

Getting the most out of your Broadband Connection

One in a series of Digital Connectivity Guides

*A guide for residents and businesses
on getting the most out of your
Broadband Connection*



worcestershire
county council

Getting the most out of your Broadband Connection

How to improve your connectivity

Whether you are in an existing contract or looking at a new broadband contract, the following advice will help you get the most from your broadband router. If you're not getting the experience promised by your supplier it may be the set up in your home. The following guide suggests some ways you might handle this.

We do recognise there may be external factors impacting the performance, if you have a 'copper' or 'fibre to the cabinet - FTTC' based solution (usually speeds sub 80Mbps) you may suffer poor signal at busy times of day (when children come home from school), in poor weather (e.g. flooded communications chambers) or if there is a fault on the network.

It can help to establish if the reason for poor performance is in the premises or outside by undertaking a 'speed test' as early in the network as you can. Try plugging an ethernet cable directly between your device and main router. If possible, run a broadband speed test without any other applications running on your device and with other devices switched off. You can run a speed test using an Ofcom accredited price comparison site such as broadband.co.uk, and broadbandchoices.co.uk. Try testing across different days and times of day. If you see a speed problem connected directly to the router, it is likely to be a supplier network issue. However, if the result is much higher than you experience elsewhere in the house this guide may help you.

Setting up and positioning your router correctly

Don't play 'Hide and Seek' with your router – if you 'Hide' the router you will be 'Seeking' the Wi-Fi. Incorrect positioning of your Internet Service Provider (ISP) provided router can lead to a poor signal as well as not fulfilling the potential of the router.

Find a central location:

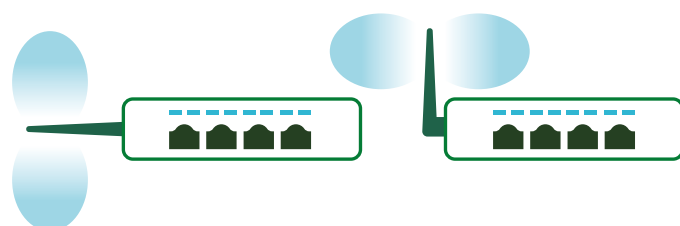
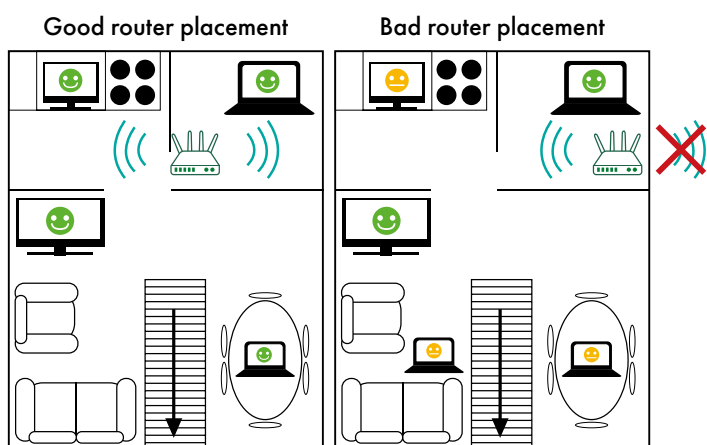
Place your router in a central location to provide free and clear wireless signal to your devices; or place nearer to areas most commonly used by your main devices. This may mean that you have to purchase an extension cable, and potentially fixings, from where the line comes into your house to where you locate the router.

Other considerations:

A good height to locate your router is at least 1 to 1.5 ft off the ground, but usually the higher the better. When positioning your router note that the Wi-Fi signals from the router can be disturbed by physical obstructions so avoid placing the router towards an outer wall, near other high-powered electrical devices that use electromagnetic waves, and hiding it within or behind furniture or decorative features. Avoid locations of direct sunlight or heat sources as these can also affect the performance of the device.

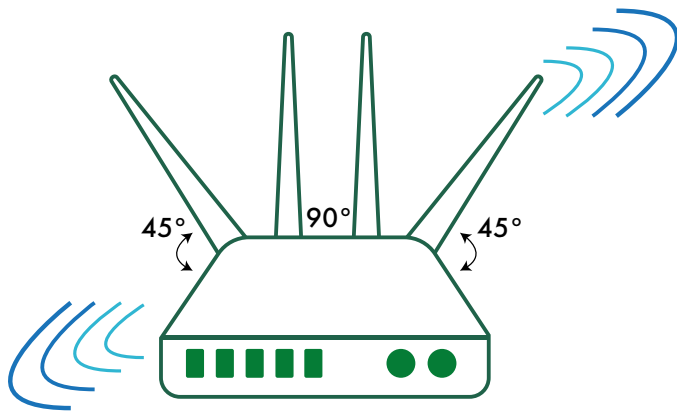
If you have antenna on your router consider the following:

If your router has antenna, note that the Wi-Fi signal is transmitted outwards at 90-degrees from and 360-degrees around the line of the antenna.



