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Technical Specification

**Digital cellular telecommunications system (Phase 2+);
Universal Mobile Telecommunications System (UMTS);
Telecommunication management;
Trace Management Integration Reference Point (IRP):
Requirements
(3GPP TS 32.441 version 7.0.0 Release 7)**



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Foreword

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Foreword

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

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

Version x.y.z

where:

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

Introduction

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

- 32.441 "Trace Management Integration Reference Point (IRP): Requirements".**
- 32.442 "Trace Management Integration Reference Point (IRP): Information Service (IS)".
- 32.443 "Trace Management Integration Reference Point (IRP): Common Object Request Broker Architecture (CORBA) Solution Set (SS)".

The present document is part of a TS-family which describes the requirements and information model necessary for the Telecommunication Management (TM) of 3G systems. The TM principles and TM architecture are specified in 3GPP TS 32.101 [2] and 3GPP TS 32.102 [3].

Trace provides very detailed information on call level for a specific subscriber or MS. This data is an additional information source to Performance Measurements and allows deeper investigations in problems solving or in case of optimization.

1 Scope

The present document specifies the overall requirements for the Trace Management Integration Reference Point (TraceIRP) as it applies to Itf-N.

The Trace IRP supports the operations that are required for the Subscriber and Equipment trace, the Service Level Trace and the Cell Traffic Trace functionalities.

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 TR 21.905: "Vocabulary for 3GPP Specifications".
- [2] 3GPP TS 32.101: "Telecommunication management; Principles and high level requirements".
- [3] 3GPP TS 32.102: "Telecommunication management; Architecture".
- [4] 3GPP TS 32.421: "Telecommunication management; Subscriber and equipment trace; Trace concepts and requirements".
- [5] 3GPP TS 32.422: "Telecommunication management; Subscriber and equipment trace; Trace control and configuration management".
- [6] 3GPP TS 32.423: "Telecommunication management; Subscriber and equipment trace; Trace data definition and management".
- [7] 3GPP TS 32.341: "Telecommunication management; File Transfer (FT) Integration Reference Point (IRP): Requirements".
- [8] 3GPP TS 32.342: "Telecommunication management; File Transfer (FT) Integration Reference Point (IRP): Information Service (IS)".
- [9] 3GPP TS 32.343: "Telecommunication management; File Transfer (FT) Integration Reference Point (IRP): Common Object Request Broker Architecture (CORBA) Solution Set (SS)".
- [10] 3GPP TS 32.150: "Telecommunication management; Integration Reference Point (IRP) Concept and definitions".

3 Definitions and abbreviations

3.1 Definitions

For the purposes of the present document, the terms and definitions given in 3GPP TR 21.905 [1] apply.

NOTE: A term defined in the present document takes precedence over the definition of the same term, if any, in 3GPP TR 21.905 [1].

3.2 Abbreviations

For the purposes of the present document, the abbreviations given in 3GPP TR 21.905 [1] apply. An abbreviation defined in the present document takes precedence over the definition of the same abbreviation, if any, in 3GPP TR 21.905 [1].

4 Trace Concepts

Trace Concepts are defined in 3GPP TS 32.421 [4].

5 Trace Requirements

5.1 Trace Management and Itf-N

The Itf-N may connect the Network Management system either to EMs or directly to the NEs (system context B). This is done by means of Integration Reference Points (IRPs). In the following, the term "subordinate entities" defines either EMs or NEs, which are in charge of supporting the Itf-N.

This clause describes the properties of an interface enabling a NM to monitor a 3G-telecommunication network including - if necessary - the managing EMs. To provide to the NM the Trace Management capability for the network implies that the NM and the subordinate entities have to agree on the following:

- The identification of the NEs and UE where the Trace Session Activation is requested.
- The identification of the files containing the trace records for retrieval by NM.
- The identification of the subscriber or equipment (IMSI, MSISDN (where available) IMEI(SV), Private user identity shall be provided in the trace record files in case of subscriber and equipment trace. In case of Cell Traffic trace the UtranCell shall be provided in the trace record file.
- Notification of available files containing trace records for retrieval by NM.
- The network configuration (see the Configuration Management (CM) NRM IRPs in 3GPP TS 32.6xy). To support the cell traffic trace functionality.

