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Vector Communications' Response to the Commerce Commission's Discussion Paper on Next Generation Networks

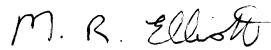
Introduction

1. Vector Communications welcomes the opportunity to respond to the Commerce Commission's (the "Commission") "Discussion Paper on Next Generation Networks" that was released on 24 December 2008 (the "Discussion Paper"). As a provider of a fibre-based open-access network in Auckland and Wellington we are very interested in the Commission's study of Next Generation Networks ("NGN").
2. Vector Communications currently provides high speed communications services over an approximately 600 kilometre fibre optic network. Vector Communications is also in the process of building a further 300km of fibre network in Auckland and has reached agreement with Vodafone to provide backhaul services to mobile network sites and 41 Telecom exchange sites in addition to other service providers.
3. Vector Communications provides advanced services with connectivity speeds up to 1 Gigabits per second ("Gbps"), with the capability to provide more. Services are provided on an open-access basis via a network of Service Providers and telecommunications companies.
4. Vector Communications has recently completed an open access (urban fibre network) UFN for North Shore City as part of the Broadband Challenge. This network will deliver 1Gbps services to schools, libraries, council facilities and businesses in North Shore City on an open-access basis.

Vector Communications' response to the Discussion Paper on NGN's

5. Our business model is consistent with Government aspirations to increase rapidly the supply of good quality broadband access and to foster competition in the retail aspects of the telecommunications market.
6. Vector Communications has answered relevant questions from the Discussion Paper in the appendix that follows. We are happy to discuss this submission in more detail if helpful. If you have any queries please contact Aaron Webb in the first instance, at aaron.webb@vector.co.nz or on 09-978-8288, or myself at maxine.elliott@vector.co.nz or on 09-978-8224.

Kind Regards,



Maxine Elliott
General Manager
Vector Communications

Appendix: Response to the Commission's specific questions

Q1. What are your views on the approach to development of the market framework and industry consultation that should be considered in New Zealand?

Vector Communications recognises that the Commission is a key stakeholder in the future success of NGN's in New Zealand, especially in regards to competition in this market. We believe that the Commission should take the approach of being a *facilitator* of debate and consensus in any market framework or industry consultation for those issues that cannot specifically be resolved through commercial channels. This could take the form of championing working groups on topics that the industry and the Commission both find difficult to gain consensus on.

Vector Communications also acknowledges the work of existing working groups, such as the TCF, as many NGN issues are already being investigated by these groups. The Commission should to the greatest extent seek to utilise these existing industry working groups, especially the TCF, to resolve NGN issues rather than starting a new forum. Vector Communications believe that the Commission's participation should be in an oversight role with no more power to influence debate than any other participants. That is, we support the approach taken in the Netherlands where the regulator maintains an oversight role and where decisions are left predominantly with industry participants (telecommunications companies, users and their representatives). Where consensus cannot be reached then it may be appropriate for the Commission, or potentially an independent party, to mediate a resolution.

We also believe that the Commission should utilise the current debate and forums on NGN's occurring globally. Firstly, any New Zealand NGN needs to be compatible internationally so, where possible, debate on universal issues should replicate work already done overseas. For instance, many overseas standards have already been agreed and could be incorporated in the New Zealand context.

Q2. Do these core principles provide a useful underpinning for considering NGN issues, or whether they should be modified or supplemented?

Vector Communications broadly agrees with the principles outlined by the Commission in the Discussion Paper. However, we suggest that the third principle on self regulation could be adjusted to reflect that self regulation is preferred but should only be applied where there is evidence of little competition.

Similarly, the fourth principle on regulation should be adjusted to emphasise that formal regulation should only be used where:

- There is no, or little potential for, competition
- self-regulation has failed or is not appropriate;
- The potential for market power is substantial and is threatened or being exercised
- The benefits of regulation outweigh the costs

Investment in NGN networks is inherently risky, especially during the transitory stage to NGN. During this phase there are likely to be many business cases and/or assets that become unviable as new business models take over. Furthermore, there are likely to be start-up ventures and investments that fail before the market fully matures. Given this, Vector Communications consider that the Commission should allow new business cases the chance to mature by adopting a higher threshold for introducing new regulation (especially so for price regulation rather than access regulation) so as to not regulate away the success of businesses whose start-up may be inherently fragile or shaky. This could take the form of requiring *very* strong evidence when assessing competition or the potential for market abuse, more than what is required in other industries, or only applying regulations where there is evidence of market abuse as opposed to the potential for it. We believe this more conservative approach to price regulation will promote competition and a variety of service offerings in the transition to NGN.

