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TELECOMMUNICATION
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oneM2M – Interoperability testing

Recommendation ITU-T Y.4500.13/Q.3954

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Recommendation ITU-T Y.4500.13/Q.3954

oneM2M – Interoperability testing

Summary

Recommendation ITU-T Y.4500.13 specifies interoperability test descriptions for the oneM2M primitives.

History

Edition	Recommendation	Approval	Study Group	Unique ID*
1.0	ITU-T Y.4500.13/Q.3954	2018-03-01	20	11.1002/1000/13508

Keywords

Interoperability, oneM2M.

* To access the Recommendation, type the URL http://handle.itu.int/ in the address field of your web browser, followed by the Recommendation's unique ID. For example, http://handle.itu.int/11.1002/1000/11830-en.

FOREWORD

The International Telecommunication Union (ITU) is the United Nations specialized agency in the field of telecommunications, information and communication technologies (ICTs). The ITU Telecommunication Standardization Sector (ITU-T) is a permanent organ of ITU. ITU-T is responsible for studying technical, operating and tariff questions and issuing Recommendations on them with a view to standardizing telecommunications on a worldwide basis.

The World Telecommunication Standardization Assembly (WTSA), which meets every four years, establishes the topics for study by the ITU-T study groups which, in turn, produce Recommendations on these topics.

The approval of ITU-T Recommendations is covered by the procedure laid down in WTSA Resolution 1.

In some areas of information technology which fall within ITU-T's purview, the necessary standards are prepared on a collaborative basis with ISO and IEC.

NOTE

In this Recommendation, the expression "Administration" is used for conciseness to indicate both a telecommunication administration and a recognized operating agency.

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NOTE – The structure and editorial style of this Recommendation depart slightly from those of ITU-T Recommendations to preserve existing cross-referencing from external documents.

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As of the date of approval of this Recommendation, ITU had not received notice of intellectual property, protected by patents, which may be required to implement this Recommendation. However, implementers are cautioned that this may not represent the latest information and are therefore strongly urged to consult the TSB patent database at http://www.itu.int/ITU-T/ipr/.

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oneM2M – Interoperability testing

1 Scope

This Recommendation specifies interoperability test descriptions (TDs) for the oneM2M primitives as specified in [ITU-T Y.4500.1], [ITU-T Y.4500.4], the bindings [ITU-T Y.4500.8], [ITU-T Y.4500.9] and [ITU-T Y.4500.10].

The Recommendation contains oneM2M Release 2 specification – oneM2M Interoperability Testing V1.0.0 and is equivalent to standards of oneM2M partners including ARIB, ATIS, CCSA, ETSI [b-ETSI TS 118 113], TIA, TSDSI, TTA [b-TTA MM-TS.0013] and TTC [b-TTC TS-M2M-0013].

2 References

The following ITU-T Recommendations and other references contain provisions which, through reference in this text, constitute provisions of this Recommendation. At the time of publication, the editions indicated were valid. All Recommendations and other references are subject to revision; users of this Recommendation are therefore encouraged to investigate the possibility of applying the most recent edition of the Recommendations and other references listed below. A list of the currently valid ITU-T Recommendations is regularly published. The reference to a document within this Recommendation does not give it, as a stand-alone document, the status of a Recommendation.

[ITU-T Y.4500.1] Recommendation ITU-T Y.4500.1 (2018), *oneM2M- Functional architecture*.

[ITU-T Y.4500.4] Recommendation ITU-T Y.4500.4 (2018), *oneM2M - Service layer core protocol specification*.

[ITU-T Y.4500.5] Recommendation ITU-T Y.4500.5 (2018), *oneM2M -Management Enablement (OMA).*

[ITU-T Y.4500.6] Recommendation ITU-T Y.4500.6 (2018), *oneM2M -Management enablement (BBF).*

[ITU-T Y.4500.8] Recommendation ITU-T Y.4500.8 (2018), *oneM2M - CoAP protocol binding*.

[ITU-T Y.4500.9] Recommendation ITU-T Y.4500.9 (2018), *oneM2M - HTTP protocol binding*.

[ITU-T Y.4500.10] Recommendation ITU-T Y.4500.10 (2018), *oneM2M - MQTT protocol binding*.

[ITU-T Y.4500.11] Recommendation ITU-T Y.4500.11 (2018), *oneM2M -Common terminology*.

[ITU-T Y.4500.15] Recommendation ITU-T Y.4500.15 (2018), *oneM2M -Testing framework.*

[IETF RFC 3986] IETF RFC 3986 (2005), *Uniform Resource Identifier (URI): Generic Syntax*.
https://www.ietf.org/rfc/rfc3986.txt

[IETF RFC 7230] IETF RFC 7230 (2014), *Hypertext Transfer Protocol (HTTP/1.1): Message Syntax and Routing*.
https://tools.ietf.org/html/rfc7230

[ETSI TS 118 103] ETSI TS 118 103 - V2.4.1 (2016), *Security solutions*.

3 Definitions

For the purposes of the present document, the terms and definitions given in oneM2M TS-0011 [ITU-T Y.4500.11] apply.

3.1 Terms defined elsewhere

This Recommendation uses the following terms defined elsewhere:

3.1.1 Application entity [ITU-T Y.4500.11]: Represents an instantiation of application logic for end-to-end M2M solutions.

3.1.2 Common services entity (CSE) [ITU-T Y.4500.11]: Represents an instantiation of a set of common service functions of the M2M environments. Such service functions are exposed to other entities through reference points.

3.2 Terms defined in this Recommendation

This Recommendation defines the following terms:

3.2.1 hosting CSE: CSE where the addressed resource is hosted.

3.2.2 M2M service provider domain: Part of the M2M system that is associated with a specific M2M service provider.

3.2.3 mc: Interface between the management server and the management client.

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

3.2.4 receiver CSE: Any CSE that receives a request.

3.2.5 registree: AE or CSE that registers with another CSE.

3.2.6 registrar CSE: CSE where an application or another CSE has registered.

3.2.7 resource: uniquely addressable entity in oneM2M architecture.

3.2.8 transit CSE: any receiver CSE that is not a hosting CSE.

4 Abbreviations and acronyms

For the purposes of the present document, the abbreviations given in oneM2M TS-0011 [ITU-T Y.4500.11] and the following apply:

ACP Access Control Policy

AE Application Entity

AE-ID Application Entity Identifier

BBF Broadband Forum

CoAP Constrained Application Protocol

CSE Common Services Entity

CSE-ID Common Service Entity Identifier

DM Device Management

DUT Device Under Test

FQDN Fully Qualified Domain Name

HTTP Hypertext Transfer Protocol

IN Infrastructure Node

IN-CSE CSE which resides in the Infrastructure Node

JSON JavaScript Object Notation

LWM2M Lightweight M2M

M2M Machine to Machine

Mca Reference Point for M2M Communication with AE

Mcc Reference Point for M2M Communication with CSE

MQTT Message Queuing Telemetry Transport

OMA Open Mobile Alliance

SP Service Provider

SUT System Under Test

TD Test Description

URI Uniform Resource Identifier

XML extensible Markup Language

5 Conventions

The keywords "shall", "shall not", "should", "should not", "may", "need not" in the present Recommendation are to be interpreted as described:

Shall/Shall not:

Requirements:

1) Effect on this Recommendation: This Recommendation needs to describe the required feature (i.e., specify a technical solution for the requirement);
2) Effect on products: every implementation (M2M solution that complies to this standard) must support it
3) Effect on deployments: every deployment (M2M service based on this Recommendation) must use the standardized feature where applicable – otherwise e.g., interoperability problems with other services could arise.

Should/Should not:

Recommendation:

1) Effect on this Recommendation: This Recommendation needs to describe a solution that allows the presence and the absence of the feature.
2) Effect on products: an implementation may or may not support it, however support is recommended
3) Effect on deployments: a deployment may or may not use it, however usage is recommended

May/Need not:

Permission/Option:

1) Effect on this Recommendation: This Recommendation needs to describe a solution that allows the presence and the absence of the required feature;
2) Effect on products: an implementation may or may not support it
3) Effect on deployments: A deployment may or may not use it

6 Testing conventions

6.1 The test description proforma

The testing methodology used in the present document is specified in [ITU-T Y.4500.15].

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, etc.) 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 1.

Table 1 – Interoperability test description

Identifier	A unique test description ID.
Objective	A concise summary of the test which should reflect the purpose of the test and enable readers to easily distinguish this test from any other test in the document.
References	A list of references to the base specification section(s), use case(s), requirement(s) and TP(s) which are either used in the test or define the functionality being tested.
Applicability	A list of features and capabilities which are required to be supported by the system under test (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.

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

- A **stimulus** corresponds to an event that enforces a device under test (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.

6.2 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

6.3 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 common services entity (CSE) and application entity (AE) are requested to support the following settings:

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

In order to address the TBDs in the oneM2M CoAP binding specification [ITU-T Y.4500.8], *basic extensible markup language (XML) and JavaScript object notation (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 [ITU-T Y.4500.4].

Host address: Refers to the authority part of a target URI as defined in [IETF RFC 3986] and [IETF RFC 7230] 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.

6.4 Pre-conditions

6.4.1 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.

6.4.2 Security

The originator and the receiver have successfully established a security association between each other. This may involve the exchange of keys 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.

6.4.3 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.

6.4.4 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 servive provider (SP) relative. The ID is then further used as the identity of the originator to perform access control, charging, etc.

6.4.5 Existence of resource

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

6.4.6 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.

6.5 Binding message convention

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

- *<resourceType> represesents a resource name (i.e., resourceName attribute) of a resource instance in that resourceType. For example, <CSEBase>/<AE> can represent "CSE1base/AE1" in structured resource ID format.*
- *<parameter> represents a value of a oneM2M request/response parameter. For example, <Request ID> can represent "0001" value of the Request ID parameter. Parameter names are case sensitive and in long names as specified in [ITU-T Y.4500.4].*
- *<ID> represents an AE-ID or CSE-ID in MQTT Topic names.*

The value will be given at an interoperability test event.

