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A Technical Guide to WightFibre Microduct Technology

Connecting you with WightFibre Microduct Technology

This White Paper explains how the physical connection is made from the local WightFibre street cabinet to your premises using the very latest 'Microduct' technology.

Microducts are just 7mm thick and very tough. Being so thin, means it can be laid very quickly and easily with only the smallest of trenches needed. If you are in an area where our original Coaxial Hybrid was available, then the microducts are laid through the old four-inch pipes meaning that no digging is necessary.

The fibre cable itself is literally 'blown' through the microduct using special equipment called a 'fibre blower'. The way the fibre blower works is to compress air into an airbox and then use a pusher to feed the fibre through the blower head and into the microduct. The force of the air blowing past the fibre within the duct creates a friction free layer of viscous air around the fibre so that it can be pushed over hundreds of meters or even around fairly sharp bends in the microducts.

As a result, only small teams are needed to lay large parts of the network, especially the last few yards to your premises, normally with minimised need for digging and no large trenches required.

As part of futureproofing your connection, the cable blown from the Active Cabinet to your premise contains three fibre optic cables, though at this stage only one is used as it presently provides more than enough capacity for any of the WightFibre ultrafast full-fibre packages, now or for a long time into the future. In fact, the capacity of each of these fibres is a staggering 100 Gbps.

In your home or business premise itself a small amount of space is needed to connect the small fibre optic connection box we use as 'Network Termination Equipment' or NTE. This is normally mounted on the outside of your home.

IPv6

One of the exciting things about the WightFibre network is its use of IPv6. This brings huge benefits and futureproofs the network still further.

You're probably familiar with IPv4 address, four decimal numbers separated by dots to make them more humanly readable, for example 169.254.1.29. These addresses are 32-bit, meaning there is a limit of 2^32 or a little over 4 billion addresses. That is not a big enough number to go around all the devices that everyone in the world has that needs to communicate via The Internet. Clever technologies were used to make these go further, using public addresses that route to different local addresses by using a 'port' number to translate which device is the end destination, known as Network Address Translation (NAT) was used. However, even clever tech has reached its limit and available addresses have now run out.

IPv6 is the next generation of addressing, although the specification was drafted backed in 1998 it was officially launched on 6th June 2012. These addresses look like – 2001:0db8:0000:0000:0000:ff00:0042:8329 - and are not so easy to remember off the top of your head! Fortunately there are rules that allow these to be represented in a simpler form – 2001:db8::ff00:42:8329.

With IPv6 there are a huge range of real Internet addresses – in fact every connection gets an IPv6 /48 subnet – that's 1,208,925,819,614,629,174,706,176 IP addresses. That's a lot of devices!

With this comes the advantages that IPv6 was designed for:

- You don't need Network Address Translation (NAT) anymore, with the benefits that brings including no need for port-forwarding and ending the dilemma if you need to forward the same port to multiple devices.
- IPv6 clients pretty much configure themselves automatically meaning you don't have to worry about address clashes.
- A simpler header format means routing in general and especially multicasting is far more efficient.
- Security is 'baked in' with Internet Protocol Security (IPSEC) a fundamental of the IPv6 standard with built-in authentication and privacy support meaning any client device can talk to any other client device securely. This in turn means you can do away with VPNs between IPv6 networks.
- You can assign true Quality of Service (QoS) using 'flow labelling'.

Old IPv4 address example 169.254.1.29.

New IPv6 address example 2001:0db8:0000:0000:0000:ff00:0042:8329. Simpler form 2001:db8::ff00:42:8329.

If you are new to IPv6 or want to know more detail you may want to read more in the White Paper 'IPv6 in the WightFibre Network'.

Also don't worry if you aren't familiar with IPv6. The WightFibre Network supports both IPv6 and IPv4, so that you can continue to use legacy services whilst they migrate to newer standards.

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