**3GPP TSG-SA5 Meeting #156 *S5-243888rev1***

**Maastricht, Netherlands, 19 - 23 August 2024**

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| *CR-Form-v12.3* |
| **CHANGE REQUEST** |
|  |
|  |  | **CR** |  | **rev** | **1** | **Current version:** |  |  |
|  |
| *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 | **X** |

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|  |
| ***Title:***  | Rel-17 CR 32.422 Clarification on metric identifier for IEs of complex type  |
|  |  |
| ***Source to WG:*** | Nokia |
| ***Source to TSG:*** | S5 |
|  |  |
| ***Work item code:*** | TEI17 |  | ***Date:*** | 2024-08-08 |
|  |  |  |  |  |
| ***Category:*** |  |  | ***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-17 (Release 17)Rel-18 (Release 18)Rel-19 (Release 19) Rel-20 (Release 20)* |
|  |  |
| ***Reason for change:*** | It is underspecified how individual elements of a complex IE shall be indicated in metric identifier. |
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| ***Summary of change:*** | Clarify how to indicate individual elements of a complex IE in metric identifier.  |
|  |  |
| ***Consequences if not approved:*** | It is not specified how single elements of a IE can be referenced in metric identifier. |
|  |  |
| ***Clauses affected:*** | 10.4 |
|  |  |
|  | **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:*** |  |

***First change***

# 10 Metric identifier

## 10.1 General

The metric identifiers are a sequence of items separated by ".". The sequence of items identifying a measurement is organised from the general to the particular. The individual items follow the Lower Camel Case naming convention [61]. There are different sequences for Immediate MDT, Logged MDT, Logged MBSFN MDT, Trace, RLF reports and RCEF reports.

## 10.2 Immediate MDT

The measurement names for Immediate MDT measurements consist of the following items:

- The first item identifies the MDT mode, i.e. "immediateMdt".

- The second item identifies the radio access technology (RAT), i.e. "nr", "lte" or "umts"

- The third item identifies the name of the measurement itself (e.g. m1, m2), see TS 37.320 [30].

- An additional item of the measurement attribute name may be present, e.g. "rsrp" or "ueLocation" or "ulThpTime" see TS 32.423 [3].

Possible examples:

- immediateMdt.nr.m1.rsrp

- immediateMdt.nr.m2

- immediateMdt.nr.m4

- immediateMdt.nr.m5.ulThpTime

- immediateMdt.nr.m6

- immediateMdt.nr.m7

- immediateMdt.nr.m8

- immediateMdt.nr.m9

- immediateMdt.lte.m2

## 10.3 Logged MDT and Logged MBSFN MDT

The measurement names for Logged MDT and Logged MBSFN MDT measurements consist of the following items:

- The first item identifies the MDT mode, i.e. "loggedMdt" or "loggedMbsfnMdt".

- The second item is optional and identifies the measurement attribute name, e.g. "rsrp" or "ueLocation".

Possible examples:

- loggedMdt.rsrp

- loggedMbsfnMdt

## 10.4 Trace

The measurement names for Trace messages consist of the following items:

- The first item identifies the job type, i.e. "trace".

- The second item identifies the network element type (e.g. amf, upf, gnbCuCp, gnbCuUp, gnbDu), see clause 5.4.

- The third item is optional and identifies the interface (e.g. n1, n2, n4, ng-c, xn-c, uu, f1-c, e1, x2-c) , see clause 5.5.

- The fourth item is optional and identifies the message name e.g. "ueContextReleaseRequest" or "handoverFailure".

- The fifth item is optional and identifies the IE name e.g. "cause". If the IE is a complex structure, subsequent items can be defined according to the hierarchy of the IE data structure, where each hierarchy level is separated by ".". Optionally the ASN.1 IE name, if existing, is used as is (i.e. no adjustment to Lower Camel Case naming convention).

Possible examples:

- trace.amf.n1

- trace.amf.n1.registrationRequest.requestedNssai

- trace.amf.n1.serviceRequest.serviceRequestMessageIdentity

- trace.amf.n1.serviceRequest.ulDataStatus

- trace.mme.s1-mme.ueContextReleaseRequest.cause

- trace.gnbCuCp.uu.CounterCheck.counterCheck.drb-CountMSB-InfoList.countMSB-Uplink

## 10.5 RLF report and RCEF report

The measurement names for RLF reports and RCEF reports consist of the following items:

- The first item identifies the job type, i.e. "rlfReport" or "rcefReport".

- The second item is optional and identifies the measurement attribute name, e.g. "rsrp" or "ueLocation".

Possible examples:

- rlfReport.rsrp

- rcefReport

***End of changes***

Annex A (normative):Trace failure notification file format

# A.1 Global structure

See 3GPP TS 32.615 [27].

The following XML namespaces are potentially used in Trace failure notification XML files:

- traceFailureNotification.xsd (see A.5)

# A.2 XML elements fileHeader and fileFooter

## A.2.1 XML elements fileHeader

See 3GPP TS 32.615 [27]

## A.2.2 XML element fileFooter

See 3GPP TS 32.615 [27]

# A.3 Trace failure notification specific XML elements

See A.5.

# A.4 Trace IRP XML File Name Conventions

For Trace failure notification XML File Name Conventions the generic file name definitions as specified by the FT IRP apply (see [28]) with the “specificIRP extension” defined below.

<SenderType>.<SenderName>

SenderType field is the type of NE defined by IOC attribute managedElementType in 3GPP TS 32.622 [35] that recorded and sent the trace failure notification file; SenderName field is the identifier of the NE that recorded and sent the trace failure notification file.

