



3GPP TSG-RAN Meeting #95-e
Electronic Meeting, March 17 - 23, 2022

RP-220444

Agenda item: 9.1.4.3
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Motivation paper for R18 RRM enhancement

Background

- The work scope summarized in RP-220051 from the email discussion (RAN95e-RAN4-R18Prep-03)
 - FR2 RRM requirements delay reduction enhancements
 - Cell identification and measurement delay reduction
 - Identify cases where FR2 cell identification and L3 measurement delay can be reduced and specify reduced delay requirements for such cases in IDLE/INACTIVE/CONNECTED modes [RAN4]
 - Identify cases where measurement/evaluation time of FR2 L1-RSRP can be reduced, and specify reduced delay requirements for such cases [RAN4]
 - Specify if needed, enhancement and/or signalling enhancement for the UE to meet the enhanced delay requirements [RAN4, RAN2]
 - Note: the work on CONNECTED mode enhancements shall be prioritized
 - [Note: delay reduction enhancements for UE supporting multi-Rx chain simultaneous DL reception are not in the scope]
 - FR2 SCell activation delay reduction
 - Identify cases where FR2 SCell activation delay can be reduced (e.g., unknown target cell cases), and specify reduced delay requirements for such cases [RAN4]
 - Specify if needed, enhancement and/or signalling enhancement for the UE to meet the enhanced delay requirements [RAN4, RAN1, RAN2]
 - Note: the technical solutions can be extended to FR1, when applicable
 - [FR2 BWP switching time enhancements] [RAN4]
 - Specify, if feasible, reduced FR2 BWP switching delay requirements for DCI/Timer/RRC based BWP switching.
 - Note: enhancements shall aim to provide switching delay in between Rel-15 BWP switching type 1 and type 2 BWP switching delay for FR2
 - Note: RAN1/RAN2 work can be triggered by RAN4 LS only
- Extension of requirements for existing features to new scenarios [RAN4]
 - Define RRM requirements for FR1-FR1 NR-DC scenarios [RAN4]
 - RRM requirements include the number of serving carriers, PSCell addition/release delay requirement, PSCell change and conditional PSCell change delay, scheduling availability, and CSSF. Other Rel-15 requirements are not precluded and are subject to WI stage discussion
 - Define HO with PSCell requirements for the following scenarios [RAN4]
 - HO from NR SA to NE-DC
 - HO from NR SA to NR-DC
 - HO from LTE SA to EN-DC
- TCI switching enhancements
 - Define reduced TCI switch delay requirements considering UE using temporary RS for fast measurements [RAN4, RAN1, RAN2]
 - Note: RAN1/RAN2 work can be triggered by RAN4 LS
 - [Define simultaneous TCI state switching requirements over multiple carriers] [RAN4]
 - [Allow UE to receive DL data after TCI state switch command decoding and before TCI state switch starts] [RAN4]



Proposal

- In our understanding, the topics shall be further down-selected from RP-220051 due to the limited TU:
 - Objective 1: Cell identification and measurement delay reduction
 - **Objective 2: FR2 SCell activation delay reduction**
 - **Objective 3: Define RRM requirements for FR1-FR1 NR-DC scenarios**
 - Objective 4: FR2 BWP switching time enhancements
 - Objective 5: Define HO with PSCell requirements for the new scenarios
 - Objective 6: TCI switching enhancements
 - **Objective 2 and 3 could be prioritized**
- We observed that:
 - RAN4 has lots of R18 enhancement candidates but only has very limited TU available
 - based on previous email discussion, companies showed strong interests on above objectives from both UE and network perspectives. The candidate objectives could be discussed in a TDM way in RAN4.
 - Some of the objectives have the similar working scope as other objectives, e.g., the FR2 measurement delay reduction in objective 2 shares the similar scope of objective 1
- With the above observations, we think
 - the above 6 objectives could be further down-selected based on companies' interests and TU limitations, and could be divided into two phases:
 - Phase 1: objective 2 and objective 3. Phase 1 is the baseline scope for this R18 eFeRRM WI.
 - Phase 2: objective 5 and objective 6. Subject to RAN plenary decision, objectives in phase 2 would be only considered after at least one of the objectives in phase 1 are completed. Phase 2 needs to be kept in the WID according to the interest of ecosystem.

Proposal:

- **Using two working phases in the R18 eFeRRM WI:**
 - **Phase 1 includes following objectives:**
 - **FR2 SCell activation delay reduction**
 - **Define RRM requirements for FR1-FR1 NR-DC scenarios**
 - **Phase 2 includes following objectives:**
 - **Define HO with PSCell requirements for the new scenarios**
 - **TCI switching enhancements**
 - **RAN4 shall start work with objectives in phase 1 as baseline scope. Subject to RAN plenary decision, objectives in phase 2 would be only considered after at least one of the objectives in phase 1 are completed.**



