**3GPP TSG-SA5 Meeting #137-e *S5-213481***

**Online, , 10th May 2021 - 19th May 2021**

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| *CR-Form-v12.1* |
| **CHANGE REQUEST** |
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|  | **32.421** | **CR** | **0100** | **rev** | **1** | **Current version:** | **17.1.0** |  |
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| *For* [***HE******LP***](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 |  |

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| ***Title:***  |  |
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| ***Source to WG:*** | Huawei |
| ***Source to TSG:*** | S5 |
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| ***Work item code:*** | TEI17 |  | ***Date:*** | 2021-04-30 |
|  |  |  |  |  |
| ***Category:*** | **F** |  | ***Release:*** | Rel-17 |
|  | *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 canbe 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-15 (Release 15)Rel-16 (Release 16)Rel-17 (Release 17)Rel-18 (Release 18)* |
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| ***Reason for change:*** | In the attached LS S5-211029 from TSG SA#90 sent to SA5#135e, it is propose to replace all occurrences on “non-inclusive terms”.  |
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| ***Summary of change:*** | Change master into primary.Change black into block.Change grey into track |
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| ***Consequences if not approved:*** | Non-inclusive language will occur. |
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| ***Clauses affected:*** | 1, 5.3.1, 5.3.2, 5.5, 6.1, 6.2.1, A.3.1 |
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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 ...  |
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| ***Other comments:*** |  |
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| ***This CR's revision history:*** |  |

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| **1st modified section** |

# 1 Scope

The present document describes the requirements for the management of Trace and the reporting of Trace data (including FDD mode and TDD mode) across UMTS, EPS or 5G networks as it refers to subscriber tracing (tracing of IMSI or Public User Identity) and equipment tracing (tracing of IMEI or IMEISV). Trace also includes the ability to trace all active calls in a cell or multiple cells (Cell Traffic Trace). The present document also includes the description of Service Level Tracing (tracing of a specific service). It defines the administration of Trace Session activation/deactivation by the management system, the network or User Equipment (UE) itself via signalling, the generation of Trace results in the Network Elements (NEs) and UE and the transfer of these results to one or more Operations Systems.

GSM Trace is outside of the scope of this specification (see [7]).

The present document also describes the requirements for the management of Minimization of Drive Tests (MDT) across UMTS networks, EPS networks or 5G networks and Radio Link Failure (RLF) reporting across EPS networks and 5G networks.

The present document is built upon the basic Subscriber and UE Trace concept described in clause 4.
The high-level requirements for Trace data, Trace Session activation/deactivation and Trace reporting are defined in clause 5. Clause 5 also contains an overview of use cases for Trace (the use cases are described in Annex A). Clause 6 defines the requirements for managing MDT. Clause 7 defines the requirements for managing RLF reports.Trace control and configuration management are described in 3GPP TS 32.422 [2], and Trace data definition and management are described in 3GPP TS 32.423 [3].

The present document does not cover any Trace capability limitations within a NE (e.g. maximum number of simultaneous traced mobiles for a given NE) or any functionality related to these limitations (e.g. NE aborting a Trace Session due to resource limitations).

The objectives of the Trace specifications are:

a) to provide the descriptions for a standard set of Trace and MDT data;

b) to produce a common description of the management technique for Trace, MDT and RLF administration and result reporting;

c) to define a method for the reporting of Trace, MDT and RLF results across the management interfaces.

The following is beyond the scope of the present document, and therefore the present document does not describe:

- tracing non-Subscriber or non-UE related events within an NE;

- tracing of all possible parties in a multi-party call (although multiple calls related to the IMSI specified in the Trace control and configuration parameters are traceable).

The definition of Trace and MDT data is intended to result in comparability of Trace and MDT data produced in a multi-vendor wireless UMTS, EPS and/or 5G network(s), for those Trace control and configuration parameters that can be standardised across all vendors' implementations.

Vendor specific extensions to the Trace control and configuration parameters and Trace and MDT data are discussed in 3GPP TS 32.422 [2] and 3GPP TS 32.423 [3].

All functions (trace, MDT etc.) specified in this specification support Network Sharing, with the following conditions:

- It is accepted that the recorded information from the shared nodes is available to the Primary Operator. Recorded information that is collected in a non shared node or cell will only be available to the operator managing the non shared node or cell.

- It is accepted that the recorded information from the shared network shall be delivered to the Participating Operator whose PLMN recording is requested, taking user consent into account. Operators must also agree on sharing the information, but how that agreement is done is outside the scope of this specification. The mapping of TCE IP addresses and TCE addresses must be coordinated among the operators that shares the network. How that coordination is done is outside the scope of this specification.

