3GPP TSG-RAN WG2 #112 electronic R2-20xxxxx

Electronic Meeting, Nov 2-13, 2020

Agenda Item: 5.4.3

Source: ZTE, Sanechips

Title: Summary of offline [AT112-e][012][NR15] UE caps II (ZTE)

Document for: Discussion, Decision

# 1 Introduction

This contribution summarizes the following discussion:

* [AT112-e][012][NR15] UE caps II (ZTE)

Treat R2-2008710, R2-2009238, R2-2009239, R2-2009162, R2-2009163, R2-2009516, R2-2009517, R2-2010537, R2-2010536, R2-2010541, R2-2010540, R2-2009944

Intended outcome: Intermediate: Determine agreeable parts. Final: For agreeable parts, agreed CRs.

Deadline: Intermediate deadline(s) by Rapporteur, Final: Discussion stop at Wed Nov 11, 1200 UTC

**Contact from companies**

|  |  |
| --- | --- |
| Company | Email |
| Ericsson (Lian) | lian.araujo@ericsson.com |
| Ericsson (Martin) | martin.van.der.zee@ericsson.com |
| Qualcomm Incorporated | mkitazoe [at] qti.qualcomm.com |
| Intel | Seau.s.lim@intel.com |
| Huawei, HiSilicon | kuangyiru@huawei.com |
| Nokia | Amaanat.Ali@nokia.com |
| OPPO | qianxi.lu@oppo.com |
| Apple | yuqin\_chen@apple.com |
| CATT | erlin.zeng@catt.cn |
| MediaTek | Chun-Fan.Tsai@mediatek.com |
| Samsung | Kimsh23@samsung.com |
| LG | sunghoon.jung@lge.com |
| ZTE (Liujing, WentngLi) | [liu.jing30@zte.com.cn](mailto:liu.jing30@zte.com.cn) li.wenting@zte.com.cn |

# Discussion

## 2.1 Part 1: Intended to determine agreeable parts

Part 1 discussion is focusing on reaching conclusion whether the proposals/CRs can be agreed in principle, and Part 2 discussion would then focus on detailed changes for those agreeable contributions.

### 2.1.1 Clarify UE capability in case of cross-carrier operation

[R2-2008710](file:///D:/Documents/3GPP/tsg_ran/WG2/TSGR2_112-e/Docs/R2-2008710.zip" \o "D:Documents3GPPtsg_ranWG2TSGR2_112-eDocsR2-2008710.zip) LS on Interpretation of UE Features in Case of Cross-Carrier Operation (R1-2007334; contact: ZTE) RAN1 LS in Rel-15 NR\_newRAT-Core To:RAN2

[R2-2009238](file:///D:/Documents/3GPP/tsg_ran/WG2/TSGR2_112-e/Docs/R2-2009238.zip" \o "D:Documents3GPPtsg_ranWG2TSGR2_112-eDocsR2-2009238.zip) CR to clarify UE capability in case of cross-carrier operation ZTE Corporation, Sanechips, Ericsson CR Rel-15 38.306 15.11.0 0418 - F NR\_newRAT-Core

[R2-2009239](file:///D:/Documents/3GPP/tsg_ran/WG2/TSGR2_112-e/Docs/R2-2009239.zip" \o "D:Documents3GPPtsg_ranWG2TSGR2_112-eDocsR2-2009239.zip) CR to clarify UE capability in case of cross-carrier operation ZTE Corporation, Sanechips, Ericsson CR Rel-16 38.306 16.2.0 0419 - A NR\_newRAT-Core

**Q1 Do companies agree with the CRs above?**

|  |  |  |
| --- | --- | --- |
| **Company** | **Agree?**  **(Yes or No)** | **Comments** |
| Ericsson (Lian) | Yes (Proponent) |  |
| Qualcomm Incorporated | Yes, but | We agree to the intention of the CRs.  The category “Per serving cell” does not seem to be scalable for future extension, because in the future there can be UE capabilities which should be indicated for the serving cell triggering the command.  It can be something like, “Triggered serving cell”. |
| Intel | Yes | We are fine with adding a new Annex for this. The future proofing from Qualcomm is also good in our view. |
| Huawei, HiSilicon | Yes but | Agree with the intention, but prefer to add the clarification in the field description using the similar wording in RAN1 LS, e.g. The UE provides the capability for the band of the scheduled/triggered/indicated cell and the band of the scheduling/triggering/indicating cell. Using “Per serving cell”, “Associated serving cells” is a bit difficult to understand and additional definition is needed. |
| Nokia | Yes | Agree with the intention of the CRs. |
| OPPO | Agree with the intention but with wording suggestion | We suggest the rewording as follows:    For per-serving-cell, the term “for a serving cell” is not accurate since the feature relates to two cells, the scheduling one and the scheduled one; And we are also fine to rename it as suggested by QC above.  For associated-serving-cell, the term “all associated serving cells” are not accurate, i.e., only the band for the scheduled cell and the band for the scheduling cell matter. |
| Apple | Yes |  |
| CATT | Yes, but | We’d better follow the wording in R1 LS, to be crystal clear. |
| MediaTek | Yes, but | Similar as Huawei, prefer to have this in field description |
| Samsung | Yes, but | Agree with the intention of the CR. Support to have it in the field description |
| LG | Yes | Fine to generate a new Annex section as proposed. We also share the view with other companies that the term “associated cell” is not crystal clear and better to be reworded. |
| ZTE  (LiuJing) | Yes  (Proponent) | Regarding whether to capture it in Annex or field description, actually, RAN2 had this discussion when introducing the Annex A.1 and A.2, and the conclusion is to put the clarification in Annex instead of field description.  For these new clarifications, it is quite similar to the ones we had in A.1 and A.2, the only difference is the type of UE capability (e.g. per-UE, or per-band…), note that within A.1, A.2, we also clarified several capabilities under cross-carrier scheduling case (e.g. twoDifferentTPC-Loop-PUCCH ). So we would suggest to follow the same principle.  In addition, thanks to companies for the comments on the wording, we will take it into account, and provide a revision for reviewing (during phase II). |

