**3GPP T****SG-RAN WG3 Meeting #124 R3-243807**

**Fukuoka, Japan, 20th – 24th May 2024**

**Agenda Item: 16.2**

**Source: Ericsson (Moderator), Huawei**

**Title: [TP for TR 38.769] CB:#AIoT1\_Architecture**

**Document for: Discussions & Approval**

# 1 Introduction

This is the summary of offline discussions on the first comeback for Ambient AIoT during RAN3#124.

The chair’s minutes are as follows:

**CB: # AIoT1\_Architecture**

**- Focus on how to capture the system architecture in TR**

**- Discuss the definition of common reader function and AIoT RAN function**

**- the possibility to send LS to other WGs on security?**

(moderator – E///)

Offline discussions were based on R3-243549 and attempted to produce commonly acceptable content for TR 38.769, as shown below in the “Text Proposal”, containing architecture related Figures and the definition of the terms used in the figure. Items for further study are captured within “Editor’s Notes”.

For chair minutes:

**Text Proposal in R3-243807 agreed**

# 2 Text Proposal

<<<<<<<<<<<<<<<<<<<< First Change >>>>>>>>>>>>>>>>>>>>

## 6.4 RAN architecture aspects

Editor’s note 0: Corresponds to the second RAN3 objective in the SID, to identify RAN architecture aspects, including whether support for split architecture is necessary.

This chapter attempts to identify and describe architectural elements necessary to define a RAN architecture for support of Ambient IoT embedded in the overall 5G system architecture in support of topology 1 and topology 2 (as defined in TR 38.848 [2]).

This chapter also attempts to identify a functional split between RAN and CN.

Figure 6.4-1 depicts the logical system architecture for AIoT common for topology 1 and topology 2.

It consists of the following architectural elements:

**AIoT device**: equipment with characteristics outlined e.g. in TS 22.369 [x] and TR 38.848 [2].

Editor’s Note 1: Further details FFS, if any.

**AIoT RAN**: hosts certain functions for AIoT as part of the functional split between RAN and CN

Editor’s Note 2: Further details regarding AIoT functions hosted in the AIoT RAN and the respective functional split to be decided by RAN2, RAN3 and SA2.

**AIoT radio**: radio interface between AIoT RAN and AIoT device.

Editor’s Note 3: Further details on AIoT radio to be discussed by RAN1 and RAN2.

**AIoT CN**: hosts certain functions for AIoT as of the functional split between RAN and CN

Editor’s Note 4: Further details regarding AIoT functions hosted in the AIoT CN and the respective functional split to be decided by RAN2, RAN3 and SA2

**XX interface**: interface between the AIoT RAN and the AIoT CN on which certain AIoT specific functions are performed.

Editor’s Note 5: The functions represented by the XX interfaces are FFS. It is also FFS whether this interface represents a new logical interface or is equal to NG:
E.g. for topology 1 it may only represent a single interface instance, e.g. a new interface between AIoT RAN and AIoT CN, for topology 2 it might represent either 2 interface instances, one instance for NG and one instance for a new interface between AIoT CN and AIoT RAN “XX” , or one instance for NG alone.

**Common reader function**: a function residing in AIoT RAN. It communicates with the AIoT device by means of AIoT radio. AIoT RAN supports multiple Common reader function instances.

Editor’s Note 6: Further on details to be discussed by RAN1&2, as for AIoT radio)

**AIoT RAN node function**: a function residing in AIoT RAN. It contains e.g. the control of the AIoT radio resources used towards the AIoT device and coordinates the Upper Layer functions (e.g. Inventory, Command) e.g. in case these functions have to be performed over a multitude of instances of the Common Reader Function.

Editor’s Note 7: further details are FFS. Note that “control of AIoT radio resources” does not necessarily imply dynamic configuration of resources but could also rely on static assignment of resources by means of OAM.



Figure 6.4-1: Logical System Architecture for AIoT common for topology 1 and topology 2.

Figure 6.4-2 depicts a deployment scenario for topology 2, based on Fiture 6.4-1, where AIoT RAN functions are deployed within an AIoT-enabled gNB and an AIoT enabled UE. The definitions of the 2 additional entities are given below:

**AIoT enabled UE**: a UE able to communicate with the AIoT Device, AIoT radio resource usage is controlled by the AIoT-enabled gNB through the NR-Uu interface.

NOTE: Figure 6.4-2 depicts a deployment scenario based on the logical system architecture depicted in Figure 6.4-1. As such, it shows, that the AIoT enabled UE, a physical node, hosting the Common reader function, a logical function being located as part of the logical system architecture in AIoT RAN. Figure 6.4-2 also shows non-AIoT functions within the physical AIoT enabled UE being located outside the AIoT RAN.

Editor’s Note 8: further details are FFS.

**AIoT-enabled gNB**: a gNB able to communicate with the AIoT enabled UE.

Editor’s Note 9: further details are FFS. currently the AIoT enabled gNB is only used for detailing the deployment scenario in Figure 6.4-2. All aspects related to logical nodes/functions contained within the AIoT RAN in order to depict an example deployment scenario for topology 1, especially handling architectural/terminology related aspects concerning the “AIoT enabled gNB” entity depicted in Figure 6.4-2, are FFS.



Figure 6.4-2: Deployment scenario for topology 2 based on the Logical System Architecture in Figure 6.4-1.

<<<<<<<<<<<<<<<<<<<< End of Changes >>>>>>>>>>>>>>>>>>>>