3GPP TSG-RAN WG3 #117bis-e R3-225906

10th – 18th Oct 2022

Online

Agenda Item: 9.2.8

Source: ZTE (moderator)

Title: Summary of Offline Discussion on CB: # 13\_DAPS

Document for: Approval

# Introduction

**CB: # 13\_DAPS**

**- Which node decides powerCoordinationDAPS infor, source CU or source DU?**

**- Whether the restriction information includes the feature set?**

**- Capture agreements and provide CR**

(ZTE - moderator)

Summary of offline disc [R3-225906](file:///D%3A%5CMy_work%5CTSGR1-111a-eMeeting-20221010%5CRAN3-107bis%5CCB%20%23%2013_DAPS%5CInbox%5CR3-225906.zip)

The 1st round of discussion is set to deadline on **12th Oct (Wednesday) 11:59 UTC.**

The 2st round of discussion is set to deadline on **17th Oct (Monday) 0800 UTC.**

# For the Chairman’s Notes

Propose the following:

R3-225364 rev in R3-225993 - endorsed

R3-225365 rev in R3-225994 - endorsed

Propose to capture the following:

Proposal 1: The same motivation on generating powerCoordination can be applied to both SN addition and DAPS HO.

Proposal 2: The two CRs (R3-225993 and R3-225994) are endorsed in this meeting, and the final detailed RRC IE shall be checked based on rapporteurs’ conclusion.

**The spec rapporteurs to find the consistent principle on referring to RRC IE in our RAN3 specs in R18 before next meeting.**

**QC Conerns that for Power coordination between SN to MN for MR-DC, requested Pmax is retrieved from SN DU by SN CU, whereas the similar principle is not followed for power coordination between source to target in DAPS HO and between MN to SN in DC.**

# Discussion- Second round

**PowerCoordination over F1 during SN addition procedure**

According to majority company’s view, we have the following conclusion.

**Conclusion 1: According to current specs, during SN addition procedure, powerCoordination is transmitted from MN-CU to SN-CU then from SN-CU to SN-DU. (9:1)**

**Conclusion 2: According to current specs, during SN addition procedure, it is the MN-CU to generate powerCoordination. (9:1)**

**Conclusion 3: During SN addition procedure, powerCoordination is to coordinate (i.e., to split) the current power into two parts (one split power for MN and another split power for SN). So that, MU-CU is the suitable node to handle the coordination (9:2).**

1 company points out that in F1AP, introduce GNB-DU Configuration Query IE in the UE context modification request message. However, moderator thinks it is not correct, because the procedure is optional and is used to query latest DU configuration, such as XnAP: SN modification procedure.

**Conclusion 4: GNB-DU Configuration Query IE in the UE context modification request message is used to query the latest configuration, is not used to request the powerCoordination.**

**PowerCoordination over F1 during DAPS procedure**

All companies agree with the following conclusions.

**Conclusion 5: According to current specs, during DAPS procedure, powerCoordination is transmitted from source CU to target CU then from target CU to target DU.**

**Conclusion 6: During DAPS procedure, power coordination transmission between source CU and source DU is needed but is missing in F1AP specs.**

**Which node decides powerCoordinationDAPS information, source CU or source DU?**

**Proposal 1: The same motivation on generating powerCoordination can be applied to both SN addition and DAPS HO.**

**Conclusion 7: Power is physical layer parameter, but powerCoordination is high layer parameter. (8:2)**

**Conclusion 8: The powerCoordination is NOT to generate current maximum total power to be used by UE, but to coordinate (i.e., to split) the current maximum total power into two parts (one split power for MN/source and another split power for SN/target). (9:1)**

**Conclusion 9: For both DC and DAPS HO, it is not needed to firstly initiate F1AP procedure to request source DU to generate powerCoordination. (8:2)**

**Whether the restriction information includes the feature set?**

Majority companies (8:2) support CRs for Set 1, and we already have the following conclusion in the Chair note.

**All endorsed CRs from bis meeting need to be re-submitted to RAN3#118**

**The spec rapporteurs to find the consistent principle on referring to RRC IE in our RAN3 specs in R18 before next meeting).**

So, moderator provides the following proposal.

**Proposal 2: The CRs: R3-225364 and R3-225365 are endorsed in this meeting, and the final detailed RRC IE shall be checked based on rapporteurs’ conclusion.**

**Summary:**

It seems that we can achieve consensus according to majority support companies (e.g., 8:2), moderator kindly wish companies can compromise.

In order to decrease your work load, companies only need to input your view if you do **NOT** agree with the above conclusions or proposals.

