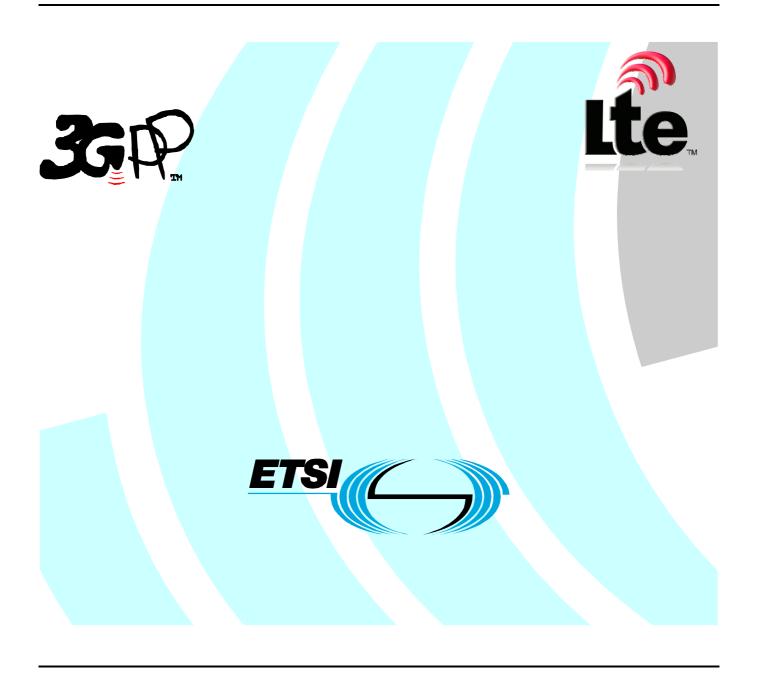
ETSI TS 132 423 V9.4.0 (2011-01)

Technical Specification

Digital cellular telecommunications system (Phase 2+); Universal Mobile Telecommunications System (UMTS); LTE:

> Telecommunication management; Subscriber and equipment trace; Trace data definition and management (3GPP TS 32.423 version 9.4.0 Release 9)



Reference RTS/TSGS-0532423v940 Keywords

GSM, LTE, UMTS

ETSI

650 Route des Lucioles F-06921 Sophia Antipolis Cedex - FRANCE

Tel.: +33 4 92 94 42 00 Fax: +33 4 93 65 47 16

Siret N° 348 623 562 00017 - NAF 742 C Association à but non lucratif enregistrée à la Sous-Préfecture de Grasse (06) N° 7803/88

Important notice

Individual copies of the present document can be downloaded from: http://www.etsi.org

The present document may be made available in more than one electronic version or in print. In any case of existing or perceived difference in contents between such versions, the reference version is the Portable Document Format (PDF). In case of dispute, the reference shall be the printing on ETSI printers of the PDF version kept on a specific network drive within ETSI Secretariat.

Users of the present document should be aware that the document may be subject to revision or change of status.

Information on the current status of this and other ETSI documents is available at

http://portal.etsi.org/tb/status/status.asp

If you find errors in the present document, please send your comment to one of the following services: http://portal.etsi.org/chaircor/ETSI_support.asp

Copyright Notification

No part may be reproduced except as authorized by written permission. The copyright and the foregoing restriction extend to reproduction in all media.

© European Telecommunications Standards Institute 2011.
All rights reserved.

DECTTM, **PLUGTESTS**TM, **UMTS**TM, **TIPHON**TM, the TIPHON logo and the ETSI logo are Trade Marks of ETSI registered for the benefit of its Members.

3GPP[™] is a Trade Mark of ETSI registered for the benefit of its Members and of the 3GPP Organizational Partners. **LTE**[™] is a Trade Mark of ETSI currently being registered

for the benefit of its Members and of the 3GPP Organizational Partners. **GSM**® and the GSM logo are Trade Marks registered and owned by the GSM Association.

Intellectual Property Rights

IPRs essential or potentially essential to the present document may have been declared to ETSI. The information pertaining to these essential IPRs, if any, is publicly available for **ETSI members and non-members**, and can be found in ETSI SR 000 314: "Intellectual Property Rights (IPRs); Essential, or potentially Essential, IPRs notified to ETSI in respect of ETSI standards", which is available from the ETSI Secretariat. Latest updates are available on the ETSI Web server (http://webapp.etsi.org/IPR/home.asp).

Pursuant to the ETSI IPR Policy, no investigation, including IPR searches, has been carried out by ETSI. No guarantee can be given as to the existence of other IPRs not referenced in ETSI SR 000 314 (or the updates on the ETSI Web server) which are, or may be, or may become, essential to the present document.

Foreword

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

The present document may refer to technical specifications or reports using their 3GPP identities, UMTS identities or GSM identities. These should be interpreted as being references to the corresponding ETSI deliverables.

The cross reference between GSM, UMTS, 3GPP and ETSI identities can be found under http://webapp.etsi.org/key/queryform.asp.

Contents

Intelle	ectual Property Rights		2
Forev	vord		2
Forev	vord		
Introd	luction		
1	Scope		5
2	References		5
3	Definitions, symbols a	nd abbreviations	6
3.1	•		
3.2			
3.3	3		
4	Trace Record Contents	S	
4.1	General		8
4.2	MSC Server Trace R	ecord Content	9
4.3	MGW Trace Record	Content	16
4.4	SGSN Trace Record	Content	17
4.5	GGSN Trace Record	Content	25
4.6	UTRAN Trace Recor	rd Content	28
4.7		rd Content	
4.8		rd Content	
4.9		ontent	
4.10		d Content	
4.11		Content	
4.12		Content	
4.13		cord Content	
4.14	SGW Trace Record C	Content	54
Anne	x A (normative):	Trace Report File Format	
A.1	Parameter description	and mapping table	60
A.2	XML file format defin	ition	62
A.2.1		am	
A.2.2		schema	
Anne	x B (normative):	Trace Report File Conventions and Transfer Procedure	65
B.1		n	
B.2	•		
Anne	x C (informative):	Trace Functional Architecture: Reporting	67
C.1	Figure of Trace Repor	ting	67
Anne	x D (informative):	Examples of trace files	69
D.1	Examples of trace XM	L file	6 ⁰
D.1.1		ce file with the maximum level of details	
D.1.2		ce file with the minimum level of details	
D.1.3		trace file for IMSI information from the MME	
Anne	x E (informative):	Void	71
Anna	x F (informative):	Change history	7
Ame	A F (IIIIOI MAUVE).	Change instity	
Histor	rx7		73

Foreword

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

The contents of the present document are subject to continuing work within the TSG and may change following formal TSG approval. Should the TSG modify the contents of the present document, it will be re-released by the TSG with an identifying change of release date and an increase in version number as follows:

Version x.y.z

where:

- x the first digit:
 - 1 presented to TSG for information;
 - 2 presented to TSG for approval;
 - 3 or greater indicates TSG approved document under change control.
- y the second digit is incremented for all changes of substance, i.e. technical enhancements, corrections, updates, etc.
- z the third digit is incremented when editorial only changes have been incorporated in the document.

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";

Subscriber and MS 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 purpose

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 and UTRAN end to end 3G 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) 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 MS Trace is the easy way to go deeper into investigation and 3G network optimisation.

In order to produce this data, Subscriber and MS 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 Trace data definition and management. It covers the trace records content, their format and transfer.

The objectives of the present document are:

- To provide the descriptions for a standard set of Trace data;
- To define the common format of trace records; and
- To define a method for Trace results reporting across the management interfaces.

Clause 4 details the various Trace records content, Annex A provides Trace report file format, Annex B provides the trace report file conventions and transfer procedure, Annex C provides the trace reporting functional architecture and Annex D provides some trace files examples. Trace concepts and requirements are covered in TS 32.421 [2] while Trace control and configuration management are described in 3GPP TS 32.422 [3].

The definition of Trace data is intended to result in comparability of Trace data produced in a multi-vendor wireless UMTS and/or EPS network.

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

- Any notification mechanisms or IRPs for trace. Only file transfer mechanism is specified for trace data transfer;
- Any data compression mechanisms for trace data transfer;
- Any Trace capability limitations (e.g. maximum number of simultaneous traced mobiles for a given NE).

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.
- For a specific reference, subsequent revisions do not apply.
- For a non-specific reference, the latest version applies. In the case of a reference to a 3GPP document (including a GSM document), a non-specific reference implicitly refers to the latest version of that document *in the same Release as the present document.*
- [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 32.422: "Telecommunication management; Subscriber and equipment trace: Trace control and configuration management".
- [4] 3GPP TR 21.905: "Vocabulary for 3GPP Specifications".
- [5] W3C Recommendation "Extensible Markup Language (XML) 1.0" (Second Edition, 6 October 2000) http://www.w3.org/TR/2000/REC-xml-20001006
- [6] W3C Recommendation "Namespaces in XML" (14 January 1999) http://www.w3.org/TR/1999/REC-xml-names-19990114
- [7] W3C Recommendation "XML Schema Part 0: Primer" (2 May 2001) http://www.w3.org/TR/2001/REC-xmlschema-0-20010502
- [8] W3C Recommendation "XML Schema Part 1: Structures" (2 May 2001) http://www.w3.org/TR/2001/REC-xmlschema-1-20010502

[9]	W3C Recommendation "XML Schema Part 2: Datatypes" (2 May 2001) http://www.w3.org/TR/2001/REC-xmlschema-2-20010502
[10]	International Standard ISO 8601: 1988 (E) "Representations of dates and times" (1988-06-15) http://www.iso.ch/markete/8601.pdf
[11]	3GPP TS 32.300: "Telecommunication management; Configuration Management (CM); Name convention for Managed Objects".
[12]	3GPP TS 32.622: "Telecommunication management; Configuration Management (CM); Generic network resources Integration Reference Point (IRP): Network Resource Model (NRM)".
[13]	3GPP TS 29.274: '3GPP Evolved Packet System (EPS); Evolved General Packet Radio Service (GPRS) Tunnelling Protocol for Control plane (GTPv2-C); Stage 3'
[14]	3GPP TS 29.212: 'Policy and Charging Control over Gx reference point'
[15]	3GPP TS 29.273: 'Evolved Packet System (EPS); 3GPP EPS AAA interfaces'

3 Definitions, symbols and abbreviations

3.1 Definitions

For the purposes of the present document, the terms and definitions given in 3GPP TS 32.421 [2] and 3GPP TS 32.422 [3] apply.

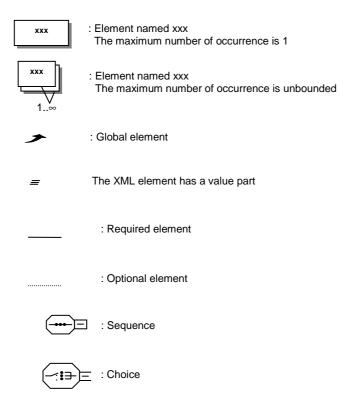
Minimum Level of detail: Allows for retrieval of a decoded subset of the IEs contained in the signalling interface messages.

Medium Level of detail: Allows for retrieval of the decoded subset of the IEs contained in the signalling interface messages in the Minimum Level plus a selected set of decoded radio measurement IEs.

Maximum Level of detail: Allows for retrieval of signalling interface messages within the Trace Scope in encoded format.

3.2 Symbols

For the purposes of the present document, the following symbols apply:



3.3 Abbreviations

For the purposes of the present document, the abbreviations given in 3GPP TR 21.905 [4] and 3GPP TS 32.101 [1] apply.

4 Trace Record Contents

4.1 General

The trace reference, trace type and operation system identification are all provided on trace activation.

Each record may contain an MSC Server, MGW, SGSN, GGSN, S-CSCF, P-CSCF, UTRAN, HSS, MME, Serving GW, or E-UTRAN event record. A key is included in the table indicating whether or not the field is mandatory.

The following table shows the template for trace record description for minimum and medium trace depth:

Interface name	Protocol namo	IE namo	Message name(s)		depth	Notes
interrace manne	Protocol fiame	IL Haine	wessage name(s)	Min	Med	Notes

Interface name: Contains the name of the interface, where the IE is available.

Protocol name: Contains the protocol name on the interface, where the IE is available.

IE name: The name of the Information Element, which should be decoded.

Message name(s): The name of the message(s), where the IE is included.

Trace depth: Shows in which trace depth the IE should be recorded. It also classifies whether the IE is mandatory in the trace record or not (M, O or X: meaning described in the previous table)

M	Mandatory	This field must be in the trace record if it is available, i.e. if the message appears during the trace recording session and the IE is present in
		the message.
0	Optional	This field is optional and its support is a matter for agreement between equipment manufacturer and network operator.
X	Not applicable	This field is not required in this instance.

NOTE: Any kind of comments related to the IE can be made here. Also this is the placeholder for referencing the relevant 3GPP specifications, which define the IE.

4.2 MSC Server Trace Record Content

The following table shows the trace record content for MSC Server.

The trace record is the same for management based activation and for signalling based activation.

For MSC Server, the Minimum level of detail shall be supported.

Interface name	Prot.	IE name	Message name(s)	Trace	depth	Notes
		Facility	ALERTING CALL PROCEEDING CONNECT DISCONNECT FACILITY RELEASE RELEASE COMPLETE SETUP	M	М	TS 24.008 TS 24.080
lu, A	cc	Bearer capability	CALL CONFIRMED CALL PROCEEDING EMERGENCY SETUP MODIFY MODIFY COMPLETE MODIFY REJECT SETUP	М	М	TS 24.008
		Cause	CALL CONFIRMED CONGESTION CONTROL DISCONNECT HOLD REJECT MODIFY REJECT RELEASE RELEASE COMPLETE RETRIEVE REJECT START DTMF REJECT STATUS	М	М	TS 24.008
		Connected number	CONNECT	М	М	TS 24.008
		Calling party BCD number	SETUP	M	М	TS 24.008
		Called party BCD number	SETUP	M	M	TS 24.008
lu, A	MM	Redirecting party BCD number Reject cause	SETUP AUTHENTICATION FAILURE CM SERVICE REJECT ABORT LOCATION UPDATING REJECT MM STATUS	M	M	TS 24.008
.,	IVIIVI	Location area identification	CM RE-ESTABLISHMENT REQUEST LOCATION UPDATING ACCEPT LOCATION UPDATING REQUEST TMSI REALLOCATION COMMAND	М	М	TS 24.008

			CM RE-ESTABLISHMENT REQUEST CM SERVICE REQUEST				
			IDENTITY REQUEST IDENTITY RESPONSE			TO 0.4.000	
		Mobile identity	IMSI DETACH INDICATION	M	М	TS 24.008	
			LOCATION UPDATING ACCEPT				
			LOCATION UPDATING REQUEST				
			TMSI REALLOCATION COMMAND				
		CM service type	CM SERVICE REQUEST	M	M	TS 24.008	
		Location updating type	LOCATION UPDATING REQUEST	M	М	TS 24.008	
			FACILITY		1		
Iu, A	SS	Facility	REGISTER	M	М	TS 24.008	
,			RELEASE COMPLETE		.	TO 01 000	
		Cause	RELEASE COMPLETE	M	M	TS 24.008	
		TP-Originating-Address	SMS-DELIVER	M	М	TS 23.040	
	1	TD Comics Control Time Ci	SMS-DELIVER		1.,	TO 60 0 40	
	1	TP-Service-Centre- Time-Stamp	SMS-SUBMIT-REPORT	M	М	TS 23.040	
			SMS-STATUS-REPORT			<u> </u>	
lu, A	SMS	TP-Failure-Cause	SMS-DELIVER-REPORT	M	M	TS 23.040	
			SMS-SUBMIT-REPORT				
		TP-Destination-Address	SMS-SUBMIT	М	М	TS 23.040	
		TD Desire and Address	SMS-COMMAND			TO 00 040	
		TP-Recipient-Address	SMS-STATUS-REPORT	M	М	TS 23.040	
		Channel Type	ASSIGNMENT REQUEST HANDOVER REQUEST	М	М	TS 48.008	
		Circuit	ASSIGNMENT REQUEST	M	M	TS 48.008	
			ASSIGNMENT COMPLETE				
			HANDOVER REQUEST				
		Cell Identifier (Serving)	HANDOVER COMMAND	M	M	TS 48.008	
			HANDOVER PERFORMED				
			PERFORM LOCATION REQUEST				
			ASSIGNMENT COMPLETE		1	TO 40 655	
		Chosen Channel	HANDOVER REQUEST ACKNOWLEDGE	M	М	TS 48.008	
			HANDOVER PERFORMED		1		
			ASSIGNMENT COMPLETE				
		On a set overeign (above a)	HANDOVER REQUEST			TO 40 000	
Α	BSSMAP	Speech version (chosen)	HANDOVER REQUIRED	M	М	TS 48.008	
			HANDOVER REQUEST ACKNOWLEDGE HANDOVER PERFORMED				
			ASSIGNMENT FAILURE			-	
			HANDOVER REQUEST				
			HANDOVER REQUEST				
			HANDOVER REQUIRED HANDOVER FAILURE				
		Cause	CLEAR REQUEST	M	M	TS 48.008	
			CLEAR COMMAND				
			HANDOVER PERFORMED				
			HANDOVER REQUIRED REJECT				
			ASSIGNMENT FAILURE			1	
		RR Cause	HANDOVER COMPLETE	l _M l _M	М	TS 48.008	
		INIX Gause		HANDOVER FAILURE		'''	13 40.000
		Cell Identifier (target)	HANDOVER REQUEST	М	М	TS 48.008	
		2 3 Addition (target)	1	171	1	1.0 10.000	

		Current Channel type 1	HANDOVER REQUEST HANDOVER REQUIRED	М	М	TS 48.008
		Cell Identifier List (Preferred)	HANDOVER REQUIRED PAGING	М	М	TS 48.008
		IMSI	PAGING COMMON ID	М	М	TS 48.008
		Location Type	PERFORM LOCATION REQUEST	М	М	TS 48.008
		Location Estimate	PERFORM LOCATION RESPONSE	M	M	TS 48.008
		LCS Cause	PERFORM LOCATION RESPONSE PERFORM LOCATION ABORT	М	М	TS 48.008
		SS-Code	MAP_REGISTER_SS MAP_ERASE_SS MAP_ACTIVATE_SS MAP_DEACTIVATE_SS MAP_INTERROGATE_SS MAP_REGISTER_PASSWORD MAP_REGISTER_CC_ENTRY MAP_ERASE_CC_ENTRY	М	М	TS 29.002
		Forwarded-to number with subaddress	MAP_REGISTER_SS	М	М	TS 29.002
В	MAP	Basic service	MAP_REGISTER_SS MAP_ERASE_SS MAP_ACTIVATE_SS MAP_DEACTIVATE_SS MAP_INTERROGATE_SS	М	М	TS 29.002
		SM RP DA	MAP-SEND-INFO-FOR-MT-SMS	М	М	TS 29.002
		Service Centre Address	MAP-SEND-INFO-FOR-MO-SMS	М	М	TS 29.002
		Alert Reason	MAP-READY-FOR-SM	М	М	TS 29.002
		Abort reason	Abort	М	М	TS 29.002 TS 23.018
		MSISDN	Complete Call Process Access Request ack Process Call Waiting Send Info For Incoming Call ack MAP-SEND-INFO-FOR-MT-SMS MAP-SEND-INFO-FOR-MO-SMS	М	М	TS 29.002 TS 23.018
С	MAP	IMEI(SV)	Complete Call Page MS ack Process Access Request Process Access Request ack Provide IMEI ack Search For MS ack	М	М	TS 29.002 TS 23.018
		PLMN bearer capability	Complete Call Process Call Waiting	М	М	TS 29.002 TS 23.018
		ISDN bearer capability	Complete Call Process Call Waiting	М	М	TS 29.002 TS 23.018
		IMSI	Page MS Process Access Request Process Access Request ack Provide IMSI ack Search For MS Send Info For Incoming Call ack MAP-SEND-INFO-FOR-MT-SMS	М	М	TS 29.002 TS 23.018

