

Broadband at a Crossroads

Conference Facilitator's Report

Introduction

The Commerce Commission convened the *Broadband at a Crossroads* conference as part of its Section 9A inquiry into the implications of the technological developments collectively known as Next Generation Networks for New Zealand.¹

The conference title suggests that New Zealand faces a choice – in fact the grammatical construction suggests a choice with multiple destinations. In the world of Information and Communication Technology it is not common for people, companies or countries to think they have choice about the future. On the one hand there is a widespread acceptance of the idea of “technological determinism”, this is the belief that the way societies and economies will develop is determined by the way technology evolves. On the other hand there is an acceptance of the concept of “path dependence”, which is the idea that a certain but small number of initial decisions will result in one alternative winning often through the operation of networks in what are also known as “bandwagon effects.”

Both of these views are popularised by the large equipment supply firms, all of whom are now global in scope. The consequence is passivity in policy making, and where there is activity it is often responding to the motives of these suppliers converted into national imperatives. A typical example is the approach to spectrum allocation. No sooner do global standards bodies determine that a particular technology will be made available in certain bands, than there is agitation for the relevant spectrum to be reallocated.

One version of this passivity is an aspiration that firms or regulatory regimes should seek to “match” international best practice”. That is fine as a safe strategy but it is not the way to greatness. It is certainly not the strategy that an economy that has been experiencing decades of below average growth should pursue if it wants to make a change.

Examples of smaller economies that have made great advances include Singapore and Ireland. The Singapore story was built on its unique location as a transport hub. The Ireland story was an IT fuelled growth, but benefited greatly from its location between Europe and the USA. A key factor in successful development of NGNs is the ability to communicate between market participants. New Zealand has an advantage in the development of Next Generation Networks as its relative size and uncomplicated political structure makes the kind of development that has typified the Internet itself as viable.

It is possible for New Zealand to have aspirations to lead the world in the development of Next Generation Networks and as facilitator I posed the question to

¹ The Terms of Reference of the NGN study state that the final study will:

- Provide a strategic assessment of the likely impact of technological change on market structure and competition;
- Provide guidance as to where regulatory intervention is unlikely to be warranted, and circumstances where regulation may be considered; and
- Identify the issues where there is consensus, and where and how views diverge..

audience members “What needs to be different if New Zealand is to lead the world in the development of the NGN.”²

This report does not seek to reproduce the material in the presentations. Instead the focus is on the themes that arose from the presentations and the associated Q&A and panel sessions. The report is broken down by conference session.

Setting the Scene

The first morning included the welcome from Paula Rebstock, Commerce Commission Chair, as well as a keynote address by the Minister Steven Joyce. These were accompanied by a technical presentation defining Next Generation Networks by Peter Darling, a presentation on the UK Broadband Stakeholders Group by Kip Meek and the first panel session.

While the Minister claimed on departing that if we paid careful attention we would see he had actually not said anything, there were three important messages in what he did say. He understands the economy wide benefits of true broadband which is why he made the FTTH promise; he understands the significance of the decision which is why he won't be rushed; and he knows the importance of demand which is why he is committing Government to be a world class user in education and health.

There was general agreement on the definition of NGNs adopted by the ITU and used throughout the conference. Standardisation work on the NGN is being pursued by the ITU and not the Internet forums like the IETF.

An important question remains whether any of this “old school” standardisation activity is actually required and that the ecosystem that is the Internet can manage all the issues. An example of this is whether there is any need to discuss the provision of Quality of Service, or simply deal with it as one participant noted by having a sufficiently resourced core (i.e. QoS through capacity).³

Time did not permit exploring the difference between the NGN work and the extensive work undertaken in standards bodies on ISDN (and more so on B-ISDN). The satirical interpretations of the acronym such as “Innovation Subscribers Don't Need” and “It Still Does Nothing” actually underestimate how much the ISDN standards contributed to the deployment of modern PABXs and interconnection of voice networks; however, they accurately reflect that the standards did not generate the unified network originally envisaged.

