**3GPP TSG RAN meeting 106 RP-24xxxx**

**Madrid, Spain, Dec 9 – Dec 12 2024**

## Status Report to TSG

**Agenda item:** 9.3.2.1

|  |  |
| --- | --- |
| **WI / SI Name** | NR mobility enhancements Phase 4 |
| included in this status report | Study Item: No | Core part: Yes | Performance part:Yes | Testing part:No |
| **Acronym** | NR\_Mob\_Ph4 |
| **Unique ID** | 1020091 |
| **TSG Tdoc of latest approved WI/SI description (if any)** | RP-242356 |
| **Target Completion Date****(indicate if changed)** | Study Item: N/A | Core part: 09/2025 | Performance part: 03/2026 | Testing part: N/A |
| **Overall Completion level** | Study Item: N/A | Core part: 50% | Performance Part: 0% | Testing part: N/A |

Note: Overall completion level percentage numbers should use one of the colors below:

* xx%: Normal progress, no RAN plenary action needed
* xx%: Progress behind schedule, may need RAN plenary intervention. If so, SR should clearly define requested action
* xx%: Progress critically behind, RAN plenary shall intervene. SR should define requested action

**Source:**

|  |  |
| --- | --- |
| **Leading WG** | RAN WG2 |
| **Rapporteur** | **Name** | Naveen Palle |
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## 1 Work plan related evaluation

|  |  |
| --- | --- |
| **Do you want to modify the time budget for this WI/SI compared to what was endorsed at the last RAN meeting?** | No |

*If you answered No: Then please remove the Excel file from the zip file of this status report.*

*If you answered Yes: Then please fill out the attached Excel template to request a modification of the time budgets for your WI /SI. The Excel table has to be filled out for all affected RAN WGs and up to the target date of the WI/SI. The basis are the endorsed time budgets of the last RAN meeting. Please highlight all changes of the values.
 One time unit (TU) corresponds to ~ 2 hours in the meeting.
 If this status report covers a WI with Core and Performance part, then please have one line for each in the attached Excel table.
 Note: If no Excel table is attached, then this means no time budget change.*

**Additional explanations/motivations for the time budget changes in the attached Excel table:**

## 2. Detailed progress in RAN WGs since last TSG meeting (for all involved WGs)

 NOTE: Agreements and Open issues impacted cross-TSG aspects shall be explicitly highlighted

## 2.1 RAN1

#### 2.1.1 Agreements

**RAN1#118bis**

**Agreement**

The agreement “Rel-18 LTM CSI reporting framework is the baseline for CSI-RS based L1-measurement report by gNB scheduled measurement reporting” made in RAN#118 is further clarified for L1-RSRP as follows:

* UCI format defined in Table 6.3.1.1.2-8C of TS38.212 can be used by replacing SSBRI with CRI.
* Whether the L1-RSRP(s) of serving cell is always included is configurable (in line with Rel-18)
* The quantization method defined in clause 5.2.1.4.3 of TS38.214 and bit width defined in Table 6.3.1.1.2-6 of TS38.212 can be used
* No L1 specified filtering for time and spatial domain is introduced
* No enhancement on how to report L cells x M beams
* Periodic reporting on PUCCH is supported
	+ FFS: semi-persistent reporting on PUCCH/PUSCH, and aperiodic reporting on PUSCH

**Agreement**

From RAN1 perspective, there is no restriction with regards to the frequency location of CSI-RS used for L1-measurement.

**Agreement**

For CSI-RS based L1-measurement report by gNB scheduled measurement reporting, semi-persistent reporting on PUCCH/PUSCH and aperiodic reporting on PUSCH are supported

**Agreement**

The serving cell RS for event evaluation is at least derived from QCL RS or SSB QCLed with the QCL RS of the indicated joint/DL TCI state for the serving cell

* QCL RS above is the RS w.r.t. QCL-TypeD when the indicated joint/DL TCI state is configured with two QCL RSs
* FFS: Details on determination of QCL RS or SSB QCLed with QCL RS

Note: This does not imply the support of mTRP scenarios

**Conclusion**

There is no consensus in RAN1 on the support L1-SINR measurement based on CSI-RS for candidate cells

**Agreement**

The following alternatives are further studied:

* Alt-1: CSI-RS measurement and CSI reporting operations are performed before reception of LTM Cell Switch Command (CSC) MAC CE.
	+ The report is sent to the serving cell and transferred to the candidate/target cell(s)
* Alt-2: CSI-RS measurement can start before reception of LTM CSC MAC CE and CSI reporting operation is performed after reception of LTM CSC MAC CE.
	+ The report is sent directly to target cell
* Alt-3: CSI-RS measurement and CSI reporting operations are performed after reception of LTM CSC MAC CE.
	+ The report is sent directly to target cell

Companies are requested to provide the details of exact report timing and triggering mechanism in the next meeting

Working Assumption

In addition to periodic CSI-RS, semi-persistent CSI-RS is supported for candidate cell L1-RSRP measurement for gNB scheduled reporting from RAN1 perspective

* Send an LS to RAN3 (CC RAN2) to ask for the feasibility of specifying the signalling for coordination between serving cell and candidate cell(s) on the transmission of semi-persistent CSI-RS(s) and any other potential issues (e.g. RAN3 workload).

Support of semi-persistent CSI-RS is subject to UE capability.

Final LS in R1-2409283.

**RAN1#119**

**Agreement**

For the identification of the serving cell RS for event evaluation,

If the RS(s) for candidate cell(s) are CSI-RS configured in a CSI-RS resource set configured with repetition, QCL RS of the indicated TCI-state is used for the serving cell; otherwise, SSB QCLed with QCL RS of the indicated TCI-state is used for the serving cell.

* UE does not expect the following configuration:
	+ CSI-RS resource in the indicated TCI state of serving cell is NOT configured in a CSI-RS resource set configured with repetition, and
	+ CSI-RS is configured as measurement resource for the candidate cell(s).

**Agreement**

CSI-RS for BM as the *referenceSignal* with QCL-TypeD is supported for an LTM TCI state, where TRS is configured as *referenceSignal* with QCL-TypeA

**Working Assumption**

As baseline, CSI-RS measurement and CSI reporting operations are performed after reception of LTM CSC MAC CE.

* The report is sent directly to target cell
* Introduce UE capability for CSI-RS measurement can start before reception of LTM CSC MAC CE
	+ Other than UE capability, strive for no additional spec impact compared to the baseline (only one triggering mechanism will be specified)

**Conclusion**

* No consensus to support CSI-RS for mobility for L1 measurement in Rel-19 LTM
* Note: From the actual gNB transmission viewpoint, CSI-RS for mobility and CSI-RS for BM may be the same

#### 2.1.2 Remaining Open issues

* L1 measurement based on CSI-RS
	+ FFS: aperiodic and semi-persistent CSI-RS for measurement
	+ FFS: details of CSI-RS resource configuration, including both gNB scheduled measurement reporting and event triggered reporting
	+ FFS: Support of intra- and inter frequency measurement for CSI-RS based L1 measurement.
* L1 aspects of event triggered reporting
	+ FFS: specified L1 filtering for event evaluation.
* CSI acquisition for candidate cell(s)
	+ Resolution of working assumption for CSI acquisition framework, i.e. the timing of CSI measurement and reporting
	+ FFS: Time domain property of CSI reporting
	+ FFS: Time domain property of CSI-RS resource for measurement.
	+ FFS: Configurations of CSI measurement and reporting
* L1 aspects of intra-CU conditional LTM, if needed

## 2.2 RAN2

#### 2.2.1 Agreements

**RAN2-127bis:**

**Agreements on inter-CU LTM**

1. The Rel18 handling on failure is reused in R19 if the UE selects an intra-CU LTM candidate cell after intra-CU LTM failure; for other cases, e.g. inter-CU LTM failure, the failure handling is FFS (related to SA3’s inputs).
2. For non-DC case, if the new Rel-19 IDs of the serving cell and the target cell have same values, the UE compares the ltm-ServingCellNoResetID and ltm-NoResetID and performs the corresponding L2 reset operation as defined in Rel-18.
3. The SCPAC-similar security update configuration is introduced for inter-CU SCG LTM, i.e. similar to IEs sk-CounterConfiguration, servingSecurityCellSetId and securityCellSetId. The names of the new IEs are to be discussed in stage3.
4. Regarding the candidate and reference configuration generation and signaling design, the following SCPAC-similar principles can be applied for inter-CU SCG LTM as baseline:

 - The reference configuration for inter-CU SCG LTM at least include SCG part, FFS on MCG part.

 - FFS: Network ensures that when UE combines the reference and candidate configuration for inter-CU SCG LTM, the configuration generated by UE must contain both MCG and SCG part configurations.

 - The candidate configuration and reference configuration are modeled as an MN RRCReconfiguration message.

 - Upon inter-CU SCG LTM, the UE performs reconfiguration with sync towards SCG, but the reconfiguration with sync in MCG is not allowed.

 - The MN generates the MCG part of the reference configuration (if any), while the SN (source or candidate) generates the SCG part of the reference configuration.

 - The MN is responsible for the reference configuration generation for SN initiated inter-CU SCG LTM. It can be up to the NW implementation whether to include the MCG part.

 - The MN can request an SCG reference configuration from any of the involved SNs.

5. For SN initiated inter-CU SCG LTM, the candidate SN provides the SCG part configuration of each candidate PSCell, and may also provide the L1 RS (e.g. a list of SSB or a list of CSI-RS) configuration for L1 measurement, early UL sync configuration or TCI-state configuration, to the MN.

6. The source SN is responsible to generate the common CSI resource configuration for L1 measurement on candidate SCG cells.

7. The MN sends the received L1 RS configuration, early UL sync configuration, or TCI-state configuration of candidate cells to the source SN. And the source SN responds with the common CSI resource configuration to the MN.

8. In order to support subsequent inter-CU SCG LTM, the MN needs to transfer ,during the LTM preparation phase, the common CSI resource configuration and the collected information of candidate cells to the candidate SN(s). Accordingly, the candidate SN(s) responds with the updated candidate SCG configuration to the MN.

9. Upon execution of inter-SN SCG LTM, the UE sends an MN RRCReconfigurationComplete message to the MN, which includes an SN RRCReconfigurationComplete message.

10. Re-use legacy LTM Cell Switch Command MAC CE for inter-SN LTM.

11. RAN2 confirms to support coexistence of following cases, it is up to network implementation to ensure simultaneous execution for both MCG and SCG will not happen:

 - Inter-MN LTM and intra-SN LTM

 - Inter-SN LTM and intra-MN LTM

**Agreements on L1 event triggered MR**

1. MR can be sent when the leaving condition is met, based on NW configuration.
2. Event triggered periodic MR can be supported, based on NW configuration.
3. For measurement resource configuration, R18 LTM CSI resource configuration is reused if possible. If CSI-RS resource only IE needs to be defined, we can revisit it in the stage 3.
4. For measurement reporting configuration, R18 LTM-CSI-ReportConfig is reused if possible. We can revisit it in the stage 3 if needed.
5. For association between measurement resource configuration and measurement reporting configuration, R18 LTM way is reused if possible. We can revisit it in the stage 3 if needed.
6. The entire event evaluation procedure is handled by MAC based on the latest L1 measured results reported by L1.
7. TTT operates only based on a timer (like TTT used in L3 event triggered MR).
8. Confirms WA (Same RS type should be used for both serving and neighbouring cell for event LTM3 and event LTM5).
9. Basic information included in MR MAC CE:

 - Beam information: FFS if SSBRI/CRI of N beams or (LTM configuration id + SSB/CSI-RS id)

 - Beam quantity: L1-RSRP or SINR (up to RAN1) of N beams

 - Triggered event information (e.g., ReportConfigID)

 MR MAC CE can include up to N beams (FFS whether the beam should satisfy the event or not).

 N is configurable by NW.

1. Additional information included in MR MAC CE:

 - The information and quantity of current beam, based on NW configuration.

11. The legacy SR procedure for resource allocation is the baseline to send the event-triggered L1 measurements MAC CE.

12. NW can configure a dedicated SR configuration for MR MAC CE transmission.

**Agreements on C-LTM**

1. Source cell sends the conditional LTM configuration via RRCReconfiguration to UE, which includes the LTM candidate configurations, and the corresponding execution conditions.
2. Event LTM3-like and LTM5-like are used as the conditional LTM execution condition. FFS on reuse of CHO conditions.
3. Source cell and each candidate cell provides its own execution condition for conditional LTM.
4. It is DU to generate the L1 execution condition. FFS on a case that L3 measurement is used.
5. RACH-less Conditional intra-CU LTM is supported.
6. RACH based conditional intra-CU LTM is supported.
7. UE based TA measurement mechanism is supported for conditional intra-CU LTM.
8. PDCCH ordered early TA acquisition is supported for conditional LTM.
9. Rel-18 Early candidate TCI State activation/deactivation is supported for conditional intra-CU LTM.
10. For RACH-less conditional LTM, CG-based first UL transmission on target cell is supported. FFS on DG-based approach.
11. The LTM completion defined for Rel-18 intra-CU LTM is reused for conditional LTM.

**RAN2-128:**

**Agreements on inter-CU LTM:**

1. Rel-19 Set ID is configured for a candidate configuration. For DRB:

 - Inter-CU MCG LTM: When Rel-19 Set ID of candidate cell is different from serving cell,

 > UE performs PDCP re-establishment to all radio bearers.

 - Inter-CU SCG LTM: When Rel-19 Set ID of candidate cell is different from serving cell,

 > For MN terminated bearer without change of termination point, UE does not perform PDCP re-establishment. PDCP recovery is needed if it is split bearer.

 > For SN terminated bearer without change of termination point, UE performs PDCP re-establishment.

