**3GPP TSG-RAN WG2 Meeting#109bis-e R2-200xxxxx**

**Electronic meeting, 20 - 30 April 2020**

**Source: Huawei, HiSilicon**

**Title: Summary of [AT109bis-e][033][DCCA] UE capabilities (Huawei)**

**Agenda item:** **6.10.2**

**Document for:** **Discussion and Decision**

# 1 Introduction

This document summarizes the following email discussion:

**[AT109bis-e][033][DCCA] UE capabilities (Huawei)**

Scope: Treat topics in 6.10.2, based on [R2-2003707](file:///D:\Documents\3GPP\tsg_ran\WG2\TSGR2_109bis-e\Docs\R2-2003707.zip) and comments. Discussion on non-controversial issues/proposals that might not need to be treated on-line can start immediately. Others can start after on-line session.

Part 1: Determine which issues that need resolution, find agreeable proposals. Deadline: April 24 0700 UTC (can be extended). Way forward for issues that cannot be resolved at this meeting.

Part 2: Running CRs capturing agreements from this meeting.

# 2 Potential agreements

This section includes proposals which had an obvious majority of companies, or from one company only but that seem non-controversial.

## 2.1 Resume with SCG

During online session, the following agreements were made for resuming with SCells in LTE:

* Split resumeWithSCells -r16 in two separate LTE capabilities:  
  a) not deleting stored MCG SCell configuration when initiating the resume procedure"  
  b) (re-)configuration of MCG SCells in the RRCConnectionResume message",

**Condition: if Ue support a the UE also must support b**

There are FFS for similar questions for resume with SCG.

Since views of various companies were very similar for resuming with SCG, it may be possible to agree the same thing for resuming the SCG in LTE and in NR, i.e. two separate capabilities for not deleting and for (re)-configuration.

For 36.306, this would be:

4.3.15.x3 *resumeWithStoredSCG -r16*

This parameter defines whether the UE supports not deleting the stored SCG configuration when initiating the resume procedure as specified in TS 36.331 [5]. A UE indicating support of *resumeWithStoredSCG -r16* shall also indicate support of *resumeWithSCCG-Config -r16*.

FFS: Split "resume from RRC\_IDLE" and "resume from RRC\_INACTIVE".

4.3.15.x4 *resumeWithSCG-Config -r16*

This parameter defines whether the UE supports (re-)configuration of SCG in the *RRCConnectionResume* message as specified in TS 36.331 [5].

FFS: Split "resume from RRC\_IDLE" and "resume from RRC\_INACTIVE".

and for 38.306

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| ***resumeWithStoredSCG-r16***  Indicates whether the UE supports not deleting the stored SCG configuration when initiating resume. The UE which indicates supports for *resumeWithStoredSCG-r16* shall also indicate support for *resumeWithSCG-Config-r16*. | UE | No | No | No |
| ***resumeWithSCG-Config-r16***  Indicates whether the UE supports (re-)configuration of an SCG during the resume procedure. | UE | No | No | No |

**Q1) Do companies agree to adopt, for NR and for LTE, two capabilities, one to resume with the stored SCG configuration, and another one for (re-)configuration of the SCG during the resume procedure, and the UE which supports resume with the stored SCG configuration also supports (re-)configuration of the SCG during the resume procedure?**

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| --- | --- | --- |
| **Company** | **Agree/Disagree** | **Additional comments** |
| Qualcomm | Agree | We think we can simply follow the same principle agreed in SCell resume in last Monday:   * Split resumeWithSCells -r16 in two separate LTE capabilities: a) not deleting stored MCG SCell configuration when initiating the resume procedure" b) (re-)configuration of MCG SCells in the RRCConnectionResume message",   **Condition: if Ue support a the UE also must support b** |
| MediaTek | Agree | We think it is reasonable to use the principle as SCell configuration. |
| Ericsson | Agree | This would be basically the same principle as agreed for SCell activation. |
| Nokia | Agree | see above |
|  |  |  |

Another FFS applies for the LTE capabilities resumeWithStoredSCells -r16, resumeWithSCellConfig -r16, resumeWithStoredSCG -r16 and resumeWithSCG-Config -r16.

