2015 08 14 Telecoms Migration Policy

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14-Aug-2015

Introduction

This submission is in response to the Telecoms Migration Assurance Policy Statement and Framework dated July 2015.

Having read through the intended (Telecommunications Service) Migration Assurance (MAP) Policy (A) and Framework (B) documents, I am very concerned because frankly, the policy and framework are very different from engineering reality for a number of fundamental reasons. In my professional engineering opinion this policy is doomed from conception, because I believe the conception / mindset within the Framework is fundamentally flawed.

The fact that this (Telecommunications Service) Migration Assurance Policy (MAP) has had to be drafted is very telling that there is an immense dislocation in practice that does not fit the hypothesis. This dislocation is a very clear indicator to me that the (political) theory is grossly incorrect, meaning that the hypothesis (to develop the theory of network ownership transfer /migration) is fundamentally flawed.

Taking this situation one step further, it is very clear to me that with a fundamentally flawed framework and policy, this situation will lead to very extensive delays and incredible business and community frustrations, huge amounts of extra Red Tape combined with extensive legal battles and a range of totally unnecessary engineering complications that will blow out the cost of the NBN (if some or all of this has not already happened).

Lack of Engineering Expertise

My immediate question is “what proportion of staff in the Dept of Communications are Electrical Engineers, well experienced in telecommunications infrastructure”? My gut feeling is that this document was written by Lawyers and Clerical staff; with virtually nil detailed experience and knowledge of what are the major components within the Australian telecommunications infrastructure, and how these major components interact and interconnect with each other.

My guess is there are probably 500 to 600 people in the Dept of Communications and the count of experienced telecoms Engineers in this Department (and/or involved with the document) is probably zero.

When I say experienced telecommunications engineers, I mean hands on (not just software office experience) and relevant experience in network: planning, design, maintenance, construction, installation, commissioning, equipment socialising.

I have over 35 years experience in the Australian telecommunications industry, primarily in telecommunications infrastructure, and I know what I am saying, because my career extends over the technical, engineering, management and consultancy in a very wide range of technology areas and infrastructure projects, specifically with telecommunications engineering.

If you want sound Professional Telecommunications Engineering advice / consultancy on how to fix this immense and drawn out mess then contact me.

The Missing Infrastructure Problem

The MAP is stuck in an extremely awkward (economic, political and engineering) position because the MAP is entirely in reference to the Customer Access Network (CAN) – with the totally incorrect belief (probably through innocent ignorance) that the CAN is the total telecommunications infrastructure. The CAN is only part of the necessary telecoms infrastructure[1] to provide a serviceable telecommunications connection to customer premises.

An analogy of the MAP is expecting a single leg to run without having the body attached (with the other leg).

The NBN infrastructure is - in itself, a very incomplete (wholesale) network that cannot be a wholesale service infrastructure because the NBN does not provide national end-to-end connectivity. Why? Because the NBN does not have any Inter-Exchange Network infrastructure. Who let that happen?

No telecommunications end-to-end connection / call can be made without connecting through the Inter-exchange (Backhaul) Network (IEN). In Australia there are thousands of isolated sub-CAN infrastructures that are back-connected with the IEN.

One analogy of the IEN is the main roads, highways, bridges that connect between suburbs, towns and cities. Without this infrastructure connecting to the local council roads and driveways there is virtually no way to transport between premises.

Telecommunications is electronic transport.

The omission of this Inter-Exchange Network (IEN) infrastructure in the MAP documents is a fundamental flaw that makes the MAP totally impractical, extremely uneconomic, and an absolutely expensive nightmare to manage that is prone to catastrophic policy failure.

The CAN consists of thousands of isolated sub-CAN infrastructures local to premises in suburbs, towns, villages / localities and to farms. With pair copper CAN construction, the sub-CAN infrastructures are called Exchange Switching Areas (ESAs). With FTTP (as per the NBN) these sub-CAN infrastructures are called Fibre Serving Areas (FSAs). With "Mobile" Radio Base Stations, these sub-CAN infrastructures are called Cells. With Hybrid Fibre Coaxial Cable (HFC) these sub-CAN infrastructures are called Coax Service Areas (CSAs).