In [ITU-T Y.4500.10], all oneM2M request/response parameters are carried in the MQTT message payload since it has no message header concept. Therefore, the message queuing telemetry transport (MQTT) message payload needs to be described more than hypertext transfer protocol (HTTP) and constrained application protocol (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>

7 Test description summary

7.1 Tests list

Nb	Procedure/Resource	TD ID	TD description
1	CSEBase Management	TD_M2M_NH_01	AE retrieves the CSEBase resource
2	RemoteCSE	TD_M2M_NH_02	Registree CSE registers to Registrar CSE
3		TD_M2M_NH_03	Registree CSE retrieves RemoteCSE from Registrar CSE
4		TD_M2M_NH_04	Registree CSE updates RemoteCSE from Registrar CSE
5		TD_M2M_NH_05	Registree CSE deletes RemoteCSE from Registrar CSE
6	Application Entity	TD_M2M_NH_06	AE registers to its registrar CSE via an AE Create Request
7		TD_M2M_NH_07	AE retrieves <AE> resource via an AE Retrieve Request
8		TD_M2M_NH_08	AE updates attribute in <AE> resource via an AE Update Request
9		TD_M2M_NH_09	AE de-registers by deleting <AE> resource via an AE Delete Request
10	Container	TD_M2M_NH_10	AE creates a container resource in registrar CSE via a container Create Request
11		TD_M2M_NH_11	AE retrieves information of a container resource via a container Retrieve Request
12		TD_M2M_NH_12	AE updates attribute in application resource via a container Update Request
13		TD_M2M_NH_13	AE deletes a specific container resource via a container Delete Request

Nb	Procedure/Resource	TD ID	TD description
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_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>
21		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>
22	Discovery	TD_M2M_NH_18	AE discovers resources residing in Registrar CSE
23		TD_M2M_NH_19	AE discovers accessible resources residing in Registrar CSE using the label filter criteria
24		TD_M2M_NH_20	AE discovers accessible resources residing in Registrar CSE limiting the number of matching resources to the specified value.
25		TD_M2M_NH_21	AE discovers accessible resources residing in Registrar CSE using multiple Filter Criteria
26		TD_M2M_NH_58	AE discovers accessible resources residing in Registrar CSE using the level filter criteria value set to 1
27		TD_M2M_NH_59	AE discovers accessible resources residing in Registrar CSE using the level filter criteria value set to 2
28		TD_M2M_NH_60	AE1 discovers accessible resources residing in Registrar CSE using the level filter criteria value set to 3
29		TD_M2M_NH_61	AE discovers accessible resources residing in Registrar CSE using the offset filter criteria value set to 3
30		TD_M2M_NH_62	AE discovers all the accessible resources residing in Registrar CSE using the offset filter criteria
31	Subscription	TD_M2M_NH_22	AE creates a subscription to Application Entity resource via subscription Create Request
32		TD_M2M_NH_23	AE retrieves information about a subscription via subscription Retrieve Request such as expirationTime, labels, etc.
33		TD_M2M_NH_24	AE updates information about a subscription via subscription Retrieve Request
34		TD_M2M_NH_25	AE cancels subscription via an subscription Delete Request
35	AccessControlPolicy	TD_M2M_NH_26	AE creates an accessControlPolicy resource
36		TD_M2M_NH_27	AE retrieves accessControlPolicy resource
37		TD_M2M_NH_28	AE updates attribute in accessControlPolicy resource
38		TD_M2M_NH_29	AE deletes accessControlPolicy resource
39		TD_M2M_NH_30	AE delete request is rejected due to accessControlPolicy
40		TD_M2M_NH_73	AE delete request is rejected due to accessControlPolicy (accessControlOriginators)
41		TD_M2M_NH_74	AE delete request is allowed due to accessControlPolicy
42	Group	TD_M2M_NH_31	AE creates a group resource
43		TD_M2M_NH_32	AE retrieves group resource
44		TD_M2M_NH_33	AE updates attribute in group resource
45		TD_M2M_NH_34	AE deletes group resource
46	Node	TD_M2M_NH_35	AE creates a node resource
47		TD_M2M_NH_36	AE retrieves node resource
48		TD_M2M_NH_37	AE updates attribute in node resource

Nb	Procedure/Resource	TD ID	TD description
49		TD_M2M_NH_38	AE deletes node resource
50	PollingChannel	TD_M2M_NH_39	AE creates a <pollingChannel> resource in registrar CSE via a Create Request
51		TD_M2M_NH_40	AE retrieves information of a pollingChannel resource via a Retrieve Request
52		TD_M2M_NH_41	AE updates attribute in pollingChannel resource via a Update Request
53		TD_M2M_NH_42	AE deletes a pollingChannel resource via a Delete Request
54		TD_M2M_NH_43	AE retrieves information of a pollingChannel resource via a Retrieve Request
55	FanoutPoint	TD_M2M_NH_44	AE creates a <contentInstance> resource in each group member
56		TD_M2M_NH_45	AE retrieves the <container> resource from in each group member
57		TD_M2M_NH_46	AE updates an <container> resource of each member resource
58		TD_M2M_NH_47	AE deletes a <container> ofeach member
59	Notification	TD_M2M_NH_48	AE receives a notification request from the HOST CSE
60	FlexContainer	TD_M2M_NH_52	AE creates a flexcontainer resource in Registrar CSE via a flexcontainer Create Request
61		TD_M2M_NH_53	AE retrieves information of a flexContainer resource via a flexContainer Retrieve Request
62		TD_M2M_NH_54	AE updates attribute in application resource via a flexContainer Update Request
63		TD_M2M_NH_55	AE deletes a specific container resource via a container Delete Request
64		TD_M2M_NH_56	AE receives a notification request on flexContainer update from the HOST CSE
65		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.
66	External Management Operations	TD_M2M_NH_63	AE creates a mgmtCmd resource
67		TD_M2M_NH_64	AE retrieves mgmtCmd resource
68		TD_M2M_NH_65	AE updates attribute (not with 'true' in execEnable attribute) in mgmtCmd resource
69		TD_M2M_NH_66	AE updates attribute (with 'true' in execEnable attribute) in mgmtCmd resource
70		TD_M2M_NH_67	AE deletes mgmtCmd resource
71		TD_M2M_NH_68	AE retrieves execInstance resource
72		TD_M2M_NH_69	AE upates attribute 'execDisable' to true in execInstance resource to cancel pending management command.
73		TD_M2M_NH_70	AE deletes execInstance resource
74	Synchronous request	TD_M2M_NB_01	AE creates a container resource using non blocking synchronous request in registrar CSE
75		TD_M2M_NB_02	AE retrieves a Container resource using non blocking synchronous request in registrar CSE
76		TD_M2M_NB_03	AE updates a Container resource using non blocking synchronous request in registrar CSE
77		TD_M2M_NB_04	AE deletes a Container resource using non blocking synchronous request
78	Asynchronous request	TD_M2M_NB_05	AE creates a container resource using non blocking asynchronous request
79		TD_M2M_NB_06	AE retrieves a Container resource using non blocking asynchronous request
80		TD_M2M_NB_07	AE updates a Container resource using non blocking asynchronous request
81		TD_M2M_NB_08	AE deletes a Container resource using non blocking asynchronous request
82	Retargeting	TD_M2M_SH_01	AE creates a remote <Resource> resource
83		TD_M2M_SH_02	AE retrieves a remote <Resource> resource
84		TD_M2M_SH_03	AE updates a remote <Resource> resource
85		TD_M2M_SH_04	AE delete a remote <Resource> resource
86	Discovery	TD_M2M_SH_09	AE discovers accessible resources residing in the remote Hosting CSE using multiple Filter Criteria
87	Unauthorized operation	TD_M2M_SH_10	AE delete request is rejected after access rights verification using retargeting.
88	Notification	TD_M2M_SH_11	AE receives a notification request from the remote hosting CSE
89	mgmtObj	TD_M2M_SH_05	AE creates a <mgmtObj> resource
90		TD_M2M_SH_06	AE updates a <mgmtObj> resource
91		TD_M2M_SH_07	AE retrieves a <mgmtObj> resource

Nb	Procedure/Resource	TD ID	TD description
92		TD_M2M_SH_08	AE deletes a <mgmtObj> resource
93	Announcement	TD_M2M_SH_12	AE1 announces itself to CSE2
94		TD_M2M_SH_13	AE1 announces a child container to CSE2
95		TD_M2M_SH_14	AE1 announces an Optional Announce attribute to CSE2
96		TD_M2M_SH_15	AE2 retrieves an Announced Resource
97		TD_M2M_SH_16	AE2 retrieves the original resource respresentation of an announced resource
98	fanOut	TD_M2M_SH_17	AE creates a <contentInstance> resource in each group member, where some memberIDs are on a remoteCSE
99		TD_M2M_SH_18	AE retrieves a <contentInstance> resource from each group member, where some memberIDs are on a remoteCSE
100		TD_M2M_SH_19	AE updates a <container> resource in each group member, where some memberIDs are on a remoteCSE
101		TD_M2M_SH_20	AE deletes a <contentInstance> resource from each group member, where some memberIDs are on a remoteCSE
102	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.

8 Configuration

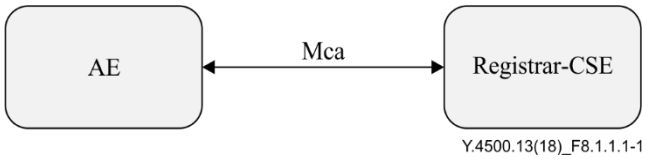
8.1 Test configuration

8.1.1 No hop

8.1.1.1 M2M_CFG_01

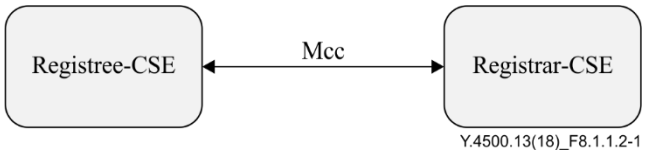
The AE manages resources on the registrar CSE (Hosting CSE)

oneM2M entities model



8.1.1.2 M2M_CFG_02

oneM2M entities model



8.1.2 Single hop

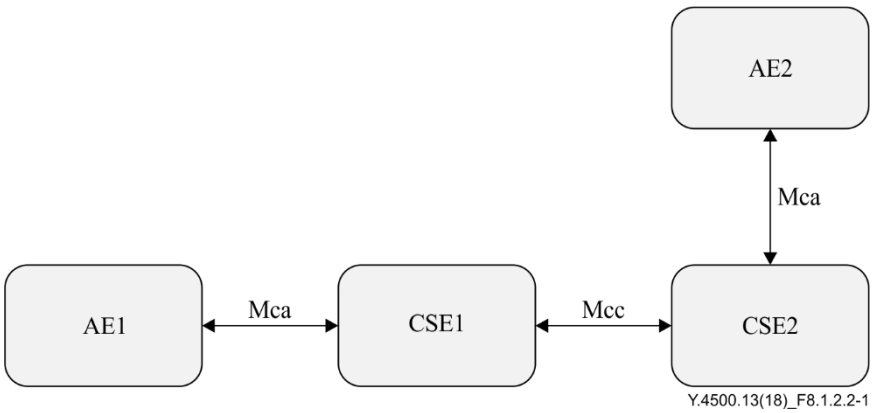
8.1.2.1 M2M_CFG_03

The AE manages resources on the remote CSE

oneM2M entities model

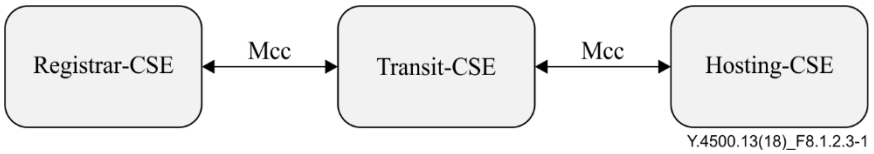
8.1.2.2 M2M_CFG_04

oneM2M entities model



8.1.2.3 M2M_CFG_05

oneM2M entities model

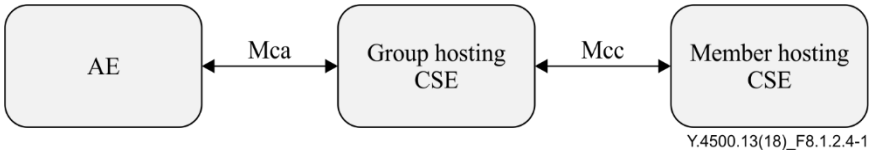


8.1.2.4 M2M_CFG_08

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 8.1.3.

