3GPP TSG-RAN WG2 Meeting #116bis electronic R2-220xxxx

Online, January 17-25, 2022

Agenda Item: 8.24.2 RAN1 Led Items

Source: Ericsson

Title: Summary of [AT116bis-e][042][NR17] DSS (Ericsson)

Document for: Discussion, Decision

# 1 Introduction

This contribution summarizes the following discussion:

* [AT116bis-e][042][NR17] DSS (Ericsson)

 Scope: Treat R2-2200294, R2-2201039, R2-2201040, R2-2201396, R2-2201618. If possible, offline only, if needed CB W2. 1 Determine Agreeable parts 2 Update Running CR(s) to reflect agreeable parts.

 Intended outcome: Report, Endorsed updated CR.

 Deadline: Friday W1

[R2-2200294](http://www.3gpp.org/ftp//tsg_ran/WG2_RL2/TSGR2_116bis-e/Docs//R2-2200294.zip) DSS and RA Procedure Samsung Electronics Co., Ltd discussion Rel-17 LTE\_NR\_DC\_enh2

[R2-2201039](http://www.3gpp.org/ftp//tsg_ran/WG2_RL2/TSGR2_116bis-e/Docs//R2-2201039.zip) RRC running CR for DSS Ericsson draftCR Rel-16 38.331 16.7.0 NR\_DSS\_enh

[R2-2201040](http://www.3gpp.org/ftp//tsg_ran/WG2_RL2/TSGR2_116bis-e/Docs//R2-2201040.zip) RAN2 impact in DSS WI Ericsson discussion NR\_DSS\_enh

[R2-2201396](http://www.3gpp.org/ftp//tsg_ran/WG2_RL2/TSGR2_116bis-e/Docs//R2-2201396.zip) Discussion on Cross-Carrier Scheduling from sSCell to P(S)Cell vivo discussion NR\_DSS\_enh

[R2-2201618](http://www.3gpp.org/ftp//tsg_ran/WG2_RL2/TSGR2_116bis-e/Docs//R2-2201618.zip) Remaining issues on cross-carrier scheduling from SCell to P(S)Cell Huawei, HiSilicon discussion Rel-17 NR\_DSS-Core

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# 2 Discussion

## 2.1 RRC

### 2.1.1 Issue 1, one or two IEs

[R2-2201039](http://www.3gpp.org/ftp//tsg_ran/WG2_RL2/TSGR2_116bis-e/Docs//R2-2201039.zip) RRC running CR for DSS Ericsson draftCR Rel-16 38.331 16.7.0 NR\_DSS\_enh

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[R2-2201618](http://www.3gpp.org/ftp//tsg_ran/WG2_RL2/TSGR2_116bis-e/Docs//R2-2201618.zip) Remaining issues on cross-carrier scheduling from SCell to P(S)Cell Huawei, HiSilicon discussion Rel-17 NR\_DSS-Core

RRC running CR was discussed in the last meeting [1] but no conclusion was made. The open issue was on whether the presence of the CIF is configurable. All submitted papers have acknowledged the latest RAN1 agreements. Note the SCell configured with cross-carrier scheduling to SpCell is referred to as ‘sSCell’.

|  |
| --- |
| AgreementConfirm the WA from RAN1#106bis-e with addition of below Note (shown in blue)*Working Assumption** *When CIF for sSCell to Pcell cross-carrier scheduling is configured, non-fallback DCI formats on P(S)Cell include same number of CIF bits as the corresponding non-fallback DCI formats on sSCell that are used for sSCell to P(S)Cell scheduling*
* Note: per RAN1#102-e agreement, when sSCell to P(S)Cell scheduling is configured for the UE, cross-carrier scheduling from P(S)Cell to another cell is not allowed. The CIF bits included in non-fallback DCI formats on P(S)Cell are considered reserved.
 |

In other words, when CIF for SCell to SpCell cross-carrier scheduling is configured, the CIF bits are also present in DCI sent on the PDCCH on the SpCell, i.e., there is no need nor possibility to configure the presence of these CIF bits explicitly.

Per the above agreements, [R2-2201039](http://www.3gpp.org/ftp//tsg_ran/WG2_RL2/TSGR2_116bis-e/Docs//R2-2201039.zip) and [R2-2201396](http://www.3gpp.org/ftp//tsg_ran/WG2_RL2/TSGR2_116bis-e/Docs//R2-2201396.zip) propose to adopt the below option to capture the RRC spec. Note that in the last email discussion [1] all companies have replied that this option works.

