TSG SA Meeting #26 SP-040915
Athens, Greece, December 2004

Agenda Item: 8.2.1

Source: **TSG RAN (RP-040431)**

Title: **Approved Study Item on Evolved UTRA and UTRAN**
Document for: **Information**

In the RAN Future Evolution Workshop, many of the presentations pointed out the need of 3G long-term evolution to meet the future demand and to maintain its competitive position for coming decades. Several interesting new technology components such as OFDM with a flexible and broader RF bandwidth were presented as potential candidates for the evolution. It was pointed out such a technology enhancement should be applied to UTRAN architecture as well as the UTRA radio interface.
It is proposed that 3GPP should initiate the feasibility study of the long-term evolution accounting for the above situation. In this paper, a Study Item Description is presented for this study.

Concerning the time plan, we propose to complete the feasibility study by June 2006 and envisage all relevant core specifications by June 2007.

Study Item Description

Title: Evolved UTRA and UTRAN

1 3GPP Work Area

X	Radio Access
	Core Network
	Services

2 Linked work items

All-IP Network (AIPN) Feasibility Study

3 Justification

With enhancements such as HSDPA and Enhanced Uplink, the 3GPP radio-access technology will be highly competitive for several years. However, to ensure competitiveness in an even longer time frame, i.e. for the next 10 years and beyond, a long-term evolution of the 3GPP radio-access technology needs to be considered. Important parts of such a long-term evolution include reduced latency, higher user data rates, improved system capacity and coverage, and reduced cost for the operator. In order to achieve this, an evolution of the radio interface as well as the radio network architecture should be considered.
Considering a desire for even higher data rates and also taking into account future additional 3G spectrum allocations the long-term 3GPP evolution should include an evolution towards support for wider transmission bandwidth than 5 MHz. At the same time, support for transmission bandwidths of 5MHz and less than 5MHz should be investigated in order to allow for more flexibility in whichever frequency bands the system may be deployed in.

4 Objective

The objective of this study item is to develop a framework for the evolution of the 3GPP radio-access technology towards a high-data-rate, low-latency and packet-optimized radio-access technology. Thus the study should focus on supporting services provided from the PS-domain. In order to achieve this, studies should be carried out in at least the following areas:

- Related to the radio-interface physical layer (downlink and uplink):
  - e.g. means to support flexible transmission bandwidth up to 20 MHz, introduction of new transmission schemes and advanced multi-antenna technologies
- Related to the radio interface layer 2 and 3:
  - e.g. signaling optimization
- Related to the UTRAN architecture:
  - identify the most optimum UTRAN network architecture and functional split between RAN network nodes, not precluding considerations on the functional

split between UTRAN and CN (SA2 experts should be invited to the latter topic)
- RF-related issues

The targets for the evolution of the radio-interface and radio-access network architecture should be:
- Significantly increased peak data rate e.g. 100 Mbps (downlink) and 50 Mbps (uplink)
- Increase "cell edge bitrate" whilst maintaining same site locations as deployed today
- Significantly improved spectrum efficiency (e.g. 2-4 x Rel6)
- Possibility for a Radio-access network latency (user-plane UE – RNC (or corresponding node above Node B) - UE) below 10 ms
- Significantly reduced C-plane latency (e.g. including the possibility to exchange user-plane data starting from camped-state with a transition time of less than 100 ms (excluding downlink paging delay))
- Scaleable bandwidth
  - 5, 10, 20 and possibly 15 MHz
  - [1.25,] 2.5 MHz: to allow flexibility in narrow spectral allocations where the system may be deployed
- Support for inter-working with existing 3G systems and non-3GPP specified systems
- Further enhanced MBMS
- Reduced CAPEX and OPEX including backhaul
- Cost effective migration from Rel-6 UTRA radio interface and architecture
- Reasonable system and terminal complexity, cost, and power consumption.
- Support of further enhanced IMS and core network
- Backwards compatibility is highly desirable, but the trade off versus performance and/or capability enhancements should be carefully considered.
- Efficient support of the various types of services, especially from the PS domain (e.g. Voice over IP, Presence)
- System should be optimized for low mobile speed but also support high mobile speed
- Operation in paired and unpaired spectrum should not be precluded
- Possibility for simplified co-existence between operators in adjacent bands as well as cross-border co-existence

5 Service Aspects

The result will enhance the capabilities of UTRA and UTRAN, enabling more advanced services. No direct study of particular services will be done.

6 MMI-Aspects

None

7 Charging Aspects

None

8 Security Aspects

The study will have to consider security aspects during the course of the work. However, security algorithms will not be studied.

9 Impacts

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

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 endorsement at plenary#	Approved at plenary#	Comments
25.xxx				RAN#31	RAN#32	Technical Report
						Technical Report
						Technical Report

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

11 Study item raporteurs

Takehiro Nakamura (NTT DoCoMo)
(vice rapporteur) Don Zelmar (Cingular)

12 Work item leadership

WG1, WG2, WG3 and WG4

13 Supporting Companies

Alcatel, Cingular, CMCC, Ericsson, Fujitsu, LG Electronics, Huawei, Lucent Technologies, Mitsubishi Electric, Motorola, NEC, Nokia, Nortel Networks, NTT DoCoMo, Orange, Panasonic, Philips, Qualcomm Europe, Samsung, Sharp, Siemens, Telecom Italia, Telefonica, TeliaSonera, T-Mobile, Vodafone

14 Classification of the WI (if known)

	Feature (go to 14a)
	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)