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.

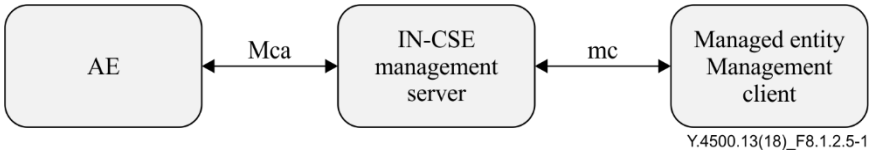


8.1.2.5 M2M_CFG_09

This configuration concerns device management using external technologies.

This configuration is mapped to cases including:

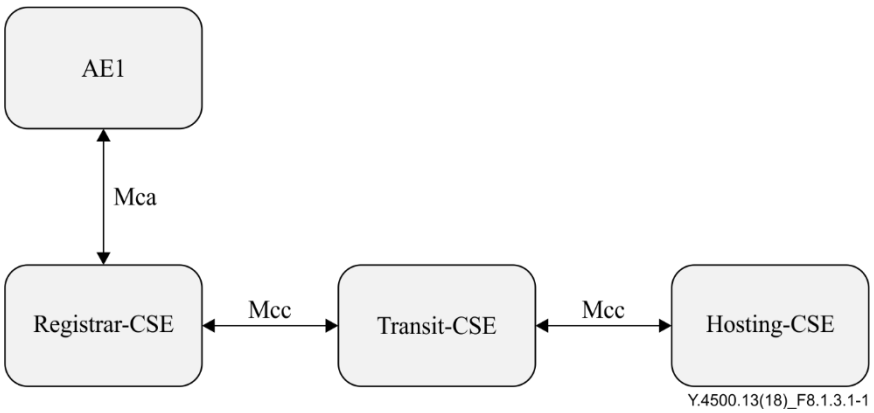
- The AE sends a request addressing <mgmtObj> to IN-CSE. IN-CSE then further acts as a management server to send management commands to managed entity over the mc interface. The management command is defined in OMA DM, BBF TR069 or LWM2M.



8.1.3 Multi hops

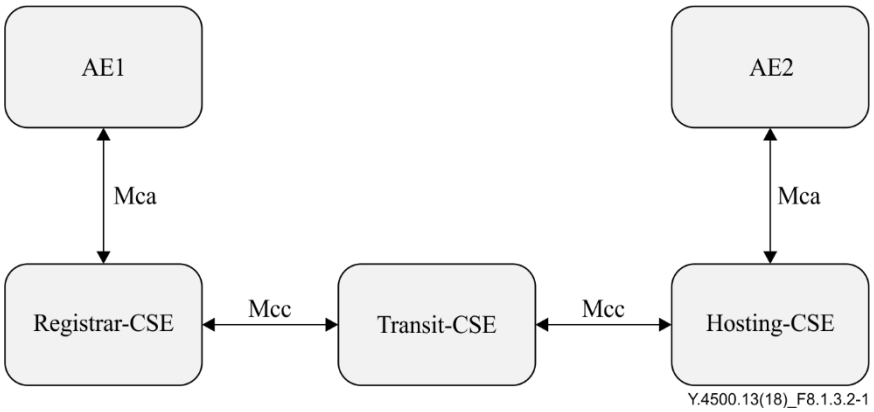
8.1.3.1 M2M_CFG_06

oneM2M entities model



8.1.3.2 M2M_CFG_07

oneM2M entities model



9 Test descriptions

9.1 No Hop configuration testing

9.1.1 CSEBase management

9.1.1.1 CSEBase Retrieve on Mca

Interoperability test description			
Identifier:			TD_M2M_NH_01
Objective:			AE retrieves the CSEBase resource
Configuration:			M2M_CFG_01
References:			[ITU-T Y.4500.1], clause 10.2.3.2 [ITU-T Y.4500.4], clause 7.3.2
Pre-test conditions:			• CSEBase resource has been automatically created in CSE
Test sequence			
Step	**RP**	**Type**	**Description**
1		Stimulus	AE is requested to send a retrieve Request to CSE CSE with name {CSEBaseName}
2	Mca	PRO Check Primitive	• Operation (op) = 2 (Retrieve) • To (to) = Resource-ID of requested <CSEBase> resource, assumed CSE-relative here • From (from) = AE-ID of request originator • Request Identifier (rqi) = (token-string)
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			

9.1.2 RemoteCSE management

9.1.2.1 RemoteCSE Create

Interoperability test description			
Identifier:			TD_M2M_NH_02
Objective:			Registree CSE registers to Registrar CSE
Configuration:			M2M_CFG_02
References:			[ITU-T Y.4500.1], clause 10.2.2.1 [ITU-T Y.4500.4], 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.
6		IOP Check	Registree CSE indicates successful operation.
IOP Verdict			
PRO Verdict			

9.1.2.2 remoteCSE Retrieve

Interoperability test descriptionInteroperability test description			
Identifier:			TD_M2M_NH_03
Objective:			Registree CSE retrieves RemoteCSE from Registrar CSE
Configuration:			M2M_CFG_02
References:			[ITU-T Y.4500.1], clause 10.2.2.2 [ITU-T Y.4500.4], 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			

9.1.2.3 remoteCSE Update

Interoperability test descriptionInteroperability test description			
Identifier:			TD_M2M_NH_04
Objective:			Registree CSE updates RemoteCSE from Registrar CSE
Configuration:			M2M_CFG_02
References:			[ITU-T Y.4500.1], clause 10.2.2.3 [ITU-T Y.4500.4], 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
IOP Verdict			
PRO Verdict			

9.1.2.4 remoteCSE Delete

Interoperability test description			
Identifier:			TD_M2M_NH_05
Objective:			Registree CSE deletes RemoteCSE from Registrar CSE
Configuration:			M2M_CFG_02
References:			[ITU-T Y.4500.1], clause 10.2.2.4 [ITU-T Y.4500.4], 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.
4		IOP Check	Registree CSE indicates successful operation.
IOP Verdict			
PRO Verdict			

9.1.3 Application entity registration

9.1.3.1 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:			[ITU-T Y.4500.1], clause 10.2.1.1 [ITU-T Y.4500.4], clause 7.3.5.2.1
Pre-test conditions:			• CSEBase resource has been created in CSE with name {CSEBaseName} • AE does not have an AE-ID, i.e., it registers from scratch
Test sequence			
Step	**RP**	**Type**	**Description**
1		Stimulus	AE is requested to send a AE Create request to register to the Registrar CSE
2	Mca	PRO Check Primitive	• op = 1 (Create) • to = {CSEBaseName} • fr = AE-ID • rqi = (token-string) • ty = 2 (AE) • pc = Serialized representation of <AE> resource
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
IOP Verdict			
PRO Verdict			

9.1.3.2 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:			[ITU-T Y.4500.1], clause 10.2.1.2 [ITU-T Y.4500.4], clause 7.3.5.2.2
Pre-test conditions:			• CSEBase resource has been created in registrar CSE with name {CSEBaseName} • AE has created a <AE> resource on registrar CSE with name {AE}bgf
Test sequence			
Step	**RP**	**Type**	**Description**
1		Stimulus	AE is requested to send a 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			

9.1.3.3 AE Update

Interoperability test description			
Identifier:			TD_M2M_NH_08
Objective:			AE updates attribute in <AE> resource
Configuration:			M2M_CFG_01
References:			[ITU-T Y.4500.1], clause 10.2.1.3 [ITU-T Y.4500.4], clause 7.3.5.2.3
Pre-test conditions:			• CSEBase resource has been created in registrar CSE with name {CSEBaseName} • AE has created a <AE> resource on registrar CSE with name {AE}
Test sequence			
Step	**RP**	**Type**	**Description**
1		Stimulus	AE is requested to send an AE Update Request
2	Mca	PRO Check Primitive	• op = 3 (Update) • to = {CSEBaseName}/{AE} • fr = AE-ID • rqi = (token-string) • pc = Serialized representation of updated <AE> resource
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			

9.1.3.4 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:			[ITU-T Y.4500.1], clause 10.2.1.4 [ITU-T Y.4500.4], clause 7.3.5.2.4
Pre-test conditions:			• CSEBase resource has been created in registrar CSE with name {CSEBaseName} • AE has created a <AE> resource on registrar CSE with name {AE}
Test sequence			
Step	**RP**	**Type**	**Description**
1		Stimulus	AE is requested to send an AE Delete Request
2	Mca	PRO Check Primitive	• op = 4 (Delete) • to = {CSEBaseName}/{AE} • fr = AE-ID • rqi = (token-string) • pc = empty
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			

9.1.4 Container management

9.1.4.1 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:			[ITU-T Y.4500.1], clause 10.2.4.1 [ITU-T Y.4500.4], clause 7.3.5.2.1
Pre-test conditions:			• AE has created an application resource <AE> on registrar CSE
Test sequence			
Step	**RP**	**Type**	**Description**
1		Stimulus	AE sends a request to create a <container>
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			

