**3GPP TSG RAN WG1 Meeting #101-e                     R1-200xxxx**

**e-Meeting, May 25 – June 5, 2020**

**Agenda Item: 7.2.2.2.2**

**Source: Charter Communications**

**Title: Draft [101-e-NR-unlic-NRU-InitAccessProc-03]**

**Document for: Discussion and Decision**

# Introduction

Four email discussions have been sanctioned in RAN1#101-e on initial access procedures for NR-U based on contributions submitted to this meeting [1]-[13]. This third discussion that aims to converge by 5/29 has the following scope:

[101-e-NR-unlic-NRU-InitAccessProc-03] Email discussion/approval on the following issue from R1-2003306 until 5/29 – Amitav (Charter)

* (#4.4) Choose between following alternatives for RSSI measurement duration in RAN1#101-e:
	+ Alt 1: {sym1, sym14or28or56or48, sym28or56or112or96, sym42or84or168or144, sym70or140or280or240}
		- “sym14or28or56or48” refers to 14 symbols for 15 kHz SCS, 28 symbols for 30 kHz SCS, 56 symbols for 60 kHz SCS with NCP, and 48 symbols for 60 kHz SCS with ECP, respectively, and so on
		- Inform RAN2 of this decision (can be within updated RRC parameter spread sheet that we send to RAN2, not necessarily a separate LS)
	+ Alt 2: {sym1, sym14or12, sym28or24, sym42or36, sym70or60}
		- “sym14or12” refers to 14 symbols for NCP and 12 symbols for ECP, respectively, and so on
		- Inform RAN2 of this decision (can be within updated RRC parameter spread sheet that we send to RAN2, not necessarily a separate LS)

Note 1: If measured bandwidth of RSSI overlaps with the active DL BWP, UE performs RSSI measurement with the SCS of the active DL bandwidth part during the measurement duration derived from combination of measDuration-r16 and rmtc-ref-SCS-CP.

Note 2: The UE expects an integer number of symbol(s) with respect to the SCS of the active DL BWP to be configured for RSSI measurement.

These issues have been selected based on the preparatory discussion summarized in [14].

# Discussion

FL Observations

All contributions on this topic generally recognize that Alt. 2 offers more flexibility and Alt. 1 values are a subset of those in Alt. 2, since Alt. 1 absolute measurement durations do not scale with the reference numerology. However, proponents of Alt. 1 observe that Alt. 1 is the only option that provides 5 ms measurement duration for all reference numerologies.

The FL believes that the current Alt. 2 formulation is not consistent with the intermediate agreement “Measurement duration can be no more than 5 ms for each numerology (requires sym70, sym140, sym280/sym240 respectively)” in the last meeting, which should be applicable to both alternatives.

Therefore, companies are requested to consider a modified proposal for Alt. 2 to address the above:

* Alt 2b: {sym1, sym14or12, sym28or24, sym42or36, sym70or140or280or240}
	+ - “sym14or12” refers to 14 symbols of the reference numerology for NCP and 12 symbols for ECP, respectively, and so on
		- “sym70or140or280or240” refers to 70 symbols for 15 kHz SCS, 140 symbols for 30 kHz SCS, 280 symbols for 60 kHz SCS with NCP, and 240 symbols for 60 kHz SCS with ECP, respectively

And potential ensuing discussion is:

Choose between following alternatives for RSSI measurement duration:

* + Alt 1: {sym1, sym14or28or56or48, sym28or56or112or96, sym42or84or168or144, sym70or140or280or240}
		- “sym14or28or56or48” refers to 14 symbols for 15 kHz SCS, 28 symbols for 30 kHz SCS, 56 symbols for 60 kHz SCS with NCP, and 48 symbols for 60 kHz SCS with ECP, respectively, and so on
		- Inform RAN2 of this decision (can be within updated RRC parameter spread sheet that we send to RAN2, not necessarily a separate LS)
	+ Alt 2b: {sym1, sym14or12, sym28or24, sym42or36, sym70or140or280or240}
		- “sym14or12” refers to 14 symbols of the reference numerology for NCP and 12 symbols for ECP, respectively, and so on
		- “sym70or140or280or240” refers to 70 symbols for 15 kHz SCS, 140 symbols for 30 kHz SCS, 280 symbols for 60 kHz SCS with NCP, and 240 symbols for 60 kHz SCS with ECP, respectively
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Note 1: If measured bandwidth of RSSI overlaps with the active DL BWP, UE performs RSSI measurement with the SCS of the active DL bandwidth part during the measurement duration derived from combination of measDuration-r16 and rmtc-ref-SCS-CP.

Note 2: The UE expects an integer number of symbol(s) with respect to the SCS of the active DL BWP to be configured for RSSI measurement.

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# References

1. R1-2003371 Remaining issues on initial access procedure for NR-U vivo
2. R1-2003451 Remaining issues on the initial access procedure for NR-U ZTE, Sanechips
3. R1-2003513 Maintenance on the initial access procedures Huawei, HiSilicon
4. R1-2003657 Remaining issues on initial access procedure for NR-U operation MediaTek Inc.
5. R1-2003729 Enhancements to initial access and mobility for NR-unlicensed Intel Corporation
6. R1-2003844 Enhancements to initial access procedures Ericsson
7. R1-2003861 Initial access procedures for NR-U Samsung
8. R1-2003973 Remaining issues on initial access procedure for NR-U ETRI
9. R1-2004001 Remaining issues on initial access procedure Spreadtrum Communications
10. R1-2004014 Remaining issues of initial access and mobility for NR-U LG Electronics
11. R1-2004086 Discussion on the remaining issues of enhancements to initial access procedure OPPO
12. R1-2004444 TP for Initial access and mobility procedures for NR-U Qualcomm Incorporated
13. R1-2004526 On Enhancements to Initial Access Procedure for NR-U Nokia, Nokia Shanghai Bell
14. R1-2003306 Feature lead summary on for initial access procedures enhancements Charter Communications