



Communications Alliance:
Building the Australian NBN
Together

Dr Paul Brooks July 2010

Communications Alliance 

Unified voice representing telecommunications industry in Australia

<p>Membership</p> <ul style="list-style-type: none">• Carriers• service providers• equipment suppliers• Consultants• experts		<p>Self-Regulation</p> <ul style="list-style-type: none">• Codes of Conduct• technical standards• operational interworking• advice to policy and regulators• Responsible Consumer Protection
---	---	---

NOT government, NOT NBN Co Ltd
(NBNCos are members)

Australian NBN



Australian Government



Australian Government initiative – April 2009

FTTP to 93% of all homes, schools, workplaces
(Wireless/Satellite to remote 7%)

Fibre Broadband 100Mbps
Wireless/Satellite up to 12 Mbps

...built in 8 years
(~5,000 connections per day)

Australian NBN (cont)



<\$49Billion estimated cost



Expected to be commercial utility
(making small profits...eventually)



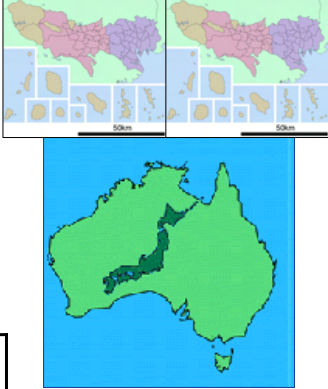
Wholesale-only – not permitted to sell directly to end users

Scale of NBN is challenging!

~2 x Population of Tokyo Prefecture (22 million)

~20.1 x Area of Japan (7.62 million km²)

	27mil	378k km ²	337 /km ²
	22mil	7,618k km ²	2.8 /km ²



Very expensive *per-user!* Economics to be profitable is a challenge...

NBN Project Structure

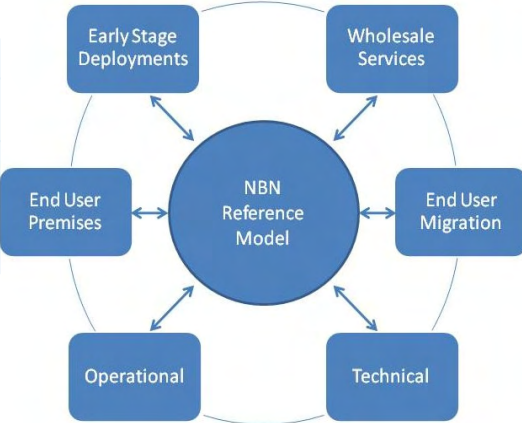
Commenced August 2009
To build agreement on requirements for NBN services from customers
To assist NBN Co in delivering the NBN
To accelerate the development and rollout of NBN services

April 2010:

December 2009:

