



Vector Communications Ltd  
101 Carlton Gore Road  
Newmarket  
PO Box 90624  
Auckland Mail Centre  
Auckland 1142  
New Zealand

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Mark Forward  
Commerce Commission  
WELLINGTON  
By email to: [mark.forward@comcom.govt.nz](mailto:mark.forward@comcom.govt.nz)

### **NGN Questionnaire**

Vector Communications is an independent owner, operator and open access telecommunications network wholesaler. We own an ultra-high bandwidth, fibre-optic network in Auckland and Wellington and can provide connectivity between the cities. We welcome the opportunity to provide responses to the Commission's study questionnaire. Our answers to the questions asked are set out in Appendix One.

Vector Communications recommends that the focus of the Commission's study should be on the operational and interconnection issues around NGN, rather than on regulating access to network and assets. We believe that access issues are largely addressed by unbundling and operational separation.

Vector Communications believes that achieving the best outcomes for consumers in an NGN environment will require maximum services based competition. This can be achieved by preserving the incentives of service providers to invest in new platforms and develop intellectual property, thus providing new services and increased efficiencies that can drive the transition to NGN. A perception that investment in NGN will be subject to regulation would weaken incentives to produce such services and efficiencies, ultimately reducing the quality of outcomes for consumers.

Vector Communications would be happy to provide further clarification or information if that would be helpful. Please direct any enquiries to Kevin Oswin ([kevin.oswin@vector.co.nz](mailto:kevin.oswin@vector.co.nz), 09-978-8209) in the first instance.

Yours sincerely,

A handwritten signature in blue ink that reads "M. R. Elliott".

Maxine Elliott  
**General Manager**  
**Vector Communications**

## **Appendix One: Vector Communications answers to Next Generation Network (NGN) Study Consultation Questionnaire**

### **A. Retail and Wholesale Services**

#### ***A.1. What are your views on the appropriateness or otherwise of retaining the existing commercial models (e.g. PSTN interconnect) in the NGN environment?***

Vector believes a “Bill and Keep” commercial model supports the following key outcomes sought in the development of NGNs. This is supported by the analysis in the ITU GSR 2007 Discussion Paper on NGN Interconnect and Access:

- Economically efficient
- Encourage usage
- No price regulation required
- Minimal implementation difficulties
- Minimal barriers to entry.

However, we believe that there may be a need for a regulatory mandate to interconnect NGNs, if dominant operators are not motivated to do so themselves. Although we note that it may be impracticable to force every NGN to interconnect with every other NGN, due to regional or coverage limitations.

NGN operators would be likely to share physical interconnection costs or bear their own costs.

#### ***A.2. What do you believe are the appropriate retail and wholesale commercial models for the various NGN services?***

In practice, a consumer may have a commercial relationship with a service provider separate to a network provider (e.g. Skype Out). In such a scenario there is no commercial relationship between the service provider and the network provider although they both have relationships with the consumer. In the future, commercial models are likely to involve the potential for unbundled elements, where the consumer pays for their network access and services separately.

Ultimately, Vector Communications believes the market development is not yet mature enough for participants to be certain which commercial models are appropriate. Commercial models will need to be determined by participants as the market develops.

**A.3. What are your views on the opportunities, merits or desirability of fostering an environment facilitating services based versus facilities based competition in the evolving NGN market?**

Vector submits that a strong services based competitive environment will lead to greater investment and competition in facilities. This is fundamentally because network operators rely on service providers to create demand for high capacity networks by delivering new services that customers value such as IPTV and video telephony. The following further explains the rationale behind our position.

NGN is by definition a packet-based network. However, this can be broken down further into core and access. Core NGNs are by necessity IP service enabled and typically operate at Layer 3 (OSI Model). Access NGNs (referred to as NGAN in this document) are typically Layer 2 packet networks that are most efficiently based on Carrier Ethernet technology. The main driver behind an NGN is to offer unrestricted access by users to different service providers. The IP services themselves therefore are not considered part of the NGN.

In this context, Vector Communications would provide Layer 2 connectivity between the user and a NGN operator of their choice, who would in turn offer up their own services but could just as readily allow a user to use someone else's services via their NGN core. Alternatively we could offer connectivity to multiple NGN operators for a single user.

