AE1> and <AE2> resources are created in Registrar CSE. A <Container> resource is created under both <AE> resources in Registrar CSE • A <ContentInstance> resource is created under both <Container> resources in Registrar CSE	
Test Sequence			
Step	RP	Type	Description
1		Stimulus	AE1 is requested to send a Discovery request in order to discover specific resources located in Registrar CSE using offset filter criteria value set to 3
2	Mca	PRO Check Primitive	Sent request contains: • op = 2 (Retrieve) • to = {CSEBaseName} • fr = AE1-ID • rqi = (token-string) • fu=1 • ofst=3 • 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 only 3 of the 6 <AE>, <container> and <contentInstance> resources hosted by the Registrar CSE
4		IOP Check	AE1 indicates successful operation
IOP Verdict			
PRO Verdict			

Interoperability Test Description			
Identifier:		TD_M2M_NH_62	
Objective:		AE discovers all the accessible resources residing in Registrar CSE using the offset filter criteria	
Configuration:		M2M_CFG_01	
References:		ETSI TS 118 101 [1], clause 10.2.6 oneM2M TS-0004 [2], clause 7.3.3.14	
Pre-test conditions:		• <AE1> and <AE2> resources are created in Registrar CSE • A <Container> resource is created under both <AE> resources in Registrar CSE • A <ContentInstance> resource is created under both <Container> resources in Registrar CSE	
Test Sequence			
Step	RP	Type	Description
1		Stimulus	AE1 is requested to send a Discovery request in order to discover specific resources located in Registrar CSE using offset filter criteria attribute value set to 0 (Default value) and limit filter Criteria attribute value set to 2
2	Mca	PRO Check Primitive	Sent request contains: • op = 2 (Retrieve) • to = {CSEBaseName} • fr = AE1-ID • rqi = (token-string) • fu = 1 • lim = 2 • pc = empty

		Interoperability Test Description	
3		IOP Check	Registrar CSE sends success response to AE1
4	Mca	PRO Check Primitive	Registrar CSE sends response containing: • rsc = 2000 (OK) • rqi = (token-string) same as received in request message • cnst = 1 • cnot = 2 • pc = Serialized representation of data object containing the address of first 2 resources hosted by Registrar CSE
5		IOP Check	AE1 sends discovery request to Registrar CSE with offset filtercriteria value set to 2 and limit filter criteria attribute value set to 2
6	Mca	PRO Check Primitive	Sent request contains: • op = 2 (Retrieve) • to = {CSEBaseName} • fr = AE1-ID • rqi = (token-string) • fu=1 • ofst = 2 • lim = 2 • pc = empty
7		IOP Check	Registrar CSE sends success response to AE1
8	Mca	PRO Check Primitive	Registrar CSE sends response containing: • rsc = 2000 (OK) • rqi = (token-string) same as received in request message • cnst=1 • cnot=4 • pc = Serialized representation of data object containing the address of next 2 resources hosted by Registrar CSE
9		IOP Check	AE1 sends discovery request to Registrar CSE with offset filtercriteria value set to 4 and limit filtercriteria attribute value set to 2
10	Mca	PRO Check Primitive	Sent request contains: • op = 2 (Retrieve) • to = {CSEBaseName} • fr = AE1-ID • rqi = (token-string) • fu = 1 • ofst = 4 • lim = 2 • pc = empty
11		IOP Check	Registrar CSE sends success response to AE1
12	Mca	PRO Check Primitive	Registrar CSE sends response containing: • rsc = 2000 (OK) • rqi = (token-string) same as received in request message • cnst = 2 • pc = Serialized representation of data object containing the address of last 2 resources hosted by Registrar CSE
13		IOP Check	AE1 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:	ETSI TS 118 101 [1], clause 10.2.10.2 oneM2M TS-0004 [2], clause 7.4.8.2.1		
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 is requested to send a subscription Create request 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
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
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:	ETSI TS 118 101 [1], clause 10.2.10.3 oneM2M TS-0004 [2], clause 7.4.8.2.2		
Pre-test conditions:	• AE has created an Application Entity resource <AE> on Registrar CSE • AE has created a container resource <container> on Registrar CSE • 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) • 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
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:	ETSI TS 118 101 [1], clause 10.2.10.4 oneM2M TS-0004 [2], clause 7.4.8.2.3
Pre-test conditions:	• AE has created an Application Entity resource <AE> on Registrar CSE • AE has created a container resource <container> on Registrar CSE • 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
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
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:	ETSI TS 118 101 [1], clause 10.2.10.5 oneM2M TS-0004 [2], clause 7.4.8.2.4
Pre-test conditions:	• AE has created an Application Entity resource <AE> on Registrar CSE • AE has created a container resource <container> on Registrar CSE • 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
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
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:	ETSI TS 118 101 [1], clause 10.2.3.3 oneM2M TS-0004 [2], clause 7.4.2.2.1
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
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
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:	ETSI TS 118 101 [1], clause 10.2.3.4 oneM2M TS-0004 [2], clause 7.4.2.2.2
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} • 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
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
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:	ETSI TS 118 101 [1], clause 10.2.3.5 oneM2M TS-0004 [2], clause 7.4.2.2.3
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} • 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
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
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:	ETSI TS 118 101 [1], clause 10.2.3.6 oneM2M TS-0004 [2], clause 7.4.2.2.4
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} • 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
3	Mca	PRO Check Primitive	Registrar CSE sends response containing: • rsc = 2002 (DELETED) • rqi = (token-string) same as received in request message • pc = empty
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, operations)

Interoperability Test Description			
Identifier:	TD_M2M_NH_30		
Objective:	AE delete request is rejected due to accessControlPolicy (accessControlOperations)		
Configuration:	M2M_CFG_01		
References:	oneM2M TS-0004 [2], clause 7.3.3.15		
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}, and accessControlOperations with no delete privilege • AE has created a <container> resource on registrar CSE under <AE>, with name {containerName} and accessControlPolicyIDs including proper identifier of accessControlPolicy resource		
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
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
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			

8.1.8.6 Unauthorized operation (Insufficient Access Rights, originators)

Interoperability Test Description			
Identifier:	TD_M2M_NH_73		
Objective:	AE delete request is rejected due to accessControlPolicy (accessControlOriginators)		
Configuration:	M2M_CFG_01		
References:	oneM2M TS-0004 [2], clause 7.3.3.15		
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}, and accessControlOriginators with no privilege for AE • AE has created a <container> resource on registrar CSE under <AE>, with name {containerName} and accessControlPolicyIDs including proper identifier of accessControlPolicy resource		
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
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
4		IOP Check	Check if possible that the <container> resource has not been removed in registrar CSE

Interoperability Test Description			
5		IOP Check	AE indicates unsuccessful operation (Delete error - no privilege)
IOP Verdict			
PRO Verdict			

8.1.8.7 Authorized operation

Interoperability Test Description			
Identifier:		TD_M2M_NH_74	
Objective:		AE delete request is allowed due to accessControlPolicy	
Configuration:		M2M_CFG_01	
References:		oneM2M TS-0004 [2], clause 7.3.3.15	
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}, and accessControlOperations with delete privilege and accessControlOriginators with privilege for AE - AE has created a <container> resource on registrar CSE under <AE>, with name {containerName} and accessControlPolicyIDs including proper identifier of accessControlPolicy resource	
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
3	Mca	PRO Check Primitive	Registrar CSE sends response containing: - rsc = 2002 (DELETED) - rqi = (token-string) same as received in request message - pc = empty
4		IOP Check	Check if possible that the <container> resource has been removed in registrar CSE
5		IOP Check	AE indicates successful operation
IOP Verdict			
PRO Verdict			

8.1.9 Group Management

8.1.9.1 Group Retrieve

Interoperability Test Description			
Identifier:		TD_M2M_NH_32	
Objective:		AE retrieves group resource	
Configuration:		M2M_CFG_01	
References:		ETSI TS 118 101 [1], clause 10.2.7.3 oneM2M TS-0004 [2], clause 7.4.14.2.2	
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)
3	Mca	PRO Check Primitive	- rsc = 2000 (OK) - rqi = (token-string) same as received in request message - pc = Serialized representation of <group> resource
4		IOP Check	AE indicates successful operation

Interoperability Test Description
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:	ETSI TS 118 101 [1], clause 10.2.7.2
	oneM2M TS-0004 [2], clause 7.4.14.2.2
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
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
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:	ETSI TS 118 101 [1], clause 10.2.7.4
	oneM2M TS-0004 [2], clause 7.4.14.2.4
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 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
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
5		IOP Check	AE indicates successful operation
IOP Verdict			
PRO Verdict			

8.1.9.4   Group Delete

<table>
<tr><td colspan="4" align="center">Interoperability Test Description</td></tr>
<tr><td colspan="2">Identifier:</td><td colspan="2">TD_M2M_NH_34</td></tr>
<tr><td colspan="2">Objective:</td><td colspan="2">AE deletes group resource</td></tr>
<tr><td colspan="2">Configuration:</td><td colspan="2">M2M_CFG_01</td></tr>
<tr><td colspan="2">References:</td><td colspan="2">ETSI TS 118 101 [1], clause 10.2.7.5
oneM2M TS-0004 [2], clause 7.4.14.2.5</td></tr>
<tr><td colspan="4"></td></tr>
<tr><td colspan="2">Pre-test conditions:</td><td colspan="2">•   AE has created a <group> resource on Registrar CSE</td></tr>
<tr><td colspan="4" align="center">Test Sequence</td></tr>
<tr><td>Step</td><td>RP</td><td>Type</td><td align="center">Description</td></tr>
<tr><td>1</td><td></td><td>Stimulus</td><td>AE is requested to send a group Delete Request</td></tr>
<tr><td>2</td><td>Mca</td><td>PRO Check Primitive</td><td>•   op = 4 (DELETE)
•   to = {CSEBaseName}/{group}
•   fr = AE-ID
•   rqi = (token-string)</td></tr>
<tr><td>3</td><td>Mca</td><td>PRO Check Primitive</td><td>•   rsc = 2002 (DELETED)
•   rqi = (token-string) same as received in request message</td></tr>
<tr><td>4</td><td></td><td>IOP Check</td><td>Check if possible that the <group> resource is deleted in Registrar CSE</td></tr>
<tr><td>5</td><td></td><td>IOP Check</td><td>AE indicates successful operation</td></tr>
<tr><td colspan="2">IOP Verdict</td><td colspan="2"></td></tr>
<tr><td colspan="2">PRO Verdict</td><td colspan="2"></td></tr>
</table>

8.1.10   Node Management

8.1.10.1   Node Create

<table>
<tr><td colspan="4" align="center">Interoperability Test Description</td></tr>
<tr><td colspan="2">Identifier:</td><td colspan="2">TD_M2M_NH_35</td></tr>
<tr><td colspan="2">Objective:</td><td colspan="2">AE creates a node resource</td></tr>
<tr><td colspan="2">Configuration:</td><td colspan="2">M2M_CFG_01</td></tr>
<tr><td colspan="2">References:</td><td colspan="2">ETSI TS 118 101 [1], clause 10.2.8.3
oneM2M TS-0004 [2], clause 7.4.18.2.1</td></tr>
<tr><td colspan="4"></td></tr>
<tr><td colspan="2">Pre-test conditions:</td><td colspan="2">•   void</td></tr>
<tr><td colspan="4" align="center">Test Sequence</td></tr>
<tr><td>Step</td><td>RP</td><td>Type</td><td align="center">Description</td></tr>
<tr><td>1</td><td></td><td>Stimulus</td><td>AE is requested to send a node Create Request</td></tr>
<tr><td>2</td><td>Mca</td><td>PRO Check Primitive</td><td>•   op = 1 (Create)
•   to = {CSEBaseName}
•   fr = AE-ID
•   rqi = (token-string)
•   ty = 14 (node)
•   pc = Serialized representation of <node> resource</td></tr>
<tr><td>3</td><td></td><td>IOP Check</td><td>Check if possible that the <node> resource is created in Registrar CSE</td></tr>
<tr><td>4</td><td>Mca</td><td>PRO Check Primitive</td><td>•   rsc = 2001 (CREATED)
•   rqi = (token-string) same as received in request message
•   pc = Serialized representation of <node> resource</td></tr>
<tr><td>5</td><td></td><td>IOP Check</td><td>AE indicates successful operation</td></tr>
<tr><td colspan="2">IOP Verdict</td><td colspan="2"></td></tr>
<tr><td colspan="2">PRO Verdict</td><td colspan="2"></td></tr>
</table>

8.1.10.2 Node Retrieve

Interoperability Test Description	
Identifier:	TD_M2M_NH_36
Objective:	AE retrieves node resource
Configuration:	M2M_CFG_01
References:	ETSI TS 118 101 [1], clause 10.2.8.4 oneM2M TS-0004 [2], clause 7.4.18.2.2
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)
3	Mca	PRO Check Primitive	• rsc = 2000 (OK) • 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			

8.1.10.3 Node Update

Interoperability Test Description	
Identifier:	TD_M2M_NH_37
Objective:	AE updates attribute in node resource
Configuration:	M2M_CFG_01
References:	ETSI TS 118 101 [1], clause 10.2.8.5 oneM2M TS-0004 [2], clause 7.4.18.2.3
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
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
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:	ETSI TS 118 101 [1], clause 10.2.8.5 oneM2M TS-0004 [2], clause 7.4.18.2.4
Pre-test conditions:	• AE has created a <node> resource on Registrar CSE

Test Sequence			
Step	RP	Type	Description

Interoperability Test 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)
3	Mca	PRO Check Primitive	• rsc = 2002 (DELETED) • rqi = (token-string) same as received in request message
4		IOP Check	Check if possible that the <node> resource is deleted in Registrar CSE
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:	ETSI TS 118 101 [1], clause 10.2.5.13 oneM2M TS-0004 [2], clause 7.4.21.2.1
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
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
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:	ETSI TS 118 101 [1], clause 10.2.5.14 oneM2M TS-0004 [2], clause 7.4.21.2.2
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

Interoperability Test Description			
3	Mca	PRO Check Primitive	• 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:		ETSI TS 118 101 [1], clause 10.2.5.15 oneM2M TS-0004 [2], clause 7.4.21.2.3	
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
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
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:		ETSI TS 118 101 [1], clause 10.2.5.16 oneM2M TS-0004 [2], clause 7.4.21.2.4	
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
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
5		IOP Check	Check if possible that the < pollingChannel > resource has been removed in registrar CSE
6		IOP Check	AE indicates successful operation

Interoperability Test Description	
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:	ETSI TS 118 101 [1], clause 10.2.5.18 oneM2M TS-0004 [2], clause 7.4.22.2.2		
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>
2	Mca	PRO Check Primitive	Sent RETRIEVE request contains: • *To*: <CSEBase>/<AE>/<pollingChannel>/pollingChannelURI • *Fr*: AE-ID
3	Mca	PRO Check Primitive	Sent RETRIEVE response contains: • *To*: AE-ID • *Fr*: CSE-ID • *Response Status Code*: OK • Cn: pending Notification request
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 Status Code*: REQUEST_TIMEOUT
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:	ETSI TS 118 101 [1], clause 10.2.7.6 oneM2M TS-0004 [2], clause 7.4.14.3.1		
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 Create Request to create <contentInstance> in each group member
2	Check Mca	PRO Check Primitive	• op = 1 (Create) • to = {CSEBaseName}/{group}/fopt • fr = AE-ID • rqi = (token-string) • ty = 4 (contentInstance) • pc = Serialized representation of <contentInstance> resource
3		IOP Check	Check if possible that the <contentInstance> resource is created in each member hosting CSE

			Interoperability Test Description
4	Check Mca	PRO Check Primitive	• rsc = 2001 (CREATED) • rqi = (token-string) same as received in request message • pc = aggregated response
5		IOP Check	AE indicates successful operation
IOP Verdict	Verify that the aggregate 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:	ETSI TS 118 101 [1], clause 10.2.7.7 oneM2M TS-0004 [2], clause 7.4.14.3.2
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}/fopt • fr = AE-ID • rqi = (token-string)
3		IOP Check	
4	Check Mca	PRO Check Primitive	• rsc = 2000 (OK) • rqi = (token-string) same as received in request message • pc = aggregated response
5		IOP Check	AE indicates successful operation
IOP Verdict	Verify that the aggregate 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:	ETSI TS 118 101 [1], clause 10.2.7.8 oneM2M TS-0004 [2], clause 7.4.14.3.3
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}/fopt • 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
5		IOP Check	AE indicates successful operation
IOP Verdict	Verify that the aggregate 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> of each member		
Configuration:	M2M_CFG_01		
References:	ETSI TS 118 101 [1], clause 10.2.7.9 oneM2M TS-0004 [2], clause 7.4.14.3.4		
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}/fopt • 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
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 aggregate response includes responses from each member of the group		
PRO Verdict			

8.1.13 Notification Management

8.1.13.1 Notification

Interoperability Test Description			
Identifier:	TD_M2M_NH_48		
Objective:	AE receives a notification request from the HOST CSE		
Configuration:	M2M_CFG_01		
References:	ETSI TS 118 101 [1], clause 10.2.10 oneM2M 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 permissions to UPDATE the container created by AE1		
Test Sequence			
Step	RP	Type	Description
1		Stimulus	AE2 is requested to send a Update request to 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
3		IOP Check	Check if the notification representation
4	Check Mca	PRO Check Primitive	Sent response contains: • rsc = 2000 (OK) • rqi = (token-string) same as received in request message
5		IOP Check	AE1 indicates notification received
IOP Verdict			
PRO Verdict			

8.1.13.2 Update Notification

Interoperability Test Description	
Identifier:	TD_M2M_NH_80
Objective:	AE2 sends maxNrOfInstances UPDATE request to <container> which has been set to subscribed-to resource. Since <subscription> resource has specific setting in eventNotificationCriteria, Hosting CSE send notification to AE1
Configuration:	M2M_CFG_10
References:	ETSI TS 118 101 [1], clause 10.2.10 oneM2M TS-0004 [2], clause 6.3.4.2.19
Pre-test conditions:	• CSEBase resource has been created in registrar CSE with name {CSEBaseName} • AE1 has created a <container> resource on registrar CSE • AE1 has created <subscription> resources under the <container> resource. AE1 has set attribute of eventNotificationCriteria to a specific condition (e.g. maxNrOfInstances in this scenario) and notificationEventType set to 1(Update of Resource) • AE2 has permissions to UPDATE the <container>

Test Sequence			
Step	RP	Type	Description
1		Stimulus	AE2 is requested to send a Update Request to the <container>. This triggers or causes the Hosting CSE to send a notification to AE1
2	Check Mca	PRO Check Primitive	• op = 3 (Update) • to = ID of <container> resource • from = AE2-ID • rqi = (token-string) • pc = Serialized representation of maxNrOfInstances update
3		IOP Check	Hosting CSE successfully updated mxNrOfInsatnce of the <container> resource
4	Check Mca	PRO Check Primitive	• rsc = 2004 (Updated) • rqi = (token-string) same as received in request message • pc = Serialized representation of <container> resource
5		IOP Check	AE2 successfully received response of Update request
6	Check Mca	PRO Check Primitive	• op = 5 (Notify) • to = ID of <subscription> resource • from = Registrar CSE-ID • rqi = (token-string) • pc = Serialized representation of Notify request which contain notificationEventType equal to 1(Update of Resource)
7		IOP Check	AE1 successfully received Notify request
8	Check Mca	PRO Check Primitive	• rsc = 2000 (OK) • rqi = (token-string) same as received in request message
9		IOP Check	Hosting CSE successfully received response of Notify request
10	Check Mca	PRO Check Primitive	• op = 3 (Update) • to = ID of <container> resource • from = AE2-ID • rqi = (token-string) • pc = Serialized representation of labels update(can be any other attribute)
11		IOP Check	Hosting CSE successfully updated labels of the <container> resource
12	Check Mca	PRO Check Primitive	• rsc = 2004 (Updated) • rqi = (token-string) same as received in request message • pc = Serialized representation of <container> resource
13		IOP Check	AE2 successfully received response of Update request, notify request will not be sent
IOP Verdict	Check that the notification is only sent when there is update of maxNrOfInstances due to setting of the eventNotificationCriteria		
PRO Verdict			

8.1.13.3 Delete Notification

Interoperability Test Description	
Identifier:	TD_M2M_NH_81
Objective:	AE2 sends DELETE request to <container> which has been set to subscribed-to resource. Since <subscription> resource has notificationEventType with 'Delete of Resource', Hosting CSE send notification to AE1
Configuration:	M2M_CFG_10
References:	ETSI TS 118 101 [1], clause 10.2.10 oneM2M TS-0004 [2], clause 6.3.4.2.19
Pre-test conditions:	• CSEBase resource has been created in registrar CSE with name {CSEBaseName} • AE1 has created a <container> resource on registrar CSE • AE1 has created a <subscription> under the <container> resource, with notificationEventType set to 2(Delete of Resource) • AE2 has permissions to DELETE the <container>

Test Sequence			
Step	RP	Type	Description
1		Stimulus	AE2 is requested to send a Delete Request to the <container>. This triggers or causes the Hosting CSE to send a notification to AE1
2	Check Mca	PRO Check Primitive	• op = 4 (Delete) • to = ID of <container> resource • fr = AE2-ID • rqi = (token-string) • pc = empty
3		IOP Check	Hosting CSE successfully deleted the <container> resource
4	Check Mca	PRO Check Primitive	• rsc = 2002 (DELETED) • rqi = (token-string) same as received in request message • pc = empty
5		IOP Check	AE2 successfully received response of Delete request
6	Check Mca	PRO Check Primitive	• op = 5 (Notify) • to = ID of <subscription> resource • from = Registrar CSE-ID • rqi = (token-string) • pc = Serialized representation of Notify request which contain notificationEventType equal to 2(Delete of Resource)
7		IOP Check	AE1 successfully received Notify request
8	Check Mca	PRO Check Primitive	• rsc = 2000 (OK) • rqi = (token-string) same as received in request message
9		IOP Check	Hosting CSE successfully received response of Notify request
IOP Verdict			
PRO Verdict			

8.1.13.4 Creation of Direct Child Resource Notification

Interoperability Test Description	
Identifier:	TD_M2M_NH_82
Objective:	AE2 sends <contentInstance> CREATE request to <container> which has been set to subscribed-to resource. Since <subscription> resource has notificationEventType with 'Create of Direct Child Resource', Hosting CSE send notification to AE1
Configuration:	M2M_CFG_10
References:	ETSI TS 118 101 [1], clause 10.2.10 oneM2M TS-0004 [2], clause 6.3.4.2.19
Pre-test conditions:	• CSEBase resource has been created in registrar CSE with name {CSEBaseName} • AE1 has created a <container> resource on registrar CSE • AE1 has created a <subscription> under the <container> resource, with notificationEventType set to 3(Create of Direct Child Resource) • AE2 has permissions to CREATE child resource under the <container>

Test Sequence			
Step	RP	Type	Description
1		Stimulus	AE2 is requested to send a Create Request of <contentInstance> resource to the <container> resource. This triggers or causes the Hosting CSE to send a notification to AE1
2	Check Mca	PRO Check Primitive	• op = 1 (Create) • to = ID of <container> resource • fr = AE2-ID • rqi = (token-string) • ty = 4 (contentInstance) • pc = Serialized representation of <contentInstance> resource
3		IOP Check	Hosting CSE successfully created the <contentInstance> resource under the <container> resource
4	Check Mca	PRO Check Primitive	• rsc = 2001 (CREATED) • rqi = (token-string) same as received in request message • pc = Serialized representation of <contentInstance> resource
5		IOP Check	AE2 successfully received response of Create request
6	Check Mca	PRO Check Primitive	• op = 5 (Notify) • to = ID of <subscription> resource • from = Registrar CSE-ID • rqi = (token-string) • pc = Serialized representation of Notify request which contain notificationEventType equal to 3(Create of Direct Child Resource)
7		IOP Check	AE1 successfully received Notify request
8	Check Mca	PRO Check Primitive	Sent response contains: • rsc = 2000 (OK) • rqi = (token-string) same as received in request message
9		IOP Check	Hosting CSE successfully received response of Notify request
IOP Verdict			
PRO Verdict			

8.1.13.5 Deletion of Direct Child Resource Notification

Interoperability Test Description	
Identifier:	TD_M2M_NH_83
Objective:	AE2 sends DELETE request to the <contentInstance> which is located under the subscribed-to resource. Since <subscription> resource has notificationEventType with 'Delete of Direct Child Resource', Hosting CSE send notification to AE1
Configuration:	M2M_CFG_10
References:	ETSI TS 118 101 [1], clause 10.2.10 oneM2M TS-0004 [2], clause 6.3.4.2.19
Pre-test conditions:	• CSEBase resource has been created in registrar CSE with name {CSEBaseName} • AE1 has created a <container> resource on registrar CSE • AE1 has created a <contentInstance> as a child resource of <container> created by AE1 • AE1 has created a <subscription> under the <container> resource, with notificationEventType set to 4(Delete of Direct Child Resource) • AE2 has permissions to DELETE the <contentInstance>

Test Sequence			
Step	**RP**	**Type**	**Description**
1		Stimulus	AE2 is requested to send a Delete Request to the <contentinstance>. This triggers or causes the Hosting CSE to send a notification to AE1
2	Check Mca	PRO Check Primitive	• op = 4 (Delete) • to = ID of <contentInstance> resource • fr = AE-ID • rqi = (token-string) • pc = empty
3		IOP Check	Hosting CSE successfully deleted the <contentInstance> resource
4	Check Mca	PRO Check Primitive	• rsc = 2002 (DELETED) • rqi = (token-string) same as received in request message • pc = empty
5		IOP Check	AE2 successfully received response of Delete request
6	Check Mca	PRO Check Primitive	• op = 5 (Notify) • to = ID of <subscription> resource • from = Registrar CSE-ID • rqi = (token-string) • pc = Serialized representation of Notify request which contain notificationEventType equal to 4(Delete of Direct Child Resource)
7		IOP Check	AE1 successfully received Notify request
8	Check Mca	PRO Check Primitive	• rsc = 2000 (OK) • rqi = (token-string) same as received in request message
9		IOP Check	Hosting CSE successfully received response of Notify request
IOP Verdict			
PRO Verdict			

8.1.13.6 Notifcation Aggregation

Interoperability Test Description	
Identifier:	TD_M2M_NH_89
Objective:	AE creates <subscription> resources by sending Create Request to the fanOutPoint. Since AE has set notifyAggregation to 2, Hosting CSE aggregate notification and send aggregated notification to AE
Configuration:	M2M_CFG_01
References:	ETSI TS 118 101 [1], clause 10.2.7.11 oneM2M TS-0004 [2], clause 7.4.14.2.4
Pre-test conditions:	• CSEBase resource has been created in registrar CSE with name {CSEBaseName} • AE has created two <container> resources on registrar CSE • AE has created a <group> resource with memberIDs set to two <container> resources. AE has set number in notifyAggregation to 2 • AE has created <subscription> resources under the members of <group> resources by sending Create Request to the fanOutPoint. AE has set notificationForwardingURI and notificationEventType set to 3(Create of Direct Child Resource)

Test Sequence			
Step	RP	Type	Description
1		Stimulus	AE is requested to send a Create Request of <contentInstance> resource to the fanOutPoint
2	Check Mca	PRO Check Primitive	• op = 1 (Create) • to = {CSEBaseName}/{group}/fopt • fr = AE-ID • rqi = (token-string) • ty = 4 (contentInstance) • pc = Serialized representation of <subscription> resource
3		IOP Check	Hosting CSE successfully created the <contentInstance> resources in each member
4	Check Mca	PRO Check Primitive	• rsc = 2000 (OK) • rqi = (token-string) same as received in request message • pc = aggregated response
5		IOP Check	AE successfully received converged response
6	Check Mca	PRO Check Primitive	• op = 5 (Notify) • to = ID of <subscription> resource • from = Registrar CSE-ID • rqi = (token-string) • pc = aggregated Notify request which contain the occurrence of child resource creation
7		IOP Check	AE successfully received aggregated Notify request
8	Check Mca	PRO Check Primitive	• rsc = 2000 (OK) • rqi = (token-string) same as received in request message
9		IOP Check	Group Hosting CSE successfully received response of Notify request
IOP Verdict	Check that the response is aggregated by the group Hosting CSE and successfully parse to AE		
PRO Verdict			

8.1.14 FlexContainer Management

8.1.14.1 FlexContainer Create

Interoperability Test Description	
Identifier:	TD_M2M_NH_52
Objective:	AE creates a flexContainer resource in Registrar CSE via a flexContainer Create Request
Configuration:	M2M_CFG_01
References:	ETSI TS 118 101 [1], clause 10.2.4.16, 9.6.35 oneM2M TS-0004 [2], clause 7.4.37.2.1
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 <flexContainer>

			Interoperability Test Description
2	Mca	PRO Check Primitive	• op = 1 (Create) • to = {CSEBaseName} • fr = AE-ID • rqi = (token-string) • ty = 28 (flexContainer) • pc = Serialized representation of <flexContainer> resource
3		IOP Check	Check if possible that the <flexContainer> 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 <flexContainer> resource
5		IOP Check	AE indicates successful operation
IOP Verdict			
PRO Verdict			

8.1.14.2   FlexContainer Retrieve

Interoperability Test Description	
Identifier:	TD_M2M_NH_53
Objective:	AE retrieves information of a flexContainer resource via a flexContainer Retrieve Request
Configuration:	M2M_CFG_01
References:	ETSI TS 118 101 [1], clauses 10.2.4.17, 9.6.35 oneM2M TS-0004 [2], clause 7.4.37.2.2
Pre-test conditions:	• AE has created an Application Entity resource <AE> on Registrar CSE • AE has created a flexContainer resource <flexContainer> on Registrar CSE

			Test Sequence
Step	RP	Type	Description
1		Stimulus	AE is requested to send a Retrieve Request for a <flexContainer>
2	Mca	PRO Check Primitive	• op = 2 (Retrieve) • to = {CSEBaseName}/URI of <flexContainer> 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 <flexContainer> resource
4		IOP Check	AE indicates successful operation
IOP Verdict			
PRO Verdict			

8.1.14.3   FlexContainer Update

Interoperability Test Description	
Identifier:	TD_M2M_NH_54
Objective:	AE updates attribute in application resource via a flexContainer Update Request
Configuration:	M2M_CFG_01
References:	ETSI TS 118 101 [1], clauses 10.2.4.18, 9.6.35 oneM2M TS-0004 [2], clause 7.4.37.2.3
Pre-test conditions:	• AE has created an Application Entity resource <AE> on Registrar CSE • AE has created a flexContainer resource <flexContainer> on Registrar CSE

			Test Sequence
Step	RP	Type	Description
1		Stimulus	AE is requested to send a flexContainer Update Request to update the any customAttribute of the resource
2	Mca	PRO Check Primitive	• op = 3 (Update) • to = {CSEBaseName}/URI of <flexContainer> resource • fr = AE-ID • rqi = (token-string) • pc = Serialized representation of updated <flexContainer> resource
3		IOP Check	Check if possible that the < flexContainer > resource is updated in Registrar CSE

			Interoperability Test Description
4	Mca	PRO Check Primitive	• rsc = 2004 (Updated) • rqi = (token-string) same as received in request message • pc = Serialized representation of <flexContainer> resource
5		IOP Check	AE indicates successful operation
IOP Verdict			
PRO Verdict			

8.1.14.4 FlexContainer Delete

Interoperability Test Description			
Identifier:	TD_M2M_NH_55		
Objective:	AE deletes a specific container resource via a container Delete Request		
Configuration:	M2M_CFG_01		
References:	ETSI TS 118 101 [1], clauses 10.2.4.19, 9.6.35 oneM2M TS-0004 [2], clause 7.4.37.2.4		
Pre-test conditions:	• AE has created an Application Entity resource <AE> on Registrar CSE • AE has created a flexContainer resource <flexContainer> on Registrar CSE		
Test Sequence			
Step	RP	Type	Description
1		Stimulus	AE is requested to send a flexContainer Delete Request
2	Mca	PRO Check Primitive	• op = 4 (Delete) • to = {CSEBaseName}/URI of <flexContainer> resource • fr = AE-ID • rqi = (token-string) • pc = empty
3		IOP Check	Check if possible that the <flexContainer> 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
5		IOP Check	Check if possible that the <flexContainer> resource has been removed in Registrar CSE
6		IOP Check	AE indicates successful operation
IOP Verdict			
PRO Verdict			

8.1.14.5 Notification Create

Interoperability Test Description			
Identifier:	TD_M2M_NH_56		
Objective:	AE receives a notification request on flexContainer update from the HOST CSE		
Configuration:	M2M_CFG_01		
References:	ETSI TS 118 101 [1], clauses 10.2.10 oneM2M TS-0004 [2], clause 7.4.1		
Pre-test conditions:	• AE1 has created an application resource <AE> on Registrar CSE • AE1 has created a flexContainer resource <flexContainer> on Registrar CSE • AE1 has created a <subscription> as a child resource of a <flexContainer> • AE2 has created an application resource <AE> on Registrar CSE • AE2 has permissions to UPDATE customAttributes of flexContainer		
Test Sequence			
Step	RP	Type	Description
1		Stimulus	AE2 is requested to send a update request to <flexContainer> for updating customAttribute. 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
3		IOP Check	Check if the notification representation
4	Check Mca	PRO Check Primitive	Sent response contains: • rsc = 2000 (OK) • rqi = (token-string) same as received in request message