**Question 1: If you do NOT agree with one or more conclusions/proposals as above, please input your view.**

|  |  |  |
| --- | --- | --- |
| **Company** | **Conclusion (1…9)****Proposal 1,2** | **Comment** |
| Huawei |  | We are fine to go with majority views to agree the two proposals. But considering there are two ConfigRestrictInfoDAPS IEs in TS 38.331, in order to make it clearer, we think the semantic descriptions should be updated from“ConfigRestrictInfoDAPS as defined in TS 38.331 [8]…”to “ConfigRestrictInfoDAPS**-r16** as defined in TS 38.331 [8]...” |
| Qualcomm |  | We are fine to go with the majority. But we would like our concern (as below) to be minuted in the Chair’s notes.“For Power coordination between SN to MN for MR-DC, requested Pmax is retrieved from SN DU by SN CU, whereas the similar principle is not followed for power coordination between source to target in DAPS HO and between MN to SN in DC “ |
|  |  |  |
|  |  |  |
|  |  |  |

Moderator’s summary:

Thanks both HW and QC to go with majority’s view.

According to HW’s comment, the two CRs are fixed accordingly (i.e., in the Semantics description, ConfigRestrictInfoDAPS => ConfigRestrictInfoDAPS-r16).

Moderator wonders if QC’s concern would introduce online argument, so moderator would not like to input it into the Chair’s note. However, since QC has strong concern, moderator agrees to input their concern into the Chair note.

Moderator also would not like to input above conclusions into the Chair’s note, because they do not have 100% support

In conclusion, moderator wishes to capture the following proposals intot the Chair’s note.

**Proposal 1: The same motivation on generating powerCoordination can be applied to both SN addition and DAPS HO.**

**Proposal 2: The CRs: R3-225364 rev in R3-225993 and R3-225365 rev in R3-225994 are endorsed in this meeting, and the final detailed RRC IE shall be checked based on rapporteurs’ conclusion.**

**The spec rapporteurs to find the consistent principle on referring to RRC IE in our RAN3 specs in R18 before next meeting.**

**QC Conerns that for Power coordination between SN to MN for MR-DC, requested Pmax is retrieved from SN DU by SN CU, whereas the similar principle is not followed for power coordination between source to target in DAPS HO and between MN to SN in DC.**

# Discussion-First round

## PowerCoordination over F1 during SN addition procedure

In [1], after analysis, the cosigned discussion paper provides two observations for DC deployment, as below.

|  |
| --- |
| **Observation 1: According to current specs, during SN addition procedure, powerCoordination is transmitted from MN-CU to SN-CU then from SN-CU to SN-DU.****Observation 2: According to current specs, during SN addition procedure, it is the MN-CU to generate powerCoordination.** |

**Question 1: Do you agree with above observations?**

|  |  |  |
| --- | --- | --- |
| **Company** | **O1, O2****Yes/No** | **Comment** |
| ZTE | Yes for both | They have been captured into the current TS 38.473. |
| Huawei | Not yet | Do we have clear agreements on how the power coordination is generated by the MN-CU or the MN-DU (it is appreciated if comanpines can provide the agreements!) And we think we can further discuss how the *ConfigRestrictInfoSCG* (including the power coordination) in the *CG-ConfigInfo* is generatged for MR-DC after the DAPS handover is clearer. We also want to point out that currently the SN-DU can request and sent the Requested P-MaxFR1/ requestedP-MaxFR2/ Selected BandCombinationIndex/ Selected FeatureSetEntryIndex to the SN-CU. And the MN-DU can send the Requested BandCombinationIndex/ Requested FeatureSetEntryIndex to the MN-CU. This somehow proves the lower layer parameters should be decided by the DU.  |
| Intel | Yes for both | The powerCoordination parameters for DC have been carried by the RAN2's inter-node RRC message *CG-ConfigInfo*, where in according to 38.331, it is delivered from MN to SN (or alternatively CU to DU). And from our limited understanding, we don't think that any DU parameters within *CG-ConfigInfo* or *HandoverPreparationInformation* have been designed to be checked and retrieved from the source DU before the source CU issues HO. This may need to be checked by RAN2, but we tend to think that they are designed in a way that the source CU or MN-CU should be able to trigger HO based on the current UE context, assuming any latest configuration update from the source DU has been successfully configured to the UE via the source CU (via RRC) and thus the source CU always maintains the latest DU configuration in its UE context. Moreover, the mobility/DC decision is on CU. Given DU does not know when CU will initiate DC for the UE, it seems not right for the MN-DU to decide and supply *ConfigRestrictInfoSCG* in advance to the MN-CU.Furthermore, this is about "uplink" power "coordination" that the source/MN suggests to the target/SN, for the UE not to exceed its maximum. From these senses, it seems right that it is the MN-CU who decides *ConfigRestrictInfoSCG* and thus we agree with two observations. [Huawei2]: thanks for the comments. About the retrival beore the source CU issues HO, we would like to point out in F1AP, we introduce **GNB-*DU Configuration Query***IE in the UE context modification request message.* *If the GNB-DU Configuration Query IE is contained in the UE CONTEXT MODIFICATION REQUEST message, gNB-DU shall include the DU To CU RRC Information IE in the UE CONTEXT MODIFICATION RESPONSE message.*

