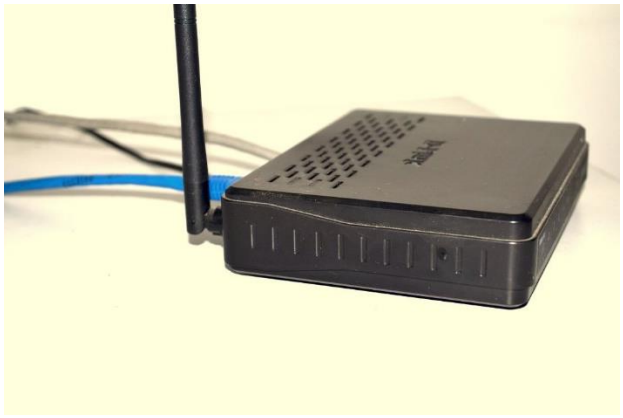
Wireless Propagation



Wireless propagation is the total of everything that happens to a wireless signal as the signal travels from Point A to Point B. Although invisible to your eyes, the wireless signal interacts with everything that it comes near or passes through, including trees, hills, buildings, bodies of water, the earth:s a tmosphere, people, vehicles, and so on. The better you understand these interactions, the more easily and more successfully you will be able to deploy wireless WANs. Hrst, it is important for you to understand how wireless signals are created.

Wireless communication is possible because changes in the electron flow within a wire cause changes in the magnetic fields and in the electric fields that surround the wire. Magnetic fields and electric fields are invisible, but you can see the results of their presence. If you have ever used a magnet to attract a piece of iron or steel, you have seen the result of a magnetic field. If you have ever seen a bolt of lightning, you have seen the effect of an electric (or electrostatic) field.

When electron streams change direction rapidly within a wire or antenna, the electrostatic and magnetic fields around the wire or antenna change at the same rapid rate. These rapidly changing fields are called electromagnetic waves. The electromagnetic waves do not simply stay near the antenna; they travel away at nearly the speed of light—186,000 miles per second (300,000,000 meters per second). The changing electron flow within the antenna has been transformed into electromagnetic (wireless) waves traveling away from the antenna.