ISSN No: - 2456- 2165

Making Effective Technique WIMAX Soft Handover

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Abstract – WIMAX stands for Wireless Interoperability of Microwave access. It is a technology that provides fast access to data over long distances by using various techniques for point to point communication in cellular networks. The main goal of this cellular system is to make faster and efficient communication without loss of data during handover process. It consists of two types of handover in cellular system: Hard Handover (break before make) and Soft handover (make before break). In this paper we will consider soft handover that uses WiMax technology under the implementation of protocols like VOIP and IPTV. VOIP and IPTV are the protocols that are used in the wireless communication whether for the voice calls or transfer of data in bulk. It always create a kind of congestion in network. We need to consider both these protocols during a soft handover. In this paper for efficient soft handover during the congestion in network created by these two protocols and fast switching during a soft handover by considering the various scenarios like distance, congestion and signal strength. By finding the different values through which we can improve the efficiency of a handover like the quality of service, balance the load on the network, improve throughput by finding the value of Beta i.e. the path lost variable. By minimizing the value of Beta we can make a soft handover more efficient.

I. INTRODUCTION

A cellular network is a communication system that uses a large number of low power wireless transmitters to create cells which consists of a fixed location transceiver known as base station. Working together they provide radio coverage over large geographical areas. For this communication UE (user equipment) like mobile phones are used so that when user changes its location from one place to another which provides numerous advantages to the user such as increased capacity , coverage to large geographical areas , reduced interference during a call and small battery power usage. It provides various services like Global System for mobile (GSM), GPRS, 3GSM. Signals carry voice, text and digital data that transmitted via radio waves from one device to another. By transmitting data through a global network using transmitters and receivers mobile network is basically divided into thousand of small geographical areas called as cells. The shape of each cell is hexagonal that has its own base station. These cells slightly overlap at the edges so that a user always within the range of a base station so when the user is moving between the base stations there is no chance of call dropping. These cells vary in sizes like small areas used small cells whether to cover a large geographical area large cells are required. Base station acts as a hub for each group of cells not for the entire network. In this radio frequency signals are transmitted by the UE (user equipment) like mobile phones are received by the BS which are again re-transmitted by the BS to another mobile phone so these two processes i.e. transmission and reception uses different frequencies.

BS are connected to each other via a central switching called Mobile station(MS) , that tracks the calls and transfer them from one BS to another BS when the user moves between the cells so the mechanism called HANDOVER occurs between these cells.

II. HANDOVER PROCESS AND WI-MAX

Handover is a process in telecommunication in which a data session is transferred from one BS to another BS without disconnecting the session. In simple manner whenever a user is travelling from one location to another during a phone call, so call will remain continued without disconnection such process of transferring the session is called handover. It involves the mobility and handovers; i.e. it allows the user to move in from one BS to another and connect to the nearest BS for the proper services. Handover are the main core element through which a cellular system is being planned and deployed. It allows users to travel easily during a phone call that remains connected the calls and data sessions even if a user moves from one cell site to another.. In this type of handover when a new connection is established to a new BS, it is necessary to break the previous connection to the old BS which is Soft handover called as Make before Break. In this type of handover whenever new connection is established there is no need to break the previous connection when shifting from this BS to new BS.

In this paper we are considering Soft handover using WiMax through which they can give the different methods for an efficient handover. For this it is very essential to create such protocols that can supports the large scale networking with high data speed. Some of technologies have been introduced in the market like 2G, 3G and the recent 4G. Now various trade companies needs the data access on large scales. So to resolve such data problems a new technology called WIMAX has been introduced in the market. Somehow it is a kind of extension to

ISSN No: - 2456- 2165

WI-FI but still there is lots of difference between these two protocols. WiMax comes under 802.16y family of wireless networking where y refers to various WiMax versions. WiMax network distance coverage range is about 80 to 90 kilometers and its can exchange the data upto 40mbps whereas data exchange speed can be varied according to the distance. It has the channel width of 1.25 MHZ to 20MHZ. WiMax uses triple encryption algorithm. The main purpose of WiMax is to provide a high speed internet access across long distances. The main factors that makes WiMax popular is the speed to access network and can covers a large distances. WiMax constantly monitors the radio waves quality and update its parameters according to the quality of the radio waves.

