3GPP TSG-RAN #20 Meeting   **RP-030355**
Hameenlinna, Finland, 03ʳᵈ – 06ᵗʰ June, 2003

Title:	**Trace in RAN: Proposed Work Item on Subscriber & Equipment Trace**
Agenda Item:	**8.12**
Source:	**Nortel Networks, Nokia, Motorola, Lucent, Telefonica, Orange, 02, Vodafone Group**
Document for:	**Discussion & Approval**

1. INTRODUCTION

In the recent months there has been a lot of discussion on the topic of Trace in RAN and especially Management-based Activation. This contribution is proposing as a way forward a compromise that takes into account the arguments raised in previous contributions.

2. DISCUSSION

The opposition was due to one technically possible and straightforward solution, i.e. to **systematically** provide on a per-connection basis the IMSI (which is already done in most cases in R99) and the IMEI(SV) to the RNC. The main concerns that have been raised are:

1. Providing **systematically** the IMEI(SV) to the RNC over the Iu on a per-connection basis. This has to be understood with the Early UE discussions in mind.
2. Load issues for the RNC (checking for each connection of the IMSI or IMEI(SV) against a "Terminal To Be Traced" list, when only a limited number of Terminals are actually concerned by the Trace).

At the last RAN3 meeting (RAN3 #36), a solution has been presented in R3-03718 that allows to take into account the two concerns described above. It was agreed that this solution is technically feasible.

3. CONCLUSION

It is proposed to decorrelate the Early UE discussions from the Trace discussions in RAN Plenary as it is now proven that it is possible not to have the IMEI(SV) over the Iu on a per-connection basis for the purpose of Trace.

Furthermore, it is proposed to agree the attached Work Item sheet.

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Work Item Description

TITLE: SUBSCRIBER AND EQUIPMENT TRACE SUPPORT IN UTRAN

1   3GPP Work Area

X	Radio Access
	Core Network
	Services

2   Linked work items

Rel6 - Trace Management

3   Justification

Subscriber and Equipment Trace provides 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/deactivated on user demand for a limited period of time for specific analysis purposes.

Thus, signalling support is needed on the UTRAN Interfaces for activation/deactivation of the Trace functionality, correlation of the Traces gathered in the different Nodes,…

4   Objective

The main objective of this Work Item is to analyse the impacts on UTRAN architecture and provide the signalling support on the UTRAN Interfaces to fulfill the requirements on Subscriber and Equipment Trace as defined in TS 32.421.

Another objective of the Work Item is to avoid mechanisms systematically providing the IMEI(SV) for each Iu signaling connection.

5   Service Aspects

None/Text

6 MMI-Aspects

None/Text

7 Charging Aspects

None/Text

8 Security Aspects

None/Text

9 Impacts

Affects:	USIM	ME	AN	CN	Others
Yes			X	X	
No	X	X			X
Don't know					

10 Expected Output and Time scale (to be updated at each plenary)

New specifications						
Spec No.	Title	Prime rsp. WG	2ndary rsp. WG(s)	Presented for information at plenary#	Approved at plenary#	Comments
Affected existing specifications					
Spec No.	CR	Subject	Approved at plenary#	Comments	
25.401		Architecture impacts of support for Subscriber and Equipment Trace	RAN #21		
25.410		Trace Function on the Iu interface	RAN #21		
25.413		Signalling support for Subscriber and Equipment Trace on Iu	RAN #21		

11 Work item raporteurs

Yann Sehedic, sehedic@nortelnetworks.com

12 Work item leadership

TSG RAN WG3

13 Supporting Companies

Nortel, Lucent, Nokia, Motorola, Telefonica, Orange

14 Classification of the WI (if known)

	Feature (go to 14a)	
X	Building Block (go to 14b)	
	Work Task (go to 14c)	

14a   The WI is a Feature: List of building blocks under this feature

14b   The WI is a Building Block: parent Feature

                Rel6 - Trace Management

14c   The WI is a Work Task: parent Building Block

Title:	**Trace in RAN: Compromise Proposal**
Agenda Item:	**12.2.1**
Source:	**Nortel Networks, Nokia, Lucent, Siemens, Telefonica, Vodafone Group, Motorola, Alcatel, O2**
Document for:	**Discussion & Approval**

1. INTRODUCTION

In the recent months there has been a lot of discussion on the topic of Trace in RAN and especially Management-based Activation. The opposition was due to one technically possible and straightforward solution, i.e. to **systematically** provide on a per-connection basis the IMSI (which is already done in most cases in R99) and the IMEI(SV) to the RNC. The main concerns that have been raised are:

1. Providing **systematically** the IMEI(SV) to the RNC over the Iu on a per-connection basis. This has to be understood with the Early UE discussions in mind.
2. Load issues for the RNC (checking for each connection of the IMSI or IMEI(SV) against a "Terminal To Be Traced" list, when only a limited number of Terminals are actually concerned by the Trace).

In an attempt to reach a compromise that will satisfy every party, this contribution outlines a completely different solution that provides the full Management-based Activation feature and benefits, but also answers those concerns.