Q3. Are there additional elements that have to be taken into account when defining NGN? If so, what are the additional elements, why should they be taken into account and what impact do they have?

Vector Communications agrees with the elements as listed within the document, however, believes that the document is restricted in its approach to the benefits of NGN's. The focus tends to be on operator benefits. Our view is that the consumer is the real beneficiary of NGN through new and improved services, lower prices, and consumer choice. Ultimately, real consumer benefits, in an NGN environment, will be derived through open competition at each level of the value chain - NGAN, NGN, services, and content.

Q5. Where and how should the balance between coverage and speed be struck?

Vector Communications believes that there is no tension between coverage and speed at a commercial level, as this implies that there is a limited pool of capital to invest in both options. Both coverage and speed can be achieved if there exists a strong business case to invest in both. If it is commercially viable to invest in telecommunications infrastructure (of a variety of technologies) that supply to remote areas, then we would expect this to happen. Furthermore, investment in

speed is more related to the additional value created through customer demand for higher bandwidth services.

Vector Communications believe that this question is really a government policy issue and relates to improving remote-area customer access to IP services. The MED is currently discussing some of these issues with the industry in regards to potentially expanding the Telecom Services Obligation (TSO) to include broadband services. In these discussions it has been identified that New Zealand currently already has near to 100% broadband coverage through satellite and wireless services. If the definition of NGN is truly technology neutral (i.e. it doesn't matter whether the customer connects to fibre, satellite or wireless) then coverage does not seem to be the issue but rather speed or, in this case, improving bandwidth capacity to remote customers.

Q6. Is industry consultation necessary on network design for NGN?

Vector Communications does not consider that industry consultation is necessary on network design. Commercial businesses are best placed to develop their own network design to meet their customers needs. There already exist relevant standards that most companies already adhere to. We believe that the TCF is the most appropriate body for gaining industry consensus if there are any outstanding network design issues.

Q7i. How does the deployment of NGN change bottleneck characteristics?

There are a number of influencing factors on bottlenecks.

- Different access technologies provide variability of available bandwidth and can be a bottleneck.
- Price of wholesale access and transmission services can create bottlenecks (service providers need to balance the quality of their services against profitability).
- Lack of competition will always create bottlenecks (e.g. international cable connectivity)
- The types and uptake of services will create bottlenecks from time to time (resolved by capacity planning).

Vector Communications believe that the most significant bottlenecks for NGN networks will occur on international links and backbone networks e.g. Southern Cross Cable.

Q7ii. Is access to the infrastructure still an issue? If not, what other elements could become important?

Unbundling of the local-loop and sub-loop along with new competitive networks and technologies have significantly opened up access to telecommunications infrastructure and service providers are utilising this access. The incumbent still has no incentive to offer open access outside of current regulations, however, new entrant NGN's (non-incumbents), such as Vector Communications, are likely to adopt open access business models that do not create access bottle necks. The negotiation of access to non-regulated/non-open-access infrastructure services will therefore continue to create access and interconnection issues for service providers and competitive infrastructure providers.

Q8. Part of the BIF is targeted at deploying open access urban fibre networks and the Government has indicated that it will set aside \$1.5 billion for open access FTTH rollout that will reach 75% of the population. What is your understanding about what is meant by open access?

Vector Communications submit that open access means access at the connectivity layer (Layer 2) to any entity that approaches the network providers. That is, any authorised service provider should have access to any network facility, in line with the following open access principles:

- All authorised service providers should be offered services on fair, transparent, and non discriminatory terms and conditions.
- Authorised service providers should be offered connectivity layer access to different capacities depending on their requirements.
- End users should be free to choose any local authorised service provider connected to the network.
- Networks should be operated in such a way as to facilitate competition and to foster innovation at the services layer and, where practical and commercially viable, at all levels with a view to maximising usage of the network and benefits to the end users.

This view is supported by best global practice: internationally, when open access is mandated to a new entrant, it is usually done at the "connectivity" layer, if at all (see the case study below).

