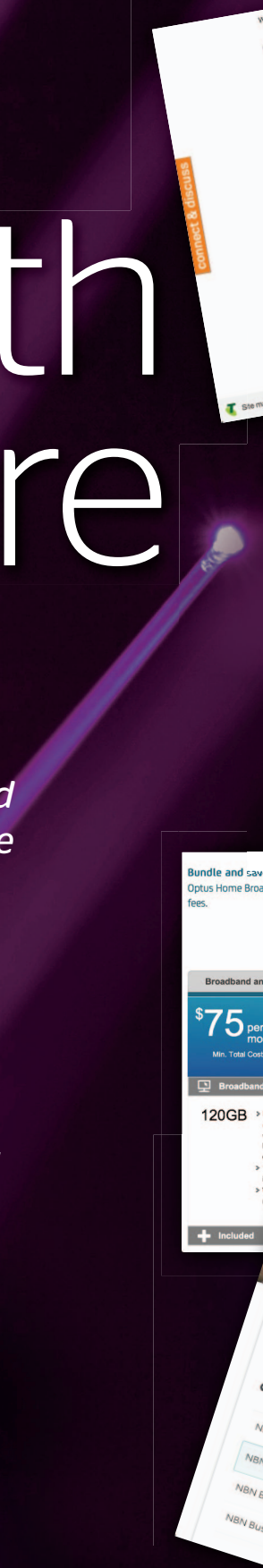
The dark truth about fibre

Some millions of column inches and billions of public funds have been dedicated to the broadband initiatives on both sides of the Tasman, but it's made little difference to the screens in front of us so far. Serious questions remain unresolved on just how fast fibre might be when it arrives and what you'll need to do to access it. And yet, fibre deals will be knocking on a door near you some time soon. Do you know what you are buying and why? **iStart** *asked some well-informed industry representatives to bring us up to speed on what we can expect to see in the future of ultra fast internet connectivity...*



OPINION // PAUL BUDDE

Can we afford not to have a fibre optic infrastructure?

*Telecommunications market commentator **Paul Budde** says there is simply no other technology that can handle the capacity of data and applications needed to run the cities and countries of our future…*

Fibre-based infrastructure requires vision and recognition of the fact that many of today's social, economic and sustainability problems can only be solved with the assistance of ICT. In many situations the capacity, robustness, security and quality necessary for this calls for fibre optic infrastructures. This need will increase dramatically over the next five to 10 years as industries and whole sectors (healthcare, energy, media, retail) carry out the process of transforming themselves in order to much better address the challenges ahead.

Most discussions regarding the need for fibre optic infrastructure take place from the wrong perspective – based on how fast people need the internet to be when they download their emails, web information, games and movies. Fibre optic technology has very little to do with this – ultimately all of that 'residential' traffic will account for less than 50 percent of all the traffic that will eventually flow over fibre optic networks.

The real reason this type of network is needed relates to the social and economic needs of our societies, and there are many clear examples that indicate that we are running out of steam trying to solve some of our fundamental problems in traditional ways.

For instance, at this moment discussions are taking place in every single developed country in the world about the fact that the cost of healthcare is unsustainable. These costs will grow – over the next 20 years – to 40-50 percent of total government budgets – clearly impossible. So we face a dilemma. Do we lower the standard of healthcare services, at the same time making them more costly for the end-user?

Budde hits nail on the head here

If we want to maintain our current lifestyle the only solution is to make the healthcare system more effective, efficient and productive. And this can only be done with the help of ICT. To make it more productive, health needs to be brought to the people rather than the other way around, as is the case at present. Similar examples apply to the education system, the energy systems and the management of cities and countries in general. We need to create smart cities, smart businesses and smart countries, with high-speed infrastructure, smart grids, intelligent buildings, etc.

In order to manage our societies and economies better we need to have much better information about what is happening within all of the individual ecosystems, and in particular information about how these different systems interact. Currently they all operate within silos and there is little or no co-operation or co-ordination between them.

ICT can be the bridge to bring them together; to collect data from them and process it in real time. Information can then be fed back to those who are managing the systems, and those who operate within them, such as doctors, teachers, business people, bureaucrats, politicians – and, of course, to you and me.

Some of these data interactions are already happening around smartphones, social media, traffic and crowd control and weather information. This is only the start of what is known as the Internet of Things (IoT) or machine-to-machine communication (M2M).

