3GPP TSG-SA Meeting #17 ***Tdoc SP-020440***
Biarritz, France, 09-12 Septembre 2002

Source: Alcatel

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

Agenda item: **New work items**

Document for: APPROVAL

Work Item Description

Title

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

1 3GPP Work Area

X	Radio Access
X	Core Network
X	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

- Push
- Packet Switched Streaming

3 Justification

This WID is introduced following a conclusion of MBMS SWG meeting held in Rome on the 10th of July 2002, see tdoc S1-021614.

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 (http://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 (http://www.cordis.lu/ist/ka4/mobile/proclu/c/satcom/satcom.htm)

4 Objective

The objective of this Work Item is to identify the impacts on the current 3GPP architecture and protocols to integrate this satellite based broadcast layer.

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

- Support for multimedia broadcast/multicast, push and streaming services
- Impact on Architecture and protocols for a smooth integration of this satellite-based layer enabling co-operation of satellite broadcast layer with UTRAN and possibly GERAN
- Identification of required modification to user equipment, and possibly UTRAN and Core Network elements. This includes functions as well as signalling.
- Liaising with ETSI TC SES S-UMTS/IMT-2000

The output of the work item will be a Technical Report containing proposed modifications to the 3GPP release 6 architecture and potential benefits of introducing satellite based broadcast/multicast layer in the 3GPP release 6 architecture.

The proposed time plan is outlined below. It should be integrated 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, PUSH and STREAMING documents if relevant	January 2002	June 2003
Submission to TSG SA for approval of TR		June 2003
Possible remaining corrections and clarifications	July 2003	Sept 2003

5 Service Aspects

This satellite based broadcast layer shall be able to support Multimedia broadcast/multicast service, Push and Streaming service in a seamless manner from the end-user point of view. This layer will be used mainly by "pay to receive" services for which subscription is required. It can also be used by "free to air" services including for example public alert in the scope of emergency telecommunication services.
It shall enable operators to distribute heavy multimedia content to a large audience of end-user in a cost efficient manner.

6 MMI-Aspects

As yet, none identified since it shall re-use features defined for MBMS, Push or Streaming

7 Charging Aspects

As yet, none identified since it shall re-use features defined for MBMS, Push or Streaming

8 Security Aspects

As yet, none identified since it shall re-use features defined for MBMS, Push or Streaming

9 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
TR23.9xy	Satellite based broadcast layer integration in 3GPP Architecture	SA1	SA2, SA3	SA# 19(Mar 2003)	SA#20 (June 2003)	TR will identify the architecture and which TSs may be impacted

Affected existing specifications				
Spec No.	CR	Subject	Approved at plenary#	Comments
22.146		Multimedia Broadcast Multicast Service stage 1	SA#14	Some modifications to this TS may be proposed to allow certain MBMS to be delivered by the satellite based broadcast/multicast layer
23.846		Multimedia Broadcast Multicast Service stage 2	-	Depending on the architecture selected, modifications may be required
22.174		Push service		Impacts to be analysed

11 Work item raporteurs

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12 Work item leadership

SA1

13 Supporting Companies

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

14 Classification of the WI (if known)

	Feature (go to 14a)
	Building Block (go to 14b)
X	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)