­3GPP TSG-RAN WG2 Meeting #109-e R2-200xxxx

Electronic Meeting, 24th February – 6th March 2020

Agenda: 6.10.3

Source: Ericsson

Title: Report on offline discussion [AT109e][045][DCCA] Early measurement reporting – Part 2

Document for: Discussion, Decision

# 1 Introduction

This is a summary of the following offline discussion:

* [AT109e][045][DCCA] Early Measurements Reporting (Ericsson)

Scope: Treat Email discussion + Summary

Part 1:

Intended outcome: Easy agreements, first round of comments for discussive topics, identify/confirm items for postponement. Report current status at Web Conf

**Deadline: Feb 26 (Web Conf)**

Part 2, Continuation:

Intended outcome: Report, Agreed Issues resolutions

**Deadline: Mar 3 1200 CET**

In [22], proposals were given for easy agreement and several of them are agreed, which are provided in the Annex. In part 2 of this offline discussion, we discuss the remaining issues.

# 2 Discussion

## ***Issue #1: regarding early measurement configuration***

In [1], the issue of how many carriers the UE can be configured to perform early measurements and how many carriers it can measure/report at once was discussed and it was proposed:

*Proposal 6 ASN.1 signaling to allow the configuration of up to 8 E-UTRA and 8 NR carries for early measurements.*

*Proposal 7 ASN.1 signaling to allow up to 8 E-UTRA and 8 NR carries in early measurement reports.*

During the offline discussion [22], further input was provided by companies

* *Qualcomm:*
* Proposal 6: we think that the current proposal (Opt2) is NOT majority view:
  + Opt1: up to 8 NR/LTE combined LTE/NR carriers (8 companies: Nokia, OPPO, MediaTek, Vodafone, Qualcomm, NEC, CATT, Samsung).
  + Opt2: 8+8 (only 3 companies: ZTE, Huawei, LG)

Since this proposal has UE impacts, we don’t think it is good way to directly agree how ASN.1 works. At least, we should first ask RAN4 for their inputs.

* Proposal 7: it is coupled with proposal 6. So, we think it is better to postpone this discussion until it is clear what is max number of NR and LTE frequenies to measure
* *Samsung:*
* Related to QC comment for proposal 6: we think proposal is mainly about what ASN.1 signalling allows. The overall limitation is seperate/ additional to that (and indeed more upto RAN4)
* *NEC:*
* On proposal 6, agree with Qualcomm. We understand this is from ASN.1 signaling but limitation is seprate issue on top of this as Samsung comments.

Another issue that was discussed in [1] [22] was on how many beams the UE is configured with to measure, and it was proposed:

*Proposal 8: Measurements of up to 32 beams can be included in the early measurement report of NR carriers.*

Samsung suggested to also add to proposal 8 that this is also about what ASN.1 signalling will support.

A related issue that was discussed in [1] and [22] was how to handle any discrepenanices regarding the number of carriers that the UE is configured to measure and the number of carriers that it can measure/report at once. It was discussed whether to introduce a priority in the carrier list to be measured or if it can be left up to UE implementation to do that prioritization. In [22], it was proposed:

*Proposal 30 WA: Left to UE implementation on how to handle the case where the UE is configured to measure more carriers than it can measure/report at once. Will be reconsidered depending on the discussion on proposal 6/7.*

This was discussed during the online session and ZTE has clarified that the priority can be decided implictly (by the order in the carrier list). Though the majority supported proposal 30, it was not possible to reach a consensus.

The rapporeturs view is with regard to proposals 6/7, it will be possible to agree with regard to the ASN.1 signaling and RAN2 can ask RAN4 input regarding the UE requirements aspects and on what to do regarding

Thus, it is proposed:

1. For early measurement configuration and reporting, ASN.1 signalling to allow the configuration of

-up to 8 E-UTRA and 8 NR carries to be measured

-up to 8 E-UTRA and 8 NR carriers to be reported

-up to 32 beams to be included in the NR results

1. LS to be sent to RAN4, with the purpose of:

- informing RAN2 decision (proposal 1)

- asking for input:

- clarification on the UE requirement aspects of early measurement performance and reporting

- if mismatch between what the number of carriers the UE can measure at once and what the UE is configured to measure/report can be handled via UE implementation.