**--Summary**

12 companies joined the discussion and all agree the change in principle. In addition 9 companies think it’s fine to generate a new Annex section as CR proposed, 3 companies prefer to add the clarification in the field description. Some wording comments were also provided. Thus, it’s assumed that these 2 CRs can be pursued and detail comments can be further discussed in part 2. As a supplementary information, please the proponent notice that RAN1 has approved an LS (the LS has been approved, the official Tdoc Number is not available yet) as below which give more clarification on such kind of cross-carrier elements, to avoid some repeat discussion, please the proponent also take into account the new approved RAN1 LS.

|  |
| --- |
|  |

Proposal 1: Update R2-2009238/R2-2009239 based on the comments from companies (e.g. improve the wording of “per serving cell” etc.), and take into account the new approved RAN1 LS on “Interpretation of UE Features in Case of Cross-Carrier Operation”

### 2.1.2 Correction to BWP capability descriptions

.[R2-2009162](file:///D:/Documents/3GPP/tsg_ran/WG2/TSGR2_112-e/Docs/R2-2009162.zip" \o "D:Documents3GPPtsg_ranWG2TSGR2_112-eDocsR2-2009162.zip) Correction to BWP capability descriptions Nokia, Nokia Shanghai Bell CR Rel-15 38.306 15.11.0 0416 - F NR\_newRAT-Core

[R2-2009163](file:///D:/Documents/3GPP/tsg_ran/WG2/TSGR2_112-e/Docs/R2-2009163.zip" \o "D:Documents3GPPtsg_ranWG2TSGR2_112-eDocsR2-2009163.zip) Correction to BWP capability descriptions Nokia, Nokia Shanghai Bell CR Rel-16 38.306 16.2.0 0417 - A NR\_newRAT-Core

**Q2 Do companies agree with the CRs above?**

|  |  |  |
| --- | --- | --- |
| **Company** | **Agree?**  **(Yes or No)** | **Comments** |
| Ericsson (Lian) | Yes | On the change to clarify the relation between *bwp-DiffNumerology* and *bwp-SameNumerology*, wouldn’t it be simpler to say that a UE reporting *bwp-DiffNumerology* shall also report *bwp-SameNumerology*? |
| Qualcomm Incorporated | No | We do not agree to the first change. bwp-DiffNumerology should not include the UE capability for the same numerology.  The rest can be release-16 correction only. |
| Intel | Yes | For the change in *bwp-DiffNumerology*, we also prefer to include a pre-requisite like ‘UE indicating support of this feature shall also indicate support of *bwp-SameNumerology*’. If this is not possible to be done in Rel-15 because of functional NBC, could check whether this can be done from Rel-16? |
| Huawei, HiSilicon | No | The first correction changes the interpretation of *bwp-DiffNumerology*. Not sure if there is the relationship that UE supporting *bwp-DiffNumerology* always supports *bwp-SameNumerology*. If so, prefer to use the wording suggested by Ericsson and Intel. |
| Nokia | Yes | Proponent |
| OPPO | No | Same view as Qualcomm. |
| Apple | Yes | We also prefer to have a pre-requisite as proposed by Intel. |
| CATT | No | We feel nothing is broken without these changes. |
| MediaTek | Partial | For the first change, We prefer not to change meaning of the capabilities.  For the second change (remove type A/B), it looks correct to us. |
| Samsung | No | Considering diverse views expressed above, we better consulte with RAN1. |
| LG | Only the second change | We should not change the meaning of the existing capability bit.  If proper, we are fine to introduce conditional support of *bwp-SameNumerology, conditioned on bwp-DiffNumerology.* |
| ZTE(LiuJing) | See comment | Agree with Ericsson and Intel to have a pre-requisite. And in detail, it should be  ‘UE indicating support of this feature shall also indicate support of *upto4* for *bwp-SameNumerology*’ |

**--Summary**

12 companies joined the discussion. For the first change, 1 company support the change in CR, 3 companies think it’s better to have a pre-requisite like “a UE reporting bwp-DiffNumerology shall also report bwp-SameNumerology”. However, 8 companies disagree with the first change, in which 2 companies can support to add a pre-requisite as above only if the UE supporting bwp-DiffNumerology always supports bwp-SameNumerology.

For the second change, 5 companies express their support, in which 1 company prefer to have it from Rel-16, the other company have no strong view on it.

