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Submission to:

NBN Co Limited
Product Technical Specification
Fibre Access Services
August 2010

This response follows the same document layout, in terms of section numbers and headings, as the original "Product Technical Specification, Fibre Access Services, August 2010" document released for comment by NBN Co Limited. Within each section of this document can be found comments and responses relevant to material found in the same section of the original document.

This response aims to represent the combined best interests of:
- **first** the Australian residential and business end-users (consumers);
- **second** an open, competitive and efficient retail service provider marketplace (producers); and
- **third** a long-term economically viable NBN Co wholesale access provider (enabler).

It is important to highlight that the current thinking of NBN Co Limited, as deduced from these publications, is not completely aligned with these stated outcomes, nor in this particular order. It is hoped that the responses here will help to re-guide NBN Co Limited in delivering its original commitment to the Nation's Government-- to deploy a National Broadband Network which meets various coverage, competition and cost effectiveness outcomes, which are **intended to address** the various short-fallings and market failures of the current telecommunications regime. It is hoped that NBN Co Limited will utilise the public national funds it is being provided in an appropriate manner that achieves desirable outcomes for the nation and its citizens as a whole (not just a subset).

Section 1
Scope and Purpose

Document Purpose

Noted. Of concern is that the close, extended and/or deep engagement has only been undertaken directly with, or through industry bodies representing, existing telecommunication operators, telecommunication hardware vendors and telecommunications service vendors. Has NBN Co closely engaged and addressed community, citizen and public interest bodies sufficiently in order to ensure a balanced and unbiased outcome? This is about co-operative engagement, not just communication.

As much as the existing carriers and vendors would like to think that this network is being built just for them. The reality is that this network is being funded by the public in order to address the market failure perceived to have occurred as a result of another publicly funded monopoly owning the current copper access and rural backhaul. We cannot reasonably expect to achieve a different and better outcome by merely applying the same techniques and approaches of the past. If we do that, we certainly risk simply recreating the past.

The challenge is to do it differently and hopefully better. In order to that, you need to lead the market, not be led.

Section 2
Introduction

Introduction

Noted. Modularity of design intent is to be commended however several definitions within this document clearly diverge from this intent and instead aim to constrain choice and flexibility. This reduces modularity.

Section 3
Product Overview

3.1 NFAS Product Integration

Noted and agreed.

Section 4
Technical Overview

4.1 Connectivity Serving Area

Noted. Intention to provide NNI POI details for each Connectivity Serving Area during the rollout is understood, however this should be in addition to an early publication of a high-level intent summary for all regions prior to actual rollout,to support advance planning and possible discussion.

4.4 Operational Processes

Noted. This is a clearly a very early and very immature specification of the intended business-to-business system interfaces and capabilities. Hopefully a more detailed update to this area will be provided soon. I assume that service modification/change is implied in ordering and fulfilment, likewise service testing is implied in the management and assurance.

4.5 Service Construction

Noted and agreed. Modularity is good.

Section 5

Supported Service Types

Noted. Many value added PSTN services are not mentioned as being supported over the integrated ATA. Services such as distinctive ring, call conferencing, long distance signal and do not disturb were not mentioned. Likewise transparent support for G3 fax and/or modem connectivity is not mentioned. Are these subsequently excluded/unsupported? Also, will transparent continuity of ADSL services be supported over the integrated POTS port?

Section 6

Service Addressing

6.1 VLAN Addressing Scheme

Noted.The text "The NFAS service uses the inner IEEE802.1ad C-TAG VID field to address an individual access VC. This C-TAG is visible at the NNI, and **may be passed across the UNI boundary**..." implies that potential for multi-RSP sharing of a given physical port utilising VLAN tagging may be supported. Is this intended or reserved for future? The concern about limited S-TAG addressing and the potential need for multiple C-TAGs to overcome this limit should in practice be of little consequence. At the levels of dimensioning S-TAGs that would incur the need for additional C-TAGs (roughly 4K), sufficient statistical multiplexing of services should be occurring that ensures efficient Connectivity VC dimensioning and utilisation. Planned support for a CE-VLAN Transparent mode to support business style services is also to be commended. Thus this is merely a technical deployment characteristic of the service which should bear little to no economic impact on service delivery end-to-end (assuming that NBN Co do not unreasonably assign charges on the basis of CVC C-TAGs).

Support for flexible mapping and allocation of S/C-VID tags is commended.

7.1 NFAS Traffic Classes

I understand that this specification is intended to be a simplified model that facilitates introduction of NFAS services and likewise is intended to support future expansion into a range of differentiated services. However, currently this specification fails to inspire any confidence that NBN Co have a clear understanding of how to support differentiated traffic classes in a wholesale context, nor that there is a clear roadmap on how NBN Co intends to introduce such future differentiated services in a manner that also supports a healthy and competitive marketplace. Whilst the specification of traffic class TC_1 is arguably passable[1], the specification of TC_4 is market unacceptable--and my expert recommendation is for the community and the Government to insist that NBN Co address this failing as soon as possible.