Interoperability Test Description			
5		IOP Check	AE1 indicates notification received
IOP Verdict			
PRO Verdict			

8.1.14.6 Discovery with attribute filter criteria over customAttributes

Interoperability Test Description	
Identifier:	TD_M2M_NH_57
Objective:	AE discovers accessible resources residing in Registrar CSE using attribute filter criteria which has a customAttribute name and value assigned to it.
Configuration:	M2M_CFG_01
References:	ETSI TS 118 101 [1], clauses 10.2.10 oneM2M TS-0004 [2], clause 7.3.3.14
Pre-test conditions:	• AE has created an Application Entity resource <AE> on Registrar CSE • AE has created a flexContainer resource <flexContainer> on Registrar CSE with customAttribute set to a specific value "x", 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 attribute filter criteria
2	Mca	PRO Check Primitive	Sent request contains: • op = 2 (Retrieve) • to = {CSEBaseName} • fr = AE-ID • rqi = (token-string) • fu=1 • atr=<nm>,<val> • 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 <flexContainer> address
4		IOP Check	AE indicates successful operation
IOP Verdict			
PRO Verdict			

8.1.15 External Management Operations Management

8.1.15.1 mgmtCmd Create

Interoperability Test Description	
Identifier:	TD_M2M_NH_63
Objective:	AE creates a mgmtCmd resource
Configuration:	M2M_CFG_01
References:	ETSI TS 118 101 [1], clause 10.2.8.8 oneM2M TS-0004 [2], clause 7.4.16.2.1
Pre-test conditions:	• AE has created an application resource <AE> on Registrar CSE • AE has created a node resource <node> on Registrar CSE

Test Sequence			
Step	RP	Type	Description
1		Stimulus	AE is requested to send a mgmtCmd Create Request
2	Mca	PRO Check Primitive	• op = 1 (Create) • to = {CSEBaseName} • fr = AE-ID • rqi = (token-string) • ty = 12 (mgmtCmd) • pc = Serialized representation of <mgmtCmd> resource
3		IOP Check	Check if possible that the <mgmtCmd> resource is created in Registrar CSE

			Interoperability Test Description
4	Mca	PRO Check Primitive	• rsc = 2001 (CREATED) • rqi = (token-string) same as received in request message • pc = Serialized representation of <mgmtCmd> resource
5		IOP Check	AE indicates successful operation
IOP Verdict			Set verdict to pass if IOP check goal is achieved exactly, otherwise verdict fail is set with corresponding error message.
PRO Verdict			

8.1.15.2　　mgmtCmd Retrieve

Interoperability Test Description			
Identifier:			TD_M2M_NH_64
Objective:			AE retrieves mgmtCmd resource
Configuration:			M2M_CFG_01
References:			ETSI TS 118 101 [1], clause 10.2.8.9 oneM2M TS-0004 [2], clause 7.4.16.2.2
Pre-test conditions:			• AE has created an application resource <AE> on Registrar CSE • AE has created a node resource <node> on Registrar CSE • AE has created a mgmtCmd resource <mgmtCmd> on Registrar CSE
Test Sequence			
Step	RP	Type	Description
1		Stimulus	AE is requested to send a mgmtCmd Retrieve Request
2	Mca	PRO Check Primitive	• op = 2 (RETRIEVE) • to = {CSEBaseName}/{mgmtCmd} • 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 <mgmtCmd> resource
4		IOP Check	AE indicates successful operation
IOP Verdict			
PRO Verdict			

8.1.15.3　　mgmtCmd Update (Normal)

Interoperability Test Description			
Identifier:			TD_M2M_NH_65
Objective:			AE updates attribute (not with 'true' in execEnable attribute) in mgmtCmd resource
Configuration:			M2M_CFG_01
References:			ETSI TS 118 101 [1], clause 10.2.8.10 oneM2M TS-0004 [2], clause 7.4.16.2.3.1
Pre-test conditions:			• AE has created an application resource <AE> on Registrar CSE • AE has created a node resource <node> on Registrar CSE • AE has created a mgmtCmd resource <mgmtCmd> on Registrar CSE
Test Sequence			
Step	RP	Type	Description
1		Stimulus	AE is requested to send a mgmtCmd Update Request
2	Mca	PRO Check Primitive	• op = 3 (Update) • to = {CSEBaseName}/{mgmtCmd} • fr = AE-ID • rqi = (token-string) • pc = Serialized representation of <mgmtCmd> resource
3		IOP Check	Check if possible that the <mgmtCmd> 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 <mgmtCmd> resource
5		IOP Check	AE indicates successful operation

Interoperability Test Description	
IOP Verdict	
PRO Verdict	

8.1.15.4 mgmtCmd Update (Execute)

Interoperability Test Description			
Identifier:	TD_M2M_NH_66		
Objective:	AE updates attribute (with 'true' in execEnable attribute) in mgmtCmd resource		
Configuration:	M2M_CFG_01		
References:	ETSI TS 118 101 [1], clause 10.2.8.12 oneM2M TS-0004 [2], clause 7.4.16.2.3.2		
Pre-test conditions:	• AE has created an application resource <AE> on Registrar CSE • AE has created a node resource <node> on Registrar CSE • AE has created a mgmtCmd resource <mgmtCmd> on Registrar CSE		
Test Sequence			
Step	RP	Type	Description
1		Stimulus	AE is requested to send a mgmtCmd Update Request
2	Mca	PRO Check Primitive	• op = 3 (Update) • to = {CSEBaseName}/{mgmtCmd} • fr = AE-ID • rqi = (token-string) • pc = Serialized representation of <mgmtCmd> resource
3		IOP Check	Check if possible that the <mgmtCmd> 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 <mgmtCmd> resource
5		IOP Check	AE indicates successful operation
IOP Verdict			
PRO Verdict			

8.1.15.5 mgmtCmd Delete

Interoperability Test Description			
Identifier:	TD_M2M_NH_67		
Objective:	AE deletes mgmtCmd resource		
Configuration:	M2M_CFG_01		
References:	ETSI TS 118 101 [1], clause 10.2.8.11 oneM2M TS-0004 [2], clause 7.4.16.2.4		
Pre-test conditions:	• AE has created an application resource <AE> on Registrar CSE • AE has created a node resource <node> on Registrar CSE • AE has created a mgmtCmd resource <mgmtCmd> on Registrar CSE		
Test Sequence			
Step	RP	Type	Description
1		Stimulus	AE is requested to send a mgmtCmd Delete Request
2	Mca	PRO Check Primitive	• op = 4 (DELETE) • to = {CSEBaseName}/{mgmtCmd} • fr = AE-ID • rqi = (token-string)
3	Mca	PRO Check Primitive	• rsc = 2002 (DELETED) • rqi = (token-string) same as received in request message
4		IOP Check	Check if possible that the <mgmtCmd> resource is deleted in Registrar CSE
5		IOP Check	AE indicates successful operation
IOP Verdict			
PRO Verdict			

8.1.15.6 execInstance Retrieve

Interoperability Test Description	
Identifier:	TD_M2M_NH_68
Objective:	AE retrieves execInstance resource
Configuration:	M2M_CFG_01
References:	ETSI TS 118 101 [1], clause 10.2.8.20 oneM2M TS-0004 [2], clause 7.4.17.2.2
Pre-test conditions:	• AE has created an application resource <AE> on Registrar CSE • AE has created a node resource <node> on Registrar CSE • AE has created a mgmtCmd resource <mgmtCmd> on Registrar CSE • AE has executed the mgmtCmd resource <mgmtCmd> on Registrar CSE (update execEnable attribute with 'true')

Test Sequence			
Step	RP	Type	Description
1		Stimulus	AE is requested to send a execInstance Retrieve Request
2	Mca	PRO Check Primitive	• op = 2 (RETRIEVE) • to = {CSEBaseName}/{mgmtCmd}/{execInstance} • 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 <execInstance> resource
4		IOP Check	AE indicates successful operation
IOP Verdict			
PRO Verdict			

8.1.15.7 execInstance Update (Cancel)

Interoperability Test Description	
Identifier:	TD_M2M_NH_69
Objective:	AE updates attribute 'execDisable' to true in execInstance resource to cancel pending management command.
Configuration:	M2M_CFG_01
References:	ETSI TS 118 101 [1], clause 10.2.8.19 oneM2M TS-0004 [2], clause 7.4.17.2.1
Pre-test conditions:	• AE has created an application resource <AE> on Registrar CSE • AE has created a node resource <node> on Registrar CSE • AE has created a mgmtCmd resource <mgmtCmd> on Registrar CSE • AE has executed the mgmtCmd resource <mgmtCmd> on Registrar CSE (update execEnable attribute with 'true')

Test Sequence			
Step	RP	Type	Description
1		Stimulus	AE is requested to send a execInstance Update Request
2	Mca	PRO Check Primitive	• op = 3 (Update) • to = {CSEBaseName}/{mgmtCmd}/{execInstance} • fr = AE-ID • rqi = (token-string) • pc = Serialized representation of <execInstance> resource
3		IOP Check	Check if possible that the <execInstance> 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 <execInstance> resource
5		IOP Check	AE indicates successful operation
IOP Verdict			
PRO Verdict			

8.1.15.8 execInstance Delete

Interoperability Test Description	
Identifier:	TD_M2M_NH_70
Objective:	AE deletes execInstance resource
Configuration:	M2M_CFG_01
References:	ETSI TS 118 101 [1], clause 10.2.8.21
	oneM2M TS-0004 [2], clause 7.4.17.2.3
Pre-test conditions:	• AE has created an application resource <AE> on Registrar CSE
	• AE has created a node resource <node> on Registrar CSE
	• AE has created a mgmtCmd resource <mgmtCmd> on Registrar CSE
	• AE has executed the mgmtCmd resource <mgmtCmd> on Registrar CSE (update execEnable attribute with 'true')

Test Sequence			
Step	RP	Type	Description
1		Stimulus	AE is requested to send a execInstance Delete Request
2	Mca	PRO Check Primitive	• op = 4 (DELETE) • to = {CSEBaseName}/{mgmtCmd}/{execInstance} • fr = AE-ID • rqi = (token-string)
3	Mca	PRO Check Primitive	• rsc = 2002 (DELETED) • rqi = (token-string) same as received in request message
4		IOP Check	Check if possible that the <execInstance> resource is deleted in Registrar CSE
5		IOP Check	AE indicates successful operation
IOP Verdict			
PRO Verdict			

8.1.16 SemanticDescriptor Management

8.1.16.1 SemanticDescriptor Create

Interoperability Test Description	
Identifier:	TD_M2M_NH_75
Objective:	AE creates a SemanticDescriptor resource in Registrar CSE via a SemanticDescriptor Create Request
Configuration:	M2M_CFG_01
References:	oneM2M TS-0034 [13], clause 6.1.2
	oneM2M TS-0004 [2], clause 7.4.34.2.1
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 <semanticDescriptor>
2	Mca	PRO Check Primitive	• op = 1 (Create) • to = {CSEBaseName}/URI of < container > resource • fr = AE-ID • rqi = (token-string) • ty = 24 (semanticDescriptor) • pc = Serialized representation of <semanticDescriptor> resource
3		IOP Check	Check if possible that the <semanticDescriptor> 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 <semanticDescriptor> resource
5		IOP Check	AE indicates successful operation
IOP Verdict			
PRO Verdict			

8.1.16.2 SemanticDescriptor Retrieve

Interoperability Test Description	
Identifier:	TD_M2M_NH_76
Objective:	AE retrieves information of a semanticDescriptor resource via a semanticDescriptor Retrieve Request
Configuration:	M2M_CFG_01
References:	oneM2M TS-0034 [13], clause 6.1.3 oneM2M TS-0004 [2], clause 7.4.34.2.2
Pre-test conditions:	• AE has created an Application Entity resource <AE> on Registrar CSE • AE has created a semanticDescriptor resource <semanticDescriptor> as child resource of <AE> resource

Test Sequence			
Step	**RP**	**Type**	**Description**
1		Stimulus	AE is requested to send a Retrieve Request for a <semanticDescriptor>
2	Mca	PRO Check Primitive	• op = 2 (Retrieve) • to = {CSEBaseName}/URI of <semanticDescriptor> 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 <semanticDescriptor> resource
4		IOP Check	AE indicates successful operation
IOP Verdict			
PRO Verdict			

8.1.16.3 SemanticDescriptor Update

Interoperability Test Description	
Identifier:	TD_M2M_NH_77
Objective:	AE updates attribute in <semanticDescriptor> resource via a semanticDescriptor Update Request
Configuration:	M2M_CFG_01
References:	oneM2M TS-0034 [13], clause 6.1.4 oneM2M TS-0004 [2], clause 7.4.34.2.3
Pre-test conditions:	• AE has created an Application Entity resource <AE> on Registrar CSE • AE has created a semanticDescriptor resource <semanticDescriptor> as child resource of <AE> resource

Test Sequence			
Step	**RP**	**Type**	**Description**
1		Stimulus	AE is requested to send a semanticDescriptor Update Request to update the *descriptor* attribute of the resource
2	Mca	PRO Check Primitive	• op = 3 (Update) • to = {CSEBaseName}/URI of <semanticDescriptor> resource • fr = AE-ID • rqi = (token-string) • pc = Serialized representation of updated <semanticDescriptor> resource
3		IOP Check	Check if possible that the <semanticDescriptor> 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 <semanticDescriptor> resource
5		IOP Check	AE indicates successful operation
IOP Verdict			
PRO Verdict			

8.1.16.4 SemanticDescriptor Delete

Interoperability Test Description			
Identifier:	TD_M2M_NH_78		
Objective:	AE deletes SemanticDescriptor resource via a SemanticDescriptor Delete Request		
Configuration:	M2M_CFG_01		
References:	oneM2M TS-0034 [13], clause 6.1.5 oneM2M TS-0004 [2], clause 7.4.34.2.4		
Pre-test conditions:	• AE has created an Application Entity resource <AE> on Registrar CSE • AE has created a semanticDescriptor resource <semanticDescriptor> as child of <AE> resource		
Test Sequence			
Step	RP	Type	Description
1		Stimulus	AE is requested to send a semanticDescriptor Delete Request
2	Mca	PRO Check Primitive	• op = 4 (Delete) • to = {CSEBaseName}/URI of <semanticDescriptor> resource • fr = AE-ID • rqi = (token-string) • pc = empty
3		IOP Check	Check if possible that the <semanticDescriptor> 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
5		IOP Check	Check if possible that the <semanticDescriptor> resource has been removed in Registrar CSE
6		IOP Check	AE indicates successful operation.
IOP Verdict			
PRO Verdict			

8.1.17 Semantic Resource Discovery

8.1.17.1 Discovery with semanticFilter filter criteria

Interoperability Test Description			
Identifier:	TD_M2M_NH_79		
Objective:	AE discovers accessible resources residing in Registrar CSE using the semanticFilter filter criteria		
Configuration:	M2M_CFG_01		
References:	oneM2M TS-0034 [13], clause 7.4 oneM2M TS-0004 [2], clause 7.3.3.18		
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 <semanticDescriptor> as a child resource of a <container>		
Test Sequence			
Step	RP	Type	Description
1		Stimulus	AE1 is requested to send a Discovery request to discover the <container> resource using the semanticFilter filterCriteria
2	Check Mca	PRO Check Primitive	Sent request contains: • op = 2 (Retrieve) • to = {CSEBaseName} • from = AE-ID • rqi = (token-string) • fu=1 • smf=sparqlQuery1 • pc = empty
3	Check Mca	PRO Check Primitive	Sent response contains: • rsc = 2000 (OK) • rqi = (token-string) same as received in request message • pc = Serialized representation of data object containing the <Container> address

Interoperability Test Description			
4		IOP Check	AE1 indicates notification received
IOP Verdict			
PRO Verdict			

8.1.18 ResultContent

8.1.18.1 ResultContent=0

Interoperability Test Description			
Identifier:	TD_M2M_NH_84		
Objective:	Check creation of <container> resource with result content set to 0(nothing)		
Configuration:	M2M_CFG_01		
References:	ETSI TS 118 101 [1], clause 8.1.2 oneM2M TS-0004 [2], clause 6.3.4.2.7		
Pre-test conditions:	• CSEBase resource has been created in CSE with name {CSEBaseName}		
Test Sequence			
Step	RP	Type	Description
1		Stimulus	AE is requested to send a <container> resource Create Request to the Registrar CSE with rcn=0
2	Check Mca	PRO Check Primitive	• op = 1 (Create) • to = {CSEBaseName} • fr = AE-ID • rqi = (token-string) • ty = 3 (container) • rcn = 0 • pc = Serialized representation of <container> resource which contain {containerName} as a rn
3		IOP Check	Hosting CSE successfully created the <container> resource
4	Check Mca	PRO Check Primitive	• rsc = 2001 (CREATED) • rqi = (token-string) same as received in request message
5		IOP Check	AE successfully received response of Create request
IOP Verdict	Check that the response body does not include any message		
PRO Verdict			

8.1.18.2 ResultContent=1

Interoperability Test Description			
Identifier:	TD_M2M_NH_85		
Objective:	Check creation of <container> resource with result content set to 1(attributes)		
Configuration:	M2M_CFG_01		
References:	ETSI TS 118 101 [1], clause 8.1.2 oneM2M TS-0004 [2], clause 6.3.4.2.7		
Pre-test conditions:	• CSEBase resource has been created in CSE with name {CSEBaseName}		
Test Sequence			
Step	RP	Type	Description
1		Stimulus	AE is requested to send a <container> resource Create Request to the Registrar CSE with rcn=1
2	Check Mca	PRO Check Primitive	• op = 1 (Create) • to = {CSEBaseName} • fr = AE-ID • rqi = (token-string) • ty = 3 (container) • rcn = 1 • pc = Serialized representation of <container> resource
3		IOP Check	Hosting CSE successfully created the <container> resource
4	Check Mca	PRO Check Primitive	• rsc = 2001 (CREATED) • rqi = (token-string) same as received in request message • pc = Serialized representation of <container> resource which contain attributes
5		IOP Check	AE successfully received response of Create request

Interoperability Test Description	
IOP Verdict	Check that the response body include attributes
PRO Verdict	

8.1.18.3 ResultContent=2

Interoperability Test Description			
Identifier:		TD_M2M_NH_86	
Objective:		Check creation of <container> resource with result content set to 2(hierarchical address)	
Configuration:		M2M_CFG_01	
References:		ETSI TS 118 101 [1], clause 8.1.2 oneM2M TS-0004 [2], clause 6.3.4.2.7	
Pre-test conditions:		• CSEBase resource has been created in CSE with name {CSEBaseName}	
Test Sequence			
Step	RP	Type	Description
1		Stimulus	AE is requested to send a <container> resource Create Request to the Registrar CSE with rcn = 2
2	Check Mca	PRO Check Primitive	• op = 1 (Create) • to = {CSEBaseName} • fr = AE-ID • rqi = (token-string) • ty = 3 (container) • rcn = 2 • pc = Serialized representation of <container> resource
3		IOP Check	Hosting CSE successfully created the <container> resource
4	Check Mca	PRO Check Primitive	• rsc = 2001 (CREATED) • rqi = (token-string) same as received in request message • pc = Hierarchical address of <container> resource
5		IOP Check	AE successfully received response of Create request
IOP Verdict		Check that the response body include hierarchical address	
PRO Verdict			

8.1.18.4 ResultContent=3

Interoperability Test Description			
Identifier:		TD_M2M_NH_87	
Objective:		Check creation of <container> resource with result content set to 3(hierarchical address and attributes)	
Configuration:		M2M_CFG_01	
References:		ETSI TS 118 101 [1], clause 8.1.2 oneM2M TS-0004 [2], clause 6.3.4.2.7	
Pre-test conditions:		• CSEBase resource has been created in CSE with name {CSEBaseName}	
Test Sequence			
Step	RP	Type	Description
1		Stimulus	AE is requested to send a <container> Create Request to the Registrar CSE with rcn=3
2	Check Mca	PRO Check Primitive	• op = 1 (Create) • to = {CSEBaseName} • fr = AE-ID • rqi = (token-string) • ty = 3 (container) • rcn = 3 • pc = Serialized representation of <container> resource
3		IOP Check	Hosting CSE successfully created the <container> resource
4	Check Mca	PRO Check Primitive	• rsc = 2001 (CREATED) • rqi = (token-string) same as received in request message • pc = Serialized representation of <container> resource with hierarchical address
5		IOP Check	AE successfully received response of Create request
IOP Verdict		Check that the response body include hierarchical address and attributes	
PRO Verdict			

8.1.18.5 ResultContent=4

Interoperability Test Description			
Identifier:	TD_M2M_NH_88		
Objective:	Check retrievability of <container> resource with result content set to 4 (attributes and child resources)		
Configuration:	M2M_CFG_01		
References:	ETSI TS 118 101 [1], clause 8.1.2 oneM2M TS-0004 [2], clause 6.3.4.2.7		
Pre-test conditions:	• CSEBase resource has been created in CSE with name {CSEBaseName} • AE has created a <container> resource on registrar CSE • AE has created two <contentInstance> resources under the <container> resources		
Test Sequence			
Step	**RP**	**Type**	**Description**
1		Stimulus	AE is requested to send a <container> Retrieve Request to the Registrar CSE with rcn=4
2	Check Mca	PRO Check Primitive	• op = 2 (Retrieve) • to = ID of <container> resource • fr = AE-ID • rqi = (token-string) • rcn = 4
3		IOP Check	Hosting CSE successfully received Retrieve request of the <container> resource
4	Check Mca	PRO Check Primitive	• rsc = 2000 (OK) • rqi = (token-string) same as received in request message • pc = Serialized representation of <container> and child resources
5		IOP Check	AE successfully received response of Retrieve request
IOP Verdict	Check that the response body include attributes and child resources		
PRO Verdict			

8.1.19 timeSeries Management

8.1.19.1 timeSeries Create

Interoperability Test Description			
Identifier:	TD_M2M_NH_90		
Objective:	AE creates a <timeSeries> resource in registrar CSE via a Create Request		
Configuration:	M2M_CFG_01		
References:	ETSI TS 118 101 [1], clause 10.2.4.21 oneM2M TS-0004 [2], clause 7.4.38.2.1		
Pre-test conditions:	• AE has created a <AE> resource on Registrar CSE		
Test Sequence			
Step	**RP**	**Type**	**Description**
1		Stimulus	AE is requested to send a Create Request of the <timeSeries> resource
2	Mca	PRO Check Primitive	• op = 1 (Create) • to = {CSEBaseName}/URI of <AE> resource • fr = AE-ID • rqi = (token-string) • ty = 29 (timeSeries) • pc = Serialized representation of <timeSeries> resource
3		IOP Check	Registrar CSE successfully created the <timeSeries> resource
4	Mca	PRO Check Primitive	• rsc = 2001 (CREATED) • rqi = (token-string) same as received in request message • pc = Serialized representation of <timeSeries> resource
5		IOP Check	AE successfully received response of Create Request
IOP Verdict			
PRO Verdict			

8.1.19.2 timeSeries Retrieve

Interoperability Test Description			
Identifier:	TD_M2M_NH_91		
Objective:	AE retrieves information of a <timeSeries> resource via a Retrieve Request		
Configuration:	M2M_CFG_01		
References:	ETSI TS 118 101 [1], clause 10.2.4.22 oneM2M TS-0004 [2], clause 7.4.38.2.2		
Pre-test conditions:	• AE has created a <AE> resource on Registrar CSE • AE has created a <timeSereis> resource on Registrar CSE		
Test Sequence			
Step	**RP**	**Type**	**Description**
1		Stimulus	AE is requested to send a Retrieve Request of the <timeSeries> resource
2	Mca	PRO Check Primitive	• op = 2 (Retrieve) • to = {CSEBaseName}/URI of <timeSeries> resource • fr = AE-ID • rqi = (token-string) • pc = empty
3		IOP Check	Registrar CSE successfully received Retrieve Request of the <timeSeries> resource
4	Mca	PRO Check Primitive	• rsc = 2000 (OK) • rqi = (token-string) same as received in request message • pc = Serialized representation of <timeSeries> resource
5		IOP Check	AE successfully received response of Retrieve Request
IOP Verdict			
PRO Verdict			

8.1.19.3 timeSeries Update

Interoperability Test Description			
Identifier:	TD_M2M_NH_92		
Objective:	AE updates attribute in <timeSeries> resource via a Update Request		
Configuration:	M2M_CFG_01		
References:	ETSI TS 118 101 [1], clause 10.2.4.23 oneM2M TS-0004 [2], clause 7.4.38.2.3		
Pre-test conditions:	• AE has created a <AE> resource on Registrar CSE • AE has created a <timeSereis> resource on Registrar CSE		
Test Sequence			
Step	**RP**	**Type**	**Description**
1		Stimulus	AE is requested to send a Update Request to the <timeSeries> resource to update the *maxNrOfInstances*
2	Mca	PRO Check Primitive	• op = 3 (Update) • to = {CSEBaseName}/URI of <timeSeries> resource • fr = AE-ID • rqi = (token-string) • pc = Serialized representation of *maxNrOfInstances* update(can be any other attribute)
3		IOP Check	Registrar CSE successfully updated the *maxNrOfInstances* of the <timeSeries> resource
4	Mca	PRO Check Primitive	• rsc = 2004 (Updated) • rqi = (token-string) same as received in request message • pc = Serialized representation of <timeSeries> resource
5		IOP Check	AE successfully received response of Update Request
IOP Verdict			
PRO Verdict			

8.1.19.4 timeSeries Delete

Interoperability Test Description			
Identifier:	TD_M2M_NH_93		
Objective:	AE deletes a <timeSeries> resource via a Delete Request		
Configuration:	M2M_CFG_01		
References:	ETSI TS 118 101 [1], clause 10.2.4.24 oneM2M TS-0004 [2], clause 7.4.38.2.4		
Pre-test conditions:	• AE has created a <AE> resource on Registrar CSE • AE has created a <timeSeries> resource on Registrar CSE		
Test Sequence			
Step	RP	Type	Description
1		Stimulus	AE is requested to send a Delete Request of the <timeSeries> resource
2	Mca	PRO Check Primitive	• op = 4 (Delete) • to = {CSEBaseName}/URI of <timeSeries> resource • fr = AE-ID • rqi = (token-string) • pc = empty
3		IOP Check	Registrar CSE successfully deleted the <timeSeries> resource
4	Mca	PRO Check Primitive	• rsc = 2002 (DELETED) • rqi = (token-string) same as received in request message • pc = empty
5		IOP Check	AE successfully received response of Delete Request
IOP Verdict			
PRO Verdict			

8.1.20 timeSeriesInstance Management

8.1.20.1 timeSeriesInstance Create

Interoperability Test Description			
Identifier:	TD_M2M_NH_94		
Objective:	AE sends Create Request of a <timeSeriesInstance> resource to a <timeSeries> resource in Registrar CSE. Registrar CSE creates the <timeSeriesInstance> resource and updates the parent <timeSeries> resource with *currentNrOfInstances* and *currentByteSize* attributes correspondingly		
Configuration:	M2M_CFG_01		
References:	ETSI TS 118 101 [1], clause 10.2.4.25 oneM2M TS-0004 [2], clause 7.4.39.2.1		
Pre-test conditions:	• AE has created a <AE> resource on Registrar CSE • AE has created a <timeSeries> resource on registrar CSE		
Test Sequence			
Step	RP	Type	Description
1		Stimulus	AE is requested to send a Create Request of the <timeSeriesInstance> resource
2	Mca	PRO Check Primitive	• op = 1 (Create) • to = {CSEBaseName}/URI of <timeSeries> resource • fr = AE-ID • rqi = (token-string) • ty = 30 (timeSeriesInstance) • pc = Serialized representation of <timeSeriesInstance> resource
3		IOP Check	Registrar CSE successfully created <timeSeriesInstance> resource and updated *currentNrOfInstances* and *currentByteSize* of the <timeSeries> resource
4	Mca	PRO Check Primitive	• rsc = 2001 (CREATED) • rqi = (token-string) same as received in request message • pc = Serialized representation of <timeSeriesInstance> resource
5		IOP Check	AE successfully received response of Create Request
IOP Verdict			
PRO Verdict			

8.1.20.2 timeSeriesInstance Retrieve

Interoperability Test Description	
Identifier:	TD_M2M_NH_95
Objective:	AE retrieves information of a <timeSeriesInstance> resource via a Retrieve Request
Configuration:	M2M_CFG_01
References:	ETSI TS 118 101 [1], clause 10.2.4.26 oneM2M TS-0004 [2], clause 7.4.39.2.2
Pre-test conditions:	• AE has created a <AE> resource on Registrar CSE • AE has created a <timeSeries> resource on registrar CSE • AE has created a <timeSeriesInstance> resource as child resource of the <timeSeries> resource

Test Sequence			
Step	**RP**	**Type**	**Description**
1		Stimulus	AE is requested to send a Retrieve Request for a <timeSeriesInstance> resource
2	Mca	PRO Check Primitive	• op = 2 (Retrieve) • to = {CSEBaseName}/URI of <timeSeriesInstance> resource • fr = AE-ID • rqi = (token-string) • pc = empty
3		IOP Check	Registrar CSE successfully received Retrieve Request of the <timeSeriesInstance> resource
4	Mca	PRO Check Primitive	• rsc = 2000 (OK) • rqi = (token-string) same as received in request message • pc = Serialized representation of <timeSeriesInstance> resource
5		IOP Check	AE successfully received response of Retrieve Request
IOP Verdict			
PRO Verdict			

8.1.20.3 timeSeriesInstance Delete

Interoperability Test Description	
Identifier:	TD_M2M_NH_96
Objective:	AE sends Delete Request of a <timeSeriesInstance> resource in Registrar CSE. Registrar CSE delete the <timeSeriesInstance> resource and updates the parent <timeSeries> resource with *currentNrOfInstances* and *currentByteSize* attributes correspondingly
Configuration:	M2M_CFG_01
References:	ETSI TS 118 101 [1], clause 10.2.4.28 oneM2M TS-0004 [2], clause 7.4.39.2.4
Pre-test conditions:	• AE has created a <AE> resource on Registrar CSE • AE has created a <timeSeries> resource on registrar CSE • AE has created a <timeSeriesInstance> resource as child resource of the <timeSeries> resource

Test Sequence			
Step	**RP**	**Type**	**Description**
1		Stimulus	AE is requested to send a Delete Requeest a <timeSeriesInstance> resource
2	Mca	PRO Check Primitive	• op = 4 (Delete) • to = {CSEBaseName}/URI of <timeSeriesInstance> resource • fr = AE-ID • rqi = (token-string) • pc = empty
3		IOP Check	Registrar CSE successfully deleted <timeSeriesInstance> resource and updated *currentNrOfInstances* and *currentByteSize* of the <timeSeries> resource
4	Mca	PRO Check Primitive	• rsc = 2002 (DELETED) • rqi = (token-string) same as received in request message • pc = empty
5		IOP Check	AE successfully received response of Delete Request
IOP Verdict			
PRO Verdict			

8.1.20.4 timeSeriesInstance Create when currentNrOfInstance equals to maxNrOfInstances in parent <timeSeries> resource

Interoperability Test Description	
Identifier:	TD_M2M_NH_97
Objective:	AE sends a <timeSeriesInstance> resource Create Request to a <timeSeries> resource which contains *currentNrOfInstances* value equals to that of *maxNrOfInstances* and Registrar CSE deletes the oldest <timeSeriesInstance> resource from the <timeSeries> resource and then creates the requested <timeSeriesInstance> resource
Configuration:	M2M_CFG_01
References:	ETSI TS 118 101 [1], clause 10.2.4.25 oneM2M TS-0004 [2], clause 7.4.38.2.1
Pre-test conditions:	• AE has created a <AE> resource on Registrar CSE • AE has created a <timeSeries> resource on registrar CSE • AE has created several <timeSeriesInstance> resources and *currentNrOfInstances* of the <timeSeries> resource reach the *maxNrOfInstances*

Test Sequence			
Step	RP	Type	Description
1		Stimulus	AE is requested to send a Create Request of the <timeSeriesInstance> resource
2	Mca	PRO Check Primitive	• op = 1 (Create) • to = {CSEBaseName}/URI of <timeSeries> resource • fr = AE-ID • rqi = (token-string) • ty = 30 (timeSeriesInstance) • pc = Serialized representation of <timeSeriesInstance> resource
3		IOP Check	Registrar CSE successfully deleted <timeSeriesInstance> resource with the oldest *dataGenerationTime* and created <timeSeriesInstance> resource
4	Mca	PRO Check Primitive	• rsc = 2001 (CREATED) • rqi = (token-string) same as received in request message • pc = Serialized representation of <timeSeriesInstance> resource
5		IOP Check	AE successfully received response of Create Request
IOP Verdict			
PRO Verdict			

8.1.21 Location Management

8.1.21.1 LocationPolicy Create

Interoperability Test Description	
Identifier:	TD_M2M_NH_98
Objective:	AE creates a <locationPolicy> resource in registrar CSE via a locationPolicy Create Request
Configuration:	M2M_CFG_01
References:	ETSI TS 118 101 [1], clause 10.2.9.2 oneM2M TS-0004 [2], clause 7.4.10.2.1
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 <locationPolicy>
2	Mca	PRO Check Primitive	• op = 1 (Create) • to = {CSEBaseName} • fr = AE-ID • rqi = (token-string) • ty = 10 (LocationPolicy) • pc = Serialized representation of <locationPolicy> resource
3		IOP Check	Check if possible that the <locationPolicy> resource is created in registrar CSE Check if possible that the <container> resource is created on registrar CSE having its *resourceID* and *locationID attribute* set to *locationContainerID* and *resourceID* attribute of the <locationPolicy> resource respectively
4	Mca	PRO Check Primitive	• rsc = 2001 (CREATED) • rqi = (token-string) same as received in request message • pc = Serialized representation of <locationPolicy> resource

