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Comparative Study WIFI vs. WIMAX

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Abstract: ***Wireless networking has become an important area of research in academic and industry. The main objectives of this paper is to gain in-depth knowledge about the Wi-Fi- WiMAX technology and how it works and understand the problems about the WiFi-WiMAX technology in maintaining and deployment. The challenges in wireless networks include issues like security, seamless handover, location and emergency services, cooperation, and QoS. The performance of the WiMAX is better than the Wi-Fi and also it provide the good response in the access. It's evaluated the Quality of Service (Qos) in Wi-Fi compare with WiMAX and provides the various kinds of security Mechanisms. Authentication to verify. The identity of the authorized communicating client stations. Confidentiality (Privacy) to secure that the wirelessly conveyed information will remain private and protected. Take necessary actions and configurations that are needed in order to deploy Wi-Fi -WiMAX with increased levels of security and privacy.***

Keywords: Wif ,Wimax, Qos, Security, Privacy, seamless

1. Introduction

Recently wireless networking has become an important area of research in academia and industry. This is due to the huge diversity of wireless network types, which range from Wireless Fidelity network (Wi-Fi) covering smallest area to Worldwide Interoperability for Microwave Access networks (Wimax) covering Up to several miles. All these Types of networks have been developed separately with different usage and applications scenarios, which make networking between them a challenging task.

1.1 Wi-Fi Network

Wi-Fi technology builds on IEEE 802.11 standards and Wi-Fi technology is still using local area network (LAN) for the predictable future. Wi-Fi can be used as various handheld devices. The handheld devices are connected to internet by using the connection of Wi-Fi. The access of the Wi-Fi network is limited to a specific area and should not expend the network. This network is only for within the specified area only. And its established limited in some restricted place. The Wi-Fi technology used different ways as follows :

City-wide Wi-Fi
This type of network implementation only for the city-wide network connection. It's Performance is not gives the better response to the established network, so this type of Network application has been canceled.

Campus-wide Wi-Fi
Many traditional college campuses provide at least partial wireless Wi-Fi Internet Coverage and also major university to offer completely wireless Internet access across the entire campus.

Internet Access
The access of an internet using the Wi-Fi network using the handheld devices. The Connection was indicated as access points, by using this access point internet is work. Routers that incorporate a digital subscriber line modem or a cable modem and a Wi-Fi Access point, often set up in homes and other premises, can provide Internet access and Internetworking to all devices connected (wirelessly or by cable) to them.

1.2 WiMax Network

WiMAX (Worldwide Interoperability for Microwave Access) is a telecommunications protocol that provides fixed and mobile Internet access. The WiMAX produce up to 40 Mbit/s using the IEEE 802.16m and also release the maximum speed is up to 1 Gbit/s . The name "WiMAX" was created by the WiMAX Forum. The forum describes WiMAX as "a standards-based technology enabling the delivery of last mile wireless broadband access as an alternative to cable and DSL". Clarifications of the formal names are as follow:

802.16d is refer to as Fixed Wimax, it's not support the mobility of a Network

2. Analysis of Wi-Fi and WiMAX

2.1 WiMAX Network

It's standards for worldwide interoperability for Microwave Access and also known as 802.16.it was designed for the longer range of wireless network connections such as to provide internet access to a particular geographic area. It can be established the range from 39 miles to 6 miles to 30miles. WiMAX technology is a standard based wireless technology which is used to provide internet access and multimedia services at very high speed to the end user .The current WiMAX revision is based upon IEEE Std802.16e- 2005 IEEE 802.16e-2005 improves upon IEEE 802.16-2004 by:

- Advanced antenna diversity schemes, and hybrid automatic repeat-request (HARQ)
- Adaptive Antenna Systems (AAS) and MIMO technology
- Denser sub-channelization, thereby improving indoor penetration
- Introducing Turbo Coding and Low-Density Parity Check (LDPC)
- Introducing downlink sub channelization, allowing administrators to trade coverage for capacity or vice versa.