Some examples describing the use of the “specificIRP\_extension” in Trace failure notification naming:

specificIRP\_extension: MME.MME04
meaning: file produced by MME<MME04>.

specificIRP\_extension: ENB.ENB122
meaning: file produced by ENB<ENB122>.

file name: CT201105131405-060012MME.MME04
meaning: unique call trace (Trace failure notification) file produced by MME<MME04> on May 13, 2011 at 14:05 local with a time differential of -6 hours against UTC and expiring in 12 hours after creation

file name: CT201105131315-060012ENB.ENB122\_-\_2
meaning: second non-unique (RC=”2”) call trace (Trace failure notification) file produced by ENB<ENB122> on May 13, 2011 at 13:15 local with a time differential of -6 hours against UTC and expiring in 12 hours after creation.

# A.5 Trace failure notification file XML schema

<?xml version="1.0" encoding="UTF-8"?>

<!--

 3GPP TS 32.422 Trace

 Trace failure notification file XML schema

 traceFailureNotification.xsd

-->

<schema

 targetNamespace=

"http://www.3gpp.org/ftp/specs/archive/32\_series/32.422#traceFailureNotification"

 elementFormDefault="qualified"

 xmlns="http://www.w3.org/2001/XMLSchema"

 xmlns:tfn=

"http://www.3gpp.org/ftp/specs/archive/32\_series/32.422#traceFailureNotification"

 xmlns:xe=

"http://www.3gpp.org/ftp/specs/archive/32\_series/32.305#notification"

>

 <import

 namespace=

"http://www.3gpp.org/ftp/specs/archive/32\_series/32.305#notification"

 />

 <!-- XML types specific for trace failure notifications -->

<complexType name="TraceReference">
 <sequence>
 <element name="MCC" type="short" minOccurs="0"/>

 <element name="MNC" type="short" minOccurs="0"/>

 <element name="TRACE\_ID" type="integer"/>

 </sequence>

</complexType>

<complexType name="NotifyTraceRecordingSessionFailure">

 <complexContent>

 <extension base="xe:Notification">

 <sequence>

 <element name="body">

 <complexType>

 <sequence>

 <element name="NeId" type="string" minOccurs="0"/>

 <element name="TraceRecordingSessionReference" type="hexBinary" maxLength="4" minOccurs="0"/>

 <element name="TraceReference" type="tfn:TraceReference"/>

 <element name="Reason" type="string" minOccurs="0"/>

 </sequence>

 </complexType>

 </element>

 </sequence>

 </extension>

 </complexContent>

</complexType>

<element name="NotifyTraceRecordingSessionFailure" type="tr:NotifyTraceRecordingSessionFailure"/>

</schema>

Annex B (informative):Examples for alternative ways to route the Trace file to the TCE

# B.1 Routing the Trace file directly to the TCE

Routing the Trace file directly to the TCE may be used when the eNBs are located on a network that is under the operator's full control, not requiring secure connection between the NE and the TCE. Minimise the signalling load through the management system. A second reason can be to minimise the signalling load through the management system. A third reason can be that the operator wants to reuse secure connections between the NE and the TCEs.

# B.2 Routing the Trace file via the management system

Routing the Trace file via the NE’s management system to the TCE may be used when the NEs are located a network that is outside the operator's control and a secure connection between the NE and the management system is to be reused (via secure gateways etc). Another reason can be that the operator wants to minimise the number of connections from a NE to TCEs. A third reason can be that a Master Operator and Participating Operator want to reuse existing management connections.