- It is accepted that the inter-PLMN recorded information for Logged MDT from the non-shared nodes of  Participating Operators may be available to the Primary Operator.

- For signalling based activation, the operators that share a network must coordinate the TCE IP addresses and the TCE address mapping must be coordinated. How that coordination´ is done is outside the scope of this specification.

For UMTS and EPS the 3GPP Managment reference model, 3GPP TS 32.101 [1] is followed.

For 5GS the 3GPP Services Based Management Architecture, 3GPP TS 28.533 [20] is followed.

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| **2nd modified section** |

## 5.3 Requirements for Trace activation

### 5.3.1 Requirements for Trace Session activation

The high level requirements for Trace Session activation, common to both Management activation and Signalling based activation), are as follows:

- In the case of a subscriber Trace, the Trace Session will be activated for a certain subscriber whose identification (IMSI in UTRAN/CS/PS) shall be known in the NEs where subscriber Trace is needed.
In the case of E-UTRAN the IMSI shall not be included in the Trace Parameter Propagation data to the e-NodeB. In the case of NG-RAN the IMSI/SUPI shall not be included in the Trace Parameter Propagation data to the NG-RAN node.

- In the case of a UE Trace, the Trace Session will be activated for a certain UE whose identification (IMEI or IMEISV) shall be known in the NEs where UE Trace is needed. In the case of E-UTRAN, neither the IMEI nor IMEISV shall be included in the Trace Parameter Propagation data to the e-NodeB - Trace Session activation shall be possible for both home subscribers and visiting subscribers. In the case of NG-RAN, neither the IMEI/SUPI nor IMEISV shall be included in the Trace Parameter Propagation data to the NG-RAN node.

- There are two methods for Trace Session activation: Management activation and Signalling activation.

- For an established call/session within a Network Element, it is optional for the Network Element to start a Trace Recording Session for the associated Subscriber or UE upon receipt of the Trace activation request from the management system.

- A globally unique ID shall be generated for each Trace Session to identify the Trace Session.
This is called the Trace Reference.
The method for achieving this is to divide the Trace reference into Country, Operator, and trace Id.

- Trace Session may be activated from the management system simultaneously to multiple NEs with the same Trace Reference (i.e. same Trace Session).

- The Trace Scope and Depth shall be specified within the control and configuration parameters during Trace Session activation.

- There can be cases in a NE when it receives multiple Trace Session activations for the same connection (e.g. simultaneous CS/PS connections). In these cases the starting time of the Trace Session Activation and the starting time of the first Trace Recording Session is the same using signalling based activation. For these cases there are two different cases for the Trace Session activation in a Network Element when it receives another Trace Session activation to the same subscriber or MS:

- If the Trace Reference is equal to an existing one, a new Trace Session shall not be started;

- If the Trace Reference is not equal to an existing one, a new Trace Session may be started.

- The management system shall always provide the trace control and configuration parameters to the appropriate NEs at the time of Trace Session activation.

- The Trace collection entity shall be notified, in case of theTrace Session activation has failed, by the response message with the specific cause (e.g. overload) from the NE on which the Trace Session activation failure happened.

- It shall be possible to specify the trace reporting method (file-based vs. streaming) during Trace Session Activation.

- In case of streaming trace reporting method being selected, the data producer shall establish the connection to the data consumer upon Trace Session Activation and provide data consumer with information about Trace Session.

The high-level requirements for Trace Session activation, specific to Signalling Based activation, are as follows:

- Signalling based activation shall be able to capture signalling messages as early in a session as possible, e.g. by means of a piggybacked trace invocation message in the case of a new connection or new bearer setup

 For active users, it shall be possible to start trace recording when the trace order is received, by means of a distinct trace invocation message.

The high-level requirements for Trace Session activation, specific to Management activation, are as follows:

- In the case of a subscriber Trace, the Trace Session will be activated for a certain subscriber whose identification (IMSI in UTRAN/CS/PS or Public User Identity in IMS) shall be known in the NEs where subscriber Trace is needed.

 In the case of a Cell Traffic Trace, Trace Session activation should be possible for all calls active in a cell or multiple cells without knowledge of the UEs’ identification (IMEI or IMEISV).

- In the case of a Cell Traffic Trace, Trace Sessions should be activated for all the NEs where Cell Traffic Trace is specified.

