1. Introduction

Currently SFN-SFN observed time difference type 2 measurements are mandatory for the UE in CELL_DCH and CELL_FACH states. In Cell_PCH and URA_PCH states the support for these measurements is optional for R99 and Rel-4, but mandatory for Rel-5.

In RAN4#27/28 a number of CRs [1,2] have been proposed to set the performance requirements for positioning measurements in Cell_PCH and in URA_PCH as these are missing in the current specification in TS25.133. However RAN#4 has had difficulty in agreeing the performance limits due to concerns on accuracy requirement, measurement period, impact on standby time and re-selection performance [3] and so far has not been able to reach a conclusion.

Therefore before RAN4 can progress this work on SFN-SFN type 2 performance requirements it would be useful to seek guidance from RAN

2. Discussion

SFN-SFN observed time difference type 2 is used for UE positioning purposes to identify the relative time difference between two cells. In TS25.306 it is indicated that it is optional for the terminal to support the use of IDPL periods together with SFN-SFN type 2. The purpose of including (IDPL) idle periods in the downlink transmission is to improve the "hearability" at the UE of the signals from neighbouring base stations. In some instances where the UE is close to a base station, the measurement of transmissions of distant base stations will be masked by the transmissions of the local base station. This interference is reduced by introducing a series of short gaps in the downlink transmission during which all the signals transmitted by a base station are simultaneously shut down. Without the use of IPDL the performance of UE positioning based upon SFN-SFN type 2 measurements is degraded.

This mixed approach introduces the anomaly that a measurement that is mandatory in the UE is only really useful to the network if the UE also supports a particular optional feature. As we should avoid the specification containing mandatory features that are not useful in practice, it is proposed that the support for SFN-SFN type 2 should be made a UE capability. This option was voiced during discussion of the SFN-SFN type 2 performance requirements at the RAN4#28 meeting and was well received by a number of companies and so it is now proposed to the plenary for further discussion and decision since this would impact other working groups.

There are different ways in which the SFN-SFN type 2 measurements could be made a UE capability:

1. A new UE capability added to 25.306 and 25.331 so the UE could indicate the support for SFN-SFN type 2. This would mean that support for SFN-SFN type 2 would still be independent from IPDL. This approach would also require extensions to be added to various RRC messages.

2. The support for SFN-SFN type 2 could be linked to the existing UE capability indicating the support for IPDL. So the existing capability would indicate support for both SFN-SFN type 2 and IPDL. This would avoid the need to make any extensions to the RRC message.

3. Conclusion

This paper has proposed that the SFN-SFN type 2 measurements that is currently mandatory for the UE to support in CELL_DCH and CELL_FACH states should be made a UE capability. The preferred approach is to link the support of SFN-SFN type to the existing UE capability that indicates support for IPDL.

If agreement can be reached at this RAN TSG than Motorola would be happy to provide the appropriate CR(s) for approval.

4. References

[1] R4-021442, "Perfomance requirements for positioning in CELL_PCH and URA_PCH", Ericsson

[2] *R4-030388* ,Perfomance requirements for positioning in CELL_PCH and URA_PCH –Ericsson

[3] RP-010820, Comments UP positioning CR's in RP-010766, document R2-012755 –Nokia