

# ETSI TS 132 423 V6.3.0 (2005-09)

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*Technical Specification*

**Universal Mobile Telecommunications System (UMTS);  
Telecommunication management;  
Subscriber and equipment trace;  
Trace data definition and management  
(3GPP TS 32.423 version 6.3.0 Release 6)**

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Reference

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- z the third digit is incremented when editorial only changes have been incorporated in the document.

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## Introduction

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

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

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

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

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).

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# 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 3G 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).

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# 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)".

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## 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.

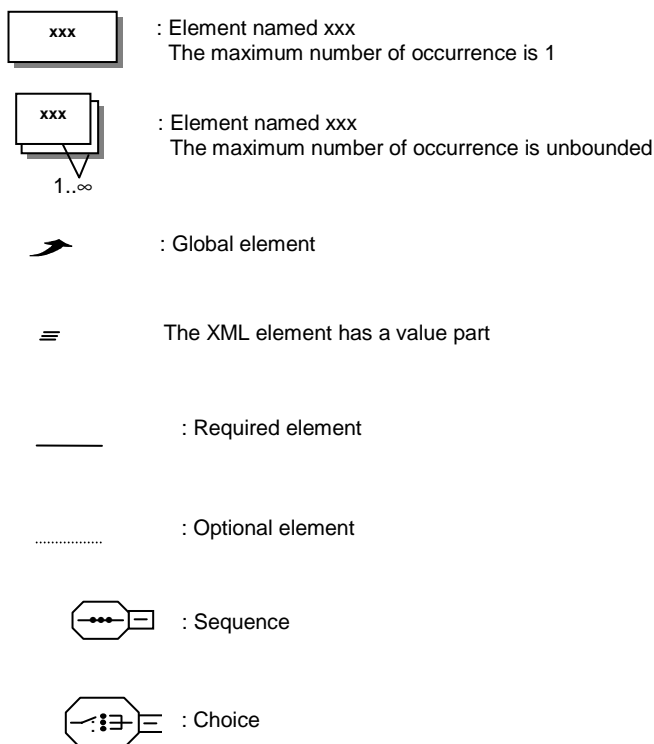
**Minimum Level of detail:** Allows for retrieval of a decoded subset of the IEs contained in the signalling interface messages.

**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.

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# 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, or HSS 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 name | IE name | Message name(s) | Trace depth |     | Notes |
|----------------|---------------|---------|-----------------|-------------|-----|-------|
|                |               |         |                 | Min         | Med |       |
|                |               |         |                 |             |     |       |

**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)

|          |                |   |
|----------|----------------|---|
| <b>M</b> | 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. |
| <b>O</b> | Optional       | This field is optional and its support is a matter for agreement between equipment manufacturer and network operator.   |
| <b>X</b> | 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. name   | IE name                      | Message name(s)   | Trace depth  |   | Notes                  |
|------------------------------|--|------------------------------|---|--------------|---|------------------------|
|                              |  |                              |   | Min          | Med   |                        |
| Iu, A                        | CC   | Facility                     | ALERTING<br>CALL PROCEEDING<br>CONNECT<br>DISCONNECT<br>FACILITY<br>RELEASE<br>RELEASE COMPLETE<br>SETUP  | M            | M   | TS 24.008<br>TS 24.080 |
|                              |  | Bearer capability            | CALL CONFIRMED<br>CALL PROCEEDING<br>EMERGENCY SETUP<br>MODIFY<br>MODIFY COMPLETE<br>MODIFY REJECT<br>SETUP   | M            | M   | TS 24.008              |
|                              |  | Cause                        | CALL CONFIRMED<br>CONGESTION CONTROL<br>DISCONNECT<br>HOLD REJECT<br>MODIFY REJECT<br>RELEASE<br>RELEASE COMPLETE<br>RETRIEVE REJECT<br>START DTMF REJECT<br>STATUS | M            | M   | TS 24.008              |
|                              |  | Connected number             | CONNECT   | M            | M   | TS 24.008              |
|                              |  | Calling party BCD number     | SETUP   | M            | M   | TS 24.008              |
|                              |  | Called party BCD number      | SETUP   | M            | M   | TS 24.008              |
|                              |  | Redirecting party BCD number | SETUP   | M            | M   | TS 24.008              |
|                              |  | Iu, A                        | MM  | Reject cause | AUTHENTICATION FAILURE<br>CM SERVICE REJECT<br>ABORT<br>LOCATION UPDATING REJECT<br>MM STATUS | M                      |
| Location area identification | CM RE-ESTABLISHMENT REQUEST<br>LOCATION UPDATING ACCEPT<br>LOCATION UPDATING REQUEST<br>TMSI REALLOCATION COMMAND  |                              |   | M            | M   | TS 24.008              |
| Mobile identity              | CM RE-ESTABLISHMENT REQUEST<br>CM SERVICE REQUEST<br>IDENTITY REQUEST<br>IDENTITY RESPONSE<br>IMSI DETACH INDICATION<br>LOCATION UPDATING ACCEPT<br>LOCATION UPDATING REQUEST<br>TMSI REALLOCATION COMMAND |                              |   | M            | M   | TS 24.008              |
| CM service type              | CM SERVICE REQUEST   |                              |   | M            | M   | TS 24.008              |
| Location updating type       | LOCATION UPDATING REQUEST  |                              |   | M            | M   | TS 24.008              |
| Iu, A                        | SS   |                              |   | Facility     | FACILITY<br>REGISTER<br>RELEASE COMPLETE  | M                      |
|                              |  | Cause                        | RELEASE COMPLETE  | M            | M   | TS 24.008              |
| Iu, A                        | SMS  | TP-Originating-Address       | SMS-DELIVER   | M            | M   | TS 23.040              |
|                              |  | TP-Service-Centre-Time-Stamp | SMS-DELIVER<br>SMS-SUBMIT-REPORT<br>SMS-STATUS-REPORT   | M            | M   | TS 23.040              |
|                              |  | TP-Failure-Cause             | SMS-DELIVER-REPORT<br>SMS-SUBMIT-REPORT   | M            | M   | TS 23.040              |
|                              |  | TP-Destination-Address       | SMS-SUBMIT<br>SMS-COMMAND   | M            | M   | TS 23.040              |
|                              |  | TP-Recipient-Address         | SMS-STATUS-REPORT   | M            | M   | TS 23.040              |
| A                            | BSSMAP   | Channel Type                 | ASSIGNMENT REQUEST<br>HANDOVER REQUEST  | M            | M   | TS 48.008              |
|                              |  | Circuit                      | ASSIGNMENT REQUEST  | M            | M   | TS 48.008              |

|   |     |                                     |   |   |   |                        |
|---|-----|-------------------------------------|---|---|---|------------------------|
|   |     | Cell Identifier (Serving)           | ASSIGNMENT COMPLETE<br>HANDOVER REQUEST<br>HANDOVER COMMAND<br>HANDOVER PERFORMED<br>PERFORM LOCATION REQUEST   | M | M | TS 48.008              |
|   |     | Chosen Channel                      | ASSIGNMENT COMPLETE<br>HANDOVER REQUEST ACKNOWLEDGE<br>HANDOVER PERFORMED   | M | M | TS 48.008              |
|   |     | Speech version (chosen)             | ASSIGNMENT COMPLETE<br>HANDOVER REQUEST<br>HANDOVER REQUIRED<br>HANDOVER REQUEST ACKNOWLEDGE<br>HANDOVER PERFORMED  | M | M | TS 48.008              |
|   |     | Cause                               | ASSIGNMENT FAILURE<br>HANDOVER REQUEST<br>HANDOVER REQUIRED<br>HANDOVER FAILURE<br>CLEAR REQUEST<br>CLEAR COMMAND<br>HANDOVER PERFORMED<br>HANDOVER REQUIRED REJECT   | M | M | TS 48.008              |
|   |     | RR Cause                            | ASSIGNMENT FAILURE<br>HANDOVER COMPLETE<br>HANDOVER FAILURE   | M | M | TS 48.008              |
|   |     | Cell Identifier (target)            | HANDOVER REQUEST  | M | M | TS 48.008              |
|   |     | Current Channel type 1              | HANDOVER REQUEST<br>HANDOVER REQUIRED   | M | M | TS 48.008              |
|   |     | Cell Identifier List (Preferred)    | HANDOVER REQUIRED<br>PAGING   | M | M | TS 48.008              |
|   |     | IMSI                                | PAGING<br>COMMON ID   | M | M | TS 48.008              |
|   |     | Location Type                       | PERFORM LOCATION REQUEST  | M | M | TS 48.008              |
|   |     | Location Estimate                   | PERFORM LOCATION RESPONSE   | M | M | TS 48.008              |
|   |     | LCS Cause                           | PERFORM LOCATION RESPONSE<br>PERFORM LOCATION ABORT   | M | M | TS 48.008              |
| B | MAP | SS-Code                             | MAP_REGISTER_SS<br>MAP_ERASE_SS<br>MAP_ACTIVATE_SS<br>MAP_DEACTIVATE_SS<br>MAP_INTERROGATE_SS<br>MAP_REGISTER_PASSWORD<br>MAP_REGISTER_CC_ENTRY<br>MAP_ERASE_CC_ENTRY | M | M | TS 29.002              |
|   |     | Forwarded-to number with subaddress | MAP_REGISTER_SS   | M | M | TS 29.002              |
|   |     | Basic service                       | MAP_REGISTER_SS<br>MAP_ERASE_SS<br>MAP_ACTIVATE_SS<br>MAP_DEACTIVATE_SS<br>MAP_INTERROGATE_SS   | M | M | TS 29.002              |
|   |     | SM RP DA                            | MAP-SEND-INFO-FOR-MT-SMS  | M | M | TS 29.002              |
|   |     | Service Centre Address              | MAP-SEND-INFO-FOR-MO-SMS  | M | M | TS 29.002              |
|   |     | Alert Reason                        | MAP-READY-FOR-SM  | M | M | TS 29.002              |
|   |     | Abort reason                        | Abort   | M | M | TS 29.002<br>TS 23.018 |
| C | MAP | MSISDN                              | Complete Call<br>Process Access Request ack<br>Process Call Waiting<br>Send Info For Incoming Call ack<br>MAP-SEND-INFO-FOR-MT-SMS<br>MAP-SEND-INFO-FOR-MO-SMS        | M | M | TS 29.002<br>TS 23.018 |
|   |     | IMEI(SV)                            | Complete Call<br>Page MS ack<br>Process Access Request<br>Process Access Request ack<br>Provide IMEI ack<br>Search For MS ack   | M | M | TS 29.002<br>TS 23.018 |
|   |     | PLMN bearer capability              | Complete Call<br>Process Call Waiting   | M | M | TS 29.002<br>TS 23.018 |
|   |     | ISDN bearer capability              | Complete Call<br>Process Call Waiting   | M | M | TS 29.002<br>TS 23.018 |

