**3GPP TSG-RAN WG2 Meeting #110 R2-20XXXXX**

**Electronic, 1 June – 12 June 2020**

**Agenda item: 5.4.1.1**

**Source: ZTE Corporation, Sanechips**

**Title: Offline-005: L2 Parameters**

**Document for: Discussion & Decision**

# Introduction

This is a summary of the following offline discussion on L2 parameters and configuration:

[AT110e][005][NR15] L2 Parameters (ZTE)

Scope: Treat R2-2004564, R2-2004565, R2-2004566, R2-2004567, R2-2004568, R2-2004770, R2-2004771, (proponents are responsible to explain and drive)

Part 1: Decision whether to make corrections or not, identify agreeable corrections. Deadline: June 4, 0700 UTC.

Part 2: For agreeable parts, continuation to agree CRs. Deadline: June 10, 0700 UTC

This document covers the following contributions submitted to RAN2#110-e meeting:

[R2-2004564](file:///C%3A%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2%5CTSGR2_110-e%5CDocs%5CR2-2004564.zip) Presence of ssb-perRACH-Occasion for the CSI-RS based CFRA ZTE Corporation, Sanechips, Samsung discussion Rel-15 NR\_newRAT-Core

[R2-2004565](file:///C%3A%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2%5CTSGR2_110-e%5CDocs%5CR2-2004565.zip) Clarification on the presence of ssb-perRACH-Occasion for the CSI-RS based CFRA-Solution 2 (R15) ZTE Corporation, Sanechips, Samsung CR Rel-15 38.331 15.9.0 1449 2 F NR\_newRAT-Core R2-2002917

[R2-2004566](file:///C%3A%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2%5CTSGR2_110-e%5CDocs%5CR2-2004566.zip) Clarification on the presence of ssb-perRACH-Occasion for the CSI-RS based CFRA-Solution 2 (R16) ZTE Corporation, Sanechips, Samsung CR Rel-16 38.331 16.0.0 1614 - F NR\_newRAT-Core

[R2-2004567](file:///C%3A%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2%5CTSGR2_110-e%5CDocs%5CR2-2004567.zip) Introduction of ssb-perRACH-Occasion-CSI-RS-Solution 3 (R15) ZTE Corporation, Sanechips, Samsung CR Rel-15 38.331 15.9.0 1615 - F NR\_newRAT-Core

[R2-2004568](file:///C%3A%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2%5CTSGR2_110-e%5CDocs%5CR2-2004568.zip) Introduction of ssb-perRACH-Occasion-CSI-RS-Solution 3 (R16) ZTE Corporation, Sanechips, Samsung CR Rel-16 38.331 16.0.0 1616 - F NR\_newRAT-Core

[R2-2004770](file:///C%3A%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2%5CRAN2%5C2005_R2_110-e%5CDocs%5CR2-2004770.zip) Clarification on the maxPUSCH-Duration for LCP Restriction Apple CR Rel-15 38.331 15.9.0 1623 - F NR\_newRAT-Core

[R2-2004771](file:///C%3A%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2%5CRAN2%5C2005_R2_110-e%5CDocs%5CR2-2004771.zip) Clarification on the maxPUSCH-Duration for LCP Restriction Apple CR Rel-16 38.331 16.0.0 1624 - A NR\_newRAT-Core

Companies are invited to provide their views for each issue.

# Discussion: Part 1

## 2.1 Issue #1. Presence of *ssb-perRACH-Occasion* for the CSI-RS based CFRA

This issue was discussed at RAN2#109bis-e [1] without reaching any agreements and thus was postponed to this meeting. The discussion history is copied below:

[R2-2002917](http://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_109bis-e/Docs/R2-2002917.zip) Clarification on the presence of ssb-perRACH-Occasion for the CSI-RS based CFRA ZTE Corporation, Sanechips, Ericsson (Rapporteur) CR Rel-15 38.331 15.9.0 1449 1 F NR\_newRAT-Core [R2-2000664](http://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_109bis-e/Docs/R2-2000664.zip)

[006]

- Chair: The issue is real, and there is support to make correction.

