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Studies carried out in the context of LTE/SAE architecture

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Abstract:

This report summarizes the studies carried out in AROMA concerning QoS and mobility management for the mobile transport network in the context of LTE/SAE-based architectures. In particular, it is assumed that the QoS model in the mobile transport network is based on the diffServ architecture extended with the Bandwidth Broker (BB) functionality for resource control and the mobility management combines IP mobility with the label switching path functionality provided by MPLS.

Keyword list: LTE/SAE architecture, QoS evaluation; Bnadwidth Broker, MPLS, DiffServ.

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1 INTRODUCTION

The AROMA project aims at providing tangible contributions, in terms of resource management, for the future all IP heterogeneous wireless systems, which will take into account 2G /2.5/3G (e.g. GERAN, UTRAN) and 3.5G networks (e.g. HSDPA), including the newly emerging RAN technologies (e.g. WLAN , WIMAX) and services for the 2010-2015 time frame. In that context, the reference QoS architecture envisaged in the project is aligned with the 3GPP R6 Network Architecture standards.

However, being the migration of the Transport Network Layer (TNL) to an All-IP architecture one of the issues addressed in the project, it could be interesting to study the performances of this new TNL configuration in the context of a more advanced QoS architecture such as the envisaged in the LTE/SAE concept of the 3GPP. Then, this document identifies the topics studied under the assumption of the LTE/SAE architecture and summarizes the main obtained results.

It is not worthless to mention here that all the concepts and results presented in this document were previously reported in deliverables D05, D09, D12 and D18.

The document is structured in five sections. After this short introduction, in section 2 and 3 the document summarizes the most relevant characteristic of the 3GPP reference network architecture, in the context of the topics addressed by the AROMA project, as well as the long-term vision for the reference architecture proposed in AROMA respectively. The aim of this part is to present and capture the major trends in network evolution coming from 3GPP SAE/LTE, previously described in section 3 of deliverable D05 and section 2.2 of deliverable D18. From these studies, three major key drivers were identified for the envisaged AROMA E2E QoS approach in the context of long-term network architecture. These key drivers are:

- Multicell Radio Resource management for evolved Node B
- Radio and IP transport coordination
- IETF IP solutions for mobility

The first topic was not addressed in the project because at the time of proposing and developing AROMA, the envisaged evolved radio access technologies were still under development in 3GPP forum. As a result AROMA was mainly concentrated in GERAN, UTRAN; WLAN and WIMAX radio access technologies.

In relation to the Radio and IP transport coordination, a new framework called CARM (Coordinated Access Resource Management) was developed in the AROMA project. However, this new concept could be applied at both R6 and LTE/SAE architectures, and AROMA selected to concentrate the CARM studies by assuming R6 network architecture in order to provide results at medium-term, due to the STREP nature of the project. Details on the studies carried out in the CARM framework can be found in section 3 of deliverable D18.

The IETF IP solutions for mobility in the context of LTE/SAE were addressed in AROMA by King's College London (KCL), and the proposed solutions are reported in section 4 of this document, which describes the considered framework concerning QoS and mobility management for the mobile transport network and summarises the studies carried out in the context of the LTE/SAE-based architectures. These results were previously reported in section 7 of the deliverable D18.

Finally, section 5 synthesizes the main conclusions extracted from the studies carried.

