Looking after your Home Network

Agenda

- Understanding your home network
- Improving your home network
  - **Extending WiFi range/Improving WiFi signal strength**
  - **Making it easier to change ISP**
- Topics for future meetings

Understanding your home network

- Your ISP nearly always will give you one of its preferred **routers** when you start your broadband contract with them
  - **NB:** In most cases they want this returned if you change ISP (but not always)

- These days you can connect directly to your router, via WiFi or a network cable, to change the settings. Some routers may even have an App for your smart phone to do this.

- There is no “standard” UI for router settings so any screen shots in this presentation may not be the same as yours, however, the names of the settings are mostly in common use now so you should be able to find them for your router

Understanding your home network (cont'd)

Common "buzz words":

- Usually you will have a "Dual Band" router with a number of "RJ45" network cable sockets and maybe even one (or more) USB ports.
- Dual Band = 2.4GHz and 5GHz WiFi frequencies
- RJ45 = is the name of the type of sockets used for "twisted pair" network cables
- Network cables are also known as CAT 5 cables (or CAT 5e or CAT 6)
- Twisted pair = winding 2 cables together to reduce interference (4 pairs in CAT 5, ie 8 cables)
- WiFi 5 = 802.11ac = 5GHz (and 2.4GHz) up to 1Gbps (in theory)
- WiFi 6 = 802.11ax = 5GHz but more efficient for higher "speed" (up to 9.6Gbps)
- WiFi 7 = 802.11be = 6GHz (and 5 & 2.4) even faster!!

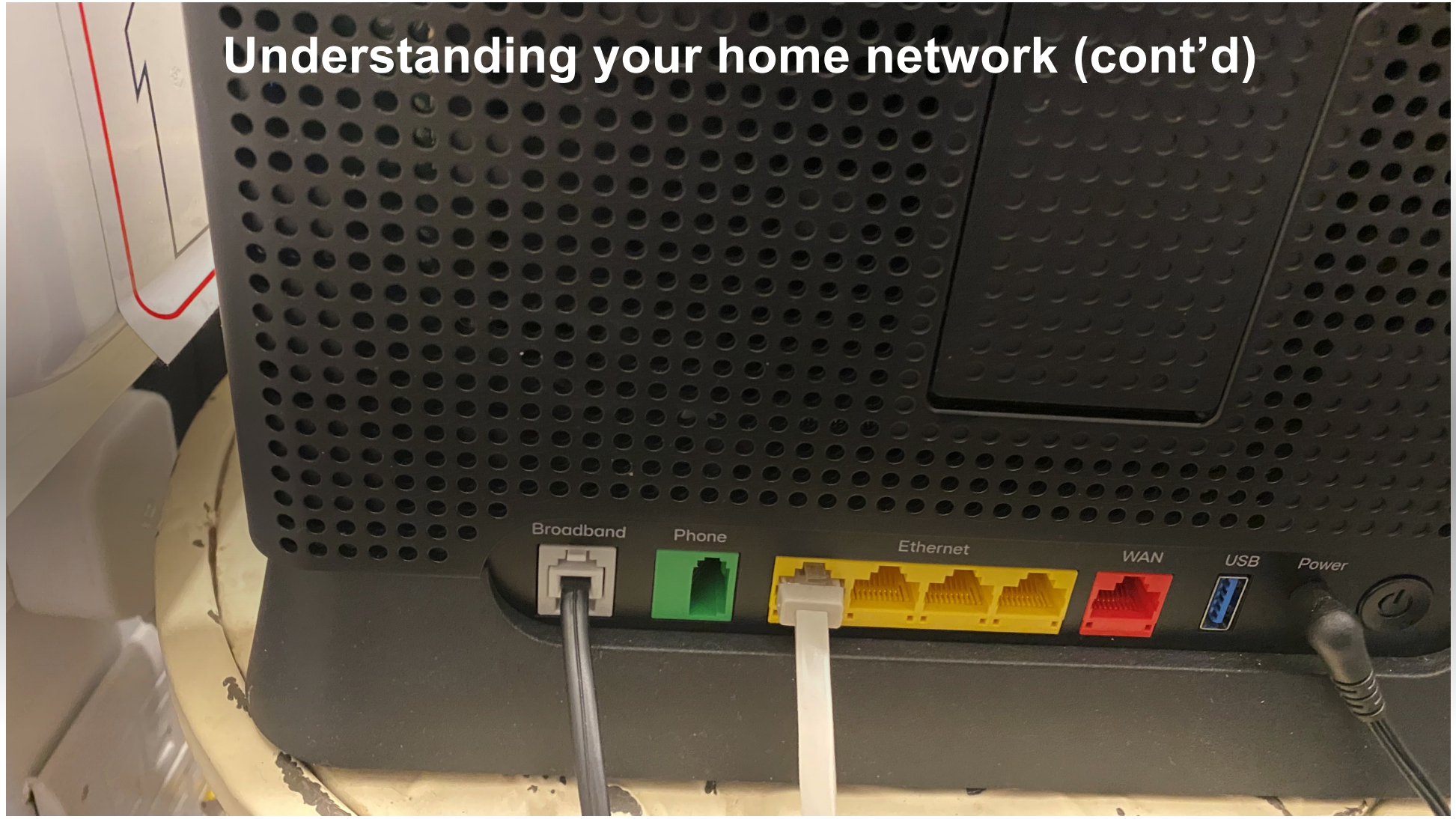
Understanding your home network (cont’d)

