Technical Specification Group Services and System Aspects   **TSGS#19(03)0133**
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Title:	Storage of IMEI information in the HLR
Release:	Rel6
Work Item:	MMS
Source:	Vodafone Group, T-Mobile Deutschland
To:	3GPP TSG SA, 3GPP TSG CN
Attachments:	none

1. Introduction

For a considerable time MMS traffic will mostly end up at legacy terminals which are not MMS capable. Since the MM originator cannot be expected to be aware of the MM recipient's terminal capabilities the originating network should take care of the appropriate handling of MMs. For the time being, legacy terminal recognition is mostly done via a simple time supervision of the MMS notification sent to an MM recipient via an MMS specific WAP push; if the recipient does not initiate an MM retrieval within a predetermined time his terminal is considered to be a non MMS capable legacy terminal, and he will then be notified via SMS about the Web retrieval possibility of the MM. This trial and error procedure is less than satisfactory.

Making use of the IMEI for other reasons than the originally intended usage for the EIR/CEIR functionality has been discussed several times in SMG and 3GPP, but with no positive outcome. It is believed that a procedure which uses the IMEI and UAProf to determine the recipient terminal's basic capabilities could significantly improve the MMS legacy handling. Furthermore, additional benefit is seen for the forthcoming MMS content adaptation solutions as well as for other services bound to specific terminals such as SMS based downloading of ringing tones.

Since a fully automated retrieval of the recipient terminal's IMEI is currently not available some alternative concepts of IMEI range population in the MMS relay/server have been considered as well:
▪ subscription based population of a terminal database in the MMS relay/server or, to grant access for other services than MMS, in an MMS relay/server external database – this is considered to place far too much work load on the point of sale staff and would only work if they are involved in terminal purchase;
▪ SAT based IMEI retrieval – but not all SIMs are SAT capable, and this will persist for quite some time;
▪ IMEI extraction from CDRs – possibly the simplest way, but it would still require some considerable maintenance effort. Also, some update delay would result from this approach: a customer who has just bought a new terminal could not immediately benefit from MMS since his old terminal would be in the database until the next update cycle is performed.

Clearly, a fully automated procedure without any operator intervention is the most elegant solution. It must be noted that the proposal is not intended to compete with the UAProf mechanism but is seen as a useful complement to it.

2. Proposal

A two step procedure is proposed.
(Step 1) The IMEI of the recipient's terminal is evaluated by the MMS relay/server. If the terminal is actually MMS capable the MMS push notification is initiated. If the terminal is not MMS capable but at least WAP capable, then
(Step 2) the User Agent Header is checked and appropriate action on the outcome is taken:
▪ MM delivery or
▪ MM delivery after content adaptation/conversion or
▪ SMS to enable Web retrieval.

3. Technical concept

It is proposed to
▪ retrieve the IMEI from a terminal as part of the LOCATION_UPDATE procedure, either every time location updating is performed or every n^{th} location update event. This can be achieved without changing the access protocol or

procedures, e.g. via the CIPHERING MODE COMPLETE message in response to the CIPHERING MODE COMMAND, or alternatively with an explicit request to the UE to provide the IMEI.
- transfer the IMEI from the MSC/VLR to the HLR and store it as part of the subscriber data in the HLR. This requires a new parameter in the MAP UpdateLocation message, to carry the IMEI.
- expand the existing MM5 interface between the MMS relay/server and the HLR by a new MAP procedure OBTAIN_IMEI_FROM_HLR,
- include an IMEI range look-up table in the MMS relay/server with all IMEI ranges uniquely determining relevant terminal parameters such as:
    - MMS capability,
    - WAP capability,
    - screen size,
    - memory size,
    - supported audio/video codecs.

For the MMS purpose outlined it would be sufficient to store only the Type Allocation Code (TAC) instead of the entire IMEI (or IMEI-SV).

Storage of the IMEI as part of the subscriber profile in the HLR would increase the average subscriber profile size and, as a consequence, may reduce the maximum number of subscribers to be served by an HLR. This effect is however marginal; the IMEI requires only 8 octets plus a field identifier, which is much less than the CAMEL subscription information.

4. Actions

- 3GPP SA1 to consider the above proposal and to decide accordingly,
- 3GPP TSG CN to develop corresponding CRs.