**3GPP TSG RAN WG1 Meeting #104-e R1-210xxxx**

**e-Meeting, January 25th – February 5th, 2021**

**Title: DRAFT** LS on Timing Assumption for Inter-Cell DL Measurement

**Response to:**

**Release:** Rel-17

**Work Item:** NR\_feMIMO-Core

**Source:** Samsung

**To:** RAN4

**Cc:** RAN2

**Contact Person:**

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**1. Overall Description:**

RAN1 has agreed to support L1-RSRP reporting (and its respective measurement) associated with non-serving cell. Pertinent to this aspect, the following agreements and conclusion have been made.

**Agreement**

On Rel.17 multi beam measurement/reporting enhancements for L1/L2-centric inter-cell mobility and inter-cell mTRP:

* Rel.15 L1-RSRP is used as reporting quantity for measurement and reporting of non-serving-cell(s)
	+ Support SSB as a measurement RS for L1/L2-centric inter-cell mobility and inter-cell mTRP, and Rel.15 SS-RSRP calculated from SSB of non-serving cell(s)
		- FFS: Whether the measurement for SS-RSRP is limited within SMTC
		- FFS: Detailed reporting method, e.g. via including existing L1-RSRP report, UE-initiated report etc.
	+ FFS: Whether or not to support CSI-RS (for e.g. mobility and/or tracking) of non-serving cell(s) as a measurement RS for L1/L2-centric inter-cell mobility and inter-cell mTRP. If the support of CSI-RS (for e.g. mobility and/or tracking) of non-serving cell(s) as a measurement RS for L1/L2-centric inter-cell mobility and inter-cell mTRP is confirmed, Rel.15 CSI-RSRP is also supported
		- Whether the support applies to CSI-RS with or without QCL source, or both
	+ FFS: The number of non-serving cell(s) for measurement/reporting
	+ FFS: time behavior of the reporting, i.e. periodic, semi-persistent, aperiodic, or UE-initiated
* FFS: If other reporting quantities are supported, e.g. L3-RSRP, hybrid L1/L3-RSRP
* FFS: Dynamic activation/deactivation/selection of the beam measurement on the RS(s) associated with non-serving cell(s) via MAC CE
* FFS: Timing assumption (e.g. time of arrival and time of the measurement) for measurement of non-serving cell RS measurement

**Agreement**

On Rel.17 multi-beam measurement/reporting enhancements for L1/L2-centric inter-cell mobility and inter-cell mTRP,

* In one reporting instance, depending on NW configuration, beam(s) associated with a non-serving cell can be mixed with that associated with serving-cell
	+ FFS: whether this applies to periodic, semi-persistent, and/or aperiodic
	+ FFS: How to report the K beams and corresponding qualities if the Tx power among the non-serving cell and with serving-cell is not the same
	+ Note: The supported numbers of non-serving cells (in terms of measurement/reporting) have not yet been decided. The above description doesn’t imply only one non-serving cell is allowed to be configured for measurement. Nor does this imply that only one non-serving cell is allowed in one reporting instance.

**Conclusion**

The UE may assume received DL transmission from multiple TRP within a CP in FR1 and FR2.

Note: This does not imply that RAN1 intends to ask RAN4 to tighten network synchronization requirements

For the aforementioned purpose, RAN1 seeks a few answers from RAN4 on the following questions (in the context of L1/L2-centric inter-cell mobility) in order to proceed further. Note that thus far (cf. R1-2102008, R1-2102248):

* Only SSB has been agreed to be used for non-serving cell measurement RS. CSI-RS is still TBD
* Only intra-frequency measurement has been agreed and inter-frequency measurement is still TBD

**Question 1**: In the context of L1/L2-centric inter-cell mobility, what are the implication(s)/benefit(s), if any, (from RAN4 perspective) of limiting the measurement for L1-RSRP on measurement RS of a non-serving cell within the SMTC window(s) for the above agreed L1-RSRP reporting? Conversely, what are the implication(s)/benefit(s), if any, of not limiting the measurement for L1-RSRP to be carried out within the SMTC window(s)?

**Question 2**: In the context of L1/L2-centric inter-cell mobility, for measurement on measurement RS of a non-serving cell, with the above agreed L1-RSRP reporting, if the receive timing of the measurement RS from the non-serving cell can be different from the receive timing of the signals from the serving cell, what are the implication(s)/benefit(s), if any, from RAN4 perspective?

**2. Actions:**

**To: RAN4**

**ACTION:** RAN1 respectfully asks RAN4 to provide answers for the above questions related to timing assumption for inter-cell DL measurement in the context of L1/L2-centric inter-cell mobility with additional details that RAN1 shall further consider.

**3. Date of Next TSG-RAN WG1 Meetings:**

TSG RAN WG1 Meeting #105-e 10th – 27th May, 2021 E-meeting