## ***Issue #2: UE context***

The aspect whether the UE context that is passed from source node to target during connection resume can include the early measurement configuration was discussed in both the email discussion [1] and offline discussion [22]. In [22], it was proposed:

*Proposal 15 In LTE/NR rel-16, the measIdleConfig is included in the AS-Config IE to enable early measurement configuration available during UE context retrieval.*

It was not possible to reach a consensus regarding this proposal, and since companies have already provided their input both in [1] and [22], the rapporteur does not think it will be necessary to request further input in this offline discussion and to treat this directly in the meeting.

1. RAN2 to decide whether to include *the measIdleConfig* in the *AS-Config* IE to enable early measurement configuration available during UE context retrieval during connection resumption.

## ***Issue #3: Early measurement reporting***

In [1] and [22], several aspects of early measurement reporting were discussed. One of the issues was on the validity of early measurement results. There was a consensus that RAN2 will not specify anything regarding this and UE’s behaviour will be based on RAN4 requirements on the validity of early measurement results. In [22], it was proposed that:

*Proposal 11 (Proposal 14) The UE shall include an early measurement result concerning a certain carrier only if that particular measurement is valid according to RAN4 measurement validity requirement.*

The rapporteur agrees to the comments received in [22] that no RAN2 specification work is required.

The other aspects discussed regarding measurement reporting were regarding granular measurement availability indication (i.e. UE indicating explicitly whether it has E-UTRA, NR, or both results) and measurement request (i.e. network requesting explicitly whether it wants the UE to send E-UTRA, NR or both results).

It was not possible to reach a consensus regarding these, and since companies have already provided their input both in [1] and [22], the rapporteur does not think it will be necessary to request further input in this offline discussion and to treat this directly in the meeting.

1. RAN2 to decide whether the UE indicates it has E-UTRA and/or NR early measurement results in *RRC(Connection)ResumeComplete/ RRC(Connection)SetupComplete*.
2. RAN2 to decide whether the network requests E-UTRA and/or NR early measurement results in *RRC(Connection)Resume/UEInformationRequest*.

# 3 Conclusion

Based on the discussion above, it is proposed:

1. For early measurement configuration and reporting, ASN.1 signalling to allow the configuration of

-up to 8 E-UTRA and 8 NR carries to be measured

-up to 8 E-UTRA and 8 NR carriers to be reported

-up to 32 beams to be included in the NR results

1. LS to be sent to RAN4, with the purpose of:

- informing RAN2 decision (proposal 1)

- asking for input:

- clarification on the UE requirement aspects of early measurement performance and reporting

- if mismatch between what the number of carriers the UE can measure at once and what the UE is configured to measure/report can be handled via UE implementation.

1. RAN2 to decide whether to include *the measIdleConfig* in the *AS-Config* IE to enable early measurement configuration available during UE context retrieval during connection resumption.
2. RAN2 to decide whether the UE indicates it has E-UTRA and/or NR early measurement results in *RRC(Connection)ResumeComplete/ RRC(Connection)SetupComplete*.
3. RAN2 to decide whether the network requests E-UTRA and/or NR early measurement results in *RRC(Connection)Resume/UEInformationRequest*.