Global FTTx access Layers

Countries	Layer 0 (ducts)	Layer 1 (dark fibre)	Layer 2 (connectivity)	None
Australia			✓	
France	✓	✓		
Germany	✓	✓		
Hong Kong				✓
Italy				✓
Japan			✓	
Korea				✓
Singapore		✓*	✓	
Spain			✓**	
Taiwan				✓
US				✓

- Majority of countries have no mandated Open Access of fibre services, to account for the high cost of rolling out the network, which the operator needs to recover
- Where wholesale is mandated, most regulators mandate the wholesale of Layer 2 access only
- In countries where Layer 0 access is required, it only applies to incumbents with significant market power, and not to new entrants or challengers
 - France Telecom agreed to provide Layer 0 and 1 access where it is available
 - Deutsche Telekom was forced by the regulator in providing Layer 0 and 1 access where it is available as per EC regulation

* The government mandates open access at Layer 1, but funds only Layer 2, which compromises open access concept at Layer 1
 ** Regional government network
 Source: Spectrum Value Partners analysis; ARCEP; Bundesnetzagentur; DBCDE; iDA; Fiber to the Home Council; company websites

In addition to the above open access principles, there should be an “equivalence principle”, which requires connectivity services to be offered to all interested parties on the same terms. This allows for the development of a strong and competitive telecommunications retail market by ensuring that no one service provider has a competitive advantage over another. Furthermore, network providers that do not participate in the retail market themselves, such as Vector Communications, provide the Government and service providers with guarantees of an even-handed approach to all retailers that seek to purchase wholesale products.

Q10 i. What do you believe is needed to drive broadband penetration and speed in the future in New Zealand?

- An innovative and vibrant retail market
- open access networks
- interconnection to key network infrastructure points
- availability to new premium content (e.g. IPTV) that customers demand

Q11. Many are of the view that the pipes should be built first and services will then follow. Others believe that a lack of services and demand for broadband services are an issue. What is your view?

Vector Communications believe that neither view is completely right. At varying times there can be a push effect to provide new services and content through new

infrastructure being built while at other times there is a pull effect on new network infrastructure as new services and content develop. However, to a certain extent both demand for new network solutions and new services and content need to exist at the same time. That is, there is recent evidence in New Zealand of telecommunications infrastructure leading before demand for a viable service provision existed (cable roll out in the 1990s). These infrastructure projects proved unsuccessful at the time. Until more recently, national broadband uptake has been slow due to the availability of reasonably priced high-speed capacity on national telecommunications networks. The unbundling of the local loop and investment in new infrastructure to meet this demand (by companies like Vector Communications) have improved broadband uptake considerably.

From an infrastructure point of view, infrastructure providers initially need real and strong demand from service providers to make a commercial case for an initial backbone investment in new network assets. Once the initial backbone investment has been made then infrastructure providers can enhance and strengthen their networks providing greater coverage and speed as customer demand dictates. The initial NGN infrastructure investment largely exists today (fibre, mobile, wireless, satellite). This infrastructure will be built upon (e.g. Fibre to the Premises ("FTTP")) as demand for services becomes more tangible and grows.

The presence of vertically integrated telecommunications companies can inhibit investment in necessary infrastructure by timing network solutions and investment to match their own retail service offerings. Full separation of telecommunications infrastructure from retail service provision and open access principles can drive new investment as disaggregated network providers will strive to meet demand from leading service and content providers (as opposed to just their own retail business units under a vertically integrated approach).

Q13. How is the nature of New Zealand's subscription TV market likely to impact the development and take up of NGN in New Zealand?

Vector Communications believes that access to premium content on the subscription TV market, as well as to must have free to air (FTA) content, is crucial for the take up of new NGN in New Zealand, most notably for FTTP as a platform. That is, without access to this content, service providers would find it extremely difficult to justify a sufficiently compelling business proposition to take advantage of FTTP as a platform. Vector Communications has argued in the Ministry of Culture and Heritage's recent consultation on Digital Broadcasting¹ that content owners *must offer* content on equivalent and fair terms.

¹ Ministry of Culture and Heritage, "Digital Broadcasting: Review of Regulations", January 2008

Q14. Is the service scenario approach seen as a useful one for the purpose of studying the New Zealand NGN market, and if so what would be the elements of practical and relevant scenarios?

The scenarios outlined by the Commission are somewhat useful. Vector Communications consider that it may be better, however, to focus on service levels and customer experience as opposed to what content will be delivered. Looking at scenarios that define the degree of scalability, latency, convergence, NGN interconnection, and customer participation, habits, and experience could all be more useful for assessing the future than trying to guess what the content will be.

