

WiMAX Technology Brief

WHAT IS IT?

WiMAX, or Worldwide Interoperability of Microwave Access, is a wireless Internet service designed to cover wide geographical areas serving large numbers of users at low cost. WiMAX is the synonym given to the IEEE 802.16 standard defining wide area wireless data networking. WiMAX is the standard being adopted worldwide by manufacturers to insure inter-operability of equipment. WiMAX is considered one of the best solutions for “last mile” distribution. In contrast, wireless local area networks (WiLANs) are designed to provide network access within an office environment or a home once Internet service has been delivered to that point.

HOW DOES IT WORK?

WiMAX uses microwave radio technology to connect computers to the Internet in place of wired connections such as DSL or cable modems. WiMAX works very much like cell phone technology in that reasonable proximity to a base station is required to establish a data link to the Internet. Users within 3 to 5 miles of the base station will be able to establish a link using non-line-of-sight (NLOS) technology with data rates as high as 75Mbps. Users up to 30 miles away from the base station with an antenna mounted for line-of-sight (LOS) to the base station will be able to connect at data rates approaching 280Mbps.

WiLANs, on the other hand, provide wireless network connectivity between devices within a given office or residence location. The 802.11b standard equipment can provide up to 11Mbps and 802.11g standard equipment will support data rates of up to 54Mbps.

Technology standard	Primary use	Data rates
WiMAX 802.16	External	75 – 250 Mbps
WiLAN 802.11g	Internal	Up to 54Mbps
WiLAN 802.11b	Internal	Up to 11Mbps

WHAT ARE THE ADVANTAGES?

- A single WiMAX main station can serve hundreds of users.
- Endpoints install within days instead of the weeks required for wired connections.
- Data rates as high as 280Mbps and distances of 30 miles are possible.
- Users can operate mobile within 3-5 miles of a base station at data rates up to 75Mbps.
- No FCC radio licensing is required.

WHAT ARE THE DISADVANTAGES?

- Line-of-sight (LOS) is required for long distance (5-30 mile) connections
- Heavy rains can disrupt the service.
- Other wireless electronics in the vicinity can interfere with the WiMAX connection and cause a reduction in data throughput or even a total disconnect.

On the WiLAN side, security has been a major concern, though this has been addressed through developments in encryption technology and authentication systems. A typical access point covers an area 300 feet in diameter, but this distance can be impacted by structures within the building such as walls, furnishings etc.

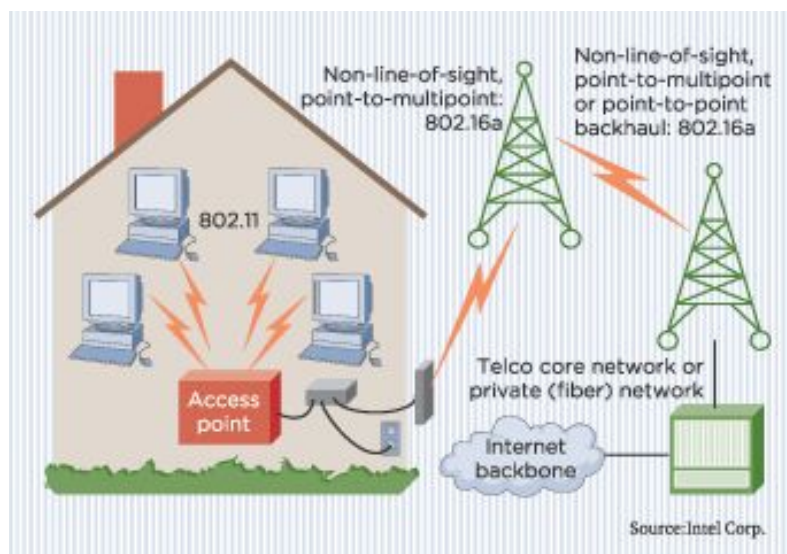
WHAT ARE THE COSTS?

Adding users to a WiMAX system is less expensive than DSL or coaxial cable once a threshold level of users is reached. The cost of a base station can vary widely from \$10,000 to over \$100,000. A typical end point will cost \$300-\$500.

WHERE IS IT DEPLOYED?

WiMAX equipment is currently deployed in Scott County, Ft. Wayne, South Bend, and Sullivan County have all established pockets of wide-area data network coverage using equipment which is a forerunner to the WiMAX standard.

A TYPICAL WiMAX AND WiLAN DEPLOYMENT:



REFERENCE LINKS:

WiMAX Forum

http://www.wimaxforum.org/news/downloads/wimax_wifi_june3.pdf

IEEE 802.11 Wireless Local Area Networks

<http://grouper.ieee.org/groups/802/11/index.html>

What is WiLAN and Why Should I Care?

<http://www.sss-mag.com/wlan.html#info>