-	<u> </u>			
Location area ID / Current location area ID	Page MS Page MS ack Process Access Request Search For MS ack	М	М	TS 29.002 TS 23.018
Page type	Page MS Search For MS	М	М	TS 29.002 TS 23.018
Serving cell ID	Page MS ack Process Access Request Search For MS ack	М	М	TS 29.002 TS 23.018
Service area ID	Page MS ack Process Access Request Search For MS ack	М	М	TS 29.002 TS 23.018
CM service type	Process Access Request	М	М	TS 29.002 TS 23.018
MSRN	Send Info For Incoming Call	М	М	TS 29.002 TS 23.018
Bearer service	Send Info For Incoming Call Send Info For Outgoing Call	М	М	TS 29.002 TS 23.018
Teleservice	Send Info For Incoming Call Send Info For Outgoing Call	М	М	TS 29.002 TS 23.018
Dialled number	Send Info For Incoming Call	М	М	TS 29.002 TS 23.018
Number of forwarding	Send Info For Incoming Call	М	М	TS 29.002 TS 23.018
Forwarded-to number	Send Info For Incoming Call ack	М	М	TS 29.002 TS 23.018
Forwarding reason	Send Info For Incoming Call ack	М	М	TS 29.002 TS 23.018
Called number	Send Info For Outgoing Call	М	М	TS 29.002 TS 23.018
MSISDN	Send Routeing Info	М	М	TS 29.002 TS 23.018
User error	Every message where it appears	М	М	TS 29.002
Provider error	Every message where it appears	M	M	TS 29.002
Service Centre Address	MAP-SEND-ROUTING-INFO-FOR-SM MAP-REPORT-SM-DELIVERY-STATUS MAP-ALERT-SERVICE-CENTRE	М	M	TS 29.002
SM Delivery Outcome	MAP-REPORT-SM-DELIVERY-STATUS	М	М	TS 29.002
MSIsdn-Alert	MAP-ALERT-SERVICE-CENTRE MAP-INFORM-SERVICE-CEN	М	М	TS 29.002
Number of forwarding	Send Routeing Info	М	М	TS 29.002 TS 23.018
ISDN BC	Send Routeing Info	М	М	TS 29.002 TS 23.018
IMSI	Send Routeing Info ack	М	М	TS 29.002 TS 23.018
Roaming number	Send Routeing Info ack	М	М	TS 29.002 TS 23.018
Forwarded-to number	Send Routeing Info ack	М	М	TS 29.002 TS 23.018
Forwarding reason	Send Routeing Info ack	М	М	TS 29.002 TS 23.018

		MSISDN	Send Routeing Info ack MAP_SEND_ROUTING_INFO_FOR_SM	М	М	TS 29.002 TS 23.018
		User error	Every message where it appears	М	М	TS 29.002
		Provider error	Every message where it appears	М	М	TS 29.002
		HLR number	MAP_RESTORE_DATA	М	М	TS 29.002
		MS Not Reachable Flag	MAP_RESTORE_DATA	М	М	TS 29.002
		SS-Code	MAP_REGISTER_SS MAP_ERASE_SS MAP_ACTIVATE_SS MAP_DEACTIVATE_SS MAP_INTERROGATE_SS MAP_REGISTER_PASSWORD MAP_REGISTER_CC_ENTRY MAP_ERASE_CC_ENTRY	М	M	TS 29.002
		Forwarded-to number with subaddress	MAP_REGISTER_SS	M	М	TS 29.002
		Basic service	MAP_REGISTER_SS MAP_ERASE_SS MAP_ACTIVATE_SS MAP_DEACTIVATE_SS MAP_INTERROGATE_SS	М	М	TS 29.002
		Alert Reason	MAP-READY-FOR-SM	М	М	TS 29.002
		MSC Address	MAP_UPDATE_LOCATION	М	М	TS 29.002
D	MAP	IMSI	Provide Roaming Number Provide Subscriber Info MAP_UPDATE_LOCATION MAP_CANCEL_LOCATION MAP_PURGE_MS MAP-INSERT-SUBSCRIBER-DATA MAP-DELETE-SUBSCRIBER-DATA MAP_RESTORE_DATA	М	M	TS 29.002 TS 23.018
		MSISDN	Provide Roaming Number MAP-INSERT-SUBSCRIBER-DATA	М	М	TS 29.002 TS 23.018
		PLMN bearer capability	Provide Roaming Number	М	М	TS 29.002 TS 23.018
		ISDN BC	Provide Roaming Number	М	М	TS 29.002 TS 23.018
		Roaming number	Provide Roaming Number ack	М	М	TS 29.002 TS 23.018
		Service area ID	Provide Subscriber Info ack	М	М	TS 29.002 TS 23.018
		Cell ID	Provide Subscriber Info ack	М	М	TS 29.002 TS 23.018
		IMEI(SV)	Provide Subscriber Info ack	М	М	TS 29.002 TS 23.018
		User error	Every message where it appears	М	M	TS 29.002
		Provider error	Every message where it appears	М	М	TS 29.002
		IMEI(SV)	MAP_CHECK_IMEI	М	М	TS 29.002 TS 23.018
F	MAP	Equipment status	MAP_CHECK_IMEI	М	М	TS 29.002 TS 23.018
		User error	Every message where it appears	М	М	TS 29.002

		Provider error	Every message where it appears	М	М	TS 29.002
		Target Cell Id	MAP_PREPARE_HANDOVER MAP_PREPARE_SUBSEQUENT_HANDOVER	М	М	TS 29.002
		Target RNC Id	MAP_PREPARE_HANDOVER MAP_PREPARE_SUBSEQUENT_HANDOVER	М	М	TS 29.002
		IMSI	MAP_PREPARE_HANDOVER	М	М	TS 29.002
		RAB ID/ Selected RAB id	MAP_PREPARE_HANDOVER MAP_PROCESS_ACCESS_SIGNALLING MAP_PREPARE_SUBSEQUENT_HANDOVER	М	М	TS 29.002
		Handover Number	MAP_PREPARE_HANDOVER MAP_SEND_HANDOVER_REPORT	М	М	TS 29.002
_		User error	Every message where it appears	М	М	TS 29.002
E	MAP	Provider error	Every message where it appears	М	М	TS 29.002
		lu-Selected Codec	MAP_PREPARE_HANDOVER MAP_PROCESS_ACCESS_SIGNALLING MAP_FORWARD_ACCESS_SIGNALLING	М	M	TS 29.002
		Iu-Currently Used Codec	MAP_PREPARE_HANDOVER MAP_FORWARD_ACCESS_SIGNALLING	М	М	TS 29.002
		Iu-Supported Codecs List	MAP_PREPARE_HANDOVER MAP_FORWARD_ACCESS_SIGNALLING	М	М	TS 29.002
		Iu-Available Codecs List	MAP_PREPARE_HANDOVER MAP_PROCESS_ACCESS_SIGNALLING	М	М	TS 29.002
		Target MSC Number	MAP_PREPARE_SUBSEQUENT_HANDOVER	М	M	TS 29.002
		IMSI	MAP_SEND_IDENTIFICATION	М	М	TS 29.002
G	MAP	MSC Number	MAP_SEND_IDENTIFICATION	М	М	TS 29.002
G	IVIAP	User error	Every message where it appears	М	М	TS 29.002
		Provider error	Every message where it appears	М	М	TS 29.002
		Context	Every procedure where it appears	М	М	TS 23.205
		Bearer Termination 1	Every procedure where it appears	М	М	TS 23.205
		Bearer Termination 2	Every procedure where it appears	М	М	TS 23.205
		Bearer Characteristics	Establish Bearer	М	М	TS 23.205
Mc	Megaco	Destination Binding Reference	Establish Bearer	М	М	TS 23.205
IVIC	Megaco	Sender Binding Reference	Prepare Bearer	М	M	TS 23.205
		Codec	Prepare Bearer Modify Bearer Characteristics	М	М	TS 23.205
		Release Cause	Release Bearer Bearer Released	М	М	TS 23.205
lu	RANAP	RAB ID	RAB ASSIGNMENT REQUEST RAB ASSIGNMENT RESPONSE RAB RELEASE REQUEST IU RELEASE COMPLETE RELOCATION REQUEST RELOCATION REQUEST RELOCATION COMMAND	М	М	TS 25.413

Cause	RAB ASSIGNMENT REQUEST RAB ASSIGNMENT RESPONSE RAB RELEASE REQUEST IU RELEASE REQUEST IU RELEASE COMMAND RELOCATION REQUIRED RELOCATION REQUEST RELOCATION REQUEST RELOCATION PREPARATION FAILURE RELOCATION FAILURE RELOCATION CANCEL SECURITY MODE REJECT LOCATION REPORT ERROR INDICATION	М	М	TS 25.413
Source ID	RELOCATION REQUIRED	М	М	TS 25.413
Target ID	RELOCATION REQUIRED	М	М	TS 25.413
Paging Cause	PAGING	М	М	TS 25.413
Permanent NAS UE Identity	COMMON ID PAGING RELOCATION REQUEST	М	М	TS 25.413
Area Identity	LOCATION REPORT	M	М	TS 25.413
Last Known Service Area	LOCATION REPORT	М	М	TS 25.413
LAI	INITIAL UE MESSAGE DIRECT TRANSFER	М	М	TS 25.413
SAI	INITIAL UE MESSAGE DIRECT TRANSFER	М	М	TS 25.413
Global RNC-ID	ERROR INDICATION	М	М	TS 25.413

4.3 MGW Trace Record Content

The following table describes the trace record content for minimum and medium trace depth for Megaco protocol in the Media GateWay (MGW).

Interface name	Prot.	IE name	Dresedure neme(s)	Trace depth		Notes			
Interface name	name	ie name	Procedure name(s)	Min	Med	Notes			
		Context	Every procedure where it appears	M	М	TS 23.205			
		Bearer Termination 1	Every procedure where it appears	М	М	TS 23.205			
		Bearer Termination 2	Every procedure where it appears	М	М	TS 23.205			
		Bearer Characteristics	Establish Bearer	М	M	TS 23.205			
		Destination Binding Reference	Establish Bearer	М	M	TS 23.205			
Mc	Megaco	Destination Bearer Address	Establish Bearer	М	M	TS 23.205			
IVIC		Sender Binding Reference	Prepare Bearer	М	M	TS 23.205			
		Sender Bearer Address	Prepare Bearer	M	М	TS 23.205			
			-	Codec Prepare Bearer	М	М	TS 23.205		
					Codec	Modify Bearer Characteristics	IVI	IVI	13 23.203
					Release Cause	Release Bearer	М	М	TS 23.205
		Nelease Cause	Bearer Released	IAI	IVI				
Iu-UP, Nb-UP		Error Cause value	Every NACK message	M	М	TS 25.415			
lu-UP, Nb-UP		RFCI indicators	Rate control procedure	M	М	TS 25.415			
Iu-UP, Nb-UP		Local_Channel_Type	TFO_TRANS	M	M	TS 28.062			
Iu-UP, Nb-UP		Indication whether <enquiry> character is received by the CTM receiver</enquiry>	CTM availability negotiation	M	M	TS 26.226			

4.4 SGSN Trace Record Content

The following table shows the trace record content for SGSN.

The trace record is the same for management based activation and for signalling based activation.

For SGSN, the Minimum level of detail shall be supported.

Interface name	Prot. IE name Message name(s)		Trace	depth	Notes	
interrace name	name	IE name	Message name(s)	Min	Med	Notes
		Requested QoS/Requested new QoS	ACTIVATE PDP CONTEXT REQUEST ACTIVATE SECONDARY PDP CONTEXT REQUEST MODIFY PDP CONTEXT REQUEST	М	м	TS 24.008
		Requested PDP address	ACTIVATE PDP CONTEXT REQUEST	M	M	TS 24.008
		Access point name	ACTIVATE PDP CONTEXT REQUEST REQUEST PDP CONTEXT ACTIVATION	М	М	TS 24.008 TS 23.003
lu	SM	Negotiated QoS/New QoS	ACTIVATE PDP CONTEXT ACCEPT ACTIVATE SECONDARY PDP CONTEXT ACCEPT MODIFY PDP CONTEXT REQUEST MODIFY PDP CONTEXT ACCEPT	М	М	TS 24.008
		PDP Address	ACTIVATE PDP CONTEXT ACCEPT MODIFY PDP CONTEXT REQUEST	М	М	TS 24.008
		SM cause	ACTIVATE PDP CONTEXT REJECT ACTIVATE SECONDARY PDP CONTEXT REJECT REQUEST PDP CONTEXT ACTIVATION REJECT MODIFY PDP CONTEXT REJECT DEACTIVATE PDP CONTEXT REQUEST SM STATUS	М	М	TS 24.008
		Offered PDP address	REQUEST PDP CONTEXT ACTIVATION	M	М	TS 24.008
		MS network capability	ATTACH REQUEST ROUTING AREA UPDATE REQUEST	М	М	TS 24.008
		Attach type	ATTACH REQUEST	M	M	TS 24.008
		IMSI	ATTACH REQUEST	M	M	TS 24.008
		MS Radio Access capability	ATTACH REQUEST ROUTING AREA UPDATE REQUEST	М	М	TS 24.008
		Attach result	ATTACH ACCEPT	M	M	TS 24.008
		Routing area identification	ATTACH ACCEPT ROUTING AREA UPDATE REQUEST ROUTING AREA UPDATE ACCEPT	М	М	TS 24.008
lu	MM	GMM cause	ATTACH ACCEPT ATTACH REJECT DETACH REQUEST AUTHENTICATION AND CIPHERING FAILURE ROUTING AREA UPDATE ACCEPT ROUTING AREA UPDATE REJECT GMM STATUS	М	М	TS 24.008
		Detach type	DETACH REQUEST	M	М	TS 24.008
		Mobile identity	AUTHENTICATION AND CIPHERING RESPONSE IDENTITY RESPONSE ROUTING AREA UPDATE ACCEPT	М	М	TS 24.008
		Update type	ROUTING AREA UPDATE REQUEST	М	М	TS 24.008

		Update result	ROUTING AREA UPDATE ACCEPT	М	M	TS 24.008
		TP-Originating-Address	SMS-DELIVER	М	М	TS 23.040
			SMS-DELIVER			
		TP-Service-Centre-Time-Stamp	SMS-SUBMIT-REPORT	М	M	TS 23.040
		· ·	SMS-STATUS-REPORT			
lu	SMS	TD Fallers Oans	SMS-DELIVER-REPORT			TO 00 040
		TP-Failure-Cause	SMS-SUBMIT-REPORT	M	М	15 23.040
		TD Destination Address	SMS-SUBMIT			TC 00 040
		TP-Destination-Address	SMS-COMMAND	M	M	15 23.040
		TP-Recipient-Address	SMS-STATUS-REPORT	М	М	TS 23.040
			CREATE PDP CONTEXT REQUEST			
			UPDATE PDP CONTEXT REQUEST			
			PDU NOTIFICATION REQUEST			
			IDENTIFICATION RESPONSE			
			SGSN CONTEXT REQUEST			
		IMSI	FORWARD RELOCATION REQUEST	M	M	TS 23.040 TS 23.040 TS 23.040 TS 23.040 TS 23.040 TS 29.060 TS 29.060
			RELOCATION CANCEL REQUEST			
			MBMS NOTIFICATION REQUEST			
			CREATE MBMS CONTEXT REQUEST			
			UPDATE MBMS CONTEXT REQUEST			
			DELETE MBMS CONTEXT REQUEST			
			CREATE PDP CONTEXT REQUEST			
			UPDATE PDP CONTEXT REQUEST			
		RAI	IDENTIFICATION REQUEST	м	м	TS 29 060
		IVAI	SGSN CONTEXT REQUEST			10 25.000
			CREATE MBMS CONTEXT REQUEST			
			UPDATE MBMS CONTEXT REQUEST			
			CREATE PDP CONTEXT REQUEST			
			CREATE PDP CONTEXT RESPONSE			
0	OTD		UPDATE PDP CONTEXT REQUEST			
Gn	GTP		PDU NOTIFICATION REQUEST			
			PDU NOTIFICATION REJECT REQUEST			
		End User Address	MBMS NOTIFICATION REQUEST MBMS NOTIFICATION REJECT REQUEST	м	м	TC 20 060
		End Oser Address	CREATE MBMS CONTEXT REQUEST	IVI	IVI	13 29.000
			DELETE MBMS CONTEXT REQUEST			
			MBMS REGISTRATION REQUEST			
			MBMS DE-REGISTRATION REQUEST			
			MBMS SESSION START REQUEST			
			MBMS SESSION STOP REQUEST			
			CREATE PDP CONTEXT REQUEST			
			PDU NOTIFICATION REQUEST			
			PDU NOTIFICATION REJECT REQUEST			
			MBMS NOTIFICATION REQUEST			
			MBMS NOTIFICATION REJECT REQUEST			
		Access Point Name	CREATE MBMS CONTEXT REQUEST	M	M	TS 29.060
			DELETE MBMS CONTEXT REQUEST			
			MBMS REGISTRATION REQUEST			
			MBMS DE-REGISTRATION REQUEST			
			MBMS SESSION START REQUEST			
			MBMS SESSION STOP REQUEST			

SGSN Address for signalling	CREATE PDP CONTEXT REQUEST UPDATE PDP CONTEXT REQUEST IDENTIFICATION REQUEST SGSN CONTEXT REQUEST SGSN CONTEXT RESPONSE FORWARD RELOCATION REQUEST FORWARD RELOCATION RESPONSE CREATE MBMS CONTEXT REQUEST UPDATE MBMS CONTEXT REQUEST	М	М	TS 29.060
SGSN Address for user traffic	CREATE PDP CONTEXT REQUEST UPDATE PDP CONTEXT REQUEST SGSN CONTEXT ACKNOWLEDGE MBMS SESSION START RESPONSE	М	М	TS 29.060
MSISDN	CREATE PDP CONTEXT REQUEST CREATE MBMS CONTEXT REQUEST	М	М	TS 29.060
Quality of Service Profile	CREATE PDP CONTEXT REQUEST CREATE PDP CONTEXT RESPONSE UPDATE PDP CONTEXT REQUEST UPDATE PDP CONTEXT RESPONSE MBMS SESSION START REQUEST	М	М	TS 29.060
RAT Type	CREATE PDP CONTEXT REQUEST UPDATE PDP CONTEXT REQUEST	М	М	TS 29.060
IMEI(SV)	CREATE PDP CONTEXT REQUEST	М	М	TS 29.060
User Location Information	CREATE PDP CONTEXT REQUEST UPDATE PDP CONTEXT REQUEST	М	М	TS 29.060
Cause	CREATE PDP CONTEXT RESPONSE UPDATE PDP CONTEXT RESPONSE DELETE PDP CONTEXT RESPONSE PDU NOTIFICATION RESPONSE PDU NOTIFICATION REJECT REQUEST PDU NOTIFICATION REJECT RESPONSE IDENTIFICATION RESPONSE SGSN CONTEXT RESPONSE SGSN CONTEXT ACKNOWLEDGE FORWARD RELOCATION RESPONSE RELOCATION CANCEL RESPONSE FORWARD RELOCATION COMPLETE ACKNOWLEDGE FORWARD SRNS CONTEXT ACKNOWLEDGE MBMS NOTIFICATION RESPONSE MBMS NOTIFICATION REJECT REQUEST MBMS NOTIFICATION REJECT RESPONSE CREATE MBMS CONTEXT RESPONSE UPDATE MBMS CONTEXT RESPONSE UPDATE MBMS CONTEXT RESPONSE MBMS REGISTRATION RESPONSE MBMS REGISTRATION RESPONSE MBMS DE-REGISTRATION RESPONSE MBMS SESSION START RESPONSE	М	М	TS 29.060

