|  |  |
| --- | --- |
| INPUT CONTRIBUTION | |
| Group Name:\* | TDE #47 |
| Title:\* | Interop test cases for haim |
| Source:\* | KETI and EGM |
| Contact: | JaeSeung Song, KETI, [jssong@sejong.ac.kr](mailto:jssong@sejong.ac.kr)  Sherzod Elamanov, KETI, [selamanov@gmail.com](mailto:selamanov@gmail.com)  Franck Le-Gall, EGM, [franck.le-gall@eglobalmark.com](mailto:franck.le-gall@eglobalmark.com)  Ahmed ABID, EGM, [ahmed.abid@eglobalmark.com](mailto:ahmed.abid@eglobalmark.com) |
| Date:\* | 2020-10-06 |
| Abstract:\* | The contribution proposes some Interoperability Test Descriptions for HAIM management to be added to TS-0013 |
| Agenda Item:\* | TBD |
| Work item(s): |  |
| Document(s)  Impacted\* | TS-0013 |
| Intended purpose of  document:\* | Decision  Discussion  Information  Other <specify> |
| Decision requested or recommendation:\* | Incorporate the proposed text into TS-0013 |

**oneM2M Notice**

The document to which this cover statement is attached is submitted to oneM2M. Participation in, or attendance at, any activity of oneM2M, constitutes acceptance of and agreement to be bound by terms of the Working Procedures and the Partnership Agreement, including the Intellectual Property Rights (IPR) Principles Governing oneM2M Work found in Annex 1 of the Partnership Agreement.

1. **Introduction**

This contribution consists of some test descriptions about HAIM management to be included into the TS-0013.

The clause numbers and the TD identifier names in the following proposal may change when included in to TS-0013.

1. **Proposal**

### -----------------------Start of change 1-------------------------------------------

### 2.1 Normative references

References are either specific (identified by date of publication and/or edition number or version number) or non‑specific. For specific references, only the cited version applies. For non-specific references, the latest version of the referenced document (including any amendments) applies.

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

[1] oneM2M TS-0001: "Functional Architecture- Release 3".

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

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

[4] oneM2M TS-0009: "HTTP Protocol Binding - Release 3".

[5] oneM2M TS-001: "MQTT Protocol Binding - Release 3".

[6] oneM2M TS-0015: "Testing Framework".

[7] oneM2M TS-0011: "Common Terminology".

[8] IETF RFC 3986: "Uniform Resource Identifier (URI): Generic Syntax".

[9] IETF RFC 7230: "Hypertext Transfer Protocol (HTTP/1.1): Message Syntax and Routing".

[10] oneM2M TS-0005: "Management Enablement (OMA) - Release 3".

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

[12] oneM2M TS-0003: "Security Solutions - Release 3".

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

[14] oneM2M TS-0023: " Home Appliances Information Model and Mapping – Release 3".

