TransACT's foundation and initial rollout
A memoir

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TransACT (2000-) introduced Australia's first VDSL network, offering a 'triple play' of voice, data (e.g. Internet access), broadcast and video-on-demand services in Australia's capital city, Canberra, in competition with the incumbent carrier Telstra. TransACT's founding Chief Architect, Robin Eckermann, reminisces on the founding of TransACT and some of the lessons to be learned from this fore-runner of the National Broadband Network (NBN).

Introduction

TransACT was a pioneering network by many measures. The deployment that began in 2000 after a four-year incubation period was one of the first to implement open access principles with the structural separation of local access and services. It took fibre deep into the access network, within 300m of the end-user, in a fibre-to-the-kerb (FTTK) architecture. It was the first network in the world to deploy VDSL technology (with a raw speed of 51.84 Mbps), enabling support of a triple play suite of services including broadcast-quality video. Fourteen years later, with the network now owned by iiNet (ASX: IIN), the original electronics are being replaced by VDSL2, enabling speeds of 100 Mbps over the original cabling. Many Australians can only hope that the NBN will provide similar capabilities in their areas over the next ten years.

It was one of the highlights of my professional career to lead the creation of TransACT, with hands-on involvement in every aspect - designing the architecture, selecting the technology, developing the business models, defining the products and raising the investment needed to proceed. My role began in 1996 as Project Leader (on a consulting basis to ACTEW, the ACT Electricity and Water Authority) and in 2000 I took up a full-time position with company and served as Chief Architect during the rollout from 2000 to 2003.

The Beginnings of TransACT

For me, the story began when I had my first exposure to broadband in 1994 – long before the advent of ADSL. I had the overwhelming sense that what I was seeing would transform the world. Coupled with a visit to CeBIT where I saw robots for laying fibres in sewers, I came

back inspired with possibilities and shared my excitement with a long-standing client within ACTEW. That led to an invitation to present to a team of ACTEW executives in November 1995. Unfortunately project "TENPARC" (as we dubbed a plan to run fibre through the sewers) wasn't an instant winner and I thought that would be the end of the idea.

Fortunately, there was another initiative brewing in the background. A small team engaged in a management development program was looking at an electricity reticulation technology called Aerial Bundled Conductors (ABC). Rather than spreading bare conductors on the cross-arm of a power pole, the conductors were insulated and twisted together into a single bundle to improve immunity to interference from vegetation. They found that ABC cabling could include an optical fibre cable – but their project ran to its conclusion in late 1995 before being really able to explore the communications possibilities that this might enable.

A new management development team commenced in early 1996, around the same time that Australia's Pay TV rollouts were running full-steam ahead. Although Telstra and Optus were engaged in a race to establish coverage in the major population centres like Sydney and Melbourne, both approached ACTEW wanting to secure the rights to string their cables on the utility's power poles within the Australian Capital Territory. However, neither was in a rush to actually start building in Canberra due to its smaller market size and the fact that electricity lines ran through back-yards with no access except by foot and ladder. This "rear spine" electricity network architecture was part of Walter Burley Griffin's design for Canberra to avoid cluttering street-scapes with power poles.

It was around this time that my earlier presentation was remembered, and I was invited to share some perspectives as to where the industry was heading with the three key members of the management development program - Joe Ceccato, Rob Clarke (both electrical engineers) and Jane Taylor (a librarian). A few weeks later, I was engaged by ACTEW and the four of us became fully consumed by the thinking that culminated in TransACT's establishment a few years later.

The initial question centred on whether to allocate pole access rights to Telstra, Optus or both. Each wanted the upper position on the pole - but it was clear that the poles couldn't support *two* additional sets of cabling for reasons of weight and/or clearance (not to mention the public outcry that would have ensued at such unsightliness).

Resolving that there could only be one set of cabling led to a series of questions that ultimately shaped the whole TransACT architecture. If ACTEW was to grant access to one party only, should it insist that they use its workforce to generate employment as well as to maintain tight control over the electricity assets? Or should ACTEW go further and build

and own the cabling, making it available to both Telstra and Optus on some form of open access basis?

A single set of cabling shared by multiple parties seemed to promise the best outcome economically, aesthetically and for customers (in terms of choice of services). Thus the concept of an open network became a key pillar of the TransACT vision.