		GGSN Address for Control Plane	CREATE PDP CONTEXT RESPONSE UPDATE PDP CONTEXT RESPONSE PDU NOTIFICATION REQUEST MBMS NOTIFICATION REQUEST CREATE MBMS CONTEXT RESPONSE UPDATE MBMS CONTEXT RESPONSE	М	М	TS 29.060
		GGSN Address for user traffic	CREATE PDP CONTEXT RESPONSE UPDATE PDP CONTEXT RESPONSE	М	М	TS 29.060
		GSN Address	ERROR INDICATION	М	М	TS 29.060
		SGSN Number	SGSN CONTEXT REQUEST FORWARD RELOCATION RESPONSE	М	М	TS 29.060
		MBMS UE Context	SGSN CONTEXT RESPONSE FORWARD RELOCATION REQUEST	М	М	TS 29.060
		RANAP Cause	FORWARD RELOCATION REQUEST FORWARD RELOCATION RESPONSE	М	М	TS 29.060
		Target Identification	FORWARD RELOCATION REQUEST	М	М	TS 29.060
Gs	BSSAP+	IMSI	BSSAP+-ALERT-ACK BSSAP+-ALERT-REJECT BSSAP+-ALERT-REQUEST BSSAP+-DOWNLINK-TUNNEL-REQUEST BSSAP+-GPRS-DETACH-ACK BSSAP+-GPRS-DETACH-INDICATION BSSAP+-IMSI-DETACH-INDICATION BSSAP+-IMSI-DETACH-INDICATION BSSAP+-LOCATION-UPDATE-ACCEPT BSSAP+-LOCATION-UPDATE-REJECT BSSAP+-LOCATION-UPDATE-REQUEST BSSAP+-MOBILE-STATUS BSSAP+-MS-ACTIVITY-INDICATION BSSAP+-MS-CTIVITY-INDICATION BSSAP+-PAGING-REJECT BSSAP+-PAGING-REJECT BSSAP+-PAGING-REJECT BSSAP+-PAGING-REQUEST BSSAP+-TMSI-REALLOCATION-COMPLETE BSSAP+-UPLINK-TUNNEL-REQUEST	M	М	TS 29.018
		Gs Cause	BSSAP+-ALERT-REJECT BSSAP+-MOBILE-STATUS BSSAP+-MS-UNREACHABLE BSSAP+-PAGING-REJECT	М	М	TS 29.018
		VLR number	BSSAP+-PAGING-REJECT BSSAP+-DOWNLINK-TUNNEL-REQUEST BSSAP+-PAGING-REQUEST BSSAP+-RESET-ACK BSSAP+-RESET-INDICATION	М	М	TS 29.018
		SGSN number	BSSAP+-GPRS-DETACH-INDICATION BSSAP+-IMSI-DETACH-INDICATION BSSAP+-LOCATION-UPDATE-REQUEST BSSAP+-RESET-ACK BSSAP+-RESET-INDICATION BSSAP+-UPLINK-TUNNEL-REQUEST	М	М	TS 29.018
		IMSI detach from GPRS service type	BSSAP+-GPRS-DETACH-INDICATION	M	M	TS 29.018

		Cell global identity/ New CGI	BSSAP+-GPRS-DETACH-INDICATION BSSAP+-IMSI-DETACH-INDICATION BSSAP+-LOCATION-UPDATE-REQUEST BSSAP+-MS-ACTIVITY-INDICATION BSSAP+-TMSI-REALLOCATION-COMPLETE	М	М	TS 29.018
		Service area identification /New SAI	BSSAP+-GPRS-DETACH-INDICATION BSSAP+-IMSI-DETACH-INDICATION BSSAP+-LOCATION-UPDATE-REQUEST BSSAP+-MS-ACTIVITY-INDICATION BSSAP+-TMSI-REALLOCATION-COMPLETE	М	М	TS 29.018
		Detach type	BSSAP+-IMSI-DETACH-INDICATION	М	М	TS 29.018
		Reject cause	BSSAP+-LOCATION-UPDATE-REJECT	M	M	TS 29.018
		Update type	BSSAP+-LOCATION-UPDATE-REQUEST	M	M	TS 29.018
		LAI/Old LAI	BSSAP+-LOCATION-UPDATE-ACCEPT BSSAP+-LOCATION-UPDATE-REQUEST BSSAP+-PAGING-REQUEST	М	М	TS 29.018
		IMEISV	BSSAP+-LOCATION-UPDATE-REQUEST	М	М	TS 29.018
		Erroneous message	BSSAP+-MOBILE-STATUS	М	М	TS 29.018
Gr		IMSI	MAP_CANCEL_LOCATION MAP_PURGE_MS MAP_UPDATE_GPRS_LOCATION MAP_NOTE_MM_EVENT MAP-INSERT-SUBSCRIBER-DATA MAP-DELETE-SUBSCRIBER-DATA MAP-READY-FOR-SM	М	М	TS 29.002
		Cancellation Type	MAP_CANCEL_LOCATION	M	M	
		User error	Every message where it appears	M	M	
		Provider error	Every message where it appears	M	M	
		Location Information for GPRS	MAP_NOTE_MM_EVENT	M	M	
	MAP	MSISDN	MAP-INSERT-SUBSCRIBER-DATA	M	M	
		Alert Reason	MAP-READY-FOR-SM	М	M	TS 29.002
		SM RP OA	MAP-MO-FORWARD-SHORT-MESSAGE MAP-MT-FORWARD-SHORT-MESSAGE	М	М	TS 29.002
Gd		SM RP DA	MAP-MO-FORWARD-SHORT-MESSAGE MAP-MT-FORWARD-SHORT-MESSAGE	M	M	TS 29.002
		IMSI	MAP-MO-FORWARD-SHORT-MESSAGE	M	M	
		More Messages To Send IMEI(SV)	MAP-MT-FORWARD-SHORT-MESSAGE MAP_CHECK_IMEI	M	M	TS 29.002
		Equipment status	MAP CHECK IMEI	M	M	
Gf		User error	Every message where it appears	M	M	TS 29.002
		Provider error	Every message where it appears	M	M	TS 29.002
lu	RANAP	RAB ID	RAB ASSIGNMENT REQUEST RAB ASSIGNMENT RESPONSE RAB RELEASE REQUEST IU RELEASE COMPLETE RELOCATION REQUEST RELOCATION REQUEST RELOCATION COMMAND	М	M	TS 25.413

3GPP TS 32.423 version 9.4.0 Release 9

		Cause	RAB ASSIGNMENT REQUEST RAB ASSIGNMENT RESPONSE RAB RELEASE REQUEST IU RELEASE REQUEST IU RELEASE COMMAND RELOCATION REQUIRED RELOCATION REQUEST RELOCATION REQUEST RELOCATION PREPARATION FAILURE RELOCATION FAILURE RELOCATION CANCEL SECURITY MODE REJECT LOCATION REPORT	М	М	TS 25.413
			ERROR INDICATION			
		Source ID	RELOCATION REQUIRED	M	М	TS 25.413
		Target ID	RELOCATION REQUIRED	М	M	TS 25.413
		Paging Cause	PAGING	М	М	TS 25.413
		Permanent NAS UE Identity	COMMON ID PAGING RELOCATION REQUEST	М	М	TS 25.413
	Area Identity	LOCATION REPORT	М	М	TS 25.413	
		Last Known Service Area	LOCATION REPORT	M	M	TS 25.413
			INITIAL UE MESSAGE			
	RAC	DIRECT TRANSFER	М	М	TS 25.413	
		SAI	INITIAL UE MESSAGE DIRECT TRANSFER	М	М	TS 25.413
		Global RNC-ID	ERROR INDICATION	М	М	TS 25.413
		IMSI	DETACH NOTIFICATION CS PAGING INDICATON RELOCATION CANCEL Request IDENTIFICATION RESPONSE CONTEXT RESPONSE CONTEXT REQUEST FORWARD RELOCATION REQUEST	М	М	TS 29.274
		TMSI	CS PAGING INDICATON	М	М	TS 25.413
		GUTI	CONTEXT REQUEST IDENTIFICATION Request	М	М	TS 29.274
S3	GTPv2C	RAI	IDENTIFICATION Request CONTEXT REQUEST	М	М	TS 29.274
		P-TMSI	IDENTIFICATION Request CONTEXT REQUEST	М	М	TS 29.274
		Indication	FORWARD RELOCATION COMPLETE NOTIFICATION FORWARD RELOCATION REQUEST	М	М	TS 29.274
		BSSGP Cause	FORWARD RELOCATION RESPONSE FORWARD RELOCATION REQUEST	М	М	TS 29.274
		RANAP Cause	FORWARD RELOCATION RESPONSE FORWARD RELOCATION REQUEST	М	М	TS 29.274
		eNodeB Cause	FORWARD RELOCATION RESPONSE	М	М	TS 29.274
		RAT Type	CONTEXT REQUEST	М	М	TS 29.274
		Target Identification	FORWARD RELOCATION REQUEST	M	M	TS 29.274

		Cause	RELOCATION CANCEL RESPONSE FORWARD SRNS CONTEXT ACKNOWLEDGE IDENTIFICATION RESPONSE CONTEXT ACKNOWLEDGE CONTEXT RESPONSE FORWARD RELOCATION COMPLETE ACKNOWLEDGE FORWARD RELOCATION RESPONSE DETACH NOTIFICATION	М	М	TS 29.274
			DETACH aCKNOWLEDGE			
		RAN Cause	FORWARD RELOCATION REQUES	М	М	TS 29.274
		Selected PLMN ID	FORWARD RELOCATION REQUEST	М	М	TS 29.274
		Traffic Aggregate Description (TAD)	Bearer Resource Command	М	М	TS 25.413
		Linked Bearer Identity (LBI)	Bearer Resource Command Create Bearer Request Delete Bearer Response	М	М	TS 25.413
		Linked EPS Bearer ID	Bearer Resource Failure Indication Delete Session Request Delete Bearer Request	М	М	TS 25.413
		Cause	Bearer Resource Failure Indication Create Session Response Create Bearer Response Modify Bearer Response Delete Session Response Delete Bearer Response Downlink Data Notification Acknowledgement Downlink Data Notification Failure Indication Update Bearer Response Create Indirect Data Forwarding Tunnel Response Update Bearer Complete	М	М	TS 25.413 TS 25.413 TS 25.413 TS 25.413
		Bearer Contexts to be modified	Modify Bearer Request	M	М	
		Bearer Contexts to be removed	Modify Bearer Request	М	М	TS 25.413
S4	GTPV2C	IMSI	Create Session Request	М	М	
		IIVIOI	Update Bearer Request	IVI	IVI	13 23.413
		MSISDN	Create Session Request	М	М	TS 25.413
		IVIOIODIA	Modify Bearer Response			13 23.413
		Serving Network	Create Session Request	М	M	TS 25.413
		Access Point Name (APN)	Create Session Request	М	M	TS 25.413
		PDN Type	Create Session Request	М	M	TS 25.413
		Bearer Contexts	Create Session Request Create Bearer Request Create Bearer Response Delete Bearer Request Delete Bearer Response Update Bearer Request	М	М	TS 25.413
			Update Bearer Response Create Indirect Data Forwarding Tunnel Request Create Indirect Data Forwarding Tunnel Response Update Bearer Complete			
		RAT Type	Create Session Request Modify Bearer Request	М	М	TS 25.413
		Bearer Contexts created	Create Session Response	М	M	TS 25.413
		Bearer Contexts marked for removal	Create Session Response	M	M	TS 25.413

		Bearer Contexts modified	Modify Bearer Response	M	М	TS 25.413
		Bearer Contexts marked for removal	Modify Bearer Response	М	М	TS 25.413
		User Name	NOTIFY REQUEST AUTHENTICATION INFORMATION REQUEST DELETE SUBSCRIBER DATA REQUEST INSERT SUBSCRIBER DATA REQUEST PURGE UE REQUEST CANCEL LOCATION REQUEST UPDATE LOCATION REQUEST	М	М	TS 29.272
		Terminal Infomration	NOTIFY REQUEST UPDATE LOCATION REQUEST	М	М	TS 29.272
S6d	Diameter	Result	NOTIFY ANSWER AUTHENTICATION INFORMATION ANSWER DELETE SUBSCRIBER DATA ANSWER INSERT SUBSCRIBER DATA ANSWER PURGE UE ANSWER CANCEL LOCATION ANSWER UPDATE LOCATION ANSWER	М	М	TS 29.272
		RAT Type	UPDATE LOCATION REQUEST	М	М	TS 29.272
		APN	NOTIFY REQUEST	М	М	TS 29.272
		Visited PLMN Id	AUTHENTICATION INFORMATION REQUEST UPDATE LOCATION REQUEST	М	М	TS 29.272

4.5 GGSN Trace Record Content

The following table describes the trace record content for minimum and medium trace depth for GGSN. The record content is same for management based activation and for signalling based activation. For GGSN, the Minimum level of detail shall be supported.

Interface name	Prot. Name	IE name	MESSAGE NAME(S)	Trace	depth	Notes
interface fiame	1 TOL. IVAILLE	IL Hame	()	Min	Med	Notes
		IMSI	CREATE PDP CONTEXT REQUEST UPDATE PDP CONTEXT REQUEST PDU NOTIFICATION REQUEST SEND ROUTEING INFORMATION FOR GPRS REQUEST SEND ROUTEING INFORMATION FOR GPRS RESPONSE FAILURE REPORT REQUEST NOTE MS PRESENT REQUEST MBMS NOTIFICATION REQUEST CREATE MBMS CONTEXT REQUEST UPDATE MBMS CONTEXT REQUEST DELETE MBMS CONTEXT REQUEST	м	М	TS 29.060
		RAI	CREATE PDP CONTEXT REQUEST UPDATE PDP CONTEXT REQUEST CREATE MBMS CONTEXT REQUEST UPDATE MBMS CONTEXT REQUEST	М	М	TS 29.060
Gn	GTP	End User Address	CREATE PDP CONTEXT REQUEST CREATE PDP CONTEXT RESPONSE UPDATE PDP CONTEXT REQUEST PDU NOTIFICATION REQUEST PDU NOTIFICATION REJECT REQUEST MBMS NOTIFICATION REJECT REQUEST MBMS NOTIFICATION REJECT REQUEST CREATE MBMS CONTEXT REQUEST DELETE MBMS CONTEXT REQUEST MBMS REGISTRATION REQUEST MBMS DE-REGISTRATION REQUEST MBMS SESSION START REQUEST MBMS SESSION STOP REQUEST	М	М	TS 29.060
		Access Point Name	CREATE PDP CONTEXT REQUEST PDU NOTIFICATION REQUEST PDU NOTIFICATION REJECT REQUEST MBMS NOTIFICATION REJECT REQUEST MBMS NOTIFICATION REJECT REQUEST CREATE MBMS CONTEXT REQUEST DELETE MBMS CONTEXT REQUEST MBMS REGISTRATION REQUEST MBMS DE-REGISTRATION REQUEST MBMS SESSION START REQUEST MBMS SESSION STOP REQUEST	м	М	TS 29.060
		SGSN Address for signalling	CREATE PDP CONTEXT REQUEST UPDATE PDP CONTEXT REQUEST CREATE MBMS CONTEXT REQUEST UPDATE MBMS CONTEXT REQUEST	М	М	TS 29.060

		SGSN Address for user traffic	CREATE PDP CONTEXT REQUEST UPDATE PDP CONTEXT REQUEST MRMS SESSION START RESPONSE	М	М	TS 29.060
		MSISDN	MBMS SESSION START RESPONSE CREATE PDP CONTEXT REQUEST CREATE MBMS CONTEXT REQUEST	М	М	TS 29.060
		Quality of Service Profile	CREATE PDP CONTEXT REQUEST CREATE PDP CONTEXT RESPONSE UPDATE PDP CONTEXT REQUEST UPDATE PDP CONTEXT RESPONSE MBMS SESSION START REQUEST	М	М	TS 29.060
		RAT Type	CREATE PDP CONTEXT REQUEST UPDATE PDP CONTEXT REQUEST	М	М	TS 29.060
		IMEI(SV)	CREATE PDP CONTEXT REQUEST	М	М	TS 29.060
		User Location Information	CREATE PDP CONTEXT REQUEST UPDATE PDP CONTEXT REQUEST	М	М	TS 29.060
		Cause	CREATE PDP CONTEXT RESPONSE UPDATE PDP CONTEXT RESPONSE DELETE PDP CONTEXT RESPONSE PDU NOTIFICATION RESPONSE PDU NOTIFICATION REJECT REQUEST PDU NOTIFICATION REJECT RESPONSE SEND ROUTEING INFORMATION FOR GPRS RESPONSE FAILURE REPORT RESPONSE NOTE MS GPRS PRESENT RESPONSE MBMS NOTIFICATION RESPONSE MBMS NOTIFICATION REJECT REQUEST MBMS NOTIFICATION REJECT RESPONSE CREATE MBMS CONTEXT RESPONSE UPDATE MBMS CONTEXT RESPONSE DELETE MBMS CONTEXT RESPONSE MBMS REGISTRATION RESPONSE MBMS DE-REGISTRATION RESPONSE MBMS SESSION START RESPONSE MBMS SESSION START RESPONSE	М	М	TS 29.060
		GGSN Address for Control Plane	CREATE PDP CONTEXT RESPONSE UPDATE PDP CONTEXT RESPONSE PDU NOTIFICATION REQUEST MBMS NOTIFICATION REQUEST CREATE MBMS CONTEXT RESPONSE UPDATE MBMS CONTEXT RESPONSE	М	М	TS 29.060
		GGSN Address for user traffic	CREATE PDP CONTEXT RESPONSE UPDATE PDP CONTEXT RESPONSE	М	М	TS 29.060
		MAP Cause	SEND ROUTEING INFORMATION FOR GPRS RESPONSE FAILURE REPORT RESPONSE	М	М	TS 29.060
		GSN Address	SEND ROUTEING INFORMATION FOR GPRS RESPONSE NOTE MS PRESENT REQUEST	М	М	TS 29.060
		IMSI	MBMS AUTHORIZATION REQUEST (AAR) MBMS AUTHORIZATION RESPONSE (AAA)	М	М	TS 29.061
Comb	Diamatan Cost	RAI	MBMS AUTHORIZATION REQUEST (AAR)	М	М	TS 29.061
Gmb	Diameter Gmb	Access Point Name	MBMS AUTHORIZATION REQUEST (AAR)	М	М	TS 29.061
		MSISDN	MBMS AUTHORIZATION REQUEST (AAR)	M	М	TS 29.061
		IMEI(SV)	MBMS AUTHORIZATION REQUEST (AAR)	M	M	TS 29.061

IP Multicast Address	MBMS AUTHORIZATION REQUEST (AAR)	М	М	TS 29.061
TMGI	MBMS AUTHORIZATION RESPONSE (AAA)	М	M	TS 29.061
Result-Code	MBMS AUTHORIZATION RESPONSE (AAA) MBMS USER DEACTIVATION RESPONSE (STA) MBMS SESSION START-STOP INDICATION RESPONSE (RAA) MBMS SERVICE TERMINATION ANSWER (ASR)	M	M	TS 29.061
Experimental-Result	MBMS AUTHORIZATION RESPONSE (AAA) MBMS SESSION START-STOP INDICATION RESPONSE (RAA)	M	M	TS 29.061
Error-Reporting-Host	MBMS AUTHORIZATION RESPONSE (AAA) MBMS USER DEACTIVATION RESPONSE (STA) MBMS SESSION START-STOP INDICATION RESPONSE (RAA) MBMS SERVICE TERMINATION ANSWER (ASR)	M	М	TS 29.061

4.6 UTRAN Trace Record Content

For RNC, the Maximum level of detail shall be supported.

