vivo

3GPP TSG RAN Meeting #94-e

Electronic Meeting, Dec. 06-17, 2021

RP-213260

RAN4 impacts for Rel-17 Multi-SIM WI

Source: vivo

Document for: Discussion & Decision

Agenda item: 9.3.2.8

Background

- Scenarios for MUSIM gap
  - **Scenarios 1:** Periodic switching, including SSB detection/paging reception, serving cell measurement, neighbouring cell measurement including intra-frequency, inter-frequency and inter-RAT measurement;
  - **Scenarios 2:** SI receiving at network B;
  - **Scenarios 3:** Aperiodic (one-shot) switching with both transmission and reception at network B but will not enter RRC-connected state in NW B (e.g. no RRC connection Resume/Setup) at network B, including On-demand SI request;
- MUSIM Gap agreed by RAN2
  - The network is allowed to configure at most 3 gap patterns (for any MUSIM purpose).
  - Only a single aperiodic gap (for MUSIM) is supported in Rel-17. At most two periodic "gaps" (for MUSIM) and a single aperiodic gap (for MUSIM) is supported in Rel-17. FFS if signalling supports more.

Background

- Responses from RAN4 in reply LS R4-2120342 for RAN2' s questions
  - **For Scenario 1:**
  - Regarding serving cell measurement, neighbor cell measurements including intra-frequency, inter-frequency and inter-RAT measurements, RAN4 concluded that the legacy gap patterns can fulfill this task, but with low efficiency in some scenarios.
  - Regarding SSB for AGC and paging reception, RAN4 has the following conclusions:
    - A legacy measurement gap patterns can be used, but with low efficiency.
    - Additional gap patterns can be used for paging reception with/without SSB for AGC. These gap patterns could be a new measurement gap patterns whose measurement gap length (MGL) can be the same as legacy MGL, but with longer MGRP equal to network B DRX cycles like {320, 640, 1280, 2560} in RRC IDLE mode.
  - **Scenario 2:**
    - RAN4 concludes that an aperiodic gap pattern can fulfill the task of MIB/SIB1 reading. In addition, legacy gap patterns can fulfill this task but RAN4 has not studied how efficient it would be. A UE may require multiple attempts to read MIB/SIB1when using an aperiodic gap. For efficiency purpose, a legacy gap pattern configured for MIB/SIB1 reading can be released after successfully decoding SIB1 information.
  - **Scenario 3:**
    - Regarding scenario 3, RAN4 has not reached conclusions

Observation1: legacy gap patterns can be used but with low efficiency for some Scenarios.

Background

- Legacy gap in RAN4 (TS 38.133)

Table 9.1.2-1: Gap Pattern Configurations

Gap Pattern Id	Measurement Gap Length (MGL, ms)	Measurement Gap Repetition Period (MGRP, ms)
0	6	40
1	6	80
2	3	40
3	3	80
4	6	20
5	6	160
6	4	20
7	4	40
8	4	80
9	4	160
10	3	20
11	3	160
12	5.5	20
13	5.5	40
14	5.5	80
15	5.5	160
16	3.5	20
17	3.5	40
18	3.5	80
19	3.5	160
20	1.5	20
21	1.5	40
22	1.5	80
23	1.5	160
24	10	80
25	20	160

NOTE 6: Measurement gap patterns #24 and #25 can be requested [2] only when the UE is configured at least with any of RSTD, UE Rx-Tx, or PRS-RSRP measurements requiring such gaps and can only be used during the corresponding positioning measurement period

Observation2: Some legacy gap patterns (#24,#25) are restricted to positioning, the modification for MUSIM purpose is needed.

Discussion

- RAN4 work on legacy gap and to define new gap patterns in Rel-17
  - Remove restriction for legacy gaps
  - Improve gap utilization efficiency by new gap patterns, without this new gap pattern, performance will be severely degraded
  - Specify the co-existence of MUSIM gaps with legacy gaps and potentially with Rel-17 concurrent gaps
- Except for introducing these new gap patterns
  - No RRM requirements are expected to be defined based on these new gap patterns at Rel-17 time frame.
  - The requirement part and further gap enhancements for MUSIM to be considered at Rel-18 MUSIM enhancement WI.

Proposals

- **Propsal1: Remove restrictions on legacy gaps(#24,#25 gaps) and define new gap patterns in Rel-17 with the following**
  - **New gap pattern: gap length (MGL) can be the same as legacy MGL or a subset of legacy MGL and longer MGRP equal to DRX cycles as {320, 640, 1280, 2560}**
- **Proposal2: Reuse existing RRM requirements and/or MG enhancement requirements to be specified, if applicable, for the MUSIM gap patterns in Rel-17 time.**
- **Proposal3: Identify the remaining MUSIM gap RRM requirement in Rel-18 MUSIM enhancement WI**
- **Proposal4: Allocate 0.25 TU to R17 MUSIM per RAN4 meeting for remaining Rel-17 RAN4 meetings.**

THANK YOU.
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