

Optimal Platform to Develop Features for Ad Hoc Extension of 4G Mobile Networks

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3G mobile telecommunication systems have been presented nowadays. Main attribute of them is the usability of reasonable bandwidth, which is sufficient for multimedia applications. Conception of mobile internet has reached the palpable realization. Evolution of it is unstoppable. On the field of mobile communication the bottle-neck of the relatively constant but not unlimited bandwidth will give stimulation to the application-developers to produce always more efficient applications at least till 2010, when fourth generation mobile systems will be able to ensure extremely big bandwidth. According to the plan of Ericsson [1] by 2011 the mobile connection will be equal to an Internet access of 100 Mbps.

Anatomizing the 4G mobile systems by developing parameters it will be a complete network if set of features are realized like below [2]:

- Majority of people can access to voice- or data-based services what are provided by mobile networks (This requires efficient resource-management, for example usage of ad hoc extension in wireless systems).
- The mobile network is able to attach to Internet fully because of basic concept of it (In this way IP based technologies would be used through mobile network (e.g. VoIP, Voice over IP)).
- Problem of virtual private networks is worked out their security and data-protection is warrantable (Security and authentication technology are improved well).
- The network is able to realign itself (It manage several type backbone and it use the best one, it means adaptation).
- The system is able to keep on QoS parameters (Quality of Service).

There are four technical trends from the current trends what are reckoned among pioneers in this moment but they have well-grounded concepts. They are: managing ad hoc networks, content provision and agents, software radio and virtual private networks.

We deal with topic of ad hoc mobile networks by stressed attention. Ad hoc mobile network is one type of communication systems, where central infrastructures (base stations and central database) are not built up. In this case, the mobile terminals use the each other to reach distant ones by transmitting radio signals. Most important is to develop the suitable routing algorithm. Using this routing algorithm, the mobile nodes of the network can find out their locations and neighborhoods, so they become to be able to hand on data packets by radio channel.

Purpose of our research is developing a scalable ad hoc routing protocol, which works with acceptable performance in different topology situations. This development is done in OmNet++ discrete event simulation environment [3]. We had to develop our ad hoc extension for this simulator program. During the presentation we introduce the simulator, our ad hoc extension and developing phases of our own routing protocols. Finally we show a method for estimating the resource requirements of ad hoc routing algorithms in mobile terminals.

Keywords: Simulator, OMNET++, Resource Estimation, Ad Hoc Networks

References

- [1] "Ericsson plans for 4th generation mobile system" ,
<http://arabia.com/article/0,1690,Business%7C30215,00.html>
- [2] János Horváth Cz., Dr. Sándor Imre. "Examination of the Viability of Fourth Generation Mobile Networks", 3GIS, Athen , June 2001
- [3] <http://www.hit.bme.hu/phd/vargaa/omnetpp/>