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Contents

Intellectual Property Rights 2
Foreword 2
Modal verbs terminology 2
Foreword 7
Introduction 7
1 Scope 9
2 References 9
3 Definitions and abbreviations 11
3.1 Definitions 11
3.2 Abbreviations 11
4 Trace/UE measurements activation and deactivation 12
4.1 Trace Session activation / deactivation for Trace and MDT 12
4.1.1 Management activation 12
4.1.1.1 General 12
4.1.1.2 UTRAN activation mechanisms 13
4.1.1.2a UTRAN activation mechanisms for area based MDT data collections without IMSI/IMEI(SV) selection 14
4.1.1.3 PS Domain activation mechanisms 17
4.1.1.4 CS Domain activation mechanisms 18
4.1.1.5 IP Multimedia Subsystem activation mechanisms 18
4.1.1.6 E-UTRAN activation mechanisms 18
4.1.1.6a E-UTRAN activation mechanisms for area based MDT data collections without IMSI/IMEI(SV) selection 19
4.1.1.6b E-UTRAN activation mechanisms for area based Logged MBSFN MDT data collections without IMSI/IMEI(SV) selection 23
4.1.1.7 EPC Domain activation mechanisms 26
4.1.2 Signalling activation 26
4.1.2.1 General 26
4.1.2.2 Intra PLMN signalling activation 28
4.1.2.3 Inter PLMN Signalling Activation 29
4.1.2.4 UTRAN activation mechanisms 31
4.1.2.5 PS Domain activation mechanisms 31
4.1.2.6 CS Domain activation mechanisms 35
4.1.2.7 Void 36
4.1.2.8 Tracing roaming subscribers 36
4.1.2.9 Service Level Tracing for IMS activation mechanisms 36
4.1.2.9.1 General 36
4.1.2.9.2 Trace session activation for non-registered UE 38
4.1.2.9.3 Trace session activation for a registered UE 42
4.1.2.9.4 Trace session activation at the UE 43
4.1.2.10 EPC activation mechanism 44
4.1.2.10.1 UE attached to EPC via E-UTRAN 44
4.1.2.10.2 UE attached to EPC via *non-3GPP* accesses with DSMIPv6 on S2c or PMIP on S2a/S2b 47
4.1.2.10.3 UE attached to EPC via non-3GPP accesses with GTP on S2b interface 48
4.1.2.10.4 Inter-RAT handover from E-UTRAN to UTRAN 50
4.1.2.11 E-UTRAN activation mechanisms 52
4.1.2.12 EPC and E-UTRAN Activation mechanism for MDT 53
4.1.2.12.1 General 53
4.1.2.12.2 Activation of MDT task before UE attaches to the network 54
4.1.2.12.3 Activation of MDT task after UE attachment 56
4.1.2.12.4 Handling of various scenarios during MDT activation 57
4.1.2.12.5 Activation of Logged MBSFN MDT task before UE attaches to the network 58