Thus for the first change, it’s assumed not pursued, anyway the proponent can continue discussion with interested companies. The second change can be pursued but please also confirmed with companies about the start version. If only the second change was agreed at last, it’s better to merge the second change into the mega CR.

Proposal 2: The first change of R2- 2009162 and R21-2009163 is not pursued, the proponent can continue discussion with interested companies.

Proposal 3: The second change is pursued but need the proponent to further confirm the start version with the companies that think it shall be started from Rel-16.

Proposal 4: If only the second change was agreed at last, merge the second change into the Other CR.

### 2.1.3 Correction of the description of ue-SpecificUL-DL-Assignment

[R2-2009516](file:///D:/Documents/3GPP/tsg_ran/WG2/TSGR2_112-e/Docs/R2-2009516.zip" \o "D:Documents3GPPtsg_ranWG2TSGR2_112-eDocsR2-2009516.zip) Correction of the description of ue-SpecificUL-DL-Assignment Apple CR Rel-15 38.306 15.11.0 0430 - F NR\_newRAT-Core

[R2-2009517](file:///D:/Documents/3GPP/tsg_ran/WG2/TSGR2_112-e/Docs/R2-2009517.zip" \o "D:Documents3GPPtsg_ranWG2TSGR2_112-eDocsR2-2009517.zip) Correction of the description of ue-SpecificUL-DL-Assignment Apple CR Rel-16 38.306 16.2.0 0431 - A NR\_newRAT-Core

**Q3 Do companies agree with the CRs above?**

|  |  |  |
| --- | --- | --- |
| **Company** | **Agree?**  **(Yes or No)** | **Comments** |
| Ericsson (Lian) |  | This seems more editorial change, so it could be merged. But we would be fine with the intention, maybe we could avoid referring to this parameter at all and have something as:  “…and associated higher layer configured parameter ~~TDD-UL-DL-ConfigDedicated~~ as specified in TS 38.213 [11]”. |
| Qualcomm Incorporated | Yes, but | We think clarification in release-16 is sufficient. |
| Intel | Yes, but | It would be good to clarify from Rel-15 but merge with other Rel-15 CR |
| Huawei, HiSilicon | Yes, but | Agree above that it is an editorial change and could be merged. |
| Nokia | Yes | Looks okay but merging with rapporteur CRs. |
| OPPO | Yes |  |
| Apple | Yes (proponent) |  |
| CATT | Yes |  |
| MediaTek | Yes, but | Rename of the reference IE is OK, but could be in Rapporteur’s CR. We think the correction could be started from Rel-15. |
| Samsung | Yes | Should be merged with other R15 CR |
| LG | Yes, but | Can be merged into rapporteur CRs |
| ZTE(Wenting) | Yes | Can be merged into rapporteur CRs |

**--Summary**

12 companies joined the discussion and all companies agree with the CR but 9 companies suggest to merge to the rapporteur CRs.

Proposal 5:  Merge the changes in R2-2009516, R2-2009517 into other CRs.

### 2.1.4 Correction to the use of simultaneous CSI-RS resources

[R2-2010537](file:///D:/Documents/3GPP/tsg_ran/WG2/TSGR2_112-e/Docs/R2-2010537.zip" \o "D:Documents3GPPtsg_ranWG2TSGR2_112-eDocsR2-2010537.zip) Correction to the use of simultaneous CSI-RS resources Ericsson CR Rel-15 38.306 15.11.0 0455 - F NR\_newRAT-Core

[R2-2010536](file:///D:/Documents/3GPP/tsg_ran/WG2/TSGR2_112-e/Docs/R2-2010536.zip" \o "D:Documents3GPPtsg_ranWG2TSGR2_112-eDocsR2-2010536.zip) Correction to the use of simultaneous CSI-RS resources Ericsson CR Rel-16 38.306 16.2.0 0454 - A NR\_newRAT-Core

