**3GPP TSG-RAN WG2 Meeting#110-e R2-200xxxx**

**Electronic, 1 - 12 June 2020**

**Agenda Item:**  **6.10.4.2**

**Source: Huawei, HiSilicon**

**Title: Summary of [AT110-e][071][DCCA] New cases (Huawei)**

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

# 1 Introduction

This document is a summary of the following offline discussion:

**[AT110-e][071][DCCA] New Cases (Huawei)**

Scope: Treat R2-2004573, R2-2005239, R2-2005616, R2-2005629. Determine agreeable parts if any, and and make corresponding agreements.

 Expected Outcome: Agreements

 Deadline: June 5 0700 UTC

# 2 Discussion

## 2.1 Idle/inactive measurements

There are the two following proposals.

[R2-2004573](file:///D%3A%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2%5CTSGR2_110-e%5CDocs%5CR2-2004573.zip) Discussion on NR-U frequency in early measurement OPPO discussion Rel-16 LTE\_NR\_DC\_CA\_enh-Core

This document is having two proposals:

**Proposal 1: RAN2 is kindly asked to confirm the *carrierFreqNR* for SSB frequency in early measurement configuration can be NR-U frequency.**

**Proposal 2: RMTC configuration can be configured for NR-U frequency in early measurement configuration. The RSSI and channel occupancy ratio measurement results are also included in early measurement results.**

Proposal 1 may not have any impact to current specifications.

Proposal 2 is to provide additional

**Q1: Do companies think that idle/inactive measurements of SSB measurements on NR carrier in unlicensed spectrum is currently supported?**

|  |  |  |
| --- | --- | --- |
| **Company** | **Yes/No** | **Comments (if any)** |
| OPPO | Yes  | From current spec, NR-U frequency is not excluded.  |
| Google | Yes | We don’t see why not to support it. The current specification does not exclude it.  |
| Nokia | Yes for P1 | But we do not try to optimize support in anyway. It may be supported as is |
| CATT | Yes | It seems ok to include the NR-U measurement in early measurement as the current spec includes the NR-U frequency and related measurements. |
| Ericsson | Yes | Yes, there is no reason why not to support it |
| MediaTek | No | If the SSB measurement in NR-U is the same as SSB measurement in IDLE mode of licenced band, it may be fine. However, we understand the measurement will be different due to the LBT failure in NR-U. The LBT may increase the measurement time and power consumption. We have some doubt to support this for early measurement. The NR-U and early measurement are discussed in different WI. RAN2 has never discuss to combine them and it is not a trivial work. It is also not enough justification to consider NR-U targets in early measurement. At this stage, we prefer to preclude NR-U targets for early measurement.  |
| Qualcomm | Maybe yes for P1 but need further discussion | Supporting RSRP/RSRQ/SINR measurements may be feasible. However, note that RAN2 agreed in this meeting to make ssb-PositionQCL mandatory for NR-U and thus the UE will need to use this parameter for NR-U measurements. Also note that RAN4 is still working on NR-U measurement requirements in Connected mode and addition of Idle mode can impact their work. Agree with Nokia that the best we can do is to support it as is and even in that case a separate UE capability will be preferable. |
| ZTE | Yes | We have same view as Nokia, i.e. it can be supported without any further changes. On the other hand, precluding this would need specifying new restrictions. So, we think we should just support it (i.e. no changes). |
| LG | Yes | In the current specification, it is already possible to configure NR-U frequency in the early measurements configuration. |

**Q2: Do companies support introducing in 38.331 idle/inactive measurement and reporting of RSSI and channel occupancy ratio measurements for NR carriers in unlicensed spectrum?**

