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Route Stability in WiMAX (802.16)

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ABSTRACT

Thesis is devoted to network with WiMAX. It is claimed that WiMAX provides a perfect opportunity for an alternative network development. Discussion is based on five main aspects of WiMAX network implementation. Establishment and development of Base Stations (BS), Access Service Network Gateway (ASNG), and Connectivity Service Network (CSN), Base Station Controllers (BSC) and an Analogous Option (AO) to the GSM model are taken into account. The above mentioned entities are considered as integrative parts of WiMAX network establishment and implementation. Starting from 2011 the system was updated and rate was up to 1 Gigabits for fixed stations. The main emphasis in thesis is made on alternative nature of WiMAX.

Key words: WiMAX, Network, Access Service Network, Gateway.

INTRODUCTION

Importance of the Study

It is relevant to study WiMAX network to solve numerous problems of its integrative parts, of the network development. WiMAX network is an optimal network developed as an alternative for wireless connections and data transfer.

Statement of the Problem

WiMAX (Worldwide Interoperability for Microwave Access) is of special interest for the modern scientists and researchers, because it is a wireless communications standard established to provide 30 to 40 megabit-per-second data transfer rates. The main emphasis is made on data transfer speed and it is relevant to know that WiMAX can serve as an optimal gateway in the field of modern Internet technologies.

Objectives

Basically, the whole network should be studied with respect to the following issues: Mobile Stations (MS) is used by the end user to get to the network. The access service network (ASN) is based on several stations and several ASN gateways establish the radio access network at the edge. Connectivity service network (CSN) is responsible for IP connections development.

Hypothesis

WiMAX data transfer rates is a perfect alternative for speedy data transfer without any wires.

Literature Review

WiMAX is a perfect opportunity to develop an alternative network. The WiMAX Forum's NWG is focused on improvement of interoperability among various WiMAX equipment and operators. Concerning the network reference model, it can be said that WiMAX is focused on an integrative network architecture development. Moreover, it is possible to provide a simplified illustration of IP-based WiMAX network architecture.

WiMAX Forum NWG developed the network reference model and defined numerous functional integrative parts and connections/ interfaces between them (Information Security Tops CPA Tech Issues in 2005). WiMAX equipment can be found in two main forms – in the form of base stations, implemented by service providers to involve the innovative technology in a certain area, and receivers, installed in clients. Several networking usage models can be correlated with WiMAX (Mumtaz, Tham Tu, Sadeghi, Gameiro 193).

Research Methodology

Qualitative research methodology is applied. This can be explained by a processing of current materials in this field. To trace current trends in WiMAX network development and implementation, it is relevant to consider modern researches and studies in this field. Qualitative research methodology is justified in terms of this research.

RESULTS AND DISCUSSION

The WiMAX Forum's Network Working Group (NWG) is responsible for improvement of end-to-end network requirements, development of architecture, and protocols advancement for WiMAX. IEEE 802.16-2009 can be used as air interface. The WiMAX NWG has been conceptualized as a network reference model which can serve as a model of an architecture framework for WiMAX deployments. The main emphasis of WiMAX implementations is made on interoperability among various WiMAX equipment and operators (Cortada).