 > If there is change of termination point for a radio bearer (the keyToUse in the RadioBearerConfig is different from the keyToUse in the current UE configuration), UE performs PDCP re-establishment.

1. For SRBs in inter-CU SCG LTM, Rel-19 ID is used to determine whether PDCP re-establishment or PDCP SDU discard is performed for LTM execution for SRB3.
2. For SRB1/2 in inter-CU SCG LTM, PDCP re-established is not performed based on NW configuration (PDCP re-establishment flag and SDU discard).
3. RAN2 confirms that inter-CU MCG LTM with SCG addition is supported assuming no much specification effort is required. If there are much specification efforts, we will not have it.
4. RAN2 confirms that the inter-CU MCG LTM with intra-SN PSCell change is supported in Rel19.
5. From RAN2 perspective, the following coexistence cases in NR-DC can be supported:

 - Case 1: Intra-CU MCG LTM + Inter-CU MCG LTM

 - Case 2: Intra-CU SCG LTM + Inter-CU SCG LTM

7. In coexistence cases of inter-CU MCG/SCG LTM and intra-CU MCG/SCG LTM, when inter-CU MCG or SCG LTM is executed, it’s up to the NW to ensure that maintained LTM candidate configurations are valid, e.g. reconfigure or release invalid intra-CU MCG/SCG LTM candidate configurations. UE does not autonomously release invalid intra-CU candidate configurations.

8. RAN2 to support intra-CU SCG LTM in MN RRC message (i.e. MN RRCReconfiguration message), in addition to SN RRC message.

9. RAN2 to support intra-CU MCG LTM with SCG configuration.

10. It’s up to NW to ensure that the complete configuration includes the MCG part and SCG part configuration when UE combines the reference and candidate configuration for inter-CU SCG LTM.

11. RAN2 assumes that how to indicate the list of candidate PSCells from source SN to MN is up to RAN3. From RAN2 perspective, in INM, source SN may send measurement results of candidate PSCells to the MN. The MN then forwards the measurement results to the candidate SN(s), and then the candidate SN(s) determines the LTM candidate cells based on the measurement results and the upper limit for the number of PSCells that can be prepared by each candidate SN. The existing IEs defined in INM can be reused as a baseline.

**Agreements on L1 event-driven MR:**

1. TTT is evaluated per beam, and measurement report is only triggered by beam that has satisfied the condition (entering/leaving) for the whole duration of TTT.
2. TTT timer is not restarted if the current beam changes and the entering condition is still met with the new current beam.
3. TTT is applied to the leaving condition.
4. Network can configure which RS type (SSB or CSI-RS) is used for LTM event evaluation.
5. Either CSI-RS or SSB could be configured as candidate beam and the measurement RS of the serving cell beam is determined based on the candidate beam to ensure same RS type, i.e. the RS for current beam of serving cell is same as or QCLed with the QCL RS of the indicated TCI state, according to what is agreed in RAN1.
6. SSBRI and CRI is used to represent the candidate beam ID in LTM MR MAC CE.
7. For event-triggered L1 LTM measurement reporting, max N is total number of all beams included into MR MAC CE.
8. For event-triggered L1 LTM measurement reporting, NW controls if the beam(s) not satisfying the event could be reported according to N beams in MR MAC CE.
9. A single MAC CE format for the event-triggered L1 measurement report is used for both the SSB and CSI-RS reference signals.
10. Support the truncated measurement report MAC CE.

**Agreements on C-LTM:**

1. The triggering condition of conditional LTM can be based on L3 measurement.
2. CondEventA3 and CondEventA5 conditions can be baseline for the conditional LTM execution.
3. The L1 execution condition of a candidate cell is associated to only one triggering event.
4. For L3 execution condition, it may consist of one or two triggering condition(s). If there are two triggering conditions associated with the same candidate cell, the UE shall consider the execution condition is fulfilled only when both triggering conditions are met. Only single RS type is supported and at most two different trigger quantities can be configured simultaneously for the evaluation of execution condition of a single candidate cell.
5. To support initial and subsequent conditional LTM, the following items can be considered for the configuration of execution condition:

 - The CLTM configuration of each candidate cell shall include the execution condition for initial conditional LTM, which is generated by the initial source cell to trigger the CLTM for the candidate cell.

 - The CLTM configuration of each candidate cell may include execution conditions for subsequent conditional LTM, which is generated by the candidate cell to trigger the CLTM for other candidate cells when the candidate cell becomes a serving cell.

1. The network can configure measurement reports e.g., L1 periodic, semi-persistent, aperiodic and event triggered report, or L3 measurement reports for conditional LTM, e.g., to trigger PDCCH ordered early RACH.
2. For CLTM, the Candidate Cell TCI States Activation/Deactivation MAC CE is re-used for the early activation/deactivation of TCI state(s) of a CLTM candidate configuration.
3. The Early TA is signalled to the UE from the source cell (i.e., not from the candidate cell directly to the UE). This agreement will be included in the LS to RAN1/3/4.
4. The network can inform the candidate cell’s TA information to UE via new MAC CE, which is the TA value when UE switches to that candidate cell during CLTM.
5. Candidate cell TA is maintained by a new timer.
6. For L1-based conditional LTM the condition evaluation is at MAC level and for L3-based conditional LTM the condition evaluation is at RRC level.

#### 2.2.2 Remaining Open issues

* Inter-CU LTM procedure
	+ Handling of security for non-DC and DC cases. Progress pending on SA3 work.
	+ Further signalling details of inter-CU LTM
		- Without DC and with DC.
	+ Further details on applicability/configuration of inter-CU in DC.
* Event triggered L1.
	+ Further details on event definition/configuration signaling design/usage
	+ Signaling structure of event reporting using MAC CE.
* support of intra-CU conditional LTM
	+ Further details on conditions/events for triggering conditional LTM
	+ Further details on defining the execution/conclusion of conditional LTM
	+ Details on the design of conditional LTM with subsequent LTM

## 2.3 RAN3

#### 2.3.1 Agreements

RAN3#125bis:

* BL CRs to TS 38.300 and TS38.423 are endorsed.
* Current SSB information in Xn Setup and Configuration Update procedures can be reused for LTM preparation phase.
* WA: For inter-CU LTM mobility, a separate LTM request message (i.e. HANDOVER REQUEST message) is used for each candidate cell.
* The LTM Configuration IDs are allocated by the source CU.
* WA: Reuse the existing XnAP UE CONTEXT RELEASE message at the source gNB if no LTM candidate cell(s) exist in the source gNB.
* Follow F1AP, the source gNB-CU sends the CSI resource configuration of candidate cells to candidate gNB-CUs via Handover Request message for subsequent LTM, and the candidate gNB-CU sends the CSI report configuration to the source gNB-CU via Handover Request ACK message.
* Confirm the name of the new procedure as “LTM Configuration Update”.
* Introduce a new procedure for candidate gNB-initiated LTM cancellation.
* Allow UE association in-between candidate CUs (in case the Xn connectivity existed) for subsequent LTM.
* TP R3-245841 for BLCR TS38.300 is agreed; TP R3-245842 for BLCR TS38.423 is agreed.

RAN3#126:

* BL CRs to TS 38.300, TS38.423, TS38.420 and TS37.483 are endorsed.
* Reply LS R3-247911 for LS on the support of semi-persistent CSI-RS resource for LTM candidate cells is agreed.
* RAN3 move forward on Legacy framework with PDCP change/switch for inter-CU LTM in this release, not considering the PDCP anchor based solution.
* The source CU can request candidate CU to provide CSI-RS configuration in HANDOVER REQUEST message, and candidate CU signals the CSI-RS configuration in HANDOVER REQUEST ACKNOWLEDGEMENT message.
* The source CU generates common CSI-RS Resource Configuration and sends it to candidate CU in LTM CONFIGURATION UPDATE message, the candidate CU signals the CSI-RS Report Configuration in LTM CONFIGURATION UPDATE ACKNOWLEDGEMENT message.
* Turn the WA into agreement: For inter-CU LTM mobility, a separate LTM request message (i.e. HANDOVER REQUEST message) is used for each candidate cell.
* To support subsequent LTM, the LTM Configuration Update procedure is reused to establish UE association between the new source gNB and the other candidate gNB(s) after each inter-CU LTM Cell Switch.
* Confirm the message name as LTM Cancel for candidate gNB-initiated LTM cancellation.
* Turn the WA into agreement: Reuse the existing XnAP UE CONTEXT RELEASE message at the source gNB if no LTM candidate cell(s) exists in the source gNB.
* TP R3-247912 for BLCR TS38.300 is agreed; TP R3-247913 for BLCR TS38.423 is agreed.

#### 2.3.2 Remaining Open issues

* The error handling of multiple UE associations needs to be considered.
* How the source gNB-CU sends the reference configuration to all candidate gNBs is pending on RAN2 progress.
* When and how to establish the UE association is FFS.
* Late data forwarding may be initiated after the source gNB decides to trigger the LTM Cell Switch Command to the UE, when exactly it is initiated is left to implementation. FFS on the details.

## 2.4 RAN4

#### 2.4.1 Agreements

**RAN4#112bis**

**Topic #1: Event triggered L1 measurement reporting**

Issue 1-1: RRM scope of Event triggered L1 measurement reporting

**<Agreement>**

* + RAN4 to define event-triggered L1 reporting requirement for SSB based and CSI-RS based measurements.
		- To start RAN4 discussion for SSB based L1 measurement firstly, and check how to apply/extend the agreements for SSB based L1 measurement to accommodate CSI-RS based L1 measurement.
	+ From RAN4 RRM requirement perspective, for FR2-1, RRM requirements for multi-Rx based LTM L1 measurement is not considered in the WI scope.
	+ RRM scope of Event triggered L1 measurement reporting
		- In addition to intra-frequency measurement and inter-frequency measurement without gap, support gap-based inter-frequency measurement for SSB-based L1 measurement. Further discuss for CSI-RS based L1 measurement.

Issue 1-2: supported frequency range in RRM requirements

**<Agreement>**

* + Both FR1 and FR2-1 are in scope of RRM requirements for Event triggered L1 measurement reporting.

Issue 1-6: accuracy

**<Agreement>**

* + for SSB based L1 RSRP event triggered reporting, the reported L1-RSRP measurement result shall meet R18 LTM L1-RSRP accuracy requirements
	+ for CSI-RS based L1-RSRP event triggered reporting, the reported L1-RSRP measurement result shall meet R19 CSI-RS based L1-RSRP accuracy requirements for LTM, which will be discussed under CSI-RS based L1-RSRP measurement agenda.

Issue 1-8: starting point in event triggered L1 reporting requirements

**<Agreement>**

* + Use the following as starting point. Wording can be discussed in CR.
		- Starting point in event triggered L1 reporting requirements is the time when a condition exists at the UE which will trigger the reporting.

**Topic #2: CSI-RS based L1 measurement**

Issue 2-1: CSI-RS based L1 measurement for known/unknown cell

**<Agreement>**

* + RRM requirements for CSI-RS based L1-RSRP measurement only apply for known target cells

Issue 2-2: known cell definition in CSI-RS based L1 measurement

For CSI-RS based L1-RSRP measurement, the cell is considered as known if the following conditions are met:

**<Agreement>**

* + The UE has performed L3 measurement on the target cell during the last 5 seconds, and
		- Further check whether to consider SSB-based L3 measurement only
	+ The SSB from the target cell configured for L3[/L1] measurement remains detectable according to the cell identification requirements in clause 9.2.
		- L1 measurement in the 2nd bullet is not needed for FR1.
		- Further discuss whether to keep or remove L1 measurement for FR2-1 in the 2nd bullet.
	+ The CSI-RS from the target cell configured for L1 measurement remains [detectable/measurable].
		- Further discuss whether to use detectable or measurable.
		- Further discuss the side condition

Issue 2-5: supported frequency range

**<Agreement>**

* + Both FR1 and FR2-1 are in scope of RRM requirements for CSI-RS based L1-RSRP measurement on LTM candidate cell(s).

Issue 2-11: CSI-RS resource density and BW

**<Agreement>**

* + For CSI-RS based L1-RSRP measurement on neighbor cell, define the measurement period and accuracy requirements based on Density=3 with (≥) 48 PRBs.

Issue 3-1: other issues

**<Agreement>**

* + It is RAN4 common understanding that R18 LTM cell switch requirements also apply for R18 subsequent LTM.

**Topic #4: Conditional LTM**

Issue 1-1-1: RAN4 scope of Conditional LTM

**< Agreement>**

* RAN4 to define cell switch delay requirements for conditional LTM
* RAN4 to define subsequent conditional LTM requirement unless there is any technical issue identified.
* Wait for other WGs input to further discuss detailed RRM requirements.

Issue 1-1-2: The applicable scenarios for conditional LTM

**< Agreement >**

* Rel-19 CLTM requirements are applicable for NR SA scenarios defined in Rel-18 LTM
* PCell switch to a neighboring LTM candidate cell
* FR1 cell to FR1 cell
* FR1 cell to FR2 cell
* FR2 cell to FR2 cell
* FR2 cell to FR1 cell
* PCell switch to an LTM candidate cell that is a serving SCell in MCG
* FR1 cell to FR1 cell
* FR2 cell to FR2 cell
* Further discuss the DC case if it will be included in the WID based on further RAN plenary discussion.

Issue 1-1-3: Measurement requirements on conditional LTM

**< Agreement >**

* On whether L3 measurement based conditional LTM in FR1 can be supported
* RAN4 can further discuss this issue in FR1 and make recommendation to RAN2 if RAN4 consensus can be reached.
* As generic procedure for the objective led by RAN2, if any conclusion will be made in RAN2, RAN4 will follow the RAN2 conclusion unless any technical issue is identified.

