3GPP TSG RAN WG2#114-e meeting                                            R2-210xxxx

Electronic meeting, 19 May – 27 May, 2021

Source: CATT

Title: Summary of [AT114e][802][SON/MDT] Reporting on demand SI related information (CATT)‎

Agenda Item: 8.13.3.2

Document for: Discussion and Decision

# Introduction

This document is for the discussions of the following topic [1]

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| * [AT114e][802][SON/MDT] Reporting on demand SI related information (CATT)   Collect companies’ views on the four options:  Option 1: Extend Logged MDT  Option 2: Extend RA report  Option 3:  Extend RA report to include successful on-demand SI related information  Extend CEF report to include failed on-demand SI related information  Option 4:  Extend RA report to include successful on-demand SI related information  Introduce a new report to include failed on-demand SI related information  Collect the option based on majority views.  Intended outcome: Email discussion report  Deadline:11:00 UTC, May 25 |

In section 2 views from companies are collected, based on which some potential conclusions. Section 3 gives a summary of the discussions and conclusions.

Participants to this discussion are invited to kidly leave their contact in the table below, for potentially further checkings.

|  |  |  |
| --- | --- | --- |
| Name | Company | Email |
| Rajeev Kumar | Qualcomm | rkum@qti.qualcomm.com |
| Jun Chen | Huawei, HiSilicon | jun.chen@huawei.com |
| Wen-Ming | vivo | ming.wen@vivo.com |
| Pradeepa Ramachandra | Ericsson | pradeepa.ramachandra@ericsson.com |
| Zhihong Qiu | ZTE | qiu.zhihong@zte.com.cn |
| Sangbum Kim | Samsung | sb07.kim@samsung.com |
| Xue Lin | OPPO | linxue@oppo.com |
| Malgorzata Tomala | Nokia, Nokia Shanghai Bell | malgorzata.tomala@nokia.com |

# Discussion

Background

Before collection of views on these options, more background information is provided.

Firstly four options for on demand SI information report have been listed in [2]. Based on that summary, some discussions were had some brief discussions during the online session. Then if one takes a closer look at the related contributions, companies have provided some reasoning as to why an option is preferred. These are listed below for information.

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| **#** | **Supporting contribution and main reasoning therein** |
| Option 1:  Extend Logged MDT ‎ | R2-2104932  The RACH report is only used for successful random access in legacy mechanism.  It is inappropriate that successful and failed information are recorded in two reports. |
| R2-2105840  Current RA procedure only considers successful case, including the failed case will change the existing behavior.  Logged MDT allows logging of both successful and failure on-demand SI information without impact on RA report, while also provide NW the flexibility to decide whether configure with interested area for UE to report on-demand SI related information. |
| R2-2106036  The RA report logs the information related to the successful RACH procedures. Furthermore, the objective of logging the on-demand SI-related information is to optimize the broadcasting and non-broadcasting SIs sets rather than optimizing the RACH procedure. |
| Option 2:  Extend RA report | R2-2105884  RA-report and on-demand SI report will have common information and RA procedure and on-demand SI procedure are tightly related.  Extension of RA-report seems to be the simplest way and based on the on-demand SI report information, the network may be able to further optimize RACH resources.  If new report is defined for on-demand SI, duplicated information will be reported. |
| R2-2106057  Since the SI request operation is performed through the random access, it is reasonable to extend RA Report to log the SI-request related information.  The RA Report is required to be improved so that it can consider even failed RA, but the failed RA should be related to on-demand SI request only. |
| Option 3:   * Extend RA report to include successful on-demand SI related information * Extend CEF report to include failed on-demand SI related information | R2-2106004  Most components of the information to be logged for on-demand SI report is available in RACH report for RACH purposes.  Logging on-demand SI information in RACH report allows the network to gather more insights without additional overhead.  CEF report also contains the information related to RA information and thus for failed SI requests one can easily reuse the CEF report. |
| Option 4:   * Extend RA report to include successful on-demand SI related information * Introduce a new report to include failed on-demand SI related information | R2-2106152  For Msg1/Msg3 SI success, we think they are part of successful RACH procedure and Msg1 based and Msg3 based indicators are sufficient for indicating on demand SI types.  For Msg1/Msg3 SI failure, it is different from CEF report because the intention is to just get specific Sis. In addition, some fields in CEF report are mandatory and they are not suitable for on demand SI case.  For RLF report, it is used for UEs in RRC\_Connected mode, so it is not suitable for on demand SI failure indication. |

Discussions

In the following, views are invited regarding which of these options companies would prefer. Also, comments are welcome, especially new reasonings or arguments that have not already covered by those that have been listed above.