**Q4 Do companies agree with the CRs above?**

|  |  |  |
| --- | --- | --- |
| **Company** | **Agree?**  **(Yes or No)** | **Comments** |
| Ericsson (Lian) | Yes (Proponent) |  |
| Qualcomm Incorporated | Yes |  |
| Intel | Yes |  |
| Huawei, HiSilicon2 | Yes/No? | Now we intend to agree with Nokia that if the NW considers the value is for both “configured” and “active/simultaneous” resources, the change is NBC. But if all the UE/chipset vendors confirm that their understanding is only for “active/simultaneous” resources, then there is no real issue and having this change is safe. In our understanding, it gives more flexibility for NW configuration. |
| Nokia | No | There was a long discussion on this one and our understanding from that discussion is that from the UE point of view it is important to have UE capabilities for both “configured” and “active/simultaneous” resources.  By removing the sentence below, does it mean the network can configure more resources but these are then limited by the previous sentence? Unfortunately, looks to us like a NBC.  We are not ready to accept this for the moment for agreement.  ***csi-RS-IM-ReceptionForFeedbackPerBandComb***  Indicates support of CSI-RS and CSI-IM reception for CSI feedback. This capability signalling comprises the following parameters:  - *maxNumberSimultaneousNZP-CSI-RS-ActBWP-AllCC* indicates the maximum number of simultaneous CSI-RS resources (irrespective of the associated codebook type) in active BWPs across all CCs, and across MCG and SCG in case of NR-DC. The network applies this limit in addition to the limits signalled in *MIMO-ParametersPerBand-> maxNumberSimultaneousNZP-CSI-RS-PerCC* and in *Phy-ParametersFRX-Diff-> maxNumberSimultaneousNZP-CSI-RS-PerCC*;  - *totalNumberPortsSimultaneousNZP-CSI-RS-ActBWP-AllCC* indicates the total number of CSI-RS ports in simultaneous CSI-RS resources (irrespective of the associated codebook type) in active BWPs across all CCs, and across MCG and SCG in case of NR-DC. The network applies this limit in addition to the limits signalled in *MIMO-ParametersPerBand-> totalNumberPortsSimultaneousNZP-CSI-RS-PerCC* and in *Phy-ParametersFRX-Diff-> totalNumberPortsSimultaneousNZP-CSI-RS-PerCC*.  The UE is mandated to report *csi-RS-IM-ReceptionForFeedbackPerBandComb*. |
| OPPO | No | Similar view as Nokia |
| Apple | Yes | In general, we think the change is right and needed.  We suggest some further changes as following:  - *maxNumberSimultaneousNZP-CSI-RS-ActBWP-AllCC* indicates the maximum number of simultaneous active CSI-RS resources (irrespective of the associated codebook type) in active BWPs across all CCs, and across MCG and SCG in case of NR-DC, according to the active CSI-RS definition in Clause 5.2.1.6 in 38.214. The network applies this limit in addition to the limits signalled in *MIMO-ParametersPerBand-> maxNumberSimultaneousNZP-CSI-RS-PerCC* and in *Phy-ParametersFRX-Diff-> maxNumberSimultaneousNZP-CSI-RS-PerCC*;  - *totalNumberPortsSimultaneousNZP-CSI-RS-ActBWP-AllCC* indicates the total number of CSI-RS ports in simultaneous active CSI-RS resources (irrespective of the associated codebook type) in active BWPs across all CCs, and across MCG and SCG in case of NR-DC, according to the active CSI-RS definition in Clause 5.2.1.6 in 38.214. The network applies this limit in addition to the limits signalled in *MIMO-ParametersPerBand-> totalNumberPortsSimultaneousNZP-CSI-RS-PerCC* and in *Phy-ParametersFRX-Diff-> totalNumberPortsSimultaneousNZP-CSI-RS-PerCC*.  ***csi-RS-IM-ReceptionForFeedback***  Indicates support of CSI-RS and CSI-IM reception for CSI feedback. This capability signalling comprises the following parameters:  - *maxConfigNumberNZP-CSI-RS-PerCC* indicates the maximum number of configured NZP-CSI-RS resources per CC;  - *maxConfigNumberPortsAcrossNZP-CSI-RS-PerCC* indicates the maximum number of ports across all configured NZP-CSI-RS resources per CC;  - *maxConfigNumberCSI-IM-PerCC* indicates the maximum number of configured CSI-IM resources per CC;  - *maxNumberSimultaneousNZP-CSI-RS-PerCC* indicates the maximum number of simultaneous active CSI-RS-resources per CC, according to the active CSI-RS definition in Clause 5.2.1.6 in 38.214;  - *totalNumberPortsSimultaneousNZP-CSI-RS-PerCC* indicates the total number of CSI-RS ports in simultaneous active CSI-RS resources per CC, according to the active CSI-RS definition in Clause 5.2.1.6 in 38.214.  The UE is mandated to report csi-RS-IM-ReceptionForFeedback. |
| CATT | yes | We agree with the intention of these CRs. Regarding the wording we are open to check what’s acceptable by majority. |
| Samsung | No | If it needs correction, RAN1 shall discuss it first. The change may impact other R16 features. |
| LG | No | We think the current text already reflects the intention of RAN1 discussion. |
| ZTE(Wenting) | Yes | We agree with the intention. From the description for this element in R1 feature, we think it also means simultaneous active CSI-RS-resources |

**--Summary**

12 companies joined the discussion and 7 companies agree with the CR but 4 companies disagree and one company is FFS. Since Companies have strong views on this issue, it’s suggested to determine online.

Proposal 6:  To online decide whether to pursue R2-1010537 and R2-2010536 online.

### 2.1.5 Correction to pdcch-MonitoringSingleOccasion

[R2-2010541](file:///D:/Documents/3GPP/tsg_ran/WG2/TSGR2_112-e/Docs/R2-2010541.zip" \o "D:Documents3GPPtsg_ranWG2TSGR2_112-eDocsR2-2010541.zip) Correction to pdcch-MonitoringSingleOccasion Ericsson CR Rel-15 38.306 15.11.0 0459 - F NR\_newRAT-Core

[R2-2010540](file:///D:/Documents/3GPP/tsg_ran/WG2/TSGR2_112-e/Docs/R2-2010540.zip" \o "D:Documents3GPPtsg_ranWG2TSGR2_112-eDocsR2-2010540.zip) Correction to pdcch-MonitoringSingleOccasion Ericsson CR Rel-16 38.306 16.2.0 0458 - A NR\_newRAT-Core

