3GPP TSG RAN Meeting #92-e
Electronic Meeting, June 14th – 18th, 2021

RP-211187

Agenda Item: 9

Source: Samsung

Title: Discussion on status of Rel-17 work

Document for: Discussion and Decision

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Introduction

- This document summarizes Samsung's view on the progress of Rel-17 work items in RAN WGs. The assessment is based on the assumption that Rel-17 completion date will not be further delayed beyond what was agreed in RAN#91-e.

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RAN Timeline (from RP-210770)

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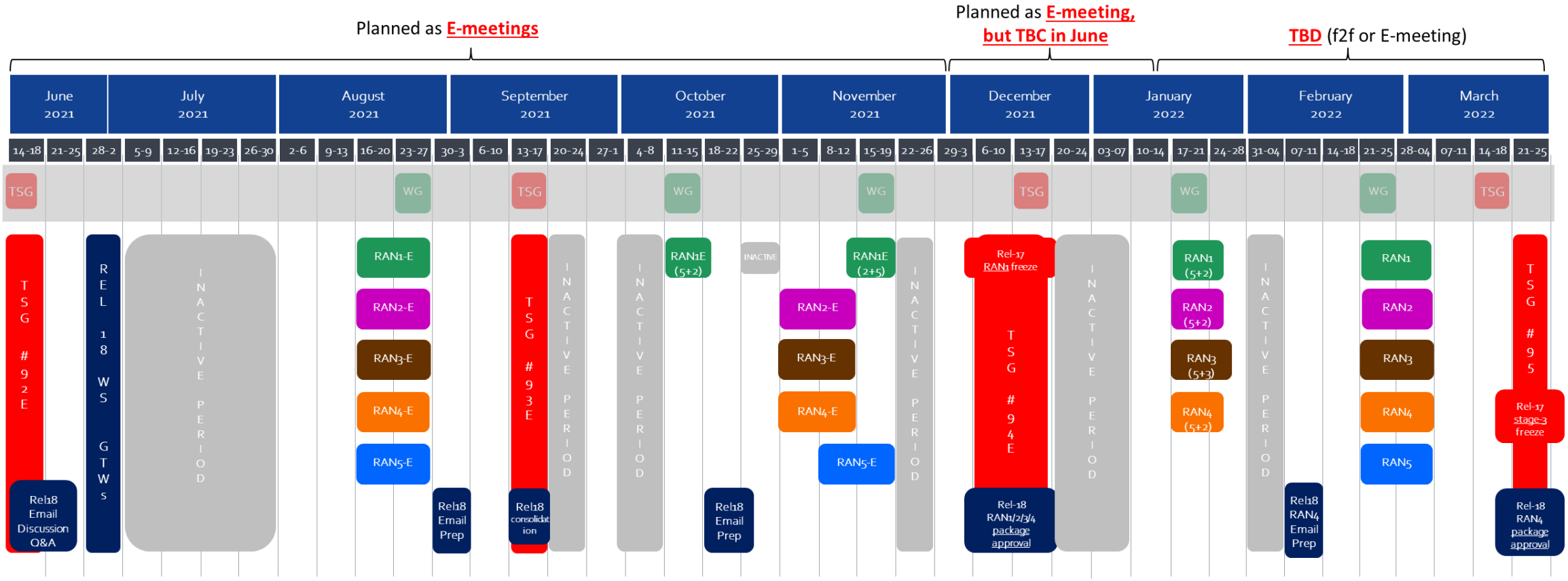
- Based on the schedule from RAN#91-e, RAN1 has 3 meetings while the other working groups have 4 meetings to complete Rel-17 stage-3 specifications



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Rel-17 Work Item Status

Following slides summarize Samsung's view on the progress of individual Rel-17 work items in each working group

RAN1 Progress on Rel-17 Work Items (1/2)

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- Currently, there are 1 LTE work item and 12 NR work items under work in RAN1
  - In addition, we expect another work item on IoT over NTN to be endorsed in RAN#92-e after early completion of the study item
- The status of each work item is summarized below:

Work item	LTE/NR	Samsung's view
NR-MIMO	NR	Overall reasonable progress but work scope is large and behind schedule in some agenda items.
NR for 52.6GHZ TO 71 GHZ	NR	Overall reasonable progress but was not able to converge on key design aspects of SSB for initial access.
IIOT AND URLLC	NR	Overall reasonable progress but behind schedule on topics such as CSI feedback and intra-UE multiplexing.
NON-TERRESTRIAL NETWORKS (NTN)	NR	Good progress. Expected to be completed on time without RAN intervention.
NR POSITIONING ENHANCEMENTS	NR	Overall reasonable progress.
REDUCED CAPABILITY NR DEVICES	NR	Good progress. Expected to be completed on time without RAN intervention.
UE POWER SAVING	NR	Overall reasonable progress.
NR COVERAGE ENHANCEMENT	NR	Good progress. Expected to be completed on time without RAN intervention.
REL-17 NB-IOT AND LTE-MTC	LTE	Good progress. Expected to be completed on time without RAN intervention.
ENHANCEMENTS TO IAB	NR	Overall reasonable progress.
NR SIDELINK ENHANCEMENT	NR	Behind schedule especially inter-UE coordination for mode-2 enhancement.
NR MULTICAST AND BROADCAST SERVICES	NR	Good progress. Expected to be completed on time without RAN intervention.
NR DYNAMIC SPECTRUM SHARING (DSS)	NR	Good progress. Expected to be completed on time without RAN intervention.
(**expected**) IoT over NTN	LTE	Focused work scope needed for timely completion with limited number of meetings.

