3GPP TSG-RA Meeting #17 ***Tdoc RP-020503***
Biarritz, France, 03-06 Septembre 2002

Source: Alcatel

Title: WID about Satellite based broadcast layer using UTRA FDD W-CDMA technology

Agenda item: **8.8**

Document for: APPROVAL

Work Item Description

Title

Analysis of the feasibility of a satellite based broadcast layer using UTRA FDD W-CDMA technology to complement UTRAN.

1 3GPP Work Area

X	Radio Access
	Core Network
	Services

2 Linked work items

?? Multimedia Broadcast/Multicast Service Architecture (SA)
?? Enhancement of broadcast and introduction of Multicast Capabilities in RAN
?? MBMS stage 1, 2545 (SA1)
?? MBMS stage 2, 32002 (SA2)
?? Introduction of MBMS in RAN, 2481
?? Support of MBMS in CN protocols, 11030

3 Justification

The Third Generation Partnership Project (3GPP) as part of release 6, is defining broadcast and multicast modes to optimise radio /network resources usage [3GPP TS 22.146]. Current studies have highlighted the complexity of providing multicast and broadcast services by relying solely on terrestrial network resources. Due to mobile network cellular topology, one-to-many services put high constraints on the radio access network for large and scattered targeted audience.

Adding a broadcast layer using dedicated resources provides high data rate capability associated to high Quality of Service and overcome issues such as mobility management, random cell loading conditions, multi radio access network capability (GERAN, UTRAN), data rate limitation.

Satellite technology provide outstanding broadcast and multicast capabilities, wide area coverage with minimum investment, robustness towards natural or man made disaster.

We propose in this work item to investigate the use of a satellite-based broadcast layer for the 3G mobile network to complement the terrestrial mobile network infrastructure and optimise MBMS service delivery to end-users.
To minimise modifications on 3GPP standardised handsets, this satellite-based broadcast layer makes use of:

?? 3GPP standardised UTRA FDD W-CDMA technology
?? IMT-2000 bands allocated to Mobile Satellite Systems (MSS) which are adjacent to the IMT-2000 bands allocated to terrestrial component.
?? High power geo-stationary satellites broadcasting over a large area

This satellite-based broadcast layer transmits additional unidirectional downlink UTRA FDD W-CDMA carriers. It can be used to provide cost effective multimedia service delivery to a large audience scattered over a wide area.

A feasibility study of using the UTRA FDD W-CDMA technology in mobile satellite system is currently performed in the ETSI Technical Committee Satellite Earth stations and Systems , see the liaison statement from ETSI TC SES entitled "Evaluation of the W-CDMA UTRA FDD as a satellite radio interface" (**RP-020464)** submitted to RAN#17. It is based on results from on going ETSI S-UMTS Work Items

?? **Work Item DTR/SES-00078 :**
Scope and Field of Application : Evaluation of the possibility to use the W-CDMA UTRA FDD as a Satellite Radio Interface according to the procedures defined by ITU-R in the recommendations M.1455 and M.1225.
Title : ETSI TR 102 058 - Satellite Earth Stations and Systems (SES); Satellite Component of UMTS/IMT-2000; Evaluation of the W CDMA UTRA FDD as a Satellite Radio Interface

?? **Work Item DTR/SES-00079** :
Scope and Field of Application : Elaboration of the System Reference Document for the Satellite Digital Multimedia Broadcasting
Title : ETSI TR 102 059 / Satellite Earth Stations and Systems (SES); Satellite Component of UMTS/IMT-2000; Satellite- Digital; Multimedia Broadcasting System Reference Document

This satellite based broadcast layer is currently studied within IST Satin project, IST MoDiS project (www.ist-modis.org) funded by the European Commission as well as the Advanced Mobile Satellite Studies funded by the European Space Agency.
This satellite based broadcast layer is one of the main fields of investigation of the Advanced Satellite Mobile System Task Force (www.cordis.lu/ist/ka4/mobile/proclu/c/satcom/satcom.htm)

4 Objective

The objective is to provide elements to assess the feasibility of a satellite based broadcast layer using UTRA FDD W-CDMA technology. These elements will be used in the WID that will be submitted in SA#17 (Analysis of the feasibility of a satellite based broadcast layer using UTRA FDD W-CDMA technology see tdoc SP-020440) following a recommendation of MBMS SWG meeting held in Rome on the 10th of July 2002, see tdoc S1-021614.

It will identify the possible impacts on UTRAN architecture and protocols to introduce this satellite based broadcast layer that will co-operate with UTRAN to support multimedia broadcast/multicast services

The following list provides examples of areas that may be considered in the work item

?? Definition of co-operation scenarios with UTRAN
?? Identification of the impacts on user equipment
?? Identification of the impacts on UTRAN functions and protocols used for the satellite based broadcast

The output of the work item will be a Technical Report containing an analysis of the impacts on the release 6 of UTRAN architecture and potential benefits of introducing satellite based

broadcast/multicast layer in the UTRAN architecture, and proposed modifications to the release 6 of 3GPP RAN & T documents.

The proposed time plan is outlined below. It should be copied into, and maintained within, the 3GPP Work Plan.

Task	Planned Start	Planned Finish
Work Item Revision	Sept 2002	Dec 2002
Work Item Approval		Dec 2002
Drafting and discussion to produce the TR and possible contributions to MBMS documents if relevant	January 2002	June 2003
Submission to TSG RA for approval of TR		June 2003
Possible remaining corrections and clarifications	July 2003	Sept 2003

5 Service Aspects

see MBMS WID in SA

6 MMI-Aspects

see MBMS WID in SA

7 Charging Aspects

see MBMS WID in SA

8 Security Aspects

see MBMS WID in SA

9 Radio interface Aspects

It shall reuse features defined in UTRA FDD WCDMA radio interface.

10 Impacts

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

Note that the impacts on the User Equipment are expected to be small.

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

New specifications						
Spec No.	Title	Prime rsp. WG	2ndary rsp. WG(s)	Presented for information at plenary#	Approved at plenary#	Comments
TR25.9xy	Satellite based broadcast layer radio access	R2	R3, R1	R# 19(Mar 2003)	R#20 (June 2003)	TR will identify the radio access constraints and architecture and which TSs may be impacted

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

11 Work item rapporteurs

Béatrice Martin, Alcatel
beatrice.martin@space.alcatel.fr

12 Work item leadership

RAN2

13 Supporting Companies

Alcatel, Agilent Technologies, Daimler-Chrysler, Centre for Communications Systems Research University of Surrey

14 Classification of the WI (if known)

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

14a The WI is a Feature: List of building blocks under this feature

(list of Work Items identified as building blocks)

14b The WI is a Building Block: parent Feature

(one Work Item identified as a feature)

14c The WI is a Work Task: parent Building Block

(one Work Item identified as a building block)