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

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

### -----------------------End of change 1-------------------------------------------

### -----------------------Start of change 2-------------------------------------------

## 8.5 HAIM Device Model

### 8.5.5 HAIM Power Outlet SubDevice Create

| **Interoperability Test Description** | | | |
| --- | --- | --- | --- |
| **Identifier:** | | | TD\_M2M\_NH\_160 |
| **Objective:** | | | AE1 creates a Power Outlet SubDevice Model |
| **Configuration:** | | | M2M\_CFG\_10 |
| **References:** | | | oneM2M TS-0023 [14], clause 5.4.1.2 |
|  | | | |
| **Pre-test conditions:** | | | * AE1 has created an application resource <AE> on registrar CSE * AE1 has created a <flexContainer> for deviceSmartPlug |
| **Test Sequence** | | | |
| **Step** | **RP** | **Type** | **Description** |
| 1 |  | Stimulus | AE1 sends a request to create a <flexContainer> for subDevicePowerOutlet |
| 2 | Mca | PRO Check Primitive | * op = 1 (Create) * to = {CSEBaseName}/URI of <AE1> resource/resource name of deviceSmartPlug * fr = AE-ID * rqi = (token-string) * ty = 28 (flexContainer) * pc = Serialized representation of <flexContainer> resource with proper *containerDefinition* |
| 3 |  | IOP Check | Check if possible that the <flexContainer> resource is created in registrar CSE. |
| 4 | Mca | PRO Check Primitive | * rsc = 2001 (CREATED) * rqi = (token-string) same as received in request message * pc = Serialized representation of <flexContainer> resource |
| 5 |  | IOP Check | AE indicates successful operation |
| 6 |  | Stimulus | AE1 sends a request to create a <flexContainer> for binarySwitch |
| 7 | Mca | PRO Check Primitive | * op = 1 (Create) * to = {CSEBaseName}/URI of <AE1> resource/resource name of subDevicePowerOutlet * fr = AE-ID * rqi = (token-string) * ty = 28 (flexContainer) * pc = Serialized representation of <flexContainer> resource with proper *containerDefinition* |
| 8 |  | IOP Check | Check if possible that the <flexContainer> resource is created in registrar CSE. |
| 9 | Mca | PRO Check Primitive | * rsc = 2001 (CREATED) * rqi = (token-string) same as received in request message * pc = Serialized representation of <flexContainer> resource |
| 10 |  | IOP Check | AE indicates successful operation |
| Note | | Optional: Repeat steps 6-10 for additional subDevicePowerOutlet Modules | |
| IOP Verdict | |  | |
| PRO Verdict | |  | |

### 8.5.6 HAIM Toggle Action Create

| **Interoperability Test Description** | | | |
| --- | --- | --- | --- |
| **Identifier:** | | | TD\_M2M\_NH\_161 |
| **Objective:** | | | AE1 creates a Toggle Action Model |
| **Configuration:** | | | M2M\_CFG\_10 |
| **References:** | | | oneM2M TS-0023 [14], clause 5.3.1.12 |
|  | | | |
| **Pre-test conditions:** | | | * AE1 has created an application resource <AE> on registrar CSE * AE1 has created a <flexContainer> for deviceSmartPlug * AE1 has created a <flexContainer> for binarySwtich as a child of deviceSmartPlug |
| **Test Sequence** | | | |
| **Step** | **RP** | **Type** | **Description** |
| 1 |  | Stimulus | AE1 sends a request to create a <flexContainer> for Toggle |
| 2 | Mca | PRO Check Primitive | * op = 1 (Create) * to = {CSEBaseName}/URI of <AE1> resource/resource name of binarySwtich * fr = AE-ID * rqi = (token-string) * ty = 28 (flexContainer) * pc = Serialized representation of <flexContainer> resource with proper *containerDefinition* |
| 3 |  | IOP Check | Check if possible that the <flexContainer> resource is created in registrar CSE. |
| 4 | Mca | PRO Check Primitive | * rsc = 2001 (CREATED) * rqi = (token-string) same as received in request message * pc = Serialized representation of <flexContainer> resource |
| 5 |  | IOP Check | AE indicates successful operation |
| IOP Verdict | |  | |
| PRO Verdict | |  | |

### 8.5.7 HAIM Device Properties Create

| **Interoperability Test Description** | | | |
| --- | --- | --- | --- |
| **Identifier:** | | | TD\_M2M\_NH\_162 |
| **Objective:** | | | AE1 creates Device Properties Model |
| **Configuration:** | | | M2M\_CFG\_10 |
| **References:** | | | oneM2M TS-0023 [14], clause 6.2.5 |
|  | | | |
| **Pre-test conditions:** | | | * AE1 has created an application resource <AE> on registrar CSE * AE1 has created a <flexContainer> for deviceLight * AE1 has created a <node> resource |
| **Test Sequence** | | | |
| **Step** | **RP** | **Type** | **Description** |
| 1 |  | Stimulus | AE1 sends a request to create a [deviceInfo] resource |
| 2 | Mca | PRO Check Primitive | * op = 1 (Create) * to = {CSEBaseName}/URI of <node> resource/ * fr = AE-ID * rqi = (token-string) * ty = 13 (mgmtObj) * pc = Serialized representation of [deviceInfo] resource with with properties set as attributes of the resource |
| 3 |  | IOP Check | Check if possible that the [deviceInfo] resource is created in registrar CSE. |
| 4 | Mca | PRO Check Primitive | * rsc = 2001 (CREATED) * rqi = (token-string) same as received in request message * pc = Serialized representation of [deviceInfo] resource |
| 5 |  | IOP Check | AE indicates successful operation |
| IOP Verdict | |  | |
| PRO Verdict | |  | |

