**3GPP T****SG-RAN WG3 Meeting #125bis R3-245723**

**Hefei, P.R. China, 14th – 18th October 2024**

**Agenda Item: 16.3**

**Source: Ericsson**

**Title: [TP for TR 38.769] CB:#AIoT2\_RANCNinterface**

**Document for: Discussions & Approval**

# 1 Introduction

This document is the summar of offline discussion **CB: # AIoT2\_RANCNinterface**

**- Check the details in** [**R3-245307**](file:///C%3A%5CUsers%5Cpgodin%5CDesktop%5CphilipDocuments%5Ca_ran3new2%5Cran3125bis_hefei%5Cmeeting%5CCB%20%23%20AIoT2_RANCNinterface%5CInbox%5CR3-245307.zip)**, taking** [**R3-245581**](file:///C%3A%5CUsers%5Cpgodin%5CDesktop%5CphilipDocuments%5Ca_ran3new2%5Cran3125bis_hefei%5Cmeeting%5CCB%20%23%20AIoT2_RANCNinterface%5CInbox%5CR3-245581.zip) **into account**

**- Continue the discussion on reader selection for Topology1 and Topology2 based on progress in RAN2**

(moderator - E///)

It contains a TP for 38.769.

# 2 Text Proposal for TR 38.769v1.0.0

#### 6.5.1.3 XX protocol elements for AIoT resource allocation in case of NAS/UP based solutions

NAS/UP based solutions require the possibility for requesting AIoT resources in advance to the NAS/UP based communication with the AIoT device.

XX AIoT resource allocation does not need to carry AIoT device specific information, but only sufficient information in order to configure the AIoT enabled UEs with respective AIoT resources.

The **AIoT Resource Request** and the **AIoT Resource Response** message shall carry the same AIoT Transaction ID (CN allocated) as communicated by the AIoT CN directly to the AIoT enabled UE(s).

Editor’s Note 1: Further details are FFS.

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### 6.5.2 Signaling and Procedures for Topology 1

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Editor’s note 1: Future discussions on A-IoT Inventory will take place based on the following message flows, working on the content of the messages including ownership, associated functions, scope, etc.

Editor’s note 2: XX communication depicted in the following chapters uses protocol elements (messages and information elements) detailed in section 6.5.1 and are not repeated, unless additional description is necessary.

Editor’s Note 3: Reader selection is FFS.

 

Figure 6.5.2.1-1: Message flow for AIoT Inventory in Topology 1

1a. The AIoT CN sends an Inventory request message to the AIoT RAN node according the AIoT transaction scope.

1b The AIoT RAN node allocates and coordinates usage of AIoT radio resources.

2. The AIoT RAN node sends an Inventory response message to the AIoT CN.

NOTE 1: In step 2, the AIoT RAN node may instead send an Inventory failure message to the AIoT CN Indicating that the inventory procedure could not be initiated towards the AIoT device(s).

3. The AIoT RAN node initiates the inventory procedure towards the AIoT device(s) over the AIoT radio interface.

4a/4b. After receiving the inventory result from the AIoT device(s), the AIoT RAN node may send one or multiple Inventory reports towards the AIoT CN including the received inventory result.

NOTE 2: Steps 4a/4b may happen in parallel with Step 3 for different AIoT devices.

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### 6.5.3 Signaling and Procedures for Topology 2

Editor’s note 1: Future discussions on A-IoT Inventory will take place based on the following message flows, working on the content of the messages including ownership, associated functions, scope, etc.

Editor’s note 3: XX communication depicted in the following chapters uses protocol elements (messages and information elements) detailed in section 6.5.1 and are not repeated, unless additional description is necessary.

Editor’s Note 4: Reader selection is FFS.

#### 6.5.3.1 Candidate procedures for A-IoT Inventory for Topology 2

##### 6.5.3.1.1 NAS/UP solution option 1 – AIoT enabled UEs requesting AIoT radio resources



Figure 6.5.3.1.1-1: Message flow for an A-IoT Inventory in Topology 2 – NAS/UP solution option 1

0 The AIoT CN identifies UE(s) according to the AIoT transaction scope.

1a. The AIoT CN sends an Inventory request message to the selected AIoT-enabled UE(s).

1b. Direct communication between the AIoT CN and and the AIoT enabled UE(s) – as of the NAS/UP solution – requires the AIoT enabled UE(s) to first request AIoT radio resources for the transaction.

1c The AIoT enabled gNB allocates and coordinates usage of AIoT radio resources among the AIoT enabled UE(s) requesting resources.

Editor’s Note 1: AIoT enabled gNB needs to learn about the AIoT transaction and the involved AIoT enabled UEs gradually from the AIoT enabled UEs requesting, details FFS.

1d The AIoT enabled gNB replies to the AIoT enabled UE(s)

Editor’s Note 2: RRC based communication is only depicted schematically. RAN2 details FFS.

2. The AIoT-enabled UE(s) sends an Inventory response message to the AIoT CN.

Editor’s Note 2: Order of steps 1b/1c/1d/2/3 are not necessarily performed as shown in Figure 6.5.3.1.1-1, details may also depend on RAN2 discussions.

NOTE 1: In step 2, the AIoT-enabled UE(s) may instead send an Inventory failure message to the AIoT CN indicating that the inventory procedure could not be initiated towards the AIoT device(s).

