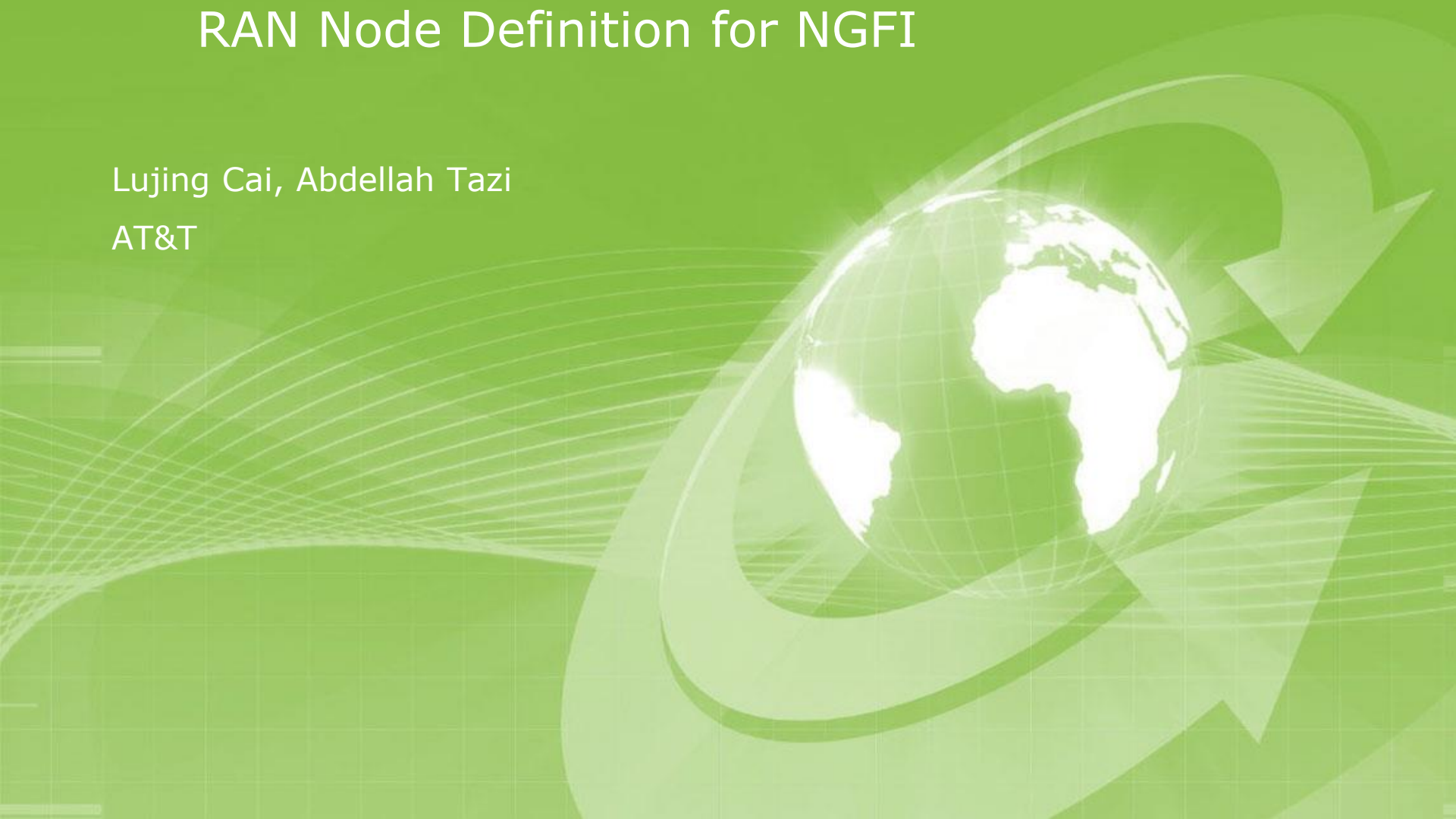


RAN Node Definition for NGFI

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Proposed TOC for NW slicing

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Author(s):