|   |     |   |   |   |   |                        |
|---|-----|---|---|---|---|------------------------|
|   |     | IMSI  | Page MS<br>Process Access Request<br>Process Access Request ack<br>Provide IMSI ack<br>Search For MS<br>Send Info For Incoming Call ack<br>MAP-SEND-INFO-FOR-MT-SMS   | M | M | TS 29.002<br>TS 23.018 |
|   |     | Location area ID / Current location area ID | Page MS<br>Page MS ack<br>Process Access Request<br>Search For MS ack   | M | M | TS 29.002<br>TS 23.018 |
|   |     | Page type                                   | Page MS<br>Search For MS  | M | M | TS 29.002<br>TS 23.018 |
|   |     | Serving cell ID                             | Page MS ack<br>Process Access Request<br>Search For MS ack  | M | M | TS 29.002<br>TS 23.018 |
|   |     | Service area ID                             | Page MS ack<br>Process Access Request<br>Search For MS ack  | M | M | TS 29.002<br>TS 23.018 |
|   |     | CM service type                             | Process Access Request  | M | M | TS 29.002<br>TS 23.018 |
|   |     | MSRN  | Send Info For Incoming Call   | M | M | TS 29.002<br>TS 23.018 |
|   |     | Bearer service                              | Send Info For Incoming Call<br>Send Info For Outgoing Call  | M | M | TS 29.002<br>TS 23.018 |
|   |     | Teleservice                                 | Send Info For Incoming Call<br>Send Info For Outgoing Call  | M | M | TS 29.002<br>TS 23.018 |
|   |     | Dialled number                              | Send Info For Incoming Call   | M | M | TS 29.002<br>TS 23.018 |
|   |     | Number of forwarding                        | Send Info For Incoming Call   | M | M | TS 29.002<br>TS 23.018 |
|   |     | Forwarded-to number                         | Send Info For Incoming Call ack   | M | M | TS 29.002<br>TS 23.018 |
|   |     | Forwarding reason                           | Send Info For Incoming Call ack   | M | M | TS 29.002<br>TS 23.018 |
|   |     | Called number                               | Send Info For Outgoing Call   | M | M | TS 29.002<br>TS 23.018 |
|   |     | MSISDN                                      | Send Routing Info   | M | M | TS 29.002<br>TS 23.018 |
|   |     | User error                                  | Every message where it appears  | M | M | TS 29.002              |
|   |     | Provider error                              | Every message where it appears  | M | M | TS 29.002              |
|   |     | Service Centre Address                      | MAP-SEND-ROUTING-INFO-FOR-SM<br>MAP-REPORT-SM-DELIVERY-STATUS<br>MAP-ALERT-SERVICE-CENTRE   | M | M | TS 29.002              |
|   |     | SM Delivery Outcome                         | MAP-REPORT-SM-DELIVERY-STATUS   | M | M | TS 29.002              |
|   |     | MSISdn-Alert                                | MAP-ALERT-SERVICE-CENTRE<br>MAP-INFORM-SERVICE-CEN  | M | M | TS 29.002              |
|   |     | Number of forwarding                        | Send Routing Info   | M | M | TS 29.002<br>TS 23.018 |
|   |     | ISDN BC                                     | Send Routing Info   | M | M | TS 29.002<br>TS 23.018 |
|   |     | IMSI  | Send Routing Info ack   | M | M | TS 29.002<br>TS 23.018 |
|   |     | Roaming number                              | Send Routing Info ack   | M | M | TS 29.002<br>TS 23.018 |
|   |     | Forwarded-to number                         | Send Routing Info ack   | M | M | TS 29.002<br>TS 23.018 |
|   |     | Forwarding reason                           | Send Routing Info ack   | M | M | TS 29.002<br>TS 23.018 |
|   |     | MSISDN                                      | Send Routing Info ack<br>MAP_SEND_ROUTING_INFO_FOR_SM   | M | M | TS 29.002<br>TS 23.018 |
|   |     | User error                                  | Every message where it appears  | M | M | TS 29.002              |
|   |     | Provider error                              | Every message where it appears  | M | M | TS 29.002              |
| D | MAP | HLR number                                  | MAP_RESTORE_DATA  | M | M | TS 29.002              |
|   |     | MS Not Reachable Flag                       | MAP_RESTORE_DATA  | M | M | TS 29.002              |
|   |     | SS-Code                                     | MAP_REGISTER_SS<br>MAP_ERASE_SS<br>MAP_ACTIVATE_SS<br>MAP_DEACTIVATE_SS<br>MAP_INTERROGATE_SS<br>MAP_REGISTER_PASSWORD<br>MAP_REGISTER_CC_ENTRY<br>MAP_ERASE_CC_ENTRY | M | M | TS 29.002              |
|   |     | Forwarded-to number with subaddress         | MAP_REGISTER_SS   | M | M | TS 29.002              |

|                   |                                 |                               |   |           |   |                        |
|-------------------|---------------------------------|-------------------------------|---|-----------|---|------------------------|
|                   |                                 | Basic service                 | MAP_REGISTER_SS<br>MAP_ERASE_SS<br>MAP_ACTIVATE_SS<br>MAP_DEACTIVATE_SS<br>MAP_INTERROGATE_SS   | M         | M | TS 29.002              |
|                   |                                 | Alert Reason                  | MAP-READY-FOR-SM  | M         | M | TS 29.002              |
|                   |                                 | MSC Address                   | MAP_UPDATE_LOCATION   | M         | M | TS 29.002              |
|                   |                                 | IMSI                          | Provide Roaming Number<br>Provide Subscriber Info<br>MAP_UPDATE_LOCATION<br>MAP_CANCEL_LOCATION<br>MAP_PURGE_MS<br>MAP-INSERT-SUBSCRIBER-DATA<br>MAP-DELETE-SUBSCRIBER-DATA<br>MAP_RESTORE_DATA | M         | M | TS 29.002<br>TS 23.018 |
|                   |                                 | MSISDN                        | Provide Roaming Number<br>MAP-INSERT-SUBSCRIBER-DATA  | M         | M | TS 29.002<br>TS 23.018 |
|                   |                                 | PLMN bearer capability        | Provide Roaming Number  | M         | M | TS 29.002<br>TS 23.018 |
|                   |                                 | ISDN BC                       | Provide Roaming Number  | M         | M | TS 29.002<br>TS 23.018 |
|                   |                                 | Roaming number                | Provide Roaming Number ack  | M         | M | TS 29.002<br>TS 23.018 |
|                   |                                 | Service area ID               | Provide Subscriber Info ack   | M         | M | TS 29.002<br>TS 23.018 |
|                   |                                 | Cell ID                       | Provide Subscriber Info ack   | M         | M | TS 29.002<br>TS 23.018 |
|                   |                                 | IMEI(SV)                      | Provide Subscriber Info ack   | M         | M | TS 29.002<br>TS 23.018 |
|                   |                                 | User error                    | Every message where it appears  | M         | M | TS 29.002              |
|                   |                                 | Provider error                | Every message where it appears  | M         | M | TS 29.002              |
| F                 | MAP                             | IMEI(SV)                      | MAP_CHECK_IMEI  | M         | M | TS 29.002<br>TS 23.018 |
|                   |                                 | Equipment status              | MAP_CHECK_IMEI  | M         | M | TS 29.002<br>TS 23.018 |
|                   |                                 | User error                    | Every message where it appears  | M         | M | TS 29.002              |
|                   |                                 | Provider error                | Every message where it appears  | M         | M | TS 29.002              |
| E                 | MAP                             | Target Cell Id                | MAP_PREPARE_HANDOVER<br>MAP_PREPARE_SUBSEQUENT_HANDOVER   | M         | M | TS 29.002              |
|                   |                                 | Target RNC Id                 | MAP_PREPARE_HANDOVER<br>MAP_PREPARE_SUBSEQUENT_HANDOVER   | M         | M | TS 29.002              |
|                   |                                 | IMSI                          | MAP_PREPARE_HANDOVER  | M         | M | TS 29.002              |
|                   |                                 | RAB ID/ Selected RAB id       | MAP_PREPARE_HANDOVER<br>MAP_PROCESS_ACCESS_SIGNALLING<br>MAP_PREPARE_SUBSEQUENT_HANDOVER  | M         | M | TS 29.002              |
|                   |                                 | Handover Number               | MAP_PREPARE_HANDOVER<br>MAP_SEND_HANDOVER_REPORT  | M         | M | TS 29.002              |
|                   |                                 | User error                    | Every message where it appears  | M         | M | TS 29.002              |
|                   |                                 | Provider error                | Every message where it appears  | M         | M | TS 29.002              |
|                   |                                 | Iu-Selected Codec             | MAP_PREPARE_HANDOVER<br>MAP_PROCESS_ACCESS_SIGNALLING<br>MAP_FORWARD_ACCESS_SIGNALLING  | M         | M | TS 29.002              |
|                   |                                 | Iu-Currently Used Codec       | MAP_PREPARE_HANDOVER<br>MAP_FORWARD_ACCESS_SIGNALLING   | M         | M | TS 29.002              |
|                   |                                 | Iu-Supported Codecs List      | MAP_PREPARE_HANDOVER<br>MAP_FORWARD_ACCESS_SIGNALLING   | M         | M | TS 29.002              |
|                   |                                 | Iu-Available Codecs List      | MAP_PREPARE_HANDOVER<br>MAP_PROCESS_ACCESS_SIGNALLING   | M         | M | TS 29.002              |
| Target MSC Number | MAP_PREPARE_SUBSEQUENT_HANDOVER | M                             | M   | TS 29.002 |   |                        |
| G                 | MAP                             | IMSI                          | MAP_SEND_IDENTIFICATION   | M         | M | TS 29.002              |
|                   |                                 | MSC Number                    | MAP_SEND_IDENTIFICATION   | M         | M | TS 29.002              |
|                   |                                 | User error                    | Every message where it appears  | M         | M | TS 29.002              |
|                   |                                 | Provider error                | Every message where it appears  | M         | M | TS 29.002              |
| Mc                | Megaco                          | Context                       | Every procedure where it appears  | M         | M | TS 23.205              |
|                   |                                 | Bearer Termination 1          | Every procedure where it appears  | M         | M | TS 23.205              |
|                   |                                 | Bearer Termination 2          | Every procedure where it appears  | M         | M | TS 23.205              |
|                   |                                 | Bearer Characteristics        | Establish Bearer  | M         | M | TS 23.205              |
|                   |                                 | Destination Binding Reference | Establish Bearer  | M         | M | TS 23.205              |
|                   |                                 | Sender Binding Reference      | Prepare Bearer  | M         | M | TS 23.205              |
|                   |                                 | Codec                         | Prepare Bearer<br>Modify Bearer Characteristics   | M         | M | TS 23.205              |