4.1.2.12.6 Activation of Logged MBSFN MDT task after UE attachment 60
4.1.2.13 PS domain activation mechanism for MDT 61
4.1.2.13.1 General 61
4.1.2.13.2 Activation of MDT task before UE attaches to the network 61
4.1.2.13.2a Activation of MDT task after UE attaches to the network 63
4.1.2.13.3 Handling of various scenarios during MDT activation 65
4.1.2.14 CS domain activation mechanism for MDT 66
4.1.2.14.0 Activation of MDT task before UE attaches to the network 66
4.1.2.14.1 MDT Error Handling 69
4.1.3 Management deactivation 70
4.1.3.1 UTRAN deactivation mechanisms 70
4.1.3.2 PS Domain deactivation mechanisms 70
4.1.3.3 CS Domain deactivation mechanisms 70
4.1.3.4 IP Multimedia Subsystem deactivation mechanisms 70
4.1.3.5 E-UTRAN deactivation mechanisms 71
4.1.3.6 EPC Domain deactivation mechanisms 72
4.1.3.7 E-UTRAN deactivation mechanisms for MDT 72
4.1.3.8 Deactivation mechanisms at UE for MDT 72
4.1.4 Signalling deactivation 73
4.1.4.1 General 73
4.1.4.2 UTRAN deactivation mechanisms 73
4.1.4.3 PS Domain deactivation mechanisms 76
4.1.4.4 CS Domain deactivation mechanisms 76
4.1.4.5 Void 76
4.1.4.6 Service Level Trace in IMS deactivation mechanisms 76
4.1.4.6.1 General 76
4.1.4.6.2 Trace session deactivation at an IMS NE 77
4.1.4.6.2.1 Trace session deactivation propagated by EM 77
4.1.4.6.2.2 Trace session deactivation following a Triggering event 77
4.1.4.6.2.3 Trace session deactivation initiated directly by an EM 77
4.1.4.6.3 Trace session deactivation at the UE 77
4.1.4.7 EPC deactivation mechanisms 78
4.1.4.8 E-UTRAN deactivation mechanisms 81
4.1.4.9 EPC deactivation mechanisms for MDT 81
4.1.4.10 Deactivation mechanisms at UE for MDT 81
4.1.5 MDT Trace selection conditions 81
4.2 Trace Recording Session Start / Stop triggering for Trace and MDT 82
4.2.1 General 82
4.2.2 Starting a trace recording session - management based 82
4.2.2.1 UTRAN starting mechanisms 82
4.2.2.2 PS Domain starting mechanisms 82
4.2.2.3 CS Domain starting mechanisms 82
4.2.2.4 IP Multimedia Subsystem starting mechanisms 83
4.2.2.5 E-UTRAN starting mechanism 83
4.2.2.6 EPC Domain starting mechanisms 85
4.2.2.7 E-UTRAN starting mechanisms for MDT 85
4.2.2.8 Starting mechanisms at UE for MDT 85
4.2.3 Starting a trace recording session - signalling based 86
4.2.3.1 UTRAN starting mechanisms 86
4.2.3.2 PS Domain starting mechanisms 89
4.2.3.3 CS Domain starting mechanisms 90
4.2.3.4 Void 92
4.2.3.5 Service level tracing for IMS starting mechanism 92
4.2.3.5.1 General 92
4.2.3.5.2 Starting mechanism at the UE 94
4.2.3.5.3 Starting mechanism at the IMS NE 95
4.2.3.5.4 Charging concepts for Service Level Tracing for IMS 95
4.2.3.6 E-UTRAN starting mechanism 95
4.2.3.7 EPC starting mechanisms 96
4.2.3.8 EPC starting mechanisms for MDT 97
4.2.3.9 E-UTRAN starting mechanisms for MDT 97
4.2.3.10 Starting mechanisms at UE for MDT 97

4.2.4 Stopping a trace recording session - management based 98
4.2.4.1 UTRAN stopping mechanisms 98
4.2.4.2 PS Domain stopping mechanisms 98
4.2.4.3 CS Domain stopping mechanisms 100
4.2.4.4 IP Multimedia Subsystem stopping mechanisms 100
4.2.4.5 E-UTRAN stopping mechanisms 100
4.2.4.6 EPC Domain stopping mechanisms 101
4.2.4.7 E-UTRAN stopping mechanisms for MDT 101
4.2.4.8 Stopping mechanisms at UE for MDT 101
4.2.5 Stopping a trace recording session - signalling based 102
4.2.5.1 UTRAN stopping mechanisms 102
4.2.5.2 PS Domain stopping mechanisms 102
4.2.5.3 CS Domain stopping mechanisms 104
4.2.5.4 Void 106
4.2.5.5 Service level tracing for IMS stopping mechanism 106
4.2.5.5.1 General 106
4.2.5.5.2 Stopping mechanism at the UE 107
4.2.5.5.3 Stopping mechanism at the IMS NE 107
4.2.5.6 Service level tracing Trace session deletion and trace retrieval 107
4.2.5.7 E-UTRAN stopping mechanisms 107
4.2.5.8 EPC Domain stopping mechanisms 107
4.2.5.9 EPC stopping mechanisms for MDT 108
4.2.5.10 E-UTRAN stopping mechanisms for MDT 108
4.2.5.11 Stopping mechanisms at UE for MDT 108
4.2.6 Void 109
4.2.7 Void 109
4.2.8 Void 109
4.2.8.1 Void 109
4.2.8.2 Void 109
4.2.9 Void 109
4.3 RLF reporting 109
4.3.1 Trace session activation for RLF reporting 109
4.3.2 Trace session deactivation for RLF reporting 112
4.4 Handling of MDT Trace sessions at handover for Immediate MDT 112
4.5 Handling of MDT Trace sessions at handover for Logged MDT and Logged MBSFN MDT 114
4.6 User consent handling in MDT 114
4.6.1 Signalling based MDT 114
4.6.2 Area based MDT 115
4.7 Anonymization of MDT data for area based MDT 117
4.8 RCEF reporting 117
4.8.1 Trace session activation for RCEF reporting 117
4.8.2 Trace session deactivation for RCEF reporting 119

