**3GPP TSG-WG SA2 Meeting #161 S2-2410747**

**14th – 18th October, 2024, Hyderabad, India (revision of S2-2410056)**

**Source: Lenovo, NEC, HONOR**

**Title: Conclusions on the common supported functionality of AIoTF**

**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

After SA2#164 meeting, initial conclusion principle on architecture support for topology 1 was agreed:

*A new core network function is introduced to support Ambient IoT*.

Based on the introduction of AIoTF, this paper continues to further discuss the supported functionality of it. **An assumption is made that the new network function, i.e., AIoTF, will also be introduced to support Ambient IoT related service in topology 2 when UE is acting as the reader.**

Based on this, some **common principles** on the supported functionality of AIoTF, for both the topology 1 and topology 2 are presented in this paper.

# 2. Text Proposal

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

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

## 8.1 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:

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.

~~Editor's note: Whether the new core network function also applies to topology 2 is FFS~~.

a. The AIoTF is responsible for both the BS reader and UE reader selection to interact with the AIoT devices for the AIoT service. Optionally, the BS reader and UE reader register at the AIoTF with their supported service information, location, and capability.

b. The AIoTF performs the AIoT device ID validation by interacting with the AUSF/UDM/AAA server, when necessary.

c. The AIoTF stores and updates the AIoT device subscription information after successful device ID validation into UDM, that includes the device status, last known (binding) reader information of the device, and the device validation result. The AIoT Device subscription data is different from the UE subscription data.

d. The AIoTF registers itself in the NRF with its NF profile, including the supported service information ~~and its service area (e.g. the service area is the sum of the coverage areas of the readers registered with the AIoTF).~~

e. The AIoTF receives an AIoT service request (e.g., inventory, write, read, enable, disable) from the AF via NEF and sends the service request towards the AIoT Devices (s) via the selected BS/UE reader.

~~The AIoTF may store a service context/parameters and creates an AIoT NAS message towards the AIoT device(s). The AIoT NAS message is encapsulate in a message to the selected BS/UE reader.~~

f. The AIoTF aggregates the service operation results from BS Readers and UE Readers and sends to AF.

~~g. A hierarchical architecture of AIoTFs is supported, e.g., there is a centralized AIoTF terminating the communication with the AF and local AIoTF(s) located in different service areas or VPLMNs~~.

NOTE 1: Some of the conclusions under Key Issue 3 may also be related to the functionality of the AIoTF.

2. A Permanent AIoT Device ~~subscriber~~ ID and credentials are stored in the AIoT Device and the UDM or a Credential Holder’s AAA server.

Editor’s Note: How the security and validation of the Ambient IoT device ID is performed is FFS and depends on the input from SA3.

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

4. A dedicated common AIoT NAS protocol is supported between the AIoT Device and the AIoTF. ~~The functionality of the AIoT NAS protocol includes:~~

~~a. Delivery of Inventory response, Command and Response messages between AIoT Device and AIoTF;~~ and

~~b. Integrity protection and ciphering for Inventory response, Command and Response messages exchanged between AIoT Device and AIoTF.~~

~~NOTE 2: The details of integrity protection and ciphering are assumed to be specified by SA3.~~

~~NOTE 3: The details of the AIoT NAS protocol are assumed to be specified by CT1.~~

~~5. The Ambient IoT services can be deployed isolated from existing deployments for legacy UEs.~~

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