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If you are covering only one floor then position one or all of the antenna in a vertical 90-degree position. If, however, you want to cover more than one floor of a property / area then consider locating the router in the centre and then turn some of the antenna to a 45-degree angle so that the direction of the Wi-Fi signal is up and down at an angle.

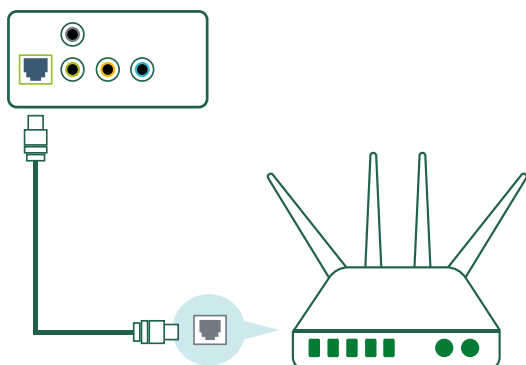


It is worth considering that mirrors may cause interference to the hub and it is recommended to place the hub at least one meter away from large mirrors. At the same time, avoid putting items that might impact the hub's signal, like baby monitors, speakers, games consoles and TVs, directly next to or in front of your router as they will interfere with the Wi-Fi and clog the natural flow of connectivity.

Hardwire connection to your router:

Running an ethernet cable to your main computing, gaming or TV device can be faster and more stable option – you can even run the cable to the other side of your property (within reason) and it is not affected by physical obstructions. The downsides are very reduced mobility and trailing cables.

TV Rear Connectors



Routers

Router maintenance:

It is advisable to restart your router at least once a month – this is called “power cycling” and enables the router time to choose the best channel with the least frequency interference for you. This can often fix dead spots or unstable connections.

You will need to disconnect the power source to the router, wait two minutes or more, and then power up again. The router will then go through its checking process. This refreshes the built-in RAM (internal memory) and allows the device to function almost as new – known as returning to “known base state”.

Updating the routers Firmware:

Like most technology, new devices soon become outdated. Firmware is a type of software that is fixed directly into the hardware providing the instructions and guidance for the device to communicate with other devices, perform basic tasks or functions. Firmware updates help to repair bugs in the system, fix speed issues, and make the router run better. Your ISP or router manufacturer should provide a web page explaining how to do this for your device.

If you turn your router off every evening to save energy, this can have negative impacts on router performance as updates are often scheduled to occur overnight.



Important

Installing firmware

Installing firmware update. Do not power off or close the browser window.



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Upgrading your router:

All routers have a life expectancy, they are subject to technology improvements and wear and tear over time. If you have had yours for some time or your ISP has been using this model for some time you may not be getting the performance and security you need. Like most devices, it is recommended that you replace your modem or router every 3 years – ask your ISP for a new replacement, it is often free as part of your service. Not all routers are created equal, you may want to upgrade your router to include additional features above and beyond that provided by your ISP which may help provide you with better connectivity and more flexibility.

For businesses or high demand users, you may be looking to:

1. Connect more devices while retaining the raw speed – currently look for devices that support **Wi-Fi 6 / 6e**.
2. Security of your routers is important, and the current standards are **WPA2 encryption** or even **WPA3** now with access controls, firewalls, spam filters and virus scanning built in.

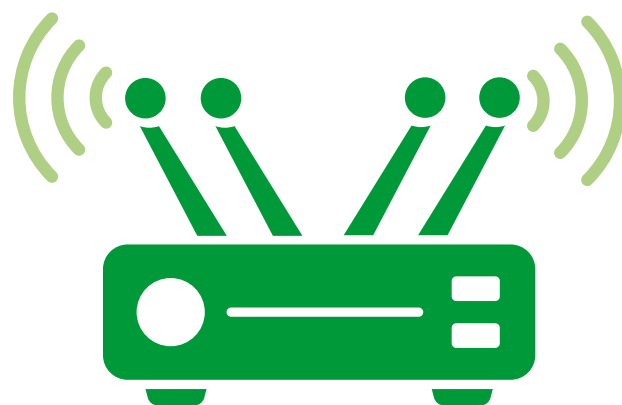


WPA3



Other features to look out for are:

1. **Smart antennas** which assemble the signal and beam then towards devices that are moving around (especially important as devices become more mobile).