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| --- | --- | --- |
| **Company** | **Yes/No** | **Comments (if any)** |
| OPPO | Yes  | For NR-U frequency is configured in the early measurement configuration, it is worth to report RSSI and channel occupancy ratio measurements. |
| Google | Maybe | Even without reporting of RSSI and channel occupancy ratio measurements, the MN can still to configure SN based on RSRP/RSRQ. No strong views on this. |
| Nokia | No | As said above |
| CATT | Yes  | If the NR-U frequency is configured in the early measurement configuration, we consider reporting the RSSI and channel occupancy ratio measurements in early measurement results  |
| Ericsson | Yes | Though it is correct that RSSI/channel occupancy ratio is not a must to have for NR-U frequencies, they are very useful for a more informed decision whether the link towards the concerned cell operating in NR-U frequency is worth setting up as a secondary cell, instead of just relying on RSRP and RSRQ. |
| MediaTek | No | See our comment in Q1 |
| Qualcomm | No | Note that RSSI/CO measurements in Idle mode were discussed extensively in RAN2 but was **ruled out**. These measurements are only supported for Connected mode and, even in that case, it is an optional UE capability. Based on the RAN2 agreements, RAN4 is also only considering requirements for Connected mode RSSI/CO measurements. Thus, it is not possible to introduce these measurements in Idle mode.  |
| ZTE | No | RSRP/RSRQ would be enough for this. Note that, channel occupancy/RSSI can also be fairly well known at the gNB; the case where the channel occupancy may be different is when there is a hidden-node, but we don’t think we need to optimise it for this case at this stage. |
| LG | No | It could be beneficial if RSSI measurement is included in EMR, but even in NR-U idle, RSSI measurement was not introduced because of complexity. We think it is not really necessary to introduce RSSI measurement for the purpose of preparing fast CA/DC setup and RSRP/RSRQ measurements is fine. |

[R2-2005239](file:///D%3A%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2%5CTSGR2_110-e%5CDocs%5CR2-2005239.zip) Using NR early measurements with network sharing Huawei, HiSilicon, BT CR Rel-16 36.331 16.0.0 4308 - C LTE\_NR\_DC\_CA\_enh-Core

This document is considering the case of an LTE cell shared between multiple PLMNs, while NR carriers may not shared between the PLMNs. In order that UEs measure NR carriers on which they are allowed, it is proposed to add, for each NR carrier, a bitmap indicating for which of the PLMN indicated in SIB1 it is accessible.

**Q3: Do companies support introducing in 36.331 an indication per NR carrier for idle/inactive measurement, to indicate its applicability for each of the PLMNs in LTE SIB1, so that the UE only measures NR carriers applicable for the PLMN that it has selected?**

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| --- | --- | --- |
| **Company** | **Yes/No** | **Comments (if any)** |
| OPPO | No | It means that the UE will read the SIB1 for PLMN checking during idle measurement period? It impacts the UE idle measurement behaviour a lot. |
| Google |  | The *RRCConnectionRelease* message can exclude the NR carrier frequency not shared by the selected PLMN so that the UE does not measure that NR carrier frequency. So we wonder why this bitmap is needed. |
| Nokia | No | Dedicated signalling handles this sufficiently well |
| CATT | No | Dedicated signalling can indicate which NR carriers should be measured, the bitmap looks redundant. |
| Ericsson | No | We agree with Nokia and CATT’s comment that such cases can be handled via dedicated signalling. |
| MediaTek | No | It seems the problem could be solved (at least partially) by dedicated signaling. We do not see strong motivation to have this. |
| Qualcomm |  | We agree that it is worth further discussion, but we can see following issues. If proponent can address well, we are happy to re-consider* SIB4 does not provide PLMN ID, why this SIB11 should provide. Should SIB4 also provide for idle measurements for cell (re)selection?
* As claimed in contribution. the main benefit is that dedicated signalling requires providing a list valid in a wider area, which may prove especially complex when network sharing is used. However, we understand RAN is already aware of the restriction based on the selected PLMN of the UE, i.e. which NR carrier can be configured for EN-DC for this specific UE. Then because carrier to PLMN mapping usually does not change in a country, dedicated signaling seems to not quite complex.
 |
| ZTE | Yes | We understand the proposal is to check the selected PLMN of current camping cell, and then decide (filter) the measured target frequencies. So it does not ask UE to read the SIB1 of measured target cells.Dedicated signalling works only when UE supports one PLMN, if the UE supports multiple PLMNs, and moves near area border, then dedicated signalling may have drawback, as network may provide more candidate frequencies but the UE has to detect all of them due to unaware of the association between frequencies and selected PLMN.We think the use case is valid (though be mainly useful in country border or area border), we would be fine to support it. The detailed solution/signalling can be further discussed once it is agreed.  |
| LG | No | Already dedicated signaling can solve this issue, as the network is aware of UE’s PLMN information. |
| BT | Yes | We’re one of the proponent companies.This proposal address RAN sharing scenarios in EN-DC areas. It is likelihood the MNO doesn’t share the NR network with MVNO or in a close future, two or more MNO sharing the LTE RAN use different NR frequencies for EN-DC. With current signalling, an MVNO UE capable of EN-DC will measure the NR bands even it is not allowed to stablish the connection. That will increase the UE power consumption and the signalling.It is not requested to measure the SIB1 of target cells as ZTE mention.We consider the scenario is perfectly valid for operators and we’re open to further discuss once this work is agreed. |

