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Quality of Service in VoIP over WiMax

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Abstract

VoIP applications are being widely used in modern-day networks challenging their functions to provide a good quality of experience level to the users. In particular, new wireless high speed broadband technologies, such as WiMAX, deployed and the performance needs to examine as a way to check the performance degrees of VoIP services. The QoS is the key concern of implementation VOIP over WiMAX networks. This daily news makes an effort to study the performance analysis of VoIP for set users, as well as, the variation of the QoS parameters. The treatment plan results had showed that using sector antenna for both BS and DURE and reduce the distance between them, improve the average packet end-to-end delay.

Keywords: *Worldwide interoperable Microwave access (WiMAX), Voice over internet Protocol (VOIP), Physical (PHY) layer, Optimized Network Engineering Tools (OPNET), Top quality of Service (QoS).*

1. Introduction

VoIP (Voice over Internet Protocol) is widely deployed technology and telecommunication operators seek to profit from it. The main good thing about this technology is utilization of existing infrastructure in the form of internet connection. The consumption of this type of communication is very cost effective. Unfortunately, this advantage brings some faults that are expectable as a result of low quality of internet connection. The quality of Service (QoS) is mostly monitored concern by telecommunication operators and vendors. The quality of speech afflicted by many factors such as box loss, packet delay, jitter, echo, noise [1], harmonic and inharmonic contortion [2], etc The QoS parameters are tightly connected; with user's satisfaction with a receive conversation quality. The user's satisfaction expressed with a summary listening score that is a result of very subjective listening tests. The alternatives to the subjective testing are objective methods. WiMAX forum promise to offer high data rate over large areas to a sizable number of users where broadband is unavailable. Work with this first industry large standard can for set wireless access with greatly higher bandwidth than most cellular networks [4]. WiMAX (IEEE802. 16) technology ensures broadband access the past mile up to 30 miles (50 km) for fixed stations, and 3 - 10 a long way (5 - 15 km) for mobile stations. The rest of the daily news organized as follows. Section (2) gives background Voice over internet protocol. Section (3)] offers with the Performance Metrics, Section (4) deals with Results and Discussion. Finally, in Section (5) we conclude this paper and future work.

2. VoIP Overview

VoIP, known as IP Telephony, is the timely transmission of voice alerts using the Internet protocol (IP) over the community Internet or a private data network [8]. In other words, Voice over internet protocol converts the voice transmission from your telephone into a digital signal that travels over the Net. One of the most significant features of VoIP over a traditional public switched telephone network (PSTN) is that one can make a long distance mobile phone call and bypass the toll charge. This included voice/data solution allows large organizations (with the finance to make the copy from a legacy network to a VoIP network) to carry voice applications over their existing data networks. Not only will this technological advancement have an impact on the best traditional telecommunications industry, it can alter the pricing and cost structures of traditional telephony [9]. Furthermore, in comparison to circuit-switched services, IP networks can carry 5 to ten-times the amount of voice calls over the same bandwidth.

3. Methodology

Inside our simulations, we use this metrics to evaluate the performance of WiMAX network in conditions of end-to-end QoS for VoIP Packet end-to-end delay (De2e).

Table 1: The Voice Parameter's

Item	Description
Voice	PCM Quality Speech
Codec type	PCM G.711with silence suspicion
Frame size	10 ms
Coding rate	64kbit/s
Voice frames per packet	1 frame
Compression and decompression delay	0.02 sec

Table 2: The IEEE802.16 parameters

Comparison	Scenario No	Distance between BS&SS	Antenna type	Transmission Power
Antenna	**1**	**50 km**	**Omni**	**0.5 W**
	2	**50 km**	**Sector**	**0.5 W**
power	**3**	**50 km**	**Omni**	**0.4 W**
	4	**50 km**	**Omni**	**0.5 W**
	5	**50 km**	**Omni**	**0.6 W**

4. Results and Discussion

This implementation was performed using OPNET 18. 5 on an Intel Core I 7; one particular) 7 GHz/2MB Éclipse processor sing Windows-7 64-bit os. In our OPNET modeler implementation of VOICE OVER INTERNET PROTOCOL over WiMAX, there are some parameters in which specified as Voice guidelines, which listed in Desk. 2 for any scenarios and some specified as IEEE802.16 parameters. The IEEE802.16 physical layer details like distance between base station and SS, Transmitter &receiver antenna and transmission electricity listed in Table 3 for different scenarios. The simulation duration is 15 min.