9.1.4.2 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:			[ITU-T Y.4500.1], clause 10.2.4.2 [ITU-T Y.4500.4], clause 7.3.5.2.2
Pre-test conditions:			• AE has created an Application Entity resource <AE> on Registrar CSE • AE has created a container resource <container> on Registrar CSE
Test sequence			
Step	**RP**	**Type**	**Description**
1		Stimulus	AE is requested to send a Retrieve Request for a <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			

9.1.4.3 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:			[ITU-T Y.4500.1], clause 10.2.4.3 [ITU-T Y.4500.4], clause 7.3.5.2.3
Pre-test conditions:			• AE has created an Application Entity resource <AE> on Registrar CSE • AE has created a container resource <container> on Registrar CSE
Test sequence			
Step	**RP**	**Type**	**Description**
1		Stimulus	AE is requested to send a 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			

9.1.4.4 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:			[ITU-T Y.4500.1], clause 10.2.4.4 [ITU-T Y.4500.4], clause 7.3.5.2.4
Pre-test conditions:			• AE has created an Application Entity resource <AE> on Registrar CSE • AE has created a container resource <container> on Registrar CSE
Test sequence			
Step	**RP**	**Type**	**Description**
1		Stimulus	AE is requested to send a 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			

9.1.5 ContentInstance management

9.1.5.1 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:			[ITU-T Y.4500.1], clause 10.2.19.2 [ITU-T Y.4500.4], clause 7.3.6.2.1
Pre-test conditions:			• AE has created an application resource <AE> on registrar CSE • AE has created a container resource <container> on registrar CSE
Test sequence			
Step	**RP**	**Type**	**Description**
1		Stimulus	AE sends a 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
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			

9.1.5.2 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:			[ITU-T Y.4500.1], clause 10.2.19.3 [ITU-T Y.4500.4], clause 7.3.6.2.2
Pre-test conditions:			• AE has created an Application Entity resource <AE> on Registrar CSE • AE has created a container resource <container> on Registrar CSE • 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			

9.1.5.3 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:			[ITU-T Y.4500.1], clause 10.2.19.5 [ITU-T Y.4500.4], clause 7.3.6.2.4
Pre-test conditions:			• AE has created an Application Entity resource <AE> on Registrar CSE • AE has created a container resource <container> on Registrar CSE • 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
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			

9.1.5.4 <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:			[ITU-T Y.4500.1], clause 10.2.22.2 [ITU-T Y.4500.4], clause 7.4.28.2.5
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 creted 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			

9.1.5.5 <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:			[ITU-T Y.4500.1], clause 10.2.22.2 [ITU-T Y.4500.4], clause 7.4.28.2.5
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

Interoperability test description			
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 value and
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			

9.1.5.6 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:		[ITU-T Y.4500.1], clause 10.2.19.2 [ITU-T Y.4500.4], clause 7.3.6.2.1	
Pre-test conditions:		• AE has created an application resource <AE> on registrar CSE • AE has created a container resource <container> (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
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			

9.1.5.7 <latest> ContentInstance Retrieve

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:			[ITU-T Y.4500.1], clause 10.2.22.1 [ITU-T Y.4500.4], 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 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 <latest>
2	Mca	PRO Check Primitive	• op = 2 (Retrieve) • to = {CSEBaseName}/URI of <latest> 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 latest <contentInstance> resource
4		IOP Check	AE indicates successful operation
IOP Verdict			
PRO Verdict			

9.1.5.8 <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:			[ITU-T Y.4500.1], clause 10.2.23.1 [ITU-T Y.4500.4], 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 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 <oldest>
2	Mca	PRO Check Primitive	• op = 2 (Retrieve) • to = {CSEBaseName}/URI of <oldest> 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 oldest <contentInstance> resource
4		IOP Check	AE indicates successful operation
IOP Verdict			
PRO Verdict			

9.1.6 Discovery

9.1.6.1 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:			[ITU-T Y.4500.1], clause 10.2.6 [ITU-T Y.4500.4], clause 7.2.3.13
Pre-test conditions:			• CSEBase resource has been created in registrar CSE with name {CSEBaseName}
Test sequence			
Step	**RP**	**Type**	**Description**
1		Stimulus	AE is requested to send a discovery request to registrar CSE
2	Mca	PRO Check Primitive	Sent request contains • op = 2 (Retrieve) • to = {CSEBaseName} • fr = AE-ID • rqi = (token-string) • fu=1 • pc = empty
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			

9.1.6.2 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:			[ITU-T Y.4500.1], clause 10.2.6 [ITU-T Y.4500.4], clause 7.2.3.13
Pre-test conditions:			• CSEBase resource has been created in registrar CSE with name {CSEBaseName} • A <Container> resource with label "key1" is created on Registrar CSE.
Test sequence			
Step	**RP**	**Type**	**Description**
1		Stimulus	AE is requested to send a Discovery request in order to discover the <Container> resource using the label filter criteria
2	Mca	PRO Check Primitive	Sent request contains • op = 2 (Retrieve) • to = {CSEBaseName} • fr = AE-ID • rqi = (token-string) • fu=1 • lbl=key1 • pc = empty
3	Mca	PRO Check Primitive	Registrar CSE sends response containing: • rsc = 2000 (OK) • rqi = (token-string) same as received in request message • pc = Serialized representation of data object containing the addresse of the <Container> address
4		IOP Check	AE indicates successful operation
IOP Verdict			
PRO Verdict			

9.1.6.3 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:			[ITU-T Y.4500.1], clause 10.2.6 [ITU-T Y.4500.4], clause 7.2.3.13
Pre-test conditions:			• CSEBase resource has been created in registrar CSE with name {CSEBaseName}
Test sequence			
Step	**RP**	**Type**	**Description**
1		Stimulus	AE is requested to send a Discovery request in order to discover at most 2 resources in registrar CSE.
2	Mca	PRO Check Primitive	Sent request contains • op = 2 (Retrieve) • to = {CSEBaseName} • fr = AE-ID • rqi = (token-string) • fu=1 • lim=2 • pc = empty
3	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 the <Container> address
4		IOP Check	AE indicates successful operation
IOP Verdict			
PRO Verdict			

9.1.6.4 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:			[ITU-T Y.4500.1], clause 10.2.6 [ITU-T Y.4500.4], clause 7.2.3.13
Pre-test conditions:			• Two <Container> resources with labels "key1" and "key2" are created in Registrar CSE. • A <Group> resources with labels "key1" and "key2" is created in Registrar CSE.
Test sequence			
Step	**RP**	**Type**	**Description**
1		Stimulus	AE is requested to send a Discovery request in order to discover specific resources located in Registrar CSE using multiple filter criteria (label, resource type and limit)
2	Mca	PRO Check Primitive	Sent request contains • op = 2 (Retrieve) • to = {CSEBaseName} • fr = AE-ID • rqi = (token-string) • fu=1 • lbl=key1 • lbl=key2 • ty=3 • lim=1 • pc = empty

Interoperability test description			
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			

9.1.6.5 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:		[ITU-T Y.4500.1], clause 10.2.6 [ITU-T Y.4500.4], 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:		[ITU-T Y.4500.1], clause 10.2.6 [ITU-T Y.4500.4], 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**

Interoperability test 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:		[ITU-T Y.4500.1], clause 10.2.6 [ITU-T Y.4500.4], 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
IOP Verdict			
PRO Verdict			

9.1.6.6 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:			[ITU-T Y.4500.1], clause 10.2.6 [ITU-T Y.4500.4], 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:			[ITU-T Y.4500.1], clause 10.2.6 [ITU-T Y.4500.4], 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
3		IOP Check	Registrar CSE sends success response to AE1

Interoperability test description			
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			

9.1.7 Subscription management

9.1.7.1 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:			[ITU-T Y.4500.1], clause 10.2.11.2 [ITU-T Y.4500.4], clause 7.3.7.2
Pre-test conditions:			• AE has created an application resource <AE> on registrar CSE • AE has created a container resource <container> on registrar CSE
Test sequence			
Step	**RP**	**Type**	**Description**
1		Stimulus	AE is requested to send a 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			

9.1.7.2 Subscription Retrieve

Interoperability test description			
Identifier:			TD_M2M_NH_23
Objective:			AE retrieves subscription resource from Registrar CSE
Configuration:			M2M_CFG_01
References:			[ITU-T Y.4500.1], clause 10.2.11.3 [ITU-T Y.4500.4], clause 7.3.7.2
Pre-test conditions:			• AE has created an Application Entity resource <AE> on Registrar CSE • AE has created a container resource <container> on Registrar CSE • AE has created a subscription resource <subscription> on Registrar CSE
Test sequence			
Step	**RP**	**Type**	**Description**
1		Stimulus	AE is requested to send a Retrieve Request for a <subscription>
2	Mca	PRO Check Primitive	• op = 2 (Retrieve) • to = {CSEBaseName}/URI of <Subscription> resource • fr = AE-ID • rqi = (token-string) • 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			

9.1.7.3 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:			[ITU-T Y.4500.1], clause 10.2.11.4 [ITU-T Y.4500.4], clause 7.3.7.2
Pre-test conditions:			• AE has created an Application Entity resource <AE> on Registrar CSE • AE has created a container resource <container> on Registrar CSE • AE has created a subscription resource <subscription> on Registrar CSE
Test sequence			
Step	**RP**	**Type**	**Description**
1		Stimulus	AE is requested to send a subscription Update Request to update the lifetime of the resource.
2	Mca	PRO Check Primitive	• op = 3 (Update) • to = {CSEBaseName}/URI of <Subscription> resource • fr = AE-ID • rqi = (token-string) • pc = Serialized representation of updated <Subscription> resource
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			

9.1.7.4 Subscription Delete

Interoperability test description			
Identifier:			TD_M2M_NH_25
Objective:			AE cancels subscription via an subscription Delete Request
Configuration:			M2M_CFG_01
References:			[ITU-T Y.4500.1], clause 10.2.11.5 [ITU-T Y.4500.4], clause 7.3.7.2
Pre-test conditions:			• AE has created an Application Entity resource <AE> on Registrar CSE • AE has created a container resource <container> on Registrar CSE • AE has created a subscription resource <subscription> on Registrar CSE
Test sequence			
Step	**RP**	**Type**	**Description**
1		Stimulus	AE is requested to send a subscription Delete Request
2	Mca	PRO Check Primitive	• op = 4 (Delete) • to = {CSEBaseName}/URI of <Subscription> resource • fr = AE-ID • rqi = (token-string) • pc = empty
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			

