Abthorpe **B**road**b**and **A**ssociation Ltd.
Bringing Broadband to the community since 2003.

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Choosing the right Wi-Fi router for your home.

Introduction

One of the most common communications we receive relates to broadband speed and interruptions. We are responsible for and can check the link to your house, but cannot see how well the equipment inside your house is performing. Any problems are usually related to the Wi-Fi and, with increasing use of the internet over the last few years, often a new Wi-Fi router is needed; this note explains how to choose one.

Tove Valley Broadband does not recommend any particular router – we suggest models which conform to a specification. It is up to the member to research the market and make their own choice from those available.

Typical causes of problems

We see the same problems occurring at many households and here are a few of the most often discovered:

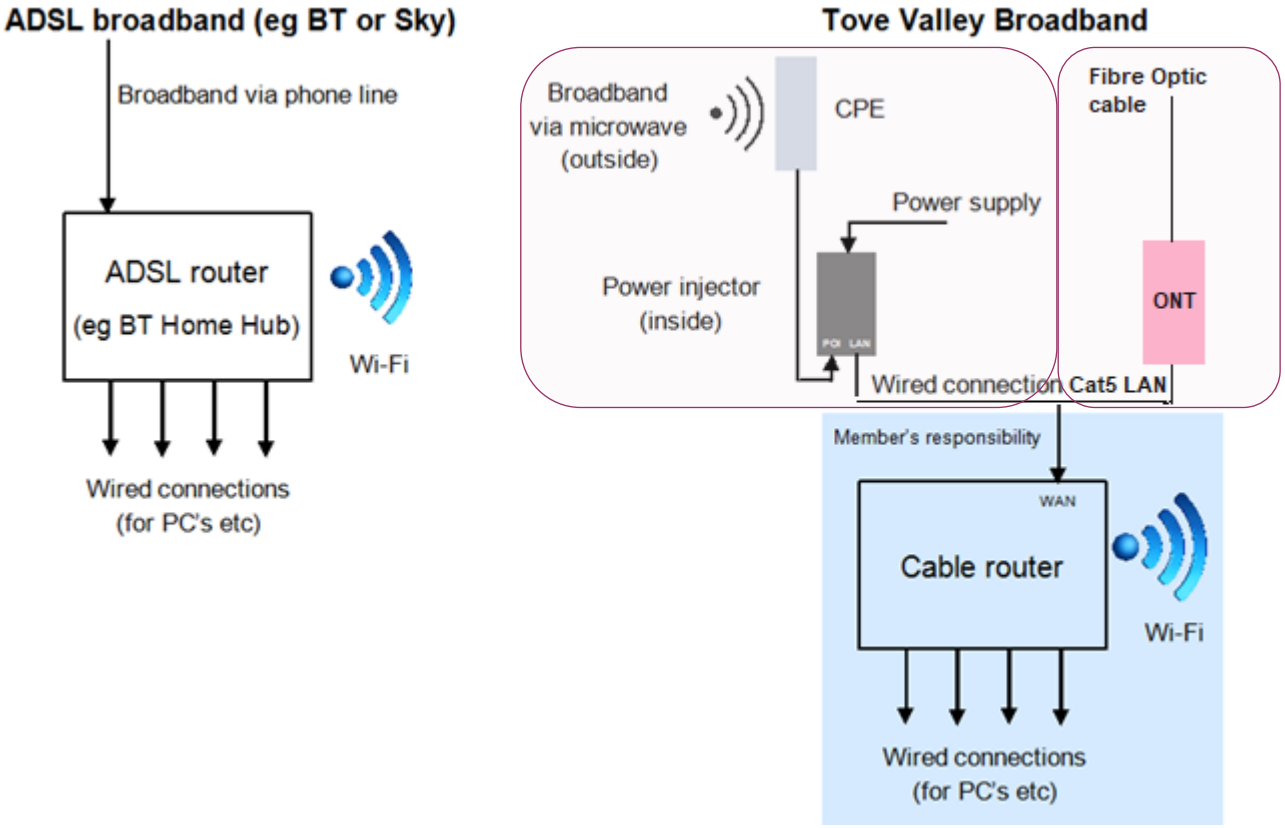
1. Expecting the WiFi to travel through walls (especially Northamptonshire Ironstone). More generally, any ferrous barrier (e.g.. a piano or TV set)
2. Mis-use of WiFi extenders. The units need to talk to each other (same rules as above) and will degrade the service due to their push-pull technology.
3. Interference from other WiFi devices such as Sky-Q, NowTV, DECT phones, radio doorbells, etc. etc. See note on Sky-Q in "WiFi_problems_2022"
4. Expecting cheaper WiFi routers to handle multiple connections – for example, a streaming service (Netflix, iPlayer, ..), mobile phones, tablets, computers, "Ring" doorbells, etc.

Please note that we do not support, and will not get involved with, the re-use of ADSL routers (such as BT Home Hubs). These devices, although it may be possible to get them to work, are not really compatible with the type of broadband service we offer.

