**COMMUNICATIONS
ALLIANCE LTD**

NBN INDUSTRY CONNECTION
DISCUSSION PAPER

HOW CAN WE DEVELOP AN OPEN-ACCESS
WHOLESALE SERVICE MODEL FOR THE NBN?

14 MAY 2009

NBN Industry Connection Discussion Paper: *How can we develop an open-access wholesale service model For the NBN?*

MAY 2009

Author: Gary McLaren, McLaren Williams Pty Ltd

Gary has 25 years of experience in the IT&T market with roles in large and small companies in Australia, Germany and Singapore.

After an initial career with Telstra and Siemens, Gary joined broadband start-up RequestDSL in 2001 where he was General Manager for Product Management, Carrier Relations and Regulatory.

Since 2004 Gary has been providing consulting services to various companies in the telecommunications and IT sectors with an emphasis on commercialisation of new technologies.

Gary is a director of IProvide, a company that has developed VoIP products tailored for the SME market, and Utiba a company that provides mobile commerce solutions to mobile carriers.

With professional qualifications from the highly regarded University of Melbourne in Engineering and Law, Gary brings a range of experience across the technical, marketing and commercial aspects of IT&T businesses.

TABLE OF CONTENTS

1 INTRODUCTION

This discussion paper has been written as background for the first in a series of NBN Industry Connection forums to be hosted by Communications Alliance in response to the Government's announcements regarding the National Broadband Network (NBN). The forums will take place on the 19th May (Sydney) and 20th May (Melbourne) 2009.

The Government released a discussion paper titled *"National Broadband Network : Regulatory Reform for 21st Century Broadband"* in April 2009 which, in Chapter 2, outlines its plans to create a NBN company that will build and operate a wholesale only, open access network using fibre optic, wireless and satellite technologies to deliver superfast broadband services. The paper also includes discussion on transitional changes to the telecommunications competition framework (Chapter 3) and consumer safeguards framework (Chapter 4).

This paper and the first of the NBN Industry Connection forums will focus on the issues raised in Chapter 2 of the Government's discussion paper. In particular the focus is on how the industry can develop an open-access wholesale service model that will facilitate the development of retail products and services that will deliver competitive, innovative and effective outcomes for end users of the NBN.

To achieve this end the paper discusses and raises a number of questions under the following topic headings:

1.   Roles and Responsibilities of Service Providers

2.   Types of Wholesale Services

3.   Technical, Operational and CPE Considerations

These topics and questions will be discussed in the first NBN Industry Connection forum in order to obtain feedback from industry participants on the best ways to consider, analyse and answer these important questions.

Based on this feedback Communications Alliance will develop a scoping report outlining a work program to consider and address these questions. Industry will then be asked to commit resources to the various components of this work program so that detailed work can commence within working groups. The progress and outcomes from these working groups will be used to inform and guide the Implementation Study announced by the Government on the NBN.

2   ROLES AND RESPONSIBILITIES OF SERVICE PROVIDERS

We currently have various reference points for understanding the roles and responsibilities of telecommunication service providers in the Australian market. Examples of these are the roles and responsibilities attached to the definitions or common use of:

- Carrier, Service Provider, Carriage Service Provider, Content Service Provider (*Telecommunications Act*)

- Access Seeker, Access Provider (*Trade Practices Act, ULLS Network Deployment Code*)

- Service Deliverer, Prime Service Deliverer, Access Service Deliverer, Originating Access Service Deliverer, Terminating Access Service Deliverer, Transit Service Deliverer (*Interconnection Model, Preselection and Local Number Portability Codes*)

- Gaining Access Seeker, Gaining C/CSP, Donor C/CSP, Losing C/CSP, Mobile Carrier, Gaining Mobile Carrier, Losing Mobile Carrier, Aggregator, Content Supplier (*Mobile Number Portability Code, Mobile Premium Services Code*)

The above is by no means an exhaustive list but serves to demonstrate how over time a range of roles and responsibilities have been attributed to different types of service providers. These roles and responsibilities are important in facilitating the interaction between the various Service Providers in the market.

Under a new NBN framework many of these terms and attached roles and responsibilities will need to be re-evaluated. This is being driven by the policy and technology changes that are enabling the new Digital Economy. The old divisions between telephone, mobile, internet and data services (and their underpinning networks) are breaking down. Furthermore, competition policies are promoting the operational, functional and/or structural separation of companies involved in the supply of services across the different service layers. In its submission to the Commonwealth on regulatory issues regarding the NBN in June 2008, Transact referred to this as the "Lasagne Model" as depicted below.