9.1.8 accessControlPolicy Management

9.1.8.1 accessControlPolicy Create

Interoperability test description			
Identifier:			TD_M2M_NH_26
Objective:			AE creates an accessControlPolicy resource
Configuration:			M2M_CFG_01
References:			[ITU-T Y.4500.1] 10.2.21.1 [ITU-T Y.4500.4], clause 7.3.1.2
Pre-test conditions:			• CSEBase resource has been created in registrar CSE with name {CSEBaseName} • AE has created a <AE> resource on registrar CSE with name {AE}
Test sequence			
Step	**RP**	**Type**	**Description**
1		Stimulus	AE is requested to send an accessControlPolicy Create Request
2	Mca	PRO Check Primitive	• op = 1 (Create) • to = {CSEBaseName}/{AE} • fr = AE-ID • rqi = (token-string) • ty = 1 (accessControlPolicy) • pc = Serialized representation of <accessControlPolicy > resource
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			

9.1.8.2 accessControlPolicy Retrieve

Interoperability test description			
Identifier:			TD_M2M_NH_27
Objective:			AE retrieves accessControlPolicy resource
Configuration:			M2M_CFG_01
References:			[ITU-T Y.4500.1], clause 10.2.21.2 [ITU-T Y.4500.4], clause 7.3.1.2
Pre-test conditions:			• CSEBase resource has been created in registrar CSE with name {CSEBaseName} • AE has created a <AE> resource on registrar CSE with name {AE} • accessControlPolicy resource has been created in registrar CSE under <AE> resource with name {accessControlPolicyName}
Test sequence			
Step	**RP**	**Type**	**Description**
1		Stimulus	AE is requested to send a accessControlPolicy retrieve request to Registrar CSE
2	Mca	PRO Check Primitive	• op = 2 (Retrieve) • to = {CSEBaseName}/{AE}/{accessControlPolicyName} • fr = AE-ID • rqi = (token-string) • pc = empty
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			

9.1.8.3 accessControlPolicy Update

Interoperability test description			
Identifier:			TD_M2M_NH_28
Objective:			AE updates attribute in accessControlPolicy resource
Configuration:			M2M_CFG_01
References:			[ITU-T Y.4500.1], clause 10.2.21.3 [ITU-T Y.4500.4], clause 7.3.1.2
Pre-test conditions:			• CSEBase resource has been created in registrar CSE with name {CSEBaseName} • AE has created a <AE> resource on registrar CSE with name {AE} • accessControlPolicy resource has been created in registrar CSE under <AE> resource with name {accessControlPolicyName}
Test sequence			
Step	**RP**	**Type**	**Description**
1		Stimulus	AE is requested to send an accessControlPolicy update request to Registrar CSE
2	Mca	PRO Check Primitive	• op = 3 (Update) • to = {CSEBaseName}/{AE}/{accessControlPolicyName} • fr = AE-ID • rqi = (token-string) • pc = Serialized representation of updated <accessControlPolicy > resource
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			

9.1.8.4 accessControlPolicy Delete

Interoperability test description			
Identifier:			TD_M2M_NH_29
Objective:			AE deletes accessControlPolicy resource
Configuration:			M2M_CFG_01
References:			[ITU-T Y.4500.1], clause 10.2.21.4 [ITU-T Y.4500.4], clause 7.3.1.2
Pre-test conditions:			• CSEBase resource has been created in registrar CSE with name {CSEBaseName} • AE has created a <AE> resource on registrar CSE with name {AE} • accessControlPolicy resource has been created in registrar CSE under <AE> resource with name {accessControlPolicyName}
Test sequence			
Step	**RP**	**Type**	**Description**
1		Stimulus	AE is requested to send an accessControlPolicy delete request to Registrar CSE
2	Mca	PRO Check Primitive	• op = 4 (Delete) • to = {CSEBaseName}/{AE}/{accessControlPolicyName} • fr = AE-ID • rqi = (token-string) • pc = empty
			•
			•
			•
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			

9.1.8.5 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:		[ITU-T Y.4500.4], 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 accessContorlOperations 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			

9.1.8.6 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:		[ITU-T Y.4500.4], 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.
5		IOP Check	AE indicates unsuccessful operation (Delete error – no privilege)
IOP Verdict			
PRO Verdict			

9.1.8.7 Authorized operation

Interoperability test description			
Identifier:			TD_M2M_NH_74
Objective:			AE delete request is allowed due to accessControlPolicy
Configuration:			M2M_CFG_01
References:			[ITU-T Y.4500.4], 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			

9.1.9 Group Management

9.1.9.1 Group Retrieve

Interoperability test description			
Identifier:			TD_M2M_NH_32
Objective:			AE retrieves group resource
Configuration:			M2M_CFG_01
References:			[ITU-T Y.4500.1], clause 10.2.7.3 [ITU-T Y.4500.4], 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
IOP Verdict			
PRO Verdict			

9.1.9.2 Group Create

Interoperability test description			
Identifier:			TD_M2M_NH_31
Objective:			AE creates a group resource
Configuration:			M2M_CFG_01
References:			[ITU-T Y.4500.1], clause 10.2.7.2 [ITU-T Y.4500.4], 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			

9.1.9.3 Group Update

Interoperability test description			
Identifier:			TD_M2M_NH_33
Objective:			AE updates attribute in group resource
Configuration:			M2M_CFG_01
References:			[ITU-T Y.4500.1], clause 10.2.7.4 [ITU-T Y.4500.4], 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			

9.1.9.4 Group Delete

Interoperability test description			
Identifier:		TD_M2M_NH_34	
Objective:		AE deletes group resource	
Configuration:		M2M_CFG_01	
References:		[ITU-T Y.4500.1], clause 10.2.7.5 [ITU-T Y.4500.4], clause 7.4.14.2.5	
Pre-test conditions:		• AE has created a <group> resource on Registrar CSE	
Test sequence			
Step	**RP**	**Type**	**Description**
1		Stimulus	AE is requested to send a group Delete Request
2	Mca	PRO Check Primitive	• op = 4 (DELETE) • to = {CSEBaseName}/{group} • fr = AE-ID • rqi = (token-string)
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 <group> resource is deleted in Registrar CSE.
5		IOP Check	AE indicates successful operation.
IOP Verdict			
PRO Verdict			

9.1.10 Node management

9.1.10.1 Node Create

Interoperability test description			
Identifier:		TD_M2M_NH_35	
Objective:		AE creates a node resource	
Configuration:		M2M_CFG_01	
References:		[ITU-T Y.4500.1], clause 10.2.14.1 [ITU-T Y.4500.4], clause 7.3.18.2.1	
Pre-test conditions:		• void	
Test sequence			
Step	**RP**	**Type**	**Description**
1		Stimulus	AE is requested to send a node Create Request
2	Mca	PRO Check Primitive	• op = 1 (Create) • to = {CSEBaseName} • fr = AE-ID • rqi = (token-string) • ty = 14 (node) • pc = Serialized representation of <node> resource
3		IOP Check	Check if possible that the <node> resource is created in Registrar CSE.
4	Mca	PRO Check Primitive	• rsc = 2001 (CREATED) • rqi = (token-string) same as received in request message • pc = Serialized representation of <node> resource
5		IOP Check	AE indicates successful operation
IOP Verdict			
PRO Verdict			

9.1.10.2 Node Retrieve

Interoperability test description			
Identifier:		TD_M2M_NH_36	
Objective:		AE retrieves node resource	
Configuration:		M2M_CFG_01	
References:		[ITU-T Y.4500.1], clause 10.2.14.2 [ITU-T Y.4500.4], clause 7.3.18.2.2	
Pre-test conditions:		• AE has created a <node> resource on Registrar CSE	
Test sequence			
Step	**RP**	**Type**	**Description**
1		Stimulus	AE is requested to send a node Retrieve Request
2	Mca	PRO Check Primitive	• op = 2 (RETRIEVE) • to = {CSEBaseName}/{node} • fr = AE-ID • rqi = (token-string)
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			

9.1.10 Node Update

Interoperability test description			
Identifier:		TD_M2M_NH_37	
Objective:		AE updates attribute in node resource	
Configuration:		M2M_CFG_01	
References:		[ITU-T Y.4500.1], clause 10.2.14.3 [ITU-T Y.4500.4], clause 7.3.18.2.3	
Pre-test conditions:		• AE has created a <node> resource on Registrar CSE	
Test sequence			
Step	**RP**	**Type**	**Description**
1		Stimulus	AE is requested to send a node Update Request
2	Mca	PRO Check Primitive	• op = 3 (Update) • to = {CSEBaseName}/{node} • fr = AE-ID • rqi = (token-string) • pc = Serialized representation of <node> resource
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			

9.1.10.4 Node Delete

Interoperability test description			
Identifier:			TD_M2M_NH_38
Objective:			AE deletes node resource
Configuration:			M2M_CFG_01
References:			[ITU-T Y.4500.1], clause 10.2.14.4 [ITU-T Y.4500.4], clause 7.3.18.2.4
Pre-test conditions:			• AE has created a <node> resource on Registrar CSE
Test sequence			
Step	**RP**	**Type**	**Description**
1		Stimulus	AE is requested to send a node Delete Request
2	Mca	PRO Check Primitive	• op = 4 (DELETE) • to = {CSEBaseName}/{node} • fr = AE-ID • rqi = (token-string)
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			

9.1.11 PollingChannel management

9.1.11.1 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:			[ITU-T Y.4500.1], clause 10.2.13.2 [ITU-T Y.4500.4], clause 7.3.21.2.1
Pre-test conditions:			• AE has created an application resource <AE> on registrar CSE
Test sequence			
Step	**RP**	**Type**	**Description**
1		Stimulus	AE sends a request to create a < pollingChannel >
2	Mca	PRO Check Primitive	• op = 1 (Create) • to = {CSEBaseName}/URI of <AE> resource • fr = AE-ID • rqi = (token-string) • ty = 15 (pollingChannel) • pc = Serialized representation of < pollingChannel > resource
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			

9.1.11.2 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:			[ITU-T Y.4500.1], clause 10.2.13.3 [ITU-T Y.4500.4], clause 7.3.21.2.2
Pre-test conditions:			• AE has created an Application Entity resource <AE> on Registrar CSE • AE has created a container resource < pollingChannel > on Registrar CSE
Test sequence			
Step	**RP**	**Type**	**Description**
1		Stimulus	AE is requested to send a Retrieve Request for a < pollingChannel >
2	Mca	PRO Check Primitive	• op = 2 (Retrieve) • to = {CSEBaseName}/URI of < pollingChannel > resource • fr = AE-ID • rqi = (token-string) • pc = empty
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			

