From regional ISP to national telco

(and some of the challenges along the way)

Phillip Britt
Managing Director

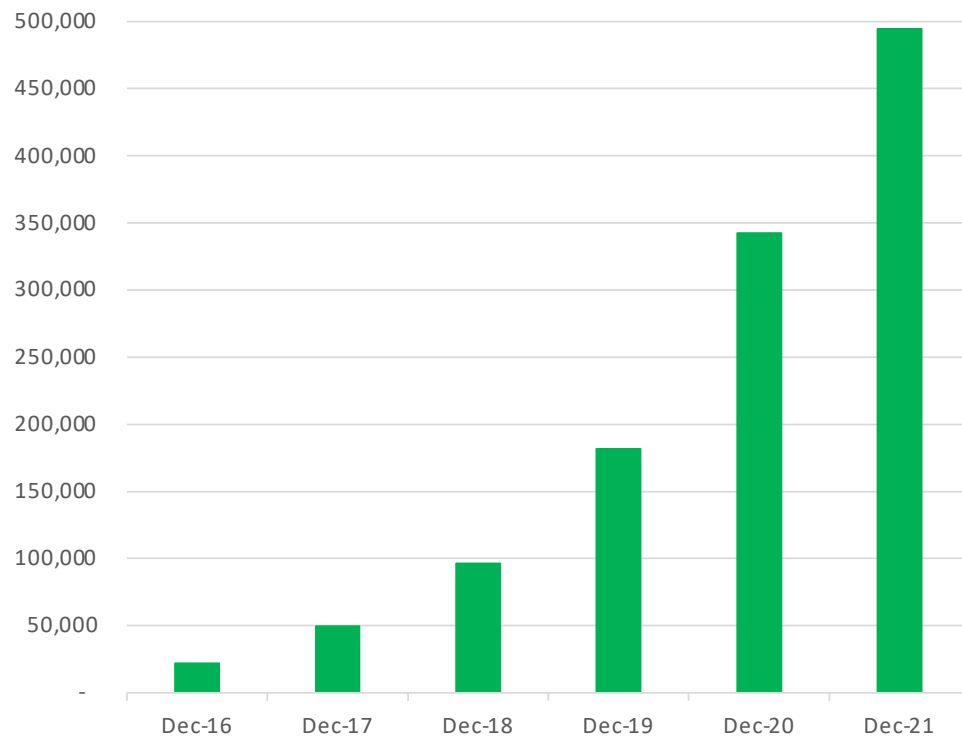Aussie Broadband

Overview

We've been keeping very busy since AusNOG 2019!

1. Sizing up the challenge, where is ABB today

2. Building a 1,200km fibre network in 20 months

3. Building a POI transport network in 5 months

4. Scale through automation

5. Questions

Aussie Broadband

5 years of growth

Aussie Broadband

Active Broadband Services

- Aussie Broadband has grown from 20,000 to over 500,000 broadband services in 5 years.

- Have rebuilt our network 3 times in the last 5 years.

- First provider outside of the big 4 at all 121 POIs.

- By June will have built a 1,200km fibre network and deployed active equipment to all 121 POIs.

- Have grown from 60 to over 1,000 team members.

- Cemented our place as the 5th largest NBN provider and rapidly approaching the 4th.

- Now own a tier 1 voice interconnect network too!
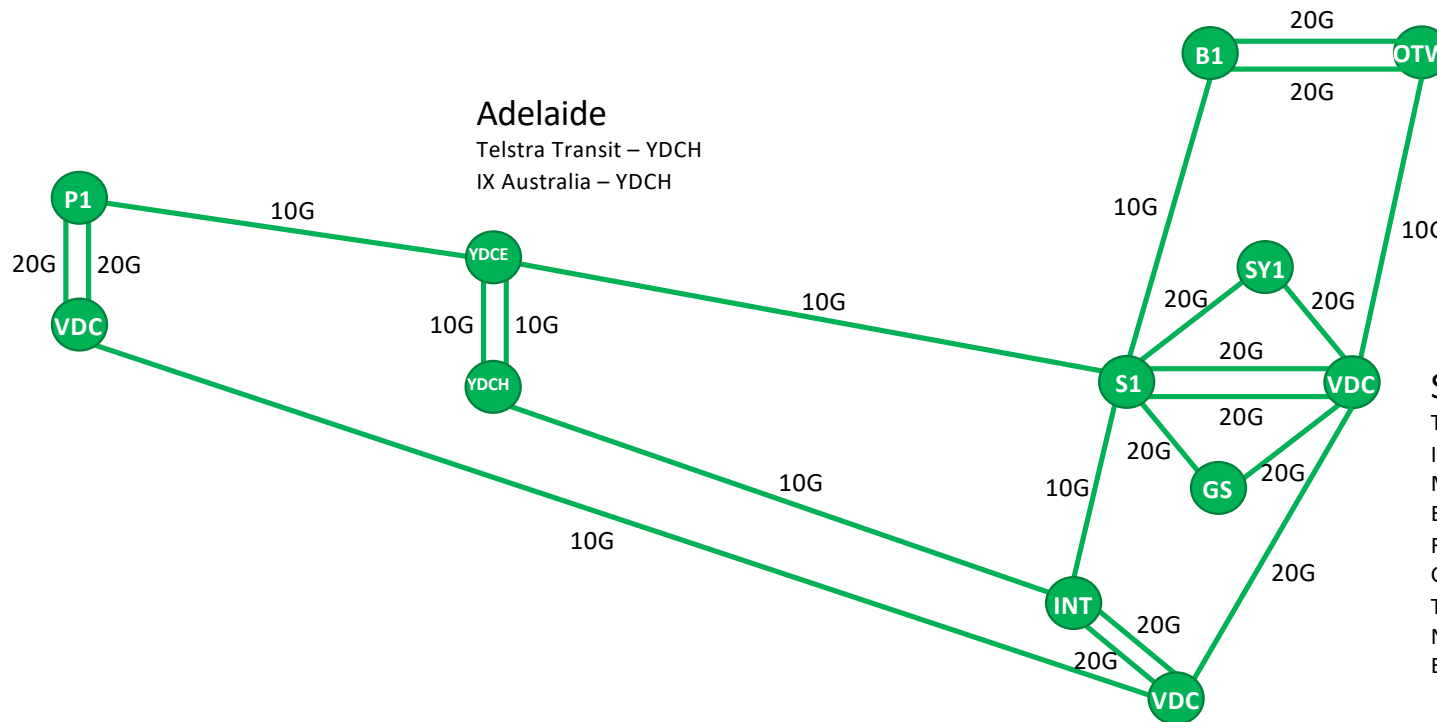
Humble beginnings - AusNOG 2017

Aussie Broadband

Brisbane
Telstra Transit – OTW
IX Australia – OTW
Megaport – OTW

Perth
Telstra Transit – VDC
IX Australia – VDC

Adelaide
Telstra Transit – YDCH
IX Australia – YDCH

Sydney
Telstra Transit – VDC
IX Australia – VDC
Megaport – VDC
Equinix Exchange – SY1

OTW — Brisbane
SY1 — 10G
10G
VDC — Sydney
10G
10G
YDCH
10G
1G
INT
10G
10G
VDC
10G

Melbourne
Telstra Transit – INT, VDC
IX Australia – VDC
Megaport – INT
Google Cache – VDC
Akamai Cache – VDC

AS4764
INT – Interactive, VDC – Vocus DCs, YDCH – Your DC Hawthorn, OTW – Over the Wire, SY1 – Equinix SY1

AusNOG 2018

Aussie Broadband

Brisbane
Telstra Transit – OTW
IX Australia – OTW, B1
Megaport – OTW, B1

Adelaide
Telstra Transit – YDCH
IX Australia – YDCH

Perth
Telstra Transit – VDC
IX Australia – VDC, P1
Megaport – VDC, P1

B1 —20G— OTW
B1 —20G— OTW

P1 —10G— YDCE
P1 —20G / 20G— VDC

YDCE —10G / 10G— YDCH

YDCE —10G— S1

B1 —10G— S1
OTW —10G— VDC

SY1 —20G— S1
SY1 —20G— VDC
S1 —20G— VDC
S1 —20G— GS
GS —20G— VDC

VDC (Perth) —10G— INT

YDCH —10G— INT

INT —10G— S1
INT —20G— VDC (Melbourne)
INT —20G— VDC (Melbourne)
VDC (Melbourne) —20G— VDC (Sydney)

Sydney
Telstra Transit – VDC, GS
IX Australia - S1, VDC
Megaport – S1, VDC
Equinix Exchange – SY1
Facebook PNI x 2 – SY1
Google PNI x 2 – SY1, GS
Twitch PNI x 2 – SY1
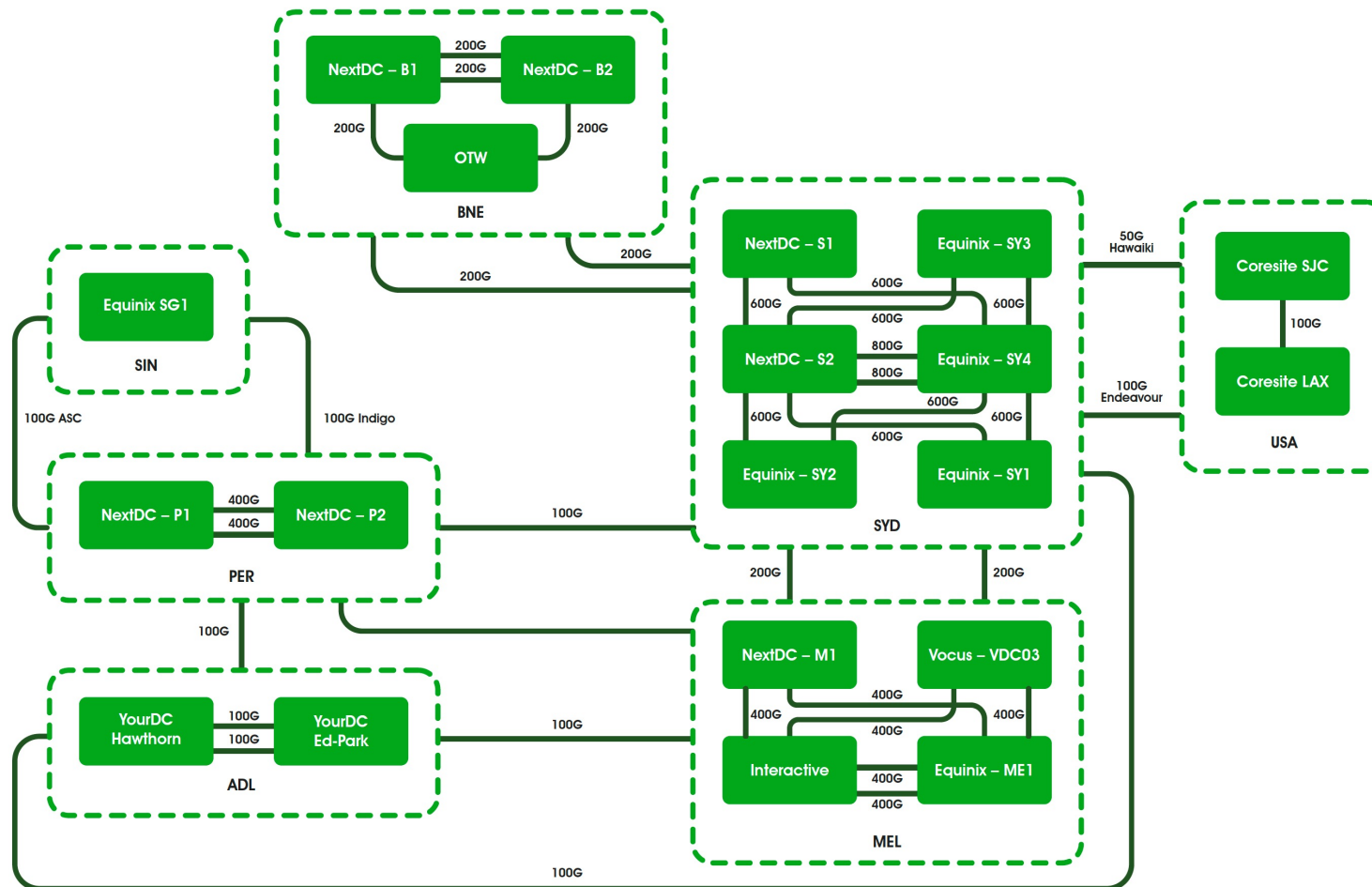Netflix PNI x 2 – SY1
EdgeCast PNI x 2 – SY1