A number of key distinctions were agreed upon. The first is that Broadband and NGN are different parts of the same puzzle. Broadband – or more generically Next Generation Access (which includes wireless) or NGA - is about the customer connection, while NGN is the set of network connections behind it. The relationship is complementary, and we need to focus on the end-to-end value chain.

The panel valued highly the work that had been conducted by the BSG in the UK but thought there was no role for another group in NZ. As facilitator it was obvious each of the panellists was very supportive of their own particular organisation. There still

² Conference participants were invited to post their answers to this question on a chart at the back of the room or (for webcast) via e-mail. All the comments received are incorporated somehow or other in this report, and the full list appears in the appendix.

³ This issue is touched on again in the session on core networks. I have been reading since the conference Jonathan Zittrain's *The Future of the Internet; and how to stop it* which covers the generative nature of the internet and the risks that creates.

may be some value in an ongoing group initially made up of the heads of the representative groups meeting with the Commission and Ministry officials with the work funded by Government. This could be called a consultation group.

Convergence of Three Worlds

The early afternoon session had four speakers coming from different aspects of the world of the user. A few simple themes emerged from this.

The first is that in adapting to the world of broadband and NGN telecommunications carriers and service providers, and internet service providers, need to be prepared to be customer led like they have never been before. The story at BT is as much about the realisation at BT about what being customer responsive meant if all you cared about was the network.

There were two messages about innovation. The first being about keeping the network open to innovation as the Internet has been. It was suggested that this requires open systems and open data. It requires firms to design APIs and gadgets for others to join in the innovation.⁴ The other key ingredient for innovation is start-ups – the ability for people to back themselves and their ideas.

From the field of the research networks we were provided with a world of ultra-high bandwidth applications and a future of all optical networking. Those present who are old enough know that we were discussing 10-100Mbps networks and applications as long ago as the early 1990s. There is no “if” about whether these higher capacity networks will emerge, the question is when and how to develop the future.

Further discussion revealed the view that there are common views on the extent to which there will be a rise of “bots”, that these will consume and create information. This suggested there are issues about copyright and privacy that are under-investigated. It also poses the question of how you regulate bottlenecks when the rate of development goes so fast.

Services and Applications

The first question posed was “if we build it will they come?” The conclusion was that the managed connectivity that is focussed on the customer needs to have scale to attract application and service partners. To attract those partners network providers need to offer openness and willingness to share.

We then saw the practical example of a booming application business, giving an example of being customer led by focussing on “Gen Y” – you need to reach out to their “digital homes”. The concept of embracing a competitor because doing so means that you can share in meeting customer needs, was introduced. This brought the term “frenemy” to the conference.

Meanwhile an alternative view was that there is no difficulty in making it pay, as there is too much focus on this. Customers will acquire broadband, there is too much emphasis on the supply driven solutions. The mismatch between accelerating broadband access and already choked international capacity was highlighted.

Finally the real world of content rights was discussed, especially premium sport. Rupert Murdoch has called this the “battering ram”. How can new IP networks get

⁴ This is the concept of a *generative* network as developed in Jonathan Zittrain’s *The Future of the Internet; and how to stop it*.

access to this content? Do the major sports need to consider a new distribution model wherein they became the producers and “networks” merely the channel? It was proposed that without access to the highly desirable content no IPTV strategy would be successful.

A brief discussion about the “Long Tail” thesis suggested that while it may exist it does not constitute a reason to believe the world of content and the significance of rights holders is about to change.

Strategic NGN and Policy Issues for New Zealand

The international keynote addressed the open access issues and how they had been addressed in the Netherlands. This included the delivery of point-to-point fibre in an open access model with the passive infrastructure provider functionally separated from the active operator and service provider. With this went a decision that regulated pricing should include an allowance for higher risk.

This led into a number of regulatory principles, which included the all-risk WACC and basing pricing on actual business case and expenditure.