- In the case of Cell Traffic Trace (in a shared network only), a Trace Session shall be started for UEs which are served by the Participating Operator that has made the request to the Primary Operator.

The high-level requirements for Trace Session activation specific for Service Level Tracing for IMS are as follows:

The following high-level OMA Service Level Tracing requirements apply [9]:

* [SLT-COM-2] with the following clarification:

- The OMA term *component* in the context of Service Level Tracing for IMS shall be understood as IMS NE and UE.

* [SLT-HL-2] with the following clarification:

- The OMA terms *device* and *component* shall be understood as UE and IMS NE, respectively;

- The IMS NEs HSS, P/I/S-CSCF, AS and UE, apply only.

* [SLT-AC-1] with the following clarification:

- The OMA term *Authorised Actor* shall be understood as NE, EM or NM;

- The OMA term *trace indication* shall be understood as Start Trigger Event.

* [SLT-AC-2] with the following clarification:

- The OMA term *Service Provider* shall be understood as Service Provider;

- The OMA term *marking request* shall be understood as the ability to send the Trace Parameter Configuration to either the UE or IMS NE.

* [SLT-AC-6]
* [SLT-AC-7] with the following clarification:

- The OMA term *criteria* shall be understood as Trace Configuration Parameters.

### 5.3.2 Requirements for starting a Trace Recording Session

The high level requirements for starting a Trace Recording Session, common to both Management activation and Signalling based activation), are as follows:

- It is optional for the NE to start a Trace Recording Session if there are insufficient resources available within the NE.

- The Trace Recording Session Reference shall be unique within a Trace Session.

- The Trace Recording Session should be started after appropriate start trigger events are detected.

The high level requirements for starting a Trace Recording Session, specific to Management activation, are as follows:

- Each NE shall generate its own Trace Recording Session Reference (i.e., independent Trace Recording Sessions).

- Each NE shall start the Trace Recording Session based upon the Trace control and configuration parameters received by the NE in the Trace Session activation.

- In the case of a trace other than Cell Traffic Trace, the correlation of Trace data will be done with a Trace Reference and IMSI / IMEI / IMEISV / Public User Identity.

- The Trace Recording Session can start only when the IMSI (in the case of a subscriber trace), the IMEI / IMEISV (in case of UE trace) or Public User Identity (in the case of IMS) is made available in the NE. In order to trace the early phases of the call the IMSI (in case of subscriber trace), the IMEI / IMEISV (in case of UE trace) or Public User Identity (in case of IMS) shall be made available to the NE as soon as practically possible. E.g. the IMSI and IMEI / IMEISV shall be made available to both Serving RNC and Drift RNC.

- In the case of E-UTRAN the Core Network node that triggers a Trace Recording Session to E-UTRAN shall either:

- provide a trace log including Trace Reference, Trace Recording Session Reference and the identity of the UE (i.e. IMSI or IMEI(SV) to the Trace Collection Entity, or

- provide a notification including Trace Reference, Trace Recording Session Reference and the identity of the UE (i.e. IMSI or IMEI(SV)) to the Trace Collection Entity.

- In the case of NG-RAN the Core Network node that triggers a Trace Recording Session to NG-RAN shall either:

- provide a trace log including Trace Reference, Trace Recording Session Reference and the identity of the UE (i.e. IMSI /SUPI or IMEI(SV) to the Trace Collection Entity, or

- provide a notification including Trace Reference, Trace Recording Session Reference and the identity of the UE (i.e. IMSI /SUPI or IMEI(SV)) to the Trace Collection Entity.

- In the case of a Cell Traffic Trace, the Trace Recording Session should start upon the Trace control and configuration parameters being received by the NEs in the Trace Session activation and the presence of call activity. Furthermore, the the Core Network node that handles the traced session should be requested to:

- provide a trace log including Trace Reference, Trace Recording Session Reference and the identity of the UE (i.e. IMSI or IMEI(SV) to the Trace Collection Entity, or

- provide a notification including Trace Reference, Trace Recording Session Reference and the identity of the UE (i.e. IMSI or IMEI(SV)) to the Trace Collection Entity.

- In the case of a Cell Traffic Trace (in a shared network only), the Trace Recording Session shall only be started for UEs which are served by the Participating Operator that has made the request to the Primary Operator.

The high-level requirements for starting a Trace Recording Session, specific for Service Level Tracing for IMS are as follows:

The following high-level OMA Service Level Tracing requirements apply [9]:

[SLT-HL-3] with the following clarification:

- The OMA term *marked* shall be understood as UE or IMS NE that has previously received Trace Parameter Configuration information.