9.1.11.3 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:			[ITU-T Y.4500.1], clause 10.2.13.4 [ITU-T Y.4500.4], clause 7.3.21.2.3
Pre-test conditions:			• AE has created an Application Entity resource <AE> on Registrar CSE • AE has created a container resource <container> on Registrar CSE
Test sequence			
Step	**RP**	**Type**	**Description**
1		Stimulus	AE is requested to send a pollingChannel Update Request to update the lifetime of the resource.
2	Mca	PRO Check Primitive	• op = 3 (Update) • to = {CSEBaseName}/URI of < pollingChannel > resource • fr = AE-ID • rqi = (token-string) • pc = Serialized representation of updated < pollingChannel > resource
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			

9.1.11.4 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:			[ITU-T Y.4500.1], clause 10.2.13.5 [ITU-T Y.4500.4], clause 7.3.21.2.4
Pre-test conditions:			• AE has created an Application Entity resource <AE> on Registrar CSE • AE has created a container resource <container> on Registrar CSE
Test sequence			
Step	**RP**	**Type**	**Description**
1		Stimulus	AE is requested to send a subscription Delete Request
2	Mca	PRO Check Primitive	• op = 4 (Delete) • to = {CSEBaseName}/URI of < pollingChannel > resource • fr = AE-ID • rqi = (token-string) • pc = empty
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
IOP Verdict			
PRO Verdict			

9.1.11.5 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:			[ITU-T Y.4500.1], clause 10.2.13.7 [ITU-T Y.4500.4], clause 7.3.22.2.2
Pre-test conditions:			• A pollingChannel resource < pollingChannel > has been created in application <AE> on the Registrar CSE • A subscription to a <container> resource has been created using the <pollingChannel> as a notificationURI in the subscription. • A single <contentInstance> resource is created in the subscribed to resource.
Test sequence			
Step	**RP**	**Type**	**Description**
1		Stimulus	AE is requested to send a pollingChannelURI Retrieve Request for <pollingChannelURI>
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 Statuse 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 Statuse Code* : REQUEST_TIMEOUT
IOP Verdict			
PRO Verdict			

9.1.12 FanoutPoint management

9.1.12.1 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:			[ITU-T Y.4500.1], clause 10.2.7.6 [ITU-T Y.4500.4], clause 7.3.14.3.1
Pre-test conditions:			• A group is created containing 2 members of type <container>
Test sequence			
Step	**RP**	**Type**	**Description**
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
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 aggregrate response includes responses from each member of the group	
PRO Verdict			

9.1.12.2 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:			[ITU-T Y.4500.1], clause 10.2.7.8 [ITU-T Y.4500.4], clause 7.3.14.3.2
Pre-test conditions:			• A group is created containing 2 members of type <container>
Test sequence			
Step	**RP**	**Type**	**Description**
1		Stimulus	AE is requested to send a Retrieve Request to the fanoutPoint of <group> resource
2	Check Mca	PRO Check Primitive	• op = 2 (Retrieve) • to = {CSEBaseName}/{group}/fopt • fr = AE-ID • rqi = (token-string)
3		IOP Check	

Interoperability test description			
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 aggregrate response includes responses from each member of the group	
PRO Verdict			

9.1.12.3 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:		[ITU-T Y.4500.1], clause 10.2.7.9 [ITU-T Y.4500.4], clause 7.3.14.3.3	
Pre-test conditions:		• A group is created containing 2 members of type <container>	
Test sequence			
Step	**RP**	**Type**	**Description**
1		Stimulus	AE is requested to send a Update Request to the fanoutPoint of <group> resource to lifetime of the resource.
2	Check Mca	PRO Check Primitive	• op = 3 (Update) • to = {CSEBaseName}/{group}/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 aggregrate response includes responses from each member of the group	
PRO Verdict			

9.1.12.4 FanoutPoint Delete

Interoperability test description			
Identifier:			TD_M2M_NH_47
Objective:			AE deletes a <container> ofeach member
Configuration:			M2M_CFG_01
References:			[ITU-T Y.4500.1], clause 10.2.7.10 [ITU-T Y.4500.4], clause 7.3.14.3.4
Pre-test conditions:			• A group is created containing 2 members of type <container>
Test sequence			
Step	**RP**	**Type**	**Description**
1		Stimulus	AE is requested to send a Delete 'oldest' Request to the fanoutPoint of <group> resource
2	Check Mca	PRO Check Primitive	• op = 4 (Delete) • to = {CSEBaseName}/{group}/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 aggregrate response includes responses from each member of the group	
PRO Verdict			

9.1.13 Notifcation Management

9.1.13.1 Notification

Interoperability test description			
Identifier:			TD_M2M_NH_48
Objective:			AE receives a notification request from the HOST CSE
Configuration:			M2M_CFG_01
References:			[ITU-T Y.4500.1], clause 10.2.12 [ITU-T Y.4500.4], clause 7.4.1
Pre-test conditions:			• AE1 has created an application resource <AE> on registrar CSE • AE1 has created a container resource <container> on registrar CSE • AE1 has created a <subscription> as a child resource of a <container> • AE2 has created an application resource <AE> on registrar CSE • AE2 has permisions to 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			

9.1.14 FlexContainer management

9.1.14.1 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:			[ITU-T Y.4500.1], clause 10.2.29.1 [ITU-T Y.4500.4], clause 7.4.37.2.1
Pre-test conditions:			• AE has created an application resource <AE> on Registrar CSE
Prerequsites:			• Custom XSD *CDT-allJoynProperty-v2_x_x* contains information about all custom attributes and is known to AE. • AE sends the details of custom XSD in containerDefinition attribute with flexContainer create request.
Test sequence			
Step	**RP**	**Type**	**Description**
1		Stimulus	AE sends a request to create a <flexContainer>
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			

9.1.14.2 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:			[ITU-T Y.4500.1], clause 10.2.29.2 [ITU-T Y.4500.4], 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
Prerequsites:			• Custom XSD *CDT-allJoynProperty-v2_x_x* contains information about all custom attributes and is known to AE. • AE has already sent the details of custom XSD in containerDefinition attribute with flexContainer create request.
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			

9.1.14.3 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:			[ITU-T Y.4500.1], clause 10.2.29.3 [ITU-T Y.4500.4], 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
Prerequsites:			• Custom XSD *CDT-allJoynProperty-v2_x_x* contains information about all custom attributes and is known to AE. • AE has already sent the details of custom XSD in containerDefinition attribute with flexContainer create request.
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.
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			

9.1.14.4 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:			[ITU-T Y.4500.1], clause 10.2.29.4 [ITU-T Y.4500.4], 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
Prerequsites:			• Custom XSD *CDT-allJoynProperty-v2_x_x* contains information about all custom attributes and is known to AE. • AE has already sent the details of custom XSD in containerDefinition attribute with flexContainer create request.
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			

9.1.14.5 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:			[ITU-T Y.4500.1], clause 10.2.1.5 [ITU-T Y.4500.4], 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 permisions to UPDATE customAttributes of flexContainer.
Prerequsites:			• Custom XSD *CDT-allJoynProperty-v2_x_x* contains information about all custom attributes and is known to AE1. • AE1 has already sent the details of custom XSD in containerDefinition attribute with flexContainer create request.
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
5		IOP Check	AE1 indicates notification received
IOP Verdict			
PRO Verdict			

9.1.14.6 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:			[ITU-T Y.4500.1], clause 10.2.6 [ITU-T Y.4500.4], 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.
Prerequsites:			• Custom XSD *CDT-allJoynProperty-v2_x_x* contains information about all custom attributes and is known to AE. • AE has already sent the details of custom XSD in containerDefinition attribute with flexContainer create request.
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

Interoperability test description			
3	Mca	PRO Check Primitive	Registrar CSE sends response containing: • rsc = 2000 (OK) • rqi = (token-string) same as received in request message • pc = Serialized representation of data object containing the addresse of the <flexContainer> address
4		IOP Check	AE indicates successful operation
IOP Verdict			
PRO Verdict			

9.1.15 External management operations management

9.1.15.1 mgmtCmd Create

Interoperability test description			
Identifier:		TD_M2M_NH_63	
Objective:		AE creates a mgmtCmd resource	
Configuration:		M2M_CFG_01	
References:		[ITU-T Y.4500.1], clause 10.2.9.2 [ITU-T Y.4500.4], 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.
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			

9.1.15.2 mgmtCmd Retrieve

Interoperability test description			
Identifier:		TD_M2M_NH_64	
Objective:		AE retrieves mgmtCmd resource	
Configuration:		M2M_CFG_01	
References:		[ITU-T Y.4500.1], clause 10.2.9.3 [ITU-T Y.4500.4], 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			

9.1.15.3 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:			[ITU-T Y.4500.1], clause 10.2.9.4 [ITU-T Y.4500.4], 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
IOP Verdict			
PRO Verdict			

9.1.15.4 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:			[ITU-T Y.4500.1], clause 10.2.9.6 [ITU-T Y.4500.4], 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			

9.1.15.5 mgmtCmd Delete

Interoperability test description			
Identifier:			TD_M2M_NH_67
Objective:			AE deletes mgmtCmd resource
Configuration:			M2M_CFG_01
References:			[ITU-T Y.4500.1], clause 10.2.9.5 [ITU-T Y.4500.4], 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			

9.1.15.6 execInstance Retrieve

Interoperability test description			
Identifier:			TD_M2M_NH_68
Objective:			AE retrieves execInstance resource
Configuration:			M2M_CFG_01
References:			[ITU-T Y.4500.1], clause 10.2.9.8 [ITU-T Y.4500.4], 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			

9.1.15.7 execInstance Update (Cancel)

Interoperability test description			
Identifier:			TD_M2M_NH_69
Objective:			AE upates attribute 'execDisable' to true in execInstance resource to cancel pending management command.
Configuration:			M2M_CFG_01
References:			[ITU-T Y.4500.1], clause 10.2.9.7 [ITU-T Y.4500.4], 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}/{execInstacne} • 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			

9.1.15.8 execInstance Delete

Interoperability test description			
Identifier:			TD_M2M_NH_70
Objective:			AE deletes execInstance resource
Configuration:			M2M_CFG_01
References:			[ITU-T Y.4500.1], clause 10.2.9.9 [Y.ONEM2M.SLCP], 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}/{execInstacne} • 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			