Annex C (informative):Change history

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| **Change history** |
| **Date** | **TSG #** | **TSG Doc.** | **CR** | **Rev** | **Subject/Comment** | **Old** | **New** |
| Jun 2006 | SA\_32 | SP-060261 | 0021 | -- | Introduction of Service Level Tracing for IMS | 6.5.0 | 7.0.0 |
| Sep 2006 | SA\_33 | SP-060552 | 0022 | -- | Add general mechanism for starting trace recording sessions at IMS Network Elements and UE - to support end-to-end Service Level Tracing for IMS | 7.0.0 | 7.1.0 |
| Sep 2006 | SA\_33 | SP-060552 | 0023 | -- | Add definition of Service Level Tracing Start Triggering Event | 7.0.0 | 7.1.0 |
| Sep 2006 | SA\_33 | SP-060552 | 0024 | -- | Clarification of Trace session deactivation mechanism | 7.0.0 | 7.1.0 |
| Sep 2006 | SA\_33 | SP-060552 | 0025 | -- | Add sending of trace control and configuration parameters for service level tracing | 7.0.0 | 7.1.0 |
| Sep 2006 | SA\_33 | SP-060552 | 0026 | -- | Add starting trace recording at IMS network elements | 7.0.0 | 7.1.0 |
| Sep 2006 | SA\_33 | SP-060552 | 0027 | -- | Add charging concepts for Service Level Tracing for IMS | 7.0.0 | 7.1.0 |
| Sep 2006 | SA\_33 | SP-060552 | 0028 | -- | Add stopping trace recording mechanism for service level tracing | 7.0.0 | 7.1.0 |
| Dec 2006 | SA\_34 | SP-060727 | 0029 | -- | Clarification to the sending of optional trace parameters | 7.1.0 | 7.2.0 |
| Dec 2006 | SA\_34 | SP-060727 | 0030 | -- | Network initiated re-authentication for SLT | 7.1.0 | 7.2.0 |
| Dec 2006 | SA\_34 | SP-060727 | 0031 | -- | Trace Session Deactivation at an IMS NE | 7.1.0 | 7.2.0 |
| Dec 2006 | SA\_34 | SP-060727 | 0032 | -- | Service level trace processes at the UE | 7.1.0 | 7.2.0 |
| Dec 2006 | SA\_34 | SP-060727 | 0033 | -- | Reception of SLT Start Trigger Event at an IMS NE | 7.1.0 | 7.2.0 |
| Dec 2006 | SA\_34 | SP-060727 | 0034 | -- | Service level tracing for IMS starting mechanism | 7.1.0 | 7.2.0 |
| Dec 2006 | SA\_34 | SP-060727 | 0035 | -- | Consistent usage of Service Level Tracing Start Triggering Event | 7.1.0 | 7.2.0 |
| Dec 2006 | SA\_34 | SP-060727 | 0036 | -- | Retrieval of Trace Records from a UE | 7.1.0 | 7.2.0 |
| Mar 2008 | SA\_39 | SP-080069 | 0037 | -- | Add Signalling Based Trace Activation procedures to EPC and E-UTRAN | 7.2.0 | 8.0.0 |
| Jun 2008 | SA\_40 | SP-080287 | 0038 | -- | Add definition of Trace control and configuration parameters for EPC and E-UTRAN | 8.0.0 | 8.1.0 |
| Jun 2008 | SA\_40 | SP-080287 | 0039 | -- | Add Trace Session deactivation procedures | 8.0.0 | 8.1.0 |
| Jun 2008 | SA\_40 | SP-080287 | 0040 | -- | Add procedures for starting/stopping a trace recording session in EPC and E-UTRAN | 8.0.0 | 8.1.0 |
| Sep 2008 | SA\_41 | SP-081211 | 0041 | -- | Providing subscriber identities for Cell Traffic Trace - Procedures | 8.1.0 | 8.2.0 |
| Dec 2008 | SA\_42 | SP-080846 | 0044 | - | Identifying IMS network elements and interfaces for trace | 8.2.0 | 8.3.0 |
| Dec 2008 | SA\_42 | SP-080846 | 0045 | - | Trace starting and stopping trigger events for IMS | 8.2.0 | 8.3.0 |
| Dec 2008 | SA\_42 | SP-080846 | 0042 | - | Introduction of EPS in 32.422 | 8.2.0 | 8.3.0 |
| Dec 2008 | SA\_42 | SP-080846 | 0043 | - | Fix inconsistencies in the definition of trace levels, trace reference parameter | 8.2.0 | 8.3.0 |
| Mar 2009 | SA\_43 | SP-090207 | 0046 | - | Refinement of the Trace Reference | 8.3.0 | 8.4.0 |
| Mar 2009 | SA\_43 | SP-090207 | 0047 | - | Enhancement of trigger events in 3GPP TS 32.423 - align with 29.274, 29.272 | 8.3.0 | 8.4.0 |
| Mar 2009 | SA\_43 | SP-090207 | 0048 | - | Trace Session activation/deactivation to PGW in case of non-3GPP access network | 8.3.0 | 8.4.0 |
| Mar 2009 | SA\_43 | SP-090207 | 0049 | - | Add reference and definitions for trace failure notifications in 32.422 | 8.3.0 | 8.4.0 |
| Mar 2009 | SA\_43 | SP-090207 | 0050 | - | Use S1-DOWNLINK NAS TRANSPORT for the trace for TAU and some failed procedures | 8.3.0 | 8.4.0 |
| Mar 2009 | SA\_43 | SP-090207 | 0051 | - | EPC signalling activation mechanisms | 8.3.0 | 8.4.0 |