Table 4.6.1: UTRAN Trace Record Content

Interface (anacific macagas)	Format	Level of details		tails	Description		
Interface (specific messages)	Format	Min	Med	Max	·		
		M	M	0	Message name		
		0	0	0	Record extensions		
RRC (without rrc dedicated	Decoded	M	M	Χ	rncID of traced RNC		
measurements)		М	М	Х	Dedicated IE extracted from RRC messages between the traced RNC and the UE. A subset of IEs as given in the table 4.6.2.		
					is provided.		
	ASN.1	Х	X	М	Raw Uu Messages: RRC messages between the traced RNC and the UE. The encoded content of the message is provided		
		M	М	0	Message name		
		0	0	0	Record extensions		
lub (without nbap dedicated	Decoded	М	М	X	rncID of traced RNC		
measurements)		М	М	Х	rbld + Dedicated IE extracted from NBAP messages send/received inside traced UEs communication context. A subset of IEs as given in the table 4.6.2.is provided		
	ASN.1	Х	Х	М	Raw lub Messages: NBAP messages between the traced RNC and the NodeB or cell. The encoded content of the message is provided		
		M	M	0	Message name		
		0	0	0	Record extensions		
lu	Decoded	M	М	X	rncID of traced RNC CoreNetworkID CN Domain Indicator		
		М	М	Х	rabId + Dedicated IE extracted from RANAP messages between the traced RNC and Core Network. A subset of IEs as given in the table 4.6.2. is provided.		
	ASN.1	Х	Х	М	Raw Iu Messages RANAP: messages between the traced RNC and Core Network The encoded content of the message is provided		
		M	M	0	Message name		
		0	0	0	Record extensions		
lue	Decoded	M	М	Х	rncID of traced RNC rncID of neighbouring RNC		
lur		М	М	Х	rlld + Dedicated IE extracted from RNSAP messages between the traced RNC and the neighbouring RNC. A subset of IEs as given in the table 4.6.2.is provided		
	ASN.1	Х	х	М	Raw lur Messages: RNSAP messages between the traced RNC and the neighbouring RNC. The encoded content of the message is provided		
nbap (only dedicated	Decoded	Х	М	Х	lub IEs from NBAP measurement reports messages		
measurements)	ASN.1	Х	Χ	М	NBAP measurement reports messages		
rra (anly dadicated magazinements)	Decoded	Х	М	Х	Uu IEs from RRC measurement reports messages		
rrc (only dedicated measurements)	ASN.1	Х	Х	М	RRC measurement reports messages		

Definitions:

• rncID of traced RNC: The id of the RNC traced, e.g. the RNC which handles the connection of the traced MS, during the Trace Recording Session.

• rncID of neighbouring RNC: The ids of all Neighbouring RNC involved in the Iur procedures during the Trace Recording Session.

• cId: The cIds of all cells involved in the Iub and Iur procedures during the Trace Recording Session. The cId is provided with each NBAP and

ETSI TS 132 423 V9.4.0 (2011-01)

RNSAP messages

for which the cId is relevant.

rabId: Specific recorded IE that contains the RAB identifier.

• rlld: Specific recorded IE that contains the Radio Link identifier

rbId: Specific recorded IE that contains the Radio Bearer identifier

• Message name: Name of the protocol message

• Record extensions: A set of manufacturer specific extensions to the record

• Decoded: Some IEs shall be decoded (cf. detailed list in table 4.6.2. depending on trace depth)

• ASN.1: Messages in encoded format

Table 4.6.2: trace record description for minimum and medium trace depth

Interface name	Prot. name	IE name	Message name(s)	Trace depth		Notes
				Min	Med	Notes
Uu	RRC	RAB info type	RADIO BEARER SETUP HO TO UTRAN COMMAND RADIO BEARER RELEASE RADIO BEARER RECONFIGURATION	M	M	TS 25.331
		RB info type	RADIO BEARER RECONFIGURATION RADIO BEARER RELEASE RADIO BEARER SETUP HO TO UTRAN COMMAND	М	M	TS 25.331
		URA identity	RADIO BEARER SETUP RADIO BEARER RELEASE URA UPDATE CONFIRM RADIO BEARER RECONFIGURATION	М	М	TS 25.331
		CN domain	SIGNALLING CONNECTION RELEASE INITIAL DIRECT TRANSFER DL DIRECT TRANSFER UL DIRECT TRANSFER	М	М	TS 25.331
		Logical channel priority	RADIO BEARER SETUP	М	М	TS 25.331

RRC state indicator	RADIO BEARER SETUP PHYSICAL CHANNEL RECONFIGURATION TRANSPORT CHANNEL RECONFIGURATION RADIO BEARER RECONFIGURATION CELL UPDATE CONFIRM URA UPDATE CONFIRM	М	М	TS 25.331
Primary CPICH scrambling code of added cell	ACTIVE SET UPDATE	0	0	TS 25.331
Primary CPICH scrambling code of removed cell	ACTIVE SET UPDATE	0	0	TS 25.331
Target cell identity	CELL CHANGE ORDER	М	М	TS 25.331
Cell synchronisation information	RRC/MEASUREMENT REPORT for measurement = intra frequency	х	М	TS 25.331
Cell parameters Id	RRC/MEASUREMENT REPORT for measurement = intra frequency	0	0	TS 25.331
Timeslot list	RRC/MEASUREMENT REPORT for measurement = intra frequency	х	0	TS 25.331
CPICH Ec/No	RRC/MEASUREMENT REPORT for measurement = intra frequency	х	0	TS 25.331
CPICH RSCP	RRC/MEASUREMENT REPORT for measurement = intra frequency	х	0	TS 25.331
PCCPCH RSCP	RRC/MEASUREMENT REPORT for measurement = intra frequency	х	0	TS 25.331
Pathloss	RRC/MEASUREMENT REPORT for measurement = intra frequency	х	М	TS 25.331
UARFCN uplink (Nu)	RRC/MEASUREMENT REPORT for measurement = inter frequency	х	0	TS 25.331
UARFCN downlink (Nd)	RRC/MEASUREMENT REPORT for measurement = inter frequency	х	0	TS 25.331
UARFCN (Nt)	RRC/MEASUREMENT REPORT for measurement = inter frequency	х	0	TS 25.331
Cell synchronisation information	RRC/MEASUREMENT REPORT for measurement = inter frequency	х	М	TS 25.331
CPICH Ec/No	RRC/MEASUREMENT REPORT for measurement = inter frequency	х	0	TS 25.331
CPICH RSCP	RRC/MEASUREMENT REPORT for measurement = inter frequency	х	0	TS 25.331
PCCPCH RSCP	RRC/MEASUREMENT REPORT for measurement = inter frequency	х	0	TS 25.331
Pathloss	RRC/MEASUREMENT REPORT for measurement = inter frequency	х	М	TS 25.331

		Cell parameters Id	RRC/MEASUREMENT REPORT for measurement = inter frequency	0	0	TS 25.331
		Timeslot list	RRC/MEASUREMENT REPORT for measurement = inter frequency	х	0	TS 25.331
		BCCH ARFCN	RRC/MEASUREMENT REPORT for measurement = inter RAT	х	М	TS 25.331
		GSM Carrier RSSI	RRC/MEASUREMENT REPORT for measurement = inter RAT	х	М	TS 25.331
		RLC buffer Payload	RRC/MEASUREMENT REPORT for measurement = traffic volume	х	М	TS 25.331
		Average RLC buffer payload	RRC/MEASUREMENT REPORT for measurement = traffic volume	х	М	TS 25.331
		Variance of RLC buffer payload	RRC/MEASUREMENT REPORT for measurement = traffic volume	х	М	TS 25.331
lub	NBAP	RL identity	RADIO LINK SETUP REQUEST RADIO LINK RECONFIGURATION PREPARE RADIO LINK RECONFIGURATION REQUEST RADIO LINK RECONFIGURATION READY RADIO LINK RECONFIGURATION FAILURE RADIO LINK RECONFIGURATION RESPONSE RADIO LINK ADDITION REQUEST RADIO LINK RECONFIGURATION REQUEST RADIO LINK SETUP RESPONSE RADIO LINK SETUP FAILURE RADIO LINK ADDITION RESPONSE RADIO LINK ADDITION FAILURE RADIO LINK ADDITION FAILURE RADIO LINK DELETION REQUEST	М	М	TS 25.433
		RL info type	RADIO LINK SETUP FAILURE RADIO LINK ADDITION FAILURE RADIO LINK RECONFIGURATION FAILURE	М	М	TS 25.433
		C-ID	RADIO LINK SETUP REQUEST RADIO LINK ADDITION REQUEST	М	М	TS 25.433
		UL Scrambling Code	RADIO LINK SETUP REQUEST RADIO LINK RECONFIGURATION PREPARE	0	0	TS 25.433
		UL Timeslot information	RADIO LINK SETUP REQUEST RADIO LINK RECONFIGURATION PREPARE	0	0	TS 25.433
		UL SIR target	RADIO LINK SETUP REQUEST RADIO LINK RECONFIGURATION PREPARE	М	М	TS 25.433
		Minimum UL channelization length	RADIO LINK SETUP REQUEST RADIO LINK RECONFIGURATION PREPARE	0	0	TS 25.433
		Initial DL transmission Power	RADIO LINK SETUP REQUEST RADIO LINK ADDITION REQUEST	М	М	TS 25.433

		Maximum DL transmission Power	RADIO LINK SETUP REQUEST RADIO LINK RECONFIGURATION PREPARE RADIO LINK ADDITION REQUEST RADIO LINK RECONFIGURATION REQUEST	М	М	TS 25.433
		Minimum DL transmission Power	RADIO LINK SETUP REQUEST RADIO LINK ADDITION REQUEST RADIO LINK RECONFIGURATION PREPARE RADIO LINK RECONFIGURATION REQUEST	М	М	TS 25.433
		DL scrambling code	RADIO LINK SETUP REQUEST RADIO LINK ADDITION REQUEST RADIO LINK RECONFIGURATION PREPARE RADIO LINK RECONFIGURATION REQUEST	0	0	TS 25.433
		DL Code information	RADIO LINK SETUP REQUEST RADIO LINK ADDITION REQUEST RADIO LINK RECONFIGURATION PREPARE RADIO LINK RECONFIGURATION REQUEST	o	0	TS 25.433
		DL Timeslot information	RADIO LINK SETUP REQUEST RADIO LINK RECONFIGURATION PREPARE RADIO LINK RECONFIGURATION REQUEST	0	0	TS25.433
		Puncture limit	RADIO LINK SETUP REQUEST RADIO LINK RECONFIGURATION PREPARE	М	М	TS 25.433
		UL Time Slot ISCP Info	RADIO LINK SETUP RESPONSE RADIO LINK ADDITION RESPONSE	0	0	TS 25.433
		Received total wide band power	RADIO LINK SETUP RESPONSE RADIO LINK SETUP FAILURE RADIO LINK ADDITION RESPONSE RADIO LINK ADDITION FAILURE	0	0	TS 25.433
		RAB identity	All messages where it is present	М	М	TS 25.413
lu	RANAP	RAB info type	RAB ASSIGNMENT REQUEST RELOCATION REQUEST RAB MODIFY REQUEST RAB ASSIGNMENT RESPONSE	М	М	TS 25.413
		RAB parameters	RAB ASSIGNMENT REQUEST RELOCATION REQUEST	М	М	TS 25.413
		Assigned RAB parameters values	RAB ASSIGNMENT RESPONSE	М	М	TS 25.413
		Requested RAB parameters values	RAB MODIFY REQUEST	М	М	TS 25.413
		Source ID	RELOCATION REQUIRED	М	М	TS 25.413
		Target ID	RELOCATION REQUIRED	М	М	TS 25.413
		LAI	DIRECT TRANSFER	М	M	TS 25.413
		RAC	DIRECT TRANSFER	М	M	TS 25.413
		SAI	DIRECT TRANSFER	M	M	TS 25.413

ETSI TS 132 423 V9.4.0 (2011-01)

				RL id identity	RL id identity	RADIO LINK SETUP REQUEST RADIO LINK RECONFIGURATION PREPARE RADIO LINK RECONFIGURATION REQUEST RADIO LINK RECONFIGURATION READY RADIO LINK RECONFIGURATION FAILURE RADIO LINK RECONFIGURATION RESPONSE RADIO LINK ADDITION REQUEST RADIO LINK RECONFIGURATION REQUEST RADIO LINK SETUP RESPONSE RADIO LINK SETUP FAILURE RADIO LINK ADDITION RESPONSE RADIO LINK ADDITION RESPONSE RADIO LINK ADDITION FAILURE RADIO LINK ADDITION FAILURE RADIO LINK DELETION REQUEST	М	М	TS 25.423			
		C-ID	RADIO LINK SETUP REQUEST RADIO LINK ADDITION REQUEST	М	М	TS 25.423						
lur	RNSAP	RL info type	RADIO LINK SETUP FAILURE RADIO LINK ADDITION FAILURE RADIO LINK SETUP FAILURE RADIO LINK RECONFIGURATION FAILURE	M	М	TS 25.423						
		UL Scrambling Code	RADIO LINK SETUP REQUEST RADIO LINK RECONFIGURATION PREPARE	0	0	TS 25.423						
		UL Timeslot information	RADIO LINK SETUP REQUEST RADIO LINK RECONFIGURATION PREPARE	0	0	TS25.423						
		UL SIR target	RADIO LINK SETUP REQUEST RADIO LINK RECONFIGURATION PREPARE	М	M	TS 25.423						
			Minimum UL channelization length	RADIO LINK SETUP REQUEST RADIO LINK RECONFIGURATION PREPARE	0	0	TS 25.423					
		Initial DL transmission Power	RADIO LINK SETUP REQUEST RADIO LINK ADDITION REQUEST	М	M	TS 25.423						
			Maximum DL transmission Power Minimum DL transmission Power DL scrambling code					Maximum DL transmission Power	RADIO LINK SETUP REQUEST RADIO LINK RECONFIGURATION PREPARE RADIO LINK ADDITION REQUEST RADIO LINK RECONFIGURATION REQUEST	М	M	TS 25.423
							Minimum DL transmission Power	RADIO LINK SETUP REQUEST RADIO LINK ADDITION REQUEST RADIO LINK RECONFIGURATION PREPARE RADIO LINK RECONFIGURATION REQUEST	M	M	TS 25.423	
				RADIO LINK SETUP REQUEST RADIO LINK ADDITION REQUEST RADIO LINK RECONFIGURATION PREPARE RADIO LINK RECONFIGURATION REQUEST	0	0	TS 25.423					
		DL channelization code	RADIO LINK SETUP REQUEST RADIO LINK ADDITION REQUEST RADIO LINK RECONFIGURATION PREPARE RADIO LINK RECONFIGURATION REQUEST	0	0	TS 25.423						

DL Timeslot information	RADIO LINK SETUP REQUEST RADIO LINK RECONFIGURATION PREPARE RADIO LINK RECONFIGURATION REQUEST	o	0	TS 25.423
Puncture limit	RADIO LINK SETUP REQUEST RADIO LINK RECONFIGURATION PREPARE	М	М	TS 25.423
UL Time Slot ISCP Info	RADIO LINK SETUP RESPONSE RADIO LINK ADDITION RESPONSE	0	0	TS 25.423
Received total wide band power	RADIO LINK SETUP RESPONSE RADIO LINK SETUP FAILURE RADIO LINK ADDITION RESPONSE RADIO LINK ADDITION FAILURE	0	0	TS 25.423

Constraints:

The following optional IE names shall be supported for corresponding modes as described below:

For FDD mode:

- Primary CPICH scrambling code of added cell
- Primary CPICH scrambling code of removed cell
- CPICH Ec/No
- CPICH RSCP
- UL Scrambling Code
- Minimum UL channelization length
- UARFCN downlink (Nd)
- UARFCN uplink (Nu)
- DL Scrambling Code
- DL Code information
- DL channelization code
- Received total wide band power

For TDD mode:

- PCCPCH RSCP
- Cell parameters Id
- UARFCN (Nt)
- Timeslot list
- UL Timeslot information
- DL Timeslot information
- UL Time Slot ISCP Info

4.7 S-CSCF Trace Record Content

[Editor"s Note: CR should be provided in Rel-6.]

4.8 P-CSCF Trace Record Content

[Editor"s Note: CR should be provided in Rel-6.]

4.9 HSS Trace Record Content

The following table contains the Trace record description for the minimum and medium trace depth for MAP and Diameter protocol for the C, D, Gr, Gc, Cx, and Sh interfaces in the HSS.

The trace record is the same for management based activation and for signalling based activation.

Interfess name	Prot.	IF name	Manager name(a)	Trace	depth	Notes
Interface name	name	IE name	IE name Message name(s)		Med	Notes
		IMSI	MAP_UPDATE_LOCATION MAP_CANCEL_LOCATION MAP_PURGE_MS MAP-INSERT-SUBSCRIBER-DATA MAP_RESTORE_DATA MAP-SEND-IMSI	М	М	TS 29.002
		MSC Address	MAP-READY-FOR-SM MAP_UPDATE_LOCATION	М	М	TS 29.002
		VLR number	MAP_UPDATE_LOCATION MAP_PURGE_MS	M	M	TS 29.002
	User error	Every message where it appears	М	М	TS 29.002	
	Provider error	Every message where it appears	М	М	TS 29.002	
	SGSN number	MAP_PURGE_MS	М	М	TS 29.002	
		MSISDN	MAP-INSERT-SUBSCRIBER-DATA MAP-SEND-IMSI	М	М	TS 29.002
D	D MAP	MS Not Reachable Flag	MAP_RESTORE_DATA	М	М	TS 29.002
		SS-Code	MAP_REGISTER_SS MAP_ERASE_SS MAP_ACTIVATE_SS MAP_DEACTIVATE_SS MAP_INTERROGATE_SS MAP_REGISTER_PASSWORD MAP_REGISTER_CC_ENTRY MAP_ERASE_CC_ENTRY	М	М	TS 29.002
		Forwarded-to number with subaddress	MAP_REGISTER_SS	М	М	TS 29.002
		Alert Reason	MAP-READY-FOR-SM	M	M	TS 29.002
		Basic service	MAP_REGISTER_SS MAP_ERASE_SS MAP_ACTIVATE_SS MAP_DEACTIVATE_SS MAP_INTERROGATE_SS	М	М	TS 29.002
		Service Centre Address	MAP-SEND-ROUTING-INFO-FOR-SM	М	М	TS 29.002
		Network Node Number	MAP-SEND-ROUTING-INFO-FOR-SM	М	М	TS 29.002
		GPRS Node Indicator	MAP-SEND-ROUTING-INFO-FOR-SM	М	M	TS 29.002
С	MAP	User error	Every message where it appears	М	M	TS 29.002
		Provider error	Every message where it appears	М	М	TS 29.002
		MSISDN	MAP-SEND-ROUTING-INFO-FOR-SM Send Routeing Info ack	М	М	TS 29.002

		Number of forwarding	Send Routeing Info	М	М	TS 29.002 TS 23.018
		IMSI	Send Routeing Info ack	М	М	TS 29.002 TS 23.018
		Roaming number	Send Routeing Info ack	М	М	TS 29.002 TS 23.018
		Forwarded-to number	Send Routeing Info ack	М	М	TS 29.002 TS 23.018
		Forwarding reason	Send Routeing Info ack	М	М	TS 29.002 TS 23.018
		Additional Number	MAP-SEND-ROUTING-INFO-FOR-SM	M	М	TS 29.002
		SGSN address	MAP_UPDATE_GPRS_LOCATION	М	М	TS 29.002
Gr MA	MAP	IMSI	MAP_CANCEL_LOCATION MAP_PURGE_MS MAP_UPDATE_GPRS_LOCATION MAP-INSERT-SUBSCRIBER-DATA MAP-READY-FOR-SM	М	М	TS 29.002
		SGSN number	MAP_UPDATE_GPRS_LOCATION MAP_PURGE_MS	М	М	TS 29.002
		Alert Reason	MAP-READY-FOR-SM	M	М	TS 29.002
		User error	Every message where it appears	M	М	TS 29.002
		Provider error	Every message where it appears	M	M	TS 29.002
		IMSI	MAP_SEND_ROUTING_INFO_FOR_GPRS MAP_FAILURE_REPORT MAP_NOTE_MS_PRESENT_FOR_GPRS	М	M	TS 29.002
		SGSN address	MAP_SEND_ROUTING_INFO_FOR_GPRS MAP_NOTE_MS_PRESENT_FOR_GPRS	М	М	TS 29.002
Gc	MAP	GGSN address	MAP_SEND_ROUTING_INFO_FOR_GPRS MAP_FAILURE_REPORT MAP_NOTE_MS_PRESENT_FOR_GPRS	М	M	TS 29.002
		Mobile Not Reachable Reason	MAP_SEND_ROUTING_INFO_FOR_GPRS	М	М	TS 29.002
		User error	Every message where it appears	M	М	TS 29.002
		Provider error	Every message where it appears	M	M	TS 29.002

4.10 BM-SC Trace Record Content

The following table describes the trace record content for minimum and medium trace depth for BM-SC.

