3GPP TSG-RAN2 Meeting #113bis-e R2-210xxxx

eMeeting, 12th – 20th April, 2021

Agenda Item: 5.4.3 UE capabilities

Source: Ericsson

Title: [AT113bis-e][010][NR15] UE caps DL scheduling slot offset

Document for: Discussion and Decision

# Introduction

During RAN2#906 it was agreed to have an offline email discussion, after the online discussion on Monday, about:

* [AT113bis-e][010][NR15] UE caps DL scheduling slot offset (Ericsson)

START ONLY AFTER ON-line Monday

Scope: Taking into account on-line agreements, Treat R2-2103768, R2-2103770, R2-2103771, R2-2103769, R2-2103799

Phase 1, determine agreeable parts, Phase 2, for agreeable parts Work on CRs.

Intended outcome: Report and Agreed-in-principle CRs.

Deadline: Schedule A

The deadline for the first round comments is **Wednesday April 14 1000 UTC**.

This report gives a summary of this offline email discussion.

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# Introduction

There was no time for online discussion on monday, and no online agreements were reached, but in this first round we will look for agreeable parts in:

1. [R2-2103768](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2//TSGR2_113bis-e/Docs/R2-2103768.zip), *Summary of [Post113-e][051][NR15] DL scheduling slot offset*, Ericsson report, RAN2#113bis-e
2. [R2-2103770](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2//TSGR2_113bis-e/Docs/R2-2103770.zip), *Introduction of DL scheduling slot offset capabilities in UERadioPagingInformation*, Ericsson, CR 38.331, Rel-15, RAN2#113bis-e
3. [R2-2103771](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2//TSGR2_113bis-e/Docs/R2-2103771.zip), *Introduction of DL scheduling slot offset capabilities in UERadioPagingInformation*, Ericsson, CR 38.331, Rel-16, RAN2#113bis-e
4. [R2-2103769](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2//TSGR2_113bis-e/Docs/R2-2103769.zip), *Open issues K0 configuration and use*, Ericsson, DISC, RAN2#113bis-e
5. [R2-2103799](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2//TSGR2_113bis-e/Docs/R2-2103799.zip), *Configuration of common fields in dedicated signalling*, Ericsson, DISC, RAN2#113bis-e

# Discussion

## Add DL scheduling slot offset capabilities to *UERadioPagingInformation* message

The gNB currently does not know if the UE has IOT-tested K0 > 0 when receiving a Paging message from CN. Thus the gNB does not know if it can use K0 > 0 in the PDCCH scheduling of the Paging message on PDSCH, provided that only UE(s) supporting K0 > 0 are paged in the Paging Occasion (PO). When the gNB does not know if the UE supports K0 > 0, or if also legacy UEs are paged in the PO, then the gNB cannot use K0 > 0 in the PO.

**Issue 1**: Do companies agree to add *SchedulingOffset-PDSCH-TypeA* and *dl-SchedulingOffset-PDSCH-TypeB* capability to the *UERadioPagingInformation* message?

|  |  |  |
| --- | --- | --- |
| **Company** | **Yes/No** | **Comments** |
| Ericsson (proponent) | Yes | None |
| Apple | Yes | We are ok with this proposal |
| ZTE | Yes |  |
| MediaTek | Yes |  |
| Intel | Yes |  |
| Huawei, HiSilicon | Yes |  |
| Nokia | Yes |  |
| Qualcomm Incorporated | Yes |  |
| Samsung | Yes |  |
| LG | Yes |  |
| CATT | Yes |  |
| OPPO | Yes |  |
| vivo | Yes |  |

**Issue 2**: Do companies agree with the draft CRs for Rel-15 and Rel-16 in [2,3]?

1. [R2-2103770](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2//TSGR2_113bis-e/Docs/R2-2103770.zip), *Introduction of DL scheduling slot offset capabilities in UERadioPagingInformation*, Ericsson, CR 38.331, Rel-15, RAN2#113bis-e
2. [R2-2103771](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2//TSGR2_113bis-e/Docs/R2-2103771.zip), *Introduction of DL scheduling slot offset capabilities in UERadioPagingInformation*, Ericsson, CR 38.331, Rel-16, RAN2#113bis-e

|  |  |  |
| --- | --- | --- |
| **Company** | **Yes/No** | **Comments** |
| Ericsson (proponent) | Yes | None |
| Apple | Yes | We do not have strong preference on Rel-15, but are ok with majority agree. |
| ZTE | Yes |  |
| MediaTek | Yes |  |
| Intel | Yes |  |
| Huawei, HiSilicon | Yes |  |
| Nokia | Yes |  |
| Qualcomm Incorporated | Yes |  |
| Samsung | Yes |  |
| LG | Yes |  |
| OPPO | Yes |  |
| Vivo | Yes |  |

## Open issues with K0 configuration and use

In the email discussion #051 [1] companies agreed that the NW can **configure** K0>0 in *pdsch-TimeDomainAllocationLis*t in *SIB1* which is a common configuration for all UEs in the cell i.e. for UEs supporting K0>0 and UEs not supporting K0>0:

A UE that does not support *dl-SchedulingOffset-PDSCH-TypeA* or *dl-SchedulingOffset-PDSCH-TypeB* capability does support *pdsch-TimeDomainAllocationList* **configuration** in *PDSCH-ConfigCommon* in *SIB1* including K0 values larger than 0.

