

# GETTING THE BEST FROM HOME AND OFFICE WIFI NETWORKS

We undertake to provide the best possible internet connection speed to your premises. We measure that speed at the wall socket, where the cable from the aerial is connected to a computer or, most often, a wireless router. You may find that, somewhere else in your premises, the speeds you see are lower than those measured at the wall socket.

The quality of the wifi network in your home or office isn't something we can control. But, if you have a problem, we're happy to advise on ways to improve things.

### What causes a wifi connection to run slowly?

The strength of a wifi signal decays over distance. The further away you are from your wifi router, the weaker the signal will become, and the slower the connection speed will be.

The materials used in building construction can be poor conductors, even blockers, of wireless signals. Thick stone, solid concrete or brick walls and floors can stop a wireless signal in its tracks. In modern buildings, walls which incorporate foil-covered foam insulation can reflect wireless signals.

Similarly, electrical wiring can affect the passage of radio waves.

Your home or office is already full of other wireless signals. Cordless phones, wireless security cameras, wireless speakers, baby monitors, microwave ovens, older Bluetooth devices, fluorescent lights, LED lights and their controllers, smart devices – all these things communicate by wireless, or generate signals on the same frequencies as your wifi network. And wireless devices are just like

human beings: when they're all shouting at the same time, no-one can hear anything.

You might have more than one wireless router, or yours might be placed by a party wall, close to a neighbour's router. That can mean connections that run slowly, as they struggle to overcome interference.

Are all your devices capable of the fastest speeds? If your iPad connection runs much faster than that to your laptop, it may be

will allow clearer routes for wireless signals.

Devices which run big downloads, or uploads, such as cloud backups, can slow the wifi down for everyone. Don't expect everything to run at highest speeds while one device is downloading large amounts of data, or is streaming HD video, for instance. If you backup to the cloud, time those backups to happen at night, or at times when other users won't be affected.

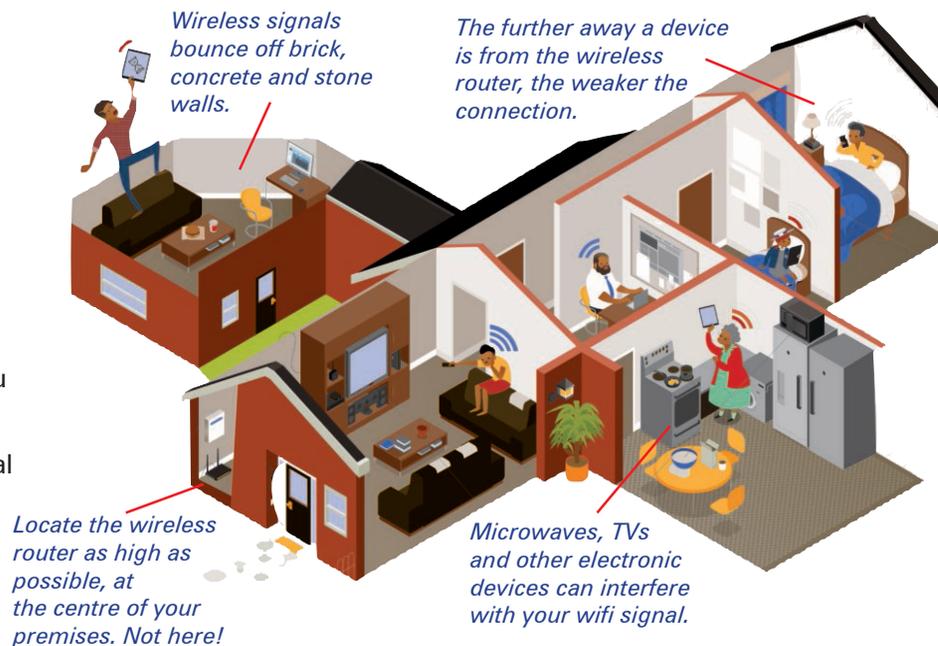
### Stone walls? Foil insulation?

No problem. There are several ways to improve wifi coverage. Assuming you've already got the best possible wireless router, you can add a signal booster. This simply plugs into a power socket, somewhere, say midway, between your wireless router and where a stronger signal is needed. The booster will identify a weak wireless signal, and retransmit it

with extra power.

Or you can use powerline network extenders. These use the electrical wiring in your house to deliver the internet connection. Connect one extender to your wireless router, and plug it into a wall socket. Then plug another extender into a power socket, wherever you need a wifi hotspot.