Before commencing the panel it was re-emphasised that nothing about the conference reflected a predilection to regulation, that the Commerce Commission was undertaking the consultation to develop a view of how the technology would impact the market structure and competition and what regulatory challenges that might present.

The panel identified the benefit in the Netherlands case of having agreement on the business model that applies to the new network, so that both regulators and investors understand the risks and rewards of the network. Also it was noted that even in markets with fairly extensive competition, there was still lots of concern about the competitive model

Key regulatory issues were identified as;

- principles of regulatory certainty,
- maintain access to bottleneck services as they evolve,
- being technology neutral, and
- while preferences for access at the lowest level, there will always need to be access at the bitstream level.

It was also noted that unsustainable entry that creates short run competition does not promote the long term interest of end-users.

“If we want large scale investment we need to foster an environment of certainty; we need; certainty of return relative to risk, clear framework of regulatory principles against which the regulator can be held to account, and having industry driven solutions.” Principles that are robust and agreed to.

Are NGN’s really high risk? Will regulatory certainty come from “international best practice?”

Suggestions that NZ should look to international best practice and “recalibrate”, and what you see are two things – on the question of market power it is the bottleneck and so target regulation at the bottleneck, and regulatory accountability. It was suggested “international best practice” isn’t giving much of a lead.

We are dealing with a “wide and converging value chain”. Best practice principles regulators should forebear unless enduring market failure. Give competition a chance before intervening.

Core Network Issues

It was noted that IP interconnection has been implemented by peering and transit, and that regulators have rarely needed to intervene. The evidence in the switched world is that high termination rates discourages service usage and may be not revenue maximising for either party. Consequently, bill and keep arrangements are attractive.

The discussion on core network issues demonstrated a need for parties to distinguish between one-way access issues and two-way access issues. (In part this is reflected in Telecom’s inability to distinguish the interconnection and the access issues). To explain, one-way access is the access required to enable a group of network operators to buy the customer connection to their network. Two-way access is the access required for two operators to send and receive traffic over their networks.

The approach to interconnection has been distorted because in the fixed network the interconnection pricing for one-way access to local access to enable toll-bypass was also applied to half the two-way access of the connection of mobile networks to fixed networks.

At a deeper technological level it was noted that the industry needs to deal with an architectural question about how much of the IP/MPLS protocols really belongs in the services layer and whether instead they are part of the transport layer (“confront the purple line”). The regulatory/policy implication is that interconnection isn’t just an economic problem, and that interconnection to support service variety needs to progress beyond the simple discussion of transport interconnection.

There was general consensus that the TCF IP interconnect group was making enormous steps but has a long way to go. Vendors are still going to focus on the ability to give NZ the benefits of global scale – which means waiting till solutions come from overseas.

The economic and technological issues remain entwined, as do the legacy issues of existing revenue models.

Access Network Issues

Quite frankly the issues I was expecting to emerge here didn’t. This includes that it is insufficient to have multiple service providers at the fixed level due to shared use of one access, while having a more tightly held though notionally competitive mobile sector. In the long run, if integration of services becomes important the total number of competitors will be limited to the number of operators in the smallest market – namely mobile. Three operators is not a highly competitive market.

In addition the NGA standards for wireless are bandwidth and spectrum hungry. Increasingly wireless networks are showing the economies of scale that are familiar in the fixed networks.

Summary

The discussion often discussed the “value chain” both of NGNs and converging industries in general. The value chain concept as developed by Michael Porter does not accurately reflect the business model of the NGN.

The “telemedia” model is typically drawn as a value chain from content creator to content provider, from there to the service provider and then network operator. But this model is deceptive – it implies that the money flows from the end user back through each element in the chain. The reality is that there are models where the end user pays any of these elements directly who then pay the other elements in the chain. As an example in the US Amazon sells the Kindle and its content, this includes the price for the wireless access through Sprint to download.

