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| --- | --- |
| HANGE REQUEST | |
| Meeting ID:\* | TDE 43.2 |
| Source:\* | Bob Flynn (Convida wireless); bob.flynn@chordant.io |
| Date:\* | 2020-01-28 |
| Reason for Change/s:\* | MgmtObj Test Purposes |
| CR against: Release\* | Rel-3 |
| CR against: WI\* | Active <Work Item number>  MNT maintenance / < Work Item number(optional)>  Is this a mirror CR? Yes  No  mirror CR number: (Note to Rapporteur - use latest agreed revision)  STE Small Technical Enhancements / < Work Item number (optional)>  Only ONE of the above shall be ticked |
| CR against: TS/TR\* | TS-0018 v3.2.0 |
| Clauses \* |  |
| Type of change: \* | Editorial change  Bug Fix or Correction  Change to existing feature or functionality  New feature or functionality  Only ONE of the above shall be ticked |
| Other TS/TR(s) impacted | None |
| Post Freeze checking:\* | This CR contains only essential changes and corrections? YES  NO  This CR may break backwards compatibility with the last approved version of the TS? YES  NO |
| Template Version: January 2019 (do not modify) | |

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# Introduction

This contribution attempts to create test purposes for Device Management operations in TS-0001/TS-0004.

This contribution addresses test purposes for [firmware].

**Relevant text from TS-0001**

## D.2 Resource *firmware*

The *[firmware]* resource is used to share information regarding the firmware on the device. The *[firmware]* resource is a specialization of the *<mgmtObj>*resource.

The *[firmware]* resource shall contain the child resources specified in table D.2-1.

Table D.2-1: Child resources of *[firmware]* resource

| Child Resources of *[firmware]* | Child Resource Type | Multiplicity | Description |
| --- | --- | --- | --- |
| *[variable]* | *<subscription>* | 0..n | See clause 9.6.8 where the type of this resource is described. |
| *[variable]* | *<semanticDescriptor>* | 0..n | See clause 9.6.30 |

The *[firmware]* resource shall contain the attributes specified in table D.2-2.

Table D.2-2: Attributes of *[firmware]* resource

| Attributes of  *[firmware]* | Multiplicity | RW/ RO/ WO | Description |
| --- | --- | --- | --- |
| *resourceType* | 1 | RO | See clause 9.6.1.3. |
| *resourceID* | 1 | RO | See clause 9.6.1.3. |
| *resourceName* | 1 | WO | See clause 9.6.1.3. |
| *parentID* | 1 | RO | See clause 9.6.1.3. |
| *expirationTime* | 1 | RW | See clause 9.6.1.3. |
| *accessControlPolicyIDs* | 0..1 (L) | RW | See clause 9.6.1.3. |
| *creationTime* | 1 | RO | See clause 9.6.1.3. |
| *lastModifiedTime* | 1 | RO | See clause 9.6.1.3. |
| *labels* | 0..1(L) | RW | See clause 9.6.1.3. |
| *mgmtDefinition* | 1 | WO | See clause 9.6.15. Has fixed value *"firmware"* to indicate the resource is for firmware management. |
| *objectIDs* | 0..1 (L) | WO | See clause 9.6.15. |
| *objectPaths* | 0..1 (L) | WO | See clause 9.6.15. |
| *description* | 0..1 | RW | See clause 9.6.15. |
| *version* | 1 | RW | The version of the firmware. This attribute is a specialization of *[objectAttribute]* attribute. |
| *name* | 1 | RW | The name of the firmware to be used on the device. This attribute is a specialization of *[objectAttribute]* attribute. |
| *URL* | 1 | RW | The URL from which the firmware image can be downloaded. This attribute is a specialization of *[objectAttribute]* attribute. |
| *update* | 1 | RW | The action that downloads and installs a new firmware in a single operation. The action is triggered by assigning value "TRUE" to this attribute. This attribute is a specialization of *[objectAttribute]* attribute. |
| *updateStatus* | 1 | RW | Indicates the status of the update. This attribute is a specialization of *[objectAttribute]* attribute. |

**Relevant text from TS-0004**

# D.2 Resource [firmware]

## D.2.1 Introduction

The detailed description of the [firmware] resource can be found in clause D.2 of the oneM2M TS-0001 [6].