- 2.4 GHz WiFi has the greater range but is much slower than 5GHz WiFi
- If you got your router before 2013 then you are 2.4GHz only – time to upgrade!!
- Most devices only support WiFi 5 but the latest smart phones and higher end devices may support WiFi 6 and even WiFi 7

Understanding your home network (cont'd)

- Usually, your router will have at least 2 RJ45 sockets (4 is most common)\
- In addition, you will usually have a dedicated RJ45 socket labelled WAN (or a maybe a different colour to the other sockets). This can be an extra socket (so you have 3 or 5 sockets in total) or one of the 2 or 4 sockets.
  - On old ADSL routers the WAN socket was not RJ45 but was instead the same form factor as a telephone socket.
- You will **always** have one network cable connected to the router's WAN socket (done as part of your ISP's installation).
- NB: Most ISP routers have Gigabit Ethernet (1 GbE) wired sockets (i.e. no point in buying more than 1 Gigabit Broadband (2.5Gb is available is some areas now)

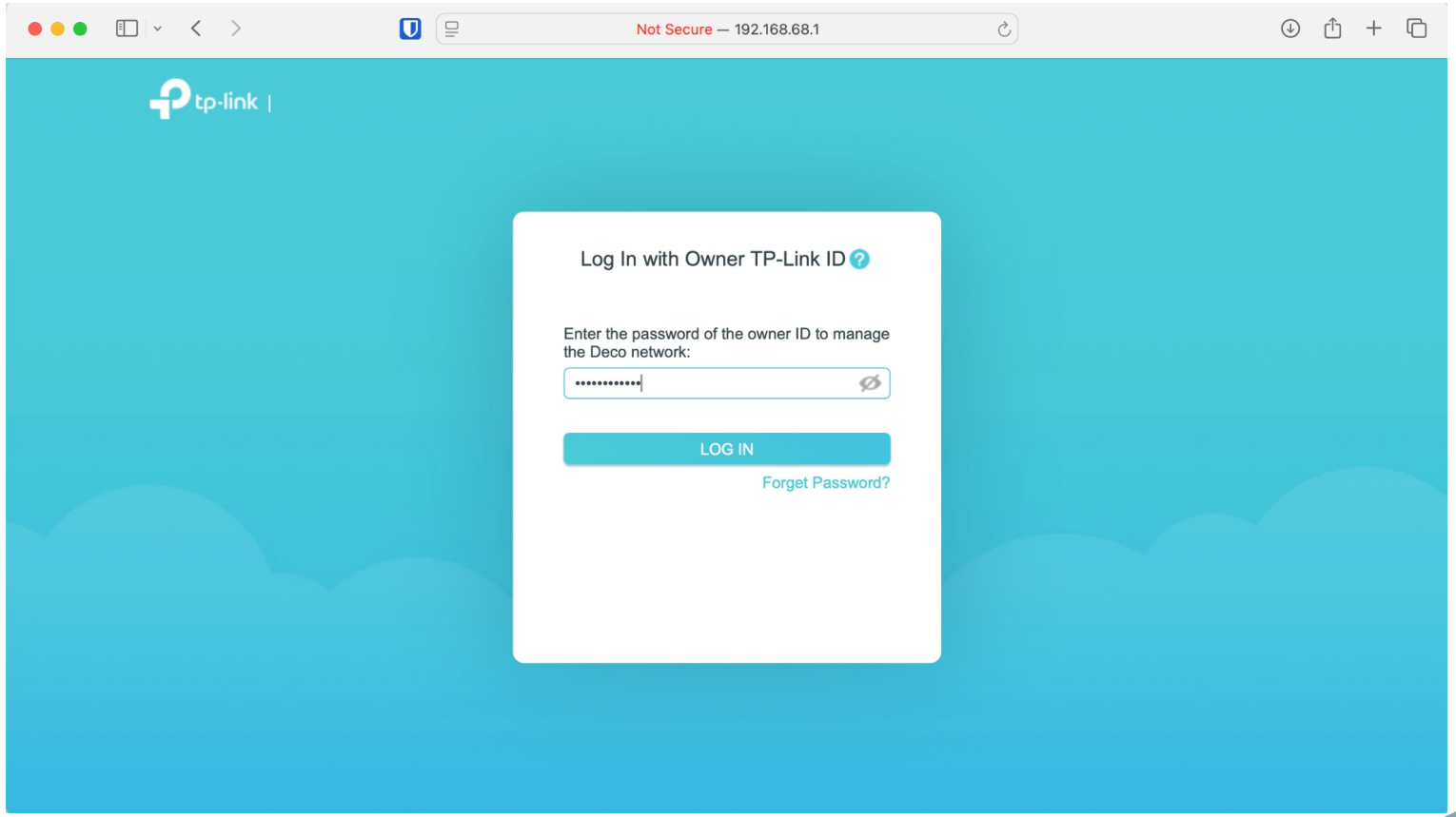
Understanding your home network (cont’d)



