

## Introduction

By using radio frequencies, PC's and other network-enabled devices can communicate with the LAN without running cables to each location. Often, this type of network is called a WLAN (Wireless Local Area Network). Applications for a wireless network include areas in which it is impractical or expensive to run cabling, or large open areas such as warehouses.

## The 802.11 Standard

The IEEE 802.11 standard is the industry specification for wireless networking. There are three currently accepted specifications included in the 802.11 standard. Ironically, the 802.11b standard was ratified before the 802.11a standard.

- 802.11b - Provides up to 11 Mbps in the 2.4Ghz band. Coverage area can be up to 300' diameter, thus requiring less access points than 802.11a for a large coverage area.
- 802.11a - Provides up to 54 Mbps in the 5Ghz band. Coverage area is less than 802.11b, but more bandwidth is available on each access point for densely populated user environments, or applications with large file sizes.
- 802.11g - Extends 802.11b data rate to 54 Mbps in the 2.4 Ghz band. Provides backward compatibility to 802.11b devices.

## Components

There are 2 basic components to enable a wireless network:

- Access Point - One or more Access Points are installed to provide the connection between the wired LAN and the wireless device. They transmit data to, and receive data from, the wireless devices forwarding information between the wired network and the wireless devices.
- WLAN Adapter - Also known as wireless NIC's (Network Interface Card), these devices replace the functionality of a traditional wired RJ-45 port on a PC or other device, and allows communication between the Access Point and the PC.

## Installation

Despite being called Wireless Access Points, these devices in fact need to be cabled back to the wired LAN using traditional Cat 5e/6 cable. In many cases, the Access Points are powered over the Ethernet cable and do not require individual power sources. Before any Access Points are installed, the proper location must be identified. This is done by conducting a detailed site survey to determine optimal placement of Access Points in order to achieve maximum coverage with the fewest number of Access Points.

## Other Uses for Wireless

Wireless technology can also be used to allow communication between buildings. In addition to radio frequencies, some devices use laser technology to transmit data between devices. Often referred to as Free Space Optics, these signals can travel distances of up to several miles and can provide very high bandwidth. There are numerous factors that can affect the effectiveness of Free Space Optics including weather conditions and availability of "line of sight" between outdoor wireless devices. As with any wireless implementation, a detailed site survey is required to determine if the desired functionality can be achieved.