9.2 Non blocking configuration testing

9.2.1 Synchronous request

9.2.1.1 Container management

9.2.1.1.1 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:			[ITU-T Y.4500.1], clause 10.2.4.1 [ITU-T Y.4500.4], clause 7.3.6.2.1
Pre-test conditions:			
Test sequence			
Step	**RP**	**Type**	**Description**
1		Stimulus	AE is requested to send a non blocking synchronous request to create a <Container> resource in registrar CSE
2	Mca	PRO Check Primitive	Sent request contains • op = 1 (Create) • to = {CSEBaseName} • fr= AE-ID • rqi = (token-string) • rt = 1 (non blocking synchronous) • ty = 3 (container) • pc = Serialized Representationof the <Container> resource
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			

9.2.1.1.2 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:			[ITU-T Y.4500.1], clause 10.2.4.2 [ITU-T Y.4500.4], clause 7.3.6.2.1
Pre-test conditions:			• AE has created a <Container> resource in registrar CSE.
Test sequence			
Step	**RP**	**Type**	**Description**
1		Stimulus	AE is requested to send a non blocking synchronous request to retrieve the <Container> resource from registrar CSE.
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			

9.2.1.1.3 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:			[ITU-T Y.4500.1], clause 10.2.4.3 [ITU-T Y.4500.4], clause 7.3.6.2.1
Pre-test conditions:			• AE has created a <Container> resource in registrar CSE.
Test sequence			
Step	**RP**	**Type**	**Description**
1		Stimulus	AE is requested to send a non blocking synchronous request to update the <Container> resource.
2	Mca	PRO Check Primitive	Sent request contains • op = 3 (Update) • to = {CSEBaseName}/URI of <Container> resource • fr= AE-ID • rqi = (token-string) • rt = 1 (non blocking synchronous) • pc = Serialized Representation of the updated <Container> resource

Interoperability test description			
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			

9.2.1.1.4 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:			[ITU-T Y.4500.1], clause 10.2.4.4 [ITU-T Y.4500.4], clause 7.3.6.2.1
Pre-test conditions:			• AE has created <Container> resource on registrar CSE.
Test sequence			
Step	**RP**	**Type**	**Description**
1		Stimulus	AE is requested to send a non blocking synchronous request to delete the <Container> resource.
2	Mca	PRO Check Primitive	Sent request contains • op = 4 (Delete) • to = {CSEBaseName}/URI of <container> resource • fr= AE-ID • rqi = (token-string) • rt = 1 (non blocking synchronous) • pc = empty
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)
8		IOP Check	AE indicates successful operation
IOP Verdict			
PRO Verdict			

9.2.2 Asynchronous request

9.2.2.1 Container management

9.2.2.1.1 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:			[ITU-T Y.4500.1], clause 10.2.4.1 [ITU-T Y.4500.4], clause 7.3.6.2.1
Pre-test conditions:			• AE is reachable on the URI: "AE-Notification-URI"
Test sequence			
Step	**RP**	**Type**	**Description**
1		Stimulus	AE is requested to send a non blocking asynchronous request to create the <Container> resource in registrar CSE.
2	Mca	PRO Check Primitive	Sent request contains • op = 1 (Create) • to = {CSEBaseName} • fr= AE-ID • rqi = (token-string) • rt = 2 (non blocking asynchronous) • ty = 3 (container) • nu= AE-Notification-URI • oneM2M-RQI: Request-ID • pc = Serialized Representationof the <Container> resource
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			

9.2.2.1.2 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:			[ITU-T Y.4500.1], clause 10.2.4.2 [ITU-T Y.4500.4], clause 7.3.6.2.1
Pre-test conditions:			• AE has created a <Container> resource on registrar CSE. • AE is reachable on the URI: "AE-Notification-URI"
Test sequence			
Step	**RP**	**Type**	**Description**
1		Stimulus	AE is requested to send a non blocking asynchronous request to retrieve the <Container> resource from registrar CSE
2	Mca	PRO Check Primitive	Sent request contains • op = 2 (Retrieve) • to = {CSEBaseName}/URI of <container> resource • fr = AE-ID • rqi = (token-string) • rt = 2 (non blocking asynchronous) • nu = AE-Notification-URI • pc = empty
	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			

9.2.2.1.3 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:			[ITU-T Y.4500.1], clause 10.2.4.3 [ITU-T Y.4500.4], clause 7.3.6.2.1
Pre-test conditions:			• AE has created a Container resource <Container> on registrar CSE • AE is reachable on the URI: "AE-Notification-URI"
Test sequence			
Step	**RP**	**Type**	**Description**
1		Stimulus	AE is requested to send a non blocking asynchronous request to update the <Container> resource in registrar CSE.
2	Mca	PRO Check Primitive	Sent request contains • op = 3 (Update) • to = {CSEBaseName}/URI of <Container> resource • fr = AE-ID • rqi = (token-string) • rt = 2 (non blocking asynchronous) • nu = AE-Notification-URI • pc = Serialized Representation of the updated <Container> resource

Interoperability test description			
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			

9.2.2.1.4 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:			[ITU-T Y.4500.1], clause 10.2.4.4 [ITU-T Y.4500.4], clause 7.3.6.2.1
Pre-test conditions:			• AE has created a <Container> resource on registrar CSE • AE is reachable on the URI: "AE-Notification-URI"
Test sequence			
Step	**RP**	**Type**	**Description**
1		Stimulus	AE is requested to send a non blocking asynchronous request to delete the <Container> resource in registrar CSE.
2	Mca	PRO Check Primitive	Sent request contains • op = 4 (Delete) • to = {CSEBaseName}/URI of <container> resource • fr = AE-ID • rqi = (token-string) • rt = 2 (non blocking asynchronous) • nu = AE-Notification-URI • pc = empty
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			

9.3 Single hop configuration testing

9.3.1 Retargeting

9.3.1.1 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			

9.3.1.2 <Resource> Create

<Resource>	Identifier	Refs	IOP Verdict	PRO Verdict
<container>	TD_M2M_SH_01#01	[ITU-T Y.4500.1], clause 10.2.4.1 [ITU-T Y.4500.4], clause 7.3.5.2.1		
<contentInstance>	TD_M2M_SH_01#02	[ITU-T Y.4500.1], clause 10.2.19.2 [ITU-T Y.4500.4], clause 7.3.7.2		
<subscription>	TD_M2M_SH_01#03	[ITU-T Y.4500.1], clause 10.2.11.2 [ITU-T Y.4500.4], clause 7.3.7.2		

<Resource>	Identifier	Refs	IOP Verdict	PRO Verdict
<accessControlPolicy>	TD_M2M_SH_01#04	[ITU-T Y.4500.1], clause 10.2.21.1 [ITU-T Y.4500.4], clause 7.3.1.2		
<group>	TD_M2M_SH_01#05	[ITU-T Y.4500.1], clause 10.2.7.2 [ITU-T Y.4500.4], clause 7.3.12.2.1		
<pollingChannel>	TD_M2M_SH_01#06	[ITU-T Y.4500.1], clause 10.2.13.2 [ITU-T Y.4500.4], clause 7.3.21.2.1		
<fanOutPoint>	TD_M2M_SH_01#07	[ITU-T Y.4500.1], clause 10.2.7.6 [ITU-T Y.4500.4], clause 7.3.14.3.1		
<node>	TD_M2M_SH_01#08	[ITU-T Y.4500.1], clause 10.2.14.1 [ITU-T Y.4500.4], clause 7.3.18.2.1		

9.3.1.3 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.
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

Interoperability test description	
IOP Verdict	
PRO Verdict	

9.3.1.4 <Resource> retrieve

<Resource>	Identifier	Refs	IOP Verdict	PRO Verdict
<container>	TD_M2M_SH_02#01	[ITU-T Y.4500.1], clause 10.2.4.2 [ITU-T Y.4500.4], clause 7.3.5.2.2		
<contentInstance>	TD_M2M_SH_02#02	[ITU-T Y.4500.1], clause 10.2.19.3 [ITU-T Y.4500.4], clause 7.3.6.2.2		
<subscription>	TD_M2M_SH_02#03	[ITU-T Y.4500.1], clause 10.2.11.3 [ITU-T Y.4500.4], clause 7.3.7.2		
<accessControlPolicy>	TD_M2M_SH_02#04	[ITU-T Y.4500.1], clause 10.2.21.2 [ITU-T Y.4500.4], clause 7.3.1.2		
<group>	TD_M2M_SH_02#05	[ITU-T Y.4500.1], clause 10.2.7.3 [ITU-T Y.4500.4], clause 7.3.12.2.2		
<pollingChannel>	TD_M2M_SH_02#06	[ITU-T Y.4500.1], clause 10.2.13.3 [ITU-T Y.4500.4], clause 7.3.21.2.2		
<fanOutPoint>	TD_M2M_SH_02#07	[ITU-T Y.4500.1], clause 10.2.7.8 [ITU-T Y.4500.4], clause 7.3.14.3.2		
<node>	TD_M2M_SH_02#08	[ITU-T Y.4500.1], clause 10.2.14.2 [ITU-T Y.4500.4], clause 7.3.18.2.2		
<remoteCSE>	TD_M2M_SH_02#09	[ITU-T Y.4500.1], clause 10.2.2.3 [ITU-T Y.4500.4], clause 7.3.3.2.3		

<Resource>	Identifier	Refs	IOP Verdict	PRO Verdict
<ae>	TD_M2M_SH_02#10	[ITU-T Y.4500.1], clause 10.2.1.2 [ITU-T Y.4500.4], clause 7.3.5.2.2		
<CSEBase>	TD_M2M_SH_02#11	[ITU-T Y.4500.1], clause 10.2.3.2 [ITU-T Y.4500.4], clause 7.3.2		

9.3.1.5 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			

9.3.1.6 <Resource> update

<Resource>	Identifier	Refs	IOP Verdict	PRO Verdict
<container>	TD_M2M_SH_03#01	[ITU-T Y.4500.1], clause 10.2.4.3 [ITU-T Y.4500.4], clause 7.3.5.2.3		
<subscription>	TD_M2M_SH_03#02	[ITU-T Y.4500.1], clause 10.2.11.4 [ITU-T Y.4500.4], clause 7.3.7.2		