**Q5 Do companies agree with the CRs above?**

|  |  |  |
| --- | --- | --- |
| **Company** | **Agree?**  **(Yes or No)** | **Comments** |
| Ericsson (Lian) | Yes (Proponent) |  |
| Qualcomm Incorporated | Yes |  |
| Intel | Yes |  |
| Huawei, HiSilicon | Yes |  |
| Nokia | Yes | Merging with rapporteur correction is preferred as this seems rather editorial? |
| OPPO | Yes |  |
| Apple | Yes |  |
| CATT | Yes |  |
| MediaTek | Yes |  |
| Samsung | Yes | Agree with Nokia that it could be merged |
| LG | Yes |  |
| ZTE(Wenting) | Yes |  |

**--Summary**

12 companies joined the discussion and all of companies agree with the CR, in which 2 companies suggest to merge the change to the Rapporteur CR.

Proposal 7: R2- 2010540 and R21-2010541 are pursued and merge into Other CRs.

### 2.1.6 UE capability and cross-slot scheduling for Paging

[R2-2009944](file:///D:/Documents/3GPP/tsg_ran/WG2/TSGR2_112-e/Docs/R2-2009944.zip" \o "D:Documents3GPPtsg_ranWG2TSGR2_112-eDocsR2-2009944.zip) UE capability and cross-slot scheduling for Paging Ericsson discussion Rel-15 NR\_newRAT-Core

|  |
| --- |
| **Observation 1**: The UE is required to support K0>0 for DL PDSCH, but the UE may not have IOT tested this, and logs show that (some) REL-15 UEs do not support *dl-SchedulingOffset-PDSCH-TypeA* or *dl-SchedulingOffset-PDSCH-TypeB*.  **Observation 2**: Rel-15 supports the default configurations  **Observation 3**: Default PDSCH time domain resource allocation B for Paging and System Information includes both K0 = 0 and 1.  Therefore it should be assumed that the UE supports K0 = 0 and 1 for Paging and System Information, even when the UE does not indicate support for *dl-SchedulingOffset-PDSCH-TypeA* or *dl-SchedulingOffset-PDSCH-TypeB*:  **Proposal 1**: RAN2 to confirm that Rel-15 UE supports K0 = 0 and 1 for Paging and System Information.  In case proposal 1 is agreeable, it can be discussed further if a clarification is needed (e.g. clarify that the UE supports the default configuration independent from the IOT capability signalling).  In case proposal 1 is not agreeable, RAN2 should discuss if legacy UE supports K0 values in the *pdsch-TimeDomainAllocationList* provided in *pdsch-ConfigCommon* in SIB1 that have not been IOT tested by the UE, but the UE is only paged with K0=0 in the Paging PDCCH. This would enable the NW to use cross-slot scheduling for UEs that have indicated to support it, while using legacy scheduling for UEs that did not indicate support. But then *dl-SchedulingOffset-PDSCH-TypeA* and *dl-SchedulingOffset-PDSCH-TypeB* should be added to the *UERadioPagingInformation* message. |

| ***dl-SchedulingOffset-PDSCH-TypeA***  Indicates whether the UE supports DL scheduling slot offset (K0) greater than 0 for PDSCH mapping type A. | UE | Yes | Yes | Yes |
| --- | --- | --- | --- | --- |
| ***dl-SchedulingOffset-PDSCH-TypeB***  Indicates whether the UE supports DL scheduling slot offset (K0) greater than 0 for PDSCH mapping type B. | UE | Yes | Yes | Yes |

**Q6-1 Do companies agree that “the UE supports K0 = 0 and 1 for Paging and System Information, even when the UE does not indicate support for *dl-SchedulingOffset-PDSCH-TypeA* or *dl-SchedulingOffset-PDSCH-TypeB*?”**

|  |  |  |
| --- | --- | --- |
| **Company** | **Agree?**  **(Yes or No)** | **Comments** |
| Ericsson (Martin) | Yes | RAN1 specified in the L1-UE feature lists that the UE is required to support K0=1 for paging (38.822) independent from FR1 and FR2:  11) DL scheduling slot offset K0=1 for type 1 CSS without dedicated RRC configuration and for type 0, 0A, and 2 CSS |
| Qualcomm Incorporated | Yes |  |
| Intel | Yes | Agree with Proposal 1 in the discussion document. |
| Huawei, HiSilicon | Yes but | Based on RAN1 spec, we share the view that for FR1 K0=0 should be by default by default supported (table for default A) and for FR2 K0=0 and 1 should be by default supported (table for default B). It is independent from capability signalling. So to be more accurate: Rel-15 UE supports K0 = 0 for FR1 and K0 = 0&1 for FR2 for Paging and System Information. |
| Nokia | Yes | Paging is sent in type 2 CSS. SI is sent in type 0 and 0A CSS. So yes, Ericsson proposal is a subset of the RAN1 agreement to the Rel-15 UE capabilities |
| OPPO | Yes |  |
| Apple | Yes |  |
| CATT | Yes |  |
| MediaTek | Yes, but | We don’t know why this is an issue that RAN2 to confirm? Even though the capability bit is captured in 38.306, the design is originated from RAN1 feature table. So, it is better to be confirmed in RAN1. |
| LG | Yes, but | Indeed, this should be confirmed in RAN1 |
| ZTE(Wenting) | Yes |  |

**--Summary**

11 companies joined the discussion and all of companies agree that “the UE supports K0 = 0 and 1 for Paging and System Information, even when the UE does not indicate support for dl-SchedulingOffset-PDSCH-TypeA or dl-SchedulingOffset-PDSCH-TypeB”. One company think the K0=1 is only for the FR2

Proposal 8: RAN2 confirms that “the UE supports K0 = 0 for FR1 and K0=0,1 for FR2 for Paging and System Information, even when the UE does not indicate support for dl-SchedulingOffset-PDSCH-TypeA or dl-SchedulingOffset-PDSCH-TypeB”. For the K0=1 for FR1 and other issues can be further discussed in Phase 2.