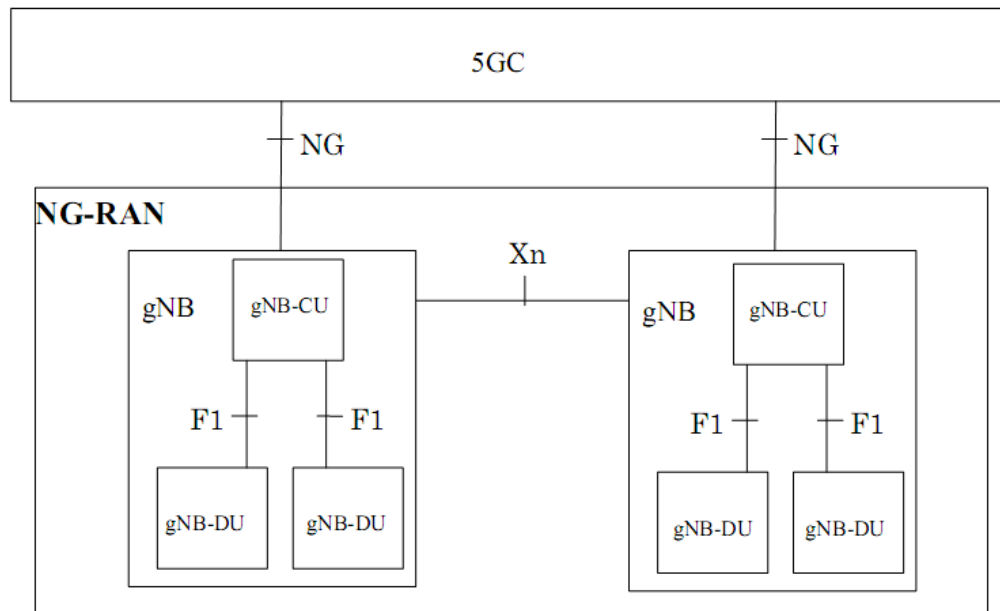
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Background

- The topic of RAN node naming has been brought up and discussed in the Aug 23rd teleconference
- Its initial motivation is to have consistent terminology to NGFI specification
- There are a number of options:
 - Following 3GPP CU/DU naming
 - NGFI specific naming options
- Some preference has been expressed to maintain the naming close to the 3GPP

- To our view, it is more important to clarify and agree the function definitions of these nodes than the actual naming by itself
 - To help better classifying the transport traffics
 - To help better definition the transport architecture
 - To help better visualization of the network slicing

NG-RAN architecture from latest 3GPP progress



gNB Central Unit (gNB-CU): a logical node hosting RRC, SDAP and PDCP protocols, and controls the operation of one or more gNB-DUs. The gNB-CU also terminates F1 interface connected with the gNB-DU.

gNB Distributed Unit (gNB-DU): a logical node hosting RLC, MAC and PHY layers, and its operation is partly controlled by gNB-CU. One gNB-DU supports one or multiple cells. One cell is supported by only one gNB-DU. The gNB-DU terminates F1 interface connected with the gNB-CU.

Reference: 3GPP 38.401 NG-RAN; Architecture description (Release 15)

Readout from the 3GPP specification

- CU/DU are the local nodes hosting certain RAN network functions
- DU includes RLC, MAC and PHY, which are viewed as time-sensitive RAN functions
- CU includes RRC, SDAP (new layer), and PDCP, which are viewed as less time-sensitive functions
- The highly time-sensitive functions RRH (and low PHY) are not specifically mentioned as a part of DU
- F1 interface provided connection of CU and DU
- Functional split option 2 implied

Proposed Way forward

- Following the similar logical function definitions as in 3GPP
- Be more flexible to accommodate future variations in standard
- Functions relate to transport key KPIs, such as latency
- Extend one more node to include radio frontend, specifically for fronthaul link
 - Also logical & functional node hosting RRH, and part of PHY
 - Complementary to the 3GPP definitions, rather than conflict
- Naming of these nodes are less important and should be defined for easy specification. Candidates:
 - RU/DU/CU (3GPP like)
 - Others, NGFI like
- Based on the defined logical nodes, transport links can also be handily defined:
 - NGFI-I: Transport between RU and DU (or other naming such as FH-LS)
 - NGFI-II: Transport between DU and CU
- Since the nodes are logical, their physical locations are flexible:
 - At any locations (pole, cell site, CO, edge cloud, etc.)
 - Two nodes can be combined in the same location for the same service
 - Two of even three nodes can be co-located (for network slicing)

Proposed Text Change in the specification

3.3 Central Unit (CU): In a distributed base station model a logical node hosting the RAN functions corresponding to the higher layers of base band processing, such as RRC, SDAP, and PDCP layers. It is a logical function unit equivalent to a Baseband Pool or an entity for processing of non-real-time tasks. that used to constitute a radio base station or part of it without the RF and antenna part.

