**3GPP TSG-SA5 Meeting #154 *S5-242066***

**Changsha, China, 15 – 19 April 2024**

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| *CR-Form-v12.2* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
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|  | **32.422** | **CR** | **0450** | **rev** | **1** | **Current version:** | **18.2.0** |  |
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| *For* [***HELP***](http://www.3gpp.org/3G_Specs/CRs.htm#_blank)*on using this form: comprehensive instructions can be found at* [*http://www.3gpp.org/Change-Requests*](http://www.3gpp.org/Change-Requests)*.* | | | | | | | | |
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| ***Proposed change affects:*** | UICC apps |  | ME |  | Radio Access Network | **X** | Core Network | **X** |

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| ***Title:*** | Rel-18 CR TS 32.422 Extending the area scope of SNPN MDT configuration | | | | | | | | | |
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| ***Source to WG:*** | Nokia | | | | | | | | | |
| ***Source to TSG:*** | S5 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** |  | | | | |  | ***Date:*** | | | 2024-04-04 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | **F** |  | | | | | ***Release:*** | | | Rel-18 |
|  | *Use one of the following categories:* ***F*** *(correction)* ***A*** *(mirror corresponding to a change in an earlier release)* ***B*** *(addition of feature),* ***C*** *(functional modification of feature)* ***D*** *(editorial modification)*  Detailed explanations of the above categories can be found in 3GPP [TR 21.900](http://www.3gpp.org/ftp/Specs/html-info/21900.htm). | | | | | | | | *Use one of the following releases: Rel-8 (Release 8) Rel-9 (Release 9) Rel-10 (Release 10) Rel-11 (Release 11) … Rel-16 (Release 16) Rel-17 (Release 17) Rel-18 (Release 18) Rel-19 (Release 19)* | |
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| ***Reason for change:*** | | For configuring the area scope for MDT in case of SNPN, RAN3 has specified 3 choices. (TS 38.413, clause 9.3.1.169)   1. SNPN based MDT 2. SNPN Cell ID based MDT 3. SNPN TAI based MDT   During release 18, the SNPN based MDT configuration for area scope has been specified in Release 18 but the cell id based and the TAI based has not been specified. This is causing misalignment with RAN3 specifications. | | | | | | | | |
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| ***Summary of change:*** | | The area scope configuration for SNPN MDT has been enhanced with cell id based and TAI based configurations. | | | | | | | | |
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| ***Consequences if not approved:*** | | Misalignment with RAN3 specifications. | | | | | | | | |
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| ***Clauses affected:*** | | 4.1.1.9.2, 5.10.2 | | | | | | | | |
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|  | | **Y** | **N** |  | | | |  | | |
| ***Other specs*** | |  | **X** | Other core specifications | | | | TS/TR ... CR ... | | |
| ***affected:*** | |  | **X** | Test specifications | | | | TS/TR ... CR ... | | |
| ***(show related CRs)*** | |  | **X** | O&M Specifications | | | | TS/TR … CR … | | |
|  | |  | | | | | | | | |
| ***Other comments:*** | |  | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | | S5-242066 is a revision of S5-241261 | | | | | | | | |

***Start of First change***

##### 4.1.1.9.2 NG-RAN activation mechanisms for management based MDT data collections without IMSI/IMEI(SV)/SUPI selection in the case of non-split architecture

For management based MDT data collection with no IMSI/IMEI(SV)/SUPI criteria in the case of non-split architecture, the UE selection can be done in the radio network at gNB based on the input information received from management system and the user consent information stored in the gNB. This mechanism works for the following OAM input parameters:

- Area information only

The following figure summarizes the flow as an example how the MDT configuration is done utilising the cell traffic trace functionality for this scenario:



Figure 4.1.1.9.2.1: Example for management based MDT activation in NG-RAN in the case of non-split architecture

Whenever the gNB receives the Management based MDT allowed IE in Initial Context Setup Request or in Handover Request message, it shall save it for possible later usage.

1) The management system sends a Trace Session activation request to the gNB. This request includes the parameters for configuring UE measurements:

- Job Type.

- Area Scope where the UE measurements should be collected: list of NG-RAN cells. Tracking Area should be converted to NG-RAN cells, additionally a list of NPN IDs in NG-RAN.

- List of Measurements.

- Reporting Trigger.

- Report Interval.

- Report Amount.

- Event Threshold.

- Logging Interval.

- Logging Duration.

- Trace Reference.

