

Networking Troubleshooting

Mendlesham Computer Club

By Giles Godart-Brown

Network performance

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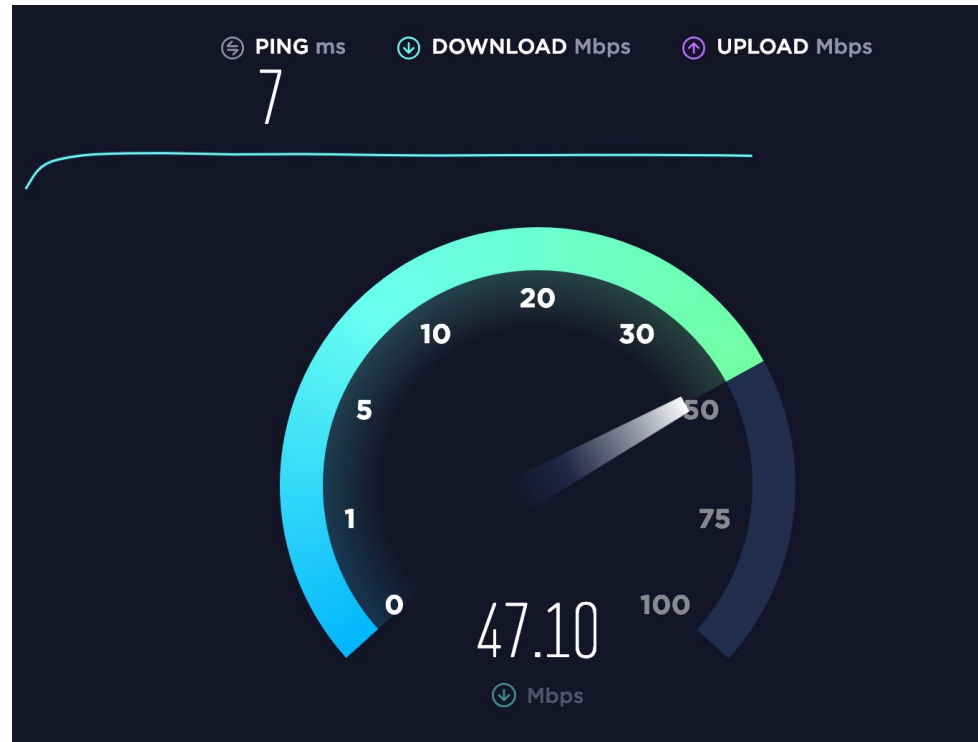
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If a web site doesn't work

- Check you have the correct URL
- Try a known, reliable site like www.amazon.com
- If it loads slowly, or partially - leading to errors, just reload it.
- If it is still slow perform a speed test

The speed test

Use a speed checker e.g. <https://www.speedtest.net/>



Addressing

Addressing on the internet

- Everything on the internet has a 4 digit IP address (IPv4)
 - Google is at 216.58.211.174
 - OSRB was 86.170.85.197 6 see <https://whatismyipaddress.com/>
 - We are running out of numbers so we are also using 8 numbers (IPv6) in some places
- Routers are a bridge between two networks and have 2 address, one for the Local Area Network (LAN) and one for the broadband or Wide Area Network(WAN)
- The Domain Name Service (DNS) manages the cross reference between IP address and a name e.g. godartbrown.co.uk = 217.42.65.88.

Routing

What happens when we want to get to Amazon

- First my PC looks up Amazon's address using DNS and discovers that it is at 54.230.10.193
- My PC is at 192.168.1.20, and the home side of my router is at 192.168.1.254
- My PC sees that Amazon isn't on my network because it doesn't start 192.168.1, so it passes the message to my router at 192.168.1.254.
- The BT side of my router is at 86.161.221.244, and Amazon isn't on that network either so it passes the message onto its router and so on until it reaches amazon.

And if you cannot get through?

If there appears to be no connection, find where the fault is

- You will need to know your address and that of your router
 - Windows – chose settings>Network & Internet>view your network properties and look for 'default gateway' – this is your router.
 - Mac - click on apple then System Preferences then chose Network then Advanced and TCP/IP.
- 'ping' is the simplest tool to diagnose your network, It is run via 'command' on a Windows PC or 'network utility' on a Mac
 - Windows - Type **command** in the search box, then select the command app to open a window to a 'command line' and enter **ping www.amazon.com**
 - Mac - Click on magnifying glass to do a spotlight search and type 'network utility' then select ping

Can you reach a web site by name?