**RAN4#113**

**Topic #1: Inter-CU**

Issue 1-1: R19 inter-CU subsequent LTM

**<Agreement>**

* The Rel-18 cell switch delay requirements can be reused for Rel-19 inter-CU subsequent LTM.
* Note: this can be revisited if any critical issue identified.

**Topic #2: Event triggered L1 measurement reporting**

Issue 2-1: RRM scope of Event triggered L1 measurement reporting

**<Agreement>**

* Confirm that CSI-RS based event triggered L1 reporting is included in RAN4 scope of this work item.

Issue 2-3: ending point in event triggered L1 report requirements

**<Agreement>**

* Ending point in event triggered L1 report requirements is defined as the point when the UE starts to transmit the first UL transmission to report measurement result over the air interface.

Issue 2-4: periodic report and single report

**<Agreement>**

* RAN4 requirements shall cover both Event triggered periodic MR and Event triggered MR.

Issue 2-5: Event triggered reporting delay for L1 reporting

**<Agreement>**

* Agree on the following high level proposal:
	+ The event triggered measurement reporting delay shall be no larger than the L1-RSRP measurement period [on the cells corresponding to the event or on the candidate cells].
		- FFS reuse L1-RSRP measurement period from the existing spec with Treport = 0.
	+ Additional time TSSB\_time\_index for SSB index acquisition is needed, unless *deriveSSB-IndexFromCell* is enabled or UE has reported SSB index in L3 measurement report of the same cell.

Issue 2-14: where to capture event triggered L1 report requirement

**<Agreement>**

* The event triggered reporting for SSB based L1 measurement requirements can be defined in clause 9.14.3 and clause 9.15.3, respectively for intra-frequency and inter-frequency.
* FFS on event triggered reporting for CSI-RS based L1 measurement.

Issue 2-16: Impact on other LTM requirements

**<Agreement>**

* Proponents of option 1 to bring detailed analysis on the potential impact.

**Topic #3: CSI-RS based L1 measurement**

**Issue 3-1-1: Whether to consider SSB-based L3 measurement only?**

**< Agreement >**

* Consider SSB based L3 measurement as the pre-requisite condition only. E.g. no need to consider CSI-RS based L3 measurement as condition.

**Issue 3-2: Measurement procedure**

**<Agreement>**

* Agree the following measurement procedure for CSI-RS based LTM candidate cell measurements:
	+ Step 1: SSB based L3 measurements and reports at least before LTM configuration.
	+ Step 2: For FR2-1, SSB-based L1 measurements and reports on the same candidate cell
		- Further discuss whether sStep 2 can be skipped under certain conditions, or based on UE capability or based on network RRC configuration. FFS the details.
		- Note: Step 2 is removed for FR1.
	+ Step 3: CSI-RS based L1 measurements on the same candidate cell
		- Depending on whether step 2 is skipped, the requirements in step 3 may be different.
	+ Note: The CSI-RS in Step 3 should be QCL’ed with the SSB in Step 1 or 2.
		- [Note: For FR1, the CSI-RS in Step 3 should be QCL’ed with the SSB in Step 1.]

**Issue 3-3: Definition of intra-frequency/inter-frequency for CSI-RS based L1 measurement**

**<Agreement>**

* A measurement is defined as a CSI-RS based intra-frequency L1 measurement provided that:
	+ the SCS of the CSI-RS resource of the neighbour cell configured for L1 measurement is the same as the SCS of [active DL BWP], and
	+ the CP type of the CSI-RS resource of neighbour cell configured for L1 measurement is the same as the CP type of [active DL BWP], and
		- It is applied for SCS = 60KHz
	+ [the centre frequency of the CSI-RS resource of the neighbour cell configured for L1 measurement is the same as the centre frequency of any of the CSI-RS resources of the serving cell indicated for L1 measurement (if configured).]

**Issue 3-8: supported measurement type**

**<Agreement>**

* CSI-RS based L1 measurement without gap is supported.
* FFS on CSI-RS based L1 measurement with gap

**Topic #4: Conditional LTM**

Conditional LTM

**Issue 1-1-3: Whether cover both RACH-based and RACH-less conditional LTM**

**< Agreement >**

* Cover both RACH-based and RACH-less conditional intra-CU LTM.

**Issue 1-1-4: The specification structure of the requirements for conditional LTM**

**< Agreement >**

* The requirements for conditional LTM can be defined in the clauses of Rel-18 LTM.

Early synchronization and TCI state activation

**Issue 1-2-1: Early UL Synchronization**

**< Agreement >**

* PDCCH ordered RACH is supported for conditional intra-CU LTM from RAN4 perspective.
	+ Note: If no new PDCCH ordered RACH procedure will be introduced in RAN2, the related R18 RAN4 requirements are applicable.

**Issue 1-2-2: Early TCI state activation**

**< Agreement >**

* Early candidate TCI State activation/deactivation is supported for conditional intra-CU LTM from RAN4 perspective.
	+ Note: If no new procedure will be introduced in RAN2, the related R18 RAN4 requirements are applicable.

**Issue 1-3-3: The ending point of conditional LTM delay**

**< Agreement >** *ad hoc*

* The ending point of conditional LTM is the time the UE transmits the first UL transmission on the target cell.

Subsequent Conditional LTM

**Issue 1-4-3: The ending point of subsequent conditional LTM delay**

**< Agreement >** *ad hoc*

* The ending point of subsequent conditional LTM delay is the time the UE transmits the first UL transmission on the target cell.

#### 2.4.2 Remaining Open issues

**Event triggered L1 measurement reporting**

Issue 2-6: impact of time-to-trigger (TTT) on RRM

**<Candidate options>**

* Option 1: RAN4 to discuss whether to take TTT (time to trigger) into account in the L1 event-triggered reporting delay requirements once more agreements from RAN1/2 are available. (Nokia, Xiaomi)

Issue 2-7: whether to introduce/update requirements for reporting criteria per measurement category

**<Candidate options>**

* Option 1: Yes (CATT, MTK, ZTE, Apple, OPPO)
* Option 2: RAN4 to postpone the detailed discussion on ‘Requirements for reporting criteria per measurement category’ until the RRM requirements on the remaining issues are sorted out (QC, Ericsson)
* Option 3: RAN4 to align common understanding that the existing number of reporting criteria per category is defined for L3 measurement and reporting only. For L1 measurements, the number of events to be supported by UE shall be discussed in RAN1 first. (vivo)

Issue 2-8: whether to define a separate capability for supported number of events triggered L1 measurement reporting

**<Candidate options>**

* Option 1: Yes (MTK, Samsung, CMCC)
* Option 2: RAN4 to postpone the detailed discussion on ‘Requirements for reporting criteria per measurement category’ until the RRM requirements on the remaining issues are sorted out (QC)
	+ Option 2a: RAN4 to wait for RAN2 progress on the TTT handling before discussing the UE capability of number of events to support. (E///)
* Option 3: RAN4 to align common understanding that the existing number of reporting criteria per category is defined for L3 measurement and reporting only. For L1 measurements, the number of events to be supported by UE shall be discussed in RAN1 first. (vivo)

Issue 2-9: how to define requirements for reporting criteria per measurement category

**<Candidate options>**

* Proposal 1: For the requirements for reporting criteria per measurement category, whether ‘SS-RSRP and CSI-RSRP’ in current description include both L1-RSRP and L3 RSRP should be clarified. (CATT)
* Proposal 2: RAN4 may not need to additionally emphasize and add L1-RSRP separately for measurement category of intra-frequency and inter-frequency. (CATT)
* Proposal 3: (MTK)
	+ For SSB based event triggered L1-RSRP measurement reporting, regard the events related to different candidate cells on different frequency layers as different events. Discuss how to differentiate intra-frequency and inter-frequency events. Further discuss the following options:
		- Option 1: if the LTM-CSI-ReportConfig is linked to multiple cells on different frequency layer, then the number of events related to this LTM-CSI-ReportConfig should be counted no less than the number of frequency layers.
		- Option 2: inform RAN2 that the events related to different candidate cells on different frequency layers are regarded as different events and ask RAN2 to take this into consideration when design the signaling.
* Proposal 4: Regarding whether to count LTM event in a per-layer basis, RAN4 shall wait for further RAN1/2 conclusions regarding the detailed resource configuration for event-triggered L1-RSRP reporting in R19 LTM. (vivo)
* Proposal 5: RAN4 to postpone the detailed discussion on ‘Requirements for reporting criteria per measurement category’ until the RRM requirements on the remaining issues are sorted out (QC)
* Proposal 6: RAN4 to agree that Ecat capability is not shared between L3 events and LTM L1 events. (E///)

Issue 2-10: whether and how to coordinate with R19 MIMO

**<Candidate options>**

* Option 1: (MTK)
	+ Events configured for mobility and MIMO should be considered as different events even when they are configured for the same beams and the same cell with the same threshold.
	+ Define the capability for L1 events shared by mobility L1 events and MIMO L1 events.
* Optoin 2: Define separate capabilities for MIMO and mobility. (Samsung, CMCC, Apple)
* Option 3: Discuss the coordination between LTM and MIMO events at the end of the Wis. (Nokia)

Issue 2-11: L1 filtering assumption in event evaluation

**<Candidate options>**

* Option 1: For whether to consider the RRM impact due to L1 filtering for event triggered L1 report, RAN4 needs to wait for more RAN1 input. (CATT, ZTE, CTC, E///)
	+ If L1 filtering is introduced in RAN1, RAN4 needs to define additional SSB based L1 measurement delay requirements with filtering for event triggered L1 report.
	+ Otherwise, there is no impact on RAN4.
* Option 2: In event triggered L1 measurement in mobility, do not consider L1 filter for requirements. (Samsung, Xiaomi, CMCC, Apple, HW)
	+ Option 2a: RAN4 to define RRM requirements for the event triggered L1 report with the assumption of no specific L1 filtering. This decision can be revisited if other working groups overturn their decision on L1 filtering. (QC)

Issue 2-12: beam level or cell level measurement result for new LTM event evaluation

**<Candidate options>**

* Option 1: For LTM event triggered L1 reporting, beam level measurement result will be used for LTM event evaluation. (CATT, Xiaomi, Samsung, CMCC, ZTE, Apple, CTC, vivo)
* Option 2: RAN4 should not discuss whether the event-based L1 measurement report should be evaluated per beam or per cell. The requirement can be defined in a way that the evaluation is agnostic to the granularity. If needed, it can be properly incorporated into the definition of the event condition, which is the starting point of the event-based measurement report requirement. (QC)

Issue 2-15: Impact of UL resource waiting time.

**<Candidate options>**

* Option 1: For L1 event triggered reporting, it needs to specify that L1 result which triggers L1 reporting will be included in L1 reporting. (Xiaomi)
	+ It means that if L1 reporting procedure starts, UE can continue to measure for L1, however, the following L1 result will not be evaluated for event anymore.
* Option 2: for event triggered L1 measurement reporting, it is proposed that measurement reporting delay excludes a delay which caused by no UL resources being available for UE to send the measurement report on, which is to follow the approach for event triggered L3 measurement reporting. (CMCC, Apple, vivo)
* Option 3: RAN4 to discuss components and criteria for defining TTime to first UL channel (E///)
	+ Once the event is met, UE needs to send the indication on the SR or special SR to the NW to indicate to the NW that event is met. It can be denoted as TTime to first UL channel.

Issue 2-17: Impact on fast ASN.1 decoding

**<Candidate solutions>**

* Option 1: Event-triggered L1 report or reporting condition becoming fulfilled triggers fast ASN.1 decoding. (Nokia)
* Option 2: postpone. (QC)

Issue 2-18: Impact on early TCI state activation

**<Candidate solutions>**

* Option 1: Event-triggered L1 report or reporting condition becoming fulfilled triggers DL synchronization for the candidate cell’s active TCI states, if not valid at the time of report triggering. (Nokia)
* Option 2: postpone. (QC)

Issue 2-19: Impact on L1 measurement

**<Candidate solutions>**

* Option 1: RAN4 to consider that after event-triggered L1 reporting condition is fulfilled, the UE is allowed to prioritize L1 measurements on the candidate cells fulfilling the reporting condition. (Nokia)
* Option 2: postpone. (QC)

Issue 2-20: others

**<Candidate solutions>**

* Proposal 1: Discuss the number of supported events at the end of the WI. (Nokia)
* Proposal 2: RAN4 to define the event triggered measurement report for known cell scenario. (E///)

**CSI-RS based L1 measurement**

**Issue 3-1-2: Whether to keep or remove L1 measurement for FR2-1 in the 2nd bullet**

**<Candidate solutions>**

* Option 1: Keep SSB based L1 measurement as one of the pre-requisite conditions for CSI-RS based L1 measurement in FR2. (Apple, Huawei, vivo)
* Option 2: Remove Rel-18 LTM SSB-based L1-RSRP measurements. (CMCC, Nokia, Samsung, MTK, Ericsson)
	+ Option 2a: Remove L1 measurement for FR2-1 as side condition and consider “The CSI-RS from the target cell configured for L1 measurement remains measurable” as requirement applicability. (Xiaomi)
* Option 3: Keep L1 measurement for FR2-1 with bracket in the 2nd bullet and wait for RAN1/RAN2’s progress. (ZTE)

**Issue 3-1-3: Whether to use detectable or measurable?**

**<Candidate solutions>**

* Option 1: The difference of the definition between detectable and measurable need to be further clarified. (CATT)
* Option 2: Use detectable. (Apple, ZTE)
* Option 3: Use measurable. (Xiaomi, OPPO, Ericsson, Nokia)

**Issue 3-1-4: Side condition for CSI-RS based L1 measurement for neighbor cell**

**<Candidate solutions>**

* Option 1: SNR of the CSI-RS from the target cell configured for L1 measurement is above -6dB (MTK)
* Option 2: It is proposed to use legacy side condition of SINR=-3dB. (Apple, Ericsson, Nokia, Saumsung)