- The OMA term *marking* shall be understood as Trace Parameter Configuration.

[SLT-COM-3] with the following clarification:

- The OMA term *indication for SLT* shall be understood as Start Trigger Event

- The OMA terms *inbound* and *outbound* protocols shall be understood as, for example, inbound SIP and outbound Diameter.

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| **3rd modified section** |

## 5.5 Requirements for Trace Data reporting

The high level requirements for Trace Data reporting, common to both Management activation/deactivation and Signalling Based Activation/Deactivation, are as follows (Trace record contents, file formats and file transfer mechanisms are defined in 3GPP TS 32.423 [3]):

- Trace records should be generated in each NE where a Trace Session has been activated and a Trace Recording Session has been started.

- Format of the Trace records shall be XML or GPB based on the Schema in TS 32.423 [3].

- In UMTS or EPS trace, the trace records should be transferred on the Itf-N to the Network Manager using one of two approaches: direct transfer from NE to NM or transfer from NE to NM via EM.

- Trace records may also be transferred to an external IP address (received in Trace Control and Configuration Parameters) in 3 ways:

1) Direct transfer from NE to IP address

2) Transfer from NE to IP address via management system

3) Transfer from NE to management system. The management system notifies the holder of the IP address that collects the files.

- The Trace Records in a shared node for a Participating Operator’s trace request should be collected by the Primary Operator’s NE and may be delivered through the Primary Operator's management system. The Trace records shall be made available to the Participating Operator’s management system.

The high-level requirements for stopping a Trace Recording Session, specific for Service Level Tracing for IMS are as follows:

The following high-level OMA Service Level Tracing requirements apply [9].

[SLT-HL-4] with the following clarification:

- Encoded trace information shall be Standard File Format. Standard File Format may not be applicable for encoded trace information at the UE.

[SLT-HL-7] with the following clarification:

- An instance of a service level trace across a PLMN shall be uniquely identifiable using the Trace Recording Session Reference.

[SLT-HL-8]

[SLT-COM-1] with the following clarification:

- Time stamping alone to determine the sequence of IMS NEs performing trace within the *service chain* shall not be used;

- Statistical information shall not be included as part of IMS NE characteristics;

- Service Level Tracing shall apply only to the IMS session layer and not the underlying transport layers.

[SLT-COM-4] with the following clarification:

- An IMS NE, in addition to providing trace information specific to a service that it has traced, may also make available other information, for example, timestamp and throughput information.

[SLT-NI-1] with the following clarification:

- The UE shall expose a standardised interface for Trace Parameter Configuration and the retrieval of trace information. This interface may not be standardized by 3GPP.

[SLT-NI-2] with the following clarification:

- An IMS NE shall transfer Trace records in Standard File Formats.

The high-level requirements for Trace Data reporting in case of file-based trace reporting are as follows:

- For transfer of Trace records FTP or secure FTP shall be used.

Editor's note: The transfer of Trace record from the UE is For Further Study.

The high-level requirements for Trace Data reporting in case of streaming trace reporting are as follows:

- The same connection between data producer and data consumer may be used for the reporting of Trace data under all Trace Recording Sessions of the same Trace Session reported by the same data producer.

- A connection from the data producer to the consumer shall be established and information about Trace Session shall be provided to the data consumer.

- Binary encoding shall be used for the transfer of all Trace data from data producer to the data consumer.

- The periodicity and amount of data in each data burst from data producer to data consumer shall maintain the data relevance while minimizing the amount of transport overhead.

- The data producer shall re-establish connection to the data consumer and provide the information about Trace Session upon unexpected connection termination (e.g. in cases such as re-start of data producer).

- It shall be possible to specify format of trace records based on GPB Schema in TS 32.423 [3].

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| **4th modified section** |

## 6.1 Business Level Requirements

REQ-MDT-CON-1 The Operator shall be able to collect measurements for Network Performance Management purposes from UEs within their network.

REQ-MDT-CON-2 The collected measurements shall be made available in a centralised entity.

REQ-MDT-CON-3 Operator shall be able to select specific set of subscribers for the measurement collection based on IMSI.

REQ-MDT-CON-4 Operator shall be able to select specific set of devices for the measurement collection based on IMEI(SV).

REQ-MDT-CON-5 Operator shall be able to select specific set of devices for the measurement collection based on geographical area.

REQ-MDT-CON-6 Operator shall be able to select specific set of devices for the measurement collection based on device capabilities.

