**3GPP TSG-****RAN WG3 Meeting #126 R3-247794**

**Orlando, USA, 18 Nov - 22 Nov 2024**

Agenda Item: 16.2

Source: Huawei (moderator)

Title: Summary of Offline Discussion for CB: # AIoT1

Document for: Discussion

# Introduction

**CB: # AIoT1\_ProtocalStack**

**- Discuss the open issues above**

**- Capture the agreement to TP**

(moderator - HW)

Summary of offline disc [R3-247794](file:///D%3A%5CRAN3%23126%5Cwork%20during%20the%20meeting%5CInbox%5CR3-247794.zip)

# For the Chair’s Notes

**In T1 and T2 RRC based solution, whether to include** **AIoT session related information in NGAP, or in** **a new protocol layer carried by NGAP, needs further discussion and decision.**

**NOTE: In T1, whether the AIoTF needs to be aware of the readers served by the A-IoT RAN node and their location, and how this information is provided to the AIoTF, needs further discussion.**

**In RRC based solution, Reader selection may need coordination between A-IoT-enabled gNB and A-IoT CN.**

**NOTE: In NAS/UP based solution, whether A-IoT CN selects the A-IoT-enabled UE for the selection needs further discussion.**

**No evaluation and no down selection for T2 solutions has been performed.**

**Only if the UE is authorized to perform the A-IoT service, the UE can communicate with the A-IoT device and be configured with AIoT radio resources controlled by the A-IoT enabled gNB.**

**NGAP protocol functions for the A-IoT-enabled UE authorization needs to be further discussed.**

**Agree TP R3-247830 (Rev of R3-247190)**

**Agree TP R3-247831 (rev of R3-247189)**

# Discussion

## XX interface

The following was agreed during online discussion:

 **NGAP is always be used between RAN and AIoT CN.**

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| * **XX interface**: Interface between the A-IoT RAN and the A-IoT CN on which certain A-IoT specific functions are performed.
* **6.4 Editor’s Note 7:** 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 A-IoT RAN and A-IoT CN, for topology 2 it might represent either 2 interface instances, one instance for NG and one instance “XX” for a new interface between A-IoT CN and A-IoT RAN, or one instance for NG alone.
	+ In Topology 1, the XX interface could be based on NG or a new interface carried over NG or a new interface.
	+ **6.4.2 Editor’s Note 2:** In Topology 2, the XX interface could be based on NG or a new interface carried over NG or a new interface. XX signaling could be transported via XX-C or XX-U, which is FFS.
 |

**Proposal 1: in T1, whether to include AIoT information in NGAP, or in a new protocol layer carried by NGAP, needs further discussion and decision.**

**Proposal 2: proposal 1 also applies to T2 RRC based solution.**

**Proposal 4: capture above agreements, remove 6.4 Editor’s Note 7 and 6.4.2 Editor’s Note 2.**

## Protocol stacks of NAS/UP solutions for AIoT operations

**Proposal: agree R3-247190, by adding clarification about the content of AIoT-AP.**

**Detailed wording of this clarification to be checked in updated TP.**

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| --- | --- | --- |
| [R3-247190](file:///D%3A%5CRAN3%23126%5CDocs%5CR3-247190.zip) | TP to TR 38.769) Protocol Stacks for Topology 2 NAS/UP based solutions | Huawei, CMCC, ZTE, CATT, NEC, Xiaomi, Lenovo, China Telecom, Samsung, Qualcomm |

**UP based solution:**



**NAS based solution:**



## Resource Control

* + 1. **Protocol stack of NAS/UP solutions for resource control via XXAP**

**Proposal: with the clarification that the following protocol stacks show one way to support resource control of NAS/UP solutions, and capture the following two protocol stacks.**

Nokia: AIoTF -> AIoT CN?

QCOM, CATT: no need to capture this, as there are many other solutions.

**Change AIoTF -> AIoT CN**

capture: E///, Nokia, ZTE, Xiaomi, Samsung, CMCC, Huawei

not capture: QCOM,

UP based solution



NAS based solution



* + 1. **Editor’s Notes clean up**

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| 6.4 RAN architecture aspects…**A-IoT RAN node function**: A function that contains e.g., the control of the A-IoT radio resources used towards the A-IoT device.Editor’s Note 9: further details are FFS. Note that “control of A-IoT radio resources” does not necessarily imply dynamic configuration of resources but could also rely on static assignment of resources by means of OAM. Aspects concerning coordination of 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 are FFS. |
| 6.4.2 Support of Topology 2…Editor’s Note 4: The A-IoT enabled gNB performs radio resource management for A-IoT related radio resources, details are pending on RAN1 and RAN2 mechanisms.…In Topology 2, the RAN architecture should enable the coordination of the usage of the A-IoT radio resources among readers.  |
|  |

**Proposal1: change 6.4 EN 9 and 6.4.2 EN 4 to NOTEs as follows:**

NOTE: Aspects concerning coordination of the Upper Layer functions (e.g., Inventory, Command) e.g., in case these functions may to be performed over a multitude of instances of the Common Reader Function, needs further discussion.

NOTE: The A-IoT enabled gNB performs radio resource management for A-IoT related radio resources, details are subject to RAN1 and RAN2 mechanisms.

## Reader Selection

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| **RAN3 agreements:*** **in T1, reader selection may need the coordination between AIoT RAN and AIoT CN;**
* **in T2, all options are still open, different alternatives are possible as per call flows.**
* **In Topology 1, an A-IoT RAN node may serve one or more readers.**

**RAN3 pCR:**For Topology 1:* + Reader selection may need coordination between A-IoT RAN node and A-IoT CN.
	+ **6.5.2 Editor’s Note 1:** Reader selection is FFS.

For Topology 2:* + **6.4.2 Editor’s Note 5**: In Topology 2, it is FFS on reader selection, may need coordination between A-IoT RAN node and A-IoT CN.
	+ **6.5.3 Editor’s Note:** Reader selection is FFS.
 |

**Proposal 1: In all solutions：**

* **Reader selection aspects to be further discussed.**

**NOTE: In T1, whether the AIoTF needs to get the reader list and/or reader location awareness, needs further discussion.**

Nokia: AIoTF does not need to know the location of readers/TRPs.

**In RRC based solution, Reader selection may need coordination between A-IoT-enabled gNB and A-IoT CN.**

**NOTE: In NAS/UP based solution, whether A-IoT CN selects the A-IoT-enabled UE for the selection needs further discussion.**

* **In all T1 and T2 solutions**
* **Option 1**
	+ **RAN selects the readers based on information from the AIoTF, the information could be e.g. a list of readers, area information.**
	+ **In T2, in case e.g. a single reader id is indicated by the AIoTF, this reader should be used by the RAN.**
* **Option 2**
	+ **AIoTF selects the reader(s) and indicates the selected reader(s) to the RAN.**

**Proposal 2: capture the above agreements and remove Editor’s Notes.**

## T2 down selection?

RRC based solution

NAS based solution

UP based solution

**Question: which option to go?**

Option1: no down selection in RAN3 in the study

 Lenovo, CMCC, Huawei, ZTE,

Option 2: exclude NAS based solution only

Option 3: ?

## AIoT-enabled UE authorization

**Only if the UE is authorized to perform A-IoT service, the UE can communicate with the A-IoT device and be configured with AIoT radio resources controlled by the A-IoT enabled gNB.**

**The details of the NGAP signalling for the A-IoT-enabled UE authorization to be discussed in WI.**