Technical Specification Group Services and System Aspects **TSGS#22(03)0763**
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Source: **Vodafone**
Title: **Early UE handling**
Document for: **Approval**
Agenda Item: **7.2.2**

1 Introduction

SA plenary has received an LS from SA 2 (in SP-030667) asking SA plenary to conclude on an open issue regarding the sending of UE Specific Behaviour Information on the A interface.

2 Proposal

Vodafone request that SA:

a) Considers the merit of sending UESBI-Iu on the A interface, and reaches a conclusion on the issue.

b) Identifies the relevant TSGs that should be involved in detailed technical study of the implications, and give them sufficient guidance in order to enable robust changes to the specifications impacted by it.

The information given below indicates a probable use case for "UESBI-Iu on the A interface". Additionally it indicates that it should be cheaper to develop MSCs to support both A and Iu interface than it will be to develop an MSC to only support Iu interface. It is noted that the BSC cost is zero until UESBI-Iu actually needs to be used.

3 Background Information

3.1 Current Situation

There are dual mode UMTS-GSM mobiles in the field, and, at least some operators are keen to dramatically increase the number of these devices. Some inter-operability testing of 3G to 2G handover has been performed. Very little testing of 2G to 3G handover has been performed. The availability of test cases is also limited.

Consequently, problems with 2G to 3G handover can be expected in "early UMTS" mobiles.

3.2 Likely problems

The specification of the neighbour cell lists in the SI 5 family of GSM messages is not simple. The history of GSM development shows that, in this area, problems can easily occur in the design of (any combination of) either the specification, the mobile, or the network (BSC and/or BTS).

The consequences of errors in this area are such that the information sent by the mobile in the Measurement Report messages may be mis-understood by the BSC;

For example:

- a mobile of Brand X might report that the "25th" cell (in the ordered list of neighbour cells) is a UMTS cell that is being received at a high "signal" strength (and hence the BSC might try to handover to it);
- while a Brand Y mobile might report the same cell as the "26th" cell in the list.

Whether this is a mobile or specification error will be irrelevant when large numbers of mobiles are in the field. If the BSC (from vendor A) does not know whether it is dealing with a brand X or a brand Y mobile, then the BSC has to choose to favour one mobile or the other. (However, with UESBI-Iu on the A interface, the BSC could treat both mobiles correctly.)

Imagine BSC-A uses software that favours brand X: then the Relocation Request message for the Brand X mobile will arrive at the correct RNC indicating the correct target cell (along with

UESBI-Iu information for Brand X). However, if the RNC (say from vendor B) favours Brand Y, then RNC-B will reject the handover attempt because it “believes Brand X is faulty”.

When BSC-A favours Brand-X, the Relocation Request message for the Brand Y mobiles will indicate the wrong target cell (and possibly wrong RNC). RNC-B will then format a “Handover to UTRAN command” that is doomed to failure.

In the absence of UESBI on the A interface, this problem is difficult to solve (eg it requires the target RNC to know what type/release/patches of software are in use on the serving BSC).

3.3 Single MSC development and testing cost

The GSM/UMTS architecture requires that Call Control and Mobility Management procedures are very similar (identical?) across both Iu and A interfaces. (Amongst other reasons, this is because handover should be able to happen immediately after encryption has been started).

Delivery of the UESBI-Iu to the Radio Access Network is simplified if the MSC does not have to consider whether the mobile is currently using an A interface or an Iu interface. Hence (for combined 2G/3G MSCs complying to the GSM/UMTS architecture) it must simplest and cheapest to add UESBI-Iu on both A and Iu interfaces and NOT just on the Iu interface.

If instead UESBI-Iu for the A interface is added in a later release, then 2 steps of MSC development have to be performed. In addition, 2 independent phases of MSC regression testing have to be performed. These extra costs provide no value to an operator.

BSC development is only needed when the UESBI-Iu needs to be used. Before that, the A interface “error handling” specifies that the BSC just ignores the extra information.