3GPP TSG-RAN WG3 Meeting #123bis R3-242145

Changsha, China, from April 15 to April 19 2024

Agenda Item: 11.1

Source: ZTE

Title: SoD on CB: # AIRAN1\_Slicing

Document for: Approval

# 1 Introduction

This SoD is to discuss the following CB:

**CB: # AIRAN1\_Slicing**

* **Work on TP**
* **Discuss the open issues above and relevant ones in the papers**

(moderator - ZTE)

Summary of offline disc [R3-242145](Inbox%5CR3-242145.zip)

# 2 Discussion

## 2.1 Interaction with CN

[1][5][9]shared the views in their contribution the coordination between CN and RAN for AI/ML assisted Network Slicing is needed.

[1] proposed that predicted AMF capacity can be considered as AI/ML related information provided from CN to NG-RAN to assist AI/ML network slicing.

For legacy network slicing, as specified in TS 38.300, NG-RAN is able to select appropriate AMF for initial attachment by default or by NSAAI provided by UE. This means that the NG-RAN node could select the better AMF to guarantee subsequent service quality if more helpful information is provided.

*====================== TS 38.300 ======================*

***RAN selection of CN entity***

*- For initial attach, the UE may provide NSSAI to support the selection of an AMF. If available, NG-RAN uses this information for routing the initial NAS to an AMF. If the NG-RAN is unable to select an AMF using this information or the UE does not provide any such information the NG-RAN sends the NAS signalling to one of the default AMFs.*

*====================== TS 38.300 ======================*

[1][5][9] proposed that predicted slice-level resource status can be exchanged between CN and RAN node.

**Summary:**

## Discuss the benefits of Core Network providing predicted information to NG-RAN nodes.

* Predicted AMF capacity
* Predicted Slice-level resource status

## 2.2 Required information

Following is agreed during the online meeting:

**Current/predicted slice-level resource status, and current/predicted slice available capacity can be transferred between NG-RAN nodes to assist AI/ML network slicing.**

Here, I try to list required information for AI/ML assisted Network Slicing mentioned in all papers.

First, whether following information which was agreed during Rel-18 information can also be applied to support of AI/ML assisted network slicing:

**Following may be easily agreed to be captured into TR.**

**Input information:**

To predict the optimized network slicing decisions, NG-RAN may need following information as input data for AI/ML-based network slicing:

From local node:

- Current/Predicted resource status per slice (agreed online)

- Current/Predicted slice available capacity (agreed online)

- Predicted UE trajectory

From neighbouring NG-RAN nodes:

- Current/Predicted resource status per slice (agreed online)

- Current/Predicted slice available capacity (agreed online)

From the UE:

- UE location information (e.g., coordinates, serving cell ID, moving velocity) interpreted by gNB implementation when available

- UE measurement report (e.g., UE RSRP, RSRQ, SINR measurement, etc), including cell level and beam level UE measurements

**Output information:**

AI/ML-based network slicing model in NG-RAN node can generate following information as output:

* Predicted resource status per slice (agreed online)
* Predicted slice available capacity (agreed online)

**Feedback information:**

To optimize the performance of AI/ML-based network slicing model, following feedback can be considered to be collected from NG-RAN nodes:

* Resource Status per slice level updates from target NG-RAN node (agreed online)
* Slice Available Capacity updates from target NG-RAN node (agreed online)
* UE performance feedback for those UEs handed over from the source NG-RAN node
* Recommended resource management between Slices
* Recommend mobility decisions to support network slices

**Following may need more time to discuss:**

Next, try to discuss something new proposed for AI/ML assisted network slicing:

1. Current/Predicted UE traffic
2. SLA fulfillment prediction:
* SLA fulfilment prediction exchanged with OAM/5GC
* Measured/Predicted SLA fulfilment prediction between NG-RAN nodes
1. Predicted UE slice level resource status information
2. Predicted slice for UE for mobility scenario
3. Predicted slice status, e.g., available, unavailable, overloaded

Feedback:

1. Measured/Predicted Energy Cost per slice per UE/ per slice per cell
2. UE Performance (total per UE, per PDU session, per QoS flow)
3. Slice-level UE performance

**Summary:**

# 3 Reference

[1] R3-241867 Discussion on AI/ML assisted Network Slicing (ZTE) discussion

[2] R3-241868 (TP to TR38.743) AI/ML assisted Network Slicing (ZTE) other

[3] R3-241589 Considerations on AI/ML based network slicing (NEC) discussion

[4] R3-241590 TP to TR38.743 for AI/ML-based Network Slicing (NEC) other

[5] R3-241611 Discussion on NG-RAN AI/ML for Network Slicing (Qualcomm Incorporated) discussion

[6] R3-241729 (TP to TR 38.743) AI/ML enabled slicing (Samsung) other

[7] R3-241791 Discussion on AIML based network slicing (Lenovo) discussion

[8] R3-241792 TP to 38.743 for AIML based network slicing (Lenovo) other

[9] R3-241822 Discussion on support of AI/ML enabled slicing (CATT) discussion

[10] R3-241823 (TP for TR 38.743) Support of AI/ML enabled slicing (CATT) other

[11] R3-241843 (TP for TR 38.743) AI/ML Network Slicing for Rel-19 (Nokia, Telecom Italia) other

[12] R3-241941 Discussion on AI-based network slice (CMCC) discussion

[13] R3-241986 Discussion on RAN AI/ML for Network Slicing (Huawei) discussion

[14] R3-242065 TP on AIML for Network Slicing (Ericsson, Charter, InterDigital, Telecom Italia) discussion

[15] R3-242066 AIML for Network Slicing (Ericsson, Charter, InterDigital, Telecom Italia) discussion