**Q2) Do companies agree that the 4 above listed LTE capabilities all apply both to resume from RRC\_IDLE and resume from RRC\_INACTIVE?**

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| --- | --- | --- |
| **Company** | **Agree/Disagree** | **Additional comments** |
| Qualcomm | Agree | For SCG/SCell resume, we don’t see any difference between LTE RRC\_INACTIVE UE and LTE RRC\_IDLE (with suspension) UE from UE perspective. Thus, we don’t think the split is necessary. |
| MediaTek | Agree |  |
| Ericsson | Agree | We are fine to have them applicable to both RRC\_IDLE and resume from RRC\_INACTIVE. |
| Nokia | Agree |  |
|  |  |  |

## 2.2 Fast MCG recovery

In 36.306, the capability was defined as:

4.3.15.x3 *mcgRLF-RecoveryViaSCG-r16*

This parameter defines whether the UE supports recovery from MCG RLF via split SRB1 (if supported) and via SRB3 (if supported) as specified in TS 36.331 [5].

TBC: No need to separate split SRB1 from SRB3.

In 38.306, this is the definition:

| ***mcgRLF-RecoveryViaSCG-r16***  Indicates whether the UE supports recovery from MCG RLF via split SRB1 (if supported) and via SRB3 (if supported) as specified in TS 38.331[9].  TBC: No need to separate split SRB1 from SRB3. | UE | No | No | No |
| --- | --- | --- | --- | --- |

In the summary, only one company think there should be separate capabilities for split SRB1 and SRB3.

**Q3) Do companies agree to have a single LTE and a single NR capability for MCG RLF recovery which covers both recovery via split SRB1 and via SRB3?**

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| --- | --- | --- |
| **Company** | **Agree/Disagree** | **Additional comments** |
| Qualcomm | Agree | Basically, we don’t see the difference in recovery procedure between split SRB1 and SRB3. And the only difference is whether the UE support split SRB1 or SRB3. Then please note that we have already separate capabilities for the support of split SRB1 and SRB3. It seems to be enough. |
| MediaTek | Agree |  |
| Ericsson | Agree | Same view as Qualcomm. |
| Nokia | Agree |  |
|  |  |  |

## 2.3 Direct SCell activation

It was observed that the support of direct SCG SCell activation in NR depends on the support of resume with SCG. This could mean the following update:

| **Definitions for parameters** | **Per** | **M** | **FDD-TDD DIFF** | **FR1-FR2 DIFF** |
| --- | --- | --- | --- | --- |
| ***directSCellActivation-r16***  Indicates whether the UE supports direct MCG SCell activation upon SCell addition, upon reconfigurationWithSync and upon resume.  If the UE supports *resumeWithSCG-Config*, this field also indicates whether the UE supports direct SCG SCell activation upon SCell addition, upon reconfigurationWithSync and upon resume.FFS: Separate capabilities for resume? | UE | No | No | FFS |

**Q4) Do companies agree with the above update for the NR capability directSCellActivation-r16?**

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| --- | --- | --- |
| **Company** | **Agree/Disagree** | **Additional comments** |
| Qualcomm | Disagree (not clear) | The 2nd change is not clear to us: we understand the point is “If the UE supports *resumeWithSCG-Config*, this field also indicates whether the UE supports direct SCG SCell activation ~~upon SCell addition, upon reconfigurationWithSync and~~ upon SCG resume.”  Not sure whether our above understanding is correct. Maybe rapporteur can comment.  Furthermore, we understand the two FFS are kept |
| MediaTek | See comments | I am also a confused by the proposal.  If we have a “direct SCell activation” capability for RRC Resume only (e.g. *directSCellActivationResume-r16*), the proposed change is reasonable.  If this is also applied to RRC Reconfiguration, we are not sure why there is dependence with *resumeWithSCG-Config*. |
| Ericsson | Wait for progress on the FFS | We agree with the intention and acknowledge that direct SCG SCell activation in NR depends on the support of resume with SCG. But maybe we would have to first progress on the FFS above (handled in Q8) before finding the proper design for this case. |
| Nokia | See comment | Agree with Ericsson |
|  |  |  |