**Issue 3-5: Measurement on CSI-RS with repetition ON**

**<Candidate solutions>**

* Option 1: Considering the potential large overhead, not support skipping SSB based L1 measurement before performing L1 measurement on CSI-RS resources with repetition ON in FR2-1. (MTK)
* Option 2: Not to support CSI-RS resources with repetition ON in FR2 for CSI-RS based L1 RSRP measurement on candidate cell. (Huawei, CATT)
	+ Option 2a: Not to support CSI-RS resources with repetition ON for L1 measurement on an LTM candidate cell. The decision shall be made in RAN1. (vivo)

**Issue 3-6: Measurement on CSI-RS with repetition OFF**

**<Candidate solutions>**

* Option 1: From RRM requirements perspective, for CSI-RS resources with repetition OFF, L1-RSRP measurement is performed only after UE has performed L1-RSRP measurement on the SSB in FR2-1. (vivo)
	+ Option 1a: For CSI-RS resources with repetition OFF in FR2, L1-RSRP measurement is performed only after UE has performed L1-RSRP measurement on the associated SSB. Considering that there is no gain compared to SSB based L1 measurement, not support skipping SSB based L1 measurement before performing L1 measurement on CSI-RS resources with repetition OFF in FR2-1. (MTK)
	+ Option 1b: In FR2, RAN4 will define the requirements for the following case, (CATT)
		- CSI-RS resources is configured with repetition OFF, UE perform CSI-RS based L1-RSRP measurement without RX beam sweeping after UE has performed L1-RSRP measurement on the associated SSB.
* Option 2: Define first requirements for the case where the repetition is ‘OFF’ (Nokia)

**Issue 3-7: CSI-RS resource type**

**<Candidate solutions>**

* Option 1: In addition to periodic CSI-RS, RAN4 also needs to consider semi-persistent CSI-RS transmission and measurements when defining RRM requirements for CSI-RS based L1 measurements for candidate cells. (CATT)
* Option 2: RAN4 prioritize CSI-RS based L1 measurement requirement for periodic CSI-RS. (Apple, vivo)
* Option 3: Start from periodic CSI RS measurements, and wait for wait until RAN1 agrees on aperiodic and semi-persistent CSI-RS support. (Nokia)
* Option 4: RAN4 define CSI-RS based L1 measurement for periodic and semi-persistent. (Samsung)
* Option 5: RAN4 should define CSI-RS based L1 measurement requirements for periodic, aperiodic and semi-persistent CSI-RS (ZTE)

**Issue 3-9: Measurement gap related**

**<Candidate solutions>**

* Option 1: In Rel-19 LTM, at least the type 1 MG should be supported for CSI-RS based L1 measurement. (CATT)
* Option 2: RAN4 at least can follow the same approach as CSI-RS based L3 measurement for gap-based measurement, i.e., requirements applicability for CSI-RS based L1 measurement will be defined to ensure existing gap can cover the CSI-RS configuration in the same frequency layer. (CATT)
* Option 3: For CSI-RS based L1 with gap measurement, if RAN4 also agree to consider semi-persistent CSI-RS transmission and measurements, may be pre-MG can be introduced for semi-persistent CSI-RS measurements. (CATT)
* Option 4: RAN4 to further discuss type of MG for the CSI-RS based L1-RSRP measurements. (Ericsson)

**Issue 3-10: CSI-RS based L1 measurement w.r.t active BWP**

**<Candidate solutions>**

* Option 1: CSI-RS based L1-RSRP measurement outside active BWP is a typical scenario and should be considered in R19 LTM. (CATT)
* Option 2: Deprioritize CSI-RS based L1-RSRP measurement outside active BWP in R19. (MTK, Xiaomi, OPPO)
* Option 3: Support CSI-RS based L1-RSRP measurement within active BWP and outside active BWP, and same principle can be used as start point, e.g., defined a window to restrict the CSI-RS within gap which is used for CSI-RS based L3 measurement. (ZTE)
* Option 4: If RAN4 agree to define requirements for both within active BWP and outside active BWP, an optional UE capability for CSI-RSs are outside active BWP shall be introduced. Prefer to deprioritize the case where CSI-RS for LTM L1 measurements are outside active BWP(s). (vivo)
* Option 5: From RRM requirement perspective, RAN4 further discuss which option is taken as the clarification for ‘the CSI-RS of candidate cell outside active BWP’ in R19 LTM:
	+ Option 5a: a CSI-RS resource is regarded as outside active BWP if the frequency domain occupied RBs of the CSI-RS include at least one RB that is outside any active BWP.
	+ Option 5b: a CSI-RS resource is regarded as outside active BWP if the frequency domain occupied RBs of the CSI-RS are all outside active BWP(s) of the UE.
	+ Option 5c: a CSI-RS resource is regarded as outside active BWP if the frequency domain occupied RBs of the CSI-RS include no more than 48 RBs within any active BWP.

**Issue 3-11: Restriction on CSI-RS resource configuration**

**<Candidate solutions>**

* Option 1: It is proposed to introduce a CSI-RS based L1 measurement timing configuration. (Apple)
* Option 2: RAN4 requirements apply only when all CSI-RS resources on candidate cells on the same layer are configured with the SCS and CP type. (Huawei, Qualcomm)
* Option 3: Only the CSI-RS resources with the same center frequency, SCS and CP type can be measured within one measurement gap occasion. (Huawei)
* Option 4: The CSI-RSs of the target cells are considered as the same frequency layer if the SSBs of these target cells are of the same SSB frequency, SCS and CP type. (vivo)

**Issue 3-12: Scenarios to be considered w.r.t. RTD**

**<Candidate solutions>**

* Option 1: Not to define CSI-RS based L1-RSRP measurement requirements on neighbor cell for RTD>CP case. (MTK)
* Option 2: Either Alt 1 or Alt 2 is ok. RTD reporting might be needed if option 2 is adopted. (Apple)
* Option 3: Support RTD>CP case for CSI-RS based L1-RSRP measurement. (CT)
	+ Option 3a: define the requirements for RTD>CP. Need further clear definition of RTD.
* Option 4: Define requirements for both RTD<CP and RTD>CP. Introduce an optional UE capability for RTD>CP. (vivo)
* Option 5: RTD < CP, and RTD > CP (Ericsson, ZTE)
	+ Option 5a: RTD < CP, and RTD > CP UE capability for supporting RTD>CP can be introduced. (CMCC, vivo)
* Option 6: As the network does not know UE RTD conditions, requirements for RTD > CP shall be defined for rel-19 LTM. Whether the support of these requirements is up to UE capability or not can be FFS. (Nokia)
* Option 7: RAN4 to limit the applicable condition for CSI-RS-based L1-RSRP measurement to scenarios where RTD is not larger than a certain value, e.g., CP length. The detailed side condition can be discussed together with the solution for direct/indirect RTD value reporting to NW in RAN4#114. (Qualcomm)
* Option 8: RAN4 to consider introducing a solution to address the ambiguity issue regarding RRM requirement applicability due to RTD being larger than CP. The detailed solution can be discussed in RAN4#114. (Qualcomm)

**Issue 3-13: Definition of frequency layer**

**<Candidate solutions>**

* Option 1: Two CSI Resource are of same frequency layer if they have same SCS, CP type, BW, center frequency, and the CSI-RS occasions are fully/partially overlapping in time domain. (Ericsson)
* Option 2: Not to define new terminology of “frequency layer” for CSI-RS based L1-RSRP measurement. Discuss directly the inter-frequency CSI-RS scenarios where CSI-RS resources have similar properties (SCS, CP type, periodicity) (Nokia)
* Option 3: If RAN4 concludes not to define CSI-RS based L1 measurement requirements for both RTD>CP case and CSI-RS outside active BWP, it is not necessary to define “frequency layer”(MTK)
* Option 4: From RRM requirement perspective, at least if RRM requirements for CSI-RSs outside active BWP are to be considered, RAN4 needs to clarify the frequency layer of the CSI-RS based L1 measurement. (vivo)
	+ The CSI-RSs of the target cells are considered as the same frequency layer if the SSBs of these target cells are of the same SSB frequency, SCS and CP type.
	+ No RRM requirements are defined, if CSI-RSs on the same frequency layer are configured with the different SCS or CP type.
	+ Note: No restriction on the center frequency and/or BW of the CSI-RS.

**Issue 3-14: Requirement applicability**

**<Candidate solutions>**

* Option 1: CSI-RS based measurement requirements are applicable if the UE measured SSB based L3 measurements less than X seconds before the CSI-RS measurement. (Ericsson)
* Option 2: Only the CSI-RS resources with the same center frequency, SCS and CP type can be measured within one measurement gap occasion. (Huawei)
* Option 3: The requirements apply all CSI-RS resources on candidate cells on the same layer are configured with the SCS and CP type. (Huawei)
* Option 4: There are some implicit restrictions on CSI-RS resources configuration, e.g., the CSI-RS resources on time domain are supposed to be aligned with measurement gap. However this is network configuration, and there is no specification impact. (Huawei)

**Issue 3-15: Whether to consider CSI-RS based L1-SINR measurement**

**<Candidate solutions>**

* Option 1: RAN4 doesn’t need to define the RRM requirements for CSI-RS based L1-SINR measurement. (CATT)
* Option 2: RAN4 focus on CSI-RS based L1-RSRP measurement and FFS on L1-SINR measurement until it is officially confirmed by RAN1. (Apple, Qualcomm, ZTE)
* Option 3: RAN4 focus on CSI-RS based L1-RSRP measurement. (Samsung)

**Issue 3-16: CSI acquisition on candidate cell(s) before or during LTM cell switch**

**<Candidate solutions>**

* Option 1: RAN4 to wait for further progress on the details of early CSI acquisition from other working groups. (Qualcomm, ZTE)

**Issue 3-17: CSI-RS accuracy requirements**

**<Candidate solutions>**

* Option 1: RAN4 to discuss the CSI-RS accuracy requirements during performance part and CSI-RS based L1-RSRP accuracy of the serving cell can be used as baseline. (ZTE, Apple)

**Issue 3-17: other**

**<Candidate solutions>**

* Option 1: Although point A of the CSI-RS is per-resource configured, RAN4 not to consider CSI-RS based L1 measurement on any SCell (s) in any candidate CG in Rel-19.

**Conditional LTM**

**Issue 1-1-1: The applicable scenarios for conditional LTM**

* FFS: RAN4 requirements of CLTM which is triggered by L1 measurement (e.g. event LTM3 and LTM5) does not apply to candidate cells on deactivated SCC, including both serving cell and neighbor cells.
* Note: This can be revisited if RAN4 agreed to introduce measurement requirements for L1 measurement on deactivated SCC.

**Issue 1-1-2: Measurement requirements on conditional LTM**

< **Way forward** > FFS the following proposal:

* Support L3 measurement based conditional LTM for FR1 from RAN4 perspective.
* Note: QC need further check. Continue to discuss in the next meeting.

Early synchronization and TCI state activation

**Issue 1-2-1: Early UL Synchronization**

For UE based TA measurement:

< **Way forward** > FFS the following proposals:

* Define RRM requirements for UE based TA measurement. (CTC, CMCC, vivo, QC, CATT)
* Do not define RRM requirements for UE based TA measurement. (Apple, MTK)

Conditional LTM delay

**Issue 1-3-1: General aspects on Conditional LTM delay**

< **Way forward** > FFS the following proposals:

* Proposal 1: CHO requirements framework can be used as baseline for Conditional LTM.
* Proposal 2: Wait for further progress in other working groups and postpone detailed discussions on whether and how to define RRM requirements for each component of C-LTM delay.
* Proposal 3: Support performing T/F fine tracking (TΔ) if needed at first and then Tprocessing, to reduce the interruption time during conditional LTM.
* Proposal 4: Rel-18 UE capability for early ASN.1 decoding or fast RRC processing shall be supported for Rel-19 Conditional LTM.

**Issue 1-3-2: The starting point of conditional LTM delay**

< **Way forward** > FFS the following proposals:

* Proposal 1: The starting point of conditional LTM is the end of the last TTI containing the RRC command for conditional LTM.
* Proposal 2: The starting point is the time when UE transmits an RRCReconfigurationComplete message that is for confirmation of the LTM configuration.
* Proposal 3: Similar as event-triggered L1 reporting. The CondEvent is met over the air.
* Proposal 4: Wait for more RAN2 agreements.

**Issue 1-3-4: The components of conditional LTM delay**

< **Way forward** > FFS the following proposals:

* Proposal 1: DCLTM = TRRC + TEvent\_DU + Tmeasure + TCLTM\_execution + Tinterrupt +TEarly\_process.
	+ Proposal 1a: TEarly\_process is the time for early candidate TCI State activation/deactivation and early TA acquisition. The time for early TA acquisition could be as the time for UE based TA measurement or PDCCH ordered early TA acquisition further.
* Proposal 2: DCLTM = TRRC + TEvent\_DU + Tmeasure + Tinterrupt + TCHO\_execution.
* Proposal 3: DCLTM = TEvent\_DU + Tmeasure + Tinterrupt + TCHO\_execution.
* Proposal 4: DC-LTM = TRRC + TEvent\_DU + Tmeasure + TCHO\_execution + TLTM-processing + Tfirst-RS + TRS-proc + TLTM-IU.
	+ Proposal 4a: TLTM-processing, Tfirst-RS, TRS-proc, TLTM-IU which are defined in R18 LTM cell switch delay can be reused.
* Proposal 5: The delay shall include the measurements time (Tmeasure) and the conditional execution preparation time (TCLTM\_execution) and interruption time (Tinterrupt) at least. Others are waiting for further progress in other groups.
* Proposal 6: TEvent\_DU and Tmeasure like components are likely needed, exact components are needed to wait for more RAN2 agreements.
* Proposal 7: Wait for RAN2 progress.