3. The AIoT-enabled UE(s) send the inventory response towards the AIoT device(s).

4a/4b. After receiving inventory result reported from the AIoT device(s), the AIoT-enabled UE(s) may send one or multiple Inventory reports towards the AIoT CN including the received inventory result.

NOTE 2: Steps 4a/4b may happen in parallel with Step 3 for different AIoT devices.

##### 6.5.3.1.2 NAS/UP solution option 2 – RAN allocating AIoT radio resources



Figure 6.5.3.1.2-1: Message flow for A-IoT Inventory in Topology 2 – NAS/UP solution option 2

0a. Direct communication between the AIoT CN and and the AIoT enabled UE(s) – as of the NAS/UP solution – requires the AIoT CN to first request AIoT radio resources for the transaction. AIoT CN provides information to the AIoT enabled gNB according to the AIoT transaction scope.

0b The AIoT enabled gNB allocates and coordinates usage of AIoT radio resources.

0c/d. If AIoT radio resources are admitted by the AIoT enabled gNB, the AIoT enabled UE is configured with AIoT resources if is allowed to use. Respective RRC signalling needs to carry information to allow association with information provided in step 1.

Editor’s Note: RRC based communication is only depicted schematically. RAN2 details FFS.

0e. The AIoT enabled gNB responds to the resource request and provides the list of selected and configured AIoT enabled UEs to the AIoT CN.

1. The AIoT CN sends an Inventory request message to the AIoT-enabled UE(s).

2. The AIoT-enabled UE(s) sends an Inventory response message to the AIoT CN.

NOTE 1：In step 2, the AIoT-enabled UE(s) may instead send an Inventory failure message to the AIoT CN indicating that the inventory procedure could not be initiated towards the AIoT device(s).

3. The AIoT-enabled UE(s) trigger the inventory procedure towards the AIoT device(s).

4a/4b. After receiving inventory result reported from the AIoT device(s), the AIoT-enabled UE(s) may send one or multiple Inventory reports towards the AIoT CN including the received inventory result.

NOTE 2: Steps 4a/4b may happen in parallel with Step 3 for different AIoT devices.

##### 6.5.3.1.2a NAS solution option 2a – RAN allocating AIoT radio resources – NAS piggy packed on XXAP.



Figure 6.5.3.1.2a-1: Message flow for A-IoT Inventory in Topology 2 – NAS solution option 2a NAS PDUs piggy-packed on XXAP.

1a. Direct communication between the AIoT CN and and the AIoT enabled UE(s) – as of the NAS/UP solution – requires the AIoT CN to first request AIoT radio resources for the transaction. AIoT CN provides information to the AIoT enabled gNB according to the AIoT transaction scope.

 The XX AIoT Resource Request carries per AIoT enabled UE the XX\* Inventory request, as described in section 6.5.3.1.2.

1b The AIoT enabled gNB allocates and coordinates usage of AIoT radio resources.

1c. If AIoT radio resources are admitted by the AIoT enabled gNB, the AIoT enabled UE is configured with AIoT resources if is allowed to use.

 This step carries the XX\* Inventory request as provided to the AIoT enabled gNB in step 1a.

2a Response to 1c, carrying the the XX\* Inventory response.

Editor’s Note 1: RRC based communication is only depicted schematically. RAN2 details FFS.

2b. The AIoT enabled gNB responds to the resource request and provides the list of selected and configured AIoT enabled UEs to the AIoT CN.

NOTE 1：In step 2, the AIoT-enabled UE(s) may instead send an Inventory failure message to the AIoT CN indicating that the inventory procedure could not be initiated towards the AIoT device(s).

3. The AIoT-enabled UE(s) trigger the inventory procedure towards the AIoT device(s).

4a/4b. After receiving inventory result reported from the AIoT device(s), the AIoT-enabled UE(s) may send one or multiple Inventory reports towards the AIoT CN including the received inventory result.

NOTE 2: Steps 4a/4b may happen in parallel with Step 3 for different AIoT devices.

##### 6.5.3.1.3 RRC solution



Figure 6.5.3.1.3-1: Message flow for A-IoT Inventory in Topology 2 – RRC solution

1a. The AIoT CN sends an Inventory request message to the AIoT enabled gNB according to the AIoT transaction scope.

1b The AIoT enabled gNB allocates and coordinates usage of AIoT radio resources.

1c/2a RRC communication with the AIoT enabled UE takes place.

Editor’s Note1: RRC based communication is only depicted schematically, details in RAN2 FFS.

2. The AIoT-enabled gNB sends an Inventory response message to the AIoT CN.

NOTE 1: In step 2, the AIoT-enabled gNB may instead send an Inventory failure message to the AIoT CN indicating that the inventory procedure could not be initiated towards the AIoT device(s).

3. The AIoT-enabled gNB requests the AIoT-enabled UE(s) to trigger inventory procedure towards the AIoT device(s).

4a/4b. After receiving inventory result reported from the AIoT enabled UEs, the AIoT-enabled gNB may send one or multiple Inventory reports towards the AIoT CN including the received inventory result.

NOTE 2: Steps 4a/4b may happen in parallel with Step 3 for different AIoT devices.

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