| Mar 2009 | SA\_43 | SP-090207 | 0052 | - | EPC and E-UTRAN signalling deactivation mechanisms | 8.3.0 | 8.4.0 |
| Mar 2009 | SA\_43 | SP-090207 | 0053 | - |  Add the missing PGW to EPC trace recording session stopping mechanism | 8.3.0 | 8.4.0 |
| Jun 2009 | SA\_44 | SP-090289 | 0054 | - | Corrections on XML file format of the trace failure notifications | 8.4.0 | 8.5.0 |
| Jun 2009 | SA\_44 | SP-090289 | 0055 | - | Correcting Trace activation/deactivation flow to P-GW in case of PMIP based S5 interface | 8.4.0 | 8.5.0 |
| Jun 2009 | SA\_44 | SP-090289 | 0056 | - | Add missing Trace Interface list | 8.4.0 | 8.5.0 |
| Sep 2009 | SA\_45 | SP-090542 | 0057 | - | Clarification on Trace depth level | 8.5.0 | 8.6.0 |
| Sep 2009 | SA\_45 | SP-090542 | 0058 | - | Alignment of EPS Trace with TS 36.413 | 8.5.0 | 8.6.0 |
| Sep 2009 | SA\_45 | SP-090534 | 0061 | - | Add reference to file format for sending IMSI/IMEI information from the MME | 8.5.0 | 8.6.0 |
| Sep 2009 | SA\_45 | SP-090534 | 0062 | - | Misleading statement on when cell traffic trace should be started | 8.5.0 | 8.6.0 |
| Sep 2009 | SA\_45 | SP-090542 | 0059 | - | Correction on XML file format for Trace failure notification | 8.6.0 | 9.0.0 |
| Sep 2009 | SA\_45 | SP-090627 | 0060 | - | Correction of Overview of Intra-PLMN and Inter-PLMN Signalling Activation | 8.6.0 | 9.0.0 |
| Jan 2010 | -- | -- | -- | -- | Removal of track changes | 9.0.0 | 9.0.1 |
| Jun 2010 | SA\_48 | SP-100412 | 0064 | - | Clarification on E-UTRAN signalling based trace activation | 9.0.1 | 9.1.0 |
| Jun 2010 | SA\_48 | SP-100412 | 0065 | - | Corrections on UTRAN signalling based trace activation | 9.0.1 | 9.1.0 |
| Jun 2010 | SA\_48 | SP-100412 | 0066 | - | Correct List of EPC TRACE Starting Mechanisms | 9.0.1 | 9.1.0 |
| Jun 2010 | SA\_48 | SP-100264 | 0063 | - | Enhancement on E-UTRAN Trace Recording Session failure | 9.1.0 | 10.0.0 |
| Sep 2010 | SA\_49 | SP-100488 | 0071 | - | Corrections to start and stop triggering events in MME | 10.0.0 | 10.1.0 |
| Sep 2010 | SA\_49 | SP-100489 | 0067 | - | Addition of PGW in management based trace | 10.0.0 | 10.1.0 |
| Sep 2010 | SA\_49 | SP-100489 | 0068 | - | Correction of the figure of EPC Trace Session activation mechanism | 10.0.0 | 10.1.0 |
| Sep 2010 | SA\_49 | SP-100489 | 0069 | - | Unclarity about the list of Trace Control and Configuration parameters in case of management based activation | 10.0.0 | 10.1.0 |
| Dec 2010 | SA\_50 | SP-100831 | 0076 | -- | Add missing interfaces S3, S4 and S6d in the interface table of SGSN | 10.1.0 | 10.2.0 |
| Dec 2010 | SA\_50 | SP-100858 | 0078 | -- | Refine Trace conflict resolution to restrict no parallel TRSRs under one TR | 10.1.0 | 10.2.0 |
| Dec 2010 | SA\_50 | SP-100833 | 0074 | 3 | Add interfaces S13 (MME trace) and S13' (SGSN trace) - Align with 32.421 | 10.1.0 | 10.2.0 |
| Dec 2010 | SA\_50 | SP-100753 | 0080 | 1 | Adding the procedures for managing Minimization of Drive Tests (MDT) functionality | 10.1.0 | 10.2.0 |
| Jan 2011 | - | - | - | - | MCC editorial clean-up of clause 5.10.x numbering introduced by CR0080R1 from SA#50 | 10.2.0 | 10.2.1 |
| Mar 2011 | SA\_51 | SP-110102 | 0081 | 2 | Correcting the handling of Minimization of Drive Tests (MDT) trace at handovers | 10.2.1 | 10.3.0 |
| Mar 2011 | SA\_51 | SP-110102 | 0083 | 1 | Adding definition of Stage 3 coding of Minimization of Drive Tests (MDT) parameters | 10.2.1 | 10.3.0 |
| Mar 2011 | SA\_51 | SP-110094 | 0085 | 1 | Correcting start and stop triggering events in Mobility Management Entity (MME) | 10.2.1 | 10.3.0 |
| Mar 2011 | SA\_51 | SP-110095 | 0088 | 2 | Clarify trace parameters for E-UTRAN activation mechanism and update EPC starting mechanism - Align with 32.441 Trace Management IRP Requirements | 10.2.1 | 10.3.0 |
| Mar 2011 | SA\_51 | SP-110094 | 0092 | 1 | Correcting start triggering event in MME in case of HSS Initiated Trace Session Activation for the attach procedure | 10.2.1 | 10.3.0 |
| Mar 2011 | SA\_51 | SP-110094 | 0094 | 1 | Change the support qualifier of 'List of NE types to trace parameter' to conditional mandatory | 10.2.1 | 10.3.0 |