Understanding your home network (cont'd)

- Your router usually has a local network address that is one of 192.168.1.1 or 192.168.0.1 but can be different (however in nearly all cases they start with 192.168…)
  - These days your ISP's router usually has a label on it that has its own IP address
  - For BT it is often http://192.168.1.254
- Connecting to a router via WiFi to change its settings usually needs joining its network in your WiFi settings with the default password that the router uses for its network (again, this is usually on a label on the router - BT uses a pull-out card) and then typing the router's IP address into a browser.
  - Connecting your PC with a network cable doesn't require any WiFi or network login (but you will need your own CAT 5 cable)
- You should then get a login page to log in as "admin" for your router using its default admin password (again, these days this is usually on a label on the router).

Understanding your home network (cont’d)



Understanding your home network (cont'd)

- Don't panic 🙂
- Your ISP's router settings are usually good to go so you will only need to log in as admin when you need to change something and that may be the case for some of the other topics in this presentation

Extending WiFi range/Improving WiFi signal strength

- If your WiFi signal doesn't reach every part of your house where you would like to use it you have basically two options to extend it
- 1) Use powerline adapters
- 2) Use a Mesh network

- There is a 3rd option using WAPs (Wireless Access Points) but each WAP needs to be connected by network cable to the main router – not practical in most homes (but is done in most businesses and – I suspect – here in the community centre)

Extending WiFi range/Improving WiFi signal strength – Powerline adapter

- Powerline adapters allow you to use the mains wiring in your house to carry your network traffic (!)
- The limitation is that the router and the powerline endpoint sockets need to be on the same electricity **meter** (not an issue for most people)
- If you want to get WiFi coverage in another part of your house then you need a WiFi powerline starter pack that consists of two units, one without WiFi that you use a cable to connect to your router and one with WiFi that you put in the other part of your house.
- You can have as many powerline adapters of each type as you want after you have connected one non-WiFi unit to your router

Extending WiFi range/Improving WiFi signal strength – Powerline adapter

- The main downside with the Powerline WiFi is that you can't use the same WiFi name (SSID) as your router uses if you can see it in the room where you want to put the powerline unit
- That means you may have to keep swapping between WiFi networks in your house which can be annoying
- If however, you only want to connect a PC in room that doesn't have good WiFi then using powerline adapters (without WiFi) can be a good solution
- Go for the highest speed rating you can afford as "your mileage may vary" depending on how "noisy" the appliances you have plugged in are.
- https://www.amazon.co.uk/powerline-adapters/b?ie=UTF8&node=430576031

