TSG-RAN Meeting No. 16 ——— ***TSG*** ***RP-020453~~373~~***
4-7 June 2002, Marco Island, Florida, USA

Source: Cambridge Positioning Systems
Title: Proposed SI: "Enhancements to OTDOA Positioning using advanced blanking methods."
Contact: David Bartlett (david.bartlett@cursor-system.com)
Agenda: 8.10
Document for: Approval

Study Item Description

Title

Enhancements to OTDOA Positioning using advanced blanking methods

1 3GPP Work Area

X	Radio Access
	Core Network
	Services

2 Linked work items

None.

3 Justification

Currently OTDOA and optionally IPDL are the supported OTD (Observed Time Difference) methods for UE positioning. The use of CDMA in the RAN introduces the problem of hearability, whereby a UE is unable to measure a distant Node B due to interference from a nearby Node B. To compute a position it is necessary to receive and measure signals from at least 3 geographically distinct Node Bs, although in practise it is necessary to receive many more than this if reliable and robust positioning is to be achieved in the presence of multipath.

Location Based Services are gaining momentum spurred on by requirements such as the FCC's E-911 directive. Phase 2 of this directive requires the UE to be located within 50m 67% of the time and within 150m 95% of the time. Any UE positioning technology adopted by RAN will need to meet this accuracy requirement.

IPDL was introduced to RAN in 1999 and the work on standardising it is now nearing completion. Several documents analysing the performance of IPDL have been presented to RAN4 recently. These indicate that it is probably able to meet the E-911 requirements, although it is likely to be some time before supporting field test results are available to verify its performance. Since IPDL's introduction three years ago considerable experience with the performance on E-OTD for GSM has been gathered and new Observed Time Difference techniques and methods have been developed.

In particular new software based approaches using interference cancellation algorithms have emerged. These promise much better performance than traditional IPDL without the need to physically blank the downlink transmission. Being based on software signal processing methods they enable multiple Node Bs to be "blanked" and this results in a dramatic improvement to the positioning accuracy and robustness.

These methods should be studied as they have the following main benefits:-

- Improved performance, compliant with E-911 phase 2,
- No effect upon existing or legacy UEs, or downlink capacity

- Algorithmic enhancements can be made in the network without affecting already deployed UEs.

4 Objective

The objectives of this Study Item are as follows:

- To evaluate the performance of new interference cancellation techniques in comparison to IPDL for UE positioning using downlink OTDOA methods,
- To identify the requirements and format of measurements that would be needed to support these algorithms, specifically avoiding specifying one particular algorithm,
- To identify signalling requirements and message formats.

5 Service Aspects

None

6 MMI-Aspects

None

7 Charging Aspects

None

8 Security Aspects

None

9 Impacts

Affects:	USIM	ME	AN	CN	Others
Yes		X	X		
No	X			X	
Don't know					X

Note: Impact on the UE is only in so far as a UE implementing the methods will require support for the new measurements and signalling. UEs that do not implement the proposed methods are expected to be completely unaffected, irrespective of whether the network supports the methods or not.

10 Expected Output and Time scale (to be updated at each plenary)

New Technical Reports						
Spec No.	Title	Prime rsp. WG	2ndary rsp. WG(s)	Presented for information at plenary#	Approved at plenary#	Comments
TR	Enhancements to OTDOA positioning using advanced blanking techniques.	2	1	18	19	

Affected existing specifications				
Spec No.	CR	Subject	Approved at plenary#	Comments

11 Work item rapporteurs

David Bartlett, Cambridge Positioning Systems.

12 Work item leadership

TSG RAN WG2 supported by WG1
Review by WG3 and WG4.

13 Supporting Companies

Cambridge Positioning Systems, Cingular Wireless LLC, Hutchison 3G, TTPCom

14 Classification of the WI (if known)

	Feature (go to 14a)
X	Building Block (go to 14b)
	Work Task (go to 14c)

14b The WI is a Building Block: parent Feature

WI 35, UE Positioning Enhancements.