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| CHANGE REQUEST |
| Meeting:\* |  ARC TP30 |
| Source:\* | BeiXu，Huawei，Echo.xubei@huawei.com |
| Date:\* | 2017-04-24 |
| Contact:\* | BeiXu，Huawei，Echo.xubei@huawei.comYulan Lu, China Telecom, luyl@sttri.com.cn; Shuling Wang,China Unicom,wangsl49@chinaunicom.cn |
| Reason for Change/s:\* | Add new section about UE power saving mode feature |
| CR against: Release\* | <Release> Only ONE Release shall be indicated |
| CR against: WI\* | [x] Active <WI-0058 - 3GPP & Cellular IoT Interworking> [ ]  MNT Maintenace / < Work Item number(optional)>[ ]  STE Small Technical Enhancements / < Work Item number (optional)>Only ONE of the above shall be ticked |
| CR against: TS/TR\* | TS-0026 - 3GPP\_interworking-V0\_2\_0 |
| Clauses/Sub Clauses\* |  |
| Type of change: \* | [ ]  Editorial change[ ]  Bug Fix or Correction[ ]  Change to existing feature or functionality[x] New feature or functionalityOnly ONE of the above shall be ticked |
| Post Freeze checking:\* | This CR contains only essential changes and corrections? YES [x]  NO [ ] This CR may break backwards compatibility with the last approved version of the TS? YES [ ]  NO [ ] This CR is a mirror CR? YES [ ]  if YES, please indicate the document number of the original CR: <Document Number) : NO [ ]   |
| Template Version:27 May 2015 (Dot not modify) |

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GUIDELINES for Change Requests:

Provide an informative introduction containing the problem(s) being solved, and a summary list of proposals.

Each CR should contain changes related to only one particular issue/problem.

In case of a correction, and the change apply to previous releases, a separated “mirror CR” should be posted at the same time of this CR

Follow the principle of completeness, where all changes related to the issue or problem within a deliverable are simultaneously proposed to be made E.g. A change impacting 5 tables should not only include a proposal to change only 3 tables. Includes any changes to references, definitions, and acronyms in the same deliverable.

Follow the drafting rules.

All pictures must be editable.

Check spelling and grammar to the extent practicable.

Use Change bars for modifications.

The change should include the current and surrounding clauses to clearly show where a change is located and to provide technical context of the proposed change. Additions of complete sections need not show surrounding clauses as long as the proposed section number clearly shows where the new section is proposed to be located.

Multiple changes in a single CR shall be clearly separated by horizontal lines with embedded text such as, start of change 1, end of change 1, start of new clause, end of new clause.

When subsequent changes are made to content of a CR, then the accepted version should not show changes over changes. The accepted version of the CR should only show changes relative to the baseline approved text.

## Introduction

None

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

## 7.X Node Schedule Management

### 7.X.1 Overview

The <schedule> resource in oneM2M contains scheduling information. The usage of the *<schedule>* resource is different depending on the associated resource type, as follows:

* A child *<schedule>* resource of the *<node>* resource shall indicate the time periods when the node can communicate via the Underlying Network. If multiple Underlying Networks are supported, for each there can be a maximum of one <*schedule>* resources. One <*schedule*> resource may be used for multiple Underlying Networks.

The *mgmtLink* attribute of the *<cmdhNwAccessRule>* child of a <node> resource shall link to a <schedule> resource, child of the same <node> resource.

In the context of 3GPP connectivity technologies according to 3GPP TS 23.682 [3], the network reachability and UE reachability are to be understood as an indication in case the UE becomes reachable for sending either SMS or downlink data to the UE. The SCEF provides capability to notify IN-CSE the network reachable status or the UE reachable status, IN-CSE shall maintain the <*schedule*> of the <*node*> to synchronize the status with the 3GPP network if the *networkCoordinated of <schedule> is* True.

### 7.X.2 Resource Structure

Refer to the clause 9.6.9 Resource Type *schedule* of TS-0001[1]

### 7.X.3 Node Schedule Management



Figure 7.x.3-1: Service Flow of Targeting UE based on the <*schedule*> of <*node*> resource

Step 001: The IN-AE requests to perform one of the CRUDN operation on a resource residing on the ASN/MN-CSE or ADN-AE, the request is sent via the Mca reference point to the IN-CSE. The request from IN-AE includes the target resource identifier.