- Email Rapporteur: Considering the CR is targeted to a Rel-15 function and the change proposed is literally NBC, more time will be allowed for companies to do further check, especially for current implementation on UE side, and the proposed solutions can be discussed in this offline discussion part 2 based on the feedback from internal checking.

- Email Rapporteur: Proposal 1. Select one from the following two solutions to have consistent understanding between RAN1 and RAN2 on the configuration of CSI-RS based CFRA:

- Option 1(RAN2 solution): Change the presence condition of *ssb-perRACH-Occasion* in CFRA into “Cond Mandatory.

- Option 2(RAN1 solution): Confirm the issue from RAN2 aspect, and send LS to RAN1 to double check the issue and also inform RAN1 the potential solution proposed in the CR.

- Chair: We can postpone decisions to next meeting, but we could think one more round whether an LS to R1 should be sent now.

- Rapporteur Reply: we do not need to send an LS now. After RAN2 concludes how to fix it in the next meeting, we will able to know if the LS is needed.

[006] Postpone to next meeting

Firstly, some further explanation is given for a better understanding of this issue.

The dedicated RACH configuration is provided via *RACH-ConfigDedicated*. If *cfra* is provided, UE can be configured either with *CFRA-SSB-Resource* or *CFRA-CSIRS-Resource*.

**CFRA resources associated with SSB**

For CFRA resources associated with SSB, the following occasions and resources will be configured:

Occasions:

rach-ConfigGeneric RACH-ConfigGeneric,

ssb-perRACH-Occasion ENUMERATED {oneEighth, oneFourth, oneHalf, one, two, four, eight, sixteen}

RACH-ConfigGeneric ::= SEQUENCE {

 prach-ConfigurationIndex INTEGER (0..255),

 msg1-FDM ENUMERATED {one, two, four, eight},

 msg1-FrequencyStart INTEGER (0..maxNrofPhysicalResourceBlocks-1),

 zeroCorrelationZoneConfig INTEGER(0..15),

 preambleReceivedTargetPower INTEGER (-202..-60),

 preambleTransMax ENUMERATED {n3, n4, n5, n6, n7, n8, n10, n20, n50, n100, n200},

 powerRampingStep ENUMERATED {dB0, dB2, dB4, dB6},

 ra-ResponseWindow ENUMERATED {sl1, sl2, sl4, sl8, sl10, sl20, sl40, sl80},

 ...

}

Resources:

ssb-ResourceList SEQUENCE (SIZE(1..maxRA-SSB-Resources)) OF CFRA-SSB-Resource,

ra-ssb-OccasionMaskIndex INTEGER (0..15)

CFRA-SSB-Resource ::= SEQUENCE {

 ssb SSB-Index,

 ra-PreambleIndex INTEGER (0..63),

 ...

}

An example of SSB associated CFRA configuration is shown below:

NTOT = 2 (total number of SSBs, obtained from the value of *ssb-PositionsInBurst* in *SIB1* or *ServingCellConfigCommon*)

PRACH configuration Index = 12 (PRACH configuration period = 2 radio frames)

ssb-perRACH-Occasion: 1/2

Msg1-FDM = 1

ra-ssb-OccasionMaskIndex: 9 (every even PRACH occasion)

totalNumberOfRA-Preambles: 60

SSB#0: ra-PreambleIndex = 32

SSB#1: ra-PreambleIndex = 34

Figure 1: An example of SSB associated CFRA resource configuration

**CFRA resources associated with CSI-RS**

For CFRA resources associated with CSI-RS, the following occasions and resources will be configured:

Occasions:

rach-ConfigGeneric RACH-ConfigGeneric,

RACH-ConfigGeneric ::= SEQUENCE {

 prach-ConfigurationIndex INTEGER (0..255),

 msg1-FDM ENUMERATED {one, two, four, eight},

 msg1-FrequencyStart INTEGER (0..maxNrofPhysicalResourceBlocks-1),

 zeroCorrelationZoneConfig INTEGER(0..15),

 preambleReceivedTargetPower INTEGER (-202..-60),

 preambleTransMax ENUMERATED {n3, n4, n5, n6, n7, n8, n10, n20, n50, n100, n200},

 powerRampingStep ENUMERATED {dB0, dB2, dB4, dB6},

 ra-ResponseWindow ENUMERATED {sl1, sl2, sl4, sl8, sl10, sl20, sl40, sl80},

 ...

}

Note that the *ssb-perRACH-Occasion* is absent based on the following presence condition:

|  |  |
| --- | --- |
| **Conditional Presence** | **Explanation** |
| *SSB-CFRA* | The field is mandatory present if the field resources in CFRA is set to ssb; otherwise it is absent. |
| *Occasions* | The field is optionally present, Need S, if the field *occasions* is present, otherwise it is absent. |

Resources:

csirs-ResourceList SEQUENCE (SIZE(1..maxRA-CSIRS-Resources)) OF CFRA-CSIRS-Resource,

rsrp-ThresholdCSI-RS RSRP-Range

CFRA-CSIRS-Resource ::= SEQUENCE {

 csi-RS CSI-RS-Index,

 ra-OccasionList SEQUENCE (SIZE(1..maxRA-OccasionsPerCSIRS)) OF INTEGER (0..maxRA-Occasions-1),

 ra-PreambleIndex INTEGER (0..63),

 ...

}

However, it has been a little bit problematic when interpreting the *ra-OccasionList* associated with a certain CSI-RS. The following descriptions have been captured in TS38.213 about the reset of the indexing of the PRACH occasions indicated by *ra-OccasionList*.

*The indexing of the PRACH occasions indicated by ra-OccasionList is reset per association pattern period. (From TS38.213 8.1)*

If we look at the determination of an association period as captured in TS38.213, it is quite clear that the length of the association period is an integral multiple of the PRACH configuration period so that SSBs are mapped at least once to the PRACH occasions within the association period, which means the association between SSB and RACH occasions are needed to decide the length of the associated period so that UE can understand how the indexing of the PRACH occasions indicated by *ra-OccasionList* is reset.

*An association period, starting from frame 0, for mapping SS/PBCH blocks to PRACH occasions is the smallest value in the set determined by the PRACH configuration period according Table 8.1-1 such that SS/PBCH blocks are mapped at least once to the PRACH occasions within the association period, where a UE obtains from the value of ssb-PositionsInBurst in SIB1 or in ServingCellConfigCommon. (From TS38.213 8.1)*

*Table 8.1-1: Mapping between PRACH configuration period and SS/PBCH block to PRACH occasion association period*

|  |  |
| --- | --- |
| PRACH configuration period (msec) | Association period (number of PRACH configuration periods) |
| 10 | {1, 2, 4, 8, 16} |
| 20 | {1, 2, 4, 8} |
| 40 | {1, 2, 4} |
| 80 | {1, 2} |
| 160 | {1} |

Additionally, it has been clearly specified in TS38.213 that the UE is provided with *ssb-perRACH-Occasion* in *occasions* if *cfra* is provided.

*For a dedicated RACH configuration provided by RACH-ConfigDedicated, if cfra is provided, a UE is provided SS/PBCH blocks associated with one PRACH occasion by ssb-perRACH-Occasion in occasions. (From TS38.213 8.1)*

**Observation 1: Since the indexing of the PRACH occasions indicated by *ra-OccasionList* is reset per PRACH association period, UE should be provided with the association between SSB and RACH occasions to derive the PRACH association period so that it can understand the indexing of the PRACH occasions indicated by *ra-OccasionList* when CSI-RS based CFRA is configured in *RACH-ConfigDedicated*.**

Based on the above understanding on the reset of the indexing of the PRACH occasions indicated by *ra-OccasionList* as specified in RAN1, the following example is given to show the expected CSI-RS associated CFRA configuration and the corresponding interpretation.