| Mar 2011 | SA\_51 | SP-110095 | 0096 | 1 | Add support for subscriber trace on PDN-GW for GTP based S2b - Align with SA2 TS 23.402 | 10.2.1 | 10.3.0 |
| Mar 2011 | SA\_51 | SP-110102 | 0098 | - | Removing UE capability from Minimization of Drive Tests (MDT) parameters | 10.2.1 | 10.3.0 |
| Mar 2011 | SA\_51 | SP-110102 | 0099 | - | Change ""UE based network performance measurements" to "MDT" - Align cross-3GPP terminology on MDT work | 10.2.1 | 10.3.0 |
| Mar 2011 | SA\_51 | SP-110102 | 0100 | 2 | Align the reporting trigger with RAN2 TS 37.320 | 10.2.1 | 10.3.0 |
| Mar 2011 | SA\_51 | SP-110102 | 0101 | 2 | Update the E-UTRAN activation mechanism for area based MDT | 10.2.1 | 10.3.0 |
| Mar 2011 | SA\_51 | SP-110095 | 0102 | 1 | Add the trace interfaces for EIR and HSS | 10.2.1 | 10.3.0 |
| Mar 2011 | SA\_51 | SP-110102 | 0103 | 3 | Using TCE identity in logged MDT configuration | 10.2.1 | 10.3.0 |
| Mar 2011 | SA\_51 | SP-110095 | 0110 | 1 | Clarify inconsistency in EPC initiated MDT text | 10.2.1 | 10.3.0 |
| Mar 2011 | SA\_51 | SP-110186 | 0107 | 3 | Adding user consent handling in MDT activation | 10.2.1 | 10.3.0 |
| May 2011 | SA\_52 | SP-110292 | 0103 | 4 | Clarify that there can be only one TRSR per TR at a given time per UE trace session for signalling based trace. | 10.3.0 | 10.4.0 |
| May 2011 | SA\_52 | SP-110292 | 0114 | - | Modify UMTS M2 measurement - Align with RAN2 25.215 and 25.225 | 10.3.0 | 10.4.0 |
| May 2011 | SA\_52 | SP-110292 | 0115 | 3 | Add error handling for Management based MDT scenarios | 10.3.0 | 10.4.0 |
| May 2011 | SA\_52 | SP-110292 | 0116 | 3 | Add error handling for EPC Signalling based MDT scenarios | 10.3.0 | 10.4.0 |
| May 2011 | SA\_52 | SP-110292 | 0120 | 1 | Add Area scope validation for cell level granularity | 10.3.0 | 10.4.0 |
| May 2011 | SA\_52 | SP-110292 | 0121 | 2 | Add error handling for PS domain MDT activation scenarios | 10.3.0 | 10.4.0 |
| May 2011 | SA\_52 | SP-110292 | 0122 | 2 | Add error handling for CS domain MDT activation scenarios | 10.3.0 | 10.4.0 |
| May 2011 | SA\_52 | SP-110292 | 0124 | 2 | Aligning MDT activation procedures with SA3 privacy requirements | 10.3.0 | 10.4.0 |
| May 2011 | SA\_52 | SP-110292 | 0125 | 2 | Adding definition of area based MDT and subscription based MDT | 10.3.0 | 10.4.0 |
| May 2011 | SA\_52 | SP-110292 | 0128 | 2 | Add behaviour of signalling-based MDT when area criterion is not met | 10.3.0 | 10.4.0 |
| May 2011 | SA\_52 | SP-110286 | 112 | - | Update file naming convention for Trace failure notification files | 10.4.0 | 11.0.0 |
| Sep 2011 | SA\_53 | SP-110537 | 0134 | - | Add PS domain MDT activiation procedure after UE attach | 11.0.0 | 11.1.0 |
| Sep 2011 | SA\_53 | SP-110537 | 0141 | 1 | RAI in MDT/LAI area scope | 11.0.0 | 11.1.0 |
| Sep 2011 | SA\_53 | SP-110537 | 0149 | 1 | MDT measurement alignment | 11.0.0 | 11.1.0 |
| Sep 2011 | SA\_53 | SP-110537 | 0151 | - | Error correction on description of "TCE IP address" in MDT report | 11.0.0 | 11.1.0 |
| Sep 2011 | SA\_53 | SP-110538 | 0154 | 1 | Cleanup text forpropagation of Immediate MDT for inter MME scenario | 11.0.0 | 11.1.0 |
| Sep 2011 | SA\_53 | SP-110537 | 0156 | 1 | Correction in flow chart for area based MDT activation in E-UTRAN | 11.0.0 | 11.1.0 |
| Sep 2011 | SA\_53 | SP-110538 | 0157 | 1 | Enhancement for MDT Initiation with IMEI-TAC usage | 11.0.0 | 11.1.0 |
| Sep 2011 | SA\_53 | SP-110537 | 0160 | 1 | Align the user consent description with RAN3 and add description on activating MDT in home operator that uses more than one PLMN | 11.0.0 | 11.1.0 |
| Dec 2011 | SA\_54 | SP-110715 | 0176 | - | Clean-up Immediate MDT handling at handover | 11.1.0 | 11.2.0 |
| Dec 2011 | SA\_54 | SP-110716 | 0177 | 2 | Adding RLF reporting to Trace function | 11.1.0 | 11.2.0 |
| Dec 2011 | SA\_54 | SP-110715 | 0182 | 1 | Error handling correction | 11.1.0 | 11.2.0 |
| Dec 2011 | SA\_54 | SP-110715 | 0184 | 2 | Add TCE address for UTRAN MDT activation | 11.1.0 | 11.2.0 |
| Dec 2011 | SA\_54 | SP-110715 | 0188 | - | Support multiple cells in area based MDT | 11.1.0 | 11.2.0 |
