

Wi-Fi: A summary of the things you need to know

What is a SSID?

The Service Set Identifier is the name of the Wi-Fi network.

What are Channels?

The 2.4 GHz range has 11 overlapping frequency 'Channels' that the signal can be transmitted over.

The 5 GHz range has 24 non-overlapping channels.

What is Contention?

Contention is the ability for multiple devices to share the same Channel to transmit and receive data.

What is Bandwidth?

Bandwidth is the rate (amount) of data transfer measured in bits per second (bit/s).

A Brief History

Wi-Fi was first released for consumers in 1997 and designed to provide a low power, short range method to allow computers and other data devices to connect wirelessly over radio signals.

To put into perspective how aging a technology this really is, for those of you that still remember dial-up modems, the 56K modem was first released to the public the following year, 1998.

Over the years many devices have made use of the technology, Baby Monitors, Cordless Phones, Garage Door Openers, Till Systems, CCTV, WDMX DJ Lighting, even Door Bells.

To try and accommodate the growing amount of data transferred by this method there have been numerous tweaks to the specifications however the core 2.4 GHz frequency with its 11 overlapping channels still remain the most popular frequency and is considered by many now pushed well past fit for purpose.

2012 saw a major overhaul in the specifications to improve the 5 GHz frequency to encourage uptake by equipment manufacturers. Although 5 GHz had always provided higher data throughput it had less range so hadn't been adopted as widely. With the 2.4 GHz getting evermore overcrowded dual band devices started to emerge.

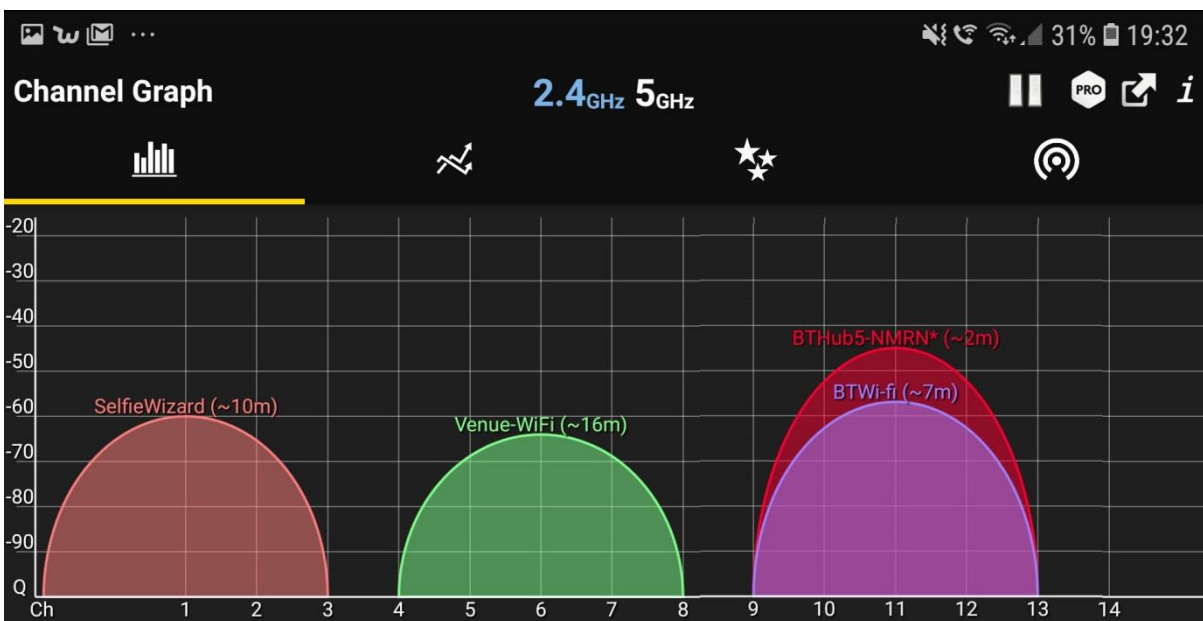
The Selfie Wizard

The Selfie Wizard uses the 2.4 GHz range and user selected Channels 1-11
The 2.4 GHz range was chosen as this will be compatible with every Wi-Fi enabled Smart Phone.
There are many phones and devices in circulation and still available to buy today that do not support the 5 GHz range.

The following graphs were taken on an Android phone using a Wi-Fi scanner App available free from the Play Store.

Apple do not allow the use of Wi-Fi scanners on their devices.