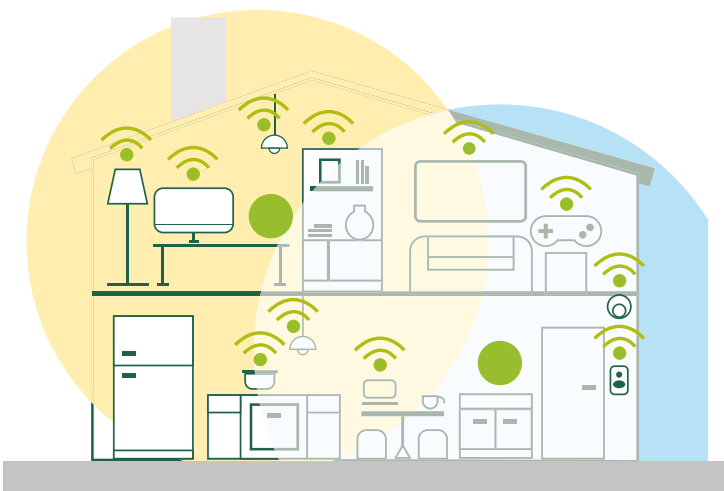
2. **Dual-band** (2.4 and 5 GHz) or **triple-band** (+ 6GHz i.e. Wi-Fi 6e) connectivity where the router transmits over two or three radio frequencies – the lower the frequency (2.4GHz) the longer the reach while the higher the frequency (5GHz) the more data can be transmitted. Utilising each frequency ensures that there is less congestion and faster wireless speeds. Perhaps think which device you attach to each frequency and if you are having performance issues, changing them.
3. **Wi-Fi 6** (also known as 802.11ax) has improvements in capacity, coverage and performance and is the new standard. However, older devices not compatible with Wi-Fi 6 will still work, as it is 100% backwards compatible, but may not see the improvements. At the time of writing Wi-Fi 6e (and even Wi-Fi 7) is on the horizon and supports the new 6GHz spectrum – faster wireless speeds and lower latencies.
4. Setting up **Guest Access** on your business router so that guest access is kept separate with different security settings from the main network.
5. Routers with **built in 4G or 5G** support which provides a backup solution if something goes wrong with the broadband line.

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Mesh networks or multiple routers

These are a great option for very large spaces providing a stable wireless network and prevent not spots if set up correctly (Figure 1: Mesh Networks). A mesh network is a group of devices that act as a single Wi-Fi network providing multiple sources of Wi-Fi around your property – the additional devices are often called Access Points.

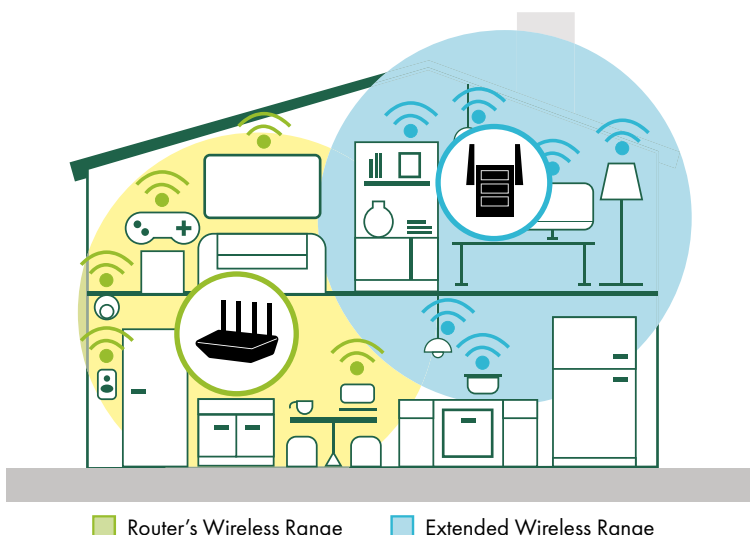
Figure 1: Mesh Networks



Wi-Fi extenders or boosters

These are an alternative, and often less daunting to install, to the mesh networks; they tap into your Wi-Fi signal and extend that signal to other parts of your property that currently does not get a good signal from the main router. (Figure 2: Wi-Fi Extenders).