This means there isn't one business model. The opportunity is to identify the range of business models that might apply and identify the risks and approaches that might apply in each.

There was general agreement that regulation in the sense of direct interventions in specifying quality of service or price is undesirable, but less agreement on exactly how to achieve that outcome.

While there was a general acceptance that the regulatory focus should be on bottlenecks, there was less agreement on where the bottlenecks actually are – as they can appear in each of access networks, national backhaul, international capacity and various varieties of content. There was also a comment that waiting to identify bottlenecks before regulating creates the opportunity for first mover advantage.

The idea of having agreement between investors and regulators on the relevant “business model” as a way to generate regulatory certainty was promoted. This itself is problematic. Firstly it suffers from the usual information asymmetry problem, that is, that information relevant to the model is not being provided to the regulator. Secondly it assumes that the only risk is the regulatory risk, and that other factors might require a complete change to the model and hence a change. (As an example, if after investing there is a sudden collapse in technology prices, the investor cannot continue to sell services at the initial prices as an entrant can underprice them. The investor is best “cutting its losses” and taking a write down on the asset and reducing retail prices to match the new technology and forestall the competitive investment. But what should happen to wholesale prices? Should they be held at the level of the initial business plan, or reduced to reflect the new retail prices?)

Finally, the question of the accountability of regulators was raised. Accountability in the Westminster tradition exists in three ways, the first is the accountability of parliament to the people, the second is accountability of the executive to the parliament, and the third is the accountability of everybody to the courts. The concept of “independent regulators” is not structured in this, they are intentionally divorced from the executive and hence are not accountable to parliament through the minister, however, at the same time some aspects of their decisions are not accountable to anyone else, as the courts are restricted to matters of statutory interpretation. Ultimately the regulator ends up being accountable to the people via the parliament, as it is the parliament that creates the rules. But this is not accountability for individual decisions of the regulator.

Ultimately though, accountability is a mindset not a legal structure. A regulator can be accountable for its decisions by being explicit about the outcomes it expects from

those decisions and then measuring those outcomes. Unfortunately the industry being regulated often rejects the data gathering that would support this monitoring as “red tape”. Calls by industry for accountability from the regulator need to be matched by the industry being prepared to participate in measuring outcomes.

Conclusion

There are a number of ways forward for the Commerce Commission in furthering its NGN study, these include;

1. Keeping the discussions about NGA (broadband and high speed wireless) separate from but coherent with the discussions about NGN.
2. Engage with industry participants about what they think the business model for further investment is. In doing so be prepared to have to engage with providers in identifying the ways their proposed business models are really motivated to earn rents. In these discussions the Commission should be prepared to ask many questions starting “Why...” or “Why not...”, and being prepared to sound naïve. The obligation is on the commercial enterprises to make the case for their business models.
3. Recognise that “bottlenecks” (or positions of economic power) can emerge at many points in the “value chain”. Identified points included the access network, the international back-haul and content. While some speakers suggested that regulators should wait till they see an actual problem before acting, consistent with point 2 above it is worth noting the potential sources of market power and engaging with the parties who will control that power early. It is also worth noting that there is no real “value chain” in most of these telecommunications (or at least telemedia) applications. While there is an identifiable sequence from content to content producer to packager to network provider then service provider through CPE to an end user, the financial relationship can be between the end user and any point in that chain. For example, the Amazon Kindle is a device supplied by Amazon and the user pays Amazon for content, but it is delivered over the Sprint network at a fee paid to Sprint by Amazon.
4. Develop clarity about the distinction between one-way and two-way access issues. Where possible use the principle of reciprocity in financial relationships to help market participants to work out suitable terms.
5. To obtain the economic benefits of an NGN requires two things;
 - a. An environment that promotes use, including the education and health applications mentioned by the Minister,
 - b. An environment that promotes innovation, maintaining what Jonathan Zittrain calls the ‘generativity’ of the internet and the PC.
6. Policy makers need to carefully consult directly with users and in particular with Gen Y users and digital natives. These users interests are not yet getting well represented by the telco marketing departments.
7. Keep the conversation going. If industry decides to build a consultative group nurture it to achieve the above goals, but note that user views will be harder to draw out.