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RAN1 Progress on Rel-17 Work Items (2/2)

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- With 3 meetings left for Rel-17, the following RAN1 WIs are behind schedule or have possibility of becoming so
  - NR-MIMO
  - NR for 52.6GHZ to 71 GHZ
  - IIOT & URLLC
  - NR SIDELINK ENHANCEMENT

- We propose the following actions be take in RAN for the four RAN1 WIs
  - NR for 52.6GHZ to 71 GHZ: Resolve the issue of no consensus on subcarrier spacing of SSB for initial access in RAN#92-e
  - NR SIDELINK ENHANCEMENT: Consider downscoping in consideration of slow progress in inter-UE coordination (e.g. by restricting the number of inter-UE coordination schemes supported in Rel-17 to one)
  - NR-MIMO: There are certain RAN1 topics where progress is behind schedule but RAN intervention for downscoping can be postponed to RAN#93-e considering progress to be made in 2021.Q3
  - IIOT & URLLC: There are certain RAN1 topics where progress is behind schedule but RAN intervention in RAN#92-e can be limited and/or postponed to RAN#93-e considering progress to be made in 2021.Q3
    - Possible RAN#92-e action can be to limit further consideration for CSI enhancements to the two schemes in the last proposal from RAN1#105-e (i.e. (a) increasing granularity of sub-band CQI reporting, and (b) reporting of delta-MCS), and to preclude support of simultaneous PUCCH and PUSCH transmissions in Rel-17 (due to very limited use cases).

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RAN2 Progress on Rel-17 Work Items (1/2)

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- Currently, there are 2 LTE work items and 17 NR work items under work in RAN2
  - For IoT over NTN, the SI can be closed from RAN2 perspective.
- The status of each NR work item is summarized below:

Work item	LTE/NR	Samsung's view
NR Multicast	NR	Overall reasonable progress. Expected to be completed on time without RAN intervention.
MR DC/CA further enhancements	NR	Overall reasonable progress. Expected to be completed on time without RAN intervention.
Multi SIM	NR	Overall reasonable progress. Expected to be completed on time without RAN intervention.
NR IAB enhancements	NR	Overall reasonable progress. Expected to be completed on time without RAN intervention.
NR IIoT URLLC	NR	Overall reasonable progress. Expected to be completed on time without RAN intervention.
Small Data enhancements	NR	Overall reasonable progress. Expected to be completed on time without RAN intervention.
NR Sidelink relay	NR	Overall reasonable progress. Expected to be completed on time without RAN intervention.
RAN slicing	NR	Overall reasonable progress. Expected to be completed on time without RAN intervention.
UE Power Saving	NR	Overall reasonable progress. Expected to be completed on time without RAN intervention.
NR Non-Terrestrial Networks (NTN)	NR	Overall reasonable progress. Expected to be completed on time without RAN intervention.
NR positioning enhancements	NR	Overall reasonable progress. Expected to be completed on time without RAN intervention.
Reduced Capability (RedCap)	NR	Overall reasonable progress. Expected to be completed on time without RAN intervention.
SON/MDT	NR	Overall reasonable progress. Expected to be completed on time without RAN intervention.
NR QoE	NR	Overall reasonable progress. Expected to be completed on time without RAN intervention.
NR Sidelink enhancements	NR	Overall reasonable progress. Expected to be completed on time without RAN intervention.
feMIMO	NR	Need attention: work scope has to be clearly defined from RAN2 perspective considering limited TUs in RAN2.
NR Non-Public Network enhancements	NR	Overall reasonable progress. Expected to be completed on time without RAN intervention.