2. DISCUSSION

2.1 GENERAL PRINCIPLE

The only possibility to answer the concerns 1 and 2 is to leave the checking of the UE Identifier on a per-connection basis to the CN. The CN will then re-use the CN Invoke Trace RANAP message to trigger a Trace in the concerned RNC only for the concerned UE only.
To enable that, the RNC needs to be able to send the Trace Configuration to the CN, which will necessitate a new RANAP message.

2.2 OVERALL SCENARIO
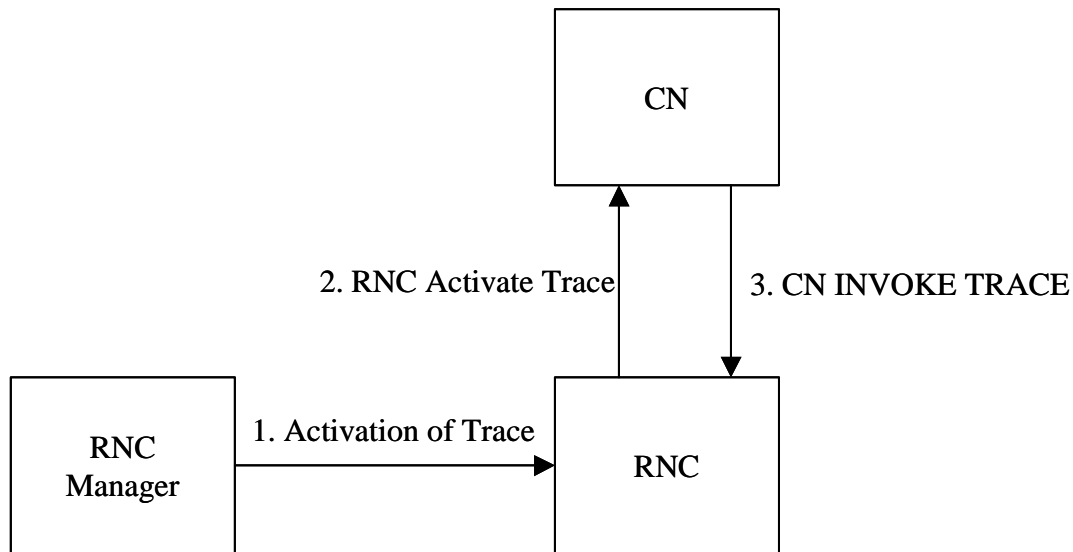
1. The RNC Manager (also known as OMC-R) sends a command to configure a Trace in the RNC.
   The Trace is identified by a Trace Reference (which is globally unique according to SA5 specifications). The identity of the UE(s) to be traced are included in this Trace Configuration. This can be e.g. a single IMEI(SV) or a mask on the IMEI(SV).
2. The RNC sends a RANAP message including the Trace Reference and the identity of the UE(s) to be traced. It is proposed to use a new RANAP message for that as no existing message can be re-used.
   The actual format of the message is left FFS: it can be dedicated to Trace (e.g. a RNC ACTIVATE TRACE) or more generic (e.g. similar to the INFORMATION TRANSFER INDICATION introduced in Rel-5). It may also be beneficial to include other parameters in this message, but this is left FFS for the time being.
3. For each UE, the CN checks the IMEI(SV) against the information provided in step 2. If the UE corresponds to an IMEI(SV) to be traced, then the CN sends the CN INVOKE TRACE message to the RNC containing the Trace Reference and the IMEI(SV) (the IMEI(SV) being necessary to easily identify the traced Terminal in the Trace Records generated by the RNC).

Although the IMEI(SV) will be provided over the Iu interface, this will happen **only for a handful of UEs (those that are to be traced)**. So the solution answers concern 1 as the IMEI(SV) is not sent systematically over the Iu interface for each connection, it happens only when needed for UE tracing based on IMEI. The concern 2 is obviously answered as the checking is done in the CN.

2.3 CASE OF THE IMSI

The previous section talks only of the IMEI(SV) as it is the greater concern. The case of the IMSI is slightly different as the IMSI is (almost) always provided to the RNC via the COMMON ID message since R99. As a consequence, Management-based Activation on the IMSI can be implemented in R99. On the other hand, if the proposed solution is not used to handle Management-based Activation on the IMSI, then the concern 2 is not answered.

In the spirit of compromise, it is proposed to extend this mechanism to the IMSI. It will be an RNC implementation choice whether to use this mechanism or make the check on the IMSI as of R99.

3. CONCLUSION

Based on this new solution proposed, the co-signing companies believe that it is possible to support the Network Management Based Activation method in UTRAN as requested by several manufacturers and operators, while avoiding the concerns mentioned by several manufacturers (and operators also).

Since the first and immediate task for RAN WG3 is to identify the feasibility of the Management-based Activation from a RAN standpoint, the co-signing companies believe that based on this proposal RAN WG3 should inform RAN and SA5 that a solution exists that answers the concerns of all the companies. The work will then be able to proceed in the Work Item based on the attached revised Work Item sheet.

Then, the details on this possible solution as well as the overall support of SA5 requirements can be progressed and the Subscriber&Equipment Trace work finalised in Release 6 as planned.