# 4 References

1. [R2-2001252](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_109_e/Docs/R2-2001252.zip)**,** Report on Email Discussion [108#54][DCCA] Early measurements (Ericsson), Ericsson, RAN2#109-e, Electronic Meeting, Feb 24th – March 6th 2020
2. [R2-2000252](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_109_e/Docs/R2-2000252.zip), Remaining issues for SSB measurement configuration,CATT, RAN2#109-e, Electronic Meeting, Feb 24th – March 6th 2020
3. [R2-2000295](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_109_e/Docs/R2-2000295.zip), Priority for early measurement frequency, vivo, RAN2#109-e, Electronic Meeting, Feb 24th – March 6th 2020
4. [R2-2000322](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_109_e/Docs/R2-2000322.zip), Open issues for early measurement, OPPO, RAN2#109-e, Electronic Meeting, Feb 24th – March 6th 2020
5. [R2-2000323](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_109_e/Docs/R2-2000323.zip)**,** Draft LS on early measurement configuration during 2 step resume procedure without UE context relocation, OPPO, RAN2#109-e, Electronic Meeting, Feb 24th – March 6th 2020
6. [R2-2000675](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_109_e/Docs/R2-2000675.zip), LTE early measurement legacy text changes, Nokia, Nokia Shanghai Bell, RAN2#109-e, Electronic Meeting, Feb 24th – March 6th 2020
7. [R2-2000676](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_109_e/Docs/R2-2000676.zip),On early measurements related to SCG CA, Nokia, Nokia Shanghai Bell, RAN2#109-e, Electronic Meeting, Feb 24th – March 6th 2020
8. [R2-2000889](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_109_e/Docs/R2-2000889.zip),Early measurement performing for SCG CA case, CATT, RAN2#109-e, Electronic Meeting, Feb 24th – March 6th 2020
9. [R2-2001124](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_109_e/Docs/R2-2001124.zip), Early measurement indication in NR SIB1, ZTE Corporation, Sanechips, Ericsson, MediaTek Inc, RAN2#109-e, Electronic Meeting, Feb 24th – March 6th 2020
10. [R2-2001162](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_109_e/Docs/R2-2001162.zip), Remaining eDCCA issues (early measurements, fast MCG recovery), Samsung Telecommunications, RAN2#109-e, Electronic Meeting, Feb 24th – March 6th 2020
11. [R2-2001193](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_109_e/Docs/R2-2001193.zip), Discussion on UE behaviour of checking MR-DC band combination when performing early measurement, Huawei, HiSilicon, RAN2#109-e, Electronic Meeting, Feb 24th – March 6th 2020
12. [R2-2001194](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_109_e/Docs/R2-2001194.zip), Discussion on editor’s notes in the running CR for early measurement, Huawei, HiSilicon, , RAN2#109-e, Electronic Meeting, Feb 24th – March 6th 2020
13. [R2-2001195](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_109_e/Docs/R2-2001195.zip), Considerations on SFTD measurement in idle/inactive state, Huawei, HiSilicon, RAN2#109-e, Electronic Meeting, Feb 24th – March 6th 2020
14. [R2-2001250](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_109_e/Docs/R2-2001250.zip), Early measurement configuration in UE context retrieval, Ericsson, Qualcomm Incorporated, LG Electronics Inc., CATT, OPPO, RAN2#109-e, Electronic Meeting, Feb 24th – March 6th 2020
15. [R2-2001251](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_109_e/Docs/R2-2001251.zip), Granular reporting of early measurement results, Ericsson, MediaTek Inc., ZTE Corporation, LG Electronics Inc., RAN2#109-e, Electronic Meeting, Feb 24th – March 6th 2020
16. [R2-2001262](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_109_e/Docs/R2-2001262.zip), Remaining Issues on Early Measurements, ZTE Corporation, Sanechips, RAN2#109-e, Electronic Meeting, Feb 24th – March 6th 2020
17. [R2-2001403](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_109_e/Docs/R2-2001403.zip), Early measurement results handling upon inter-RAT cell reselection, LG Electronics, RAN2#109-e, Electronic Meeting, Feb 24th – March 6th 2020
18. [R2-2001404](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_109_e/Docs/R2-2001404.zip) , Validity area enhancement in NR, LG Electronics, RAN2#109-e, Electronic Meeting, Feb 24th – March 6th 2020
19. [R2-2001574](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_109_e/Docs/R2-2001574.zip), Early measurement configuration mismatch in 2-step resume, Samsung Electronics Co., Ltd, RAN2#109-e, Electronic Meeting, Feb 24th – March 6th 2020
20. [R2-2000298](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_109_e/Docs/R2-2000298.zip),Granularity of early measurement and reporting, vivo, RAN2#109-e, Electronic Meeting, Feb 24th – March 6th 2020
21. [R2-2002043](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_109_e/Docs/R2-2002043.zip), Feature summary for early measurements, Ericsson, RAN2#109-e, Electronic Meeting, Feb 24th – March 6th 2020
22. R2-2002131, Report on offline discussion [AT109e][045][DCCA] Early measurement reporting – Phase 1, Ericsson, RAN2#109-e, Electronic Meeting, Feb 24th – March 6th 2020

