



RP-213376

3GPP TSG RAN #94e  
Electronic Meeting, December 6 - 17, 2021

# UE Aggregation

Apple Inc.

# Introduction

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- After a couple of rounds of heated email discussion, we have three camps
  - Camp 1: Standalone SI on UE aggregation (Alt. 2)
  - Camp 2: Sidelink Relay Multipath as part of Sidelink Relay Enhancements WI (Alt. 1)
  - Camp 3: Not pursue in Rel-18
- There seems to be strong operator interest in UE aggregation
- The primary use case for UE aggregation is increasing uplink throughput
  - especially in cell-edge scenarios
- But can also be useful for
  - Increasing reliability in both uplink and downlink directions
  - Increasing throughput in downlink



# Alt.1 or Alt.2?

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- We think Alt.2 (Standalone SI) is better than Alt.1 (as part of SL Relay Enhancements WI)
- Unclear if there is bandwidth in the SL WI to include Multipath
  - The scope of SL Multipath is limited (1 direct + 1 indirect path)
  - Rules out clean-slate design
- Requires UEs to support SL just for UE aggregation
  - Additional complexity to support SL features that are not needed for UE aggregation
- A separate solution (Alt.2) is broadly applicable
  - WiFi, HT BT, Wired, ...
  - SL can be one of the technologies used for unspecified UE-UE link
- RAN2 has rich experience in developing L2 solutions to support aggregation in various forms
  - Dual connectivity, LWA, LWIP, DAPS
- We believe RAN2 can leverage this experience to develop an L2 solution for UE aggregation with reasonable effort



# Proposal

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- A SI in Release 18 to support UE aggregation
  - Identify the layer at which aggregation is performed
    - SDAP, PDCP, new AS layer
  - Study RRC procedures (e.g., Setup/Modification/Release) for control of UE aggregation and coordinated mobility
- Can liaise with SA and CT groups as necessary, but expect minimal impact to their specifications
- Lead WG: RAN2