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

8.1.21.2 LocationPolicy Retrieve

Interoperability Test Description			
Identifier:			TD_M2M_NH_99
Objective:			AE retrieves information of a <locationPolicy> resource via a locationPolicy Retrieve Request
Configuration:			M2M_CFG_01
References:			ETSI TS 118 101 [1], clause 10.2.9.3 oneM2M TS-0004 [2], clause 7.4.10.2.2
Pre-test conditions:			• AE has created an Application Entity resource <AE> on Registrar CSE • AE has created a locationPolicy resource <locationPolicy> on Registrar CSE • AE has created a container resource <container> on Registrar CSE having its *resourceID* and *locationID attribute* set to *locationContainerID* and *resourceID* attribute of the <locationPolicy> resource respectively
Test Sequence			
Step	**RP**	**Type**	**Description**
1		Stimulus	AE is requested to send a Retrieve Request for a <locationPolicy>
2	Mca	PRO Check Primitive	• op = 2 (Retrieve) • to = {CSEBaseName}/URI of <locationPolicy> 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 <locationPolicy> resource
4		IOP Check	AE indicates successful operation
IOP Verdict			
PRO Verdict			

8.1.21.3 LocationPolicy Update

Interoperability Test Description			
Identifier:			TD_M2M_NH_100
Objective:			AE updates attribute in <locationPolicy> resource via a locationPolicy Update Request
Configuration:			M2M_CFG_01
References:			ETSI TS 118 101 [1], clause 10.2.9.4 oneM2M TS-0004 [2], clause 7.4.10.2.3
Pre-test conditions:			• AE has created an Application Entity resource <AE> on Registrar CSE • AE has created a locationPolicy resource <locationPolicy> on Registrar CSE • AE has created a container resource <container> on Registrar CSE having its *resourceID* and *locationID attribute* set to *locationContainerID* and *resourceID* attribute of the <locationPolicy> resource respectively
Test Sequence			
Step	**RP**	**Type**	**Description**
1		Stimulus	AE is requested to send a locationPolicy Update Request to update the lifetime of the resource
2	Mca	PRO Check Primitive	• op = 3 (Update) • to = {CSEBaseName}/URI of <locationPolicy> resource • fr = AE-ID • rqi = (token-string) • pc = Serialized representation of updated <locationPolicy> resource
3		IOP Check	Check if possible that the < locationPolicy > 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 <locationPolicy> resource
5		IOP Check	AE indicates successful operation

Interoperability Test Description	
IOP Verdict	
PRO Verdict	

8.1.21.4   LocationPolicy Delete

Interoperability Test Description	
Identifier:	TD_M2M_NH_101
Objective:	AE deletes a specific <locationPolicy> resource via a locationPolicy Delete Request
Configuration:	M2M_CFG_01
References:	ETSI TS 118 101 [1], clause 10.2.9.5 oneM2M TS-0004 [2], clause 7.4.10.2.4
Pre-test conditions:	• AE has created an Application Entity resource <AE> on Registrar CSE • AE has created a locationPolicy resource <locationPolicy> on Registrar CSE • AE has created a container resource <container> on Registrar CSE having its *resourceID* and *locationID attribute* set to *locationContainerID* and *resourceID* attribute of the <locationPolicy> resource respectively

Test Sequence			
Step	RP	Type	Description
1		Stimulus	AE is requested to send a locationPolicy Delete Request
2	Mca	PRO Check Primitive	• op = 4 (Delete) • to = {CSEBaseName}/URI of <locationPolicy> resource • fr = AE-ID • rqi = (token-string) • pc = empty
3		IOP Check	Check if possible that the <locationPolicy> 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
5		IOP Check	Check if possible that the <locationPolicy> resource has been removed in registrar CSE
6		IOP Check	Check if possible that the associated resources (e.g. <container>, <contentInstance> resources) are removed from the registrar CSE
7		IOP Check	Check if possible that if the locationSource attribute and the locationUpdatePeriod attribute of the <locationPolicy> resource were set with appropriate value, the session with underlying network are torn down
8		IOP Check	AE indicates successful operation
IOP Verdict			
PRO Verdict			

8.1.22   Schedule management

8.1.22.1   Schedule Create

Interoperability Test Description	
Identifier:	TD_M2M_NH_155
Objective:	AE creates a <schedule> resource in Registrar CSE via a Schedule Create Request
Configuration:	M2M_CFG_01
References:	ETSI TS 118 101 [1], clause 10.2.17.2 oneM2M TS-0004 [2], clause 7.4.9.2.1
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 <schedule>
2	Mca	PRO Check Primitive	• op = 1 (Create) • to = {CSEBaseName} • fr = AE-ID • rqi = (token-string) • ty = 18 (schedule) • pc = Serialized representation of <schedule> resource
3		IOP Check	Check if possible that the <schedule> resource is created in Registrar CSE

			Interoperability Test Description
4	Mca	PRO Check Primitive	• rsc = 2001 (CREATED) • rqi = (token-string) same as received in request message • pc = Serialized representation of <schedule> resource
5		IOP Check	AE indicates successful operation
IOP Verdict			
PRO Verdict			

8.1.22.2 Schedule Retrieve

Interoperability Test Description	
Identifier:	TD_M2M_NH_156
Objective:	AE retrieves information of a <schedule> resource via a schedule Retrieve Request
Configuration:	M2M_CFG_01
References:	ETSI TS 118 101 [1], clause 10.2.17.3 oneM2M TS-0004 [2], clause 7.4.9.2.2
Pre-test conditions:	• AE has created an Application Entity resource <AE> on Registrar CSE • AE has created a schedule resource <schedule> as child resource of <CSEBase> resource
Test Sequence	

Step	RP	Type	Description
1		Stimulus	AE is requested to send a Retrieve Request for a <schedule>
2	Mca	PRO Check Primitive	• op = 2 (Retrieve) • to = {CSEBaseName}/URI of <schedule> 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 <schedule> resource
4		IOP Check	AE indicates successful operation
IOP Verdict			
PRO Verdict			

8.1.22.3 Schedule Update

Interoperability Test Description	
Identifier:	TD_M2M_NH_157
Objective:	AE updates attribute in <schedule> resource via a schedule Update Request
Configuration:	M2M_CFG_01
References:	ETSI TS 118 101 [1], clause 10.2.17.4 oneM2M TS-0004 [2], clause 7.4.9.2.3
Pre-test conditions:	• AE has created an Application Entity resource <AE> on Registrar CSE • AE has created a schedule resource <schedule> as child resource of <AE> resource
Test Sequence	

Step	RP	Type	Description
1		Stimulus	AE is requested to send a schedule Update Request to update an attribute of the resource
2	Mca	PRO Check Primitive	• op = 3 (Update) • to = {CSEBaseName}/URI of <schedule> resource • fr = AE-ID • rqi = (token-string) • pc = Serialized representation of updated <schedule> resource
3		IOP Check	Check if possible that the <schedule> 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 <schedule> resource
5		IOP Check	AE indicates successful operation

Interoperability Test Description	
IOP Verdict	
PRO Verdict	

8.1.22.4 Schedule Delete

Interoperability Test Description			
Identifier:	TD_M2M_NH_158		
Objective:	AE deletes <schedule> resource via a Schedule Delete Request		
Configuration:	M2M_CFG_01		
References:	ETSI TS 118 101 [1], clause 10.2.17.5 oneM2M TS-0004 [2], clause 7.4.9.2.4		
Pre-test conditions:	• AE has created an Application Entity resource <AE> on Registrar CSE • AE has created a <schedule> resource as child of <AE> resource		
Test Sequence			
Step	RP	Type	Description
1		Stimulus	AE is requested to send a schedule Delete Request
2	Mca	PRO Check Primitive	• op = 4 (Delete) • to = {CSEBaseName}/URI of <schedule> resource • fr = AE-ID • rqi = (token-string) • pc = empty
3		IOP Check	Check if possible that the <schedule> 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
5		IOP Check	Check if possible that the <schedule> resource has been removed in Registrar CSE
6		IOP Check	AE indicates successful operation
IOP Verdict			
PRO Verdict			

8.1.22.5 Notification to AE with configured Schedule resource

Interoperability Test Description			
Identifier:	TD_M2M_NH_159		
Objective:	CSE sends a notification request to the AE when <schedule> resource is configured		
Configuration:	M2M_CFG_10		
References:	ETSI TS 118 101 [1], clause 9.6.9, 10.2.12 oneM2M 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> • AE1 has created a <schedule> as a child resource of a <subscription> • AE2 has created an application resource <AE> on registrar CSE • AE2 has permissions to UPDATE the container created by AE1		
Test Sequence			
Step	RP	Type	Description
1		Stimulus	AE2 is requested to send a Update request to the <container> created by AE1
2	Check 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
3		IOP Check	The HOST CSE prepares a notification to AE1 and sends it within the time window indicated in scheduleElement attribute of <schedule> resource
4	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

			Interoperability Test Description
5	Check Mca	PRO Check Primitive	Sent response contains: • rsc = 2000 (OK) • rqi = (token-string) same as received in request message
6		IOP Check	Check that AE1 has received the notification within the time window indicated in scheduleElement attribute of <schedule> resource
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:	ETSI TS 118 101 [1], clause 10.2.4.1 oneM2M TS-0004 [2], clause 7.4.6.2.1
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 Representation of 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
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
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
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:	ETSI TS 118 101 [1], clause 10.2.4.1 oneM2M TS-0004 [2], clause 7.4.6.2.1		
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
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
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
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
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
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:	ETSI TS 118 101 [1], clause 10.2.4.1 oneM2M TS-0004 [2], clause 7.4.6.2.1		
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

			Interoperability Test Description
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
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
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
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
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:		ETSI TS 118 101 [1], clause 10.2.4.1 oneM2M TS-0004 [2], clause 7.4.6.2.1	
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
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
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
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)
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:			ETSI TS 118 101 [1], clause 10.2.4.1 oneM2M TS-0004 [2], clause 7.4.6.2.1
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 Representation of 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
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
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
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:	ETSI TS 118 101 [1], clause 10.2.4.1
	oneM2M TS-0004 [2], clause 7.4.6.2.1
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
	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
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
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
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:	ETSI TS 118 101 [1], clause 10.2.4.1
	oneM2M TS-0004 [2], clause 7.4.6.2.1
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

			Interoperability Test Description
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
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
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
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
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:	ETSI TS 118 101 [1], clause 10.2.4.1 oneM2M TS-0004 [2], clause 7.4.6.2.1
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
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
4		IOP Check	AE indicates successful operation
5		IOP Check	Registrar CSE sends notify request to AE

			Interoperability Test Description
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
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
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
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
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
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
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	ETSI TS 118 101 [1], clause 10.2.4.1 oneM2M TS-0004 [2], clause 7.3.5.2.1		
<contentInstance>	TD_M2M_SH_01#02	ETSI TS 118 101 [1], clause 10.2.19.2 oneM2M TS-0004 [2], clause 7.3.7.2		
<subscription>	TD_M2M_SH_01#03	ETSI TS 118 101 [1], clause 10.2.11.2 oneM2M TS-0004 [2], clause 7.3.7.2		
<accessControlPolicy>	TD_M2M_SH_01#04	ETSI TS 118 101 [1], clause 10.2.21.1 oneM2M TS-0004 [2], clause 7.3.1.2		
<group>	TD_M2M_SH_01#05	ETSI TS 118 101 [1], clause 10.2.7.2 oneM2M TS-0004 [2], clause 7.3.12.2.1		
<pollingChannel>	TD_M2M_SH_01#06	ETSI TS 118 101 [1], clause 10.2.13.2 oneM2M TS-0004 [2], clause 7.3.21.2.1		
<fanOutPoint>	TD_M2M_SH_01#07	ETSI TS 118 101 [1], clause 10.2.7.6 oneM2M TS-0004 [2], clause 7.3.14.3.1		
<node>	TD_M2M_SH_01#08	ETSI TS 118 101 [1], clause 10.2.14.1 oneM2M 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)
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)
5	Mcc	PRO Check Primitive	• 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
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	ETSI TS 118 101 [1], clause 10.2.4.2 oneM2M TS-0004 [2], clause 7.3.5.2.2		
<contentInstance>	TD_M2M_SH_02#02	ETSI TS 118 101 [1], clause 10.2.19.3 oneM2M TS-0004 [2], clause 7.3.6.2.2		
<subscription>	TD_M2M_SH_02#03	ETSI TS 118 101 [1], clause 10.2.11.3 oneM2M TS-0004 [2], clause 7.3.7.2		
<accessControlPolicy>	TD_M2M_SH_02#04	ETSI TS 118 101 [1], clause 10.2.21.2 oneM2M TS-0004 [2], clause 7.3.1.2		
<group>	TD_M2M_SH_02#05	ETSI TS 118 101 [1], clause 10.2.7.3 oneM2M TS-0004 [2], clause 7.3.12.2.2		
<pollingChannel>	TD_M2M_SH_02#06	ETSI TS 118 101 [1], clause 10.2.13.3 oneM2M TS-0004 [2], clause 7.3.21.2.2		
<fanOutPoint>	TD_M2M_SH_02#07	ETSI TS 118 101 [1], clause 10.2.7.8 oneM2M TS-0004 [2], clause 7.3.14.3.2		
<node>	TD_M2M_SH_02#08	ETSI TS 118 101 [1], clause 10.2.14.2 oneM2M TS-0004 [2], clause 7.3.18.2.2		
<remoteCSE>	TD_M2M_SH_02#09	ETSI TS 118 101 [1], clause 10.2.2.3 oneM2M TS-0004 [2], clause 7.3.3.2.3		
<ae>	TD_M2M_SH_02#10	ETSI TS 118 101 [1], clause 10.2.1.2 oneM2M TS-0004 [2], clause 7.3.5.2.2		
<CSEBase>	TD_M2M_SH_02#11	ETSI TS 118 101 [1], clause 10.2.3.2 oneM2M 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
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
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
7		IOP Check	Check if possible that the response is forwarded by the registrar CSE to the AE
8	Mca	PRO Check Primitive	• rsc = 2004 (CHANGED) • 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			

8.3.1.6 <Resource> update

<Resource>	Identifier	Refs	IOP Verdict	PRO Verdict
<container>	TD_M2M_SH_03#01	ETSI TS 118 101 [1], clause 10.2.4.3 oneM2M TS-0004 [2], clause 7.3.5.2.3		
<subscription>	TD_M2M_SH_03#02	ETSI TS 118 101 [1], clause 10.2.11.4 oneM2M TS-0004 [2], clause 7.3.7.2		
<accessControlPolicy>	TD_M2M_SH_03#03	ETSI TS 118 101 [1], clause 10.2.21.3 oneM2M TS-0004 [2], clause 7.3.1.2		
<group>	TD_M2M_SH_03#04	ETSI TS 118 101 [1], clause 10.2.7.4 oneM2M TS-0004 [2], clause 7.3.12.2.3		
<pollingChannel>	TD_M2M_SH_03#05	ETSI TS 118 101 [1], clause 10.2.13.4 oneM2M TS-0004 [2], clause 7.3.21.2.3		
<fanOutPoint>	TD_M2M_SH_03#06	ETSI TS 118 101 [1], clause 10.2.7.9 oneM2M TS-0004 [2], clause 7.3.14.3.3		
<node>	TD_M2M_SH_03#07	ETSI TS 118 101 [1], clause 10.2.14.3 oneM2M TS-0004 [2], clause 7.3.18.2.3		
<remoteCSE>	TD_M2M_SH_03#08	ETSI TS 118 101 [1], clause 10.2.2.3 oneM2M TS-0004 [2], clause 7.3.3.2.3		
<ae>	TD_M2M_SH_03#09	ETSI TS 118 101 [1], clause 10.2.1.3 oneM2M 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
2	Mca	PRO Check Primitive	• op = 4 (Delete) • to = URI of the resource <Resource> • fr = AE-ID • rqi = (token-string)
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)
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
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
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	ETSI TS 118 101 [1], clause 10.2.4.4 oneM2M TS-0004 [2], clause 7.3.5.2.4		
<contentInstance>	TD_M2M_SH_04#02	ETSI TS 118 101 [1], clause 10.2.19.5 oneM2M TS-0004 [2], clause 7.3.6.2.4		
<subscription>	TD_M2M_SH_04#03	ETSI TS 118 101 [1], clause 10.2.11.5 oneM2M TS-0004 [2], clause 7.3.7.2		
<accessControlPolicy>	TD_M2M_SH_04#04	ETSI TS 118 101 [1], clause 10.2.21.4 oneM2M TS-0004 [2], clause 7.3.1.2		
<group>	TD_M2M_SH_04#05	ETSI TS 118 101 [1], clause 10.2.7.5 oneM2M TS-0004 [2], clause 7.3.12.2.4		
<pollingChannel>	TD_M2M_SH_04#06	ETSI TS 118 101 [1], clause 10.2.13.5 oneM2M TS-0004 [2], clause 7.3.21.2.4		
<fanOutPoint>	TD_M2M_SH_04#07	ETSI TS 118 101 [1], clause 10.2.7.10 oneM2M TS-0004 [2], clause 7.3.14.3.4		
<node>	TD_M2M_SH_04#08	ETSI TS 118 101 [1], clause 10.2.14.4 oneM2M 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:		ETSI TS 118 101 [1], clause 10.2.6 oneM2M 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 criteria (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
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 • 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
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
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:	oneM2M 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
3		IOP Check	Check if possible that a request is sent by the registrar CSE to the Hosting CSE to retrieve 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
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
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
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:	ETSI TS 118 101 [1], clause 10.2.12 oneM2M 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 <container> resource. This triggers or causes the hosting CSE to send a notification to AE

			Interoperability Test Description
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
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
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
7		IOP Check	Check if possible that the response is forwarded by registrar CSE to Hosting CSE
8	Mca	PRO Check Primitive	Registrar CSE sends response containing: - rsc = 2000 (OK) - 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)

8.3.2   <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:		ETSI TS 118 101 [1], clause 10.2.8.8	
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
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 ETSI TS 118 105 [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 ETSI TS 118 106 [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 ETSI TS 118 105 [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 ETSI TS 118 105 [10]

		Interoperability Test Description	
		PRO Check BBF TR069	Successful response of the RPC. Details can be found in clause 8.1 ETSI TS 118 106 [11]
		PRO Check OMA LWM2M	Response with status code 2.01 Created. Details can be found in clause 6.4 ETSI TS 118 105 [10]
7	Mca	PRO Check Primitive	• rsc = 2001 (CREATED) • 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			

8.3.2.2 <mgmtObj> Update

Interoperability Test Description				
Identifier:			TD_M2M_SH_06	
Objective:			AE updates a <mgmtObj> resource	
Configuration:			M2M_CFG_03	
References:			ETSI TS 118 101 [1], clause 10.2.8.10	
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	
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 ETSI TS 118 105 [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 ETSI TS 118 106 [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 ETSI TS 118 105 [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	
		PRO Check OMA DM	Response with status code (200) OK. Details can be found in clause 5.4 ETSI TS 118 105 [10]	
		PRO Check BBF TR069	Successful response of the RPC. Details can be found in clause 8.1 ETSI TS 118 106 [11]	
		PRO Check OMA LWM2M	Response with status code 2.04 Changed. Details can be found in clause 6.4 ETSI TS 118 105 [10]	
7	Mca	PRO Check Primitive	• rsc = 2004 (CHANGED) • 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				

8.3.2.3   <mgmtObj> Retrieve

Interoperability Test Description			
Identifier:	TD_M2M_SH_07		
Objective:	AE retrieves a <mgmtObj> resource		
Configuration:	M2M_CFG_03		
References:	ETSI TS 118 101 [1], clause 10.2.8.9		
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)
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 ETSI TS 118 105 [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 ETSI TS 118 106 [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 ETSI TS 118 105 [10]
7	Mca	PRO Check Primitive	• rsc = 2000 (OK) • 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			

8.3.2.4 <mgmtObj> Delete

Interoperability Test Description			
Identifier:	TD_M2M_SH_08		
Objective:	AE deletes a <mgmtObj> resource		
Configuration:	M2M_CFG_03		
References:	ETSI TS 118 101 [1], clause 10.2.8.11		
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> 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)
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

		Interoperability Test Description	
		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 ETSI TS 118 105 [10]
		PRO Check BBF TR069	Successful response of the RPC. Details can be found in clause 8.1 ETSI TS 118 106 [11]
		PRO Check OMA LWM2M	Response with status code 2.02 Deleted. Details can be found in clause 6.4 ETSI TS 118 105 [10]
7	Mca	PRO Check Primitive	• rsc = 2002 (DELETED) • rqi = (token-string) same as received in request message
8		IOP Check	AE indicates successful operation
IOP Verdict			
PRO Verdict			

8.3.3 Announcement Management

8.3.3.1 AEAnnc Create

Interoperability Test Description	
Identifier:	TD_M2M_SH_12
Objective:	AE1 announces itself to CSE2
Configuration:	M2M_CFG_04
References:	
Pre-test conditions	• <CSEBase> resource has been created in CSE1 with name {CSEBaseName1} • AE1 has created a <AE> resource on registrar CSE with name {AE1} • <CSEBase> resource has been created in CSE2 with name {CSEBaseName2} • CSE1 is registered to CSE2

			Test Sequence
Step	RP	Type	Description
1		Stimulus	AE1 is requested to send an AE Update Request with announceTo attribute set to CSE2 CSE-ID
2	Mca	PRO Check Primitive	• 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 CREATE <AEannc> is sent from CSE1 to CSE2
4	Mcc	PRO Check Primitive	• op = 1 (Create) • to = {CSEBaseName2}/{CSEBaseName1} • fr = CSE1-ID • rqi = (token-string) • ty = 10002 (AEAnnc) • pc = Serialized representation of <AEAnnc> resource
5		IOP Check	Check if possible that the <AEAnnc> resource is created in CSE2 **with only MA attributes**
6	Mcc	PRO Check Primitive	• rsc = 2001 (CREATED) • rqi = (token-string) same as received in request message • pc = Serialized representation of <AEAnnc> resource
7		IOP Check	CSE1 sends a UPDATED response to the AE1
8	Mca	PRO Check Primitive	• rsc = 2004 (UPDATED) • rqi = (token-string) same as received in request message • pc = Serialized representation of <AE> resource
9		IOP Check	AE indicates successful operation
IOP Verdict			
PRO Verdict			

8.3.3.2 ContainerAnnc Create

Interoperability Test Description			
Identifier:	TD_M2M_SH_13		
Objective:	AE1 announces a child container to CSE2		
Configuration:	M2M_CFG_04		
References:			
Pre-test conditions	• <CSEBase> resource has been created in CSE1 with name {CSEBaseName1} • AE1 has created a <AE> resource on registrar CSE with name {AE1} • <CSEBase> resource has been created in CSE2 with name {CSEBaseName2} • AE2 has created a <AE> resource on registrar CSE with name {AE2} • CSE1 is registered to CSE2 • <container> resource is created as a child of AE1 • AE1 is announced on CSE2		
Test Sequence			
Step	**RP**	**Type**	**Description**
1		Stimulus	AE1 is requested to send a an <container> Update Request with announceTo attribute set to CSE2 CSE-ID
2	Mca	PRO Check Primitive	• op = 3 (Update) • to = {CSEBaseName}/{container} • fr = AE-ID • rqi = (token-string) • pc = Serialized representation of updated <container> resource
3		IOP Check	Check if possible that the CREATE <ContainerAnnc> is sent from CSE1 to CSE2
4	Mcc	PRO Check Primitive	• op = 1 (Create) • to = {CSEBaseName2}/{AE1Annc} • fr = CSE1-ID • rqi = (token-string) • ty = 10003 (containerAnnc) • pc = Serialized representation of < containerAnnc > resource
5		IOP Check	Check if possible that the < containerAnnc > resource is created in CSE2 **with only MA attributes**
6	Mcc	PRO Check Primitive	• rsc = 2001 (CREATED) • rqi = (token-string) same as received in request message • pc = Serialized representation of < containerAnnc > resource
7		IOP Check	CSE1 sends a UPDATED response to the AE1
8	Mca	PRO Check Primitive	• rsc = 2004 (UPDATED) • rqi = (token-string) same as received in request message • pc = Serialized representation of <container> resource
9		IOP Check	AE indicates successful operation
IOP Verdict			
PRO Verdict			

8.3.3.3 ContainerAnnc Update

Interoperability Test Description			
Identifier:	TD_M2M_SH_14		
Objective:	AE1 announces an Optional Announce attribute to CSE2		
Configuration:	M2M_CFG_04		
References:			
Pre-test conditions	• <CSEBase> resource has been created in CSE1 with name {CSEBaseName1} • AE1 has created a <AE> resource on registrar CSE with name {AE1} • <CSEBase> resource has been created in CSE2 with name {CSEBaseName2} • AE2 has created a <AE> resource on registrar CSE with name {AE2} • CSE1 is registered to CSE2 • <container> resource is created as a child of AE1 • AE1 is announced on CSE2 • <container> is announced on CSE2		
Test Sequence			
Step	**RP**	**Type**	**Description**
1		Stimulus	AE1 is requested to send a an <container> Update Request with announcedAttribute = maxNrOfInstances

			Interoperability Test Description
2	Mca	PRO Check Primitive	• op = 3 (Update) • to = {CSEBaseName}/{container} • fr = AE-ID • rqi = (token-string) • pc = Serialized representation of updated <container> resource
3		IOP Check	Check if possible that the UPDATE <ContainerAnnc> is sent from CSE1 to CSE2
4	Mcc	PRO Check Primitive	• op = 3 (Update) • to = {CSEBaseName2}/{ ContainerAnnc } • fr = CSE1-ID • rqi = (token-string) • pc = Serialized representation of < containerAnnc > resource
5		IOP Check	Check if possible that the < containerAnnc > resource is update in CSE2 **with maxNrOfInstances attributes**
6	Mcc	PRO Check Primitive	• rsc = 2004 (UPDATED) • rqi = (token-string) same as received in request message • pc = Serialized representation of < containerAnnc > resource
7		IOP Check	CSE1 sends a UPDATED response to the AE1
8	Mca		• rsc = 2004 (UPDATED) • rqi = (token-string) same as received in request message • pc = Serialized representation of <container> resource
9		IOP Check	AE1 indicates successful operation
IOP Verdict			
PRO Verdict			

8.3.3.4 ContainerAnnc Retrieve

Interoperability Test Description			
Identifier:		TD_M2M_SH_15	
Objective:		AE2 retrieves an Announced Resource	
Configuration:		M2M_CFG_04	
References:			
Pre-test conditions:		• <CSEBase> resource has been created in CSE1 with name {CSEBaseName1} • AE1 has created a <AE> resource on registrar CSE with name {AE1} • <CSEBase> resource has been created in CSE2 with name {CSEBaseName2} • AE2 has created a <AE> resource on registrar CSE with name {AE2} • CSE1 is registered to CSE2 • <container> resource is created as a child of AE1 • AE1 is announced on CSE2 • <container> is announced on CSE2	
Test Sequence			
Step	**RP**	**Type**	**Description**
1		Stimulus	AE2 is requested to send a Retrieve Request for a < containerAnnc >
2	Mca	PRO Check Primitive	• op = 2 (Retrieve) • to = {CSEBaseName2}/URI of < containerAnnc > resource • fr = AE2-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 <containerAnnc> resource
4		IOP Check	AE indicates successful operation
IOP Verdict	Verify that this is a containAnnc resource		
PRO Verdict			

8.3.3.5 ContainerAnnc Retrieve Original

Interoperability Test Description	
Identifier:	TD_M2M_SH_16
Objective:	AE2 retrieves the original resource representation of an announced resource
Configuration:	M2M_CFG_04
References:	
Pre-test conditions	<CSEBase> resource has been created in CSE1 with name {CSEBaseName1} - AE1 has created a <AE> resource on registrar CSE with name {AE1} <CSEBase> resource has been created in CSE2 with name {CSEBaseName2} - AE2 has created a <AE> resource on registrar CSE with name {AE2} - CSE1 is registered to CSE2 <container> resource is created as a child of AE1 - AE1 is announced on CSE2 <container> is announced on CSE2

Test Sequence			
Step	RP	Type	Description
1		Stimulus	AE2 is requested to send a Retrieve Request to a < containerAnnc > with rcn = 7
2	Mca	PRO Check Primitive	- op = 2 (Retrieve) - to = {CSEBaseName2}/URI of < containerAnnc > resource - fr = AE2-ID - rqi = (token-string) - rcn = 7 (original) - pc = empty
3		IOP Check	Check if possible that the GET <container> is sent from CSE2 to CSE1
4	Mcc	PRO Check Primitive	- op = 2 (Retrieve) - to = {CSEBaseName1}/{ Container} - fr = AE2-ID - rqi = (token-string) - pc = empty
5		IOP Check	
6	Mcc	PRO Check Primitive	- rsc = 2000 (OK) - rqi = (token-string) same as received in request message - pc = Serialized representation of <container> 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 = 2000 (OK) - rqi = (token-string) same as received in request message - pc = Serialized representation of <container> resource
9		IOP Check	AE indicates successful operation
IOP Verdict			
PRO Verdict			

8.3.3.6 ContainerAnnc Delete by updating announceTo attribute

Interoperability Test Description	
Identifier:	TD_M2M_SH_21
Objective:	AE1 deletes its announced child container from CSE2
Configuration:	M2M_CFG_04
References:	ETSI TS 118 101 [1], clause 10.2.13.4
Pre-test conditions	<CSEBase> resource has been created in CSE1 with name {CSEBaseName1} - AE1 has created a <AE> resource on registrar CSE with name {AE1} <CSEBase> resource has been created in CSE2 with name {CSEBaseName2} - CSE1 is registered to CSE2 - AE1 is announced on CSE2 <container> resource is created as a child of AE1 and announced on CSE2

Test Sequence			
Step	RP	Type	Description
1		Stimulus	AE1 is requested to send a an container Update Request with announceTo attribute set to NULL

			Interoperability Test Description
2	Mca	PRO Check Primitive	• op = 3 (Update) • to = {CSEBaseName1}/{AE1}/{container} • fr = AE-ID • rqi = (token-string) • pc = Serialized representation of updated <container> resource
3		IOP Check	Check if possible that the DELETE <containerAnnc> is sent from CSE1 to CSE2
4	Mcc	PRO Check Primitive	• op = 4 (Delete) • to = {CSEBaseName2}/{AE1Annc}/{containerAnnc} • fr = CSE1-ID • rqi = (token-string)
5		IOP Check	Check if possible that the <containerAnnc> resource is deleted in CSE2
6	Mcc	PRO Check Primitive	• rsc = 2002 (DELETED) • rqi = (token-string) same as received in request message
7		IOP Check	CSE1 sends a UPDATED response to the AE1
8	Mca	PRO Check Primitive	• rsc = 2004 (UPDATED) • rqi = (token-string) same as received in request message • pc = Serialized representation of <container> resource
9		IOP Check	AE indicates successful operation
IOP Verdict			
PRO Verdict			

8.3.3.7 ContainerAnnc Delete by deleting original resource

Interoperability Test Description			
Identifier:	TD_M2M_SH_22		
Objective:	AE1 deletes its announced child container from CSE2		
Configuration:	M2M_CFG_04		
References:	ETSI TS 118 101 [1], clause 10.2.13.4		
Pre-test conditions	• <CSEBase> resource has been created in CSE1 with name {CSEBaseName1} • AE1 has created a <AE> resource on registrar CSE with name {AE1} • <CSEBase> resource has been created in CSE2 with name {CSEBaseName2} • CSE1 is registered to CSE2 • AE1 is announced on CSE2 • <container> resource is created as a child of AE1 and announced on CSE2		
Test Sequence			
Step	**RP**	**Type**	**Description**
1		Stimulus	AE1 is requested to send a an container Delete Request
2	Mca	PRO Check Primitive	• op = 4 (Delete) • to = {CSEBaseName1}/{AE1}/{container} • fr = AE-ID • rqi = (token-string)
3		IOP Check	Check if possible that the DELETE <containerAnnc> is sent from CSE1 to CSE2
4	Mcc	PRO Check Primitive	• op = 4 (Delete) • to = {CSEBaseName2}/{AE1Annc}/{containerAnnc} • fr = CSE1-ID • rqi = (token-string)
5		IOP Check	Check if possible that the <containerAnnc> resource is deleted in CSE2
6	Mcc	PRO Check Primitive	• rsc = 2002 (DELETED) • rqi = (token-string) same as received in request message
7		IOP Check	CSE1 sends a DELETE response to the AE1
8	Mca	PRO Check Primitive	• rsc = 2002 (DELETED) • rqi = (token-string) same as received in request message
9		IOP Check	AE indicates successful operation
IOP Verdict			
PRO Verdict			