|    |       |                           |   |   |   |           |
|----|-------|---------------------------|---|---|---|-----------|
|    |       | Release Cause             | Release Bearer<br>Bearer Released   | M | M | TS 23.205 |
| Iu | RANAP | RAB ID                    | RAB ASSIGNMENT REQUEST<br>RAB ASSIGNMENT RESPONSE<br>RAB RELEASE REQUEST<br>IU RELEASE COMPLETE<br>RELOCATION REQUEST<br>RELOCATION REQUEST ACKNOWLEDGE<br>RELOCATION COMMAND   | M | M | TS 25.413 |
|    |       | Cause                     | RAB ASSIGNMENT REQUEST<br>RAB ASSIGNMENT RESPONSE<br>RAB RELEASE REQUEST<br>IU RELEASE REQUEST<br>IU RELEASE COMMAND<br>RELOCATION REQUIRED<br>RELOCATION REQUEST<br>RELOCATION REQUEST ACKNOWLEDGE<br>RELOCATION PREPARATION FAILURE<br>RELOCATION FAILURE<br>RELOCATION CANCEL<br>SECURITY MODE REJECT<br>LOCATION REPORT<br>ERROR INDICATION | M | M | TS 25.413 |
|    |       | Source ID                 | RELOCATION REQUIRED   | M | M | TS 25.413 |
|    |       | Target ID                 | RELOCATION REQUIRED   | M | M | TS 25.413 |
|    |       | Paging Cause              | PAGING  | M | M | TS 25.413 |
|    |       | Permanent NAS UE Identity | COMMON ID<br>PAGING<br>RELOCATION REQUEST   | M | M | TS 25.413 |
|    |       | Area Identity             | LOCATION REPORT   | M | M | TS 25.413 |
|    |       | Last Known Service Area   | LOCATION REPORT   | M | M | TS 25.413 |
|    |       | LAI                       | INITIAL UE MESSAGE<br>DIRECT TRANSFER   | M | M | TS 25.413 |
|    |       | SAI                       | INITIAL UE MESSAGE<br>DIRECT TRANSFER   | M | M | TS 25.413 |
|    |       | Global RNC-ID             | ERROR INDICATION  | M | M | 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. name    | IE name  | Procedure name(s)                               | Trace depth |           | Notes     |
|----------------|---------------|--|---|-------------|-----------|-----------|
|                |               |  |   | Min         | Med       |           |
| Mc             | Megaco        | Context  | Every procedure where it appears                | M           | M         | TS 23.205 |
|                |               | Bearer Termination 1   | Every procedure where it appears                | M           | M         | TS 23.205 |
|                |               | Bearer Termination 2   | Every procedure where it appears                | M           | M         | TS 23.205 |
|                |               | Bearer Characteristics   | Establish Bearer                                | M           | M         | TS 23.205 |
|                |               | Destination Binding Reference  | Establish Bearer                                | M           | M         | TS 23.205 |
|                |               | Destination Bearer Address   | Establish Bearer                                | M           | M         | TS 23.205 |
|                |               | Sender Binding Reference   | Prepare Bearer                                  | M           | M         | TS 23.205 |
|                |               | Sender Bearer Address  | Prepare Bearer                                  | M           | M         | TS 23.205 |
|                |               | Codec  | Prepare Bearer<br>Modify Bearer Characteristics | M           | M         | TS 23.205 |
|                | Release Cause | Release Bearer<br>Bearer Released                                      | M   | M           | TS 23.205 |           |
| Iu-UP, Nb-UP   |               | Error Cause value  | Every NACK message                              | M           | M         | TS 25.415 |
| Iu-UP, Nb-UP   |               | RFCl indicators  | Rate control procedure                          | M           | M         | 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 | 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. name                 | IE name                         | Message name(s)   | Trace depth |     | Notes                  |
|----------------|----------------------------|---------------------------------|---|-------------|-----|------------------------|
|                |                            |                                 |   | Min         | Med |                        |
| lu             | SM                         | Requested QoS/Requested new QoS | ACTIVATE PDP CONTEXT REQUEST<br>ACTIVATE SECONDARY PDP CONTEXT REQUEST<br>MODIFY PDP CONTEXT REQUEST  | M           | M   | TS 24.008              |
|                |                            | Requested PDP address           | ACTIVATE PDP CONTEXT REQUEST  | M           | M   | TS 24.008              |
|                |                            | Access point name               | ACTIVATE PDP CONTEXT REQUEST<br>REQUEST PDP CONTEXT ACTIVATION  | M           | M   | TS 24.008<br>TS 23.003 |
|                |                            | Negotiated QoS/New QoS          | ACTIVATE PDP CONTEXT ACCEPT<br>ACTIVATE SECONDARY PDP CONTEXT ACCEPT<br>MODIFY PDP CONTEXT REQUEST<br>MODIFY PDP CONTEXT ACCEPT   | M           | M   | TS 24.008              |
|                |                            | PDP Address                     | ACTIVATE PDP CONTEXT ACCEPT<br>MODIFY PDP CONTEXT REQUEST   | M           | M   | TS 24.008              |
|                |                            | SM cause                        | ACTIVATE PDP CONTEXT REJECT<br>ACTIVATE SECONDARY PDP CONTEXT REJECT<br>REQUEST PDP CONTEXT ACTIVATION REJECT<br>MODIFY PDP CONTEXT REJECT<br>DEACTIVATE PDP CONTEXT REQUEST<br>SM STATUS | M           | M   | TS 24.008              |
|                |                            | Offered PDP address             | REQUEST PDP CONTEXT ACTIVATION  | M           | M   | TS 24.008              |
| lu             | MM                         | MS network capability           | ATTACH REQUEST<br>ROUTING AREA UPDATE REQUEST   | M           | M   | 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<br>ROUTING AREA UPDATE REQUEST   | M           | M   | TS 24.008              |
|                |                            | Attach result                   | ATTACH ACCEPT   | M           | M   | TS 24.008              |
|                |                            | Routing area identification     | ATTACH ACCEPT<br>ROUTING AREA UPDATE REQUEST<br>ROUTING AREA UPDATE ACCEPT  | M           | M   | TS 24.008              |
|                |                            | GMM cause                       | ATTACH ACCEPT<br>ATTACH REJECT<br>DETACH REQUEST<br>AUTHENTICATION AND CIPHERING FAILURE<br>ROUTING AREA UPDATE ACCEPT<br>ROUTING AREA UPDATE REJECT<br>GMM STATUS                        | M           | M   | TS 24.008              |
|                |                            | Detach type                     | DETACH REQUEST  | M           | M   | TS 24.008              |
|                |                            | Mobile identity                 | AUTHENTICATION AND CIPHERING RESPONSE<br>IDENTITY RESPONSE<br>ROUTING AREA UPDATE ACCEPT  | M           | M   | TS 24.008              |
|                |                            | Update type                     | ROUTING AREA UPDATE REQUEST   | M           | M   | TS 24.008              |
| Update result  | ROUTING AREA UPDATE ACCEPT | M                               | M   | TS 24.008   |     |                        |
| lu             | SMS                        | TP-Originating-Address          | SMS-DELIVER   | M           | M   | TS 23.040              |
|                |                            | TP-Service-Centre-Time-Stamp    | SMS-DELIVER<br>SMS-SUBMIT-REPORT<br>SMS-STATUS-REPORT   | M           | M   | TS 23.040              |
|                |                            | TP-Failure-Cause                | SMS-DELIVER-REPORT<br>SMS-SUBMIT-REPORT   | M           | M   | TS 23.040              |
|                |                            | TP-Destination-Address          | SMS-SUBMIT<br>SMS-COMMAND   | M           | M   | TS 23.040              |
|                |                            | TP-Recipient-Address            | SMS-STATUS-REPORT   | M           | M   | TS 23.040              |

|    |     |                               |   |   |   |           |
|----|-----|-------------------------------|---|---|---|-----------|
| Gn | GTP | IMSI                          | CREATE PDP CONTEXT REQUEST<br>UPDATE PDP CONTEXT REQUEST<br>PDU NOTIFICATION REQUEST<br>IDENTIFICATION RESPONSE<br>SGSN CONTEXT REQUEST<br>FORWARD RELOCATION REQUEST<br>RELOCATION CANCEL REQUEST<br>MBMS NOTIFICATION REQUEST<br>CREATE MBMS CONTEXT REQUEST<br>UPDATE MBMS CONTEXT REQUEST<br>DELETE MBMS CONTEXT REQUEST  | M | M | TS 29.060 |
|    |     | RAI                           | CREATE PDP CONTEXT REQUEST<br>UPDATE PDP CONTEXT REQUEST<br>IDENTIFICATION REQUEST<br>SGSN CONTEXT REQUEST<br>CREATE MBMS CONTEXT REQUEST<br>UPDATE MBMS CONTEXT REQUEST  | M | M | TS 29.060 |
|    |     | End User Address              | CREATE PDP CONTEXT REQUEST<br>CREATE PDP CONTEXT RESPONSE<br>UPDATE PDP CONTEXT REQUEST<br>PDU NOTIFICATION REQUEST<br>PDU NOTIFICATION REJECT REQUEST<br>MBMS NOTIFICATION REQUEST<br>MBMS NOTIFICATION REJECT REQUEST<br>CREATE MBMS CONTEXT REQUEST<br>DELETE MBMS CONTEXT REQUEST<br>MBMS REGISTRATION REQUEST<br>MBMS DE-REGISTRATION REQUEST<br>MBMS SESSION START REQUEST<br>MBMS SESSION STOP REQUEST | M | M | TS 29.060 |
|    |     | Access Point Name             | CREATE PDP CONTEXT REQUEST<br>PDU NOTIFICATION REQUEST<br>PDU NOTIFICATION REJECT REQUEST<br>MBMS NOTIFICATION REQUEST<br>MBMS NOTIFICATION REJECT REQUEST<br>CREATE MBMS CONTEXT REQUEST<br>DELETE MBMS CONTEXT REQUEST<br>MBMS REGISTRATION REQUEST<br>MBMS DE-REGISTRATION REQUEST<br>MBMS SESSION START REQUEST<br>MBMS SESSION STOP REQUEST  | M | M | TS 29.060 |
|    |     | SGSN Address for signalling   | CREATE PDP CONTEXT REQUEST<br>UPDATE PDP CONTEXT REQUEST<br>IDENTIFICATION REQUEST<br>SGSN CONTEXT REQUEST<br>SGSN CONTEXT RESPONSE<br>FORWARD RELOCATION REQUEST<br>FORWARD RELOCATION RESPONSE<br>CREATE MBMS CONTEXT REQUEST<br>UPDATE MBMS CONTEXT REQUEST  | M | M | TS 29.060 |
|    |     | SGSN Address for user traffic | CREATE PDP CONTEXT REQUEST<br>UPDATE PDP CONTEXT REQUEST<br>SGSN CONTEXT ACKNOWLEDGE<br>MBMS SESSION START RESPONSE   | M | M | TS 29.060 |
|    |     | MSISDN                        | CREATE PDP CONTEXT REQUEST<br>CREATE MBMS CONTEXT REQUEST   | M | M | TS 29.060 |
|    |     | Quality of Service Profile    | CREATE PDP CONTEXT REQUEST<br>CREATE PDP CONTEXT RESPONSE<br>UPDATE PDP CONTEXT REQUEST<br>UPDATE PDP CONTEXT RESPONSE<br>MBMS SESSION START REQUEST  | M | M | TS 29.060 |
|    |     | RAT Type                      | CREATE PDP CONTEXT REQUEST<br>UPDATE PDP CONTEXT REQUEST  | M | M | TS 29.060 |
|    |     | IMEI(SV)                      | CREATE PDP CONTEXT REQUEST  | M | M | TS 29.060 |
|    |     | User Location Information     | CREATE PDP CONTEXT REQUEST<br>UPDATE PDP CONTEXT REQUEST  | M | M | TS 29.060 |