Figure 1 - Transact's "Lasagne" Technology & Service Model[1]

As the divisions between telephone, mobile, internet and data networks disappear, competition policy is promoting the separation of organisations involved in multiple vertical layers. The challenge now for the industry is to re-articulate many of the roles and responsibilities of service providers given the developments in technology and policy.

Of particular importance will be the roles and responsibilities of the new NBN company. Do these extend to any telephony related roles of the Originating Access Service Deliverers or Terminating Access Service Deliverers kind? If not, what type of roles does the NBN company take on to assist origination and termination of telephone services? What types of generic services are required to enable the retail Service Providers to supply telephone services? How far up the "Lasagne" model will the NBN company's roles and responsibilities extend? Similar issues exist for internet and data services, but with a different emphasis, as physical wholesale fibre and/or wireless access (similar to the unbundled copper loop) may no longer be available in many circumstances where higher bandwidths are deployed.

Conversely, how will the roles of other Service Providers change? Will today's resellers of telecommunication services (voice, internet or data) need to extend their scope to become involved in a wider range of network and operational matters? How do the existing Service Providers who have access to today's copper network adjust to be able to provide end-to-end services without physical access to the new NBN network?

Now seems an opportune time for the industry to collectively share information and have a conversation on how we see the proposed NBN framework changing existing roles and responsibilities and creating new ones. Even the (seemingly?) simple process of agreeing a new set of terminology consistent with the new NBN framework will be important in the early stages of working with the Government to create a model that is based on open-access wholesale services.

At this early stage an outcome focussed on agreeing terminology and principles may be a way forward. This will provide clarification and a common language and understanding to use as the NBN framework unfolds. Looking back, the AUSTEL Interconnect Model achieved these outcomes for telephony services in the run up to de-regulation prior to 1997. Once some basic principles outlining the various roles

---

[1] See "TransACT's Broadband Regulatory Submission" – June 2008

and responsibilities were understood the industry could move on to define the next level of wholesale services required to facilitate the de-regulation of the long distance telephony market.

Questions for Discussion

- *Should the industry re-examine the terminology used to describe different Service Providers to bring it more in line with the open-access and converged IP networks of today and tomorrow?*

- *Can the industry agree a range of fundamental key principles that describe the roles and responsibilities of Service Providers in an NBN framework?*

- *Which of these key principles should apply to the NBN Company?*

- *Can the industry develop a reference model outlining the roles and responsibilities of Service Providers which serves a similar purpose to the AUSTEL Interconnect Model from the mid-1990s?*

3   TYPES OF WHOLESALE SERVICES

The types of wholesale services required in a multi-service provider market have evolved over time. As with other international markets, the Australian market has seen a clear distinction develop between the wholesale services required for telephony and the wholesale services required for internet and data. Some of these have been declared as bottleneck services by the ACCC and some have developed according to competitive market principles.

In general however these services can be categorised according to the following hierarchy:

Figure 2 – Wholesale Services Hierarchy

On the one hand the wholesale supplier achieves increasing value for each step on the way up the hierarchy, while the wholesale customer achieves increasing scope for control and innovation of the service on the way down the hierarchy. The choice of which type of wholesale service to supply or procure depends on a range of factors related to competition, financial and regulatory arrangements in the market.

A number of questions arise however in the NBN framework.

Firstly, what is the scope to retain arrangements for the supply of passive wholesale services in the NBN? Will the technology deployments allow access to the equivalent of unbundled copper from the NBN company (this is not likely to be possible where GPON or wireless technologies are deployed)? Will it be possible to provide passive access on a mass scale as is now happening with access to the copper loop (optical cross connects consume more physical space and require particular technical expertise)? Will provision be made for access to ducts and poles to allow existing network infrastructure companies to deploy independent fibre networks directly to customers?

Secondly, what type of active wholesale services are required to allow the deployment of a range of services with different bandwidth, quality of service and location requirements? Will we retain the current split between voice based wholesale services and data/internet based wholesale services (i.e. will the NBN company actually install voice switching infrastructure in order to provide voice wholesale services, albeit packetized services using VoIP)? Can we define a set of services based on one technology such as Ethernet that covers everyone's requirements for voice, internet and future high-bandwidth services? Where will customers of the active wholesale services deploy their infrastructure to connect to these voice services? Will there be independent competitive backhaul suppliers supplying services to enable geographic reach to the different connection locations? Are we looking at having interconnection to these services in just the capital cities or will interconnection extend to regional centres and if so how many?