 And in section 8.2.1 Intra-NR Mobility in TS 38.401, it has the following descriptions. So this means indeed we had the retrival procedure between the source CU and source DU before the HO. *2a. The gNB-CU may send an UE CONTEXT MODIFICATION REQUEST message to the source gNB-DU to query the latest configuration.* |
| Google | Yes for both | We also think it makes sense for the CU to do powerCoordination to split power without execeeding UE capability. As for the GNB-DU Configuration Query IE, it was introduced for supporting delta configuration at the target DU and not for coordination.  |
| Nokia | Yes for both |  |
| Qualcomm | See Comments | We agree that in DC case, that MN CU sends the power coordination parameters to SN CU. However, we think that is incorrect. We have a clear split of functionalities between CU and DU. DU deals with lower layer (MAC and PHY parameters). Power is a PHY layer parameter. Hence it should be DU’s responsibility.Our recommendation is that source CU should retrieve from source DU the power parameters for source and target (both DC and DAPS) when it is needed, as DU is responsible for PHY layer parameters.For DAPS handover, the source CU can request from DU the power parameters based on the target cell and the provide the uplink power split sent from source DU to target CU. Since the DAPS issue is raised now, we prefer to first work upon DAPS and then look into DC case when we agree on the principles.RAN3 should discuss and decide if CU or DU owns the lower layer parameters and if CU or DU should provide the lower layer parameters for Handover and DC.If needed a LS can be sent to RAN2 for further clarification. |
| CATT | Yes for both | The DC case is already specified as observation state. Check the history of the specified this function, which node generate the powersplit was discussed in RAN3. The CU has the knowledge and capability to generate it. If DU is responsible for the powersplit generating, the delay should be introduced due to the query before sending to SN.  |
| Lenovo | Yes for both |  |
| NEC | Yes for both |  |
| Ericsson | Yes for both |  |
|  Samsung | Yes for both |  |

Summary:

11 companies input their view.

9 companies agree with the two observations.

1 company also agree with them but bring some comments, i.e. “*We agree that in DC case, that MN CU sends the power coordination parameters to SN CU. However, we think that is incorrect*.”

1 company does not agree with them, and point out that in F1AP, introduce GNB-DU Configuration Query IE in the UE context modification request message. However, moderator thinks it is not correct, because the procedure is optional and is used to query latest DU configuration, such as XnAP: SN modification procedure.

Sine majority companies (9:1) agree with the observation, we give the following conclusion.

**Conclusion (9:1):**

**According to current specs, during SN addition procedure, powerCoordination is transmitted from MN-CU to SN-CU then from SN-CU to SN-DU.**

**According to current specs, during SN addition procedure, it is the MN-CU to generate powerCoordination.**

In [1], it also gives the reason why the MN-CU to generate powerCoordination during SN addition procedure, is that

**Reason 1：**During SN addition procedure, powerCoordination is to coordinate (i.e., to split) the current power into two parts (one split power for MN and another split power for SN). So that, MU-CU is the suitable node to handle the coordination.

**Reason 2：**During SN addition procedure, if MN-DU generates the powerCoordination, before it initiates SN addition procedure, it has to firstly initiate F1AP procedure to request source DU to generate powerCoordination, which will introduce unnecessary latency.