Melbourne
Telstra Transit – INT, VDC
IX Australia x 2 – VDC
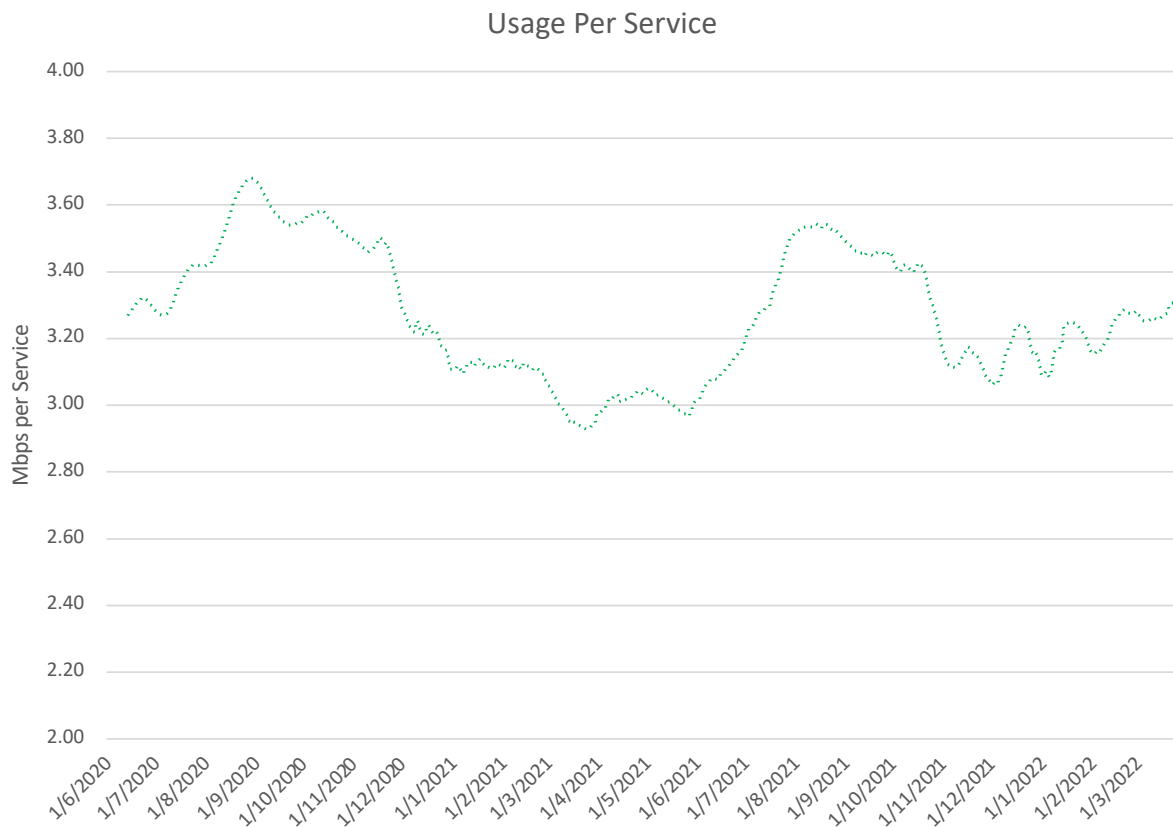Megaport – INT, VDC
Google Cache x 2 – VDC
Akamai Cache – VDC

AS4764

INT – Interactive, VDC – Vocus DCs, YDCH YDCE – Your DC, OTW – Over the Wire, SY1 – Equinix, P1 B1 S1 – NextDC, GS – Global Switch

AusNOG 2019 (JEFF)

Aussie Broadband

Cisco Powered Network using the latest NCS55A1 and ASR9K platforms.

100% fully protected core with path and carrier diversity.

International connectivity and points of presence in the USA and Singapore.

Direct peering links with all major content providers

Connected directly to all 121 NBN points of interconnect (POIs).

AS4764

Core network today

Aussie Broadband

AS4764

BNE
- NextDC – B1 — 200G / 200G — NextDC – B2
- NextDC – B1 — 200G — OTW
- OTW — 200G — NextDC – B2

SIN
- Equinix SG1

PER
- NextDC – P1 — 400G / 400G — NextDC – P2

ADL
- YourDC Hawthorn — 100G / 100G — YourDC Ed-Park

SYD
- NextDC – S1, Equinix – SY3
- NextDC – S2, Equinix – SY4
- Equinix – SY2, Equinix – SY1
- 600G, 600G, 600G, 600G, 800G, 800G, 600G, 600G, 600G

MEL
- NextDC – M1, Vocus – VDC03
- Interactive, Equinix – ME1
- 400G, 400G, 400G, 400G, 400G, 400G

USA
- Coresite SJC — 100G — Coresite LAX

Connections:
- BNE — 200G — SYD
- SYD — 50G Hawaiki — USA
- SYD — 100G Endeavour — USA
- SIN — 100G ASC — PER
- SIN — 100G Indigo — SYD
- PER — 100G — SYD
- PER — 100G — ADL
- ADL — 100G — MEL
- SYD — 200G — MEL
- SYD — 200G — MEL
- ADL — 100G — MEL

Bandwidth per customer

Usage Per Service

- Prior to the first round of lockdowns in March 2020, bandwidth per user was tracking around 2.8 Mbps per service.

- Prior to the pandemic, traffic per service was growing around 20% year on year.

- Per user traffic levels have fluctuated widely during the various lockdowns but are trending up again since December 2021, even though Australia is no longer in lockdown.

- A 0.2 Mbps per service difference makes 100 Gbps difference to ABB's traffic levels presently.

CVC – spawn of the devil

Insert complaining about CVC here

Aussie
Broadband

To have **<u>full</u>** end to end control of our network wherever it makes commercial sense to do so.

Why did we build?

- Like many others we had tried to purchase dark fibre into POIs and were knocked back by the major carriers, or it came with conditions.

- When we ran the numbers based on continuing to purchase wavelength services, there was a tipping point where it made commercial sense to build.

- Forecasting customer growth and utilisation per customer was becoming harder as connection growth outstripped even our own expectations.

- "Diverse" links provided by other carriers on multiple occasions were not diverse.

- Equipment failure (power or optics) on carrier wavelength equipment was a regular occurrence.

- We wanted end to end visibility of the service and not needing to rely on other carriers for fault restorations.

- Improved margins through lower backhaul costs to the POIs was an added bonus.

- The network would also provide the ability to directly connect business services to our own fibre at significantly improved margin.

Key early lessons (Port Melbourne)

- Be strict on your contractors – have clear expectations, fully documented in writing and key terms on the purchase order.

- Know what a fair price is, contractors will take the piss if they sense someone is inexperienced.

- Shop around and beware contractors that bad mouth other contractors.

- Be in the field often and continuously inspect work.

- Ensure where new duct is installed that its well documented, at the correct depths, especially for drill shots.

- It's going to cost a lot more than you think.

Melbourne
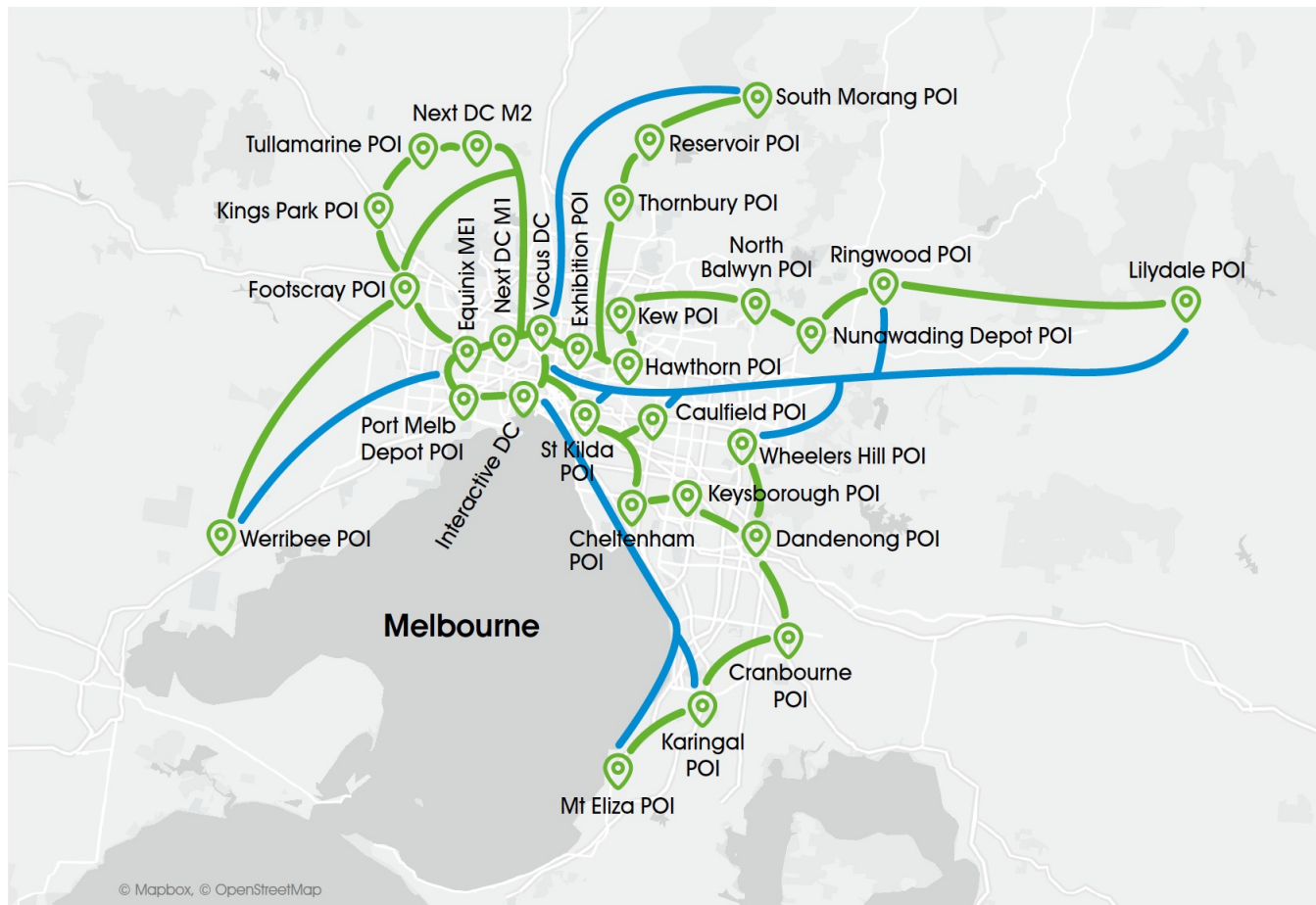
Stats:

- 5 Data centres, and 24 of 30 NBN POIs connected to ABB owned or leased fibre.