NTOT = 2 (total number of SSBs, obtained from the value of *ssb-PositionsInBurst* in *SIB1* or *ServingCellConfigCommon*)

ssb-perRACH-Occasion: 1/2

PRACH configuration Index = 12 (PRACH configuration period = 2 radio frames)

Msg1-FDM = 1

totalNumberOfRA-Preambles: 60

csi-RS#0: ra-OccasionList: 0, 3 ; ra-PreambleIndex = 36

csi-RS#1: ra-OccasionList: 1, 2 ; ra-PreambleIndex = 38

=> Association period = 4\*PRACH configuration period



Figure 2: An example of per CSI-RS CFRA resource configuration

**Q1.1) Based on the descriptions in TS38.213, do companies agree with the above observation that UE should be provided with the association between SSB and RACH occasions to derive the PRACH association period so that it can understand the indexing of the PRACH occasions indicated by *ra-OccasionList* when CSI-RS based CFRA is configured in *RACH-ConfigDedicated* ?**

|  |  |  |
| --- | --- | --- |
| **Company** | **Yes/No** | **Comments (if any)** |
| Ericsson | Yes |  |
| Huawei, Hisilicon | Yes |  |
| Nokia | Yes | There seems to be a misunderstanding which needs to be resolved. |
| MediaTek | Yes |  |
| vivo | Yes, but | In our understanding, when CFRA resources are provided, the CBRA resources in the same UL BWP are also provided. Then the UE can derive the association period based on the *ssb-perRACH-OccasionAndCB-PreamblesPerSSB* configured within *RACH-ConfigCommon* for CBRA.Then both the NW and UE have the same understanding on the association period.  |
| Samsung | Yes |  |
| Apple | Yes |  |
| OPPO | Yes | If I understood correctly, the issue is that for CFRA , when network configures csirs , the ssb-perRACH-Occasion is absent according to the condition "SSB-CFRA ", then it may cause issues since this parameter is needed to determine the association pattern period according to 213As we raised in last meeting, maybe we need to confirm whether the ssb-perRACH-OccasionAndCB-PreamblesPerSSB in RACH-ConfigCommon can be used for this case as also commented by vivo.If UE can not use the corresponding parameter in RACH-ConfigCommon, we are wondering in this case whether network ensures that the occasions in RACH -ConfigDedicated will NOT be configured, so that UE can rely on the parameter in RACH –ConfigCommon. |
| ZTE | Yes |  |
| Qcom | Yes |  |
| CATT | Yes |  |
| NTT DOCOMO | Yes |  |

To align with RAN1 spec on configuration of the CSI-RS associated CFRA, the following solutions have been proposed:

* **Solution 1: Change the presence condition of *ssb-perRACH-Occasion* in CFRA into “Cond Mandatory” [2] [3].**
* **Solution 2: Introduce a new IE as a NCE change in *RACH-ConfigDedicated* to configure the association between SSB and RACH occasions for CSI-RS based CFRA. [4] [5]**
* **Solution 3: Use the ssb-perRACH-OccasionAndCB-PreamblesPerSSB configured within RACH-ConfigCommon for CBRA.**

During the [Offline-006] [NR15] L2 Configuration (Samsung, ZTE) at RAN2#109bis, it was also proposed to solve this issue by NW implementation to not configure the *occasions* in *RACH-ConfigDedicated* and UE will use the *rach-ConfigGeneric* and *ssb-perRACH-OccasionAndCB-PreamblesPerSSB* in *RACH-ConfigCommon* instead. However, this is not a “solution” because the intention of having *occasions* configured in *RACH-ConfigDedicated* is to provide UE specific RACH resource in frequency and time domain for CFRA while limiting NW configuration to reuse the *rach-ConfigGeneric* and *ssb-perRACH-OccasionAndCB-PreamblesPerSSB* in *RACH-ConfigCommon* will actually disable the functionality to configure separate UE specific CSI-RS based CFRA resources.