David Havyatt - April 2009

Conference participant comments posted on the noticeboard in response to the question “What needs to be DIFFERENT if NZ is to lead the world in NGN development?”

Consultation

Build a BSG for NZ with Government support – but use representative bodies (DH)

A single industry group replacing TUANZ, InternetNZ, TCF (and to some extent ComCom) which have competing agendas

Applications/users

Educate the public to the possibilities – increase uptake.

Why all the focus on IPTV – where are all the other applications?

Test the demand before putting in the pipes.

Service providers need to learn to be customer led (DH)

Understand Gen Y and the Digital Natives – these will be the main future users.

Let Gen Y develop it.

MOH and MOE develop or buy world class applications for Health and Education.

Focus on applications, not access technologies.

Funding Networks

Recognise that Services and Networks have different business characteristics and if they are bundled together, value is destroyed.

Key and Joyce should be like JFK “We are going to land on the moon “ just get on with FttH.

Get rid of the politics and JUST DO IT!

Set target for economic growth from ICT use.

The Government buys the current network off Telecom at a fair “economic price” = gets public good upside for free.

Treat access network/fibre access as national infrastructure and fund accordingly.
Requires full separation of Chorus/network provider.

Build a national fibre network with many stakeholders like Telecom, other ISPs power cos and public.

Leverage the other networks and integrate their capabilities into the NGN competitive/regulator package (e.g. Electrical)

I want the Ferrari funded by the Govt too please – I’ll pay Toyota price.

Don’t impose a one size fits all approach to NGA/NGN – create a national architecture and allow others to build ...regional, community

Equal focus to wireless broadband and fibre.

Mobile data MUST accompany FttH as NGN-connected open access for many service providers.

Set sights on Next Next Generation Networks – optical networking (DH)

100% real time, 10Gbps interconnect – QoS irrelevant.

Telecom needs to get off its high horse and act as a peer not an autocrat.

Utility wholesale pricing (as proposed by Bob James)

Content Issues

What does happen if “the All Blacks decide to go direct” (i.e. content owners become content and service providers) – where does NGN fit in the value chain?

Investigate and understand copyright – not the conduit issue but the fair use and derivative work stuff) (DH)

Innovation

Maintain technology for innovation – open systems & open data (DH)

Encourage start-ups to drive innovation (DH).

QoS

QoS enabled Internet

QoS is a big issue to solve (DH)

QoS is solved by a big enough core (DH)

Regulation

Create some really strong market power rules so Telecom and Vodafone don't abuse their power.

Map all the bottlenecks – access, core, international, content (DH)

What can be deregulated?

Acknowledge there is nil market at Layer 0 + Layer 1 – Monitor/Reg

Identify and regulate all market power pinch points , address “fair use” to all P2P and other customer created content and clarify privacy laws

Identify bottlenecks early and regularly and take prompt action (Tristan G had suggested waiting till anti-competitive effect of bottleneck is known – but commentator notes this provides first mover advantage)

Other/unsure

Streamline the hell out of TransitNZ and LINZ

Application + content = service layer, fibre+LTE= transport layer “Technology independent”

\$10B

Light and nimble will go a long way – KISS – let's get it started

Should telcos be the leaders in NGN or are they a service provider (voice 2.0)??

Encourage, cajole make wireless operators peer locally (and reduce prices)

Model business models (DH)

Service layer benefits attribute value to NZ Inc, not offshore companies

Let the global marketplace and not social outcomes drive NFGN development. Do this by exploiting NZ's unique attributes, its remoteness, timezone, and political stability and build/regulate cost-based tariffson international capacity that will deliver NZ to the doorstep of international markets.

Sensible cross-the-board local and international peering.

Understand the privacy issues.