## 8.6 Modbus Interworking

### 8.6.1 Modbus Thermometer Device Create

| **Interoperability Test Description** | | | |
| --- | --- | --- | --- |
| **Identifier:** | | | TD\_M2M\_NH\_163 |
| **Objective:** | | | AE1 creates Device Model for Modbus device |
| **Configuration:** | | | M2M\_CFG\_10 |
| **References:** | | | oneM2M TS-0040 [], clause 6.3 |
|  | | | |
| **Pre-test conditions:** | | | * AE1 is running in Modbus IPE * AE1 has created an application resource <AE> on registrar CSE |
| **Test Sequence** | | | |
| **Step** | **RP** | **Type** | **Description** |
| 1 |  | Stimulus | AE1 sends a request to create a <flexContainer> resource for Modbus deviceThermometer |
| 2 | Mca | PRO Check Primitive | * op = 1 (Create) * to = {CSEBaseName}/URI of <AE1> resource * fr = AE1-ID * rqi = (token-string) * ty = 28 (flexContainer) * pc = Serialized representation of <flexContainer> resource with proper *containerDefinition* |
| 3 |  | IOP Check | Check if possible that the <flexContainer> resource is created in registrar CSE. |
| 4 | Mca | PRO Check Primitive | * rsc = 2001 (CREATED) * rqi = (token-string) same as received in request message * pc = Serialized representation of <flexContainer> resource |
| 5 |  | IOP Check | AE indicates successful operation |
| 6 |  | Stimulus | AE1 sends a request to create a <flexContainer> for temperature |
| 7 | Mca | PRO Check Primitive | * op = 1 (Create) * to = {CSEBaseName}/URI of <AE1> resource/resource name of Modbus deviceLight * fr = AE1-ID * rqi = (token-string) * ty = 28 (flexContainer) * pc = Serialized representation of <flexContainer> resource with proper *containerDefinition and nodnProperties* |
| 8 |  | IOP Check | Check if possible that the <flexContainer> resource is created in registrar CSE. |
| 9 | Mca | PRO Check Primitive | * rsc = 2001 (CREATED) * rqi = (token-string) same as received in request message * pc = Serialized representation of <flexContainer> resource |
| 10 |  | IOP Check | AE indicates successful operation |
| Note | | Optional: Repeat steps 5-10 for battery Module | |
| IOP Verdict | |  | |
| PRO Verdict | |  | |