The record content is same for management based activation and for signalling based activation.

For BM-SC, the Minimum level of detail shall be supported.

Interface	Prot.	IE nama	Macaga nama(a)	Trace	depth	Netes
name	name	IE name	Message name(s)	Min	Med	Notes
		IMSI	MBMS AUTHORIZATION REQUEST (AAR) MBMS AUTHORIZATION RESPONSE (AAA)	M	М	TS 29.061
		RAI	MBMS AUTHORIZATION REQUEST (AAR)	М	M	TS 29.061
		Access Point Name	MBMS AUTHORIZATION REQUEST (AAR)	M	M	TS 29.061
		MSISDN	MBMS AUTHORIZATION REQUEST (AAR)	М	M	TS 29.061
		IMEI(SV)	MBMS AUTHORIZATION REQUEST (AAR)	М	М	TS 29.061
		IP Multicast Address	MBMS AUTHORIZATION REQUEST (AAR)	М	М	TS 29.061
		TMGI	MBMS AUTHORIZATION RESPONSE (AAA)	М	М	TS 29.061
Gmb Diameter Gmb	Result-Code	MBMS AUTHORIZATION RESPONSE (AAA) MBMS USER DEACTIVATION RESPONSE (STA) MBMS SESSION START-STOP INDICATION RESPONSE (RAA) MBMS SERVICE TERMINATION ANSWER (ASR)	M	M	TS 29.061	
		Experimental-Result	MBMS AUTHORIZATION RESPONSE (AAA) MBMS SESSION START-STOP INDICATION RESPONSE (RAA)	M	М	TS 29.061
	Error-Reporting-Host	MBMS AUTHORIZATION RESPONSE (AAA) MBMS USER DEACTIVATION RESPONSE (STA) MBMS SESSION START-STOP INDICATION RESPONSE (RAA) MBMS SERVICE TERMINATION ANSWER (ASR)	M	М	TS 29.061	

4.11 PGW Trace Record Content

The following table shows the trace record content for PGW.

The trace record is the same for management based activation and for signalling based activation.

PGW shall support at least one of the following trace depth levels – Maximum, Medium or Minimum.

Table 4.11.1: PGW Trace Record Content

Interface (specific	Format	Level of details		tails	Decarintian
messages)	Format	Min	Med	Max	Description
		M	M	0	Message name
		0	0	0	Record extensions
S2a/S2b	Decoded	М	М	Х	SGSNID of connected SGSN PGW ID of the traced PGW
		М	М	Х	Dedicated IE extracted from S2a/S2b messages between the traced PGW and the SGSN. A subset of IEs as given in the table 4.11.2. is provided.
	Encoded*	X	Х	M	Raw Messages: S2a/S2b messages between the traced PGW and the SGSN. The encoded content of the message is provided.
		М	M	0	Message name
		0	0	0	Record extensions
\$5/\$8	Decoded	М	М	X	SGW ID of the connected SGW PGW of the traced PGW
		M	M	Х	IE extracted from S5/S8 messages between the traced PGW and SGW. A subset of IEs as given in the table 4.11.2. is provided.
	Encoded*	Х	Х	M	Raw S5/S8 Messages: messages between the traced PGW and SGW. The encoded content of the message is provided
		M	M	0	Message name
		0	0	0	Record extensions
S6b	Decoded	M	M	Х	PGWID of the traced PGW
300		M	М	Х	Dedicated IE extracted from S6b messages between the traced PGW and the AAA. A subset of IEs as given in the table 4.11.2.is provided
	Encoded*	Х	Х	M	Raw S6b messages between the traced PGW and the AAA. The encoded content of the message is provided
		М	M	0	Message name
		0	0	0	Record extensions
Gx	Decoded	М	М	Х	PCRF ID of the connected PCRF PGW ID of the traced PGW
		М	М	Х	Dedicated IE extracted from Gx messages between the traced PGW and another PCRF. A subset of IEs as given in the table 4.11.2.is provided
	Encoded*	Х	Х	M	Raw Gx messages between the traced PGW and another PCRF. The encoded content of the message is provided

Encoded* - the messages are left encoded in the format it was received.

Table 4.11.2 : PGW trace record description for minimum and medium trace depth

Interface name	Prot.	IE name	Message name(s)		ace pth	Notes
	name			Min	Med	
S2a/S2b	PMIP					
		IMSI	Create Session Request Update Bearer Request Create Session Request	M	M	TS 29.274
		MSISDN Serving Network	Modify Bearer Response Create Session Request Modify Bearer Request	М	M M	29.274 TS 29.274
		Access Point Name (APN)	Create Session Request	М	М	TS 29.274
		PDN Type	Create Session Request	М	М	TS 29.274
S5/S8	GTPv2C	Bearer Contexts	Create Session Request Create Bearer Request Create Bearer Response Delete Bearer Response Modify Bearer Command Modify Bearer Failure Indication Update Bearer Response Delete Bearer Response Delete Bearer Response Delete Bearer Response Delete Bearer Command Delete Bearer Failure Indication	М	М	TS 29.274

		Cause	Create Session Response Create Bearer Response Bearer Resource Failure Indication Modify Bearer Response Delete Session Response Delete Bearer Response Modify Bearer Failure Indication Update Bearer Response Delete Bearer Response Delete Bearer Failure Indication	M	М	TS 29.274
		Bearer Contexts created	Create Session Response	М	М	TS 29.274
		Bearer Contexts marked for removal	Create Session Response	М	М	TS 29.274
		APN Restriction	Create Session Response	М	М	TS 29.274
		Linked Bearer Identity (LBI)	Create Bearer Request Bearer Resource Command Delete Bearer Response	М	М	TS 29.274
		Traffic Aggregate Description (TAD)	Bearer Resource Command	М	М	TS 29.274
		Linked EPS Bearer ID	Bearer Resource Failure Indication Delete Session Request Delete Bearer Request	М	М	TS 29.274
		RAT Type	Create Session Request Modify Bearer Request	М	М	TS 29.274
		Bearer Contexts to be modified	Modify Bearer Request	M	М	TS 29.274
		Bearer Contexts to be removed	Modify Bearer Request	М	М	TS 29.274
		Bearer Contexts modified		М	М	TS 29.274
		Bearer Contexts marked for removal		М	М	TS 29.274
		MIP Subscriber Profile	AAR AAA	М	М	TS 29.273
		APN	AAR	M	М	TS 29.273
S6b	Diameter	QoS capabilities	AAR	М	М	TS 29.273
		Result Code	AAA	M	М	TS 29.273
		QoS resources	AAA	M	М	TS 29.273

		3GPP AAA Server Name	AAA	М	М	TS 29.273	
			+				
			_				
			+				
S2c	DSMIP						
			+				
		Bearer-Identifier	CCR	М	М	TS 29.212 TS	
		Bearer-Operation	CCR	М	М	29.212	
		IP-CAN-Type	CCR	M	М	TS 29.212	
		RAT-Type	CCR	М	М	TS 29.212	
		QoS-Information	CCR CCA	М	М	TS 29.212	
		QoS-Negotiation	RAR CCR	М	М	TS	
	5					29.212 TS	
Gx	Diameter	QoS-Upgrade	CCR	М	М	29.212	
		Default-EPS-Bearer-QoS	CCR CCA RAR	м	М	TS 29.212	
		Supported-Features	CCR CCA RAR RAA	М	М	TS 29.212	
		Event-Trigger	CCR CCA RAR	М	М	TS 29.212	
		Result Code	RAA	М	М	TS 29.212	

	Origin-Realm	CCR CCA RAR RAA	М	М	TS 29.212
	Destination-Realm	CCR RAR	M	М	TS 29.212
SGi					

4.12 MME Trace Record Content

The following table shows the trace record content for MME.

The trace record is the same for management based activation and for signalling based activation.

MME shall support at least one of the following trace depth levels – Maximum, Medium or Minimum.

Table 4.12.1: MME Trace Record Content

Interface (specific	Format	Level of details		etails	Description
messages)	Format	Min	Med	Max	Description
		М	М	0	Message name
		0	0	0	Record extensions
S1	Decoded	М	М	Х	eNBID of connected eNB MME ID of the traced MME
		М	M	Х	Dedicated IE extracted from S1 messages between the traced eNB and the MME. A subset of IEs as given in the table 4.12.2. is provided.
	ASN.1	Х	Х	М	Raw Messages: S1 messages between the traced eNB and the MME. The encoded content of the message is provided.
S1 NAS PDU IE	3GPP TS 24.301, sections 8 and 9	Х	X	М	Hexdata dump of the decrypted NAS message formatted according to 3GPP TS 24.301, sections 8 and 9, recorded as a separate message entry in the call trace file
		M	М	0	Message name
	Decoded	0	0	0	Record extensions
S3		М	М	Х	SGSN ID of the connected SGSN MME ID of the traced MME
		M	M	х	IE extracted from S3 messages between the traced MME and SGSN. A subset of IEs as given in the table 4.12.2. is provided.
	Encoded *	X	Χ	М	Raw S3 Messages: messages between the traced MME and SGSN. The encoded content of the message is provided
		M	М	0	Message name
		0	0	0	Record extensions
S11	Decoded		М	Х	SGW ID of the connected SGW MME ID of the traced MME
		М	М	Х	Dedicated IE extracted from S11 messages between the traced SGW and the MME. A subset of IEs as given in the table 4.12.2.is provided
	Encoded *	X	X	М	Raw S11 messages between the traced SGW and the MME. The encoded content of the message is provided

		M	М	0	Message name
		0	0	0	Record extensions
S6a	Decoded	М	М	Х	HSS ID of the connected HSS MME ID of the traced MME
		М	М	Х	Dedicated IE extracted from S6a messages between the traced HSS and the MME. A subset of IEs as given in the table 4.12.2.is provided
	Encoded *	X	Х	M	Raw S6a messages between the traced HSS and the MME. The encoded content of the message is provided
		M	М	0	Message name
		0	0	0	Record extensions
S10	Decoded	м м х		Х	MME ID of the connected MME MME ID of the traced MME
		М	М	Х	Dedicated IE extracted from S10 messages between the traced MME and another MME. A subset of IEs as given in the table 4.12.2.is provided
	Encoded *	Х	Х	М	Raw S10 messages between the traced MME and another MME. The encoded content of the message is provided

Encoded* - the messages are left encoded in the format it was received.

Table 4.12.2 : MME trace record description for minimum and medium trace depth

1	Prot.	IE	M(-)	Trace	depth	Neter
Interface name	name	IE name	Message name(s)	Min	Med	Notes
		EPS attach type	ATTACH REQUEST	М	М	TS 24.301
		GUTI	ATTACH REQUEST ATTACH ACCEPT TRACKING AREA UPDATE REQUEST TRACKING AREA UPDATE ACCEPT DETACH REQUEST GUTI REALLOCATION COMMAND	М	М	TS 24.301
		IMSI	ATTACH REQUEST DETACH REQUEST	М	М	TS 24.301
		Old P-TMSI	ATTACH REQUEST TRACKING AREA UPDATE REQUEST	М	М	TS 24.301
		M-TMSI		М	М	TS 24.301
		Last visisted registered TAI	ATTACH REQUEST TRACKING AREA UPDATE REQUEST	М	М	TS 24.301
		UE network capability	ATTACH REQUEST TRACKING AREA UPDATE REQUEST	М	М	TS 24.301
		MS network capability	ATTACH REQUEST	М	М	TS 24.301
S1	MM	LAI	ATTACH REQUEST ATTACH ACCEPT TRACKING AREA UPDATE REQUEST TRACKING AREA UPDATE ACCEPT	М	М	TS 24.301
0.		EPS attach result	ATTACH ACCEPT	М	М	TS 24.301
		EMM cause	ATTACH ACCEPT ATTACH REJECT TRACKING AREA UPDATE ACCEPT TRACKING AREA UPDATE REJECT DETACH REQUEST AUTHENTICATION FAILURE SERVICE REJECT SECURITY MODE REJECT EMM STATUS	М	М	TS 24.301
		EPS bearer context status	TRACKING AREA UPDATE REQUEST TRACKING AREA UPDATE ACCEPT	М	М	TS 24.301
		Detach type	DETACH REQUEST	М	М	TS 24.301
		EPS update type	TRACKING AREA UPDATE REQUEST	М	М	TS 24.301
		EPS update result	TRACKING AREA UPDATE ACCEPT	М	М	TS 24.301
		Identity type	IDENTITY REQUEST	М	М	TS 24.301
		Mobile identity	IDENTITY RESPONSE	М	М	TS 24.301
		IMEISV request	SECURITY MODE COMMAND	М	M	TS 24.301
		IMEISV	SECURITY MODE COMPLETE	М	М	TS 24.301
		Selected NAS security algorithms	SECURITY MODE COMMAND	М	М	TS 24.301

		UE security capability	SECURITY MODE COMMAND	М	М	TS 24.301
		Equivalent PLMNs list	ATTACH ACCEPT	М	М	TS 24.301
		7	TRACKING AREA UPDATE ACCEPT ATTACH ACCEPT			
		TAI list	TRACKING AREA UPDATE ACCEPT	М	М	TS 24.301
		1711100	GUTI REALLOCATION COMMAND			1021.001
		EPS bearer identity	PDN CONNECTIVITY REQUEST PDN CONNECTIVITY REJECT PDN DISCONNECT REQUEST PDN DISCONNECT REJECT ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST ACTIVATE DEFAULT EPS BEARER CONTEXT ACCEPT ACTIVATE DEFAULT EPS BEARER CONTEXT REJECT ACTIVATE DEDICATED EPS BEARER CONTEXT REQUEST ACTIVATE DEDICATED EPS BEARER CONTEXT REQUEST ACTIVATE DEDICATED EPS BEARER CONTEXT REJECT ESM STATUS DEACTIVATE EPS BEARER CONTEXT REQUEST DEACTIVATE EPS BEARER CONTEXT REQUEST DEACTIVATE EPS BEARER CONTEXT ACCEPT MODIFY EPS BEARER CONTEXT ACCEPT MODIFY EPS BEARER CONTEXT ACCEPT MODIFY EPS BEARER CONTEXT REJECT BEARER RESOURCE ALLOCATION REQUEST BEARER RESOURCE MODIFICATION REQUEST BEARER RESOURCE MODIFICATION REJECT BEARER RESOURCE MODIFICATION REJECT	М	М	TS 24.301
S1	SM	Linked EPS bearer identity	PDN DISCONNECT REQUEST ACTIVATE DEDICATED EPS BEARER CONTEXT REQUEST BEARER RESOURCE ALLOCATION REQUEST BEARER RESOURCE MODIFICATION REQUEST	М	М	TS 24.301
		Procedure Transaction Identity	PDN CONNECTIVITY REQUEST PDN CONNECTIVITY REJECT PDN DISCONNECT REQUEST PDN DISCONNECT REJECT ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST ACTIVATE DEFAULT EPS BEARER CONTEXT ACCEPT ACTIVATE DEFAULT EPS BEARER CONTEXT REJECT ACTIVATE DEDICATED EPS BEARER CONTEXT REQUEST ACTIVATE DEDICATED EPS BEARER CONTEXT REQUEST ACTIVATE DEDICATED EPS BEARER CONTEXT REJECT ESM STATUS DEACTIVATE EPS BEARER CONTEXT REQUEST DEACTIVATE EPS BEARER CONTEXT REQUEST DEACTIVATE EPS BEARER CONTEXT ACCEPT MODIFY EPS BEARER CONTEXT REQUEST MODIFY EPS BEARER CONTEXT REQUEST MODIFY EPS BEARER CONTEXT REJECT BEARER RESOURCE ALLOCATION REQUEST BEARER RESOURCE ALLOCATION REQUEST BEARER RESOURCE MODIFICATION REQUEST	М	М	TS 24.301
			BEARER RESOURCE MODIFICATION REJECT			
		Request type	BEARER RESOURCE MODIFICATION REJECT PDN CONNECTIVITY REQUEST PDN CONNECTIVITY REQUEST	M	М	TS 24.301