The CAN does not connect between the towns, suburbs and cities. This part of the telecommunications infrastructure is the Inter-Exchange Network (IEN).

One analogy of the CAN is the premises driveways and local council streets in towns and suburbs. Without major / main roads, bridges, highways none of these towns / cities / suburbs could connect and these locality / areas would be totally isolated.

The CAN connects from the Local Telecommunications buildings (commonly called the “Local Exchange” in Australian terms or “Chief Office[2]” in USA terminology) to customer premises and personal mobile devices.

[1] http://www.moore.org.au/comms001.htm

[2] The USA TERM “Chief Office” is a mash of “Wire Chief” – the USA name for the person who physically tested customer lines for faults, and “Post Office” – where the local switchboards were located to manually connect and switch customer calls.

There is a further fundamental flaw in the MAP in that behind both the CAN and the IEN (which in practice come as a pair that economically and physically cannot be separated); both these network infrastructures (these days) are externally managed from a national control area called a Global Operations Centre (GOC).

Framework Responses

Forward

P1: "high speed broadband and telephony services". This is very loose terminology because the phrase "high speed" needs to be defined very clearly.

The term "Broadband" was coined within Telstra to deliberately mean a wide range of digitally-based premises connected communications facilities".

Further, the loose term "broadband and telephony services" effectively means "(premises associated) telecommunications services"

P1: "structural reform of the industry via the structural separation of Telstra's copper and hybrid-fibre coaxial (HFC) networks" ***Whoever wrote this / signed off on this mess of wording has demonstrated that they have literally nil intelligent comprehension of the telecommunications infrastructure / business in Australia.***

There are basically two primary parts to the CAN infrastructure: External Plant and Internal Plant.

The **External Plant components of the CAN** includes all conduits, cables, pits, pillars, remote Nodes, poles, power, power supplies, batteries and external buildings.

The ***Internal Plant components of the CAN for the Pair Copper CAN infrastructure includes:***

- the exchange located Main Distribution Frame (MDF) and all its wiring, plus
- all the Digital Services Line Access Multiplex (DSLAM) equipment, plus
- the associated power supplies in every associated local exchange site, plus
- a considerable part of the local telephony switches up to the middle of the Line Access Card, plus
- all the associated Service Control Network (SCN) for all the above equipment, plus
- the associated Intermediate Distribution Frames (IDFs) at all associated exchanges, plus
- the wiring right up to the Edge Routers (on the edge of the IEN infrastructure) at all associated "Local / District" exchanges.

The Internal Plant components of the CAN infrastructures for the HFC includes:

- the Optical Fibre Distribution Frames (ODFs) and all associated optical patching, plus
- the Optical Headends (for Pay TV and Cable Internet), plus
- all the associated Intermediate Distribution Frames (IDFs), plus

- all the Broadband Routers associated with the Cable Internet service provision, plus
- all the associated power supplies in every associated local exchange site, plus
- all the associated Service Control Network (SCN), plus
- all the wiring right up to the Edge Routers (on the edge of the IEN infrastructure) at all associated "local" exchanges.

Put this another way: A very high proportion of the approximately 5100 or so exchange sites in Australia are "Local Exchanges" and a very high proportion of the 400 or so exchange sites in the metropolitan areas (State Capital Cities and associated Suburbs) are also "Local Exchanges" that effectively are almost 100% CAN infrastructure.

It therefore stands to reason that "**structurally separating Telstra**" by progressively moving the pair copper / HFC out and rolling in FTTP or whatever mix of CAN technologies under the NBN cap **is by far the most wasteful economic strategy possible and has that so many fundamental flaws; it beggars belief that such a grossly inept strategy even got past the first very brief consideration**.