|    |        |                                    |   |   |   |           |
|----|--------|------------------------------------|---|---|---|-----------|
|    |        | Cause                              | CREATE PDP CONTEXT RESPONSE<br>UPDATE PDP CONTEXT RESPONSE<br>DELETE PDP CONTEXT RESPONSE<br>PDU NOTIFICATION RESPONSE<br>PDU NOTIFICATION REJECT REQUEST<br>PDU NOTIFICATION REJECT RESPONSE<br>IDENTIFICATION RESPONSE<br>SGSN CONTEXT RESPONSE<br>SGSN CONTEXT ACKNOWLEDGE<br>FORWARD RELOCATION RESPONSE<br>RELOCATION CANCEL RESPONSE<br>FORWARD RELOCATION COMPLETE<br>ACKNOWLEDGE<br>FORWARD SRNS CONTEXT ACKNOWLEDGE<br>MBMS NOTIFICATION RESPONSE<br>MBMS NOTIFICATION REJECT REQUEST<br>MBMS NOTIFICATION REJECT RESPONSE<br>CREATE MBMS CONTEXT RESPONSE<br>UPDATE MBMS CONTEXT RESPONSE<br>DELETE MBMS CONTEXT RESPONSE<br>MBMS REGISTRATION RESPONSE<br>MBMS DE-REGISTRATION RESPONSE<br>MBMS SESSION START RESPONSE<br>MBMS SESSION STOP RESPONSE | M | M | TS 29.060 |
|    |        | GGSN Address for Control Plane     | CREATE PDP CONTEXT RESPONSE<br>UPDATE PDP CONTEXT RESPONSE<br>PDU NOTIFICATION REQUEST<br>MBMS NOTIFICATION REQUEST<br>CREATE MBMS CONTEXT RESPONSE<br>UPDATE MBMS CONTEXT RESPONSE   | M | M | TS 29.060 |
|    |        | GGSN Address for user traffic      | CREATE PDP CONTEXT RESPONSE<br>UPDATE PDP CONTEXT RESPONSE  | M | M | TS 29.060 |
|    |        | GSN Address                        | ERROR INDICATION  | M | M | TS 29.060 |
|    |        | SGSN Number                        | SGSN CONTEXT REQUEST<br>FORWARD RELOCATION RESPONSE   | M | M | TS 29.060 |
|    |        | MBMS UE Context                    | SGSN CONTEXT RESPONSE<br>FORWARD RELOCATION REQUEST   | M | M | TS 29.060 |
|    |        | RANAP Cause                        | FORWARD RELOCATION REQUEST<br>FORWARD RELOCATION RESPONSE   | M | M | TS 29.060 |
|    |        | Target Identification              | FORWARD RELOCATION REQUEST  | M | M | TS 29.060 |
| Gs | BSSAP+ | IMSI                               | BSSAP+-ALERT-ACK<br>BSSAP+-ALERT-REJECT<br>BSSAP+-ALERT-REQUEST<br>BSSAP+-DOWNLINK-TUNNEL-REQUEST<br>BSSAP+-GPRS-DETACH-ACK<br>BSSAP+-GPRS-DETACH-INDICATION<br>BSSAP+-IMSI-DETACH-ACK<br>BSSAP+-IMSI-DETACH-INDICATION<br>BSSAP+-LOCATION-UPDATE-ACCEPT<br>BSSAP+-LOCATION-UPDATE-REJECT<br>BSSAP+-LOCATION-UPDATE-REQUEST<br>BSSAP+-MOBILE-STATUS<br>BSSAP+-MS-ACTIVITY-INDICATION<br>BSSAP+-MS-UNREACHABLE<br>BSSAP+-PAGING-REJECT<br>BSSAP+-PAGING-REQUEST<br>BSSAP+-TMSI-REALLOCATION-COMPLETE<br>BSSAP+-UPLINK-TUNNEL-REQUEST   | M | M | TS 29.018 |
|    |        | Gs Cause                           | BSSAP+-ALERT-REJECT<br>BSSAP+-MOBILE-STATUS<br>BSSAP+-MS-UNREACHABLE<br>BSSAP+-PAGING-REJECT  | M | M | TS 29.018 |
|    |        | VLR number                         | BSSAP+-DOWNLINK-TUNNEL-REQUEST<br>BSSAP+-PAGING-REQUEST<br>BSSAP+-RESET-ACK<br>BSSAP+-RESET-INDICATION  | M | M | TS 29.018 |
|    |        | SGSN number                        | BSSAP+-GPRS-DETACH-INDICATION<br>BSSAP+-IMSI-DETACH-INDICATION<br>BSSAP+-LOCATION-UPDATE-REQUEST<br>BSSAP+-RESET-ACK<br>BSSAP+-RESET-INDICATION<br>BSSAP+-UPLINK-TUNNEL-REQUEST   | M | M | 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<br>BSSAP+-IMSI-DETACH-INDICATION<br>BSSAP+-LOCATION-UPDATE-REQUEST<br>BSSAP+-MS-ACTIVITY-INDICATION<br>BSSAP+-TMSI-REALLOCATION-COMplete   | M        | M  | TS 29.018 |   |           |
|                       |                              | Service area identification /New SAI | BSSAP+-GPRS-DETACH-INDICATION<br>BSSAP+-IMSI-DETACH-INDICATION<br>BSSAP+-LOCATION-UPDATE-REQUEST<br>BSSAP+-MS-ACTIVITY-INDICATION<br>BSSAP+-TMSI-REALLOCATION-COMplete   | M        | M  | TS 29.018 |   |           |
|                       |                              | Detach type                          | BSSAP+-IMSI-DETACH-INDICATION  | M        | M  | 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<br>BSSAP+-LOCATION-UPDATE-REQUEST<br>BSSAP+-PAGING-REQUEST   | M        | M  | TS 29.018 |   |           |
|                       |                              | IMEISV                               | BSSAP+-LOCATION-UPDATE-REQUEST   | M        | M  | TS 29.018 |   |           |
|                       |                              | Erroneous message                    | BSSAP+-MOBILE-STATUS   | M        | M  | TS 29.018 |   |           |
| Gr                    | MAP                          | IMSI                                 | MAP_CANCEL_LOCATION<br>MAP_PURGE_MS<br>MAP_UPDATE_GPRS_LOCATION<br>MAP_NOTE_MM_EVENT<br>MAP-INSERT-SUBSCRIBER-DATA<br>MAP-DELETE-SUBSCRIBER-DATA<br>MAP-READY-FOR-SM   | M        | M  | TS 29.002 |   |           |
|                       |                              | Cancellation Type                    | MAP_CANCEL_LOCATION  | M        | M  | TS 29.002 |   |           |
|                       |                              | User error                           | Every message where it appears   | M        | M  | TS 29.002 |   |           |
|                       |                              | Provider error                       | Every message where it appears   | M        | M  | TS 29.002 |   |           |
|                       |                              | Location Information for GPRS        | MAP_NOTE_MM_EVENT  | M        | M  | TS 29.002 |   |           |
|                       |                              | MSISDN                               | MAP-INSERT-SUBSCRIBER-DATA   | M        | M  | TS 29.002 |   |           |
|                       |                              | Alert Reason                         | MAP-READY-FOR-SM   | M        | M  | TS 29.002 |   |           |
|                       |                              | Gd                                   |  | SM RP OA | MAP-MO-FORWARD-SHORT-MESSAGE<br>MAP-MT-FORWARD-SHORT-MESSAGE | M         | M | TS 29.002 |
|                       |                              |                                      |  | SM RP DA | MAP-MO-FORWARD-SHORT-MESSAGE<br>MAP-MT-FORWARD-SHORT-MESSAGE | M         | M | TS 29.002 |
|                       |                              |                                      |  | IMSI     | MAP-MO-FORWARD-SHORT-MESSAGE                                 | M         | M | TS 29.002 |
| More Messages To Send | MAP-MT-FORWARD-SHORT-MESSAGE |                                      |  | M        | M  | TS 29.002 |   |           |
| Gf                    |                              | IMEI(SV)                             | MAP_CHECK_IMEI   | M        | M  | TS 29.002 |   |           |
|                       |                              | Equipment status                     | MAP_CHECK_IMEI   | M        | M  | TS 29.002 |   |           |
|                       |                              | User error                           | Every message where it appears   | M        | M  | TS 29.002 |   |           |
|                       |                              | Provider error                       | Every message where it appears   | M        | M  | TS 29.002 |   |           |
| Iu                    | RANAP                        | RAB ID                               | RAB ASSIGNMENT REQUEST<br>RAB ASSIGNMENT RESPONSE<br>RAB RELEASE REQUEST<br>IU RELEASE COMPLETE<br>RELOCATION REQUEST<br>RELOCATION REQUEST ACKNOWLEDGE<br>RELOCATION COMMAND  | M        | M  | TS 25.413 |   |           |
|                       |                              | Cause                                | RAB ASSIGNMENT REQUEST<br>RAB ASSIGNMENT RESPONSE<br>RAB RELEASE REQUEST<br>IU RELEASE REQUEST<br>IU RELEASE COMMAND<br>RELOCATION REQUEST<br>RELOCATION REQUEST ACKNOWLEDGE<br>RELOCATION PREPARATION FAILURE<br>RELOCATION FAILURE<br>RELOCATION CANCEL<br>SECURITY MODE REJECT<br>LOCATION REPORT<br>ERROR INDICATION | M        | M  | TS 25.413 |   |           |
|                       |                              | Source ID                            | RELOCATION REQUIRED  | M        | M  | TS 25.413 |   |           |
|                       |                              | Target ID                            | RELOCATION REQUIRED  | M        | M  | TS 25.413 |   |           |
|                       |                              | Paging Cause                         | PAGING   | M        | M  | TS 25.413 |   |           |
|                       |                              | Permanent NAS UE Identity            | COMMON ID<br>PAGING<br>RELOCATION REQUEST  | M        | M  | TS 25.413 |   |           |
|                       |                              | Area Identity                        | LOCATION REPORT  | M        | M  | TS 25.413 |   |           |
|                       |                              | Last Known Service Area              | LOCATION REPORT  | M        | M  | TS 25.413 |   |           |
|                       |                              | RAC                                  | INITIAL UE MESSAGE<br>DIRECT TRANSFER  | M        | M  | TS 25.413 |   |           |
|                       |                              | SAI                                  | INITIAL UE MESSAGE<br>DIRECT TRANSFER  | M        | M  | TS 25.413 |   |           |
|                       |                              | Global RNC-ID                        | ERROR INDICATION   | M        | M  | TS 25.413 |   |           |