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RAN2 Progress on Rel-17 Work Items (2/2)

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- Scope of Rel-17 feMIMO (i.e. 'Inter-cell multi-TRP-like model' vs. 'L1L2 mobility model')
  - RAN2 had difficulty to draft the response LS to RAN1 due to unclear scope/wording, so spent lots of efforts to first have common understanding about the RAN1's scenario itself, and finally concluded two simplified procedures for the following two scenarios, as captured in the reply LS R2-2106787:
    - Scenario 1: Inter-cell multi-TRP-like model (which assumes that UE should always be in coverage of the serving cell)
    - Scenario 2: L1L2 mobility model (i.e. with serving cell change)

  - From RAN1 perspective, the procedure for inter-cell beam management can be common for both scenarios
  - However, from RAN2 perspective, Scenario 2 would require substantial amount of additional work compared to Scenario 1, and RAN2 would be not possible to complete the WI given very limited TUs for the WI in RAN2.
    - For both LTE and NR, serving cell change (e.g. handover, PSCell change) which also involves security key update has been handled by layer 3 procedures to ensure the stable performance.
    - RAN2 only has 2.5 TUs (0.5 + 0.5+ 0.5+ 1) in Rel-17 for feMIMO.

  - Hence, we think that the scope of L1/L2 centric inter-cell mobility in RAN2 should be clarified to avoid any confusion/debate in subsequent RAN2 meetings: Rel-17 to focus on Scenario 1 only, leaving Scenario 2 for Rel-18.
    - We also have a company contribution to describe the details in RP-211190.

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RAN3 Progress on Rel-17 Work Items

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- Currently, there are 2 LTE work items and 11 NR work items under work in RAN3. Two more Rel-17 WIs will be discussed in RAN3:
  - Following the completion of RAN slicing Enhancement SI, the WI is assumed to be started from next meeting
  - NR Sidelink Relay will be discussed in RAN3 from RAN3#113bis meeting.
- The status of each work item is summarized below:

Work item	LTE/NR	Samsung's view
SON/MDT	NR	Overall reasonable progress. Expected to be completed on time without RAN intervention.
IAB	NR	Overall reasonable progress. Expected to be completed on time without RAN intervention.
Further Multi-RAT Dual Connectivity Enhancements	NR	Overall reasonable progress. Expected to be completed on time without RAN intervention.
NR QoE	NR	Overall reasonable progress
Enhancement of Private Network Support	NR	Overall reasonable progress. Expected to be completed on time without RAN intervention.
NR Positioning Enhancements WI	NR	Overall reasonable progress. Expected to be completed on time without RAN intervention.
NR Non-Terrestrial Networks WI	NR	Overall reasonable progress. Expected to be completed on time without RAN intervention.
Enhanced IIoT and URLLC	NR	Overall reasonable progress. Expected to be completed on time without RAN intervention.
NR Multicast and Broadcast Services WI	NR	Overall reasonable progress. Expected to be completed on time without RAN intervention.
Enhanced eNB Architecture Evolution WI	LTE	Overall reasonable progress. Expected to be completed on time without RAN intervention.
SMALL DATA TRANSMISSION	NR	Started the discussion at May meeting based on RAN2 LS using Basket TU(TU for this WI is from Q4). No intervention at RAN#92e is needed.
SUPPORT FOR MULTI-USIM DEVICES	NR	Had a discussion at May meeting based on RAN2 LS. Need to update the WID to include RAN3 specification impact.
Enhan. for NB-IoT and LTE MTC WI	LTE	Overall reasonable progress. Expected to be completed on time without RAN intervention.

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RAN4 Progress on Rel-17 Work Items

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- For NR, in total 43 NR *spectrum related WI, 22 non-spectrum related WI are under work in RAN4*
- For LTE, in total 7 spectrum related WI and 1 non-spectrum related WI are under work in RAN4
- All spectrum related WIs have reasonable progress except the lower 6GHz NR unlicensed band. RAN guideline is needed on whether the existing defined band n96 can be reused for range 5945 – 6425MHz
- For other WG led non-spectrum related WI, RAN4 progress is largely depending on the other WG progress
- RAN4 led non-spectrum related WIs have reasonable progress. Expected to be completed on time without RAN intervention.
  - The status of each NR RAN4 led non-spectrum related WI is summarized below

Work item	LTE/NR	Samsung's view
MIMO OTA	NR	Performance requirements can be only progressed based on lab alignment activities
UE TRP and TRS	NR	1st meeting in May. Good progress in May
UE FR1 RF	NR	WI scope was revised in March plenary. Reasonable progress
UE RF2 RF	NR	WI scope was revised in March plenary. Reasonable progress
NR repeater	NR	Reasonable progress. Expected to be completed on time without RAN intervention
DL1024 QAM	NR	Reasonable progress. Expected to be completed on time without RAN intervention
High speed train in FR1	NR	Reasonable progress. Expected to be completed on time without RAN intervention
High speed train in FR2	NR	Reasonable progress. Expected to be completed on time without RAN intervention
Further RRM enhancement for NR and MR-DC	NR	Reasonable progress. Expected to be completed on time without RAN intervention
Gap enhancement	NR	Reasonable progress. Expected to be completed on time without RAN intervention
Further Enhancement on NR Demod	NR	WI scope was revised in March plenary. Reasonable progress in Q2. RAN discussion is needed for confirming the scope related CRS-IM

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