Extending WiFi range/Improving WiFi signal strength – Mesh

- If your WiFi signal is only 1 bar or is too slow in parts of your house, then the better solution is to add two or more Mesh WiFi devices to get 3 or 4 bars everywhere in your house
- The big plus of Mesh over Powerline is that you **do** get to use the same WiFi name everywhere in your house
- Your devices seamlessly switch between Mesh routers based on signal strength as you move around (with no interruption to service and no manual action needed)
- BT users are in luck as BT can supply its own Mesh routers that work with existing BT Hub routers which makes Mesh setup easier to do.
- The rest of us probably need to buy our own Mesh solution

Extending WiFi range/Improving WiFi signal strength – Mesh (cont'd)

- Lots of choice of Mesh systems and usually the product names use the 802.11 codes to give you an idea of their capabilities (i.e. AC, AX & BE)
- https://www.amazon.co.uk/mesh-wifi/s?k=mesh+wifi
- If you are getting a new Mesh then you should get the highest WiFi spec you can afford (for future proofing)
- Dedicated "back haul" will give you better performance for your device WiFi (back haul is the way data gets to/from from a Mesh router to the main router)
- Even if you only have AC devices, WiFi 6e or 7 Mesh routers can use the 6 GHz band for back haul (**NB:** not std WiFi 6)

Extending WiFi range/Improving WiFi signal strength – Mesh (cont'd)

- You will usually need to buy your own network cable to connect the first Mesh router to your ISP's router
- Unless your ISP's router is Mesh compatible, you will not be able to use your ISP's SSID (WiFi name) with your Mesh – however, that is not necessarily a bad thing (see next agenda item)
- Ideally you want to turn off WiFi on your ISP's router so that it does not interfere with your Mesh WiFi in the area around them both.
  - This is one reason why you need to be to use your ISP router's admin console
- In most cases you can put your ISP router into "modem" mode and this is a better option (as you then only have one admin console to worry about).
  This might also be called "Bridge" or "Passthrough" mode

Making it easier to change ISP

- When you decide to change ISP you will almost certainly be given a new router
- The upside is you (usually) get a more up to date router (WiFi 6 or even 7)
- The downside is that you will get a new SSID **and** a new WiFi password

Making it easier to change ISP (cont'd)

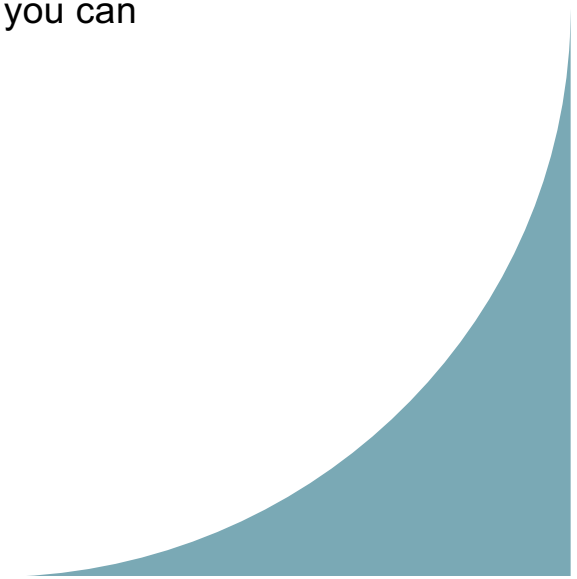
- If you only have 1 or 2 devices using WiFi at home then changing them is not usually an issue
  - Who remembers how to change the WiFi settings on their printer??
- Of course, all your friends/family will have to do likewise when they next visit you…
- This is much more a problem for you if you are not a Virginmedia Broadband customer
  - unlike with BT Virginmedia is not yet forced to let other providers use their cable network

Making it easier to change ISP (cont'd)

- If you want to change Broadband suppliers frequently to get better deals, then you can eliminate the new SSID/password problem by having your own router connected to your ISP router and using your ISP router in "modem" mode
- Now you will have total control of your home network and it never needs to change its SSID or password (as long as you have a "good" password 😉)
- You can use any router you like but, again, you should get the highest performance router that you can afford for future proofing

Things to bear in mind…

- If you buy your own router/mesh, you will need to look after its “firmware”
  - In theory, you ISP looks after its router’s firmware
- You will need to get comfortable with your router’s admin console so that you can
  - Change the default “admin” password(!)
  - Set up your own SSID (WiFi network name) and password
  - Update router firmware
  - Check on what devices are connected
  - Etc…



Topics for future meetings