

# Report on wireless info system

[Sociology](#), [Communication](#)



## Wireless Info Systems

### Wi-Fi

Wi-Fi is an acronym for Wireless Fidelity. It is a groundbreaking invention in the field of networking and has been finding increasing uses everyday. Based on IEEE 802. 11a/g, current Wi-Fi systems support a maximum data rate of up to 54mbps. There are different features and aspects of this technology, which define it and its applications. Some of the most important and prominent uses of Wi-Fi Technologies are:

**Based on Radio Signals:** Radio Signals form the basis of operations for the Wi-Fi technology. The data is transmitted through these radio signals from one Wi-Fi enabled device to the other. The radio signals sent from Wi-Fi Antennas are picked up by W-Fi receivers to gain or have access to the data or information sent. Access points consisting of antennas and routers are the main medium or source of transmittance and reception of radio waves. While Antennas are used for stronger and better transmission with a radius of 300-500 feet, it is usually around 100-150 feet for the routers (tutorialspoint, 2013). These radio signals are responsible for the reliability and strength that Wi-Fi as a technology possesses.

**Wi-Fi is Half Duplex:** One of the most mistaken conception about Wi-Fi technology is that it is Full Duplex or that it allows two way communication or data sharing simultaneously, while the reality is totally different. As a matter of fact, Wi-Fi systems are contention-based TDS systems in which the access points and the mobile stations vie for the same channel. Because of this shared operation, Wi-Fi networks are half duplex i. e. only one-way communication is possible at a time unlike full duplex where both sides can

communicate simultaneously.

**Offers Unmatched Mobility and Elasticity:** Wi-Fi as a technology is highly mobile and offers plethora of benefits. It adds intensity to connectivity and supports additional benefits. Even though it is sans wires, the technology does better than wired connections in many aspects. Music streamer that transmits music to speakers without any wire is an important example, which displays the kind of mobility that Wi-Fi is capable of offering. It facilitates sharing of data and information at a click of a button sans the cumbersome and complex processes involving wires.

**Supports a wide bracket of products:** Wi-Fi technology since it supports wide range of products right from gaming consoles, MP3 players to PDA's, Laptops and much more. All such devices can maintain a connection through a same network and can then transfer data or share files and information in a very convenient and easy manner. This feature of Wi-Fi technology has in a way revolutionized the wireless networks and has made Wi-Fi a necessary and imperative feature in almost all modern gadgets.

**Wi-Fi is faster and secure:** Wi-Fi enables high speed Internet and can even get faster than DSL and Cable connections. The Wi-Fi systems can be easily configured and re-configured for installations or to fight potential threats thus making it secure. Wi-Fi security systems make it much less vulnerable to threats and can protect VPN and provide access to safe browsing.

Moreover, Wi-Fi allows multiple systems to access Internet using a single connection.

## **Bluetooth**

Bluetooth is a telecommunications industry specification that describes how mobile phones, computers, and personal digital assistants (PDAs) can be easily interconnected using a short-range wireless connection (SearchMobileComputing 2013). The technology offers numerous benefits and enables the usage of a Bluetooth enabled device in a number of ways. It allows data to be transferred between different Bluetooth enabled devices over a short range of distance usually ranging between 30 and 50 feet and could go up to 100 feet in case of very powerful devices.

Bluetooth needs a cheap and low-cost transceiver chip to be included in the device that is to support Bluetooth technology or transfers with other devices. This transceiver plays the central role in transmitting as well as receiving. Reception and transmittance of data or information takes place in an unused or vacant frequency band of 2.45 GHz which is used and available globally primarily for Bluetooth communication or usage.

There are three voice channels available too other than the data channel in the frequency band of 2.45 GHz used for Bluetooth related communication. Bluetooth enables point-to-point as well as multipoint communication and the maximum range supported by Bluetooth technology is 10 meters.

Though there have been some advancement lately which support ranges bigger and larger than 10 meters, this is the conventional and true range of the original Bluetooth technology.