**Issue 1-3-5: TRRC**

< **Way forward** > FFS the following proposal:

* Proposal 1: TRRC is the RRC procedure delay.

**Issue 1-3-6: TEvent\_DU**

< **Way forward** > FFS the following proposals:

* Proposal 1: TEvent\_DU is the delay uncertainty which is the time from when the UE successfully decodes a conditional LTM command until a condition exists at the measurement reference point which will trigger the conditional intra-CU LTM.
* Proposal 2: Wait for more RAN2 progress.
	+ Proposal 2a: If certain process can guarantee that UE first completes DL sync and UL sync and then performs execution condition evaluation, the delay for DL sync and UL sync can be contained in TEvent\_DU.
* Proposal 3: Wait for more RAN2 agreements.

**Issue 1-3-7: Tmeasure**

< **Way forward** > FFS the following proposals:

* Proposal 1: Tmeasure is measurements time. It is defined from the end of TEvent\_DU until UE executes LTM to a target cell and interruption time starts.
	+ Proposal 1a:
	+ If SSB based L1-RSRP measurement is used in the event, Tmeasure is same as one measurement period of SSB based L1-RSRP measurement as introduced in R18.
	+ If CSI-RS based L1-RSRP measurement is used in the event, Tmeasure is same as one measurement period of CSI-RS based L1-RSRP measurement which will be introduced in R19.
		- Proposal 1b: If L3 measurement is used in the event, Tmeasure is same as one measurement period of legacy L3 measurement.
		- Proposal 1c: FFS on L3 measurement period depending on the conclusion of whether L3 based measurement is considered in R19 C-LTM.
* Proposal 2: Wait for more RAN2 progress.

**Issue 1-3-8: TCLTM\_execution / TLTM\_execution**

< **Way forward** > FFS the following proposal:

* Proposal 1: TCLTM\_execution is the UE execution preparation time for conditional intra-CU LTM and starts after UE realizes the condition of LTM is met and identity of the target cell is determined.

**Issue 1-3-9: Tinterrupt**

< **Way forward** > FFS the following proposals:

* Proposal 1: Tinterrupt is the time between when the UE starts to execute the conditional intra-CU LTM to the target cell and the time the UE starts to transmit the first UL message on the target cell.
* Proposal 2: It highly depends on further discussion on procedure design in RAN2 group.
* Proposal 3: The term Tinterrupt may induce ambiguity when define conditional LTM delay, as interruptions may also happen in early PDCCH RACH procedure.
* Proposal 4: ASN.1 decoding and validity check and fine DL synchronization (first SSB) is not part of Tinterrupt but may be part of DCLTM if not done before the starting point of the cell switch delay.

**Issue 1-3-10: The components of Tinterrupt**

< **Way forward** > FFS the following proposal:

* Proposal 1: Tinterrupt = TLTM-processing + Tfirst-RS + TRS-proc + TLTM-IU.
* TLTM-processing is the time for UE processing, consisting of applying the target cell parameters and L1/L2 change.
* Tfirst-RS is the time for fine time tracking and acquiring full timing information of the target cell.
* TRS-proc is the time for SSB processing.
* TLTM-IU is the interruption uncertainty during LTM cell switch.

Subsequent Conditional LTM

**Issue 1-4-1: General aspects on Subsequent Conditional LTM delay**

|  |
| --- |
| *RAN4#112bis***< Agreement>*** RAN4 to define cell switch delay requirements for conditional LTM
* RAN4 to define subsequent conditional LTM requirement unless there is any technical issue identified.
* Wait for other WGs input to further discuss detailed RRM requirements.
 |

< **Way forward** > FFS the following proposals:

* Proposal 1: Subsequent conditional LTM cell switch delay can be discussed based on the conclusion of conditional LTM delay.
	+ Proposal 1a: TRRC will not be considered in subsequent conditional LTM delay.
	+ Proposal 1b: TEvent\_DU is the delay uncertainty which is the time from when UE transmits RRCReconfigurationcomplete message for the previous CLTM until a condition exists at the measurement reference point which will trigger the subsequent CLTM.
* Proposal 2: Wait for further progress in other working groups and postpone detailed discussions on whether and how to define RRM requirements for subsequent conditional LTM.

**Issue 1-4-2: The starting point of Subsequent conditional LTM delay**

< **Way forward** > FFS the following proposals:

* Proposal 1: The starting point of the subsequent conditional LTM delay is when UE transmits RRCReconfigurationcomplete message for the previous conditional LTM.
* Proposal 2: Wait for RAN2 further progress.

**Issue 1-4-4: The components of subsequent conditional LTM delay**

< **Way forward** > FFS the following proposal:

* Proposal 1: DLTM\_Conditional\_subsequent = TEvent\_DU + Tmeasure + TLTM\_execution + TLTM-interrupt.
* TEvent\_DU is the delay uncertainty which is the time from when the UE successfully transmits an RRCReconfigurationcomplete message for the previous cell switch until a condition exists at the measurement reference point which will trigger the conditional LTM.
* Tmeasure is measurements time.
* TLTM\_execution is the UE execution preparation time for conditional LTM, and starts after UE realizes the condition of conditional LTM is met and identity of the target cell is determined. TLTM\_execution can be up to 10ms.
* TLTM-interrupt is the interruption time as specified in Rel-18.

## 2.5 RAN5

#### 2.5.1 Agreements

#### 2.5.2 Remaining Open issues

#### 2.5.3 Remaining Open issues with cross-WG dependencies

## 2.6 RAN6

#### 2.6.1 Agreements

#### 2.6.2 Remaining Open issues

## 3. Detailed progress in SA/CT WGs since last TSG meeting (for all involved WGs)

NOTE: This section only needs to be filled in for WI/SIs where there is a corresponding relevant WI/SI in SA/CT.

## 3.1 SAx/CTs

#### 3.1.1 Agreements with cross-TSG impacts

#### 3.1.2 Remaining Open issues with cross-TSG impacts

NOTE: This section should also flag any critical dependencies that need TSG attention.

## 4. References

NOTE: This can be e.g. a list of all related Tdocs in the affected WGs since last TSG, references to LSs, produced TRs/TSs, the work/study item description or status reports of previous TSGs.

RP-241914 Status Report for Work Item: NR mobility enhancements Phase 4 (rapporteur: Apple)

RP-242356 Revised Work Item: NR mobility enhancements Phase 4

**RAN1#118bis:**

*Will be added*

**RAN1#119:**

*Will be added*

**RAN2#127bis:**

R2-2408595 Important aspects of Rel-19 mobility enhancements WI Rapporteurs (Apple, China Telecom) discussion NR\_Mob\_Ph4-Core

R2-2408052 Introduction of NR mobility enhancements Phase 4 in TS 37.340 China Telecom draftCR Rel-19 37.340 18.3.0 B NR\_Mob\_Ph4-Core

R2-2408598 Introduction of NR mobility enhancements Phase 4 in TS 38.300 Apple draftCR Rel-19 38.300 18.3.0 B NR\_Mob\_Ph4-Core

R2-2409031 Multiple reference configuration for inter-CU LTM KDDI Corporation, LG Electronics, Nokia, ZTE, Rakuten, KT, CMCC, ETRI, ITL, ITRI, Fujitsu, SK telecom, Uplus discussion

R2-2407987 Discussion on Inter-CU LTM CATT discussion Rel-19 NR\_Mob\_Ph4-Core

R2-2408053 Discussion on inter-CU LTM in DC China Telecom discussion Rel-19 NR\_Mob\_Ph4-Core

R2-2408061 Discussion on remaining issues of inter-CU LTM cell switch Transsion Holdings discussion Rel-19

R2-2408087 Discussion on Inter-CU LTM CMCC discussion Rel-19 NR\_Mob\_Ph4-Core

R2-2408117 Discussion on inter-CU LTM vivo discussion Rel-19 NR\_Mob\_Ph4-Core

R2-2408193 Discussion on inter-CU LTM Xiaomi discussion Rel-19 NR\_Mob\_Ph4-Core

R2-2408259 Discussion on Inter-CU LTM standalone and DC MediaTek Inc. discussion Rel-19 NR\_Mob\_Ph4-Core

R2-2408279 Further discussion on inter-CU LTM HONOR discussion Rel-19 NR\_Mob\_Ph4-Core

R2-2408292 Discussion on Inter CU LTM Lekha Wireless Solutions discussion Rel-19

R2-2408319 Discussion on Inter-CU LTM Lenovo discussion Rel-19

R2-2408328 Discussion on issues for supporting inter-CU LTM Sharp discussion Rel-19 NR\_Mob\_Ph4-Core

R2-2408498 Discussion on open issues for inter-CU LTM OPPO discussion Rel-19 NR\_Mob\_Ph4-Core

R2-2408524 Discussion on inter-CU LTM ZTE Corporation discussion Rel-19 NR\_Mob\_Ph4-Core

R2-2408596 Open items for inter-CU LTM in SA and DC cases Apple discussion NR\_Mob\_Ph4-Core

R2-2408607 Discussion on inter-CU LTM with DC LG Electronics Inc. discussion Rel-19 NR\_Mob\_Ph4-Core

R2-2408659 Discussion on inter-CU LTM NEC discussion Rel-19 NR\_Mob\_Ph4-Core

R2-2408682 The Rel-19 ID for subsequent inter-CU LTM ITRI discussion NR\_Mob\_Ph4-Core

R2-2408714 LTM for Inter-CU Sony discussion Rel-19 NR\_Mob\_Ph4

R2-2408752 On Inter-CU LTM Open Issues Nokia discussion

R2-2408758 DC aspects for inter-CU LTM Ericsson discussion Rel-19 NR\_Mob\_Ph4-Core

R2-2408860 Further Considerations to Support Inter-CU LTM Samsung discussion Rel-19 NR\_Mob\_Ph4-Core

R2-2408867 Initial considerations for inter-CU LTM Rakuten Mobile, Inc discussion Rel-19

R2-2408870 LTM in DC scenarios Rakuten Mobile, Inc discussion Rel-19

=> Withdrawn

R2-2408876 LTM in DC scenarios Rakuten Mobile, Inc discussion Rel-19

R2-2408957 Discussion on Inter-CU LTM InterDigital, Europe, Ltd. discussion Rel-19

R2-2408959 Further Discussion to Support the inter -CU LTM ETRI discussion Rel-19

R2-2408966 Inter-gNB LTM Qualcomm Innovation Center Inc discussion

R2-2409000 Discussion on Inter-CU LTM Kyocera discussion Rel-19

R2-2409009 Discussion on fast LTM recovery support for Rel-19 LTM Fujitsu discussion Rel-19 NR\_Mob\_Ph4-Core

R2-2409142 Inter-CU LTM Huawei, HiSilicon discussion Rel-19 NR\_Mob\_Ph4-Core

R2-2407988 L1 event triggered measurement reporting CATT discussion Rel-19 NR\_Mob\_Ph4-Core

R2-2408021 Remaining issues of L1 event triggered measurement reporting Xiaomi discussion Rel-19 NR\_Mob\_Ph4-Core

R2-2408054 Discussion on L1 event triggered measurement reporting China Telecom discussion Rel-19 NR\_Mob\_Ph4-Core

R2-2408062 Discussion on L1 event triggered measurement reporting Transsion Holdings discussion Rel-19

R2-2408070 Discussion on L1 event triggered measurement reporting CMCC discussion Rel-19 NR\_Mob\_Ph4-Core

R2-2408118 Discussion on LTM measurement event evaluation and reporting vivo discussion Rel-19 NR\_Mob\_Ph4-Core

R2-2408150 Discussions on event triggered L1 measurement reporting Fujitsu discussion Rel-19 NR\_Mob\_Ph4-Core

R2-2408164 Discussion on L1 event triggered measurement reporting Spreadtrum Communications discussion Rel-19

R2-2408260 Measurement reporting discussion MediaTek Inc. discussion Rel-19 NR\_Mob\_Ph4-Core

R2-2408280 Discussion on measurement event evaluation and report HONOR discussion Rel-19 NR\_Mob\_Ph4-Core

R2-2408320 L1 Measurement enhancements Lenovo discussion Rel-19

R2-2408329 Discussion on issues for L1 event triggered measurement reporting Sharp discussion Rel-19 NR\_Mob\_Ph4-Core

R2-2408384 Discussion on LTM measurement reporting configuration Baicells discussion

R2-2408455 L1 measurement event configuration and reporting Panasonic discussion Rel-19

R2-2408492 Discussion on L1 event triggered measurement Jio discussion

R2-2408499 Open issues for event triggered L1 measurement reporting OPPO discussion Rel-19 NR\_Mob\_Ph4-Core

R2-2408525 Discussion on L1 event triggered measurement reporting ZTE Corporation discussion Rel-19 NR\_Mob\_Ph4-Core

R2-2408597 LTM event triggered measurement reporting Apple discussion NR\_Mob\_Ph4-Core

R2-2408613 Details of L1 event triggered measurement reporting NEC discussion Rel-19 NR\_Mob\_Ph4-Core

R2-2408759 Event definition and MAC CE content for L1 event-triggered measurements Ericsson discussion Rel-19 NR\_Mob\_Ph4-Core

R2-2408783 Discussion on event-triggered measurement report Huawei, HiSilicon discussion Rel-19 NR\_Mob\_Ph4-Core

R2-2408871 Event based L1 measurements triggered LTM candidate cell addition/release Rakuten Mobile, Inc discussion Rel-19

R2-2408948 On L1 Measurement Reporting Enhancements for Rel-19 LTM Nokia discussion Rel-19 NR\_Mob\_Ph4

R2-2408965 Measurement enhancements for LTM Qualcomm Incorporated discussion

R2-2408996 L1 measurement reporting procedures for LTM enhancements Kyocera discussion Rel-19

