

# LG's View on Rel-18 5G-Advanced: eMBB related

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# Rel-18 eMBB overview

## eMBB evolution

- TCP boosting (RWS-210226)
- Enhancement for MIMO (RWS-210240)
- Enhancement for mobility (RWS-210227)
- Enhancement for SON
- Enhancement for NR QoE

## Non-MBB evolution

Supporting diverse vertical applications

- Factory IAB (RWS-210228)
- Inter-UE duplication avoidance (RWS-210229)
- Enhancement for sidelink operation (RWS-210244)
- Enhancement for RAN slicing (RWS-210230)
- Enhancement for SDT (RWS-210231)
- Enhancement for NTN (RWS-210232)
- Enhancement for RedCap

## Cross Functionalities

Both for eMBB & non-eMBB

- Full duplex operation (RWS-210241, RWS-210242)
- Physical layer aspects for AI/ML operation (RWS-210243)
- ML-aided predictive mobility (RWS-210233)
- AI/ML enabled NG-RAN
- Enhancement for positioning (RWS-210245)
- Enhancement for device requirement (RWS-210249)
- Enhancement for XR operation

\* Separate Tdocs submitted for items in red color

# eMBB related [1/2]

- **TCP boosting (RWS-210226)**
  - UL TCP ACK prioritization to boost up DL TCP throughput
  - Prioritized TCP ACK transmission/reception, low latency TCP ACK transmission
- **Enhancement for MIMO (RWS-210240)**
  - Support of simultaneous UL transmission across multiple UE panels
  - Enhanced UL synchronization for multi-panels/TRPs
  - Cross-link interference mitigation in FR2
  - Reliability enhancement for multi-DCI based MTRP transmission
  - Enhancements for vehicular Distributed Antenna System (DAS) UE transmission
- **Enhancement for mobility (RWS-210227)**
  - Fast recovery for PCell connection failure via multi-cell mTRP
  - Fast recovery with CHO/CPAC capabilities in DC
  - Support of more than two cell groups and enhancement of CG deactivation/activation for dual connectivity

# eMBB related [2/2]

- **Enhancement for SON**

- RACH report retrieval from DU to CU
- Enhancement of MRO for CHO/DAPS
- Enhancement of load information signaling for Inter-system load balancing

- **Enhancement for NR QoE**

- Support of QoE continuity for inter-system/inter-RAT mobility
- Support of QoE in MR-DC
- Support of QoE measurement in RRC\_IDLE



# Annex

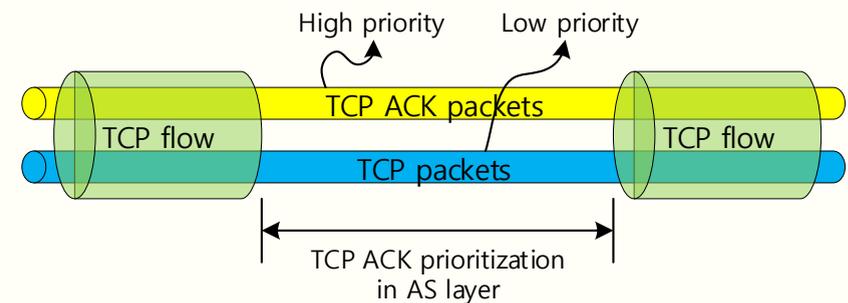
More detailed proposals for some selected topics

# TCP boosting<sup>[1]</sup>

[1] RWS-210226

## • Motivation

- Up to Rel-17, NR is mainly designed for eMBB, which is well-suited for DL TCP transmission. However, NR is not optimized for UL TCP ACK transmission.
- NR aims at DL TCP throughput of ~20 Gbps. However, actual throughput in TCP layer is much less than 20 Gbps due to limitation by TCP ACK in UL.
- To boost up the DL TCP throughput, UL TCP ACK prioritization should be studied in NR Rel-18.



## • Objective

- Prioritized TCP ACK processing in the transmitter side
  - Head-of-line blocking problem of TCP ACK should be addressed.
  - Mechanism can be considered in SDAP/PDCP/RLC/MAC depending on the targeted granularity for TCP ACK prioritization.
    - E.g. Radio Bearer level, RLC bearer level, Logical channel level, etc.
- Low latency TCP ACK transmission in the radio interface
  - Scheduling and resource allocation enhancement for TCP ACK.
- Prioritized TCP ACK processing in the receiver side
  - Out-of-order delivery for TCP ACK.

# Enhancement for MIMO<sup>[2]</sup>

[2] RWS-210240

- **Motivation**

- UL performance in FR2 is still vulnerable to UE mobility, rotation and beam blockage due to the limitation of single beam/panel transmission
- Usage of MTRP transmission is limited due to the limitation of using same TA for different TRPs even though separate TA can be manageable per UE panel.
- Cross-link interference becomes more severe in FR2 TDD due to beamforming based transmission/reception
- MTRP reliability schemes are useful tool for coverage and reliability in FR2, but these schemes are only supported with single DCI based MTRP
- Based on input from 5GAA, it is desired to improve MIMO performance for vehicular DAS UE

- **Objective**

- Support of simultaneous UL transmission across multiple UE panels
- Enhanced UL synchronization for multi-panels/TRPs
- Cross-link interference mitigation in FR2
- Reliability enhancement for multi-DCI based MTRP transmission
- Enhancements for vehicular Distributed Antenna System (DAS) UE transmission

# Enhancement for mobility<sup>[3]</sup>

[3] RWS-210227

## • Motivation

- There is a potential for faster recovery via exploiting CHO/CPAC candidates and inter-cell mTRP resources.
- Current dual connectivity is restricted to two cell groups. Lifting this restriction can provide a possibility for better performance. Further enhancement of CG deactivation/activation is beneficial for balancing performance and UE power consumption.
- Further enhancement of Dual Active Protocol Stack to support CA/DC would be desirable for meaningful performance benefit

## • Objective

- Enhancement for fast recovery
  - Fast recovery with CHO/CPAC capabilities in DC
  - Fast recovery via non-serving cell or SCell with inter-cell mTRP capabilities
- Extension of Dual Connectivity
  - Support of multi-connectivity beyond dual connectivity
  - Enhancement of CG deactivation/activation scheme
- Support of CA/DC for Dual Active Protocol Stack