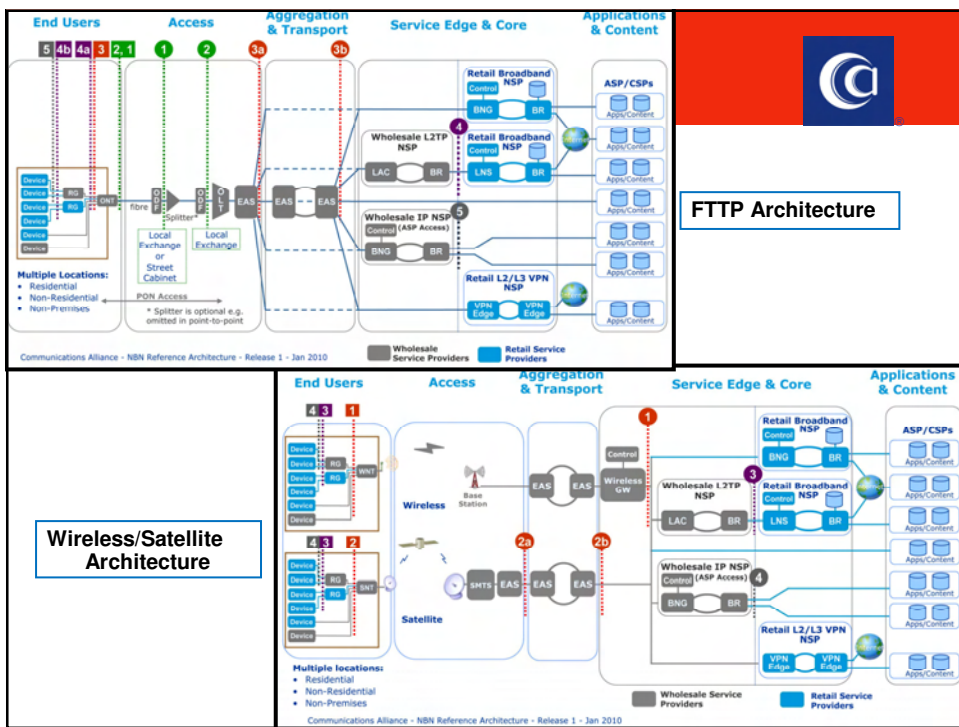
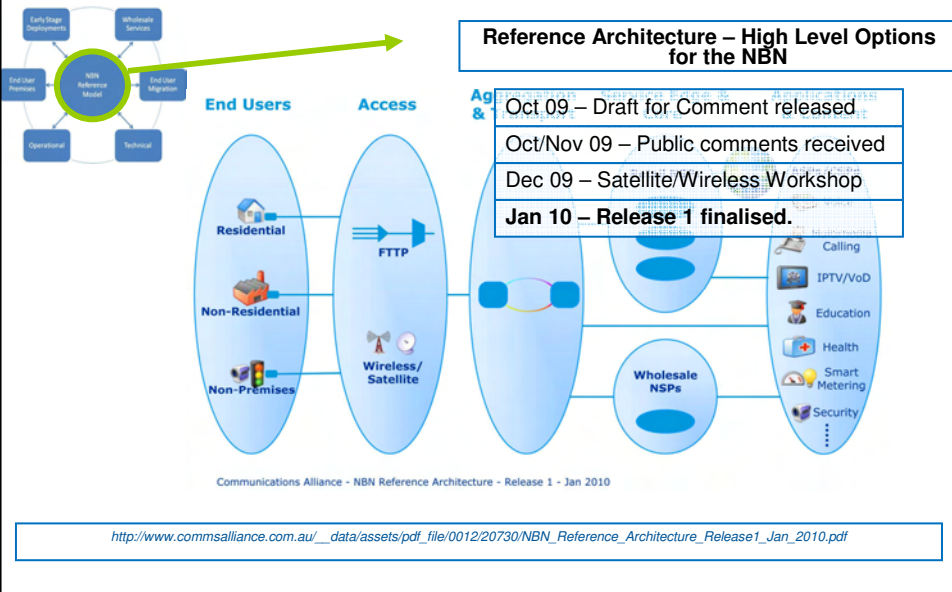
145+ 129 people