R2-2409033 Discussion on Event-triggered L1 measurement reporting NTT DOCOMO, INC. discussion Rel-19

R2-2409065 Event LTM report LG Electronics Inc. discussion NR\_Mob\_Ph4-Core

R2-2409096 Support of Event Triggered L1 Measurement Reporting Samsung discussion Rel-19 NR\_Mob\_Ph4-Core

R2-2409105 Discussion on event triggered L1 measurement reporting ITL discussion Rel-19 NR\_Mob\_Ph4-Core

R2-2409127 Discussion on L1 event triggered measurement reporting KDDI Corporation discussion

R2-2409192 Event triggered L1 measurement reporting for LTM Interdigital, Inc. discussion Rel-19 NR\_Mob\_Ph4-Core

R2-2408055 Discussion on conditional intra-CU LTM China Telecom discussion Rel-19 NR\_Mob\_Ph4-Core

R2-2408063 Discussion on supporting conditional intra-CU LTM Transsion Holdings discussion Rel-19

R2-2408088 Disucssion on conditional LTM CMCC discussion Rel-19 NR\_Mob\_Ph4-Core

R2-2408119 Discussion on conditional LTM vivo discussion Rel-19 NR\_Mob\_Ph4-Core

R2-2408151 Discussion on conditional LTM Fujitsu discussion Rel-19 NR\_Mob\_Ph4-Core

R2-2408165 Discussion on conditional intra-CU LTM Spreadtrum Communications discussion Rel-19

R2-2408194 Discussion on conditional LTM Xiaomi discussion Rel-19 NR\_Mob\_Ph4-Core

R2-2408261 Initial thinking on conditional LTM MediaTek Inc. discussion Rel-19 NR\_Mob\_Ph4-Core

R2-2408281 Discussion on conditional LTM HONOR discussion Rel-19 NR\_Mob\_Ph4-Core

R2-2408330 Discussion on conditional LTM Sharp discussion Rel-19 NR\_Mob\_Ph4-Core

R2-2408500 Discussion on conditional LTM OPPO discussion Rel-19 NR\_Mob\_Ph4-Core

R2-2408507 Considerations for conditional LTM Panasonic discussion Rel-19

R2-2408526 Discussion on conditional intra-CU LTM ZTE Corporation discussion Rel-19 NR\_Mob\_Ph4-Core

R2-2408599 Scoping conditional LTM for Rel-19 Apple discussion NR\_Mob\_Ph4-Core

R2-2408608 Discussion on conditional LTM LG Electronics Inc. discussion Rel-19 NR\_Mob\_Ph4-Core

R2-2408614 Discussion on conditional intra-CU LTM NEC discussion Rel-19 NR\_Mob\_Ph4-Core

R2-2408640 Conditional LTM basics Lenovo discussion Rel-19 NR\_Mob\_Ph4-Core

R2-2408724 Conditional Intra-CU LTM Sony discussion Rel-19 NR\_Mob\_Ph4

R2-2408760 Baseline assumptions for conditional LTM Ericsson discussion Rel-19 NR\_Mob\_Ph4-Core

R2-2408928 On conditional LTM Nokia discussion Rel-19 NR\_Mob\_Ph4

R2-2408960 Discussion on conditional intra-CU LTM ETRI discussion Rel-19

R2-2408964 Conditional intra-gNB LTM Qualcomm Incorporated discussion

R2-2408997 Discussion on Conditional LTM KT Corp. discussion

R2-2409001 Discussion on Conditional Intra-CU LTM Kyocera discussion Rel-19

R2-2409035 Discussion on Conditional intra-CU LTM NTT DOCOMO, INC. discussion Rel-19

R2-2409097 Support of Conditional Intra-CU LTM Samsung discussion Rel-19 NR\_Mob\_Ph4-Core

R2-2409106 Discussion on Conditional LTM ITL discussion Rel-19 NR\_Mob\_Ph4-Core

R2-2409111 Discussion on Conditional mobility CEWiT discussion Rel-19 NR\_Mob\_Ph4-Core

R2-2409143 Intra-CU conditional LTM Huawei, HiSilicon discussion Rel-19 NR\_Mob\_Ph4-Core

R2-2409193 Conditional LTM Interdigital, Inc. discussion Rel-19 NR\_Mob\_Ph4-Core

**RAN2#128:**

R2-2409514 LS on the support of semi-persistent CSI-RS resource for LTM candidate cells (R1-2409283; contact: Fujitsu) RAN1 LS in Rel-19 NR\_Mob\_Ph4-Core To:RAN3 Cc:RAN2

R2-2409534 Reply LS on security handling for inter-CU LTM in non-DC cases (S3-244316; contact: Samsung) SA3 LS in Rel-19 NR\_Mob\_Ph4-Core To:RAN2 Cc:RAN3

R2-2409535 Reply LS on security key update of inter-CU SCG LTM (S3-244317; contact: Xiaomi) SA3 LS in Rel-19 NR\_Mob\_Ph4-Core To:RAN2 Cc:RAN3

R2-2409979 Introduction of NR mobility enhancements Phase 4 in TS 38.300 Apple draftCR Rel-19 38.300 18.3.0 B NR\_Mob\_Ph4-Core

R2-2410112 Introduction of NR mobility enhancements Phase 4 in TS 37.340 China Telecom draftCR Rel-19 37.340 18.3.0 B NR\_Mob\_Ph4-Core

R2-2409593 Discussion on Inter-CU LTM CATT discussion Rel-19 NR\_Mob\_Ph4-Core

R2-2409616 Discussion on remaining issues of inter-CU LTM LG Electronics Inc. discussion Rel-19 NR\_Mob\_Ph4-Core

R2-2409764 Discussion on inter-CU LTM vivo discussion Rel-19 NR\_Mob\_Ph4-Core

R2-2409863 Discussion on Inter CU LTM Lekha Wireless Solutions discussion Rel-19

R2-2409873 Discussion on open issues for inter-CU LTM OPPO discussion Rel-19 NR\_Mob\_Ph4-Core

R2-2409886 Further discussion on remaining issues of inter-CU LTM cell switch Transsion Holdings discussion Rel-19

R2-2409973 Important issues in Inter-CU LTM Apple discussion Rel-19 NR\_Mob\_Ph4-Core

R2-2409980 Important issues in Inter-CU LTM Apple discussion Rel-19 NR\_Mob\_Ph4-Core Withdrawn

R2-2410012 Further Discussion on inter -CU LTM ETRI discussion Rel-19

R2-2410021 Discussion on inter-CU LTM Xiaomi discussion Rel-19 NR\_Mob\_Ph4-Core

R2-2410035 Discussion on inter-CU LTM in non-DC and DC cases Fujitsu discussion Rel-19 NR\_Mob\_Ph4-Core

R2-2410113 Discussion on inter-CU LTM China Telecom discussion Rel-19 NR\_Mob\_Ph4-Core

R2-2410118 Leftover issues on Inter-CU LTM MediaTek Inc. discussion Rel-19 NR\_Mob\_Ph4-Core

R2-2410228 Discussion on reference configuration for inter-CU LTM ITRI discussion NR\_Mob\_Ph4-Core

R2-2410242 Discussion on inter-CU LTM NEC discussion Rel-19 NR\_Mob\_Ph4-Core

R2-2410279 Remaining issues for Inter-CU LTM Lenovo discussion Rel-19

R2-2410323 Discussion on Inter-CU LTM CMCC discussion Rel-19 NR\_Mob\_Ph4-Core

R2-2410382 LTM for Inter-CU Sony discussion Rel-19 NR\_Mob\_Ph4

R2-2410443 Dsicussion on Inter-CU LTM ZTE Corporation discussion Rel-19 NR\_Mob\_Ph4-Core

R2-2410466 On remaining issues for Inter-CU LTM Nokia discussion

R2-2410518 Inter-CU LTM Huawei, HiSilicon discussion Rel-19 NR\_Mob\_Ph4-Core

R2-2410530 Security handling for Inter-CU LTM Qualcomm Incorporated discussion

R2-2410544 Security handling and DC aspects for inter-CU LTM Ericsson discussion Rel-19 NR\_Mob\_Ph4-Core

R2-2410598 Discussion on Inter-CU LTM InterDigital, Inc. discussion Rel-19

R2-2410660 Potential issue on coexistence of inter-MN LTM and intra-SN LTM Kyocera discussion Rel-19

R2-2410690 Further discussion on inter-CU LTM HONOR discussion Rel-19 NR\_Mob\_Ph4-Core

R2-2410703 Discussion on issues for supporting inter-CU LTM Sharp discussion Rel-19 NR\_Mob\_Ph4-Core

R2-2410742 Discussion on Inter-CU LTM Rakuten Mobile, Inc discussion Rel-19

R2-2410752 Further Considerations to Support Inter-CU LTM Samsung discussion Rel-19 NR\_Mob\_Ph4-Core

R2-2410763 LTM in DC scenarios Rakuten Mobile, Inc discussion

R2-2410856 Discussion on inter-CU LTM DENSO CORPORATION discussion Rel-19 NR\_Mob\_Ph4-Core

R2-2409594 L1 event triggered measurement reporting CATT discussion Rel-19 NR\_Mob\_Ph4-Core

R2-2409630 Event LTM triggered measurement report LG Electronics Inc. discussion NR\_Mob\_Ph4-Core

R2-2409657 Discussion on event triggered L1 MR MediaTek Inc. discussion Rel-19 NR\_Mob\_Ph4-Core

R2-2409659 Remaining issues of L1 event triggered measurement reporting Xiaomi discussion Rel-19 NR\_Mob\_Ph4-Core

R2-2409765 Discussion on LTM measurement event evaluation and reporting vivo discussion Rel-19 NR\_Mob\_Ph4-Core

R2-2409802 Event triggered L1 measurement reporting for LTM. Interdigital, Inc. discussion Rel-19 NR\_Mob\_Ph4-Core

R2-2409842 Discussions on event triggered L1 measurement reporting Fujitsu discussion Rel-19 NR\_Mob\_Ph4-Core

R2-2409874 Open issues for event triggered L1 measurement reporting OPPO discussion Rel-19 NR\_Mob\_Ph4-Core

R2-2409887 Discussion on L1 event triggered measurement reporting Transsion Holdings discussion Rel-19

R2-2409952 LTM event triggered measurement reporting Apple discussion Rel-19 NR\_Mob\_Ph4-Core

R2-2409987 L1 event-triggered measurement reporting for LTM Qualcomm Incorporated discussion

R2-2410062 Further details of L1 event triggered measurement reporting NEC discussion Rel-19 NR\_Mob\_Ph4-Core

R2-2410114 Discussion on L1 event triggered measurement reporting China Telecom discussion Rel-19 NR\_Mob\_Ph4-Core

R2-2410153 Discussion on L1 event-triggered measurement reporting Huawei, HiSilicon discussion Rel-19 NR\_Mob\_Ph4-Core

R2-2410180 Discussion on L1 measurement reporting for LTM ASUSTeK discussion Rel-19 NR\_Mob\_Ph4-Core

R2-2410244 Discussion on event triggered L1 report Huawei, HiSilicon discussion Rel-19 NR\_Mob\_Ph4-Core Withdrawn

R2-2410280 Event based L1 measurement report Lenovo discussion Rel-19

R2-2410306 L1 measurement event configuration and reporting Panasonic discussion Rel-19

R2-2410340 Discussion on L1 event triggered measurement reporting CMCC discussion Rel-19 NR\_Mob\_Ph4-Core

R2-2410399 Discussion on L1 event triggered measurement reporting Rakuten Mobile, Inc discussion Rel-19

R2-2410441 On L1 Measurement Reporting Enhancements for Rel-19 LTM Nokia discussion Rel-19 NR\_Mob\_Ph4-Core

R2-2410444 Discussion on L1 event triggered measurement reporting ZTE Corporation discussion Rel-19 NR\_Mob\_Ph4-Core

R2-2410545 Event definition and MAC CE content for L1 event-triggered measurements Ericsson discussion Rel-19 NR\_Mob\_Ph4-Core

R2-2410567 Discussion on L1 event triggered measurement Jio discussion

R2-2410571 Open issues for L1 event triggered measurement reporting Fraunhofer HHI, Fraunhofer IIS discussion

R2-2410621 Support of Event Triggered L1 Measurement Report Samsung discussion Rel-19 NR\_Mob\_Ph4-Core

=> Revised in R2-2410888

R2-2410888 Support of Event Triggered L1 Measurement Report Samsung discussion Rel-19 NR\_Mob\_Ph4-Core

R2-2410648 Details of event-triggered L1 measurement reporting for LTM Kyocera discussion Rel-19

R2-2410663 Discussion on LTM measurement reporting configuration Baicells discussion

R2-2410688 Discussion on measurement event evaluation and report HONOR discussion Rel-19 NR\_Mob\_Ph4-Core

R2-2410702 L1 event triggered measurement reporting Sharp discussion Rel-19 NR\_Mob\_Ph4-Core

R2-2410708 Discussion on L1 event triggered measurement reporting KDDI Corporation discussion Rel-19

R2-2410710 Discussion on event triggered L1 measurement reporting ITL discussion Rel-19 NR\_Mob\_Ph4

R2-2409595 Discussion on Conditional Intra-CU LTM CATT discussion Rel-19 NR\_Mob\_Ph4-Core

R2-2409617 Discussion on conditional LTM LG Electronics Inc. discussion Rel-19 NR\_Mob\_Ph4-Core

R2-2409658 Further discussion on Conditional LTM MediaTek Inc. discussion Rel-19 NR\_Mob\_Ph4-Core

R2-2409766 Discussion on conditional LTM vivo discussion Rel-19 NR\_Mob\_Ph4-Core

R2-2409803 Conditional LTM. Interdigital, Inc. discussion Rel-19 NR\_Mob\_Ph4-Core