For the ultimate in wifi coverage, consider fitting your home or office with access points wherever you need coverage. Each access point is connected by a cable to a switch, and ensures you have the highest possible speeds, in what is effectively one seamless wireless network, however large or complicated the premises.



because your laptop is using older technology. Some older wireless devices can only run at a fraction of the speed of the latest equivalents. Out of date device firmware and operating systems can also cause slow connections. And note that most wireless routers will adjust to run at the speed of the slowest device in the network. Or, if you have a device that is demanding all the bandwidth from your wireless router, it can cause all the other devices to run slowly.

### How to make things work better

If you want the most uniform wifi coverage of your home or office, place your wireless router as near to the middle of the property as possible. If you can, locate it as high as possible too – on a top bookshelf, for example. The height

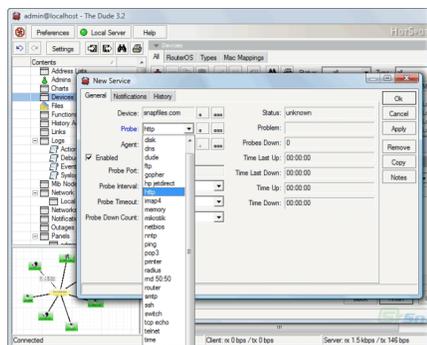
# NETWORK STANDARDS AND NETWORK MANAGEMENT

We work to maintain the highest possible standards of network performance for all our subscribers. We have a set of agreed performance criteria, and standard operating procedures to ensure that we deliver the best possible quality of connections at all times, and which enable us to respond most effectively should a problem arise.

## Network Monitoring

We constantly monitor the status of the network's core backhaul and access layers with automatic alerting at all key points in the core infrastructure. Those alerts include customer devices such as power supplies at node locations, but not necessarily to the same standard as for the core network.

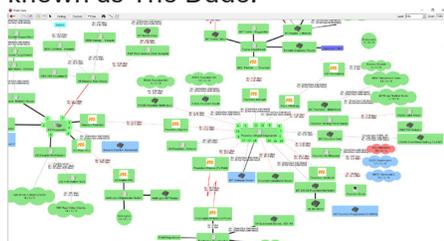
Our minimum standards require every device on the network to be monitored 24/7 x 365 with some historical data available to network engineers. The core network is managed through a system called LibreNMS.



A typical LibreNMS display

A powerful auto-discovering PHP-based network monitoring system, LibreNMS uses the SNMP protocol, and provides a sophisticated alerting system, sending notifications by email, irc, slack, and other channels.

Business subscribers and residential subscriber connections are managed through a system known as The Dude.



A typical The Dude display

The Dude automatically scans all devices within specified subnets, and maps our networks, monitors the services of our

devices and alerts use in case of problems. It provides device and link monitoring, supports SNMP, ICMP, DNS and TCP monitoring. It also provides direct access to remote control tools for device management.

## Load Management



We design our networks to manage the maximum potential demand from subscribers at both residential and business premises. Across our networks, we measure connection speed and quality against criteria established for the demand generated by the anticipated maximum number of subscribers in that part of the network.

When the traffic on any part of the core network or infrastructure approaches the anticipated maximum, we implement upgrade solutions ranging from firmware updates and network reconfiguration to hardware changes.

We proactively monitor network capacity and traffic, and expect to identify connection issues before they become apparent to subscribers.

## Speed Measurements

Different network connection speed measurement applications show different speeds. For simplicity, consistency and ease of use, we recommend [www.speedtest.net](http://www.speedtest.net). We use this simple application to measure speeds achieved at each new connection, and to provide a reference for future speed measurement.

Speed tests must be undertaken on a device that is connected to the

ethernet wall socket terminating the cable from the outdoor aerial, or directly connected to the ethernet port of the principal wireless router. No other devices should be connected to the network while speed tests are being conducted.

## Network Uptime

We constantly monitor core network uptime and availability. This includes all routers, nodes and network switches across our network.

We take great care to ensure that at critical locations there is no potential single point of failure.

For any events impacting network uptime, we complete an RFO (Reason for Outage) report for each event. This document is then reviewed and any necessary changes required are actioned.

## Fault Management Procedures

We have a standard operating procedure for dealing with network issues. That procedure sets priorities for different types of fault. For example, an issue with a node must be treated as a higher priority than an individual customer aerial.

We have a system in place to monitor the progress of faults and the conclusion of each fault. This is then available to all members of the team, to ensure that any improvements that should be made are implemented.

## Support Procedures

Subscribers may call the Village Networks support line at any time: 03333 321817. The line is manned from 0800 to 2000hrs, Mon-Fri. Outside those hours, calls are recorded and distributed to the team via email, enabling the first available member of the team to respond as soon as the message is received.

Emails sent to: [support@villagenetworks.co.uk](mailto:support@villagenetworks.co.uk) automatically raise a ticket on our support system software. Tickets are responded to as they are received, or reviewed following overnight or weekend arrival.