

3GPP TSG RAN#94e RP-213621

Electronic Meeting, December 06 - 17, 2021

Source: Moderator (Nokia)

Title: Moderator's Summary on "[94e-44-R17-SDT-WID]"

Document for: Information

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## 1 Introduction

This NWM thread is collecting company views with the goal of eventually providing a way forward on the Proposal contained in RP-212948:

**Proposal: Add the following performance part objective to the Rel-17 SDT WID:**

*Specify BS demodulation requirements, if found necessary*

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## 2 Initial Phase - now closed

In this Initial Phase companies are invited to provide overall comments on the proposal.

**Feedback Form 1: Initial comments on the Proposal in RP-212948**

### 1 – ZTE Corporation

- We don't think BS demodulation requirements are needed for this WI.
- We want to point out that we removed the BS demodulation requirements from the WID in the past and replaced them with the RRM requirements for synchronization after having a discussion in the RAN plenary in the past on this specific issue (please see the related discussion on RP-200954 which was eventually approved in RP-201305 in RAN#88-e).
- As noted during the above discussion, the reason for not having the BS demodulation requirements is that we do not introduce any new UL channels for SDT. Both RA-SDT and CG-SDT use existing channels. The main thing is that for both RA-SDT and CG-SDT PUSCH (either MSG3/CG message or subsequent PUSCH transmissions) is sent only when the UE is in UL sync state. For RA-SDT, the UE acquires synchronization during RACH procedure (i.e. legacy procedure). For CG-SDT, the PUSCH should be sent only when the UE is uplink sync (i.e. TA validation succeeds). There are separate RRM requirements to make sure UL is synchronised for CG case (which is aligned with LTE-PUR) and RAN4 are currently discussing these. These RRM requirements are necessary and are also sufficient. Once the UE is in UL sync according to these requirements, there is no need to

have any further demodulation requirements (as has been already agreed at RAN#88-e).

So, considering the above background, we don't think we need to revisit this aspect and we should instead stick to the original conclusion that there is no need for BS demod requirements for SDT.

## **2 – Nokia Corporation**

As proponent we support the propose objective and thus, allow RAN4 to discuss the need for BS demodulation requirements. Adding this new objective does not mean that BS demodulation requirements are defined but it allows technical discussion in RAN4.

For instance, for CG-SDT the UE has to rely on a potentially outdated timing advance command, especially if the UE has moved. This combined with potentially worse time/frequency synchronization, when compared to connected mode transmissions, can result in non-negligible changes to UL timing accuracy (w.r.t. PUSCH connected mode). In our view it would be important that RAN4 discusses and decides if BS demodulation requirements are needed for SDT. In any case RAN4 has not yet started its performance work item work yet.

## **3 – Intel**

We are ok with the proposal. We are open to investigate the BS performance aspects and further decide in RAN4 if additional BS demodulation requirements are required. In addition to demodulation requirements, the BS conformance requirement may need to be included (e.g. “Specify BS demodulation and conformance requirements, if found necessary”).

## **4 – Samsung Electronics Benelux BV**

Samsung

We are ok with this proposal to update the WID. From baseband processing perspective, in our view, existing Rel-16 BS 2 step-RA with MsgA test cases can fulfill the test purpose of worse synchronization. We are open to investigate the necessity of additional BS demodulation requirements for CG-SDT in RAN4.

## **5 – CATT**

We are ok to allow RAN4 to investigate the BS demodulation requirements and specify if needed.

## **6 – LG Electronics Inc.**

We are skeptical about the proposal. Given that RAN2 introduced SDT specific RRM requirements (e.g. SDT specific RSRP threshold, SDT specific TA validation, etc.), we are not sure whether BS demodulation requirements needs to be changed due to SDT.

## **7 – Ericsson France S.A.S**

We share the same view as ZTE. RRM requirements being specified to ensure that the UE will transmit on CG-SDT PUSCH only if the UE meets timing requirements i.e. TA is valid and UE meets timing error requirements. Note that PUR in cat-M/NB-IoT is similar to CG-SDT PUSCH transmission, and we have no BS requirements for PUR. So we do not see a need to burden RAN4 with a technical discussion in demodulation given that RRM is solving the issue.