8.3.3.8   Announced attribute Create by addition to announcedAttribute attribute

Interoperability Test Description			
Identifier:	TD_M2M_SH_23		
Objective:	AE1 announces an announcable attribute of its child container to CSE2		
Configuration:	M2M_CFG_04		
References:	ETSI TS 118 101 [1], clause 10.2.13.7		
Pre-test conditions	• <CSEBase> resource has been created in CSE1 with name {CSEBaseName1} • AE1 has created a <AE> resource on registrar CSE with name {AE1} • <CSEBase> resource has been created in CSE2 with name {CSEBaseName2} • CSE1 is registered to CSE2 • AE1 is announced on CSE2 • <container> resource is created as a child of AE1 and announced on CSE2		
Test Sequence			
Step	**RP**	**Type**	**Description**
1		Stimulus	AE1 is requested to send a an <container> Update Request with announcedAttribute attribute containing currentNrOfInstances
2	Mca	PRO Check Primitive	• op = 3 (Update) • to = {CSEBaseName1}/{AE1}/{container} • fr = AE-ID • rqi = (token-string) • pc = Serialized representation of updated <container> resource
3		IOP Check	Check if possible that the UPDATE <ContainerAnnc> is sent from CSE1 to CSE2
4	Mcc	PRO Check Primitive	• op = 3 (Update) • to = {CSEBaseName2}/{AE1Annc}/{containerAnnc} • fr = CSE1-ID • rqi = (token-string) • pc = Serialized representation of < containerAnnc > resource
5		IOP Check	Check if possible that the < containerAnnc > resource is updated in CSE2 **with currentNrOfInstances attribute**
6	Mcc	PRO Check Primitive	• rsc = 2004 (UPDATED) • rqi = (token-string) same as received in request message • pc = Serialized representation of < containerAnnc > resource
7		IOP Check	CSE1 sends a UPDATED response to the AE1
8	Mca	PRO Check Primitive	• rsc = 2004 (UPDATED) • rqi = (token-string) same as received in request message • pc = Serialized representation of <container> resource
9		IOP Check	AE indicates successful operation
IOP Verdict			
PRO Verdict			

8.3.3.9   Announced attribute Create by creation of a MA attribute at the original resource

Interoperability Test Description			
Identifier:	TD_M2M_SH_24		
Objective:	AE1 announces an MA attribute of its child container to CSE2		
Configuration:	M2M_CFG_04		
References:			
Pre-test conditions	• <CSEBase> resource has been created in CSE1 with name {CSEBaseName1} • AE1 has created a <AE> resource on registrar CSE with name {AE1} • <CSEBase> resource has been created in CSE2 with name {CSEBaseName2} • CSE1 is registered to CSE2 • AE1 is announced on CSE2 • <container> resource is created as a child of AE1 and announced on CSE2		
Test Sequence			
Step	**RP**	**Type**	**Description**
1		Stimulus	AE1 is requested to send a an <container> Update Request with labels attribute

			Interoperability Test Description
2	Mca	PRO Check Primitive	• op = 3 (Update) • to = {CSEBaseName1}/{AE1}/{container} • fr = AE-ID • rqi = (token-string) • pc = Serialized representation of updated <container> resource
3		IOP Check	Check if possible that the UPDATE <ContainerAnnc> is sent from CSE1 to CSE2
4	Mcc	PRO Check Primitive	• op = 3 (Update) • to = {CSEBaseName2}/{AE1Annc}/{containerAnnc} • fr = CSE1-ID • rqi = (token-string) • pc = Serialized representation of < containerAnnc > resource
5		IOP Check	Check if possible that the < containerAnnc > resource is updated in CSE2 **with labels attribute**
6	Mcc	PRO Check Primitive	• rsc = 2004 (UPDATED) • rqi = (token-string) same as received in request message • pc = Serialized representation of < containerAnnc > resource
7		IOP Check	CSE1 sends a UPDATED response to the AE1
8	Mca	PRO Check Primitive	• rsc = 2004 (UPDATED) • rqi = (token-string) same as received in request message • pc = Serialized representation of <container> resource
9		IOP Check	AE indicates successful operation
IOP Verdict			
PRO Verdict			

8.3.3.10 Announced attribute Delete by deletion from announcedAttribute attribute

Interoperability Test Description	
Identifier:	TD_M2M_SH_25
Objective:	AE1 de-announces an announcable attribute of its child container to CSE2
Configuration:	M2M_CFG_04
References:	ETSI TS 118 101 [1], clause 10.2.13.8
Pre-test conditions	• <CSEBase> resource has been created in CSE1 with name {CSEBaseName1} • AE1 has created a <AE> resource on registrar CSE with name {AE1} • <CSEBase> resource has been created in CSE2 with name {CSEBaseName2} • CSE1 is registered to CSE2 • AE1 is announced on CSE2 • <container> resource is created as a child of AE1 and announced on CSE2 with currentNrOfInstances attribute announced

Test Sequence			
Step	**RP**	**Type**	**Description**
1		Stimulus	AE1 is requested to send a <container> Update Request with announcedAttribute attribute set to NULL
2	Mca	PRO Check Primitive	• op = 3 (Update) • to = {CSEBaseName1}/{AE1}/{container} • fr = AE-ID • rqi = (token-string) • pc = Serialized representation of updated <container> resource
3		IOP Check	Check if possible that the UPDATE <ContainerAnnc> is sent from CSE1 to CSE2
4	Mcc	PRO Check Primitive	• op = 3 (Update) • to = {CSEBaseName2}/{AE1Annc}/{containerAnnc} • fr = CSE1-ID • rqi = (token-string) • pc = Serialized representation of < containerAnnc > resource
5		IOP Check	Check if possible that the < containerAnnc > resource is updated in CSE2 **with no currentNrOfInstances attribute**
6	Mcc	PRO Check Primitive	• rsc = 2004 (UPDATED) • rqi = (token-string) same as received in request message • pc = Serialized representation of < containerAnnc > resource
7		IOP Check	CSE1 sends a UPDATED response to the AE1
8	Mca	PRO Check Primitive	• rsc = 2004 (UPDATED) • rqi = (token-string) same as received in request message • pc = Serialized representation of <container> resource

Interoperability Test Description			
9		IOP Check	AE indicates successful operation
IOP Verdict			
PRO Verdict			

8.3.3.11 Announced attribute Delete by deletion of a MA attribute at the original resource

Interoperability Test Description			
Identifier:		TD_M2M_SH_26	
Objective:		AE1 de-announces an MA attribute (conditionally mandatory) of its child container to CSE2	
Configuration:		M2M_CFG_04	
References:			
Pre-test conditions		<CSEBase> resource has been created in CSE1 with name {CSEBaseName1} - AE1 has created a <AE> resource on registrar CSE with name {AE1} <CSEBase> resource has been created in CSE2 with name {CSEBaseName2} - CSE1 is registered to CSE2 - AE1 is announced on CSE2 <container> resource is created as a child of AE1 and announced on CSE2 with labels attribute announced	
Test Sequence			
Step	**RP**	**Type**	**Description**
1		Stimulus	AE1 is requested to send a <container> Update Request with labels attribute set to NULL
2	Mca	PRO Check Primitive	- op = 3 (Update) - to = {CSEBaseName1}/{AE1}/{container} - fr = AE-ID - rqi = (token-string) - pc = Serialized representation of updated <container> resource
3		IOP Check	Check if possible that the UPDATE <ContainerAnnc> is sent from CSE1 to CSE2
4	Mcc	PRO Check Primitive	- op = 3 (Update) - to = {CSEBaseName2}/{AE1Annc}/{containerAnnc} - fr = CSE1-ID - rqi = (token-string) - pc = Serialized representation of < containerAnnc > resource
5		IOP Check	Check if possible that the < containerAnnc > resource is updated in CSE2 **with no labels attribute**
6	Mcc	PRO Check Primitive	- rsc = 2004 (UPDATED) - rqi = (token-string) same as received in request message - pc = Serialized representation of < containerAnnc > resource
7		IOP Check	CSE1 sends a UPDATED response to the AE1
8	Mca	PRO Check Primitive	- rsc = 2004 (UPDATED) - rqi = (token-string) same as received in request message - pc = Serialized representation of <container> resource
9		IOP Check	AE indicates successful operation
IOP Verdict			
PRO Verdict			

8.3.4 Single Hop <fanOutPoint> operations

8.3.4.1 Create <fanOutPoint>

Interoperability Test Description	
Identifier:	TD_M2M_SH_17
Objective:	AE creates a <contentInstance> resource in each group member, where some memberIDs are on a remoteCSE
Configuration:	M2M_CFG_08
References:	ETSI TS 118 101 [1], clause 10.2.7.6 oneM2M TS-0004 [2], clause 7.4.14.2, 7.4.14.3
Pre-test conditions	• Two or more resources of type <container> exist on the member hosting CSE • A group exists containing these two members of type <container>

Test Sequence			
Step	**RP**	**Type**	**Description**
1		Stimulus	AE is requested to send a Create Request to create <contentInstance> in each group member
2	Mca	PRO Check Primitive	• op = 1 (Create) • to = {CSEBaseName}/{group}/fopt • fr = AE-ID • rqi = (token-string) • ty = 4 (contentInstance) • pc = Serialized representation of <contentInstance> resource
3		IOP Check	Check if possible that the request is forwarded by the registrar/Group Hosting CSE to the Member Hosting CSE
4	Mcc	PRO Check Primitive	• op = 1 (Create) • to = {MemberCSEBaseName}/{subgroupId}/fopt • or {MemberCSEBaseName}/{memberId} • fr = AE-ID • rqi = (token-string) • gid = (grpId-token-string) • ty = 4 (contentInstance) • pc = Serialized representation of <contentInstance> resource
5		IOP Check	Check if possible that the <contentInstance> resource is created in the Member Hosting CSE
6	Mcc	PRO Check Primitive	• rsc = 2001 (CREATED) • rqi = (token-string) same as received in request message • gid = (grpId-token-string) same as received in request message • pc = Serialized representation of <contentInstance> resource or <aggregated response>
7		IOP Check	Check that the response is aggregated by the group hosting CSE and sent to the AE
8	Mca	PRO Check Primitive	• rsc = 2001 (CREATED) • rqi = (token-string) same as received in request message • pc = Serialized representation of <aggregated response>
9		IOP Check	AE indicates successful operation
IOP Verdict			
PRO Verdict			

8.3.4.2 Retrieve <fanOutPoint>

Interoperability Test Description	
Identifier:	TD_M2M_SH_18
Objective:	AE retrieves a <container> resource from each group member, where some memberIDs are on a remoteCSE
Configuration:	M2M_CFG_08
References:	ETSI TS 118 101 [1], clause 10.2.7.7
Pre-test conditions:	• Two or more resources of type <container> exist on the member hosting CSE • A group exists containing these two 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

		Interoperability Test Description	
2	Mca	PRO Check Primitive	• op = 2 (Retrieve) • to = {CSEBaseName}/{group}/fopt • fr = AE-ID • rqi = (token-string)
3		IOP Check	Check if possible that the request is forwarded by the registrar/group hosting CSE to the Member Hosting CSE
4	Mcc	PRO Check Primitive	• op = 2 (Retrieve) • to = {MemberCSEBaseName}/{subgroupId}/fopt • or {MemberCSEBaseName}/{memberId} • fr = AE-ID • rqi = (token-string) • gid = (grpId-token-string)
5	Mcc	PRO Check Primitive	• rsc = 2000 (OK) • rqi = (token-string) same as received in request message • gid = (grpId-token-string) same as received in request message • pc = Serialized representation of <container> resource
6		IOP Check	Check that the response is aggregated by the group hosting CSE and sent to the AE
7	Mca	PRO Check Primitive	• rsc = 2000 (OK) • rqi = (token-string) same as received in request message • pc = Serialized representation of <aggregated_response>
8		IOP Check	AE indicates successful operation
IOP Verdict			
PRO Verdict			

8.3.4.3 Update <fanOutPoint>

Interoperability Test Description			
Identifier:			TD_M2M_SH_19
Objective:			AE updates a <container> resource in each group member, where some memberIDs are on a remoteCSE
Configuration:			M2M_CFG_08
References:			ETSI TS 118 101 [1], clause 10.2.7.8
Pre-test conditions:			• Two or more resources of type <container> exist on the member hosting CSE • A <group> exists containing these two 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	Mca	PRO Check Primitive	• op = 3 (Update) • to = {CSEBaseName}/{group}/fopt • fr = AE-ID • rqi = (token-string) • pc = Serialized representation of <container> resource
3		IOP Check	Check if possible that the request is forwarded by the registrar/group hosting CSE to the Member Hosting CSE
4	Mcc	PRO Check Primitive	• op = 3 (Update) • to = {MemberCSEBaseName}/{subgroupId}/fopt • or {MemberCSEBaseName}/{memberId} • fr = AE-ID • rqi = (token-string) • pc = Serialized representation of <container> 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 • gid = (grpId-token-string) same as received in request message • pc = Serialized representation of <container> resource or <aggregated response>
7		IOP Check	Check that the response is aggregated by the group hosting CSE and sent to the AE
8	Mca	PRO Check Primitive	• rsc = 2004 (CHANGED) • rqi = (token-string) same as received in request message • pc = Serialized representation of <aggregated response>
9		IOP Check	AE indicates successful operation

Interoperability Test Description	
IOP Verdict	
PRO Verdict	

8.3.4.4 Delete <fanOutPoint>

Interoperability Test Description			
Identifier:		TD_M2M_SH_20	
Objective:		AE deletes a <contentInstance> resource from each group member, where some memberIDs are on a remoteCSE	
Configuration:		M2M_CFG_08	
References:		ETSI TS 118 101 [1], clause 10.2.7.9	
Pre-test conditions:		• Two or more resources of type <container> exist on the member hosting CSE • Each <container> has at least 1 <contentInstance> • A group exists containing these two 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	Mca	PRO Check Primitive	• op = 4 (Delete) • to = {CSEBaseName}/{group}/fopt/ol • fr = AE-ID • rqi = (token-string)
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 = {MemberCSEBaseName}/{subgroupId}/fopt/ol • or {MemberCSEBaseName}/{memberId}/ol • fr = AE-ID • rqi = (token-string) • gid = (grpId-token-string)
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 • gid = (grpId-token-string) same as received in request message
7		IOP Check	Check that the response is aggregated by the group hosting CSE and sent to the AE
8	Mca	PRO Check Primitive	• rsc = 2002 (DELETED) • rqi = (token-string) same as received in request message • pc = Serialized representation of <aggregated_response>
9		IOP Check	AE indicates successful operation
IOP Verdict			
PRO Verdict			

8.4 Security management

8.4.1 Secure AE Registration

8.4.1.1 PSK Security Association Establishment Framework

Interoperability Test Description	
Identifier:	TD_M2M_SE_01
Objective:	AE uses Provisioned Symmetric Key Security Association Establishment Framework to enable mutual authentication with the Registrar CSE. Registrar CSE performs AE authorization check on incoming AE registration request
Configuration:	M2M_CFG_01
References:	ETSI TS 118 103 [12], clause 8.2.2.1 ETSI TS 118 101 [1], clauses 9.6.29, 9.6.19, 9.16.20
Pre-test conditions:	• AE and Registrar CSE are pre-Provisioned with Kpsa = 123456,KpsaId = test@onem2m.com and Cipher Suites = TLS_PSK_WITH_AES_128_CBC_SHA256, TLS_PSK_WITH_AES_128_CCM_8 • Registrar CSE is provisioned with Service Subscribed Profile and Service Subscribed Node Resources • Service Subscribed Node contains csi <Registrar CSE-ID> and rlk < URI of serviceSubscribedAppRule > attributes • Registrar CSE is configured with <serviceSubscribedAppRule> resource having a CredentialD, APP-ID and AE-ID with the following values: • <m2m:asar rn="asar"> • <aci>00-test@onem2m.com</aci> • <aai>APP01</aai> • <aae>AE-ID</aae> • </m2m:asar>

Test Sequence			
Step	**RP**	**Type**	**Description**
1		Stimulus	AE is requested to send a primitive to the Registrar CSE
2	Mca	PRO Check Primitive	Security Association Establishment
		PRO Check TCP	TLS Handshake • Cipher Suite:TLS_PSK_WITH_AES_128_CBC_SHA256 • Version: TLS v1.2 • KpsaId = test@onem2m.com
		PRO Check UDP	DTLS Handshake • Cipher Suite:TLS_PSK_WITH_AES_128_CCM_8 • Version: DTLS v1.2 • KpsaId = test@onem2m.com
3		IOP Check	Check if possible that Handshake was successful
4	Mca	PRO Check Primitive	• op = 1 (Create) • to = {CSEBaseName} • fr = AE-ID • rqi = (token-string) • ty = 2 (AE) • pc = Serialized representation of <AE> resource
5		IOP Check	Check that APP-ID, AE-ID, Credential ID are in <serviceSubscribedAppRule> Check if possible that the <AE> resource is created in registrar CSE
6	Mca	PRO Check Primitive	• rsc = 2001 (CREATED) • rqi = (token-string) same as received in request message • pc = Serialized representation of <AE> resource
7		IOP Check	AE indicates successful operation
IOP Verdict			
PRO Verdict			

8.4.2 Authentication

8.4.2.1 Authentication using the Provisioned Symmetric Key Security Association Establishment Framework with TLS

Interoperability Test Description			
Identifier:	TD_M2M_SE_02		
Objective:	AE establishes mutual authentication with the Registrar CSE using Provisioned Symmetric Key Security Association Establishment Framework		
Configuration:	M2M_CFG_01		
References:	ETSI TS 118 103 [12], clause 8.2.2.1		
Pre-test conditions:	• AE and Registrar CSE are pre-Provisioned with Kpsa = 123456,KpsaId = test@onem2m.com and Cipher Suites = TLS_PSK_WITH_AES_128_CBC_SHA256		
Test Sequence			
Step	**RP**	**Type**	**Description**
1		Stimulus	The TLS client on AE sends a Client Hello Handshake message
2	Mca	PRO Check TCP	Client Hello handshake message • Handshake Type = 0x01 (Client Hello) • Cipher Suite:TLS_PSK_WITH_AES_128_CBC_SHA256 • Version: TLS v1.2
3	Mca	PRO Check TCP	Server Hello handshake message • Handshake Type = 0x02 (Server Hello) • Cipher Suite:TLS_PSK_WITH_AES_128_CBC_SHA256 • Version: TLS v1.2 Server Hello Done handshake message • Handshake Type = 0x0e (Server Hello Done)
4		Stimulus	The TLS client on AE sends Client Key Exchange, Change Cipher Spec, Finished messages
5	Mca	PRO Check TCP	The TLS client Key Exchange handshake message • Handshake Type = 0x10 (Client Key Exchange) • psk_identity = test@onem2m.com • Version: TLS v1.2 Client Change Cipher Spec message • Content type = 0x14 (Change Cipher Spec) Client Finished handshake message • Handshake Type = 0x14 (Client Finished) • Version: TLS v1.2
6		IOP Check	Check that The TLS server authenticated the Client by validating Verify Data Check that AE associated the established TLS session with the CSE-ID
7	Mca	PRO Check TCP	Server New Session Ticket handshake message • Handshake Type = 0x04 (New Session Ticket) • psk_identity = test@onem2m.com • Version: TLS v1.2 Server Change Cipher Spec message • Content type = 0x14 (Change Cipher Spec) Server Finished handshake message • Handshake Type = 0x14 (Client Finished) • Version: TLS v1.2
8		IOP Check	Check that The TLS client authenticated the Server by validating Verify Data
IOP Verdict			
PRO Verdict			

8.4.2.2 Authentication using the Certificate-Based Security Association Establishment Framework with TLS

Interoperability Test Description	
Identifier:	TD_M2M_SE_03
Objective:	AE establishes mutual authentication with the Registrar CSE using Certificate-Based Security Association Establishment Framework
Configuration:	M2M_CFG_01
References:	ETSI TS 118 103 [12], clause 8.2.2.2
Pre-test conditions:	• The Registrar CSE uses the CSE-ID certificate signed by a root CA certificate • AE uses the AE-ID certificate signed by a root CA certificate • Cipher Suite = TLS_ECDHE_ECDSA_WITH_AES_128_CBC_SHA256

Test Sequence			
Step	**RP**	**Type**	**Description**
1		Stimulus	The TLS client on AE sends a client Hello Handshake message
2	Mca	PRO Check TCP	The TLS client sends a Hello handshake message to the TLS server • Handshake Type = 0x01 (Client Hello) • Cipher Suite: TLS_ECDHE_ECDSA_WITH_AES_128_CBC_SHA256 • Version: TLS v1.2
3	Mca	PRO Check TCP	The TLS server sends Hello, Certificate, Key Exchange, Certificate Request, Hello Done messages to the TLS client Server Hello handshake message • Handshake Type = 0x02 (Server Hello) • Cipher Suite: TLS_ECDHE_ECDSA_WITH_AES_128_CBC_SHA256 • Version: TLS v1.2 Server Certificate handshake message • Handshake Type = 0x0b (Server Certificate) • Certificate: the Registrar CSE certificate Server Key Exchange handshake message • Handshake Type = 0x0c (Server Key Exchange) • Public key: ECDHE generated key Server Certificate Request handshake message • Handshake Type = 0x0d (Certificate Request) Server Hello Done handshake message • Handshake Type = 0x0e (Server Hello Done)
4		IOP Check	The TLS client on AE checks if the certificate of the Server is valid
5		Stimulus	The TLS client on AE sends Certificate, Client Key exchange, Certificate Verify, Change Cipher Spec, Finished messages
6	Mca	PRO Check TCP	Client Certificate handshake message • Handshake Type = 0x0b (Client Certificate) • Certificate: AE certificate Client Key Exchange message • Handshake Type = 0x10 (Client Key Exchange) • Public key: ECDHE generated key Client Certificate Verify message • Handshake Type = 0x0f (Certificate Verify) Client Change Cipher Spec message • Content type = 0x14 (Change Cipher Spec) Client Finished handshake message • Handshake Type = 0x14 (Client Finished)
7		IOP Check	The TLS server on CSE checks if the certificate of the Client is valid

Interoperability Test Description			
8	Mca	PRO Check TCP	The TLS server sends New Session Ticket, Change Cipher Spec, and Finished messages to the TLS client Server New Session Ticket message • Handshake Type = 0x04 (New Session Ticket) Server Change Cipher Spec message • Content type = 0x14 (Change Cipher Spec) Server Finished message • Handshake Type = 0x14 (Client Finished) • Version: TLS v1.2
9		IOP Check	Check that The TLS client authenticated the Server by validating Verify Data
IOP Verdict			
PRO Verdict			

8.4.3 Authorization

8.4.3.1 Authorization using selfPrivileges

Interoperability Test Description	
Identifier:	TD_M2M_SE_04
Objective:	AE accesses <accessControlPolicy> resource using its selfPrivileges credentials
Configuration:	M2M_CFG_01
References:	ETSI TS 118 101 [1], clause 9.6.2.0
Pre-test conditions:	• CSEBase resource has been created in registrar CSE with name {CSEBaseName} • AE has created an <AE> resource on registrar CSE with name {AE} • accessControlPolicy resource has been created in registrar CSE under <AE> resource with name {accessControlPolicyName} • selfPrivileges attribute of {accessControlPolicyName} contains the following access control tuple: acor = AE-ID acop = 63

Test Sequence			
Step	RP	Type	Description
1		Stimulus	AE is requested to send an accessControlPolicy Retrieve Request
2	Mca	PRO Check Primitive	• 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
4		IOP Check	AE indicates successful operation
IOP Verdict			
PRO Verdict			

8.4.3.2 Authorization using accessControlPolicy privileges

Interoperability Test Description			
Identifier:	TD_M2M_SE_05		
Objective:	AE accesses <AE> resource using its accessControlPolicyIDs attribute		
Configuration:	M2M_CFG_01		
References:	ETSI TS 118 101 [1], clause 9.6.2.0		
Pre-test conditions:	- CSEBase resource has been created in registrar CSE with name {CSEBaseName} - AE has created an <AE> resource on registrar CSE with name {AE} - accessControlPolicy resource has been created in registrar CSE under <AE> resource with name {accessControlPolicyName} - accessControlPolicyIDs attribute of {AE} is set to resource id of {accessControlPolicyName} - privileges attribute of {accessControlPolicyName} contains the following access control tuple: acor = AE-ID acop = 34		
Test Sequence			

Step	RP	Type	Description
1		Stimulus	AE is requested to send an AE Retrieve Request
2	Mca	PRO Check Primitive	- op = 2 (Retrieve) - to = {CSEBaseName}/{AE} - 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
4		IOP Check	AE indicates successful operation
5		Stimulus	AE is requested to send an AE Delete Request
6	Mca	PRO Check Primitive	- op = 4 (Delete) - to = {CSEBaseName}/{AE} - fr = AE-ID - rqi = (token-string) - pc = empty
7	Mca	PRO Check Primitive	Registrar CSE sends response containing: - rsc = 4103 (ACCESS_DENIED) - rqi = (token-string) same as received in request message pc = empty
8		IOP Check	Check if possible that the <AE> resource has not been removed in registrar CSE.
9		IOP Check	AE indicates unsuccessful operation (Delete error - no privilege)
IOP Verdict			
PRO Verdict			

8.4.3.3 Authorization using default access privileges (owner is configured)

Interoperability Test Description	
Identifier:	TD_M2M_SE_06
Objective:	AE accesses <AE> resource using default access privileges
Configuration:	M2M_CFG_01
References:	ETSI TS 118 101 [1], clause 9.6.2.0
Pre-test conditions:	- CSEBase resource has been created in registrar CSE with name {CSEBaseName} - AE has created an <AE> resource on registrar CSE with name {AE} <container> resource has been created in registrar CSE under <AE> resource with name {containerName} - accessControlPolicyIDs attribute of {containerName} is *NULL* - owner attribute of {containerName} = AE-ID

Interoperability Test Description			
Test Sequence			
Step	**RP**	**Type**	**Description**
1		Stimulus	AE is requested to send a container Retrieve Request
2	Mca	PRO Check Primitive	• op = 2 (Retrieve) • to = {CSEBaseName}/{AE}/{containerName} • 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
4		IOP Check	AE indicates successful operation
5		Stimulus	AE2 is requested to send a container Retrieve Request
6	Mca	PRO Check Primitive	• op = 2 (Retrieve) • to = {CSEBaseName}/{AE}/{containerName} • fr = AE2-ID • rqi = (token-string) • pc = empty
7	Mca	PRO Check Primitive	Registrar CSE sends response containing: • rsc = 4103 (ACCESS_DENIED) • rqi = (token-string) same as received in request message • pc = empty
8		IOP Check	AE indicates unsuccessful operation (Retrieve error - no privilege)
IOP Verdict			
PRO Verdict			

8.4.3.4 Authorization using default access privileges (owner is not configured)

Interoperability Test Description	
Identifier:	TD_M2M_SE_07
Objective:	AE accesses <AE> resource using default access privileges
Configuration:	M2M_CFG_01
References:	ETSI TS 118 101 [1], clause 9.6.2.0
Pre-test conditions:	• CSEBase resource has been created in registrar CSE with name {CSEBaseName} • AE has created an <AE> resource on registrar CSE with name {AE} • <container> resource has been created in registrar CSE under <AE> resource with name {containerName} • accessControlPolicyIDs attribute of {containerName} is *NULL* • owner attribute of {containerName} is not set • creator attribute of {containerName} = AE-ID

Test Sequence			
Step	**RP**	**Type**	**Description**
1		Stimulus	AE is requested to send a ContainerRetrieve Request
2	Mca	PRO Check Primitive	• op = 2 (Retrieve) • to = {CSEBaseName}/{AE}/{containerName} • 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
4		IOP Check	AE indicates successful operation
5		Stimulus	AE2 is requested to send a Container Retrieve Request
6	Mca	PRO Check Primitive	• op = 2 (Retrieve) • to = {CSEBaseName}/{AE}/{containerName} • fr = AE2-ID • rqi = (token-string) • pc = empty

		Interoperability Test Description	
7	Mca	PRO Check Primitive	Registrar CSE sends response containing: • rsc = 4103 (ACCESS_DENIED) • rqi = (token-string) same as received in request message • pc = empty
8		IOP Check	AE indicates unsuccessful operation (Retrieve error - no privilege)
IOP Verdict			
PRO Verdict			

8.4.3.5 Direct Dynamic Authorization

Interoperability Test Description	
Identifier:	TD_M2M_SE_08
Objective:	AE accesses <AE> resource using Direct Dynamic Authorization
Configuration:	M2M_CFG_01
References:	ETSI TS 118 103 [12] , clause 7.3.2.2
Pre-test conditions:	• CSEBase resource has been created in registrar CSE with name {CSEBaseName} • AE has created an <AE> resource on registrar CSE with name {AE} • <container> resource has been created in registrar CSE under <AE> resource with name {containerName} • Arbitrary set of <accessControlPolicy> resources are linked to the {containerName}

Test Sequence			
Step	**RP**	**Type**	**Description**
1		Stimulus	AE is requested to send a Container Retrieve Request
2	Mca	PRO Check Primitive	• op = 2 (Retrieve) • to = {CSEBaseName}/{AE}/{containerName} • fr = AE-ID • rqi = (token-string) • pc = empty
3		IOP Check	Check if possible that Tokens or Token-Ids have not been included in the request
4		IOP Check	Check if possible that CSE selected a DAS Server based on accessControlRules linked to the requested resource
5	Mca	PRO Check Primitive	Registrar CSE sends a Notify request to the DAS server: • op = 6 (Notify) • pc: securityInfo: Direct Dynamic Authorization Originator = AE-ID Originator Resource Type = 3 (Container) Operation = 2 (Retrieve)
6		IOP Check	Check that if the DAS Server issued token(s), they conform to the Token structure (ETSI TS 118 103 [12], clause 7.3.2.4)
7	Mca	PRO Check Primitive	The DAS server responds to the Registrar CSE: • op = 6 (Notify response) • pc: securityInfo: Direct Dynamic Authorization (optional) token(s): authorization token(s) (optional) dynamicACPInfo: information for creating accessControlPolicy dynamicaly
8		IOP Check	Check that if token(s) present in response content, the token is validated in the Registrar CSE successfully (ETSI TS 118 103 [12], clause 7.3.2.5)
9		IOP Check	Check that if dynamicACPInfo present in response content, the Registrar CSE created <accessControlPolicy> resource matching the dynamicACPInfo.
10	Mca	PRO Check Primitive	If access is granted, the Registrar CSE responds to the AE: • rsc = 2000 (OK) • rqi = (token-string) same as received in request message • pc = Serialized representation of <container> resource If access is not granted, the Registrar CSE responds to the AE: • rsc = 4103 (ACCESS_DENIED) • rqi = (token-string) same as received in request message • pc = empty

Interoperability Test Description			
11		IOP Check	If access is granted, AE indicates successful operation, otherwise AE indicates unsuccessful operation (Retrieve error - no privilege)
IOP Verdict			
PRO Verdict			

8.4.3.6　　Indirect Dynamic Authorization

Interoperability Test Description			
Identifier:			TD_M2M_SE_09
Objective:			AE accesses <AE> resource using Indirect Dynamic Authorization
Configuration:			M2M_CFG_01
References:			ETSI TS 118 103 [12] , clause 7.3.2.3
Pre-test conditions:			• CSEBase resource has been created in registrar CSE with name {CSEBaseName} • AE has created an <AE> resource on registrar CSE with name {AE} • <container> resource has been created in registrar CSE under <AE> resource with name {containerName} • Arbitrary set of <accessControlPolicy> resources are linked to the {containerName}
Test Sequence			
Step	**RP**	**Type**	**Description**
1		Stimulus	AE is requested to send a Container Retrieve Request
2	Mca	PRO Check Primitive	• op = 2 (Retrieve) • to = {CSEBaseName}/{AE}/{containerName} • fr = AE-ID • rqi = (token-string) • pc = empty
3	Mca	PRO Check Primitive	• rsc = 4103 (ACCESS_DENIED) • rqi = (token-string) same as received in request message • tqf: DAS Server PoA • pc = empty
4		IOP Check	AE indicates unsuccessful operation (Retrieve error - no privilege)
5		Stimulus	AE is requested to send a token request to the DAS using original request data. *AuthorSignIndicator* parameter is optional.
6		IOP Check	Check that if the DAS Server issued token(s), they conform to the Token structure (ETSI TS 118 103 [12], clause 7.3.2.4)
7		Stimulus	AE is requested to send a Container Retrieve Request with additional token(s) information
8	Mca	PRO Check Primitive	• op = 2 (Retrieve) • to = {CSEBaseName}/{AE}/{containerName} • fr = AE-ID • rqi = (token-string) • (optional) tkns: token(s) if ESData-protected Token(s) are provided • (optional) tids: token Id(s) if ESData-protected Token(s) are not provided • pc = empty
9	Mca	PRO Check Primitive	If the request in step 7 includes token Id(s), the Registrar CSE sends a Notify request to the DAS Server: • op = 6 (Notify) • securityInfo Type: Indirect Dynamic Authorization • pc: 　tids: token Id(s)
10	Mca	PRO Check Primitive	The DAS server responds to the Registrar CSE: • op = 6 (Notify response) • pc: 　securityInfo: Indirect Dynamic Authorization 　token(s): authorization token(s) corresponding token Id(s)
12		IOP Check	Check that the token(s) are validated in the Registrar CSE successfully (ETSI TS 118 103 [12], clause 7.3.2.5)
13		IOP Check	If access is granted, AE indicates successful operation, otherwise AE indicates unsuccessful operation (Retrieve error - no privilege)

