

WI-FI : How Stuff It Works

Wi-Fi is the trade mark of the **Wi-Fi Alliance** and the brand name of products using the **IEEE 801.11** family of standards and not the short form of **Wireless Fidelity** as most of us think. Wi-Fi simply represents the trade mark of IEEE 802.11x. Wi-Fi is the technology that allows an electronic device to transfer data wirelessly using radio waves. It is the **WLAN** (Wireless Local Area Network) used in home, office, educational institutions etc to provide wireless networking for the internet access.

The common Wi-Fi activated systems like Computer, Mobile phone etc can be connected to the internet wirelessly through the Wi-Fi system. For this, the computer should have a wireless network interface controller called **Station**.

The access point of Wi-Fi- is called **Hot spot** and may be a wireless **Router** or **Modem**. The Wi-Fi usually has a range of 20 meters in indoor applications. The technology of Wi-Fi came into action during 1985.

In the Wi-Fi system, the entire stations share a single radio frequency communication channel. Transmission on this channel will be received by all the stations within the range of the Wi-Fi. A carrier wave is used by the Wi-Fi systems to send and receive data packets called **Ethernet frames**. Each station is tuned to the particular transmission frequency continuously. When an RF current is supplied to an antenna, an electromagnetic field is created that then is able to propagate through space.

The wireless Wi-Fi system has four components.

1. High speed access

It is the **Broad band** internet connection that connects the internet faster than the **Dial up** service. ISDN, Cable Modem, DSL Satellite services are the examples of High speed access.

2. Network gateway

It is the **gate** that connects the high speed access with the wireless system. The gateway prevents unauthorized access to the network. Authentication, Network monitoring, VoIP etc are the common gate ways.

3. Wireless Local Area Network

It is the system that connects the **Wi-Fi source** with the computer wirelessly using high speed radio frequency.

4. Wireless customer

The user having a **Computer** and a **Wireless adapter** is the Wireless customer. The wireless adapter may be a built in type one or external device. The adapter circuit is called LAN Card.

Wi-Fi connection suffers speed loss if other wireless devices are operating nearby. Many devices operating in **2.4 GHz** may interfere with the signals from the Wi-Fi. **Wi-Fi pollution** is another problem causing congestion in the Wi-Fi network by overlapping the channels. Micro wave ovens, Surveillance cameras, Bluetooth devices, Cordless phones etc are also working in the 2.4GHz range and can cause interferences in Wi-Fi system.