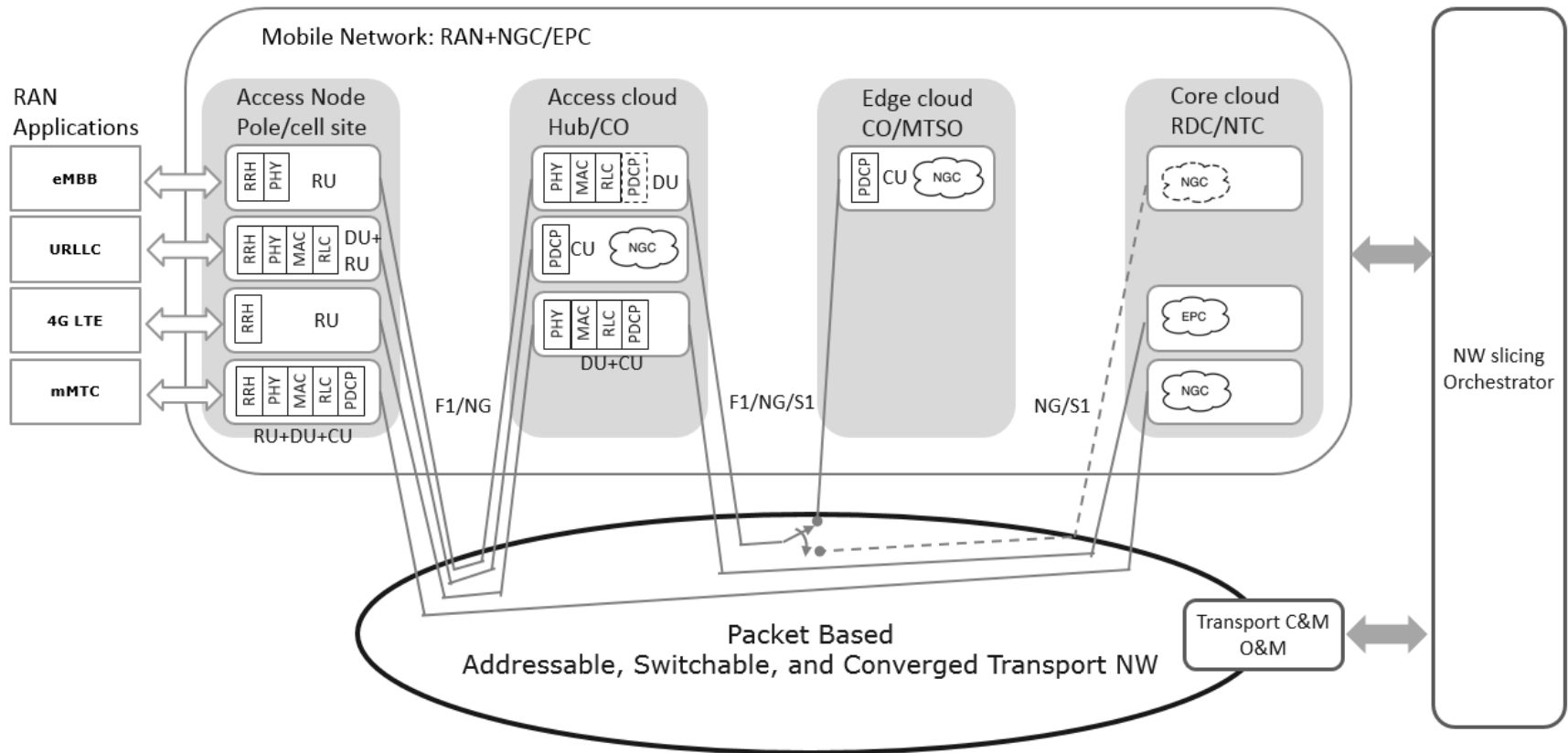
3.4 Distributed Unit (DU): In a distributed base station model a logical node hosting the RAN processing functions corresponding to the lower layers of the base band processing, such as PHY, MAC, and RLC layers. It is a logical function unit equivalent to a Baseband Pool or an entity for processing of real-time tasks.

3.5 Remote Unit (RU): a logical RAN node hosting the RAN functions corresponding to the radio frontend, such as antenna and RF. Part of PHY layer due to low functional split can also be included in this logical node. It is a functional unit equivalent to a remote radio head (RRH) or some part of it i.e., an enclosure near the antennas integrating radio frequency (RF) unit.