**Alternative 1: SCell scheduling SpCell is configured by configuring the field ‘*schedulingCellInfo*’ in *CrossCarrierSchedulingConfig* for SpCell as ‘*other*’**

[R2-2201618](http://www.3gpp.org/ftp//tsg_ran/WG2_RL2/TSGR2_116bis-e/Docs//R2-2201618.zip) proposes to introduce a new IE which would introduce additional RRC signalling overhead. The argument is for good readability.

**Alternative 2: Introduce a new IE to configure SCell scheduling SpCell.**

**Q1. Which one of the above alternatives does the company support?**

|  |  |  |
| --- | --- | --- |
| **Company** | **Alt 1 or Alt 2 ?** | **Comments** |
| Ericsson | Alt 1 | We agree with the description in the R2-2201618 from Huawei that some further clarfications are needed, which can be discussed in the RRC running CR discussion. These apply for both alt 1 and alt 2. We prefer the alt 1, because we don’t consider readability as an issue and also the below concerns for the alt 2:1. In the legacy IE, one code point of the RRC configuration is not supported, i.e., *other* for SpCell in the legacy IE. For the alt 1, it is not changing the legacy signalling, but rather enabling the configuration in Rel-17 which was “artificially” disabled in Rel-15/Rel-16. This would of course come with field description update. Adding a new IE as in alt2 would work, but it does not seem to be necessary and it also introduces RRC signalling overhead.
2. Alt 2 has more impacts on the ASN.1 coding. One example is the below discussion on *enableDefaultBeamForCCS* and *carrierIndicatorSize*. These new fields may or may not be in the new IE, depending on the discussion which may further require RAN1 input. It is our preference to have a stable/workable RRC running CR and, if needed, make small corrections like a field description change in Alt1.
3. Alt 2 does not consider extensibility. If there are further generic enhancements for cross carrier scheduling, then one needs to add field in both the legacy IE and the new IE.
 |
| Huawei, HiSilicon | Alt 2 | We understand Alt 1 and Alt 2 are a matter of different tastes. From our understanding, we prefer Alt 2 over Alt 1 for better readability of a new feature, rather than mixing the feature with the legacy one. Some responses as shown below,1. The changes of Alt 1 is not simply extending the values, but to give a different interpretation of the legacy IE with significant changes in the field descriptions. We don’t think it is the ususal way we treat a new feature in ASN.1. Adding a new IE should be the most clean approach and we don’t think it is an issue for RRC signalling overhead given that it is applicable only for DSS CCS capable UE. On the contrary, Alt 2 is more compatible to legacy CCS. 2. Difficult to say which one has more ASN.1 impacts. As we mentioned in our contributions, the parent IE with Alt 1 should be also updated. And the legacy IEs is not relevant to alternatives, see more comments to Q4.3. We are not convinced by the comments of extensibility. Further enhancements should be common to Alt 1 and Alt 2. On the contrary, we believe Alt 2-like apporach is more future proof, without twisting all the features in the field description. In a summary, Alt 1 would cause more difficult in readablity and not compatible (actually too “artificial“) with the legacy since we have to change the legacy description everywhere when applicable, thus Alt 2 is more desirable.  |
| LGE | Alt 1 | Reusing the exiting IE seems sufficient while updating the field description is of course a necessary job.  |
| ZTE | Alt 1 | We also think reusing the existing IE with some updates in the field description is enough. No need to introduce additional IE.  |
| Intel | Alt 1 | The exiting IE can be reused. |
| vivo | Alt 1 | As we analyzed in the last meeting, if CIF bits are present in the DCI format on SpCell, reusing existing IE with field description modification should be enough. |
| Apple | Open to Alt 2 | While Alt 1 is acceptable to us, Alt 2 offers a slightly cleaner way to differentiate the Rel-17 feature from legacy. Alt 1 may be ok for now, but it is not very flexible for extensions in the future. Depending on the number of future updates required, chances are that we have to redesign the IE later on, and this would have an impact on implementation. So why not define a clean split right away? Moreover, Alt 2 would make the signalling for *PCell-CCSscaling* (see section 2.3) easier, and we can avoid interdependencies between different fields. |
| Nokia, Nokia Shanghai Bell | Alt.2 (slight preference) | Generally speaking, it's often better to introduce new IEs for new features. Cross-carrier scheduling is already not the most readable IE, and we agree with Huawei arguments that it's better to keep the legacy IE as it is and introduce a new one for this.That said, it is certainly true that both alternatives can work. |
| Samsung | Alt 1 | Reusing the exiting IE has no problem (i.e. The combination of already given field (i.e., ‘other’, ‘own’) and the target serving cell for adopting this configuration (i.e., spcell or SCell) can indicate the necessary configuration enough.).Then, we think it would be better to reuse the legacy RRC signaling. That is why we design RRC IE something general to be extended for future easily. |