III. MOBILE WIMAX

In telecommunication, mobile phones are widely used to create a communication channel among the various users. As we know these mobile phones are connections less and needs mobility. We can say that these mobile phones are capable to move from one place to another. A network must have the ability to provide the access during the mobility of the user. This can be achieved when there is an efficient handover. It means that when a user is travelling from one location to another accessing the network for communication there must be no interruption or disturbance appears when one BS handover its channel to another BS within range . a handover is considered an efficient handover if it creates no disturbance , no loss of data and maintains the confidentiality among the BS and the MS. MOBILE WIMAX uses standard 802.16e , that deploy a system of mobile broadband wireless access. It uses physical layer with OFDMA technology. It can provide the access. OFDMA technology used the division of channels and each channel works in parallel. Mobile WiMax reduces the latency and increase the quality of services by using various technologies like VOIP and IPTV. It uses (IEEE) 802.16e which is approved by ITU (International Telecommunication Union). Mobile. For the various modes of transmission like point to point, point to multi point to portable and various internet accesses on mobile phones. Mobile WiMax provides full scalability to radio waves technology and network architecture to operate in more flexible network along with various services.

IV. PROBLEM STATEMENT

Efficient method for WIMAX software handover in VOIP and IPTV.

V. ADVANTAGES

Basic purpose of using this scheme is to make an efficient soft handover in Mobile WiMax using the real application protocols i.e. VOIP and IPTV. We know there are various issues that arise during a soft handover in Mobile WiMax using these protocols. These protocols are used for the applications like multimedia, streaming, video conferencing etc so these applications required a large bandwidth because a large amount of data needs to be accessed. Here we have so many advantages of using the proposed scheme.

1. There must be FBSS (Fast Base Station Switching) without any breakage in the link. It means that the handover process takes less time so that there must be no loss of data or any data packet.

2. It maintains a diversity set to know which base station is lying nearby and which base station is capable of taking a handover efficiently.

3. If two base stations are capable of taking a handover so that it must check that the congestion at both base stations. If a base station that is lying near congestion then this scheme give handover to the another base station which has less congestion or having no congestion even that base station is at some distance away. So in this way it balances the load at the two base stations.

4. In this scheme we are using WiMax with proper coverage as well as its accessing speed will improve the quality of service.

5. This proposed work also analyzes end to end delay, through put and packet delivery ratio. It gives the different variation in time for sending and receiving the packet for this we take different values that gives different handover times. To minimize it we can reduce the handover delay to make a soft handover more efficient.

6. It also provides a method to find the value of path lost exponent during a handover process that arises in various conditions like congestion, distance or signal problem. Path lost exponent's value must vary with different scenarios.

7. It provides the different efficient methods for the soft handover by reducing the delay time and improves the quality of service.

VI. RESULTS and DISCUSSION

Figure 1.1 Signaling of mobile station with target base station. As the mobile station moves, its distance from serving base station increases and the mobile station looks for another base station for soft handover ie. Target Base Station. The above figure shows handover when the mobile station connects with target base station. Node 2 is target base station.

ISSN No: - 2456- 2165

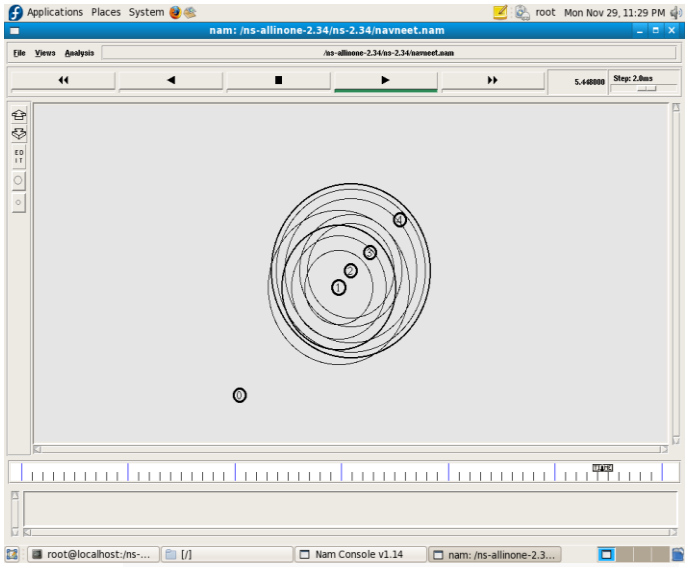

Figure 1.1. Signaling of mobile station with target base station

Figure1.2 First result is comparison between the fast base station switching handover and our proposed technique. It shows that using the proposed technique the performance of soft handover is improved. The x axis represents the time and y-axis represents the packet to be received.

