**3GPP TSG-RAN WG2 Meeting #116 electronic R2-2xxxxxx**

**Online, November 1-12, 2021**

Agenda Item: xx

Source: Session chair (CMCC)

Title: Report from SON/MDT session

Document for: Approval

**Organizational:**

1. LSs – contact companies should flag LSs that need presenting. Otherwise we will directly note them
2. Running CRs will be endorsed to be used as baseline and moved to email discussion. Further agreements will be captured on that baseline CR.
3. Only Email discussions and summary discussions will be treated during e-meetings (indicated clearly in the meeting notes)
4. All organization emails and notes will be shared over the following email discussion throughout the two meeting weeks:
* [AT116][800][SON/MDT] Organizational Hu

Scope:

* + - Share plans for the meetings and list of ongoing email discussions for the sessions related to SON/MDT
		- Share meetings notes and agreements for review and endorsement

## 8.13 SON/MDT

(NR\_ENDC\_SON\_MDT\_enh-Core; leading WG: RAN3; REL-17; WID: RP-201281)

Time budget: 1 TU

Tdoc Limitation: 6 tdocs

Email max expectation: 6 threads

### 8.13.1 Organizational

Including outcome of [Post116-e][887][SON/MDT] Running 38.331 for introducing R17 SON (Ericsson)

Including outcome of [Post116-e][889][SON/MDT] Running 38.331 for introducing R17 MDT (Huawei)

Including outcome of [Post116-e][879][SON/MDT] Running R17 38.314 (CMCC)

Including outcome of [Post116-e][897][SON/MDT] Running R17 37.320 (CMCC, Nokia)

R2-2200004 Running 38.331 for introducing R17 SON Ericsson CR Rel-17 38.331 16.7.0 2865 - B NR\_ENDC\_SON\_MDT\_enh-Core

=> Endorsed as the baseline for further running

R2-2200010 Running 38.331 for introducing R17 MDT Huawei, HiSilicon draftCR Rel-17 38.331 16.7.0 B NR\_ENDC\_SON\_MDT\_enh-Core

=> Endorsed as the baseline for further running

R2-2200056 37.320 Running CR for R17 MDT in NR and E-UTRAN CMCC draftCR Rel-17 37.320 16.7.0 B NR\_ENDC\_SON\_MDT\_enh-Core

=> Endorsed as the baseline for further running

R2-2200054 Report of [Post116-e][879][SON/MDT] Running R17 38.314 CMCC discussion Rel-17 NR\_ENDC\_SON\_MDT\_enh-Core

Agreements

 1 RAN2 agree on the following definition for excess packet delay for NR: It represents the ratio of packets in UL per DRB exceeding the configured delay threshold among the UL PDCP SDUs received. The delay for each packet is calculated from packet arrival at PDCP upper SAP until the UL grant to transmit the packet is available, which has included the delay the UE gets resources granted (from sending SR/RACH to get the first grant).

2 Excess packet delay for NR is measured per DRB.

3 The *delayThreshold* in TS 38.331 is re-designed with the granularity of 0.25ms, 0.5ms, 1ms. Other larger values FFS.

R2-2200053 Running CR for TS 38.314 CMCC draftCR Rel-17 38.314 16.4.0 NR\_ENDC\_SON\_MDT\_enh-Core

=> Endorsed in principle.

R2-2200097 LS on UP measurements for Successful Handover Report (R3-212935; contact: Ericsson) RAN3 LS in Rel-17 NR\_ENDC\_SON\_MDT\_enh-Core To:RAN2

R2-2200098 Reply LS on UE context keeping in the source cell (R3-212944; contact: Ericsson) RAN3 LS in Rel-17 NR\_ENDC\_SON\_MDT\_enh-Core To:RAN2

R2-2200099 LS Reply on the details of logging forms reported by the gNB-CU-CP, gNB-CU-UP and gNB-DU under measurement pollution conditions (R3-214429; contact: Ericsson) RAN3 LS in Rel-17 NR\_ENDC\_SON\_MDT\_enh-Core To:SA5, RAN2

R2-2200103 LS on NR-U channel information and procedures (R3-216042; contact: Samsung) RAN3 LS in Rel-17 NR\_ENDC\_SON\_MDT\_enh-Core To:RAN1, RAN2

* **[AT116bise][801][SON/MDT] Rely LS on NR-U (Samsung)**

 Draft reply LS for R2-2200103. R2-2200664  can be used as baseline.

