The VOIP Optimization in WIMAX

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Abstract
With the growth of wireless networks in urban Community integration hypothesis is further strengthened. This is the most important WIMAX network. Due to the high bandwidth, the urban area of mobility and technology. Will be suitable for VoIP services. In VoIP services over WIMAX network Quality assurance requirements and provide greater capacity; the main topics of research. WIMAX networks for each service provider, VoIP service to more users would be very desirable, the customer or the user expects Quality is acceptable for conversation. Important issues such as delay, Delay and delay variation, a major role in the quality of their VoIP services.
Keywords : Wireless networks, transmission of voice, VoIP Optimization

1- Introduction

Information needed to communicate with the world and the users of the restrictions of time and place unnecessary Computer science experts have long considered The Internet is especially engineers. What different generations of wireless technology It also distinguishes Speed limit their access. In this way, WIMAX (WIMAX) as a phenomenon unparalleled in the field of communications, In terms of ease of access, Broad bandwidth, Capacity Service And radio coverage, good performance recorded in their careers. WIMAX the term is an acronym that originally developed Means "the ability to exchange and use information At the global level to achieve By Microwave » (Worldwide Interoperability for Microwave Access) is. In summary, Wireless communication technology, WIMAX Services the radio is Service transferred to the recipient site. Networks based on WIMAX technology, Municipal wireless networks are considered as That can easily In the range of WIMAX base stations Https shush its merits, Take advantage of broadband to organizations, Providing businesses and residences. WIMAX Technology In ideal conditions with a range of 50 km and a speed of 70 Mbps access, up the current broadband technology is evolving. This technology could have access to broadband services Provides wireless common way to trade. Another feature of WIMAX this is in addition to data transfer, Voice and image transmission are also well supported and services that will be provided in this area, Volume and time constraints will not. WIMAX equipment can Due to the different levels of the network, including users, Radio access network and core network is these can be divided into:

2- Users' supplies:

This equipment, known as CPE or are Customer Premises Equipment And in general, including internal communications equipment (Indoor), External communications equipment (Outdoor), USB Device Or, as is predicted And to some extent the researcher has Chips can be installed on computers and laptops. Equipment or CPE in a common final (Also known as WIMAX modem users) in various shapes and configurations for applications and are available in different subscribers.

3- Radio access network equipment:

This category of equipment, Users interface with the network core counts And include such access points And transmitters or base stations (BS) are responsible for the overall management of radio resources. A WIMAX base station, of antennas, Control hardware, WIMAX towers Cables are fed up.

4- Network core equipment:

This includes network management systems, Equipment to monitor users Routers and specific interfaces to communicate with different networks. The core of the WIMAX network; Is part of the WIMAX base station Voice or data network infrastructure and the Traffic WIMAX subscribers Is transferred through the routers and switches. IP network design And engineering equipment, High quality services Guarantees for end users Then, simply operation WIMAX brings to providers.

5- Materials and Methods

As various wireless networks are developed to provide better service, a key technology The WIMAX wireless network WIMAXWMN, VOIP optimization has emerged recently. In WIMAXWMN, the Nodes include routers, WIMAX and WIMAX clients are. I.e., each node not only as a host It acts like a VOIP optimization, Packets on behalf of other nodes that may Send Mush Anshan not within direct wireless (multichip), are forwarded. WIMAXWMN as a self-organizing dynamic and

Kuhn dopy frond is the nodes in the network automatically connect to WIMAX the establishment and support themselves. It features many of the points in the WIMAXWMN Including support for easy network Robust and reliable service is covered. Common nodes (such as desktop computers, Laptops, PDA and Pocket PC, the Phones and other wireless network interface card (NIC)) Equipment have been Can be directly VOIP optimizing WIMAX wireless link. Customers can no NIC by connecting to optimize WIMAX VOIP For example, the Ethernet WIMAXWMN have access. So WIMAXWMN great help to users always online at any time and to any location. Further capabilities gateway / bridge WIMAX VOIP optimization and integration in WIMAXWMN With various existing wireless networks Such as cellular networks, Wireless Sensor; Wi-Fi, WIMAX and Wimedia provides. WIMAXWMN results from an integrated, not possible with any other existing network user services of these networks are secure. WIMAXWMN a promising wireless technology For many applications, such as home networking, broadband Neighborhood and community networks, Economic networks, Building Automation etc. The audio transfer is optimal [2].

6- Voice over Internet Protocol (VOIP)

Technology to send voice calls over a data network using IP is used. It operates by providing digital Voice packets are discrete Independently that are sent over the network, Instead of using traditional PSTN protocols The need to establish a circuit between the sender and Their receptors [www.chrsolutions.com, Glossary of Telecom Acronyms and Terms].