- Ping a known site by name e.g. www.amazon.com

```
pi@mhmaster:~ $ ping www.amazon.com
PING e15316.e22.akamaiedge.net (23.39.112.133) 56(84) bytes of data.
64 bytes from a23-39-112-133.deploy.static.akamaitechnologies.com (23.39.112.133): icmp_seq=1 ttl=57 time=7.33 ms
64 bytes from a23-39-112-133.deploy.static.akamaitechnologies.com (23.39.112.133): icmp_seq=2 ttl=57 time=7.69 ms
```

- If this fails, proceed to next step.
- If it works then you do NOT have a network connectivity problem, but it may be slow.
 - Most probable cause is something with the browser.

Can you reach a known site by IP address ?

- Ping a known site by address e.g. 4.2.2.1

```
pi@mhmaster:~ $ ping 4.2.2.1
PING 4.2.2.1 (4.2.2.1) 56(84) bytes of data.
64 bytes from 4.2.2.1: icmp_seq=1 ttl=55 time=7.86 ms
64 bytes from 4.2.2.1: icmp_seq=2 ttl=55 time=7.73 ms
```

- If this works and the ping by name did not work you have a DNS problem.
 - First try rebooting your router.
 - Check your PC's DNS settings, it should be set to your router address
- If this does not work proceed to next step.

Can you see your router

- Ping your router e.g. 192.168.1.254

```
pi@mhmaster:~ $ ping 192.168.100.1
PING 192.168.100.1 (192.168.100.1) 56(84) bytes of data.
64 bytes from 192.168.100.1: icmp_seq=1 ttl=64 time=1.15 ms
64 bytes from 192.168.100.1: icmp_seq=2 ttl=64 time=1.14 ms
```

- If this works and the other tests did not, then you have a problem between you router and the internet
 - Check the cables
 - Reboot the router and look for warning lights
 - Call your provider, e.g. BT
- If this does not work then the problem is between your pc and the router
 - Check wireless settings

Fixing WiFi problems

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Wi-Fi Problems

- Wi-Fi only has a short range. The rule-of-thumb is it will pass through 2 walls and one ceiling, less if the rooms have brick walls, foil-backed plasterboard, render over metal mesh, chimneys or, doors are closed.
- Look at the number of bars to see the signal strength.
- There are various mechanisms to boost strength.

How to boost signal strength.

- Move your router
- Use wires instead of wireless
- Boosters
 - Mesh
 - Wireless
 - Powerline
 - Hybrid



Mesh boosters

Most expensive, but best solution (about £170)



Wi-Fi Booster

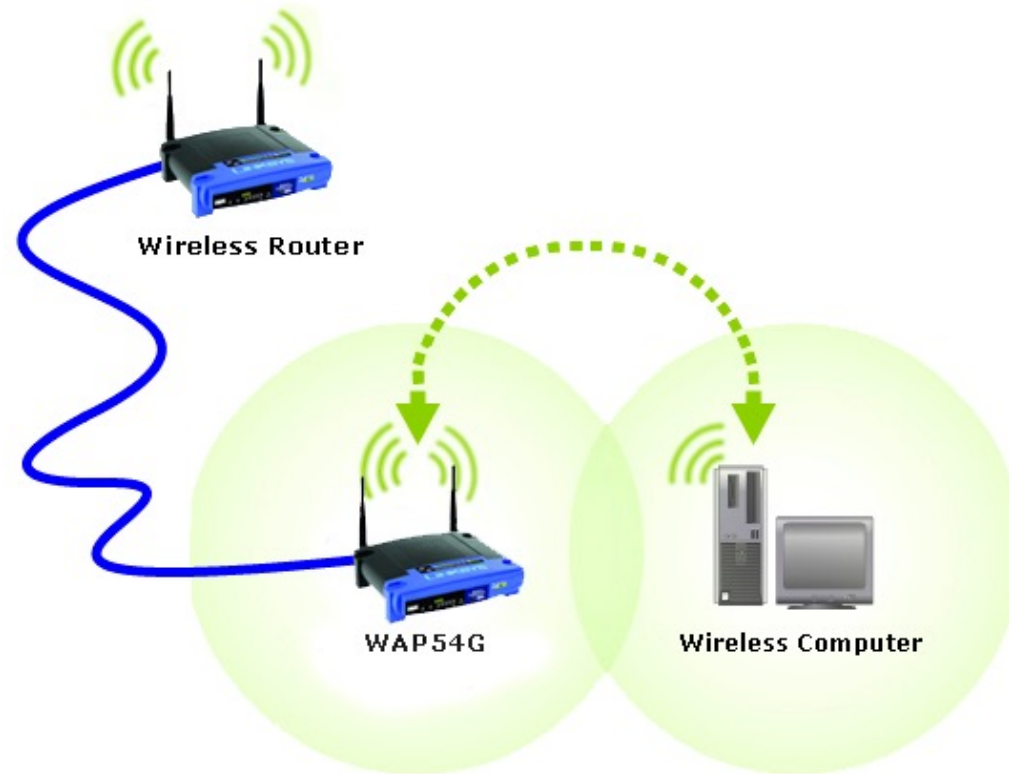
Wi-Fi Boosters have 2 aerials, one connects to your current Wi-Fi and the other amplifies and transmits these signals to extend the network

