

REVIEW ON SCOPE AND FUTURE OF WIMAX

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Abstract: The upcoming wireless system is WIMAX which is use IEEE standard 802.16. limitation in wireless network like small coverage area and poor security and less data rate can be overcome by using wimax technology. It provides economic environment development by accessing wireless multi-service in metropolitan area. This wimax technology is use OFDMA for providing mobile broadband access in very large area. The quality of service provide by scheduling of different classes. Every class is having bandwidth range limited.

KEYWORD: IEEE, WIMAX,

[1] INTRODUCTION:

Wimax is stands for Worldwide Interoperability for Microwave Access. IEEE 802.16 based wimax is an emerging wireless internet technology. wimax having high speed data rate upto 70 mbps and distance over 30 miles is primarily aimed at making broadband network access widely available without the expense of stringing wires. It consist of:

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).

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.



It has two type of transmission technology they are:

1. line-of-sight(los) Uses a higher frequency range.
2. Non line-of-sight(nlos).Uses a lower frequency range.

IEEE 802.16 Specifications

802.16a

-Uses the licensed frequencies from 2 to 11 GHz.

-Supports Mesh network.

802.16b

-Increase spectrum to 5 and 6 GHz.

-Provides QoS(for real time voice and video service).



802.16c

-Represents a 10 to 66GHz.

802.16d

-Improvement and fixes for 802.16a

802.16e

-Addresses on Mobile.

Enable high-speed signal handoffs necessary for communications with users moving at vehicular speeds.

IEEE 802.16

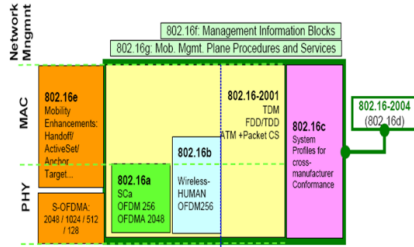
- + Range- 30 miles from base station
- + Speed- 70 Megabits per second
- + Frequency bands- 2 to 11 and 10 to 66(licensed and unlicensed bands respectively)
- + Defines both MAC and PHY layer and allows multiple PHY layer specifications

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802.16 Specifications

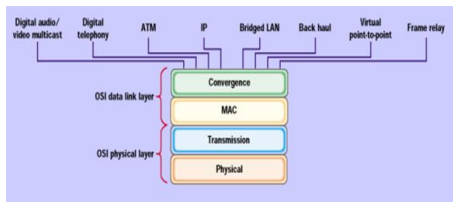


-Much wider coverage than WiFi hotspots

BENEFITS TO SERVICE PROVIDERS

- Allow service providers to deliver high throughput broadband based services like VoIP, high-speed Internet and Video
- Facilitate equipment compatibility
- Reduce the capital expenditures required for network expansion
- Provide improved performance and extended range

PROTOCOL ARCHITECTURE

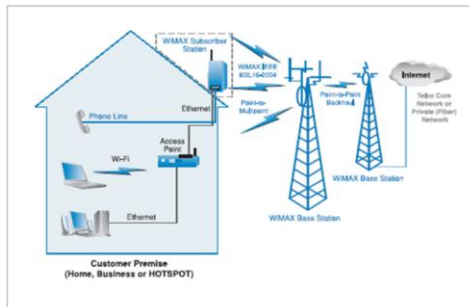


[3] BENEFITS TO CUSTOMERS

- Range of technology and service level choices from both fixed and wireless broadband operators
- DSL-like services at DSL prices but with portability
- Rapidly declining fixed broadband prices

802.16 ARCHITECTURE

- P2MP Architecture
 - BS connected to Public Networks
 - BS serves Subscriber Stations (SS)
 - Provides SS with first mile access to Public Networks
- Mesh Architecture
 - Optional architecture for WiMAX



[2] FEATURES OF WiMAX

- Scalability
- Quality of Service
- Range
- Coverage

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

ADVANTAGES OF WIMAX OVER 3G

- Using an assortment of proprietary and standards-based technologies, such as OFDM and W-CDMA, WiMax has a clear advantage over 3G
- The advantages include
 - Higher Throughput
 - Low Cost
 - Lower Latency
- WiMAX is important for mobile broadband wireless, as it completes 3G by providing higher performance for data with more than 1 Mbps downstream to allow connection of laptops and PDAs
- WiMAX technology is the solution for many types of high-bandwidth applications at the same time across long distances and will enable service carriers to converge the all-IP-based network for triple-play services data, voice, and video
- WiMAX interoperable solutions enable economies of scale through integration of standard chipsets, making WiMAX Forum Certified products cost-effective at delivering high-capacity broadband services at large coverage distances in Line Of Sight and Non Line Of Sight conditions

- WiMax spectrum is more economical than 3G.
 - The price paid per Hz is as much as 1000 times lower than for 3G spectrum
 - The low cost is a clear driver for service providers to enter the field of wireless services with WiMax

[4] LITERATURE REVIEW

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[5] METHODOLOGY

SIMULATION USING OPNET MODELER

Generally, network simulator always tries to model the real world network. The principal is that if a system could be modeled, then features of the model can be changed and corresponding result can be analyzed as the process o model modification is relatively cheap than the complete real implementation, a wide variety of scenarios can be analyzed at low cost.

Network simulator always are not perfect always, means they cannot model all the details of the network. However, if well modeled, they will be close enough so as to give the researcher a meaningful insight into the network under test, how changes will affect its operation.

In the research area of computer and communications network, simulator is a useful technique since the behaviour of a network can be modeled by calculating the interaction between the different network component using mathematical formulas. They can also modeled by actually or virtually capturing and playing back experimental observations from a real production networks.

After we get the observation data from simulation experiment, the behaviour of the network and protocols supported can then be observed and analysed in a series of offline test experiments.

All kind of environmental attributes can also be modified in a controlled manner to assess how the network can behave under different parameters combinations or different configurations conditions. Another characteristics of network simulation that worth noticing I that the simulation program can be used together with different applications and services in ordered to observe end-to-end or other point-to-point performance in the network.

Different types of network simulators can be categorized and explained based on some criteria such as if they are commercial or free, or if they are simple ones or complex one.

[6] PROBLEM FORMULATION

- To find the security level of the information present in the network.
- The resources distribution in wimax for all users properly on their demand.
- Scheduling of the services globally to the wimax users.
- The unrecognized attack in physical layer e.g jamming.

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