



3GPP TSG Rel-19 Workshop

RWS-230064

Taipei, June 15-16, 2023

Views on Rel-19 mobility enhancements

Source: vivo

Document for: Discussion & Decision

Agenda Item: 5

Contents

- Inter-CU LTM
- Conditional LTM
- UL measurement based LTM
- Data loss improvement for LTM
- RRM enhancement for LTM

Inter-CU LTM

Scenario extension

- In Rel-18, LTM (L1/L2 Triggered Mobility) is specified to reduce the interrupt time for cell switch with the following mechanisms
 - Pre-configure UE with configurations of candidate cells before cell switch
 - Early TA acquisition before cell switch and include TA value in cell switch command
 - L1/2 based measurement, reporting, and cell switch
- However, LTM has only focused on intra-CU mobility scenario in Rel-18
 - For inter-CU mobility, legacy L3 handover has to be performed
 - Consistent performance of data interrupt is expected for both intra-CU and inter-CU mobility scenario
- Potential enhancements for Inter-CU LTM:
 - Security anchor relocation
 - Corresponding Xn signalling, e.g. to exchange the configuration of candidate cells

Conditional LTM

HO robustness enh.

- Conditional reconfiguration is specified to provide robustness cell switch of PCell and/or PSCell
 - Pre-configure UE with configurations of candidate cells before cell switch
 - Cell switch is triggered when UE determines the pre-configured execution condition is fulfilled
 - Fulfillment of execution condition is determined based on L3 measurement
 - Robustness gain obtained via skipping measurement reporting and cell switch command
- Conditional LTM can be considered to improve robustness
- Potential enhancements for conditional LTM:
 - L1 measurement based execution condition
 - Corresponding procedure enhancement, e.g. early TA acquisition with UE based TA maintain

UL measurement based LTM

HO robustness enh.

- In Rel-18, LTM is performed based on L1 measurement on DL RS and suffers from:
 - Signaling overhead caused by delivering RS configurations of multiple candidate cells to UE and Frequent L1/L2 measurement reporting
 - Latency led by serial measurement across candidate spectrum frequencies with measurement gap and measurement reporting
- UL signaling has been already introduced for positioning:
 - Measurement on UL signaling will be used for positioning
 - Meanwhile, detailed design for UL SRS, e.g. power control, TA, have been already specified
- UL measurement based LTM could be considered, in order to:
 - Reduce signalling overhead and UE complexity especially for inter-freq. case
 - Improve measurement and reporting latency
- Potential enhancements for UL measurement based LTM:
 - Determine UL signal for UL measurement
 - Procedure to exchange the configuration of UL signal and measurement results between NW nodes

LTM enhancement

Data loss improvement

- Rel-18 LTM may cause severe data loss issue of RLC UM traffic
 - HARQ buffer flush and data loss of RLC UM traffic occurs when MAC reset is performed during LTM
 - LTM occurs more frequent than L3 handover since the L1 signal quality changes quickly
 - QoS of some traffic with stringent Packet Error Rate, e.g. Conversational Video(10^{-3}), can not be met with LTM
 - RLM AM may not be fit for some traffic with stringent latency requirement
- In order to improve the LTM performance then to extend the applicability for LTM, data loss improvement could be considered, e.g. not reset MAC for some scenarios
- Potential enhancements for data loss for RLC UM during LTM
 - Mechanisms to enable HARQ continuation, e.g. HARQ entity mapping between source and target cells
 - Continuation for some MAC timer/status, e.g. TAT, Bj value

LTM R18 Leftover

RRM aspects

Following RRM leftover for R18 LTM could be considered in Rel-19:

- Low-layer (L1/L2) report of L3 measurement results:
 - In Rel-18, RAN4 concluded that UE can optionally support to report L3 measurement results in L1 report, and agreed no impact to RAN1/RAN2 design.
 - In order to support reporting L3 measurement results in L1/L2 report, some necessary signaling for report and reporting mechanism perspective should be defined.
- RRM requirements for SpCell switch with direct SCell activation, which was deprioritized in RAN4.
- RRM requirements enh. for L1 measurement, e.g.
 - Inter-f L1 measurement requirements with NCSG.
 - Inter-f L1 measurement requirements with NeedforGap
 - L1 gap, if not in Rel-18

Conclusions

Potential Rel-19 mobility enhancements

- Potential enhancements for Inter-CU LTM [RAN2, RAN1, RAN3]
 - Security anchor relocation
 - Corresponding Xn signaling, e.g. to exchange the configuration of candidate cells
- Potential enhancements for conditional LTM [RAN2, RAN2]
 - L1 measurement based execution condition
 - Corresponding procedure enhancement, e.g. early TA acquisition with UE based TA maintain
- Potential enhancements for UL measurement based LTM [RAN1, RAN2, RAN3]
 - Determine UL signal for UL measurement
 - Procedure to exchange the configuration of UL signal and measurement results between NW nodes
- Potential enhancements for data loss for RLC UM during LTM [RAN2]
 - Mechanisms to enable HARQ continuation, e.g. HARQ entity mapping between source and target cells
 - Continuation for some MAC timer/status, e.g. TAT, Bj value
- To specify corresponding RRM core requirements for LTM enhancements, as necessary [RAN4]
- RRM leftover for LTM
 - Low-layer (L1/L2) report of L3 measurement results[RAN4, RAN2]
 - RRM requirements for SpCell switch with direct SCell activation[RAN4]
 - RRM requirements enh. for L1 measurement[RAN4]

THANK YOU