

# Views on UE aggregation for Rel-18



# Background

- Pre-plenary email discussion “[RAN93e-R18Prep-16] Additional RAN1/2/3 candidate topics Set 3” under UE aggregation topic concluded with the following moderator’s summary
- This whole proposed SI is contentious. The support is significant and includes some major operators.
- UE aggregation (SI) Areas / Scope:
  - Determine the level of coordination between the UEs and the assumptions for the interconnect link (e.g. non-specified high performance link). Determine if / to what extent the multiplicity of UEs is handled by / is visible to the Core Network / higher layers. (RAN2)
  - UP operation and architecture, e.g. PDCP aggregation. (RAN2)
  - CP AS coordination and handling for the multiple connections (e.g. Setup/Modification/Release procedures for the UE aggregation and mobility in coordination manner), (RAN2)

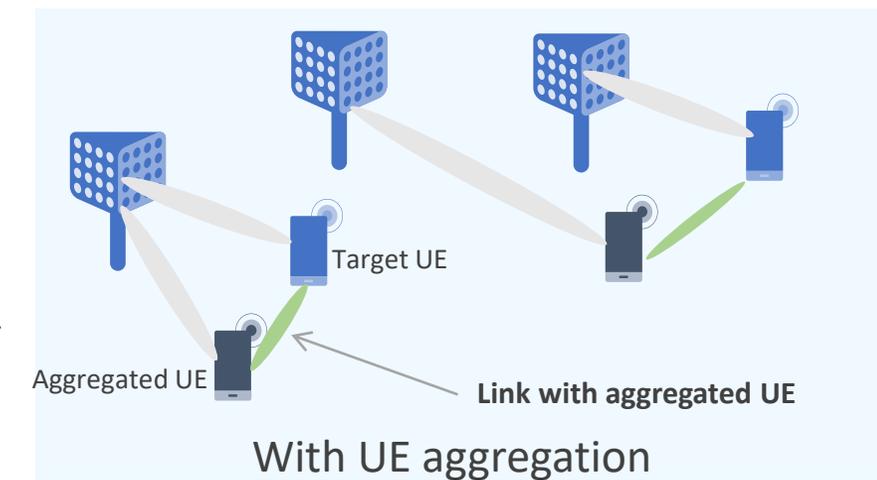
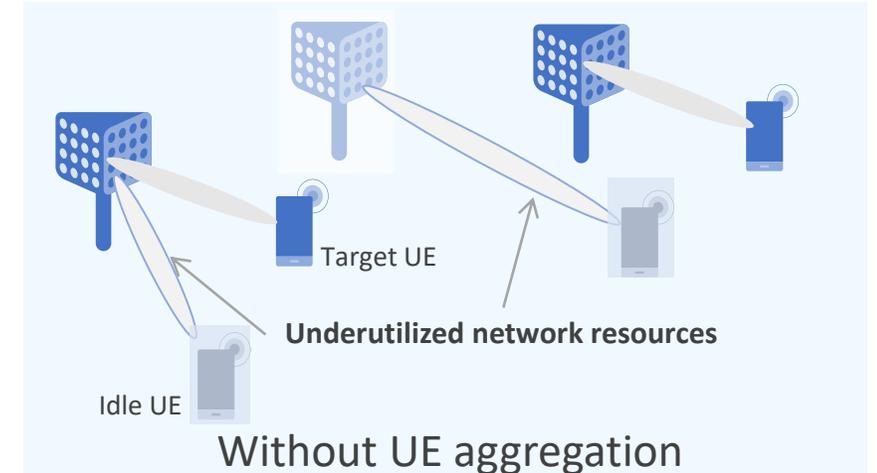
# Background – continued

- Note

- Justification (main): To support Applications requiring high UL bitrates on 5G terminals, in cases when normal UEs are too limited by UL UE transmission power to achieve required bitrate, especially at the edge of a cell. Compared to just supporting higher power, UE aggregation is more flexible in that a flexible number of UEs can be aggregated. Higher layer solutions such as MPTCP are usually not available as they need to be available both in server and device. Also a higher layer aggregation function will never be able to take radio conditions into account, be link adaptive. Additionally it is argued by some companies that lower layer aggregation in general will always be more efficient than higher layer aggregation. It is further noted that aggregation will also benefit DL performance.
- Contentious Points (Observation): A number of companies think MP-TCP can perform similar aggregation (without impact). Some company assumes that SL relay may be used for the desired aggregation. Target scenario and motivation (what to achieve) and detailed reasons why are not clear. The impact may be unreasonably high in Rel-18.

# Qualcomm's views

- UE aggregation can provide benefits beyond a single use case of increased UL Tx power and benefits of other use cases should be considered in the study
  - The feature can also benefit DL User Perceived Throughput (UPT) and may have even larger benefit for FR2 or in conjunctions with other features
- Wireless interconnect link allows aggregation of non-collocated UEs that can be exploited to improve performance and reliability of the network
  - Utilization of unlicensed spectrum for interconnect links would enable operators to benefit from the feature without acquiring more spectrum



# Qualcomm's views

- To alleviate concerns on complexity, we propose that the focus of the study item should be on potential solutions that minimize the impact on RAN and CN
  - Consider features already supported in Rel-17, and other features to be standardized in Rel-18 under other work items for the purposes of UE aggregation
  - It might be premature to single out one form of UP aggregation and architecture and at this point

# Qualcomm's views

- **Proposal 1:** Edits for UE aggregation (SI) Areas / Scope

- Determine the level of coordination between the UEs and the assumptions for the interconnect link (e.g. non-specified high performance link). Determine if / to what extent the multiplicity of UEs is handled by / is visible to the Core Network / higher layers. (RAN2)
- UP operation and architecture, ~~e.g. PDCP aggregation.~~ (RAN2)
- CP AS procedures ~~coordination and handling for the multiple connections (e.g. Setup/Modification/Release procedures for the UE aggregation and mobility in coordination manner),~~ (RAN2)

- **Proposal 2:** For the follow up email discussion

- Address identified contentious points
  - Target scenarios
  - Impact on RAN and CN for the proposed solutions



# Thank you

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