For the solution 1 V.S. solution 2, it depends on whether there is any UE who has implemented the feature as solution 1 suggested.

If there is any UE implement the feature as solution 1 suggested, which means the UE in the market either do not support the feature or implement the feature as solution 1 suggested, then there will be no compatibility issue if we go for solution 1. Otherwise the CSI-RS CFRA configuration for all the legacy UE should be disabled and a new capability bit should be introduced to indicate support for separate CSI-RS CFRA resource configuration.

If currently there is no UE supporting the feature, no compatibility issue is foreseen for both solution 1 and solution 2.

**Q1.2) If the answer to Q1.1 is “Yes”, which solution do companies prefer to align with RAN1 specs on the configuration of CSI-RS CFRA resource, solution 1, 2 or any other solutions?**

|  |  |  |
| --- | --- | --- |
| **Company** | **Solution** | **Comments (if any)** |
| Ericsson | Solution 1 | Our assumption is that this one of the multiple cases where there is some misalignment with the RAN1 specification, but this misalignment is kind of obvious. For this reason, we believe that Solution 1 is a clean way to solve this.Regarding solution 2, we are a bit hesitant to added new IEs/fields at this late stage of Rel-15. |
| Huawei, Hisilicon | Solution 2 | Solution 2 is an acceptable way to us. Solution 1 is not backward compatible from signalling point of view. |
| Nokia | Option 2 (in previous meeting) | This needs to be checked by RAN1. We favour the Option 2(RAN1 solution): Confirm the issue from RAN2 aspect, and send LS to RAN1 to double check the issue and also inform RAN1 the potential solution proposed in the CR. |
| MediaTek | Solution 1 | Based on the analysis, it appear that the original CSIRS-CFRA function is broken. Thus we think that NBC change is fine. We prefer Solution 1 as the solution is simpler. We are reluctant to add new ASN.1 filed in Rel-15. |
| vivo | Solution 1 or 3 | This seems to be a legacy issue. We should check with RAN1 about the legacy UE behaviours. |
| Samsung | Solution 2 | We think solution 2 is cleaner way. But we are fine with Solution 1, since it does not change OPTIONAL to MANDATORY but change the presence condition. It may not affect existing implementation. |
| Apple |  | We can check with RAN1 first.  |
| OPPO |  | Maybe we can check with RAN1 firstly. |
| ZTE | Solution 1 | Solution 1 is preferable because only the presence condition is changed while the ASN.1 itself is not changed and this is the simplest way to go.For the solution 3 added, as explained above, this is not a real “solution” because the intention of having occasions configured in *RACH-ConfigDedicated* is to provide UE specific RACH resource in frequency and time domain for CFRA while limiting NW configuration to reuse the *rach-ConfigGeneric* and *ssb-perRACH-OccasionAndCB-PreamblesPerSSB* in *RACH-ConfigCommon* will actually disable the functionality to configure separate UE specific CSI-RS based CFRA resources. |
| CATT | Solution1 | We reckon solution1 is simpler at the current stage. |
| NTT DOCOMO | Solution 1 | Solution1 is clean and preferred to us. There is no IOT problem, since this function has not been implemented and used in the field to our knowledge. ASN.1 extension for Rel-15 is not preferred at this late stage, even though the extension is backward compatible. |