5.2 Managing Trace Sessions

The IRPManager shall be able to request the IRPAgent to:

- Activate a Trace Session for a specific subscriber or equipment in a specific NE. The trace session activation shall be possible both for management based activation ("") and for signalling based activation (""). It shall also be possible to schedule the activation. The trace session activation shall also be possible for Service Level Tracing and for cell traffic trace.
- Retrieve the Trace Records in a file. The data format of the file shall be specified in the 3GPP defined trace specifications (See 3GPP TS 32.423 [6]).
- Retrieve the Trace Records of one specific Trace Session.
- Emit notification when a Trace Session's configuration parameters are changed in the NE or when a Trace Session is activated from the EM directly.
- Emit notification when a Trace Recording Session was not started in the NE for any reason.
- Interrogate the configuration parameters and other information of a specific Trace Session.
- Interrogate the list of activated Trace Sessions in a specific NE. The Trace Session is identified by a combination of the following parameters: the Trace Reference, the IMSI, IMEI(SV), MSISDN (when it is available in the network elements) or the Private User Identity. In case of cell traffic trace the Trace Session is identified by the Trace Reference and the UtranCell where the trace was activated.
- Deactivate a Trace Session for a specific subscriber or equipment in a specific NE. The trace session deactivation shall be possible for both "" and ". It shall also be possible to schedule the deactivation. The Trace Session deactivation shall also be possible for Service Level Tracing and for cell traffic trace.

Editor's note: The requirements for Service Level Tracing are FFS.

The Trace Session Deactivation shall target the same NE as the Trace Session Activation. If the trace session is activated in more than one NE, the trace session shall be deactivated in all those NEs. During Trace Session deactivation the Trace Reference and the object of the trace (IMSI, IMEI(SV), MSISDN (when it is available in the network elements), Private User Identity, or the object of the cell traffic trace (UtranCell(s)) shall be given. In case of a failed Trace Session Deactivation there shall be a mechanism to ensure that unnecessary Trace Sessions will not remain active in the network (i.e. send Trace Session Deactivation multiple times, etc.).

The IRPManager is responsible for allocating a unique Trace Reference for the Trace Sessions it's activate.

It shall be possible that an IRPManager activates/deactivates a Trace Session to multiple NEs for multiple subscribers or equipments or service initiated from a UE. In case of Service Level Trace the IRPManager shall be able to send the Trace Session Activation/Deactivation also to the Device Management Server.

The IRPManager is responsible for scheduling the Trace Session Activation and Deactivation, i.e. there is no requirement to Itf-N due to scheduling the Trace Session Activation/Deactivation.

5.3 Management of trace record files

5.3.1 General

The IRPManager shall be able to:

- Manage the transfer of data files containing trace records.
- Request a list of available files.
- Request the IRPAgent to emit a notification announcing the availability of the Trace Record files.

For information:

- The requirements for trace record file management may be satisfied by a separate File Transfer IRP.

NOTE: In case of Signalling Based Activation the trace record files may be transferred from a different EM than the Trace Session Activation is sent to! In order to find always the appropriate NM the address of NM shall be part of the trace control and configuration parameter that needs to be propagated during Trace Session activations.

5.3.2 Managing trace records for roaming cases (inter-operator cases)

It is possible that Trace Session Activation/Deactivation goes across Operator's boundaries. Trace Records may contain sensible information therefore the exchange of trace records between operators are subject to agreements between operators, therefore this case is out of the scope of the present document.

5.4 Overview of IRPs related to Trace

The Itf-N is built up by a number of IRPs. The basic structure of the IRPs is defined in 3GPP TS 32.101 [2], 3GPP TS 32.102 [3] and 3GPP TS 32.150 [10].

For the purpose of Trace the following IRPs are needed:

- Trace Management IRP (TraceIRP), i.e. 3GPP TS 32.44x (the present TS-family).
- File Transfer IRP (3GPP TS 32.34x [7], [8], [9]).

Annex A (informative): Use Cases

A.1 General

The use cases presented in the present document provides the usability of the Trace IRP. These use cases are different from those ones that are presented in 3GPP TS 32.421 [4].

A.2 Use case #1: Centralized place for Trace Session Activation in case of "

Figure A.2-1 illustrates an example where Operator would like to activate a trace session in the 6 RNCs (example for system context A). The activation method required is Management Based Activation (").

