



## Problems

The radio signal of domestic Wi-Fi is not that strong. Signal strength actually halves about every three metres you move away from the router. You could actually move through your house and move closer to your neighbour's device as you do so without realising it. That is not much of an issue if you are on totally different channels, but if you are on the same channel or one close to each other you can get data "slow down".

When the signals are bleeding over each other you can experience slowness on your connection as the signal is getting interference and your data may be corrupted in transmission, meaning it gets retransmitted. It's all in the background to you, the only thing you'll see if it getting slow.

## Best Practice

There are only three channels you can use without bleeding over neighbouring channels. These are channels 1, 6 and 11. If you are on channel 6 and your neighbours either side on 1 and 11, you're going to get the cleanest signal you can. The picture below shows a really good set up within the NSMRA streets.

This means working with your neighbours to help each other. The table below gives an example to follow:

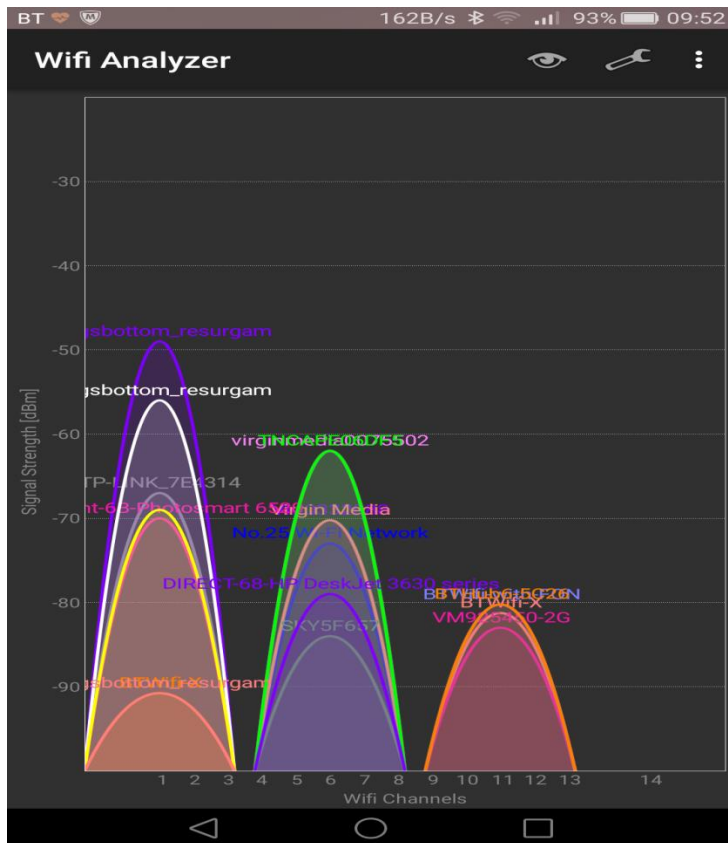
House Number	Channel to Use
1	1
3	6
5	11
7	1
9	6
11	11
13	1
15	6
17	11

Remember there's not a great benefit in you using 1, 6 or 11 if your neighbours are using channels immediately next to you, or worse, several channels. For the best service it's good to talk to your neighbours.

Some WiFi hub devices are smart enough to recognise signal clashes and work together to optimise the channels they are using. If neighbouring houses are both using BT Hubs those hubs will recognise the signal overlap and move to the best available. In reality we are all sprad over different suppliers and kit, so this does not always happen.

As Wi-Fi travels some distance if someone is three doors away on the same channel as yourself, the signal will be much weaker than yours so should not be an issue. Theirs should have faded enough not to impact you.

The picture below shows a good example.



## Help

If anyone has a problem checking their channels, please let us know if you need any help.

## Addendum

### Other Wi-Fi issues

Most houses in the NSMRA area are of similar sizes, but inside they have very different builds of rooms, walls, kitchen, microwaves etc. Wi-Fi routers are placed in different positions. All of these can impact the service you get around the house, and getting a clean signal is not the only action you need to take to get a decent network. To ensure all your rooms get the coverage you want you may have to add in more equipment, but you should add it using the same principle of channel choice.

You can use powerline type Wi-Fi extenders, wired extenders or wireless extenders.

### **Whole-home style solutions**

These systems position additional Wi-Fi access points in one or more other rooms, depending on your needs. They communicate back to your internet router normally using Wi-Fi to a unit connected using wires to the router. These devices are good in that they will take your existing network ID (SSID) and channels, extending them around the house. They handle passing your connection between themselves as you walk around the rooms transparently to you. By keeping the same channels, they do not create any issues for you or the neighbours.

Variations are available from Google, BT, Netgear, TP-Link, Huawei and many others.

### **Plug based extenders**

These can repeat a signal to another room but they do not handle the transparent passing of your link to another if you move around. They may not have the same SSID, making you login again if you change rooms. As such they're ok to fix a small problem, but nothing massive.

If they are not using the same SSID and you put them on the same channel, they can interfere with your router, and if you put them on a different one, you interfere with your neighbours. So they are to be used with caution.

The worst thing that you can do is use several plug based extenders around the house and put them on multiple channels. Do this and you are creating problems for yourself and others. Please avoid this!

### **Powerline**

The devices were initially used to extend wired networks – you plug them in and they link over your domestic power wiring. Quality depends on your wiring and if they are on the same ring. One end has to take a wired port of your router so they are limited in that respect. They provide one or two network ports in another room and some have Wi-Fi. The same limitations as plug based extenders then become applicable.

### **Microwaves**

Microwaves work on the 2.4 GHz frequency to heat up food. A Wi-Fi router works normally at 100 milliwatts – a Microwave typically around 750 watts. That's far more powerful and if you have a working microwave between you and your router you may want to consider repositioning one of them.