3GPP TSG-RAN Meeting #92-eRP-21xxxx

Electronic Meeting, 14-18 June 2021

Agenda Item: 9.7.1.7

Source: Email discussion moderator (RAN Vice-Chair – Deutsche Telekom)

Title: Report from Email Discussion [92-e-24-Repeaters]

Document for: Discussion and decision

# 1 Introduction

This document reports on the following email discussion during RAN#92-e:

**[92-e-24-Repeaters]**

Input contribution covered: RP-211311

It is understood by the Moderator that this proposal is only for NR repeaters which are part of the Rel-17 RAN4 work currently. At this point in time the proposal is only for the configuration of the NR repeater channel bandwidth. It is proposed to use RRC based SIB signalling provided from the gNB.

## 2 Discussion

### 2.1 Initial Round

The initial round should help to gain a feeling if there is support on such configuration of NR repeaters channel bandwidth in the group. It should also take into account the proposal by the proponents to base such configuration on RRC using SIB signalling while taking into account the workload of involved RAN WGs (RAN2 and RAN3 for signalling, RAN4 for general guidance and requirements) for Rel-17.

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| **Indicate your potential interest to support the work proposed in RP-211311 and comment on the 3GPP release (Rel-17 or Rel-18) you see the work being manageable** | |
| **Company** | **Comments** |
| AT&T | We are not convinced of the need for this signalling enhancement in Rel-17. Considering the potential for many additional enhancements for so-called “smart repeaters” in Rel-18, it may be preferable to handle them all under a common framework rather than individual optimizations which do not necessarily address all use cases. |
| Pivotal | We share ATT’s view.  Some network equipment is perfectly capable of getting this info (and other timely info) out of band & remotely & at $0 cost, and remote management may already be in place.  What would surely imply higher cost is making this signalling capability a must (i.e. a modem that would decode, a scanner of sort) into otherwise simple device.  This should at the very least be considered only in the context of a broader motivation/cost-benefit analysis for a TBD signaling package as part of Rel-18. |
| Samsung | We do NOT support work proposed in RP-211311 given involving other WG has been extensively discussed and already precluded during the discussion of approval the WI. Also, it is our understanding that introducing such signalling is NOT essential for repeater operation in REl-17 since bandwidth issue can be solved in implementation manner, e.g., pre-configured bandwidth. For whether such work can be manageable in REl-18, it is too early to discuss the Rel-18 work at this moment. Rel-18 repeater work if proposed shall be discussed together with other proposals in REl-18 package. |
| China Telecom | In RAN #90e, when we discussed the signalling aspect for the WID, it was about the TDD pattern and beam information, and we have not discussed and precluded the bandwidth information.  The motivation for us is that the channel bandwidth for repeater will change with time, with the refarming of LTE and 3G networks. For example, in band n1, it is 20MHz or 40MHz NR in the initial deployment, and increase to 45 to 55MHz CBW in the future. |
| MTK | We support the proposal.  The intention is for forward compatibility of the repeater device to work in a new BW which may be changed over time. As China Telecom mentions, if the repeater only amplifies the signal in a partial BW (E.G., 20MHz) out of a 45MHz carrier, the UE decoding performance would become problematic.  Regarding the workload to other WG, we think it is extremely low. The simplest way is to add an additional BW broadcasted in system information. |
| Intel | The current proposal is not in the scope of Rel-17 RF Repeaters WI. No network assistance was included in the scope of Rel-17 item and RF repeaters are defined in a completely transparent manner to the network. Extending the scope of the WI will delay the whole work. The CBW configuration can be left up to implementation (e.g. can be preconfigured or remotely configured via non-3GPP interfaces)  Any potential proposals for Rel-18 shall be discussed in the workshop and we prefer not to discuss the applicability of the work to Rel-18. |
| Deutsche Telekom | In general, we are supportive of such enhancements, but as indicated by multiple companies above there is no room for Rel-17. Especially considering the workload in RAN2 and RAN3 which would need to define the related signalling there is realistically no time in Rel-17.  We propose to come back with this topic (and other related “smart repeater“ proposals) in Rel-18 |
| CMCC | It’s true that the channel bandwidth would change with time as 2G, 3G, or 4G network re-farm. In most cases the re-farming is manageable and predictable and operator could pre-configure passband with the maximum bandwidth.  However, there may be some exceptions that the change of bandwidth is unpredictable. For example, the co-construction and spectrum sharing among operators would change the practical bandwidth, in which cases bandwidth configuration signalling could be helpful to change repeater pass-band bandwidth without incurring a large cost by manually re-configuring pass-band bandwidth. Therefore, pass-band bandwidth configuration signalling is useful in this case.  But we are not sure whether this feature should be discussed in R17 or in R18 smart repeater part. We share the same view with AT&T that it may be better to discuss all smart repeater features under a common framework rather than individual optimization. |
| Ericsson | The inclusion of passband information in the SIBs is a potential optimization rather than a necessity. We assume that anyhow there are more parameters than just bandwidth to configure and that if needed the repeater will be equipped with a means of remote configuration. It could also be questioned whether the proposed signaling would be appropriate for all scenarios; suppose for example the passband should be configured differently for different repeaters within a cell? In our view, it is better to keep the scope as it is now in Rel-17 and address all signaling optimizations in a smart repeater WI. |
| KDDI | We support the proposal.  As MTK and China Telecom mention above, the motivation is for forward compatibility of the repeater device to work in a new BW which may be changed over time, fully justified. Even though some vendor proprietary solutions may work as Pivotal mentions, it’s good for operators to have a standardized solution. We also think that RAN2 work seems to be trivial and manageable. |
| Nokia | The proposal is a major increase to the scope of the current WI, as it implies that a basic analogue repeater has the capability to read SIBs, thus including a control channel. The associated scope increase is large and extends beyond RAN4. We therefore cannot support this proposal. |
| NTT DOCOMO, INC. | Basically we are supportive this proposal in order to make NW more flexible. However, as same as other company, we are concerning whether it can be finalized in Rel-17. In addition it is unclear that this functionality can cover both NSA and SA because the proposal assumes using SIB. In order to clearly define the scope, it seems to be better to discuss in Rel-18. |
| ZTE | We could understand the motivation for that which also sounds reasonable, however we might extend the the existing scope beyond RAN4, maybe we could further discuss this feature in future release or actually this signalling could also been done by implementation for repeater. |
| Huawei | This idea seems to be more suitable for the Smart repeater concept, and the Rel-18 timeframe. Then, NR-limitation of such concept can be re-evaluated.  Some discussion may be needed to understand how frequently such bandwidth re-configuration may be required for the repeater (in our understanding very seldom), to justify if such feature implementation based on broadcast signalling is justified.  Also, consideration of other alternative (remote) O&M solutions may be useful here. |

### 2.2 Intermediate / Final Round - Conclusion

Based on the feedback from 13 companies providing feedback in the initial round, we could draw the following picture:

* 3 Companies provided the view that the work as outlined in RP-211311 should be done for Rel-17   
  (China Telecom, MKT & KDDI)
* 10 Companies provided the view that the work should be done as part of a pot. “Smart Repeater” SI/WID in Rel-18, but not in Rel-17 (  
  AT&T, Pivotal, Samsung, INTEL, Deutsche Telekom, CMCC, Ericsson, Nokia, NTT DOCOMO, ZTE

**Proposal: Given this picture the moderator proposes to defer this topic to Rel-18 and close this email discussion.**

## Annex: Contacts

Please provide a company contact that the email discussion moderator can contact if required.

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