| Dec 2011 | SA\_54 | SP-110715 | 0174 | 1 | Align the Reporting Trigger parameter with the RAN implementation | 11.1.0 | 11.2.0 |
| Dec 2011 | SA\_54 | SP-110715 | 0164 | 2 | Correct MDT UE selection procedures to protect user privacy | 11.1.0 | 11.2.0 |
| Mar 2012 | SA\_55 | SP-120053 | 0190 | 1 | Clarify handling of anonymization when JobType is MDT+Trace - to align with RAN3 36.413 CR#0954 CR R3-113117 | 11.2.0 | 11.3.0 |
| Mar 2012 | SA\_55 | SP-120053 | 0193 | 1 | Aligning the MDT specification with RAN specifications TS 36.413 and TS 25.413 | 11.2.0 | 11.3.0 |
| Mar 2012 | SA55 | SP-120054 | 0194 | 1 | Add trace session deactivation of RLF reporting | 11.2.0 | 11.3.0 |
| June-2012 | SA56 | SP-120368 | 0199 | -- | Remove MDT Country Restriction | 11.3.0 | 11.4.0 |
| June-2012 | SA56 | SP-120368 | 0201 | -- | Align MDT Reporting with TS 32.421 | 11.3.0 | 11.4.0 |
| June-2012 | SA56 | SP-120367 | 0205 | 1 | Correcting the Trace Recording Session stopping mechanism at eNB | 11.3.0 | 11.4.0 |
| June-2012 | SA56 | SP-120369 | 0207 | -- | Editorial cleanup | 11.3.0 | 11.4.0 |
| Sep-2012 | SA57 | SP-120645 | 0214 | 1 | Clarification of different interpretations of bit significance in the "List of interfaces" parameter bitmap | 11.4.0 | 11.5.0 |
| Sep-2012 | SA57 | SP-120570 | 0219 | 3 | Correcting the missing event threshold parameters for the event 1F and event 1l reporting triggers | 11.4.0 | 11.5.0 |
| Sep-2012 | SA57 | SP-120571 | 0220 | 1 | Adding new MDT parameters to align with TS 37.320 | 11.4.0 | 11.5.0 |
| Sep-2012 | SA57 | SP-120570 | 0223 | - | Add combined Trace and Immediate MDT job type to the MDT parameters scope | 11.4.0 | 11.5.0 |
| Sep-2012 | SA57 | SP-120627 | 0226 | 1 | Reference list correction to align with the corrected TS 29.212 title | 11.4.0 | 11.5.0 |
| Dic-2012 | SA-58 | SP-120795 | 0217 | 2 | Add RCEF reporting | 11.5.0 | 11.6.0 |
| SP-120796 | 0221 | 4 | All RRM triggers to MDT in LTE and UMTS |
| SP-120783 | 0227 | 1 | Correction of Trace Recording Session Reference (TRSR) data type |
| SP-120796 | 0229 | 1 | Cleanup on the scope,references and abbreviations |
| SP-120794 | 0234 | 1 | Correction of UMTS M2 Reporting trigger configuration |
| SP-120796 | 0236 | 1 | Adding E-CID positioning measurement collection for MDT |
| SP-120796 | 0237 | 2 | Introducing common measurement period for MDT measurements |
| SP-120795 | 0238 | 1 | update mdt reporting trigger restriction text |
| SP-120794 | 0240 | - | add report amount clarification |
| SP-120795 | 0241 | - | split MDT measurements into UL-DL |
| SP-120796 | 0243 | 1 | Addition of Network Sharing |
| SP-120795 | 0244 | 1 | Add measurement M7 |
| SP-120795 | 0245 | - | Combine measurement period parameters for LTE |
| SP-120794 | 0247 | - | Clarify report interval parameter scope |
| Mar-2013 | SA-59 | SP-130048 | 0248 | 3 | Add anonymization mechanism for UMTS MDT | 11.6.0 | 11.7.0 |
| SP-130047 | 0250 | - | Correct TAC abbreviation error |
| SP-130048 | 0251 | 1 | Support for Inter-RAT Trace/MDT |
| June-2013 | SA-60 | SP-130304 | 0252 | - | Correction in the UMTS anonymization procedure | 11.7.0 | 11.8.0 |
|  |  |  |  |  | Correction in the history table to the right version | 11.8.0 | 11.8.1 |
| Dec 2013 | SA-62 | SP-130615 | 0260 | 1 | Add description on RLF reporting mechanism | 11.8.1 | 12.0.0 |
| Mar-2014 | SA-63 | SP-140031 | 0262 | 1 | Add missing figure for RCEF reporting example scenario | 12.0.0 | 12.1.0 |
| Jun-2014 | SA-64 | SP-140344 | 0264 | 1 | Add missing MDT configuration parameters. Align with RAN specifications | 12.1.0 | 12.2.0 |
| 0266 | 1 | Corrections on location measurements for MDT |
| 0270 | - | add missing anonymization scenario |
| Sep-2014 | SA-65 | SP-140570 | 0272 | 1 | Adding reference for location measurement Angle of Arrival for MDT | 12.2.0 | 12.3.0 |
| Dec-2014 | SA-66 | SP-140800 | 0277 | 1 | Super CR for work item Network Sharing. | 12.3.0 | 12.4.0 |
| Jun 2015 | SA-68 | SP-150315 | 0278 | 2 | Multi-Broadcast Single Frequency Network (MBSFN) Minimization of Drive Tests (MDT) enhancement. | 12.4.0 | 13.0.0 |