**Question 2: Do you also agree with above reasons for MN-CU to generate powerCoordination during SN addition procedure? Or, other reason?**

|  |  |  |
| --- | --- | --- |
| **Company** | **R1, R2****Yes/No** | **Comment** |
| ZTE | Yes for both | More, CU has more information about both Source/MN node and Target/SN node than DU, so that CU is the suitable node to handle coordination between two nodes (source node and targe node, MN and SN). |
| Huawei |  | See our replies in Q1. We can further discuss the MR-DC cases on the ConfigRestrictInfoSCG including not only the power coodirnation, but also pdcch-BlindDetectionSCG etc  |
| Intel | Yes for both | Please see our replies in Q1.  |
| Google | Yes for both | The MN CU shall be able to generate powerCoordination based on UE capability |
| Nokia | Yes for 1 | Not sure if the 2nd reason was indeed deliberately considered, but the 1st is plenty enough. One may also add that the source DU has little knowledge about mobility and neighbours, because this is CU’s domain. |
| Qualcomm |  | Source/MN CU in most cases will request DU for latest configuration before HO or DC. In the same message the lower layer parameters can also be retrieved by CU. Hence it does not cause additional delay as stated in R2 |
| CATT | Yes for both | See our replies in Q1 |
| Lenovo | Yes for both |  |
| NEC | Yes for both | Certainly that CU has the role of centrally controls, it is more suitable than DU to handle coordination. |
| Ericsson | Yes for both | Target DU has little information on SN |
| Samsung  | Yes for both  |  |

Summary:

11 companies input their view.

8 companies agree with two reasons and 1companies agree with the first reason.

Since majority companies (9:2) agree with the reason 1, we provide the following conclusion.

**Conclusion:**

**During SN addition procedure, powerCoordination is to coordinate (i.e., to split) the current power into two parts (one split power for MN and another split power for SN). So that, MU-CU is the suitable node to handle the coordination (9:2).**

## PowerCoordination over F1 during DAPS procedure

In [1], it observes that according to current specs, during DAPS HO procedure, powerCoordination is transmitted from source CU to target CU then from target CU to target DU.

Meanwhile, in all papers on the table, they agree that power coordination transmission between source CU and source DU is needed but is missing for Inter frequency DAPS HO.

|  |
| --- |
| **Observation 3: According to current specs, during DAPS procedure, powerCoordination is transmitted from source CU to target CU then from target CU to target DU.****Observation 4: During DAPS procedure, power coordination transmission between source CU and source DU is needed but is missing in F1AP specs.** |

**Question 3: Do you agree with the above observations?**

|  |  |  |
| --- | --- | --- |
| **Company** | **O3, O4****Yes/No** | **Comment** |
| ZTE | Yes for both |  |
| Huawei | Yes | What we discuss here is whether the source CU or the source DU determines the power coordination parameters.  |
| Intel | Yes for both | Please see our replies in Q1, but basically, the powerCoordination parameters for DAPS have been carried by the RAN2's inter-node RRC message *HandoverPreparationInformation*, where in according to 38.331, it is delivered from the source to the target (or alternatively CU to DU) and from our limited understanding, * We don't think that any DU parameters within *HandoverPreparationInformation* have been designed to be checked and retrieved from the source DU before the source CU issues HO (but we may be wrong).
* The mobility decision is on CU. Given DU does not know when CU will initiate DAPS HO for the UE, it seems non right for the source DU to decide and supply *ConfigRestrictInfoDAPS* in advance to the source CU.
* This is about "uplink" power "coordination" that the source suggests to the target, for the UE not to exceed its maximum.

If no consensus, we may further check with RAN2… |
| Google | Yes for both |  |
| Nokia | Yes |  |
| Qualcomm | Yes | But we need to agree on the principle that who decides the power split |
| CATT | Yes for Both |  |
| Lenovo | Yes for both |  |
| NEC | yes |  |
| Ericsson | Yes for both |  |
| Samsung  | Yes  |  |

Summary:

11 companies input their view.

Since all companies agree with two observations, we provide the following conclusions.

**Conclusion:**

**According to current specs, during DAPS procedure, powerCoordination is transmitted from source CU to target CU then from target CU to target DU.**

**During DAPS procedure, power coordination transmission between source CU and source DU is needed but is missing in F1AP specs.**

## Which node decides powerCoordinationDAPS information, source CU or source DU?

According the papers ([1], [2]… [7]), there are two solutions to decide powerCoordinationDAPS.

**Solution 1: Source CU decides it**

**8** companies support Solution 1: ZTE, Ericsson, CATT, Google, Samsung, Intel Corporation, Lenovo, and NEC.

**Solution 2: Source DU decides it**

**2** companies support Solution 2: QC and HW

In [1]. It gives the reason for Solution 1 as below.