Summary: 6 companies prefer Alt1, 2 companies slightly prefer Alt2 but seem to indicate that Alt1 is acceptable, and 1 company prefers Alt1. Both Alt1 and Alt2 work, but neither is perfect. RAN2 has only one meeting, and so it is important to have a running CR. Thus, the rapporteur suggests following the majority.

**Proposal 1 SCell scheduling SpCell is configured by configuring the field ‘*schedulingCellInfo*’ in *CrossCarrierSchedulingConfig* for SpCell as ‘*other*’.**

### 2.1.2 Issue 2, carrierIndicatorSize

[R2-2201618](http://www.3gpp.org/ftp//tsg_ran/WG2_RL2/TSGR2_116bis-e/Docs//R2-2201618.zip) Remaining issues on cross-carrier scheduling from Scell to P(S)Cell Huawei, HiSilicon discussion Rel-17 NR\_DSS-Core

There are two legacy fields in the IE *CrossCarrierSchedulingConfig*. The paper [R2-2201618](http://www.3gpp.org/ftp//tsg_ran/WG2_RL2/TSGR2_116bis-e/Docs//R2-2201618.zip) proposes to discuss how the below field can be configured in light of the Rel-17 DSS feature.

*carrierIndicatorSize-r16*

According to the conditional presence, *carrierIndicatorSize* is configured only in the scheduling cell in the legacy. The paper R2-2201618 proposes that this can be extended to the Rel-17, i.e., configured only in the scheduling SCell for the SpCell but not in the SpCell.

It is rapporteur’s understanding from the RAN1 agreement that when SCell schedules SpCell, non-fallback DCI formats on SpCell includes the same number of CIF bits as the scheduling SCell. There is no need to configure this field in the SpCell (i.e., the scheduled cell), as in the legacy Rel-16.

**Q2. Do companies agree that *carrierIndicatorSize-r16* is configured only in the scheduling SCell for the SpCell but not in the SpCell?**

|  |  |  |
| --- | --- | --- |
| **Company** | **Yes or No ?** | **Comments** |
| Ericsson | Yes |  |
| Huawei, HiSilicon | Yes | Proponent |
| LGE | Yes |  |
| ZTE | Yes |  |
| Intel | Yes |  |
| vivo | Yes |  |
| Apple | Yes |  |
| Nokia, Nokia Shanghai Bell | Yes |  |
| Samsung | Yes |  |

Summary: all 9 companies agree.

**Proposal 2 *carrierIndicatorSize-r16* is configured only in the scheduling SCell for the SpCell but not in the SpCell.**

### 2.1.3 Issue 3, *enableDefaultBeamForCCS*

[R2-2201618](http://www.3gpp.org/ftp//tsg_ran/WG2_RL2/TSGR2_116bis-e/Docs//R2-2201618.zip) Remaining issues on cross-carrier scheduling from SCell to P(S)Cell Huawei, HiSilicon discussion Rel-17 NR\_DSS-Core

There are two legacy fields in the IE *CrossCarrierSchedulingConfig*. The paper [R2-2201618](http://www.3gpp.org/ftp//tsg_ran/WG2_RL2/TSGR2_116bis-e/Docs//R2-2201618.zip) proposes to discuss how the below field can be configured in light of the Rel-17 DSS feature.

*enableDefaultBeamForCCS-r16*

There is no configuration restriction in the Rel-16 RRC spec for this field. The understanding is that they can be configured in both scheduling cell and scheduled cell. The paper [R2-2201618](http://www.3gpp.org/ftp//tsg_ran/WG2_RL2/TSGR2_116bis-e/Docs//R2-2201618.zip) proposes that RAN1 should discuss and give a confirmation on if this field is configurable or not.