		EPS QoS	ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST ACTIVATE DEDICATED EPS BEARER CONTEXT REQUEST	М	М	TS 24.301
		Negotiated QoS/New QoS	MODIFY EPS BEARER CONTEXT REQUEST ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST ACTIVATE DEDICATED EPS BEARER CONTEXT REQUEST	M	M	TS 24.301
		. regenates Que, rien Que	MODIFY EPS BEARER CONTEXT REQUEST			
		PDN address	ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST	M	М	TS 24.301
		APN-AMBR	ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST MODIFY EPS BEARER CONTEXT REQUEST	М	М	TS 24.301
		ESM cause	PDN CONNECTIVITY REJECT PDN DISCONNECT REJECT ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST ACTIVATE DEFAULT EPS BEARER CONTEXT REJECT ACTIVATE DEDICATED EPS BEARER CONTEXT REJECT ESM STATUS DEACTIVATE EPS BEARER CONTEXT REQUEST MODIFY EPS BEARER CONTEXT REJECT BEARER RESOURCE ALLOCATION REJECT BEARER RESOURCE MODIFICATION REQUEST BEARER RESOURCE MODIFICATION REJECT	М	М	TS 24.301
		Traffic flow template	ACTIVATE DEDICATED EPS BEARER CONTEXT REQUEST MODIFY EPS BEARER CONTEXT REQUEST	М	М	TS 24.301
		Traffic flow aggregate	BEARER RESOURCE ALLOCATION REQUEST BEARER RESOURCE MODIFICATION REQUEST	М	М	TS 24.301
		Required traffic flow QoS	BEARER RESOURCE ALLOCATION REQUEST BEARER RESOURCE MODIFICATION REQUEST	М	М	TS 24.301
		PDN type	PDN CONNECTIVITY REQUEST	М	М	TS 24.301
		IMSI	DETACH NOTIFICATION CS PAGING INDICATON	М	М	TS 29.274
S3	GTPv2-C	TMSI	CS PAGING INDICATON	М	М	TS 29.274
		Cause	DETACH NOTIFICATION DETACH ACKNOWLEDGE	М	М	TS 29.274
		IMSI	RELOCATION CANCEL REQUEST IDENTIFICATION RESPONSE CONTEXT RESPONSE CONTEXT REQUEST FORWARD RELOCATION REQUEST	М	М	TS 29.274
		GUTI	CONTEXT REQUEST IDENTIFICATION REQUEST	М	М	TS 29.274
		RAI	IDENTIFICATION REQUEST CONTEXT REQUEST	М	М	TS 29.274
S3/S10	GTPv2-C	P-TMSI	IDENTIFICATION REQUEST CONTEXT REQUEST	М	М	TS 29.274
		Indication	FORWARD RELOCATION COMPLETE NOTIFICATION FORWARD RELOCATION REQUEST	М	М	TS 29.274
		BSSGP Cause	FORWARD RELOCATION RESPONSE FORWARD RELOCATION REQUEST	М	М	TS 29.274
		RANAP Cause	FORWARD RELOCATION RESPONSE FORWARD RELOCATION REQUEST	М	М	TS 29.274
		eNodeB Cause	FORWARD RELOCATION RESPONSE	М	М	TS 29.274
		RAT Type	CONTEXT REQUEST	М	М	TS 29.274
		Target Identification	FORWARD RELOCATION REQUEST	М	М	TS 29.274

		Cause	RELOCATION CANCEL RESPONSE FORWARD SRNS CONTEXT ACKNOWLEDGE IDENTIFICATION RESPONSE CONTEXT ACKNOWLEDGE CONTEXT RESPONSE FORWARD RELOCATION COMPLETE ACKNOWLEDGE FORWARD RELOCATION RESPONSE FORWARD RELOCATION REQUEST	М	М	TS 29.274
		RAN Cause		M	M	TS 29.274
		Selected PLMN ID User Name	FORWARD RELOCATION REQUEST NOTIFY REQUEST AUTHENTICATION INFORMATION REQUEST DELETE SUBSCRIBER DATA REQUEST INSERT SUBSCRIBER DATA REQUEST PURGE UE REQUEST CANCEL LOCATION REQUEST UPDATE LOCATION REQUEST	М	М	TS 29.274
S6a	Diameter	Terminal Infomration Result	NOTIFY REQUEST UPDATE LOCATION REQUEST NOTIFY ANSWER AUTHENTICATION INFORMATION ANSWER DELETE SUBSCRIBER DATA ANSWER INSERT SUBSCRIBER DATA ANSWER PURGE UE ANSWER CANCEL LOCATION ANSWER UPDATE LOCATION ANSWER	М	М	TS 29.272
		RAT Type	UPDATE LOCATION REQUEST	M	M	TS 29.272
		APN	NOTIFY REQUEST			
		Visited PLMN Id	AUTHENTICATION INFORMATION REQUEST UPDATE LOCATION REQUEST	М	М	TS 29.272
		IMSI	CREATE SESSION REQUEST CHANGE NOTIFICATION REQUEST CHANGE NOTIFICATION RESPONSE SUSPEND NOTIFICATION SUSPEND ACKNOWLEDGE RESUME NOTIFICATION RESUME ACKNOWLEDGE	М	М	TS 29.274
		APN	CREATE SESSION REQUEST	M	М	TS 29.274
		Indication Flags	MODIFY BEARER REQUEST DELETE SESSION REQUEST	М	М	TS 29.274
S11	GTPv2-C	EPS Bearer ID	CREATE SESSION RESPONSE CREATE BEARER RESPONSE MODIFY BEARER REQUEST MODIFY BEARER RESPONSE DELETE BEARER RESPONSE DELETE BEARER RESPONSE UPDATE USER PLANE RESPONSE MODIFY BEARER COMMAND MODIFY BEARER FAILURE INDICATION UPDATE BEARER RESPONSE DELETE BEARER FAILURE INDICATION CREATE INDIRECT DATA FOPRWARDING TUNNEL RESPONSE UPDATE BEARER COMPLETE	М	М	TS 29.274

		MME-CSID	CREATE SESSION REQUEST CREATE BEARER RESPONSE	М	М	TS 29.274
			DELETE BEARER RESPONSE			
			CREATE SESSION REQUEST			
			CREATE SESSION RESPONSE			
		SGW-CSID	CREATE BEARER REQUEST	М	м	TS 29.274
		3GW-C3ID	CREATE BEARER RESPONSE	IVI	IVI	13 29.274
			DELETE BEARER REQUEST			
			DELETE BEARER RESPONSE			
		MSISDN	CREATE SESSION REQUEST	М	М	TS 29.274
		WISISDIN	MODIFY BEARER RESPONSE	IVI	IVI	13 29.274
			CREATE SESSION REQUEST			
			CREATE BEARER REQUEST			1
		Bearer Level QoS	MODIFY BEARER REQUEST	М	м	TS 29.274
		Bearer Level Q03	MODIFY BEARER RESPONSE	IVI	IVI	13 29.274
			MODIFY BEARER COMMAND			
			UPDATE BEARER REQUEST			
			CREATE SESSION REQUEST			
		RAT Type	MODIFY BEARER REQUEST	M	M	TS 29.274
			CHANGE NOTIFICATION REQUEST			
		MEI	CREATE SESSION REQUEST	М	М	TS 29.274
			MODIFY BEARER REQUEST	IVI	IVI	15 29.274
			CREATE SESSION RESPONSE			
			CREATE BEARER RESPONSE			
			BEARER RESOURCE FAILURE INDICATION			
			MODIFY BEARER RESPONSE			
			DELETE SESSION RESPONSE			
			DELETE BEARER RESPONSE			
			DOWNLINK DATA NOTIFICATION ACKNOWLEDGEMENT			
		0	DOWNLINK DATA NOTIFICATION INDICATION		м	TO 00 074
		Cause	UPDATE USER PLANE RESPONSE	М	IVI	TS 29.274
			MODIFY BEARER FAILURE INDICATION			
			UPDATE BEARER RESPONSE			
			DELETE BEARER FAILURE INDICATION			
			CREATE INDIRECT DATA FOPRWARDING TUNNEL RESPONSE			
			UPDATE BEARER COMPLETE			
			CHANGE NOTIFICATION RESPONSE			
			CREATE FORWARDING TUNNEL RESPONSE			
		DOW COID	CREATE BEARER REQUEST			TO 00 074
		PGW-CSID	DELETE BEARER REQUEST	М	М	TS 29.274
		E-RAB ID	All messages where it is present	М	М	TS 36.413
04	CAAD		E-RAB SETUP REQUEST			
S1	S1AP	STAP I	E-RAB MODIFY REQUEST	M	М	TS 36.413
	E TO B ECOCI QUE I alamotore	INITIAL CONTEXT SETUP REQUEST				

50

	Cause	INITIAL CONTEXT SETUP FAILURE UE CONTEXT RELEASE REQUEST UE CONTEXT RELEASE COMMAND UE CONTEXT MODIFICATION FAILURE HANDOVER REQUIRED HANDOVER PREPARATION FAILURE HANDOVER REQUEST HANDOVER FAILURE HANDOVER CANCEL PATH SWITCH REQUEST FAILURE NAS NON DELIVERY INDICATION	м	М	TS 36.413
	Handover Type	HANDOVER REQUIRED HANDOVER COMMAND HANDOVER REQUEST	М	M	TS 36.413
	E-UTRAN CGI	HANDOVER NOTIFY PATH SWITCH REQUEST INITIAL UE MESSAGE UPLINK NAS TRANSPORT	М	М	TS 36.413
	TAI	HANDOVER NOTIFY PATH SWITCH REQUEST UPLINK NAS TRANSPORT PAGING	М	М	TS 36.413
	Target ID	HANDOVER REQUIRED	М	М	TS 36.413
	CDMA2000 HO Status	DOWNLINK S1 CDMA2000 TUNNELING	М	М	TS 36.413
	CDMA2000 RAT Type	DOWNLINK S1 CDMA2000 TUNNELING UPLINK S1 CDMA2000 TUNNELING	М	М	TS 36.413
	CDMA2000 Sector ID	UPLINK S1 CDMA2000 TUNNELING	М	М	TS 36.413
	CDMA2000 HO Required Indication	UPLINK S1 CDMA2000 TUNNELING	М	М	TS 36.413

4.13 E-UTRAN Trace Record Content

For eNB, the Maximum level of detail shall be supported.

Table 4.13.1: E-UTRAN Trace Record Content

lutaria (F	Level of details		tails	Proceeded by
Interface (specific messages)	Format	Min	Med	Max	Description
		М	М	0	Message name
	Decoded	0	0	0	Record extensions
RRC (without rrc dedicated		M	M	Х	eNBID of traced eNB
measurements)		M	М	Х	Dedicated IE extracted from RRC messages between the traced eNB and the UE. A subset of IEs as given in the table 4.13.2. is provided.
	ASN.1	Х	Х	M	Raw Uu Messages: RRC messages between the traced eNB and the UE. The encoded content of the message is provided
		M	M	0	Message name
	Decoded	0	0	0	Record extensions
S1		М	М	X	eNBID of traced eNB MME ID of the connected MME
		М	М	Х	E-Rabld + Dedicated IE extracted from S1AP messages between the traced eNB and Core Network. A subset of IEs as given in the table 4.13.2. is provided.
	ASN.1	Х	Х	М	Raw S1 Messages S1AP: messages between the traced eNB and Core Network The encoded content of the message is provided
		М	М	0	Message name
		0	0	0	Record extensions
X2	Decoded	М	М	Х	eNBID of traced eNB eNBID of neighbouring eNB
Λ2		M	М	X	Dedicated IE extracted from X2AP messages between the traced eNB and the neighbouring eNB. A subset of IEs as given in the table 4.13.2.is provided
	ASN.1	Х	Х	М	Raw X2 Messages:X2AP messages between the traced eNB and the neighbouring eNB. The encoded content of the message is provided
RRC (only dedicated measurements)	Decoded	Х	М	Х	Uu IEs from RRC measurement reports messages
NC (only dedicated measurements)	ASN.1	Х	X	М	RRC measurement reports messages

NOTE: For the security keys in IEs or part of IEs that are containing security keys used by the eNB (e.g. K_{eNB}), the value 0 shall be written in the trace file.

Definitions:

• eNBID of traced eNB: The id of the eNB traced, e.g. the eNB which handles the connection of the traced MS, during the Trace Recording Session.

• eNBID of neighbouring eNB: The ids of all Neighbouring eNB involved in the X2 procedures during the Trace Recording Session.

• cell Id: The cell Ids of the cells involved in the X2 procedures during the Trace Recording Session. The cell Ids is provided with each X2AP

messages for which the cId is relevant.

• E-RABId: Specific recorded IE that contains the E-RAB identifier.

• Message name: Name of the protocol message

• Record extensions: A set of manufacturer specific extensions to the record

• Decoded: Some IEs shall be decoded (cf. detailed list in table 4.6.2. depending on trace depth)

• ASN.1: Messages in encoded format

Table 4.13.2: trace record description for minimum and medium trace depth

Interface name	Prot.	IE name	Mossago namo(s)		depth	Notes
interrace name	name	IE Hallie	Message name(s)	Min	Med	Notes
		Cs fallback indicator	MOBILITY FROM EUTRA COMMAND	М	М	TS 36.331
		CN domain	PAGING	М	М	TS 36.331
		S-TMSI	PAGING	М	М	TS 36.331
		ReestablishmentCause	RRC CONNECTION REESTABLISHMENT REQUEST	М	М	TS 36.331
		Wait time	RRC CONNECTION REJECT	М	М	TS 36.331
		Release Cause	RRC CONNECTION RELEASE	М	М	TS 36.331
		Redirection Information	RRC CONNECTION RELEASE	М	М	TS 36.331
Uu	RRC	Establishment Cause	RRC CONNECTION REQUEST	М	М	TS 36.331
		Selected PLMN-Identity	RRC CONNECTION SETUP COMPLETE	М	М	TS 36.331
		RegisteredMME	RRC CONNECTION SETUP COMPLETE	М	М	TS 36.331
		Rat-Type	UE CAPABILITY INFORMATION	М	М	TS 36.331
		Measured Results	MEASUREMENT REPORT	Х	М	TS 36.331
		CDMA2000-Type	HANDOVER FROM EUTRA PREPARATION REQUEST UL HANDOVER PREPARATION TRANSFER UL INFORMATION TRANSFER	М	М	TS 36.331
		Target RAT Type	MOBILITY FROM EUTRA COMMAND	М	М	TS 36.331
S1	S1AP	E-RAB ID	All messages where it is present	М	М	TS 36.413

E-RAB Level QoS Parameters			T	,			
Le CONTEXT RELEASE REQUEST UE CONTEXT RELEASE COMMAND UE CONTEXT RELEASE COMMAND UE CONTEXT RELEASE COMMAND UE CONTEXT MODIFICATION FAILURE HANDOVER PEOURED HANDOVER PEOURED HANDOVER PEOUREST HANDOVER PEOUREST HANDOVER PEOUREST HANDOVER PEOUREST HANDOVER CANCEL PATH SWITCH PEOUREST PATH SWITCH PEOUREST PATH SWITCH REQUEST PATH SWITCH REQUES			E-RAB Level QoS Parameters	E-RAB MODIFY REQUEST	M	М	TS 36.413
Handover Type			Cause	UE CONTEXT RELEASE REQUEST UE CONTEXT RELEASE COMMAND UE CONTEXT MODIFICATION FAILURE HANDOVER REQUIRED HANDOVER PREPARATION FAILURE HANDOVER REQUEST HANDOVER FAILURE HANDOVER CANCEL PATH SWITCH REQUEST FAILURE	М	М	TS 36.413
E-UTRAN CGI			Handover Type	HANDOVER COMMAND	М	М	TS 36.413
TAI			E-UTRAN CGI	PATH SWITCH REQUEST INITIAL UE MESSAGE	M	М	TS 36.413
CDMA2000 HO Status DOWNLINK S1 CDMA2000 TUNNELING M M TS 36.413			TAI	PATH SWITCH REQUEST	M	М	TS 36.413
CDMA2000 RAT Type			Target ID	HANDOVER REQUIRED	М	М	TS 36.413
CDMA2000 RAT Type			CDMA2000 HO Status	DOWNLINK S1 CDMA2000 TUNNELING	М	М	TS 36.413
CDMA2000 HO Required Indication UPLINK S1 CDMA2000 TUNNELING M M TS 36.413			CDMA2000 RAT Type		М	М	TS 36.413
E-RAB id All messages where it is present M M TS 36.423			CDMA2000 Sector ID	UPLINK S1 CDMA2000 TUNNELING	М	М	TS 36.413
X2AP E-RAB Level QoS			CDMA2000 HO Required Indication	UPLINK S1 CDMA2000 TUNNELING	М	М	TS 36.413
X2AP Cause HANDOVER REQUEST M M TS 36.423 Target Cell ID HANDOVER REQUEST M M TS 36.423 GUMMEI HANDOVER REQUEST M M TS 36.423			E-RAB id	All messages where it is present	М	М	TS 36.423
X2 Cause HANDOVER PREPARATION FAILURE HANDOVER CANCEL M M M TS 36.423 Target Cell ID HANDOVER REQUEST M M M TS 36.423 GUMMEI HANDOVER REQUEST M M TS 36.423			E-RAB Level QoS	HANDOVER REQUEST	М	М	TS 36.423
GUMMEI HANDOVER REQUEST M M TS 36.423	X2	X2AP	Cause	HANDOVER PREPARATION FAILURE	М	М	TS 36.423
			Target Cell ID	HANDOVER REQUEST	М	М	TS 36.423
UE History InformationHANDOVER REQUESTMMTS 36.423			GUMMEI	HANDOVER REQUEST	М	М	TS 36.423
			UE History Information	HANDOVER REQUEST	М	М	TS 36.423

53

4.14 SGW Trace Record Content

The following table shows the trace record content for SGW.

The trace record is the same for management based activation and for signalling based activation.

SGW shall support at least one of the following trace depth levels – Maximum, Medium or Minimum.

Table 4.14.1: SGW Trace Record Content

Interface (specific	Format	Level of details		tails	Description
messages)	Format	Min	Med	Max	Description
		M	M	0	Message name
		0	0	0	Record extensions
	Decoded	мм	х	MME ID of the connected MME	
S11	Decoded	IVI	IVI	^	SGW ID of the traced SGW
311		М	М	х	Dedicated IE extracted from S11 messages between the traced MME and
		IAI	141	^	the SGW. A subset of IEs as given in the table 4.14.2.is provided
	Encoded*	х	Х	м	Raw S11 messages between the traced MME and the SGW. The encoded
	Liicoded	^	^	IVI	content of the message is provided
		M	M	0	Message name
	Decoded	0	0	0	Record extensions
		М	М	Х	PGW ID of the connected PGW
S5/S8		IVI	IVI	^	SGW of the traced SGW
33/38		М	м	Х	IE extracted from S5/S8 messages between the traced SGW and PGW. A
			IVI	^	subset of IEs as given in the table 4.14.2. is provided.
	Encoded*	Х	х	м	Raw S5/S8 Messages: messages between the traced SGW and PGW. The
	Liicoded		^		encoded content of the message is provided
		M	M	0	Message name
		0	0	0	Record extensions
	Decoded	м	м	х	SGSNID of the connected SGSN
S4	Decoded	IVI	141	^	SGWID of the traced SGW
34		м	м	х	Dedicated IE extracted from S4 messages between the traced SGW and the
		141	141	^	SGSN. A subset of IEs as given in the table 4.14.2.is provided
	Encoded*	х	х	м	Raw S4 messages between the traced PGW and the AAA. The encoded
	Liicoded				content of the message is provided
		M	M	0	Message name
		0	0	0	Record extensions
	Decoded	М	М	х	PCRF ID of the connected PCRF
Gxc	Doctored	IVI	IVI	^	SGW ID of the traced SGW
GAC .		м м		Х	Dedicated IE extracted from Gx messages between the traced SGW and
		IVI	IVI X		another PCRF. A subset of IEs as given in the table 4.14.2.is provided
	Encoded*	Х	Х	М	Raw Gx messages between the traced SGW and another PCRF. The
	Liicoded	_ ^	^	IVI	encoded content of the message is provided

Encoded* - the messages are left encoded in the format it was received.