- 331km of ABB owned fibre.

Legend

— ABB owned fibre
— Leased fibre

Sydney & Canberra

© Mapbox, © OpenStreetMap
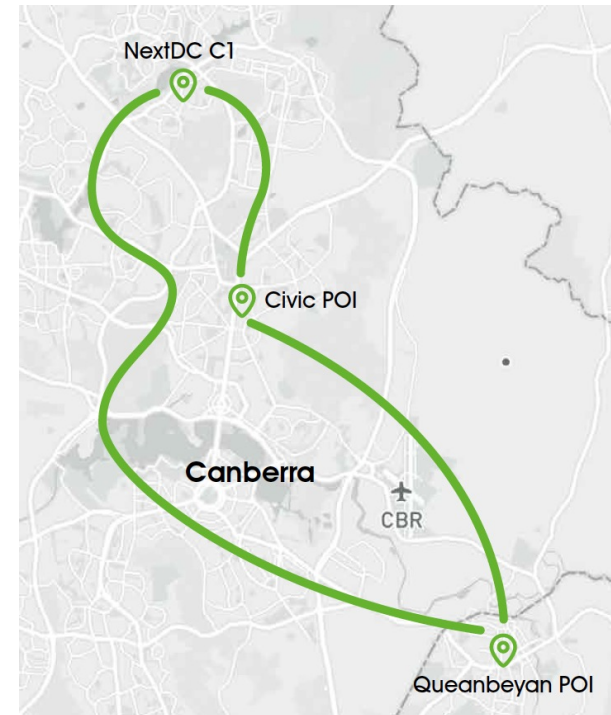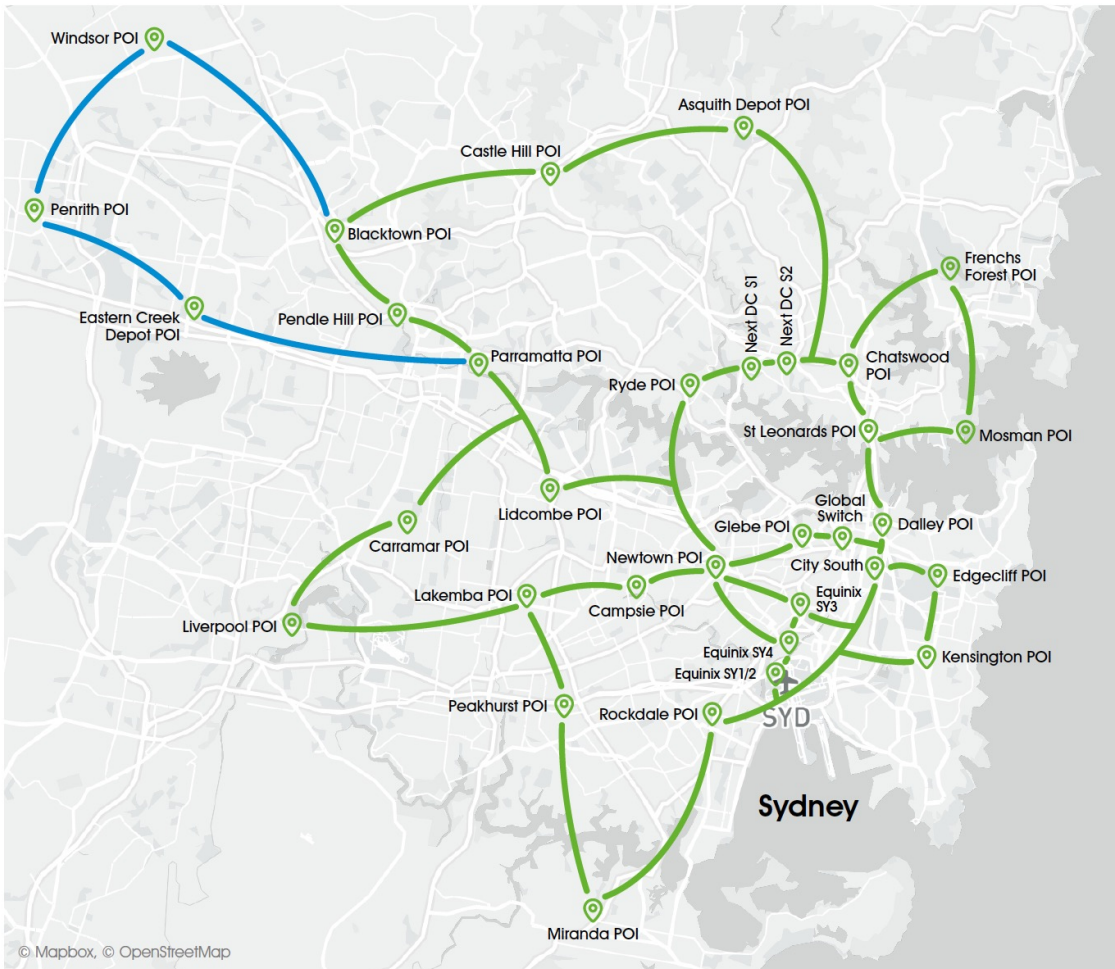
Stats:

- 7 Data centres, and 28 of 43 NBN POIs connected to ABB owned or leased fibre.
- 311km of ABB owned fibre.

Brisbane & Gold Coast

Aussie Broadband

Map of Brisbane & Gold Coast showing POIs including: Petrie POI, Aspley Depot POI, Aspley POI, Next DC B2, Over The Wire, Next DC B1, Woolloongabba POI, Bundamba POI, Ipswitch POI, Goodna POI, Acacia Ridge Depot POI, Camp Hill POI, Eight mile POI, Stacks Creek POI, Polaris DC, Nerang POI, Southport POI, Merrimac POI. Brisbane.

© Mapbox, © OpenStreetMap
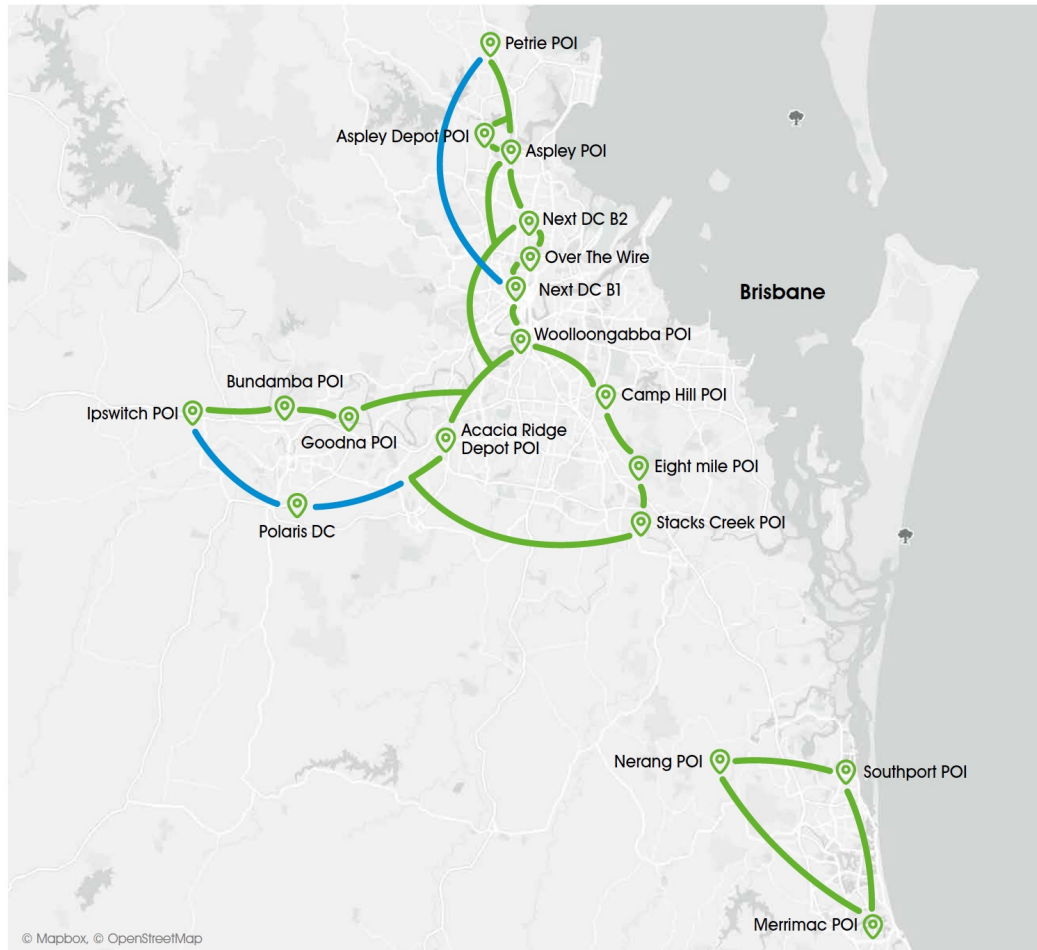
Stats:

- 4 Data centres, and 14 of 22 NBN POIs connected to ABB owned, IRU or leased fibre.

- 236km of ABB owned fibre.

Legend

— ABB owned fibre
— IRU and leased fibre

Perth & Adelaide

Aussie Broadband
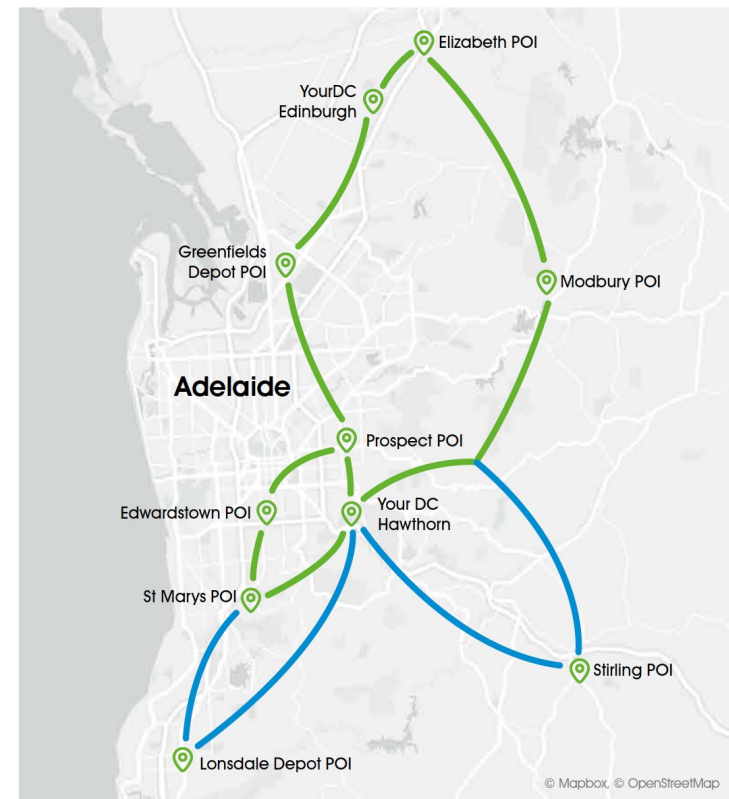
Legend

— ABB owned fibre
— Leased fibre

Stats:

- 5 Data centres, and 19 of 23 NBN POIs connected to ABB owned or leased fibre.