Thirdly, will service providers who wish to simply re-sell services (so-called "virtual operators") be able to access the new NBN services? Will they be able to access these services directly from the NBN company? Or will there be a middle layer of wholesale service providers who effectively aggregate and productise services for these resellers? Is there scope for such wholesale service providers and their "virtual operator" customers to add value and innovation to their offerings?

In other markets it is interesting to see that government policy and regulators are creating market structures which seek to define and shape the companies involved in this wholesale service hierarchy.

The most notable example is Singapore where there is functional separation between the passive and active wholesale service layer for their equivalent of the NBN as depicted below:
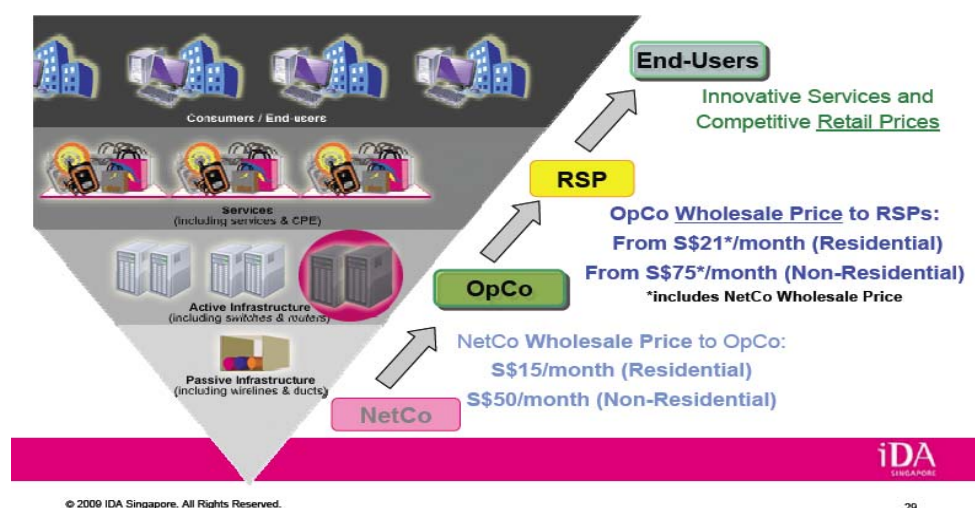

Figure 3 – Singapore Next Gen NBN Service Hierarchy[2]

---

[2] See Media Briefing – Selection of Next Generation NBN OpCo – 3 April 2009 - http://www.ida.gov.sg/doc/News%20and%20Events/News_and_Events_Level2/20090403155250/BriefingSlides.pdf

Rather than focusing on creating market structures, the regulator in the United Kingdom (Ofcom) is encouraging the development of active wholesale services in areas with FTTP deployments that seek to maximize the control and innovation options for upstream retail service providers. While not ruling out the value that passive wholesale services have in developing competition, it appears the focus has been on practical outcomes that are achievable at this early stage of FTTP deployments. The choice of Ethernet as the preferred technology with configurations that support voice, video, multicast and other requirements is aimed at providing a foundation building block that is as close as possible to a passive wholesale service in the level of control and innovation it gives the upstream wholesale customer. It is anticipated that this will lead to the natural formation of market structures which allow wholesale and end user services to develop in pro-competitive ways using such active wholesale services.

Ofcom
OFFICE OF COMMUNICATIONS

Key competitive requirements of Ethernet Active Line Access

Functionality	Justification	Technical requirements
Security enablement	• Secure delivery of services • Authentication of users	• Separate traffic streams • CPs implement own security
QoS enablement	• Satisfactory delivery of voice and video	• ALA-provider offers QoS information • ALA-user labels traffic
Multicast enablement	• Bandwidth savings in backhaul of one to many services (e.g. IPTV)	• Choice between ALA-provider and ALA-user implemented solution • Common interface • Static and dynamic support
Flexible customer premises equipment	• To allow CPs to innovate in CPE functionality	• Common Ethernet interface (initial) • Wires- / Fibre-only interface (future)
Flexible interconnection	• There is no universally economical interconnection point	• Local, regional, national interconnect • Common interface • Freedom to move

©Ofcom   11

Figure 4 – Ofcom requirements for Wholesale Ethernet Services[3]

---

[3] See Next Generation Competitive Broadband : from LLU to ALA? – 2 March 2009 - http://www.ofcom.org.uk/telecoms/discussnga/eala/nga_llu_ala.pdf

In New Zealand the government has foreshadowed the development of a "widespread wholesale market for the provision of 'dark fibre' network access services"[4] (i.e. passive wholesale services at the fibre level) via a combination of private and public investment in Local Fibre Companies (LFCs).