|  |
| --- |
| For powerCoordination, its generation and transmission are very similar between both SN addition procedure and DAPS HO procedure.During SN addition procedure, since we have already agreed that MN-CU is the suitable node to generate the powerCoordination and which is already captured in the current TS38.473, we shall propose source CU to generate the powerCoordination during DAPS HO procedure.On the contrary, if MN CU generates powerCoordination for SN addition, but source DU (other than source CU) generates powerCoordination for DAPS, then both CU and DU are involved to generate powerCoordination, which introduces extra complexity. And if source DU generates the powerCoordination, before it initiates DAPS HO procedure, the source CU has to firstly initiate F1AP procedure to request source DU to generate powerCoordination, which will introduce extra handover latency, seen as figure.Figure : Extra F1AP procedure (power coordination) before DAPS HO procedure**Observation: During DAPS HO procedure, it will introduce extra complexity and latency when source DU to generate the powerCoordination.** |

In [5] and [6], they give the reason for Solution 2 as below.

|  |
| --- |
| [5] Currently source CU sends the source and target Pmax for DAPS HO to target CU. Target CU sends the target Pmax to target DU. However Pmax is a gNB-DU parameter. Hence the Pmax needed for DAPS Handover for source and target should be provided by source gNB-DU to source gNB-CU in DU to CU RRC Container IE in F1 UE Context Modification Response when the latest UE configuration is queried by gNB-CU before sending XN Handover Request for DAPS handover. For inter frequency DAPS HO, the source CU should request the source DU to provide the source and target Pmax.[6] - The power coordination defines the maximum total transmit power to be used by the UE in the source and target, which is much related to the physical /L1 parameters. Hence it should be decided for the MN DU discretion. - For MR-DC case at the SN side, the SN-DU will provide the Requested P-MaxFR1/ Requested P-MaxFR2/ FeatureSetEntryIndex etc to the SN CU, indicating the maximum value for FR1/FR2 and feature set entry index to be used at the SN side. This proves that the DU decide the DAPS lower layer parameters, for the DAPS handover. |

**Question 4: Do you agree with the following view? If not agreed, please provide your reason.**

**The mechanism on generating powerCoordination shall be the same between both SN addition procedure and DAPS HO procedure**

|  |  |  |
| --- | --- | --- |
| **Company** | **Same/Different** | **Comment** |
| ZTE | Same | The union mechanism is helpful to decrease normative work and product design complexity. |
| Huawei | Same | We are fine. But do RAN3 have agreements about the power coordination for MR-DC at the MN side (whether the MN-CU or the MN-DU decides)? Then we can further discuss the MR-DC case if the DAPS is clear.  |
| Intel | Same |  |
| Google | Same | Btter to be consistent  |
| Nokia |  | No sure if it has to be the same, but the same argument is applicable here as mentioned above (reason 1 in Q2). |
| Qualcomm | Agree | But we first need to decide of CU or DU is responsible for providing uplink power split parameters in DAPS. We can then discuss DC.Currently for MR-DC case, the SN CU requests from SN DU the Requested P-MaxFR1/FR2 in DU to CU RRC Container over F1. This shows that P-Max is handled by DU. Then the open question is why only SN CU requests SN DU for P-Max. Why not MN CU? |
| CATT | same |  |
| Lenovo | same |  |
| NEC | same |  |
| Ericsson |  | It does not have to be the same, but agree with Nokia that same motivation can be applied to both cases. |
| Samsung  | same |  |

Suammry:

11 companies input their view.

9 companies agree with above proposal and 2 companies think the same motivation can be applied to both cases. As compromised, we give the following proposal.

**Proposal: The same motivation on generating powerCoordination can be applied to both SN addition and DAPS HO.**

For Solution 2, there is no discussion paper to analyse the detail, however, moderator finds some different between both Solution 1 and Solution 2.

**Issue 1：Power & powerCoordination**

* Understanding 1: Power is physical layer parameter, but powerCoordination is high layer parameter.
* Understanding 2: Both power and powerCoordination are physical parameter
* Understanding 3: If any.

**Issue 2：Usage of powerCoordination**

* Understanding 1: The powerCoordination is **NOT** to generate current maximum total power to be used by UE, but to coordinate (i.e., to split) the current maximum total power into two parts (one split power for MN/source and another split power for SN/target).
* Understanding 2: The power coordination defines the maximum total transmit power to be used by the UE in the source and target.
* Understanding 3: If any.

**Issue 3：powerCoordination used for SN addition vs DAPS HO**

* Understanding 1: Same, i.e., it is generated at MN/source CU for both SN addition and DAPS HO
* Understanding 2: Different, i.e, it is generated at MN CU for SN addition, but at source DU for DAPS HO
* Understanding 3: If any.