## 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     |
|----------------|------------|-------------------------------|---|-------------|-----|-----------|
|                |            |                               |   | Min         | Med |           |
| Gn             | GTP        | IMSI                          | CREATE PDP CONTEXT REQUEST<br>UPDATE PDP CONTEXT REQUEST<br>PDU NOTIFICATION REQUEST<br>SEND ROUTEING INFORMATION FOR GPRS REQUEST<br>SEND ROUTEING INFORMATION FOR GPRS RESPONSE<br>FAILURE REPORT REQUEST<br>NOTE MS PRESENT REQUEST<br>MBMS NOTIFICATION REQUEST<br>CREATE MBMS CONTEXT REQUEST<br>UPDATE MBMS CONTEXT REQUEST<br>DELETE MBMS CONTEXT REQUEST  | M           | M   | TS 29.060 |
|                |            | RAI                           | CREATE PDP CONTEXT REQUEST<br>UPDATE PDP CONTEXT REQUEST<br>CREATE MBMS CONTEXT REQUEST<br>UPDATE MBMS CONTEXT REQUEST  | M           | M   | TS 29.060 |
|                |            | End User Address              | CREATE PDP CONTEXT REQUEST<br>CREATE PDP CONTEXT RESPONSE<br>UPDATE PDP CONTEXT REQUEST<br>PDU NOTIFICATION REQUEST<br>PDU NOTIFICATION REJECT REQUEST<br>MBMS NOTIFICATION REQUEST<br>MBMS NOTIFICATION REJECT REQUEST<br>CREATE MBMS CONTEXT REQUEST<br>DELETE MBMS CONTEXT REQUEST<br>MBMS REGISTRATION REQUEST<br>MBMS DE-REGISTRATION REQUEST<br>MBMS SESSION START REQUEST<br>MBMS SESSION STOP REQUEST | M           | M   | TS 29.060 |
|                |            | Access Point Name             | CREATE PDP CONTEXT REQUEST<br>PDU NOTIFICATION REQUEST<br>PDU NOTIFICATION REJECT REQUEST<br>MBMS NOTIFICATION REQUEST<br>MBMS NOTIFICATION REJECT REQUEST<br>CREATE MBMS CONTEXT REQUEST<br>DELETE MBMS CONTEXT REQUEST<br>MBMS REGISTRATION REQUEST<br>MBMS DE-REGISTRATION REQUEST<br>MBMS SESSION START REQUEST<br>MBMS SESSION STOP REQUEST  | M           | M   | TS 29.060 |
|                |            | SGSN Address for signalling   | CREATE PDP CONTEXT REQUEST<br>UPDATE PDP CONTEXT REQUEST<br>CREATE MBMS CONTEXT REQUEST<br>UPDATE MBMS CONTEXT REQUEST  | M           | M   | TS 29.060 |
|                |            | SGSN Address for user traffic | CREATE PDP CONTEXT REQUEST<br>UPDATE PDP CONTEXT REQUEST<br>MBMS SESSION START RESPONSE   | M           | M   | TS 29.060 |
|                |            | MSISDN                        | CREATE PDP CONTEXT REQUEST<br>CREATE MBMS CONTEXT REQUEST   | M           | M   | TS 29.060 |
|                |            | Quality of Service Profile    | CREATE PDP CONTEXT REQUEST<br>CREATE PDP CONTEXT RESPONSE<br>UPDATE PDP CONTEXT REQUEST<br>UPDATE PDP CONTEXT RESPONSE<br>MBMS SESSION START REQUEST  | M           | M   | TS 29.060 |
|                |            | RAT Type                      | CREATE PDP CONTEXT REQUEST<br>UPDATE PDP CONTEXT REQUEST  | M           | M   | TS 29.060 |
|                |            | IMEI(SV)                      | CREATE PDP CONTEXT REQUEST  | M           | M   | TS 29.060 |
|                |            | User Location Information     | CREATE PDP CONTEXT REQUEST<br>UPDATE PDP CONTEXT REQUEST  | M           | M   | TS 29.060 |

|     |              |                                |   |   |   |           |
|-----|--------------|--------------------------------|---|---|---|-----------|
|     |              | Cause                          | CREATE PDP CONTEXT RESPONSE<br>UPDATE PDP CONTEXT RESPONSE<br>DELETE PDP CONTEXT RESPONSE<br>PDU NOTIFICATION RESPONSE<br>PDU NOTIFICATION REJECT REQUEST<br>PDU NOTIFICATION REJECT RESPONSE<br>SEND ROUTEING INFORMATION FOR GPRS RESPONSE<br>FAILURE REPORT RESPONSE<br>NOTE MS GPRS PRESENT RESPONSE<br>MBMS NOTIFICATION RESPONSE<br>MBMS NOTIFICATION REJECT REQUEST<br>MBMS NOTIFICATION REJECT RESPONSE<br>CREATE MBMS CONTEXT RESPONSE<br>UPDATE MBMS CONTEXT RESPONSE<br>DELETE MBMS CONTEXT RESPONSE<br>MBMS REGISTRATION RESPONSE<br>MBMS DE-REGISTRATION RESPONSE<br>MBMS SESSION START RESPONSE<br>MBMS SESSION STOP RESPONSE | M | M | TS 29.060 |
|     |              | GGSN Address for Control Plane | CREATE PDP CONTEXT RESPONSE<br>UPDATE PDP CONTEXT RESPONSE<br>PDU NOTIFICATION REQUEST<br>MBMS NOTIFICATION REQUEST<br>CREATE MBMS CONTEXT RESPONSE<br>UPDATE MBMS CONTEXT RESPONSE   | M | M | TS 29.060 |
|     |              | GGSN Address for user traffic  | CREATE PDP CONTEXT RESPONSE<br>UPDATE PDP CONTEXT RESPONSE  | M | M | TS 29.060 |
|     |              | MAP Cause                      | SEND ROUTEING INFORMATION FOR GPRS RESPONSE<br>FAILURE REPORT RESPONSE  | M | M | TS 29.060 |
|     |              | GSN Address                    | SEND ROUTEING INFORMATION FOR GPRS RESPONSE<br>NOTE MS PRESENT REQUEST  | M | M | TS 29.060 |
| Gmb | Diameter Gmb | IMSI                           | MBMS AUTHORIZATION REQUEST (AAR)<br>MBMS AUTHORIZATION RESPONSE (AAA)   | M | M | TS 29.061 |
|     |              | RAI                            | MBMS AUTHORIZATION REQUEST (AAR)  | M | M | TS 29.061 |
|     |              | Access Point Name              | MBMS AUTHORIZATION REQUEST (AAR)  | M | M | TS 29.061 |
|     |              | MSISDN                         | MBMS AUTHORIZATION REQUEST (AAR)  | M | M | TS 29.061 |
|     |              | IMEI(SV)                       | MBMS AUTHORIZATION REQUEST (AAR)  | M | M | TS 29.061 |
|     |              | IP Multicast Address           | MBMS AUTHORIZATION REQUEST (AAR)  | M | M | TS 29.061 |
|     |              | TMGI                           | MBMS AUTHORIZATION RESPONSE (AAA)   | M | M | TS 29.061 |
|     |              | Result-Code                    | MBMS AUTHORIZATION RESPONSE (AAA)<br>MBMS USER DEACTIVATION RESPONSE (STA)<br>MBMS SESSION START-STOP INDICATION RESPONSE (RAA)<br>MBMS SERVICE TERMINATION ANSWER (ASR)  | M | M | TS 29.061 |
|     |              | Experimental-Result            | MBMS AUTHORIZATION RESPONSE (AAA)<br>MBMS SESSION START-STOP INDICATION RESPONSE (RAA)  | M | M | TS 29.061 |
|     |              | Error-Reporting-Host           | MBMS AUTHORIZATION RESPONSE (AAA)<br>MBMS USER DEACTIVATION RESPONSE (STA)<br>MBMS SESSION START-STOP INDICATION RESPONSE (RAA)<br>MBMS SERVICE TERMINATION ANSWER (ASR)  | M | M | 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 (specific messages)             | Format  | Level of details |     |     | Description   |
|---|---------|------------------|-----|-----|---|
|   |         | Min              | Med | Max |   |
| RRC (without rrc dedicated measurements)  | Decoded | M                | M   | O   | Message name  |
|   |         | O                | O   | O   | Record extensions   |
|   |         | M                | M   | X   | rnclD of traced RNC   |
|   |         | M                | M   | X   | 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   | X                | X   | M   | Raw Uu Messages: RRC messages between the traced RNC and the UE. The encoded content of the message is provided   |
| Iub (without nbap dedicated measurements) | Decoded | M                | M   | O   | Message name  |
|   |         | O                | O   | O   | Record extensions   |
|   |         | M                | M   | X   | rnclD of traced RNC<br>cld  |
|   |         | M                | M   | X   | 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   | X                | X   | M   | Raw Iub Messages: NBAP messages between the traced RNC and the NodeB or cell. The encoded content of the message is provided                                    |
| Iu  | Decoded | M                | M   | O   | Message name  |
|   |         | O                | O   | O   | Record extensions   |
|   |         | M                | M   | X   | rnclD of traced RNC<br>CoreNetworkID<br>CN Domain Indicator   |
|   |         | M                | M   | X   | rabld + 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   | X                | X   | M   | Raw Iu Messages RANAP: messages between the traced RNC and Core Network The encoded content of the message is provided  |
| Iur                                       | Decoded | M                | M   | O   | Message name  |
|   |         | O                | O   | O   | Record extensions   |
|   |         | M                | M   | X   | rnclD of traced RNC<br>rnclD of neighbouring RNC  |
|   |         | M                | M   | X   | 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   | X                | X   | M   | Raw Iur Messages: RNSAP messages between the traced RNC and the neighbouring RNC. The encoded content of the message is provided                                |
| nbap (only dedicated measurements)        | Decoded | X                | M   | X   | Iub IEs from NBAP measurement reports messages  |
|   | ASN.1   | X                | X   | M   | NBAP measurement reports messages   |
| rrc (only dedicated measurements)         | Decoded | X                | M   | X   | Uu IEs from RRC measurement reports messages  |
|   | ASN.1   | X                | X   | M   | RRC measurement reports messages  |

Definitions:

- rnclD 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.
- rnclD 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 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
- rbld: 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 |           |
| Uu             | RRC        | RAB info type                                 | RADIO BEARER SETUP<br>HO TO UTRAN COMMAND<br>RADIO BEARER RELEASE<br>RADIO BEARER RECONFIGURATION  | M           | M   | TS 25.331 |
|                |            | RB info type                                  | RADIO BEARER RECONFIGURATION<br>RADIO BEARER RELEASE<br>RADIO BEARER SETUP<br>HO TO UTRAN COMMAND  | M           | M   | TS 25.331 |
|                |            | URA identity                                  | RADIO BEARER SETUP<br>RADIO BEARER RELEASE<br>URA UPDATE CONFIRM<br>RADIO BEARER RECONFIGURATION   | M           | M   | TS 25.331 |
|                |            | CN domain                                     | SIGNALLING CONNECTION RELEASE<br>INITIAL DIRECT TRANSFER<br>DL DIRECT TRANSFER<br>UL DIRECT TRANSFER   | M           | M   | TS 25.331 |
|                |            | Logical channel priority                      | RADIO BEARER SETUP   | M           | M   | TS 25.331 |
|                |            | RRC state indicator                           | RADIO BEARER SETUP<br>PHYSICAL CHANNEL RECONFIGURATION<br>TRANSPORT CHANNEL RECONFIGURATION<br>RADIO BEARER RECONFIGURATION<br>CELL UPDATE CONFIRM<br>URA UPDATE CONFIRM | M           | M   | TS 25.331 |
|                |            | Primary CPICH scrambling code of added cell   | ACTIVE SET UPDATE  | M           | M   | TS 25.331 |
|                |            | Primary CPICH scrambling code of removed cell | ACTIVE SET UPDATE  | M           | M   | TS 25.331 |
|                |            | Target cell identity                          | CELL CHANGE ORDER  | M           | M   | TS 25.331 |
|                |            | SFN-SFN observed time difference              | RRC/MEASUREMENT REPORT for measurement = intra frequency   | X           | M   | TS 25.331 |
|                |            | CFN-SFN observed time difference              | RRC/MEASUREMENT REPORT for measurement = intra frequency   | X           | M   | TS 25.331 |
|                |            | CPICH Ec/No                                   | RRC/MEASUREMENT REPORT for measurement = intra frequency   | X           | M   | TS 25.331 |
|                |            | RSCP  | RRC/MEASUREMENT REPORT for measurement = intra frequency   | X           | M   | TS 25.331 |
|                |            | Pathloss                                      | RRC/MEASUREMENT REPORT for measurement = intra frequency   | X           | M   | TS 25.331 |
|                |            | UARFCN  | RRC/MEASUREMENT REPORT for measurement = inter frequency   | X           | M   | TS 25.331 |
|                |            | SFN-SFN observed time difference              | RRC/MEASUREMENT REPORT for measurement = intra frequency   | X           | M   | TS 25.331 |
|                |            | CFN-SFN observed time difference              | RRC/MEASUREMENT REPORT for measurement = intra frequency   | X           | M   | TS 25.331 |
|                |            | CPICH Ec/No                                   | RRC/MEASUREMENT REPORT for measurement = inter frequency   | X           | M   | TS 25.331 |
|                |            | RSCP  | RRC/MEASUREMENT REPORT for measurement = inter frequency   | X           | M   | TS 25.331 |
|                |            | Pathloss                                      | RRC/MEASUREMENT REPORT for measurement = inter frequency   | X           | M   | TS 25.331 |