**In LTE, the capability was not considering the case of SCG SCells for NE-DC, but this case should probably be also covered.**

4.3.19.x *directSCellActivationResume-r16*

This field defines whether the UE supports having an MCG SCell configured in activated SCell state in the *RRCConnectionResume* message, as defined in TS 36.321 [4] and TS 36.331 [5]. If the UE supports NE-DC, this capability also defines whether the UE supports having an SCG SCell configured in activated SCell state in the *RRCConnectionResume* message, as defined in TS 36.321 [4] and TS 36.331 [5].

If the UE indicates support of *directSCellActivationResume-r16*, the UE shall also indicate support of *resumeWithSCellConfig-r16*.

**Q5) Do companies agree with the above update for the LTE capability directSCellActivation-r16?**

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| --- | --- | --- |
| **Company** | **Agree/Disagree** | **Additional comments** |
| Qualcomm | Disagree (not clear) | We are not sure whether “update” is inserted part or highlight part..  For inserted part, we are confused. We understand the point is:  “If the UE supports ~~NE-DC~~EN-DC and resumeWithSCG-Config -r16, this capability also defines whether the UE supports having an SCG SCell configured in activated SCell state in the *RRCConnectionResume* message, as defined in TS 36.321 [4] and TS 36.331 [5].”  For highlighted part, it seems reasonable, but we need more time to check |
| MediaTek | Agree the intention | We think the further change from QC is needed. Also, we may have to say (NG)EN-DC.  “If the UE supports ~~NE-DC~~(NG)EN-DC and *resumeWithSCG-Config -r16*, this capability also defines whether the UE supports having an SCG SCell configured in activated SCell state in the *RRCConnectionResume* message, as defined in TS 36.321 [4] and TS 36.331 [5].” |
| Ericsson | Wait for progress on the FFS | We are fine to add the NE-DC case. But maybe we would have to first progress on the FFS handled in Q8 before finding the proper design for this case. |
| Nokia | Wait for FFS progress | Agree with Ericsson |
|  |  |  |

## 2.4 Fast recovery

In 36.306, the capability was defined as:

4.3.15.x3 *mcgRLF-RecoveryViaSCG-r16*

This parameter defines whether the UE supports recovery from MCG RLF via split SRB1 (if supported) and via SRB3 (if supported) as specified in TS 36.331 [5].

TBC: No need to separate split SRB1 from SRB3.

In 38.306, this is the definition:

| ***mcgRLF-RecoveryViaSCG-r16***  Indicates whether the UE supports recovery from MCG RLF via split SRB1 (if supported) and via SRB3 (if supported) as specified in TS 38.331[9].  TBC: No need to separate split SRB1 from SRB3. | UE | No | No | No |
| --- | --- | --- | --- | --- |

**Q6) Do companies agree to have a single capability covering both split SRB1 and SRB3, as above, for LTE and for NR (i.e. remove the TBC)**

|  |  |  |
| --- | --- | --- |
| **Company** | **Agree/Disagree** | **Additional comments** |
| Qualcomm | Agree | Basically, we don’t see the difference in recovery procedure between split SRB1 and SRB3. And the only difference is whether the UE support split SRB1 or SRB3. Then please note that we have already separate capabilities for the support of split SRB1 and SRB3. It seems to be enough. |
| MediaTek | Agree |  |
| Ericsson | Agree | Same view as Qualcomm. |
| Nokia | Agree |  |
|  |  |  |

# 3 Updated 36.306 and 38.306 CRs

Draft updates are provided in the draft folder.