The initial leaning was to own the cables only, but it soon became apparent that electronics would be needed to convert passive wires into a network capable of supporting multiple services (including video services) and service providers. We invited proposals, and the choice quickly netted down to either one of several Hybrid Fibre Coaxial (HFC) solutions or a unique FTTK/VDSL solution - in either case, deploying an entirely new cabling regime. Whilst we recognised the proven capabilities of HFC for video delivery, ultimately we saw broadband data as the primary service of the future. Accordingly we opted for the FTTK/VDSL approach in the belief that the dedicated copper "tails" would give superior broadband performance as well as supporting a high-quality conventional POTS service.

Our initial goal was to avoid venturing into the services space, so we embarked on discussions with prospective partners who could provide ISP and telephony services, subscription TV services and video-on-demand services. In the telephony area, we came close to consummating deals with each of two major carriers. However, it became clearer that their view of sharing risk and reward was that we take the risk (with the massive investment involved in a cabling deployment) and they take the rewards (with lucrative telephony revenue). It also would have largely put TransACT's fate in the hands of the partner who owned telephony switch and risked reducing TransACT's asset to little more than a tangle of wires.

From Concept to a Working Pilot

During all of these negotiations, the network solution had progressed from loose concepts (often sketched out on paper napkins at the local coffee shop) to a laboratory-based proof-of-concept configuration. In mid-1998, ACTEW's Board approved a $6m budget to embark on the next stage and test the solution by deploying the network in one of Canberra suburbs. The ACT Chief Minister was booked to launch the initiative at the end of November, and that set a 4 month timer ticking on building a network head-end at a new site, extending optical fibre cable some 7 kms to the pilot area, running a complex cabling architecture past some 850 homes and establishing a credible suite of services.

There was no longer time to pursue a deal with a telephony provider, so we bit the bullet and purchased a Class 5 telephony switch. Several ISPs came on board, and we were able to

secure partners to provide a range of broadcast video channels as well as some video-on-demand content.

Few people will know just how hard the team pedalled during that four-month period, and there are many entertaining anecdotes from the era. The story of how we came to get planning approval is an example of venturing into territory that was as unknown to us as it was to the planning authorities. We simply joined the queue of builders with garage plans etc under their arms, and when we got to the front of the queue, unrolled a map of the pilot suburb showing all the proposed cabling. There was some nervous shuffling on the other side of the counter, then a consultation with a supervisor – but in the end we secured the necessary approvals for the same $60 fee as applied to housing extensions and other minor building works.

The launch was a great success – and the demonstrations of multi-megabit speeds, at a time when dial-up was the norm, drew an audible gasp from those attending. From a personal viewpoint, one of the great team triumphs was delivering what many others saw as a "mission impossible" on time and a few thousand dollars *under* budget.

From Pilot to Deployment

Following on from the successful pilot, TransACT started its quest to attract the investment needed to progress to a large-scale rollout. With the assistance of a merchant banker, the initial investors signed up, led by Telecommunications Venture Group (TVG) from Hong Kong and ACTEW. Their confidence triggered a scramble to get a stake in the venture, and ultimately it proved necessary to cap the funds it took on board. What a stark contrast to the mood that set in just a few months later, from April 2000, when the technology bubble burst. TransACT was formally established as a company in 2000, and the first CEO – the late Richard Vincent – took up his role in March.

The network rollout proceeded over the subsequent three-and-a-half years, ultimately passing some 65,000 premises and representing an investment of the order of a quarter of a billion dollars. The original FTTK/VDSL network was augmented with ULL/ADSL access to the "other half" of Canberra that fell outside the FTTK footprint. In greenfield areas, TransACT became one of the pioneers of fibre-to-the-premises (FTTP) in Australia and the first to deploy GPON technology (the same technology to be chosen many years later by NBN Co for its FTTP deployment).

The TransACT business was acquired by iiNet in late 2011, and the FTTP areas have since been acquired by NBN Co. In addition to serving tens of thousands of residential customers, TransACT has built a successful business meeting the specialised and high-performance

needs of major government and corporate users - including offering high quality data-centre space.

Lessons Learned

There were lots of lessons in the TransACT experience. We made our share of mistakes – indeed, they represent some of the most valuable lessons learned, and it always disappoints me when I see others reinventing the same mistakes for themselves! However, we got some important things right:

1. Good people and good teamwork are the keys to great outcomes. If I had been asked to pick my team at the outset of the TransACT adventure, I probably wouldn't have picked all the individuals that I inherited as team leader. However, looking back at the end of the journey, I don't think we could have succeeded with any lesser team. During the course of growth the occasional misfit found their way into the group – but they were quickly ejected by the rest of the team. Individual egos, ambitions and politics get in the way of the collective mission and must be quickly excised if they are not to undermine progress.

