**3GPP TSG-RAN WG4 Meeting #109 R4-2321398**

**Chicago, USA, November 13 – 17, 2023**

**Agenda item:** 8.24.4

**Source:** Apple

**Title:** WF on R18 Further NR mobility enhancement – part 2

**Document for:** Approval

# Wayforward

## Topic #1: NR-DC with selective activation of cell groups via L3 enhancements

**Issue 1-1-1: whether to define RAN4 delay requirement for Subsequent PSCell addition**

* Agreements:
  + Define RAN4 delay requirement for Subsequent PSCell addition.

## Topic #2: Improvement on SCell/SCG setup delay

### Sub-topic 2-1 scope and overall solution

**Issue 2-1-1: relationship between R16 EMR and R18 enhancement to SCell/SCG setup delay**

* Agreements:
  + Rel-16 EMR and R18 enhancement to SCell/SCG setup delay are independent features.

**Issue 2-1-3: Update definition of valid measurement results**

* Agreements:
  + If accuracy requirements are met, the measurement results are valid for IDLE/INACTIVE measurements within the last [X] sec before msg1 transmission for RRC resume/setup request.

### Sub-topic 2-2 solution based on existing measurement

* Agreements in RAN4#108bis:
  + The measurements are considered valid if both of the following conditions are satisfied
    - A) the measurement are performed within the last [X] seconds before it is reported
      * X value is network configured. Signalling details are up to RAN2
      * FFS on the X value(s) and will be decided by RAN4
      * If X is not defined then no requirements will be introduced
    - B) the reported measurement results satisfy measurement accuracy [at the measurement instance]
    - FFS on side conditions

**Issue 2-2-1: ‘X’ value**

* Agreements:
  + If network doesn’t provide configuration of the timer, UE is not required to perform validity check.
  + Candidate values for ‘X’: 5s, 10s, 20s, 50s, 100s

**Issue 2-2-2: the reported measurement results satisfy measurement accuracy [at the measurement instance]**

* Agreements:
  + Confirm that in solution based on existing measurement the reported measurement results satisfy measurement accuracy at the measurement instance.

**Issue 2-2-3: side conditions**

* Candidate solutions:
  + Proposal 1: there is no cell reselection occurred before reporting. (vivo)
  + Proposal 2: Reuse the same side conditions configured on RSRP or RSRQ for EMR. (MTK)
  + Proposal 3: UE perform a validity check if the following conditions: (QC)
    - If NW explicitly configured measurement configurations for R18 fast FR2 CA/DC setup,
      * If the FR2 configurations are broadcasted in SIB11, measurement configuration are not changed in SIB11 during IDLE/INACTIVE state,
      * Otherwise, validity check is not performed.
      * If the configurations are provided upon RRC release
        + EMR needs to be configured.
        + T331 timer does not expire within the last [X] sec before msg1 transmission.
      * Otherwise, validity check is not performed.
    - Otherwise, UE does not perform a validity check.
  + Proposal 4: The validity check is not applicable to: (QC)
    - Any measurements during IDLE/INACTIVE but not related to R18 fast FR2 CA/DC setup.
    - R16 EMR measurements reporting, if EMR is configured.
    - Any measurements during CONNECTED mode.
* Recommended WF
  + Discuss other side conditions in maintenance.

### Sub-topic 2-3 solution based on enhanced measurement

**Issue 2-3-4: feasibility or necessity of RRM requirements for enhanced measurement which starts from RRC setup/resume procedure.**

* Definition of scenarios:
  + Scenario 1: measurement object configuration for RRC connected does NOT include the carrier that being measured during the RRC idle/inactive status.
  + Scenario 2: measurement object configuration for RRC connected at least includes the carrier that being measured during the RRC idle/inactive status.
* Candidate solutions:
  + Option 1: (Apple, [ZTE], Nokia, [QC])
    - Existing accuracy requirements defined in clause 10.1 for RRC connected mode apply for the measurement report after MO configuration for RRC connected mode in scenario 2.
    - After MO configuration for RRC connected mode, existing RRM requirements including measurement period, reporting latency, accuracy apply to all the MO.
  + [Option 2: HW
    - When UE enters to connected mode, according agreed starting point and ending point, the gain of allowing UE perform enhanced measurement just dozens of milliseconds before RRC reconfiguration is not outstanding. Furthermore the measurement requirement of the enhanced solution is hard to be quantitatively specified.]
  + Option 3: OPPO
    - define requirements for enhanced measurement which starts from RRC setup/resume procedure under scenario 2 that MO configuration for RRC connected at least includes the carrier that being measured during the RRC idle/inactive status.
  + Option 4: MTK
    - For the solution based on enhanced measurement, the delay requirements would be the same as legacy measurement requirements in CONNECTED mode.
    - If the measurement results are reported through EMR, the results reported should satisfy the accuracy requirements defined for EMR. If the measurement results are reported in CONNECTED mode measurement report, the results should satisfy accuracy requirements defined for measurement in CONNECTED mode.
* Tentative agreements for online discussion:

RAN4 confirms the feasibility of solution based on enhanced measurement. RAN4 will not define RRM requirements for solution based on enhanced measurement in R18.

## Topic #3: UE feature list for part 2

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Features** | **Index** | **Feature group** | **Components** | **Prerequisite feature groups** | **Need for the gNB to know if the feature is supported** | **Applicable to the capability signalling exchange between UEs (V2X WI only)”.** | **Consequence if the feature is not supported by the UE** | **Type**  **(the ‘type’ definition from UE features should be based on the granularity of 1) Per UE or 2) Per Band or 3) Per BC or 4) Per FS or 5) Per FSPC)** | **Need of FDD/TDD differentiation** | **Need of FR1/FR2 differentiation** | **Capability interpretation for mixture of FDD/TDD and/or FR1/FR2** | **Note** | **Mandatory/Optional** |
| 39.  NR\_Mob\_enh2 | [39-x1] | Measurement validation during connection setup/resume | Support of measurement validation during connection setup/resume |  | [Yes] | N/A | UE does not support measurement validation during connection setup/resume | [Per-UE] | [No] | [Yes] | N/A |  | Optional with capability signaling |
|  | [39-x2] | Enhanced measurement during RRC connection setup/resume | Support of enhanced measurement during RRC connection setup/resume |  | [Yes] | N/A | UE does not support enhanced measurement during RRC connection setup/resume | [Per-UE] | [No] | [Yes] | N/A |  | Optional with capability signaling |