

Simulation study of Quality Video Oriented delivery over Wimax

Kirandeep Kaur

CSE Dept, Desh Bhagat University, MandiGobindgarh, Punjab, India

Khushboo Bansal

HOD CSE Dept, Desh Bhagat University, MandiGobindgarh, Punjab, India

Neha Soni

CSE Dept, RIMT University, MandiGobindgarh, Punjab, India

Abstract WiMax means worldwide interoperability for Microwave Access. WiMax is also a component of 4G Technology like LTE. WiMax network provide higher speed and data transmission rates than Wi Fi. WiMax is based on IEEE 802.16 standard. IEEE 802.16d for fixed networks and IEEE 802.16e for Mobile networks.it provides higher speed than WiFi Network. WiMax is used for the MAN which stands for Metropolitan Area network.

Keywords: WiMax, Qos, Video Conferencing, IPsec, Security.

Introduction

Demand of higher bit rate and higher transmission speed increases day by day it means demand of WiMax network increases. WiMax Network provides 70 megabits speed per second and range 50 km radius from the base stations. Wimax network includes base stations, users and service stations.it provides frequency bands 2 to 11GHz for licensed and 10 to 66GHz for unlicensed bands. DSL (Digital Subscriber Line) is also used for the higher bit rate and higher transmission speed but does not provide mobility. Due to mobility reasons DSL is not used because it provides a limited access for fixed networks. In WiMax provides high mobility, due to this reason there are some security issues on the WiMax Network. To remove these security issues we use IPsec Protocol. WiMax is also used for audio and video transmission .In WiMax network different layers like PHY, MAC layer etc. are used.

II QoS in WiMax

Quality of service is a measurement of overall performance of a service like jitter, delay, throughput etc. Wimax is used only 5 classes which are as follows:

- 1) Unsolicited grant Service
- 2) Real Time Polling Service
- 3) Non-Real Time Polling Service
- 4) Best Effort Service
- 5) Extended Real Time Polling Services

Unsolicited grant Service

It is also known as UGS and it is designed for constant bit rate.

Real Time Polling Service

It is also denoted as rtps and designed for variable bit rate and real time traffic requirements.

Example: Transmission of Compressed Video on real time.

Non-Real Time Polling Service

It is also known as nrtPS. Designed for non-real time variable bit rate. There are no requirements for delay guarantee.

Best Effort Service

No guarantee of Quality of services. Possible to impose the minimum throughput.

Extended Real Time Polling Services

During the silent periods we don't send any traffic. It is designed to optimize the voice over IP.

III Video Conferencing in WiMax

User's demands to applications which give the guarantee of the throughput, delay etc. video conferencing and voice over IP are the two applications which fulfill the demand of their internet users. These applications require higher bandwidth for data transmission etc. So, these applications are mostly used on the WiMax network because this network provides higher bandwidth and higher data transmission speed. Different types of parameters are used here.

IV Security in WiMax

Due to Mobility in the WiMax network, security becomes an important issue in this network. We use different types of mechanisms to secure our network for data transmission etc. if this network does not become secure then delay, packet loss will be increase because other users that are not anonymous

are attached with the network or we can say anonymous user starts to use WiMax network.

V Simulation

In this research created a network with *Wimax Network with 3 Subnet* in OPNET & checked that throughput, delay of network at different video quality. For this a simple network is created with the three subnet which is shown in Fig 1.1 and various parameters that are used by this is shown in table 1.1 By using these parameters this network will help to find out, how delay, throughput varied in the network at different video quality. In this Wimax network with 3 Subnet with 3 nodes and a Wimax router each is created in which all the subnet are connected to them. In this, three other nodes such as Application Configuration, Profile Configuration & Wimax Configuration have been used.

Table 1.1: Wimax Network with Application Description

DESCRIPTION	VALUE
Custom	Off
Database	Off
Email	Off
FTP	Off
HTTP	Off
Remote Login	Off
Video Conferencing	Low resolution
Voice	Off

These are used to define the application definition & profile definition. All these are connected with topology 802.11. Following table shows the various parameters of Application name and its description.