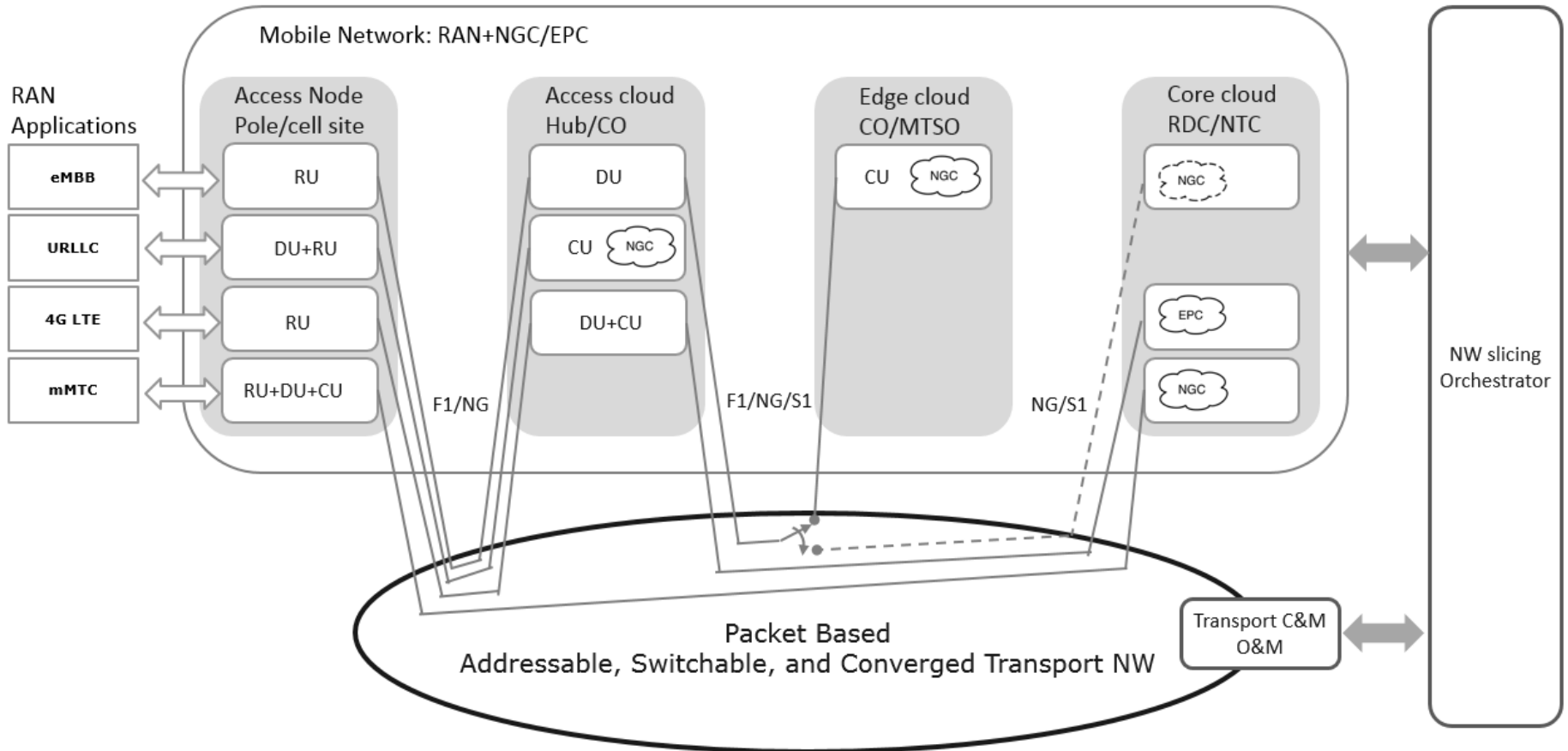
3.6 NGFI-I: the bidirectional transport link that provides the data-plane and control-plane connection between RU and DU.

3.7 NGFI-II: the bidirectional transport link that provides the data-plane and control-plane connection between DU and CU.

Network slicing as example of the node definition



Simplified presentation for converged transport NW



Motion

Agree to adopt WF for the NGFI RAN node definitions proposed in slide 7 of “tf1_17_08_cai_tazi_RAN_node_definition_1.pdf”.

- Moved by: Lujing Cai
- Seconded by:
- (technical, require $\geq 2/3$)