- TCE IP Address.

- Anonymization of MDT Data.

- Collection Period for RRM Measurements NR (present only if any of M4 or M5 measurements are requested).

- Collection Period M6 in NR (present only if any of M6 measurements (DL or UL) is requested).

- Collection Period M7 in NR (present only if any of M7 measurements (DL or UL)is requested).

- Positioning Method.

- MDT PLMN List.

- Report Type for Logged MDT (periodical logged or event-triggered measurement) for logged MDT only.

- Event Threshold, Hysteresis and Time to Trigger (present only if L1 event is configured for logged MDT)

- Event List for Event Triggered Measurement for logged MDT only.

- Area Configuration for Neighbouring Cells for logged MDT only.

- Sensor Information for logged MDT and immediate MDT.

- Excess packet delay thresholds (present only if M6 measurements are requested).

Note that at the same time not all the parameters can be present. The criteria for which parameters are present are described in clause 5 of the present document.

2) When gNB receives the Trace Session activation request from its management system, it shall start a Trace Session and should save the parameters associated to the Trace Session.

3) gNB shall select the suitable UEs for MDT data collection. The selection is based on the area received from the management system and the area where UE is located, user consent information received from the core network as part of the Management based MDT PLMN List IE (As described in section in 4.9.2 of this document). If the user is not in the specified area or if the Management based MDT PLMN List IE is not present in the UE context the UE shall not be selected by the gNB for MDT data collection. During UE selection, the gNB shall take into account also the UE capability (MDT capability) when it selects UE for logged MDT configuration. If the UE does not support logged MDT, the UE shall not be selected.   
If M4 or M5 measurements are requested in the MDT configuration, gNB should start the measurement according to the received configuration. Details of the measurements are defined in TS 38.314 [50].

4) gNB shall activate the MDT functionality to the selected UEs. When gNB selects a UE, it shall take into account the availability of Management based MDT PLMN List IE in the user context and the area scope parameter received in MDT configuration (Trace Session activation). Detailed description about user consent handling and how it is provided to the gNB is described in section 4.9.2. If there is no Management based MDT PLMN List IE in the user context or the user is outside the area scope defined in the MDT configuration, the UE shall not be selected for MDT data collection. The gNB shall assign Trace Recording Session Reference corresponding to the selected UE. The gNB shall send at least the following configuration information to the UE in case of Logged MDT:

- Trace Reference

- Trace Recording Session Reference

- TCE Id (The value signalled as IP address of TCE from the EM is mapped to a TCE Id, using a configured mapping in the gNB)

- Logging Interval

- Logging Duration

- Absolute time reference

- Area Scope where the UE measurements should be collected: list of NG-RAN cells/TA, additionally a list of NPN IDs in NR.

- MDT PLMN List

NOTE: For UEs currently being in idle or inactive mode and camping in the cell the logged MDT configuration cannot be sent. These UEs may be configured when they initiate some activity (e.g., Service Request or Tracking Area Update) at next time.

In case of Immediate MDT, the following parameters shall be sent to the UE:

- List of Measurements

- Reporting Trigger

- Report Interval

- Report Amount

- Event Threshold

- Excess packet delay thresholds (present only if M6 UL measurements are requested)

Note that at the same time not all the parameters can be present. Conditions of the parameters are described in clause 5 of the present document.

gNB performs necessary actions (e.g. activates GNSS module of the UE, enables and collects certain positioning measurements) specified in TS 38.305 [52] according to the value of Positioning Method (see clause 5.10.19) received in the Trace configuration. gNB captures location information and/or positioning measurements in the MDT trace record.

If Reporting Trigger parameter indicates that all configured RRM measurement trigger should be reported in MDT, then gNB should ask the UE to provide the "best effort" location information together with the measurement reporting by setting the *includeCommonLocationInfo* IE in all RRC measurement reporting configurations.

5) When UE receives the MDT activation it shall start the MDT functionality based on the received configuration parameters.