|     |      |                                  |   |   |   |           |
|-----|------|----------------------------------|---|---|---|-----------|
|     |      | BCCH ARFCN                       | RRC/MEASUREMENT REPORT for measurement = inter RAT  | X | M | TS 25.331 |
|     |      | UTRA Carrier RSSI                | RRC/MEASUREMENT REPORT for measurement = inter RAT  | X | M | TS 25.331 |
|     |      | RLC buffer Payload               | RRC/MEASUREMENT REPORT for measurement = traffic volume   | X | M | TS 25.331 |
|     |      | Average RLC buffer payload       | RRC/MEASUREMENT REPORT for measurement = traffic volume   | X | M | TS 25.331 |
|     |      | Variance of RLC buffer payload   | RRC/MEASUREMENT REPORT for measurement = traffic volume   | X | M | TS 25.331 |
| Iub | NBAP | RL identity                      | RADIO LINK SETUP REQUEST<br>RADIO LINK RECONFIGURATION PREPARE<br>RADIO LINK RECONFIGURATION REQUEST<br>RADIO LINK RECONFIGURATION READY<br>RADIO LINK RECONFIGURATION FAILURE<br>RADIO LINK RECONFIGURATION RESPONSE<br>RADIO LINK ADDITION REQUEST<br>RADIO LINK RECONFIGURATION REQUEST<br>RADIO LINK SETUP RESPONSE<br>RADIO LINK SETUP FAILURE<br>RADIO LINK ADDITION RESPONSE<br>RADIO LINK ADDITION FAILURE<br>RADIO LINK DELETION REQUEST | M | M | TS 25.433 |
|     |      | RL info type                     | RADIO LINK SETUP FAILURE<br>RADIO LINK ADDITION FAILURE<br>RADIO LINK RECONFIGURATION FAILURE   | M | M | TS 25.433 |
|     |      | C-ID                             | RADIO LINK SETUP REQUEST<br>RADIO LINK ADDITION REQUEST   | M | M | TS 25.433 |
|     |      | UL Scrambling Code               | RADIO LINK SETUP REQUEST<br>RADIO LINK RECONFIGURATION PREPARE  | M | M | TS 25.433 |
|     |      | UL SIR target                    | RADIO LINK SETUP REQUEST<br>RADIO LINK RECONFIGURATION PREPARE  | M | M | TS 25.433 |
|     |      | Minimum UL channelization length | RADIO LINK SETUP REQUEST<br>RADIO LINK RECONFIGURATION PREPARE  | M | M | TS 25.433 |
|     |      | Initial DL transmission Power    | RADIO LINK SETUP REQUEST<br>RADIO LINK ADDITION REQUEST   | M | M | TS 25.433 |
|     |      | Maximum DL transmission Power    | RADIO LINK SETUP REQUEST<br>RADIO LINK RECONFIGURATION PREPARE<br>RADIO LINK ADDITION REQUEST<br>RADIO LINK RECONFIGURATION REQUEST   | M | M | TS 25.433 |
|     |      | Minimum DL transmission Power    | RADIO LINK SETUP REQUEST<br>RADIO LINK ADDITION REQUEST<br>RADIO LINK RECONFIGURATION PREPARE<br>RADIO LINK RECONFIGURATION REQUEST   | M | M | TS 25.433 |
|     |      | DL scrambling code               | RADIO LINK SETUP REQUEST<br>RADIO LINK ADDITION REQUEST<br>RADIO LINK RECONFIGURATION PREPARE<br>RADIO LINK RECONFIGURATION REQUEST   | M | M | TS 25.433 |

|     |                 |                                  |   |           |   |           |
|-----|-----------------|----------------------------------|---|-----------|---|-----------|
|     |                 | DL Code information              | RADIO LINK SETUP REQUEST<br>RADIO LINK ADDITION REQUEST<br>RADIO LINK RECONFIGURATION<br>PREPARE<br>RADIO LINK RECONFIGURATION<br>REQUEST   | M         | M | TS 25.433 |
|     |                 | Puncture limit                   | RADIO LINK SETUP REQUEST<br>RADIO LINK RECONFIGURATION<br>PREPARE   | M         | M | TS 25.433 |
|     |                 | Received total wide band power   | RADIO LINK SETUP RESPONSE<br>RADIO LINK SETUP FAILURE<br>RADIO LINK ADDITION RESPONSE<br>RADIO LINK ADDITION FAILURE  | M         | M | TS 25.433 |
| lu  | RANAP           | RAB identity                     | All messages where it is present  | M         | M | TS 25.413 |
|     |                 | RAB info type                    | RAB ASSIGNMENT REQUEST<br>RELOCATION REQUEST<br>RAB MODIFY REQUEST<br>RAB ASSIGNMENT RESPONSE   | M         | M | TS 25.413 |
|     |                 | RAB parameters                   | RAB ASSIGNMENT REQUEST<br>RELOCATION REQUEST  | M         | M | TS 25.413 |
|     |                 | Assigned RAB parameters values   | RAB ASSIGNMENT RESPONSE   | M         | M | TS 25.413 |
|     |                 | Requested RAB parameters values  | RAB MODIFY REQUEST  | M         | M | TS 25.413 |
|     |                 | Source ID                        | RELOCATION REQUIRED   | M         | M | TS 25.413 |
|     |                 | Target ID                        | RELOCATION REQUIRED   | M         | M | TS 25.413 |
|     |                 | LAI                              | DIRECT TRANSFER   | M         | M | TS 25.413 |
|     |                 | RAC                              | DIRECT TRANSFER   | M         | M | TS 25.413 |
| SAI | DIRECT TRANSFER | M                                | M   | TS 25.413 |   |           |
| lur | RNSAP           | RL id identity                   | RADIO LINK SETUP REQUEST<br>RADIO LINK RECONFIGURATION<br>PREPARE<br>RADIO LINK RECONFIGURATION<br>REQUEST<br>RADIO LINK RECONFIGURATION<br>READY<br>RADIO LINK RECONFIGURATION<br>FAILURE<br>RADIO LINK RECONFIGURATION<br>RESPONSE<br>RADIO LINK ADDITION REQUEST<br>RADIO LINK RECONFIGURATION<br>REQUEST<br>RADIO LINK SETUP RESPONSE<br>RADIO LINK SETUP FAILURE<br>RADIO LINK ADDITION RESPONSE<br>RADIO LINK ADDITION FAILURE<br>RADIO LINK DELETION REQUEST | M         | M | TS 25.423 |
|     |                 | C-ID                             | RADIO LINK SETUP REQUEST<br>RADIO LINK ADDITION REQUEST   | M         | M | TS 25.423 |
|     |                 | RL info type                     | RADIO LINK SETUP FAILURE<br>RADIO LINK ADDITION FAILURE<br>RADIO LINK SETUP FAILURE<br>RADIO LINK RECONFIGURATION<br>FAILURE  | M         | M | TS 25.423 |
|     |                 | UL Scrambling Code               | RADIO LINK SETUP REQUEST<br>RADIO LINK RECONFIGURATION<br>PREPARE   | M         | M | TS 25.423 |
|     |                 | UL SIR target                    | RADIO LINK SETUP REQUEST<br>RADIO LINK RECONFIGURATION<br>PREPARE   | M         | M | TS 25.423 |
|     |                 | Minimum UL channelization length | RADIO LINK SETUP REQUEST<br>RADIO LINK RECONFIGURATION<br>PREPARE   | M         | M | TS 25.423 |



|  |                                |   |   |   |           |
|--|--------------------------------|---|---|---|-----------|
|  | Initial DL transmission Power  | RADIO LINK SETUP REQUEST<br>RADIO LINK ADDITION REQUEST   | M | M | TS 25.423 |
|  | Maximum DL transmission Power  | RADIO LINK SETUP REQUEST<br>RADIO LINK RECONFIGURATION<br>PREPARE<br>RADIO LINK ADDITION REQUEST<br>RADIO LINK RECONFIGURATION<br>REQUEST | M | M | TS 25.423 |
|  | Minimum DL transmission Power  | RADIO LINK SETUP REQUEST<br>RADIO LINK ADDITION REQUEST<br>RADIO LINK RECONFIGURATION<br>PREPARE<br>RADIO LINK RECONFIGURATION<br>REQUEST | M | M | TS 25.423 |
|  | DL scrambling code             | RADIO LINK SETUP REQUEST<br>RADIO LINK ADDITION REQUEST<br>RADIO LINK RECONFIGURATION<br>PREPARE<br>RADIO LINK RECONFIGURATION<br>REQUEST | M | M | TS 25.423 |
|  | DL channelization code         | RADIO LINK SETUP REQUEST<br>RADIO LINK ADDITION REQUEST<br>RADIO LINK RECONFIGURATION<br>PREPARE<br>RADIO LINK RECONFIGURATION<br>REQUEST | M | M | TS 25.423 |
|  | Puncture limit                 | RADIO LINK SETUP REQUEST<br>RADIO LINK RECONFIGURATION<br>PREPARE   | M | M | TS 25.423 |
|  | Received total wide band power | RADIO LINK SETUP RESPONSE<br>RADIO LINK SETUP FAILURE<br>RADIO LINK ADDITION RESPONSE<br>RADIO LINK ADDITION FAILURE                      | M | M | TS 25.423 |

## 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 protocol for the C, D, Gr and Gc interfaces in the HSS. The trace record is the same for management based activation and for signalling based activation.