R2-2409843 Discussion on conditional Intra-CU LTM Fujitsu discussion Rel-19 NR\_Mob\_Ph4-Core

R2-2409875 Discussion on conditional LTM OPPO discussion Rel-19 NR\_Mob\_Ph4-Core

R2-2409888 Further discussion on supporting intra-CU conditional LTM Transsion Holdings discussion Rel-19

R2-2409953 Conditional Intra-CU LTM Topics Apple discussion Rel-19 NR\_Mob\_Ph4-Core

R2-2409988 Conditional intra-CU LTM Qualcomm Incorporated discussion

R2-2410013 Discussion on conditional intra-CU LTM ETRI discussion Rel-19

R2-2410022 Discussion on conditional LTM Xiaomi discussion Rel-19 NR\_Mob\_Ph4-Core

R2-2410044 Discussion on Conditional Intra CU LTM Lekha Wireless Solutions discussion Rel-19

R2-2410064 Discussion on conditional intra-CU LTM NEC discussion Rel-19 NR\_Mob\_Ph4-Core

R2-2410115 Discussion on conditional intra-CU LTM China Telecom discussion Rel-19 NR\_Mob\_Ph4-Core

R2-2410136 Discussion on conditional intra-CU LTM Spreadtrum, UNISOC discussion Rel-19

R2-2410230 Discussion on early TA acquisition for conditional intra-CU LTM ITRI discussion NR\_Mob\_Ph4-Core

R2-2410252 Discussion on Conditional LTM KT Corp. discussion

R2-2410324 Discussion on Conditional LTM CMCC discussion Rel-19 NR\_Mob\_Ph4-Core

R2-2410389 Conditional Intra-CU LTM Sony discussion Rel-19 NR\_Mob\_Ph4

R2-2410445 Discussion on conditional intra-CU LTM ZTE Corporation discussion Rel-19 NR\_Mob\_Ph4-Core

R2-2410448 Conditional LTM Scenarios and remaining points Lenovo discussion Rel-19 NR\_Mob\_Ph4-Core

R2-2410465 Discussion on conditional intra-CU LTM Panasonic discussion Rel-19

R2-2410519 Intra-CU conditional LTM Huawei, HiSilicon discussion Rel-19 NR\_Mob\_Ph4-Core

R2-2410546 Further considerations for conditional LTM Ericsson discussion Rel-19 NR\_Mob\_Ph4-Core

R2-2410622 Support of Conditional Intra-CU LTM Samsung discussion Rel-19 NR\_Mob\_Ph4-Core

=> Revised in R2-2410889

R2-2410889 Support of Conditional Intra-CU LTM Samsung discussion Rel-19 NR\_Mob\_Ph4-Core

R2-2410661 Discussion on Conditional Intra-CU LTM Kyocera discussion Rel-19

R2-2410689 Discussion on conditional LTM HONOR discussion Rel-19 NR\_Mob\_Ph4-Core

R2-2410695 Discussion on Conditional intra-CU LTM NTT DOCOMO, INC. discussion Rel-19

R2-2410701 Discussion on conditional LTM Sharp discussion Rel-19 NR\_Mob\_Ph4-Core

R2-2410709 Discussion on Conditional LTM ITL discussion Rel-19 NR\_Mob\_Ph4-Core

R2-2410782 Discussion on Conditional LTM CEWiT discussion Rel-19 NR\_Mob\_Ph4-Core

R2-2410795 On conditional LTM Nokia discussion Rel-19 NR\_Mob\_Ph4

**RAN3 #125bis:**

1. R3-245841 (TP for LTM BLCR for TS38.300): Update on inter-CU LTM basic procedure Huawei, Nokia, China Telecom, Samsung, NTT Docomo, Ericsson,CATT, Lenovo, NEC, ZTE, Google, LG Electronics
2. R3-245842 (TP for TS 38.423) Xn support for inter-CU LTM Ericsson, Samsung, Nokia, China Telecom, CATT, Huawei, Google, Lenovo, NEC, ZTE, LG Electronics
3. R3-245032 (BL CR to 38.300) Support for Inter-CU LTM Nokia, Huawei, Google, China Telecom, NEC, Ericsson, LGE, ZTE, CATT, Samsung
4. R3-245007 LS on security key update of inter-CU SCG LTM RAN2(CATT)
5. R3-245040 Discussion on Rel-19 Inter-CU LTM Nokia
6. R3-245041 Discussion on Inter-CU LTM Dual Connectivity Nokia
7. R3-245045 TP (BL CR TS 38.401) L1/2 Triggered Mobility (LTM) Procedures Nokia
8. R3-245050 Discussion on inter-CU LTM ZTE Corporation
9. R3-245142 Discussion on signaling enhancement for inter-CU LTM China Telecom
10. R3-245143 Discussion on support of inter-CU LTM in NR-DC scenario China Telecom
11. R3-245144 (TP for TS38.300) On support of inter-CU LTM China Telecom
12. R3-245162 Discussion on inter-gNB-CU LTM Samsung
13. R3-245163 Additional discussion on Inter-gNB-CU LTM Samsung
14. R3-245164 (TP to BLCR for TS 38.401) Procedure on Inter-gNB-CU LTM Samsung
15. R3-245201 Discussion on the PDCP anchor based solution Huawei, Ericsson, CATT, China Telecom, CMCC,Samsung
16. R3-245202 Discussion on Inter-CU LTM procedure Huawei
17. R3-245204 (TP for LTM BLCR for TS 38.473): F1 impact for Inter-CU LTM Huawei
18. R3-245244 Discussion for Inter-CU LTM CATT
19. R3-245245 Discussion for Inter-CU LTM in DC CATT
20. R3-245246 TP for LTM BLCR for TS38.300 CATT
21. R3-245264 Discussion on Early Sync and CFRA resource configurations in inter-CU LTM Google
22. R3-245280 inter-CU LTM issues NEC
23. R3-245281 (TP to 38.423 on inter-CU LTM) inter-CU LTM related information NEC
24. R3-245316 Further discussion on XnAP signaling for inter-CU LTM Ericsson
25. R3-245318 (TP for TS 38.300) Stage-2 signalings for inter-CU LTM Ericsson
26. R3-245458 [TP to BLCR for TS 38.300] Inter-CU LTM Lenovo
27. R3-245459 [TP for TS 38.423] Inter-CU LTM Lenovo
28. R3-245460 General aspects of inter-CU SCG LTM Lenovo
29. R3-245521 Discussion on inter-CU LTM CMCC
30. R3-245522 (TP to BL CR for TS 38.300) Inter-CU LTM procedure CMCC
31. R3-245568 Continuing discussions on Inter-CU LTM signaling design LG Electronics Inc.
32. R3-245569 Baseline CR for introducing Rel-19 Mobility enhancement in E1AP LG Electronics Inc., Nokia, China Telecom, Google, Ericsson, CATT, Qualcomm, Samsung, CMCC, ZTE, Huawei, NTT Docomo, Lenovo
33. R3-245570 (TP for NR\_Mob\_Ph4 TS 38.423) LG Electronics Inc.
34. R3-245585 Discussion on inter-CU LTM non-DC case NTT DOCOMO INC..
35. R3-245643 Data forwarding and transmission in Inter-CU LTM Rakuten Mobile, Inc
36. R3-245645 Initial considerations on Inter-CU LTM Rakuten Mobile, Inc
37. R3-245652 TP to 38.423 for inter-CU LTM ZTE Corporation
38. R3-245653 TP to 38.300 for inter-CU LTM ZTE Corporation
39. R3-245676 Response to R3-245201 Qualcomm Incorporated
40. R3-245744 Signalling enhancements for inter-CU LTM HO Qualcomm Incorporated, Vodafone, Bharti Airtel (India), Jio
41. R3-245745 Enabling subsequent inter-gNB LTM by decoupling of cell and anchor changes Qualcomm Incorporated, Vodafone, NTT DOCOMO, Sony, Bharti Airtel (India), Jio
42. R3-245746 Impact analysis of coupling LTM cell switch and CU anchor changes on subsequent inter-gNB LTM Qualcomm Incorporated, Vodafone, NTT DOCOMO, Sony, Bharti Airtel (India), Jio
43. R3-245747 CB:#MobilityEnh\_LTM China Telecom, Lenovo
44. R3-245748 Summary of offline for two solutions for Inter-CU LTM Lenovo
45. R3-245203 (TP for LTM BLCR for TS38.300): Update on inter-CU LTM basic procedure Huawei
46. R3-245313 Signalling enhancements for inter-CU LTM HO Qualcomm Incorporated, Vodafone, Bharti Airtel (India)
47. R3-245314 Enabling subsequent inter-gNB LTM by decoupling of cell and anchor changes Qualcomm Incorporated, Vodafone, NTT DOCOMO, Sony, Bharti Airtel (India)
48. R3-245315 Impact analysis of coupling LTM cell switch and CU anchor changes on subsequent inter-gNB LTM Qualcomm Incorporated, Vodafone, NTT DOCOMO, Sony, Bharti Airtel (India)
49. R3-245317 (TP for TS 38.423) Xn support for inter-CU LTM Ericsson
50. R3-245798 (TP for LTM BLCR for TS38.300): Update on inter-CU LTM basic procedure Huawei
51. R3-245833 (TP for TS 38.423) Xn support for inter-CU LTM Ericsson, Samsung, Nokia, China Telecom, CATT, Huawei, Google, Lenovo, NEC
52. R3-245859 (BL CR to 38.300) Support for Inter-CU LTM Nokia, Huawei, Google, China Telecom, NEC, Ericsson, LGE, ZTE, CATT, Samsung
53. R3-245860 (BL CR to 38.423) Xn support for inter-CU LTM Ericsson, Samsung, Nokia, China Telecom, CATT, Huawei, Google, Lenovo, NEC, ZTE, LG Electronics