**Issue 4：For MR-DC case at the SN side, the SN-DU will provide the Requested P-MaxFR1/ Requested P-MaxFR2 to the SN CU, indicating the maximum value for FR1/FR2 to be used at the SN side.**

* Understanding 1: For DC, it is used at SN side other than MN side. For DAPS HO, it is the same mechanism, i.e., it is used at target side other than source side.
* Understanding 2: For DC, it is used at SN side other than MN side. For DAPS HO, it is used at both source side and target side.
* Understanding 3: If any.

**Issue 5：Before source CU initiates DAPS HO procedure, does it need to firstly initiate F1AP procedure to request source DU to generate powerCoordination?**

* Understanding 1: For both DC and DAPS HO, it is not needed.
* Understanding 2: For DC it is not needed, but for DAPS HO, it is needed.
* Understanding 3: If any.

**Issue 6: Other issue, if any. Please input.**

**Question 5: Companies are kindly invited to input your understanding for above issues?**

|  |  |  |
| --- | --- | --- |
| **Company** | **Issue1… Issue 5** | **Comment** |
| ZTE | All issues: understanding 1 |  |
| Huawei |  | We prefer to discuss DAPS first at this meeting. Then MR-DC case can be further addressed later.  |
| Intel | All issues: understanding 1 |  |
| Google | Understanding 1 in general |  |
| Qualcomm |  | We understand that companies are trying to design DAPS power co-ordination similar to DC case. However we would like to first agree on the principle for power co-ordination for DAPS.Issue 1: Unsderstanding 2Issue 2: Unsderstanding 1Issue 3: Unsderstanding 3 need to discuss further on thisIssue 4: Unsderstanding 3 need to discuss further on thisIssue 5: Unsderstanding 3 need to discuss further on this |
| CATT | All issues: understanding 1 |  |
| Lenovo | All issues: understanding 1 |  |
| NEC | All issues, Understanding 1 |  |
| Ericsson |  | Issues 1/2/5: Understanding 1Issue 3/4: Prefer to discuss DAPS HO only |
| Samsung | All issues, Understanding 1 |  |

Suammry:

10 companies input their view.

7 companies agree with the understanding 1 for all issues.

1 companies agree with the understanding 1 for issue 1/2/5.

1 companiess agree with the understanding 1 for issue 2.

According to majority company’s view, we provide the following conclusion.

**Conclusion:**

**Power is physical layer parameter, but powerCoordination is high layer parameter. (8:2)**

**The powerCoordination is NOT to generate current maximum total power to be used by UE, but to coordinate (i.e., to split) the current maximum total power into two parts (one split power for MN/source and another split power for SN/target). (9:1)**

**For both DC and DAPS HO, it is not needed to firstly initiate F1AP procedure to request source DU to generate powerCoordination. (8:2)**

## Whether the restriction information includes the feature set?

In [6], it indicates the following information from TS38.331

ConfigRestrictInfoDAPS-r16 ::= SEQUENCE {

 powerCoordination-r16 SEQUENCE {

 p-DAPS-Source-r16 P-Max,

 p-DAPS-Target-r16 P-Max,

 uplinkPowerSharingDAPS-Mode-r16 ENUMERATED {semi-static-mode1, semi-static-mode2, dynamic }

 } OPTIONAL

}

ConfigRestrictInfoDAPS-v1640 ::= SEQUENCE {

 sourceFeatureSetPerDownlinkCC-r16 FeatureSetDownlinkPerCC-Id,

 sourceFeatureSetPerUplinkCC-r16 FeatureSetUplinkPerCC-Id

}

|  |
| --- |
| * The feature set information indicates the index selected by the source for DL and UL, which includes a set of features that the UE supports on one band entry with detailed physical parameters. Hence it is up to the MN DU decision.

In order for the DU to provide the accurate information, the **target cell ID related information** is also provided to the source DU so that the source DU can select the more proper restriction information. Note that this can be sent together with the *GNB-DU Configuration Query* IE in the UE CONTEXT MODIFICATION REQUEST message, when the gNB-CU requests the latest lower layer information before the handover. |

Then in [6], it proposes that:

|  |
| --- |
| - Add the ConfigRestrictInfoDAPS1 IE and ConfigRestrictInfoDAPS2 IE in the DU to CU RRC Information. - Add the Target Cell Information DAPS IE in the UE CONTEXT MODIFICATION REQUEST message. |

There are two kinds of methods and three kinds of IEs to transfer powerCoordination between source CU and source DU.