# 5. Agreements in RAN2#109-e DCCA web session #1

* The UE starts to perform early measurements only when it is configured with measIdleDuration in RRC(Connection)Release (i.e. early measurement cannot be started only based on SIB signalling).
* RAN2 to confirm that the different ways of configuring early measurements are: *All configuration received in dedicated signalling (i.e. RRC(Connection)Release; or All configuration received in broadcast (except for the measIdleDuration); or The dedicated signalling contains measIdleDuration and the list of the EUTRA/NR carriers:*

***- For E-UTRA carriers, the measurement configuration is contained via the dedicated signaling***

***- For each of the NR carriers, the SSB configuration can be configured either via dedicated signalling or via SIB.***

* RAN2 to confirm that the NR/EUTRA carrier list can not be split into SIB and dedicated signalling (i.e. either both in SIB or both in dedicated).
* The measIdleDuration range in LTE euCA to be adopted in NR (i.e. ENUMERATED {sec10, sec30, sec60, sec120, sec180, sec240, sec300, spare})
* As in LTE euCA, the RSRQ-Range-r13 IE (i.e. -30..46) will be used for specifying the thresholds for early measurement reporting of E-UTRA carriers in NR.
* The SCS IE to be on the top level of the MeasIdleCarrierNR (i.e. not within the ssb-MeasConfig IE).
* Capture the “available” aspect in procedure text.
* Clarification to be added in 36.331 that the UE will be configured with only one validity area (either the rel-15 or rel-16 version).
* In LTE/NR rel-16, the UE performs measurement on a carrier only if it is capable of CA or DC between the concerned carrier and the serving carrier.
* No special handling will be specified for the case of 2-step resume without context fetch (i.e. can be handled via network implementation).
* RNA update is not triggered due to going out of the validity area.
* For early measurements while camping in LTE, the UE is required to measure E-UTRA if idleModeMeasurements-r15 is included. The UE is required to measure NR carriers, if idleModeMeasurements-r16 is included IEs, in SIB2 respectively.
* In NR rel-16, the idleModeMeasurements can be used to specify whether the UE is required to perform early measurements on EUTRA, NR or both carriers. FFS if one IE (i.e. ENUMERATED {eutra, nr, both} or separate IEs (i.e. one for EUTRA, one for NR) is to be used.
* The frequencyBandList to be on the top level of MeasIdleCarrierNR. FFS regarding nrofSS-BlocksToAverage-r16 and absThreshSS-BlocksConsolidation-r16 IEs.
* No additional information elements regarding dedicated SSB configuration validity will be specified.
* In rel-16, SFTD measurements cannot be configured as part of early measurement configuration.
* No special handling of early measurement results during inter-RAT cell reselection will be specified.
* The early measurement configuration will not be enhanced to support per (serving)-frequency early measurement target frequency list.
* A NOTE to be added in 36/38.331 that UE is not required to perform early measurements on a given frequency if it finds mismatch between dedicated and SIB SSB configuration.