The lack of a specification of the notional "dimensioned CIR" for TC_4, some level of performance guarantee beyond just "none" for TC_4 or the preferred definition of an independently priced CIR and PIR option for TC_4 means the following:

- wholesale customers of NBN Co (the RSPs) are forced to make unwarranted and most likely invalid assumptions about how NBN Co intend to support and dimension for such services end-to-end;
- it complicates the performance expectations that NBN Co may inadvertently establish for TC_4 that may later become invalidated as end-users take-up or utilise services;
- it forces market players and their end-users to up-purchase to a super-premium service which may over-perform as the only other option available is unsuitable due to the unpredictability of its performance characteristics (under-perform);

This represents typical monopolistic abuse of market power by directly impacting the flexibility of market competitors and their ability to innovate without reasonable justification.

This also represents a classic misunderstanding of the abstract causes of potential performance differentiation within any carrier packet delivery network. Primarily these are twofold, first is the specification of the scheduler hierarchy and its ability to support priority and weighted fair schedulers, coupled with second being support for excess burst traffic handling within a shared queuing structure. The situation is further even more complex as it also requires an analysis of instantaneous (fractal and/or phase clumping effects) burst traffic handling versus sustained (busy-period) congested traffic handling. These concepts require not just a class of traffic specification but also a relative dimensioning specification between the PIR and CIR of a class which directly implies the necessity for support of excess packet marking. This is NOTICEABLY ABSENT from the NBN Co specification and by implication NBN Co's understanding. I refer you to my original paper[2] which pioneered this material and also explains why it is crucial for numerous reasons[3] that the monopoly incumbent carrier support the traffic class abstractions in this manner.

As I detailed in my submission[4] to the Senate Select Committee for the National Broadband Network earlier this year:

"I understand that there is a focus within NBN Co on identifying a single solution and then implementing that. I also suspect that the internal defence is most likely something along the lines of 'we can always come along later and add something if we have too, this is just the starting point'. That doesn't work in this case. This is the early design and architecture phase. This is where if mistakes are made, they are really expensive or even impossible to correct once deployment and operation has begun. In particular, once vendor selection has occurred, once a declared service submission is approved by the ACCC and once legislation policies have been passed, it will be very hard to correct any mistakes. For so many reasons, this is not the appropriate time nor the place to begin to compromise the future telecommunications access regime of Australia for the next half

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[1]And it is only really arguable under the assumption that the equipment chosen to support the active Ethernet services is capable of supporting multiple concurrent priority queue schedulers in parallel with multiple concurrent weighted fair queue schedulers and even then still represents sub-optimal end-to-end performance characteristics.

[2]http://www.aph.gov.au/senate/committee/broadband_ctte/submissions_from_march_2010/sub_139a.pdf

[3]In the case of NBN Co it is to support optimal output efficiency (read, profitable industry and sustainable NBN Co) and consumer welfare (read, Government delivery of promise of affordable broadband for all Citizens).

[4]http://www.aph.gov.au/senate/committee/broadband_ctte/submissions_from_march_2010/sub_139.pdf

century. Forcing a 'one size fits all' approach will both hamper and constrain the intended innovation and competition objectives. The simple message here is DO NOT LIMIT choice. There is no need to force the 'one size fits all' paradigm, as all that is going to do is appeal to the existing large and highly integrated players. Everyone is much better served by adopting a multi-size, multi-colour model, that is designed to address and appeal to all players in the market (both existing and new). Then natural market dynamics will kick in and take effect to the benefit of all users. If we maximise choice and maximise flexibility within the constraints of costs, then we ensure a healthy, vibrant, innovative and competitive market place. This ensures the best outcome possible."

Lastly, and this is nitpicking, whilst an attempt is made to "specify" that services be ordered by CIR for TC_1 and PIR for TC_4, no actual "specification" is made for how to measure, report and verify said xIR beyond the table in Appendix C. This specification is missing details such as: What are the parameters for instantaneous burst rate versus sustained rate and over what time intervals and sampling methodology? What are the parameters for handling multi-service phasing or clumping? What is the Ethernet packet equivalent specification of ATM's CDVT? In short, this is nice layman's summary of the service specification but it is missing detailed technical parameters that are needed for real services to be deployed, activated and most importantly assured. Basically, it lacks specification maturity.

7.8/9 Priority Code Point Decoding/DSCP Mapping

Noted and agreed, abstract mapping of Traffic Class concepts to/from Ethernet CoS and IP DSCP is commended.

Section 8 — Service Components

Noted. Please note comments from the summary sections 4 thru 7 are not repeated here in the detail section but still apply.

Commend support for flexible service tag and priority mappings.
Recommend a specification of maximum DSCP to CoS map entries per service.
Commend support for 2000byte MTU framesizes.
Commend consideration but would have preferred greater detail around future IPv6 support.
Recommend a specification of the maximum number of "dial-plan" entries for SIP services.
Commend the use of unambiguous industry standard specifications (IETF RFCs) for SIP based services.
Commend the support for DHCP Option 82 and PPPoE Intermediate Agent support.
Commend the offering of diversity options in addition to resiliency options.
Concerned at the lack of support for IEEE802.3ah transparency across the NFAS service, expect that equivalent high performance assurance interfaces will be delivered via SOA platform.

Section 9 — Service Management

Noted. Clearly this is still high level as it lacks detailed specification of the SOA interfaces.

Mention is made of B2B system avoidance of duplicate entries but no details are provided on the mechanisms by which this is to be achieved and corresponding requirements placed upon the Access Seeker systems to support this.

Noted.

Noted.