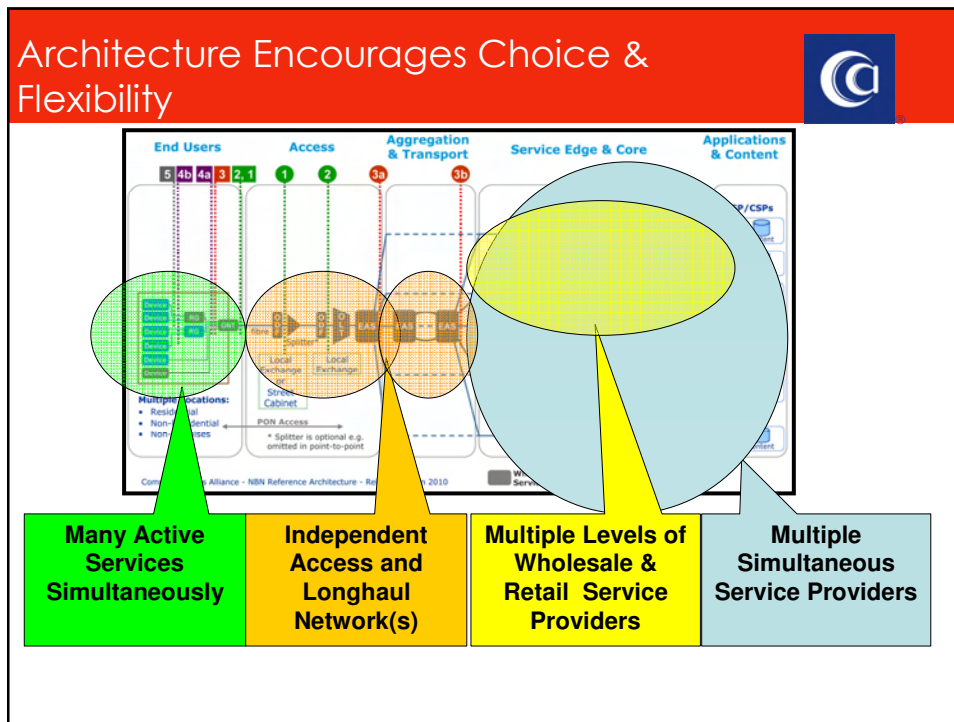
61+ 53 organisations



Seven NBN related topics

NBN Project Deliverable 1





Future Proofed Infrastructure

Initial NBN: GPON – 2500 Mbps↓ / 1250↑ Mbps shared amongst up to 32 locations	
10GPON ratified: 10 Gbps ↓ / 5 Gbps ↑ shared amongst up to 32 locations	4x
WDM-PON Operating, non-standard (Nortel+LG): 10Gbps bidirectional per user	32x
Last month IEEE 802.3 ratified 40Gbps and 100 Gbps Ethernet interfaces	4 - 10x

Over next 10-15 years a well understood path to increase fibre capacity by 500x – 1000x – using initial optical fibre cables

Wholesale Services

Wholesale Service Definition Framework - Ethernet

Nov 09 – Draft for Comment released
Nov/Dec 09 – Public comments received
Dec 09 – Release 1 finalised.

Broadband Access Provider

http://www.commsalliance.com.au/_data/assets/pdf_file/0016/20725/NBN-Wholesale-Service-Definition-Framework-Ethernet-Release1-Dec-2009.pdf

Layered Relationships

Retail

Wholesale

Application & Content Services

- Web Applications & Content
- Voice Services
- Video Services

Retail Service Provider

• RG Authentication
• IP Addressing
• Service QoS & Bandwidth Control

• Ethernet Connectivity Service
• OLT Management
• Access QoS & Bandwidth Control

• Wholesale IP Control
• Wholesale L2TP


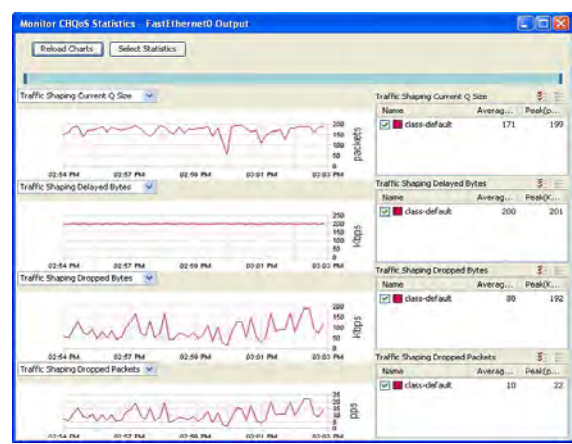
Layer 3 IP

Layer 2

Layer 1 Passive Optical Infrastructure

Communications Alliance - DRAFT NBN Reference Architecture - Oct 2009

Wholesale Service - Not just about speed

- Latency
- Traffic Shaping
- QoS queuing
- Encryption
- IPv6, MPLS, more
- Data, Voice, Video

“Business grade” QoS queuing – to SOHOs and residences

Left Undefined for future study, comment, NBNCo/Access Network discretion

- Numbers and characteristics of bandwidth profiles
- Performance Metrics/Service Level Agreements (latency limit, frame-loss limit, etc)
- Number of QoS profiles that should be supported (minimum 2? 3? 4?more ?)
- Location of Pols

Option	Committed Information Rate (CIR)	Excess Information Rate (EIR)	Committed Burst Size (CBS)	Excess Burst Size (EBS)
Metric	Kbps	Kbps	Bytes	Bytes
1				
...				
N				

Class of Service Designation	Frame Delay (one-way, mean)	Frame Delay Variation (one-way)	Frame Loss Ratio
Metric	Milliseconds	Milliseconds	%
1 Bandwidth Profile A			

End Users See...