**Method 1: ConfigRestrictInfoDAPS-r16 (seen in CR [5])**

ConfigRestrictInfoDAPS-r16 ::= SEQUENCE {

 powerCoordination-r16 SEQUENCE {

 p-DAPS-Source-r16 P-Max,

 p-DAPS-Target-r16 P-Max,

 uplinkPowerSharingDAPS-Mode-r16 ENUMERATED {semi-static-mode1, semi-static-mode2, dynamic }

 } OPTIONAL

}

**IE 1: used for method 1:**

|  |  |  |
| --- | --- | --- |
| Config Restrict Info DAPS | OCTET STRING | ConfigRestrictInfoDAPS-r16, as defined in TS 38.331 [8].This IE is used by gNB-DU to inform gNB-CU the power parameters required for DAPS Handover Preparation |

**Method 2: ConfigRestrictInfoDAPS-r16 and ConfigRestrictInfoDAPS-v1640 (seen in CR [2] and CR [6])**

ConfigRestrictInfoDAPS-r16 ::= SEQUENCE {

 powerCoordination-r16 SEQUENCE {

 p-DAPS-Source-r16 P-Max,

 p-DAPS-Target-r16 P-Max,

 uplinkPowerSharingDAPS-Mode-r16 ENUMERATED {semi-static-mode1, semi-static-mode2, dynamic }

 } OPTIONAL

}

ConfigRestrictInfoDAPS-v1640 ::= SEQUENCE {

 sourceFeatureSetPerDownlinkCC-r16 FeatureSetDownlinkPerCC-Id,

 sourceFeatureSetPerUplinkCC-r16 FeatureSetUplinkPerCC-Id

**IE2: used for method 2, including all rel-16 ConfigRestrictInfoDAPS IEs defined in TS38.331**

|  |  |  |
| --- | --- | --- |
| ConfigRestrictInfoDAPS | OCTET STRING | ConfigRestrictInfoDAPS as defined in TS 38.331 [8]. This IE is used at the source node if DAPS HO is configured. |

**IE3: used for method 2, two separate IEs, one for rel-16, another for rel-1640 ConfigRestrictInfoDAPS IE**

|  |  |  |
| --- | --- | --- |
| ConfigRestrictInfoDAPS1 | OCTET STRING | ConfigRestrictInfoDAPS-r16, as specifed in TS 38.331 [8]. |
| ConfigRestrictInfoDAPS2 | OCTET STRING | ConfigRestrictInfoDAPS-v1640, as specifed in TS 38.331 [8]. |

**Question 6: Which method and which kind of IE as above do you prefer for DAPS HO procedure?**

|  |  |  |
| --- | --- | --- |
| **Company** | **Method 1 vs Method 2****IE1 vs IE2 vs IE3** | **Comment** |
| ZTE | Method 2, IE 2 | In current RAN3 specs, suffix (e.g., “-r16” or “-r17”) is not used in OCTET STRING type of RAN3 IE for the RRC reference. IE2 (i.e., a union RAN3 IE without release/version suffix) can include all releases and versions of RRC reference (i.e., rel16 and v1640…). For future proof, the IE2 is suitable. |
| Huawei | IE1 | We think we need first to discuss which node determines the sourceFeatureSet. Now we think the **source CU** can determine the feature set. ConfigRestrictInfoDAPS-v1640 ::= SEQUENCE { sourceFeatureSetPerDownlinkCC-r16 FeatureSetDownlinkPerCC-Id, sourceFeatureSetPerUplinkCC-r16 FeatureSetUplinkPerCC-Id}Then IE1 would be sufficient.  |
| Intel |  | We also think we should first reach consensus (or get consultation from RAN2) on which entity decides which.  |
| Google | Method 2, IE 2 | But as ZTE raised also during the online session when R3-225893 was treated, we may leave the final detail after rapporteurs’ conclusion.**The spec rapporteurs to find the consistent principle on referring to RRC IE in our RAN3 specs in R18 before next meeting** |
| Nokia |  | I don’t have it in fron of me, but shouldn’t it be the same format as used from the target CU to the target DU? |
| Qualcomm |  | We should first reach consensus on the principle of Power coordination and then we can discuss the CRs |
| CATT |  | Agree with intel |
| NEC | Method 2 and IE2 |  |
| Ericsson | Method 2 IE2 |  |
| Samsung | Method 2 and IE2 |  |

Suammry:

10 companies input their view.

**No proposal.**

If it is agreed to transfer powerCoordination from source DU to source CU, there are two options to request powerCoordination via UE CONTEXT MODIFICATION REQUEST message.

