3GPP TSG-RAN #93 Tdoc RP-21XXXX

Electronic meeting, 2021-09-13 - 2021-09-17

Agenda Item: X

Source: Ericsson (Moderator)

Title: Moderator Summary for [93e-30-band-n77]

Document for: Discussion, Decision

# 1 Introduction

This is a summary of the email discussion [93e-30-band-n77].

# 2 Discussion

### 2.1 Background

RAN2 and RAN4 were tasked to extend the n77 band in the US to cover the 3450-3550 MHz region, in addition to the 3700-3980 MHz region.

At RAN2#115, RAN2 discussed two solutions for this:

- A new cap signalling + new NS value

- B new frequency band replace n77 in the US including the DoD part.

RAN4 agreed that new capability signalling shall be defined, i.e., not the new frequency band solution.

For Solution A, RAN2 clarified in their LS [RP-211671](http://www.3gpp.org/ftp/tsg_ran/TSG_RAN//TSGR_93e/Docs//RP-211671.zip) that:

RAN2 has agreed that UE’s that don’t support the DoD band need to be barred from accessing the DoD band in the US. RAN2 thinks that a new NS-value can be defined to prevent legacy UEs supporting n77 from camping on the DoD bands and as legacy UEs cannot identify the new value, the UE would not camp on that cell.

RAN2 provided technically endorsed CRs for Solution A which are adding the capability bit for Solution A, see [RP-212445](http://www.3gpp.org/ftp/tsg_ran/TSG_RAN//TSGR_93e/Docs//RP-212445.zip). RAN4 provided CRs for Solution A in [RP-211887](http://www.3gpp.org/ftp/tsg_ran/TSG_RAN//TSGR_93e/Docs//RP-211887.zip), but these CRs are lacking the NS-value.

Nokia ([RP-212169](http://www.3gpp.org/ftp/tsg_ran/TSG_RAN//TSGR_93e/Docs//RP-212169.zip)), Ericsson ([RP-212204](http://www.3gpp.org/ftp/tsg_ran/TSG_RAN//TSGR_93e/Docs//RP-212204.zip)) and OPPO ([RP-211815](http://www.3gpp.org/ftp/tsg_ran/TSG_RAN//TSGR_93e/Docs//RP-211815.zip)) propose to approve CRs as per Solution A defined by RAN2 (capability bit + NS-value). Company contributions for this approach from Ericsson, Nokia, Verizon, Qualcomm can be found in [RP-212513](http://www.3gpp.org/ftp/tsg_ran/TSG_RAN//TSGR_93e/Docs//RP-212513.zip), [RP-212514](http://www.3gpp.org/ftp/tsg_ran/TSG_RAN//TSGR_93e/Docs//RP-212514.zip), [RP-212515](http://www.3gpp.org/ftp/tsg_ran/TSG_RAN//TSGR_93e/Docs//RP-212515.zip), [RP-212516](http://www.3gpp.org/ftp/tsg_ran/TSG_RAN//TSGR_93e/Docs//RP-212516.zip), [RP-212517](http://www.3gpp.org/ftp/tsg_ran/TSG_RAN//TSGR_93e/Docs//RP-212517.zip), [RP-212518](http://www.3gpp.org/ftp/tsg_ran/TSG_RAN//TSGR_93e/Docs//RP-212518.zip).

Apple, MediaTek and Skyworks Solution Inc. ([RP-212305](http://www.3gpp.org/ftp/tsg_ran/TSG_RAN//TSGR_93e/Docs//RP-212305.zip)) proposes to approve CRs without the NS-value.

### 2.2 Initial round

#### 2.2.1 Discussion initial round

Do you agree to approve Solution A as per RAN2's agreement, i.e. having both UE capability bit and an NS value? If no, please clarify how do you propose to ensure that UE’s that don’t support the DoD band need to be barred from accessing the DoD band in the US.

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| **Company** | **Input** |
| Nokia, Nokia Shanghai Bell | Agree: this resolves IDLE mode camping issues since barring due to unknown NS-value was introduced by Rel-15 specifications, so it works for all UEs. |
| Verizon | We agree Solution A!  As what Nokia mentioned above, this soltoin is aligning on the RAN2 soltuion. Also, it is same as the RAN4 agreement. |
| Huawei | Ok to follow the RAN2/4 agreements. As per GTW discussion, if needed, also fine to continue the NS-related technical discussion in next RAN4. |
| ZTE | Yes, to approve Solution A. RAN4 has already excluded the new band approach. |
| AT&T | Although we do not see the need for NS-value, we can accept Solution A with the assumption that the RAN4 CRs below are modified to address our comments and concerns below. |
| T-Mobile USA | We agree with Solution A, to have a new capability bit and NS value. We can live without the new NS value if that is the only way to get CRs approved at this meeting, |
| Apple | Though we are not quite convinced the new NS value is needed as when foreign UEs receive the Mobile Country Code from SIB, they should realize that they are roaming in US and should refrain themselves from accessing the cell if they are not FCC certified for the band, just like all UEs in US. Nonetheless, if the majority companies think the new NS value is needed, we can also accept that. However, in our view, we think the support of the new NS value is better paired with modifiedMPR-Behavior bits in NR rather than paired with a new capability bit. As commented in RP-212204, the new NS value is not used according to its conventional purpose. So using the modifiedMPR-Behavior bit to indicate the UE capability and the support of the new NS value would have the merit to rationalize the use of the new NS value. And in RAN4, we’ve already had similar precedent when the new NS\_203 was introduced for n258. Using modifiedMPR-Behavior bit also provides the advantage that no new UE capability in NR nor a new band number would need to be considered again if more new frequency ranges in Band n77 open up in future.  To sum up our view, we would prefer to either approve the endorsed CRs only, or go with the package of (new NS value + modifiedMPR-Behavior + new LTE capability endorsed in RAN2) in this meeting. With the modifiedMPR-Behavior in RAN4 specifications, we would no longer need new UE capability bit in NR. |
| Qualcomm Incorporated | We support Solution A. The overall system behaviour is more stable with new NS value than relying on network implementations to handle UEs not indicating the new UE capability for support for 3450-3550 MHz. New NS value avoids the situation a UE not supporting the new UE capabilty camps on 3450-3550 MHz without knowing if it will be rejected by the network.  We propose not to postpone the discussion. |

