3GPP TSG-RAN WG2 #118-e R2-2206647

Electronic meeting, 9th May – 20th May 2022

Agenda Item: 5.1.4

Source: Ericsson

Title: [AT118-e][016][NR1516] Connection Control I (Ericsson)

Document for: Discussion, Decision

# 1 Introduction

The following document is to provide and collect input about a way forward related to the following email discussion:

* [AT118-e][016][NR1516] Connection Control I (Ericsson)

Scope: Treat [R2-2205965](http://www.3gpp.org/ftp//tsg_ran/WG2_RL2/TSGR2_118-e/Docs//R2-2205965.zip), [R2-2205966](http://www.3gpp.org/ftp//tsg_ran/WG2_RL2/TSGR2_118-e/Docs//R2-2205966.zip), [R2-2205867](http://www.3gpp.org/ftp//tsg_ran/WG2_RL2/TSGR2_118-e/Docs//R2-2205867.zip), [R2-2205406](http://www.3gpp.org/ftp//tsg_ran/WG2_RL2/TSGR2_118-e/Docs//R2-2205406.zip), [R2-2205407](http://www.3gpp.org/ftp//tsg_ran/WG2_RL2/TSGR2_118-e/Docs//R2-2205407.zip), [R2-2205868](http://www.3gpp.org/ftp//tsg_ran/WG2_RL2/TSGR2_118-e/Docs//R2-2205868.zip), [R2-2205614](http://www.3gpp.org/ftp//tsg_ran/WG2_RL2/TSGR2_118-e/Docs//R2-2205614.zip), [R2-2205586](http://www.3gpp.org/ftp//tsg_ran/WG2_RL2/TSGR2_118-e/Docs//R2-2205586.zip), [R2-2205599](http://www.3gpp.org/ftp//tsg_ran/WG2_RL2/TSGR2_118-e/Docs//R2-2205599.zip)

Ph1 Determine agreeable parts, Ph2 for agreeable parts agree CRs (offline agreement, CB online only if necessary).

Intended outcome: Report, Agreed CRs

Deadline: Schedule 1

A first round with Deadline for comments W1 Thursd May 12th 1200 UTC to settle scope what is agreeable etc  
A Final round with Final deadline W2 Wednesd May 18th 1200 UTC to settle details / agree CRs etc.

# 2 Contact information

|  |  |  |
| --- | --- | --- |
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# 3 Discussion

## 3.1 L1 parameters

[R2-2205965](http://www.3gpp.org/ftp//tsg_ran/WG2_RL2/TSGR2_118-e/Docs//R2-2205965.zip) Correction of Need Code in IE SearchSpace Ericsson CR Rel-15 38.331 15.17.0 3140 - F NR\_newRAT-Core, TEI16

[R2-2205966](http://www.3gpp.org/ftp//tsg_ran/WG2_RL2/TSGR2_118-e/Docs//R2-2205966.zip) Correction of Need Code in IE SearchSpace Ericsson CR Rel-16 38.331 16.8.0 3141 - A NR\_newRAT-Core, TEI16

[R2-2205967](http://www.3gpp.org/ftp//tsg_ran/WG2_RL2/TSGR2_118-e/Docs//R2-2205967.zip) Correction of Need Code in IE SearchSpace Ericsson CR Rel-17 38.331 17.0.0 3142 - A NR\_newRAT-Core, TEI16

The CRs correct a conflict between Need Code and Field Description.   
Strictly, the proposed change is not backwards compatible.