2.1.1 Mobility

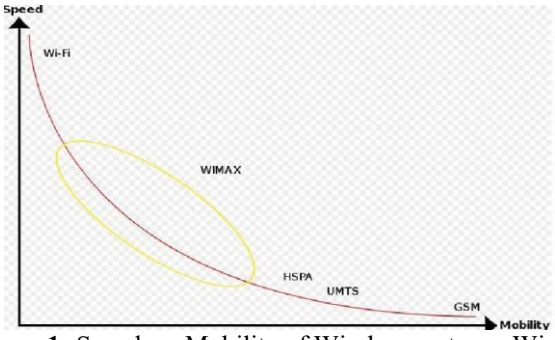

Figure 1: Speed vs. Mobility of Wireless systems: Wimax, HSPA, UMTS, and GSM

The comparison of speed and mobility of Wimax, HSPA, UMTS, and GSM drastically increase from Wi-Fi to GSM. The wireless systems speed is changed as per the no of access points in a network.

2.2 Wi-Fi technology

This technology is used in LAN; it allows the connection using wireless devices. The entire network was established with in the small amount of area like rooms. It could not run the outside environment. Because of the range of the bandwidth and frequency is limited to access the networks.

Wi-Fi is a family of networking, it sometimes called Ethernet. The Wi-Fi is used 802.11 protocols Standards for wireless network. The speed and Wi-Fi network difference factors like freq, bandwidth. Generally Wi-Fi is designed for the medium range data transfers i.e. 100 to 300 feet in indoor. The following versions are used as the Wi-Fi:

Version	*Description*
802.11b	It support data transfer rate of 11 Mbps
802.11a	Data Transfer rate is 54Mbps,freq:5GHZ
802.1 lg	Similar data transfer rate of 802.1 la but freq:2.4G^
802.1 In	It supports speeds up to 5 times better then the J can use the either 2.4GHZ or 5GHZ frequency.

2.2.1 Mobility

The mobility of a network is based on networking points. It's worked as the short-range wireless networking, such as to network PCs within the building. The following graph represents comparison of the speed and mobility of the network.

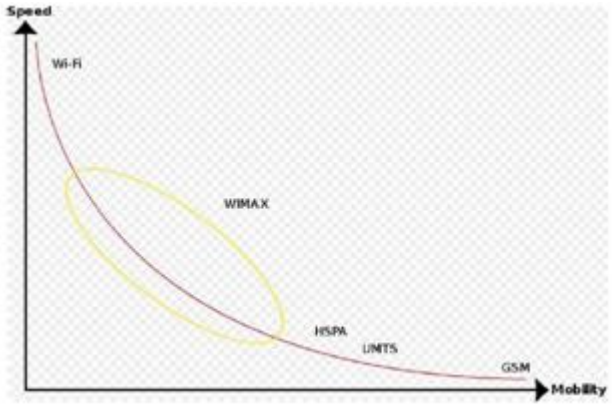

Figure 2: Speed vs Mobility of Wireless systems: wif, HSPA, UMTS, GSM

3. Comparisons of WiMAX and WiFi

- The WiMax network is to establish by any network service providers. and also used in LAN
- WiMAX network execute a connection oriented MAC while Wi-Fi runs on the CSMA/CA protocol, which is wireless and strife based
- WiMAX is faster than the Wi-Fi, because is type of the connection in that area.
- The major difference of the WiMAX and Wi-Fi is speed and distance of a network
- The QoS of the both the networks are simple and reliable.

The following major comparisons are involved the Wimax and Wi-Fi:

Wi-Fi	WiMAX
Connection Oriented	Connection Less
Limited area	Depends on the Networks establi:
Use the versions ,802.1 In 802.11b,8O2.11a,8O2.11g	Use the versions 802.16
Less bandwidth	Medium Band width
Limited access points	No of access points
Connection must be relialie	Connect is Unreliable

The following data is compare the both Wi-Fi and WiMAX

Standard	*Family*	*Primary Use*	*Downlink (Mbit/s)*	*Uplink (Mbit/s)*	*1*
Wimax	802.16	Mobile Internet	128 (in 20MHz bandwidth)	56 (in 20MHz bandwidth)	**I** 8l**e**d ra1**1**r
Wi-Fi	802.11	Mobile Internet	300 (using 4x4 configuration in 20MHz bandwidth) or 600 (using 4x4 configuration in 40MHz bandwidth		*i*en **niPi thi**

4. Conclusion

The performance of Wi-Fi compared with of WiMAX is good response of a wireless network. The problems in Wi-Fi network is overcome by the WiMAX network. Here the enter problem of the Wi-Fi network is restricted area. But the WiMAX has no restriction to work. Both of the networks are reliable networks. Compare with Wi-Fi network and WiMAX technology is more secure, reliable service.

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