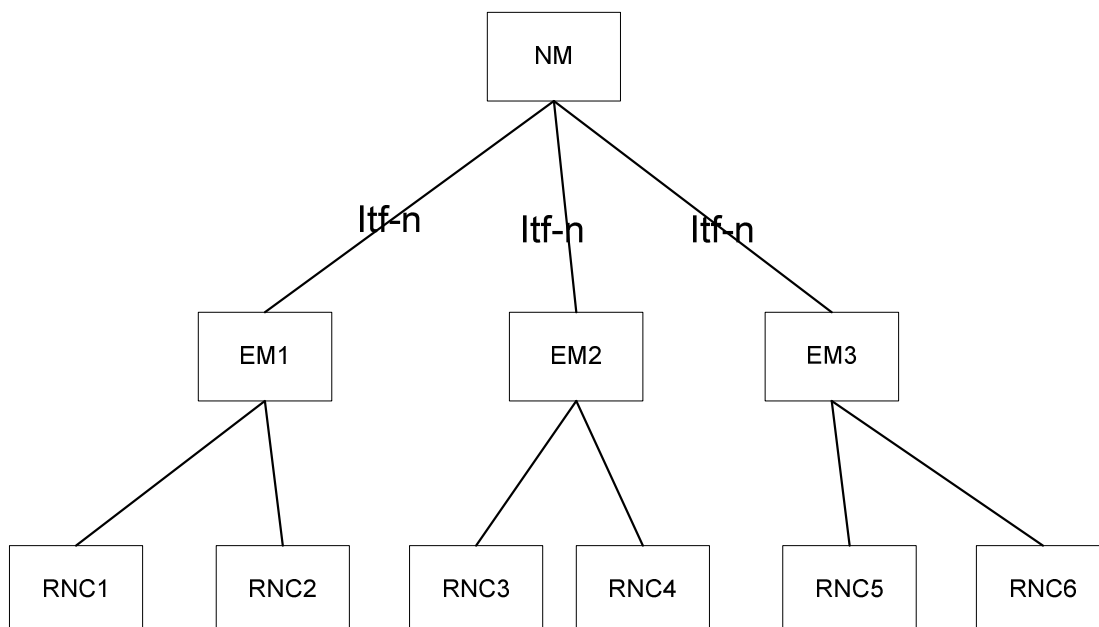


Figure A.2-1: Trace Session Activation for "

Using the trace IRP operator has to give the Trace Session Activation command in the Network Manager only. The Operator has to specify in which NEs trace is required and also has to give the trace control and configuration parameters. The NM (Trace IRP Manager) can initiate the Trace Session Activation to the EMs (Trace IRP Agents). The EMs can send the Trace Session Activation commands to the RNCs.

As shown in this example Trace IRP helps the operator in managing trace in the network.

A.3 Use case #2: Centralized place to collect trace records in case of "

Figure A.3-1 shows an example (assuming system context A) where trace records are generated in many different NEs which are managed by different EMs.

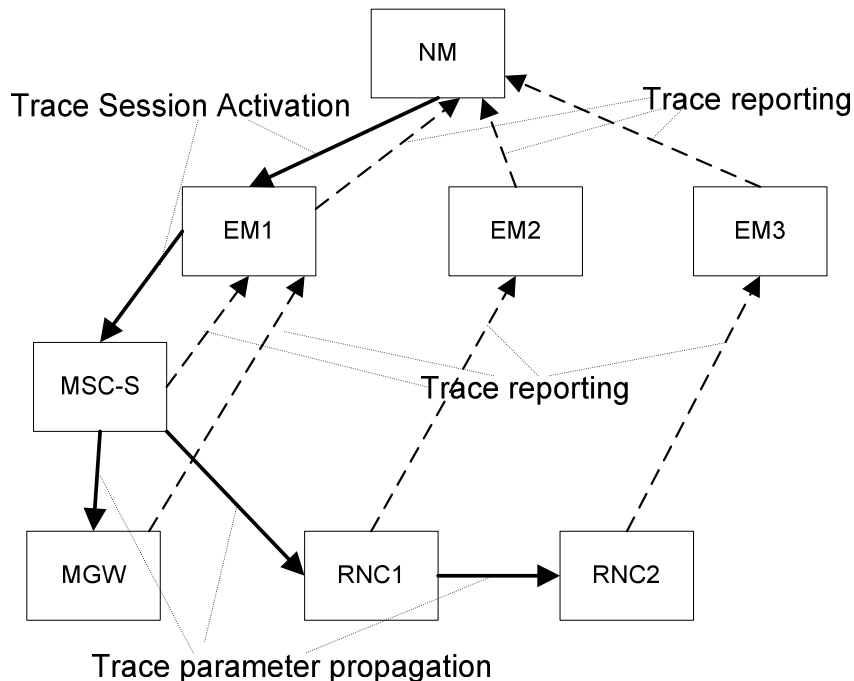


Figure A.3-1: Trace Record Collection in case of "

In the example above the trace session is activated from the NM to the MSC-S via EM1. If the subscriber or MS that is being traced starts a call then the trace parameters are propagated to the MGW and to the RNC1.

If during the call the subscriber makes a handover to RNC2, the trace parameters will also be propagated to RNC2.

In this example all the NEs (MSC-S, MGW, RNC1 and RNC2) generate their own trace records and these trace records are sent to the NEs own EM.

There are three different EMs shown in the figure. Each of them will get the trace records from the NEs they manage. The EMs (traceIRPAgents) can then send the trace records to the NM (traceIRPManager).

By using the TraceIRP the Operator can retrieve all the trace records generated in the network in one place at the NM.

Without the trace IRP the trace records are stored only in the EM level, which in this case is distributed in 3 different boxes and locations.

Annex B (informative): Change history

Change history								
Date	TSG #	TSG Doc.	CR	Rev	Subject/Comment	Cat	Old	New
Mar 2005	SA_32	SP-060256	--	--	Submitted to SA#32 for Information	--	1.0.0	
Mar 2007	SA_35	SP-070063	--	--	Submitted to SA#35 for Approval	--	2.0.0	7.0.0

History

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