The consideration to "**structurally separate Telstra**" as an economic reform was raised several years ago and I am stunned that after all these years nobody in the Department of Communications has rationally gone through the physical structures involved and recognised that **structurally separating a large (economy of scale highly efficient infrastructure) into a fractionated and expensive infrastructure is economically fatal for Australia**.

Some Modern Telecommunications Economic History:

Pre 1985, PMG / Telecom Australia was fundamentally an infrastructure business with a large amount of high maintenance mechanical and analogue telecommunications equipment and a very small amount of commercial retail products. These mechanical / analogue technologies simply could not provide a range of commercial retail products.

From about 1985 through to about 2005 Telecom Australia / Telstra went through a globally driven technological revolutionary change with extremely low maintenance silicon-based transmission and switching technologies, totally replacing very high maintenance mechanical switching and very high maintenance valve-based transmission equipment. These silicon / digital technologies made a range of inexpensive retail products that commercially were/are very viable.

As a direct consequence of these inexpensive revolutionary global technology advances in telecommunications and office equipment, the "efficiency" of the Australian telecomms industry soared because the massive maintenance overheads were virtually eliminated.

Unfortunately, the economists were in total denying ignorance of global industry standardisation and global economies of scale, and consequently praised broad "competition" for these efficiencies in the telecommunications industry. As a direct consequence of this ignorance about "infrastructure businesses" being diametrically opposite in mindset than "competitive businesses", these economists kept pressing the "competition is good" button resulting in a massive geographical

telecommunications service standards divide between non-metropolitan and metropolitan areas.

The fallout caused by these half-educated economists was the introduction of a range of Federal Government heralded "Initiatives", starting in about 1998 and culminating in the NBN (for all the wrong reasons) to try to minimise the massive divide in Standard Telecommunications Service delivery.

From about 1993 to 2003, Telstra changed focus from being an infrastructure business to being a competitive business as a retail product "service" provider; dropped its extensive engineering expertise in favour of globally sourced engineering strategies and heavily focussed on retail products that provided the highest (short term) maximised Return On Investment (ROI).

From 2003 onwards, the Telstra was "competitive" in retail products and has basically very little focus on supporting low ROI retail products and services.

Infrastructure Businesses and Competitive Businesses

Infrastructure Businesses and Competitive Businesses are both highly efficient when operated in the right mindsets, but these mindsets[3] are virtually diametrically opposite in thinking. Both really need each other to be economically efficient! Both cannot work efficiently under the one Board.

All retail resellers, most builders and a high proportion of manufacturers are Competitive Businesses, that strive to be "Monopolies" where they can command / limit the overall production and maximise the profit by charging as much as possible and providing as least as possible.

The rest of the "businesses" are effectively Infrastructure Businesses , that strive to have a large "Economy of Scale" so they can provide a maximum of service with a minimum of overhead cost, are funded through common taxes and charge as little as possible so that the (free retail market) Competitive Businesses can use these infrastructures to maximise their profits. (*USA-controlled western economics deliberately does not allow this economic teaching as it goes against the multi-nationals control of infrastructures and control of governments.*)

The Department of Communications (DoC) is an Infrastructure Business, not a Competitive Business. Can you imagine how inefficient the DoC would be if it were split into 30 separate small businesses each competing to do the same work and not sharing any resources at all, and all be in separate (non-Government) buildings with isolated computer networks, isolated databases, each with their own executive management, board, shareholders - and all the income comes from sales only?

Telstra is actually two businesses. The retail reselling part of Telstra is a very efficient Competitive Business. The rest of Telstra (i.e. the telecomms infrastructure) is an Infrastructure Business. ***Physically separating Telstra (and Optus etc) and combining all the separate telecomms infrastructure components into one large "economy of scale" infrastructure would give Australia a massive jump start to our ailing economy.***

[3] http://www.moore.org.au/busn/01/Competitive%20Business%20and%20Infrastructure%20Business.pdf

The Davidson Report Stumbling Block

The Davidson Report (1982) used the terms "**telephone**" and "**telephony**", to implicitly mean the "**standard telecommunications service**", which at that time, was based on "**Voice Band**" (0.2 kHz - 3.4 kHz) communications of the day. Consumer Dial-Up modem connections also used the Voice Band "**telephony**" Customer Access Network (CAN) and analogue Inter-Exchange Network transmission channels as part of the "**standard telecommunications service**" at that time.