**Note** there is a typo in the Rel-15 CR. CR missed to add the Need Code “S” that replaces the “R”.

**Question 1:** Do companies agree with the changes proposed in CRs listed above?

|  |  |  |
| --- | --- | --- |
| Company | Yes/No | Comments |
| Samsung | See the comments | Either approach has no functional differences but this Need R with adding the description of absent condition violates the general guideline.  From our understanding, Need R without the description of absent condition is also possible (i.e. remove “If the field is absent, the UE applies the value 1 slot, except for DCI format 2\_0”) because this field is used for “Number of consecutive slots that a SearchSpace lasts in every occasion”. In other words, absent of this field, UE use the value 1 slot for monitoring of SearchSpace.  If we strictly apply the rule for handing need code, we share the view from this change but no strong view on this change. |
| Nokia | Yes | This seems to have been missed and we are okay to correct this. |
| OPPO | Yes with comments | It seems there is no issue if the need code for duration is Need R, because the value range starts from 2 which is the minimal value for consecutive slots, otherwise our understanding is the UE will use 1 slot.  But we also share the view that if following strictly the rule for the need code, it should be Need S.  For R15/R16 CR, are there BC issues? |
| Huawei, HiSilicon | Yes | We would consider this as a typo (Agree with Samsung there is no functional difference, as Need R with the description means the same things as Need S with the description).  We suggest to not highlight this in a separate CR, i.e. can be merged into the rapporteur CR.  In the Rel-15 CR, the “S” is still missing? |
| ZTE | Yes | The modification is correct and we assume all existing UEs already support the corresponding behaviour (no NBC issue). |
| Apple | No strong view on whether we need this change or not | Agree with Samsung views. |
| Qualcomm Inc | No strong view | Good to align with description.  Quick note:   * Rel-15 CR forget to add the "S" * Rel-16 CR forget to Strick the "R" |
| vivo | Yes | Agree with Nokia |
| Lenovo | Yes | Agree to correct it. |
| MediaTek | Yes |  |
| CATT | Yes |  |
| LGE | Yes |  |
| Ericsson | Yes (proponent) |  |
| NEC | Yes |  |
| Google | Yes | In the inter-operability analysis, we are wondering the description that the UE could trigger re-establishment is correct. |
| Intel | Yes | Agree in principle, noting the editorial errors as commented by others. |
| Fujitsu | Yes |  |
| Sequans | Yes | Same comment as Intel |

Summary Phase1:

There is support to agree on revised CRs.

1. CRs “Correction of Need Code in IE SearchSpace” (R2-2205965, R2-2205966, R2-2205967) are agreeable after revision.

## 3.2 L2 parameters

[R2-2205406](http://www.3gpp.org/ftp//tsg_ran/WG2_RL2/TSGR2_118-e/Docs//R2-2205406.zip) CR on 38.331 for sn-FieldLength ZTE Corporation,Sanechips CR Rel-15 38.331 15.17.0 3079 - F NR\_newRAT-Core

[R2-2205407](http://www.3gpp.org/ftp//tsg_ran/WG2_RL2/TSGR2_118-e/Docs//R2-2205407.zip) CR on 38.331 for sn-FieldLength ZTE Corporation,Sanechips CR Rel-16 38.331 16.8.0 3080 - A NR\_newRAT-Core

The CRs proposes to correct the field description of *sn-FieldLength* as ‘The value of *sn-FieldLength* for a RLC shall be changed only using reconfiguration with sync’

