3GPP RAN#104

RP-241270

Shanghai, China, 2024

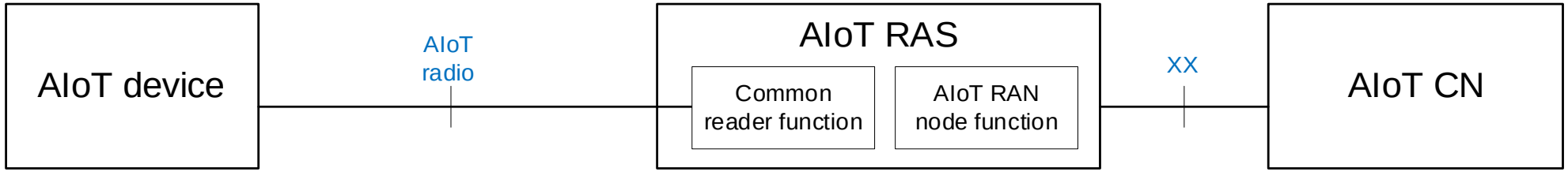
Agenda Item: 9.2.2

Views on Ambient IoT architecture for Topology 2

Qualcomm Incorporated, Vivo, Apple, Vodafone, MediaTek

Discussion in RAN3 on AIoT architecture

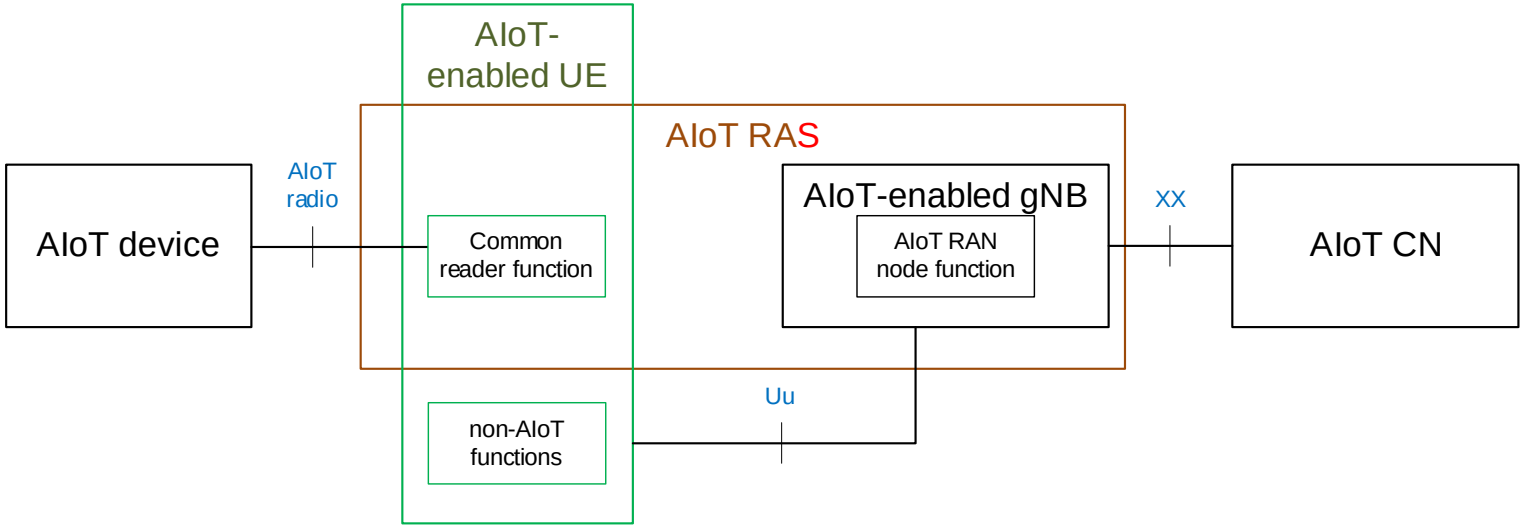
- In RAN3#124, RAN3 agreed in R3-243962 on the below logical system architecture for AIoT identifying the potential entities and functions involved along with their definitions with several editor's notes:
  - **AIoT device**: equipment with characteristics outlined e.g. in TS 22.369 [x] and TR 38.848 [2].
  - **AIoT radio**: radio interface between AIoT device and Common reader function.
  - **AIoT RAS (AIoT Radio Access System):** hosts certain functions for AIoT as part of the functional split between RAN and CN.
  - **AIoT CN**: hosts certain functions for AIoT as of the functional split between RAN and CN
  - **XX interface**: interface between the AIoT RAS and the AIoT CN on which certain AIoT specific functions are performed.
  - **Common reader function:** a function that communicates with the AIoT device by means of AIoT radio.
  - **AIoT RAN node function**: a function residing in AIoT RAS. It contains e.g. the control of the AIoT radio resources used towards the AIoT device.



