**SA WG2 Meeting #162S2-2405480**

**April 15 – 19, 2024, Changsha, China (revision of S2-2405439, 4942)**

**Source:: Spreadtrum**

**Title:** **KI#3 New Sol: UE reader selection for inventory procedure**

**Document for: Approval**

**Agenda Item: 19.14**

**Work Item / Release: FS\_AmbientIoT / Rel-19**

*Abstract: A new solution to address the support for Ambient IoT services.*

# 1. Introduction/Discussion

A new solution applies to Key issue #3 in terms of selecting the reader used for Ambient IoT inventory service.

# 2. Text Proposal

It is proposed to capture the following changes in TR 23.700-13.

\* \* \* \* Start of changes \* \* \* \*

## 6.0 Mapping of Solutions to Key Issues

Table 6.0-1: Mapping of Solutions to Key Issues

|  |  |
| --- | --- |
|  | Key Issues |
| Solutions | Key Issue #1 | Key Issue #2 | Key Issue #3 |
| #1 |  | X |  |
| #2 |  | X |  |
| #3 | X | X | X |
| #4 | X | X | X |
| #5 |  | X | X |
| #6 | X | X | X |
| #7 | X | X |  |
| #8 | X | X |  |
| #9 | X | X | X |
| #10 | X | X |  |
| #11 |  |  | X |
| #12 | X | X | X |
| #X |  |  | X |

\* \* \* \*Next Change (all new texts) \* \* \* \*

## 6.X Solution #X: UE reader selection for inventory procedure

### 6.X.1 Description

#### 6.x.1.1 Definition

**AIoT device capability**: e.g. inventory frequency, etc. Different AIoT devices may support different inventory frequency.

**reader**: part of the intermediate node UE, which can communicate with the AIoT device via radio interface;

**UE reader capability**: e.g. inventory frequency, etc. Different readers may support different inventory frequencies, and the inventory frequency supported by the reader may be different from the inventory frequency supported by the AIoT device as well. To execute the inventory related procedure between the device and the reader, the inventory frequency used by the device and the reader should match with each other;

#### 6.x.1.2 General

This solution applies to Key issue #3 in terms of selecting the reader used for Ambient IoT inventory service.

This solution applies to the following scenario:

* The AF (i.e. third party) uses a bulk of AIoT devices that have the same AIoT device capabilities, e.g. the same inventory frequency, etc;
* the AF holds the AIoT device information (e.g. device capabilities, etc.).

This solution applies to topology 2.

This solution proposes to select the appropriate UE readers before performing the inventory procedure.

#### 6.x.1.3 Architecture and Principles



Figure 6.x.1.3-1: Reference architecture

The principles of the solution:

* AF provides the AIoT device capability to the Ambient IoT Function (AIoTF);
* the selection of the intermediate node UE will be based on: the AIoT device capability, the inventory area wherein the AIoT devices are supposed to be, and the the UE reader capability;

AIoTF is responsible for:

* mapping the third party information (e.g. the inventory area information) to 3GPP information (e.g. cell ID, etc);
* selecting the appropriate intermediate node UE;

### 6.X.2 Procedures

This clause provides how to select the UE readers that will be used for the inventory procedure.



Figure 6.x.2-1: UE reader selection procedure

1. The intermediate node UE performs the registration procedure. The AIoT UE reader capabilities (e.g. supported inventory frequency) will be transmitted to the AMF via the NAS message (e.g. the Registration Request message).

2. The AF sends to the AIoTF the inventory request information that includes: inventory area information, AIoT device capabilities (e.g. supported frequency, etc.), etc. The inventory area information defined by the third party indicates the area where the AIoT devices are supposed to be.

Editor's note: It is FFS how the AF selects AIoTF if multiple AIoTFs are deployed in the core network.

3. The AIoTF maps the third party defined information into the information defined in 3GPP. For example, the inventory area information is mapped into the cell ID which could help the AIoTF to select the AMF.

Editor's note: It is FFS how the AIoTF selects AMF if multiple AMFs serve the same area.

4. The AIoTF get from the AMF the information of the intermediate node UEs that are available in the cell with the cell ID mapped in step 3. The information of the intermediate node UE includes: e.g. UE ID, inventory frequency;

5. The AIoTF selects the appropriate intermediate node UEs that will be engaged in the inventory procedure. The inventory frequency of the intermediate UE should overlap with the inventory frequency supported by the AIoT device.

6. void.

6a. void.

7. The inventory procedure is carried out. The radio configuration (inventory frequency, etc.) of the intermediate node, e.g. how RAN to schedule the radio resource to reader UE, is up to RAN WGs.

NOTE 1: It depends on operator's policy or configuration that there can be different selection criteria of the intermediate node, e.g. based on the frequency capability of the AIoT device and the intermediate node.

Editor's note: It is FFS how the inventory procedure is carried out in terms of other aspects.

### 6.X.3 Impacts on services, entities and interfaces

Editor's note: This clause captures impacts on existing services, entities and interfaces.

\* \* \* \* End of changes \* \* \* \*