4.1 Packet End-to-End Delay

Packet end-to-end delay is one of the main packet end-to-end delay deceased by using sector antenna and elevated the transmission power of both BS & SS.

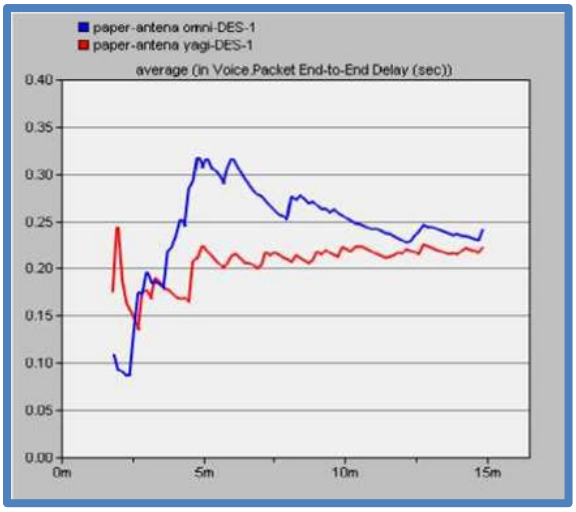

Figure 1: Delay (Antenna)

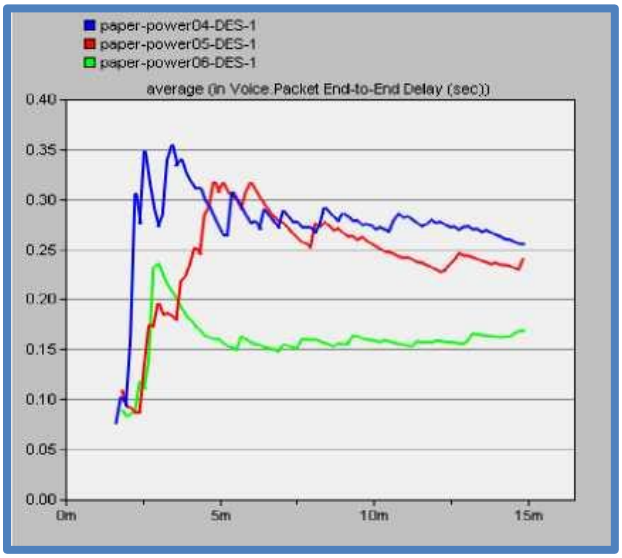

Figure 2: Delay (Power comparison)

5. Conclusions

Next generation sites with multiple technologies offer different multimedia services to an individual. It also provides the luxury of utilizing the best available technology for the required in order to an end user, companies and business organizations. In this study, we certainly have conducted comprehensive simulation review to evaluate the performance of WiMAX for promoting VoIP traffic. We have analyzed end-to-end delay. Box end-to-end delay is one of the main performances Metric in VoIP, Figures1, and Figure 2 show the average packet end-to-end hold up deceased by using sector antenna and raised the transmission power of both BS and SS Ruse results show that when raise the distance between BULL CRAP and SS, the average E2E deceased and the average delay increased. In the event we use sector antenna the average E2E around when it was in Omni antenna nevertheless the average delay decreased, finally when we raised the tranny power, the average E2E for transmission power sama dengan 0. 4 watt better than transmission power sama dengan 0. 5 or zero. 6 watt. This review is our first step towards exploring possible implementations of the next technology wireless

networks. Future work includes the auto-configuration device for the guarantee of QoS requirement during network switching.

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