In one scenario, the NGN core operator has agreements with third party service providers to deliver services via their core. In another, the third party service providers are disaggregated from the NGN core provider and there is no commercial arrangement between them. In the latter scenario the service provider would have no guarantee of quality across the NGN core or access networks. This would exclude services such as real time IPTV (especially HDTV), alarm signalling, remote surgery, etc. from being disaggregated services (WebTV by definition is offered up on a best effort basis.)

There are no independent NGN core networks today and current market drivers would indicate that this is unlikely for some time. So the reality is somewhat different to the picture painted by the definition of NGN.

Therefore, we potentially have three areas of competition:

- NGAN
- NGN
- IP based services.

There are different drivers for investment and different competitive pressures for each area.

## *NGAN*

This is the most capital intensive investment area for our industry. Network operators will invest in new and upgraded networks if they can achieve a sufficient return to justify the investments. As a wholesale network operator, Vector Communications must build a business case that provides a return without having any direct influence on consumer ARPU or uptake. Vector Communications submits that the most effective environment to build this type of business case is one where there is vibrant competition and innovation in the service provider market. Network operators are more likely to build with open access business models in this type of market.

## *NGN*

Service providers are currently building NGN cores to facilitate delivery of their own IP based services to their customers. This focus ignores the Google phenomenon. Vector Communications submits that NGNs by definition should be open. Service providers could be seen as separate to NGN operators. If NGN operators also provide services then they should not be allowed to unreasonably exclude service providers who do not operate NGNs from delivering their services over the NGN operator's network, either on a best effort or contracted Service Level Agreement basis. NGN operators will need to have a presence in NZ to participate in this market however they may be global operators.

## *Service Providers*

Service providers are no longer just local entities. There is now a range of commercial models behind delivering services to consumers, from bundled offerings from local providers to free offerings from global providers. The different service providers deliver choice for consumers and expose them to a global service provider market. There is scope for local providers to offer locally differentiated services to the local market, or indeed to compete in larger overseas markets.

### ***A.4. Can you envisage any areas where industry limitations are likely to prevent (e.g. commercial or technical) agreements?***

Vector Communications considers the following three areas are worthy of consideration:

- Where a party mandates non-standards based interconnect technology
- Where dominant operators decline to offer reasonable terms
- Where NGN operators unreasonably block 3<sup>rd</sup> party services.

***A.5. Can you envisage any areas where policy support would likely aid or facilitate agreements?***

Vector Communications notes that the NGN market is developing and believes there is a risk that any action by a regulator to develop standards in this area may restrict innovation. Vector Communications believes the role of the regulator should focus on protecting the consumer and preventing anti-competitive behaviour. We are not convinced regulatory action is required in other areas at this stage.

***A.6. Can you envisage any areas where significant barriers to entry are likely to emerge?***

From Vector Communications' perspective the key barriers are regulatory uncertainty and the risk of anti-competitive behaviour from a dominant vertically integrated market player.

**B. Architecture**

***B.1. What technical issues need to be resolved to allow you to offer the services you would like to be able to offer today, and over the next 1-3 years?***

There are currently no particular technical issues from the network that we can identify.

As a fibre access and transmission provider, Vector Communications is able to provide connectivity that overcomes many of the issues facing service providers today when trying to deliver innovative services to consumers.

***B.2. What commercial issues need to be resolved to allow you to offer the services you would like to be able to offer today, and over the next 1-3 years?***

As a backhaul service provider, Vector Communications believes that commercial terms need to reflect the potential for service providers to acquire services from a range of network providers. At present, this is not generally provided for.

Vector Communications would like to have a point of presence in each NGN where we can deliver both physical and virtual interconnects for other NGNs. We are currently required to deliver a separate fibre cable into a Telecom exchange to each service provider's cabinet. This is a very inefficient use of resource and assumes that a service provider or NGN operator is also a physical network operator. As discussed above, this is not a reality today for most operators and certainly will not be in the future.

