

A

Seminar report

on

WIMAX Technology

Submitted in partial fulfillment of the requirement for the award of degree
of Computer Science

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Preface

I have made this report file on the topic **WIMAX**, I have tried my best to elucidate all the relevant detail to the topic to be included in the report. While in the beginning I have tried to give a general view about this topic.

My efforts and wholehearted co-corporation of each and everyone has ended on a successful note. I express my sincere gratitude towho assisting me throughout the preparation of this topic. I thank him for providing me the reinforcement, confidence and most importantly the track for the topic whenever I needed it.

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ABSTRACT

The new era of communication, currently employed in some parts of the world, is Worldwide Interoperability for Microwave Access (WIMAX). It is the latest technology which is approved by IEEE 802.16 group, which is a standard for point-to-multipoint wireless networking. Wimax vision is to deliver “last mile” broadband connectivity to home or business locations, also its data rates are comparable with Cable and Digital Subscriber line (DSL) rates. It has the capability which connects to the ISP (Internet Service Provider) even when you are roaming outside home or office. The Wimax technology is becoming the way to avert the impending crisis of rural connectivity i.e. it will be accessible till the last mile. This paper explains about the purpose of Wimax, the study of Wimax systems, its implications and applications and its wireless capabilities.

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What is WIMAX ?

- WIMAX stands for **Worldwide Interoperability for Microwave Access**
- WiMAX refers to broadband wireless networks that are based on the IEEE 802.16 standard, which ensures compatibility and interoperability between broadband wireless access equipment
- WiMAX, which will have a range of up to 31 miles, is primarily aimed at making broadband network access widely available without the expense of stringing wires (as in cable-access broadband) or the distance limitations of Digital Subscriber Line.

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A WIMAX system consists of

- 1) A **WiMAX tower**, similar in concept to a cell-phone tower - A single WiMAX tower can provide coverage to a very large area as big as 3,000 square miles (~8,000 square km).
- 2) A **WiMAX receiver** - The receiver and antenna could be a small box or Personal Computer Memory card, or they could be built into a laptop the way WiFi access is today

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BENEFITS OF WIMAX

- Speed
 - Faster than broadband service
- Wireless
 - Not having to lay cables reduces cost
 - Easier to extend to suburban and rural areas
- Broad Coverage
 - Much wider coverage than WiFi hotspots

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Application & Forum

Wimax is a moniker for IEEE 802.16 interface specifications promoted by the industry trade organization “Forum for Worldwide Interoperability for Microwave Access”. Members of the Wimax forum include operators, equipment & component makers.

The Wimax forum has introduced a new standard for wireless broadband access. Wimax forum has adopted certain profiles based on the 802.16 standard for interoperability testing and Wimax certification which operates in the frequency bands of 2.5GHz, 3.5GHz, 5.8GHz and also which are licensed by various government authorities.

The purpose of The Wimax Forum is to gather together the industry participants and form and communicate a clear vision for where Wimax is heading, what stages and market development focus the standards, regulatory actions and systems development will take and how these things will occur.

Wimax is a standard base technology which will serve as a wireless extension or alternative to cable and DSL for broadband access. Wimax is built on open standards and is widely accepted by regulatory agencies and standard groups around the globe.

FUTURE

- WiMax will be deployed in three stages
 - In the first phase WiMaX technology (based on IEEE 802.16-2004) provides fixed wireless connections
 - In the second phase WiMaX will be available as a cheap and self-installing Subscriber Terminal (ST), linked to PC and to antenna
 - The third phase enables portability, thus WiMAX (based on IEEE 802.16e) will be integrated into commercial laptops

ISSUES in 3G vs. WIMAX

- Deployment of the network
 - WIMAX deployment is in the planning stages and it might take 3-5 years in providing reasonable coverage in well populated areas
 - WiMax may initially be relegated to college campuses and larger corporate campuses where people are less mobile and costs containment is important
- Cost Issue
 - The main reason to opt for WIMAX is its low cost.
 - The price paid per Hz for WIMAX spectrum is as much as 1000 times lower than for 3G spectrum
 - The low cost of WIMAX spectrum compared to 3G is a clear driver for service providers to enter the field of wireless services with WIMAX

Conclusion (The Final Issue)

Will WiMAX replace 3G?

- Along with the forthcoming standardization, WiMAX has the potential to substitute 3G and become a promising 4G
- WiMAX has its distinct identity as either a stand-alone solution for incumbent and competitive fixed network operators or as complementary radio access solution for established 2G and 3G cellular network operators
- Fixed-line operators, on the one hand, may consider WiMAX as a viable alternative to add mobility to the service portfolio, leveraging their huge subscriber base, in particular in countries where 3G licensing is delayed or not affordable

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