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| **Change history** |
| **Date** | **Meeting** | **TDoc** | **CR** | **Rev** | **Cat** | **Subject/Comment** | **New version** |
| 2016-06 | SA#72 | SP-160407 | 0011 | - | F | Update the link from IRP Solution Set to IRP Information Service | 13.2.0 |
| 2017-03 | SA#75 | - | - | - |  | Promotion to Release 14 without technical change | 14.0.0 |
| 2017-06 | SA#76 | SP-170510 | 0015 | 2 | B | Modifications to align with IS to support Configuration Management for mobile networks that include virtualized network functions | 14.1.0 |
| 2018-03 | SA#79 | SP-180060 | 0016 | 1 | B | Add attribute peeParametersList to Solution Set definitions | 15.0.0 |
| 2017-03 | SA#75 |  |  |  |  | Promotion to Release 14 without technical change | 14.0.0 |
| 2017-09 | SA#77 | SP-170655 | 0279 | - | F | Modification of parameters of Area Scope for MDT | 15.0.0 |
| 2018-06 | SA#80 | SP-180434 | 0285 | 1 | B | Add support for 5G Trace (scope, references, definitions, abbreviations) | 15.1.0 |
| 2018-06 | SA#80 | SP-180434 | 0286 | 2 | B | Add support for 5G Trace (management activation in 5GC and NG-RAN) | 15.1.0 |
| 2018-06 | SA#80 | SP-180434 | 0287 | 2 | B | Add support for 5G Trace (signaling activation in 5GC) | 15.1.0 |
| 2018-06 | SA#80 | SP-180434 | 0288 | 1 | B | Add support for 5G Trace (signaling activation in NG-RAN) | 15.1.0 |
| 2018-06 | SA#80 | SP-180434 | 0289 | 2 | B | Add support for 5G Trace (management deactivation in 5GC and NG-RAN) | 15.1.0 |
| 2018-06 | SA#80 | SP-180434 | 0291 | 2 | B | Add support for 5G Trace (management trace recording session starting in 5GC and NG-RAN) | 15.1.0 |
| 2018-06 | SA#80 | SP-180434 | 0292 | 2 | B | Add support for 5G Trace (signaling trace recording session starting in 5GC and NG-RAN) | 15.1.0 |
| 2018-06 | SA#80 | SP-180434 | 0293 | 2 | B | Add support for 5G Trace (management trace recording session stopping in 5GC and NG-RAN) | 15.1.0 |
| 2018-06 | SA#80 | SP-180434 | 0294 | 2 | B | Add support for 5G Trace (signaling trace recording session stopping in 5GC and NG-RAN) | 15.1.0 |
| 2018-06 | SA#80 | SP-180434 | 0295 | 1 | B | Add support for 5G Trace (triggering events in 5GC) | 15.1.0 |
| 2018-06 | SA#80 | SP-180434 | 0296 | 2 | B | Add support for 5G Trace (5G NEs, interfaces and trace parameters) | 15.1.0 |
| 2018-06 | SA#80 | SP-180434 | 0297 | - | B |  Add support for 5G Trace (5G trace reporting) | 15.1.0 |
| 2019-06 | SA#84 | SP-190385 | 0301 | 1 | F | Update eNB/NG-RAN List of interfaces for NSA support of trace activation | 15.2.0 |
| 2019-12 | SA#86 | SP-191181 | 0302 | - | B | New references | 16.0.0 |
| 2019-12 | SA#86 | SP-191181 | 0303 | - | B | Addition of general management activation mechanisms for 5GS | 16.0.0 |
| 2019-12 | SA#86 | SP-191181 | 0304 | - | B | Addition of general signalling activation mechanisms for 5GS | 16.0.0 |
| 2019-12 | SA#86 | SP-191181 | 0305 | - | B | Update 5GS deactivation mechanisms | 16.0.0 |
| 2019-12 | SA#86 | SP-191181 | 0306 | - | B | Update trace recording session start-stop | 16.0.0 |
| 2019-12 | SA#86 | SP-191181 | 0307 | 1 | B | Update trace configuration parameters | 16.0.0 |
| 2019-12 | SA#86 | SP-191181 | 0308 | 1 | B | Add streaming trace reporting description | 16.0.0 |
| 2020-03 | SA#87E | SP-200165 | 0311 | 1 | A | Updating the measurements list for Immediate MDT | 16.1.0 |
| 2020-03 | SA#87E | SP-200173 | 0314 | - | F | Alignment with RAN2, Replace area based MDT with management based MDT | 16.1.0 |
| 2020-03 | SA#87E | SP-200173 | 0315 | 1 | B | Add anonymization of MDT data for 5G  | 16.1.0 |
| 2020-03 | SA#87E | SP-200173 | 0316 | 1 | B | Add MDT signalling activation and deactivation mechanisms for 5G | 16.1.0 |
| 2020-03 | SA#87E | SP-200173 | 0317 | 1 | B | Add MDT management activation and deactionvation mechanism for 5G | 16.1.0 |
| 2020-03 | SA#87E | SP-200173 | 0318 | 1 | B | Add MDT specific configuration parameters for 5G  | 16.1.0 |
| 2020-03 | SA#87E | SP-200173 | 0319 | 1 | B | Add MDT user consent handling for 5G  | 16.1.0 |
| 2020-03 | SA#87E | SP-200173 | 0320 | 1 | B | Add MDT trace recording session start and stop mechanism for 5G  | 16.1.0 |
| 2020-07 | SA#88E | SP-200512 | 0321 | - | F | Replace Management based MDT Allowed IE with Management based MDT PLMN List IE for MDT user consent handling in NR | 16.2.0 |
| 2020-07 | SA#88E | SP-200485 | 0322 | 1 | F | Adding SINR measurement in M1 for Immediate MDT | 16.2.0 |
| 2020-07 | SA#88E | SP-200512 | 0323 | - | B | Add MDT additional configuration information for MDT reporting in NR | 16.2.0 |
| 2020-07 | SA#88E | SP-200487 | 0334 | 1 | A | Clean up of the editor notes | 16.2.0 |
| 2020-09 | SA#89e | SP-200753 | 0337 | 1 | A | Adding AUSF and SMSF as Trace Entity | 16.3.0 |
| 2020-09 | SA#89e | SP-200725 | 0342 | - | A | Adding AMF interface trace information definition | 16.3.0 |
