**3GPP TSG-RAN WG4 Meeting #112 R4-241xxxx**

**Maastricht, The Netherlands, 19 – 23 August, 2024**

**Agenda item:** 8.19.4

**Source:** Huawei, HiSilicon

**Title:** WF on SBFD RRM

**Document for:** Approval

# Sub-Topic #1: General issues

Sub-topic 1-1: Work plan

Agreements (from online session)

* The work plan in R4-2412534 is approved.

Sub-Topic #2: RRM requirements

Sub-topic 2-1: RRM impacts of UE-to-UE CLI handling

Issue 2-1-1: Scope of requirements for UE-to-UE CLI handling

Agreements (from online session)

* RAN4 to define RRM requirements for L1 based UE-to-UE CLI measurement and reporting.

Issue 2-1-2: Measurement quantities

Recommended WF

* RAN4 to define core requirements for L1-SRS-RSRP and L1-CLI-RSSI measurements. This can be revisited based on further RAN1 agreement.
* FFS if other measurement quantities to be considered in the core requirements based on further RAN1 agreement.

Issue 2-1-3: Baseline for defining requirements

Recommended WF

* Both R16 CLI measurement requirements and L1-RSRP measurement requirements are to be considered for defining requirements for L1 based UE-to-UE CLI measurement.
* RAN4 can directly discuss the requirements for L1 based UE-to-UE CLI measurement in next meeting.

Issue 2-1-4: Measurement methods

Recommended WF

* RAN4 to wait for RAN1 conclusion on the supported methods of L1 based UE-to-UE CLI measurement.
* Meanwhile, RAN4 to discuss the impacts of different measurement methods on the requirements.

Issue 2-1-5: Rx beam

Recommended WF

* RAN4 to wait for RAN1 conclusion on the Rx beam for L1 based UE-to-UE CLI measurement.
* Meanwhile, RAN4 to discuss the impacts of Rx beam configuration/determination on the requirements.

Issue 2-1-6: Measurement resources

Recommended WF

* RAN4 to wait for RAN1 conclusion on measurement resources to discuss whether is an impact on the requirements.

Issue 2-1-7: Side condition

Agreements (from online session)

* RAN4 to define side conditions for L1 based UE-to-UE CLI measurement requirements.
* RAN4 to discuss at least time offset between DL timing and SRS arrival timing, SRS Es/Iot, SRS configuration and maximum/minimum SRS-RSRP.
	+ The RAN1 progress will be taken into account when discussing the values for the side conditions.

Options for further discussion and down-selection (for information purpose):

* Time offset between DL timing and SRS arrival timing
	+ Option 1: Rel-16 CLI SRS RSRP assumption
	+ Option 2: Remove cell phase error from option 1
	+ Other options are not precluded, pending on RAN1 progress.
* SRS Es/Iot, SRS configuration and maximum/minimum SRS-RSRP
	+ Option 1: Rel-16 CLI SRS RSRP assumption
	+ Other options are not precluded.

Issue 2-1-8: Measurement period

Agreements (from online session)

* RAN4 to define measurement periods for L1 based UE-to-UE CLI measurement requirements,
* RAN4 to discuss the number of shots for the measurement, which can be based on RAN4 simulation results and RAN1 design.
	+ Number of shots for simulation: 1, 2, 3.
	+ Companies to bring proposals on other simulation parameters in the next meeting.

Issue 2-1-9: Measurement reporting

Recommended WF:

* RAN4 to define measurement reporting requirements for L1 based UE-to-UE CLI measurement at least for aperiodic reporting
* FFS on reporting requirements for periodic and semi-persistent reporting pending on RAN1 agreement
* FFS whether L1-RSRP measurement reporting requirement can be re-used.

Issue 2-1-10: Measurement accuracy

Recommended WF:

* RAN4 to define measurement accuracy requirements for L1 based UE-to-UE CLI measurement based on the agreed side condition and measurement period.

Issue 2-1-11: Scheduling and measurement restriction

Recommended WF

* RAN4 to define scheduling and measurement restriction for L1 based UE-to-UE CLI measurement if it is needed.
* FFS the impact of measurement methods and Rx beam assumption

Issue 2-1-12: Measurement capability

Recommended WF

* FFS whether RAN4 needs to discuss measurement capability for L1 based UE-to-UE CLI measurement in terms of number of resources UE shall be able to monitor.

Issue 2-1-13: Report mapping

Recommended WF

* FFS whether RAN4 needs to discuss report mapping for L1 based UE-to-UE CLI measurement.
* FFS whether R16 report mapping can be re-used.

Sub-topic 2-2: RRM impacts of gNB-to-gNB CLI handling

#### Issue 2-2-1: Scope of requirements for gNB-to-gNB CLI handling

Agreements (from online session)

* RAN4 not to define RRM requirements for gNB to gNB CLI handing.

Sub-topic 2-3: RRM impacts of SBFD operation

#### Issue 2-3-1: Requirements for legacy UE

Agreements (from online session)

* The legacy UEs shall perform and operate according to the legacy RRM requirements and no new RAN4 RRM requirement for legacy UEs, despite being served by a gNB operating with SBFD.
* Clarification on the applicability of the existing RRM requirements in RAN4 spec is not precluded.
* The legacy UEs refer to non-SBFD aware UE.

#### Issue 2-3-2: Requirements for SSB based measurement

Agreements (from online session)

* For SBFD-aware UE, existing requirements apply for SSB-based serving cell measurement. Further discuss for SSB based neighbour cell measurement in RAN4.
* Note: The serving cell is SBFD cell, and the neighbour cell is SBFD or non-SBFD cell.

Recommended WF

RAN4 further discuss impact on SSB based neighbour cell measurement in RAN4.

#### Issue 2-3-3: Requirements for CSI-RS based measurement

Recommended WF

* RAN4 to discuss the impact of SBFD operation on the CSI-RS measurement requirements.

#### Issue 2-3-4: Requirements for scheduling restriction

Recommended WF

* RAN4 to discuss whether scheduling restriction requirements are impacted due to SBFD operation based on RAN1 agreements.

#### Issue 2-3-5: Requirements for RACH requirements

Recommended WF

* RAN4 to discuss whether RACH requirements are impacted due to SBFD operation based on RAN1 agreements.

#### Issue 2-3-6: Requirements for UL PC and or spatial relation update

Recommended WF

* RAN4 to discuss whether requirements for UL PC and or spatial relation switch are impacted due to SBFD operation based on RAN1 agreements.

#### Issue 2-3-7: Requirements for MG and BWP switch

Recommended WF

* RAN4 to discuss whether to clarify the term “UL slot” in MG and BWP switch requirements when SBFD operation is enabled.

#### Issue 2-3-8: Requirements for UL resource muting

Recommended WF

* RAN 4 further to discuss whether additional RRM requirements would be defined for UL resource muting for PUSCH feature.

####  Issue 2-3-9: Requirements for generic SBFD operation

Recommended WF

* RAN4 to discuss whether there is any RRM impact e.g. to scheduling restrictions/interruptions requirements due to SBFD operation.

#### Issue 2-3-10: Limits on the maximum number of DL/UL switching

Recommended WF

* RAN4 to discuss whether to put limits on the maximum number of DL/UL switching during SBFD slots within the SBFD periodicity