			Interoperability Test Description
14	Mca	PRO Check Primitive	If access is granted, the Registrar CSE responds to the AE: • rsc = 2000 (OK) • ltids: Local-Token-ID(s) • tkns: Token(s) • rqi = (token-string) same as received in request message • pc = Serialized representation of <container> resource If access is not granted, the Registrar CSE responds to the AE: • rsc = 4103 (ACCESS_DENIED) • rqi = (token-string) same as received in request message pc = empty
15		IOP Check	If access is granted, AE indicates successful operation, otherwise AE indicates unsuccessful operation (Retrieve error - no privilege)
IOP Verdict			
PRO Verdict			

8.4.4 Key provisioning management

8.4.4.1 MEF Handshake Procedure using certificates

Interoperability Test Description			
Identifier:			TD_M2M_SE_10
Objective:			A MEF Handshake procedure establishes a mutually authenticated TLS session for protecting the communication between an MEF Client and MEF using pre-provisioned certificates.
Configuration:			M2M_CFG_01
References:			ETSI TS 118 103 [12], clause 8.3.5.2.2
Pre-test conditions:			• The MEF Client and MEF have been provisioned with certificates and Cipher Suite = TLS_PSK_WITH_AES_128_CBC_SHA256
Test Sequence			
Step	**RP**	**Type**	**Description**
1		Stimulus	MEF Client and MEF establish the TLS or DTLS session using the certificate-based TLS handshake
2		IOP Check	Check that MEF Handshake is successful Check that the MEF's certificate is verified against the set of provisioned MEF certificate trust anchors (as described in ETSI TS 118 103 [12])
IOP Verdict			
PRO Verdict			

8.4.4.2 MEF Handshake Procedure using Master Credentials

Interoperability Test Description			
Identifier:			TD_M2M_SE_ 11
Objective:			A MEF Handshake procedure establishes a mutually authenticated TLS or DTLS session for protecting the communication between an MEF Client and MEF using pre-provisioned Master Credentials.
Configuration:			M2M_CFG_01
References:			ETSI TS 118 103 [12], clause 8.3.5.2.2
Pre-test conditions:			• The MEF Client and MEF have been provisioned with Kpm = 123456, KpmID = psk_identity, and Cipher Suites = TLS_PSK_WITH_AES_128_CBC_SHA256, TLS_PSK_WITH_AES_128_CCM_8
Test Sequence			
Step	**RP**	**Type**	**Description**
1		Stimulus	MEF Client and MEF establish the TLS or DTLS session using the certificate-based TLS handshake
2	Mca	PRO Check TCP/UDP	• psk_identity = test@onem2m.com • psk = 123456
3		IOP Check	Check that MEF Handshake is successful

Interoperability Test Description	
IOP Verdict	
PRO Verdict	

8.4.4.3 MEF Client Registration Procedure

Interoperability Test Description			
Identifier:	TD_M2M_SE_ 12		
Objective:	The MEF Client registers with the MEF to confirm that it is willing to use the services of the MEF, under the authorization of the administrating stakeholder		
Configuration:	M2M_CFG_01		
References:	ETSI TS 118 103 [12], clause 8.3.5.2.3		
Pre-test conditions:	• The MEF Client, and MEF have been provisioned with the parameters described in ETSI TS 118 103 [12], clause 8.3.7		
Test Sequence			
Step	RP	Type	Description
1		Stimulus	The MEF Client establishes a TLS (or DTLS) connection with the MEF by performing the MEF Handshake procedure
2		Stimulus	The MEF Client sends a MEF Client Registration request
3	Mca	PRO Check TCP/UDP	• MEF-FQDN = FQDN of the MEF • adminFQDN = FQDN of the administrating stakeholder • expirationTime = time when the registration shall expire
4		IOP Check	Check if possible that MEF has created a MEF Client Registration record
5	Mca	PRO Check TCP/UDP	The MEF sends a MEF Client Registration response • MEFClientRegID = Identifier for the new MEF Client Registration • expirationTime = time when the MEF Client Registration record shall expire • MEF Client ID = Identifier of the MEF Client • adminFQDN = FQDN of the administrating stakeholder
6		IOP Check	Check if possible that MEF Client has stored parameters provided by the MEF
IOP Verdict			
PRO Verdict			

8.4.4.4 MEF Client Configuration Retrieval Procedure

Interoperability Test Description			
Identifier:	TD_M2M_SE_13		
Objective:	The MEF Client retrieves MEF Client Configurations provided by the administrating stakeholder to the MEF		
Configuration:	M2M_CFG_01		
References:	ETSI TS 118 103 [12], clause 8.3.5.2.4		
Pre-test conditions:	• The MEF Client has previously performed the MEF Client Registration procedure to create the MEF Client Registration record • The MEF Client Registration record is not expired		
Test Sequence			
Step	RP	Type	Description
1		Stimulus	The MEF Client establishes a TLS (or DTLS) connection with the MEF by performing the MEF Handshake procedure
2		Stimulus	The MEF Client sends a MEF Client Configuration Retrieval request
3	Mca	PRO Check TCP/UDP	• MEF-FQDN = FQDN of the MEF, from MEF Instruction Configuration • MEFClientRegID = Identifier for the MEF Client registration record being updated
4	Mca	PRO Check TCP/UDP	The MEF sends a MEF Client Configuration Retrieval response • MEFClientCfg = MEF Client Configuration currently associated with the identified MEF Client registration record
IOP Verdict			
PRO Verdict			

8.4.4.5   MEF Client Configuration Update Procedure

Interoperability Test Description			
Identifier:		TD_M2M_SE_14	
Objective:		MEF Client updates the MEF Client registration by any combination of extending the *expirationTime* of the MEF Client Registration record or updating the *labels*.	
Configuration:		M2M_CFG_01	
References:		ETSI TS 118 103 [12], clause 8.3.5.2.5	
Pre-test conditions:		• The MEF Client has previously performed the MEF Client Registration procedure to create the MEF Client Registration record • The MEF Client Registration record is not expired	
Test Sequence			
Step	**RP**	**Type**	**Description**
1		Stimulus	The MEF Client establishes a TLS (or DTLS) connection with the MEF by performing the MEF Handshake procedure
2		Stimulus	The MEF Client shall send a MEF Client Registration Update request
3	Mca	PRO Check TCP/UDP	• MEF-FQDN = FQDN of the MEF • MEFClientRegID = Identifier for the MEF Client registration record being updated • (optional) expirationTime = time when the MEF Client registration record shall expire • (optional) labels = labels to aid discovery of the MEF Client registration record NOTE: At least one of expirationTime and labels shall be included.
4		IOP Check	Check if possible that MEF has updated the MEF Client Registration record with the proposed values
5	Mca	PRO Check TCP/UDP	The MEF sends a MEF Client Registration Update response • (optional) expirationTime = time when the MEF Client registration record shall expire • (optional) labels = labels to aid discovery of the MEF Client registration record NOTE: The response only includes *expirationTime* and/or *labels* if those parameters were present in the corresponding request.
6		IOP Check	Check if possible that MEF Client has stored parameters provided by the MEF
IOP Verdict			
PRO Verdict			

8.4.4.6   MEF Client De-Registration Procedure

Interoperability Test Description			
Identifier:		TD_M2M_SE_15	
Objective:		The MEF Client registers with the MEF to confirm that it is willing to use the services of the MEF, under the authorization of the administrating stakeholder	
Configuration:		M2M_CFG_01	
References:		ETSI TS 118 103 [12], clause 8.3.5.2.6	
Pre-test conditions:		• The MEF Client has previously performed the MEF Client Registration procedure to create the MEF Client Registration record • The MEF Client Registration record is not expired	
Test Sequence			
Step	**RP**	**Type**	**Description**
1		Stimulus	The MEF Client establishes a TLS (or DTLS) connection with the MEF by performing the MEF Handshake procedure
2		Stimulus	The MEF Client sends a MEF Client De-Registration request
3	Mca	PRO Check TCP/UDP	• MEF-FQDN = FQDN of the MEF • MEFClientRegID = Identifier for the MEF Client Registration record being ended
4		IOP Check	Check if possible that MEF has deleted the information associated with the identified MEF Client Registration record
5		IOP Check	The MEF sends a MEF Client Registration Update response. The MEF Client indicates the success of the operation
IOP Verdict			
PRO Verdict			

8.4.4.7 MEF Key Registration Procedure

Interoperability Test Description	
Identifier:	TD_M2M_SE_16
Objective:	Source MEF Client establishes a symmetric key with the MEF which can be retrieved for use by one or more Target MEF Clients
Configuration:	M2M_CFG_01
References:	ETSI TS 118 103 [12], clause 8.3.5.2.7
Pre-test conditions:	• The Source MEF Client is provided with (or has otherwise determined) the information in the MEF Key Registration Configuration (ETSI TS 118 103 [12], clause 8.3.7.3) • The Source MEF Client has performed the MEF Client Registration procedure (ETSI TS 118 103 [12], clause 8.3.5.2.3) with the MEF for the administrating stakeholder identified in the MEF Key Registration Configuration

Test Sequence			
Step	RP	Type	Description
1		Stimulus	The Source MEF Client establishes a TLS (or DTLS) connection with the MEF by performing the MEF Handshake procedure
2		Stimulus	The MEF Client sends a MEF Key Registration request
3	Mca	PRO Check TCP/UDP	• MEF-FQDN = FQDN of the MEF • expirationTime = time when the MEF Client Registration shall expire • adminFQDN = Identifier for the administrating stakeholder • SUID = The Security Usage Identifier limiting the security feature in which the symmetric key may be used • (optional) targetIDs = list of identifiers for the initial set of Target MEF Clients authorized to retrieve the symmetric key • (optional) Key Value = output symmetric key value which is self-generated by the Source MEF Client
4		IOP Check	If the MEF Key Registration request included Key Value, check that MEF has stored the value. Otherwise, MEF generates Key Value from the (D)TLS session using TLS Key Export
5	Mca	PRO Check TCP/UDP	The MEF sends a MEF Key Registration response: • RelativeKeyID = the relative part of the Key Identifier associated with the Key Registration • expirationTime = time when the MEF Client Registration record shall expire • Source MEF Client ID = Identifier of the Source MEF Client • adminFQDN = FQDN of the administrating stakeholder • SUID = the Security Usage Identifier limiting the security feature in which the symmetric key may be used • targetIDs =list of identifiers for the initial set of Target MEF Clients authorized to retrieve the symmetric key
6		IOP Check	Check if possible that the Source MEF Client and MEF has stored the output symmetric key value and corresponding Key Identifier
IOP Verdict			
PRO Verdict			

8.4.4.8 MEF Key Retrieval Procedure

Interoperability Test Description			
Identifier:	TD_M2M_SE_17		
Objective:	The Target MEF Client to retrieve the Key Value from a MEF corresponding to a RelativeKeyID received by the Target MEF Client		
Configuration:	M2M_CFG_01		
References:	ETSI TS 118 103 [12], clause 8.3.5.2.8		
Pre-test conditions:	- The Target MEF Client has performed the MEF Client Credential Configuration with the MEF, including configuration of the MEF Key Retrieval URI - The Source MEF Client has performed the MEF Key Registration procedure with the MEF, resulting in a registered Key Value and assigned RelativeKeyID for a specific administrating stakeholder and Security Usage Identifier - The Target MEF Client received a Key Identifier from the Initiating-MEF Client in a security feature with the SUID which the Source MEF Client provided to the MEF during the MEF Key Registration procedure - The Target MEF Client may expect that it is authorized to obtain the corresponding output symmetric key value		
Test Sequence			
Step	**RP**	**Type**	**Description**
1		Stimulus	The MEF Client establishes a TLS (or DTLS) connection with the MEF by performing the MEF Handshake procedure
2		Stimulus	The MEF Client sends a MEF Key Retrieval request
3	Mca	PRO Check Primitive	RelativeKeyID = The relative part of the Key Identifier received from the Source MEF Client in a security feature
4	Mca	PRO Check TCP/UDP	The MEF sends a MEF Key Retrieval response: - expirationTime = time when the Key Registration shall expire - Source MEF Client ID = Identifier of the Source MEF Client - adminFQDN = Identifier for the administrating stakeholder - SUID = the Security Usage Identifier limiting the security feature in which the symmetric key may be used - Key Value = The registered value of the output symmetric key
IOP Verdict			
PRO Verdict			

8.4.4.9 MEF Key Registration Update Procedure

Interoperability Test Description			
Identifier:	TD_M2M_SE_18		
Objective:	MEF Client updates the MEF Client registration by any combination of extending the *expirationTime* of the MEF Client Registration record or updating the *labels*		
Configuration:	M2M_CFG_01		
References:	ETSI TS 118 103 [12], clause 8.3.5.2.9		
Pre-test conditions:	- The MEF Client has previously performed the MEF Key Registration procedure to create the key registration - The key registration is not expired		
Test Sequence			
Step	**RP**	**Type**	**Description**
1		Stimulus	The MEF Client establishes a TLS (or DTLS) connection with the MEF by performing the MEF Handshake procedure
2		Stimulus	The MEF Client shall send a MEF Key Registration Update request
3	Mca	PRO Check TCP/UDP	- MEF-FQDN = FQDN of the MEF - RelativeKeyID = the relative part of the Key Identifier associated with the Key Registration (optional) expirationTime = time when the Key Registration shall expire (optional) labels = labels to aid discovery of the registered key (optional) targetIDs = proposed list of identifiers for the set of Target MEF Clients authorized to retrieve the symmetric key NOTE: At least one of expirationTime, labels or targetIDs shall be included.
4		IOP Check	Check if possible that MEF has updated the metadata with the proposed values

			Interoperability Test Description
5	Mca	PRO Check TCP/UDP	The MEF sends a MEF Key Registration Update response • (optional) expirationTime = current time when the key registration shall expire • (optional) labels = Updated list of labels to aid discovery of the Key Registration, if any • (optional) targetIDs = current list of identifiers for the initial set of Target MEF Clients authorized to retrieve the symmetric key NOTE: The response includes only those parameters that were present in the corresponding request.
IOP Verdict			
PRO Verdict			

8.4.4.10 MEF Key De-Registration Procedure

Interoperability Test Description	
Identifier:	TD_M2M_SE_19
Objective:	Source MEF Client requests the MEF to stop distributing the registered key
Configuration:	M2M_CFG_01
References:	ETSI TS 118 103 [12], clause 8.3.5.2.10
Pre-test conditions:	• The MEF Client has previously performed the MEF Key Registration procedure to create the key registration • The key registration is not expired

Test Sequence			
Step	RP	Type	Description
1		Stimulus	The MEF Client establishes a TLS (or DTLS) connection with the MEF by performing the MEF Handshake procedure
2		Stimulus	The MEF Client sends a MEF Key De-Registration request
3	Mca	PRO Check TCP/UDP	• MEF-FQDN = FQDN of the MEF • RelativeKeyID = the relative part of the Key Identifier associated with the Key Registration
4		IOP Check	Check if possible that MEF has deleted the information associated with the identified key registration
5		IOP Check	The MEF sends a MEF Client De-Registration response. The MEF client indicates success of the operation
IOP Verdict			
PRO Verdict			

8.4.5 End-to-End security management

8.4.5.1 End-to-End Security of Primitives (ESPrim) Architecture

Interoperability Test Description	
Identifier:	TD_M2M_SE_20
Objective:	AE sends an arbitrary request primitive inside of ESPrim Object to CSE
Configuration:	M2M_CFG_01
References:	ETSI TS 118 103 [12], clause 8.4.2
Pre-test conditions:	• AE and CSE has established a secure ESPrim connection, so that both are able to extract ESPrim Objects sent from each other • AE has produced an ESPrim Object from the serialization of the arbitrary request primitive

Test Sequence			
Step	RP	Type	Description
1		Stimulus	AE sends a NOTIFY Request Message with ESPrim Object
2	Mca	PRO Check Primitive	• op = 5 (Notify) • to = {CSEBaseName} • from = AE-ID • rqi = (token-string) • pc: {seci: {sit = "esprimObject ", epo: serialized ESPrim Object }}
3		IOP Check	Check if possible that the CSE successfully extracted the inner request primitive Check if possible that the CSE successfully processed the inner request primitive

			Interoperability Test Description
4	Mca	PRO Check Primitive	The CSE sends a NOTIFY response to the AE: • op = 5 (Notify) • to = AE-ID • from = CSE-ID • rqi = (token-string) • pc: {seci: {sit = "esprimObject ", epo: serialized ESPrim Object }}
5		IOP Check	Check that the AE successfully extracted the inner response primitive Check that the AE successfully processed the inner response primitive
IOP Verdict			
PRO Verdict			

8.4.5.2   End-to-End Certificate-based Key Establishment (ESCertKE)

			Interoperability Test Description	
Identifier:			TD_M2M_SE_21	
Objective:			AE establishes a connection with the Registrar CSE using pairwiseE2EKey	
Configuration:			M2M_CFG_01	
References:			ETSI TS 118 103 [12], clause 8.7.2	
Pre-test conditions:			• Both the Registrar CSE and AE support ESCertKE and are provisioned with private key and certificates. Both entities are configured with the information needed for the authentication and identification • Cipher Suite = TLS_ECDHE_ECDSA_WITH_AES_128_CBC_SHA256	
			Test Sequence	
Step	**RP**	**Type**	**Description**	
1		Stimulus	AE sends an ESCertKE Message 1 in Notify request	
2	Mca	PRO Check Primitive	• op = 5 (Notify) • to = {CSEBaseName} • from = AE-ID • rqi = (token-string) • pc: {seci: {sit = "escertkeMessage",eckm: ESCertKE Message 1 }} ESCertKE Message 1 includes TLS a Client Hello handshake message: • Handshake Type = 0x01 (Client Hello) • Cipher Suite: TLS_ECDHE_ECDSA_WITH_AES_128_CBC_SHA256 • Version: TLS v1.2	
3	Mca	PRO Check Primitive	The Registrar CSE sends an ESCertKE Message 2 in Notify response: • op = 5 (Notify) • to = AE-ID • from = CSE-ID • rqi = (token-string) • pc: {seci: {sit = "escertkeMessage",eckm: ESCertKE Message 2 }} ESCertKE Message 2 includes Server Hello, Certificate, Server Key Exchange, Certificate Request, Server Hello Done messages Server Hello handshake message: • Handshake Type = 0x02 (Server Hello) • Cipher Suite: TLS_ECDHE_ECDSA_WITH_AES_128_CBC_SHA256 • Version: TLS v1.2 Certificate handshake message: • Handshake Type = 0x0b (Server Certificate) • Certificate: the Registrar CSE certificate Server Key Exchange handshake message: • Handshake Type = 0x0c (Server Key Exchange) • Public key: ECDHE generated key Certificate Request handshake message • Handshake Type = 0x0d (Certificate Request) Server Hello Done handshake message • Handshake Type = 0x0e (Server Hello Done)	

		Interoperability Test Description	
4		IOP Check	The TLS client on AE checks if the certificate of the Server is valid
5		Stimulus	AE sends an ESCertKE Message 3 in Notify request
6	Mca	PRO Check Primitive	• op = 5 (Notify) • to = {CSEBaseName} • from = AE-ID • rqi = (token-string) • pc: {seci: {sit = "escertkeMessage",eckm: ESCertKE Message 3 }} ESCertKE Message 3 includes Certificate, Client Key exchange, Certificate Verify, Change Cipher Spec, Finished messages Certificate handshake message: • Handshake Type = 0x0b (Client Certificate) • Certificate: AE certificate Client Key Exchange message: • Handshake Type = 0x10 (Client Key Exchange) • Public key: ECDHE generated key Certificate Verify message: • Handshake Type = 0x0f (Certificate Verify) Change Cipher Spec message: • Content type = 0x14 (Change Cipher Spec) Finished handshake message: • Handshake Type = 0x14 (Client Finished)
7		IOP Check	The TLS server on CSE checks if the certificate of the Client is valid
8	Mca	PRO Check Primitive	The Registrar CSE sends an ESCertKE Message 2 in Notify response: • op = 5 (Notify) • to = AE-ID • from = CSE-ID • rqi = (token-string) pc: {seci: {sit = "escertkeMessage",eckm: ESCertKE Message 4 }} ESCertKE Message 4 includes Change Cipher Spec, and Finished messages Server Change Cipher Spec message: • Content type = 0x14 (Change Cipher Spec) Server Finished message: • Handshake Type = 0x14 (Client Finished)
9		IOP Check	Check that The TLS client authenticated the Server by validating Verify Data
10		IOP Check	Check that AE and the Registrar CSE has generated and cached a pairwiseE2EKey
IOP Verdict			
PRO Verdict			

8.5 HAIM Device Model

8.5.1 HAIM Light Device Creation

Interoperability Test Description			
Identifier:		TD_M2M_NH_102	
Objective:		AE1 creates a HAIM Light Device Model	
Configuration:		M2M_CFG_10	
References:		ETSI TS 118 123 [14], clause 5.5.27	
Pre-test conditions:		• AE1 has created an application resource <AE> on registrar CSE	
Test Sequence			
Step	RP	Type	Description
1		Stimulus	AE1 sends a request to create a <flexContainer> for deviceLight

			Interoperability Test Description
2	Mca	PRO Check Primitive	• op = 1 (Create) • to = {CSEBaseName}/URI of <AE1> resource • fr = AE-ID • rqi = (token-string) • ty = 28 (flexContainer) • pc = Serialized representation of <flexContainer> resource with proper *containerDefinition*
3		IOP Check	Check if possible that the <flexContainer> 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 <flexContainer> resource
5		IOP Check	AE indicates successful operation
6		Stimulus	AE1 sends a request to create a <flexContainer> for binarySwitch
7	Mca	PRO Check Primitive	• op = 1 (Create) • to = {CSEBaseName}/URI of <AE1> resource/resource name of deviceLight • fr = AE-ID • rqi = (token-string) • ty = 28 (flexContainer) • pc = Serialized representation of <flexContainer> resource with proper *containerDefinition*
8		IOP Check	Check if possible that the <flexContainer> resource is created in registrar CSE
9	Mca	PRO Check Primitive	• rsc = 2001 (CREATED) • rqi = (token-string) same as received in request message • pc = Serialized representation of <flexContainer> resource
10		IOP Check	AE indicates successful operation
Note			Optional: Repeat steps 5-10 for additional deviceLight Modules
IOP Verdict			
PRO Verdict			

8.5.2 HAIM Light Device Status Read

Interoperability Test Description			
Identifier:		TD_M2M_NH_103	
Objective:		AE2 reads the status of a HAIM Light Device Model	
Configuration:		M2M_CFG_10	
References:		ETSI TS 118 123 [14], clauses 5.5.27, 5.3.12	
Pre-test conditions:		• AE2 has created an application resource <AE> on registrar CSE • AE1 has created a HAIM Light Device model	
Test Sequence			
Step	**RP**	**Type**	**Description**
1		Stimulus	AE2 sends a request to retrieve a <flexContainer> for binarySwitch
2	Mca	PRO Check Primitive	• op = 2 (Retrieve) • to = {CSEBaseName}/URI of <deviceLight> resource/binarySwitch • 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 <flexContainer> resource
4		IOP Check	AE2 indicates successful operation
Note			Optional: Repeat steps 1-4 for additional deviceLight Modules
IOP Verdict			
PRO Verdict			

8.5.3 HAIM Light Device Update

Interoperability Test Description	
Identifier:	TD_M2M_NH_104
Objective:	AE2 turns the binarySwitch of a HAIM Light Device Model "ON" or "OFF"
Configuration:	M2M_CFG_10
References:	ETSI TS 118 123 [14], clause 5.5.27
Pre-test conditions:	• AE2 has created an application resource <AE> on registrar CSE • AE1 has created a HAIM Light Device model

Test Sequence			
Step	RP	Type	Description
1		Stimulus	AE2 sends a request to create a <flexContainer> for deviceLight
2	Mca	PRO Check Primitive	• op = 3 (Update) • to = {CSEBaseName}/ URI of <deviceLight> resource/binarySwitch • fr = AE-ID • rqi = (token-string) • pc = Serialized representation of <flexContainer> resource with new value for powerState
3		IOP Check	Check if possible that the <flexContainer> resource is updates in registrar CSE
4	Mca	PRO Check Primitive	• rsc = 2004 (UPDATED) • rqi = (token-string) same as received in request message • pc = Serialized representation of <flexContainer> resource
5		IOP Check	AE indicates successful operation
Note			Optional: Repeat steps 1-5 for additional device states and settings
IOP Verdict			
PRO Verdict			

8.5.4 HAIM Light Device Toggle Action

Interoperability Test Description	
Identifier:	TD_M2M_NH_105
Objective:	AE2 toggles the state of a HAIM Light Device Model
Configuration:	M2M_CFG_10
References:	ETSI TS 118 123 [14], clause 5.5.27
Pre-test conditions:	• AE2 has created an application resource <AE> on registrar CSE • AE1 has created a HAIM Light Device model

Test Sequence			
Step	RP	Type	Description
1		Stimulus	AE2 sends a request to create a <flexContainer> for deviceLight
2	Mca	PRO Check Primitive	• op = 3 (Update) • to = {CSEBaseName}/ URI of <deviceLight> resource/binarySwitch/toggle • fr = AE-ID • rqi = (token-string) • pc = Serialized representation of <flexContainer> resource for *toggle* action
3		IOP Check	Check if possible that the <flexContainer> resource is updates in registrar CSE
4	Mca	PRO Check Primitive	• rsc = 2004 (UPDATED) • rqi = (token-string) same as received in request message • pc = Serialized representation of <flexContainer> resource
5		IOP Check	AE2 indicates successful operation. Check that the powerState of the binarySwitch is updated
Note			Optional: Repeat steps 1-5 for additional device states and settings
IOP Verdict			
PRO Verdict			

8.5.5 HAIM Power Outlet SubDevice Create

Interoperability Test Description			
Identifier:	TD_M2M_NH_160		
Objective:	AE1 creates a Power Outlet SubDevice Model		
Configuration:	M2M_CFG_10		
References:	ETSI TS 118 123 [14], clause 5.4.1.2		
Pre-test conditions:	• AE1 has created an application resource <AE> on registrar CSE • AE1 has created a <flexContainer> for deviceSmartPlug		
Test Sequence			
Step	**RP**	**Type**	**Description**
1		Stimulus	AE1 sends a request to create a <flexContainer> for subDevicePowerOutlet
2	Mca	PRO Check Primitive	• op = 1 (Create) • to = {CSEBaseName}/URI of <AE1> resource/resource name of deviceSmartPlug • fr = AE-ID • rqi = (token-string) • ty = 28 (flexContainer) • pc = Serialized representation of <flexContainer> resource with proper *containerDefinition*
3		IOP Check	Check if possible that the <flexContainer> 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 <flexContainer> resource
5		IOP Check	AE indicates successful operation
6		Stimulus	AE1 sends a request to create a <flexContainer> for binarySwitch
7	Mca	PRO Check Primitive	• op = 1 (Create) • to = {CSEBaseName}/URI of <AE1> resource/resource name of subDevicePowerOutlet • fr = AE-ID • rqi = (token-string) • ty = 28 (flexContainer) • pc = Serialized representation of <flexContainer> resource with proper *containerDefinition*
8		IOP Check	Check if possible that the <flexContainer> resource is created in registrar CSE
9	Mca	PRO Check Primitive	• rsc = 2001 (CREATED) • rqi = (token-string) same as received in request message • pc = Serialized representation of <flexContainer> resource
10		IOP Check	AE indicates successful operation
Note		Optional: Repeat steps 6-10 for additional subDevicePowerOutlet Modules	
IOP Verdict			
PRO Verdict			

8.5.6 HAIM Toggle Action Create

Interoperability Test Description			
Identifier:	TD_M2M_NH_161		
Objective:	AE1 creates a Toggle Action Model		
Configuration:	M2M_CFG_10		
References:	ETSI TS 118 123 [14], clause 5.3.1.12		
Pre-test conditions:	• AE1 has created an application resource <AE> on registrar CSE • AE1 has created a <flexContainer> for deviceSmartPlug • AE1 has created a <flexContainer> for binarySwtich as a child of deviceSmartPlug		
Test Sequence			
Step	**RP**	**Type**	**Description**
1		Stimulus	AE1 sends a request to create a <flexContainer> for Toggle

			Interoperability Test Description
2	Mca	PRO Check Primitive	• op = 1 (Create) • to = {CSEBaseName}/URI of <AE1> resource/resource name of binarySwtich • fr = AE-ID • rqi = (token-string) • ty = 28 (flexContainer) • pc = Serialized representation of <flexContainer> resource with proper *containerDefinition*
3		IOP Check	Check if possible that the <flexContainer> 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 <flexContainer> resource
5		IOP Check	AE indicates successful operation
IOP Verdict			
PRO Verdict			

8.5.7 HAIM Device Properties Create

Interoperability Test Description			
Identifier:			TD_M2M_NH_162
Objective:			AE1 creates Device Properties Model
Configuration:			M2M_CFG_10
References:			ETSI TS 118 123 [14], clause 6.2.5
Pre-test conditions:			• AE1 has created an application resource <AE> on registrar CSE • AE1 has created a <flexContainer> for deviceLight • AE1 has created a <node> resource
Test Sequence			
Step	**RP**	**Type**	**Description**
1		Stimulus	AE1 sends a request to create a [deviceInfo] resource
2	Mca	PRO Check Primitive	• op = 1 (Create) • to = {CSEBaseName}/URI of <node> resource/ • fr = AE-ID • rqi = (token-string) • ty = 13 (mgmtObj) • pc = Serialized representation of [deviceInfo] resource with with properties set as attributes of the resource
3		IOP Check	Check if possible that the [deviceInfo] 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 [deviceInfo] resource
5		IOP Check	AE indicates successful operation
IOP Verdict			
PRO Verdict			

8.6 Semantics management

8.6.1 Semantic Access Control Policy management

8.6.1.1 Procedure for creating ACP triples when a new <accessControlPolicy> resource is created

Interoperability Test Description	
Identifier:	TD_M2M_NH_106
Objective:	ACP triples are created when a new *<accessControlPolicy>* resource is created
Configuration:	M2M_CFG_01
References:	oneM2M TS-0034 [13], clause 7.2.1.5.2
Pre-test conditions:	• AE has created an application resource <AE> on Registrar CSE • The Registrar CSE has SGS available

Test Sequence			
Step	**RP**	**Type**	**Description**
1		Stimulus	AE sends a request to create an <accessControlPolicy> resource
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
3		IOP Check	Check if possible that the <accessControlPolicy> resource is created in Registrar CSE Check if possible that Registrar CSE has created ACP Triples in SGS for the new <accessControlPolicy> resource
4	Mca	PRO Check Primitive	• 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			

8.6.1.2 Procedure for updating ACP triples when a new <accessControlPolicy> resource is updated

Interoperability Test Description	
Identifier:	TD_M2M_NH_107
Objective:	ACP triples are updated when an existing <accessControlPolicy> resource is updated
Configuration:	M2M_CFG_01
References:	oneM2M TS-0034 [13], clause 7.2.1.5.3
Pre-test conditions:	• AE has created an application resource <AE> on Registrar CSE • accessControlPolicy resource has been created in registrar CSE under <AE> resource with name {accessControlPolicyName} • The Registrar CSE has SGS available

Test Sequence			
Step	**RP**	**Type**	**Description**
1		Stimulus	AE sends a request to update a privileges attribute of {accessControlPolicyName}
2	Mca	PRO Check Primitive	• op = 1 (Create) • to = {CSEBaseName}/{AE}/{accessControlPolicyName} • fr = AE-ID • rqi = (token-string) • ty = 1 (accessControlPolicy) • pc = Serialized representation of updated <accessControlPolicy> resource
3		IOP Check	Check if possible that the <accessControlPolicy> resource has been updated in Registrar CSE Check if possible that Registrar CSE has updated corresponding ACP Triples in SGS

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

8.6.1.3 Procedure for deleting ACP triples when an existing <accessControlPolicy> resource is deleted

Interoperability Test Description	
Identifier:	TD_M2M_NH_108
Objective:	ACP triples are deleted when an existing <accessControlPolicy> resource is deleted
Configuration:	M2M_CFG_01
References:	oneM2M TS-0034 [13], clause 7.2.1.5.4
Pre-test conditions:	• AE has created an application resource <AE> on Registrar CSE • accessControlPolicy resource has been created in registrar CSE under <AE> resource with name {accessControlPolicyName} • The Registrar CSE has SGS available

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
3		IOP Check	Check if possible that the <accessControlPolicy> resource has been removed from registrar CSE Check if possible that Registrar CSE has deleted corresponding ACP Triples in SGS
4	Mca	PRO Check Primitive	Registrar CSE sends response containing: • rsc = 2002 (DELETED) • rqi = (token-string) same as received in request message • pc = empty
5		IOP Check	AE indicates successful operation
IOP Verdict			
PRO Verdict			

8.6.1.4 Procedure for creating ACP-SD binding triples and SD relationship in SGS

Interoperability Test Description	
Identifier:	TD_M2M_NH_109
Objective:	ACP-SD Binding Triples and SD relationship in SGS are created when AE creates a <semanticDescriptor> resource in Registrar CSE
Configuration:	M2M_CFG_01
References:	oneM2M TS-0034 [13], clause 7.2.1.5.5
Pre-test conditions:	• AE has created an application resource <AE> on Registrar CSE • accessControlPolicy resource has been created in registrar CSE under <AE> resource with name {accessControlPolicyName} • The Registrar CSE has SGS available