We would also suggest that the Commission adopt a conservative approach in developing scenarios of future NGN. More importantly, we would suggest caution in formulating any competition policy, based on uncertain future scenarios, that may result in unintended consequences or commercial decisions that impact the future of NGN. The scenarios should therefore be technology neutral and focus on service levels and customer experience.

Q15. What other implications for the value chain of traditional operators and suppliers can be expected when moving towards an all-IP environment?

We believe that infrastructure providers will still continue to function as the operators and owners of networks but there may be a shift in where their revenues will flow from. That is, content providers, especially large international providers, may end up dealing directly with network providers rather than having to deal with local retailers. As such, retail service providers may need to innovate, in terms of the services they offer and in terms of their commercial arrangements and structures, to be competitive in a global content-based industry.

Q18. To what extent is symmetric speed or capacity necessary to provide future services to customers?

Symmetric speed and capacity is becoming more important to customers as user generated content (e.g. uploading video content to *Youtube*) and user interaction, such as on-line gaming, become more popular. The growth in both has been phenomenal and it is likely that more, rather than less, user interaction will occur in the near future. In short, digital users are becoming digital producers. Symmetric speed or capacity is therefore important for providing future services to customers.

Q19. What are the most important and significant drivers of bandwidth demand?

We believe the most important drivers are growing demand for high-definition video downloading and IPTV, video calling, on-line gaming, social networking, peer to peer, and demand for multiple use of these services from one connection (e.g. multiple computers/TVs in one house).

Q20. Is a differentiation of classes of services an appropriate approach for solving QoS degradation for end-to-end services?

Yes, we believe it is the only scalable approach.

Q21. What issues and effects could possibly arise due to a differentiation of services classes?

Differentiation of service classes adds operational complexity through the implementation and assurance of this service (e.g. in network troubleshooting of differentiation of service classes). There is technology being developed to reduce this complexity, however.

Q23. Beyond the costs for NGN core, access, CPE and drop lead, are there additional costing elements to be taken into account? If so, what is their likely impact?

Other Capex costs include, but are not limited to, setting up operations and business support systems, lab environments, research and development and testing. Other operational costs should also be included; maintenance, corporate overheads, employee costs etc.

Q24. Do you agree that in an NGN environment, a higher proportion of cost of the network is shared in common cost? What in your view is the best method for allocating costs, i.e., should it be based on volume, minutes or new drivers such as capacity?

Vectors Communications has no specific view on this question, although we do consider that pricing, whether cost-based or otherwise, is currently a commercial decision based on commercial and customer drivers. It therefore seems too early to discuss cost allocation methodologies and pricing for NGN's, especially where cost based pricing regulation is not the intention of the Commissions NGN study.

Q25. What is your view on the benefits and constraints of PON (Passive Optical Network) and P2P (Point to Point)?

PON provides very real capital expenditure benefits when designing and building FTTP networks. It is generally accepted that PON based networks costs up to 20% less to build than P2P fibre networks on a wide scale deployment. Consequently PON is the most deployed FTTP architecture globally today and PON technology is therefore at the best price-point for any deployment. We have not seen any P2P unit forecasts coming close to PON unit forecasts for ONT cost. There is no reason for this other than manufacturing volume.

PON also provides bandwidth efficiencies in the access network that are not achieved in P2P. IP traffic is by nature very "bursty". It seems counter-intuitive to dedicate 100Mbit/s or 1Gbit/s on a single fibre to a consumer if the average utilisation is <2% as we would expect in a P2P environment. PON provides bandwidth efficiencies in that a group of customers can share a single fibre (until the splitter point) and the associated bandwidth, whilst still maintaining a guaranteed minimum bandwidth far in excess of the access technology available today. It will still allow them to burst to the maximum of 1Gbit/s too. In other words, PON technology better reflects the nature of IP traffic and customer usage diversity.

PON also enables large areas to be served by a single active exchange. We would estimate for example that the whole of Auckland could be easily serviced by 10 exchanges in a PON environment. This is due to the inherent range of PON technology (up to 20km today) and the fact that you are only managing one fibre and one OLT port at the exchange for every 32 or 64 customers. For example if a network were serving an area of 40,000 premises with 50% market penetration they would likely be terminating less than 1000 fibres at the exchange in a PON environment. For P2P there would be 20,000 fibre terminations. The cost implications of this are enormous - the physical size of the exchange and power usage would be a multiple of that required for PON. Therefore in a P2P environment you would most likely have more exchanges serving fewer customers per exchange to make it manageable. Fundamentally this not only incurs higher Capex, it incurs higher Opex.