It is rapporteur’s understanding that *enableDefaultBeamForCCS* is introduced in the LTE\_NR\_DC\_CA-enhCore WI in Rel-16, see RAN1 RRC parameter list [R1-2003190](http://www.3gpp.org/ftp//tsg_ran/WG1_RL1/TSGR1_100b_e/Docs//R1-2003190.zip), line 14 of tab NRDCCA. The RRC parameter list indicates that this is applicable to a cross-carrier scheduled SCell only and used for cross carrier scheduling with different SCS. This is also a per-UE parameter. It is to the best of rapporteur’s knowledge that this was not discussed in the Rel-17 enhanced DSS WI.

**Q3. What are companies’ view for the field *enableDefaultBeamForCCS*, if SCell scheduling SpCell is configured?**

|  |  |  |
| --- | --- | --- |
| **Company** | **Views** | **Comments** |
| Ericsson | No need to clarify in RRC now  | In the Rel-17 discussion, RAN1 did not identify any change compared to the Rel-16. The best way forward, in our view, is to leave this part unchanged. If we adopt Alt1 in Q1, then this can be easily done. However, if we adopt Alt2 in Q1, then one needs to discuss if this field can be in the new IE, which we don’t prefer. One can argue that the Rel-16 RRC spec is not clear regarding the configuration restriction. It is our understanding that the configuration restriction could have been written in the RAN1 specs. If not, it is RAN1’s task to correct it and should also be in Rel-16 maintenance work not in a Rel-17 WI. By the similar argument, if there were any Rel-17 DSS enhancement regarding this field, such would be captured in the RAN1 specs or be indicated clearly in the RRC parameter list. |
| Huawei, HiSilicon | Okay with an EN and can be further updated | As we stated in our contribution, this issue is not relevant to which alternative to capture in Q1. Actually if it is confirmed that this IE is not applicable for DSS CCS, we think it would be cleaner for Alt 2 in Q1 by excluding this IE from the new CCS IE. We agree that it was not even discussed in R16, but we also think it would good to clarify in R17. Otherwise the current RRC spec remains unclear, even worse than R16 given that DSS CCS is introduced. We would think it is better to put an EN to this IE and RAN1 can further update this by tracking RAN2’s discussions. Note that for cross-WI ASN.1 issues, RAN2 may have better view of handling this.  |
| LGE | No change needed for now | We can keep this part unchanged unless further input from RAN1 is received. |
| ZTE | No change needed for now | Agree with LGE. |
| Intel | No change needed for now | Any further change could be triggered by RAN1. |
| vivo | No change needed for now | If there is issue triggerd by RAN1, we can come back at this. We agree with HW that clarification might be needed, and an EN is acceptable. |
| Apple | Okay with an EN, but no change needed for now | In general, we have a similar view as Huawei but we are fine to wait until further input is received from RAN1 or a clarification is reached. |
| Nokia, Nokia Shanghai Bell | No change needed for now (Depends on the chosen ASN.1) | Agree with Ericsson that there is some dependency on the chose signalling option (as per Q1), but Huawei also has a point that this is relevant anyway even if Alt1 is adopted since the field is included there. So either way, we likely need to capture something, but it's better to first choose the ASN.1 option and then come back to this question.  |
| Samsung | No change needed for now | We can further update the clarification based on RAN1 input. |

Summary: 5 companies prefer no changes now, 3 companies suggest or are okay with an editor’s note, 1 company prefers no changes but proposes to wait for the discussion on the chosen ASN.1. It is rapporteur’s understanding that all companies are fine with no change now but are open for further RAN1 inputs. Additionally, this feature is discussed only in RAN1. Rapporteur proposes to note the below conclusion, assuming Proposal 1 can be agreed.