**Q1.3) Do companies see the need to introduce a new capability bit to indicate UE’s support for separate CSI-RS CFRA resource configuration via** **the field *occasions* and *resources* (set to csirs) in CFRA in *RACH-ConfigDedicated*?**

|  |  |  |
| --- | --- | --- |
| **Company** | **Yes/No** | **Comments (if any)** |
| Ericsson | Probably not | This depends pretty much if there are UEs in the field that do not follow what we want to achieve with Solution 1. We are fine to go with majority view. |
| Nokia | - | See Q1.2 answer |
| MediaTek | Probably not | It also depends on the result of Q1.2. |
| vivo |  | This needs to be discussed in RAN1. |
| Samsung | No | CSI-RS based CFRA is not implemented yet as far as we know. Thus, the capability bit is not necessary. |
| ZTE |  | If the UE in the market either do not support the feature or implement the feature as solution 1 suggested, then we do not need the capability bit. Otherwise, UE has to indicate to NW whether it supports separate CSI-RS CFRA resource configuration via the field occasions and resources (set to csirs) in CFRA in RACH-ConfigDedicated and NW can then decide the configuration. |
| Qcom | If needed | We’re fine not to have a capability if this is the majority will. |
| CATT | Agree with Ericsson |  |
| NTT DOCOMO | No | Agree with Samsung given that the function has not been implemented and used in the field. |

## 2.2 Issue #2. Clarification on the *maxPUSCH-Duration* for LCP Restriction

Regarding which issues that need resolution, it is suggested to use the reason for change from [R2-2004770](file:///C%3A%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2%5CRAN2%5C2005_R2_110-e%5CDocs%5CR2-2004770.zip) and [R2-2004771](file:///C%3A%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2%5CRAN2%5C2005_R2_110-e%5CDocs%5CR2-2004771.zip) as the input:

|  |
| --- |
| *maxPUSCH-Duration* is configured for LCP restriction as the absolute time (i.e. ms), and independent from SCS restriction.In previous RAN2 discussion on this usage of this restriction, RAN2 ignored the aspect that all PUSCH symbols are not of equal duration ( due to symbols with longer CP every 0.5 ms).**For example:** > Logical Channel “y” = > maxPuschDuration : 250us. Allowed SCS : 30KHz> Consider 2 PUSCH grants of 7 symbol duration each:>> The first PUSCH grant includes the symbol with larger CP hence its duration is 250.26us;>> The 2nd PUSCH grant does not include the symbol with longer CP hence is of duration 249.74us. > Problem: Logical channel “y” can be mapped to the second PUSCH but not the first PUSCH. This is not the intention of the standard.> Correct UE behavior: Logical channel y should be allowed to transmit via either UL grant (250.26us, 249.74us) |

**Q2.1) Do companies agree with the reason for change in** [**R2-2004770**](file:///C%3A%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2%5CRAN2%5C2005_R2_110-e%5CDocs%5CR2-2004770.zip) **and** [**R2-2004771**](file:///C%3A%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2%5CRAN2%5C2005_R2_110-e%5CDocs%5CR2-2004771.zip)**?**

|  |  |  |
| --- | --- | --- |
| **Company** | **Yes/No** | **Comments (if any)** |
| Ericsson | Yes |  |
| Huawei, Hisilicon | Yes |  |
| Nokia | No | The clarification is not that clear, it is not "the longer symbol duration for the first symbol should be ignored", but the slot length difference caused by CP is ignored?Can the proponent clarify this? |
| MediaTek | Yes but | We agree there is ambiguity here but do not think it is an essential issue. In the example above, we don’t think there will be problem no matter UE choose to transmit on the UL grant or not. We also think this is a corner case and thus leave to UE implementation would be fine. |
| vivo | No | This seems to be an NBC change. If companies want to allow different CP length PUSCH, we could introduce a new LCP restriction of PUSCH duration with the symbol level granularity.  |
| Samsung | Yes |  |
| Apple | Yes | We are the proponent company. What we would like to clarify is to avoid the different treatments of the UL grant in symbol level, not slot level.We donot think there is any NBC impact, since it’s just to clarify the correct UE behavior and there is no ASN.1 impact.  |
| OPPO | Yes |  |
| ZTE | Yes |  |
| Qcom |  Yes |  |
| CATT | Yes  |  |

In [R2-2004770](file:///C%3A%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2%5CRAN2%5C2005_R2_110-e%5CDocs%5CR2-2004770.zip) and [R2-2004771](file:///C%3A%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2%5CRAN2%5C2005_R2_110-e%5CDocs%5CR2-2004771.zip), it is proposed to clarify that the LCP restriction of *maxPUSCH-Duration* is based on the assumption that all symbols are equal duration, and the longer symbol duration for the first symbol should be ignored.