2. A clear vision inspires people and enables them to power through the tough times. Being attacked by sceptics ("You're crazy thinking you can do this") is healthy – it tests, refines and strengthens the vision until ultimately it becomes robust enough to withstand the most aggressive pressure. And for some of us, there is no greater motivator than being told that something in which you believe cannot be done!

3. Capturing the order of a third of the fixed line telecommunications market in TransACT's network footprint within a year of turning on services was a measure of tremendous public acceptance. Considering the strengths and resources of the incumbent, this was a real David versus Goliath accomplishment and something that few other telecommunication start-ups anywhere in the world have been able to match.

4. Open access is the right approach in areas where duplication of infrastructure simply doesn't make sense. If a single advanced network is capable of supporting an unlimited array of services and service providers, it makes no more sense to build multiple networks than it would to deploy a second set of power-poles to get competition into the supply of electricity. TransACT's implementation of open access involved the structural separation of local access (retailed directly by TransACT to the end-user) and services (available from a range of retail service providers (RSPs)). This avoided the inherent duplicate charging that occurs – for example, under the wholesale/retail approach that NBN Co has adopted – where each RSP that an end-user engages must pay the network owner/operator for another full access line and

recover this in their retail charges. TransACT's approach was cost-reflective in that the end-user paid the line rental costs only once, and each additional RSP only paid a marginal fee for access to the customer.

5. Punting on the growth of broadband (rather than prioritorising video services) was a good decision. At the time of TransACT's commencement, Internet access for most homes involved dial-up connections layered on top of the phone service. This is totally inverted today, with broadband data rapidly becoming the "foundation service", and both telephony and video services being increasing layered on top of it.

6. The deep fibre plus high-quality "Cat5" copper cabling regime has proven its long-term worth. Electronics come and go, but cabling is the durable asset in any network. The original FTTK/VDSL network has already been partially upgraded with VDSL2 technology, and speeds of 30-100 Mbps are now available to all customers in the original network footprint. For just a few million dollars (a tiny fraction of the hundreds of millions that would need to be spent in over-building new FTTP infrastructure), the network can be further upgraded with VDSL2 throughout – making speeds of 100 Mbps available to all users. Further, when the time comes, there's enough fibre in the network to migrate to an FTTP architecture simply by upgrading the last 300m – again at a fraction of the cost of a total rebuild.

Conclusions

Unquestionably, it was a unique set of conditions that prevailed back at the time TransACT originated.

Some were largely coincidental – relating to the particular activities in which I and some other folk at ACTEW were engaged at the time and to the personalities of a team of individuals who weren't constrained by traditional thinking.

Others related more to the general environment of Canberra back in the mid-1990s. Canberra's economy is information/knowledge-centric, and its population are amongst the most highly educated in Australia. Households led the country in their uptake of personal computers and their use of the Internet – so there was no better market in Australia to pioneer an advanced broadband network. ACTEW had a sound platform from which to venture into telecommunications – not just its own electricity poles and wires, but a workforce used to operating critical infrastructure, a multi-utility business (electricity, water, sewerage and gas), a 100% customer-base and an entrepreneurial CEO. All it needed was the spark of approaches from the companies engaged in Pay TV rollouts to ignite this melting pot of potential.

The years leading TransACT's establishment were the most demanding in my professional career, with the routine 12-hour days, 6 days a week, taking a toll on other family priorities and a healthy, balanced lifestyle. However, when I look back and ask myself if it was all worthwhile, the answer is a resounding "Absolutely!"

Acknowledgements

Needless to say, projects like TransACT are never the result of any individual person's efforts, and I want to pay tribute to the outstanding team of colleagues with whom I had the privilege of working. It would also be remiss of me not to particularly acknowledge the role that Mike Sargent (CEO of ACTEW, the ACT Electricity and Water authority at the time TransACT commenced) and Neville Smith (Business Development Director) played. Mike "got" the vision and gave TransACT the initial space to take root; Neville "flew cover" for the project – insulating the team from the distractions of corporate politics so that it could get on with the challenge at hand.