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

|    |     |                             |   |          |          |                        |
|----|-----|-----------------------------|---|----------|----------|------------------------|
|    |     | MSISDN                      | MAP-SEND-ROUTING-INFO-FOR-SM<br>Send Routeing Info ack  | <b>M</b> | <b>M</b> | TS 29.002              |
|    |     | Number of forwarding        | Send Routeing Info  | <b>M</b> | <b>M</b> | TS 29.002<br>TS 23.018 |
|    |     | IMSI                        | Send Routeing Info ack  | <b>M</b> | <b>M</b> | TS 29.002<br>TS 23.018 |
|    |     | Roaming number              | Send Routeing Info ack  | <b>M</b> | <b>M</b> | TS 29.002<br>TS 23.018 |
|    |     | Forwarded-to number         | Send Routeing Info ack  | <b>M</b> | <b>M</b> | TS 29.002<br>TS 23.018 |
|    |     | Forwarding reason           | Send Routeing Info ack  | <b>M</b> | <b>M</b> | TS 29.002<br>TS 23.018 |
|    |     | Additional Number           | MAP-SEND-ROUTING-INFO-FOR-SM  | <b>M</b> | <b>M</b> | TS 29.002              |
| Gr | MAP | SGSN address                | MAP_UPDATE_GPRS_LOCATION  | <b>M</b> | <b>M</b> | TS 29.002              |
|    |     | IMSI                        | MAP_CANCEL_LOCATION<br>MAP_PURGE_MS<br>MAP_UPDATE_GPRS_LOCATION<br>MAP-INSERT-SUBSCRIBER-DATA<br>MAP-READY-FOR-SM | <b>M</b> | <b>M</b> | TS 29.002              |
|    |     | SGSN number                 | MAP_UPDATE_GPRS_LOCATION<br>MAP_PURGE_MS  | <b>M</b> | <b>M</b> | TS 29.002              |
|    |     | Alert Reason                | MAP-READY-FOR-SM  | <b>M</b> | <b>M</b> | TS 29.002              |
|    |     | User error                  | Every message where it appears  | <b>M</b> | <b>M</b> | TS 29.002              |
|    |     | Provider error              | Every message where it appears  | <b>M</b> | <b>M</b> | TS 29.002              |
| Gc | MAP | IMSI                        | MAP_SEND_ROUTING_INFO_FOR_GPRS<br>MAP_FAILURE_REPORT<br>MAP_NOTE_MS_PRESENT_FOR_GPRS                              | <b>M</b> | <b>M</b> | TS 29.002              |
|    |     | SGSN address                | MAP_SEND_ROUTING_INFO_FOR_GPRS<br>MAP_NOTE_MS_PRESENT_FOR_GPRS  | <b>M</b> | <b>M</b> | TS 29.002              |
|    |     | GGSN address                | MAP_SEND_ROUTING_INFO_FOR_GPRS<br>MAP_FAILURE_REPORT<br>MAP_NOTE_MS_PRESENT_FOR_GPRS                              | <b>M</b> | <b>M</b> | TS 29.002              |
|    |     | Mobile Not Reachable Reason | MAP_SEND_ROUTING_INFO_FOR_GPRS  | <b>M</b> | <b>M</b> | TS 29.002              |
|    |     | User error                  | Every message where it appears  | <b>M</b> | <b>M</b> | TS 29.002              |
|    |     | Provider error              | Every message where it appears  | <b>M</b> | <b>M</b> | 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 name | Prot. name   | IE name              | Message name(s)  | Trace depth |     | Notes     |
|----------------|--------------|----------------------|--|-------------|-----|-----------|
|                |              |                      |  | Min         | Med |           |
| Gmb            | Diameter Gmb | IMSI                 | MBMS AUTHORIZATION REQUEST (AAR)<br>MBMS AUTHORIZATION RESPONSE (AAA)  | M           | M   | TS 29.061 |
|                |              | RAI                  | MBMS AUTHORIZATION REQUEST (AAR)   | M           | M   | TS 29.061 |
|                |              | Access Point Name    | MBMS AUTHORIZATION REQUEST (AAR)   | M           | M   | TS 29.061 |
|                |              | MSISDN               | MBMS AUTHORIZATION REQUEST (AAR)   | M           | M   | TS 29.061 |
|                |              | IMEI(SV)             | MBMS AUTHORIZATION REQUEST (AAR)   | M           | M   | TS 29.061 |
|                |              | IP Multicast Address | MBMS AUTHORIZATION REQUEST (AAR)   | M           | M   | TS 29.061 |
|                |              | TMGI                 | MBMS AUTHORIZATION RESPONSE (AAA)  | M           | M   | TS 29.061 |
|                |              | Result-Code          | MBMS AUTHORIZATION RESPONSE (AAA)<br>MBMS USER DEACTIVATION RESPONSE (STA)<br>MBMS SESSION START-STOP INDICATION RESPONSE (RAA)<br>MBMS SERVICE TERMINATION ANSWER (ASR) | M           | M   | TS 29.061 |
|                |              | Experimental-Result  | MBMS AUTHORIZATION RESPONSE (AAA)<br>MBMS SESSION START-STOP INDICATION RESPONSE (RAA)   | M           | M   | TS 29.061 |
|                |              | Error-Reporting-Host | MBMS AUTHORIZATION RESPONSE (AAA)<br>MBMS USER DEACTIVATION RESPONSE (STA)<br>MBMS SESSION START-STOP INDICATION RESPONSE (RAA)<br>MBMS SERVICE TERMINATION ANSWER (ASR) | M           | M   | TS 29.061 |

---

## 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 3G 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: <ul style="list-style-type: none"> <li>- a file header (element "fileHeader")</li> <li>- the collection of trace data items (elements "traceRecSession").</li> </ul>   |
| fileHeader                                | This is the trace file header element. This element includes: <ul style="list-style-type: none"> <li>- a version indicator (attribute specification "fileFormatVersion")</li> <li>- the vendor name of the sending network node (attribute specification "vendorName")</li> <li>- the name of the sending network node (attribute specification "fileSender elementDn")</li> <li>- the type of the sending network node (attribute specification "fileSender elementType")</li> <li>- a time stamp (attribute specification "traceCollec beginTime").</li> </ul>   |
| fileHeader<br>fileFormatVersion           | This attribute specification identifies the file format version applied by the sender. The format version defined in the present document shall be the abridged number and version of this 3GPP document (see below).<br>The abridged number and version of a 3GPP document is constructed from its version specific full reference "3GPP [...] (yyyy-mm)" by: <ul style="list-style-type: none"> <li>- removing the leading "3GPP TS"</li> <li>- removing everything including and after the version third digit, representing editorial only changes, together with its preceding dot character</li> <li>- 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.</li> </ul>  |
| 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. "RNC", "SGSN".   |
| traceCollec beginTime                     | This attribute specification contains a timestamp that refers to the start of the first trace data that is 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: <ul style="list-style-type: none"> <li>- the DN prefix (attribute specification "dnPrefix")</li> <li>- the trace session identifier (attribute specification "traceSessionRef")</li> <li>- the trace recording session identifier (attribute specification "traceRecSessionRef")</li> <li>- the start time of the call (attribute specification "stime")</li> <li>- the ue identifier (element "ue")</li> <li>- the traced messages (elements "msg")</li> </ul>   |
| traceRecSession dnPrefix                  | Optional attribute specification that provides the DN prefix (see 3GPP TS 32.300 [11]).  |
| traceRecSession traceSessionRef           | Attribute specification that provides a unique trace session identifier as described in 3GPP TS 32.421 [2].  |
| traceRecSession traceRecSessionRef        | Attribute specification that provides a unique trace recording session identifier as described in 3GPP TS 32.421 [2] and 3GPP TS 32.422 [3].   |
| traceRecSession stime                     | Optional attribute specification that provides the start time of the call.   |
| ue  | This element gives the ue identifier provided in trace activation messages. It includes: <ul style="list-style-type: none"> <li>- the ue identifier type (attribute specification "idType")</li> <li>- the ue identifier value (attribute specification "idValue")</li> </ul>  |
| 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.   |
| msg                                       | This element contains the information associated to a traced message. It includes: <ul style="list-style-type: none"> <li>- the function name associated to the traced message (attribute specification "function")</li> <li>- the time difference with attribute specification "traceCollec beginTime" (attribute specification "changeTime")</li> <li>- a boolean value that indicates if the message is vendor specific (attribute specification "vendorSpecific")</li> <li>- the protocol message name (attribute specification "name")</li> <li>- the NE initiator of the protocol message (element "initiator")</li> <li>- the NE target of the protocol message (element "target")</li> <li>- the encoded protocol message (element "rawMsg")</li> <li>- the traced IEs, either simple (elements "ie") or complex (elements "ieGroup"), in any order</li> </ul> |
| msg function                              | Attribute specification that provides the function name associated to the traced message (e.g. luu, lu 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).  |

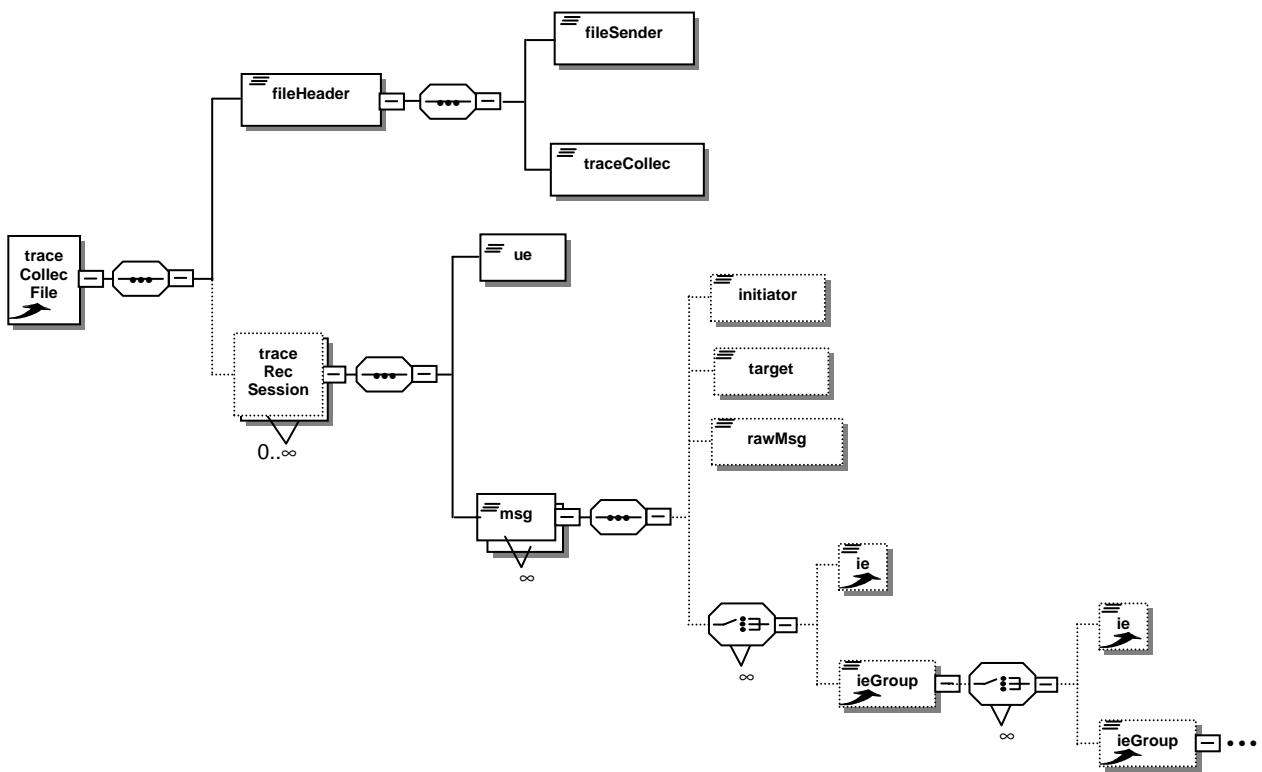
| XML element / XML attribute specification | Description  |
|---|--|
| msg vendorSpecific                        | Attribute specification whose value part is a boolean value that indicates if the message is vendor specific (true) or not (false).  |
| msg name                                  | Attribute specification that provides the protocol message name.   |
| initiator                                 | Optional element that identifies the NE initiator of the protocol message. It includes: <ul style="list-style-type: none"> <li>- the type of the network node that initiate the message (attribute specification "type")</li> <li>- 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</li> </ul>   |
| initiator type                            | Optional attribute specification that provides the type of the network node that initiate the message, e.g. "RNC", "SGSN".   |
| target                                    | Optional element that identifies the NE target of the protocol message. It includes: <ul style="list-style-type: none"> <li>- the type of the network node that receive the message (attribute specification "type")</li> <li>- the LDN 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</li> </ul>   |
| target type                               | Optional attribute specification that provides the type of the network node that receive the message, e.g. "RNC", "SGSN".  |
| rawMsg                                    | Optional element that contains the encoded protocol message. It includes: <ul style="list-style-type: none"> <li>- the protocol name associated to the event (attribute specification "protocol")</li> <li>- the protocol version (attribute specification "version")</li> <li>- the hexadecimal encoded form of the message (element's content)</li> </ul> This element is available only if the trace depth is maximum.  |
| rawMsg protocol                           | Attribute specification that provides the protocol name associated to the event (e.g. "Ranap").  |
| rawMsg version                            | 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: <ul style="list-style-type: none"> <li>- the IE group name (attribute specification "name")</li> <li>- the IE group value (attribute specification "value")</li> <li>- zero or more traced IEs, either simple (elements "ie") or complex (elements "ieGroup"), in any order</li> </ul> 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: <ul style="list-style-type: none"> <li>- the IE name (attribute specification "name")</li> <li>- the IE value (element's content)</li> </ul> This element is available only if the trace depth is medium or minimum.   |
| 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/latest/rel-6/32_series/32423-600.zip#traceData"
  elementFormDefault="qualified"
  xmlns="http://www.w3.org/2001/XMLSchema"
  xmlns:td=
"http://www.3gpp.org/ftp/specs/latest/rel-6/32_series/32423-600.zip#traceData"
>

