**3GPP TSG RAN Meeting #88-e RP-20XXXX**

**e-meeting, 29 June - 3rd July 2020**

Source: T-Mobile USA (Email discussion moderator)

Title: New Channel Bandwidths discussion

TDOC Type: discussion

Agenda Item: 9.1.1 Proposals led by RAN4 (spectrum related)

Release: Rel-17

# Introduction

The following TDOC is submitted to the email discussion decided during RAN#88-E and referenced as follow :

* [New\_Channel\_BWs] (T-Mobile USA)

Goal: Discuss the WIs and SIs proposals for existing channel BWs and potential new channel BWs and recommend what RAN Plenary should approve in terms of WID(s) and/or a SID

Moderator: Bill Shvodian

# Discussion

The following tdocs were submitted related to new channel BWs:

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| --- | --- | --- |
| [**RP-200609**](http://www.3gpp.org/ftp/TSG_RAN/TSG_RAN/TSGR_88e/Docs/RP-200609.zip) | Motivation for new WI on introduction of brand new channel bandwidths for NR | Huawei Technologies Japan K.K. |
| [**RP-200610**](http://www.3gpp.org/ftp/TSG_RAN/TSG_RAN/TSGR_88e/Docs/RP-200610.zip) | New WID proposal: introduction of brand new channel bandwidths for NR | Huawei Technologies Japan K.K. |
| [**RP-200834**](http://www.3gpp.org/ftp/TSG_RAN/TSG_RAN/TSGR_88e/Docs/RP-200834.zip) | New basket WID: adding new channel bandwidth(s) support to existing NR bands | Ericsson |
| [**RP-200835**](http://www.3gpp.org/ftp/TSG_RAN/TSG_RAN/TSGR_88e/Docs/RP-200835.zip) | Motivation for adding new channel bandwidth(s) support to existing NR bands | Ericsson |
| [**RP-200940**](http://www.3gpp.org/ftp/TSG_RAN/TSG_RAN/TSGR_88e/Docs/RP-200940.zip) | On adding new channel BW for existing band | MediaTek Inc. |
| [**RP-201029**](http://www.3gpp.org/ftp/TSG_RAN/TSG_RAN/TSGR_88e/Docs/RP-201029.zip) | On UE bandwidths for NR bands | Huawei, HiSilicon |
| [**RP-201130**](http://www.3gpp.org/ftp/TSG_RAN/TSG_RAN/TSGR_88e/Docs/RP-201130.zip) | On efficient usage of operator spectrum that is not aligned with NR channel bandwidths | T-Mobile USA |
| [**RP-201131**](http://www.3gpp.org/ftp/TSG_RAN/TSG_RAN/TSGR_88e/Docs/RP-201131.zip) | Motivation for new SID: Efficient utilization of licensed spectrum that is not aligned with existing NR channel bandwidths | T-Mobile USA |
| [**RP-201231**](http://www.3gpp.org/ftp/TSG_RAN/TSG_RAN/TSGR_88e/Docs/RP-201231.zip)  Revision of  [**RP-201132**](http://www.3gpp.org/ftp/TSG_RAN/TSG_RAN/TSGR_88e/Docs/RP-201132.zip) | New SID on Efficient utilization of licensed spectrum that is not aligned with existing NR channel bandwidths | T-Mobile USA |

As discussed during the Monday Early Items RAN Plenary GotoWebinar session, the proposals can be broken into three categories: 1) A basket for adding already defined channel BWs to existing bands (as in [**RP-200834**](http://www.3gpp.org/ftp/TSG_RAN/TSG_RAN/TSGR_88e/Docs/RP-200834.zip)), 2) Proposals for adding new channel BWs that are multiples of 5 MHz such as 35 MHz and 45 MHz, 3) Proposals for efficiently supporting operator licensed channel BWs that are not multiples of 5 MHz. Given that, this e-mail discussion document will be broken up into three parts to discuss these three topics.