Test Sequence			
Step	RP	Type	Description
1		Stimulus	AE sends a request to create an <semanticDescriptor> resource

			Interoperability Test Description
2	Mca	PRO Check Primitive	• op = 1 (Create) • to = {CSEBaseName}/<AE> • fr = AE-ID • rqi = (token-string) • ty = 24 (semanticDescriptor) • pc = Serialized representation of <semanticDescriptor> resource − acpi = URI of {accessControlPolicyName}
3		IOP Check	Check if possible that the <semanticDescriptor> resource is created in Registrar CSE. Check if possible that Registrar CSE has created SD Relationship Triples and ACP-SD Binding Triples for the new <semanticDescriptor> in SGS
4	Mca	PRO Check Primitive	• rsc = 2001 (CREATED) • rqi = (token-string) same as received in request message • pc = Serialized representation of <semanticDescriptor> resource
5		IOP Check	AE indicates successful operation
IOP Verdict			
PRO Verdict			

8.6.1.5 Procedure for updating ACP-SD binding triples in SGS

Interoperability Test Description			
Identifier:		TD_M2M_NH_110	
Objective:		ACP-SD Binding Triples are updated when the accessControlPolicyIDs attribute of a <semanticDescriptor> resource is updated	
Configuration:		M2M_CFG_01	
References:		oneM2M TS-0034 [13], clause 7.2.1.5.6	
Pre-test conditions:		• AE has created an application resource <AE> on Registrar CSE • accessControlPolicy resource has been created in registrar CSE under <AE> resource with name {accessControlPolicyName} • AE has created a semanticDescriptor resource <semanticDescriptor> as child resource of <AE> resource • The Registrar CSE has SGS available	
Test Sequence			
Step	RP	Type	Description
1		Stimulus	AE sends a request to update an accessControlPolicyIDs attribute of the resource
2	Mca	PRO Check Primitive	• op = 3 (Update) • to = {CSEBaseName}/URI of <semanticDescriptor> resource • fr = AE-ID • rqi = (token-string) • pc = Serialized representation of updated <semanticDescriptor> resource
3		IOP Check	Check if possible that the <semanticDescriptor> resource is updated in Registrar CSE. Check if possible that Registrar CSE has updated corresponding ACP-SD Binding Triples in SGS
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
5		IOP Check	AE indicates successful operation
IOP Verdict			
PRO Verdict			

8.6.1.6 Procedure for updating SD relationship triples in SGS

Interoperability Test Description	
Identifier:	TD_M2M_NH_111
Objective:	SD Relationship Triples are updated when the descriptor attribute of a <semanticDescriptor> resource is changed
Configuration:	M2M_CFG_01
References:	oneM2M TS-0034 [13], clause 7.2.1.5.7
Pre-test conditions:	- AE has created an application resource <AE> on Registrar CSE - accessControlPolicy resource has been created in registrar CSE under <AE> resource with name {accessControlPolicyName} - AE has created a semanticDescriptor resource <semanticDescriptor> as child resource of <AE> resource - The Registrar CSE has SGS available

Test Sequence			
Step	RP	Type	Description
1		Stimulus	AE is requested to send a semanticDescriptor Update Request to update the *descriptor* attribute of the resource
2	Mca	PRO Check Primitive	- op = 3 (Update) - to = {CSEBaseName}/URI of <semanticDescriptor> resource - fr = AE-ID - rqi = (token-string) - pc = Serialized representation of updated <semanticDescriptor> resource
3		IOP Check	Check if possible that the <semanticDescriptor> resource is updated in Registrar CSE. Check if possible that Registrar CSE has updated old SD Relationship Triples and/or add new SD Relationship Triple in the SGS
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
5		IOP Check	AE indicates successful operation
IOP Verdict			
PRO Verdict			

8.6.1.7 Procedure for deleting SD relationship triples and ACP-SD binding triples in SGS

Interoperability Test Description	
Identifier:	TD_M2M_NH_112
Objective:	SD Relationship Triples are deleted when the descriptor attribute of a <semanticDescriptor> resource is deleted
Configuration:	M2M_CFG_01
References:	oneM2M TS-0034 [13], clause 7.2.1.5.8
Pre-test conditions:	- AE has created an application resource <AE> on Registrar CSE - accessControlPolicy resource has been created in registrar CSE under <AE> resource with name {accessControlPolicyName} - AE has created a semanticDescriptor resource <semanticDescriptor> as child resource of <AE> resource - The Registrar CSE has SGS available

Test Sequence			
Step	RP	Type	Description
1		Stimulus	AE is requested to send a semanticDescriptor Delete Request to update the *descriptor* attribute of the resource
2	Check Mca	PRO Check Primitive	- op = 4 (Detete) - to = {CSEBaseName}/URI of <semanticDescriptor> resource - fr = AE-ID - rqi = (token-string) - pc = empty
3		IOP Check	Check if possible that the <semanticDescriptor> resource is deleted in Registrar CSE. Check if possible that Registrar CSE has removed SD Original Triples, SD Relationship Triples, and ACP-SD Binding Triples related to the <semanticDescriptor> from SGS

			Interoperability Test Description
4	Check Mca	PRO Check Primitive	• rsc = 2002 (DELETED) • rqi = (token-string) same as received in request message • pc = empty
5		IOP Check	AE indicates successful operation
IOP Verdict			
PRO Verdict			

8.6.2 Semantic Filtering and discovery

8.6.2.1 Semantic Filtering and Discovery using <semanticFanOutPoint> resource

Interoperability Test Description	
Identifier:	TD_M2M_NH_113
Objective:	AE discovers accessible resources residing in Registrar CSE using the <semanticFanOutPoint>
Configuration:	M2M_CFG_01
References:	oneM2M TS-0034 [13], clause 7.4.1
Pre-test conditions:	• AE has created an application resource <AE> on Registrar CSE • AE has created <container> resources {container1} and {container2} in registrar CSE under <AE> resource • AE has created a group resource with semanticSupportIndicator attribute set to TRUE and memberIds set to {container1} and {container2} ids • AE has created <semanticDescriptor> as a child resources of a resources {container1} and {container2}

			Test Sequence
Step	**RP**	**Type**	**Description**
1		Stimulus	AE is requested to send a Discovery request to discover the < semanticFanOutPoint > virtual resource of <group>
2	Mca	PRO Check Primitive	• op = 2 (Retrieve) • to = {CSEBaseName}/<AE>/<group>/sfopt • from = AE-ID • rqi = (token-string) • fu=1 • smf=sparqlQuery1 • pc = empty
4	Mca	PRO Check Primitive	Sent response contains: • rsc = 2000 (OK) • rqi = (token-string) same as received in request message • pc = Serialized representation of data object containing the <Container> resources addresses
5		IOP Check	AE indicates successful operation
IOP Verdict			
PRO Verdict			

8.6.2.2   Resource link-based Semantic Discovery

Interoperability Test Description	
Identifier:	TD_M2M_NH_114
Objective:	AE discovers accessible resources residing in Registrar CSE using the resource link-based Semantic Discovery
Configuration:	M2M_CFG_01
References:	oneM2M TS-0034 [13], clause 7.4.3
Pre-test conditions:	- AE has created an application resource <AE> on Registrar CSE - AE has created <container> resources {container1} and {container2} in registrar CSE under <AE> resource - AE has created a group resource with semanticSupportIndicator attribute set to TRUE and memberIds set to {container1} and {container2} ids - AE has created <semanticDescriptor> resources as a child resources of a resources {container1} and {container2} named {descriptor1} and {descriptor2} {descriptor1} has *relatedSemantics* attribute set to ID of {descriptor2} {descriptor2} has *relatedSemantics* attribute set to ID of {descriptor1}

Test Sequence			
Step	RP	Type	Description
1		Stimulus	AE1 is requested to send a Discovery request to discover the <container> resource using the semanticFilter filterCriteria
2	Mca	PRO Check Primitive	- op = 2 (Retrieve) - to = {CSEBaseName}/<AE> - from = AE-ID - rqi = (token-string) - fu=1 - smf=sparqlQuery1 - pc = empty
4	Mca	PRO Check Primitive	Sent response contains: - rsc = 2000 (OK) - rqi = (token-string) same as received in request message - pc = Serialized representation of data object containing the <Container> resources addresses
5		IOP Check	AE indicates successful operation
IOP Verdict			
PRO Verdict			

8.6.2.3   Semantic query

Interoperability Test Description	
Identifier:	TD_M2M_NH_115
Objective:	AE performs a Semantic Query request in Registrar CSE using the semanticFilter filter criteria
Configuration:	M2M_CFG_01
References:	oneM2M TS-0034 [13], clause 7.4 oneM2M TS-0004 [2], clause 7.3.3.18
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 <semanticDescriptor> as a child resource of a <container>
Test Sequence	

Step	RP	Type	Description
1		Stimulus	AE1 is requested to send a Semantic Query Operation request to query the <container> resource using a SPARQL query

			Interoperability Test Description
2	Check Mca	PRO Check Primitive	Sent request contains: • op = 2 (Retrieve) • to = {CSEBaseName} • from = AE-ID • rqi = (token-string) • sqi = TRUE • smf=sparqlQuery1 • rcn = 10 (semantic content) • pc = empty
3	Check Mca	PRO Check Primitive	Sent response contains: • rsc = 2000 (OK) • rqi = (token-string) same as received in request message • pc = Serialized representation semantic query result
4		IOP Check	AE indicates notification received
IOP Verdict			
PRO Verdict			

8.6.3 Semantic Mashup management

8.6.3.1 SemanticMashupJobProfile Create

	Interoperability Test Description		
Identifier:	TD_M2M_NH_116		
Objective:	AE creates a SemanticMashupJobProfile resource in Registrar CSE via a SemanticMashupJobProfile Create Request		
Configuration:	M2M_CFG_01		
References:	oneM2M TS-0034 [13], clause 6.3.2 oneM2M TS-0004 [2], clause 7.4.49.2.1		
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 <semanticMashupJobProfile>
2	Mca	PRO Check Primitive	• op = 1 (Create) • to = {CSEBaseName} • fr = AE-ID • rqi = (token-string) • ty = 40 (semanticMashupJobProfile) • pc = Serialized representation of <semanticMashupJobProfile> resource
3		IOP Check	Check if possible that the <semanticDescriptor> 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 <semanticMashupJobProfile> resource
5		IOP Check	AE indicates successful operation
IOP Verdict			
PRO Verdict			

8.6.3.2 SemanticMashupJobProfile Retrieve

Interoperability Test Description	
Identifier:	TD_M2M_NH_117
Objective:	AE retrieves information of a semanticMashupJobProfile resource via a semanticMashupJobProfile Retrieve Request
Configuration:	M2M_CFG_01
References:	oneM2M TS-0034 [13], clause 6.3.3 oneM2M TS-0004 [2], clause 7.4.49.2.2
Pre-test conditions:	• AE has created an Application Entity resource <AE> on Registrar CSE • AE has created a semanticMashupJobProfile resource <semanticMashupJobProfile> as child resource of <AE> resource

Test Sequence			
Step	RP	Type	Description
1		Stimulus	AE is requested to send a Retrieve Request for a <semanticMashupJobProfile>
2	Mca	PRO Check Primitive	• op = 2 (Retrieve) • to = {CSEBaseName}/URI of <semanticMashupJobProfile> 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 <semanticMashupJobProfile> resource
4		IOP Check	AE indicates successful operation
IOP Verdict			
PRO Verdict			

8.6.3.3 SemanticMashupJobProfile Update

Interoperability Test Description	
Identifier:	TD_M2M_NH_118
Objective:	AE updates attribute in <semanticMashupJobProfile> resource via a semanticMashupJobProfile Update Request
Configuration:	M2M_CFG_01
References:	oneM2M TS-0034 [13], clause 6.3.4 oneM2M TS-0004 [2], clause 7.4.49.2.3
Pre-test conditions:	• AE has created an Application Entity resource <AE> on Registrar CSE • AE has created a semanticMashupJobProfile resource <semanticMashupJobProfile> as child resource of <AE> resource

Test Sequence			
Step	RP	Type	Description
1		Stimulus	AE is requested to send a semanticMashupJobProfile Update Request to update the *memberFilter* attribute of the resource
2	Mca	PRO Check Primitive	• op = 3 (Update) • to = {CSEBaseName}/URI of <semanticMashupJobProfile> resource • fr = AE-ID • rqi = (token-string) • pc = Serialized representation of updated <semanticMashupJobProfile> resource
3		IOP Check	Check if possible that the <semanticDescriptor> 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 <semanticMashupJobProfile> resource
5		IOP Check	AE indicates successful operation
IOP Verdict			
PRO Verdict			

8.6.3.4 SemanticMashupJobProfile Delete

Interoperability Test Description	
Identifier:	TD_M2M_NH_119
Objective:	AE deletes semanticMashupJobProfile resource via a semanticMashupJobProfile Delete Request
Configuration:	M2M_CFG_01
References:	oneM2M TS-0034 [13], clause 6.3.5 oneM2M TS-0004 [2], clause 7.4.49.2.4
Pre-test conditions:	• AE has created an Application Entity resource <AE> on Registrar CSE • AE has created a semanticMashupJobProfile resource <semanticMashupJobProfile> as child of <AE> resource
Test Sequence	

Step	RP	Type	Description
1		Stimulus	AE is requested to send a semanticMashupJobProfile Delete Request
2	Mca	PRO Check Primitive	• op = 4 (Delete) • to = {CSEBaseName}/URI of <semanticMashupJobProfile> resource • fr = AE-ID • rqi = (token-string) • pc = empty
3		IOP Check	Check if possible that the <semanticMashupJobProfile> 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
5		IOP Check	Check if possible that the <semanticMashupJobProfile> resource has been removed in Registrar CSE
6		IOP Check	AE indicates successful operation
IOP Verdict			
PRO Verdict			

8.6.3.5 SemanticMashupInstance Create

Interoperability Test Description	
Identifier:	TD_M2M_NH_120
Objective:	AE creates a semanticMashupInstance resource in Registrar CSE via a semanticMashupInstance Create Request
Configuration:	M2M_CFG_01
References:	oneM2M TS-0034 [13], clause 6.4.2 oneM2M TS-0004 [2], clause 7.4.50.2.1
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 <semanticDescriptor>
2	Mca	PRO Check Primitive	• op = 1 (Create) • to = {CSEBaseName} • fr = AE-ID • rqi = (token-string) • ty = 41 (semanticMashupInstance) • pc = Serialized representation of <semanticMashupInstance> resource
3		IOP Check	Check if possible that the <semanticDescriptor> 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 <semanticMashupInstance> resource
5		IOP Check	AE indicates successful operation
IOP Verdict			
PRO Verdict			

8.6.3.6   SemanticMashupInstance Retrieve

Interoperability Test Description			
Identifier:	TD_M2M_NH_121		
Objective:	AE retrieves information of a semanticMashupInstance resource via a semanticMashupInstance Retrieve Request		
Configuration:	M2M_CFG_01		
References:	oneM2M TS-0034 [13], clause 6.4.3 oneM2M TS-0004 [2], clause 7.4.50.2.2		
Pre-test conditions:	• AE has created an Application Entity resource <AE> on Registrar CSE • AE has created a semanticMashupInstance resource <semanticMashupInstance> as child resource of <CSEBase> resource		
Test Sequence			
Step	RP	Type	Description
1		Stimulus	AE is requested to send a Retrieve Request for a <semanticMashupInstance>
2	Mca	PRO Check Primitive	• op = 2 (Retrieve) • to = {CSEBaseName}/URI of <semanticMashupInstance> 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 <semanticMashupInstance> resource
4		IOP Check	AE indicates successful operation
IOP Verdict			
PRO Verdict			

8.6.3.7   SemanticMashupInstance Update

Interoperability Test Description			
Identifier:	TD_M2M_NH_122		
Objective:	AE updates attribute in <semanticMashupInstance> resource via a semanticMashupInstance Update Request		
Configuration:	M2M_CFG_01		
References:	oneM2M TS-0034 [13], clause 6.4.4 oneM2M TS-0004 [2], clause 7.4.50.2.3		
Pre-test conditions:	• AE has created an Application Entity resource <AE> on Registrar CSE • AE has created a semanticMashupInstance resource <semanticMashupInstance> as child resource of <CSEBase> resource		
Test Sequence			
Step	RP	Type	Description
1		Stimulus	AE is requested to send a semanticMashupInstance Update Request to update the *smjpInputParameter* attribute of the resource.
2	Mca	PRO Check Primitive	• op = 3 (Update) • to = {CSEBaseName}/URI of <semanticMashupInstance> resource • fr = AE-ID • rqi = (token-string) • pc = Serialized representation of updated <semanticMashupInstance> resource
3		IOP Check	Check if possible that the <semanticDescriptor> 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 <semanticMashupInstance> resource
5		IOP Check	AE indicates successful operation
IOP Verdict			
PRO Verdict			

8.6.3.8   SemanticMashupInstance Delete

Interoperability Test Description			
Identifier:	TD_M2M_NH_123		
Objective:	AE deletes semanticMashupInstance resource via a semanticMashupInstance Delete Request		
Configuration:	M2M_CFG_01		
References:	oneM2M TS-0034 [13], clause 6.4.5 oneM2M TS-0004 [2], clause 7.4.50.2.4		
Pre-test conditions:	• AE has created an Application Entity resource <AE> on Registrar CSE • AE has created a semanticMashupInstance resource <semanticMashupInstance> as child resource of <CSEBase> resource		
Test Sequence			
Step	**RP**	**Type**	**Description**
1		Stimulus	AE is requested to send a semanticMashupInstance Delete Request
2	Mca	PRO Check Primitive	• op = 4 (Delete) • to = {CSEBaseName}/ URI of <semanticMashupInstance> resource • fr = AE-ID • rqi = (token-string) • pc = empty
3		IOP Check	Check if possible that the <semanticMashupInstance> 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
5		IOP Check	Check if possible that the <semanticMashupInstance> resource has been removed in Registrar CSE
6		IOP Check	AE indicates successful operation
IOP Verdict			
PRO Verdict			

8.6.3.9   SemanticMashupResult Retrieve

Interoperability Test Description			
Identifier:	TD_M2M_NH_124		
Objective:	AE retrieves information of a semanticMashupResult resource via a semanticMashupResult Retrieve Request		
Configuration:	M2M_CFG_01		
References:	oneM2M TS-0034 [13], clause 6.6.2 oneM2M TS-0004 [2], clause 7.4.52.2.2		
Pre-test conditions:	• AE has created an Application Entity resource <AE> on Registrar CSE • AE has created a semanticMashupInstance resource <semanticMashupInstance> as child resource of <CSEBase> resource • <semanticMashupResult> resource is created as child resource of <semanticMashupInstance> resource		
Test Sequence			
Step	**RP**	**Type**	**Description**
1		Stimulus	AE is requested to send a Retrieve Request for a <semanticMashupResult>
2	Mca	PRO Check Primitive	• op = 2 (Retrieve) • to = {CSEBaseName}/URI of <semanticMashupInstance> 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 <semanticMashupResult> resource
4		IOP Check	AE indicates successful operation
IOP Verdict			
PRO Verdict			

8.6.3.10 SemanticMashupResult Delete

Interoperability Test Description	
Identifier:	TD_M2M_NH_125
Objective:	AE deletes semanticMashupResult resource via a semanticMashupResult Delete Request
Configuration:	M2M_CFG_01
References:	oneM2M TS-0034 [13], clause 6.6.3 oneM2M TS-0004 [2], clause 7.4.52.2.4
Pre-test conditions:	• AE has created an Application Entity resource <AE> on Registrar CSE • AE has created a semanticMashupInstance resource <semanticMashupInstance> as child resource of <CSEBase> resource • <semanticMashupResult> resource is created as child resource of <semanticMashupInstance> resource

Test Sequence			
Step	RP	Type	Description
1		Stimulus	AE is requested to send a semanticMashupResult Delete Request
2	Mca	PRO Check Primitive	• op = 4 (Delete) • to = {CSEBaseName}/ URI of <semanticMashupInstance> resource/ URI of <semanticMashupResult> resource • fr = AE-ID • rqi = (token-string) • pc = empty
3		IOP Check	Check if possible that the <semanticMashupResult> 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
5		IOP Check	Check if possible that the <semanticMashupResult> resource has been removed in Registrar CSE
6		IOP Check	AE indicates successful operation
IOP Verdict			
PRO Verdict			

8.6.3.11 Mashup Retrieve

Interoperability Test Description	
Identifier:	TD_M2M_NH_126
Objective:	AE triggers a calculation and generation of the mashup result by sending a <semanticMashupInstance>/<mashup> Retrieve Request
Configuration:	M2M_CFG_01
References:	oneM2M TS-0034 [13], clause 6.5.2 oneM2M TS-0004 [2], clause 7.4.51.2.2
Pre-test conditions:	• AE has created an Application Entity resource <AE> on Registrar CSE • AE has created a semanticMashupInstance resource <semanticMashupInstance> as child resource of <CSEBase> resource

Test Sequence			
Step	RP	Type	Description
1		Stimulus	AE retrieves a <mashup> resource in a <semanticMashupInstance>
2	Mca	PRO Check Primitive	• op = 2 (Retrieve) • to = {CSEBaseName}/URI of <semanticMashupInstance> resource/msp • fr = AE-ID • rqi = (token-string) • pc = empty
3		IOP Check	Check if possible that a <semanticMashupResult> resource is created under the <semanticMashupInstance> resource
4	Mca	PRO Check Primitive	• rsc = 2000 (OK) • rqi = (token-string) same as received in request message • pc = Serialized representation of <semanticMashupResult> resource
5		IOP Check	AE indicates successful operation
IOP Verdict			
PRO Verdict			

8.6.4   Ontology Repository management

8.6.5.1   OntologyRepository Create

Interoperability Test Description			
Identifier:	TD_M2M_NH_127		
Objective:	AE creates a OntologyRepository resource in Registrar CSE via a OntologyRepository Create Request		
Configuration:	M2M_CFG_01		
References:	oneM2M TS-0034 [13], clause 6.7.2 oneM2M TS-0004 [2], clause 7.4.46.2.1		
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 <ontologyRepository>
2	Mca	PRO Check Primitive	• op = 1 (Create) • to = {CSEBaseName} • fr = AE-ID • rqi = (token-string) • ty = 38 (ontologyRepository) • pc = Serialized representation of <ontologyRepository> resource
3		IOP Check	Check if possible that the <ontologyRepository> 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 <ontologyRepository> resource
5		IOP Check	AE indicates successful operation
IOP Verdict			
PRO Verdict			

8.6.4.2   OntologyRepository Retrieve

Interoperability Test Description			
Identifier:	TD_M2M_NH_128		
Objective:	AE retrieves information of a ontologyRepository resource via a ontologyRepository Retrieve Request		
Configuration:	M2M_CFG_01		
References:	oneM2M TS-0034 [13], clause 6.7.3 oneM2M TS-0004 [2], clause 7.4.46.2.2		
Pre-test conditions:	• AE has created an Application Entity resource <AE> on Registrar CSE • AE has created a ontologyRepository resource <ontologyRepository> as child resource of <AE> resource		
Test Sequence			
Step	**RP**	**Type**	**Description**
1		Stimulus	AE is requested to send a Retrieve Request for a <ontologyRepository>
2	Mca	PRO Check Primitive	• op = 2 (Retrieve) • to = {CSEBaseName}/URI of <ontologyRepository> 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 <ontologyRepository> resource
4		IOP Check	AE indicates successful operation
IOP Verdict			
PRO Verdict			

8.6.4.3   OntologyRepository Update

Interoperability Test Description			
Identifier:	TD_M2M_NH_129		
Objective:	AE updates attribute in <ontologyRepository> resource via a ontologyRepository Update Request		
Configuration:	M2M_CFG_01		
References:	oneM2M TS-0034 [13], clause 6.7.4 oneM2M TS-0004 [2], clause 7.4.46.2.3		
Pre-test conditions:	• AE has created an Application Entity resource <AE> on Registrar CSE • AE has created a ontologyRepository resource <ontologyRepository> as child resource of <AE> resource		
Test Sequence			
Step	**RP**	**Type**	**Description**
1		Stimulus	AE is requested to send a ontologyRepository Update Request to update an attribute of the resource
2	Mca	PRO Check Primitive	• op = 3 (Update) • to = {CSEBaseName}/URI of <ontologyRepository> resource • fr = AE-ID • rqi = (token-string) • pc = Serialized representation of updated <ontologyRepository> resource
3		IOP Check	Check if possible that the <ontologyRepository> 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 <ontologyRepository> resource
5		IOP Check	AE indicates successful operation
IOP Verdict			
PRO Verdict			

8.6.4.4   OntologyRepository Delete

Interoperability Test Description			
Identifier:	TD_M2M_NH_130		
Objective:	AE deletes OntologyRepository resource via a OntologyRepository Delete Request		
Configuration:	M2M_CFG_01		
References:	oneM2M TS-0034 [13], clause 6.7.5 oneM2M TS-0004 [2], clause 7.4.46.2.4		
Pre-test conditions:	• AE has created an Application Entity resource <AE> on Registrar CSE • AE has created a ontologyRepository resource <ontologyRepository> as child of <AE> resource		
Test Sequence			
Step	**RP**	**Type**	**Description**
1		Stimulus	AE is requested to send a ontologyRepository Delete Request
2	Mca	PRO Check Primitive	• op = 4 (Delete) • to = {CSEBaseName}/URI of <ontologyRepository> resource • fr = AE-ID • rqi = (token-string) • pc = empty
3		IOP Check	Check if possible that the <ontologyRepository> 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
5		IOP Check	Check if possible that the <ontologyRepository> resource has been removed in Registrar CSE
6		IOP Check	AE indicates successful operation
IOP Verdict			
PRO Verdict			

8.6.5　Semantic validation management

8.6.5.1　Semantic validation independent of <semanticDescriptor> resource operation

Interoperability Test Description	
Identifier:	TD_M2M_NH_131
Objective:	AE checks the validity of the <semanticDescriptor> resource via a <semanticValidation> Update Request
Configuration:	M2M_CFG_01
References:	oneM2M TS-0034 [13], clause 7.10.2 oneM2M TS-0004 [2], clause 7.4.48.2.3
Pre-test conditions:	• AE has created an Application Entity resource <AE> on Registrar CSE • AE has created a semanticDescriptor resource <semanticDescriptor> as child of <AE> resource
Test Sequence	

Step	RP	Type	Description
1		Stimulus	AE is requested to send a <semanticValidation> Update Request to check the validity of the <semanticDescriptor>resource
2	Mca	PRO Check Primitive	• op = 3 (Update) • to = {CSEBaseName}/URI of <semanticDescriptor> resource/smv • fr = AE-ID • rqi = (token-string) • pc = Serialized representation of <semanticValidation> parameters
3		IOP Check	Check if possible that the received <semanticDescriptor> resource with the *semanticValidated* attribute is set to 'true' in Registrar CSE
4	Mca	PRO Check Primitive	• rsc = 2004 (Updated) • rqi = (token-string) same as received in request message
5		IOP Check	AE indicates successful operation
IOP Verdict			
PRO Verdict			

8.6.5.2　Semantic validation triggered when Create a semanticDescriptor resource

Interoperability Test Description	
Identifier:	TD_M2M_NH_132
Objective:	AE creates a <semanticDescriptor> resource visa SemanticDescriptor Create Request and Registrar CSE checks the validity of the created <semanticDescriptor> resource
Configuration:	M2M_CFG_01
References:	oneM2M TS-0034 [13], clause 7.10.3 oneM2M TS-0004 [2], clause 7.4.34.2.1
Pre-test conditions:	• AE has created an Application Entity resource <AE> on Registrar CSE
Test Sequence	

Step	RP	Type	Description
1		Stimulus	AE is requested to send a < semanticDescriptor > Create Request with *validationEnable* attribute set to 'true'
2	Mca	PRO Check Primitive	• op = 1 (Create) • to = {CSEBaseName} • fr = AE-ID • rqi = (token-string) • ty = 24 (semanticDescriptor) • pc = Serialized representation of <semanticDescriptor> resource
3		IOP Check	Check if possible that the <semanticDescriptor> resource is created in Registrar CSE Check if possible that the semanticValidated attribute of the <semanticDescriptor> is set to 'true'
4	Mca	PRO Check Primitive	• rsc = 2001 (CREATED) • rqi = (token-string) same as received in request message • pc = Serialized representation of <semanticDescriptor> resource
5		IOP Check	AE indicates successful operation
IOP Verdict			
PRO Verdict			

8.6.6 Ontology Mapping management

8.6.6.1 OntologyMapping Create

Interoperability Test Description			
Identifier:	TD_M2M_NH_133		
Objective:	AE creates an OntologyMapping resource in Registrar CSE via an OntologyMapping Create Request		
Configuration:	M2M_CFG_01		
References:	oneM2M TS-0034 [13], clause 6.10.2 oneM2M TS-0004 [2], clause 7.4.62.2.1		
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 <ontologyMapping> resource
2	Mca	PRO Check Primitive	• op = 1 (Create) • to = {CSEBaseName} • fr = AE-ID • rqi = (token-string) • ty = 52 (ontologyMapping) • pc = Serialized representation of <ontologyMapping>resource
3		IOP Check	Check if possible that the <ontologyMapping> 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 <ontologyMapping> resource
5		IOP Check	AE indicates successful operation
IOP Verdict			
PRO Verdict			

8.6.6.2 OntologyMapping Retrieve

Interoperability Test Description			
Identifier:	TD_M2M_NH_134		
Objective:	AE retrieves information of an ontology mapping result via a ontologyMapping Retrieve Request		
Configuration:	M2M_CFG_01		
References:	oneM2M TS-0034 [13], clause 6.10.3 oneM2M TS-0004 [2], clause 7.4.62.2.2		
Pre-test conditions:	• AE has created an Application Entity resource <AE> on Registrar CSE • AE has created a ontologyMapping resource <ontologyMapping> as child resource of <AE> resource		
Test Sequence			
Step	**RP**	**Type**	**Description**
1		Stimulus	AE is requested to send a Retrieve Request for a <ontologyMapping>
2	Mca	PRO Check Primitive	• op = 2 (Retrieve) • to = {CSEBaseName}/URI of <ontologyMapping> 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 <ontologyMapping> resource
4		IOP Check	AE indicates successful operation
IOP Verdict			
PRO Verdict			

8.6.6.3   OntologyMapping Update

Interoperability Test Description			
Identifier:	TD_M2M_NH_135		
Objective:	AE updates attribute in <ontologyMapping> resource via a ontologyMapping Update Request		
Configuration:	M2M_CFG_01		
References:	oneM2M TS-0034 [13], clause 6.10.4 oneM2M TS-0004 [2], clause 7.4.62.2.3		
Pre-test conditions:	• AE has created an Application Entity resource <AE> on Registrar CSE • AE has created a ontologyMapping resource <ontologyMapping> as child resource of <AE> resource		
Test Sequence			
Step	RP	Type	Description
1		Stimulus	AE is requested to send a ontologyMapping Update Request to update the *mappingPolicy* attribute of the resource
2	Mca	PRO Check Primitive	• op = 3 (Update) • to = {CSEBaseName}/URI of <ontologyMapping> resource • fr = AE-ID • rqi = (token-string) • pc = Serialized representation of updated <ontologyMapping> resource
3		IOP Check	Check if possible that the <ontologyMapping> 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 <ontologyMapping> resource
5		IOP Check	AE indicates successful operation
IOP Verdict			
PRO Verdict			

8.6.6.4   OntologyMapping Delete

Interoperability Test Description			
Identifier:	TD_M2M_NH_136		
Objective:	AE deletes OntologyMapping resource via a OntologyMapping Delete Request		
Configuration:	M2M_CFG_01		
References:	oneM2M TS-0034 [13], clause 6.10.5 oneM2M TS-0004 [2], clause 7.4.62.2.4		
Pre-test conditions:	• AE has created an Application Entity resource <AE> on Registrar CSE • AE has created a ontologyMapping resource <ontologyMapping> as child of <AE> resource		
Test Sequence			
Step	RP	Type	Description
1		Stimulus	AE is requested to send a ontologyMapping Delete Request
2	Mca	PRO Check Primitive	• op = 4 (Delete) • to = {CSEBaseName}/URI of <ontologyMapping> resource • fr = AE-ID • rqi = (token-string) • pc = empty
3		IOP Check	Check if possible that the <ontologyMapping> 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
5		IOP Check	Check if possible that the <ontologyMapping> resource has been removed in Registrar CSE
6		IOP Check	AE indicates successful operation
IOP Verdict			
PRO Verdict			

8.7 3GPP Interworking

8.7.1 Cellular IoT non-IP data delivery (NIDD)

8.7.1.1 SCEF Configuration for NIDD

Interoperability Test Description	
Identifier:	TD_M2M_SH_27
Objective:	IN-CSE establishes SCEF Configuration for NIDD
Configuration:	M2M_CFG_09
References:	oneM2M TS-0026 [15], clause 7.1.1.1
Pre-test conditions:	• UE hosts an ADN-AE node • IN-CSE has a <m2mServiceSubscriptionProfile> resource created as a child of <CSEBase> resource • <serviceSubscribedNode> resource is created as a child of <m2mServiceSubscriptionProfile> • Node-ID attribute of <serviceSubscribedNode> resource is set to M2M-Ext-ID of UE and niddRequired attribute is set to TRUE • SCEF identifier is pre-provisioned to IN-CSE

Test Sequence			
Step	RP	Type	Description
1		Stimulus	IN-CSE issues a NIDD Configuration Request to SCEF for ADN-AE hosted on a UE
2	(T8) Mcn	PRO Check HTTP	• Method = POST • URI = {apiRoot}/3gpp-nidd/v1/{scsAsId}/configurations/ The *{apiRoot}* and *{scsAsId}* segments are configured based on Service Provider and MNO policies. • Payload shall include *NiddConfiguration* data structure with the following attributes included in the request: externalId, notificationDestination, duration, pdnEstablishmentOption, duration, pdnEstablishmentOption, reliableDataService, rdsPorts, supportedFeatures
3		IOP Check	Check if possible that the SCEF has successfully processes the NIDD Configuration Request
4	(T8) Mcn	PRO Check HTTP	SCEF responds for the NIDD Configuration Response: • Status code = 201 (CREATED) • Location header = *{apiRoot}/3gpp-nidd/v1/{scsAsId}/configurations/{configurationId}* • Payload shall include *NiddConfiguration* data structure with the following attributes included in the request: maximumPacketSize, status, self
5		IOP Check	IN-CSE indicates successful operation
IOP Verdict			
PRO Verdict			

8.7.1.2 SCEF-based Mobile Terminated NIDD

Interoperability Test Description	
Identifier:	TD_M2M_SH_28
Objective:	IN-AE sends a downlink non-IP data to a UE hosting ADN-AE
Configuration:	M2M_CFG_11
References:	oneM2M TS-0026 [15], clause 7.1.1.2
Pre-test conditions:	• IN-AE has created an Application Entity resource <AE> on IN-CSE • ADN-AE has created an Application Entity resource <AE> on IN-CSE • IN-CSE has a <m2mServiceSubscriptionProfile> resource created as a child of <CSEBase> resource • <serviceSubscribedNode> resource is created as a child of <m2mServiceSubscriptionProfile> • Node-ID attribute of <serviceSubscribedNode> resource is set to M2M-Ext-ID of UE and niddRequired attribute is set to TRUE • SCEF identifier is pre-provisioned to IN-CSE • NIDD configuration procedure is competed successfully

Test Sequence			
Step	RP	Type	Description
1		Stimulus	(Optional) IN-AE issues an arbitrary oneM2M request targeting an ADN-AE.