About £20.



Second access point

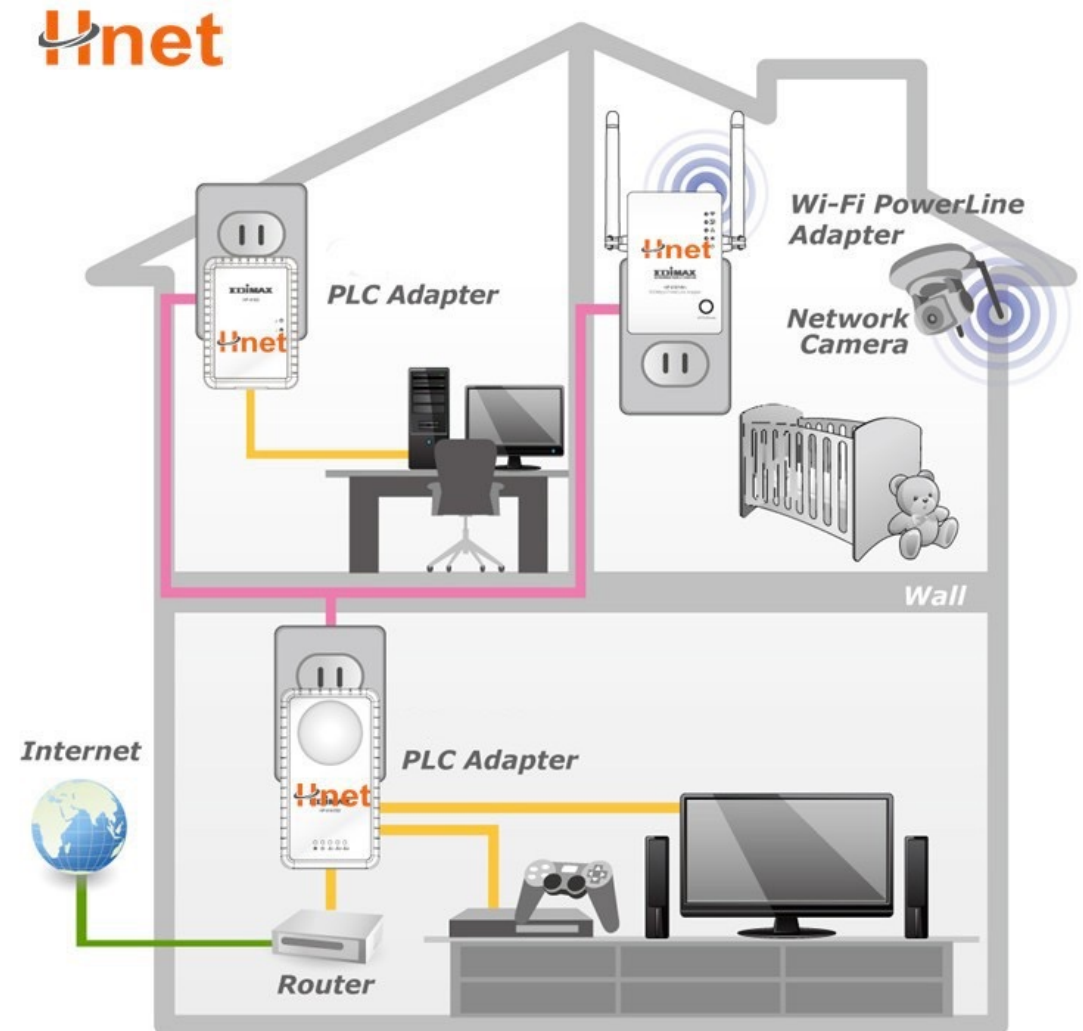
- Wired Ethernet between your current router and the second access point



Powerline

Use you house mains wiring to extend the network.

Some have additional wireless network.



Questions

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