

**3GPP TSG RAN Meeting #82**

**Sorrento, Italy, 10-13 Dec, 2018**

**Agenda Item: 9.1.3**

**Document for: Discussion**

RP-182480  **中国电信**  
CHINA TELECOM

# **Motivation for Study on Enhancement for Disaggregated gNB Architecture**

**Source: China Telecom, CATT , China Unicom,Dish**

# Background

For NR system, the disaggregated deployment has been introduced for gNB. In this deployment, gNB node is further split into two entities, namely gNB-DU (gNB Distributed Unit) and gNB-CU (gNB Central Unit). Furthermore, the benefits and scenarios for a separation of CP and UP functions have also been identified in Rel-15. In order to provides the possibility of optimizing the location of different RAN functions based on the scenario and desired performance, the CU entity is further split into two entities, namely gNB-CU-CP (gNB Central Unit control plane) and gNB-CU-UP (gNB Central Unit user plane).

Based on the current standardization progress and new requirements in future NSA/SA network deployment, the enhancement for disaggregated gNB architecture should be studied in Rel-16 as follows:

- User plane enhancement to achieve efficient data transmission
- Multiple CU-UP connectivity with different security domain connected

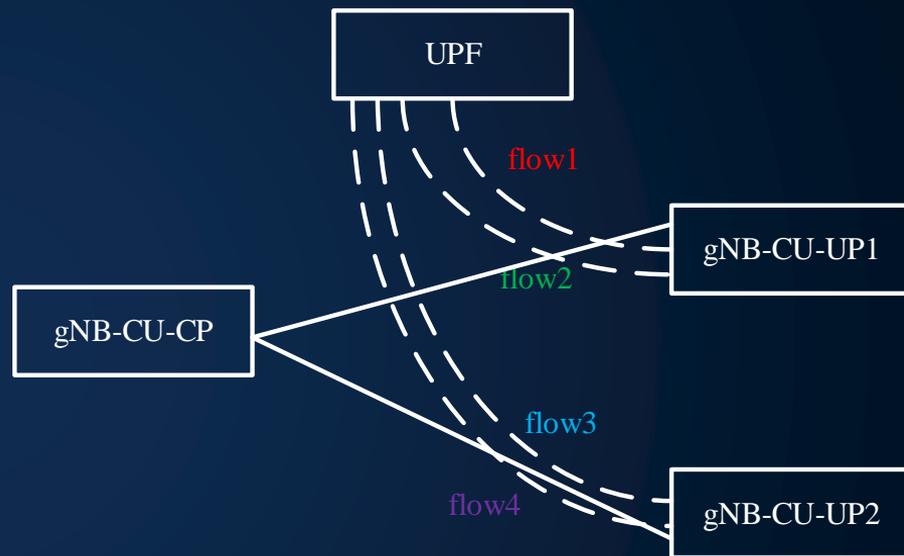
# UP Enhancement to Achieve Efficient Data Transmission

For CU/DU split scenario, the flow control between PDCP and RLC is not as good as the aggregated gNB scenario. The current DDDS mechanism has some drawbacks which may result in unnecessary data transmission and /or delay of buffer freezing with more scenarios considered:

- The PDCP PDUs are delivered to UE out of sequence:
  - ✓ The unnecessary duplicated transmission may occurs when duplicated PDCP PDUs are sent via two or more gNB-DUs. The further enhancements on the feedback from gNB-DU to gNB-CU-UP are needed
- The re-transmitted PDCP PDUs arrived at DU out of order:
  - ✓ This scenario has ever been discussed in previous RAN3 meeting. However, no conclusion had been reached in Rel-15. Considering the complexity of different cases , further study for this scenario is needed in Rel-16
- The granularity of fast re-transmission:
  - ✓ In current mechanism, the PDCP level retransmission would bring unnecessary resource utilization. The further enhancement for fast re-transmission should be considered in Rel-16

# Scenario for Multiple gNB-CU-UPs Connectivity

- In the CP/UP separation scenario, the central UP entity and distributed UP entity may be deployed at different physical sites. At the same time, the two types of gNB-CU-UPs may provide different services which are supported by one UE.
- For the above scenario, only the case that two CU-UPs belong to the same security domains are discussed in Rel-15 and it is agreed to further consider solutions for the case that UE connects to different CU-UPs belonging to different security domain in Rel-16.



The scenario that one UE connects to several gNB-CU-UPs which belong to different security domains needs to be considered in Rel-16

# Objective of this Study Item

The objectives of this SI are to:

- Identifying detailed solutions for further enhancements on current flow control and fast re-transmission mechanism with the following aspects considered
  - PDCP PDUs may be delivered in the Uu interface out of sequence
  - The re-transmitted PDCP PDUs may arrive at DU out of order
  - The possibility of fine granularity for fast re-transmission
- Identifying detailed solutions to support the scenario that one UE connects to several gNB-CU-UPs which belong to different security domains

**Time Budget: Jan,2019~June,2019**

**Thanks For Your Attention**