

# Views on RAN Rel-18 package

Agenda Item:	8A.5
Source:	Intel Corporation
Document for:	Discussion



# General comments

- These slides show our current thinking on a possible overall package of work in RAN for Rel-18
  - Considers the Rel-18 email discussions held in October
  - Considers both Intel priorities and wider industry priorities as seen from the workshop and email discussions to date
  - Does not consider RAN4 centric items – these are discussed separately in RP-213313
- The package is structured according the draft WI/SIs that were the outcome of the email discussion
  - For each item we indicate our preference for the high level scope for inclusion in the package to be approved at RAN#94e

Topic	WI/SI	Scope and comments
MIMO enhancements	WI	<p>DL MIMO</p> <ul style="list-style-type: none"> <li>• CSI enhancements for high/medium velocities</li> <li>• Extension of Rel-17 Unified TCI framework</li> <li>• Specify to support larger number DMRS ports</li> <li>• CSI acquisition for Coherent-JT for both FDD and TDD targeting FR1</li> <li>• Overhead and/or Latency reduction with UE-initiated beam management/beam acquisition procedures</li> </ul> <p>UL MIMO</p> <ul style="list-style-type: none"> <li>• Enhancements to enable 6 and 8 Tx UL operation to support up to 4 layers per UE</li> <li>• Simultaneous multi-panel UL transmission for higher UL throughput/reliability</li> <li>• Panel-specific/beam-specific timing/power control for UL multi-TRP/panel scenario</li> </ul> <p>Notes:</p> <ul style="list-style-type: none"> <li>• More detail provided in RP-212910</li> <li>• Frequency-selective precoding for &gt; 4 Tx, and 2 CW for &gt;= 2 layers in uplink are proposed to be downscoped</li> </ul>
Uplink enhancements	WI	<ul style="list-style-type: none"> <li>• PRACH coverage enhancements (multiple PRACH transmissions to same beam PRACH transmissions with different means, 4 step RACH only)</li> <li>• Enhancements for multi-carrier UL operation</li> <li>• Dynamic switching between DFT-s-OFDM and CP-OFDM</li> <li>• Multi-layer with DFT-s-OFDM (but better to be considered under in MIMO WI)</li> <li>• UL dense deployment enhancements</li> </ul> <p>Notes:</p> <ul style="list-style-type: none"> <li>• More detail provided in RP-212908</li> <li>• Dynamic power aggregation proposed to be discussed as part of RAN4 package</li> <li>• Reduction of MPR/PAR and PUCCH coverage enhancements proposed to be downscoped</li> </ul>
Mobility enhancements	WI	<ul style="list-style-type: none"> <li>• Layer 1/layer 2 based inter cell mobility (SA, CA, NR-DC; intra-DU; inter-DU within intra-CU; Intra/inter-Freq; FR1/FR2)</li> <li>• MR-DC with selective activation of the cell groups via L3 enhancements;</li> <li>• CHO including target MCG and target SCG;</li> <li>• CHO including target MCG and candidate SCG for CPC/CPAC;</li> </ul> <p>Notes</p> <ul style="list-style-type: none"> <li>• More detail provided in RP-213009</li> <li>• We propose to only consider SA and NR-DC for MR-DC with selective activation, support both MCG and SCG change and allow both network triggering and execution condition based triggering.</li> <li>• CHO related changes mainly impact RAN3 and should be discussed in RAN3 first</li> </ul>

Topic	WI/SI	Scope and comments
Positioning enhancements	WI	<ul style="list-style-type: none"> <li>• Sidelink positioning/ranging</li> <li>• Integrity for RAT dependent positioning</li> <li>• PRS/SRS bandwidth aggregation</li> <li>• Carrier phase (should study and introduction of new reference signals)</li> <li>• LPHAP (should be led by RAN2 with minimal work expected from RAN1)</li> <li>• RedCap positioning</li> </ul> <p>Notes:</p> <ul style="list-style-type: none"> <li>• More detail provided in RP-212919</li> <li>• Scope is large and some reduction is desirable. Carrier phase and LPHAP are candidates for downscoping discussion.</li> </ul>
Sidelink enhancements	WI	<ul style="list-style-type: none"> <li>• SL carrier aggregation (limited to FR1 licensed/ITS spectrum only)</li> <li>• Sidelink on FR1 Unlicensed Spectrum</li> <li>• Sidelink on FR2 Licensed Spectrum (sidelink beam management in FR2 should be limited to sidelink unicast only)</li> <li>• LTE and NR Sidelink Co-channel Coexistence</li> </ul> <p>Notes:</p> <ul style="list-style-type: none"> <li>• More detail provided in RP-212918</li> <li>• Scope is large and diverse. Refinement of objectives is required so the work is well defined and contained.</li> </ul>
RedCap enhancements	WI	<ul style="list-style-type: none"> <li>• RedCap UE with 5MHz bandwidth</li> <li>• Enhanced eDRX in RRC_INACTIVE</li> </ul> <p>Notes:</p> <ul style="list-style-type: none"> <li>• More detail in RP-212920</li> <li>• Prefer WI with study phase over SI + WI</li> <li>• Propose to agree in RAN#94e to a WI objective to specify a UE with max UE BW of 5MHz</li> <li>• Study phase to consider cost/complexity reduction in addition to max UE BW of 5MHz</li> </ul>
XR	SI	<ul style="list-style-type: none"> <li>• Current scope as per outcome of October email discussion is acceptable</li> </ul>
IAB enhancements	WI	<ul style="list-style-type: none"> <li>• Current scope as per outcome of October email discussion is acceptable</li> </ul>
NR MBS enhancements	WI	<ul style="list-style-type: none"> <li>• Current scope as per outcome of October email discussion is acceptable</li> </ul>
Small Data transmission Enhancement	WI	<ul style="list-style-type: none"> <li>• Current scope as per outcome of October email discussion is acceptable</li> </ul> <p>Notes:</p> <ul style="list-style-type: none"> <li>• Some small refinement of objective text proposed in RP-213010</li> </ul>