If Solution A, as defined in the RAN2 LS (with both capability bit and NS value) should be introduced, do you agree to introduce them as per the CRs in [RP-212513](http://www.3gpp.org/ftp/tsg_ran/TSG_RAN//TSGR_93e/Docs//RP-212513.zip), [RP-212514](http://www.3gpp.org/ftp/tsg_ran/TSG_RAN//TSGR_93e/Docs//RP-212514.zip), [RP-212515](http://www.3gpp.org/ftp/tsg_ran/TSG_RAN//TSGR_93e/Docs//RP-212515.zip), [RP-212516](http://www.3gpp.org/ftp/tsg_ran/TSG_RAN//TSGR_93e/Docs//RP-212516.zip), [RP-212517](http://www.3gpp.org/ftp/tsg_ran/TSG_RAN//TSGR_93e/Docs//RP-212517.zip), [RP-212518](http://www.3gpp.org/ftp/tsg_ran/TSG_RAN//TSGR_93e/Docs//RP-212518.zip)?

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| **Company** | **Input** |
| Nokia, Nokia Shanghai Bell | Yes (proponent). |
| Verizon | Yes, we agree with CRs! |
| Huawei | Regarding RAN4 CRs: revised versions in RP-212517, RP-212518 have corrected the identified issue of the already used NS\_52 value.  Still, further text corrections needed:   1. Proper reference to be added in the text to „FCC 21-32A1“ document. 2. Note 12 missing the extendedBand-n77 reference to [7]. 3. Align table 5.2-1 and Table 6.2.3.1-1 for the use of “US” vs “USA” wording. |
| ZTE | Yes, the CRs are fine. Approving these CRs can save RAN4 time. |
| AT&T | We would like to propose the following updates to RP-212517 and RP-212518.   1. Keep the RAN4 agreed table note in Table 5.2-1 as shown in R4-2115112 (R4-2112050) as it is sufficient to specify the required frequency range for n77 and this was agreed even with the fact that there was a signalling bit solution identified during the RAN4 meeting. The RAN2 CRs already adequately cover the required signalling aspects with adequate references to the RAN4 spec. There is also no need to refer to FCC 21-32A1 as we did not refer to a FCC R&O for C-Band in the core requirements and the option to include any FCC R&O reference was already determined as not needed based on previous RAN4 agreements.   NOTE 12: In the USA this band is restricted to 3450 – 3550 MHz and 3700 – 3980 MHz.  2. Modify NOTE 5 in Table 6.2.3.1-1 as follows. We think that it is better to refer back to signalling specs since the requirement is defined there concerning when it needs to be used. The comment on the FCC R&O is also similar to item #1.  NOTE 5: This NS value is applicable for cells in the range 3450-3550 MHz for operations in the US as indicated in clause 4.2.7.11 of 38.306 [YY] and clause 4.3.7.X of 36.306 [ZZ].  3. We need to ensure that the introduction of NS\_55 does not result in any addtional RF conformance tests. Normally, we would have to test A-MPR/A-SEM for each NS value. Given that the NS value is not being used for its intended purpose, we need a clear way to indicate this in the specification. The UE shall essentially act as if NS\_01 was signalled for the purposes of RF conformance. |
| T-Mobile USA | We want to have CRs approved at this meeting. We want to see the RAN2 endorsed CR’s in RP-212445 approved at this meeting. We could accept the RAN4 agreed CRs contained in RP-211887, but we would prefer addition of NS signalling in 38.101-1 Table 6.2.3.1-1 if that is agreeable to the majority of companies. We agree with AT&T that there is no need to refer to FCC 21-32A1. |
| Apple | We would prefer to go with the package of (new NS value + modifiedMPR-Behavior + new LTE capability endorsed in RAN2), or we only approve the endorsed RAN2 and RAN4 CRs in this meeting. |
| Qualcomm Incorporated | Yes |

#### 2.2.2 Conclusion initial round

# 3 Conclusion

TODO