TSG-RAN meeting #27 **RP-050155**
Tokyo, Japan 9th – 11th March 2005

Agenda Item: **9.10.1**
Source: **Rapporteur**
Title: **Agreed Text Proposals for the Requirement TR**
Document for: **Information**

Introduction

In the RAN Long-Term Evolution meeting, text proposals for the requirement TR are discussed and some of them are agreed as a first step to fix the requirements by the next RAN LTE meeting. This document summarises agreed text proposals for items listed on the SID as targets. These text proposals will be included in the skeleton TR by the Rapporteur and the TR will be sent to the e-mail reflector to progress the document.

1 Supporting services provided from the PS-domain.

(No discussion)

2 Significantly increased peak data rate e.g. 100 Mbps (downlink) and 50 Mbps (uplink)

EUTRA should support significantly increased peak data rates e.g. 100 Mbps (downlink) and 50 Mbps (uplink). The supported peak data peak rate should scale according to the UE capability, which may specify support for parameters such as bandwidth mode, number of transmit and receive antennas (and hence spatial sub-channels for MIMO-based links), supported modulation type etc.
The targets for downlink (DL) and uplink (UL) link peak data rates are specified in terms of a reference UE configuration comprising:

a) *Downlink capability – 2 receive antennas with support for 16-QAM*
b) *Uplink capability – 1 transmit antenna with support for 16-QAM*

For this baseline configuration, the system should support a peak data rate of 5b/s/Hz on the downlink and 2.5b/s/Hz on the uplink. This translates into a peak data rate of 100Mb/s on the downlink and 50Mb/s on the uplink within a 20MHz bandwidth.

The baseline UE can support at least two RX antennas for multi-stream MIMO reception

Evolved UTRAN specifications is expected to support for more than one TX antennas in both uplink and downlink direction but the use of single antenna TX for both uplink and downlink shall be also supported.

3 Increase “cell edge bitrate” whilst maintaining same site locations as deployed today

Downlink

User throughput at the 5 % point of the C.D.F., 3 to 4 times Release 6 HSDPA deployed with single Tx and Rx antennas and improved receiver performance type 2.

Averaged user throughput, 3 times Release 6 HSDPA deployed with single Tx and Rx antennas and Frequency Domain Equalizer.

Both should be achievable by the evolved UTRAN using a maximum of 2 Tx and 2 Rx antennas.”

Uplink

User throughput at the 5 % point of the C.D.F., 2 to 4 times Release 6 HSUPA deployed with 1 Tx and Rx diversity.

Averaged user throughput, 2 to 3 Release 6 HSUPA deployed with 1 Tx and Rx diversity.

Both should be achievable by the evolved UTRAN using a maximum of 1 Tx and 2 Rx antennas. Greater user throughput should be achievable using multiple Tx antennas”

4 Significantly improved spectrum efficiency (e.g. 2-4 x Rel6)

EUTRA should deliver significantly improved spectrum efficiency (e.g. 2-4x Rel6) and increased cell edge bit rate whilst maintaining the same site locations as deployed today.
Spectrum efficiency needs to be significantly increased as followings:

Downlink

In a loaded network, spectrum efficiency (bits/sec/Hz/site), 3 to 4 times Release 6 HSDPA with single Tx and Rx antennas improved receiver performance type 2. This should be achievable by the evolved UTRAN using a maximum of 2 Tx and 2 Rx antennas.

Uplink

In a loaded network, spectrum efficiency (bits/sec/Hz/site), 2 to 3 times Release 6 HSUPA with Receive diversity. This should be achievable by the evolved UTRAN using a maximum of 1 Tx and 2Rx antennas."

For initial guidance, a reference system deployment is given in Table Y, although a fully-specified deployment model is FFS and will be captured in the Study Item simulation assumptions.

Deployment Attribute	***Units***	***Value (Range)***
Cell Radius (Typical)	*M*	*500-1000*
RMS Delay Spread (Typical) for Unicast	*s*	*0.3-3*

Table Y – Reference system deployment topology

5 Possibility for a Radio-access network latency (user-plane UE – RNC (or corresponding node above Node B) - UE) below 10 ms

(Discussed but no agreement)

6 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))

(Keep sentences as it is the SID, i.e.)

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))

7 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**

Scalable bandwidths of 1.25, 2.5, 5, 10, 15, 20 MHz bandwidth are required.

Scalable bandwidth is needed for flexible spectrum deployment purposes.

Due to UE complexity considerations, it may be appropriate to consider that certain frequency bands might not require that all the channel bandwidths be supported, particularly the lowest and highest channel bandwidth choices. The mandatory supported channel bandwidth for all UEs should be similarly determined in conjunction with the consideration of use of channel bandwidth based on frequency bands.

This would be assessed in the study item phase and then appropriately specified in the work item phase.

UL and DL operating bandwidths may be different.

8 Support for inter-working with existing 3G systems and non-3GPP specified systems

(Discussed but no aqgreement)

9 Further enhanced MBMS

EUTRA systems should support enhanced MBMS modes compared to UTRA operation. In pursuit of this, the following spectral efficiency requirement should be targeted when operating according to the following exemplary system-wide broadcast example:

at [x]% coverage, at a frame error rate (FER) of [y]%, the target MBMS spectral efficiency is in the range [a-b]bps/Hz, representing an improvement of approximately [c] to [d] times that of Release-6 MBMS systems..

Further requirements applicable to MBMS systems are:

As for the unicast case, EUTRA should be capable of achieving the target performance levels when operating from the same site locations as existing UTRA systems.

EUTRA should provide enhanced support for MBMS services. Specifically, EUTRA support for MBMS should take the following requirements into account:

a) ***Physical Layer Component Re-use*** *– in order to reduce EUTRA terminal complexity, the same fundamental modulation, coding and multiple access approaches used for unicast operation should apply to MBMS services, and the same UE bandwidth mode set supported for unicast operation should be applicable to MBMS operation.*
b) ***Voice and MBMS*** *– the EUTRA approach to MBMS should permit simultaneous, tightly integrated and efficient provisioning of voice and MBMS services to the user.*
c) ***Unpaired MBMS Operation*** *– the deployment of EUTRA carriers bearing MBMS services in unpaired spectrum arrangements should be supported*

10 Reduced CAPEX and OPEX including backhaul

(Regarding three requirements, 10, 11 and 12, the rapporteur will propose text to merge them into a generic cost-related requirement.)

11 Cost effective migration from Rel-6 UTRA radio interface and architecture

(Regarding three requirements, 10, 11 and 12, the rapporteur will propose text to merge them into a generic cost-related requirement.)

12 Reasonable system and terminal complexity, cost, and power consumption

(Regarding three requirements, 10, 11 and 12, the rapporteur will propose text to merge them into a generic cost-related requirement. Starting point for UE output power behaviour is fully specified UE output power classes (21 and 24 dBm).)

13 Support of further enhanced IMS and core network

(No discussion)

14 Backwards compatibility is highly desirable, but the trade off versus performance and/or capability enhancements should be carefully considered.

(No discussion)

15 Efficient support of the various types of services, especially from the PS domain (e.g. Voice over IP, Presence)

(No discussion)

16 System should be optimized for low mobile speed but also support high mobile speed

(No discussion)

17 Operation in paired and unpaired spectrum should not be precluded

(No discussion)

18 Possibility for simplified co-existence between operators in adjacent bands as well as cross-border co-existence

(No discussion)