5 Trace/UE measurement control and configuration parameters 120
5.1 Triggering events (M) 120
5.2 Service Level Tracing Start Triggering event (M) 124
5.3 Trace Depth (M) 125
5.4 List of NE types (M) 125
5.5 List of interfaces (O) 127
5.6 Trace Reference (M) 129
5.7 Trace Recording Session Reference (M) 129
5.8 Void 129
5.9 IP Address of Trace Collection Entity (CM,CO) 129
5.9a Job type (CM) 129
5.9b PLMN Target (CM) 130
5.10 MDT specific configuration parameters (CM) 130
5.10.1 Void 130
5.10.2 Area Scope 130
5.10.3 List of measurements 131
5.10.4 Reporting Trigger 131
5.10.5 Report Interval 132
5.10.6 Report Amount 133

5.10.7 Event Threshold for RSRP 133
5.10.7a Event Threshold for RSRQ 134
5.10.8 Logging Interval 134
5.10.9 Logging Duration 134
5.10.10 Void 135
5.10.11 Trace Collection Entity Id 135
5.10.12 Anonymization of MDT data 135
5.10.13 Event Threshold for Event 1F 135
5.10.14 Event threshold for Event 1I 135
5.10.15 Measurement quantity 136
5.10.16 void 136
5.10.17 void 136
5.10.18 void 136
5.10.19 Positioning Method 136
5.10.20 Collection period for RRM measurements LTE 136
5.10.21 Collection period for RRM measurements UMTS 137
5.10.22 Measurement period UMTS 137
5.10.23 Measurement period LTE 138
5.10.24 MDT PLMN List 139
5.10.25 MBSFN Area List 139

6 MDT Reporting 140
6.1 MDT reporting in case of Immediate MDT: 140
6.2 MDT reporting in case of Logged MDT 141
6.3 MDT reporting in case of Logged MBSFN MDT 142

7 Trace reporting 143
7.1 Single operator case 143
7.2 Shared network case for Participating Operator 144

8 RLF Reporting 145

9 RCEF Reporting 145

Annex A (normative): Trace failure notification file format 146

A.1 Global structure 146

A.2 XML elements fileHeader and fileFooter 146
A.2.1 XML elements `fileHeader` 146
A.2.2 XML element `fileFooter` 146

A.3 Trace failure notification specific XML elements 146

A.4 Trace IRP XML File Name Conventions 146

A.5 Trace failure notification file XML schema 147

Annex B (informative): Examples for alternative ways to route the Trace file to the TCE 148

B.1 Routing the Trace file directly to the TCE 148

B.2 Routing the Trace file via the management system 148

Annex C (informative): Change history 149

History 152

Foreword

This Technical Specification has been produced by the 3rd Generation Partnership Project (3GPP).

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Introduction

The present document is part of a TS-family covering the 3rd Generation Partnership Project; Technical Specification Group Services and System Aspects; Telecommunication management, as identified below:

TS 32.421: "Subscriber and equipment trace: Trace concepts and requirements";

TS 32.422: "Subscriber and equipment trace: Trace control and configuration management";

TS 32.423: "Subscriber and equipment trace: Trace data definition and management";

Additionally, there is a GSM only Subscriber and Equipment Trace specification: 3GPP TS 52.008 [5].