**Q2.2) If the answer to Q2.1 is “Yes”, do you agree with the changes made in** [**R2-2004770**](file:///C%3A%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2%5CRAN2%5C2005_R2_110-e%5CDocs%5CR2-2004770.zip) **and** [**R2-2004771**](file:///C%3A%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2%5CRAN2%5C2005_R2_110-e%5CDocs%5CR2-2004771.zip)**?**

|  |  |  |
| --- | --- | --- |
| **Company** | **Yes/No** | **Comments (if any)** |
| Ericsson | Yes | Our understanding is that RAN2 made an error on 0.26 microseconds. Apparently in some cases the symbol duration is a bit longer than 250 microseconds as specified due to longer CP. |
| Huawei, Hisilicon | Yes | We agree with the intention, but the wording is a bit ambiguous.It is suggested “The PUSCH duration is calculated based on a same length of all symbols, and the longer symbol duration for the first symbol is ignored.” |
| Nokia |  | See Q2.1 answer |
| MediaTek | No | See our comment in Q.2. Prefer to leave it to UE implementation. |
| Vivo |  | See our answer for Q2.1. |
| Samsung | Yes | We agree with Huawei’s comment that “the assumption that all symbols are equal duration” is ambiguous. TP can be improved to be precise as in RAN1 spec. We suggest the following:

|  |
| --- |
| When normal cyclic prefix is used, 16κ (as specified in TS 38.211 [16], clause 5.3.1) is ignored from the PUSCH duration calculation (i.e. assuming all the OFDM symbols have same length) |

 |
| Apple | Yes | We are fine to improve the wording.  |
| OPPO |  | Maybe we need to improve the wording to avoid ambiguity |
| ZTE | Yes | The wording can be improved as suggested by HW or Samsung. |
| Qcom |  Yes | agree with the reason of change, but the wording gives the impression that the longer symbol duration is not considered in the calculation of the duration, instead the longer symbol should be assume to be equal to the rest of the symbols. |
| CATT | No | In our point of view, it can be left to UE implementation. |
| NTT DOCOMO |  | Agree with Huawei, Samsung and Qualcomm that the wording needs to be improved. |

# Conclusion: Part 1

Based on the above, RAN2 is request to agree the following proposals:

TBD

# Reference

[1] R2-2004118 Offline-006: L2 Configuration Samsung, ZTE Corporation, Sanechips

[2] [R2-2004565](file:///C%3A%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2%5CTSGR2_110-e%5CDocs%5CR2-2004565.zip) Clarification on the presence of ssb-perRACH-Occasion for the CSI-RS based CFRA-Solution 2 (R15) ZTE Corporation, Sanechips, Samsung

[3] [R2-2004566](file:///C%3A%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2%5CTSGR2_110-e%5CDocs%5CR2-2004566.zip) Clarification on the presence of ssb-perRACH-Occasion for the CSI-RS based CFRA-Solution 2 (R16) ZTE Corporation, Sanechips, Samsung

[4] [R2-2004567](file:///C%3A%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2%5CTSGR2_110-e%5CDocs%5CR2-2004567.zip) Introduction of ssb-perRACH-Occasion-CSI-RS-Solution 3 (R15) ZTE Corporation, Sanechips, Samsung CR Rel-15 38.331 15.9.0 1615 - F NR\_newRAT-Core

[5] [R2-2004568](file:///C%3A%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2%5CTSGR2_110-e%5CDocs%5CR2-2004568.zip) Introduction of ssb-perRACH-Occasion-CSI-RS-Solution 3 (R16) ZTE Corporation, Sanechips, Samsung CR Rel-16 38.331 16.0.0 1616 - F NR\_newRAT-Core