**Issue 3**: Do companies agree to clarify this in the chairman notes?

|  |  |  |
| --- | --- | --- |
| **Company** | **Yes/No** | **Comments** |
| Ericsson (proponent) | Yes | None |
| Apple | Ok |  |
| ZTE | Yes |  |
| MediaTek | acceptable | We have some concern during the email discussion but would be fine to compromise as it is broadcast configuration in SIB1. |
| Intel | No | We think that It is clear that the common configuration is per cell and thus network can provide configuration that may not be supported by all UEs. However, we are ok to clarify this in the chairman notes if majority thinks it is needed. |
| Huawei, HiSilicon | Yes |  |
| Nokia | Yes |  |
| Qualcomm Incorporated | Yes |  |
| Samsung | Yes |  |
| LG | Yes |  |
| CATT | Yes |  |
| OPPO | Yes |  |
| vivo | Yes |  |

In the email discussion #051 [1] it was also discussed whether it should be clarified that the NW cannot **use** K0>0 when the NW does not know if the UE has IOT-tested it:

The network cannot **use** K0>0 for PDCCH/PDSCH scheduling without possible IOT issues when the network does not know if the UE has IOT-tested K0>0.

**Issue 4**: Do companies agree to clarify this in the chairman notes?

|  |  |  |
| --- | --- | --- |
| **Company** | **Yes/No** | **Comments** |
| Ericsson (proponent) | Yes | None |
| Apple | Yes |  |
| ZTE | Yes |  |
| MediaTek | Yes |  |
| Intel | No | This should already be clear. Again, we are ok to clarify this in the chairman notes if majority thinks it is needed. |
| Huawei, HiSilicon | Yes |  |
| Nokia | Yes |  |
| Qualcomm Incorporated | Yes |  |
| Samsung | Yes |  |
| LG | Yes |  |
| CATT | Yes |  |
| OPPO | Yes |  |
| Vivo | Yes |  |

In the email discussion #051 [1] it was also discussed whether the NW should use the UE capabilities when configuring K0 via *PDSCH-Config* (not *PDSCH-Config****Common***) in dedicated signalling, i.e. not configure K0>0 when the UE has not IOT-tested it. It is the understanding of the rapporteur that the normal approach is to use the UE capabilities in dedicated configuration in dedicated signalling:

The network configures K0 in *PDSCH-Config* in dedicated signalling according to the UE capabilities.

**Issue 5**: Do companies agree to clarify this in the chairman notes?

|  |  |  |
| --- | --- | --- |
| **Company** | **Yes/No** | **Comments** |
| Ericsson (proponent) | Yes | None |
| Apple | Yes |  |
| ZTE | Yes |  |
| MediaTek | Yes |  |
| Intel | No | Not sure why we need such clarification. |
| Huawei, HiSilicon |  | No strong view, it is a general principle that the NW configures UE according to the UE capabilities. |
| Nokia | Yes |  |
| Qualcomm Incorporated | Yes |  |
| Samsung | Yes |  |
| LG | Yes |  |
| CATT | Yes | seems to be common sense? |
| OPPO | Yes |  |
| vivo | Yes |  |

## Common configuration in dedicated signalling

The contribution [5] presents three types of RRC signaling in the dimension of common (cell specific) and dedicated (UE specific):

1. Common configuration included in SI
2. Dedicated configuration included in dedicated signaling
3. Common configuration included in dedicated signaling

The issue at hand is the third type, and the paper argues that it should be clarified whether Type 3 configurations should comply with what the UE supports or not.