### 8.6.2 Retrieve data from a Modbus Thermometer device

| **Interoperability Test Description** | | | |
| --- | --- | --- | --- |
| **Identifier:** | | | TD\_M2M\_NH\_164 |
| **Objective:** | | | Modbus IPE reads data from Modbus device and updates Registrar CSE with the read data |
| **Configuration:** | | | M2M\_CFG\_10 |
| **References:** | | | oneM2M TS-0040 [], clause 6.5.1 |
|  | | | |
| **Pre-test conditions:** | | | * AE1 is running in Modbus IPE * AE1 has created an application resource <AE> on registrar CSE * AE1 has created a <flexContainer> for deviceThermometer * AE1 has created a <flexContainer> for temperature as a child of deviceThermometer * AE2 has created an application resource <AE> on registrar CSE * AE2 has created a <subscription> resource as a child of temperature |
| **Test Sequence** | | | |
| **Step** | **RP** | **Type** | **Description** |
| 1 |  | Stimulus | AE1 sends a request to retrieve a <flexContainer> resource for temperature |
| 2 | Mca | PRO Check Primitive | * op = 2 (Retrieve) * to = {CSEBaseName}/URI of <deviceThermometer> resource/ temperature * fr = AE1-ID * rqi = (token-string) |
| 3 | Mca | PRO Check Primitive | * pc = Serialized representation of <flexContainer> resource * rsc = 2000 (OK) |
| 4 |  | IOP Check | AE1 indicates successful operation |
| 5 |  | Stimulus | Modbus IPE sends a request(s) to retrieve data from Modbus Thermometer device |
| 6 |  | IOP Check | Check if possible that Modbus IPE has successfully retrieved data from Modbus device |
| 7 |  | Stimulus | AE1 sends a request to update a <flexContainer> resource for deviceThermometer |
| 8 |  | IOP Check | * op = 3 (Update) * to = {CSEBaseName}/URI of deviceThermometer/temperature * fr = AE1-ID * rqi = (token-string) * pc = Serialized representation of updated <flexContainer> resource |
| 9 |  | IOP Check | * rsc = 2004 (Updated) * rqi = (token-string) same as received in request message * pc = Serialized representation of <flexContainer> resource |
| 10 |  | IOP Check | Check if possible that the < flexContainer > resource for temperature is updated in Registrar CSE. Registrar CSE sends a notification to AE2 |
| 11 | Mca | PRO Check Primitive | * op = 5 (Notify) * to = AE2-ID * from = Registrar CSE-ID * rqi = (token-string) * pc = Serialized representation of Notification data object |
| 12 | Check  Mca | PRO Check Primitive | AE2 responds to notification   * rsc = 2000 (OK) * rqi = (token-string) same as received in request message |
| 13 |  | IOP Check | AE2 indicates notification received |
| IOP Verdict | |  | |
| PRO Verdict | |  | |

### 8.6.3 Write data to a Modbus Thermometer device

| **Interoperability Test Description** | | | |
| --- | --- | --- | --- |
| **Identifier:** | | | TD\_M2M\_NH\_165 |
| **Objective:** | | | AE1 creates Device Model for Modbus device |
| **Configuration:** | | | M2M\_CFG\_10 |
| **References:** | | | oneM2M TS-0040 [], clause 6.5.2 |
|  | | | |
| **Pre-test conditions:** | | | * AE1 is running in Modbus IPE * AE1 has created an application resource <AE> on registrar CSE * AE1 has created a <flexContainer> for deviceThermometer * AE1 has created a <flexContainer> for temperature as a child of deviceThermometer * AE2 has created an application resource <AE> on registrar CSE * AE2 has created a <subscription> resource as a child of temperature |
| **Test Sequence** | | | |
| **Step** | **RP** | **Type** | **Description** |
| 1 |  | Stimulus | AE2 is requested to send a flexContainer Update Request to update the any customAttribute of the resource. |
| 2 | Mca | PRO Check Primitive | * op = 3 (Update) * to = {CSEBaseName}/URI of <flexContainer> resource * fr = AE-ID * rqi = (token-string) * pc = Serialized representation of updated <flexContainer> resource |
| 3 |  | IOP Check | Check that Registrar CSE sent a notification to AE1 |
| 4 | Mca | PRO Check Primitive | * op = 5 (Notify) * to = AE1-ID * from = Registrar CSE-ID * rqi = (token-string) * pc = Serialized representation of Notification data object |
| 5 |  | Stimulus | Modbus IPE sends a request(s) to write data to Modbus Thermometer device |
| 6 |  | IOP Check | Check if possible that Modbus IPE has successfully written data to Modbus device |
| 7 |  | Stimulus | AE1 sends a response to notification to Registrar CSE |
| 8 | Check  Mca | PRO Check Primitive | Sent response contains   * rsc = 2000 (OK) * rqi = (token-string) same as received in request message |
| 9 | Check  Mca | PRO Check Primitive | Registrar CSE sends a response to AE2   * rsc = 2004 (Updated) * rqi = (token-string) same as received in request message * pc = Serialized representation of <flexContainer> resource |
| 10 |  | IOP Check | AE2 indicates successful operation |
| IOP Verdict | |  | |
| PRO Verdict | |  | |

### -----------------------End of change 2-------------------------------------------