**8 – vivo Mobile Communication Co.**

We are also wondering why new BS demodulation requirements are needed. For RA-SDT, all the candidate transmission schemes (e.g. maximum TBS, DM-RS configuration, and waveform) are directly inherited from the existing RA solution. In this sense, no new BS demodulation scenarios are found. Then, it is a spontaneous logic to assume that the existing requirement is sufficient for RA-SDT. Regarding CG-SDT, we understand that RAN4 is investigating the CG-SDT TA validation requirements, which are supposed to guarantee that no new BS demodulation requirements are needed, similarly to the design for LTE PUR. But we are open to have such investigation in RAN4 for further check.

**9 – Huawei Technologies Sweden AB**

We support ZTE view. We see no need to define BS demodulation requirements for SDT.

First, it would be good to clarify ZTE concerns and motivation behind removal of such requirements from the WID in the past.

For the CG-SDT the potentially worse time/frequency synchronization is ensured by RRM requirements for UL synchronization. Also RAN2 has defined mechanism of running TA timer and condition to meet certain threshold of RSRP measurement to ensure the UL synchronization before BS initiates the CG-SDT. From demodulation requirements point of view, we do not think that it is much meaningful to additionally verify the TA by defining a separate PUSCH performance requirements as defined for 2-step RA type. Also the existing PUSCH performance requirements are defined under fading channel.

4SR-SDT: the only difference of SDT and normal Rel-15 case is larger payload, we do not think that it is necessary to define a requirements just for different payload size. The existing PUSCH demodulation requirements already cover all modulation orders of QPSK, 16QAM, 64QAM and 256QAM (to be defined).

If anything, the proposal from RP-212948 should be modified to focus on analyses first (e.g. *“the need for BS demod requirements may be discussed in RAN4”*), while the discussion should not be started in RAN4 before Q2 2022.

**10 – New H3C Technologies Co.**

We have the same view with ZTE and Ericsson. From our perspective, It isn't necessary to specify new BS demodulation requirement for SDT because RRM requirements for UL synchronization can be specified by RAN4 and ensure TA for CG-SDT is valid.

**11 – Xiaomi Communications**

We have the same view with ZTE and Ericsson.

**12 – Nokia Corporation**

Considering that UE RRM requirements are not yet completed and different options are currently considered in RAN4, would it be acceptable that we'll wait for RAN4 to decide the related UE RRM requirements first (hopefully in the next RAN4 meeting) and if time/frequency synchronization errors remain due to UE RRM requirements, RAN should then update the WID (performance part) to allow RAN4 to discuss the need of potential BS demodulation requirements (and conformance testing if BS demodulation requirements are defined)?

**13 – ZTE Corporation**

Thank you for the further comment above! We are fine to postpone this issue for now and revisit if needed at next meeting.

Our view is that we should define RRM requirements to ensure that PUSCH transmissions are only possible when UE is in UL sync (same as in LTE-PUR). Once the UL sync is guaranteed (to the required degree of accuracy as deemed sufficient by RAN4), we don't think we should burden RAN4 with any further checks on the UL receiver side (again same paradigm as LTE-PUR) – since these are then redundant. With this understanding, we are fine to postpone this issue for now as proposed.

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### 3 Final phase - now closed

From the initial phase comments it is clear that the original proposal in RP-212948 cannot be agreed at this point.

However, depending on the progress on RAN4 RRM requirements there may be a need to revisit the topic. Hence, the moderator proposed way forward is to:

1. Note the original input document RP-212948
2. Add to the Minutes that "Potential need to define BS demodulation requirements (and related conformance testing needs) for SDT will be re-addressed by RAN at a later point in time once RAN4 defined the UE RRM requirements"

Please provide any final comments on the proposed way forward above.

**Feedback Form 2: Final comments on the Moderator proposal above**

**1 – Nokia Corporation**

The moderator's WF proposal is acceptable for us.

**2 – ZTE Corporation**

We are also okay with the proposal.

**3 – vivo Mobile Communication Co.**

We are fine with this WF.

**4 – CATT**

We are fine with moderator's proposal.