# Variables play into how well wireless works

August 28 2009, By Anne Krishnan

In a recent column, Dianne Dunlap, a customer support engineer specializing in wireless technology for Cisco Systems, gave a thorough breakdown of how to check whether wireless Internet connectivity problems are due to wireless card issues -- and how to fix them.

This week, she's digging into how to identify and remedy potential problems with your wireless network.

Readers often report that their computers have different connectivity in different parts of the house. That's not uncommon, Dunlap said, due to factors such as the quality of the card and its ability to discriminate between noise and good signal; interference from other wireless equipment; and non-wireless interference in one location but not another.

There are two wireless bands -- 2.4 GHz and 5 GHz; within the bands are channels. Some network interface cards (NIC or wireless cards) and access points can access both 2.4 GHz and 5 GHz reception. Some wireless cards and access points can only transmit/receive one band, leaving you out of luck if they're incompatible.

The analogy would be AM and FM radio, Dunlap said. Your AM radio receiver cannot receive FM stations; conversely an FM receiver cannot receive AM stations. But some radios can tune into both AM and FM stations.

To see what wireless networks (including yours) are operating in your

area, go to "Start," "Control Panel" and "Network Connections." You may need to click on "View Wireless Connections."

If you are using software provided by your wireless card vendor to manage the card, it should show you similar information, but may provide more detail such as the channels that the different networks are using.

The channels in use are of interest, because there can be conflict if neighboring wireless access points are on the same or nearby channels. On the 2.4 GHz band, which is more susceptible to interference, both your access point and your neighbors' points should be set for channels 1, 6 or 11. If you have the 5 GHz band, the channel selection is less critical because more channels are available.

In addition to having your neighbors on a competing channel, there also are many other sources of interference on the 2.4 GHz band, including cordless phones, garage door openers, baby monitors, microwaves, video surveillance cameras and wireless audio equipment. Microwaves typically cause interference on the higher channels.

Signal quality also is important. Even though wireless transmissions might start at the router's highest rate (from 11 Mb/sec for an older B access point to 300 Mb for the newest N routers), when signal quality is poor -- if the PC is in the vicinity of a microwave, perhaps -- the data rates may later be negotiated down to a lower rate to keep the traffic going.

Furthermore, while older network cards theoretically should work fine with newer access points, this may not be the case if the card's hardware or drivers are poor. If your card cannot perform at the faster rate and your rates are configurable, you might want to see if turning off the higher data rates on the access point makes the connection more stable.

Mounting of the access point can also be an issue. If it has omni-directional antennas (usually 3-4" long), the beam pattern is like a doughnut with the antenna going through the doughnut hole. Omni antennas should be mounted vertically, not horizontally.

Finally, some service providers anticipate that they are servicing one device at a time, e.g., if there are multiple PCs at a site, only the first PC to boot will be able to get an IP address and access the Internet. This possibility can be ruled out by powering off the other PCs and rebooting the service provider's equipment so that the problem PC is the only PC it sees. If the problem PC reliably works when it is the only PC, then the issue would be with this limitation from the service provider.

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