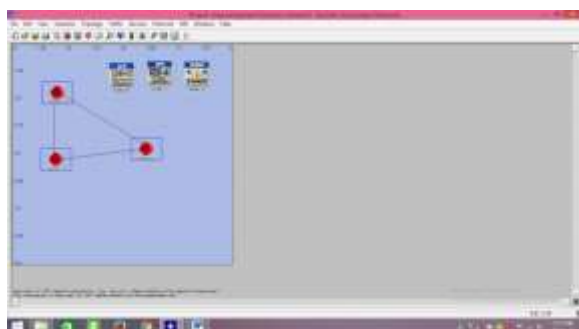


Figure 1.1: Video Conferencing with Wimax Network at Low resolution

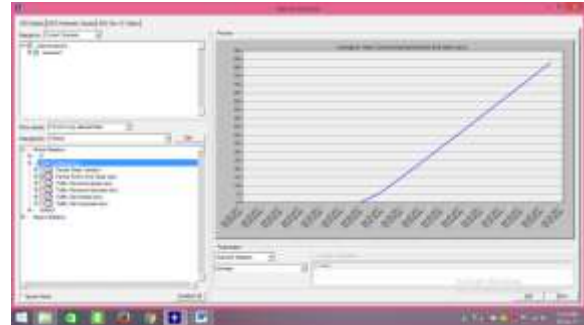


Figure 1.2 packet End to End Delay(sec) of Video Conferencing at Low resolution

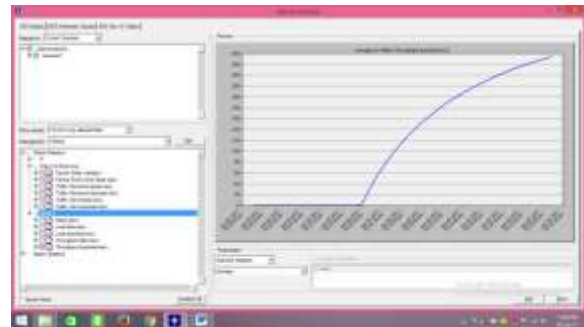


Figure 1.3: Throughput of Video Conferencing at Low resolution

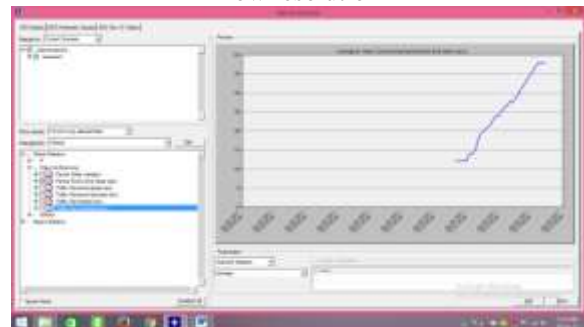


Figure 1.4 packet End to End Delay(sec) of Video Conferencing at VCR Quality

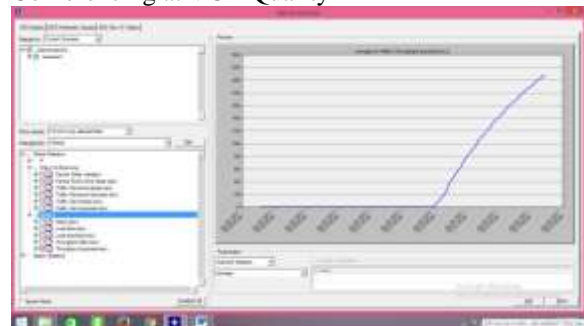


Figure 1.5 Throughput of Video Conferencing at VCR Quality



Figure 1.6 packet End to End Delay(sec) of Video Conferencing at High Resolution

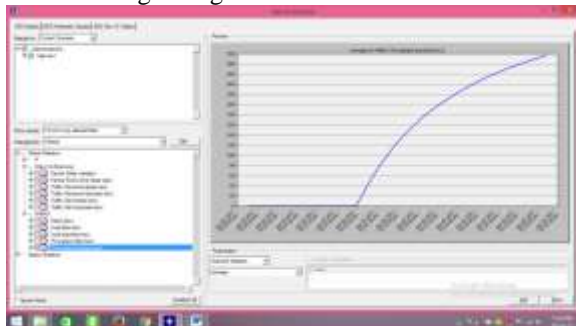


Figure 1.7 Throughput of Video Conferencing at High Resolution

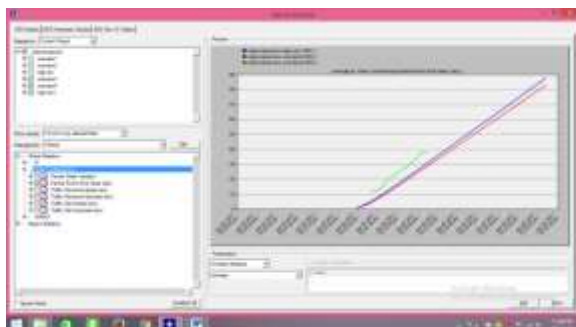


Figure 1.8 Comparison between packet End to End Delay(sec) of at Low, High, VCR quality

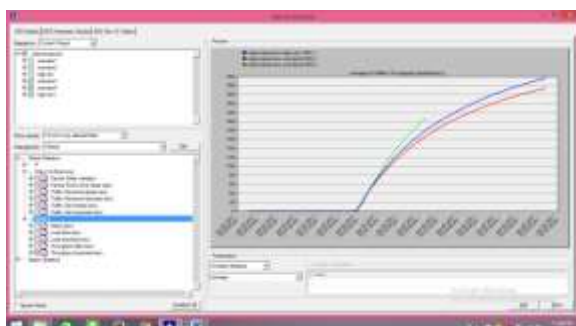


Figure 1.9 Comparison between Throughput of at Low, High, VCR quality Resolution

From the results of all these, it has been find out that if there is a use of different video quality on the same

network then the chances of throughput and delay network performance is degrade.

VI Conclusion

In this thesis, a network is created for all different Video Quality with Low, High resolution and VCR Quality. The reason behind to design the network is to find that how network performance degrade by different Video quality. If there is a large amount of network degrades in the network then that network is not reliable. Even, the main objective in networking is to create a network which is secure as well as reliable so that the data that is sent by the sender should be correctly received by the receiver. And from the above discussion and results it is concluded that if we have different video quality on the same network then the chances of network performance differentiated.

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