**3GPP TSG-WG SA2 Meeting #166-Ad Hoc-e *S2-2500463r05***

**Online, 20th Jan 2025 - 24th Jan 2025 (revision of S2-24xxxxx)**

**Source: Nokia**

**Title: Conclusions for KI#1 on the aggregation aspects (Topic#3)**

**Document for: Approval**

**Agenda Item: 19.14.1**

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

*Abstract: conclusions for KI#1 on the aggregation aspects are proposed.*

# 1. Introduction/Discussion

This contribution is prepared to update the conclusions for KI#1 on the aggregation aspect related to the EN below.

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

It is proposed for the AIOTF to determine the aggregation rule based on some factors and provide it to the AIoT RAN Reader so that it can use the rule to determine whether and how to aggregate the data read from multiple AIoT devices.

# 2. Text Proposal

It is proposed to approve the following changes in TR 23.700-13 v1.2.1.

*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 clause.

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.

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 registers itself in the NRF with its NF profile.

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

b. For topology 1, the AIOTF selects the BS readers or AIOT RAN nodes. For topology 2, the AIOTF selects the UE readers (e.g. candidate or final UE readers) and provides the selected UE Reader list to the RAN.

NOTE 1: Providing the UE Reader list to the RAN only applies to the RRC-based option.

Editor’s note: Whether and how AIOTF selects BS readers or AIOT RAN nodes in topology 1 needs coordination between SA WG2 and RAN WG(s).

c. 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).

d. 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.

e. The AIOTF may provide the following assistance information to RAN/UE Reader:

- AIoT service type (e.g. Inventory, Command);

- approximate number of AIoT devices based on AF request;

- approximate D2R message size based on AF request.

Editor's note: Other assistance information may be added later if necessary.

Editor's note: Further information on AIoT service type may be determined later in cooperation with RAN WGs.

NOTE 2: If there are multiple Readers selected for the AIoT Service, the AIOTF may provide the approximate number of AIoT devices to each Reader based on implementation.

NOTE 3: The approximate D2R message size considering the overhead of AIoT Device NAS layer will be determined later in cooperation with CT WG1 and SA WG3.

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.

f. The AIOTF may provide the aggregation control information to the AIoT RAN to assist in the aggregation of AIoT data received from AIoT device(s). The AIOTF determines the aggregation control information based on operator policy and/or request from the AF, which includes:

- Per time window (e.g., aggregate and report data for a time period)

- Per reader

- Number of AIoT devices (e.g. for inventory, threshold for the number of AIoT Device ID(s) required for reporting)

- Any combination of above (if needed)NOTE X: The AIoT service operations aggregated from the AIoT devices share the same correlation identifier.

g. When the AIOTF sends an operation request to a UE Reader or BS Reader (via AIOT RAN), a response and one or more reports with the results of the AIoT service operation is returned to the AIOTF with the results of the AIoT service operation, and the AIOTF needs to correlate the results to a given operation request. The AMF (if used to route the requests) additionally provides an AIOTF identifier with the request from the AIOTF which is returned with the response(s) related to the request, so the AMF can be routed back the requesting AIOTF.

2. A Permanent AIoT Device ID is stored in the AIoT Device and the network or a Credential Holder's AAA server. The AIOTF checks whether the AIoT Device ID from AIoT Device has a subscription and retrieves.

Editor's note: Whether and how the AIoT Device ID privacy protection and ID authentication 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 4: 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.

4. AIoT Device NAS protocol is supported between the AIoT Device and the AIoTF. The AIoT Device NAS layer supports Inventory Response and Command (e.g. Read and Write) Request and Response.

Editor's note: It is FFS whether to support any other messages besides Inventory Response, Command (e.g. Read and Write) Request and Response over AIoT Device NAS layer.

5. The network may manage the AIOT device related information (e.g. device context information), includes the AIOT device permanent ID, and optionally the last known reader information.

Editor’s note: How this AIOT device related information is used is FFS.

Editor’s note: Where to store the AIOT device related information is FFS.

*END OF CHANGES*