2.1 Basket for adding already defined channel BWs to existing NR bands

Ericsson has submitted a basket WI to add already defined NR channel bandwidths to existing NR bands. In Rel-16 RAN4 had separate Work Items for each instance when an operator needed to add an already defined NR channel Bandwidth to an existing NR band, including NR\_n3\_BW, NR\_n65\_BW, NR\_n1\_BW2, etc. This basket WI would enable RAN and RAN4 to operate more efficiently by creating a basket for adding these already defined channel BWs to the existing bands. The Objectives and scope from RP-200834 are copied here for reference:

Objective and scope

* Specify channel bandwidth – sub-carrier spacing combinations to be supported for each considered band.
  + The channel bandwidth should be on of the following list: {5 MHz, 10 MHz, 15 MHz, 20 MHz, 25 MHz, 30 MHz, 40 MHz, 50 MHz, 60 MHz, 70 MHz, 80 MHz, 90 MHz, 100 MHz}.
  + The band should be an already specified NR band, including SUL and SDL bands.
* Analyze and specify requirements:
  + Reference sensitivity and associated RB allocation.
  + When needed:
    - MPR (relative bandwidth criteria)
    - Additional Maximum Power Reduction (A-MPR)
    - NS signalling.
  + Any other RF requirement which might be relevant.
* CA or EN/DC combinations updates are not in the scope of this WI.

**Question 1-1: Are there any comments on the proposed WI?**

| **Organization** | **Comments** |
| --- | --- |
| Skyworks | For n48 it should be clarified that 70 MHz is only for the DL. |
|  |  |

**Question 1-2: Should the WI be approved?**

| **Organization** | **Comments** |
| --- | --- |
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|  |  |

2.2 The addition of new channel BWs that are a multiple of 5 MHz

As discussed on the early item GTW call, some channel BWs such as 35 MHz and 45 MHz have been requested for multiple bands by multiple operators. From RP-201130:

|  |  |
| --- | --- |
| **Band** | **Channel Bandwidth** |
| **n3, n8, n25, n66, n71** | 35 MHz |
| **n3, n25, n66** | 45 MHz |

RAN4 has defined NR channel BWs in 5 MHz increments up to 30 MHz, so extending this up to 50 MHz should be straight forward. Such a WI could be based on Phase 2 of the Huawei proposal in RP-200610.

The core scope is as follows:

* Specify the core requirements for the generic approach to support 35 MHz and 45 MHz NR channel bandwidths
  + Specify the spectrum utilization
  + Specify the channel arrangement, if needed
  + Specify UE RF requirements for UL and DL
  + Specify BS RF requirements for UL and DL
  + Specify RRM core requirement, if needed
  + Specify the necessary RAN2 signalling, if needed

The scope of performance part is as follows:

* Specify the performance requirements for the generic approach to support 35 MHz and 45 MHz NR channel bandwidths
  + Specify the UE demodulation/CSI reporting requirements
  + Specify the BS demodulation performance requirements
  + Specify the RRM test cases, if needed.

**Question 2-1: Are there any comments on approving a new Work Item to define 35 MHz and 45 MHz as NR channel BWs?**

| **Organization** | **Comments** |
| --- | --- |
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|  |  |

**Question 2-2: Are there any comments modifying the Huawei WID in** **RP-200610 to only include 35 and 45 MHz channel bandwidths and the core and performance objectives listed above?**

| **Organization** | **Comments** |
| --- | --- |
|  |  |
|  |  |

2.3 Efficient usage of operator spectrum that is not a multiple of 5 MHz

A study Item was proposed in RP-201231 to consider efficient usage of operator spectrum that is not aligned with existing NR channel bandwidths. A new tdoc number was assigned Depending on the outcome of the discussion in 2.2 above, 35 MHz and 45 MHz may or may not be included in the scope of such a Study Item.

**Question 3-1: Other than the inclusion of 35 and 45 MHz (which is discussed in 2.2 above), are there any comments on the Study Item proposed in RP-201231?**

| **Organization** | **Comments** |
| --- | --- |
| Dish Network | Please add 6 MHz channel Bandwidth for n29 to the list in the SI |
| AT&T | Please add 6 MHz and 11 MHz channel bandwidths for n29 to the list in the SI |
| SaankhyaLabs | Request to add 6 MHz channel Bandwidth for n29 to the list in the SI |

**Question 3-2: Should RAN Plenary approve a Study Item based on a revised version of RP-201231?**

| **Organization** | **Comments** |
| --- | --- |
| MTK | * It is OK to us to have either a SI or a WI with study phase. In either way, a clear goal for the study should be provided. * In this RAN meeting, we should focus on listing possible solutions to address operator’s concern, while leave it to RAN4 to down select the final approach. * Channel BW for gNB and UE should be handled differently. * A single meeting for SI or the study phase of a WI is definitely not sufficient to have deep analysis on feasibility, network/UE complexity as well as spec impacts. |
|  |  |

# Summary

# Proposed way forward

***END***