| 2020-09 | SA#89e | SP-200723 | 0343 | - | F | Add support in band notification of error conditions when streaming trace data | 16.3.0 |
| 2020-09 | SA#89e | SP-200744 | 0344 | - | F | Add missing 5G RCEF report collection | 16.3.0 |
| 2020-09 | SA#89e | SP-200744 | 0346 | - | F | Add missing 5G RLF report collection | 16.3.0 |
| 2020-09 | SA#89e | SP-200746 | 0335 | - | B | Add handling of Xn handover for inter-RAT and information for mapping between URI of TCE and TCE ID | 17.0.0 |
| 2020-12 | SA#90e | SP-201063 | 0348 | 1 | A | Clarification of tracing roaming UE for 5GC | 17.1.0 |
| 2020-12 | SA#90e | SP-201063 | 0350 | 1 | A | Add additional information for MDT specific parameters in NR aligning with RAN TSs | 17.1.0 |
| 2020-12 | SA#90e | SP-201063 | 0352 | - | A | Fix inconsistencies in NR positioning method | 17.1.0 |
| 2021-03 | SA#91e | SP-210168 | 0356 | - | A | Correct tracing roaming subscribers case | 17.2.0 |
| 2021-03 | SA#91e | SP-210168 | 0358 | 1 | A | Add new clause and clarification for TCE URI and clarify some MDT measurements | 17.2.0 |
| 2021-03 | SA#91e | SP-210169 | 0360 | 1 | A | Add new clauses and clarification for MDT collection peroid  | 17.2.0 |
| 2021-06 | SA#92e | SP-210397 | 0368 | 1 | A | Correction, alignment and cleanup of Trace/MDT related parameters | 17.3.0 |
| 2021-09 | SA#93e | SP-210865 | 0370 | - | A | Introduce missing parameter descriptions related to reporting of Trace/MDT  | 17.4.0 |
| 2021-09 | SA#93e | SP-210865 | 0372 | - | A | Correction and cleanup of Trace/MDT related parameters and procedures  | 17.4.0 |
| 2021-09 | SA#93e | SP-210865 | 0374 | - | A | Align RAN specification for MDT Event Threshold for SINR | 17.4.0 |
| 2021-12 | SA#94e | SP-211458 | 0376 | - | A | Introduce missing references | 17.5.0 |
| 2021-12 | SA#94e | SP-211458 | 0377 | - | A | Introduce missing interfaces of HSS | 17.5.0 |
| 2021-12 | SA#94e | SP-211483 | 0379 | 1 | B | Add beam level configuration parameter in NR | 17.5.0 |
| 2021-12 | SA#94e | SP-211458 | 0381 | 1 | A | Update to include trace failure admin messages. | 17.5.0 |
| 2021-12 | SA#94e |  | 0383 | - | A | Correction of IP Address of Trace Collection Entity | 17.5.0 |
| 2022-03 | SA#95e | SP-220185 | 0384 | 1 | A | Correct the value of Report Interval in NR for alignment | 17.6.0 |
| 2022-03 | SA#95e | SP-220171 | 0386 | 1 | B | Add MDT reporting for NR | 17.6.0 |
| 2022-03 | SA#95e | SP-220171 | 0387 | 1 | B | Add MDT signalling activation and deactivation mechanisms in a split architecture for NR | 17.6.0 |
| 2022-03 | SA#95e | SP-220171 | 0388 | 1 | B | Add MDT management activation and deactivation mechanism in the case of split architecture for NR | 17.6.0 |
| 2022-03 | SA#95e | SP-220165 | 0390 | 1 | A | Alignment of parameter names and clean up  | 17.6.0 |
| 2022-03 | SA#95e |  |  |  |  | Corrections in the implementation of CR 0390 | 17.6.1 |
| 2022-06 | SA#96 | SP-220505 | 0392 | 1 | B | Add metric identifier for trace metrics | 17.7.0 |
| 2022-06 | SA#96 | SP-220516 | 0394 | 1 | A | Adding missing signalling and interface related to SMF for trace | 17.7.0 |
| 2022-06 | SA#96 |  |  |  |  | Adding missing reference from CR0392 | 17.7.1 |
| 2022-09 | SA#97e | SP-220864 | 0398 | - | A | Correcting the name of referenced RAN3 RRC IE | 17.8.0 |
| 2022-09 | SA#97e | SP-220871 | 0401 | - | F | Clarification of inclusion of Management based MDT PLMN (Modification) List IE in NG messages | 17.8.0 |
| 2022-09 | SA#97e | SP-220872 | 0402 | 1 | A | Correction on NG-RAN activation mechanism | 17.8.0 |
| 2022-09 | SA#97e | SP-220864 | 0405 | - | A | Enhancement of scope regarding RCEF | 17.8.0 |
| 2022-12 | SA#98e | SP-221197 | 0406 | 1 | F | Correct M6 Delay Threshold to align with TS 38.314 and TS 38.413 | 17.9.0 |
| 2023-03 | SA#99 | SP-230197 | 0408 | - | F | Correcting the attribute properties for Excess packet delay threshold attribute  | 17.10.0 |
| 2023-03 | SA#99 | SP-230210 | 0410 | 1 | A | Clarify behaviour when cell list is not specified | 17.10.0 |
| 2023-12 | SA#102 | SP-231489 | 0416 | 1 | A | Rel-17 CR TS32.422 Align N38 in SMF requirement with TS23.501  | 17.11.0 |
| 2024-03 | SA#103 | SP-240183 | 0423 | - | A | Rel-17 CR TS32.422 Missing TCE Identity Mapping | 17.12.0 |
| 2024-03 | SA#103 | SP-240182 | 0428 | 1 | A | Rel-17 CR TS 32.422 Add missing steps of Trace Start in N3IWF for untrusted non-3GPP access | 17.12.0 |
| 2024-03 | SA#103 | SP-240183 | 0444 | - | A | Correction of interface definition for SMF | 17.12.0 |
| 2024-03 | SA#103 | SP-240183 | 0447 | 1 | A | Update NG-RAN activation mechanisms for management based MDT data collections | 17.12.0 |
| 2024-06 | SA#104 | SP-240815 | 0455 | 1 | A | R17 CR 32.422 Trace Report Format Correction | 17.13.0 |
| 2024-06 | SA#104 | SP-240807 | 0459 |  | F | Update management based MDT activation in RAN split architecture | 17.13.0 |