As the visitors at the venue we need to fit into whatever other Wi-Fi networks are being used in the vicinity. An ideal setup would be this:



- The Selfie Wizard has Channel 1 to itself.
This will give you maximum range and bandwidth.
- Venue WiFi is running on Channel 6 – Note how it overlaps channels 4, 5, 7 and 8.
- Another two networks are running on Channel 11 which overlap 9, 10, 12 and 13

You will often find multiple networks running at venues, typically you will be faced with Channels 1, 6 and 11 already being used as per the following example:



The obvious choice would at first seem to be to select an unused Channel such as Channel 3:



However, due to the way the Channels overlap this could potentially result in interference from the Till System running on Channel 1 and the Venue Wi-Fi on Channel 6.



So whats the answer..?

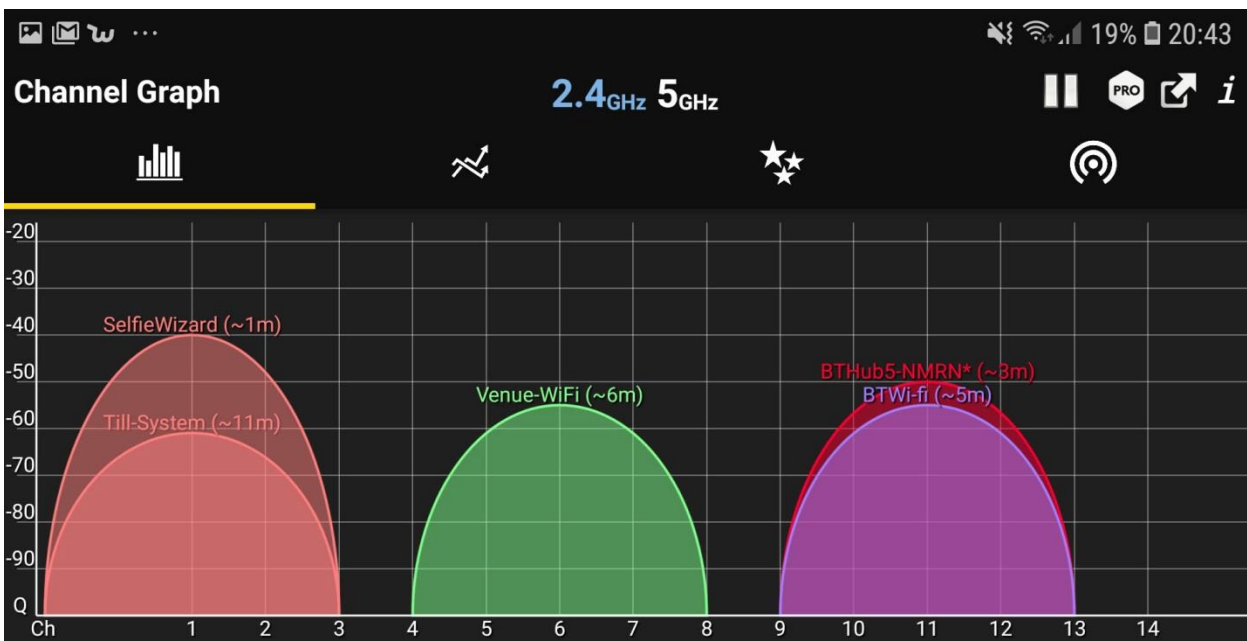
This is where Contention and Bandwidth come into play.

Interference from a neighbouring Channel is potentially a worse problem that Contention.

The Venue Wifi on Channel 6 is likely to be busy, it has a finite amount of Bandwidth, the amount of data it can carry, so would result in slower uploads to the Selfie Wizard as Guests fight for space with other traffic on the Venue Wi-Fi.

Channel 11 already has 2 Networks running on it, its Contention ratio, so once again not the best choice.

Faced with this scenario the most likely best option would be to select Channel 1.



The amount of data being sent across the Till System Network is likely to be small and in short bursts so it should have ample Bandwidth available to share the Channel with the Selfie Wizard.

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FAQ's and Tips

- Wi-Fi is a low power low range technology.
- The Selfie Wizard built-in Wi-Fi only supports the more popular 2.4 GHz range.
- **Careful choice of the Channel you use at an event is the main factor in getting the best performance.**
- Channels 1, 6 or 11 are preferred.
- There is no sure way to tell which channel will work best – it's often a case of trial and error.
- Contention (sharing a Channel) is less of a problem than Interference from an overlapping Channel.
- Position the Selfie Wizard up High.
- Try to keep clear line of sight.
- If it's necessary to share a channel with another network try to opt for the network with the least amount of traffic.
- If you have problems connecting to the Selfie Wizard to access the admin panel to change channels. **Take the Selfie Wizard to another area away from the likely cause of interference to make the changes to the settings.**
- Would a Range Extender help..?
Yes – a simple plug in range extender can be used to clone the Wi-Fi SSID and extend the range however these also reduce available bandwidth and slow down uploads as they double the data traffic on the network.