**Question 2:** Do companies agree with the changes proposed in CRs listed above?

|  |  |  |
| --- | --- | --- |
| Company | Yes/No | Comments |
| Samsung | Yes | We think the proposed change is correct. |
| Nokia | Not sure | We are not sure really we got the essence of the change. Is it editorial as there is no problem with interoperability but still some essential correction?  ZTE: Since this is a CR only regarding the restriction to the NW(e.g: Not allow NW to do sth), so there is no clear inter-operability, for example, if NW do something is allowed according to the change, the UE behavior is not predictable, that’s why there is no clear inter-operability. |
| OPPO | No | We understand the issue is that for SN-fieldLength, the field descriptions says it can only be changed using reconfigure with sync. However, for RRC re-establishment case, the SN-FieldLength may also need to be configured by bearer type change which is not supposed to be the way of reconfiguration with sync. We share sympathy on this issue if our understanding is correct.  However, we don’t think by updating the “DRB” to “RLC” in the field description, the issue can be solved because the concerned part is the “reconfiguration with sync”. Or can the CR proponent further elaborate it?  ZTE: Thanks for sympathies.firstly, yes, your understanding is correct. Not only for RRC re-establishment case, in most case, we may encounter the same issue once the bearer type change is performed.  We mainly focus on resolving the issue raised in the CR (e.g the Bearer type change), in the procedure of bearer type change, the target CG shall establish a new RLC entity to associate with the DRB of the source CG. With the change ‘The value of *sn-FieldLength* for a RLC shall be changed only using reconfiguration with sync’, NW can set any one value of *sn-FieldLength* because the RLC entity in the target CG is newly established.  On contrast, if the ‘DRB’ is kept as it is, the establishing a new RLC entity in the target CG is definitely not allowed according to the current wording ‘The value of *sn-FieldLength* for a DRB shall be changed only using reconfiguration with sync’ because the RLC entity is a part of a DRB. |
| Huawei, HiSilicon | No | In the scenario mentioned in the CR, the SCG DRB is not valid which should be released, and a new MCG DRB should be added. No issue in this case we think.  ZTE: technically speaking, not only for RRC re-establishment procedure, in any case, once the barer type change is performed (e.g SCG bearer -> MCG bearer, or vice versa), the specified behavior defined in 37.340 is not allowed, please see below:    It will result that the bearer type change would be totally forbade because MN have no idea about the *sn-FieldLength* of the changed bearer on SN, the only thing NW can do is as you said, to release SCG DRB, and then re-establish MCG DRB. It will make the bearer type change procedure be useless. |
| ZTE | Yes, Proponent | Not only for RRC re-establish procedure as mentioned in CR, in any case, once the bearer type change is performed (e.g SCG Bearer ->MCG Bearer as shown in the below table in 37.340),if NW strictly follow the current sentence ‘The value of *sn-FieldLength* for a DRB shall be changed only using reconfiguration with sync’ MN cannot promise to establish the RLC entity for bearer type change with a same value of *sn-FieldLength* because MN totally have no idea about the *sn-FieldLength* of the changed bearer on SN.  It will result that the bearer type change would be forbade by the current sentence. |
| Apple | No | This can be handled by gNB implementation. The sn-FieldLength is a RLC parameter, so there does not seem to be much room for misinterpretation. Besides to replace “DRB” by just “RLC” is not correct, it should be “RLC entity”. However, there should be the same SN length for all RLC entities for a DRB, so we’d prefer not to change the current text. |
| Ericsson (Tony) | No | We also tend to agree that network implementation can solve this. If this change has no inter-operability impact this means that it is not essential and thus we can skip it. |
| vivo | No | We are skeptical if replacing DRB by RLC is a correct answer as these are different entities. Additionally, we think gNB implementation can deal with this. |
| Lenovo | No | During re-establishment procedure, MN can get UE Context from previous gNB. |
| MediaTek | No | We don’t really understnad the proposed change (replacing DRB by RLC). It seems change nothing but add more confusion.  Is the intention to chnage RLC SN length without reconfigruation with sync ? If yes, the inter-operability issue need to be further studied. |
| CATT | Yes | We think the case (DRB modification but not reconfiguration with sync) mentioned by ZTE is valid. Changing DRB to RLC in the spec allows network to change the value sn-FieldLength via RLC release and establihsment, without having to do reconfiguraiton with sync.  If majority think no change is needed perhaps we could have something in the minutes to clarify that in this case DRB modification procedure is possible. |
| LGE | No for now | We think network implementation can handle this case by releasing SCG DRB and adding DRB. But we are open to further discuss this. |
| NEC | Yes | Unfortunately this seems the valid issue and it would be good to fix. One smalle clarification to the proposed change. Should it be ”RLC bearer”, instead of just ”RLC”? |
| Google | Yes | We understand the issue and change. Changing ”DRB” to ”RLC” allows the network to release the SCG RLC entity and establish a MCG RLC entity for the SCG DRB. |
| Intel | Yes with comments | We agree that the current specification is not strictly correct and the change makes it clearer. But we are not sure if there is risk of wrong implementation. |
| Fujitsu | No strong view | We think the proposed change is logically reasonable. However, we also think the change may cause problems for UEs already in the market. |
| Sequans | No | We are not sure to understand why a change is needed.  We think "For a DRB" comes in constrast to " For a SRB".  I.e. it means "for a RLC entity of a DRB".  When establishing a new RLC entity, we do not see restriction. There is a restiction on reconfiguring an existing RLC entity. |

Summary Phase1:

There is not consensus on the need for this CR, also argued that nw implementation can fix this. Need further consider Inter-operability issues and consequences if CR not agreed.

Rapporteur proposes to discuss topic online.

1. Discuss the need for CRs on sn-FieldLength (R2-2205406, R2-2205407) online.

## 3.3 n77

[R2-2205968](http://www.3gpp.org/ftp//tsg_ran/WG2_RL2/TSGR2_118-e/Docs//R2-2205968.zip) WF for NS\_55 in NR CA Ericsson discussion Rel-16 NR\_RF\_FR1-Core, TEI16

The document proposes to send LS to RAN4 to ask RAN4 to decide on solution for NS\_55 in NR CA.

