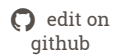# system76

← *Wireless - Solve Wireless Issues*

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WiFi issues are influenced by many different factors, including:

- Hardware (WiFi card, access point)
- Settings at both ends of the connection
- The local environment

Basic Troubleshooting

If you're having problems, try these steps first:

- Try unplugging the wireless router or modem to reboot it.
- Try airplane mode by pressing `Fn` + `F11` waiting 10s, then disabling.
- Try rebooting the computer.

Some router settings can cause problems. Try adjusting your access point to these settings:

- WPA2-AES is preferred over WPA/WPA2 mixed mode or TKIP.
- A channel width of 20 MHz in the 2.4 GHz band is more stable than automatic 20/40 MHz or fixed 40 MHz.
- Set 2.4Ghz and 5Ghz SSID names differently.
- Pick a fixed channel. Use either 1, 6, or 11 in the 2.4 Ghz band, rather than automatic selection.
- Check if the router is set to N speeds only. Auto B/G/N is preferred.
- Lower the max/burst speeds, turn off channel bonding, and reduce channel width. Setting the speed to 600 Mb/s or 450 Mb/s will use spread frequencies to achieve those speeds and may decrease stability. Try setting it to 289/300 Mb/s (N speed) or or 54 Mb/s (G speed).
- After making these changes, reboot the router.

Advanced Troubleshooting

If the above steps aren't working, or you would like to fine tune and improve you connection, see the following steps.

Regulatory Domain

In many cases, it's recommended to explicitly set the WiFi regulatory domain. Check yours with this command:

```
sudo iw reg get
```

If you get 00, that is a one-size-maybe-fits-all setting. Find yours here: ISO_3166.

And set it permanently with this command:

```
sudo gedit /etc/default/crda
```

Change the last line to read:

> REGDOMAIN=US

Save and close the text editor.

IPv6

Unless specifically required, you can set IPv6 to Ignore in Network Manager. Go to **System Settings** → **Network** and click the orange arrow next to your network, then click **Settings** → **IPv6 Settings** → **Automatic** to **Ignore**.

Antenna Aggregation

If these changes do not help, you can try enabling antenna aggregation:

```
sudo modprobe -r iwlwifi
sudo modprobe iwlwifi 11n_disable=8
```

Then, test to see if that helps. To make it permanent:

```
sudo gedit /etc/modprobe.d/iwlwifi.conf
```

Then, add this line to the bottom (effective upon reboot):

> options iwlwifi 11n_disable=8

N Mode

You can try disabling N mode completely by using `11n_disable=1` in the previous settings. N mode can be more unstable than G mode, and the speed gained isn't typically useful as total bandwidth available in/out from/to the Internet is less than N speeds.

Bluetooth Coexistence

If you have trouble with a Bluetooth headset and keeping a steady downlink speed, try disabling Bluetooth coexistence in the configuration file above:

> options iwlwifi bt_coex_active=0

Power Management

Another way to help with Wifi issues is to turn off power management for the hardware. To do so, edit the configuration file with this command:

```
sudo gedit /etc/NetworkManager/conf.d/default-wifi-powersave-on.conf
```

And change the file to read (effective upon reboot):

> [connection]
> wifi.powersave = 2

Useful Programs

The program wavemon can be used to see info about nearby access points, such as power levels, channels, and BSSIDs. It can be installed with this command:

```
sudo apt install wavemon
```

And run with this command:

```
sudo wavemon
```

Useful Commands

```
iwevent
```

Run this command to watch what the Wifi hardware is doing. Pay attention to the disconnect reasons, and ignore the scans.

```
sudo systemctl restart network-manager
```

This command will restart the service that manages all Internet traffic on the computer, which is usually easier than restarting the computer.

```
dmesg | grep iwlwifi
```

This will check the hardware startup and driver loading messages.

```
lspci | grep Network
```

This will check if the hardware is being detected by the kernel.

```
lsmod | grep iwlwifi
```

This will check to see if the device driver (module) is loaded.

```
sudo rm /etc/NetworkManager/system-connections/*
```

This will erase the stored information about all wireless access points.

```
sudo apt install --reinstall network-manager
```

This will reinstall network-manager, which can fix some network issues.

Additional Info

Wifi Speeds and Frequencies:

- 54 Mb/s uses the 802.11g & 802.11b standards.
- 145 Mb/s and 300 Mb/s modes use the 802.11n standard and 20MHz or 40MHz bandwidths.
- 300Mbps / 40Mhz will provide the maximum performance in most cases.
- 145Mbps / 20MHz will work better in areas with more access points.
- 450Mbps uses a 60Mhz channel width and 600Mbps uses a 80Mhz channel width, and is typically less stable.

The name of the Linux driver for Intel Wifi cards is called iwlwifi and is included in the kernel by default. All information about the driver can be found here:

wireless.wiki.kernel.org/en/users/drivers/iwlwifi

The newest version of the linux-firmware package, which contains the iwlwifi driver, can be found here:

mirrors.kernel.org/ubuntu/pool/main/l/linux-firmware

Sometimes the newest version of the firmware will clear up occasional bugs. Please download the newest `.deb` package.