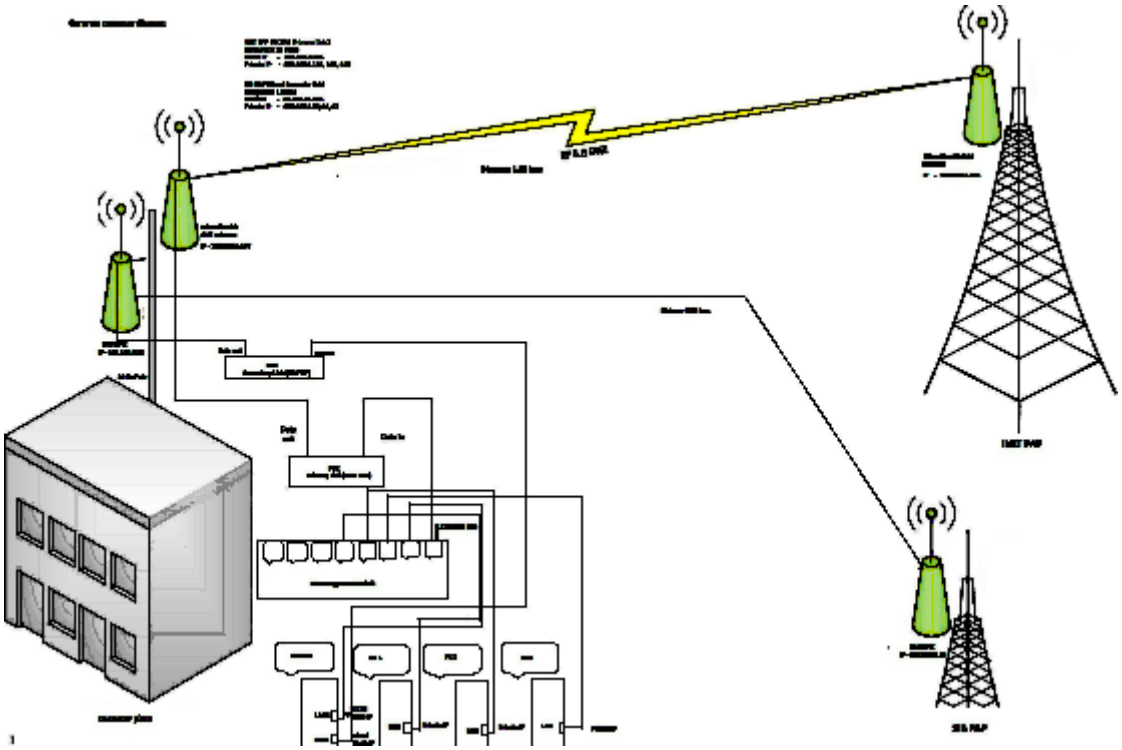

Fig. 1: Wimax Architecture

Findings

It is possible to differentiate between base stations (BS) as the alternative for providing the air interface to the MS. One can argue that it is relevant to focus on additional functions of BS, such as changes in management functions of micro mobility, radio resources management, intensification of QoS policy, traffic classification of data transfer, proxy issues of Dynamic Host Control Protocol and many other steps of management. BS should be developed with respect to these requirements.

Access service network gateway (ASN-GW) is suggested as an agent. It can speed up gateway and a layer 2 traffic aggregation point (Dyck, Gordon, Kung 4). Moreover, it should be mentioned that ASN gateway includes intra-ASN location management and paging, radio deals with management issues and admission control. ASN gateway is focused on subscriber profiles' caching etc.

CSN enables Internet connection and can connect to numerous public and corporate networks (Godwin-Jones 8). Therefore, it is relevant to consider WiMAX architecture as a framework for the flexible remodeling of functional integrative parts in the process of physical entities creation. We can surely claim that the ASN can be remodeled in the main station transceivers (BST) and base station controllers (BSC). Moreover, further process of remodeling is based on the following issues: ASNGW analogous connection to the GSM model of BTS, BSC, and SGSN) (The Change Function: Why Some Technologies Take off and Others Crash and Burn 61).

CONCLUSION

Initially the name "WiMAX" was invented to promote conformity and interoperability of the standard. WiMAX was at first described as "a standards-based technology enabling the delivery of last mile wireless broadband access as an alternative to cable and DSL".

From the perspective given above, WiMAX can be positioned as "Wi-Fi on steroids" and numerous applications can be supported by this network. A portable mobile connection occurs in the result of five integrative entities of WiMAX implementation (Blau 4).

Therefore, the main conclusion can be made as follows: WiMAX network is a relevant means for data transfer across an Internet service provider network (also known as backhaul). It is appropriate to mention that satellite Internet service can be replaced by this network. WiMAX is established by an industry consortium, considered by a group called the WiMAX Forum. The Forum is focused on certification issues and this technology should meet its standards. Actually, WiMAX occupies the niche of Internet communications model. Moreover, in the modern dynamical context there is a great need for a wireless alternative to cable and digital subscriber line (DSL). Of course, the main emphasis is made on the Internet access. At-home or mobile Internet access should be studied as a relevant option providing last-mile broadband Internet access in distant locations.

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