From a regulatory perspective there are some fundamental differences today. P2P allows for unbundling at a fibre level today, PON does not. The next generation of PON, however, will allow for virtual unbundling at an equivalent level to P2P fibre. This is achieved by multi-wavelength technology and will effectively mean that you get all of the benefits of PON plus all of the benefits of P2P. This technology is still a number of years off commercial deployment, however, it would only be introduced as an evolution to an existing PON network. It would not be likely that a business would upgrade from P2P Architecture to WDM-PON in the future to

achieve the outcomes that WDM-PON delivers for PON architectures due to the large sunk costs associated with the existing P2P network.

This is not to say that PON cannot be managed in such a way that there can be multiple network operators using the same physical infrastructure. It would mean though that the number of network operators would be restricted in order to maintain at least some of the efficiencies of PON. In other words, not all service providers could be network operators and indeed there is some argument that network operators should not be service providers in a true open market.

Q26. Do you agree with the generic definition of the terms interconnection and access? If not, what would be the alternative definitions?

Yes, in principle we agree with the generic definitions outlined in the Discussion Paper.

Q27. Do you agree with the pricing concepts outlined for NGN? What other pricing mechanisms could be applied?

Yes, we agree with the pricing concepts outlined in the Discussion Paper. Our preferred pricing option in the current environment is "Bill and Keep" if it can be adjusted to recoup the costs of any traffic imbalances. Other advantages of Bill and Keep pricing including it being:

- Economically efficient
- Encourages usage
- Removes the need for price regulation
- Minimal implementation difficulties
- Minimal barriers to entry.

Q28. What additional factors have to be taken into account with regards to point of interconnection in an NGN environment and what is their effect?

An imbalance of market power at key interconnection points will create delays in rolling out new services and content and will create additional costs and network inefficiencies in sending data between networks. The abuse of this market power is costly and time-consuming for the connecting party who often need to negotiate commercial arrangements with a large incumbent who has no incentive to interconnect. The effect of this market power on service providers is that NGN

network providers may have trouble, or be blocked from, gaining access to certain customer groups on behalf of these service providers. The speed of roll-out of new services and content to customers will suffer as a result.

Q29. What are the implications for these issues in New Zealand? Are there specific regulatory issues anticipated?

As a network operator we would expect that some of the issues identified will have flow down affects to us. For example, the TCF draft code for provision of emergency services stipulates that availability beyond the first data switch should be 99.99%. This implies that backhaul products need to be more robust than those currently available on the market today.

Rights of use to public corridors and in particular the rules and conditions around their use do need to be accounted for by the Commission in assessing the potential speed of any future NGN rollout, especially for FTTP. In the Auckland region, for example, Vector deals with seven different sets of local government rules and conditions. Nationally the problem is even worse with in excess of 80 TLA's and RCA's. There are several developments that may impact future access to public corridors too. Firstly, there is an industry working group seeking to develop a national code of practice for utility access to transmission corridors. One national consistent set of rules and conditions may provide a significant benefit to network infrastructure owners, but only if the right balance is found between different stakeholders. Auckland City Council are also formally consulting on proposals to designate local roads so that utility works need to be approved by them. This could affect the timing or viability of NGN infrastructure investments.

Q30. What additional factors have to be taken into account and what is their effect?

Resource management compliance affects the speed and cost of investment in NGN networks. Potentially, some of these issues may be addressed with the review of the Resource Management Act announced recently by the Government.

Uncertainty over the regulation of NGN's has the potential to lead to caution in investment decisions, especially in this transitory phase to an NGN world. Vector Communications is appreciative that the Commission has outlined its principles that it will follow for the transition to next generation services (see page 10 of the Discussion Paper). However, we would like the Commission to give some clarity, as part of this NGN study report, over its potential approach to regulation of telecommunications infrastructure, if it does find a lack of competition as part of this study. As discussed earlier, we also believe that a conservative approach to pricing regulation should be adopted by the Commission.

Vector Communications believe that disaggregation of content from service provision (e.g. *Skype, Google*) and the potential market power of these content owners could be a relevant trend that may impact upon the future of NGN participants. As mentioned previously, network owners may receive revenue directly from content owners, while service providers may have to adapt to larger internationally based competition.

The Governments policy on telecommunications is likely to have a very large affect on NGN services and the structure of the industry. Government funding of investment in NGN's has the power to shape the future of competing infrastructure providers as well as the current incumbents.