**Conclusion 1 It is up-to RAN1 to decide the need to clarify *enableDefaultBeamForCCS* in the RRC spec; an EN is added in the RRC running CR.**

### 2.1.4 Issue 4, Monitoring capability

[R2-2201396](http://www.3gpp.org/ftp//tsg_ran/WG2_RL2/TSGR2_116bis-e/Docs//R2-2201396.zip) Discussion on Cross-Carrier Scheduling from sSCell to P(S)Cell vivo discussion NR\_DSS\_enh

The paper proposes to capture the below RAN1 agreement in the RRC spec.

|  |
| --- |
| Agreement• Alt1: When CCS from sSCell to P(S)Cell is configured for the UE, o r16monitoringcapability is not configured for PDCCH monitoring on P(S)Cell and not configured for PDCCH monitoring on sSCell; o r16monitoringcapability can be configured for PDCCH monitoring on Scells other than sSCell |

Per the rapporteur’s understanding, the *r16monitoringcapability* configuration restriction is already captured in the RAN1 spec, see clause 10.1.1, TS 38.213 v17.0.0.

|  |
| --- |
| A UE can be configured for scheduling on the primary cell from the primary cell and from a secondary cell [12, TS 38.331]. The UE is either not provided *monitoringCapabilityConfig* or the UE is provided only *monitoringCapabilityConfig* = *r15monitoringcapability* for the primary cell and for the secondary cell. The UE is not provided *coresetPoolIndex* on the primary cell or on the secondary cell. |

**Q4. Do companies agree to capture *r16monitoringcapability* restriction in the RRC spec?**

|  |  |  |
| --- | --- | --- |
| **Company** | **Yes or No ?** | **Comments** |
| Ericsson | No | We prefer capturing this agreement only in one spec. Since RAN1 has done so, there is no need to do it in the RRC spec. |
| Huawei, HiSilicon | No | Agree with Ericsson |
| LGE | No | As in the legacy, it should be in 213 specification.  |
| ZTE | No | Agree with Ericsson. |
| Intel | No | Agree with Ericsson |
| vivo |  | We are fine with Ericsson’s view. |
| Apple | No | Ok to have the RRC spec refer to the definition in the RAN1 spec. |
| Nokia, Nokia Shanghai Bell | No | As this was not requested, fine not to capture it. The current RRC already captures that the behaviour is specified in 38.213, which seems sufficient. |
| Samsung | No | Agree with Ericsson |

Summary: All companies are fine not to capture it.

**Conclusion 2 There is no need to capture *r16monitoringCapability* restriction in the RRC spec.**

### 2.1.5 Issue 5, search space linkage

[R2-2201396](http://www.3gpp.org/ftp//tsg_ran/WG2_RL2/TSGR2_116bis-e/Docs//R2-2201396.zip) Discussion on Cross-Carrier Scheduling from sSCell to P(S)Cell vivo discussion NR\_DSS\_enh

The paper proposes to discuss how to capture the search space linkage for the Rel-17 DSS. Per rapporteur’s understanding, this has been discussed in the discussion point 13 in the [R1-2112884](http://www.3gpp.org/ftp//tsg_ran/WG1_RL1/TSGR1_107-e/Docs//R1-2112884.zip), the email summary from the RAN1#107e. It is in general not preferred to have parallel discussions in two different groups. Before summarizing and discussing the technical details, it is proposed to collect views on the need to discuss this in RAN2.

**Q5. Do companies agree to discuss search space linkage in RAN2?**

|  |  |  |
| --- | --- | --- |
| **Company** | **Yes or No ?** | **Comments** |
| Ericssson | No | In general, we don’t prefer parallel discussions in two working groups. RAN2 invovlement in this topic would be useful only if RAN2 can provide additional inputs on top of the RAN1 discussion. We don’t believe this is the case here. Additionally, in the R1-2112884, the views from various RAN1 companies are split and we believe it is not fruitful to start this type of discussions in RAN2. |
| Huawei, HiSilicon | No | Agree with Ericsson |
| LGE | No | RAN1 is already discussing this issue.  |
| ZTE | No | Agree with Ericsson. |
| Intel | No | No need to have parallel discussion with RAN1 |
| vivo |  | Although we think RAN2’s insight regarding this issue is also necessary, we are fine with Ericsson’s view. |
| Apple | No for now | OK to wait until RAN1 has a conclusion, RAN2 can revisit the topic afterwards. |
| Nokia, Nokia Shanghai Bell | Not now | Let's wait for RAN1 to converge. If there are still RAN2 issues after RAN1 decision, we can continue the discussion. |
| Samsung | No |  |

Summary: All companies are fine to wait for RAN1 inputs (if any)

**Conclusion 3 Wait for further RAN1 inputs (if any) on if/how to capture search space linkage in the RRC spec.**

## 2.2 MAC

[R2-2200294](http://www.3gpp.org/ftp//tsg_ran/WG2_RL2/TSGR2_116bis-e/Docs//R2-2200294.zip) DSS and RA Procedure Samsung Electronics Co., Ltd discussion Rel-17 LTE\_NR\_DC\_enh2

