**3GPP TSG-RAN2#121 R2-230xxxx**

**Athens, 27 Feb – 3 Mar, 2023**

**Source: ZTE Corporation (offline moderator)**

**Title: Offline discussion 306 summary (mt-sdt open issues)**

**Agenda item:** **8.18**

**Document for:** **Discussion and Decision**

1. **SPS support**

If SPS support is needed, then we need to understand the actual procedure and whether companies think this is useful and whether it is supported in the WI.

Firstly, there seem to be different thinking on what an SPS based solution would look like. The following options seem to be the possible ones. Companies can clarify which option they have in mind:



Then, it is important to stress that option 2 and option 3 only work if the UE is ‘guaranteed’ to be in the same cell (since there is no RRCResumeRequest). Option 1 seems similar to what we have today, but the gains with this option are unclear.

**Question 1: Which option do companies have in mind for SPS (or are there other variants)?**

 **Majority (all the proponents of SPS that joined the offline) think that it is option 1.**

**Question 2: What are the gains (especially option 1)?**

 **PDCCH capacity gain**

 **Battery saving (which did not seem a consensus with companies thinking that there could be negative impacts)**

 **Reliability (again arguments were heard on positive and negative side)**

**Question 3: Do companies think this is covered by the current WI scope?**

 **Some companies think it is covered**

 **Some think it is not covered and it needs plenary discussion**

1. **UL data handling**

Some companies think that after UE is paged for MT-SDT and the MT-SDT procedure is initiated, UE should be allowed to check for UL data availability and the response (resume cause and/or UL RACH resource to be used) is based on the availability of UL data. However, it needs to be discussed whether this is really the intended modelling we want to specify, because in Rel-15 we don’t model it this way.

In Rel-15, when the UE is paged, the UE responds to the paging, but in the procedure for paging response we don’t specify what happens if there is UL data. The understanding is that the UE is allowed to initiate resume procedure for MO-Data at any point, but the internal behaviour within the UE on exact point when the UL data arrives (compared to when it reads the paging bit) is not specified. Even if the MT-Data and UL data arrive at roughly the same time, the UE has flexibility to respond to either of these and we don’t specify how or which trigger the UE responds to (since this is not really testable anyway).

Based on this existing modelling, companies are encouraged to check if we can go with the following approach (which seems to satisfy company preferences whilst reusing existing modelling of resume initiation):

**Proposal 1: Specify an independent UE procedure for responding to MT-SDT paging in RRC (without checking for availability of UL data within this procedure) – similar to existing resume procedure initiated by RAN paging procedure**

**Proposal 2: UE is allowed to initiate MO-SDT based resume or non-SDT based resume at any point using separate procedures which are already fully specified (but no need to specify any cross-links between these independent procedures)**

1. **RACH resource used for UL**

We should decide which RACH resources are used for RA procedure when MT-SDT is initiated.

It seems companies want to be able to use common RACH resources (to avoid the dependency on RA partitioning which is a prerequisite for RA-SDT resources). This was the reason for introducing separate *resumeCause* for MT-SDT at the last meeting. Based on this we can check if there is a real need for using RA-SDT resources for MT-SDT (both for initial RACH and for any RACH during subsequent RACH procedure). We can check the following proposal.

**Proposal 3: If MT-SDT procedure is initiated (see P1 above):**

* **For initial RACH (i.e. RACH before CCCH message) UE uses common RACH resources (i.e. non-SDT RACH resources)?**
* **For subsequent RACH (i.e. RACH triggered due to SR) UE uses common RACH resources (i.e. non-SDT RACH resources)?**
1. **Summary**

**Modelling of UL data arrival:**

**Proposal 1: Specify an independent UE procedure for responding to MT-SDT paging in RRC (without checking for availability of UL data within this procedure) – similar to existing resume procedure initiated by RAN paging procedure**

**Proposal 2: UE is allowed to initiate MO-SDT based resume (in which case RA-SDT resources can be used as specified currently) or non-SDT based resume (in which case only non-SDT RACH resources are used) at any point using separate procedures which are already fully specified (but no need to specify any cross-links between these independent procedures)**

**RACH resources used during MT-SDT procedure:**

**Proposal 3: If MT-SDT procedure is initiated (see P1 above):**

* **For initial RACH (i.e. RACH before CCCH message), UE uses only the non-SDT RACH resources ???**
* **For RACH during subsequent data transfer (i.e. RACH triggered due to SR), UE uses only the non-SDT RACH resources ???**

**SPS support:**

**Observation 1: For SPS support, majority of companies (all proponents of SPS that joined the offline) think that option 1 is the option of interest (i.e., preconfigured SPS resources in RRCRelease that are activated after RRCResumeRequest is sent by the UE in response to MT-SDT paging)**

**Observation 2: Pros and Cons of using SPS have been debated without a consensus**

**Pros: PDCCH capacity saving, Power saving, Reliability, positioning use cases, low spec impact**

**Cons: Power consumption, low reliability, supports only same cell case**

**Observation 3: No consensus yet whether SPS can be progressed within the existing WI scope (arguments heard on both sides)**