This is a complex subject, so if you don't want all the technical details, **you will find suggestions for routers in the table at the end of this document**.

How does TVB differ from conventional broadband services?

This drawing shows the differences between how phone-line (ADSL) broadband and Tove Valley Broadband service is supplied.



The TVB ***radio*** supply is via the Customer Premises Equipment (CPE) on the outside of your house and terminates in a single wired connection at the power injector inside your house. A ***fibre-optic*** cable supply is terminated in your house at an Optical Network Termination (ONT) which also provides a single wired connection. The service at this port is where the TVB responsibility ends.

Our personal broadband requirements usually are for a wired supply (to plug into a PC, ATA or TV for example) and Wi-Fi (for your phones and tablets).

Most users now require Wi-Fi and therefore members need to provide a WiFi access point for this purpose. Most of these come in the form of a WiFi *router* and this document discusses these options.

What type of Wi-Fi router do I need?

Actually you do not need a router as the TVB broadband service acts as a router already, and separates your in-house network from other users in the wider TVB network.
However, it is rare to find a Wi-Fi access point without a router function until you get into the higher-cost office grade units such as Ubiquity Unify (see table) and TP-Link EAP models. We do not discuss these herein but if you would like more information, contact us.

Many routers in the shops and on the internet are ADSL (or DSL) routers (they have a telephone socket on the back). **These are not suitable for TVB**.
You will need a Wi-Fi router with a WAN ethernet port for connection to TVB and other ethernet ports for your local connections.
Sometimes these are called **Cable Routers**, but definitely NOT ADSL or DSL routers. This picture shows the rear of a Cable Router – most have a similar layout. NOTE there is no connection for a telephone cable!

The LAN socket on your power injector (Radio broadband) or on the Optical Network termination (fibre broadband) should be connected to the WAN socket (sometimes labelled “Internet” and usually coloured differently from the other sockets).

Connecting the router to your incoming TVB service in this way will work “straight out of the box”. There are no configuration or authorisation settings required to join TVB because the necessary settings to authorise your connection are set by TVB in the CPE/ONT.

Which router should I choose?

All the routers we suggest, and in fact the greater majority of routers, come with 4 LAN (Local Area Network) ports to which you can connect computers, TVs, TV service boxes, ATAs (for VOIP service) and game controllers. You can run up to 100m of Ethernet cable through your house to, say, another Wi-Fi router or access point which might then give coverage in a different part of your home.
At the same time, a Wi-Fi router will provide connection for mobile, tablets and other devices which require a Wi-Fi signal but be aware that a wired-in connection is far more reliable than WiFi and you would be the obvious choice for TV and gaming connections.

Wi-Fi capability

Rather than explain the differences between WiFi devices, we suggest you concentrate on WiFi 6 routers. This technology is far superior than previous (WiFi 5, 4, 3, 2, 1) and is little more expensive. Additionally, make sure the router is dual-band 2.4Ghz and 5Ghz. The notation 802.11ac/ax or just AC/AX identifies a dual band capability.

Most devices now (phone and tablets etc.) will work on the 5Ghz band. The advantage of 5Ghz is that it is less prone to interference (from microwaves, doorbells, wireless telephones, etc.) and provides a faster speed than 2.4Ghz. However the disadvantage is that it is less capable of penetrating walls and other obstacles.

There are a considerable number of routers available so how best can you be more precise in your choice?

You need to consider these factors:

a) How far do you want your signal to reach (within reason) and are there restrictions to your positioning of a WiFi router?
b) How many devices might be connected to it and through it at the same time?
c) What level or quantity of usage of the internet do you need?

a) How far do you want your signal to reach?

By far the highest incidents of reported broadband problems are due to the difficulty of Wi-Fi to penetrate walls, floors, etc. However up-to-date premium units have better electronics and clever (multiple) aerials that can increase the range and penetration of signals significantly.

How far you can reach with a Wi-Fi signal is governed by the age and quality of the unit and very much by the environment. Stone walls and modern foil-backed plasterboard and insulation boards are not good for Wi-Fi.

A word of warning - there are several ways in which you can extend the Wi-Fi coverage by installing more Wi-Fi devices. Among these are powerline adapters (where your network uses the mains wiring as a cable), Wi-Fi Extenders and Mesh systems. We warn you that powerline adapters sometimes give bad results especially if your house wiring is suspect or has multiple consumer units. We **recommend you do not** use simple “wall plug” Wi-Fi Extenders unless you really understand how they work. If you are not able to extend your network using wired connections, investigate “mesh” systems as they are better suited to the job.

b) How many devices might be connected to it at the same time?

The capability of your router to handle many connections at once is important if you have mobile phones, tablets, lap-tops and desk computers as well as door-bells, Alex and other devices all connected and all being used at the same time. If you have more than 6 devices connected to one router, you need to spend more to get a decent performance. Look for routers with specific information about the number of connections

c) What level or quantity of usage of the internet do you need?