7- **Handoff (Handover)**

Assignment Inarch a connection between two or more base stations (base station) which use the same wireless technology The key feature of mobile telephony systems based On today's cell. Because single transmitters can not all mobile phone systems in a city that's a lot of BS Each radio cell to produce Cover. As soon as a user of a cell Due to changes in signal intensity, Interference, Or balance the load change, All connections to the system should be re-directed All data is forwarded or [Mobile Communications, by Joachim Schiller].

8- Roaming

Compared with the handoff, Roaming is usually more complicated, the change in network access is more time consuming. Roaming usually takes more time it can include changes in network technology, several calls to the database, Authentication procedures, Data forwarding, Relay connections, or supplier is [Mobile Communications, by Joachim Schiller].

9- **Results and Discussion**

In recent years, Popular VOIP services as a result of the massive growth in WIMAX Broadband access has greatly increased. The VOIP service when a wireless WIMAX will spread Imposes new challenges, while users able to make phone calls using Wi-Fi makes. Delay and packet loss Due to interference and limited capacity WIMAX network in a multi-step Quality considerably End To reduce the VOIP call. In this paper, the basic requirements to develop efficient and optimized VOIP services we talk on a wireless WIMAX network. Optimization techniques offer a practical and the evaluation that we can improve the network capacity, VOIP quality is maintained, and Mobile users in the performance of their office. Extensive experiments on a real test-bed and ns-2 provided insight about the performance implications and the level of improvement demonstrated that can be achieved using the proposed techniques. Specifically, we found that the accumulation of (aggregation) Packets with header compression can Many supported VOIP calls Network in a multi-step increase to 2 or 3 times. The proposed fast path switching VOIP is very effective in maintaining quality. Fast handoff scheme we almost negligible service interruption the mobile client gets the calls. Cost savings and benefits from easy expansion VOIP Using existing data infrastructure Sustainable growth are the main factors VOIP. Recently, due to the presence of wireless local area network (WLAN) in homes and offices, Wireless VOIP has gained considerable popularity. Wireless VOIP callers can simply use a portable phone can make with limited roaming. A practical solution And cost For users by providing mobile phone services While in a large area No need to be roaming coverage, Using WIMAX wireless networks Chant gamy Is based on the IEEE 802.11 standard. WIMAX network rates Compared to a wired LAN access points (Access Point) Connect to each other as follows:

• Ease of development
• Wider coverage and better
• Having elasticity of node failures (i.e., return to original state)
• Reduce maintenance costs

Potential of WIMAX as a wireless network creating a wireless backbone Commercial scale or community scale is there to support mobile VOIP users. A typical scenario of VOIP services Wireless WIMAX network is shown in Figure 1. While such deployment scenarios are common everywhere, Stimulate potential users the use of wireless phones for VOIP Instead landline has.

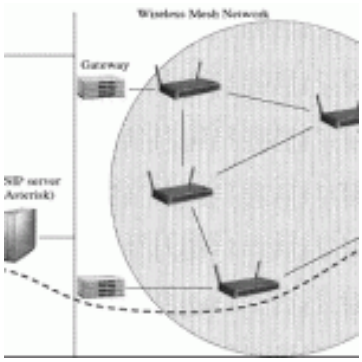

Fig. 1: WIMAX network with two clients connected to each other, and keep the paths between them.

10- Maintaining quality VOIP

Applications Support Delay sensitive real-time Such as VOIP over WIMAX network is a challenge. Because of the changing wireless channel conditions and interference channels Profile of delay and packet loss can during the route Chant gamy between a source and destination may change a voice call. Such changes can greatly affect the quality of a voice call. By exploiting multiple routes Choosing a path between source and destination nodes the best delay and loss characteristics has we can overcome this problem. Using a switching scheme zero overhead label, Voice traffic along the best path the routing path is available. Our experiments show that using effective path switching, we have the quality to 86% No switching time compared with 46% of the time get.

11- Customer support mobile VOIP

Support calls without amputations Mobile VOIP client between different AP During a voice call handoff are Is very difficult.

Our handoff scheme we design a fast link-layer feedback mechanism to detect the shift of customer and the update Within the WIMAX network uses. Moreover, to prevent packet loss during a handoff, Voice packets are buffered at the old AP and again, these packages via the new AP We optimized VOIP client. Our experiments on WIMAX Chant gamy amputations VOIP quality is nearly zero are fixed during the handoff.

12- Conclusion and recommendations

In this paper, the design and optimization of VOIP WIMAX is a wireless network based on Bra standard 802/11 Focus which efficiently supports VOIP calls. Full development of the VOIP service we will pursue the following objectives in this article.