[R2-2201040](http://www.3gpp.org/ftp//tsg_ran/WG2_RL2/TSGR2_116bis-e/Docs//R2-2201040.zip) RAN2 impact in DSS WI Ericsson discussion NR\_DSS\_enh

[R2-2201618](http://www.3gpp.org/ftp//tsg_ran/WG2_RL2/TSGR2_116bis-e/Docs//R2-2201618.zip) Remaining issues on cross-carrier scheduling from Scell to P(S)Cell Huawei, HiSilicon discussion Rel-17 NR\_DSS-Core

Neither [R2-2201040](http://www.3gpp.org/ftp//tsg_ran/WG2_RL2/TSGR2_116bis-e/Docs//R2-2201040.zip) nor [R2-2201618](http://www.3gpp.org/ftp//tsg_ran/WG2_RL2/TSGR2_116bis-e/Docs//R2-2201618.zip) proposes any spec enhancements, e.g., leaving to network implementation, re-using the legacy procedure, or waiting for RAN1 inputs, and etc. Only the paper [R2-2200294](http://www.3gpp.org/ftp//tsg_ran/WG2_RL2/TSGR2_116bis-e/Docs//R2-2200294.zip) has proposed an enhancement for RA procedure.

[R2-2200294](http://www.3gpp.org/ftp//tsg_ran/WG2_RL2/TSGR2_116bis-e/Docs//R2-2200294.zip): In legacy, contention resolution is received on the SpCell. In the case of DSS, PDCCH for contention resolution can be received via Scell. So, the paper proposes to consider in the contention resolution also a PDCCH transmission for the SpCell.

**Q6. Do companies agree that reception of a PDCCH for the SpCell from the scheduling Scell is considered for contention resolution in the MAC procedure?**

|  |  |  |
| --- | --- | --- |
| **Company** | **Yes or No ?** | **Comments** |
| Ericsson | No | We understand the proposal may increase flexiblity (assuming no other bugs are introduced), but we are not convinced that the change itself is strictly needed.1. For type-B UE, there is no issue at all since type-B UE can monitor user-specfic search space (USS) for SpCell on SpCell and for SpCell on Scell simultaneously; for type-A UE, it can only monitor USS at a given time (TDM between USS), but still no big issue.
2. The question is what if USS is configured only on the scheduling Scell. But we understand whether this is configurable is not determined yet in Ran1. In the worst case, the Common Search Space (CSS) is still available on SpCell. PDCCH with C-RNTI (which carries contention resolution) can be transmitted on the CSS of the SpCell.
 |
| Huawei, HiSilicon | No | There may some risk that the UE may mistake the normal CCS from Scell as contention resolution. For instance, for CB-BFR on Pcell, given that the UE still monitors the PDCCH on the sSCell, thus in case even Msg3 transmission fails, normal CCS from Scell for Pcell is still applicable, then the PDCCH for Pcell from sSCell cannot be considered as contention resolution for BFR on Pcell. Therefore, we believe that the legacy contention resolution is the only way to go by restricting PDCCH reception is on Pcell. |
| LGE | No | The UE can still receive PDCCH on SpCell even when cross-carrier scheduled by sSCell. So, there is no issue to keep the legacy way of contention resolution as it is. |
| ZTE | No | Share the same view with Huawei. |
| Intel | No | Not necessary to make this change, as the Common Search Space (CSS) is still available on SpCell. |
| vivo | No | We agree with HW on the point that misaligned comprehension between network and UE might happen. |
| Apple | TBD | The proposal seems reasonable. We would like to cross-check some more and think that RAN2 should wait for RAN1, as Ericsson has mentioned.  |
| Nokia, Nokia Shanghai Bell | No | Agree with others. |
| Samsung | Yes | If USS is not configured on SpCell, it is beneficial. Even though CSS is configured on SpCell, opportunities to transmit PDCCH addressed to C-RNTI are limited.* If a UE is provided
	+ one or more search space sets by corresponding one or more of *searchSpaceZero, searchSpaceSIB1*, *searchSpaceOtherSystemInformation*, *pagingSearchSpace*, *ra-SearchSpace*, and
	+ a C-RNTI, an MCS-C-RNTI, or a CS-RNTI

the UE monitors PDCCH candidates for DCI format 0\_0 and DCI format 1\_0 with CRC scrambled by the C-RNTI, the MCS-C-RNTI, or the CS-RNTI in the one or more search space sets in a slot where the UE monitors PDCCH candidates for at least a DCI format 0\_0 or a DCI format 1\_0 with CRC scrambled by SI-RNTI, RA-RNTI, MsgB-RNTI, or P-RNTI. * In these CSS, slots in which UE can monitor PDCCH addressed to C-RNTI are limited to slots of SI window/PO/RAR window.