**Option 1: Add a new code point in the existing IE *GNB-DU Configuration Query* (seen in CR [5])**

**Option 2: Add a new IE “Target Cell Information DAPS” (seen in CR [6])**

**Question 7: If it is agreed to transfer powerCoordination from source DU to source CU, which option as above do you prefer for DAPS HO procedure?**

|  |  |  |
| --- | --- | --- |
| **Company** | **Option1 vs Option2** | **Comment** |
| ZTE |  | If source CU generates powerCoordination, it is not needed. |
| Huawei |  | It can be discussed if the group agree that the source DU should generate the power coordination.  |
| Intel |  | Think it is a bit pre-mature to discuss.  |
| Google |  | Same as ZTE’s comment. |
| Qualcomm |  | We should first reach consensus on the principle of Power coordination and then we can discuss the CRs |
| CATT |  | Same as ZTE’s comment. |
| Lenovo |  | Agree with ZTE |
| NEC |  | Similar with ZTE comment. |
| Samsung  |  | Agree with ZTE |

Summary:

9 companies input their view.

**According the above conclusion, it seems no need.**

## Which set of CRs do you support?

There are three set of CR on the table.

**Set 1 ([2] and [3]): Source CU generates powerCoordination for DAPS HO, including IE2 as above**

Companies: ZTE, Ericsson, CATT, Google, Samsung, Intel Corporation, Lenovo, NEC

**Set 2 ([4] and [5]): Source DU generates powerCoordination for DAPS HO, including IE1 as above**

Companies: QC

**Set 3 ([6] and [7]): Source DU generates powerCoordination for DAPS HO, including IE3 as above**

Companies: HW, QC

**Question 8: Which set of CRs do you support?**

|  |  |  |
| --- | --- | --- |
| **Company** | **Set 1 vs Set 2 vs Set 3** | **Comment** |
| ZTE | Set 1 | Source CU is the suitable node to coordinate power during DAPS HO procedure. |
| Huawei |  | This can be discussed at the next round, if group has common understanding.  |
| Intel | Set 1 | But open for further clarifications.  |
| Google | Set 1 |  |
| Nokia | Set 1 | The proposed CRs are all right. |
| Qualcomm |  | We should first reach consensus on the principle of Power coordination and then we can discuss the CRs |
| CATT | Set1 |  |
| Lenovo | Set 1 |  |
| NEC | Set 1 |  |
| Samsung  | Set 1 |  |

Summary:

10 companies input their view.

Majority companies (8:2) support CRs for Set 1, and we already have the following conclusion in the Chair note.

**All endorsed CRs from bis meeting need to be re-submitted to RAN3#118**

**The spec rapporteurs to find the consistent principle on referring to RRC IE in our RAN3 specs in R18 before next meeting).**

So, moderator provides the following proposal.

**Proposal: The CRs: R3-225364 and R3-225365 are endored in this meeting, and the final detaied RRC IE shall be checked based on rapporteurs’ conclusion**

# Conclusion, Recommendations [if needed]

# References

1. R3-225363 Discussion on DAPS over F1 (ZTE, Ericsson, CATT, Google, Samsung, Intel Corporation, Lenovo, NEC) discussion
2. [R3-225364](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_117bis-e%5CDocs%5CR3-225364.zip) R16CR for DAPS over F1 to TS38.473 (ZTE, Ericsson, CATT, Google, Samsung, Intel Corporation, Lenovo, NEC) CR0974r2, TS 38.473 v16.11.0, Rel-16, Cat. F
3. [R3-225365](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_117bis-e%5CDocs%5CR3-225365.zip) R17CR for DAPS over F1 to TS38.473 (ZTE, Ericsson, CATT, Google, Samsung, Intel Corporation, Lenovo, NEC) CR0975r2, TS 38.473 v17.2.0, Rel-17, Cat. A
4. [R3-225402](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_117bis-e%5CDocs%5CR3-225402.zip) Power Co-ordination for DAPS HO over F1 for R17 (Qualcomm India Pvt Ltd) CR1040r, TS 38.473 v17.2.0, Rel-17, Cat. A
5. [R3-225403](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_117bis-e%5CDocs%5CR3-225403.zip) Power Co-ordination for DAPS HO over F1 for R16 (Qualcomm India Pvt Ltd) CR1041r, TS 38.473 v16.11.0, Rel-16, Cat. F
6. [R3-225737](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_117bis-e%5CDocs%5CR3-225737.zip) Configuration Restriction Info for DAPS handover (Huawei, Qualcomm Incorporate) CR1064r, TS 38.473 v16.11.0, Rel-16, Cat. F
7. [R3-225738](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_117bis-e%5CDocs%5CR3-225738.zip) Configuration Restriction Info for DAPS handover (Huawei, Qualcomm Incorporate) CR1065r, TS 38.473 v17.2.0, Rel-17, Cat. A