6 Conclusion

In this work, we propose a mobility architecture called Global Mobility Architecture (GMA) which uses a new mobility signaling protocol known as GMA Mobility Protocol (GMP). The proposed architecture has several advantages when compared to the traditional IP mobility protocols: (i) simplification of the signaling protocol on the MN; (ii) optimization of the binding update procedure; (iii) optimization of the registering procedure; and (iv) optimization of the L3 handover.

The simplification of the signaling protocol on the MN reduces the signaling messages implemented by the MN. This leads to a lower risk related to errors caused by wrong signaling and security attacks performed to damage the network operation originated by MNs. The core signaling is performed by the network entities, so, the priority of these messages could be increased to enhance the overall performance of the GMP with lower risk to the system.

Unlike MIP, HMIP and FMIP, the binding update procedure of the GMA is executed by the network functional entities on behalf of the MN during the L2 handover. So, the MN does not have to perform additional tasks after the L2 handover, such as the return routability procedure, to restore the communication with the CN. There is a secure relationship established between the network functional entities as a requisite to their operation at the GMA. Hence, the binding update procedure that takes place at the GMA has a lower overhead than the same procedure usually has in other protocols.

The registering procedure of the GMA does not impact on the MN communication after the handover. The AR of the GAN is usually informed about the future presence of the MN (handover context) by its LRS prior to the arrival of the

MN (anticipated mode of operation). The registering procedure of the MN at the new GAN is also performed by the network entities on behalf of the MN and in parallel to the L2-handover.

To optimize the L3 handover process, the network prefix of the access network is constant and there is no need to discover it. Therefore, the handover signaling of the MN is reduced to just sending one message before the L2-Down trigger is fired. All other signaling necessary to transfer the handover context of the MN to the AR of the new GAN and to begin the packet forwarding from the AR of the old GAN to the AR of the new GAN is performed by the network functional entities. These operations are performed in parallel with L2 handover of the MN and maximize the chance of a successful seamless handover.

The performance evaluations have justified the benefits of the proposed mobility architecture and the result analysis demonstrated that the advantages are significantly important.

In the future, we plan to implement the architecture and its mobility signaling protocol in order to measure the performance in a real system. We will also study the performance of the GMA in respect to the maintenance of the Quality of Service (QoS) requirements of the applications while the mobile node moves through different networks with different traffic conditions. Finally, we need to investigate issues related to the scalability of our architecture. For now, we believe that scalability issues are well addressed by elevating the priority of the N2N signaling messages.