  <!-- Trace data file root XML element -->

  <element name="traceCollecFile">
    <complexType>
      <sequence>
        <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">
                <complexType>
                  <attribute
                    name="idType"
                    type="string"
                    use="required"
                    default="IMSI"
                  />
                  <attribute name="idValue" type="long" use="required"/>
                </complexType>
              </element>
              <element name="msg" maxOccurs="unbounded">
                <complexType>
                  <sequence>
                    <element name="initiator" minOccurs="0">
                      <complexType>
                        <simpleContent>
                          <restriction base="string"/>
                        </simpleContent>
                        <attribute name="type" type="NCName" use="optional"/>
                      </complexType>
                    </element>
                    <element name="target" minOccurs="0">
                      <complexType>
                        <simpleContent>
                          <restriction base="string"/>
                        </simpleContent>
                        <attribute name="type" type="NCName" use="optional"/>
                      </complexType>
                    </element>
                  </sequence>
                </complexType>
              </element>
            </sequence>
          </complexType>
        </element>
      </sequence>
    </complexType>
  </element>

```

```

        </complexType>
      </element>
      <element name="rawMsg" minOccurs="0">
        <complexType>
          <simpleContent>
            <restriction base="hexBinary"/>
          </simpleContent>
          <attribute
            name="protocol"
            type="string"
            use="required"
          />
          <attribute name="version" type="string" use="required"/>
        </complexType>
      </element>
      <choice minOccurs="0" maxOccurs="unbounded">
        <element ref="td:ie"/>
        <element ref="td:ieGroup"/>
      </choice>
    </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="long" 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>
      <restriction base="string"/>
    </simpleContent>
    <attribute name="name" type="string" use="required"/>
  </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
- 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.
- 6) TraceReference field is set only if the type field is A.

Some examples describing file naming convention:

- 1) file name: A20030225.2315+0200-RNC.RNC01.01.125,

meaning: file produced by RNC<RNC01> on February 25, 2003, 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 01 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.

---

### 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.

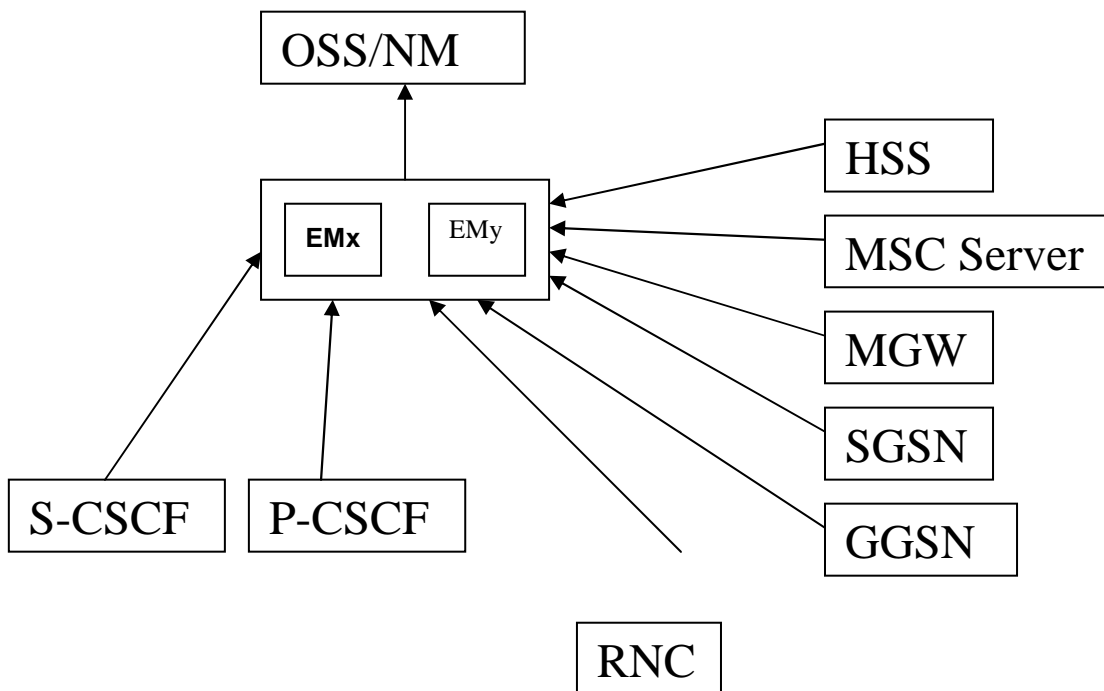


Figure C.1.1: Trace Reporting in System context A

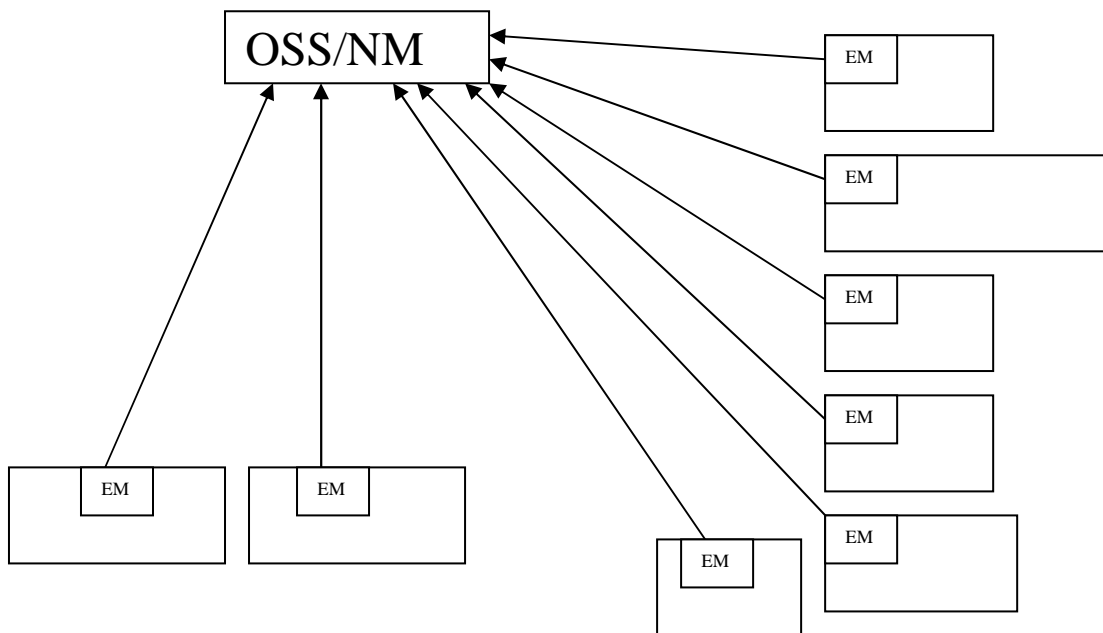


Figure C.1.2: Trace Reporting in System Context B

---

## Annex D (informative): Examples of trace files

### 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/latest/rel-6/32_series/32423-600.zip#traceData"
>
  <fileHeader fileFormatVersion="32.423 V6.0"
    vendorName="Company NN"
    <fileSender
      elementDn=
"DC=a1.companyNN.com,SubNetwork=1,SubNetwork=1,ManagedElement=RNC-1"
      elementType="RNC"
    />
    <traceCollec beginTime="2001-09-11T09:30:47-05:00"/>
  </fileHeader>
  <traceRecSession
    dnPrefix="DC=a1.companyNN.com,SubNetwork=1"
    traceSessionRef="1"
    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"
      vendorSpecific="false"
    >
      <target type="Cell">SubNetwork=1,ManagedElement=Cell-1</target>
      <rawMsg protocol="Nbap" version="001">A9FD64E12C</rawMsg>
    </msg>
  </traceRecSession>
</traceCollecFile>
```

## 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/latest/rel-6/32_series/32423-600.zip#traceData"
>
  <fileHeader fileFormatVersion="32.423 V6.0"
    vendorName="Company NN"
    <fileSender
      elementDn=
"DC=a1.companyNN.com,SubNetwork=1,SubNetwork=1,ManagedElement=RNC-1"
      elementType="RNC"
    />
    <traceCollec beginTime="2001-09-11T09:30:47-05:00"/>
  </fileHeader>
  <traceRecSession
    dnPrefix="DC=a1.companyNN.com,SubNetwork=1"
    traceSessionRef="1"
    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"
      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"
      vendorSpecific="false"
    >
      <ieGroup name="RAB" value="1">
        <ieGroup name="RAB Failed To Setup Or Modify">
          <ie name="cause">2</ie>
        </ieGroup>
      </ieGroup>
    </msg>
  </traceRecSession>
</traceCollecFile>

```

# Annex E (informative): Change history

| Change history |       |           |      |     |  |     |       |       |
|----------------|-------|-----------|------|-----|--|-----|-------|-------|
| Date           | TSG # | TSG Doc.  | CR   | Rev | Subject/Comment  | Cat | Old   | New   |
| Sep 2004       | SA_25 | SP-040544 | --   | --  | Submitted to TSG SA#25 for Information   | --  | 1.0.0 |       |
| Dec 2004       | SA_26 | SP-040771 | --   | --  | Submitted to TSG SA#26 for Approval  | --  | 2.0.0 | 6.0.0 |
| Mar 2005       | SA_27 | SP-050043 | 0001 | --  | Add missing Media GateWay (MGW) trace record for the Nb-UP and lu-UP interfaces    | F   | 6.0.0 | 6.1.0 |
| Jun 2005       | SA_28 | SP-050294 | 0002 | --  | Stage 3 modifications for MBMS tracing   | B   | 6.1.0 | 6.2.0 |
| Sep 2005       | SA_29 | SP-050452 | 0003 | --  | Remove trace content "Observed time difference to GSM cell" - Align with TS 25.215 | F   | 6.2.0 | 6.3.0 |
|                |       |           |      |     |  |     |       |       |
|                |       |           |      |     |  |     |       |       |
|                |       |           |      |     |  |     |       |       |
|                |       |           |      |     |  |     |       |       |
|                |       |           |      |     |  |     |       |       |
|                |       |           |      |     |  |     |       |       |
|                |       |           |      |     |  |     |       |       |
|                |       |           |      |     |  |     |       |       |
|                |       |           |      |     |  |     |       |       |
|                |       |           |      |     |  |     |       |       |

---

## History

| <b>Document history</b> |                |             |
|-------------------------|----------------|-------------|
| V6.0.0                  | December 2004  | Publication |
| V6.1.0                  | March 2005     | Publication |
| V6.2.0                  | June 2005      | Publication |
| V6.3.0                  | September 2005 | Publication |
|                         |                |             |