3GPP TSG-RAN WG4 Meeting #104-e R4-2211550

Electronic Meeting, 15th Aug. – 26th Aug., 2022

**Agenda Item: 11.16.1**

**Source: MediaTek Inc., Apple**

**Title: Work Plan for** **Further NR Mobility Enhancements**

**Document for: Approval**

# Introduction

A new Work Item of “NR\_Mob\_enh2” has been approved in RAN Plenary #94-e meeting. The objectives of the latest version are quoted [1] as below,

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| The following objective are considered in this WI:1. To specify mechanism and procedures of L1/L2 based inter-cell mobility for mobility latency reduction:
* Configuration and maintenance for multiple candidate cells to allow fast application of configurations for candidate cells [RAN2, RAN3]
* Dynamic switch mechanism among candidate serving cells (including SpCell and SCell) for the potential applicable scenarios based on L1/L2 signalling [RAN2, RAN1]
* L1 enhancements for inter-cell beam management, including L1 measurement and reporting, and beam indication [RAN1, RAN2]
	+ *Note 1: Early RAN2 involvement is necessary, including the possibility of further clarifying the interaction between this bullet with the previous bullet*
* Timing Advance management [RAN1, RAN2]
* CU-DU interface signaling to support L1/L2 mobility, if needed [RAN3]

*Note 2: FR2 specific enhancements are not precluded, if any.**Note 3: The procedure of L1/L2 based inter-cell mobility are applicable to the following scenarios:** + - *Standalone, CA and NR-DC case with serving cell change within one CG*
		- *Intra-DU case and intra-CU inter-DU case (applicable for Standalone and CA: no new RAN interfaces are expected)*
		- *Both intra-frequency and inter-frequency*
		- *Both FR1 and FR2*
		- *Source and target cells may be synchronized or non-synchronized*
1. To specify mechanism and procedures of NR-DC with selective activation of the cell groups (at least for SCG) via L3 enhancements:
* To allow subsequent cell group change after changing CG without reconfiguration and re-initiation of CPC/CPA [RAN2, RAN3, RAN4]

*Note 4: A harmonized RRC modelling approach for objective*s *1 and 2 could be considered to minimize the workload in RAN2.*1. To specify CHO including target MCG and target SCG [RAN3, RAN2].

*Note 5: This is already being targeted for Rel-17, so this objective will be reviewed at RAN#97-e.*1. To specify CHO including target MCG and candidate SCGs for CPC/CPA in NR-DC [RAN3, RAN2]
* CHO including target MCG and target SCG is used as the baseline
1. To specify RRM core requirements for the following, as necessary [RAN4]:
* L1/L2-based inter-cell mobility
* Enhanced CHO configurations addressed by this WI
1. To specify RF requirements to cover inter-frequency L1/L2-based mobility, as necessary [RAN4].
2. To study the following, with completion targeted by RAN#98 meeting [RAN4]:
* The impact of FR2 RRM mobility measurement acquisition and reporting on FR2 SCell/SCG setup/resume delay for a UE connecting from idle/inactive mode.
* The level of feasible improvement in FR2 SCell/SCG setup delay from defining new UE measurement procedures and RRM core requirements, and whether additional information from the network would help the UE to perform those measurements effectively. The following sequence of events should be assumed.
	+ - The UE initiates and performs improved measurements when it requests RRC connection setup/resume.
		- After acquiring those improved measurements, the UE subsequently reports those measurements to the network to support SCell/SCG setup.
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In this contribution, we provide a work plan for new WI on Further NR Mobility Enhancements.

# Work plan for Further NR Mobility Enhancements

Based on the WID [1], the completion date for objective#7 is 12/2022 (RAN#98), and for other objectives the completion date of Core Part is 12/2023 and Performance Part is 06/2024.

**Work plan: (for approval)**

1. 3GPP RAN4 #104-e meeting (August 2022, **Core Part**)
* Discuss and approve the work plan for RRM part
* Discuss feasible FR2 SCell/SCG setup delay improvement and identify potential impacts
* Discuss RRM core part requirements on
	+ L1/L2-based inter-cell mobility
1. 3GPP RAN4 #104-bis-e meeting (October 2022, **Core Part**)
* Discuss potential FR2 SCell/SCG setup delay improvement and RRM requirements
* Discuss RRM core part requirements on
	+ L1/L2-based inter-cell mobility
* Reply RAN1/2 LS, if any
1. 3GPP RAN4 #105 meeting (November 2022, **Core Part**)
* Finalize the discussion on feasibility of FR2 SCell/SCG setup delay improvement
* Discuss the RRM core part requirements on
	+ L1/L2-based inter-cell mobility
* Reply RAN1/2 LS, if any
1. 3GPP RAN4 #106 meeting (February 2023, **Core Part**)
* Work plan update based on RAN 98’s conclusion if needed
* Discuss RRM core part requirements
* Reply RAN1/2 LS, if any
1. 3GPP RAN4 #106-bis meeting (April 2023, **Core Part**)
* Discuss RRM core part requirements
* Reply RAN1/2 LS, if any
1. 3GPP RAN4 #107 meeting (May 2023, **Core Part**)
* Discuss RRM core part requirements
* Work split on RRM core part CRs
* Reply RAN1/2 LS, if any
1. 3GPP RAN4 #108 meeting (August 2023, **Core Part**)
* Discuss RRM core part requirements
* Provide initial draft CR(s) on core part in TS38.133
* Reply RAN1/2 LS, if any
1. 3GPP RAN4 #108bis meeting (October 2023, **Core Part and Performance Part**)
* Discuss RRM core part requirements
* Provide and refine the draft CR on core part in TS38.133
* LS initial RRC parameters to RAN2, if needed
* Initial discussion on performance part
1. 3GPP RAN4 #109 meeting (November 2023, **Core Part and Performance Part**)
* Finalize RRM core part change and the corresponding final CR(s) on core part in TS38.133
* LS final RRC parameters to RAN2, if needed
* Discuss and decide test case lists
* Work split on test cases CR(s).
1. 3GPP RAN4 #110 meeting (February, 2024, **Performance Part**)
* Provide initial draft test cases in TS38.133.
1. 3GPP RAN4 #110-bis meeting (April, 2024, **Performance Part**)
* Provide and refine the draft CR(s) on test cases in TS38.133.
1. 3GPP RAN4 #111 meeting (May, 2024, **Performance Part**)
* Finalize test cases design.
* Approve CR(s) on test cases in TS38.133.

By the above, we have the following proposal:

*Proposal 1: RAN4 to endorse the RRM work plan for Further NR Mobility Enhancements as presented in this contribution.*

# Summary

In this contribution, we provided RAN4 RRM work plan for Further NR Mobility Enhancements.

***Proposal 1: RAN4 to endorse the RRM work plan for Further NR Mobility Enhancements as presented in this contribution.***

# References

1. RP-221799, “Revised WID on Further NR Mobility Enhancements”, MediaTek Inc., RANP #96 meeting, June 2022.