 Intended outcome: LS ready for being approved.

 Deadline: 22:22 UTC, Monday Week2

R2-2201923 Reply LS on NR-U channel information and procedures

=> Change to “From RAN2 perspective, at least 'NR ARFCN' and 'Bandwidth' are defined, and 'Channel ID' does not exist in RAN2 specifications.

=> With this change the LS is approved in R2-xxxxxx

R2-2200105 Reply LS on scenarios need to be supported for MRO in SCG Failure Report (R3-216159; contact: Samsung) RAN3 LS in Rel-17 NR\_ENDC\_SON\_MDT\_enh-Core To:RAN2

R2-2200156 Reply LS on the details of logging forms reported by the gNB-CU-CP, gNB-CU-UP and gNB-DU under measurement pollution conditions (S5-213499; contact: Ericsson) SA5 LS in Rel-17 NR\_ENDC\_SON\_MDT\_enh-Core To:RAN3 Cc:RAN2

R2-2200157 Reply LS on Report Amount for M4, M5, M6, M7 measurements (S5-214523; contact: Nokia) SA5 LS in Rel-17 NR\_ENDC\_SON\_MDT\_enh-Core To:RAN3 Cc:RAN2

R2-2200158 Reply LS on the details of logging forms reported by the gNB-CU-CP, gNB-CU-UP and gNB-DU under measurement pollution conditions (S5-215493; contact: Ericsson) SA5 LS in Rel-17 e\_5GMDT To:RAN3 Cc:RAN2

R2-2200163 Reply LS on the Beam measurement reports for the MDT measurements (S5-216628; contact: Ericsson) SA5 LS in Rel-17 e\_5GMDT To:RAN3 Cc:RAN2

R2-2200664 [Draft] Reply LS on NR-U channel information and procedures Samsung LS out Rel-17 NR\_ENDC\_SON\_MDT\_enh-Core To:RAN3 Cc:RAN1

R2-2201611 LS Reply on user plane masurements for successful handover report Ericsson discussion NR\_ENDC\_SON\_MDT\_enh-Core

### 8.13.2 SON

#### 8.13.2.1 Handover related SON aspects

R2-2200005 Report of [Post116-e][887.5][SONMDT] Leftover issues on SON (Ericsson) Ericsson discussion

Agreements

1 In case the UE experiences an RLF in a cell after being configured with CHO configuration in that cell (i.e., RLF in source while having CHO config), the UE shall log in the RLF-Report, the already agreed timeSinceCHOReconfig which represents in this case the time elapsed between the RLF in that cell and the latest received CHO configuration while connected to that cell.

2 The following granularities are adopted for the timers timeConnSourceDAPSFailure, timeSinceCHOReconfig, timeBetweenEvents:

a. timeConnSourceDAPSFailure: milliseconds

b. timeSinceCHOReconfig: hundreds of ms

c. timeBetweenEvents: milliseconds

3 Related to how to set the timeSinceFailure: keep the specification as-is (time since last failure).

4 For the inclusion of RA-InformationCommon in the SHR: RA-InformationCommon is included in SHR when T304 is above the threshold.

Observation 1 It is not possible for the network to identify that the SHR and RLF report are generated for the same HO.

5 The UP interruption time at HO is evaluated at PDCP layer without considering duplicates.

6 The UE is responsible for performing the user plane interruption time measurements at the HO i.e., inline with the agreement from RAN2#115 meeting.