**Issue 6**: Do you think clarifications are needed (why/why not)?

|  |  |
| --- | --- |
| **Company** | **Comments** |
| Apple | In our view, the common config in the dedicated signalling should be the same (or similar) to the one in common config of SI. Infact, it is one of the agreements in RAN2 that UE gets the common config in a dedicated message that reflects the content of the common config of the cell in handover. However we understand the scenario in this case (Esp for BWP config which has common part in UE dedicated info).  We think that if we follow the philosophy of including only cell-specific config in UE dedicated common config, then we do not have to run into the issue and the relation to UE capability (as cell-specific config using in broadcast does not depend on UE capability).  We are open to other companies view in this regard. |
| Ericsson (proponent) | We think some clarification is needed. It seems there is a baseline principle of adapting all dedicated signalling to the capabilities of the UE. At the same time, there seems to be circumstances when this principle is broken. It can be for good reasons, but we think RAN2 should discuss why this happens and if it happens too often, does the baseline principle really hold? |
| ZTE | We think at least for the parameters that also included in the system information, it shall be aligned with the system Information. For other parameters, we need more time to check, maybe we need to list the related parameters and related UE capabilities then discuss them case by case. |
| MediaTek | There are two general principles  <1> Configuration in dedicated signalling should match UE capability  <2> common configuration is dedicated signalling and in broadcast information should be the same  While we agree both <1> and <2>, there seems conflict on principle <1> and <2> for some parameters in type 3 configuration. The parameters that are broadcasting in SI are mostly basic functionality and are mandatory support by the UE. So, we are hoping that this kind of “conflict parameter” is not much and we can discuss it case by base if needed.  Note that UE in connected mode basically follow the dedicated signalling and it would NOT check whether the common configuration is the same in dedicate signalling and in SI. So, it may be okay to have some exception for <2> as it would not result in RRC Re-establishment. |
| Intel | It is unclear which common configuration this is referring to. If it is servingCellConfigCommon, similar to other companies, our understanding is that it should aligned with the servingCellConfigCommonSIB. Whether there are parameters in servingCellConfigCommon that is restricted by UE capability and may not be set the same as servingCellConfigCommonSIB, we may have to discuss this on a case by case basis. |
| Huawei, HiSilicon | We share the same view that the common configuration should be cell-specific configuration and this principle is already clear in specifications.  We also agree with ZTE that we should discuss case by case if there is a problem. |
| Nokia | We think the dedicated configuration is always up to UE capabilities, unless this would create an issue with SIB configuration. But we hope that's not possible (otherwise we have a bigger problem), so we would go with always aligning with SIB configuration. Then generally we agree with MTK that one could discuss potential conflicts (based on overlap of 1 and 2) on a case by case basis but the 1 and 2 principles should hold independently.  Given this, we also need time to digest the conflicting cases each of them and would need time until May meeting. |
| Qualcomm Incorporated | It is clear from the section 5.3.5.8.2 “Inability to comply with RRCReconfiguration” that the UE does not distinguish between dedicated configuration and common configuration.  We suggest we look at the configuration parameters in common configuration carefully. It should be noted that common configuration includes configurations of SUL or IAB. It is strange that the network “configures” those parameters even if the UE does not support the feature. Also the common configuration in SIB can include UL configuration, while the UE capability / configuration for the serving cell can be DL only. |
| Samsung | We share the view with many others that the common configuration should be cell-specific configuration (i.e. network does not have to modify cell-specific configuration based on UE's capability).  Regarding Qualcomm's comment, we are not sure whether UE should perform comply check for the common configuration, like UE does not perform comply check when it receives SIB. |
| LG | We share the view with MTK that the two principles should hold true in general. So at least we should be able to say that for common parameters configured to UE via dedicated signalling, the values should be identical to those in SIB, but not exactly in the reverse way because some common but not essential parameters may not be comprehended by UEs (and thus ignored). |
| Qualcomm Incorporated | Just to respond to Samsung’s comment. Our comment is about the section 5.3.5.8.2, which is clearly for compliance check on RRC Reconfiguration message, but not SIBs. |
| CATT | Agree with the general principles mentioned by MTK. On top of that we do not see any issue specific to DL scheduling slot offset…  Maybe this can be discussed based on real issue on a case by case basis. |
| OPPO | We also think common parameters in SIB and dedicated signalling hold on same meaning for UE. In case there is any interpretation issue we can discuss case by case. |
| vivo | Firstly, we think we should follow the principle that common configuration in dedicated signalling and broadcast should be guaranteed. This principle should be applicable at least for some parameters related to UE initial access, e.g. search space or CORESET configuration. (Actually, we had some discussion on this point during Rel-15).  With this principle, we assume there is not much common configurations which cannot match UE capability in dedicated signaling, as common configuration (especially essential for UEs) should be supported by all UEs in the cell, except some features which are not supported by UEs (these parts should not be included in the common configuration of dedicated signaling).  If some essential common configuration which cannot match UE capability were identified, we think we could discuss it. |

**Issue 7**: If clarifications are needed, what should be the intended behaviour (e.g. network adapts all type 3 signalling to UE capabilities, or network does not have to adapt all type 3 signalling and the UE has to comprehend it regardless of UE capabilities, or something else)?

|  |  |
| --- | --- |
| **Company** | **Comments** |
| Apple | Pls see our comments above. |
| Ericsson (proponent) | We are open to both having the network adapt Type 3 signalling to UE capabilities and forcing UEs to comprehend all common IEs, regardless if included in dedicated messages or not. As we do not want to create lots of problems for existing implementations, we are eager to hear from other companies. |
| ZTE | Pls see our comments above. |
| MediaTek | See comment above. A general rule to resolve this seems risky. Case by case discussion is preferred. |
| Intel | Please see our comments above. |
| Huawei, HiSilicon | Pls see our comments above. |
| Nokia | Agree with MTK. Given this, we also need time to digest the conflicting cases each of them and would need time until May meeting. |
| Qualcomm Incorporated | It is clear from the section 5.3.5.8.2 “Inability to comply with RRCReconfiguration” that the UE does not distinguish between dedicated configuration and common configuration. |
| Samsung | We tend to agree with MediaTek. |
| LG | Please see our comments for issue5. |
| CATT | See our previous comments. |
| OPPO | Please refer to our previous comment |
| vivo | Please see our previous comment. |

# Summary of email discussion

TBD

# Conclusions

TBD