• Increased capacity in WIMAX network VOIP: If you can see in Figure 2 Our experiments on a real test bed for WIMAX the calls are encrypted G.729 specifies that:

1) The number of calls, average quality step increases in a simple linear topology should steadily decrease.

2) In a WIMAX network with link speeds of 2Mb / s, Number of calls supported by eight calls in a first step, the call dropped after four steps. The significant reduction in the number of supported calls can be attributed to the following factors:

1) Low throughput UDP protocol because of its interference

2) Missing package in multiple steps

3) high-overhead protocol for VOIP packets their small size (20-byte header Peeled 802/11/IP/UDP/RTP for each package). We aim to increase the number of supported calls VOIP WIMAX is Chant gamy on certain quality measures. Our approach is based on the aggregation of two VOIP packets we proved the proposed header compression Using these approaches, the proposed increase in capacity to 2 or 3 times.

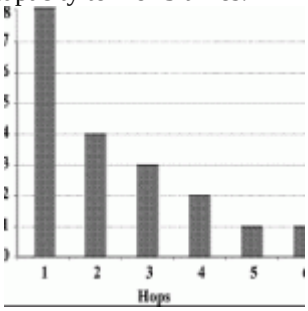

Fig.2: Capacity touch of a linear sequence of nodes is reduced compared to the length of the sequence.

13- Conclusions

VoIP on WIMAX technology has its own limitations. The main problem with VoIP WIMAX service, Quality sound. Perhaps some readers not agree with this comment as to which reasonable and appropriate equipment and bandwidth, Sound quality can be improved and leads to an acceptable level. In real world situations in a way other there is no guarantee Sound quality is good and acceptable. Parameters and can be several reasons be effective in reducing sound quality. The first and most important reason, however, VoIP refers to a way of working. As was pointed out, VoIP Voice over IP is the word. When a file from point A to point B Is sent on an IP network, File into a set of packets will be distributed or what. The packets based on priority and an arrangement are sent. Due to the distributed nature of the Internet, Packets may be sent with the same priority as the origin, Not arrive to the destination (send and receive different priorities). At the time, the situation will not create a problem. Because the recipient is unable to use Number is the number assigned to the packet it can help to place incoming packets all packets sent between the data and the reconstruction process is performed. Technology, VoIP, voice data into digital after putting them in packets can be sent via the Internet. As with other data types, these packets may that have been sent with the same priority are unable to destination. VoIP systems receiving WIMAX capable of packets in reconstruction Regardless, they are given priority. Real-time nature of voice conversion is This means that if you send packets

with priority Not received at the destination, During the restoration project data (converting the digital data to sound) The silent witness. As was pointed out, Delay will cause serious issues in VoIP systems. Must be fast enough to be sent to the recipient after receiving and without a perceptible delay them again "to rebuild. Weak in the broadband problem can Issues such as delays in data transmission For VoIP systems to be followed. VoIP equipment manufacturers WIMAX systems are trying to produce products which require less bandwidth requirements. The focus is on the use of compression algorithms. Since many compression algorithms are designed and implemented they each have their own advantages and limitations. One of the limitations of VoIP technology WIMAX systems is consistent. A VoIP system in cases two contact points of the PC does not adhere to a comprehensive standard. Some VoIP systems are proprietary and only Provides the possibility of contact with other people Use the same software. Compress and restore data to the original status, Will have its own processing time. In addition, Compress the sound quality loss will follow. Some compression algorithms specific issues would like to echo the sound. However, the possibility of echo filter there will be created but doing this will take more time than the CPU. Data filtering and compression subject of much a common problem for computer-based VoIP systems VoIP phones are compared. Mobile VoIP filtering and compression required in doing hardware level. This process is concerned this was not by phone. It is clear that VoIP phone prices WIMAX systems are more expensive than conventional systems. If you use PC-based VoIP systems; to make a call, we will be dependent on their computers. Because the computer is first necessary to clarify after activating the operating system. And software needed to be able to make calls. Unlike traditional systems, Systems, VoIP (based on a mobile computer or VoIP)

the electricity cut off time will be useless. If you could cut electricity use the old system will be because telecommunications companies, Electricity can be sent over the phone lines. Of electricity Phones are used as sources of energy (Cordless phones are an exception). Thus, even in the case of electricity cut off, Phone usually active "and can be used Will provide an alternative source of electricity, since phones. A mobile VoIP (or a computer-based VoIP system) In order to carry out its proper functions and require the use of sources of energy (electricity) Foreign and Internet. Thus, if the cut off electricity or Internet connection; the possibility of using VoIP services In particular, there will be a WIMAX wireless systems.

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