## 2.2 Fast recovery

[R2-2005616](file:///D%3A%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2%5CTSGR2_110-e%5CDocs%5CR2-2005616.zip) Introduction of transmitting NAS messages on SCG Google Inc. draftCR Rel-16 36.331 16.0.0 F LTE\_NR\_DC\_CA\_enh-Core

[R2-2005629](file:///D%3A%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2%5CTSGR2_110-e%5CDocs%5CR2-2005629.zip) Introduction of transmitting NAS messages on SCG Google Inc. draftCR Rel-16 38.331 16.0.0 F LTE\_NR\_DC\_CA\_enh-Core

These documents are proposing to allow transmission of UL NAS messages on split SRB2 or SRB3 while T316 is running (i.e. during fast MCG recovery).

 **Q4: Do companies support introducing in 36.331/38.331 the possibility to transmit UL NAS messages and DL NAS mesages on split SRB2 or SRB3?**

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| **Company** | **Yes/No** | **Comments (if any)** |
| OPPO | No | we do not think it is necessary to deliver the NAS message when MCG failure is ongoing. If there is NAS message is delivered to the gNB, the gNB will repose with “NAS Non Delivery Indication” message. |
| Google | Yes | We are the proponent company. Here are some clarifications:* While T316 is running, the UE may need to send NAS messages to establish an emergency PDN connection for an emergency call or make a voice call with CS fallback in EN-DC. Similarly, while T316 is running, the network may need to send NAS messages to the UE, e.g., to initiate a voice call with CS fallback for the UE in EN-DC. Split SRB2 or SRB3 can be configured, so there should be no restriction to exchange NAS messages on split SRB2 or SRB3 while T316 is running.
* A typo in changes in section 5.6.2.3 in 36.331 CR in R2-2005616: “SRB1” should be replaced by “SRB2”.

1> if T316 is running (i.e., MCG failure):2> if SRB2 is configured as split SRB:3> submit the *ULInformationTransfer* message via SRB2 to lower layers for transmission using the new configuration; |
| Nokia | No | This needs to be understood and checked more generally, not only for SRB3. This requires more discussions. |
| CATT | No | We don’t think it is necessary, and it is too late to introduce such a new case without further discussion |
| Ericsson | No | This is not an important/necessary aspect to discuss at such a late stage of the WI. |
| MediaTek | No | We think that period of fast recovery is short as NW will trigger re-sync as soon as possible. There is no need to transmit NAS message at that time. It could just be queued in L2 buffer. |
| Qualcomm | No | This proposal requires to introduce split SRB2 or SRB3. It seems to have significant spec impact in late Rel-16. |
| ZTE | No | If split SRB2 is configured and duplication is enabled, We understand the current spec already allows the UE to deliver NAS message via the SCG leg of split SRB2. For other cases, we prefer not to enhance it at this late stage. |
| LG | No | We also think this enhancement is not needed considering specification impact at this time point. |

# 3 Conclusion

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