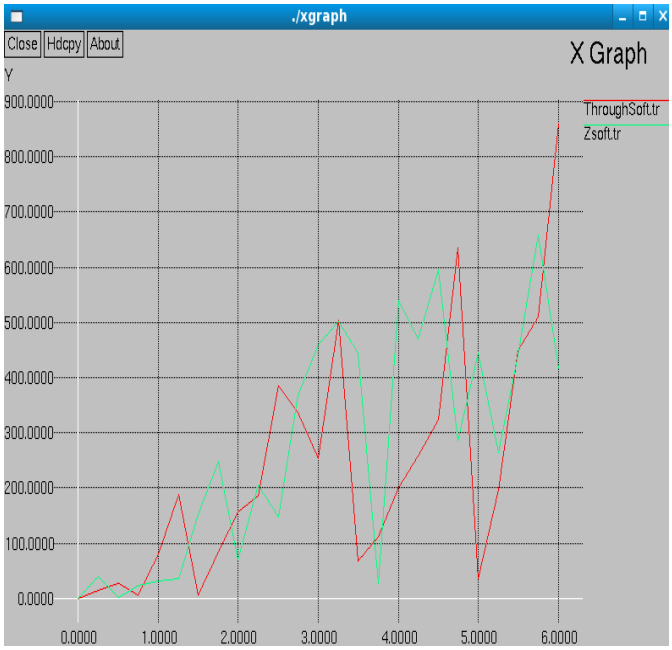

Figure 1.2. Comparison between the fast base station switching handover and proposed technique

Figure 1.3 Second result is round trip time calculated for three nodes (or base station). This shows how far the base station is from mobile station. The x axis denotes trip time and y axis denotes number of nodes. The node that has minimum round trip time is nearest to mobile station and hence is best option for being target base station.

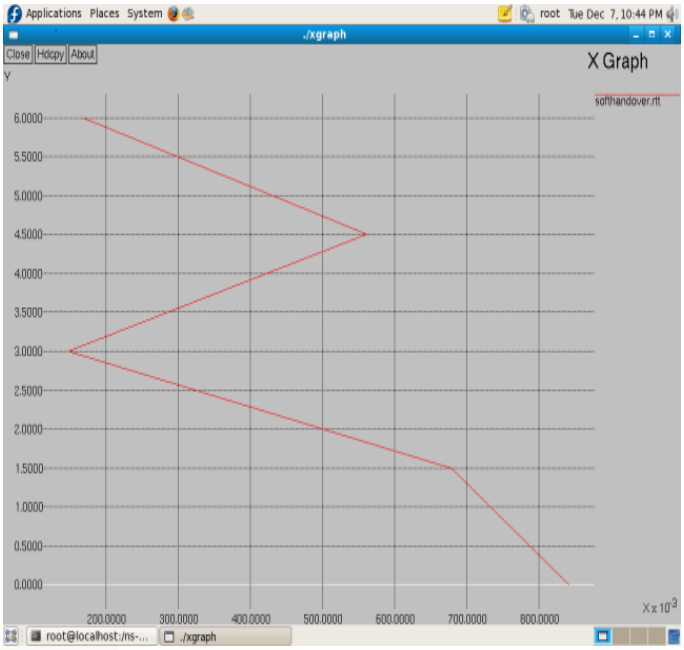

Figure 1.3. Second result is round trip time calculated for three nodes (or base station)

VII. CONCLUSION

From the proposed scheme, we can make a soft handover more efficient by reducing the hand over delay. It also helps in maintaining the appropriate load on each base station that improves the throughput, end to end delay and maintains a packet ratio. So all these factors lead to improves the Quality of service as well we are a high speed network access and proper coverage to the miles. So if a user is travelling from one place to another during a phone call, due to efficient handover there is no loss of data without any kind of interruption. The call will be continued in the conditions of weak signaling or other distance factors even in the condition of congestion. Over all it increases the performance of the network.

In this paper we will also find the value of beta i.e. path lost exponent. In the previous research the path lost exponent has the constant value that has no greater impact on the value of handover duration. So here the value of beta must vary so that the value of handover duration improves.

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