ICT cannot solve world hunger, but without ICT world hunger cannot be solved, and this applies to all the important social and economic problems that societies around the world are now facing.

None of this can be done overnight; it requires massive transformations of industries and sectors. There is no instant business model available that will supply an immediate return on the investment that is needed to create these smart systems. All of these investments need to be looked at over a period of 10 to 20 years and even longer. No private business will take such a business risk. To make it happen government leadership and government policies are needed.

This is also the message from the UN Broadband Commission for Digital Development, and it applies to countries all over the world. More than 120 countries worldwide have now developed broadband policies, recognising that such infrastructure is critical to their development. The challenge now is to put these policies into practice/implement these policies, and at a time when government leadership around the world as at an all-time low.

Ultimately all of these developments will require national fibre optic networks. There simply is no other technology that can handle the capacity of data and applications that will be needed to run the cities and countries from today onwards. This infrastructure needs to be robust. It has to have enormous capacity. It needs to be secure and to be able to protect privacy. There is simply no other infrastructure technology that is up to that job.

So those business and government leaders who are in charge of looking towards the future do have an obligation to ask themselves, based on the above, whether we can afford not to have a fibre optic network.

OPINION // MIKE WEMYSS

Why the need for speed?

*Despite significant improvement in internet speeds over the last five years, in this part of the world we are still, so to speak, driving on gravel roads rather than motorways. What does 'ultra fast' mean, why do we need it and how will you connect? **Mike Wemyss**, technical director of FibrePlus offers some handy advice...*

Despite the help of tax dollars and subsidised costs, a common customer response to marketing efforts around fibre upgrades is to say they are quite happy on their $99 per month business ADSL line. For some businesses there may be little advantage to a fibre internet connection, however as we become increasingly dependent on the internet to function and make money there are several reasons for most businesses to consider fibre:

- **Speeds** – Fibre internet provides the same speed for uploading as it does for downloading with speeds from 5mbps to 1000mbps and higher.
- **SaaS, cloud and hosted solutions** – As applications move off premise they are reliant on the internet to function, so low bandwidth can have an impact on speed and therefore productivity. This also applies to companies hosting servers in data centres.
- **Growing file sizes** – We're now in a high definition world for video and imagery, which means much larger file sizes with HD video files that can reach the 8Gb mark. Uploading such large files over ADSL can be a slow process and also consume a large chunk of your internet connection, having an impact on your other internet dependent services such as email, POS systems and SaaS/cloud-based applications.
- **New methods of communications** – Phone communications have gone through a revolution, moving from analogue to digital and the world of VoIP, but the quality of a VoIP conversation, particularly for video calling, can degrade sharply without adequate bandwidth. ADSL can support the requirements for most VoIP telephone systems but fibre internet can offer more stability with higher bandwidth and the same upload and download speeds, and by allocating a portion of your internet capability for VoIP only.
- **Improved reliability** – The well-reported Telecom ADSL outages at the end of 2012 left businesses without connectivity for a significant period of time leading to loss of business and productivity. QoS or Quality of Service can be an important factor in reliability and defines a guaranteed level of service. At present the Vector Fibre network is the only MEF (Metro Ethernet Fibre) certified network in New Zealand, MEF certification requires a QoS enabled system.

THE PROBLEM WITH ADSL

ADSL and ADSL+2 work well and prices are reasonable, but they are old technology that is potentially holding back the productivity of your business. It can provide 'up to 8mbps', but the key is in the phrase 'up to'. This means that, depending on how far you are from the exchange and your ISP's contention levels, you could experience much slower speeds. This is because the further from the exchange you are the more degraded the signal across copper wire can become, which decreases bandwidth and lowers the overall performance and speed. 'Contention' is the ratio of the potential maximum demand to the actual bandwidth. The higher the contention ratio, the greater the number of users that may be trying to use the actual bandwidth at any one time and, therefore, the lower the effective bandwidth offered. Back to the roading analogy, the speed you travel on the motorway is directly proportional to the number of cars on the road.

For most low-cost internet you'll be in the region of 20:1 and up to 50:1 with some ISPs. For home use this might not be an issue but for business use you should know what your ISPs contention ratio is and if your productivity is being affected, decide whether fibre is the answer.