Agreements

1 For the 2-step RA, the UE reports the payload size without considering the padding.

2 For the 2-step RA, the UE reports the payload size per RA procedure.

3 The UE includes intendedSIBs, ssbsForSI-Acquisition in the RA report also for a successfully completed on-demand SI procedure.

4 The UE includes the PCell ID in the RA-Report, if the RA procedure is performed in an SCell of the MCG.

5 The UE includes the PSCell ID in the RA-Report, if the RA procedure is performed in an SCell of the SCG.

Proposal 20 The UE sets the failureType to randomAccessProblem if the UE initiates transmission of the SCGFailureInformationNR message to indicate the reason for declaring failure to be the random access problem from the SCG MAC even if T304 is running. Otherwise, if no random access problem has been detected at T304 expiry, the UE sets the failureType to synchReconfigFailureSCG.

Proposal 21 The UE includes a 1 bit flag in the SCGFailureInformation to indicate that the T304 was running when the UE declared the SCG failure due to random access problem indication in the SCG MAC.

Proposal 9 RAN2 to discuss in which HO scenarios the UP interruption measurements should be considered:

a. Only at DAPS HO (6/12)

b. For all HO types (ordinary HO, DAPS, CHO) (5/12)

Proposal 10 The UE shall generate a SHR due to RLF in the source cell during a DAPS HO, only if it is configured to do so in the SHR configuration (i.e. in the successHO-Config)

a. If the above is not agreeable, discuss whether it is acceptable that the T310 threshold is used to determine whether the UE shall log the rlfInSource-DAPS-r17. Consider however, there might be other reasons for which the source RLF is declared beside the T310 (e.g., BFR Failure, reaching maximum number of random accesss attempts etc.).

Proposal 11 RAN2 to discuss whether there is any issue for the following topics related to SHR, and whether those should be addressed in the next revision of running CR:

a. Discarding of the SHR if HO fails

b. Which message carries the SHR configuration, e.g. HO command, or other RRC message

c. Alignment of the SHR content with the RLF-Report in the ASN.1, e.g. inclusion of the CHO configuration in the SHR, inclusion of the CHO candidate cell list in the SHR.

Proposal 18 RAN2 to discuss whether there is any issue for the following topics related to the RA report, and whether those should be addressed in the next revision of running CR:

a. Whether it is mandatory for the UE to log SN RACH report

b. Whether the TS 36.331 modifications are introduced to handle the scenario of LTE MN fetching the list of NR RA reports.

c. Consider to capture other reasons for changing the procedure from 2-step to 4-step, e.g. due to LBT, due to fallback RAR reception

d. Consider to capture fallback from 4-step CFRA to 4-step CBRA

Proposal 19 The RA Information associated to a SCG failure (when failureType is set to randomAccessProblem or beamFailureRecoveryFailure-r16) are included in the SCGFailureInformation.

Proposal 22 RAN2 to discuss the need to introduce an explicit capability indicator that indicates that the UE is capable of storing the PSCell related MHI.

Proposal 23 RAN2 to discuss the total number of PSCell (across all PCells) related information that should be stored by the UE in the MHI:

a. 16 PSCells

b. 32 PSCells

c. 64 PSCells

Proposal 24 RAN2 to discuss whether there is any issue for the following topics related to MHI, and whether those should be addressed in the next revision of running CR:

a. How to deal with the PSCell MHI if the SN is released

b. How to deal with the PSCell MHI if the SN is added

FFS: RAN2 to consider one or more of the following solutions to address the issue in Observation 1:

a. Indicator in the RLF-Report (SHR) indicating that the SHR (RLF-Report) has been already sent to the network for this HO

b. Indicator in the RLF-Report (SHR) indicating that there is an SHR (RLF-Report) associated to the same HO

c. UE-ID and C-RNTI to be included in the SHR, RLF-Report

d. Timestamps in the SHR and RLF-Report to link them in time

e. RLF-Report should be merged with the SHR if the SHR has not been sent yet at the moment of RLF-Report generation, or the SHR should be merged in the RLF-Report.