Regarding the CB-BFR issue, our understanding is that BFD/BFR is applied for FR2 and DSS is not applied for FR2 as LTE is not supported on FR2. Also note that FR2 is not the scope of the as per WID RP-211345. |

Summary: 8 companies do not agree. One argument is that the UE may mistake the normal CCS from SCell as contention resolution, and the other argument is that it is still possible to use CSS of the SpCell for contention resolution. 1 company proposes to wait for further RAN1 input. 1 company agrees and responds with that the CB-BFR issue happens only in FR2 which is out of the scope and considers that the CSS on SpCell is limited.

There is no consensus on that the reception of a PDCCH for the SpCell from the scheduling SCell can be considered for contention resolution. The rapporteur suggests to further discuss, in particular considering the latest comment from the proponent company. Companies are encouraged to provide further inputs below

**Q6a. Any further inputs, in light of the above comment?**

|  |  |
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| **Company** | **Comments** |
| Huawei, HiSilicon | Thanks Samsung for the comments. Regarding CB-BFR case, it is just used as an example, maybe not proper in DSS, but there can be other CBRA cases, e.g. PDCCH-triggered CBRA on PCell. Then, regarding CSS/USS on PCell, it seems fall in RAN1 area, but in my humble knowledge, the UE can be also configured with Type 3 PDCCH CSS (other than the listed CSS, but additional CSS) and can still monitor PDCCH scrambled by C-RNTI for (at least) Msg4 reception on PCell, which can be found in the following 38.213 spec. So we don’t see an issue with the current spec. - a Type3-PDCCH CSS set configured by *SearchSpace* in *PDCCH-Config* with *searchSpaceType* = *common* for DCI formats with CRC scrambled by INT-RNTI, SFI-RNTI, TPC-PUSCH-RNTI, TPC-PUCCH-RNTI, TPC-SRS-RNTI, CI-RNTI, or PS-RNTI and, only for the primary cell, C-RNTI, MCS-C-RNTI, or CS-RNTI(s), andEven without Type 3 PDCCH CSS, I doubt if C-RNTI scheduling is as limited as mentioned by Samsung, if so, then how to receive SMC or initial RRC reconfiguration that is supposed to be scrambled by C-RNTI, after transiting to active state?In general, it is better to leave this issue to RAN1, not RAN2. |
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## 2.3 Any Other Issues

**Q7. Any other issues?**

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| **Company** | **Issue and Comments** |
| Apple | Comments on parameter *ccs-BlindDetectionSplit* in the running CR (R2-2201039): * RAN1 talks about this parameter as a scaling factor $α$, which is used in RAN1 specs. We could reflect that in the RRC text, calling it a scaling factor would make it more clear. The scaling factor $α$ is used to determine maximum number of PDCCH candidates and non-overlapping CCEs for PDCCH monitoring on P(S)Cell and the SCell that is used for cross-carrier scheduling to P(S)Cell).
* Moreover, there should be a reference that this parameter links with *PCell-CCSBDscaling* in TS 38.213 (see R1-2112929 and the initial R17 version of TS 38.213, section 10.1.1, where the $α$ is provided by *PCell-CCSscaling*).
* If we have two IEs as in Alt 2 of issue 2 then this parameter can be combined with the new field? No need to define in the parameter description any dependencies on other parameters, which does not look very clean.
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Summary: Thank you for the inputs. Rapporteur suggests discussing this in the RRC running CR.

# 3 Conclusion

TBD

# 4 References

1. [R2-2111459](http://www.3gpp.org/ftp//tsg_ran/WG2_RL2/TSGR2_116-e/Docs//R2-2111459.zip), Summary of [AT116-e][026][NR17] DSS (Ericsson), Ericsson
2. [R2-2110730](http://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_116-e/Docs/R2-2110730.zip) , RRC running CR for DSS, Ericsson