Table 4.14.2 : SGW trace record description for minimum and medium trace depth

Interface name	Prot.	IF name Message name(s)		Trace depth		Notes		
interiace name	name	iz namo	mossage name(s)	Min	Med	Notes		
		IMSI	Create Session Request Suspend Notification Suspend Acknowledge Resume Notification Resume Acknowledge	М	М	TS 29.274		
			MSISDN	Create Session Request Modify Bearer Response	М	М	TS 29.274	
			RAT type	Create Session Request Modify Bearer Request	М	М	TS 29.274	
		Serving Network	Create Session Request Modify Bearer Request	М	М	TS 29.274		
		Access Point Name (APN)	Create Session Request	М	М	TS 29.274		
		PDN Type	Create Session Request	М	М	TS 29.274		
S11	GTPv2C	GTPv2C	GTPv2C	Bearer Contexts	Create Session Request Create Bearer Request Create Bearer Response Delete Bearer Response Modify Bearer Command Modify Bearer Failure Indication Update Bearer Response Delete Bearer Response Delete Bearer Response Delete Bearer Response Delete Bearer Command Delete Bearer Failure Indication Create Indirect Data Forwarding Tunnel Request Create Indirect Data Forwarding Tunnel Response Update Bearer Complete	М	М	TS 29.274
				Cause	Create Session Response Create Bearer Response Bearer Resource Failure Indication Modify Bearer Response Delete Session Response Downlink Data Notification Acknowledgement Downlink Data Notification Failure Indication Modify Bearer Failure Indication Update Bearer Response Delete Bearer Failure Indication Create Indirect Data Forwarding Tunnel Response Update Bearer Complete	М	М	TS 29.274
		Bearer Contexts created	Create Session Response	М	М	TS 29.274		
		APN Restriction	Create Session Response	М	М	TS 29.274		
		Linked Bearer Identity (LBI)	Create Bearer Request Bearer Resource Command Delete Session Request Delete Bearer Request Delete Bearer Response	М	М	TS 29.274		
		Traffic Aggregate Description (TAD)	Bearer Resource Command	М	М	TS 29.274		
		Linked EPS Bearer ID	Bearer Resource Command	М	М	TS 29.274		

		Bearer Contexts to be removed	Modify Bearer Request	М	М	TS 29.274
		Bearer Contexts modified	Modify Bearer Response	М	М	TS 29.274
		Bearer Contexts marked for removal	Modify Bearer Response Update User Plane Response	М	М	TS 29.274
		Bearer Contexts to be updated	Update User Plane Request	М	М	TS 29.274
		Bearer Contexts to be	Update User Plane Request	М	М	TS 29.274
		removed Bearer Contexts updated	Update User Plane Response	М	М	TS
		Bearer Contexts to be	Modify Bearer Request	М	М	29.274 TS
		modified Traffic Aggregate	Bearer Resource Command	М	М	29.274 TS 29.274
		Description (TAD) Linked Bearer Identity	Bearer Resource Command			7S
		(LBI)	Create Bearer Request Delete Bearer Response	М	М	29.274
		Linked EPS Bearer ID	Bearer Resource Failure Indication Delete Session Request Delete Bearer Request	м	М	TS 29.274
		Cause	Bearer Resource Failure Indication Create Session Response Create Bearer Response Modify Bearer Response Delete Session Response Delete Bearer Response Downlink Data Notification Acknowledgement Downlink Data Notification Failure Indication Update Bearer Response Create Indirect Data Forwarding Tunnel Response Update Bearer Complete	М	М	TS 29.274
		Bearer Contexts to be modified	Modify Bearer Request	М	М	TS 29.274
		Bearer Contexts to be removed	Modify Bearer Request	М	М	TS 29.274
S4	GTPv2C	IMSI	Create Session Request Update Bearer Request	М	М	TS 29.274
		MSISDN	Create Session Request Modify Bearer Response	М	М	TS 29.274
		Serving Network	Create Session Request	М	М	TS 29.274
		Access Point Name (APN)	Create Session Request	М	М	TS 29.274
		PDN Type	Create Session Request	М	М	TS 29.274
		Bearer Contexts	Create Session Request Create Bearer Request Create Bearer Response Delete Bearer Response Update Bearer Request Update Bearer Response Create Indirect Data Forwarding Tunnel Request Create Indirect Data Forwarding Tunnel Response Update Bearer Complete	М	М	TS 29.274
		RAT Type	Create Session Request Modify Bearer Request	М	М	TS 29.274
		Bearer Contexts created	Create Session Response	М	М	TS 29.274
		Bearer Contexts marked for removal	Create Session Response	М	М	TS 29.274

		Bearer Contexts modified	Modify Bearer Response	М	М	TS 29.274	
		Bearer Contexts marked for removal	Modify Bearer Response	М	М	TS 29.274	
		IMSI	Create Session Request Update Bearer Request	М	М	TS 29.274	
		MSISDN	Create Session Request Modify Bearer Response	М	М	TS 29.274	
		Serving Network	Create Session Request Modify Bearer Request	М	М	TS 29.274	
		Access Point Name (APN)	Create Session Request	М	М	TS 29.274	
				PDN Type	Create Session Request	М	М
\$5/\$8 GTF		Bearer Contexts	Create Session Request Create Bearer Request Create Bearer Response Delete Bearer Response Modify Bearer Command Modify Bearer Failure Indication Update Bearer Response Update Bearer Response Delete Bearer Command Delete Bearer Failure Indication	М	М	TS 29.274	
	GTPv2C	Cause	Create Session Response Create Bearer Response Bearer Resource Failure Indication Modify Bearer Response Delete Session Response Delete Bearer Response Modify Bearer Failure Indication Update Bearer Response Delete Bearer Failure Indication	М	М	TS 29.274	
		Bearer Contexts created	Create Session Response	М	М	TS 29.274	
		Bearer Contexts marked for removal	Create Session Response	М	М	TS 29.274	
		APN Restriction	Create Session Response	М	М	TS 29.274	
		Linked Bearer Identity (LBI)	Create Bearer Request Bearer Resource Command Delete Bearer Response	М	М	TS 29.274	
		Traffic Aggregate Description (TAD)	Bearer Resource Command	М	М	TS 29.274	
		Linked EPS Bearer ID	Bearer Resource Failure Indication Delete Session Request Delete Bearer Request	М	М	TS 29.274	
		RAT Type	Create Session Request Modify Bearer Request	М	М	TS 29.274	
		Bearer Contexts to be modified	Modify Bearer Request	М	М	TS 29.274	
		Bearer Contexts to be removed	Modify Bearer Request	М	М	TS 29.274	
		Bearer Contexts modified		М	М	TS 29.274	
		Bearer Contexts marked for removal		М	М	TS 29.274	
		IP-CAN-Type	CCR	М	M	TS 29.212	
Gxc		RAT-Type	CCR	М	М	TS 29.212	
	Diameter	QoS-Information	CCR CCA RAR	М	М	TS 29.212	
		QoS-Negotiation	CCR	М	М	TS 29.212	
		QoS-Rule-Report	CCR RAA	М	М	TS 29.212	

	Default-EPS-Bearer- QoS	CCR CCA RAR	М	М	TS 29.212
	Supported-Features	CCR CCA RAR RAA	М	М	TS 29.212
	Event-Trigger	CCR CCA RAR	М	М	TS 29.212
	Result Code	RAA	М	М	TS 29.212
	Origin-Realm	CCR CCA RAR RAA	М	M	TS 29.212
	QoS-Rule-Remove	RAR CAA	М	M	TS 29.212
	QoS-Rule-Install	RAR CAA	М	M	TS 29.212
	Destination-Realm	CCR RAR	М	М	TS 29.212

Annex A (normative): Trace Report File Format

This annex describes the format of trace result files. Those files are to be transferred from the network (NEs or EM) to the NM.

The following conditions have been considered for the definition of this file format:

- The trace data volume and trace duration is not predictable. Depending on the data retrieval and storage mechanisms, several consecutive trace result files could be generated for a single traced call. The file naming convention shall allow rebuilding the temporal file sequences.
- Since the files are transferred via a machine-machine interface, the files should be machine-readable using standard tools.
- The file format should be independent from the data transfer protocol used to carry the file from one system to another.
- The file format should be generic across UMTS and EPS systems.
- The file format should be flexible enough to support further trace data types and decoded IEs, as well as vendor specific trace data.

A.1 Parameter description and mapping table

The following table describes the XML trace file parameters.

Table: XML trace file parameters

XML element / XML attribute specification	Description
traceCollecFile	This is the top-level element. It identifies the file as a collection of trace data. This element includes:
	- a file header (element "fileHeader")
613.77	- the collection of trace data items (elements "traceRecSession").
fileHeader	This is the trace file header element. This element includes: - a version indicator (attribute specification "fileFormatVersion")
	- the vendor name of the sending network node (attribute specification "vendorName")
	- the name of the sending network node (attribute specification "fileSender elementDn")
	- the type of the sending network node (attribute specification "fileSender elementType")
	- a time stamp (attribute specification "traceCollec beginTime").
fileHeader	This attribute specification identifies the file format version applied by the sender. The format version
fileFormatVersion	defined in the present document shall be the abridged number and version of this 3GPP document (see below).
	The abridged number and version of a 3GPP document is constructed from its version specific full
	reference "3GPP [] (yyyy-mm)" by:
	- removing the leading "3GPP TS"
	 removing everything including and after the version third digit, representing editorial only changes, together with its preceding dot character
	- from the resulting string, removing leading and trailing white space, replacing every multi
	character white space by a single space character and changing the case of all characters to
	uppercase.
fileHeader vendorName	Optional attribute specification that has the following value part: vendor of the equipment that provided the trace file.
fileSender elementDn	Optional attribute specification that uniquely identifies the NE or EM that assembled this trace file,
	according to the definitions in 3GPP TS 32.300 [11].
fileSender elementType	Optional attribute specification that identifies type of the network node that generated the file, e.g.
to a second control of the second control of	"RNC", "SGSN". This attribute specification contains a timestamp that refers to the start of the first trace data that is
traceCollec beginTime	stored in this file. It is a complete timestamp including day, time and delta UTC hour. E.g. "2001-09-
	11T09:30:47-05:00".
traceRecSession	Optional element that contains the traced data associated to a Trace Recording Session. It includes:
	- the DN prefix (attribute specification "dnPrefix")
	- the trace session identifier (attribute specification "traceSessionRef")
	- the trace recording session identifier (attribute specification "traceRecSessionRef") - the start time of the call (attribute specification "stime")
	- the ue identifier (element "ue")
	- the traced messages (elements "msg")
traceRecSession	Optional attribute specification that provides the DN prefix (see 3GPP TS 32.300 [11]).
dnPrefix traceRecSession	Attails to a seriff action that was idea a unique trace accion ideatifies as described in 2000 TO 20 404
traceRecSession	Attribute specification that provides a unique trace session identifier as described in 3GPP TS 32.421 [2]. Trace Reference is composed of MCC digits, MNC digits, and Trace ID where:
eracebebbiomer	[2]. That the transfer to composed of Mee digital, Mitter digital, and That is Micro.
	- MCC is in BCD format, 3 digits in length
	- MNC is in BCD format, 1 to 3 digits in length, with no filler digit for MNCs less than 3 digits
	Mirto to in 202 format, i to o digito in forigin, militare digit for mirto 1000 than o digito
	- Trace ID is in hexadecimal format, 6 digits in length, hex letters (A thu F) are capitalized.
traceRecSession	Attribute specification that provides a unique trace recording session identifier as described in
traceRecSessionRef	3GPP TS 32.421 [2] and 3GPP TS 32.422 [3]. Trace Recording Session Reference is represented in
	hexadecimal format. No filler digits for hex numbers of less than four digits. All hex letters (A thru F) are
+magaDagGaggia	Capitalized.
traceRecSession stime	Optional attribute specification that provides the start time of the call. This element gives the ue identifier provided in trace activation messages. It includes:
	- the ue identifier type (attribute specification "idType")
	- the ue identifier value (attribute specification "idValue")
	This element shall not be present in the Trace record of E-UTRAN.
ue idType	Attribute specification that provides the ue identifier type (IMSI, IMEI (SV), or Private User Id).
ue idValue	Attribute specification that provides the ue identifier value, represented in decimal.

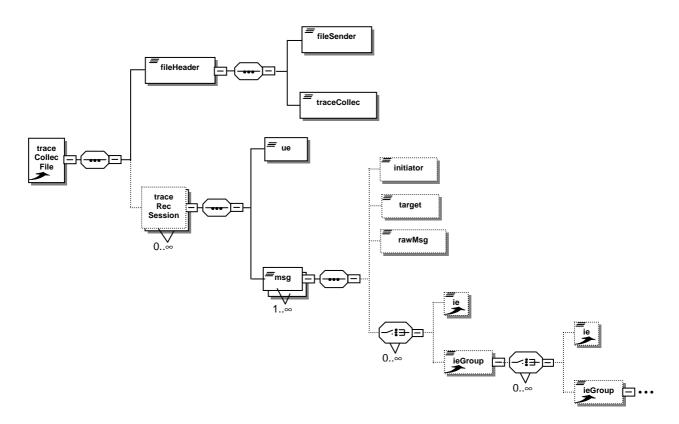
XML element / XML attribute specification	Description			
msg	This element contains the information associated to a traced message. This element will not be included if the file is from the MME for retrieving the IMSI/IMEI (SV) information. It includes:			
	 the function name associated to the traced message (attribute specification "function") the time difference with attribute specification "traceCollec beginTime" (attribute 			
	specification "changeTime")			
	- a boolean value that indicates if the message is vendor specific (attribute specification "vendorSpecific")			
	- the protocol message name (attribute specification "name")			
	- the NE initiator of the protocol message (element "initiator")			
	- the NE target(s) of the protocol message (element "target")			
	- the encoded protocol message (element "rawMsg")			
msq function	- the traced IEs, either simple (elements "ie") or complex (elements "ieGroup"), in any order Attribute specification that provides the function name associated to the traced message (e.g. luu, lu			
msg runccion	CS, lub, Intra frequency measurement, Gb,).			
msg changeTime	Attribute specification that provides the time difference with attribute specification "traceCollec			
	beginTime". It is expressed in number of seconds and milliseconds (nbsec.ms).			
msg vendorSpecific	Attribute specification whose value part is a boolean value that indicates if the message is vendor specific (true) or not (false).			
msg name	Attribute specification that provides the protocol message name.			
initiator	Optional element that identifies the NE initiator of the protocol message. Each includes:			
	 the type of the network node that initiate the message (attribute specification "type") the LDN of NE initiator of the protocol message (element's content). The element's content may be empty in case the initiator is the sender or the mobile 			
initiator type	Optional attribute specification that provides the type of the network node that initiate the message, e.g.			
h	"RNC", "SGSN".			
target	Optional element that identifies the NE target(s) of the protocol message. It includes: - the type of the network node that receive the message (attribute specification "type")			
	- the LDN or IP Address of NE target of the protocol message (element's content). The element's			
	content may be empty in case the target is the sender or the mobile			
target type	Optional attribute specification that provides the type of the network node that receive the message, e.g. "RNC", "SGSN".			
NumOfTargets	Optional attribute specification that provides the number of targets that the message is sent to. This is			
	populated ONLY if the Target is not explicitly specified and is useful when there are a large number of targets that the message is sent to.			
rawMsg	Optional element that contains the encoded protocol message. It includes:			
	- the protocol name associated to the event (attribute specification "protocol")			
	- the protocol version (attribute specification "version")			
	- the hexadecimal encoded form of the message (element's content)			
rawMsg protocol	This element is available only if the trace depth is maximum.			
rawMsg proceed	Attribute specification that provides the protocol name associated to the event (e.g. "Ranap"). Attribute specification that provides the protocol version.			
ieGroup	Optional element that contains a complex traced IE, i.e. an IE that contains other traced IEs. It			
	includes: - the IE group name (attribute specification "name")			
	- the IE group value (attribute specification "value")			
	- zero or more traced IEs, either simple (elements "ie") or complex (elements "ieGroup"), in			
	any order			
	This element is available only if the trace depth is medium or minimum.			
ieGroup name	Optional attribute specification that provides the IE group name (e.g. "RAB parameters").			
ieGroup value	Optional attribute specification that provides the IE group value when it exists (e.g. "RAB identifier").			
ie	Optional element that contains a simple traced IE, i.e. an IE decoded from the traced message. It includes:			
	- the IE name (attribute specification "name")			
	- the IE value (element's content)			
i e name	This element is available only if the trace depth is medium or minimum. Attribute specification that provides the IE name (o.g. "Minimum DI. Poves")			
ie name	Attribute specification that provides the IE name (e.g. "Minimum DL Power").			

A.2 XML file format definition

For encoding of the information content, XML (see Extensible Markup Language (XML) 1.0, W3C Recommendation [5]) will be used. The XML schema contains the mark-up declarations that provide a grammar for the trace file format. The XML schema is defined below.

A.2.1 XML trace file diagram

The following figure describes the XML element structure of a trace XML file.



Note: Refer to "Symbol" paragraph for the symbols meaning

Figure: XML trace file diagram

A.2.2 Trace data file XML schema

The following XML schema traceData.xsd is the schema for trace data XML files:

```
<?xml version="1.0" encoding="UTF-8"?>
<!--
  3GPP TS 32.423 Subscriber and Equipment Trace data definition and management
 Trace data file XML schema
 traceData.xsd
<schema
  targetNamespace=
"http://www.3gpp.org/ftp/specs/archive/32_series/32.423#traceData"
  elementFormDefault="qualified"
  xmlns="http://www.w3.org/2001/XMLSchema"
  xmlns:td=
"http://www.3gpp.org/ftp/specs/archive/32 series/32.423#traceData"
<!-- XML types specific for Trace data file -->
<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>
  <!-- Trace data file root XML element -->
    <element name="traceCollecFile">
        <complexType>
            <seguence>
                <element name="fileHeader">
                     <complexType>
                         <sequence>
                             <element name="fileSender">
                                 <complexType>
                                      <attribute name="elementDn" type="string" use="optional"/>
                                      <attribute name="elementType" type="string" use="optional"/>
                                 </complexType>
                             </element>
                             <element name="traceCollec">
                                 <complexType>
                                     <attribute name="beginTime" type="dateTime" use="required"/>
                                 </complexType>
                             </element>
                         </sequence>
                         <attribute name="fileFormatVersion" type="string" use="required"/>
                         <attribute name="vendorName" type="string" use="optional"/>
                     </complexType>
                 </element>
                 <element name="traceRecSession" minOccurs="0" maxOccurs="unbounded">
                     <complexType>
                         <sequence>
                             <element name="ue" minOccurs="0">
                                 <complexType>
                                     <attribute name="idType" type="string" use="required" />
                                     <attribute name="idValue" type="long" use="required"/>
                                 </complexType>
                             <element name="msg" minOccurs="0" maxOccurs="unbounded">
                                 <complexType>
                                     <sequence>
                                          <element name="initiator" minOccurs="0">
                                              <complexType>
                                                  <simpleContent>
                                                      <extension base="string">
                                                  <attribute name="type" type="NCName"</pre>
use="optional"/>
                                                  </extension>
                                                  </simpleContent>
                                              </complexType>
                                          </element>
                                          <element name="target" minOccurs="0" maxOccurs="unbounded">
                                              <complexType>
                                                  <simpleContent>
                                                      <extension base="string">
```

```
<attribute name="type" type="NCName"</pre>
use="optional"/>
                                                    </extension>
                                                    </simpleContent>
                                                </complexType>
                                           </element>
                                           <element name="rawMsg" minOccurs="0">
                                               <complexType>
                                                    <simpleContent>
                                                        <extension base="hexBinary">
                                                    <attribute name="protocol" type="string"</pre>
use="required"/>
                                                    <attribute name="version" type="string"</pre>
use="required"/>
                                                    <attribute name="NumOfTargets" type="integer"</pre>
use="optional"/>
                                                    </extension>
                                                    </simpleContent>
                                                </complexType>
                                           </element>
                                           <choice minOccurs="0" maxOccurs="unbounded">
                                               <element ref="td:ie"/>
<element ref="td:ieGroup"/>
                                       </sequence>
                                       <attribute name="function" type="string" use="required"/>
                                       <attribute name="name" type="string" use="required"/>
                                       <attribute name="changeTime" type="float" use="required"/>
                                       <attribute name="vendorSpecific" type="boolean" use="required"/>
                                   </complexType>
                              </element>
                          </sequence>
                          <attribute name="dnPrefix" type="string" use="optional"/>
<attribute name="traceSessionRef" type="td:TraceReference" use="required"/>
                          <attribute name="traceRecSessionRef" type="long" use="required"/>
                          <attribute name="stime" type="dateTime" use="optional"/>
                     </complexType>
                 </element>
             </sequence>
         </complexType>
    </element>
    <!-- Additional supporting XML elements -->
    <element name="ieGroup">
         <complexType>
             <choice minOccurs="0" maxOccurs="unbounded">
                 <element ref="td:ie"/>
                 <element ref="td:ieGroup"/>
             </choice>
             <attribute name="name" type="string" use="optional"/>
            <attribute name="value" type="string" use="optional"/>
        </complexType>
    </element>
    <element name="ie">
        <complexType>
             <simpleContent>
                 <extension base="string">
             <attribute name="name" type="string" use="required"/>
             </extension>
             </simpleContent>
         </complexType>
    </element>
</schema>
```

Annex B (normative): Trace Report File Conventions and Transfer Procedure

This annex describes naming conventions of files containing trace results and the procedure to transfer these files from the network to the NM.