**Q1 Which Option do you prefer, and further reasonings or comments if any?**

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| **Company Name** | **Which Option** | **Further comments if any (especially new reasonings or arguments that have not already covered)** |
| Qualcomm | Option 1 | In our understanding, the purpose of logging of on-demand SI is not the RACH optimizations. Therefore, RA-report should consider more critical aspects, where RACH optimization play significant rols, for example initial access and others.  Furthermore, as previously mentioned, RA-report is expected to log only success scenario, therefore logged MDT remains the better choice in our understanding. |
| Huawei, HiSilicon | Option 4 | Among option 2/3/4, the same part is:   * **Extend RA report to include successful on-demand and SI related information**   And the difference is where to put the failure info.   * For using RA report extension, we do not want to change the original purpose, and we think there are extra complexities if including failure info in RA report * For using CEF report, we think CEF and on-demand SI failure are different cases, and there are some mandatory Ies in CEF reports which may not be suitable for on-demand SI failure   Regarding option 1, basically we are open and we have the following technical comments:   * Firstly, we think on-demand SI optimization is more like SON features because RAN can directly use such info for optimizing on-demand SI transmission * Secondly, coupling with logged MDT means mandatory Ies are shared between legacy logged MDT and on-demand SI, e.g. trace related info. In addition, in Rel-16 logged MDT configuration, report type is mandatory (periodical or event trigger), and it may be an issue whether to introduce a standalone report Type or to allow “combinations” (e.g. co-existence of legacy logged MDT and on-demand SI) * Thirdly, if RA report is to be added into logged measurement results, it means that the storage will be shared between different measurement functionalities, so we wonder whether the effect of legacy logged MDT will be compromised or not |
| vivo | Option 3 or 4 | **Option 1:** We don’t want to couple logged MDT and on demand SI optimization, those are two features. The latter one is more like RA/CEF report, don’t see the need to incorporate this feature into logged MDT.  In case logged MDT configuration is not configured by NW, UE cannot record SI request info, or when it is configured, area restriction shall be taken into account which limits the flexibility of such a report.  **Option 2:** not comply with the design of RA report.  **Option 3:** we see the benefits of reusing the CEF to include the on-demand SI report. As for the mandatory fields in CEF that not suitable for on-demand SI report mentioned by HW, one possible solution to make it workable for this case may be to set those IEs to value ‘0’.  **Option 4:** We are also open for this solution, but option 3 should override this option if option 3 is feasible. |
| Ericsson | Option-3 preferrable (option-2 is also acceptable) | **Issues associated to option-1:**  Logged MDT has the following constraints.   1. MDT is a user consent based procedure i.e., only those UEs whose user have provided that user consent are part of the MDT procedure. 2. MDT is an explicit configuration based procedure wherein the UE logs the MDT related measurements only if it was configured with MDT related configuration.   If we include on demand SI as part of logged MDT, then this reporting is subjected to user consent and also becomes part of the explicit configuration based reporting approach. This is not acceptable to us.  **Simplicity of option-2/option-3:**  Both option-2 and option-3 uses an existing SON reporting framework. It is to be mentioned that the measurements collected via a SON report (e.g., RA report) need not be used only for the RA optimization. This can also be used for other purposes if the network deem it to be useful.  Further, some companies (R2-2105840) have expressed that adding the on demand SI report in the RA report breaks the existing behavior. We do not agree with that. The new additions will be introduced with a new UE capability. If the network was not interested in the on demand SI optimization and only interested in RA optimization, then it will throw away the new additions added to the RA report and use only the legacy contents of RA report. This is already the case for many information included in each SON reports wherein the network implementation might not use all the measurements included in the report.  Further, some companies (R2-2106036) have mentioned that the purpose of the on-demand SI report is only to identify which SI needs to be broadcasted and which SI can be on demand. However, this is not the only purpose of on-demand SI optimization. The msg1 RA resource allocation for a specific SI is also part of the on-demand SI optimization. For example, the network can assign preamble-x to SIB8 instead of SIB8 and SIB9 based on the on-demand SI optimization.  SI-SchedulingInfo ::= SEQUENCE {  schedulingInfoList SEQUENCE (SIZE (1..maxSI-Message)) OF SchedulingInfo,  si-WindowLength ENUMERATED {s5, s10, s20, s40, s80, s160, s320, s640, s1280},  si-RequestConfig SI-RequestConfig OPTIONAL, -- Cond MSG-1  si-RequestConfigSUL SI-RequestConfig OPTIONAL, -- Cond SUL-MSG-1  systemInformationAreaID BIT STRING (SIZE (24)) OPTIONAL, -- Need R  ...  }    SI-RequestConfig::= SEQUENCE {  rach-OccasionsSI SEQUENCE {  rach-ConfigSI RACH-ConfigGeneric,  ssb-perRACH-Occasion ENUMERATED {oneEighth, oneFourth, oneHalf, one, two, four, eight, sixteen}  } OPTIONAL, -- Need R  si-RequestPeriod ENUMERATED {one, two, four, six, eight, ten, twelve, sixteen} OPTIONAL, -- Need R  si-RequestResources SEQUENCE (SIZE (1..maxSI-Message)) OF SI-RequestResources  }  SI-RequestResources ::= SEQUENCE {  ra-PreambleStartIndex INTEGER (0..63),  ra-AssociationPeriodIndex INTEGER (0..15) OPTIONAL, -- Need R  ra-ssb-OccasionMaskIndex INTEGER (0..15) OPTIONAL -- Need R  }    Regarding the aspects of storing the successful and failed on-demand SI reports in the RA reports and or RA report+CEF report, we are fine with any solution as both RA report and CEF reports provide details regarding the cell identities, SSB identities and the number of RA attempts etc. which are necessary for on demand SI optimization. |