Emerging as one of the most popular, useful and convenient last-inch connectivity technology, it uses radio waves to maintain connections between different Bluetooth supporting devices like mobile phones,

desktops, laptops, headphones, printers etc. But unlike other radio waves based technologies Bluetooth technology has shorter range because it is designed to provide last-inch connectivity unlike Wi-Fi Technology which are basically last-foot or last-mile technologies to provide connections. It is the usage of radio waves that makes Bluetooth safer than the other infrared-based technologies available.

Each Bluetooth enabled device has a unique 48-bit address as per the IEEE 802 standards. These addresses ensure that data transfer takes place between the correct devices. Based on these address, Bluetooth devices form a type of network called Piconet. A Piconet, as a standard, contains a minimum of 2 devices and can have a maximum of 8. Thus, a Bluetooth enables device can transfer data simultaneously to seven devices. While one of these devices becomes the master, other acts as slave. The process of setting up of the network and transmittance and reception is totally automatic and requires no human or manual assistance.

The communication between the devices takes at a speed of 1 Mbps in case of Standard Bluetooth and goes up to 3 Mbps for the advanced version of Bluetooth i. e. Bluetooth 2. 0. Bluetooth supports half-duplex, full duplex, asynchronous connectionless and synchronous connection oriented communication or data transfer unlike Wi-Fi technology that is only half duplex in nature. Though Bluetooth operates in the same frequency band as that of Wi-Fi, the technique of frequency hopping is used to ensure that there is no interference. Thus Bluetooth enables last step communication between devices in a very fast, secure and easy manner.

## **WiMax**

WiMax is one of the latest and pioneer inventions in the field of wireless communications. As a technology, WiMax is capable of providing up to 30 miles of broadband access to mobile users. The WiMax technology is based on IEEE 802. 16 standard and is a telecommunication protocol offering full access to mobile Internet across cities and countries with a wide range of devices (FreeWiMaxInfo 2013).

Acronym for Worldwide Interoperability for Microwave access, WiMax is a based on Wireless Metropolitan Area Network (MAN) technology. It has emerged as a cheaper and better alternative to cable modems, DSL and T1/E1 links to provide broadband access. It offers better connectivity and high speeds when compared to other technologies serving the same purpose.

WiMax is capable of providing two forms of wireless services i. e. Non-Line-of-Sight and Line-Of-Sight. Both these services serve different purposes and aims. While Non-Line-of-Sight is comparable to Wi-Fi and uses frequencies in the range of 2 and 11 GHz, Line-of-Sight uses bigger antennas and use frequency range of up to 66 GHz. While Non-Line-of-Sight provides low range, which is almost equal to what Wi-Fi systems are capable of providing, the Line-of-Sight connection is stronger and much more stable and offers much more speed (tutorialspoint 2013).

WiMax as a technology is built to support and provide staggeringly high peak data rates and that is where its main advantage and benefit lies. It can provide the peak data rate of a whopping 74Mbps when operating in a 20 MHz wide spectrum. That's way too higher than what the Wi-Fi technology is

capable of providing in the same frequency range.

WiMax is indeed much more faster and reliable since it supports multipath.

WiMax technology comes bundled with OFDM-Based physical layer that is based on orthogonal frequency distribution. This allows WiMax to operate in NLOS condition. The feature is unique to WiMax technology and gives it added strength when compared to other technologies of same genre.

WiMax also comes with an additional feature cum benefit of scalable bandwidth and data rate support. WiMax, with its physical-layer architecture, can allow for data rates to scale down easily as per or in accordance with the available channel bandwidth. This is one more feature that makes WiMax unique and highly secure and robust as a technology.

WiMax technology is designed in a way a to support both Time Division Multiplexing (TDM) and Frequency Division Duplexing (FDD). This puts WiMax into the bracket of few technologies, which have support for both the techniques of duplexing. Support for both these techniques enable and offer low cost system accomplishment and implementation.

WiMax systems not only provide robust and highly reliable security through strong encryption and usage of techniques and standards like Advanced Encryption Standard (AES) but also support mobility since it has the mechanism to support applications like VoIP.

Thus WiMax as a wireless technology has taken a giant leap when compared to its predecessors and offers much more in a faster, reliable manner to a much larger populace or area.

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