Interoperability Test Description			
2		Stimulus	IN-CSE issues a SCEF-based Mobile Terminated (MT) NIDD Downlink Data Transfer Request
3	(T8) Mcn	PRO Check HTTP	• Method = POST • URI = *{apiRoot}/3gpp-nidd/v1/{scsAsId}/configurations/{configurationId}/downlink-data-deliveries* • Payload shall include NiddDownlinkDataTransfer data structure with the following attributes included in the request: externalId, maximumLatency, priority, pdnEstablishmentOption, pdnEstablishmentOption, reliableDataService, rdsPorts, data (containing onem2m primitive)
4		IOP Check	Check if possible that the SCEF has successfully processes the NIDD Downlink Data Transfer Request
5	(T8) Mcn	PRO Check HTTP	SCEF responds for the NIDD Downlink Data Transfer Request: • Status code = 201 (CREATED) • Location header = *{apiRoot}/3gpp-nidd/v1/{scsAsId}/configurations/{configurationId}* • Payload shall include *NiddConfiguration* data structure with the following attributes included in the request: maximumPacketSize, status, self
6		IOP Check	In case the UE does not have an active NIDD PDN connection to the SCEF, check that SCEF buffered the request until the UE establishes the connection
7	(T8) Mcn	PRO Check HTTP	SCEF responds with NIDD Downlink Data Transfer Response: • Status code = 200 (OK) / 201 (CREATED, Buffered request) • Location header = *{apiRoot}/3gpp-nidd/v1/{scsAsId}/configurations/{configurationId}/downlink-data-deliveries/{downlinkDataDeliveryId}* • Payload shall include NiddDownlinkDataTransfer data structure with the following attributes included in the request: deliviryStatus, self, requestedRetransmissionTime
8	(T8) Mcn	PRO Check HTTP	(Optional) SCEF returns a MT NIDD Downlink Data Delivery Status Notification to IN-CSE: • Method = POST • URI = *{notification_uri}* • Payload shall include a NiddDownlinkDataDeliveryStatusNotification data structure with the following attributes included in the request: niddDownlinkDataTransfer, deliveryStatus, requestedRetransmissionTime
9	(T8) Mcn	PRO Check HTTP	IN-CSE responds to the MT NIDD Downlink Data Delivery Status Acknowledgement: • Status code = 204 (NO CONTENT)
10		IOP Check	Check that ADN-AE on UE has executed the oneM2M request primitive accordingly
11		Stimulus	(Optional) ADN-AE hosted on the UE issues a MO NIDD Uplink Data Notification to deliver a oneM2M response primitive back to the Originator
12	(T8) Mcn	PRO Check HTTP	(Optional) SCEF sends for the NIDD Uplink Data Notification: • Method = POST • URI = *{notification_uri}* • Payload shall include NiddUplinkDataNotification data structure with the following attributes included in the request: niddConfiguration, externalId, reliableDataService, rdsPort, data
13	(T8) Mcn	PRO Check HTTP	(Optional) IN-CSE responds with MO NIDD Uplink Data Acknowledgement and sends oneM2M response primitive to IN-AE • Status code = 204 (NO CONTENT)
14		IOP Check	(Optional) Check that IN-AE received a corresponding oneM2M response primitive
IOP Verdict			
PRO Verdict			

8.7.1.3 SCEF-based Mobile Originated NIDD

Interoperability Test Description	
Identifier:	TD_M2M_SH_29
Objective:	IN-AE sends a downlink non-IP data to a UE hosting ADN-AE
Configuration:	M2M_CFG_11
References:	oneM2M TS-0026 [15], clause 7.1.1.3

Pre-test conditions:	- IN-AE has created an Application Entity resource <AE> on IN-CSE - ADN-AE has created an Application Entity resource <AE> on IN-CSE - IN-CSE has a <m2mServiceSubscriptionProfile> resource created as a child of <CSEBase> resource <serviceSubscribedNode> resource is created as a child of <m2mServiceSubscriptionProfile> - Node-ID attribute of <serviceSubscribedNode> resource is set to M2M-Ext-ID of UE and niddRequired attribute is set to TRUE - SCEF identifier is pre-provisioned to IN-CSE - NIDD configuration procedure is competed successfully - RDS source and destination port numbers are pre-provisioned in ADN-AE

Test Sequence			
Step	**RP**	**Type**	**Description**
1		Stimulus	ADN-AE issues MO NIDD Uplink Data Notification to deliver an arbitrary primitive to the IN-CSE
2	(T8) Mcn	PRO Check HTTP	SCEF triggers a MO NIDD Uplink Data Notification carrying request primitive: - Method = POST - URI = *notification_uri}* - Payload shall include NiddUplinkDataNotification data structure with the following attributes included in the request: niddConfiguration, externalId, reliableDataService, rdsPort, data (containing onem2m primitive)
3	(T8) Mcn	PRO Check HTTP	IN-CSE responds with MO NIDD Uplink Data Acknowledgement: Status code = 204 (NO CONTENT)
4		IOP Check	Check if possible that SCEF has processed the MO NIDD Uplink Data Acknowledgement from the IN-CSE
5		PRO Check	SCEF sends an RDS acknowledgment to the UE: Status code = 204 (NO CONTENT)
6		IOP Check	Check if possible that IN-CSE processes the oneM2M request primitive
7	(T8) Mcn	PRO Check HTTP	(Optional) If a response is required, IN-CSE generates a oneM2M response and sends a MT NIDD Downlink Data Transfer Request: - Method = POST - URI = *{apiRoot}/3gpp-nidd/v1/{scsAsId}/configurations/{configurationId}/downlink-data-deliveries* - Payload shall include *NiddDownlinkDataTransfer* data structure with the following attributes included in the request:externalId, maximumLatency, priority, pdnEstablishmentOption, (optional) reliableDataService, rdsPort, data (containing response to oneM2M primitive)
8	(T8) Mcn	PRO Check HTTP	(Optional) Scef returns MT NIDD Downlink Data Transfer Response to IN-CSE: - Status code = 200 (OK) / 201 (Created) - URI = *{apiRoot}/3gpp-nidd/v1/{scsAsId}/configurations/{configurationId}/downlink-data-deliveries/{downlinkDataDeliveryId}* Payload may include *NiddDownlinkDataTransfer* data structure with the following attributes included in the response: deliveryStatus, self, requestedRetransmissionTime
9		IOP Check	(Optional) Check if possible that SCEF has processed the request and delivered it to the targeted UE (Optional) Check if possible that UE has responded with an RDS acknowledgment
10	(T8) Mcn	PRO Check HTTP	(Optional) SCEF returns MT NIDD Downlink Data Delivery Status Notification to IN-CSE: - Method = POST - URI = *{notification_uri}* - Payload shall include *NiddDownlinkDataDeliveryStatusNotification* data structure with the following attributes included in the request: niddDownlinkDataTransfer, deliveryStatus, requestedRetransmissionTime
11	(T8) Mcn	PRO Check HTTP	(Optional) IN-CSE responds to SCEF: Status code = 204 (NO CONTENT)
12		IOP Check	(Optional) Check if possible that ADN-AE has processed the oneM2M response primitive

Interoperability Test Description	
IOP Verdict	
PRO Verdict	

8.7.2 Monitoring events

8.7.2.1 UE Reachability monitoring

Interoperability Test Description			
Identifier:	TD_M2M_SH_30		
Objective:	IN-AE monitors UE Reachability status		
Configuration:	M2M_CFG_10		
References:	oneM2M TS-0026 [15], clause 7.4.1		
Pre-test conditions:	- UE, SCEF and IN-CSE are attached to the underlying 3GPP network - IN-AE has created an Application Entity resource <AE> on IN-CSE - ADN-AE has created an Application Entity resource <AE> on IN-CSE - ADN-AE has created a Node resource <node> on IN-CSE representing UE - ADN-AE has created a Schedule resource <schedule> on IN-CSE under <node> resource. The networkCoordinated attribute is set to TRUE. - IN-AE has subscribed to the <schedule> resource by creating a child <subscription> resource. - IN-CSE has subscribed to to the SCEF to receive notifications (monitoringType = UE_REACHABILITY). - UE is in idle mode		
Test Sequence			
Step	**RP**	**Type**	**Description**
1		Stimulus	UE transitions to connected mode
2		IOP Check	Check if possible that the 3GPP network entities (e.g. HSS) has detected the condition and sent a Monitoring Event Report to SCEF
3	(T8) Mcn	PRO Check HTTP	SCEF receives the report and sends Monitoring Notification UE for_REACHABILITY to IN-CSE: - Method = POST - URI = *{notification_uri}* - Payload shall include MonitoringNotification data structure with the following attributes included in the request: subscription, configResults, cancelInd, monitoringEventReports (externalIDs, monitoringType, idleStatusInfo, reachabilityType)
4	(T8) Mcn	PRO Check HTTP	IN-CSE responds to the UE Reachability Monitoring Notification: Status code = 204 (NO CONTENT)
5		IOP Check	Check if possible that if idleStatusInfo information is provided in the report, IN-CSE has updated scheduleElement attribute of the <schedule> resource
6	(T8) Mcn	PRO Check Primitive	IN-CSE sends a Notify message to IN-CSE: - op = 6 (Notify) - pc = serialized representation of the updated <schedule> resource
7		IOP Check	Check if possible that ADN-AE on UE has updated its local <schedule> resource (if applicable)
IOP Verdict			
PRO Verdict			

8.7.2.2 UE Availability after DDN Failure

Interoperability Test Description	
Identifier:	TD_M2M_SH_31
Objective:	UE Availability after DDN Failure scenario
Configuration:	M2M_CFG_11
References:	oneM2M TS-0026 [15], clause 7.4.2
Pre-test conditions:	- UE, SCEF and IN-CSE are attached to the underlying 3GPP network - IN-AE has created an Application Entity resource <AE> on IN-CSE - ADN-AE has created an Application Entity resource <AE> on IN-CSE - ADN-AE has created a Node resource <node> on IN-CSE representing UE - ADN-AE has created a Schedule resource <schedule> on IN-CSE under <node> resource. The networkCoordinated attribute is set to TRUE. - IN-AE has subscribed to the <schedule> resource by creating a child <subscription> resource. - IN-CSE has subscribed to to the SCEF to receive notifications (monitoringType = AVAILABILITY_AFTER_DDN_FAILURE) - UE is in unreachable for Downlink data and in state that DDN Failure condition can be reproduced

Test Sequence			
Step	**RP**	**Type**	**Description**
1		Stimulus	IN-AE issues an arbitrary oneM2M request targeting an ADN-AE
2		IOP Check	Check that no response for UE paging is received Check if possible that if UE is in PSM mode, the UE subscription has been updated to reflect that a notification of availability should be sent after this DDN failure
3		Stimulus	UE contacts the network
4		IOP Check	Check if possible that SCEF has received a Monitoring Indication that the UE is available
5	(T8) Mcn	PRO Check HTTP	SCEF receives the report and sends Monitoring Notification for AVAILABILITY_AFTER_DDN_FAILURE to IN-CSE: - Method = POST - URI = {notification_uri} - Payload shall include MonitoringNotification data structure with the following attributes included in the request: subscription, configResults, cancelInd, monitoringEventReports (externalIDs, monitoringType, idleStatusInfo)
6	(T8) Mcn	PRO Check HTTP	IN-CSE responds to the DDN Failure Monitoring Notification: Status code = 204 (NO CONTENT)
7		IOP Check	Check if possible that IN-CSE has updated the <schedule> resource to indicate that UE is available and created new scheduleElement Check if possible that notification has been sent to the <schedule> resource subscribed entities
8		Stimulus	UE transitions to Idle
9	(T8) Mcn	PRO Check HTTP	SCEF sends a UE Reachability Monitoring Event Notification Request to IN-CSE: - Method = POST - URI = {notification_uri} - Payload shall include MonitoringNotification data structure with the following attributes included in the request: subscription, configResults, cancelInd, monitoringEventReports (externalIDs, monitoringType, idleStatusInfo)
10	(T8) Mcn	PRO Check HTTP	IN-CSE responds to the UE Reachability Monitoring Notification: Status code = 204 (NO CONTENT)
11		IOP Check	Check if possible that IN-CSE has updated the <schedule> resource to indicate that UE is idle Check if possible that notification has been sent to the <schedule> resource subscribed entities
IOP Verdict			
PRO Verdict			

8.7.2.3 UE Communication Failure

Interoperability Test Description			
Identifier:	TD_M2M_SH_32		
Objective:	UE Communication Failure scenario		
Configuration:	M2M_CFG_11		
References:	oneM2M TS-0026 [15], clause 7.4.3		
Pre-test conditions:	• UE, SCEF and IN-CSE are attached to the underlying 3GPP network • IN-AE has created an Application Entity resource <AE> on IN-CSE • ADN-AE has created an Application Entity resource <AE> on IN-CSE • ADN-AE has created a Node resource <node> on IN-CSE representing UE • ADN-AE has created a Schedule resource <schedule> on IN-CSE under <node> resource. The networkCoordinated attribute is set to TRUE • IN-AE has subscribed to the <schedule> resource by creating a child <subscription> resource. • IN-CSE has subscribed to to the SCEF to receive notifications (monitoringType = COMMUNICATION_FAILURE)		
Test Sequence			
Step	**RP**	**Type**	**Description**
1		Stimulus	UE communication failure occurs
2		IOP Check	Check if possible SCEF has received a Monitoring Event Report
3	(T8) Mcn	PRO Check HTTP	SCEF receives the report and sends Monitoring Notification Report for COMMUNICATION_FAILURE to IN-CSE: • Method = POST • URI = *{notification_uri}* • Payload shall include MonitoringNotification data structure with the following attributes included in the request: subscription, configResults, cancelInd, monitoringEventReports (externalIDs, monitoringType, failureCause).
4	(T8) Mcn	PRO Check HTTP	IN-CSE responds to the Monitoring Notification Report request: Status code = 204 (NO CONTENT)
5		IOP Check	Check if possible that IN-CSE has updated the <schedule> resource to indicate that UE is available and created new scheduleElement
6	(T8) Mcn	PRO Check HTTP	SCEF sends a UE Communication Failure Monitoring Event Notification Request to IN-CSE: • Method = POST • URI = *{notification_uri}* • Payload shall include MonitoringNotification data structure with the following attributes included in the request: subscription, configResults, cancelInd, monitoringEventReports (externalIDs, monitoringType, failureCause)
7	(T8) Mcn	PRO Check HTTP	IN-CSE responds to the UE Communication Failure Monitoring Notification: Status code = 204 (NO CONTENT)
8		IOP Check	Check if possible that IN-CSE has updated the scheduleElement of the <schedule> resource to indicate that no communications are currently available Check if possible that notification has been sent to the <schedule> resource subscribed entities
IOP Verdict			
PRO Verdict			

8.7.2.4   Roaming Status

Interoperability Test Description			
Identifier:		TD_M2M_SH_33	
Objective:		Roaming status scenario	
Configuration:		M2M_CFG_09	
References:		oneM2M TS-0026 [15], clause 7.4.6	
Pre-test conditions:		• UE, SCEF and IN-CSE are attached to the underlying 3GPP network • IN-CSE can make Roaming Status Reports requests • ADN-AE has created an Application Entity resource <AE> on IN-CSE • ADN-AE has created a Node resource <node> on IN-CSE representing UE. roamingStatus and networkID attributes of <node> resource are configured. • IN-CSE has subscribed to to the SCEF to receive notifications (monitoringType = ROAMING_STATUS)	
Test Sequence			
Step	**RP**	**Type**	**Description**
1		Stimulus	Roaming status of UE has changed
2		IOP Check	Check if possible SCEF has received a Monitoring Event Report
3	(T8) Mcn	PRO Check HTTP	SCEF receives the report and sends Monitoring Notification Report for ROAMING_STATUS to IN-CSE: • Method = POST • URI = *{notification_uri}* • Payload shall include MonitoringNotification data structure with the following attributes included in the request: subscription, configResults, cancelInd, monitoringEventReports (externalIDs, monitoringType, plmnId, roamingStatus)
4	(T8) Mcn	PRO Check HTTP	IN-CSE responds to the DDN Failure Monitoring Notification: Status code = 204 (NO CONTENT)
5		IOP Check	Check if possible that IN-CSE has updated roamingStatus and networkID attributes the <node> resource
IOP Verdict			
PRO Verdict			

8.7.2.5   Location updating triggered by retrieval

Interoperability Test Description			
Identifier:		TD_M2M_SH_34	
Objective:		Location Reporting scenario	
Configuration:		M2M_CFG_09	
References:		oneM2M TS-0026 [15], clause 7.4.7.2	
Pre-test conditions:		• UE, SCEF and IN-CSE are attached to the underlying 3GPP network • ADN-AE has created an Application Entity resource <AE> on IN-CSE • IN-CSE has subscribed to to the SCEF to receive notifications (monitoringType = LOCATION_REPORTING)	
Test Sequence			
Step	**RP**	**Type**	**Description**
1		Stimulus	IN-AE sends a < locationPolicy> CREATE request

2	(T8)
	Mcn
		PRO Check
		Primitive
			• op = 1 (Create)
			• to = {CSEBaseName}
			• fr = IN-AE-ID
			• rqi = (token-string)
			• ty = 10 (LocationPolicy)
			• pc = Serialized representation of <locationPolicy> resource
			  o locationSource = Netwrork based
			  o locationUpdatePeriod = 0
			  o locationTargetID = M2M-Ext-ID of the UE
			  o locationInformationType = position fix
			  o retrieveLastKnownLocation = TRUE/FALSE

3		IOP Check	Check if possible that IN-CSE has created <locationPolicy> resource
4		Stimulus	AE is requested to send a Retrieve Request for a <latest> content instance

		Interoperability Test Description		
5	(T8) Mcn	PRO Check Primitive	• op = 2 (Retrieve) • to = {CSEBaseName}/URI of <container> resource/la • fr = IN-AE-ID • rqi = (token-string) • pc = empty	
6	(T8) Mcn	PRO Check HTTP	IN-CSE makes Monitoring Event Subscription request to retrieve current location of UE • Method = POST • URI = {apiRoot}/3gpp-monitoring-event/v1/{scsAsId}/subscriptions/ • Payload shall include *MonitoringEventSubscription* data structure with the following attributes included in the request: externalId, notificationDestination, monitoringType, supportedFeatures, maximumNumberOfReports, monitorExpireTime, accuracy. • locationType = CURRENT_KNOWNLOCATION	
7	(T8) Mcn	PRO Check HTTP	SCEF sends a Monitoring Event Subscription Response message to the IN-CSE • Status code = 201 (CREATED) • Location header = {apiRoot}/3gpp-monitoring-event/v1/{scsAsId}/subscriptions/{subscriptionId} • Payload shall include NiddConfiguration data structure with the following attributes included in the request: monitoringEventReport, self	
8		IOP Check	Check if possible that SCEF detected and retrieved location of UE	
9	(T8) Mcn	PRO Check HTTP	SCEF sends a Monitoring Event Report message to the IN-CSE: • Method = POST • URI = {notification_uri} • Payload shall include *MonitoringEventSubscription* data structure with the following attributes included in the request: subscription, configResults, cancelid,monitoring, EventReports (externalID, monitoringType, locatonInfo)	
10	(T8) Mcn	PRO Check HTTP	IN-CSE responds to the DDN Failure Monitoring Notification: Status code = 204 (NO CONTENT)	
11		IOP Check	Check if possible that IN-CSE has created a new <contentInstance> child resource of the <container>. The <contentInstance> contains the UE's current location	
12	(T8) Mcn	PRO Check HTTP	IN-CSE sends a Monitoring Event Subscription message to the SCEF: • Method = POST • URI = {apiRoot}/3gpp-monitoring-event/v1/{scsAsId}/subscriptions/ • Payload shall include MonitoringEventSubscription with the following attributes included in the request: subscription, configResults, cancelid,monitoringEventReports (externalID, monitoringType, locatonInfo) • locationType = LAST_KNOWNLOCATION	
13	(T8) Mcn	PRO Check HTTP	SCEF sends a Monitoring Event Report message to the IN-CSE: • Method = POST • Response code = 201 (CREATED) • URI = {apiRoot}/3gpp-monitoring-vent/v1/{scsAsId}/subscriptions/{subscriptionId} • Payload shall include *MonitoringEventSubscription* data structure with the following attributes included in the request: self, monitoringEnentReport	
14		IOP Check	Check if possible that SCEF receives a last known location information of UE	
15	(T8) Mcn	PRO Check HTTP	SCEF sends a Monitoring Notification Report message to the IN-CSE for LOCATION_REPORTING: • Method = POST • URI = {notification_uri} • Payload shall include *MonitoringEventSubscription* data structure with the following attributes included in the request: subscription, configResults, cancelid,monitoringEventReports	
16	(T8) Mcn	PRO Check HTTP	IN-CSE responds to the Monitoring Notification: Status code = 204 (NO CONTENT)	
17		IOP Check	Check if possible that IN-CSE has created a new *<contentInstance>* child resource of the *<container>* containing the UE's last known location in this *<contentInstance>*	
18	(T8) Mcn	PRO Check HTTP	• rsc = 2000 (OK) • rqi = (token-string) same as received in request message pc = Serialized representation of latest <contentInstance> resource, created after acquiring location info from SCEF	
19		IOP Check	AE indicates successful operation	
NOTE:			Steps: 12-17 are only applicable, if retrieveLastKnownLocation is set to TRUE.	
PRO Verdict				

8.7.3   3GPP Based Device triggering

8.7.3.1   General Procedure for 3GPP Based Device Triggering

Interoperability Test Description			
Identifier:	TD_M2M_SH_35		
Objective:	IN-AE triggers ADN-AE hosted on UE		
Configuration:	M2M_CFG_09		
References:	oneM2M TS-0026 [15], clause 7.5.1		
Pre-test conditions:	• UE, SCEF and IN-CSE are attached to the underlying 3GPP network • ADN-AE has created an Application Entity resource <AE> on IN-CSE • ADN-AE is available to receive the Device Trigger Requests (triggerEnable = "TRUE")		
Test Sequence			
Step	**RP**	**Type**	**Description**
1		Stimulus	IN-AE sends a request to create a <triggerRequest>
2	Mca	PRO Check Primitive	• op = 1 (Create) • to = {CSEBaseName}/{AE-ID}/ • fr = AE-ID • rqi = (token-string) • ty = 47 (triggerRequest) • pc = Serialized representation of < triggerRequest > resource
3		IOP Check	Check if possible that IN-CSE has created <triggerRequest> resource
4	(T8) Mcn	PRO Check HTTP	IN-CSE sends a Device Triggering request to the SCEF • Method = POST • URI = *{apiRoot}/3gpp-device-triggering/v1/{scsAsId}/transactions* • Payload shall include DeviceTriggering data structure with the following attributes included in the request: supportedFeatures, validityPeriod, triggerPayload, externalId, *applicationPortID,* notificationDestination, priority
5		IOP Check	Check that SCEF has responded to IN-CSE for Device Triggering request Check that SCEF has delivered the device trigger message to the UE hosting ADN-AE Check that SCEF has delivered the Device Triggering Delivery Report Notification request to IN-CSE
6		IOP Check	Check that IN-CSE has responded to SCEF the Device Triggering Delivery Report Notification request Check if possible that IN-CSE has updated triggerStatus attribute of <triggerRequest> resource Check that IN-CSE has responded to IN-AE for <triggerRequest> Create request
7		IOP Check	Check that ADN-AE has performed the trigger actions
IOP Verdict			
PRO Verdict			

8.7.3.2   3GPP Based Device Trigger Recall/Replace Procedure

Interoperability Test Description			
Identifier:	TD_M2M_SH_36		
Objective:	IN-AE recalls/replaces a trigger request targeting ADN-AE hosted on UE that has been already created in IN-CSE		
Configuration:	M2M_CFG_09		
References:	oneM2M TS-0026 [15], clause 7.5.2		
Pre-test conditions:	• UE, SCEF and IN-CSE are attached to the underlying 3GPP network • ADN-AE has created an Application Entity resource <AE> on IN-CSE • ADN-AE is available to receive the Device Trigger Requests (triggerEnable = "TRUE") • <triggerRequest> resource targeting ADN-AE has been created in IN-CSE • IN-CSE has already sent a device trigger request to the underlying 3GPP network		
Test Sequence			
Step	**RP**	**Type**	**Description**
1		Stimulus	IN-AE sends a request to UPDATE/DELETE a <triggerRequest>

			Interoperability Test Description
2	Mca	PRO Check Primitive	• op = 3 (Update) / 4 (Delete) • to = {CSEBaseName}/{AE-ID}/{URI of <triggerRequest> resource} • fr = AE-ID • rqi = (token-string) • pc = Serialized representation of < triggerRequest > resource (for UPDATE only)
3		IOP Check	Check if possible that IN-CSE has created <triggerRequest> resource
4	(T8) Mcn	PRO Check HTTP	IN-CSE sends a Trigger UPDATE (Replace) / DELETE (Recall) Request to the SCEF • Method = PUT/DELETE • URI = *{apiRoot}/3gpp-device-triggering/v1/{scsAsId}/transactions* • (For Trigger UPDATE only) Payload shall include DeviceTriggering data structure with the following attributes included in the request: supportedFeatures, validityPeriod, triggerPayload, externalId, applicationPortID, notificationDestination, priority
5		IOP Check	Check that SCEF has recalled/replaced the trigger Check that SCEF responded to IN-CSE for Device Trigger Recall/Replace Check that SCEF has delivered the device trigger message to the UE hosting ADN-AE Check that SCEF has delivered the Device Triggering Delivery Report Notification request to IN-CSE
6		IOP Check	Check if possible that IN-CSE has updated triggerStatus attribute of <triggerRequest> resource / deleted <triggerRequest> resource Check that IN-CSE has responded to IN-AE for <triggerRequest> UPDATE/DELETE request
IOP Verdict			
PRO Verdict			

8.7.4   Configuration of traffic patterns

Interoperability Test Description			
Identifier:	TD_M2M_SH_37		
Objective:	IN-CSE translates the oneM2M Node Traffic Pattern (TP) into a 3GPP Device Communication Pattern		
Configuration:	M2M_CFG_09		
References:	oneM2M TS-0026 [15], clause 7.6		
Pre-test conditions:	• UE, SCEF and IN-CSE are attached to the underlying 3GPP network • ADN-AE hosted on UE has created an Application Entity resource <AE> on IN-CSE • IN-CSE has established relationship with MNO and is allowed to request Configuration of Device Communication Patterns.		
Test Sequence			
Step	**RP**	**Type**	**Description**
1		Stimulus	ADN-AE sends a request to create an activityPatternElements attribute in <AE> resource
2	Mca	PRO Check Primitive	• op = 3 (Update) • to = {CSEBaseName}/{AE-ID} • fr = AE-ID • rqi = (token-string) • pc = Serialized representation of <AE> resource
3		IOP Check	Check if possible that IN-CSE has updated <AE > resource
4	(T8) Mcn	PRO Check HTTP	IN-CSE sends a Communication Patterns Configuration creation request to the SCEF • Method = POST • URI = *{apiRoot}/3gpp-cp-parameter-provisioning/v1/{scsAsId}/subscriptions* • Payload shall include DeviceTriggering data structure with the following attributes included in the request: externalId, supportedFeatures, cpParameterSets
5		IOP Check	Check if possible that underlying 3GPP network elements has stored the new/updated CP parameter Check that SCEF has responded to IN-CSE for Communication Patterns Configuration request
IOP Verdict			
PRO Verdict			

8.7.5 Group message delivery using MBMS

8.7.5.1 Create MBMS Group

Interoperability Test Description	
Identifier:	TD_M2M_SH_38
Objective:	IN-AE creates a MBMS Group for handling group related requests
Configuration:	M2M_CFG_12
References:	oneM2M TS-0026 [15], clause 7.7.3.1
Pre-test conditions:	- Member Hosting CSE, SCEF and Group Hosting CSE are attached to the underlying 3GPP network - Member Hosting CSE on UE has created a <RemoteCSE> resource on Group Hosting CSE - IN-AE has created an Application Entity resource <AE> on Group Hosting CSE - The MBMS service area information provided by the MNO is configured in the oneM2M System - External Group Identifiers for the devices have been pre-provisioned in the oneM2M System
Test Sequence	

Step	RP	Type	Description
1		Stimulus	IN-AE is requested to send a group Create Request
2	Mca	PRO Check Primitive	- op = 1 (Create) - to = {CSEBaseName} - fr = AE-ID - rqi = (token-string) - ty = 9 (group) - pc = Serialized representation of <group> resource
3		IOP Check	Check if possible that the <group> resource is created in Registrar CSE Check if possible that multicastType attribute of the Multicast Group Information is set to 3GPP_MBMS_group
4	Mca	PRO Check Primitive	Group Hosting CSE responds to IN-AE: - rsc = 2001 (CREATED) - rqi = (token-string) same as received in request message - pc = Serialized representation of <group> resource
5	(T8) Mcn	PRO Check HTTP	Group Hosting CSE sends a Allocate TMGI Request to the SCEF - Method = POST - URI = *{apiRoot}/3gpp-group-message-delivery-mb2 /v1/{scsAsId}/*tmgi-allocation - Payload shall include TMGIAllocation data structure with the following attributes included in the request: externalGroupId, mbmsLocArea, supportedFeatures
6		IOP Check	Check that SCEF has delivered Allocate TMGI Response to Group Hosting CSE
7		IOP Check	Check if possible that the Group Hosting CSE has stored the tmgi and tmgiExpiration in the local Multicast Group Information Check that Group Hosting CSE has sent <localMulticastGroup> creation requests to the Member Hosting CSE Check that Member Hosting CSE has created <localMulticastGroup> resource
IOP Verdict			
PRO Verdict			

8.7.5.2 Group message delivery using MBMS

Interoperability Test Description	
Identifier:	TD_M2M_SH_39
Objective:	IN-AE sends a request for accessing member resources to the Group Hosting CSE
Configuration:	M2M_CFG_12
References:	oneM2M TS-0026 [15], clause 7.7.3.1
Pre-test conditions:	• Member Hosting CSE, SCEF and Group Hosting CSE are attached to the underlying 3GPP network • Member Hosting CSE on UE has created a <RemoteCSE> resource on Group Hosting CSE • <node> resource representing UE has been created on Group Hosting CSE • <schedule> resource has been created as a child of the <node> resource on Group Hosting CSE • IN-AE has created a <group> resource in Group Hosting CSE • <node> resource is the member of the <group> • Group Hosting CSE has created a <localMulticastGroup> in the Member Hosting CSE • Group Hosting CSE stores tmgi and tmgiExpiration in the local Multicast Group Information