OPINION // JOHN STANTON

Making sense of the fibre wars

These days no one will really argue that we don't need fibre, but there are plenty of other areas of vociferous discussion, such as the best way to build the fibre network. ***John Stanton,*** *CEO of the Communications Alliance discusses the relative merits of Australia's NBN plans…*

One of the key ingredients for a really good argument is that a reasonably convincing case can be made for each of the two sides of the debate. We are gifted exactly this happy circumstance when it comes to the enduring stoush between Federal Labor and the Coalition about how to best roll out a high speed broadband network in Australia. But before getting into the details, let's first celebrate the fact that all sides of politics in Australia agree on the need to create a high speed network, with serious Government funds committed towards making it a reality.

Now; Labor's version has it that:

• Fibre to the Home (FTTH) is the best solution – it will be rolled out to 93 percent of households, it is faster and it's future-proofed via the ability to upgrade to multi-gigabit-per-household performance as future needs may require;

• Fibre to the Node (FTTN), the Coalition's policy, is less capable, more expensive to maintain and operate, relies too heavily on the ageing copper 'last mile' and is at best a stepping stone to the inevitable need for FTTH; and

• There is a need to plan and make provision for data download requirements beyond what we envisage today as history shows us that those requirements will rapidly outstrip today's best-laid plans.

The Coalition puts the alternative point of view that:

• FTTH is too slow and too expensive to roll out, particularly when, for around A$16 billion less, FTTN can be rolled out and reach more people, more quickly, with speeds of up to 50Mbps or more, which is more than adequate for the immediate future;

• Given the roll-out already underway, FTTH can proceed where it makes economic sense, i.e. to about 31 percent of the population; and

• FTTN can be upgraded to FTTH if that is necessary in the future, and in the meantime we also need to focus on improving mobile coverage in the bush, which is another important component of how people connect to the internet.

There are reams of supporting evidence for both sides of the argument, and personal circumstance will influence many people when they decide which policy they prefer. Those slated to receive FTTH in the foreseeable future under the Labor plan may well want to keep it that way (but might indeed still get FTTH under the Coalition plan). Many consumers who would get FTTN under the Coalition plan might prefer it that way, if it arrives sooner, or prefer instead to wait for FTTH to arrive.

What makes it impossible for either side to win the argument today, of course, are the questions we can't yet answer definitively, including but not limited to:

• Exactly how much faster or cheaper is FTTN to roll out?

• Can the existing FTTH rollout be achieved on time and within budget?

• Will it cost the estimated A$169 million extra per annum to operate an FTTN network versus FTTH, or more?

• Will data needs, driven by ultra high definition TV, or the 'Internet of Things', or some other hungry group of apps, mean that we have to start upgrading to FTTH mid-way through rolling out FTTN?

• If that happens, is it three years down the track, or five or eight? And what does that do to the overall capex numbers?

• How big an impact will the advent of very high speed LTE mobile data networks have on all of this?

• How will looming upgrades to the capability of FTTN change the equation, or will other technologies burst onto the scene and alter the picture yet again?

• Can a fundamental shift in policy be effected quickly and smoothly, without long delays that could imperil savings and progress?

good question – but what's the answer?

The last Federal Election was decided partly on the issue of the NBN. Pity the Aussie voter if she/he is expected to cut an informed view on the broadband debate to help guide their vote at the next election.

The truth about the best broadband plan for Australia rests on a series of "known unknowns" as Donald Rumsfeld would have put it. It probably also rests on some "unknown unknowns". But I wouldn't know about that.

OPINION // PAUL BRISLEN

No pain, no gain

*Like many countries New Zealand is going through similar broadband growing pains and **Paul Brislen**, CEO of the Telecommunications User Association of New Zealand, outlines what we can expect in the years to come, suggesting that, at first, it won't be pretty…*

In the future we'll look back at the debate about fibre and wonder what all the fuss was about. Of course it makes sense to build a fibre network – look at what we do with it, we'll say. Of course we needed to invest the money and it's money well spent. Sadly, from this end of the telescope that rose-tinted future is at least a decade away and between now and then we have a wealth of wailing and gnashing to get through.

Between now and then we have to build the network, pay for the build, get customers excited enough to connect and train the connection teams to deliver on the promise.

