



Red Broadband

Understanding Internet Speeds

Technology - click on the links below

[Fibre to the Premises \(FTTP\)
Satellite](#)

[Hybrid Fibre Coaxial \(HFC\)](#)

[Fibre to the Node \(FTTN\)](#)

[Fixed Wireless Broadband \(FWB\)](#)

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Theoretical Maximum Speed

Each technology has its own varying **theoretical** maximum speeds. When we say theoretical, it means when the technology was being invented and then upgraded, these were the speeds achieved in laboratory and other testing environments.

However, in real world conditions, it is highly unlikely you will be able to 'max out' your Internet connection 24x7x365, using the technology theoretical maximum speed.

You may be asking why? Well, you are using a shared medium that many others are using at the same time as you (collectively sharing bandwidth), and when it gets busy, things slow down. This is especially true in the evening, normally between 6-11pm. (this is what we call 'peak period')

Bandwidth is defined as the amount of data that can be transmitted in a fixed amount of time. Bandwidth is usually expressed in bits per second (bps) or bytes per second

Broadband speeds are also measured in 'megabits per second', often shortened to Mb, Mbits p/s or **Mbps**. Bits are tiny units of data, with a megabit representing a million of them. The higher the number of **Mbps** (megabits per second) you have, the faster your online activity should be.

Perception of Slow Speeds

Also, surprisingly to many, and unknown to others, a customer's premises wiring, own equipment, configuration of their software often can cause a perception of a slow Internet service, when in fact when their equipment is isolated, far better speeds are achieved.

A classic example of a perception of slow speed is where a customer may be using a laptop that they've had since 2005. They have turned on Wi-Fi to connect to a router



that is connected to their new Fibre service that is setup as a 100/40 service (100 Mbps down / 40 Mbps up).

They do a local speed test and only ever get about 30 Mbps down, not realising that the Wi-Fi standard of their laptop being 802.11a can only achieve 32 Mbps. See table below of the various Wi-Fi standards.

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802.11 version	Maximum possible speed
802.11ac	2100 Mbps - 7000 Mbps
802.11n	100 Mbps – 300 Mbps
802.11a/b/g	11 Mbps – 54 Mbps

Factors of varying Internet speed

FTTN, FTTC or FTTB:

- Length of the copper line from the premises to the node
- Quality of the copper line from the premises to the node
- Bad or severe weather conditions
- Quality and layout of in-premises cabling
- Internal and external electrical interference

HFC:

- Quality of co-axial cable
- Quality and layout of in-premises cabling
- Internal and external electrical interference.

Fixed Wireless:

- Signal strength or obstruction of the antenna's line of sight to the tower
- Weather conditions, like extreme heat and heavy rain

Satellite:

- Weather conditions, like cloud cover and heavy rain
- The speed that your service is capable of can only be determined by you, once your service has been installed.

While we may be able to provide some statistics on what speeds that may be achieved from time to time, based on speed tests, we will not be able to provide any guarantee of the speeds you will receive on a day to day or regular basis.

Network management and congestion

During peak periods, the speed of the Red Broadband network generally will determine the speeds you experience rather than your technology speed.



In managing congestion, Red Broadband uses network management tools to prioritise bandwidth. For example, we may prioritise VoIP (which requires specific speeds to operate effectively). We may also de-prioritise software upgrades and file-sharing applications such as BitTorrent.

Speeds at home can also be affected by congestion on the Internet in general. An example would be, if you're downloading from a server based in Europe which itself is experiencing congestion it will be slow downloading to you, even if you have a fast connection at home.

The network can be subject to failure, congestion, impairment, degradation, delays and loss.

Wiring, equipment and usage in your premises

There are a varying number of factors outside of our control that could affect your Internet speed. Generally speaking, they can be things like:

Internal wiring and configuration:

Damaged, corroded, badly connected or poorly configured copper lines within your premises can significantly reduce your speed.

Equipment:

The quality and age of your modem, routers and devices can significantly reduce your speed.

Wi-Fi interference:

The location of your modem and any radio or electrical interference with other devices in or near your home can interfere with your Internet speeds.

Simultaneous Users:

The number of users and devices online at once, can saturate the available bandwidth, giving you the perception of slow speeds.

Malware, viruses and other automatic programs:

If you have had without your knowledge, programs installed on your computer for example, which send out huge amounts of spam emails, or distributes malicious software, this will saturate your Internet service, and you will experience slow speeds.