- 348km of ABB owned fibre.

Getting the team right has been critical to the success of this project!

- An awesome manager who previously worked for NBN, Vocus, and Digital River.

- Lead fibre designer – no prior fibre experience but qualified in Geospatial Sciences and super smart.

- Fibre designer – had fibre construction experience.

- 4 x Core Network Project Managers – previous big 4 carrier experience.

- 2 x Customer connections project managers – previous big 4 carrier experience

- 2 x GIS specialists.

- 1 x Customer connections SQ & designer.

- 1 x Administration Officer (LAANs, PO's, cost tracking).

What we did well

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- Built a separate core and access network from the start so that we don't need to touch the core network very often, which leads to less faults & risks from splicing (we only do tube splicing in the core).

- Established a good relationship with the Telstra InfraCo duct team up front to understand the ground rules and to ensure we built to their standards.

- Engaged splicers early for their professional opinion on the best way to build the joints rather than just looking at it from a desktop perspective.

- Laid up all of the fibres into the trays from the start so you're not dragging up tubes from storage later on (creates way neater joints, takes more time).

- Restricted splicing to a single company in each state so that we could hold them to account on joint quality and faults.

- Hired an experienced manager that had worked in other carriers including Vocus & NBN.

- Hired experienced project managers from other carriers that had built similar dark fibre networks.

- Spent nearly a year designing the vision and building solid financial models to support the business case – then raised the necessary funds through IPO onto the ASX.

- Overall project will be delivered on time and on budget (~$50m spent over the 2 year project).

Cable diversity

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NBN POI

NBN ODF #1

NBN ODF #2

Primary Lead-in Cable

Diverse Lead-in Cable

Secondary Lead-in Cable

Aussie Pit/Joint

Aussie Pit/Joint
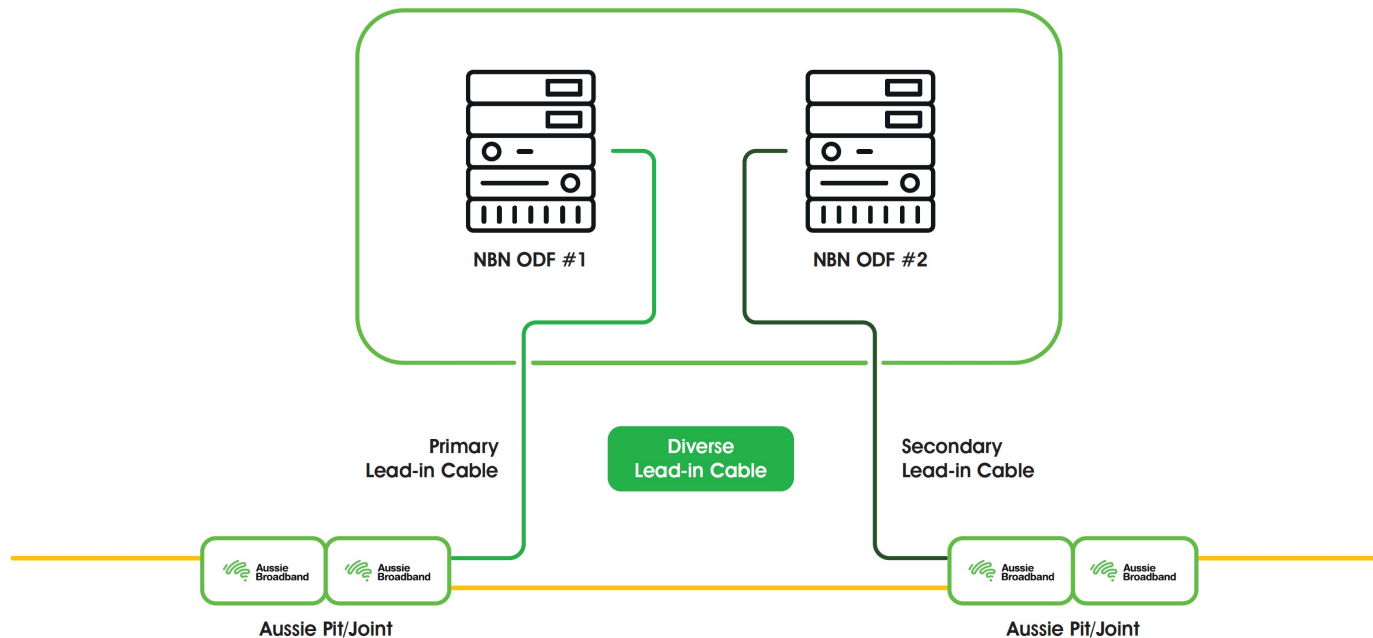
- Cable diversity was key to the design from the beginning, rather than an afterthought. We've been super strict on this.

- The whole network was desktop designed and verified against Telstra ADR before putting a shovel in the ground to ensure (as best you can) the route would be available.

- The network has been specifically designed around POI and data centre diversity. Most other carriers' cables were built before the POIs came into existence.

GIS – knowing where your stuff is

Aussie Broadband
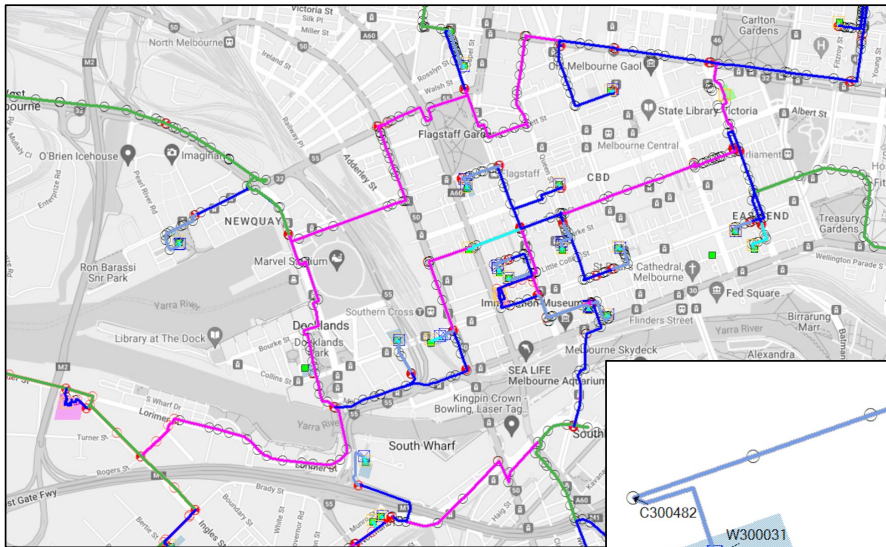
- Initially started with a cloud-based GIS platform but performance issues after 12 months triggered a rethink.

- Have recently implemented Connect Master (on prem) which is performing well.
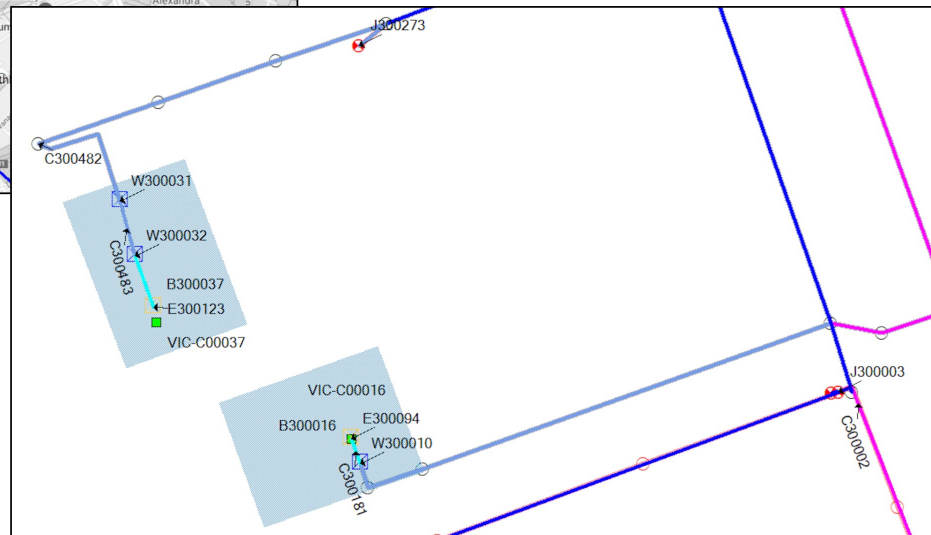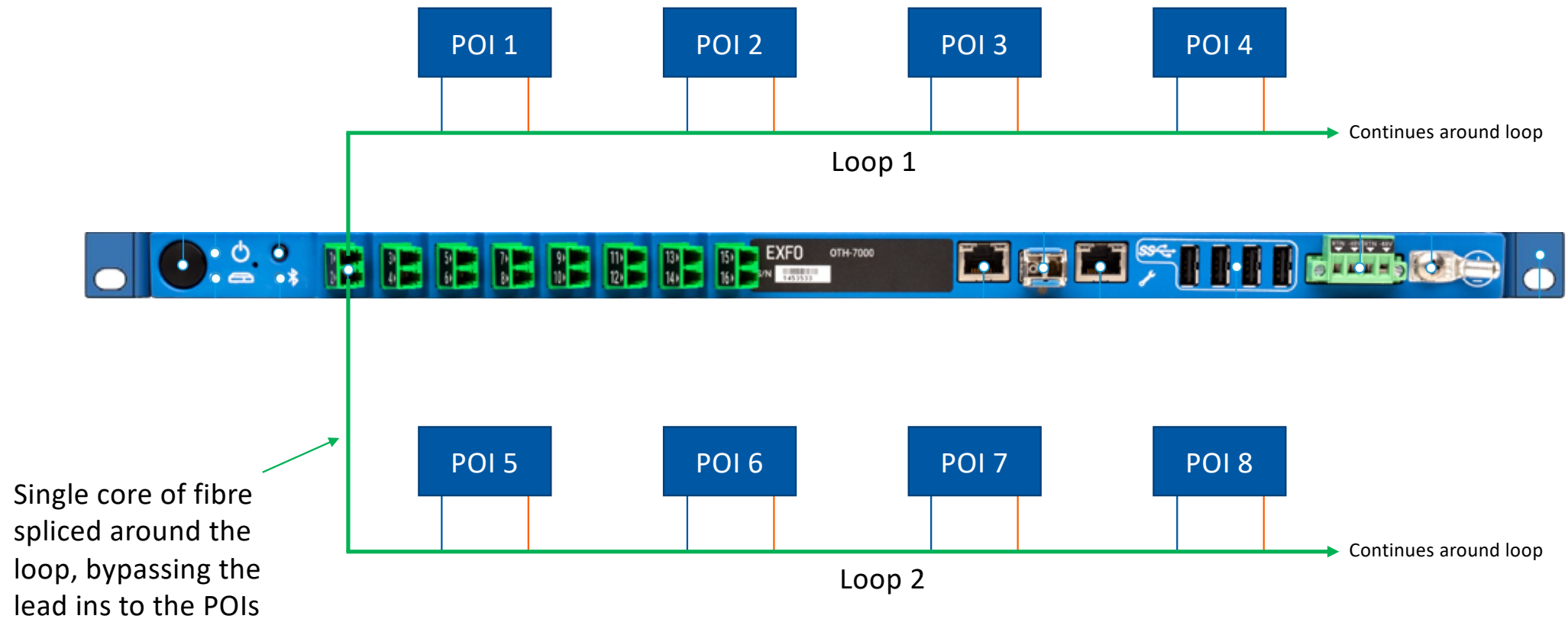

- GIS is linked with alarm systems to enable quick location of faults.