f. If RLF occurs within a certain time window after the generation of the SHR, the SHR should be discarded if not yet transmitted

R2-2201680 Summary of AI 8.13.2 on SON open issues (Ericsson)

R2-2200392 Further Discussion on Handover Related SON Aspects CATT discussion Rel-17 NR\_ENDC\_SON\_MDT\_enh-Core

R2-2200560 Further consideration of SON of HO related aspects OPPO discussion Rel-17 NR\_ENDC\_SON\_MDT\_enh-Core

R2-2200561 Further consideration on successful handover report OPPO discussion Rel-17 NR\_ENDC\_SON\_MDT\_enh-Core

R2-2200575 Remaining issues on SHR NEC discussion Rel-17 NR\_ENDC\_SON\_MDT\_enh-Core

R2-2200668 SON Enhancements for CHO Optimization Samsung discussion NR\_ENDC\_SON\_MDT\_enh-Core

R2-2200669 SON Enhancements for Successful HO Report Samsung discussion NR\_ENDC\_SON\_MDT\_enh-Core

R2-2200752 SON Enhancements for CHO Lenovo, Motorola Mobility discussion Rel-17

R2-2200753 SON Enhancements for SHR Lenovo, Motorola Mobility discussion Rel-17

R2-2200901 On measurements of CHO candidate cells CMCC, Ericsson, Huawei, Nokia, ZTE discussion Rel-17 NR\_ENDC\_SON\_MDT\_enh-Core

R2-2200902 Remaining issues on SON Enhancement for CHO CMCC discussion Rel-17 NR\_ENDC\_SON\_MDT\_enh-Core

R2-2200903 Further Discussion on Successful Handover Report CMCC discussion Rel-17 NR\_ENDC\_SON\_MDT\_enh-Core

R2-2200966 Discussion on handover related SON aspects Huawei, HiSilicon discussion Rel-17 NR\_ENDC\_SON\_MDT\_enh-Core

R2-2201035 HO related SON changes Qualcomm Incorporated discussion Rel-17

R2-2201036 Open Issues in Successful Handover Report Qualcomm Incorporated discussion Rel-17

R2-2201211 Remaining CHO related issues on SON LG Electronics discussion NR\_ENDC\_SON\_MDT\_enh-Core

R2-2201212 Remaining SHR related issues on SON LG Electronics discussion NR\_ENDC\_SON\_MDT\_enh-Core

R2-2201229 Successful HO report in CHO recovery case SHARP Corporation discussion Rel-17 NR\_ENDC\_SON\_MDT\_enh-Core

R2-2201230 Discussion on successful HO report in DC case SHARP Corporation discussion NR\_ENDC\_SON\_MDT\_enh-Core

R2-2201326 Further consideration on SHR enhancements ZTE Corporation, Sanechips discussion Rel-17

R2-2201423 Discussion on SHR enhancements vivo discussion Rel-17

R2-2201612 Handover-related SON aspects Ericsson discussion NR\_ENDC\_SON\_MDT\_enh-Core

#### 8.13.2.2 2-step RA related SON aspects

Including outcome of [Post116-e][887.5][SON/MDT] Leftover issues on SON (Ericsson )

R2-2200393 The left issues on 2-step RA Report CATT discussion Rel-17 NR\_ENDC\_SON\_MDT\_enh-Core

R2-2200670 2-step Random Access Optimization Samsung discussion NR\_ENDC\_SON\_MDT\_enh-Core

R2-2200900 Remaining issues for 2-step RA CMCC,ZTE discussion Rel-17 NR\_ENDC\_SON\_MDT\_enh-Core

R2-2200967 Discussion on 2 step RA related SON aspects Huawei, HiSilicon discussion Rel-17 NR\_ENDC\_SON\_MDT\_enh-Core

R2-2201327 Remaining issues on RA-report enhancements ZTE Corporation, Sanechips discussion Rel-17