- Ethernet Wallplate
 - 4+ independent sockets?
- Transparent link to their (multiple) SP of choice
- QoS-enabled – 802.1p/Q
- VLAN capable



This may be more challenging for a wireless network than within the fibre footprint


Service Providers See...

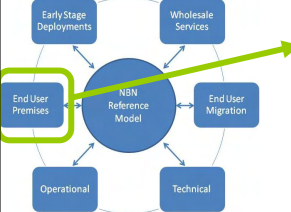


- Thousands of users aggregated per fibre POI interconnect – GigE, 10GigE
- Each end-user connection on 1:1 dedicated VLAN
- Connection identified by S-TAG/C-TAG (different from current DSL scheme using PPPoE/L2TP)
- Independent of user's MAC address, Protected against MAC spoofing



End User Premises group End User Premises Handbook





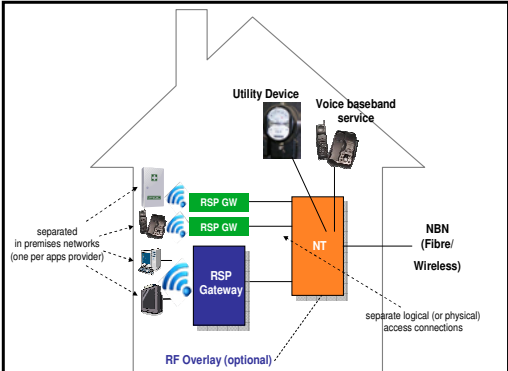
Premises Installation Practices, Cabling, Technologies

Mar 2010 – Release 1 - Handbook


3 May 2010 – Draft for Comment – Release 2

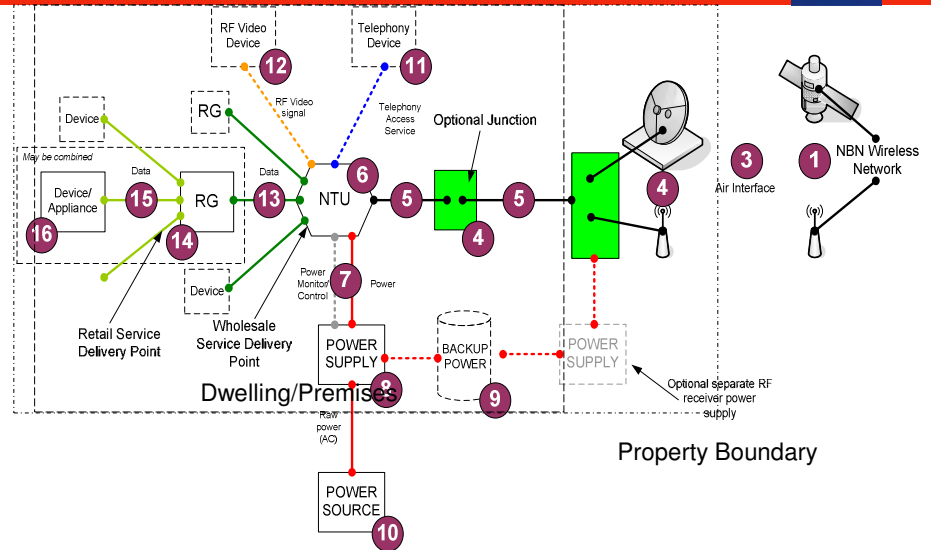
2 July 2010 – Release 2 – Handbook

- Architecture Overview
- Architecture Components
- Architecture – Wireless/Satellite
- Distribution Technologies
- Installation Practices
- Testing & Diagnostics
- Sustainability
- Robustness
- Security
- Battery Backup & UPS
- Future Proofing
- Industry Codes & Practices



End User – Functional Model





Property Boundary

http://www.commsalliance.com.au/data/assets/pdf_file/0008/23957/NBN-End-User-Premises-Handbook--Release-2-Jun10.pdf


End User Premises




- Models for:
 - Single Premises/Locations
 - MDU w/ multiple OLTs
 - MDU w/ shared OLTs
- Leverages Broadband Forum TR-101, TR-156, TR-94
- Installation Options
- Distribution technologies
- Testing Practices