Step 002: IN-CSE checks the local *<schedule>* of target ASN/MN-CSE or ADN-AE node which indicates the pre-defined reachable schedule information of target ASN/MN-CSE or ADN-AE. If *networkCoordinated* of *<schedule>* is True, which means it has been synchronized with network. For example, IN-CSE support to synchronize the start time of *scheduleElement* to be the same as the start time of targeted UE idle status by the Monitor Event UE Reachability in clause 7.Y.

IN-CSE checks if the current time in the scope of <*schedule*> which indicate the reachable status of target ASN/MN-CSE or ADN-AE in the current time

Case A: if the current time is within the period of <*schedule*> which indicates the target ASN/MN-CSE or ADN-AE current status is reachable

* Step 003a: IN-CSE sends the request to ASN/MN-CSE or ADN-AE directly after CMDH message processing successfully in Annex H in TS-0004[xx] ;
* Step 004a: the ASN/MN-CSE or ADN-AE sends the response message to the IN-CSE;
* Step 005a: IN-CSE sends response message to the IN-AE;

Case B: if the current time is not within the period of <*schedule*> which indicates the target ASN/MN-CSE or ADN-AE node current status is unreachable, IN-CSE calculates the next reachable start time based on the *<schedule>*, and check if the ***Operation Execution Time*** or ***Request Expiration Timestamp*** in the IN-AE request message is earlier than the next reachable start time , if yes, or the ***Operation Execution Time*** or ***Request Expiration Timestamp*** isnot configured in the request, then go to Step 003b,

* Step 003b: IN-CSE sends error response message to the IN-AE to which indicates that the request cannot be delivered to the target ASN/MN-CSE or ADN-AE:

 if the ***Operation Execution Time*** and ***Request Expiration Timestamp*** are absent, the error information should be the targeted resource is not reachable.

if the ***Request Expiration Timestamp*** exists, and ***Request Expiration Timestamp*** is earlier than the next reachable start time, the error information should be the request cannot be delivered to the target resource before ***Request Expiration Timestamp*** expires.

if the ***Operation Execution Time*** and ***Request Expiration Timestamp*** are configured, the ***Request Expiration Timestamp*** is later than thenext reachable start time and ***Operation Execution Time*** is earlier than the next reachable start time, the error information should be the request cannot be delivered to the target resource before ***Operation Execution Time*** expires.

Case C: if the current time is not within the scope of <*schedule*> which indicates the target ASN/MN-CSE or ADN-AE current status is unreachable and the ***Operation Execution Time*** and ***Request Expiration Timestamp*** in the IN-AE request message are both later than the next reachable start time, then got Step 003c:

* Step 003c: IN-CSE buffers the message until the ASN/MN-CSE or ADN-AE is reachable again.
* Step 004c: IN-CSE(SCS) forwards CRUDN request message to the target ASN/MN-CSE or ADN-AE node before the ***Operation Execution Time*** and ***Request Expiration Timestamp*** expire during the next reachable time. The more detail is specified in Annex H2.4 in in TS-0004[xx];
* Step 005c: the ASN/MN-CSE or ADN-AE sends the response message to the IN-CSE;

Step 006c: IN-CSE sends response message to the IN-AE.

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

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

## 2.1 Normative references

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

[1] oneM2M TS-0001 Reference Architecture (v3)

[2] 3GPP 23.682 Architecture enhancements to facilitate communications with packet data networks and applications; (Release 14)

 [3] OMA-TS-REST-NetAPI-CommunicationPatterns-V1-0: '"RESTful Network API for Communication Patterns'", Version 1.0, Open Mobile Alliance.

[xx] oneM2M TS-0004 Service Layer Core Protocol Specification(v4)

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

CHECK LIST

* Does this change request include an informative introduction containing the problem(s) being solved, and a summary list of proposals.?
* Does this CR contain changes related to only one particular issue/problem?
* Have any mirror crs been posted?
* Does this change request make **all** the changes necessary to address the issue or problem? E.g. A change impacting 5 tables should not only include a proposal to change only 3 tables. Includes any changes to references, definitions, and acronyms in the same deliverable?
* Does this change request follow the drafting rules?
* Are all pictures editable?
* Have you checked the spelling and grammar?
* Have you used change bars for all modifications?
* Does the change include the current and surrounding clauses to clearly show where a change is located and to provide technical context of the proposed change? (Additions of complete sections need not show surrounding clauses as long as the proposed section number clearly shows where the new section is proposed to be located.)
* Are multiple changes in this CR clearly separated by horizontal lines with embedded text such as, start of change 1, end of change 1, start of new clause, end of new clause.?