REQ-MDT-CON-7 Operator shall be able to select specific set of subscribers based on IMSI and a geographical area for the measurement collection.

REQ-MDT-CON-8 Operator shall be able to select specific set of devices based on IMEI(SV) and a geographical area for the measurement collection.

REQ-MDT-CON-9 Operator shall be able to configure set of device capabilities and a geographical area for the measurement collection.

REQ-MDT-CON-10 Operator shall be able to select specific set of subscribers based on IMSI and a set of device capabilities and a geographical area for the measurement collection.

REQ-MDT-CON-11 Operator shall be able to select specific set of devices IMEI(SV) and capabilities and a geographical area for the measurement collection.

REQ-MDT-CON-12 Operator shall be able to select set of subscribers based on IMSI and a set of device capabilities for the measurement collection

REQ-MDT-CON-13 Operator shall be able to select specific set of devices IMEI(SV) and capabilities for the measurement collection.

REQ-MDT-CON-14 The operator shall be able to configure the duration of the measurement collection.

REQ-MDT-CON-15 The operator shall be able to configure the UE measurement types and events for collection.

REQ-MDT-CON-16 The operator shall be able to configure the type of UE measurement reporting and log formats i.e. raw measurement results or type of measurement aggregation (e.g. statistical aggregation of raw measurement results, sampling of raw measurement results, etc.)

REQ-MDT-CON-17 The management of MDT shall be independent from the management of SON functionalities

REQ-MDT-CON-18 The management of UE based network performance measurements shall allow the network operator to control whether or not it is possible to link a measurement result and related information (e.g. location information) to the user terminal type ID (i.e. IMEI-TAC).

REQ-MDT-CON-19 An operator that uses more than one PLMN shall be able to activate MDT in each of those PLMN andcontinue MDT cross its own PLMN IDs.

 NOTE: MDT data can be collected by a network operator operating with a set of PLMN\_IDs in different countries, but under the same common user privacy agreement in different countries in the same legal privacy protection domain.

REQ-MDT-CON-20 The operator shall be able to request collection of positioning information related to UE measurements.

REQ-MDT-CON-21 Operator shall be able to correlate the location information with the MDT UE measurements.

REQ-MDT-CON-22 MDT function shall support RAN sharing scenarios.

REQ-MDT-CON-23 The TCE used to collect MDT data shall be controlled by the same operator, as the operator that the user has given his consent to.

REQ-MDT-CON-24 Operator shall be able to minimize the amount of redundant MDT data.

REQ-MDT-CON-25 For management based MDT data collection, operator shall be able to specify the desired amount of MDT data and the desired number of UEs over period of time.

REQ-MDT-CON-26 The MOP shall be able to select UEs according to the POP intention.

REQ-MDT-CON-27 The recorded Subscriber and Equipment Trace data related to a particular POP shall be delivered to that POP but no other POP.

REQ-MDT-CON-28 The Operator shall be able to collect MBSFN UE measurements.

REQ-MDT-CON-29 The operator shall be able to request collection of sensor information related to UE measurements.

REQ-MDT-CON-30 The operator shall be able to configure MDT for a UE in dual connected mode both on primary and secondary node.

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| **5th modified section** |

### 6.2.1 Logged MDT and Immediate MDT requirements

All requirements are valid for Logged MDT and Immediate MDT functionality if not mentioned otherwise:

REQ-MDT-FUN-01 It shall be possible to collect UE measurements based on one or more IMEI(SV) number.

REQ-MDT-FUN-02 It shall be possible to collect UE measurements based on one or more IMSI number.

REQ-MDT-FUN-03 It shall be possible to collect UE measurement logs preceding and following a particular event (e.g. radio link failure).

REQ-MDT-FUN-04 Each UE measurement result shall be linked to a time stamp. Accuracy of time information including absolute time and relative time. The absolute time can refer to the *absoluteTimeStamp* IE defined in clause 6.2.2, 3GPP TS 36.331[18] for LTE or the *absoluteTimeInfo* IE in clause 11.3, 3GPP TS 25.331[19] for UMTS. The relative time can refer to the *relativeTimeStamp* IE defined in clause 6.2.2, 3GPP TS 36.331[18] for LTE or the *relativeTimeStamp* IE in clause 11.3, 3GPP TS 25.331[19] for UMTS.

REQ-MDT-FUN-05 The solutions for collecting UE measurements for the purpose of minimization of drive tests shall be able to work independently from SON support in the network.

REQ-MDT-FUN-06 It shall be possible to collect UE measurements in one or more cells or TA/RA/LA.