R2-2201604 2-Step RA information for SON purposes Ericsson discussion NR\_ENDC\_SON\_MDT\_enh-Core

#### 8.13.2.3 Other WID related SON features

R2-2200394 Specification Impact of SgNB RACH Report on TS38.331 and TS36.331 CATT discussion Rel-17 NR\_ENDC\_SON\_MDT\_enh-Core

R2-2200395 Open Issues of PSCell MHI Enhancement CATT discussion Rel-17 NR\_ENDC\_SON\_MDT\_enh-Core

R2-2200679 SON Enhancements: Others Samsung discussion NR\_ENDC\_SON\_MDT\_enh-Core

R2-2200968 Discussion on UE capabilities for R17 SON and MDT Huawei, HiSilicon discussion Rel-17 NR\_ENDC\_SON\_MDT\_enh-Core

R2-2201037 Open Issues in Other SON Topics Qualcomm Incorporated discussion Rel-17

R2-2201043 Mobility History Information storing Nokia, Nokia Shanghai Bell discussion Rel-17 NR\_ENDC\_SON\_MDT\_enh-Core

R2-2201044 Discussion on other SON features Nokia, Nokia Shanghai Bell discussion Rel-17 NR\_ENDC\_SON\_MDT\_enh-Core

R2-2201045 Reporting Enhancements for SON in unlicensed Nokia, Nokia Shanghai Bell discussion Rel-17 NR\_ENDC\_SON\_MDT\_enh-Core

R2-2201213 Remaining issues on SCG related MRO LG Electronics discussion NR\_ENDC\_SON\_MDT\_enh-Core

R2-2201328 Consideration on SN MHI enhancements ZTE Corporation, Sanechips discussion Rel-17

R2-2201329 Clarification on failureType of SCG failure information ZTE Corporation, Sanechips, CMCC discussion Rel-17

R2-2201605 On Other WID related SON features Ericsson discussion NR\_ENDC\_SON\_MDT\_enh-Core

### 8.13.3 MDT

R2-2201658 Summary on MDT aspects ZTE

**Signalling-based logged MDT protection**

Agreements:

1 Signalling based MDT protection is applicable for scenarios below: intra-NR Handover scenarios.

* **[AT116bise][877][SON/MDT] MDT aspects (ZTE)**

 Based on proposals not concluded yet in R2-2201658 and R2-2201691

 Intended outcome: Report with easy agreements and reasonable WF.

 Deadline: 22:22 UTC, Monday Week2

R2-2201691 Summary on issues for MDT RRC CR Huawei

=> Included in the email discussion #877

R2-2201927 Summary of [Offline 877]MDT aspects (ZTE)

Agreements:

1 Only one PLMN is allowed in multiple CEF reports and UE clears stored connection establishment/resume failure information upon logging a CEF report in a cell with a different RPLMN identity

2 Capture in 37320 that M5 ~ M7 configuration triggers can apply to MR-DC.

3 PerRAInfoList is included in CEF report when multiple CEF is stored.

4 Existing availability bit and request bit is reused for multiple CEF reports.

5 Only one explicit indication (e.g., sigLogMeasConfigAvailable) is used for signalling MDT protection:

 - the indication is included when UE has sig-based logged MDT config or if UE has sig-based logged MDT results, otherwise it is absence

6 For setting EMR results in logged MDT results：

 − No impact on the ASN.1 but the neighbour cell measurements included in the logged MDT results (measResultNeighCells) contains both EMR frequencies measurements (amongst measIdleCarrierListNR and/or measIdleCarrierListEUTRA) and cell reselection frequencies measurements (included in SIB4 and SIB5). (8/11)

7 At most one measurement identity for D1 measurements is allowed per the node hosting PDCP entity.

8 RAN2 to confirm below behavior:

− when earlyMeasIndication-r17 is configured in loggedMeasurementConfiguration, UE is allowed to log measurements on early measurement frequencies in logged MDT;

− When earlyMeasIndication-r17 is not configured in loggedMeasurementConfiguration, UE shall not log measurements on early measurement frequencies in logged MDT.