- GIS contains all splicing information and can do tray-to-tray visual path tracing and issuing of splicing plans to contractors.

Fault monitoring

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- We connect one test fibre per loop to an Exfo OTH-7000 which is an OTDR and iOLM test platform.

- The fibre management system (FMS) schedules an initial baseline test recording the characteristics of the fibre cable noting joints etc.

- The next test compares the new trace to the baseline and identifies deviations between the two traces.

- If any deviation threshold is exceeded, eg a fibre break or pressure point, it immediately alerts our Network Security Operations Centre (NSOC) management system.

- Network engineers access the FMS to determine the exact location of a fault on the integrated GIS map. This enables the dispatch of repair crews without the need to first go to a central location to conduct OTDR testing to identify the fault location.

- Tests are run around each loop every 60 seconds, across the entire network.

- We can choose between the OTDR trace or friendlier iOLM measurements for analysis, and export data points to Grafana to correlate with other data sources for enriched analysis.

Loop monitoring

POI 1   POI 2   POI 3   POI 4

Continues around loop

Loop 1

POI 5   POI 6   POI 7   POI 8

Continues around loop

Loop 2

Single core of fibre spliced around the loop, bypassing the lead ins to the POIs

What we didn't do well

- Underestimated the design resources required – very labour intensive and requires the right mindset particularly, with optical route and splicing design.

- Had good tracking of purchase orders and job costs but lacked the ability to easily dive into that data, which has taken considerable management time to ensure things were on budget (thankfully they were!).

- Underestimated how much of the Telstra duct network is congested (duct availability and breakout locations).

- General congestion of underground assets (telco, power, gas and other utilities).

- Underestimating the cost of restoration in New South Wales, primarily because the councils stipulate their own reinstatement contractors. One pit could be $20K vs $10K in Melbourne.

- Lack of understanding of Queensland's telecommunications laws, particularly around their TMR road authority.

Congestion (of a different kind)
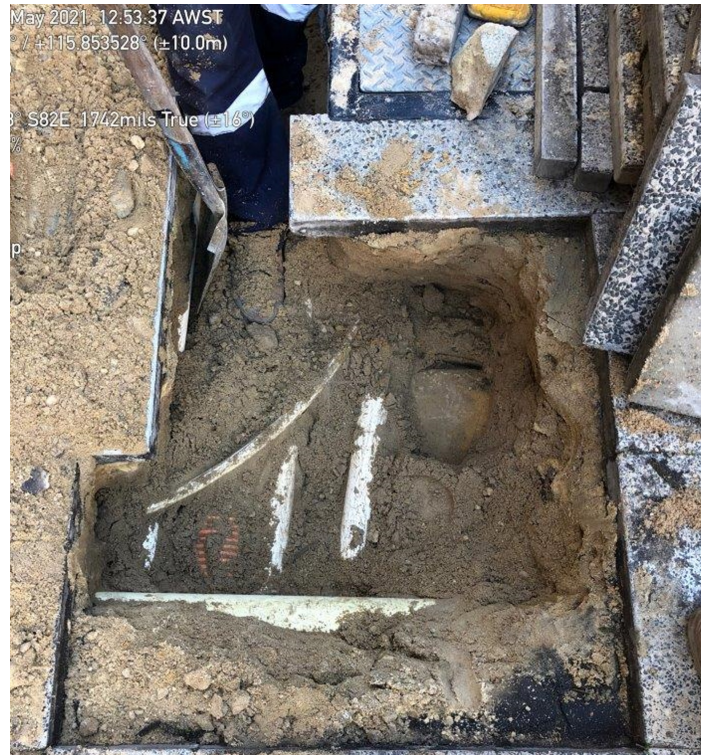
450mm deep???

Difficult conditions

Telstra Manhole inside rail corridor (within 1m of active tracks) requiring special permits and closing the tracks for hauling

Tree roots inside Telstra manhole

Super deep manhole, special works required to work in it
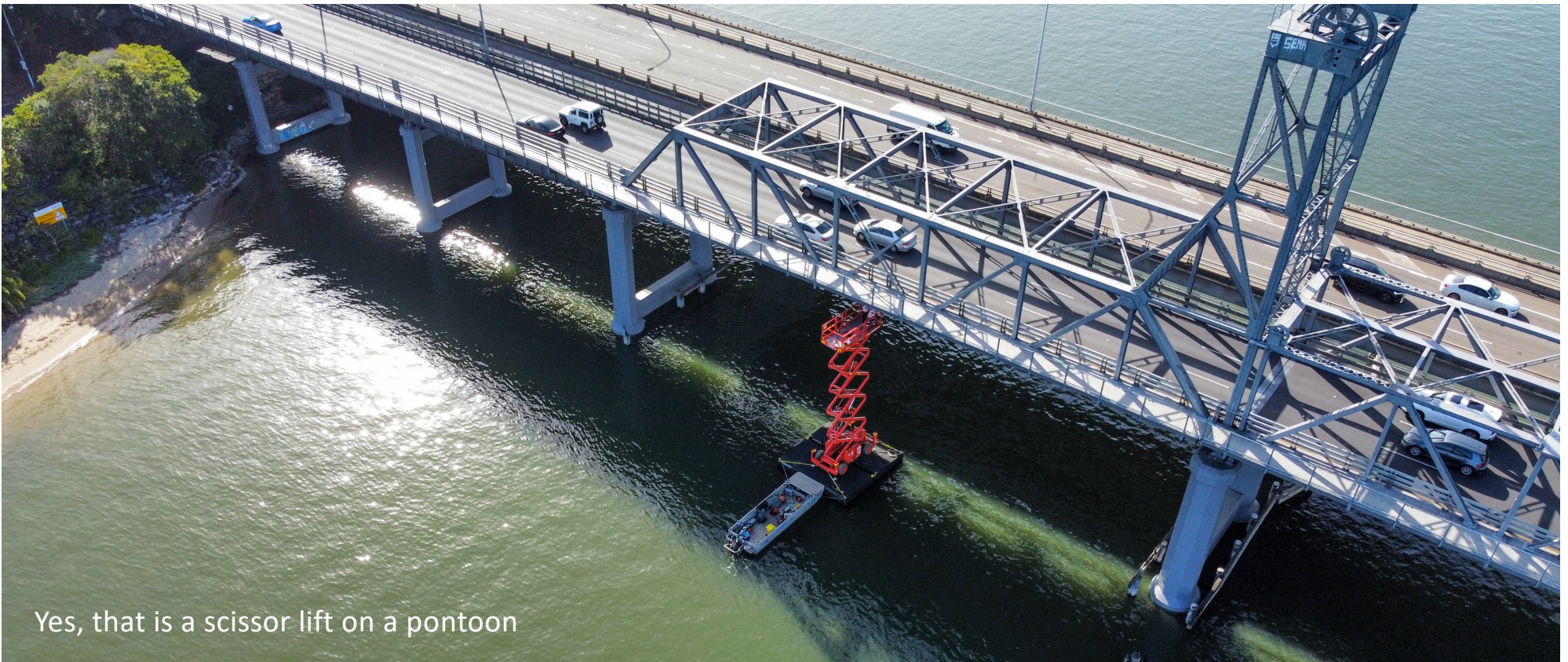
Fixing others' mistakes

Telstra manhole concreted
over by property developer

Aussie needed access to the manhole, so we lifted and aligned it
with the new footpath and re-concreted the area.

Bridge blockage

Yes, that is a scissor lift on a pontoon

Bridge blockage

Duct blockage was preventing hauling 360F cable through the duct. A scissor lift on a pontoon was the only solution due to the way the bridge was constructed.

Summary

If you're going to build a 1,200km fibre network…..

- It will cost more than you think – build a pilot network first in a difficult area so you know how bad it can be. Use those learnings to develop your commercial model.

- Get expert help, ideally in house – that will de-risk the project in the longer term (no stealing my team!)

- Avoid the big integrated "head" contracting firms – you'll wind up paying a lot more.

- Keep up with your documentation, falling behind puts the asset at risk and can cause compliance issues.

- Don't be a cowboy – don't cut corners, ensure you and your contractors do good quality work – reinstatement that your mum would be proud of!

Building a POI transport network

(without DWDM)

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The problem

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Ability to scale quickly was the primary issue!

- Connection growth and average bandwidth per user was outstripping our ability to scale the network, primarily due to the long lead times on new wavelength services.

- Rapid uptake of High CoS Enterprise Ethernet services (NBN EE) was chewing up a lot of NNI capacity, even when they hadn't been delivered yet.

- Couldn't provision more High CoS EE services unless the NNI capacity was available.

- Lack of visibility at the POI between backhaul services and NBN NNI services.

- 100G was becoming affordable from a backhaul perspective but no current need for 100G NNIs.