Subscriber and Equipment Trace provide very detailed information at call level on one or more specific mobile(s). This data is an additional source of information to Performance Measurements and allows going further in monitoring and optimisation operations.

Contrary to Performance Measurements, which are a permanent source of information, Trace is activated on user demand for a limited period of time for specific analysis purposes.

Trace plays a major role in activities such as determination of the root cause of a malfunctioning mobile, advanced troubleshooting, optimisation of resource usage and quality, RF coverage control and capacity improvement, dropped call analysis, Core Network, UTRAN, EPC and E-UTRAN UMTS procedure validation.

The capability to log data on any interface at call level for a specific user (e.g. IMSI) or mobile type (e.g. IMEI or IMEISV), or service initiated from a UE allows getting information which cannot be deduced from Performance Measurements such as perception of end-user QoS during his call (e.g. requested QoS vs. provided QoS), correlation between protocol messages and RF measurements, or interoperability with specific mobile vendors.

Moreover, Performance Measurements provide values aggregated on an observation period, Subscriber and Equipment Trace give instantaneous values for a specific event (e.g., call, location update, etc.).

If Performance Measurements are mandatory for daily operations, future network planning and primary trouble shooting, Subscriber and Equipment Trace is the easy way to go deeper into investigation and network optimisation.

In order to produce this data, Subscriber and Equipment Trace are carried out in the NEs, which comprise the network. The data can then be transferred to an external system (e.g. an Operations System (OS) in TMN terminology, for further evaluation).

1 Scope

The present document describes the mechanisms used for the control and configuration of the Trace, Minimization of Drive Test (MDT) and Radio Link Failure (RLF) reporting functionality at the EMs, NEs and UEs. For Trace functionality, it covers the triggering events for starting/stopping of subscriber/UE activity traced over 3GPP standardized signalling interfaces, the types of trace mechanisms, configuration of a trace, level of detail available in the trace data, the generation of Trace results in the Network Elements (NEs) and User Equipment (UE) and the transfer of these results to one or more EM(s) and/or Network Manager(s) (NM(s)). For MDT, it also covers logged MDT and immediate MDT mechanims in both area based and signalling based scenarios. GSM is excluded from the RAT systems which the present document can be applied to.

The mechanisms for Trace, MDT and RLF reporting activation/deactivation are detailed in clause 4; clause 5 details the various Trace, MDT and RLF reporting control and configuration parameters and the triggering events that can be set in a network. Trace, MDT and RLF reporting concepts and requirements are covered in 3GPP TS 32.421 [2] while Trace and MDT data definition and management is covered in 3GPP TS 32.423 [3].

The conditions for supporting Network Sharing are stated in 3GPP TS 32.421 [2].

2 References

The following documents contain provisions, which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication, edition number, version number, etc.) or non-specific.
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NOTE: Overall management principles are defined in 3GPP TS 32.101 [1].

[1] 3GPP TS 32.101: "Telecommunication management; Principles and high level requirements".

[2] 3GPP TS 32.421: "Telecommunication management; Subscriber and equipment trace: Trace concepts and requirements".

[3] 3GPP TS 32.423: "Telecommunication management; Subscriber and equipment trace: Trace data definition and management".

[4] 3GPP TR 21.905: "Vocabulary for 3GPP Specifications".

[5] 3GPP TS 52.008: "Telecommunication management; GSM subscriber and equipment trace".

[6] 3GPP TS 23.060: "General Packet Radio Service (GPRS) Service description; Stage 2".

[7] 3GPP TS 23.205: "Bearer-independent circuit-switched core network; Stage 2".

[8] 3GPP TS 23.108: "Mobile radio interface layer 3 specification, core network protocols; Stage 2 (structured procedures)".

[9] 3GPP TS 23.246: "Multimedia Broadcast/Multicast Service (MBMS); Architecture and functional description".

[10] 3GPP TS 29.232: "Media Gateway Controller (MGC) - Media Gateway (MGW); interface; Stage 3".

[11] 3GPP TS 29.002: "Mobile Application Part (MAP) specification".