**Question 3:** Do companies agree with sending LS to RAN4 and await further RAN4 input.

|  |  |  |
| --- | --- | --- |
| Company | Yes/No | Comments |
| Samsung | Yes | We are fine to send LS to RAN4. |
| Nokia | See comment | Our preference would be to have an explicit exception for this (for now) - otherwise we get very strange behaviour when C-band cells start using NS-55 and UEs do not camp on the cells because of that. |
| Huawei, HiSilicon |  | Our preference is also to have an exception for this.  If there is no consensus in RAN2, we are fine with an LS. |
| Apple | yes |  |
| ZTE (Wenting) | See comment | Similar view as Huawei and Nokia. Our preference is also to have an exception for this.  Furthermore, we think it’s more like a RAN2 issue, so prefer RAN2 to have a conclusion (or at least a WF for RAN4 to confirm if no consensus in RAN2). |
| Qualcomm Inc | Yes |  |
| vivo | Yes | We are fine to send the LS |
| Lenovo | Yes | Fine to send LS. |
| MediaTek | Prefer Not | We prefer to make an excpetion in RAN2 SPEC. We actually think this kind of configraiton limiation could be discussed in RAN2. |
| CATT |  | ok to send ls. |
| LGE | Yes but | We slighty prefer to make an exception for this case.  The other workaround is only related to RAN2 signaling restriction beteen common and dedicated, which RAN4 would not be familiar with. If we send an LS, we can ask if the exception is OK. |
| Ericsson | Yes (proponent) |  |
| AT&T | See comment | We believe the original intent of the TS 38.331 language cited by R2-2205968 was due to the understanding that NS values have emissions impact. This is not the case with NS\_55 as NS\_55 is used for barring purposes. We prefer to treat this case as an exception and to apply this exception to any NS value used for barring purposes only. We do not see the need for NS\_55 to be signalled on the C-Band cell for idle mode purposes. If RAN2 does send a liaison to RAN4, it should request RAN4 to adopt a solution for exception cases which is generic for NS values used exclusively for barring purposes. |
| NEC | See comment | Similar view as Nokia, Huawei and ZTE. If comapnies want to send an LS, RAN2 conclusion could be informed as suggested by ZTE. |
| Google |  | Same view as AT&T. |
| Intel | See comment | We tend to agree with the above suggestion to introduce an exception for this. The root cause is because we mis-use NS value for restriction of non-supporting UE’s camping, which is different purpose of actual NS value. RAN4 has a note that for NS\_55, no additional emission requirement is introduced. So, it should be equivalent to NS\_01 and applying exception (e.g. NS\_55 is considered as same as NS\_01) should be acceptable.  We could ask RAN4 if this approach is reasonable. |

Summary Phase1:

RAN4 is also discussing this issue based on [R4-2208741](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_103-e/Docs/R4-2208741.zip) ”Correct the NS value applicability for operation in the n77 frequency range in the US" (Ericsson), and (according to the Rapporteur info from RAN4) RAN4 is already aware of ongoing dicussion i RAN2 on applying exceptionin RRC signalling of NS\_55. So no need to send LS. If CR in RAN2 is needed, this can be discussed after RAN4 conclusion.

1. On R2-2205968 ”WF for NS\_55 in NR CA”, wait for outcome on RAN4 internal discussion.

## 3.4 SMTC configuration

[R2-2205614](http://www.3gpp.org/ftp//tsg_ran/WG2_RL2/TSGR2_118-e/Docs//R2-2205614.zip) SMTC configuration for target cell Lenovo CR Rel-16 38.331 16.8.0 3103 - F NR\_newRAT-Core, TEI16

[R2-2205586](http://www.3gpp.org/ftp//tsg_ran/WG2_RL2/TSGR2_118-e/Docs//R2-2205586.zip) SMTC configuration for target cell Lenovo (Beijing) Ltd CR Rel-15 36.331 15.17.0 4804 - F NR\_newRAT-Core

[R2-2205599](http://www.3gpp.org/ftp//tsg_ran/WG2_RL2/TSGR2_118-e/Docs//R2-2205599.zip) SMTC configuration for target cell Lenovo (Beijing) Ltd CR Rel-16 36.331 16.8.0 4805 - F NR\_newRAT-Core

The CRs suggest to change ‘SN change’ to ‘PSCell change’ in the field description of targetCellSMTC-SCG-r16.

