WiMAX Introduction

- **W**orldwide **I**nteroperability for **M**icrowave **Acc**ess

- The Institute of Electrical and Electronics Engineers (IEEE) 802 committee (802.16).

- Orthogonal Frequency Division Multiplexing (OFDM) (carriers of width of 5MHz or greater can be used)

- connectivity at speeds up to 70 Mbps

- provide high speed access to about 60 businesses at T1 speeds.

- can serve up to a thousand homes in term of DSL speed.

How it works??

- WiMAX system consists of two parts:
    - WiMAX Base Station: Typically, a base station can cover up to 10 km radius.
    - WiMAX receiver: could be a stand-alone box or a PC card.

    Several base stations can be connected with one another by backhaul microwave links.
    wireline backhauling
    microwave Point-to-Point connection

    - what would happen if you got WiMAX ??
        - Internet service provider
        - WiMAX base station 10 miles from your home
        - WiMAX-enabled computer
        - receive a special encryption code
        - base station beam data from the Internet to your computer

WiMax vs. WLAN

- WiMAX provides a media access control (MAC) layer.
- the support of real-time and voice applications is simple
- WiMAX proposes the full range of security
  - Terminal authentication by exchanging certificates to prevent rogue devices
  - User authentication using the Extensible Authentication Protocol (EAP)
  - Data encryption using the Data Encryption Standard (DES) or Advanced Encryption Standard (AES) , both much more secure than the Wireless Equivalent Privacy (WEP) used by WLAN

WiMax VS. WiFi

- WiFi connection can transmit up to 54Mbps (under optimal conditions)
- WiMAX should be able to handle up to 70Mbps
- The biggest difference isn't speed!! ☺
- WiFi's range is about 100 feet (30 m)
- WiMAX will blanket a radius of 30 miles (50 km) with wireless access
  - due to the frequencies used and the power of the transmitter.
- WiMAX(10-66 GHz frequency)
- WiFi(5GHz frequency maximum)

Where can be applied??

- large area public (airports, university campuses,…)
- Large numbers of small and medium sized businesses (for lower costs)
- High speed internet for areas where wired connectivity is not viable.

Quistions??

Attack