Solutions considered

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- Active DWDM with ROADM

- Hop by hop with coherent optics and passive DWDM mux

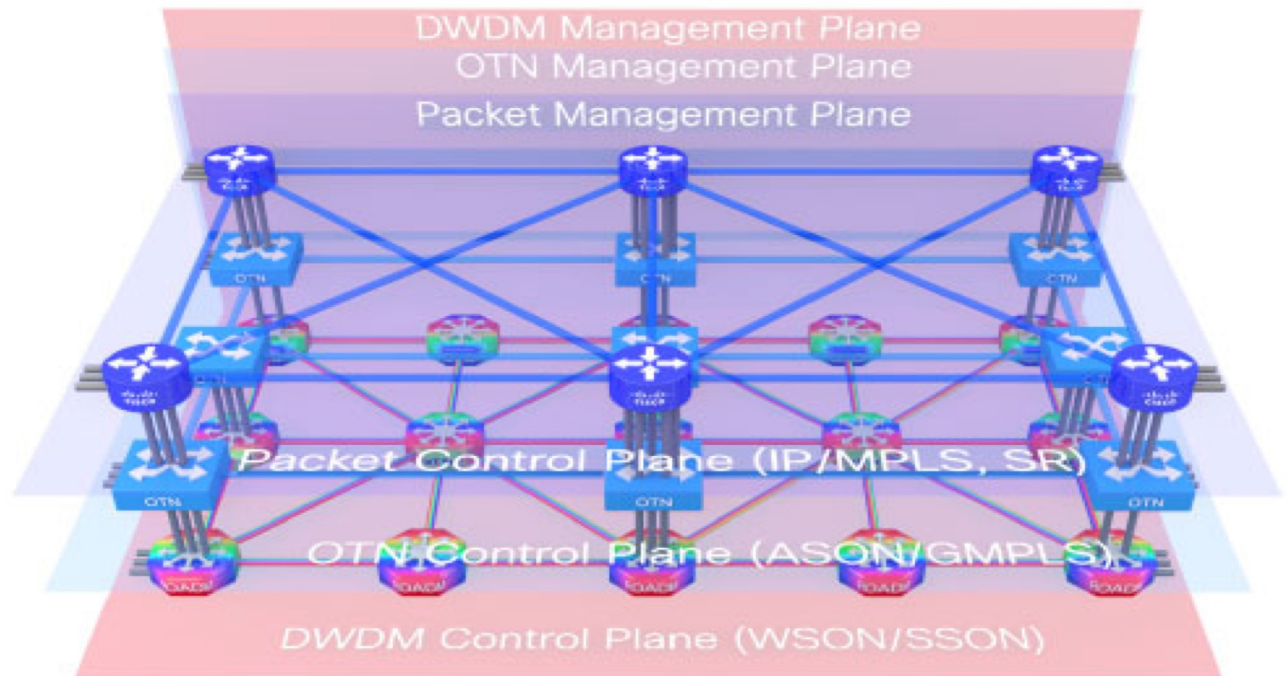- Hop by hop with standard optics (uses more fibres, but significantly lower costs optics)
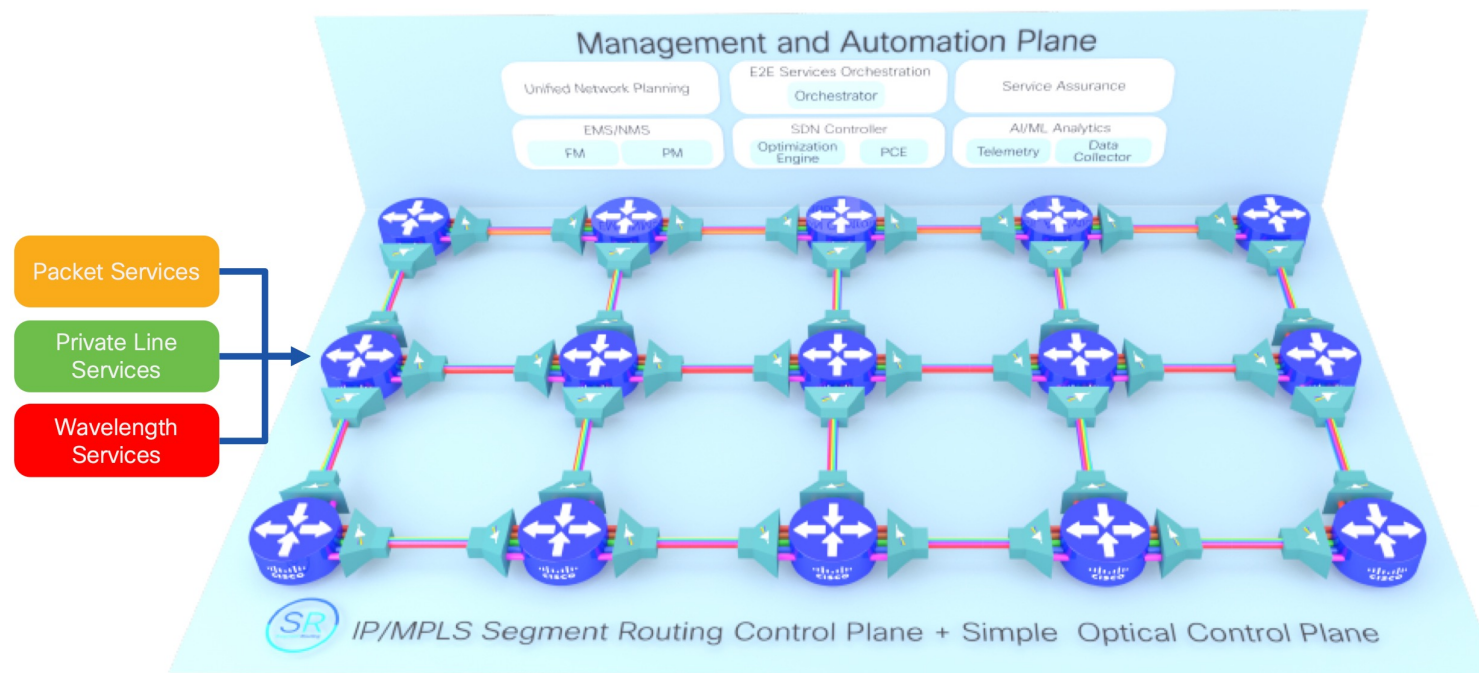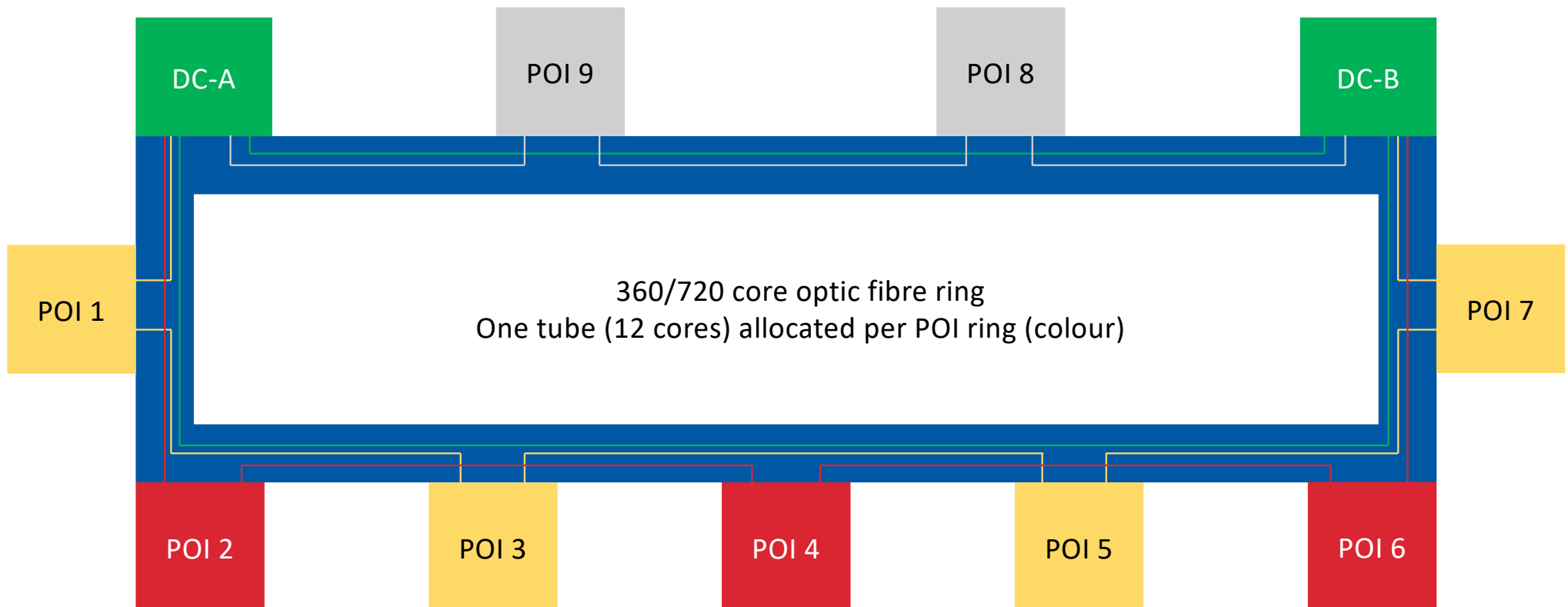

Figure 2 – Traditional Network Architecture

Image credit https://www.cisco.com/c/dam/en/us/products/collateral/optical-networking/white-paper-sp-ip-optimized-optical-transport.pdf

Where we settled (kinda)

Figure 3 – Cisco Routed Optical Networking Architecture

Image credit https://www.cisco.com/c/dam/en/us/products/collateral/optical-networking/white-paper-sp-ip-optimized-optical-transport.pdf

Our design

Aussie Broadband

DC-A	POI 9	POI 8	DC-B

POI 1

360/720 core optic fibre ring
One tube (12 cores) allocated per POI ring (colour)

POI 7

|				
POI 2	POI 3	POI 4	POI 5	POI 6

Design considerations

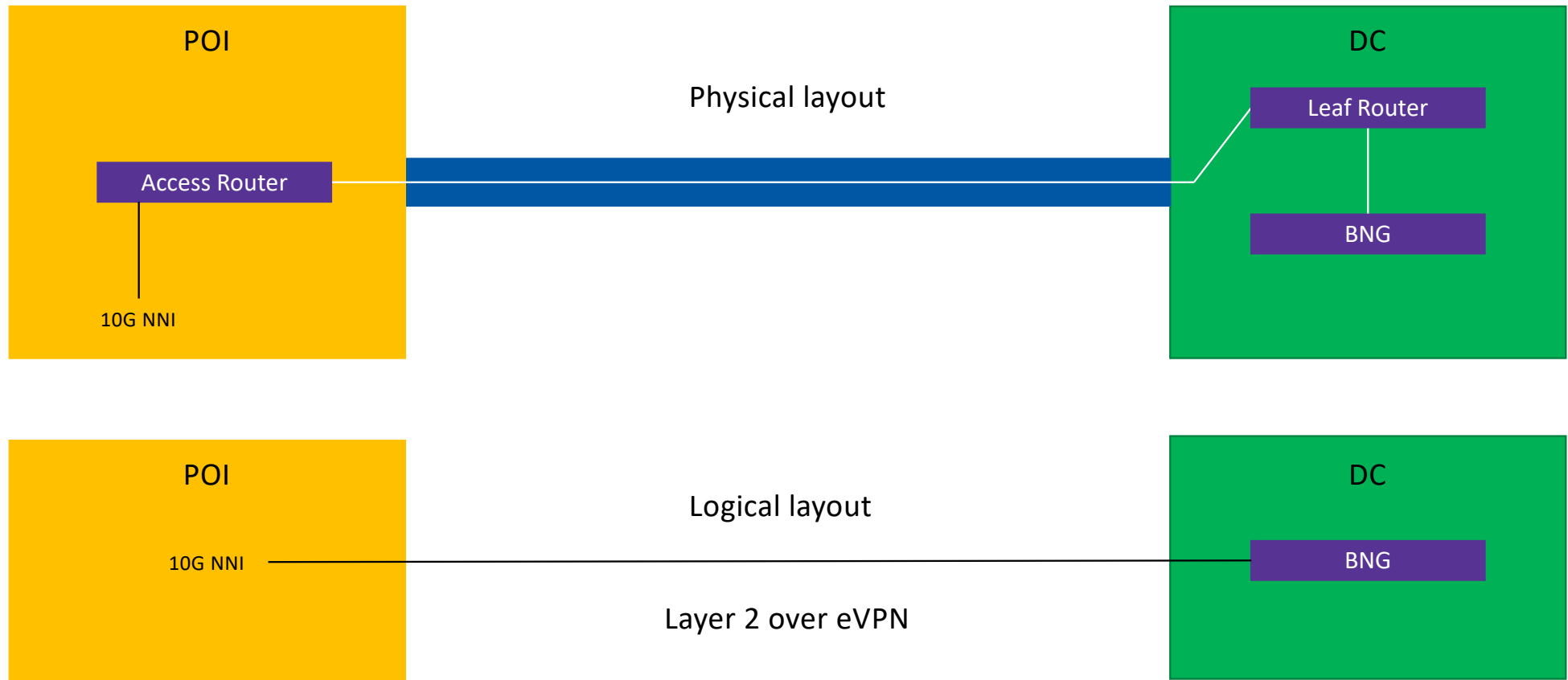**Designed to see Aussie scale to 1 million customers and beyond**

- One loop can support 300G in a failover state, but has been provisioned as 200G today (300G limitation due to 6 x 100G interfaces per router).

- Number of POIs per loop has been limited to 5 (40G per POI by default, 50G if loop upgraded to 300G).

- Optical path loss is an important factor. Currently no hop requires more than an ER optic. Modern fibre with fewer joints (separate core and access design) has allowed us to run further than other dark fibre networks.