**Q6-2 If companies agree with Q6-1, do companies agree that “a clarification is needed (e.g. clarify that the UE supports the default configuration independent from the IOT capability signalling).”**

|  |  |  |
| --- | --- | --- |
| **Company** | **Agree?**  **(Yes or No)** | **Comments** |
| Ericsson (Martin) | Yes | In our understanding the RAN1 requirement specified in 38.822 for K0=1 was “lost in translation”, i.e. this requirements should be captured. |
| Qualcomm Incorporated | Yes, but | In light of the observation 1 in the document, which we agree to, we would like to get the confirmation from RAN2 that it is left to operators’ deployment to make sure there is no IOT problems with legacy UEs that are not IOTed for K0>0. |
| Intel |  | This feature is mandatory without signalling. |
| Huawei |  | RAN1 spec is clear. |
| Nokia | Yes, but | Agree with Intel and QC, it would be up to given deployment. |
| OPPO |  | Similar to the comment from QC/Intel/Nokia, it is can only be handled by deployment. |
| Apple | Yes, but | Similar view as QC. |
| CATT | Yes |  |
| MediaTek | No | We do not see the need to change RAN2 SPEC. |
| LG | No |  |
| ZTE(Wenting) | No | It has been clearly included in the RAN1 spec |
|  |  |  |

**--Summary**

11 companies joined the discussion and 5 companies say yes but in which 3 company think it would be up to the operators’ deployment. 5 companies say no and don’t want to introduce any change in Ran2 spec. Considering that the proposal 8 was companies’ common understanding, thus suggest to add the proposal 8 in to the chairman notes without any RAN2 spec change.

**Q6-3 If companies disagree with Q6-1, do companies agree that some spec modification is needed, e.g “add *dl-SchedulingOffset-PDSCH-TypeA* and *dl-SchedulingOffset-PDSCH-TypeB* to the UERadioPagingInformation message.”**

|  |  |  |
| --- | --- | --- |
| **Company** | **Agree?**  **(Yes or No)** | **Comments** |
| Ericsson (Martin) | Yes | In case the gNB would like to use K0>1 then the IOT capabilities should be included in the radio paging capabilities. |
| OPPO | No | There might be no much point to discuss the capability in paging message, since this capability relates to SIB reading as well, which means that if the UE does not support this feature, it cannot read the SIB to camp on the cell, so not no follow-up procedure of TAC and paging either. |
| ZTE(Wenting) | FFS | It seems that even 6-1 was agreed, we still need to consider the K0>1 case. However, in the paper it seems mainly focus on k0=0/1, we need more time to check K0>1 issue |
|  |  |  |

**--Summary**

For k0>1 case, the paper didn’t give enough information, it can be further discussed in the next meeting if necessary.

## 2.2 Part 1 discussion summary

### 2.2.1 Clarify UE capability in case of cross-carrier operation

**--Summary**

12 companies joined the discussion and all agree the change in principle. In addition 9 companies think it’s fine to generate a new Annex section as CR proposed, 3 companies prefer to add the clarification in the field description. Some wording comments were also provided. Thus, it’s assumed that these 2 CRs can be pursued and detail comments can be further discussed in part 2. As a supplementary information, please the proponent notice that RAN1 has approved an LS as below which give more clarification on such kind of cross-carrier elements, to avoid some repeat discussion, please the proponent also take into account the new approved RAN1 LS.

|  |
| --- |
|  |

Proposal 1: Update R2-2009238/R2-2009239 based on the comments from companies (e.g. improve the wording of “per serving cell” etc.) , and take into account the new approved RAN1 LS on “ Interpretation of UE Features in Case of Cross-Carrier Operation”

### 2.2.2 Correction to BWP capability descriptions

12 companies joined the discussion. For the first change, 1 company support the change in CR, 3 companies think it’s better to have a pre-requisite like “a UE reporting bwp-DiffNumerology shall also report bwp-SameNumerology”. However, 8 companies disagree with the first change, in which 2 companies can support to add a pre-requisite as above only if the UE supporting bwp-DiffNumerology always supports bwp-SameNumerology. Thus for the first change, it’s assumed not pursued, anyway the proponent can continue discussion with interested companies.

For the second change, 5 companies express their support, in which 1 company prefer to have it from Rel-16, the other company have no strong view on it. The second change can be pursued but please also confirmed with companies about the start version. If only the second change was agreed at last and companies disagree to have it in rel-15, it’s better to merge the second change into the mega CR.