We're not supposed to pay for a standard installation, but until recently what defined 'standard' was pretty much up in the air. Chorus (which is responsible for building the vast bulk of the network) has a different contractual definition to the Local Fibre Companies (LFCs) which are building around 30 percent of the network, which has caused no end of noise about how Crown Fibre (the government department responsible for the rollout) managed to stuff things up so badly. That's been put aside, for now, but will become an issue before most of us get connected.

Which brings us to another bone of contention – when will we see fibre in our street? The UFB build priority is schools and hospitals first, then businesses and then residential addresses. Sure, some will see the connection sooner rather than later, but most of us won't see a Chorus van in the street until after 2016.

All this has led to a lot of shouting about why Chorus in particular seems so willing to build fibre in places where other fibre deployments already exist. In the Hawkes Bay, in Nelson, in central Auckland, Chorus is overbuilding existing fibre networks instead of partnering with those providers to deliver the service. Shades of monopolistic practices abound and there are likely to be more before the job is done.

Then there's the trouble with connecting each home. The contractors are learning on the job and I've heard horror stories of days spent without phone or internet access, of footpaths being dug up multiple times, and of reinstatement of grass verges being haphazard.

I've seen a photo of the hole some contractor has knocked in the lounge wall to install the equipment and it's big enough to put my head in. I've heard of customers telling them to come back and take the gear away. Chorus now says the cost of connecting each home is far higher than it anticipated and that it is now $300 million in the toilet. !!

What can you expect once the fibre is connected, assuming that happens soon, and is working? Assuming it all happens as it's supposed to?

You can sign up for a plan that starts with a 30Mbit/s down, 10Mbit/s upload speed, or move up to a faster one (up to 100Mbit/s down, 50Mbit/s up) but that doesn't tell the full story. You won't actually see those speeds.

Instead, you'll get to share those speeds with others in your street. You'll also fight for national backhaul with all the rest of the customers and you'll fight for international capacity just as you do today – the UFB won't change those all-important legs of your internet journey, just the last mile to your house.

The upside is, however, that in ten years' time when you and your kids and your parents are all trying to watch HD TV on various devices around the house all at the same time, you'll be able to. The downside is quite a bit of pain before you get that far.

OPINION // MIKE WEMYSS

How to get fibre

Mike Wemyss, technical director of FibrePlus explains how you can connect to the fibre network once it is running past your door…

There are already relatively extensive fibre networks in Auckland, Wellington and Christchurch and various other networks being used by business and schools etc. These networks are expanding and probably the best known right now (in the North Island at least) is the Chorus UFB network.

To connect to the fibre network you need to have fibre running to your building. The fibre backbone may already be connected to your building, but if not your service provider will connect you (for a fee) or use a third party such as Chorus. For high rise buildings the connection will typically be in the basement comms room. From here you have two options:

1. For speeds of up to 100mbps you can run a copper CAT5 cable (standard network cable) from the basement to your office. The length of cable required is not likely to be long enough to cause degradation of signal.

2. For speeds up to and over 100mbps, a fibre connection directly to your office may prove to be more future-proof as you can increase your internet bandwidth without the need to change the connection.

You should be able to plug your firewall or router into the newly-installed standard network connection. ADSL modems are not fit for purpose so you will need to invest in a network router that is high-speed capable.

Once the installation is complete, you can choose the access bandwidth, internet speed and data plan based on your requirements and price.

Fibre contentious too

Contention also exists in the world of fibre internet, in particular to provide low-cost plans. It has its place in the market, and if you see fibre internet at the same price as ADSL you can be sure that there will be contention in place. It is possible to purchase 1:1 or direct connections, which are not contended, for a fee, and the cost is not unrealistic for those who require the lift in speed and reliability. While early adopters of fibre broadband may not notice much effect from contention, future uptake could change that significantly, so take some time to understand how contention could impact the quality of service that you will receive now, and in the future.

If you are seeking a quality connection ensure you know the contention rate you are signing up for. Be wary of suppliers saying they have zero contention unless their prices fit with uncontended bandwidth.

Costs

For most of us the fibre non-contended 1000mbps option is just not in the budget but we can't afford to stay with ADSL in the long run either, so we go for something midrange, which in fibre means the 10mbps to 50mbps mark. Prices will vary depending on data caps, contention and the access and internet bandwidths. As the saying goes "pay peanuts, get monkeys". In the world of the internet peanuts will get you heavily contended bandwidth and potential negative effects on performance. You may be able to get by on an ADSL connection for now, but for comfort, speed and toward the future, the extra spend on fibre is worthwhile.