**RAN3 #126:**

1. R3-247006 LS on the support of semi-persistent CSI-RS resource for LTM candidate cells RAN1(Fujitsu)
2. R3-247031 (BL CR to 38.300) Support for Inter-CU LTM Nokia, Huawei, Google, China Telecom, NEC, Ericsson, LGE, ZTE, CATT, Samsung
3. R3-247032 (BL CR to 38.423) Xn support for inter-CU LTM Ericsson, Samsung, Nokia, China Telecom, CATT, Huawei, Google, Lenovo, NEC, ZTE, LG Electronics
4. R3-247102 Discussion on Inter-gNB-CU LTM Procedure Nokia
5. R3-247103 Discussion on Inter-CU LTM Dual Connectivity Nokia
6. R3-247104 TP (BL CR TS 38.401) L1/2 Triggered Mobility (LTM) Procedures Nokia
7. R3-247108 Discussion on semi-persistent CSI-RS resource for LTM Nokia
8. R3-247111 LS on RAN2 agreements for inter-CU LTM RAN2(ZTE)
9. R3-247112 Support of Multiple Reference Configurations Nokia. KDDI, LG Electronics, ZTE, Rakuten, Fujitsu
10. R3-247126 (TP to BL CR to 38.300 and 38.423) Support for reference configurations in the inter-CU MCG LTM Google
11. R3-247181 (BL CR to 38.420) Support for Inter-CU LTM ZTE Corporation
12. R3-247182 TP for SN initiated inter-SN LTM ZTE Corporation
13. R3-247183 Discussion on inter-CU LTM ZTE Corporation
14. R3-247211 discussion of Rel-19 inter-CU LTM issues NEC
15. R3-247212 Rel-19 inter-CU LTM in DC scenario NEC
16. R3-247213 (TP to 38.423 on inter-CU LTM) inter-CU LTM related information NEC
17. R3-247232 Comparison of RRC/PDCP anchor and anchor switch-based solutions for inter-gNB LTM Qualcomm Incorporated, Reliance JIO, Vodafone, NTT DoCoMo, Sony
18. R3-247234 Impact analysis of coupling LTM cell switch and CU anchor changes on subsequent inter-gNB LTM Qualcomm Incorporated, Reliance JIO, Vodafone, NTT DoCoMo, Sony, Bharti Airtel
19. R3-247235 Signalling enhancements for inter-CU LTM HO Qualcomm Incorporated, Reliance JIO, Vodafone, NTT DoCoMo, Sony, Bharti Airtel
20. R3-247239 Inter-gNB/CU LTM typical deployment scenarios and operational requirements Jio, Qualcomm, Sony, Bharti Airtel, NTT Docomo, Telstra
21. R3-247260 Further analysis on the PDCP anchor based solution Huawei, Ericsson, CATT, China Telecom, CMCC,Samsung
22. R3-247261 (TP for LTM BLCR for TS38.473): Further discussion on inter-CU LTM procedure Huawei
23. R3-247262 (TP for LTM BLCR for TS38.300): Update on inter-CU LTM basic procedure Huawei
24. R3-247263 [DRAFT] Reply LS on the support of semi-persistent CSI-RS resource for LTM candidate cells Huawei
25. R3-247350 Discussion on inter-gNB-CU LTM Samsung
26. R3-247351 Additional discussion on Inter-gNB-CU LTM Samsung
27. R3-247352 (TP to BLCR for TS 38.401) Procedure on Inter-gNB-CU LTM Samsung
28. R3-247367 Discussion on signaling enhancement for inter-CU LTM China Telecom
29. R3-247368 Discussion on support of inter-CU LTM in NR-DC scenario China Telecom
30. R3-247369 (TP for TS38.300) On support of inter-CU LTM China Telecom
31. R3-247389 (draft reply LS) Discussion on support of semi-persistent CSI-RS resource CATT
32. R3-247390 Discussion for Inter-CU LTM CATT
33. R3-247391 Discussion for Inter-CU LTM in DC CATT
34. R3-247432 [TP to BLCR for TS 38.300] Inter-CU LTM Lenovo
35. R3-247433 [TP to BLCR for TS 38.423] Inter-CU LTM Lenovo
36. R3-247434 General aspects of inter-CU SCG LTM Lenovo
37. R3-247483 Comprehensive analysis of inter-CU LTM Ericsson
38. R3-247484 (TPs to BL CRs for TS 38.300 and 38.423) – Support for inter-CU LTM Ericsson
39. R3-247485 Network coordination for transmission of semi-persistent CSI-RS Ericsson
40. R3-247590 Baseline CR for introducing Rel-19 Mobility enhancement in E1AP LG Electronics Inc., Nokia, China Telecom, Google, Ericsson, CATT, Qualcomm, Samsung, CMCC, ZTE, Huawei, NTT Docomo, Lenovo, NEC
41. R3-247591 Keep continuing discussions on Inter-CU LTM signaling design LG Electronics Inc.
42. R3-247592 (TP for NR\_Mob\_Ph4 TS 38.423 BL CR) LG Electronics Inc.
43. R3-247629 Discussion on inter-CU LTM non-DC case NTT DOCOMO INC..
44. R3-247630 [Draft] Reply LS on the support of semi-persistent CSI-RS resource for LTM candidate cells NTT DOCOMO INC..
45. R3-247661 Comparison of RRC/PDCP anchor and anchor switch-based solutions for inter-gNB LTM Qualcomm Incorporated, Reliance JIO, Vodafone, NTT DOCOMO, Sony, Bharti Airtel
46. R3-247680 Discussion on inter-CU LTM CMCC
47. R3-247709 Initial considerations on Inter-CU LTM Rakuten Mobile, Inc
48. R3-247710 Data forwarding and transmission in Inter-CU LTM Rakuten Mobile, Inc
49. R3-247747 Inter-gNB/CU LTM typical deployment scenarios and operational requirements Jio, NTT DOCOMO, Qualcomm Incorporated, Vodafone, Sony, Bharti Airtel, Telstra
50. R3-247751 Discussion on inter-CU LTM DC case NTT DOCOMO INC..
51. R3-247755 Response to R3-247260 Qualcomm Incorporated
52. R3-247757 Reply LS on security handling for inter-CU LTM in non-DC cases SA3(Samsung)
53. R3-247758 Reply LS on security key update of inter-CU SCG LTM SA3(Xiaomi)
54. R3-247762 Response to R3-247111 and R3-247112 LG Electronics Inc, ZTE, Fujitsu, KDDI, KT Corp., ITRI, Rakuten, ETRI, SK Telecom, LG Uplus
55. R3-247820 (BL CR to 38.423) Xn support for inter-CU LTM Ericsson, Samsung, Nokia, China Telecom, CATT, Huawei, Google, Lenovo, NEC, ZTE, LG Electronics
56. R3-247822 Reply LS for LS on the support of semi-persistent CSI-RS resource for LTM candidate cells RAN3(CATT)
57. R3-247824 CB:#25\_MobilityEnh China Telecom
58. R3-247887 (BL CR to 38.420) Support for Inter-CU LTM ZTE Corporation, China Telecom, Samsung, Nokia, CATT, NEC, LG Electronics, Ericsson, Huawei
59. R3-247889 (TP for LTM BLCR for TS38.300): Update on inter-CU LTM basic procedure Huawei
60. R3-247890 (TP to BL CR for TS 38.423) – Further updates for inter-CU LTM Ericsson, LG Electronics, CATT, Huawei, Nokia, Google, China Telecom
61. R3-247911 Reply LS for LS on the support of semi-persistent CSI-RS resource for LTM candidate cells RAN3(CATT)
62. R3-247912 (TP for LTM BLCR for TS38.300): Update on inter-CU LTM basic procedure Huawei, LG Electronics, Nokia, ZTE, Ericsson, Samsung, CATT, NEC, China Telecom, Google, Lenovo
63. R3-247913 (TP to BL CR for TS 38.423) – Further updates for inter-CU LTM Ericsson, LG Electronics, CATT, Huawei, Nokia, Google, China Telecom, NEC
64. R3-247914 (BL CR to 38.420) Support for Inter-CU LTM ZTE Corporation, China Telecom, Samsung, Nokia, CATT, NEC, LG Electronics, Ericsson, Huawei, Lenovo
65. R3-247932 (BL CR to 38.300) Support for Inter-CU LTM Nokia, Huawei, Google, China Telecom, NEC, Ericsson, LGE, ZTE, CATT, Samsung
66. R3-247933 (BL CR to 38.423) Xn support for inter-CU LTM Ericsson, Samsung, Nokia, China Telecom, CATT, Huawei, Google, Lenovo, NEC, ZTE, LG Electronics

**RAN4 #112bis:**

R4-2414928 Discussion on measurement enhancements for LTM MediaTek Inc.

R4-2414944 RRM Core requirements on measurements related enhancements for LTM China Telecom

R4-2414945 RRM Core requirements on Conditional Intra-CU LTM China Telecom

R4-2415067 Initial discussion on Conditional Intra-CU LTM for NR mobility enhancements Phase 4 Xiaomi

R4-2415074 Discussion on RRM impact on measurements related enhancements for LTM Xiaomi

R4-2415147 Initial discussion on Conditional Intra-CU LTM vivo

R4-2415155 Discussion on measurements related enhancements for Rel-19 LTM CATT

R4-2415156 Discussion on conditional Intra-CU LTM for Rel-19 mobility enhancements CATT

R4-2415240 Discussion on measurements related enhancements for LTM CMCC

R4-2415241 Discussion on conditional LTM CMCC

R4-2415349 Measurement enhancement for LTM Qualcomm Incorporated

R4-2415350 Conditional LTM Qualcomm Incorporated

R4-2415491 Discussion on measurements related enhancements for LTM Apple

R4-2415492 Discussion on conditional Intra-CU LTM Apple

R4-2415521 draft LS on intra-frequency/inter-frequency definition for CSI-RS based L1 measurement Apple

R4-2415539 Discussion on RRM requirements for R19 LTM vivo

R4-2415553 Discussion on RRM requirements of enhanced LTM Samsung

R4-2415554 Discussion on RRM requirements of conditional Intra-CU LTM Samsung

R4-2415604 LS to RAN2 on conditional LTM cell switch Apple

R4-2415665 Topic summary for [112bis][218] NR\_Mob\_Ph4\_Part1 Moderator (Apple)

R4-2415666 Topic summary for [112bis][219] NR\_Mob\_Ph4\_Part2 Moderator (China Telecom)

R4-2415841 Discussion on Measurements related enhancements for LTM Huawei, HiSilicon

R4-2415842 Discussion on conditional Intra-CU LTM Huawei, HiSilicon

R4-2416015 Discussion on Conditional LTM RRM requirements Nokia

R4-2416124 Discussion on measurements related enhancements for LTM OPPO

R4-2416166 Initial discussion on RRM core requirements for conditional LTM Ericsson

R4-2416292 Discussion on Measurements related enhancements for LTM Nokia

R4-2416336 Discussion on measurements enhancements for purpose of supporting LTM Ericsson

R4-2416384 Discussion on NR mobility enhancements ZTE Corporation, Sanechips

R4-2416385 Discussion on Conditional Intra-CU LTM ZTE Corporation, Sanechips

R4-2416847 Discussion on measurements related enhancements for LTM Apple

R4-2416862 WF on RRM requirements for NR\_Mob\_Ph4\_Part1 Apple

R4-2416863 WF on RRM requirements for NR\_Mob\_Ph4\_Part2 China Telecom

R4-2416875 Ad-hoc minutes for NR\_Mob\_Ph4 Apple

**RAN4 #113:**

R4-2417687 On Rel-19 event-triggered L1 reporting requirements Nokia

R4-2417688 On Rel-19 CLTM requirements Nokia

R4-2417717 Discussion on Event triggered L1 measurement reporting for Rel-19 LTM enhancements CATT

R4-2417718 Discussion on CSI-RS based L1 measurement for Rel-19 LTM enhancements CATT

R4-2417719 Discussion on conditional Intra-CU LTM for Rel-19 mobility enhancements CATT

R4-2417890 Discussion on event triggered L1 report for LTM MediaTek Inc.

R4-2417891 Discussion on CSI-RS L1 measurement for LTM MediaTek Inc.

R4-2417892 Discussion on Conditional LTM MediaTek Inc.

R4-2417944 Discussion on Conditional Intra-CU LTM for NR mobility enhancements Phase 4 Xiaomi

R4-2417952 Discussion on event triggered L1 measurement reporting for mobility Xiaomi

R4-2417953 Discussion on CSI-RS based L1 for mobility Xiaomi

R4-2418111 Discussion on RRM requirements of event triggered L1 measurement reporting for LTM Samsung

R4-2418112 Discussion on RRM requirements of CSI-RS based L1 measurement for LTM Samsung

R4-2418113 Discussion on RRM requirements of conditional Intra-CU LTM Samsung

R4-2418244 Event triggered L1 measurement reporting for LTM Qualcomm Incorporated

R4-2418245 CSI-RS based L1 measurement for LTM Qualcomm Incorporated

R4-2418246 Conditional LTM Qualcomm Incorporated

R4-2418285 Topic summary for [113][227] NR\_Mob\_Ph4\_Part1 Moderator (Apple)

R4-2418286 Topic summary for [113][228] NR\_Mob\_Ph4\_Part2 Moderator (China Telecom)

R4-2418442 Discussion on inter-CU subsequent LTM CMCC

R4-2418443 Discussion on event triggered L1 measurement reporting CMCC

R4-2418444 Discussion on CSI-RS based L1 measurement CMCC

R4-2418445 Discussion on conditional intra-CU LTM CMCC

R4-2418504 Discussion on Event triggered L1 measurement reporting ZTE Corporation, Sanechips

R4-2418505 Discussion on CSI-RS based L1-RSRP measurement ZTE Corporation, Sanechips

R4-2418506 Discussion on Conditional Intra-CU LTM ZTE Corporation, Sanechips

R4-2418582 on CSI-RS based L1 measurement Apple

R4-2418587 Discussion on event triggered L1 measurement reporting Apple

R4-2418588 Discussion on conditional Intra-CU LTM Apple

R4-2418670 Discussion on Event triggered L1 measurement reporting Huawei, HiSilicon

R4-2418671 Discussion on CSI-RS based L1 measurement Huawei, HiSilicon

R4-2418672 Discussion on conditional Intra-CU LTM Huawei, HiSilicon

R4-2418775 On event triggered L1 measurement reporting OPPO

R4-2418776 On CSI-RS based L1 measurement OPPO

R4-2418859 RRM Core requirements on event triggered L1 measurement reporting for LTM China Telecom

R4-2418860 RRM Core requirements on CSI-RS based L1 measurement for LTM China Telecom

R4-2418861 RRM Core requirements on conditional Intra-CU LTM China Telecom

R4-2419088 Further discussion on Conditional Intra-CU LTM vivo

R4-2419106 Discussion on RRM requirements for event-triggered L1-RSRP reporting in R19 LTM vivo

R4-2419107 Discussion on RRM requirements for CSI-RS based L1 measurement in R19 LTM vivo

R4-2419298 Discussion on event triggered L1 measurement reporting Ericsson

R4-2419299 Discussion on CSI-RS based L1 measurement Ericsson

R4-2419447 Discussion for RRM requirement for conditional intra-CU LTM Ericsson

R4-2419729 Discussion on CSI-RS based L1 measurement Nokia

R4-2420083 "Ad-hoc minutes for NR mobility enhancements " Apple

R4-2420101 WF on RRM requirements for NR\_Mob\_Ph4\_Part1 Apple

R4-2420102 WF on RRM requirements for NR\_Mob\_Ph4\_Part2 China Telecom

 17.05.2021 minor adaptations for RAN #92e

 28.01.2021 minor adaptations for RAN #91e

 09.11.2020 minor adaptations for RAN #90e

 31.08.2020 minor adaptations for RAN #89e

 20.04.2020 minor adaptations for RAN #88e

 18.02.2020 minor adaptations for RAN #87e

 14.11.2019 minor adaptations for RAN #86

 18.08.2019 minor adaptations for RAN #85

 12.05.2019 minor adaptations for RAN #84

 27.02.2019 minor adaptations for RAN #83

 21.11.2018 completion levels with colours added (for RAN #82)

v04.81 31.07.2018 simplification of template and addition of cross-TSG aspects (for RAN #81)

v04.80 21.05.2018 minor adaptations for RAN #80

v04.79 26.02.2018 minor adaptations for RAN #79

v04.78 18.11.2017 minor adaptations for RAN #78

v04.77 06.08.2017 minor adaptations for RAN #77

v04.76 15.05.2017 minor adaptations for RAN #76

v04.75 31.01.2017 minor adaptations for RAN #75

v04.74 28.10.2016 minor adaptations for RAN #74

v04.73 01.09.2016 adaptations for RAN #73 (time units in extra Excel table, RAN6 reporting included)

v04.72 26.05.2016 adaptations for RAN #72 (introduction of NR & GERAN TUs)

v04.71 10.02.2016 minor adaptations for RAN #71

v04.70 30.10.2015 minor adaptations for RAN #70

v04.69 12.08.2015 minor adaptations for RAN #69

v04.68 21.05.2015 minor adaptations for RAN #68

v04.67 01.02.2015 minor adaptations for RAN #67

v04.66 16.11.2014 minor adaptations for RAN #66

v04.65 16.08.2014 minor adaptations for RAN #65

v04.64 22.05.2014 minor adaptations for RAN #64

v04.63 24.01.2014 restructuring for RAN #63 to cover Core & Perf. in one doc file

v03.62 11.11.2013 section 1.2.3 adapted for RAN #62

v03 11.08.2013 section 1.2.3 added on time budget

v02 07.05.2010 history added, some spelling corrections

v01 13.11.2009 First version of the template