Proposal 2: The first change of R2- 2009162 and R21-2009163 is not pursued, the proponent can continue discussion with interested companies.

Proposal 3: The second change is pursued but need the proponent to further confirm the start version with the companies that think it shall be started from Rel-16.

Proposal 4: If only the second change was agreed at last, merge the second change into Other CRs.

### 2.2.3 Correction of the description of ue-SpecificUL-DL-Assignment

12 companies joined the discussion and all companies agree with the CR but 9 companies suggest to merge to the rapporteur CRs.

Proposal 5:  Merge the changes in R2-2009516/R2-2009517 into other CRs.

### 2.2.4 Correction to the use of simultaneous CSI-RS resources

12 companies joined the discussion and 8 companies agree with the CR but 4 companies disagree. Since Companies have strong views on this issue, it’s suggested to determine online.

Proposal 6:  To online decide whether to pursue R2-1010537 and R2-2010536.

### 2.2.5 Correction to pdcch-MonitoringSingleOccasion

12 companies joined the discussion and all of companies agree with the CR, in which 2 companies suggest to merge the change to the Rapporteur CR.

Proposal 7: R2- 2010540 and R21-2010541 are pursued and merge into Other CRs.

### 2.2.6 UE capability and cross-slot scheduling for Paging

Q6-1: 11 companies joined the discussion and all of companies agree that “the UE supports K0 = 0 and 1 for Paging and System Information, even when the UE does not indicate support for dl-SchedulingOffset-PDSCH-TypeA or dl-SchedulingOffset-PDSCH-TypeB”

Q6-2: 11 companies joined the discussion and 5 companies say yes but in which 3 company think it would be up to the operators’ deployment. 5 companies say no and don’t want to introduce any change in Ran2 spec. Considering that the proposal 8 was companies’ common understanding, thus suggest to add the proposal 8 in to the chairman notes without any RAN2 spec change.

Q6-3: For k0>1 case, the paper didn’t give enough information, it can be further discussed in the next meeting if necessary.

Proposal 8: RAN2 confirms that “the UE supports K0 = 0 for FR1 and K0=0,1 for FR2 for Paging and System Information, even when the UE does not indicate support for dl-SchedulingOffset-PDSCH-TypeA or dl-SchedulingOffset-PDSCH-TypeB”. For the K0=1 for FR1 and other issues can be further discussed in Phase 2.

## 2.3 Part 2 discussion and Summary: CR details review Phase

For the paper below

[R2-2009944](file:///D:/Documents/3GPP/tsg_ran/WG2/TSGR2_112-e/Docs/R2-2009944.zip" \o "D:Documents3GPPtsg_ranWG2TSGR2_112-eDocsR2-2009944.zip) UE capability and cross-slot scheduling for Paging Ericsson discussion Rel-15 NR\_newRAT-Core

During the phase 1 discussion, one company point out that “ K0=0 should be by default supported for FR1, and K0=0 and 1 should be by default supported for FR2”. Besides, even companies agree 6-1 that “the UE supports K0 = 0 and 1 for Paging and System Information, even when the UE does not indicate support for dl-SchedulingOffset-PDSCH-TypeA or dl-SchedulingOffset-PDSCH-TypeB”, there are 4 companies hope the confirmation from RAN2 that “ it is left to operators’ deployment to make sure there is no IOT problems with legacy UEs that are not IOTed for K0>0.” Based on these, one company wants to continue discussion of proposal 8 in phase 2, i.e. there is not a common understanding whether K0 support is dependent on FR1 and FR2, and not a common understanding what “support” means, i.e. whether it still needs to be IOT tested, or that it can be assumed to work (like for other parameter values ranges which are not extensively/exhaustively tested). Based on this, 2 further questions were asked for the clarification.

**Q7-1: Whether K0=1 requires IOT testing?**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Company** | **FR1** | **Comments** | **FR2** | **Comments** |
| Qualcomm incorporated |  | Should be left to operator’s deployment. RAN2 should not dictate whether IOT is requirement or not. |  | Should be left to operator’s deployment. RAN2 should not dictate whether IOT is requirement or not. |
| ZTE |  | After further confirming with our RAN1, now our understanding is that it’s not mandatory for the UE to support K0=1 for the FR1.  And we agree with Qualcomm that RAN2 should not dictate whether IOT is requirement or not, it shall be left to operator’s deployment (e.g. always set k0=0 for the paging scheduling) |  | For the FR2, for that the system information may also be scheduled with k0=1, thus it’s mandatory for the UE to support k0=0/1 for the FR2.  About the IOT, we agree with Qualcom that RAN2 should not dictate whether IOT is requirement or not, it shall be left to operator’s deployment (e.g. always set k0=0 or 1 for the paging scheduling on FR2). |

**Q7-2: Any other questions that need to be further clarified, e.g. k0>1**

|  |  |  |
| --- | --- | --- |
| **Company** | **Yes or No** | **Comments** |
| Qualcomm Incorporated | No | It is already clear in RAN1 specification.  The “default” configurations as specified in Table 5.1.2.1-1 of 38.214 merely indicate the default configurations that are applicable when pdsch-ConfigCommon -> pdsch-TimeDomainAllocationList is not configured. It is NOT meant to indicate mandatory UE implementation or UE minimum requirement. |
|  |  |  |