| ZTE | Option 1 | Agree with QC that RA report shall focus on RACH optimization part. Similar view for CEF report, it is used to identify coverage issues. Option 2 requires UE to store failure information of on-demand SI as well in RA report, which changes the existing RA report behavior.  Failure on-demand SI doesn’t trigger connection failure, it is preferred not to include such information in CEF report.  Both option 3/4 requires NW to request two reports to obtain complete information for on-demand SI, which is not a desirable behavior.  To us, since UE only needs to store the on-demand SI in idle/inactive state, it is simpler to use logged MDT to store such information, and it will bring more flexibility for NW to decide whether such information is required to report or not, and whether only specific area is interested for reporting, which can also be beneficial for NW to optimize SI area configuration. |
| CATT | Option 1 | We prefer logged MDT mechanism for on-demand SI and have the following reasons:   1. In our understanding, the main purpose of the on-demand SI report is to help the network side to acquire the UE’s requirement of SIBs. It seems not necessary to sepeately report whether the on-demand SI request is successful or failed. Therefore, no strong need that successful and failed information are recorded in two seperate reports. 2. For the purpose of on-demand SI report, msg1 RA resource allocation for a specific SI is mainly depend on which SIBs has the same period (the SIBs included in one SI message can have the same broadcast period and mapping to one preamble) and whether there is enough preambles/resource allocated for on-demand SI (SI messages can share one preamble with different occasion/mark), so it could only focus on the broadcasted/nonBroadcasted which is on-demand SI optimization but not RACH optimization. 3. Logged MDT configuration will allow network to configure the interested SIBs or area which provides network flexibility. |
| Samsung | Option 2 | It seems suitable to extend RA Report because the SI request is performed over the random access, and the current RA Report has been already specified very well in order to provide RA related information. For instance,   * Since RA report already has raPurpose, it is easy to indicate SI request type, i.e. msg1-based or msg3-based. * Since RA report already has ra-InformationCommon, it is easy to identify RA related information per RA attempt.   It also means that any unnecessary information can be excluded as we reuse current logged MDT or CEF report.  The current RA report is used to log RA-related information for successful RA cases only. However, RA report can be extended to additionally consider the failure only for random access initiated due to on-demand SI request, and we have assumed it’s so minor update.  The current Logged MDT has not been used to collect RA-related information. Thus, heavy update would be expected.  The current CEF report is used to address any problem in the transition to connected mode from idle or inactive. However, the SI request procedure does not intend to transit to connected mode. Furthermore, the combination of current RA report and the modified CEF report could spoil the commonality in SI request opimitization mechanism. |
| LGE | Option 2 | We prefer Option2 (propoenent of contribution).  Option 3 is also fine for us. Athough SI requrest is not for transition to connected mode, we think extension of CEF report is ok to report SI request failure cases as long as there is no confusion for interpretation. |
| OPPO | Option1 | We think Option1 is more desirable since the network would get a full picture of the SIBs that are in need by a common IE, including those successful or failure requests. Compared with Option1, Option2 can not accommodate ;the failure cases according to the intention of RA-Report in current specification, Option3 and Option4 would have two IEs involved, due to which the network has to request for both RA-Report or CEF/CEF-like report to get a complete result. |
| Nokia, Nokia Shanghai Bell | Option 2 | Including in the RA Report information about on-demand SI is logical since it is requested by the UE through a RACH procedure. Thus, it is natural that RA Report holds all information that is related to RACH. In addition, RA Report already provides the possibility to indicate that RACH is for SI request through the raPurpose-r16 field. It is true that some modifications will need to be done to the RA Report to support also failure information but in practice RA Report also stores failure information of RACH attempts (though under the constraint that in the end a RA Procedure is successful). |

**Summary of Q1**

TBD (will try to summarize further reasonings or arguments if any, and count company preference for the options)

# Conclusion

TBD

# Reference

[1] Draft session report, SON MDT, RAN2#114-e

[2] R2-2106482‎ Summary on agenda item 8.13.3.2 Logged MDT enhancements Huawei