FFS the missing scenario(s) if figured out.

9 UE logs one CEF report entry in multiple CEF report list, for the failures happening consecutively in the same cell.

10 The maximum number of supported CEF entries: 4.

11 New capability bit is introduced to indicate if UE supports multiple CEF

12 To include the successful SI request procedure related information in RA report by removing the conditions that preclude logging of successful SI request related information.

#### 8.13.3.1 Immediate MDT enhancements

R2-2200396 The Corrections on Immediate MDT Enhancements CATT discussion Rel-17 NR\_ENDC\_SON\_MDT\_enh-Core

R2-2200890 On Immediate MDT Enhancements Ericsson discussion NR\_ENDC\_SON\_MDT\_enh-Core

R2-2200969 Discussion on immediate MDT enhancements Huawei, HiSilicon discussion Rel-17 NR\_ENDC\_SON\_MDT\_enh-Core

R2-2201330 Consideration on miscellaneous on IMM MDT ZTE Corporation, Sanechips discussion Rel-17

R2-2201658 Summary of AI 8.13.3 MDT aspects ZTE Corporation, Sanechips discussion Rel-17 NR\_ENDC\_SON\_MDT\_enh-Core

#### 8.13.3.2 Logged MDT enhancements

R2-2200397 Discussion on Logged MDT Enhancement CATT discussion Rel-17 NR\_ENDC\_SON\_MDT\_enh-Core

R2-2200648 Discussion on multiple CEF reports Samsung Electronics Co., Ltd discussion Rel-17 NR\_ENDC\_SON\_MDT\_enh-Core

R2-2200680 SI Request Optimization Samsung discussion NR\_ENDC\_SON\_MDT\_enh-Core

R2-2200889 On logged MDT related enhancements Ericsson discussion NR\_ENDC\_SON\_MDT\_enh-Core

R2-2200970 Discussion on logged MDT enhancements Huawei, HiSilicon discussion Rel-17 NR\_ENDC\_SON\_MDT\_enh-Core

R2-2201038 Logged measurement Enhancements Qualcomm Incorporated discussion Rel-17

R2-2201042 Remaining Stage 2 open issues Nokia, Nokia Shanghai Bell, CMCC discussion Rel-17 NR\_ENDC\_SON\_MDT\_enh-Core

### 8.13.4 L2 Measurements

R2-2200888 On layer-2 measurements Ericsson discussion NR\_ENDC\_SON\_MDT\_enh-Core

R2-2200971 Discussion on L2M Huawei, HiSilicon discussion Rel-17 NR\_ENDC\_SON\_MDT\_enh-Core

* **[Post116bis-e][833][SON/MDT] SON related open issue list (Ericsson)**

- Figure out the open issue list on running stage-3 CRs for SON. Open Issues should be defined for aspects that need to be**closed, important to make already agreed functionality work in a reasonable way**. Not yet agreed optimizations that may not be needed shall not be listed as Open Issues List

- Intended outcome: report with agreed open issues list

 Deadline: 23:24 UTC, Friday, January 28th

* **[Post116bis-e][844][SON/MDT] MDT related open issue list (Huawei)**

- Figure out the open issue list on running stage-3 CRs for MDT. Open Issues should be defined for aspects that need to be**closed, important to make already agreed functionality work in a reasonable way**. Not yet agreed optimizations that may not be needed shall not be listed as Open Issues List

- Intended outcome: report with agreed open issues list

 Deadline: 23:24 UTC, Friday, January 28th

* **[Post116bis-e][855][SON/MDT] Stage-2 Running CR related open issue list (Nokia)**

- Figure out the open issue list on running stage 2 CR. Open Issues should be defined for aspects that need to be**closed, important to make already agreed functionality work in a reasonable way**. Not yet agreed optimizations that may not be needed shall not be listed as Open Issues List

- Intended outcome: report with agreed open issues list

 Deadline: 23:24 UTC, Friday, January 28th