REQ-MDT-FUN-07 It shall be possible to collect UE measurements based on one or more IMSI in one or more cells or TA/RA/LA.

REQ-MDT-FUN-08 It shall be possible to collect UE measurements based on one or more IMEI(SV) in one or more cells or TA/RA/LA.

REQ-MDT-FUN-09 It shall be possible to configure UE measurement types and triggering conditions under which UE measurements would be collected for MDT.

REQ-MDT-FUN-10 Void.

REQ-MDT-FUN-11 It shall be possible to configure the condition of MDT data collection based on certain device capability information in one or more cells or in TA/RA/LA.

REQ-MDT-FUN-12 It shall be possible to configure MDT data collection based on one or more IMSI/SUPI in one or more cells or TA/RA/TA with a set of device capability information.

REQ-MDT-FUN-13 It shall be possible to configure MDT data collection based on one or more IMEI(SV) in one or more cells or TA/RA/TA with a set of device capability information.

REQ-MDT-FUN-14 It shall be possible to configure MDT data collection based on one or more IMEI(SV) with a set of device capability information.

REQ-MDT-FUN-15 It shall be possible to configure MDT data collection based on one or more IMSI/SUPI with a set of device capability information.

REQ-MDT-FUN-16 It shall be possible to activate a Trace Session for MDT data collection (or UE measurement collection for MDT purpose) independently from other mobility related performance measurements and call trace collection.

REQ-MDT-FUN-17 It shall be possible to deactivate MDT data collection by using Trace Reference.

REQ-MDT-FUN-18 It shall be possible to create a combine Trace Session for UE measurement collection and for subscriber and equipment/cell trace.

REQ-MDT-FUN-19 Void.

REQ-MDT-FUN-20 MDT activation shall be supported for a UE belonging to any PLMN within the same MDT PLMN list.

REQ-MDT-FUN-21 MDT data collection shall continue if a user is changing PLMN and the target PLMN within the same MDT PLMN list.

REQ-MDT-FUN-22 It shall be possible to collect positioning data related to UE measurements, which can be either geographical coordinates or raw positioning measurements sufficient to be input for a post processing positioning algorithm.

REQ-MDT-CON-23 It shall be possible for management system to correlate MDT UE measurements with location information.

NOTE: There may be regulatory obligation to delete MDT data after processing.

REQ-MDT-FUN-24 The PLMN where TCE collecting MDT data resides shall match the RPLMN of the UE providing the MDT data.

REQ-MDT-FUN-25 In the case of Management based MDT the MOP shall be able to select UEs according to the POP intention.

REQ-MDT-FUN-26 The recorded Subscriber and Equipment Trace data related to a particular POP shall contain information so that if can be sent to that POP.

REQ-MDT-FUN-27 In case of non-file-based trace reporting, binary encoding shall be used for the transfer of all MDT data from data producer to the data consumer.

REQ-MDT-FUN-28 It shall be possible to configure MDT report type to be used for logged MDT for NR.

REQ-MDT-FUN-29 Management based MDT configuration and signalling based MDT configuration shall be able to coexist in parallel for NR.

REQ-MDT-FUN-30 In case of logged MDT, it shall be possible to collect specific NR neighbour cell measurements on cell level.

REQ-MDT-FUN-31 It shall be possible to continue the actual ongoing process of logging for the UE in RRC INACTIVE state when the logging process for the UE starts in RRC IDLE state in NR.

REQ-MDT-FUN-32 In the case of immediate MDT, the measurement quantities shall be able to handle cell level RSRP/RSRQ/SINR in LTE and NR and beam level BRSRP/BRSRQ/BSINR in NR.

REQ-MDT-FUN-33 In the case of signalling based immediate MDT, configuration shall be able to propagate across RATs for the case of Xn inter-RAT intra-system handover to/from NR.

REQ-MDT-FUN-34 In the case of EN-DC scenario, for immediate MDT, configuration shall be able to be provided for both primary node and secondary node independently.

REQ-MDT-FUN-35 In the case of MR-DC, there is a split DRB in which data shall be sent over both MN and SN. In such a case, the PDCP data volume shall include the data sent over both MN and SN for that DRB.

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| **6th modified section** |

## A.3.1 Description

The aim of this use case is to check a UE, which is not working correctly.

The study can be initiated by the operator when he/she suspects that a UE not working according to the specifications or he/she would like to get more information on a specific UE, which is on the track or block EIR list.

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| **End of modified section** |