**Question 4:** Do companies agree with the changes proposed in CRs listed above?

|  |  |  |
| --- | --- | --- |
| Company | Yes/No | Comments |
| Samsung | Yes |  |
| Nokia | No | There is a potential misunderstanding of Lenovo. It was clarified  earlier already that when there is no SN change, the smtc is based  on the NR PSCell. This scenario for NR-DC has similar understanding.  So, we are not sure the change is really needed. |
| OPPO | Yes |  |
| Huawei, HiSilicon | No | Similar understanding as Nokia. Not sure PSCell change without SN change requires SMTC configuration. |
| ZTE | See comments | This field is configured by MN, included in MN RRC message. The motivation of introducing the field is to address SN addition and SN change cases.  For PSCell change without SN change, typically, the SN will include the *smtc* field in *reconfigurationWithSync* within SN RRCReconfiguration (this smtc is provided based on the timing of source PSCell).  However, for MN initiated intra-SN PSCell change, it is feasible for MN to also include the targetCellSMTC-SCG-r16 in MN generated RRC message, and this smtc is based on the timing of PCell. From UE’s perspective, the UE cannot differentiate whether SN is changed or not. So this change does not impact UE’s implementation. If both MN and SN provide smtc, it is up to the UE to decide which one to use, as specified in TS 37.340:  “In (NG)EN-DC and NR-DC, SMTC can be used for PSCell addition/PSCell change to assist the UE in finding the SSB in the target PSCell. In case the SMTC of the target PSCell is provided by both MN and SN it is up to UE implementation which one to use.”  From network perspective, this CR provides another way to indicate smtc field, and it is only applicable to MN-initiated PSCell change procedure, but considering the SN will set the *smtc* field in *reconfigurationWithSync*. So this change cannot bring much benefit in practice.  So we are fine with current spec (without modification). |
| Apple | Not needed | We share similar views as ZTE |
| Ericsson (Tony) | No | Similar to Nokia and Huawei. |
| Vivo | No | Agree with Nokia |
| Lenovo | Yes |  |
| MediaTek | Yes | ZTE analysis is quite correct. There is no UE beahvior change in this CR. We however think this change is okay as the 38.331 SPEC should be written from UE perspective (it defines the UE behavior). The UE does not really know the difference between SN change and PSCell change and we feel using PSCell change is more correct way. |
| CATT | No | Similar view as Nokia and Huawei. |
| LGE | No | We also think targetCellSMTC-SCG is configured for SN change but not configured for MN initiated intra-SN PSCell change. |
| NEC | No | We have similar understanding as Nokia and Huawei. |
| Goolge | No | Same view as Nokia. |
| Intel | No | Firstly, we agree with ZTE comment that UE does not differentiate between SN change and PSCell change. The sentence is written for informative purpose for network side handling (though we would have preferred to have written it from UE perspective). So this discussion does not impact UE.  Then, on the actual reason for change and network side handling, we agree with others that this change is not needed. |
| Fujitsu | No | Agree with Nokia and Huawei |
| Sequans | No | Similar view as Nokia. |

Summary Phase 1

There is not support for the CRs

1. CRs in R2-2205614, R2-2205586 and R2-2205599 are not pursued.

# 4 Phase 2 discussion

## 4.1 L1 parameters

No further comments were received on the revised Rel-15/16 CRs and the Rel-17 CR.

1. CRs “Correction of Need Code in IE SearchSpace” are agreed in (R2-2206645, R2-2206646, R2-2205967).

## 4.2 L2 parameters

CRs on 38.331 for sn-FieldLength was agreed to be POSTPONED at Monday W2 online session, so not further discussed in this email discussion.

## 4.3 n77

The Rapporteur reports that RAN4 tentatively agreed on way forward. For the case of Intra-frequency non-contiguous NR CA in n77, RAN4 agreed to allow for an exception for NS\_55 in n77 to the rule in TS 38.331 requiring the same NS-value for all serving cells having uplink.

The Rapporteur’s company (Ericsson) volunteers to provide related CR to 38.331. The Rapporteur proposes to postpone this to next meeting proposes to postpone discussions on related CR to 38.331 to the next meeting.

1. Discussion on CR to TS38331 to allow for an exception for NS\_55 in n77 to the rule in TS 38.331 requiring the same NS-value for all serving cells having uplink is postponed to next meeting.

# 5 Conclusion

After Phase 1 of this email discussion, the following is proposed:

1. CRs “Correction of Need Code in IE SearchSpace” (R2-2205965, R2-2205966, R2-2205967) are agreeable after revision.
2. Discuss the need for CRs on sn-FieldLength (R2-2205406, R2-2205407) online.
3. On R2-2205968 ”WF for NS\_55 in NR CA”, wait for outcome on RAN4 internal discussion.
4. CRs in R2-2205614, R2-2205586 and R2-2205599 are not pursued.

After Phase 2 of this email discussion, the following is proposed

1. CRs “Correction of Need Code in IE SearchSpace” are agreed in (R2-220xxxx, R2-220yyyy, R2-2205967).
2. Discussion on CR to TS38331 to allow for an exception for NS\_55 in n77 to the rule in TS 38.331 requiring the same NS-value for all serving cells having uplink is postponed to next meeting.