There is no current consistent industry approach to commercial terms. In fact, Telecom is likely to produce their position and invite comment from the industry. This is not necessarily an ideal approach as other operators such as TelstraClear and Vodafone will potentially have a fundamentally different set of commercial terms.

***B.3. Which of these issues do you believe can be satisfactorily resolved through the current industry work groups in a timely manner?***

The TCF industry working groups generally focus on technical, rather than commercial, issues. Vector Communications believes resolution of commercial issues will ultimately need to be resolved through bilateral agreements between participants.

***B.4. Do you envisage any issues in NGN interconnect or in relation to current peering arrangements?***

At this point in time the industry is working to resolve technical interconnect and peering issues through a TCF Working Party.

***B.5. Do you envisage any issues in NGAN to NGN interconnect?***

We do not see any issues with NGAN to NGN interconnect if that occurs through an E-NNI or Ethernet interconnect.

***B.6. Do you envisage any issues around NGN to service, content and application provider interconnect?***

Vector Communications is not aware of any current issues relevant to this question. NGN to service provider interconnect is only required where there is a commercial relationship between the parties. Otherwise service providers may deliver their services via normal network peering arrangements. Service providers may be hosted within an NGN operator's facilities or be physically separate. Vector Communications believes part of our role as an independent network operator is to provide the connectivity between service providers and NGN operators.

***B.7. Do you envisage any issues around agreement on appropriate parameters and values relating to Quality of Service in the NGN environment?***

A common set of QoS parameters for the industry in NZ would be ideal. However this is a complex issue and any parameters would need to cover a wide range of technologies and operators. We note that this has been dealt with in some overseas jurisdictions under the direct guidance of the regulator. It is interesting to note the Network Interconnect Consultation Committee (NICC) in the UK, which was established by the regulator, has now been transferred to an industry ownership model.

Vector Communications believes that the regulator should provide guidance for the industry, potentially through the TCF, to deliver a result in a timely manner.

***B.8. Do you envisage any issues around the integration with the developing open access fibre networks?***

The answer to this question depends very much on the definition of “open access”. It is very important that open access is provided at the appropriate functional level of the network – in Vector Communication’s view, that level is not the duct.

Even where open access to dark fibre exists, there remain barriers for any new NGN operator. Firstly they would be required to become infrastructure operators by co-locating equipment at every access aggregation point around the country. Secondly they would each need to recruit sufficient people to design, build and operate access and transmission technology in a skills market that is very tight. In our view this would lead to fewer participants at an NGN core level and at a fibre network level.

Future technologies such as WDM-PON will enable cost effective open access at Layer 1.5 or wavelength service level using the same basic network architecture as G-PON, thus providing effective open access fibre without the inherent cost of point-to-point fibre networks.

**C. Transition**

***C.1. Can you comment on the need or timing to migrate from IPv4 to IPv6 and any role you see for government in this transition?***

As a Layer 2 network operator, Vector Communications does not have any comment on this issue.

***C.2. Can you comment on the need for revisions to numbering plans for new services, and the need or otherwise for non-geographic codes recognising increasing user nomadicity?***

Vector Communications does not provide any services requiring phone numbers and therefore has not considered this issue. We would expect that many overseas jurisdictions have progressed much further in addressing this issue than New Zealand. We recommend that New Zealand look to these overseas models for suggestions for solutions that will fit with our environment.

The current numbering plan structure is specified by ITU-T Recommendation E.164. It is more likely that future numbering issues will be resolved by the IETF’s ENUM protocol. Any changes to E.164 based numbering plans will most likely be only short term fixes to the challenges that an IP service arena brings to this area.

***C.3. Do you have a view as to the best approach in dealing with stranded assets in the event of significant network rearrangements?***

Every network operator is faced with having to deal with stranded assets from time to time and the risk of stranding from the ordinary workings of a competitive market should

be factored into commercially-based investment decisions. Where asset stranding arises from the imposition of regulatory arrangements, or from subsidy regimes (e.g., broadband investment fund) there should be appropriate compensation by the Government/regulator for such stranding.