Editor's Note 9: whether the logical system architecture above is applied to topology 2 to be discussed in next meeting.

Discussions in RAN3 on AIoT architecture for Topology 2 (1)

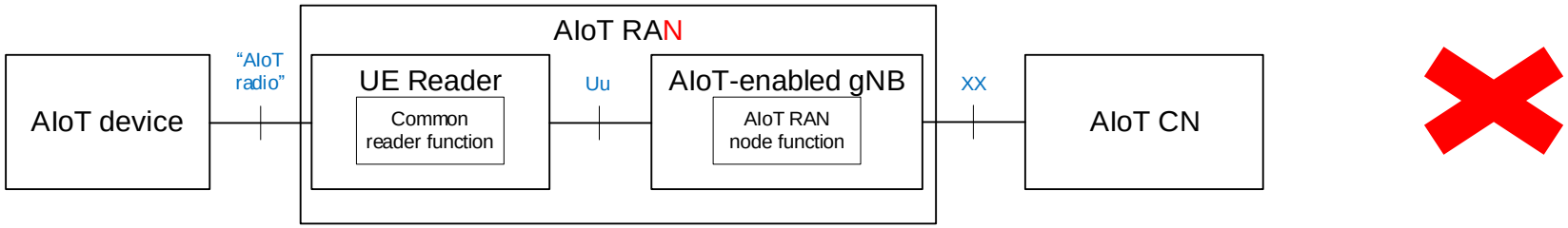
- There were a few proposals in RAN3#124 to capture **Topology 2 as a special case of Topology 1** (i.e., just a deployment option where Common reader function is deployed as part of a UE Reader and the AIoT RAN node function as part of an AIoT enabled gNB) e.g., as shown below:



No consensus in R3#124 because multiple companies expressed concerns on having the Common reader function in T2 as part of AIoT RAS and instead it should simply be a UE functionality.

Discussions in RAN3 on AIoT architecture for Topology 2 (2)

- Further there were proposals to even consider UE Reader as part of an “AIoT RAN” i.e., **consider UE Reader as an infrastructure element** with the intention to unify the system architecture for T1 and T2



In our view, the UE Reader should **not** be considered as part of an AIoT RAN (i.e., **not** as an infrastructure element) and should be just considered as a **UE with AIoT reader capabilities**

Proposals

- **Proposal 1**: In Topology 2, the UE Reader (i.e., intermediate node) should be just considered as a **UE with AIoT capabilities** and not considered as part of an "AIoT RAN" (i.e., not as an infrastructure element)

- Considering the UE Reader is just a UE with AIoT capabilities, any discussions on functionalities of UE Reader and its architecture should involve RAN2 as well. We therefore propose the following:
- **Proposal 2**: Revise the SID to explicitly capture that RAN2 should be involved in the architecture discussions for Topology 2 e.g.,
  - RAN2 and RAN3 are expected to identify RAN-CN functional split in coordination with SA2. RAN2 is also expected to be involved in the architecture discussions for Topology 2 .

Qualcomm

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