<Resource>	Identifier	Refs	IOP Verdict	PRO Verdict
<accessControlPolicy>	TD_M2M_SH_03#03	[ITU-T Y.4500.1], clause 10.2.21.3 [ITU-T Y.4500.4], clause 7.3.1.2		
<group>	TD_M2M_SH_03#04	[ITU-T Y.4500.1], clause 10.2.7.4 [ITU-T Y.4500.4], clause 7.3.12.2.3		
<pollingChannel>	TD_M2M_SH_03#05	[ITU-T Y.4500.1], clause 10.2.13.4 [ITU-T Y.4500.4], clause 7.3.21.2.3		
<fanOutPoint>	TD_M2M_SH_03#06	[ITU-T Y.4500.1], clause 10.2.7.9 [ITU-T Y.4500.4], clause 7.3.14.3.3		
<node>	TD_M2M_SH_03#07	[ITU-T Y.4500.1], clause 10.2.14.3 [ITU-T Y.4500.4], clause 7.3.18.2.3		
<remoteCSE>	TD_M2M_SH_03#08	[ITU-T Y.4500.1], clause 10.2.2.3 [ITU-T Y.4500.4], clause 7.3.3.2.3		
<ae>	TD_M2M_SH_03#09	[ITU-T Y.4500.1], clause 10.2.1.3 [ITU-T Y.4500.4], clause 7.3.5.2.3		

9.3.1.7 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			

9.3.1.8 <Resource> delete

<Resource>	Identifier	Refs	IOP Verdict	PRO Verdict
<container>	TD_M2M_SH_04#01	[ITU-T Y.4500.1], clause 10.2.4.4 [Y.ONEM2M.SLCP], clause 7.3.5.2.4		
<contentInstance>	TD_M2M_SH_04#02	[ITU-T Y.4500.1], clause 10.2.19.5 [Y.ONEM2M.SLCP], clause 7.3.6.2.4		
<subscription>	TD_M2M_SH_04#03	[ITU-T Y.4500.1], clause 10.2.11.5 [Y.ONEM2M.SLCP], clause 7.3.7.2		
<accessControlPolicy>	TD_M2M_SH_04#04	[ITU-T Y.4500.1], clause 10.2.21.4 [Y.ONEM2M.SLCP], clause 7.3.1.2		
<group>	TD_M2M_SH_04#05	[ITU-T Y.4500.1], clause 10.2.7.5 [Y.ONEM2M.SLCP], clause 7.3.12.2.4		
<pollingChannel>	TD_M2M_SH_04#06	[ITU-T Y.4500.1], clause 10.2.13.5 [Y.ONEM2M.SLCP], clause 7.3.21.2.4		
<fanOutPoint>	TD_M2M_SH_04#07	[ITU-T Y.4500.1], clause 10.2.7.10 [Y.ONEM2M.SLCP], clause 7.3.14.3.4		
<node>	TD_M2M_SH_04#08	[ITU-T Y.4500.1], clause 10.2.14.4 [ITU-T Y.4500.4], clause 7.3.18.2.4		

9.3.1.9 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:	[ITU-T Y.4500.1], clause 10.2.6 [ITU-T Y.4500.4], clause 7.2.3.13		
Pre-test conditions:	• Two <Container> resources with labels "key1" and "key2" are created in Hosting CSE. • A <Group> resources with labels "key1" and "key2" is created in Hosting CSE.		
Test sequence			
Step	**RP**	**Type**	**Description**
1		Stimulus	AE is requested to send a discovery request to discover specific resources located in hosting CSE using multiple filter critiria (label, resource type and limit)
2	Mca	PRO Check Primitive	Sent request contains • op = 2 (Retrieve) • to = URI of hosting CSEBase • fr = AE-ID • rqi = (token-string) • fu=1 • lbl=key1 • lbl=key2 • rty=3 • lim=1 • pc = empty

Interoperability test description			
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

9.3.1.10 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:			[ITU-T Y.4500.4], 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 retrive the corresponding remote <accessControlPolicy> resource.
4	Mcc	PRO Check Primitive	Sent request contains • op = 2 (Retrieve) • to = URI of addressed resource • fr = Registrar CSE-ID • rqi = (token-string) • pc = empty
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

Interoperability test description			
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)

9.3.1.11 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:			[ITU-T Y.4500.1], clause 10.2.12 [ITU-T Y.4500.4], clause 7.4.1
Pre-test conditions:			• A <container> resource has been created on hosting CSE • AE has created an <AE> resource on registrar CSE • AE has created a <subscription> resource for the <container> resource on the remote hosting CSE.
Test sequence			
Step	**RP**	**Type**	**Description**
1		Stimulus	A <contentInstance> sub-resource is created on the the <container> resource. This triggers or causes the hostting CSE to send a notification to AE.
2	Mca	PRO Check Primitive	• op = 5 (Notify) • to = URI of AE resource • from = Hosting CSE-ID • rqi = (token-string) • pc = Serialized representation of Notification data object
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).

9.3.2 <mgmtObj> Test description

9.3.2.1 <mgmtObj> Create

Interoperability test description			
Identifier:			TD_M2M_SH_05
Objective:			AE creates a <mgmtObj> resource
Configuration:			M2M_CFG_03
References:			[ITU-T Y.4500.1],clause 10.2.8.2
Pre-test conditions:			• Management Session between Management Server and Management Client
Test sequence			
Step	**RP**	**Type**	**Description**
1		Stimulus	AE is requested to send an <mgmtObj> Create Request to create an <mgmtObj> on IN-CSE.
2	Mca	PRO Check Primitive	• op: 1 (CREATE) • fr: AE-ID • to: {CSEBaseName}/{node} • rqi = (token-string) • ty = 13 (mgmtObj) • pc: Serialized representation of the <mgmtObj> resource
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 6.3 of [ITU-T Y.oneM2M.DM.OMA].
		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 8 of [ITU-T Y.ONEM2M.DM.BBF].
		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 7.3 of [ITU-T Y.ONEM2M.DM.OMA].
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 6.4 [ITU-T Y.ONEM2M.DM.OMA].
		PRO Check BBF TR069	Successful response of the RPC. Details can be found in clause 9.1 [Y.ONEM2M.DM.BBF].
		PRO Check OMA LWM2M	Response with status code 2.01 Created. Details can be found in clause 7.4 [ITU-T Y.ONEM2M.DM.OMA].
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			

9.3.2.2 <mgmtObj> Update

Interoperability test description			
Identifier:		TD_M2M_SH_06	
Objective:		AE updates a <mgmtObj> resource	
Configuration:		M2M_CFG_03	
References:		[ITU-T Y.4500.1], clause 10.2.8.4	
Pre-test conditions:		• Management Session between Management Server and Management Client	
Test sequence			
Step	**RP**	**Type**	**Description**
1		Stimulus	AE is requested to send an <mgmtObj> Update Request to update an <mgmtObj> on IN-CSE.
2	Mca	PRO Check Primitive	• op: 3 (UPDATE) • fr: AE-ID • to: {CSEBaseName}/{node}/{mgmtObj} • rqi = (token-string) • pc: Serialized representation of the <mgmtObj> resource
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 6.3 of [ITU-T Y.ONEM2M.DM.OMA].
		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 8 of [ITU-T Y.ONEM2M.DM.BBF].
		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 7.3 of [ITU-T Y.ONEM2M.DM.OMA].
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 6.4 [ITU-T Y.ONEM2M.DM.OMA].
		PRO Check BBF TR069	Successful response of the RPC. Details can be found in clause 9.1 [ITU-T Y.ONEM2M.DM.BBF].
		PRO Check OMA LWM2M	Response with status code 2.04 Changed. Details can be found in clause 7.4 [ITU-T Y.ONEM2M.DM.OMA].
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			

9.3.2.3 <mgmtObj> Retrieve

Interoperability test description			
Identifier:		TD_M2M_SH_07	
Objective:		AE retrieves a <mgmtObj> resource	
Configuration:		M2M_CFG_03	
References:		[ITU-T Y.4500.1], clause 10.2.8.3	
Pre-test conditions:		• Management Session between Management Server and Management Client	
Test sequence			
Step	**RP**	**Type**	**Description**
1		Stimulus	AE is requested to send an <mgmtObj> Retrieve Request to retrieve an <mgmtObj> on IN-CSE.
2	Mca	PRO Check Primitive	• op = 2 (RETRIEVE) • to = {CSEBaseName}/{node}/{mgmtObj} • fr = AE-ID • rqi = (token-string)
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 6.4 [ITU-T Y.ONEM2M.DM.OMA].
		PRO Check BBF TR069	Successful response of the RPC with the information about the management related information. Details can be found in clause 9.1 [ITU-T Y.ONEM2M.DM.BBF].
		PRO Check OMA LWM2M	Response with status code 2.05 Content with the information of the Object. Details can be found in clause 7.4 [ITU-T Y.ONEM2M.DM.OMA].
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			

9.3.2.4 <mgmtObj> Delete

Interoperability test description			
Identifier:		TD_M2M_SH_08	
Objective:		AE deletes a <mgmtObj> resource	
Configuration:		M2M_CFG_03	
References:		[ITU-T Y.4500.1], clause 10.2.8.5	
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.
		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 6.4 [ITU-T Y.ONEM2M.DM.OMA].
		PRO Check BBF TR069	Successful response of the RPC. Details can be found in clause 9.1 [ITU-T Y.ONEM2M.DM.BBF].
		PRO Check OMA LWM2M	Response with status code 2.02 Deleted. Details can be found in clause 7.4 [ITU-T Y.ONEM2M.DM.OMA]
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			

9.3.3 Announcement management

9.3.3.1 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 a 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			

9.3.3.2 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

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 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			

9.3.3.3 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
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.

Interoperability test description			
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			

9.3.3.4 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			

9.3.3.5 ContainerAnnc Retrieve Original

Interoperability test description			
Identifier:		TD_M2M_SH_16	
Objective:		AE2 retrieves the original resource respresentation 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

Interoperability test description			
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			

9.3.4 Single Hop <fanOutPoint> operations

9.3.4.1 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:			[ITU-T Y.4500.1], clause 10.2.7.7 [ITU-T Y.4500.4], clause 7.4.15.2, 7.4.15.3
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

Interoperability test description			
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			

9.3.4.2 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:			
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
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			

9.3.4.3 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:			
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
IOP Verdict			
PRO Verdict			

9.3.4.4 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:			
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.

Interoperability test description			
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			

9.4 Secure AE registration

9.4.1 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] 8.2.2.1 [ITU-T Y.4500.1],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

Interoperability test description			
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			

Annex A

oneM2M specification update and maintenance control procedure

(This annex forms an integral part of this Recommendation.)

The provisions of Annex L in [ITU-T Y.4500.1] regarding oneM2M specification update and maintenance control procedure shall apply to this Recommendation.

Bibliography

[b-ETSI TS 118 113] European Telecommunications Standards Institute, TS 118 113 v1.0.0 (2016), *Interoperability testing*.

[b-TTA MM-TS.0013] Telecommunications Technology Association, TTAT.MM-TS.0013 v1.0.0 (2016), *Interoperability testing*.

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