If you have many devices connected and/or you regularly stream music, video or TV then you need to consider the throughput of the unit (ie the amount of data that it can handle). Units do vary in this respect and it's worth paying a bit more for a more satisfactory service.

For a good layman's explanation of WiFi routers, visit https://www.broadbandbuyer.com/store/wifi-routers/

To start with investigate:

TP-Link AX1800 cable router for a stand-alone minimum capability router;
TP-Link AX3000 multi-gigabit cable router for high capability and option to be extended as a mesh system;
TP-Link AX5400 which will satisfy the gamers among you;

In this range of routers there are off-the-shelf mesh systems and specialist access points, so do some homework before you decide and if in doubt, contact us.

There are similar ranges of devices by other manufacturer available.

Good luck!

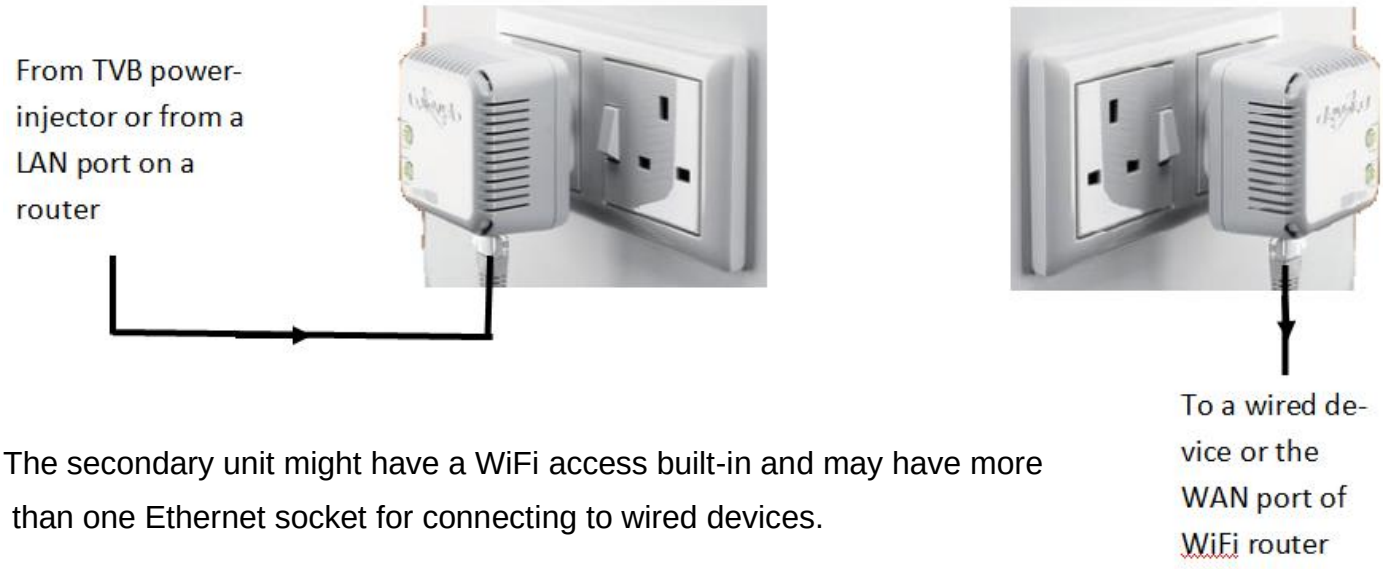
About “mesh” WiFi distribution devices (see TP-LINK DECO for example)

Mesh systems are where two or more WiFi access points “talk” to each other passing information to the master device which is connected with a LAN cable to your internet feed. They have instructions on how to place the devices in your house so that they do maintain good connections. These devices are best suited to horizontal delivery of WiFi throughout the house. However, bar far the best way of connecting them is by wire rather than relying on their WiFi connections.

Some WiFi 6 routers will also “mesh” – the choice will be how many and type of devices are connected at each point.

About power-line (Homeplug) devices

Power-line devices allow you to take an Ethernet connection and pass it into your electricity power cables at a mains socket, then in another place in your house take the signal out in the form of an ethernet wired or WiFi connection.



The secondary unit might have a WiFi access built-in and may have more than one Ethernet socket for connecting to wired devices.

The things to watch are that powerline plugs *must not* be used in suppressed sockets and that the two points must be on the same phase *and desirably* on the same distribution board (fuse box). You should avoid using these devices with old wiring.

About simple Range Extenders / WiFi boosters / WiFi repeaters

We repeat that we recommend you do not use these devices. Range extenders (all of the above mean the same thing) connect to your WiFi router and re-transmit the signal. It is important to position the extender in a suitable place so that it can *both* connect easily to your main WiFi router *and* provide WiFi into an area where your main router cannot adequately reach. Each link in a range-extender will at least halve the capability of your WiFi access.