The industry response to this perceived focus on passive wholesale services has prompted the Minister for Communications and Information Technology to recently state:

> "Because the importance of a competitive Layer 2 service goes beyond our fibre project and appears to be a fundamental aspect of the new "NGN" world, we have also taken on board the comments suggesting there needs to be industry-wide input into the definition of such Layer 2 services."[5]

In New Zealand, the Commerce Commission has been conducting an inquiry into Next Generation Networks. The preliminary view appears to be that both passive and active wholesale services are regarded as necessary to facilitate both facilities based and services based competition:

> "No one solution is deemed sufficient to deliver competitive outcomes"[6]

In Australia there has been limited open discussion about the nature of wholesale services under an NBN framework.

These active wholesale services appear to be based on Ethernet technologies and include various classes of service to allow a range of services to be provided.

FANOC, a company formed by the G9 Consortium, in its special access undertaking lodged with the ACCC in May 2007 described a service which included a basic access telephone service and 4 different broadband services with increasing bandwidths. The interface to all of these services specified the Internet Protocol (IP) with the ability to use tunnelling technologies to ensure security and other requirements[7].

In the recent FTTN Request For Proposal (RFP) conducted by the Government, respondents were asked to provide details of their proposed wholesale services. The responses to the tender are confidential at this stage and as a result no public documentation is available of what had been proposed. However, Optus in their public regulatory submission highlighted the need for both active wholesale services (including capabilities to allow broadcasting services such as IPTV, radio and datacasting and point-to-point or multipoint Ethernet services) and passive wholesale services particularly as the FTTN migrates to an FTTP architecture[8] .

---

[4] See "New Zealand Government Broadband Initiative – Draft Proposal for Comment" – 31 March 2009 - p3

[5] See Speech Notes by Minister of Communications and Information Technology to TUANZ Telecommunications – 12th May 2009 - http://www.beehive.govt.nz/speech/speech+tuanz+telecommunications+day

[6] See "Next Generation Networks – Strategic Issues and Themes" New Zealand Commerce Commission – 6 May 2009

[7] See FANOC's Special Access Undertaking to the ACCC – 30 May 2007

[8] See Optus Submission – Regulating the National Broadband Network– June 2008 - p67-68

A dialogue on the role of passive, active and resaleable wholesale services is important in the Australian context given the NBN framework announced by the Government. An initial starting point for this dialogue could be the publication of those parts of the submitted FTTN RFP proposals that described the wholesale services proposed by each respondent in the FTTN environment. This could be facilitated by Communications Alliance in a way which allows informed discussion and debate that looks to find common principles and standards to be used going forward.

The timing for this dialogue should be expedited given the announced trials of FTTP networks in Tasmania and the proposed legislation to mandate FTTP networks in greenfield real estate developments from 1 July 2010.

The participants in these developments should be open to such a dialogue given that the upstream service providers will be the major customers for these services. We all know that it is best to build your products and services to meet the requirements of your customers – a dialogue on what upstream service providers see as the necessary service types will thus benefit everyone.

Questions for Discussion

- *Should the industry investigate the types of wholesale services that the NBN company should supply to other service providers?*

- *What types of passive and active wholesale services should the NBN company supply?*

- *What types of wholesale services should be the responsibility of the wholesale market under normal competitive principles?*

- *How far up the wholesale service hierarchy should the NBN company proceed in supplying services (ie. should it supply resaleable wholesale services)?*

- *Would the FTTN NBN tender respondents be prepared to share details of their proposed wholesale services to assist development of an open-access wholesale service model?*

- *Is there value in the industry developing key principles regarding the different passive and active wholesale services?*

- *Should the industry develop service descriptions for the wholesale services that are seen as necessary?*

- *How should the industry work with the initial NBN deployments in Tasmania and Greenfield real estate developments to ensure wholesale services are available in an efficient and flexible manner?*

4   TECHNICAL, OPERATIONAL AND CPE CONSIDERATIONS

The changes contemplated by the Government's NBN announcement will impact many of the technical standards and operational processes that are currently deployed throughout the industry. This extent and nature of the change will depend on a number of factors, such as:

1.   The types of new wholesale services that are used to access the NBN

2.   The manner in which existing services are migrated or transferred to the NBN

3.   The extent to which customer premises equipment (CPE) are integrated with wholesale and retail services or left to the customer to procure and install

4.   The degree to which the NBN company is established as a greenfields business rather than part of an existing wholesale business which currently services the market

All of the above factors are, to varying degrees, uncertain at the moment and require further clarification.