Technical and Optical Standards NBN Project Deliverable 4&5








Overview of Technical Standards	
Feb 2010	Draft for Comment – Technical Standards
Mar 2010	Release 1 – Technical Standards
June 2010	Release 1 – Optical Access



 World Class Standards



 OPTICAL INTERNETWORKING FORUM






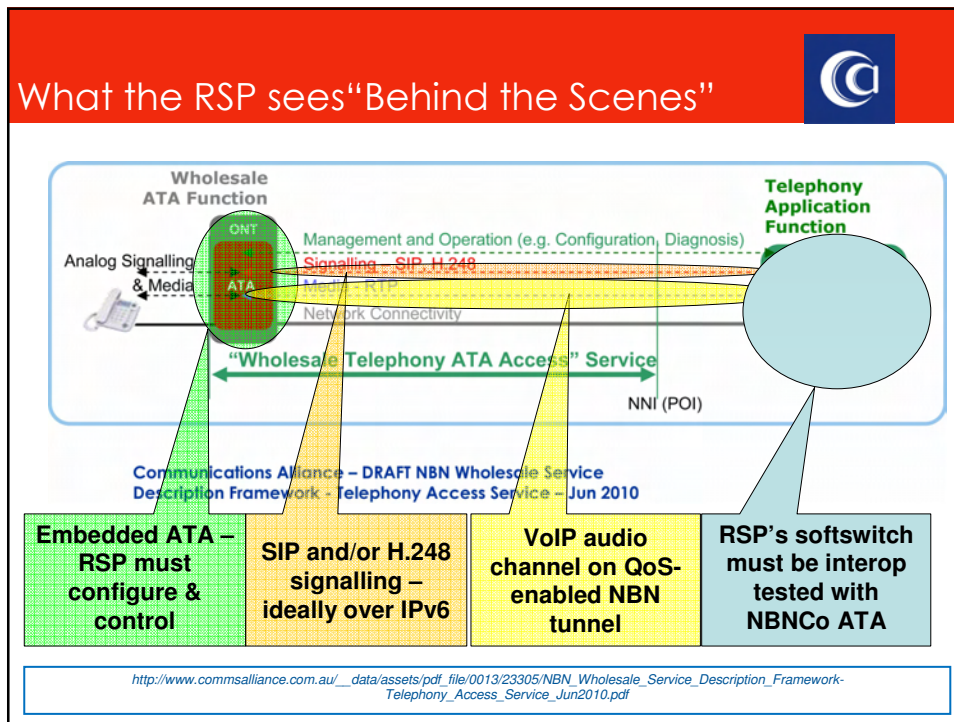








http://www.commsalliance.com.au/_data/assets/pdf_file/0010/22312/NBN-Technical-Standards-Release1-Apr-2010.pdf
http://www.commsalliance.com.au/_data/assets/pdf_file/0010/23410/NBN_Optical_Access_Release1_Jun10.pdf

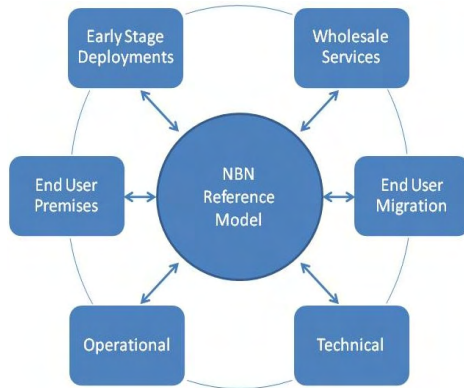


Early Stage Deployments "Greenfields" Construction Standards

- Express Conduit
- Distribution Conduit
- "pit and pipe"
- Developer and Approval authority checklists

Express Conduit Guidelines
Distribution Conduit Guidelines
Apr 2010 – Draft for Public Comment
May 2010 – Release 1 Completed

http://www.commsalliance.com.au/_data/assets/pdf_file/0015/23262/NBN_FTP_Planning_Express_Conduit_Release1_May_2010.pdf
http://www.commsalliance.com.au/_data/assets/pdf_file/0016/23263/NBN_Fibre_Ready_Distribution_Networks_Release1_May_2010.pdf



Thankyou

Paul Brooks
Project Lead
pbrooks@layer10.com.au

<http://www.commsalliance.com.au/Activities/national-broadband-network>