OPINION // GLENN JOHNSTONE

Fibre slow to catch on

Glenn Johnstone, CEO of WorldxChange Communications looks at the reasons why there has been so little uptake of fibre to date…

It's hard to imagine anyone saying that the deployment of fibre throughout New Zealand is not a good idea. The underlying principal that the country will benefit from faster data speeds and more data is difficult to challenge in a world when information generation and availability is growing at an exponential rate.

We all know that New Zealand does things a little differently to other countries. Our famous 'number 8 wire' mentality and the 'she'll be right' attitude makes us approach things in a way that often means close enough is good enough. We are great at getting the 80 percent done but maybe not so good at the last 20 percent of the job. Take Auckland's roads as an example. We have never quite committed to a solution that really solves the problem, we dabble and tinker with what we have but can't quite crack the problem.

The deployment of the Ultrafast Broadband (UFB) is a problem of a similar ilk. The government has done a great job at understanding the issues and committing to a path that will build core infrastructure to step change New Zealand's information super highway. By anyone's standards this was a major undertaking and they should be congratulated for having the conviction and commitment to really follow through with the project.

The government has committed to three primary goals for UFB:

1. 75 percent of homes will have access to UFB optic cable by 2019;
2. Schools, hospitals and 90 percent of businesses will be connected by 2015;
3. Homes and the remaining 10 percent of businesses will be connected by 2019.

As a result of these commitments, many areas of New Zealand have seen obvious signs of progress. Roads and footpaths have been closed, dug up, and repaired. Progress is being made and as of 31 December 134,000 homes and businesses have fibre running past their door. All is well you would say.

The only problem is, having fibre run past your premise does not deliver any benefit and of the 134,000 homes and businesses passed, only 2.8% have been connected to the fibre network*.

So why, if UFB is so critical to enabling New Zealand, do we see such poor uptake rates? As a service provider, we see a number of reasons:

1. No compelling change event: People simply can't see the compelling reason to move to fibre just yet. Whilst conceptually they get the fact that fibre equals fast, they are apathetic about taking it up because there is nothing that makes them desperate to connect. For the majority of New Zealander's, their existing DSL connection is good enough and the average DSL customer does not have a pressing need to implement a step change in their access technology.

2. Installation issues: taking the fibre from the street into your house is no mean feat. The process is long and therefore costly. Who these costs lie with is one of the unresolved issues – and on top of that who is responsible for getting permission to dig up driveways when either multiple people live down that driveway or the tenant (not the owner) orders the service?

3. Problems within the home: Once the fibre is in the home, there are other issues. There is no doubt that newer homes are much easier to deal with as the cabling can be done correctly from the start. For existing houses there may be the need to redo some wiring, or the placement of the cabinet may be awkward. These are not insurmountable, but do lead to additional costs and barriers to uptake.

4. The second-mover advantage: The commercial agreement places the burden of some of these costs on the first service provider to offer services. There are no such problems with being a second or over-the-top provider the provides just international toll calls or internet content. Although this provides choice for the consumer, it means the service providers may be hesitant to leap in.

5. Multi-dwelling units: Where there is more than one house (or business) in a location, the current model is to build fibre to each and every one of these. The logistics and practicalities of this are extremely difficult, especially when it comes to the likes of apartment blocks. Why would you need to build fibre including having hardware in each place? Given high speed is the desired result, putting fibre into a building and then running cable to each separate unit is surely more practical and cost effective.

As with all things, time will iron out these issues. The problems will be worked through and the public's insatiable appetite for data and applications will mean that consumer demand will start to drive the uptake. But in the meantime we will wallow and stutter into the future and the Government (and Crown Fibre Holdings, the New Zealand state-owned company that is building the fibre to the home network) will sit uncomfortably on a significant investment that is struggling to fully justify the decision to spend our hard-earned tax dollar.

But if you ask me, I say thanks to the Government, for once we have invested in infrastructure for the future ahead of the demand curve. I just wish someone had had the gumption to do the same with Auckland's roads!

**WxC has itself connected over 3500 fibre customers in new subdivisions over the last three years using the same technology that the UFB is now using.*