Test Sequence			
Step	**RP**	**Type**	**Description**
1		Stimulus	IN-AE is requested to send a Retrieve Request to the fanoutPoint of <group> resource
2	Mca	PRO Check Primitive	• op = 2 (Retrieve) • to = {CSEBaseName}/{group}/fopt • fr = AE-ID • rqi = (token-string)
3	(T8) Mcn	PRO Check HTTP	Group Hosting CSE sends a Group Message Delivery Request to the SCEF: • Method = POST • URI = to *{apiRoot}/3gpp-group-message-delivery-mb2 /v1/{scsAsId}/*tmgi-allocation{*tmgi*}/delivery-via-mbms • Payload shall include GMDViaMBMSByMb2data structure with the following attributes included in the request: externalGroupId, mbmsLocArea, messageDeliveryStartTime, notificationDestination
4		IOP Check	Check that SCEF has responded to the Group Message Check that SCEF has sent Group Message Delivery Notification to Group Hosting CSE
5		IOP Check	Check that Group Hosting CSE has responded to the Group Message Delivery Notification
6		IOP Check	Check that Member Hosting CSE has sent response message within the scope of responseTimeWindow
7		IOP Check	Check that Group Hosting CSE has received the response messages from Member Hosting CSEs until responseTimeWindow expires and returned the aggregated group member responses to the IN-AE/CSE
IOP Verdict			
PRO Verdict			

8.8 Advanced Subscriptions & Notifications management

8.8.1 Notification Target removal procedure

Interoperability Test Description	
Identifier:	TD_M2M_NH_137
Objective:	AE removes notificationTargetMgmtPolicyRef via a notificationTargetMgmtPolicyRef Delete Request
Configuration:	M2M_CFG_10
References:	ETSI TS 118 101 [1], clause 10.2.10.8 oneM2M TS-0004 [2], clause 7.4.33.2.4
Pre-test conditions:	• AE1 has created an Application Entity resource <AE> on Registrar CSE • AE1 has created a <subscription> resource on Registrar CSE • AE1 has created a <notificationTargetPolicy> resource on Registrar CSE, where policyLabel = "default", action = "accept" • AE2 has created an Application Entity resource <AE> on Registrar CSE

Test Sequence			
Step	RP	Type	Description
1		Stimulus	AE2 is requested to send a notificationTargetSelfReference Delete Request
2	Mca	PRO Check Primitive	• op = 4 (Delete) • to = {CSEBaseName}/URI of <subscription> resource/ntsr • fr = AE-ID • rqi = (token-string) • pc = empty
3	Mca	PRO Check Primitive	• rsc = 2002 (DELETED) • rqi = (token-string) same as received in request message • pc = empty
4		IOP Check	Check if possible that the registrar CSE has removed the AE2 in the notificationURI attribute in the <subscription> resource
5		IOP Check	AE2 indicates successful operation
IOP Verdict			
PRO Verdict			

8.8.2 NotificationTargetMgmtPolicyRef management

8.8.2.1 NotificationTargetMgmtPolicyRef Create

Interoperability Test Description	
Identifier:	TD_M2M_NH_138
Objective:	AE creates a notificationTargetMgmtPolicyRef resource in registrar CSE via a notificationTargetMgmtPolicyRef Create Request
Configuration:	M2M_CFG_01
References:	ETSI TS 118 101 [1], clause 10.2.10.10 oneM2M TS-0004 [2], clause 7.4.30.2.1
Pre-test conditions:	• AE has created an application resource <AE> on registrar CSE • AE has created a <subscription> resource on registrar CSE

Test Sequence			
Step	RP	Type	Description
1		Stimulus	AE sends a request to create a notificationTargetMgmtPolicyRef>
2	Mca	PRO Check Primitive	• op = 1 (Create) • to = {CSEBaseName}/URI of <subscription> resource • fr = AE-ID • rqi = (token-string) • ty = 25 (notificationTargetMgmtPolicyRef) • pc = Serialized representation of <notificationTargetMgmtPolicyRef> resource
3		IOP Check	Check if possible that the <notificationTargetMgmtPolicyRef> 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 <notificationTargetMgmtPolicyRef> resource
5		IOP Check	AE indicates successful operation

Interoperability Test Description	
IOP Verdict	
PRO Verdict	

8.8.2.2 NotificationTargetMgmtPolicyRef Retrieve

Interoperability Test Description			
Identifier:	TD_M2M_NH_139		
Objective:	AE retrieves notificationTargetMgmtPolicyRef resource from Registrar CSE		
Configuration:	M2M_CFG_01		
References:	ETSI TS 118 101 [1], clause 10.2.10.11 oneM2M TS-0004 [2], clause 7.4.30.2.2		
Pre-test conditions:	• AE has created an Application Entity resource <AE> on Registrar CSE • AE has created a subscription resource <subscription> on Registrar CSE • AE has created a <notificationTargetMgmtPolicyRef> on Registrar CSE		
Test Sequence			
Step	RP	Type	Description
1		Stimulus	AE is requested to send a Retrieve Request for a <notificationTargetMgmtPolicyRef>
2	Mca	PRO Check Primitive	• op = 2 (Retrieve) • to = {CSEBaseName}/URI of <notificationTargetMgmtPolicyRef> 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 <notificationTargetMgmtPolicyRef> resource
4		IOP Check	AE indicates successful operation
IOP Verdict			
PRO Verdict			

8.8.2.3 NotificationTargetMgmtPolicyRef Update

Interoperability Test Description			
Identifier:	TD_M2M_NH_140		
Objective:	AE updates information about a notificationTargetMgmtPolicyRef via notificationTargetMgmtPolicyRef>Update Request		
Configuration:	M2M_CFG_01		
References:	ETSI TS 118 101 [1], clause 10.2.10.12 oneM2M TS-0004 [2], clause 7.4.30.2.3		
Pre-test conditions:	• AE has created an Application Entity resource <AE> on Registrar CSE • AE has created a subscription resource <subscription> on Registrar CSE • AE has created a subscription resource <notificationTargetMgmtPolicyRef> on Registrar CSE		
Test Sequence			
Step	RP	Type	Description
1		Stimulus	AE is requested to send a notificationTargetMgmtPolicyRef Update Request to update the notificationlPolicyID attribute of the resource
2	Mca	PRO Check Primitive	• op = 3 (Update) • to = {CSEBaseName}/URI of <notificationTargetMgmtPolicyRef> resource • fr = AE-ID • rqi = (token-string) • pc = Serialized representation of updated <notificationTargetMgmtPolicyRef> resource
3		IOP Check	Check if possible that the <notificationTargetMgmtPolicyRef> 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 <notificationTargetMgmtPolicyRef> resource
5		IOP Check	AE indicates successful operation

Interoperability Test Description	
IOP Verdict	
PRO Verdict	

8.8.2.4 NotificationTargetMgmtPolicyRef Delete

Interoperability Test Description			
Identifier:	TD_M2M_NH_141		
Objective:	AE removes notificationTargetMgmtPolicyRef via a notificationTargetMgmtPolicyRef Delete Request		
Configuration:	M2M_CFG_01		
References:	ETSI TS 118 101 [1], clause 10.2.10.12 oneM2M TS-0004 [2], clause 7.4.30.2.4		
Pre-test conditions:	• AE has created an Application Entity resource <AE> on Registrar CSE • AE has created a notificationTargetMgmtPolicyRef resource <notificationTargetMgmtPolicyRef> on Registrar CSE		
Test Sequence			
Step	RP	Type	Description
1		Stimulus	AE is requested to send a notificationTargetMgmtPolicyRef Delete Request
2	Mca	PRO Check Primitive	• op = 4 (Delete) • to = {CSEBaseName}/URI of <notificationTargetMgmtPolicyRef> resource • fr = AE-ID • rqi = (token-string) • pc = empty
3	Mca	PRO Check Primitive	• rsc = 2002 (DELETED) • rqi = (token-string) same as received in request message • pc = empty
4		IOP Check	Check if possible that the <notificationTargetMgmtPolicyRef> resource has been removed in registrar CSE
5		IOP Check	AE indicates successful operation
IOP Verdict			
PRO Verdict			

8.8.3 NotificationTargetPolicy management

8.8.3.1 NotificationTargetPolicy Create

Interoperability Test Description			
Identifier:	TD_M2M_NH_142		
Objective:	AE creates a notificationTargetPolicy resource in registrar CSE via a notificationTargetPolicy Create Request		
Configuration:	M2M_CFG_01		
References:	ETSI TS 118 101 [1], clause 10.2.10.14 oneM2M TS-0004 [2], clause 7.4.31.2.1		
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 <notificationTargetPolicy>
2	Mca	PRO Check Primitive	• op = 1 (Create) • to = {CSEBaseName} • fr = AE-ID • rqi = (token-string) • ty = 26 (notificationTargetPolicy) • pc = Serialized representation of <notificationTargetPolicy> resource
3		IOP Check	Check if possible that the <notificationTargetPolicy> 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 <notificationTargetPolicy> resource
5		IOP Check	AE indicates successful operation

Interoperability Test Description	
IOP Verdict	
PRO Verdict	

8.8.3.2 NotificationTargetPolicy Retrieve

Interoperability Test Description			
Identifier:	TD_M2M_NH_143		
Objective:	AE retrieves notificationTargetPolicy resource from Registrar CSE		
Configuration:	M2M_CFG_01		
References:	ETSI TS 118 101 [1], clause 10.2.10.15 oneM2M TS-0004 [2], clause 7.4.31.2.2		
Pre-test conditions:	• AE has created an Application Entity resource <AE> on Registrar CSE • AE has created a <notificationTargetPolicy> on Registrar CSE		
Test Sequence			
Step	**RP**	**Type**	**Description**
1		Stimulus	AE is requested to send a Retrieve Request for a <notificationTargetPolicy>
2	Mca	PRO Check Primitive	• op = 2 (Retrieve) • to = {CSEBaseName}/URI of <notificationTargetPolicy> 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 <notificationTargetPolicy> resource
4		IOP Check	AE indicates successful operation
IOP Verdict			
PRO Verdict			

8.8.3.3 NotificationTargetPolicy Update

Interoperability Test Description			
Identifier:	TD_M2M_NH_144		
Objective:	AE updates information about a notificationTargetPolicy via <notificationTargetPolicy> Update Request		
Configuration:	M2M_CFG_01		
References:	ETSI TS 118 101 [1], clause 10.2.10.16 oneM2M TS-0004 [2], clause 7.4.31.2.3		
Pre-test conditions:	• AE has created an Application Entity resource <AE> on Registrar CSE • AE has created a notificationTargetPolicy resource <notificationTargetPolicy> on Registrar CSE		
Test Sequence			
Step	**RP**	**Type**	**Description**
1		Stimulus	AE is requested to send a notificationTargetPolicy Update Request to update the policyLabel attribute of the resource
2	Mca	PRO Check Primitive	• op = 3 (Update) • to = {CSEBaseName}/URI of <notificationTargetPolicy> resource • fr = AE-ID • rqi = (token-string) • pc = Serialized representation of updated <Subscription> resource
3		IOP Check	Check if possible that the <notificationTargetPolicy> 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 <notificationTargetPolicy> resource
5		IOP Check	AE indicates successful operation
IOP Verdict			
PRO Verdict			

8.8.3.4 NotificationTargetPolicy Delete

Interoperability Test Description	
Identifier:	TD_M2M_NH_145
Objective:	AE removes notificationTargetPolicy via a <notificationTargetPolicy> Delete Request
Configuration:	M2M_CFG_01
References:	ETSI TS 118 101 [1], clause 10.2.10.17 oneM2M TS-0004 [2], clause 7.4.31.2.4
Pre-test conditions:	• AE has created an Application Entity resource <AE> on Registrar CSE • AE has created a notificationTargetPolicy resource <notificationTargetPolicy> on Registrar CSE
Test Sequence	

Step	RP	Type	Description
1		Stimulus	AE is requested to send a notificationTargetPolicy Delete Request
2	Mca	PRO Check Primitive	• op = 4 (Delete) • to = {CSEBaseName}/URI of <notificationTargetPolicy> resource • fr = AE-ID • rqi = (token-string) • pc = empty
3	Mca	PRO Check Primitive	• rsc = 2002 (DELETED) • rqi = (token-string) same as received in request message • pc = empty
4		IOP Check	Check if possible that the <notificationTargetPolicy> resource is deleted in registrar CSE
5		IOP Check	AE indicates successful operation
IOP Verdict			
PRO Verdict			

8.8.4 PolicyDeletionRules management

8.8.4.1 PolicyDeletionRules Create

Interoperability Test Description	
Identifier:	TD_M2M_NH_146
Objective:	AE creates a policyDeletionRules resource in registrar CSE via a policyDeletionRules Create Request
Configuration:	M2M_CFG_01
References:	ETSI TS 118 101 [1], clause 10.2.10.18 oneM2M TS-0004 [2], clause 7.4.32.2.1
Pre-test conditions:	• AE has created an application resource <AE> on registrar CSE • AE has created a <notificationTargetPolicy> on Registrar CSE
Test Sequence	

Step	RP	Type	Description
1		Stimulus	AE sends a request to create a <policyDeletionRules>
2	Mca	PRO Check Primitive	• op = 1 (Create) • to = {CSEBaseName}/ URI of <notificationTargetPolicy> • fr = AE-ID • rqi = (token-string) • ty = 27 (policyDeletionRules) • pc = Serialized representation of <policyDeletionRules> resource
3		IOP Check	Check if possible that the <policyDeletionRules> 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 <policyDeletionRules> resource
5		IOP Check	AE indicates successful operation
IOP Verdict			
PRO Verdict			

8.8.4.2 PolicyDeletionRules Retrieve

Interoperability Test Description	
Identifier:	TD_M2M_NH_147
Objective:	AE retrieves policyDeletionRules resource from Registrar CSE
Configuration:	M2M_CFG_01
References:	ETSI TS 118 101 [1], clause 10.2.10.19 oneM2M TS-0004 [2], clause 7.4.32.2.2
Pre-test conditions:	• AE has created an Application Entity resource <AE> on Registrar CSE • AE has created a <notificationTargetPolicy> on Registrar CSE • AE has created a <policyDeletionRules> as a child of <notificationTargetPolicy> on Registrar CSE

Test Sequence			
Step	**RP**	**Type**	**Description**
1		Stimulus	AE is requested to send a Retrieve Request for a <policyDeletionRules>
2	Mca	PRO Check Primitive	• op = 2 (Retrieve) • to = {CSEBaseName}/URI of <policyDeletionRules> 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 <policyDeletionRules> resource
4		IOP Check	AE indicates successful operation
IOP Verdict			
PRO Verdict			

8.8.4.3 PolicyDeletionRules Update

Interoperability Test Description	
Identifier:	TD_M2M_NH_148
Objective:	AE updates information about a policyDeletionRules via <policyDeletionRules> Update Request
Configuration:	M2M_CFG_01
References:	ETSI TS 118 101 [1], clause 10.2.10.20 oneM2M TS-0004 [2], clause 7.4.32.2.3
Pre-test conditions:	• AE has created an Application Entity resource <AE> on Registrar CSE • AE has created a <notificationTargetPolicy> on Registrar CSE • AE has created a <policyDeletionRules> as a child of <notificationTargetPolicy> on Registrar CSE

Test Sequence			
Step	**RP**	**Type**	**Description**
1		Stimulus	AE is requested to send a policyDeletionRules Update Request to update the deletionRulesRelation attribute of the resource
2	Mca	PRO Check Primitive	• op = 3 (Update) • to = {CSEBaseName}/URI of <policyDeletionRules> resource • fr = AE-ID • rqi = (token-string) • pc = Serialized representation of updated <policyDeletionRules> resource
3		IOP Check	Check if possible that the <policyDeletionRules> 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 <policyDeletionRules> resource
5		IOP Check	AE indicates successful operation
IOP Verdict			
PRO Verdict			

8.8.4.4 PolicyDeletionRules Delete

Interoperability Test Description	
Identifier:	TD_M2M_NH_149
Objective:	AE removes policyDeletionRules via a <policyDeletionRules> Delete Request
Configuration:	M2M_CFG_01
References:	ETSI TS 118 101 [1], clause 10.2.10.21 oneM2M TS-0004 [2], clause 7.4.32.2.4
Pre-test conditions:	• AE has created an Application Entity resource <AE> on Registrar CSE • AE has created a <notificationTargetPolicy> on Registrar CSE • AE has created a <policyDeletionRules> as a child of <notificationTargetPolicy> on Registrar CSE

Test Sequence			
Step	RP	Type	Description
1		Stimulus	AE is requested to send a policyDeletionRules Delete Request
2	Mca	PRO Check Primitive	• op = 4 (Delete) • to = {CSEBaseName}/URI of <policyDeletionRules> resource • fr = AE-ID • rqi = (token-string) • pc = empty
3	Mca	PRO Check Primitive	• rsc = 2002 (DELETED) • rqi = (token-string) same as received in request message • pc = empty
4		IOP Check	Check if possible that the <notificationTargetPolicy> resource has been removed in registrar CSE
5		IOP Check	AE indicates successful operation
IOP Verdict			
PRO Verdict			

8.8.5 CrossResourceSubscription management

8.8.5.1 CrossResourceSubscription Create

Interoperability Test Description	
Identifier:	TD_M2M_NH_150
Objective:	AE creates a crossResourceSubscription resource in registrar CSE via a crossResourceSubscription Create Request
Configuration:	M2M_CFG_01
References:	ETSI TS 118 101 [1], clause 10.2.10.22 oneM2M TS-0004 [2], clause 7.4.58.2.1
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 <crossResourceSubscription> where regularResourcesAsTarget = AE-ID
2	Mca	PRO Check Primitive	• op = 1 (Create) • to = {CSEBaseName} • fr = AE-ID • rqi = (token-string) • ty = 48 (crossResourceSubscription) • pc = Serialized representation of <crossResourceSubscription> resource
3		IOP Check	Check if possible that the <crossResourceSubscription> resource is created in registrar CSE Check if possible that the <subscribtion> resource is created as a child of <AE> resource in registrar CSE
4	Mca	PRO Check Primitive	• rsc = 2001 (CREATED) • rqi = (token-string) same as received in request message • pc = Serialized representation of <crossResourceSubscription> resource
5		IOP Check	AE indicates successful operation
IOP Verdict			
PRO Verdict			

8.8.5.2 CrossResourceSubscription Retrieve

Interoperability Test Description			
Identifier:	TD_M2M_NH_151		
Objective:	AE retrieves crossResourceSubscription resource from Registrar CSE		
Configuration:	M2M_CFG_01		
References:	ETSI TS 118 101 [1], clause 10.2.10.23 oneM2M TS-0004 [2], clause 7.4.58.2.2		
Pre-test conditions:	• AE has created an Application Entity resource <AE> on Registrar CSE • AE has created a <crossResourceSubscription> on Registrar CSE		
Test Sequence			
Step	RP	Type	Description
1		Stimulus	AE is requested to send a Retrieve Request for a <crossResourceSubscription>
2	Mca	PRO Check Primitive	• op = 2 (Retrieve) • to = {CSEBaseName}/URI of <crossResourceSubscription> 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 <crossResourceSubscription> resource
4		IOP Check	AE indicates successful operation
IOP Verdict			
PRO Verdict			

8.8.5.3 CrossResourceSubscription Update

Interoperability Test Description			
Identifier:	TD_M2M_NH_152		
Objective:	AE updates information about a crossResourceSubscription via <crossResourceSubscription> Update Request		
Configuration:	M2M_CFG_01		
References:	ETSI TS 118 101 [1], clause 10.2.10.24 oneM2M TS-0004 [2], clause 7.4.58.2.3		
Pre-test conditions:	• AE has created an Application Entity resource <AE> on Registrar CSE • AE has created a <crossResourceSubscription> on Registrar CSE		
Test Sequence			
Step	RP	Type	Description
1		Stimulus	AE is requested to send a crossResourceSubscription Update Request to update the regularResourcesAsTarget attribute of the resource
2	Mca	PRO Check Primitive	• op = 3 (Update) • to = {CSEBaseName}/URI of <crossResourceSubscription> resource • fr = AE-ID • rqi = (token-string) • pc = Serialized representation of updated <crossResourceSubscription> resource
3		IOP Check	Check if possible that the <crossResourceSubscription> resource is updated in Registrar CSE If regularResourcesAsTarget contains new target resources, check if possible that <subscription> resources are created to each new target resource
4	Mca	PRO Check Primitive	• rsc = 2004 (Updated) • rqi = (token-string) same as received in request message • pc = Serialized representation of <crossResourceSubscription> resource
5		IOP Check	AE indicates successful operation
IOP Verdict			
PRO Verdict			

8.8.5.4 CrossResourceSubscription Delete

Interoperability Test Description	
Identifier:	TD_M2M_NH_153
Objective:	AE removes crossResourceSubscription via a <crossResourceSubscription> Delete Request
Configuration:	M2M_CFG_01
References:	ETSI TS 118 101 [1], clause 10.2.10.21 oneM2M TS-0004 [2], clause 7.4.32.2.4
Pre-test conditions:	• AE has created an Application Entity resource <AE> on Registrar CSE • AE has created a <crossResourceSubscription> on Registrar CSE • Registrar CSE has created <subscription> resources as targets of <crossResourceSubscription>

Test Sequence			
Step	**RP**	**Type**	**Description**
1		Stimulus	AE is requested to send a crossResourceSubscription Delete Request
2	Mca	PRO Check Primitive	• op = 4 (Delete) • to = {CSEBaseName}/URI of <crossResourceSubscription> resource • fr = AE-ID • rqi = (token-string) • pc = empty
3	Mca	PRO Check Primitive	• rsc = 2002 (DELETED) • rqi = (token-string) same as received in request message • pc = empty
4		IOP Check	Check if possible that the <crossResourceSubscription> resource is deleted in registrar CSE Check if possible that the target <subscription> resources are deleted in registrar CSE
5		IOP Check	AE indicates successful operation
IOP Verdict			
PRO Verdict			

8.8.5.5 Cross-Resource Notification

Interoperability Test Description	
Identifier:	TD_M2M_NH_154
Objective:	AE receives a notification request from the HOST CSE
Configuration:	M2M_CFG_10
References:	ETSI TS 118 101 [1], clause 10.2.10.26
Pre-test conditions:	• AE1 has created an application resource <AE> on registrar CSE • AE1 has created <crossResourceSubscription> on registrar CSE • AE1 has created a container1 resource <container> on registrar CSE • AE1 has created a container2 resource <container> on registrar CSE • AE2 has permissions to UPDATE the container1 and container2 created by AE1 • Registrar CSE has created <subscription> resources as a child resource of a container1 and container2 as a target of <crossResourceSubscription> resource

Test Sequence			
Step	**RP**	**Type**	**Description**
1		Stimulus	AE2 is requested to send an Update request to the container1 created by AE1. This triggers the timer as indicated in timeWindowSize attribute of <crossResourceSubscription>
2		Stimulus	AE2 is requested to send an Update request to the container2 created by AE1 within the time frame indicated in timeWindowSize after the 1st request. This triggers or causes the Registrar CSE to send a notification to AE1
3	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
3		IOP Check	Check if the notification representation
4	Check Mca	PRO Check Primitive	Sent response contains: • rsc = 2000 (OK) • rqi = (token-string) same as received in request message

Interoperability Test Description			
5		IOP Check	AE1 indicates notification received
IOP Verdict			
PRO Verdict			

8.9   Modbus Interworking

8.9.1   Modbus Thermometer Device Create

Interoperability Test Description			
Identifier:			TD_M2M_NH_163
Objective:			AE1 creates Device Model for Modbus device
Configuration:			M2M_CFG_10
References:			oneM2M TS-0040 [16], clause 6.3
Pre-test conditions:			- AE1 is running in Modbus IPE - AE1 has created an application resource <AE> on registrar CSE
Test Sequence			
Step	**RP**	**Type**	**Description**
1		Stimulus	AE1 sends a request to create a <flexContainer> resource for Modbus deviceThermometer
2	Mca	PRO Check Primitive	- op = 1 (Create) - to = {CSEBaseName}/URI of <AE1> resource - fr = AE1-ID - rqi = (token-string) - ty = 28 (flexContainer) - pc = Serialized representation of <flexContainer> resource with proper *containerDefinition*
3		IOP Check	Check if possible that the <flexContainer> 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 <flexContainer> resource
5		IOP Check	AE indicates successful operation
6		Stimulus	AE1 sends a request to create a <flexContainer> for temperature
7	Mca	PRO Check Primitive	- op = 1 (Create) - to = {CSEBaseName}/URI of <AE1> resource/resource name of Modbus deviceLight - fr = AE1-ID - rqi = (token-string) - ty = 28 (flexContainer) - pc = Serialized representation of <flexContainer> resource with proper *containerDefinition and nodnProperties*
8		IOP Check	Check if possible that the <flexContainer> resource is created in registrar CSE
9	Mca	PRO Check Primitive	- rsc = 2001 (CREATED) - rqi = (token-string) same as received in request message - pc = Serialized representation of <flexContainer> resource
10		IOP Check	AE indicates successful operation
Note		Optional: Repeat steps 5-10 for battery Module	
IOP Verdict			
PRO Verdict			

8.9.2 Retrieve data from a Modbus Thermometer device

Interoperability Test Description	
Identifier:	TD_M2M_NH_164
Objective:	Modbus IPE reads data from Modbus device and updates Registrar CSE with the read data
Configuration:	M2M_CFG_10
References:	oneM2M TS-0040 [16], clause 6.5.1
Pre-test conditions:	• AE1 is running in Modbus IPE • AE1 has created an application resource <AE> on registrar CSE • AE1 has created a <flexContainer> for deviceThermometer • AE1 has created a <flexContainer> for temperature as a child of deviceThermometer • AE2 has created an application resource <AE> on registrar CSE • AE2 has created a <subscription> resource as a child of temperature

Test Sequence			
Step	**RP**	**Type**	**Description**
1		Stimulus	AE1 sends a request to retrieve a <flexContainer> resource for temperature
2	Mca	PRO Check Primitive	• op = 2 (Retrieve) • to = {CSEBaseName}/URI of <deviceThermometer> resource/ temperature • fr = AE1-ID • rqi = (token-string)
3	Mca	PRO Check Primitive	• pc = Serialized representation of <flexContainer> resource • rsc = 2000 (OK)
4		IOP Check	AE1 indicates successful operation
5		Stimulus	Modbus IPE sends a request(s) to retrieve data from Modbus Thermometer device
6		IOP Check	Check if possible that Modbus IPE has successfully retrieved data from Modbus device
7		Stimulus	AE1 sends a request to update a <flexContainer> resource for deviceThermometer
8	Mca	PRO Check Primitive	• op = 3 (Update) • to = {CSEBaseName}/URI of deviceThermometer/temperature • fr = AE1-ID • rqi = (token-string) • pc = Serialized representation of updated <flexContainer> resource
9	Mca	PRO Check Primitive	• rsc = 2004 (Updated) • rqi = (token-string) same as received in request message • pc = Serialized representation of <flexContainer> resource
10		IOP Check	Check if possible that the < flexContainer > resource for temperature is updated in Registrar CSE. Registrar CSE sends a notification to AE2
11	Mca	PRO Check Primitive	• op = 5 (Notify) • to = AE2-ID • from = Registrar CSE-ID • rqi = (token-string) • pc = Serialized representation of Notification data object
12	Mca	PRO Check Primitive	AE2 responds to notification • rsc = 2000 (OK) • rqi = (token-string) same as received in request message
13		IOP Check	AE2 indicates notification received
IOP Verdict			
PRO Verdict			

8.9.3 Write data to a Modbus Thermometer device

Interoperability Test Description	
Identifier:	TD_M2M_NH_165
Objective:	AE writes data into a Modbus device by updating <flexContainer> resource in Registrar CSE
Configuration:	M2M_CFG_10
References:	oneM2M TS-0040 [16], clause 6.5.2
Pre-test conditions:	• AE1 is running in Modbus IPE • AE1 has created an application resource <AE> on registrar CSE • AE1 has created a <flexContainer> for deviceThermometer • AE1 has created a <flexContainer> for temperature as a child of deviceThermometer • AE2 has created an application resource <AE> on registrar CSE • AE2 has created a <subscription> resource as a child of temperature (notificationEventType = Blocking_Update)

Test Sequence			
Step	RP	Type	Description
1		Stimulus	AE2 is requested to send a flexContainer Update Request to update the any customAttribute of the resource
2	Mca	PRO Check Primitive	• op = 3 (Update) • to = {CSEBaseName}/URI of <flexContainer> resource • fr = AE-ID • rqi = (token-string) • pc = Serialized representation of updated <flexContainer> resource
3		IOP Check	Check that Registrar CSE sent a notification to AE1
4	Mca	PRO Check Primitive	• op = 5 (Notify) • to = AE1-ID • from = Registrar CSE-ID • rqi = (token-string) • pc = Serialized representation of Notification data object
5		Stimulus	Modbus IPE sends a request(s) to write data to Modbus Thermometer device
6		IOP Check	Check if possible that Modbus IPE has successfully written data to Modbus device
7		Stimulus	AE1 sends a response to notification to Registrar CSE
8	Mca	PRO Check Primitive	Sent response contains: • rsc = 2000 (OK) • rqi = (token-string) same as received in request message
9	Mca	PRO Check Primitive	Registrar CSE sends a response to AE2 • rsc = 2004 (Updated) • rqi = (token-string) same as received in request message • pc = Serialized representation of <flexContainer> resource
10		IOP Check	AE2 indicates successful operation
IOP Verdict			
PRO Verdict			

8.10 NoDN Interworking

8.10.1 Retrieve data from a NoDN device

Interoperability Test Description	
Identifier:	TD_M2M_NH_166
Objective:	NoDN IPE reads data from a NoDN device and updates Registrar CSE with the read data
Configuration:	M2M_CFG_10
References:	

Pre-test conditions:	- AE1 is running in NoDN IPE - AE1 has created an application resource <AE> on registrar CSE - AE1 has created a <flexContainer> representing NoDN DeviceClass - AE1 has created a <flexContainer> for the ModuleClass as a child of the DeviceClass representing the NoDN device - AE2 has created an application resource <AE> on registrar CSE - AE2 has created a <subscription> resource as a child of the ModuleClass

		Test Sequence	
Step	**RP**	**Type**	**Description**
1		Stimulus	AE1 sends a request to retrieve a <flexContainer> resource for the ModuleClass
2	Mca	PRO Check Primitive	- op = 2 (Retrieve) - to = {CSEBaseName}/URI of ModuleClass - fr = AE1-ID - rqi = (token-string)
3	Mca	PRO Check Primitive	- pc = Serialized representation of <flexContainer> resource - rsc = 2000 (OK)
4		IOP Check	AE1 indicates successful operation
5		Stimulus	NoDN IPE retrieves data from NoDN device
6		IOP Check	Check if possible that NoDN IPE has successfully retrieved data from NoDN device
7		Stimulus	AE1 sends a request to update a <flexContainer> resource for the ModuleClass
8	Mca	PRO Check Primitive	- op = 3 (Update) - to = {CSEBaseName}/URI of the ModuleClass - fr = AE1-ID - rqi = (token-string) - pc = Serialized representation of the updated ModuleClass
9	Mca	PRO Check Primitive	- rsc = 2004 (Updated) - rqi = (token-string) same as received in request message - pc = Serialized representation of <flexContainer> resource
10		IOP Check	Check if possible that the <flexContainer> resource for the ModuleClass is updated in Registrar CSE. Registrar CSE sends a notification to AE2
11	Mca	PRO Check Primitive	- op = 5 (Notify) - to = AE2-ID - from = Registrar CSE-ID - rqi = (token-string) - pc = Serialized representation of Notification data object
12	Mca	PRO Check Primitive	AE2 responds to notification - rsc = 2000 (OK) - rqi = (token-string) same as received in request message
13		IOP Check	AE2 indicates notification received
IOP Verdict			
PRO Verdict			

8.10.2   Write data to a NoDN device

Interoperability Test Description	
Identifier:	TD_M2M_NH_167
Objective:	AE writes data into a NoDN device by updating <flexContainer> resource in Registrar CSE
Configuration:	M2M_CFG_10
References:	
Pre-test conditions:	• AE1 is running in NoDN IPE • AE1 has created an application resource <AE> on registrar CSE • AE1 has created a <flexContainer> representing the NoDN DeviceClass • AE1 has created a <flexContainer> for the ModuleClass as a child of the DeviceClass representing the NoDN device • AE2 has created an application resource <AE> on registrar CSE • AE2 has created a <subscription> resource as a child of the ModuleClass (notificationEventType = Blocking_Update)

Test Sequence			
Step	**RP**	**Type**	**Description**
1		Stimulus	AE2 is requested to send a flexContainer Update Request to update any customAttribute of the ModuleClass
2	Mca	PRO Check Primitive	• op = 3 (Update) • to = {CSEBaseName}/URI of the ModuleClass • fr = AE-ID • rqi = (token-string) • pc = Serialized representation of the updated ModuleClass
3		IOP Check	Check that Registrar CSE sent a notification to AE1
4	Mca	PRO Check Primitive	• op = 5 (Notify) • to = AE1-ID • from = Registrar CSE-ID • rqi = (token-string) • pc = Serialized representation of Notification data object
5		Stimulus	NoDN IPE sends a request(s) to write data to NoDN device
6		IOP Check	Check if possible that NoDN IPE has successfully written data to NoDN device
7		Stimulus	AE1 sends a response to notification to Registrar CSE
8	Mca	PRO Check Primitive	Sent response contains: • rsc = 2000 (OK) • rqi = (token-string) same as received in request message
9	Mca	PRO Check Primitive	Registrar CSE sends a response to AE2 • rsc = 2004 (Updated) • rqi = (token-string) same as received in request message • pc = Serialized representation of the ModuleClass
10		IOP Check	AE2 indicates successful operation
IOP Verdict			
PRO Verdict			

History

Document history		
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