Table D.2.1‑1: Data Type Definition of [firmware]

|  |  |  |
| --- | --- | --- |
| Data Type ID | File Name | Note |
| firmware,  firmwareAnnc | CDT-firmware-V3\_15\_0.xsd |  |

Table D.2.1‑2: Resource specific attributes of [firmware]

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Attribute Name | Request Optionality | | Data Type | Default Value and Constraints |
| Create | Update |
| mgmtDefinition | M | NP | See clause 7.4.15 | 1001 (firmware) |
| objectIDs | O | NP | See clause 7.4.15 |  |
| objectPaths | O | NP | See clause 7.4.15 |  |
| description | O | O | See clause 7.4.15 |  |
| version | M | O | xs:string |  |
| firmwareName | M | O | xs:string |  |
| URL | M | O | xs:anyURI |  |
| update | M | O | xs:boolean |  |
| updateStatus | NP | O | m2m:actionStatus |  |

## D.2.2 Resource specific procedure on CRUD operations

### D.2.2.0 Introduction

When management is performed using technology specific protocols, the procedures defined in clause 7.4.15.2 <mgmtObj> specific procedures shall be used. The following clauses define additional procedures besides the generic procedure defined in clause 7.2.2.

### D.2.2.1 Create

***Originator:***

No change from the generic procedures in clause 7.2.2.1.

***Receiver:***

Primitive specific step after generic procedure defined in clause 7.2.2.2.

May start to download the firmware image from the location indicated by attribute URL in the firmware resource.

### D.2.2.2 Update

***Originator:***

No change from the generic procedures in clause 7.2.2.1.

***Receiver:***

Primitive specific operations to be performed after Recv-6.5 "Create/Update/Retrieve/Delete/Notify operation is performed":

If the attribute *update* is present in the request and set to true, download the new firmware image from the address indicated by attribute *URL* of the firmware resource if it is not already downloaded else use the downloaded firmware image to update the current using firmware. The Receiver may need to update the *fwVersion* attribute of the [deviceInfo] resource.

WRF – This clause describes “Reciever” actions. The “Reciever” is the Host CSE (by convention of TS-0004). This clause states that the Host CSE will check for “*update* = true”. The Hosting CSE will download the specified firmware and then update the firmware. The Hosting CSE will (may) then update the *fwVersion* of [deviceInfo].

All of this is supposed to be done by the device that this MO represents. The current wording does not describe any concept of this device.

### D.2.2.3 Retrieve

***Originator:***

No change from the generic procedures in clause 7.2.2.1.

***Receiver:***

No change from the generic procedures in clause 7.2.2.2.

### D.2.2.4 Delete

***Originator:***

No change from the generic procedures in clause 7.2.2.1.

***Receiver:***

Primitive specific step after generic procedure defined in clause 7.2.2.2:

Delete the downloaded firmware image locally.

WRF – A normal resource is “deleted” when this primitive is received. This description indicates that the Hosting CSE should delete a downloaded firmware image. This is not uninstalling a firmware image or De-Activating.

Isssues:

IUT can be a CSE or device (native oneM2M or nodn with IPE). But TS-0001/TS-0004 do not address the device. It addresses the CSE as a device (CSE as a managed device with DM client capabilities) – Is this intended?

It is not clear that the CSE has (or should have) any responsibilities beyond normal <resource> handling if the CSE is not the managed device.

These are some potential test purposes written for the “device”, even though this is not appropriate based on the existing specifications.

1. When a [firmware] resource is created, the “device” should download the indicated firware version.
2. When a [firmware] resource is updated, if “*update*=true” the device will download and install the FW.
3. When a [firmware] resource is deleted the device should delete the specified “image”.