***C.4. Do you have a view on emergency service, mains powering and location information in an NGN environment?***

*Emergency Service*

Access to emergency services should be mandatory for any service provider offering voice services that utilise NZ resources such as E.164 numbers. Services such as Skype, MSN and other messaging or communications applications that could be used for voice communication but are not linked to an E.164 number should not be required to provide access to emergency services.

With the potential for there to be many service providers who are obliged to offer access to emergency services, the Government will need to either mandate minimum levels of service for delivery of emergency services (in particular the initial call centre function) or provide this service themselves and require service providers to deliver calls and associated metadata to a centralised call centre.

*Mains Powering*

Vector Communications does not believe that IP based fixed line services should be required to have battery backed power supplies provided by the network operator or service provider in the user premise, for the following reasons:

- The costs (including the environmental costs of disposing of batteries) would be excessive.
- Most homes have access to at least one mobile phone which already operates in a situation where mains power is disrupted.

*Location Information*

As a Layer 2 network operator without any visibility into the services using our network or direct relationships with users, Vector Communications would be unable to provide location information. However, we believe that, given the nature of IP based services, service providers should be required to deliver location metadata with emergency service calls.

## **D. Environment**

### ***D.1. Is access to physical infrastructure such as ducts, poles and rights of way likely to impact on NGN rollouts?***

Access to infrastructure is no longer what holds back NGN rollouts. Service providers now have access to reasonably fast and well priced broadband infrastructure and are able to concentrate on developing differentiated services for their customers.

Vector Communications considers that the key to promoting uptake is in demonstrating the value to consumers of NGN services. In the short term, fibre-based broadband is likely to be more expensive than existing delivery modes, so it will be necessary to provide a compelling value proposition to customers to drive uptake.

Vector Communications does not consider that physical access issues are the key issue, although there should be stronger incentives on councils to keep their compliance costs and those imposed on infrastructure developers as low as possible.

### ***D.2. What is your view on the ability to provide services into multi-tenant buildings, and the potential to share optical line termination equipment?***

The term OLT normally refers to PON equipment that typically resides in an access aggregation node. This equipment is not typically able to be shared from a management and provisioning perspective by multiple operators and there is usually a single management domain. Therefore OLTs must be operated by a single entity. Vector Communications operates OLTs in its network and delivers PON based connectivity to customer end points on an open access basis. We see no difference in a multi-dwelling environment that is able to be fibred.

Multi-dwelling units (MDUs) provide a multitude of connectivity options once the fibre is inside the building and each building will need to be evaluated independently to determine the optimal method for delivering connectivity to individual end customers. Vector Communications does not believe there is a one size fits all solution for MDUs and a range of solutions will need to be configured.

### ***D.3. Do you have a view of the role of the regulator and other industry bodies (e.g. TCF) in the evolving NGN environment?***

As discussed above, Vector Communications believes that as far as possible regulation of NGN should have a restricted focus on facilitating industry resolution of interconnection and operational issues associated with new technology platforms. Vector does not believe that there should be broad regulatory involvement in establishing terms and conditions for access to assets for which investment decision are yet to be made.

The TCF's role in the evolving NGN is to facilitate industry self regulation and to provide advocacy for the industry as a whole on important issues of policy and consumer interest.

Other bodies such as TUANZ and the potential broader ICT industry body all have critical roles to play in helping develop the vision for the NGN and then in encouraging adoption.

***D.4. Do you have a view on whether or how the "Ladder of Investment" model could operate in the NGN environment?***

Vector Communications does not believe that all players need to be involved at all levels of the value chain. In fact, the most efficient utilisation of resources would have many players at the service provider level and far fewer players at the network infrastructure level. Many overseas jurisdictions are intentionally building just this type of industry model to gain the best efficiencies from the resources available and therefore the best outcomes for the consumers.

Vector Communications sees no reason for service providers to be infrastructure investors if they are able to deliver their services profitably to any customer on any NGN core or access network. The nature of NGN networks is that players can exist at any point(s) of the value chain without the need to invest in other "rungs of the ladder". A service provider is not required to have the same skills and expertise as a network operator.

***D.5. Do you see any issues or opportunities relating to the access to and use of spectrum now, and potentially emerging from the current Telecommunications and Broadcasting convergence?***

Vector Communications does not have a view on this question.