

Crappy Antennas Wreck Wireless Networks



Frustrated with wireless signal loss in parts of your home? Wireless networking is supposed to be about the freedom to connect where you want to connect, not a virtual chain that forces you to hover around your router in search of a good signal. If you've got your router in a central location away from metal, concrete and brick and you're still having signal problems, a poor antenna could be the culprit.

Catch the Waves

Wireless networking uses radio waves, just like the radio in a car. In a car radio, the antenna receives a transmission from a broadcast antenna. In wireless networking, the antennas in routers and network adapters are both receivers and transmitters.

If you drive far enough away from a radio station's transmitter, the signal starts to fade and sooner or later you get nothing but static. The same thing happens as you move away from your router in a wireless network. More powerful antennas let you get further from the router, just as a more powerful antenna lets you drive further from a radio station and still get a clear signal. It's all about the antenna's ability to receive and transmit radio waves.

Dealing with Network Adapters

In most cases, tiny antennas in network adapters are the culprit when you can't

get a wireless signal. The smaller an antenna is, the less powerful it is. Wireless networking cards for laptops have the smallest antennas, which means they need to be used closer to the router.

To see if your networking card is the problem, you can do two things. First, try using a laptop with a different network card in the same area. If you can connect, you'll simply need to upgrade to a network card with a better antenna.

If you don't have access to another laptop, try plugging a wireless USB network adapter into your laptop. These external adapters have much larger antennas that allow smooth operation across longer distances. Look for models built specifically for laptops; these are generally the size of a thumb drive and don't have any cords. Larger models with cords are more powerful, but they're meant to be used with desktop computers.

Switching Router Antennas

Your wireless router has one or two antennas attached to it. Take a look to see how they're attached. If they're fused to the body of the router, you're stuck with them. If the antenna has a threaded bottom and screws into the router, you can replace it, potentially solving your signal problems. You've even got a choice of antenna types.

The antennas that come with routers are known as omnidirectional antennas or simply omnis. These put out a signal in a 360-degree radius, so long as there are no major sources of interference, such as brick or concrete walls, metal surfaces or sources of radio interference, such as microwave ovens and garage door openers. If you put one of these routers in the exact center of your home, you should get equal coverage on all sides. Replacing the built-in omni with a more powerful omni will extend the range of your network in all directions.

Most people don't live in spherical homes, and if you live in an apartment, condominium or a particularly large house, boosting your signal on all sides could cause problems. You'll be sending a good deal of signal outdoors or into your neighbors' homes, where you can't use it and where others may be tempted to steal it.

In this situation, it's worth looking into directional router antennas. Instead of a 360-degree sphere, a directional antenna sends the signal out in an arc that's strongest in one direction and that drops off dramatically on the sides. Once the antenna is installed, you simply point it where you want more signal.

Changing your router's antenna is the best option if you've got multiple devices struggling to connect to your network, or if you've got devices with built-in antennas, such as a desktop computer or video game console, that are impractical

to move. While a more powerful antenna can compensate for a poor antenna in a networking card, it's better to replace the networking card than the antenna if a laptop is the only device that's affected. Powerful antennas inevitably broadcast wireless signals outside of your home, presenting security and privacy risks.

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