Topic	WI/SI	Scope and comments
AI/ML for Physical Layer	SI	<ul style="list-style-type: none"> <li>• Develop evaluation methodology and decide KPIs</li> <li>• Limited use cases selected for evaluation: CSI reporting; Beam management; Positioning</li> <li>• Consider potential specification impacts</li> </ul> <p>Notes</p> <ul style="list-style-type: none"> <li>• More detail in RP-212913</li> <li>• Prefer to select no more than 3 use cases for the study: CSI, beam-management, positioning</li> <li>• RS overhead reduction use case to be downscoped</li> <li>• Objectives for RAN2/4 need some review and refinement: "signalling design" proposed to be removed as this is more appropriate for normative phases</li> </ul>
AI/ML for NG-RAN	WI	<ul style="list-style-type: none"> <li>• Current scope as per outcome of October email discussion is acceptable</li> </ul>
Network Energy Saving	SI	<ul style="list-style-type: none"> <li>• Current scope as per outcome of October email discussion is acceptable</li> </ul>
Duplex Evolution	SI	<ul style="list-style-type: none"> <li>• Current scope as per outcome of October email discussion is acceptable</li> </ul>
Smart Repeater	SI with follow-on Rel-18 WI	<ul style="list-style-type: none"> <li>• Current scope as per outcome of October email discussion is acceptable</li> </ul>

Topic	WI/SI	Scope and comments
NTN enhancements	WI	<ul style="list-style-type: none"> <li>Coverage enhancements for handset type UEs (prefer to consider RAN protocol overhead reduction for VoNR only if other enhancements cannot address the coverage requirements)</li> <li>NR-NTN in 10GHz (Prefer a separate RAN4-led WI for this)</li> <li>Network based UE location</li> </ul> <p>Notes</p> <ul style="list-style-type: none"> <li>More detail in RP-212912</li> <li>Network based UE location objective needs some careful refinement to ensure work scope is clear</li> <li>NTN-TN and NTN-NTN mobility and service continuity is proposed to be downscoped</li> </ul>
UAV	WI	<ul style="list-style-type: none"> <li>Measurement reporting enhancements (with LTE as baseline)</li> <li>Support for subscription-based aerial-UE identification</li> <li>Support for broadcast of UAV identification</li> </ul> <p>Notes</p> <ul style="list-style-type: none"> <li>More detail in RP-212916</li> <li>Beam management enhancements proposed to be downscoped</li> <li>CHO enhancements for UAV proposed to be downscoped</li> </ul>
Sidelink Relay	WI	<ul style="list-style-type: none"> <li>Current scope as per outcome of October email discussion is acceptable</li> </ul>
MUSIM	WI	<ul style="list-style-type: none"> <li>Current scope as per outcome of October email discussion is acceptable</li> </ul>
IDC	WI	<ul style="list-style-type: none"> <li>Current scope as per outcome of October email discussion is acceptable</li> </ul>
Support for <5MHz BW	WI	<ul style="list-style-type: none"> <li>Current scope as per outcome of October email discussion is acceptable</li> </ul>
Inter-gNB coordination	SI	<ul style="list-style-type: none"> <li>Current scope as per outcome of October email discussion is acceptable</li> </ul>
SON/MDT	WI	<ul style="list-style-type: none"> <li>Current scope as per outcome of October email discussion is acceptable</li> </ul>
QoE	WI	<ul style="list-style-type: none"> <li>Current scope as per outcome of October email discussion is acceptable</li> </ul>
DSS	WI	<ul style="list-style-type: none"> <li>Enable CRS rate-matching on NR PDCCH (no RAN1 scope, RAN4 only)</li> <li>Study necessity of solution for collision handling between NR PDCCH and LTE PCFICH / PHICH channels</li> <li>Study necessity of dynamic indication of CRS rate matching</li> </ul> <p>Notes</p> <ul style="list-style-type: none"> <li>More detail in RP-212911</li> </ul>

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