6) The gNB shall not retrieve MDT report from the UE if UE’s rPLMN does not match the PLMN where TCE used to collect MDT data resides (e.g. gNB’s primary PLMN). When the gNB receives the MDT report from UE, the gNB shall get the Trace Recording Session Reference, Trace Reference and TCE Id from the report, and compare the Trace PLMN (PLMN portion of Trace Reference) with the PLMN where TCE used to collect MDT data resides (e.g. its primary PLMN) and discard MDT report in case of a mismatch. Otherwise if the MDT anonymization requires the IMEI-TAC in the MDT record gNB shall send the Trace Recording Session Reference, Trace Reference, serving cell CGI, and TCE IP Address in the CELL TRAFFIC TRACE message to the AMF via the NG connection. When AMF receives this NG signalling message containing the Trace Recording Session Reference, Trace Reference, serving cell CGI, and the Privacy Indicator (that shall be set to *Logged MDT* or *Immediate MDT* depending on the configured Job Type) if so indicated in the privacy indicator, the AMF shall look up the subscriber identities (IMEI(SV)) of the given call from its database, and send the IMEI-TAC together with the Trace Recording Session Reference and Trace Reference and for immediate MDT also the serving cell CGI to the TCE, as described in section 4.7 of the present document. For logged MDT, AMF will send the IMEI-TAC together with the Trace Recording Session Reference, Trace Reference to the TCE.

NOTE: For management based Immediate MDT, TRSR may be duplicated among different gNBs when multiple cells are selected as the area scope for the same MDT job. In this case, the combination of TRSR and the UE’s serving cell CGI in the MDT report can uniquely identify one trace recording session.

7) For Immediate MDT when the gNB receives the MDT report from the UE in the RRC message the gNB shall capture it and put the UE’s serving cell CGI together with the MDT report from the UE to the trace record. A UE configured to perform Logged MDT measurements in IDLE or INACTIVE indicates the availability of MDT measurements, by means of a one-bit indicator, in *RRCConnectionSetupComplete* message during connection establishment as specified in 3GPP TS 32.421 [2]. The gNB can decide to retrieve the logged measurements based on this indication by sending the UEInformationRequest message to the UE. The UE can answer with the collected MDT logs in UEInformationResponse message.

8) The gNB shall forward the Trace Records to the Trace Collection Entity (TCE). In case of logged MDT, the TCE Id is indicated in the MDT report is translated to the actual IP address of the TCE by the gNB before it forwards the measurement records. (The address translation is using configured mapping in the gNB.) In case of immediate MDT, the IP address of the TCE is indicated for the gNB in the trace configuration.

The Immediate MDT measurement configuration is deleted in the UE together with the RRC context when entering idle or inactive mode.

The Logged MDT trace session is preserved in the UE until the duration time of the trace session expires, including also multiple idle or inactive periods interrupted by various state transitions such as idle-connected-idle state transitions.

The Logged MDT trace session context of the UE is stored in the network as long as the trace session is active, including also the periods when the UE is in connected state.

Management system shall validate that the MCC and MNC specified in the Trace Reference is the same as the PLMN supported by all the cells specified in the area scope. If the gNB receives a request with a PLMN in the TraceReference that does not match any PLMN in its list, it shall ignore the request.

***Start of next Change***

### 5.10.2 Area Scope

The Area Scope optional parameter defines the area in terms of Cells or Tracking Area/Routing Area/Location Area where the MDT data collection shall take place. The area scope specified in an MDT session shall support the PLMNs of the MDT PLMN list (defined in clause 5.10.24). If the parameter is not present the MDT data collection shall be done throughout the PLMNs of the MDT PLMN list. In case of NR NPN scenarios, the area scope parameter may also contain a combination of NPN ID and any of the existing parameters such as cells or tracking area or tracking area identity. For further details see also TS 37.320 [30] and 38.413 [49].

The Area Scope parameter in UMTS is either:

- list of Cells, identified by CGI. Maximum 32 CGI can be defined.

- List of Routing Area, identified by RAI. Maximum of 8 RAIs can be defined.

- List of Location Area, identified by LAI. Maximum of 8 LAIs can de defined.

The Area Scope parameter in LTE and NR contains one of the followings:

- list of Cells, identified by E-UTRAN-CGI or NG-RAN CGI. Maximum 32 CGI can be defined.

- List of Tracking Area, identified by TAC. Maximum of 8 TAC can be defined.

- List of Tracking Area Identity, identified by TAC with associated plmn-Identity perTAC-List containing the PLMN identity for each TAC. Maximum of 8 TAI can be defined. For further details see also TS 36.331[32].

The Area Scope parameter in NR can also contain:

- List of NPN IDs in NR. It is either a list of PNI-NPNs identified by CAG ID with associated plmn-Identity (Maximum 256 PNI-NPNs can be defined) or a list of SNPN by Network ID with associated plmn-Identity (Maximum 16 SNPNs can be defined).

***End of Changes***