3GPP TSG-RAN WG4 Meeting # 106
Athens, Greece, February 27 – March 3, 2023

R4-2300289

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Motivation of WID revision for R18 eFeRRM

Justification for R18 eFeRRM WI scope expansion (1/2)

- New scope: BWP operation without bandwidth restriction
  - The conclusions from RAN4 #104-bis-e and #105 were summarized in approved LS R4-2220437
  - In the RAN4#105 meeting, RAN4 agreed to deprioritize some of the options and the final candidate options for high-level analysis and for RAN decision are as below.
    - **Candidate options**
      - Option A) Perform BM/RLM/BFD based on CSI-RS within active BWP
      - Option B) Perform BM/RLM/BFD based on SSB outside active BWP
        - Option B-1) UE's capability not requiring additional measurement gap for BM/RLM/BFD
          - Option B-1-1) Using larger BW covering SSB outside active BWP without interruptions
          - Option B-1-2) Using larger BW covering SSB outside active BWP with interruptions
        - Option B-2) BM/RLM/BFD on SSB outside BWP within measurement gaps
          - Option B-2-2) Dedicated MG or NCSG for RLM/BFD/BM measurements
      - Option C) NCD-SSB approach which would work with existing UE hardware architectures (FG6-1) and be compatible with existing RAN4 specifications for BM/RLM/BFD
  - In our view, which candidate options in above RAN4 LS will be adopted is up to RAN #98e decision.
- In RAN #97e meeting minutes, it was captured that,
  - conclusion: The following is endorsed:
    - **No new solution for FG 6-1a shall be added to Rel-17**
    - If CSI-RS based RLM/BM/BFD are supported by a UE, FG6-1a can work without any issue. FG1-7 (CSI-RS based RLM) and FG 2-24 (SSB/CSI-RS for beam measurement) are mandatory with capability signalling features.
    - No change to TU allocation for current RAN4 work in Q4 2022.
    - RAN asks RAN4 to do a high level analysis of the options (copied below) in RAN4's answer to Q2 in RP-221911 and report it to RAN#98 for RAN decision.

Justification for R18 eFeRRM WI scope expansion (2/2)

- Current time plan for R18 eFeRRM WI (RP-221925):
  - The completion target of core part is Dec 2023
    - Before the completion target, there are 6 RAN4 meetings for core part discussion
    - RAN4 #106/106bis/107 has 1TU budget per meeting for core part, and RAN4 #108/108bis/109 have 0.5TU budget for core part.

Title	RAN #98 Dec.22	RAN4 #106	RAN #99 Mar.23	RAN4 #106bis	RAN4 #107	RAN #100 Jun.23	RAN4 #108	RAN #101 Sep.23	RAN4 #108bis	RAN4 #109	RAN #102 Dec.23
Core part: Even Further RRM enhancement for NR and MR-DC		1 TU		1 TU	1 TU		0.5 TU		0.5 TU	0.5 TU	
Perf. part: Even Further RRM enhancement for NR and MR-DC									0.25 TU	0.5 TU	

- The progress of R18 eFeRRM WI:
  - Completion ratio for this WI is **45%**, for the existing scope of (1)FR2 SCell activation enhancement and (2)FR1+FR1 NR-DC RRM
  - All key technical parts are concluded for FR1+FR1 NR-DC RRM only except two remaining issues (according to WF R4-2220736)
    - In R4-2220736, there were 11 original issues and RAN4 has concluded 9 of them in last RAN4 #105 meeting (only 2 issues for FFS).
    - TU for FR1+FR1 NR-DC discussion can be released for other new scope
- eFeRRM is an umbrella WI, and it's the most appropriate WI to contain the BWP without restriction work which is a kind of mixed RRM enhancement associated with different aspects(e.g., NCD-SSB, RF adjustment, NCSG and etc)

Observations and proposals to expand the eFeRRM WI scope

- **Observations from above slides**
  - New solutions for BWP operation without bandwidth restriction, i.e.,the adopted ones among option A/B/C based on next RAN #99 meeting decision, can be specified from R18
  - FR1+FR1 NR-DC RRM in eFeRRM WI has good progress, and the TU for this topic can be release partially
  - eFeRRM is an umbrella WI, and it's the most appropriate WI to contain the BWP without restriction work which is a kind of mixed RRM enhancement associated with different aspects(e.g., NCD-SSB, RF adjustment, NCSG and etc)

Title	**RAN #99 Mar.23**	**RAN4 #106bis**	**RAN4 #107**	**RAN #100 Jun.23**	**RAN4 #108**	**RAN #101 Sep.23**	**RAN4 #108bis**	**RAN4 #109**	**RAN #102 Dec.23**
FR2 SCell activation		0.5 TU	0.5 TU		0.25 TU		0.25 TU	0.25 TU	
FR1+FR1 NR-DC RRM		**0.5 TU —> 0.25 TU**	**0.5 TU —> 0.25 TU**		**0.25 TU —> 0 TU**		**0.25 TU —> 0 TU**	**0.25 TU —> 0 TU**	
BWP without restriction (new scope if added)		**0.5 TU**	**0.5 TU**		**1 TU**		**1TU**	**1 TU**	
Total TU		**1TU —> 1.25TU**	**1TU—> 1.25TU**		**1TU—> 1.25TU**		**1TU—> 1.25TU**	**1TU—> 1.25TU**	

- ***Proposal:***
  - ***The R18 eFeRRM WI is expanded to contain the work scope of adopted R18 solutions for BWP operation without bandwidth restriction.***

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