3GPP TSG-RAN WG4 Meeting #101-bis-e R4-22xxxxx

**Electronic Meeting, 17 – 25 January, 2022**

**Title:** LS on R17 MG enhancement - NCSG

**Response to:**

**Release:** Rel-17

**Work Item:** NR\_MG\_enh-Core

**Source:** RAN WG4

**To:** RAN WG2

**Cc:** RAN WG1

**Contact person:**

#### **Name:** Qiming Li

#### **E-mail Address:** li\_qiming@apple.com

**Attachments: None**

# 1 Overall description

RAN4 further discussed NCSG design in RAN4#101-bis-e and reached the following agreements which may have RAN2 impact:

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| --- |
| 1. **Scenarios and use cases**
2. For different types of measurement with NCSG:

Agreements: * NCSG can be used for RRM measurement on dormant SCell
* It is FFS whether NCSG can be used for CSI-RS based inter-frequency measurement with gap.
1. Applicable scenarios:

Agreements: * RAN4 will not further discuss feasibility of NCSG in EN-DC, NE-DC and NR-DC. The feasibility is expected to be decided in RAN2.
* NCSG is feasible in FR2
1. **NCSG patterns**
2. Mandatory NCSG patterns for UE supporting this feature

Agreements: * On top of #0 and #1, NCSG patterns corresponding to legacy patterns #13 and #14 are mandatorily supported in FR2 for per-FR capable UE
* UE can indicate support of some NCSG patterns which can only be used for NR-only measurement. It is FFS how to indicate support NR-only NCSG pattern.
* The time offset for NCSG is FFS:
	+ Option 1:The offset of NCSG refers to the starting point of VIL1.
	+ Option 2: The offset of NCSG refers to the starting point of ML – RRT.
1. Timing offset for NCSG

Agreements: * Option 1: The offset of NCSG refers to the starting point of VIL1.
* Option 2: The offset of NCSG refers to the starting point of ML – RRT.
1. MGTA for NCSG

Agreements: * On top of existing MGTA {ms0, ms0dot25, ms0dot5}, a new MGTA {ms0dot75} is agreed to be introduced for the case wherein NCSG is configured as a per-FR gap in FR2.
1. Per-UE NCSG and per-FR NCSG

Agreements: * It is FFS whether additional UE capability is needed for per-UE and per-FR differentiation for NCSG on top of that defined for legacy gap
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Besides, RAN4 identified that efficiency of NCSG can be increased if the SSB indexes of target cell(s) on a frequency different than serving cell frequency can be derived from a serving cell. However, the flag *deriveSSB-IndexFromCell* introduced in R15 can only enable UE to derive SSB indexes of target cell(s) on the same frequency as the serving cell frequency. RAN4 kindly asks RAN2 to design the corresponding signalling for enabling the derivation of SSB indexes of target cell(s) on a frequency different than serving cell frequency from serving cell timing, to increase NCSG efficiency.

The new signaling can only be configured if the SCS of SSB is the same between target cell and the serving cell which is used for SSB indexes derivation.

* The new signaling can be used in both FR1 and FR2.
* UE needs to be indicated which serving cell to be referred from under CA.
* The indication can be per-MO

The discussion for NCSG design is on-going in RAN4. RAN4 will provide further updates if the conclusions are reached.

# 2 Actions

**To RAN WG2**

**ACTION:** RAN4 kindly asks RAN2 to take the above information into account and implement the configuration of NCSG. RAN4 also kindly asks RAN2 to design the signaling for enabling the derivation of SSB indexes of target cell(s) on a frequency different than serving cell frequency, and the serving cell timing to utilize, to increase NCSG efficiency.

# 3 Dates of next TSG RAN WG4 meetings

TSG RAN WG4 Meeting #102-e 21 Feb - 3 Mar 2022 Online