Figure 2: Wi-Fi Extenders

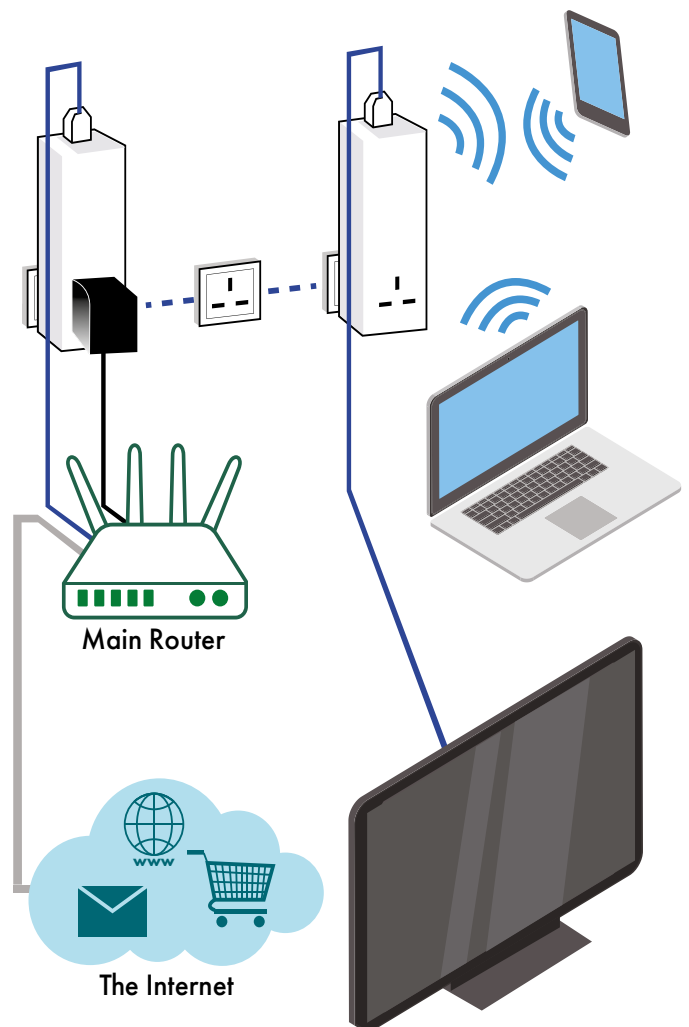


Powerline extender kits

A third option (Figure 3: Powerline Extender) is using powerline extender kits that are not as effective as a Wi-Fi extenders but still a simple option.

There are usually two devices that are plugged into the wall sockets – one is by the router to which it is connected via an Ethernet cable and the other is placed in the area you want to extend the connection to. You can connect either via a wired or wireless connection in this area.

Figure 3: Powerline Extender Kits



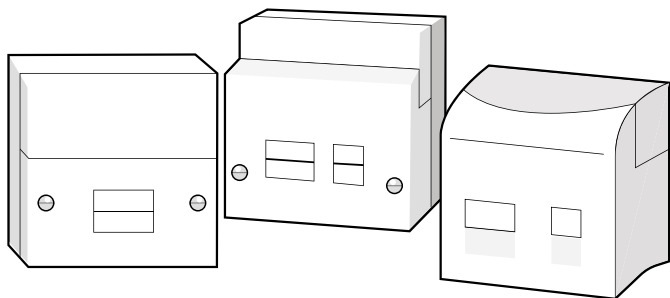
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Internet efficiency

To help improve connectivity, consider:

1. "Spring cleaning" your computer and ensure that it has the most up to date antivirus, drivers etc.
2. Downloading noncritical items such as games or videos at off-peak times so as not to conflict with day-to-day activities, scheduling any uploads/ back-ups at off-peak times too.
3. Shut down unused devices that may still be accessing the internet.
4. Plug your broadband router directly into the main communications 'in' socket (maybe the main phoneline) to reduce interference on the line which will result in lowering your speeds and check you have an up-to-date socket and microfilter (Figure 4: Different Master Sockets).
5. If you have an important call or meeting, agree if other 'users' to reduce their activity or switch off camera, if it helps with bandwidth.

Figure 4: Different Master Sockets



Ofcom provide other tips and advice for improving your broadband speeds at:

www.ofcom.org.uk/phones-telecoms-and-internet/advice-for-consumers/advice/improve-bb-speeds-at-home

How to Guides

This guide is one of number of guides Worcestershire County Council has created to help support residents, businesses, and visitors to get the most out of their broadband and mobile connectivity.

Other guides can be found on the Worcestershire County Council website:

www.worcestershire.gov.uk/digitalconnectivity

The information provided by Worcestershire County Council through these Mobile and Broadband Connectivity Guides is for general informational and educational purposes only and is not a substitute for professional advice. Accordingly, if you are not familiar with the technology and before taking any actions based upon such information, we encourage you to consult with the appropriate professionals.

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