Aggregating the loops
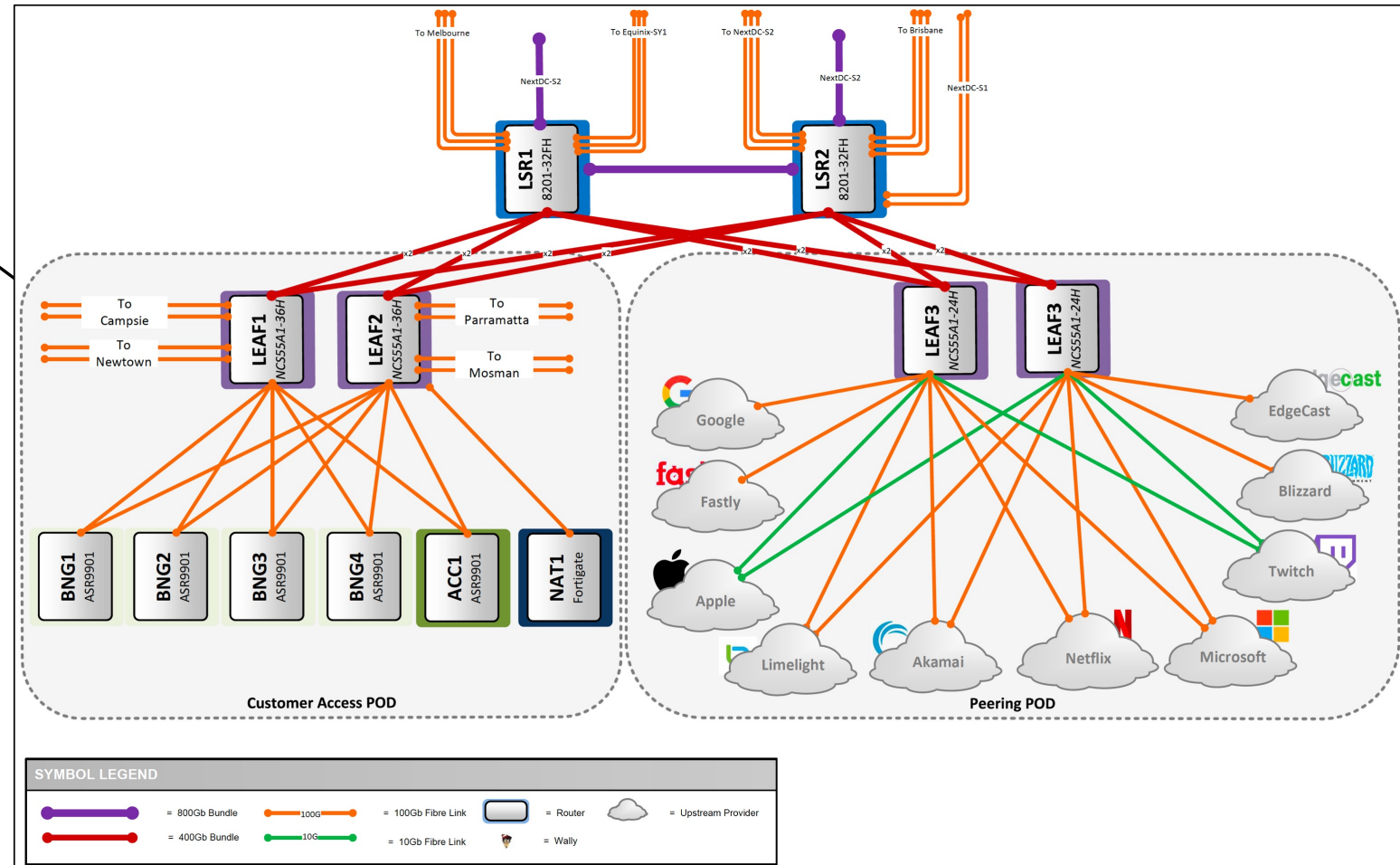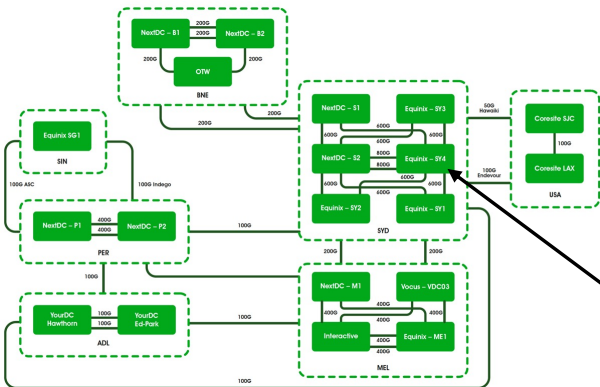
- Spine and leaf design in a building block model.

- Allowed re-use of existing equipment in the peering leaf (route table size).

- POIs connect back into customer access POD.

From physical to logical

Aussie Broadband

POI

Access Router

10G NNI

Physical layout

DC

Leaf Router

BNG

POI

10G NNI

Logical layout

Layer 2 over eVPN

DC

BNG

Lessons from the lab

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- Firstly, have a lab and preferably one that is connected to an actual POI and test with some real AVCs.

- Packet remarking before traffic egresses towards NBN is important. Traffic like ARP, DHCP will be dropped if not set to a valid NBN CoS.

- NCS can't remark outer (s tags) and inner (c tags) on a single pass (limitations of Broadcom implementation/chipset).

- The lab environment should be EXACTLY the same as the production environment (even down to the port numbers).

- We use DAC cables and loop a number of 10G ports together. In the lab we only had access to 10m cables and they worked fine, in production we used 1m cables and the router came up with unknown transceiver on the shorter cables (same cable vendor).

To get around the packet re-marking issues we loop the NNI through the NCS twice, once to strip the outer tag, and then again to remark the inner tag and re-apply the outer tag. Works well but there are things to be aware of:

- You double the amount of traffic flowing through the router so we needed to install a higher spec box with larger backplane.

- If you use the combo 10/25G ports on the NCS (port 25 onwards) as the loop ports, it won't work. (Will drop smaller packets like PPP - considers them runts).

- Needed to use tracking objects to tie the state of the NBN NNI physical interfaces so that the loops go up or down when the NNI does which then triggers the eVPNs back to the BNGs to go up or down.

- Increases the complexity in the configuration and requires more advanced knowledge to troubleshoot – trade off for cheaper hardware.

Easy until you build 121 of them

~100 routers in this picture

The stats:

- 242 x Cisco NCS Routers

- 1089 x 10G LR Optics

- 484 x 100G Optics

- 1573 x fibre patch leads

- 1936 x 10G DAC cables

- 242 x 100G DAC cables

- 242 x Cat 6 patch cables

Physical build completed by 3 field staff and 1 project manager over 5 months.

Before an install, clean the rack

- We find most Telstra exchange-based NBN POIs like this.

- NBN owned and managed POIs are more like data centres and are well presented.

- A mindset shift is needed at Telstra in how these facilities are managed if they want to monetise their InfraCo assets.

- NBN should be putting pressure on Telstra to maintain their facilities to a higher standard – our teams and equipment deserve better!

Aussie Broadband

Standard POI rack build
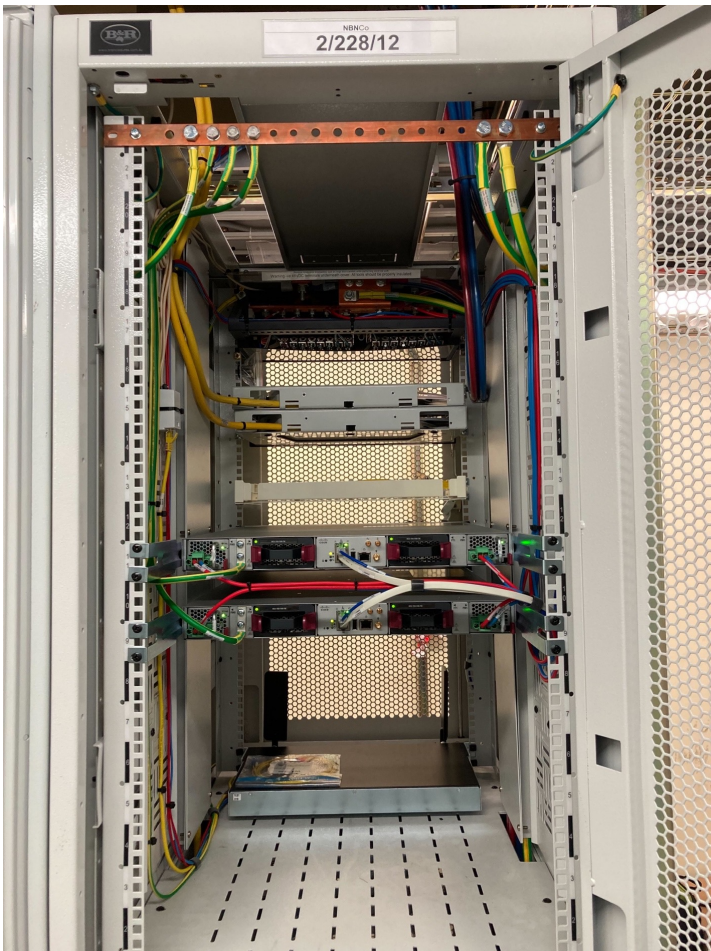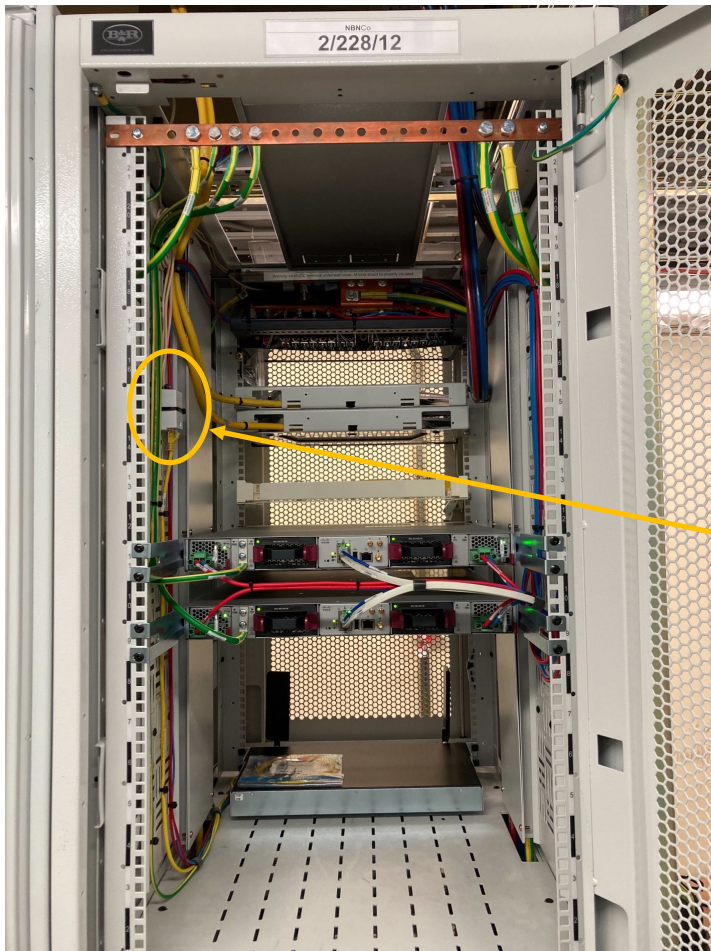

Dual A & B DC power feeds

Diverse fibre trays to NBN ODF racks (optional extra from NBN)

Fibre slack management tray

Redundant access routers Cisco NCS-55A1-24Q6H-S

Out of band management

Out of band & alarms

86 POIs have a dedicated fibre core for out of band management with 4G backup should there be a fibre cut.

35 POIs use 4G only for out of band.

Routers are manageable by console and ethernet.

Aggregate alarm contacts into RJ45 socket (circuit breaker alarms, door reed switches) which then connect to the Westell box.

