

11th – 14th of March 2003, Birmingham, UK**Agenda Item:****Source:** Nokia**Title:** Early UE Handling**Document for:** Discussion & Approval

1. Introduction

The handling of early mobiles has been extensively discussed within RAN plenary and working groups as well as in the separate Ad Hoc to solve the issue. What is still remaining open is whether there will be bitmap over the Iu interface used or whether they would be e.g. partial/full IMEI-SV sent over the Iu interface to RNC.

This contribution summarises the Nokia views on the issue, e.g. the requirements and benefits of the bit map based solution have been discussed several times, and there is no specific reason to repeat that discussion in full. For convenience the earlier presented argumentation and requirements are given as annex at the end of this paper. The possible linking of the RRC bits and bit map is recapitulated as that might be needed eventually depending on the error cases to faced. Further this contribution clarifies the relationship between the early UE handling and trace activity in SA5 and also the only remaining concern raised for the bit map proposal is discussed.

2. Relationship of early UE handling and trace

In few occasions the use of IMEI-SV in the RNC has been linked in some comments and contributions to the potential trace work item in TSG RAN. It has been suggested that as the trace could eventually anyway bring the IMEI-SV to the RNC, then why not to use this for the purpose of early UE handling as well. The argumentation is not related to the discussion and trace should be kept separately of the discussion as:

- ?? Tracing is a functionality that is not intended for all UEs. Thus only a fraction of the active UEs in the network may be traced and thus any additional information for those UEs from CN side is done only when actually activating tracing from CN
- ?? Also it is not clear whether IMEI-SV is even needed to be available in the RNC for tracing purposes as this can be done with other information as well. (the topic that is to be discussed in the actual trace WI phase once started).
- ?? Further work on trace has not yet been even started in TSG RAN side, thus timeframe in question is also clearly different.
- ?? Trace functionality is optional for the system, and it's up to each operator whether to deploy it or not. Hence the solution of early UE handling must be independent from trace, or any other Release'6/7' feature, since most likely this functionality is of interest of wider operator and terminal manufacturing community.

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3. Concerns on the practical way of working with the bit map proposal

During the TSG RAN Ad Hoc on early UE handling, the concern was again raised whether the companies would be willing to “grant” the bits for other vendors for the cases when they themselves do not experience any problems with the feature. This is clearly a point that requires careful consideration. From Nokia point of view the bit map approach should be the starting point and naturally if that would prove unworkable due to blocking behaviour then the meaning of the bits can be obviously altered to convey the IMEI-SV fully or partly over the Iu interface.

This statement is obviously valid for general case, not if the blocking is caused (only) by the proponents of the full IMEI-SV distribution.

4. Early RRC bit(s) and bit map over Iu common aspects

In the TSG RAN#18 a few bits were reserved in the first RRC message for the purpose of early UE handling in early phase of RRC connection. Those bits can be used to indicate what kind of basic functions should be used in order to get the IMEI-SV from UE to CN and then from CN the bit map information. This solves the concern regarding the UE specific information availability at the connection set up.

This should be understood in a manner that some of the bits on the bit map can be used to indicate level of testing coverage if there are errors detected that are due to the non-availability of the relevant tests or network implementation related to the particular feature in the terminal (at the time of launching the terminal in the market). This could allow generic early terminal handling where the solutions could typically cover most if not all of the terminal vendors.

5. Error handling principles

One should keep in mind that preference always should be given to solutions that do not require Iu signalling and can be solved by internally in UTRAN by e.g. having in a TR recommendation of parameter combination restriction that avoids the problem and is not causing problems to other UEs. (i.e. the non-faulty ones).

6. Conclusion

It is proposed to get forward with the bitmap approach, but also to keep in mind that if the approach proves to be non-working, then the meaning of the bits (or part of those) can be mapped then later to IMEI-SV if needed. First the process should be started with the bit map assumption however and relying on the constructive way of working when problems are emerging and solutions for corrections are discussed.

ANNEX A: Requirements of the solution and benefits from the use of bit map solution.

Requirements (as in RPA030011)

- ?? Global roaming needs to be ensured
- ?? Approach needs to be such that any addition to the Release'99 protocols is backward compatible
- ?? Existing release'99 functionality shall not be disabled due to the adding of error handling mechanisms
- ?? It must be possible to separate faulty and non-faulty UEs
- ?? The solution shall be such that it can be applied early enough in the signalling to cover all situations – ie. When first connecting to UTRAN or entering UMTS from another system (GERAN)

Based on the earlier discussions, the framework chosen should additionally

- ?? Be capable of handling different types of errors, even those that influence early phases of the connection

Benefits on the bit map proposal (as in RPA030011)

The following benefits are offered.

- ?? Only UE models including any particular problems are targeted
- ?? Addresses the terminals already deployed.
- ?? This is a generic solution taking into account also GERAN issues, and which can take care also inter RAT HO before the actual procedure is established.
- ?? Does not require any changes to the UE or Uu interface.
- ?? The overall memory in the network needed is less than with e.g. full IMEI-SV distribution. (up to 50 to 100 times less storage places for IMEI-SV/bitmap information) (as commented in the Ad Hoc, this is difficult to assess in details as total memory requirement for IMEI-SV information storage in RNC is not known)
- ?? Less entities involved on IMEI-SV, thus faster update.
- ?? Error common to a more than one UE type can be rapidly covered for the full network as once the reaction for the bit map is done in RAN side, then for extending the same specific behaviour for another type UE needs only CN side adjustment
- ?? No duplication of information between UTRAN and CN.
- ?? Can address the problems in all phases of the connection with the help of the RRC bits (RRC bits as agreed in the last TSG RAN meeting)
- ?? Also contributes to the error tracking as potential places of making mistakes how to implement a particular feature are discussed in public.
- ?? Necessary specific behaviour information is available to all vendors and operators.