# 3 Conclusion

- To be updated after discussion on part 2 -

# 4 References

1. [R2-2008710](file:///D:/Documents/3GPP/tsg_ran/WG2/TSGR2_112-e/Docs/R2-2008710.zip" \o "D:Documents3GPPtsg_ranWG2TSGR2_112-eDocsR2-2008710.zip) LS on Interpretation of UE Features in Case of Cross-Carrier Operation (R1-2007334; contact: ZTE) RAN1 LS in Rel-15 NR\_newRAT-Core To:RAN2
2. [R2-2009238](file:///D:/Documents/3GPP/tsg_ran/WG2/TSGR2_112-e/Docs/R2-2009238.zip" \o "D:Documents3GPPtsg_ranWG2TSGR2_112-eDocsR2-2009238.zip) CR to clarify UE capability in case of cross-carrier operation ZTE Corporation, Sanechips, Ericsson CR Rel-15 38.306 15.11.0 0418 - F NR\_newRAT-Core
3. [R2-2009239](file:///D:/Documents/3GPP/tsg_ran/WG2/TSGR2_112-e/Docs/R2-2009239.zip" \o "D:Documents3GPPtsg_ranWG2TSGR2_112-eDocsR2-2009239.zip) CR to clarify UE capability in case of cross-carrier operation ZTE Corporation, Sanechips, Ericsson CR Rel-16 38.306 16.2.0 0419 - A NR\_newRAT-Core
4. [R2-2009162](file:///D:/Documents/3GPP/tsg_ran/WG2/TSGR2_112-e/Docs/R2-2009162.zip" \o "D:Documents3GPPtsg_ranWG2TSGR2_112-eDocsR2-2009162.zip) Correction to BWP capabiltiy descriptions Nokia, Nokia Shanghai Bell CR Rel-15 38.306 15.11.0 0416 - F NR\_newRAT-Core
5. [R2-2009163](file:///D:/Documents/3GPP/tsg_ran/WG2/TSGR2_112-e/Docs/R2-2009163.zip" \o "D:Documents3GPPtsg_ranWG2TSGR2_112-eDocsR2-2009163.zip) Correction to BWP capabiltiy descriptions Nokia, Nokia Shanghai Bell CR Rel-16 38.306 16.2.0 0417 - A NR\_newRAT-Core
6. [R2-2009516](file:///D:/Documents/3GPP/tsg_ran/WG2/TSGR2_112-e/Docs/R2-2009516.zip" \o "D:Documents3GPPtsg_ranWG2TSGR2_112-eDocsR2-2009516.zip) Correction of the description of ue-SpecificUL-DL-Assignment Apple CR Rel-15 38.306 15.11.0 0430 - F NR\_newRAT-Core
7. [R2-2009517](file:///D:/Documents/3GPP/tsg_ran/WG2/TSGR2_112-e/Docs/R2-2009517.zip" \o "D:Documents3GPPtsg_ranWG2TSGR2_112-eDocsR2-2009517.zip) Correction of the description of ue-SpecificUL-DL-Assignment Apple CR Rel-16 38.306 16.2.0 0431 - A NR\_newRAT-Core
8. [R2-2010537](file:///D:/Documents/3GPP/tsg_ran/WG2/TSGR2_112-e/Docs/R2-2010537.zip" \o "D:Documents3GPPtsg_ranWG2TSGR2_112-eDocsR2-2010537.zip) Correction to the use of simultaneous CSI-RS resources Ericsson CR Rel-15 38.306 15.11.0 0455 - F NR\_newRAT-Core
9. [R2-2010536](file:///D:/Documents/3GPP/tsg_ran/WG2/TSGR2_112-e/Docs/R2-2010536.zip" \o "D:Documents3GPPtsg_ranWG2TSGR2_112-eDocsR2-2010536.zip) Correction to the use of simultaneous CSI-RS resources Ericsson CR Rel-16 38.306 16.2.0 0454 - A NR\_newRAT-Core
10. [R2-2010541](file:///D:/Documents/3GPP/tsg_ran/WG2/TSGR2_112-e/Docs/R2-2010541.zip" \o "D:Documents3GPPtsg_ranWG2TSGR2_112-eDocsR2-2010541.zip) Correction to pdcch-MonitoringSingleOccasion Ericsson CR Rel-15 38.306 15.11.0 0459 - F NR\_newRAT-Core
11. [R2-2010540](file:///D:/Documents/3GPP/tsg_ran/WG2/TSGR2_112-e/Docs/R2-2010540.zip" \o "D:Documents3GPPtsg_ranWG2TSGR2_112-eDocsR2-2010540.zip) Correction to pdcch-MonitoringSingleOccasion Ericsson CR Rel-16 38.306 16.2.0 0458 - A NR\_newRAT-Core
12. [R2-2009944](file:///D:/Documents/3GPP/tsg_ran/WG2/TSGR2_112-e/Docs/R2-2009944.zip" \o "D:Documents3GPPtsg_ranWG2TSGR2_112-eDocsR2-2009944.zip) UE capability and cross-slot scheduling for Paging Ericsson discussion Rel-15 NR\_newRAT-Core