### -----------------------Start of new text 1-------------------------------------------

|  |  |  |  |
| --- | --- | --- | --- |
| **TP Id** | | TP/oneM2M/AE/DM/FW/001 | |
| **Test objective** | | Check that the IUT downloads a firmware image when a [firmware] mgmtObj is created. | |
| **Reference** | | TS-0004, clause D.2.2.1 | |
| **Parent Release** | | Release 2 | |
| **Config Id** | | CFG?? | |
| **PICS Selection** | |  | |
| **Initial conditions** | **with {**  the IUT **being** in the "initial state"  **and** the IUT **being** registered to a CSE  **and** the CSE **having** a <node> resource that represents the IUT at *NODE\_RESOURCE\_ADDRESS*  **and** the AE1 **being** registered to a CSE  **}** | | |
| **Expected behaviour** | **Test events** | | **Direction** |
| **when {**  the CSE **receives** a valid CREATE request **from** AE1 **containing**  To **set to** *NODE\_RESOURCE\_ADDRESS* **and**  From **set to** AE1\_ID **and**  Resource Type **set to** 13 (mgmtObj) **and**  Content **containing a** valid resource representation    **}** | | CSE 🡨 AE1 |
| **then {**  the IUT **downloads** a firmware image  **from** the location specified in URL  **}** | | IUT 🡪 Image repository |

|  |  |  |  |
| --- | --- | --- | --- |
| **TP Id** | | TP/oneM2M/AE/DM/FW/002 | |
| **Test objective** | | Check that the IUT installs a firmware image when a [firmware] mgmtObj is updated. | |
| **Reference** | | TS-0004, clause D.2.2.2 | |
| **Parent Release** | | Release 2 | |
| **Config Id** | | CFG?? | |
| **PICS Selection** | |  | |
| **Initial conditions** | **with {**  the IUT **being** in the "initial state"  **and** the IUT **being** registered to a CSE  **and** the CSE **having** a [firmware] resource at *FW\_RESOURCE\_ADDRESS*  **and** the CSE **having** a [deviceinfo] resource at *DEVICEINFO \_RESOURCE\_ADDRESS*  **and** the AE1 **being** registered to a CSE  **}** | | |
| **Expected behaviour** | **Test events** | | **Direction** |
| **when {**  the CSE **receives** a valid UPDATE request **from** AE1 **containing**  To **set to** *FW\_RESOURCE\_ADDRESS* **and**  From **set to** AE1\_ID **and**  Content **containing a** *update* attribute **set to** true  **and** *fwVersion*set to NEW\_FW\_VERSION  **}** | | CSE 🡨 AE1 |
| **then {**  the IUT **installs** a firmware image **and**  the IUT **sends** a valid UPDATE request  To **set to** *DEVICEINFO\_RESOURCE\_ADDRESS*  Content **containing** attribute *fwVersion* **set to** NEW\_FW\_VERSION  **}** | | IUT 🡪 CSE |

|  |  |  |  |
| --- | --- | --- | --- |
| **TP Id** | | TP/oneM2M/AE/DM/FW/003 | |
| **Test objective** | | Check that the IUT deletes a firmware image when a [firmware] mgmtObj is deleted. | |
| **Reference** | | TS-0004, clause D.2.2.2 | |
| **Parent Release** | | Release 2 | |
| **Config Id** | | CFG?? | |
| **PICS Selection** | |  | |
| **Initial conditions** | **with {**  the IUT **being** in the "initial state"  **and** the IUT **being** registered to a CSE  **and** the CSE **having** a [firmware] resource at *FW\_RESOURCE\_ADDRESS*  **and** the AE1 **being** registered to a CSE  **}** | | |
| **Expected behaviour** | **Test events** | | **Direction** |
| **when {**  the CSE **receives** a valid DELETE request **from** AE1 **containing**  To **set to** *FW\_RESOURCE\_ADDRESS* **and**  From **set to** AE1\_ID  **}** | | CSE 🡨 AE1 |
| **then {**  the IUT **uninstalls** a *fwVersion* firmware image  **}** | | IUT 🡪 ??? |

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

### -----------------------Start of new text 2-------------------------------------------

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