However, it is clear that the industry is in the best position to commence work on items 1, 2 and 3 above and that this will help inform and promote outcomes that may actually influence the way forward for item 4.

The technical aspects should involve work that as far as possible uses standards and specifications that are being deployed widely in other international markets. In today's globalised telecommunications market it is inevitable that service providers will be looking to deploy "off-the-shelf' network and CPE solutions that are widely available. This will drive the industry to using internationally recognised standards for interconnection, interworking and management of networks and CPE.

In the operational area many companies will be seeking to maximise the re-use of existing processes and IT systems. It is now well recognised across the industry that the deployment of new or improved operational IT systems and their attached processes can be both high cost and high risk. As a result most companies will be looking to limit the amount of change that has to be made, especially during the lengthy transitional period when both existing processes and new NBN processes will exist in parallel. This factor, above all else, will see many companies looking to limit the changes that impact them from the rollout of new NBN wholesale and retail services. However, if there is an early understanding and broad agreement on what the new NBN wholesale service model will look like then it will be possible to plan for and manage the necessary changes in an incremental manner over time rather than the dreaded "big-bang" cutovers to new systems that are the nightmare scenarios for CIOs and service managers across the country.

A clear trend going forward will be the deployment of more sophisticated and intelligent CPE on customer premises, especially with the development of new services such as IPTV. The supply, management and control of these intelligent CPE devices are likely to be integral to the quality, simplicity and impression of the service experienced by the end user. As a result it is likely that the CPE environment will be a key competitive area that drives competition. However, the NBN company will also have a key interest in the CPE that terminates its service on the customer premises. This "Network Termination Device" (NTD) will play a key role in

delivering the service experienced by the end user and also serve as key boundary point between the network and customer premises. Depending on the service paradigm deployed for a service it may be vital that the retail service provider has the ability to configure and monitor this device in real-time. As a result it is vital that industry develops its own views on what are the requirements for the NTD and the level of intelligence and serviceability that should be deployed.

In summary, it is clear that the technical standards, operational processes and systems and CPE considerations for the NBN need to be addressed comprehensively across the industry. In many cases these considerations will need to follow development of (i) clear principles that describe the roles and responsibilities of the different service providers and (ii) an understanding of the types of wholesale services that will be available in the NBN framework. However, an early dialogue and appreciation of these issues will also help inform the debate over (i) and (ii).

Questions for Discussion

- *What technical, operational and CPE areas should be investigated to assist development of an open-access wholesale service model?*

- *Which international bodies can provide guidance and support in developing the technical, operational and CPE arrangements for the NBN?*

- *How can the impacts on operational IT systems be managed in the transition to the NBN?*

- *What principles can be agreed that enable competitive supply of CPE but ensure operational integrity of services?*

5   SUMMARY

This paper has discussed a range of questions and issues related to the establishment of the Government's planned National Broadband Network and the open-access, wholesale service model that should be deployed to obtain the best outcomes for industry and end-users.

The questions and issues raised will be discussed in detail at the NBN Industry Connection forums on the 19th May (Sydney) and 20th May (Melbourne) 2009.

The forum discussions will be used to guide the development of a work program that allows the industry to further investigate, analyse, debate and agree on ways forward. The progress and outcomes of these working groups will be used to inform and advise the Government during its Implementation Study for the NBN.

Communications Alliance was formed in 2006 to provide a unified voice for the Australian communications industry and to lead it into the next generation of converging networks, technologies and services.

In pursuing its goals, Communications Alliance offers a forum for the industry to make coherent and constructive contributions to policy development and debate.

Communications Alliance seeks to facilitate open, effective and ethical competition between service providers while ensuring efficient, safe operation of networks, the provision of innovative services and the enhancement of consumer outcomes.

It is committed to the achievement of the policy objective of the Telecommunications Act 1997 - the greatest practicable use of industry self-regulation without imposing undue financial and administrative burdens on industry.