B.1 File naming convention

The following convention shall be applied for trace result file naming:

<Type><Startdate>.<Starttime>-<SenderType>.<SenderName>.[<TraceReference>].[<TraceRecordingSessionRef>]

- 1) The Type field indicates if the file contains trace data for single or multiple calls, where:
 - "A" means single Trace Recording Session, single sender NE
 - "B" means multiple Trace Recording Sessions, single sender NE
 - "C" means IMSI/IMEI (SV) information for cell traffic trace
- 2) The Startdate field indicates the date of the first record in the trace file. The Startdate field is of the form YYYYMMDD, where:
 - YYYY is the year in four-digit notation;
 - MM is the month in two digit notation (01 12);
 - DD is the day in two digit notation (01 31).
- 3) The Starttime field indicates the time of the first record in the trace file. The Starttime field is of the form HHMMshhmm, where:
 - HH is the two digit hour of the day (local time), based on 24 hour clock (00 23);
 - MM is the two digit minute of the hour (local time),
 - s is the sign of the local time differential from UTC (+ or -), in case the time differential to UTC is 0 then the sign may be arbitrarily set to "+" or "-";
 - hh is the two digit number of hours of the local time differential from UTC (00-23);
 - mm is the two digit number of minutes of the local time differential from UTC (00-59).
- 4) SenderType field is the type of NE defined by IOC attribute managedElementType in 3GPP TS 32.622 [12] that recorded and sent the trace file; SenderName field is the identifier of the NE that recorded and sent the trace file.
- 5) TraceRecordingSessionReference field is set only if the type field is A, and is represented in hexa-decimal format. TraceRecordingSessionReference is a 4 digit hexadecimal number and will not include filler digits for values less than 4 digits in length. All hexadecimal letters (A thru F) are capitalized.
- 6) TraceReference field is set if the type field is A. For type B the Trace Reference is optional and will be used when one trace file is created per trace session with multiple trace recording session. Trace Reference is represented in hexadecimal format. Trace Reference as defined in 3GPP TS 32.422 [1] PLMN ID (MCC, MNC) and Trace ID.

The PLMN identity consists of 3 digits for MCC followed by either - a filler digit plus 2 digits from MNC (in case of 2 digit MNC) or 3 digits from MNC (in case of a 3 digit MNC). MCC and MNC are in BCD format.

```
Example: If MCC: 405, MNC: 139

octet 1: 0x04 (MCC digit 2, MCC digit 1)

octet 2: 0x15 (MNC digit 1, MCC digit 3)

octet 3: 0x93 (MNC digit 3, MNC digit 2)

Also if the MNC is 2 digits (MCC: 405 and MNC 39)
```

octet 1: 0x04 (MCC digit 2, MCC digit 1) octet 2: 0xF5 (MNC digit 1, MCC digit 3) octet 3: 0x93 (MNC digit 3, MNC digit 2)

7) Trace Reference is set if the type field is C.

See bullet 6 above for details regarding the representation of the Trace Reference. Some examples describing file naming convention:

1) file name: A20090928.2315+0200-MME.MME5.13F23200056.125,

meaning: file produced by MME< MME5> on September 28, 2009, first trace record at 23:15 local with a time differential of +2 hours against UTC. The file contains trace data for the Trace Session with the Trace reference 13F232000056 (where MCC is 312, MNC is 23, and Trace ID is 000056, all in hexadecimal format) and for the Trace Recording Session with the reference 125.

2) file name: B20030115.1700-0300-RNC.RNC02,

meaning: file produced by RNC<RNC02> on January 15, 2003, first trace record at 17:00 local with a time differential of -3 hours against UTC. The file contains trace data for several Trace Recording Sessions.

3) file name: B20033485700034D715.1700-0300-RNC.RNC02.01,

meaning: file produced by RNC<RNC02> on January 15, 2003, first trace record at 17:00 local with a time differential of -3 hours against UTC. The file contains trace 3485700034D7 (where MCC is 348, MNC is 570, and Trace ID is 0034D7) data for Trace reference and several Trace Recording Sessions.

4) file name C20030115.1700-0300-MME.MME02. 26F4520021

Meaning: file produced by MME<MME02> on January 15, 2003, first trace record at 17:00 local with a time differential of -3 hours against UTC. The file contains IMSI/IMEI (SV) information for one or more UEs traced at eNB with Trace Reference26F452550021 (where MCC is 624, MNC is 25, and Trace ID is 550021).

B.2 File transfer

- Data retrieval and storage mechanisms are vendor specific.
- There is no constraint on data retrieval periodicity.

Annex C (informative):

Trace Functional Architecture: Reporting

C.1 Figure of Trace Reporting

The following represents the trace reporting procedures.

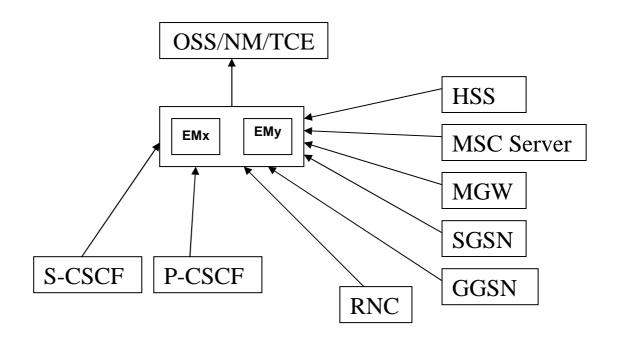


Figure C.1.1: Trace Reporting in System context A

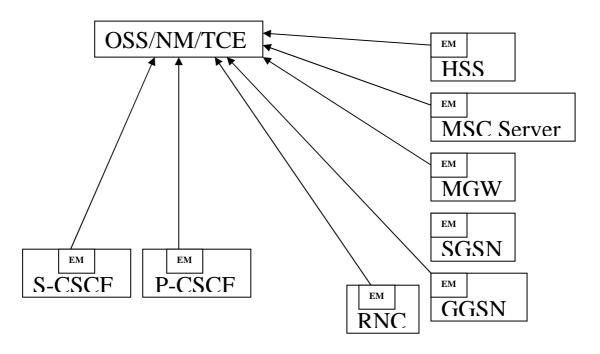


Figure C.1.2: Trace Reporting in System Context B

Annex D (informative): Examples of trace files

</traceCollecFile >

D.1 Examples of trace XML file

D.1.1 Example of XML trace file with the maximum level of details

```
<?xml version="1.0" encoding="UTF-8"?>
<traceCollecFile xmlns="http://www.3gpp.org/ftp/specs/archive/32 series/32.423#traceData"</pre>
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:schemaLocation="http://www.3gpp.org/ftp/specs/archive/32_series/32.423#traceData
http://www.3gpp.org/ftp/specs/archive/32_series/32423#traceData">
<fileHeader fileFormatVersion="32.423 V6.0" vendorName="Company NN">
        <fileSender elementDn="DC=a1.companyNN.com,SubNetwork=1, ManagedElement=RNC-1"</pre>
elementType="RNC"/>
        <traceCollec beginTime="2001-09-11T09:30:47-05:00"/>
    </fileHeader>
    <traceRecSession dnPrefix="DC=a1.companyNN.com,SubNetwork=1" traceSessionRef="1"</pre>
traceRecSessionRef="2147483647" stime="2001-09-11T09:30:47-05:00">
        <ue idType="IMSI" idValue="32795"/>
        <msg function="Iub" name="Radio LinkSetup Request" changeTime="0.005"</pre>
vendorSpecific="false">
            <target type="Cell">SubNetwork=1,ManagedElement=Cell-1</target>
            <rawMsg protocol="Nbap" version="001">A9FD64E12C</rawMsg>
        </msq>
    </traceRecSession>
</traceCollecFile>
An additional example added;
<?xml version="1.0" encoding="UTF-8"?>
<traceCollecFile xmlns="http://www.3gpp.org/ftp/specs/archive/32_series/32.423#traceData"</pre>
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:schemaLocation="http://www.3gpp.org/ftp/specs/archive/32_series/32.423#traceData
http://www.3gpp.org/ftp/specs/archive/32_series/32423#traceData">
<fileHeader fileFormatVersion="32.423 V9.0" vendorName="Company NN">
        <fileSender elementDn="DC=a1.companyNN.com,SubNetwork=1, ManagedElement=MME-1"</pre>
elementType="MME"/>
        <traceCollec beginTime="2001-09-11T09:30:47-05:00"/>
    </fileHeader>
    <traceRecSession dnPrefix="DC=a1.companyNN.com,SubNetwork=1" traceSessionRef="1"</pre>
traceRecSessionRef="2147483647" stime="2001-09-11T09:30:47-05:00">
        <ue idType="IMSI" idValue="32795"/>
        <msg function="S1AP" name="Handover Request" changeTime="0.005" vendorSpecific="false">
            <target type="Cell">SubNetwork=1, ManagedElement=Cell-1</target>
            <target type="Cell">SubNetwork=1,ManagedElement=Cell-2</target>
            <target type="Cell">123.222.213.5 </target>
            <rawMsg protocol="S1AP" version="001" NumOfTargets=3>A9FD64E12C/rawMsg>
        </msq>
    </traceRecSession>
```

D.1.2 Example of XML trace file with the minimum level of details

```
<?xml version="1.0" encoding="UTF-8"?>
<traceCollecFile xmlns="http://www.3gpp.org/ftp/specs/archive/32_series/32.423#traceData"</pre>
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:schemaLocation="http://www.3gpp.org/ftp/specs/archive/32_series/32.423#traceData
http://www.3gpp.org/ftp/specs/archive/32_series/32.423#traceData">
    <fileHeader fileFormatVersion="32.423 V6.0" vendorName="Company NN">
        <fileSender elementDn="DC=a1.companyNN.com,SubNetwork=1, ManagedElement=RNC-1"</pre>
elementType="RNC"/>
        <traceCollec beginTime="2001-09-11T09:30:47-05:00"/>
    </fileHeader>
    <traceRecSession dnPrefix="DC=a1.companyNN.com,SubNetwork=1" traceSessionRef="1"</pre>
traceRecSessionRef="2147483647" stime="2001-09-11T09:30:47-05:00">
        <ue idType="IMSI" idValue="32795"/>
        <msg function="Iub" name="Radio Link Setup Request" changeTime="0.005"</pre>
vendorSpecific="false">
            <target type="Cell">SubNetwork=1,ManagedElement=Cell-1</target>
            <ie name="UL Scrambling Code">54</ie>
            <ie name="UL SIR Target">17.3</ie>
            <ie name="Min UL Channelisation Code Length">8</ie>
            <ie name="Poncture Limit">2</ie>
            <ieGroup name="RadioLink" value="1">
                <ie name="DL Scrambling Code">1</ie>
                <ie name="DL Channelisation Code Number">15</ie>
                <ie name="Maximum DL Power">9.3</ie>
                <ie name="Minimum DL Power">-10.1</ie>
            </ieGroup>
        </msg>
        <msg function="IuPs" name="RAB Assignment Response" changeTime="0.010"</pre>
vendorSpecific="false">
            <ieGroup name="RAB" value="1">
                <ieGroup name="RAB Failed To Setup Or Modify">
                    <ie name="cause">2</ie>
                </ieGroup>
            </ieGroup>
        </msq>
    </traceRecSession>
</traceCollecFile>
```

D.1.3 Example of XML trace file for IMSI information from the MME

```
<?xml version="1.0" encoding="UTF-8"?>
<traceCollecFile xmlns=http://www.3gpp.org/ftp/specs/archive/32_series/32.423#traceData xmlns:xsi="http://www.w3.org/2001/XMLSchema-partial-resolution-resolution-resolution-resolution-resolution-resolution-resolution-resolution-resolution-resolution-resolution-resolution-resolution-resolution-resolution-resolution-resolution-resolution-resolution-resolution-resolution-resolution-resolution-resolution-resolution-resolution-resolution-resolution-resolution-resolution-resolution-resolution-resolution-resolution-resolution-resolution-resolution-resolution-resolution-resolution-resolution-resolution-resolution-resolution-resolution-resolution-resolution-resolution-resolution-resolution-resolution-resolution-resolution-resolution-resolution-resolution-resolution-resolution-resolution-resolution-resolution-resolution-resolution-resolution-resolution-resolution-resolution-resolution-resolution-resolution-resolution-resolution-resolution-resolution-resolution-resolution-resolution-resolution-resolution-resolution-resolution-resolution-resolution-resolution-resolution-resolution-resolution-resolution-resolution-resolution-resolution-resolution-resolution-resolution-resolution-resolution-resolution-resolution-resolution-resolution-resolution-resolution-resolution-resolution-resolution-resolution-resolution-resolution-resolution-resolution-resolution-resolution-resolution-resolution-resolution-resolution-resolution-resolution-resolution-resolution-resolution-resolution-resolution-resolution-resolution-resolution-resolution-resolution-resolution-resolution-resolution-resolution-resolution-resolution-resolution-resolution-resolution-resolution-resolution-resolution-resolution-resolution-resolution-resolution-resolution-resolution-resolution-resolution-resolution-resolution-resolution-resolution-resolution-resolution-resolution-resolution-resolution-resolution-resolution-resolution-resolution-resolution-resolution-resolution-resolution-resolution-resolution-resolution-resolution-resolution-resolution-resolution-resolution-res
instance" xsi:schemaLocation="http://www.3gpp.org/ftp/specs/archive/32_series/32.423#traceData
http://www.3gpp.org/ftp/specs/archive/32_series/32423#traceData">
<fileHeader fileFormatVersion="32.423 V8.0" vendorName="Company NN">
                      <fileSender elementDn="DC=a1.companyNN.com,SubNetwork=1, ManagedElement=MME" elementType="MME"/>
                      <traceCollec beginTime="2001-09-11T09:30:47-05:00"/>
</fileHeader>
11T09:30:47-05:00">
                      <ue idType="IMSI" idValue="32795"/>
</traceRecSession>
<ue idType="IMSI" idValue="12345"/>
</traceRecSession>
</traceCollecFile>
```

Annex E (informative): Void

Annex F (informative): Change history

			Change history									
Date	TSG#	TSG Doc.	CR	Rev	Subject/Comment	Cat	Old	New				
Sep 2005	SA_29	SP-050623	0004	1	Clarify Trace Messages for FDD and TDD modes	В	6.2.0	7.0.0				
Dec 2005	SA_30	SP-050690	0007		Differentiate Trace Contents for FDD and TDD	В	7.0.0	7.1.0				
Dec 2005	SA_30	SP-050709	8000		Remove SFN-SFN observed time difference - Align with 25.331	Α	7.0.0	7.1.0				
Dec 2005	SA_30	SP-050709	0009		Correction to name space URI	Α	7.0.0	7.1.0				
Jun 2006	SA_32	SP-060258	0011		Correction for compilation errors of schema and addition of the missing link	Α	7.1.0	7.2.0				
Sep 2006	SA_33	SP-060533	0013		Correct UTRA Carrier RSSI for trace contents- Align with RAN2's 25.331	Α	7.2.0	7.3.0				
Sep 2006		SP-060533	0015		Correct CFN-SFN observed time difference for trace IE - Align with RAN2's 25.331	A		7.3.0				
·		SP-060552	0016		Add Trace IEs to differentiate UARFCN for FDD and TDD - Align with RAN2's 25.331	С		7.3.0				
		SP-060552	0018		Correction in XML schema and examples	F		7.3.0				
Dec 2006	SA_34	SP-060728	0019		Correct the errors in figure and examples	F	7.3.0	7.4.0				
Mar 2009	SA_43	SP-090207	0020		Constraint of the presence for the 'ue' element	F		8.0.0				
Mar 2009	SA_43	SP-090207	0021		Adding PGW trace record content	В	7.4.0	8.0.0				
Mar 2009	SA_43	SP-090207	0022		Alignment with 32.421 and 32.422. Introduction medium and minimum trace dept IEs for the GTP and S1AP protools in MME	В	7.4.0	8.0.0				
Mar 2009	SA_43	SP-090207	0023		Alignment with 32.421 and 32.422. Introduction of E-UTRAN	В	7.4.0	8.0.0				
Jun 2009		SP-090289	0024		Alignment with 32.421 and 32.422 - Introduction medium and minimum trace depth IEs in MME.	F	8.0.0	8.1.0				
Jun 2009	SA_44	SP-090289	0025		Add missing SGW Trace Record content	F	8.0.0	8.1.0				
Jun 2009	SA_44	SP-090289	0026		Add missing PGW Trace Record content for Gx and S6b interfaces	F	8.0.0	8.1.0				
Jun 2009	SA_44	SP-090289	0027		Alignment with 32.421 and 32.422 - Introduction medium and minimum trace dept IEs for NAS in MME.	F	8.0.0	8.1.0				
Sep 2009	SA_45	SP-090534	0028		Correction in TS 32.423 Trace Depth requirements for MME, SGW and PGW	F	8.1.0	8.2.0				
Sep 2009	SA_45	SP-090534	0030		Unable to uniquely identify file name when one file per UE trace	F	8.1.0	8.2.0				
Sep 2009	SA_45	SP-090534	0031		Added a file format and example for sending the IMSI/IMEI (SV) information from the MME	F	8.1.0	8.2.0				
Sep 2009	SA-45	SP-090542	0029		Correction on XML file format for Trace failure notification	F	8.2.0	9.0.0				
Dec 2009	SA-46	SP-090719	0032		Clarify Trace Reference and Trace Recording Session Reference format	F	9.0.0	9.1.0				
Jan 2010					Removal of track changes		9.1.0	9.1.1				
Mar 2010	SA-47	SP-100034	0034		Align with 32.421 and 33.401	Α	9.1.1	9.2.0				
		SP-100487	0039		Correcting references	Α	9.2.0	9.3.0				
Sep 2010	SA-49	SP-100488	0035		Correct call trace file format to allow multiple targets	F	9.2.0	9.3.0				
		SP-100831			Add missing interfaces S3, S4 and S6d trace record contents of SGSN -							
			0046		Align with 32.422	Α	9.3.0	9.4.0				
Dec 2010	SA-50	SP-100858	0041	1	Correcting the Trace Reference definition - Align with RAN3 TS 36.423, 36.413	F	9.3.0	9.4.0				

History

Document history			
V9.1.1	January 2010	Publication	
V9.2.0	April 2010	Publication	
V9.3.0	October 2010	Publication	
V9.4.0	January 2011	Publication	