**3GPP TSG-WG SA2 Meeting #171 S2-25XXXXX**

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**Source: Lenovo, China Telecom**

**Title: New Solution: UE reader revocation**

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**Agenda Item: 20.5.1**

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*Abstract of the contribution:* *This paper proposes the solution on how to support the UE reader management regarding the revocation and subscription management.*

# 1 Introduction

This paper proposes the solution to address the following two editor’s notes in the TR 23.700-13 about topology 2, and enhance the UE reader management. The existing two editor’s notes in the clause 8.1.3 (Architecture to support Topology 2) are copied below:

*Editor’s note: Additional subscription information, e.g. validity information, for the UE Reader is FFS.*

*Editor’s note: Whether and how to enable authorization to the UE is FFS.*

From our perspective, it is essential for the UE to be authorized as an AIoT reader first and then interact with the AIoT Devices to perform the AIoT service operation, and the authorization should be under the full control of the MNO that the UE reader is currently connected and registered with.

What’s more, the authorization is not a one time for all thing and should be associated with the validity information, which can be stored as part of the UE subscription data in the UDM/UDR. The validity information (e.g., time based, or location based) can not only be used by the AMF and the AIOTF to determine whether to authorize the UE as an AIoT reader but also can be used by the AMF and the AIOTF as one of the triggers/factors to revoke the UE reader authorization, i.e., UE will stop acting as the AIoT reader. This kind of revocation can ensure the operator has the control and flexibility over the UE reader and make full use of the resources.

# 2. Text Proposal

It is proposed to capture the following changes to TR 23.700-30.

\* \* \* \* First change \* \* \* \*

6.X Solution #X: Support of UE reader management

6.X.0 High-level Solution Principles

The solution is based on the following general principles to support the UE reader management:

* The UE subscription data stored in the UDM is enhanced with UE reader allowed indication, and the associated validity information per UE that contains the allowed time/duration, allowed area/location for the UE as an AIoT reader. This information is available to both AMF and AIOTF.
* The AMF performs the UE reader authorization by checking the UE subscription data stored in the UDM.
* AMF can determine to revoke the UE reader authorization, based on local policies and configuration, UE reader associated validity information, and subscription data update from UDM, and sends the UE reader revocation message to both the NG-RAN (that serves the UE reader) and the UE. NG-RAN will release the radio resources configured for that UE to act as an AIoT reader.
* AIOTF can also determine to revoke the UE reader authorization based on local configuration that is related to the AIoT service.

It addresses the KI#1.

6.X.1 Description

This solution is aiming for the case when UE is acting as an AIoT reader and gives the procedure on how to revoke the UE authorization as an AIoT reader, which is enabled at both the AMF and AIOTF.

6.X.2 Procedures

6.X.2.1 UE reader revocation procedure



Figure 6.X.2.1-1. UE reader revocation procedure

**Step 1** to **Step 2** is basically the general UE registration procedure as described in clause 4.2.2.2.2 of TS 23.502. UE sends the UE registration request towards the AMF, that further includes the reader indication capability. After receiving the UE registration request with a reader indication, the AMF will send the UE ID and use ambient IoT reader or ambient IoT as the subscription data type to check the UE subscription data related to the AIoT service, which is stored in the UDM.

**Step 3:** UDM sends the UE ID, UE reader allowed indication (or not), together with the reader validity information to the AMF. The validity information can include the validity time and validity location information. The AMF will also subscribe to the UE reader subscription update towards the UDM.

**Step 4:** AMF sends the authorized UE reader information to the AIOTF, that includes the UE ID, UE reader location (cell ID, TAI, or coordinate obtained from LMF), and the associated validity information (optional) received in step 3. The validity information may not be sent to the AIOTF since AIOTF can also check the UE subscription data from UDM.

**Step 5:** Based on the received UE reader information from AMF, AIOTF can also subscribe to the UDM about the UE subscription data update.

**Step 6:** AMF sends the UE registration response to both the UE and the NG-RAN that serves the UE. The registration response includes the UE reader allowed indication and UE ID.

**Step 7:** Based on the UE reader allowed indication, the NG-RAN will allocate the radio resources for the UE to act as an AIoT reader.

**Step 8 and step 9:** NG-RAN forwards the UE reader registration response to the UE, together with the UE reader allowed indication. The UE can in turn perform the AIoT service operation towards the AIoT Devices.

Revocation procedure

**AMF determination:**

**Step 10-a:** Based on the local policy, the validity information, or UDM notification that UE is no longer allowed as an AIoT reader, AMF determines that the UE reader authorization needs to be revoked.

**Step 11-a:** AMF sends the revoked UE reader notification information to the AIOTF, that contains the UE ID and a revoke indication.

**AIOTF determination:**

**Step 10-b:** Alternatively, based on local configuration (that can be related to service), AIOTF may also determine that UE reader authorization needs to be revoked, and sends the UE reader revocation information to the AMF in **step 11-b,** including the UE ID and revocation indication.

**NOTE:** The local configuration at AIOTF can be based on the SLA between the MNO, AF and UE, and is related to the AIoT service.

For both option a and b, AIOTF will also delete the reader information stored locally for the revoked UE.

**Step 12:** For both options, AMF sends the UE reader revocation indication, and the UE ID to both the NG-RAN (that serves the UE) and the UE, to notify about the UE reader revocation.

**Step 13:** After receiving the UE reader revocation indication, NG-RAN releases the radio resources for the UE in **Step 7**.

**Step 14** and **step 15**: After UE receives the UE reader revocation indication from the NG-RAN, UE stops acting as a reader to interact with the AIoT Devices.

### 6.X.3 Impacts on Services, Entities and Interfaces

**AMF:**

* Perform the UE reader authorization
* Determine that the UE reader authorization needs to be revoked
* Send UE reader revocation indication to UE and NG-RAN.
* Inform the UE reader revocation to AIOTF.

**AIOTF:**

* Determine that the UE reader authorization needs to be revoked
* Send UE reader revocation indication to AMF, NG-RAN and UE
* Subscribe to UDM about UE reader subscription data update

**NG-RAN:**

* Release the allocated resources for UE acting as the AIoT reader based on received revocation indication
* Inform the UE about reader revocation

**UE:**

- Stop acting as an AIoT reader based on received revocation indication.

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