Westell RMX-4000

Pre-patched for growth

By default we pre-patch:

- 4 x 10G ports to NBN A side NNI chassis

- 4 x 10G ports to NBN B side NNI chassis

- 2 x 100G ports going "East" to the next POI or data centre

- 2 x 100G ports going "West" to the next POI or data centre

Extra special care is taken to ensure TX/RX follows the standard to remove repeat visits to the site.

Cut over challenges

Aussie Broadband

The largest, most complex network project Aussie has ever undertaken

- Aussie has a mixture of single and dual chassis NNI bearers due to legacy backhaul issues which significantly completed the cut over.

- Each POI has been different in its cutover, resulting in a specific project plan for both field and network teams (primarily due to non-automated configs).

- Getting everyone one to play ball at the same time has been hard.

- Limitations on NBN migration slots has been extremely challenging – NBN will only do migrations on 4 nights per week, and only have 4 slots nationally per night for all RSPs to use.

Single to dual chassis migration

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1. Order new dual chassis NNI (10 business days)

2. Order cross connects to new NNI (5 business days, unless they run out of patch leads!)

3. Request activation of new NNIs (2 business days)

4. Jointly activate new NNIs

4a. If Activation fails, investigate fault, check SFPs etc, move to joint investigation (5-10 working days), then back to step 3.

5. Order migration of CVC on single chassis to new dual chassis NNI (15+ business days) – can only happen once NNI active.

6. Arrive at migration day, NBN and ABB jointly manage the migration.

6a. If any other orders (like a CVC bandwidth upgrade/downgrade) are present at the time of the migration, migration will fail – back to step 5 and hope for another migration slot quickly.

7. CVC on new NNI, cancel single chassis NNI

Dual chassis migrations

Thankfully, dual chassis migrations have been a lot simpler!

1. Order NNI migration (15 business days).

2. Ahead of cutover, ABB network engineers rollout config template to POI routers, prepare cutover scripts for NSOC to use on cutover night.

3. NBN patches existing NNIs across to new cross connect locations.

    3a. If no traffic, cross connects rolled back and back to step 1 (very rare we have issues here).

4. ABB confirms circuits are up and traffic is flowing.

EE migration challenges

Whoever designed the NBN EE product clearly didn't think that RSPs would want to migrate services between NNIs!

- 4 migration nights per week

- 6 x OVC (EE service) migration slots per hour, 6 hours per night. One POI per slot.

- **FOR THE ENTIRE INDUSTRY!**

- NBN staff that would normally do this work are currently tied up with flood recovery network work which has reduced available slots.

- ABB has around 700 services we need to migrate!

- **Can NBN please automate this???**

All of that 121 times!

with a small but dedicated team looking after it all.

Future expansion options

- As traffic levels grow on particular POIs there is the ability to split POIs off a loop onto their own dedicated loop, or smaller number of POIs per loop.

- New 80km & 120km 100G optics are removing the optical link budget limitations.

- For very long distance POIs option to aggregate them half way along at a "super POI".

- Can move to using coherent optics (which are dropping in price) and then combine them with passive DWDM if fibre core count becomes an issue.

Summary

- Hop by hop felt familiar to us rather than active DWDM which would have been a steep learning curve, more staff and a new vendor.

- Allow enough time to test every scenario in the lab. Don't just test them individually, test everything running together at scale – that's when you'll find the issues.

- Make sure the lab is 100% the same as the production network (down to the sub revision of firmware and patches, and which interfaces are used for what).

- There are optics and there are optics – choose your optics vendor carefully (cheap, reliable, quick delivery – pick any two!)

- Script and automate as much of your migration work as possible.

- Standardise the build – we rebuilt our test POI rack 7 times before we were happy with it and then ordered equipment and cables for that design.

- Document everything down to the last connector so that the build can be completed by anyone.

Scale through automation

(sounds easy but gee it's hard!)

Aussie Broadband

Our automation journey

Aussie Broadband

Humble beginnings with automation

- Back in the early 2000's we started Telnet connecting into the devices and scripting changes that way

- Moved onto SSH which was more secure but still less than ideal

- Did a little bit with SNMP, things like VRF pings for monitoring MPLS customers. More reliable, well structured format, widely adopted.

- "Check connection" would log onto the router and then display the customers session to the support staff.

- "Kick connection" allowed us to clear PPP sessions that would get stuck in the routers.

Config backup

- Router backup configuration solution which would connect to each router and switch in the network nightly and download the configuration.

- Provides a DIFF to the team each day showing the changes that have been made in the network.

- Script did a WR to write out the config in case someone has forgotten to save the config – saved our bacon many times!

- Also did a show debug to ensure people hadn't left any debug commands on.

Router configuration for core1.yourdc-ed.adl - ████████ as of Tuesday 5th April 2022:

Differences detected since previous version (Wednesday 9th March 2022):

```
@@ -543,6 +543,8 @@
     4764:8113,
     #Equinix Peering,
     4764:8052,
+    #Facebook Cache,
+    4764:8185,
     #Facebook PNI,
     4764:8183,
     #Fastly PNI,

Tue Apr  5 05:20:33.403 AEST
Building configuration...
```

Implemented NSO (kinda)

Aussie Broadband

NSO is a journey we're on to convert our network from being completely manually managed to as automated as possible

- NSO has allowed us to deploy at scale, as it just "knows" what things need to be configured.

- The more staff you have, the more people don't know what's going on.

- NSO becomes the source of truth rather than people's heads.

- It forces you to be strict, if you haven't defined the product sets correctly then it will lead to manual configs and complexity.

- One of the coolest features is "references", it keeps the config clean and removes config that is no longer needed when the dependencies no longer exist.

CARBON

Industry leading automation & control

- Single platform that enables businesses and partners to quote, service qualify, connect, modify and manage nbn services in minutes all through a single platform.

- Manage complex solutions using a simple interface.

- Over 400 partners now signed up and using Carbon including a major corporate customer with over 3000 services.

- Next evolution of Carbon is under development to enable all Aussie Broadband products to be sold and managed through Carbon.
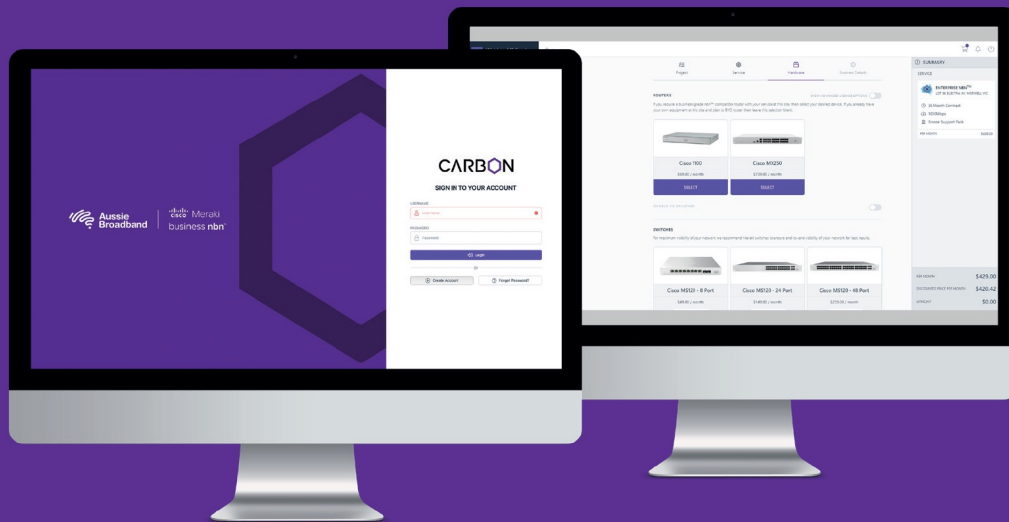
Vision behind Carbon

- Was designed to allow business customers and managed service providers to service qualify, price, connect, configure and manage any NBN service.

- Wanted to remove the need to always talk to an account manager - complete self service.

- Data services can be layer 3 internet, layer 2 point to point, or layer 2 onto a central head end.

- NBN NEBS or Enterprise Ethernet (High or Low CoS), will shortly add Telstra EA.

- Westpac migrated their national network of over 3,000 branches to the NBN using Carbon.

Aussie Broadband

Carbon automation

Aussie Broadband

Changing a service from Layer 3 to Layer 2 in Carbon
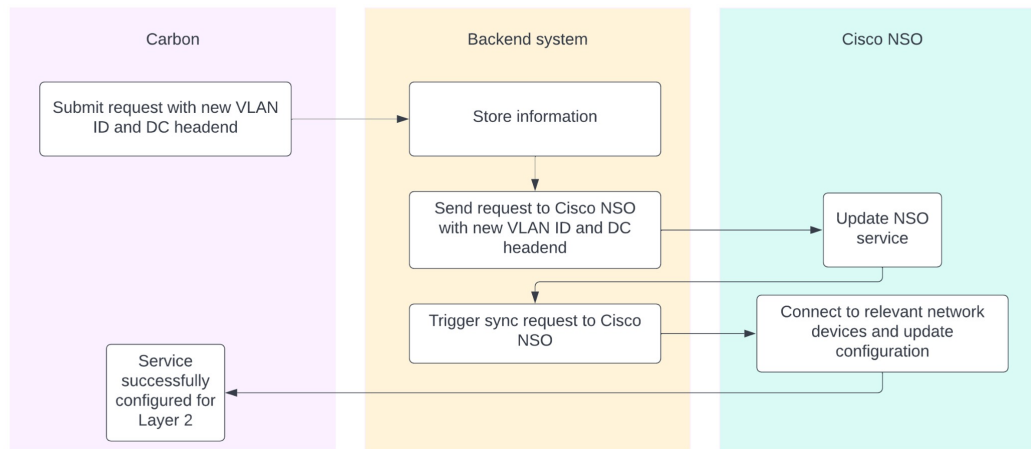
- Carbon connects a number of internal and external platforms together including:

    - NBN's APIs for ordering, service modification and service qualification

    - Aussie mobile (on the Optus network)

    - Aussie's network connecting Layer 3, Layer 2 NBN NEBS and NBN EE services

    - Aussie's Hosted PBX platform.

- 100% built and maintained internally by the Aussie software development team.

- Designed to put the full power of Aussie's network in the hands of our partners.

CVC Bot

CVC Bot has allowed Aussie to remain profitable whilst providing the right amount of bandwidth to customers

- Telemetry data is fed in once per minute from each access router for every CVC in the network.

- The utilisation data is processed in real time and compared to a set of business rules and current bandwidth limits on each CVC.

- If utilisation has breached the business rules for a given CVC, it will place an order with NBN to increase or decrease the amount of bandwidth on a particular CVC.

- Once the order is completed by NBN, the automation changes the shaping policies on the access router and makes the capacity available to customers.

Key learnings

- Automation must come first – it is much harder to implement after the fact.

- Our culture has been to not automate initially because of low volumes or unsure if a product will sell well – this then becomes hard to unwind later leading to tech debt.

- When automating, you need to go all in for the specific product or task you're trying to automate (e.g. think of all the product options like static IP, routing protocols required, all the options and sub options). If you implement a minimum viable implementation it will continue to bite you for a long time!

- Need to have manual process "policers" watching out for tasks which are being done manually that should be automated.

- Ideally you need to have a wall between automated systems and the custom config systems otherwise migrations become very complex (different routers for automated services vs custom config services).

- Automating residential products is easy, business is far more complex because everyone wants something different!

- Most dangerous time in the network is when automation is half done.

Questions

You can download this from aubb.me/ausnog21

Aussie
Broadband