**3GPP TSG-WG SA2 Meeting #166 S2-2412508**

**18 – 22 November 2024, Orlando, USA S2-2412297**

**Source: China Mobile**

**Title: Conclusions on the KI#1 general part – Reader selection**

**Document for: Approval**

**Agenda Item: 19.14.1**

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

*Abstract of the contribution:* *This paper proposes conclusion principles for the supported functionality of AIoTF.*

# 1 Discussion

It is vital how 5GS selects the targeted BS readers, UE readers, or both BS readers and UE readers based on information input from AF in the ambient IoT solution.

For topology 1, regardless of application scenarios, AIoTF will choose targeted BS readers based on location information and other information provided by AF.

For topology 2, there are the following typical application scenarios:

1. The operator uses the specific UE reader to scan.

Once the operator clicks the UE reader's button to trigger the scan service, the UE reader will send AF GPSI info (out of 3GPP spec). AF will trigger an inventory command with the GPSI parameter for AIoTF via NEF. Then, AIoTF will choose the target UE reader based on the UE reader's GPSI. RAN couldn't downsize the UE reader selection in this scenario.

2) warehouse inventory service at midnight without a person involved

 AF triggers an inventory command with location parameters via NEF to AIoTF. One precondition is that the 5GC must ensure that selected targeted UE readers can cover 100% of the store service area. Otherwise, the inventory results are untrustworthy. If the RAN chooses targeted UE readers, how can it guarantee 100% service area coverage in the store in the condition of UE readers' mobility? Refering to indoor/outdoor seamless coverage by gNBs or BS readers , it has to have strict wireless coverage plan and test in advance. It is impossible to dynamicaly calculate the result based on UE readers location, signal strength and other factors by gNB to ensure 100% service area coverage in the store in the condition of UE readers' mobility .

 AIoTF has already had the solution to choose targeted UE readers (treat fixed UE reader as mini BS reader, the perform wireless coverage plan and test in advance) to ensure 100% service area coverage in the store, and please refer to AIoT solution 31 for details ).

3) Topology 1 BS readers and Topology 2 UE readers hybrid networking

 Topology 2 UE readers can perform the hybrid networking with Topology 1 BS readers together to realize 100% service area covrage. If the RAN chooses targeted UE readers in the hybrid networking scenarios, how can it select correct UE readers which are cooperating with Topology 1. AIoTF has already had the solution to choose both BS readers and UE readers (hybrid networking) to ensure 100% service area coverage in the store, and please refer to AIoT solution 18 and solution 31 for details (Fixed UE reader type).

4) other scenarios

 There may be other scenarios in which RAN could downsize the UE reader selection based on the UE reader candidate list offered by AIoTF.

**Proposal:** The AIoTF is responsible for selecting BS readers, UE readers, or both BS readers and UE readers.

 Editor’s Note: whether and how the RAN can downsize UE readers selection based on the UE reader candidate list from AIoTF is FFS, and coordination with RAN WGs is needed

# 2. Text Proposal

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

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

## 8.1 Interim Conclusion on Key Issue #1

### 8.1.1 General

Key issue #1 includes the following aspects:

- System architecture identified along with the solutions for KI#2 and KI#3.

Key issue#2 aspect on "Ambient IoT Device subscription management" and key issue#3 aspect on "Ambient IoT service exposure" is considered in this section.

The following aspects common for Topology 1 and Topology 2 are concluded as principles for normative work:

Editor's note: Final conclusions are assumed to be taken in coordination with RAN WGs.

Editor's note: Information needed for radio resource allocation to readers is FFS and requires cooperation with RAN WG2/RAN WG3.

Editor's note: Which architecture options described in the following clauses will be concluded is FFS.

1. A new core network function is introduced to support Ambient IoT (e.g. AIoTF) service for both the topology 1 and topology 2. The AIoTF performs the following functionality.

a. The AIoTF manages the device related information.

Editor's note: Whether and what AIoT Device related information (e.g. AIoT Device last known Reader ID, optionally the result of AIoT device validation result, etc.) is stored in the AIOTF, are FFS.

Editor's note: Whether the UDM should store the device related information is FFS.

b. The AIoTF registers itself in the NRF with its NF profile.

Editor's note: The details of the NF profile are FFS.

c．For topology 1, the AIoTF selects the BS readers. For topology 2, the AIoTF selects the UE readers and provides the UE Reader list to the RAN.

Note: whether and how the RAN may downsize UE readers selection based on the UE readers candidate list from AIoTF will coordinate with RAN WGs.

d. The AIoTF receives an AIoT service request from the AF and triggers the BS/UE readers to perform AIoT service operations towards the AIoT Devices (s).

e. The AIoTF aggregates the service operation results (including the removal of the duplicated devices records) from BS Readers and UE Readers and sends to AF.

Editor's note: For RRC based solution of topology 2, whether the aggregation can be performed by the RAN is FFS and coordination with RAN WGs is needed.

Editor's note: How the aggregation can be done is FFS.

2. A Permanent AIoT Device IDis stored in the AIoT Device and the UDM or a Credential Holder's AAA server.

Editor's note: Whether and how the validation of the Ambient IoT Device ID is done will be concluded by SA WG3.

3. The AIoT Device does not distinguish whether the connectivity topology is Topology 1 or Topology 2, nor the transport used by the AIoT Reader.

NOTE: The AIoT device is also agnostic to the potential different architectures if more than one architecture is concluded for both the topology 1 and topology 2.

Editor's note: Whether an AIoT NAS protocol is supported between the AIoT Device and the AIoTF, and what is the supported functionality, is FFS.

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