3GPP TSG-RAN WG3 #113e R3-214145

Online, 16 – 26 August 2021

Agenda Item: 8.3.2

Source: Lenovo, Motorola Mobility (moderator)

Title: Summary of Offline Discussion on Expected UE Activity Behaviour

Document for: Approval

# Introduction

This paper provides the summary of offline discussion:

**CB: # 13\_ ExpUEActivBehavior**

**- Check SA2 spec, whether the PDU session level “Expected UE Activity Behavior” is included within or outside of the SMF container for NGAP?**

**- Stage3 CRs, if agreeable**

(Lenovo - moderator)

Summary of offline disc in [R3-214145](Inbox%5CR3-214145.zip)

# For the Chairman’s Notes

# Discussion – 1st Round

In the reply LS on PDU Session level "Expected UE activity behaviour", SA2 confirmed that PDU session level “Expected UE Activity Behaviour” is provided to the NG-RAN. Before discussing the solutions proposed in RAN3, it would be better to clarify the understanding on SA2’s specifications.

Currently the basic procedure on the PDU session level “Expected UE Activity Behaviour” is described section in 5.4.6.2 of TS 23.501 as follows.

- The SMF derives and sends the “CN assisted RAN parameters tuning” to the AMF.

- Based on this, the AMF determines the PDU session level “Expected UE activity behavior”, associated with a PDU Session.

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| *<Excerpt from Section 5.4.6.2 of TS 23.501>**The SMF uses the SMF-Associated parameters (e.g. Expected UE Behaviour parameters or Network Configuration parameters of the UE) to derive the SMF derived CN assisted RAN parameters tuning. The SMF sends the SMF derived CN assisted RAN parameters tuning to the AMF during the PDU Session establishment procedure and if the SMF-Associated parameters change the PDU Session modification procedure is applied. The AMF stores the SMF derived CN assisted RAN parameters tuning in the PDU Session level context. The AMF uses the SMF derived CN assisted RAN parameters tuning to determine a PDU Session level "Expected UE activity behaviour" parameters set, which may be associated with a PDU Session ID, as described below in this clause.* |

Also, it is specified that the AMF provides to the RAN the PDU session level “Expected UE activity behaviour”.

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| *- "Expected UE activity behaviour", i.e. the expected pattern of the UE's changes between CM-CONNECTED and CM-IDLE states or the duration of CM-CONNECTED state. This may be derived e.g. from the statistical information, or Expected UE Behaviour or from subscription information. The AMF derives one or more sets of the "Expected UE activity behaviour" parameters for the UE as follows:**- AMF may derive and provide to the RAN a UE level of "Expected UE activity behaviour" parameters set considering the Expected UE Behaviour parameters or Network Configuration parameters received from the UDM (see clauses 4.15.6.3 or 4.15.6.3a of TS 23.502 [3]) and the SMF derived CN assisted RAN parameters tuning associated with a PDU Session using Control Plane CIoT 5GS Optimisation. This set of "Expected UE activity behaviour" parameters is valid for the UE; and**- AMF may provide to the RAN a PDU Session level "Expected UE activity behaviour" parameters set, e.g. considering the SMF derived CN assisted RAN parameters tuning, per established PDU Session. The PDU Session level "Expected UE activity behaviour" set of parameters is associated with and valid for a PDU Session ID. The RAN may consider the PDU Session level "Expected UE activity behaviour" parameters when the User Plane resources for the PDU Session are activated;* |

From moderator’s view, SA2 specifications clearly specifies that AMF determines the PDU session level “Expected UE activity behavior” using the SMF derived CN assisted RAN parameters. This point is also proved in CT4 specification 29.502, in which the CN assisted RAN parameters tuning is defined as:

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| CnAssistedRanPara | 6.1.6.2.48 | SMF derived CN assisted RAN parameters tuning |

6.1.6.2.48 Type: CnAssistedRanParaTable 6.1.6.2.48-1: Definition of type CnAssistedRanPara

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| Attribute name | Data type | P | Cardinality | Description |
| stationaryIndication | StationaryIndication | O | 0..1 | Identifies whether the UE is stationary or mobile (see 3GPP TS 23.502 [3] clause 4.15.6.3). |
| communicationDurationTime | DurationSec | O | 0..1 | Indicates for how long the UE will normally stay in CM-Connected for data transmission (see 3GPP TS 23.502 [3] clause 4.15.6.3). |
| periodicTime | DurationSec | O | 0..1 | Identifies interval time of periodic communication (see 3GPP TS 23.502 [3] clause 4.15.6.3). |
| scheduledCommunicationTime | ScheduledCommunicationTime | O | 0..1 | Identifies time and day of the week when the UE is available for communication (see 3GPP TS 23.502 [3] clause 4.15.6.3). |
| scheduledCommunicationType | ScheduledCommunicationType | O | 0..1 | Indicates that the Scheduled Communication Type (see 3GPP TS 23.502 [3] clause 4.15.6.3).(NOTE 2) |
| trafficProfile | TrafficProfile | O | 0..1 | Identifies the type of data transmission: single packet transmission (UL or DL), dual packet transmission (UL with subsequent DL or DL with subsequent UL), and multiple packets transmission (see 3GPP TS 23.502 [3] clause 4.15.6.3). |
| batteryIndication | BatteryIndication | O | 0..1 | Indicates the power consumption type(s) of the UE (see 3GPP TS 23.502 [3] clause 4.15.6.3). |
| NOTE 1: At least one of optional parameters above shall be present.NOTE 2: The value of attribute "scheduledCommunicationType" shall be used together with the value of "scheduledCommunicationTime". |

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**Question 1: Companies are kindly asked if you agree that SA2 and CT4 specifications clearly specify that AMF determines the PDU session level “Expected UE activity behavior” using the SMF derived CN assisted RAN parameters? If no, please clarify the unclear part in SA2 specification.**

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| Company | Yes/No | Comment |
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Two solutions are proposed on how to provide the PDU session level “Expected UE Activity Behaviour” to the NG-RAN node:

- Solution 1: AMF determines the PDU session level “Expected UE Activity Behaviour” and provides it to NG-RAN outside of SMF container [3].

- Solution 2: SMF determines the PDU session level “Expected UE Activity Behaviour” and provides it to NG-RAN in a SMF container [1].

From moderator point of view, solution 1 is aligned with the existing SA2 and CT4 specifications. However, some companies think the PDU session level parameters should be included in the SMF transparent container as proposed in solution 2. Moderator thinks that both solutions can work. The main concern on solution 2 is that if RAN3 adopts solution 2, then SA2 and CT4 needs to change/align the Rel-16 specs, which have been frozen since more than 1.5 years.

**Question 2: Companies are kindly asked that if RAN3 adopts solution 2, do you accept the necessary update on SA2 and CT4 specifications (TS 23.501 and TS 29.502), which have been frozen？**

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| Company | Yes/No | Comment |
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# Discussion – 2nd Round

[TBD]

# References

1. R3-213359 Discussion on PDU Session level "Expected UE activity behaviour" (Ericsson)
2. R3-213360 PDU Session level Expected UE activity behaviour (Ericsson)
3. R3-213736 Finalizing the PDU session level Expected UE Activity Behaviour (Huawei, Lenovo, Motorola Mobility, Qualcomm Incorporated, ZTE)
4. R3-213737 Expected UE Activity Behaviour (Huawei, Lenovo, Motorola Mobility, Qualcomm Incorporated, ZTE)
5. R3-213748 Correction on Expected UE activity behaviour (Lenovo, Motorola Mobility, Huawei, Qualcomm Incorporated, ZTE)