

# Cost effective fourth generation network for small and medium enterprises

Tsvetan V. Filev<sup>1</sup>

**Abstract** – In the current paper an approach will be presented for design of cost effective fourth generation network based on existing standards and software. The network propose number of services like multimedia, corporative services access: email, ERP, CRM, groupware, and also phone conversations between users. The used technologies are WiFi, skype and DHCP.

**Keywords** – WiFi, 4G, skype, small medium enterprises.

## I. INTRODUCTION

Working networks from this kind are extremely suitable for covering the area of different buildings of small and medium enterprises, universities, government institutions, schools etc. They allow authorized or unauthorized users to use free of charge conversations, email access, corporate web sites, groupware or web pages.

The construction is very easy and is accomplished by the use of existing software and hardware tools.

## II. REVIEW OF DIFFERENT MOBILE TECHNOLOGIES – EVOLUTION

1G – Wireless technologies from this kind appear in the beginning of the 70's of the previous century. As a whole they propose low mobility that concerns both coverage and speed of movement, low power, and two way wireless voice communications. The modulations and the process of signals are absolutely analog and frequency division is used to divide the channels so the users can be distinguished.

The speed of data transmission is extremely low and inappropriate for modern digital technologies including the internet

2G – The analog technology acquire great popularity and is wide spread fast and evolutes after few unsuccessful attempts into digital. In a result in Europe GSM system appears – Global Standard for Mobile, which uses GMSK – Gaussian Minimum Shift Keying.

In north America the analog is IS-54. In Japan PDC – Personal Digital Cellular shows up. The technologies are fully digital and even though the frequency band is very low to be applied to fast advancing existing digital technologies and computer wired networks and the services they offer.

3G – The great success of digital networks for connection leads to the appearance of the networks from third generation, which employs wideband modulation or CDMA – Code Division Multiple Access. This fully digital network offers

high mobility, all current services as voice transfer, messages exchange as data exchange, video and files, internet connection etc.

4G – These networks are still experimental and because of the fact that there are no good expressed standards and also frequency resources. However there are multiple designs which allow to be adopted in small and medium enterprises with the aim to decrease expenses and increase communication abilities. The networks are built with the help of base stations covering one premises, floor or building.

## III. REVIEW OF THE EXISTING WORKING PROTOCOLS

TCP/IP – This is a protocol designed exclusively for packet oriented networks like the Internet. It allows the construction of virtual sessions between separate users as every each one of them has its address called IP. The protocol allows statically and dynamically to point the separate packets between users and numerous of other operations.

DHCP – This is a protocol for dynamic assignment of the settings of a given network users. It allows dynamically or previously defined to allocate network addressess. For this purpose software is attention which works on centralized server. The settings can be assigned only for certain hardware devices which brings security in the network.

Routing, QoS, masquerade – The routing is a process of directing the packets to their proper destination. It can be statically predefined or dynamically, as it changes in working progress. QoS or Quality of Service is a service performed by the routers aimed to give priority of certain services like voice or text messages. Masquerading aims the translation of one real address to internal not real address to extend the network and for security.

WiFi – This is a wireless protocol on the IEEE 802.11g standard. It allows the construction of so called WLAN which mimics network from fourth generation. The protocol exploits widespread modulation and the last designs allow coverage of 100 meters with non directional antennas.

Therefore a floor or a building could be covered very easy with two or even one wireless access point.

## IV. REVIEW OF THE EXISTING SOFTWARE

Linux – The operating system Linux is born in the beginning of nineties of the last century. It very fast gains popularity and transforms to whole area of the software. It inherits the functionality of the UNIX systems and simplicity and the readiness of Windows.

In practice on this platform can work every kind of software including one written for other systems. The open

<sup>1</sup>Tsvetan V. Filev is with the Faculty of Computer Systems and Control, Technical University, Kliment Ohridski 8, 1000, Sofia, Bulgaria, E-mail: tsvetan.filev@gmail.com

