3GPP TSG RAN Meeting #18 ***Tdoc: RP-020867***
New Orleans, Louisiana, December 3-6, 2002

Title: **Handling of Early UE**
Source: **Alcatel**
Document for: **Discussion and decision**
Agenda: **8.7.1**

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1 Introduction

Document **RP-020695** Status report for study item “Early Mobile Handling in UTRAN" lists solutions elaborated in TSG RAN WG2 and WG3 to handle faulty mobiles.

A number of companies are supporting solution (a): “Early Uu indication of a bitmap of mobiles faults in RRC”.

This document states the key reasons for this and explains a simple method to "update" the bitmap stored in the mobile in order not to restrict features to non-faulty mobiles.

2 Early Uu indication of a bitmap of mobiles faults in RRC

The main reasons for choosing “an early indication of a bitmap of mobiles faults in RRC” (option a) are:

- This method allows for covering errors that may occur in early phase of RRC connection, which is an essential feature. This is not the case of Iu-based only solutions.
- Contrary to the “compressed IMEI-SV” solution, option (a) allows discussing the entry in the bitmap in 3GPP, so the best possible solution will be chosen.
- As stated in contribution RP-020817 from Three, Ericsson and Telecom Italia spa, compressed IMEI-SV "will introduce changes to the mobiles at this stage of R99 as it would be required in all mobiles, whereas mobiles supporting earlier versions of the specification will not support this indication and so can not be managed accordingly" .

3 Need to update the RRC bitmap

In addition to the bitmap mechanism, there is a need to update the UESBI sent by UE for the reasons explained below, and especially to avoid any feature restriction to non-faulty mobiles.

When a mobile is launched on the market it may happen that a radio feature has been implemented and tested on the mobile, but has never been tested on any network. When this feature is activated, it may be discovered that it is improperly implemented by some mobiles. In this case:

- A relevant position in the bitmap is reserved by the 3GPP, related to the correct implementation of the feature in mobiles.
- The feature is inhibited in the network unless a mobile sends a bitmap with the bit in the relevant position set to indicate that the mobile correctly supports the feature.

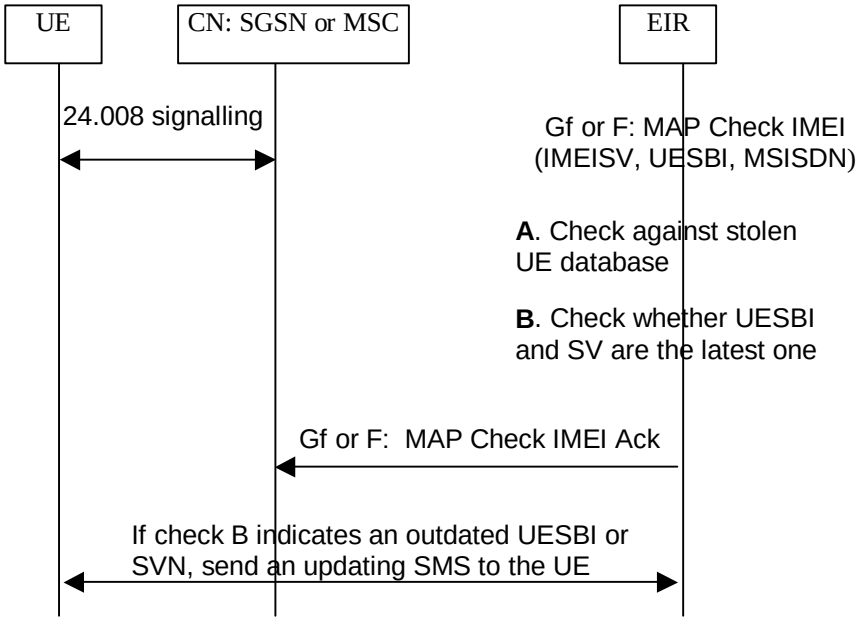
For the mobile launched before the problem is discovered, the default value of the bitmap is “function not supported”. In order to be able to use the feature for any mobile actually supporting the feature, it is necessary to be able to update the bitmap in the UE.

This contribution proposes a method consisting in the use of **SMS messages** containing the updated bitmap value (or request to perform a SW download). This method is fully transparent to the UTRAN and has minimal impacts on the CN.

3. Principle of the proposed solution using SMS messages

The detailed operation of the method are provided below:

1. When UE accesses to the network, UE gives to the CN its IMEI-SV together with its current bitmap value
2. The CN goes to EIR to check IMEI-SV against the list of stolen UE and gives furthermore the current bitmap value received from the UE together with the main MSISDN or IMSI of the UE.
3. EIR compares the bitmap of the UE with the most recent bitmap value known for mobiles having the same TAC & SVN. This assumes that EIR manages a table giving the relationship between (TAC + SVN) and the expected bitmaps.
4. If the check carried out in step 3. has detected that the mobile has an outdated value of the bitmap (or of the SW), then EIR sends to the mobile a SMS containing the updated bitmap (or a message indicating that a SW download is available). That could be done according to USIM Toolkit (TS 31.115), which is applicable to the exchange of secured packets between an entity in a 3G or GSM PLMN and an entity in the (U)SIM.
5. The UE internal bitmap is updated from the USIM.



4. Advantages of SMS messages solution compared to Iu bitmap and Iu IMEI-SV solutions

The advantages of SMS message solution compared to "IMEI-SV over Iu" solution are the following ones:

1. The new bitmap is immediately available even for early RRC messages in all subsequent transactions: this is not the case with other solutions since the UE bitmap remain unchanged for ever,
2. Allows discussing the entry in the bitmap in 3GPP, so the best possible solution will be chosen.

The advantages of SMS message solution compared to "Iu bitmap" solution are the following ones:

1. The new bitmap is immediately available even for early RRC messages in all subsequent transactions: this is not the case with other solutions since the UE bitmap remain unchanged for ever,
2. The EIR can be interrogated less often than with the Iu bitmap solution where the VLR has to store the new bitmap: at each LA Update to a new VLR, a call to EIR is needed. And calls to EIR must be minimised.

5. Conclusion

It is proposed to use the “Early Uu indication of a bitmap of mobiles faults in RRC” solution in combination with an update mechanism using SMS messages.

- It is proposed to agree on CR 1758-1763 on 25.331, and:
- To ask the relevant CN and SA groups to do the necessary changes to the applicable standards in order to allow for the updating of the bitmap through SMS if this is felt necessary.