



## Wireless Networking Tutorial

### Wireless Networking Terms

**802.11a:** An IEEE standard for wireless Ethernet networking that operates in the 5 GHz radio band (ISM frequency band) and uses the IP protocol. Maximum transmission speed is 54 Mbps and approximate wireless range is 25-75 feet indoors.

**802.11b:** An IEEE standard for wireless Ethernet networking that operates in the 2.4 GHz radio band (ISM frequency band) and uses the IP protocol. Maximum transmission speed is 11 Mbps and approximate wireless range is 100-200 feet indoors.

**802.11g:** An IEEE standard for wireless Ethernet networking that operates in the 2.4 GHz radio band (ISM frequency band) and uses the IP protocol. Maximum transmission speed is 54 Mbps and approximate wireless range is 100-200 feet indoors.

**802.11n:** An IEEE standard for wireless Ethernet networking that operates in the 2.4 GHz or 5 GHz radio band (ISM frequency band) and uses the IP protocol. Maximum transmission speed is 3600Mbps (20MHz channel) and approximate wireless range is 300 feet indoors.

**Access Point:** A wireless Access Point is used to connect PC's with wireless adapter cards to a wired Ethernet network. Access points can support several

or all of the three most popular IEEE WLAN standards including 802.11a, 802.11b and 802.11g. Sometimes people may refer to an Access Point as a Wireless Hub.

**Adapter:** A wireless adapter or NIC (Network Interface Card) that is used to connect to a laptop or PC to a wireless LAN (Local Area Network).

**Ad-hoc:** An Ad-hoc wireless network is made up of a group of PC's and/or laptops connected as an independent wireless LAN.

**Encryption:** Encryption is used to hide or mask the data being sent through wireless transmissions. There are several popular and widely used encryption methods used today including WEP (Wired Equivalent Privacy, and WPA (Wi-Fi Protected Access).

**Hot Spot:** A wireless Hot Spot is a public area where wireless laptops can connect to WLAN and receive Internet access. Recently many coffee shops and airports have added this capability for their customer's convenience.

**ISM Band:** The ISM (Industrial, Scientific and Medical) band, which is controlled by the FCC in the US, generally requires licensing for various spectrum use. To accommodate wireless LAN's, the FCC has set aside bandwidth for unlicensed use including the

2.4GHz spectrum where many WLAN products operate.

**Roaming:** The ability to use a wireless device and be able to move from one access point's range to another without losing the connection.

**Router:** A wireless router is a protocol dependent device that is used to connect sub networks or different independent WLAN's together. Routers provide security as they can be configured to only allow certain users access to different services such as the Internet and file servers when connecting a WLAN to the Internet a router is required.

**SOHO (Small Office/Home Office):** Is a widely used acronym which defines applications or products used in homes or in small offices.

**SSID:** The SSID is the unique name shared among all devices on the same wireless network

**Wi-Fi:** Wi-Fi stands for Wireless Fidelity and is used to define any of the IEEE 802.11 wireless standards. The term Wi-Fi was created by the Wireless Ethernet Compatibility Alliance (WECA). Products certified as Wi-Fi compliant are interoperable with each other even if they are made by different manufacturers.

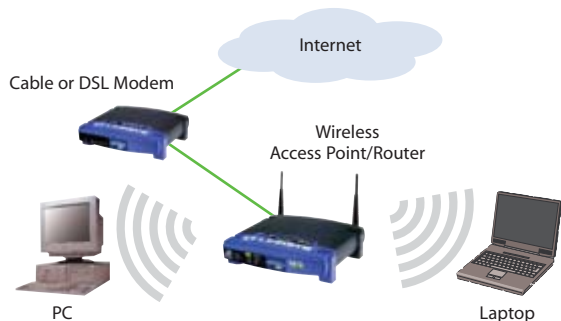


### What is a Wireless Network?

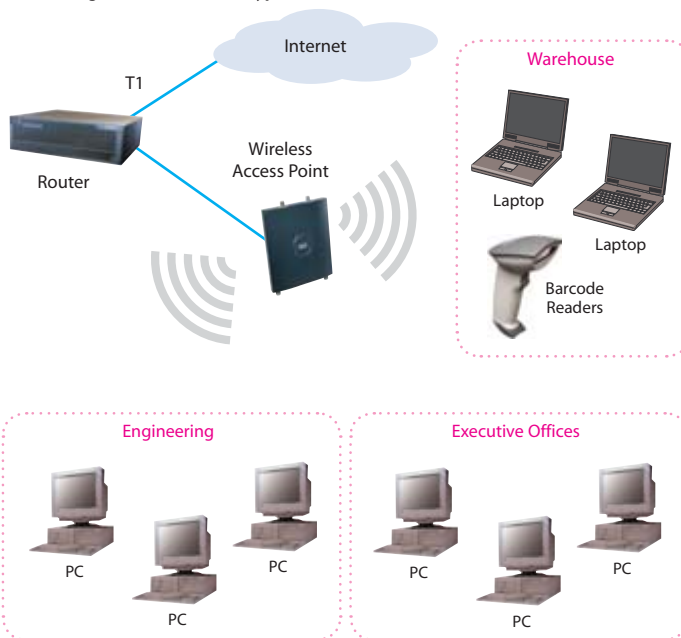
A wireless network is very similar to the wired network in that all the same pieces are still required, a wireless NIC, Access Point (similar to a wired network Ethernet Switch) and a wireless router. The only thing that's missing is the cables.

First you will need to determine if your desktop or Laptop PC already has a wireless NIC built in. Again, check your user's guide to confirm this. Once your wireless NIC is installed you will need to configure the SSID (service set identifier) on each of the PC's to use the same name. Also, you need to make sure all the wireless NICs are configured to be on the same channel and set levels of encryption if desired. Your wireless access point or router should come with detailed explanation of how to configure the SSID and security features such as encryption and access lists. Many of today's wireless routers come with the access point functionality built right in.

The diagram below shows a SOHO wireless network set up.



The diagram below shows a typical business wireless LAN.



	802.11a	802.11b	802.11g	802.11n
Speed	Up to 54 Mbps	Up to 11 Mbps	Up to 54 Mbps	Up to 300 Mbps
Frequency	5 GHz	2.4 GHz	2.4 GHz	2.4 GHz or 5 GHz
Indoor Range	25-75 feet	100-200 feet	100-200 feet	300 feet
Compatibility	Incompatible with 801.11b and 802.11g	Compatible with 802.11g	Compatible with 802.11b	Compatible with 802.11b, 802.11g, 802.11a (5GHz)