There are some updates:

- highlighted in green: agreements made this meeting

- highlighed in yellow: potential agreements as in section 2

**Q7) Do companies agree with the updated CRs? (yellow highlighted parts may be changed if the potential agreements in section 2 above cannot be agreed)**

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| --- | --- | --- |
| **Company** | **Agree/Disagree** | **Additional comments** |
| Qualcomm |  | We need more time to check if we need to endorse these 2 CRs in today’s online discussion. |
| MediaTek |  | In general looks fine. But we will need more time check. Anyway, the CR needed to be updated based on the outcome of this e-mail discussion. |
| Ericsson |  | We think more time is needed for checking the CRs as such. |
| Nokia |  | Does not look too bad but for proper checking more time would be needed |
|  |  |  |

# 4 More controversial

The following points are more controversial:

- **direct SCell activation in NR**

1) introduce separate capability for resume

2) introduce FR1/FR2 separation

- **NR measurements in LTE idle/inactive**

3) introduce separate capabilities for NR FR1 and NR FR2 measurements

- **NR measurements in NR idle/inactive**

4) set FR1/FR2 separation to "Yes": i.e. separate support for NR FR1 measurements and NR FR2 measurements

**Q8) What are company preferences on the above 4 points (Separate/Not separate), please provide view one by one, e.g. 1: separate, 2: not separate, 3: not separate, 4: not separate?**

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| --- | --- | --- |
| **Company** | **Agree/Disagree** | **Additional comments** |
| Qualcomm | 1. Agree  2. Agree  3. Agree  4.Agree | For 1), we think that different from direct SCell activation during HO and SCell addition, direct SCell activation in resume is always blind SCell activation because the measurement results are not available by RRCResume message. It will cause different impacts on UE implementation from direct SCell activation in HO and SCell addition. Thus, we think it is worth a separate capability  For 2), because it is blind activation, it is questioned how NW can send updated TCI to UE upon UE resume. In FR2, the activation of TCI is necessary. We think it is extra efforst for the UE to handle TCI indications for PDCCH monitoring when working in FR2. Thus, we think that FR1/FR2 seperation is needed to be introduced for this capability.  For 3), we think FR1/FR2 capability seperation is needed for NR SSB based early measurement because the UE needs longer measurement time to handle multiple beams and higher power consumption cost in FR2. It is an extra requirement for the UE only working in FR1.  For 4), similar to 3), we think FR1/FR2 capability seperation is needed for NR SSB based early measurement for the same justification. |
| MediaTek | 1. Tend to Agree  2. No strong view  3 and 4. Agree | For 1), Since RRC resume and RRC reconfiguration are separated message and LTE already separate the capability. We slightly prefer to separate this also in NR.  For 3) and 4), we should have same decision, otherwise it would be strange. We share the view from QC that FR2 measurement is much difficult than FR1 and create more power consumption in IDLE/INACTIVE mode, thus it is better to separate. |
| Ericsson | 1. Not separate  2. LS to RAN4  3. LS to RAN4  4. LS to RAN4 | For 1), a separation may be needed if there are other concerns. But the blind SCell activation aspect could as well happen in the case of reconfigurationWithSync, so we do not see the resume case as a different requirement. For 2),3) and 4), see our reply to Q9. |
| Nokia | 1. Not separate  2. Not separate  3. Not separate  4. Not separate | 1/2) technically direct activation in resume or reconfiguration are not different and no need to separate.  ¾) Difficult to see need for separation between FRs. IF UE supports FR1/FR2 then why it would not support early measurements if it support reselection measurements? |
|  |  |  |

**Q9) Do companies prefer to send LS to RAN4 or to wait?**

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| --- | --- | --- |
| **Company** | **Wait/LS** | **Additional comments** |
| Qualcomm |  | We are fine to send LS to RAN4 on 2)/3)/4) to get their inputs.  It seems 1) doesn’t need RAN4 input |
| MediaTek |  | We actually think that RAN2 could make the decision. |
| Ericsson | LS | We would prefer to send an LS on 2), 3) and 4). |
| Nokia |  | RAN2 could decide not to separate FR1/FR2 but if that is not agreeable we could consult RAN4 for the need for separation. |
|  |  |  |

# 5 Conclusion

# 6 References

1. R2-2003707 Summary for UE capabilities Huawei, HiSilicon