In my Professional Engineering opinion, I believe the wording of "**telephone**" was intentionally and deceitfully misinterpreted from the implicit meaning at that time in the Davidson Report which then meant "**Standard Telecommunications Service**" (**STS**) to be incorrectly literally worded as "**Standard Telephone Service**" (**STS**).

Part of the Davidson Report (1982) was the proposed introduction of a "pension" of about $190 M pa to be paid to Telecom Australia (later Telstra) to make the telecommunications areas that are non-metropolitan (i.e. areas outside the State Capital Cities and their suburbs) "look profitable", so that the telecomms sector could be floated on the Australian Stock Exchange (ASX) by the privatisation / sale of Telecom Australia / Telstra and the introduction of "competition" to (apparently) increase economic productivity.

Although I believe the intent had a lot of credit (to make the telecommunications infrastructure business far more productive), the economic initiative / methodology of "privatising" and splitting up a large and very efficient infrastructure into several small infrastructures was seriously flawed (as outlined above).

The problem for Telecom Australia / Telstra was that the silicon-based digital and optical revolution that started in the mid-late 1980s and moved into globalised equipment engineering manufacture by the early 1990s dramatically reducing the cost of infrastructure and virtually zeroed the maintenance overhead costs while dramatically increasing the available bandwidths (See Appendix 1 for more detail).

I believe that Telstra deliberately minimised the amount of new telecommunication infrastructure in the non-metropolitan areas to keep the STS operating as a continual "Cost Centre", so the USO funding of $190 M pa would keep rolling in.

In the late 1990s, the introduction of ADSL (Asymmetrical (data rate speeds) Digital Service Line) modem technology (and Cable and PON / FTTP etc) dramatically and very inexpensively, significantly increased data communications speeds over the same "**telephony**" Customer Access Network - but with one difference: the bandwidth used for ADSL on pair copper extended well past the Voice Band limit of 0.0034 MHz to about 2.2 MHz.

This advance in Customer Access Network technology now included ADSL and other Broadband technologies, e.g. FTTP. This technological advance has implicitly changed the meaning of the term of "**Standard Telecommunications Service**" to include Broadband connectivity, not just Voice Band connectivity as used for Telephones and Dial-Up Modems as was standard back in 1982.

Consequences of Privatising Infrastructure

The consequences of introducing this well-intended but fundamentally flawed fractionated / privatised telecommunications competitive business strategy were very well hidden under the rapid technological advances that coincidentally transformed the telecomms infrastructure to provide ongoing support the now possible telecommunications reselling business. Some of these well-concealed consequences included:

- The decimation of a then very efficient "economy of scale" infrastructure business into several smaller highly inefficient infrastructure businesses.
- These smaller infrastructure businesses paid top $ for telecomms equipment, and were put on the end of the production runs with minimum engineering support.
- The HFC infrastructure was rolled out in an extremely rushed competition costing $4.7 Bn: $2.5 Bn (Telstra) plus $2.2 Bn (Optus), minimally engineered, 90% duplicated and covered 85% of the metropolitan areas, and only about 80% of premises passed are able to connect because if rushed / poor engineering.
- With an infrastructure mindset this HFC infrastructure would have cost in total about $1.5 Bn, no duplication, 100% geographic coverage and fully engineered and all premises passed being able to connect.
- Very expensive multi-duplicated Radio Base Stations for Mobile Personal Devices, costing over 300% to cover the same geographic territory.
- Thousands of km of partially utilised SMOF cable systems that really do not connect as a national grid to make all this infrastructure efficient.
- Thousands of Radio Black Spots in the non-metropolitan areas that would otherwise never exist if the National SMOF grid was properly engineered under one infrastructure body.
- Very thin SMOF inland Inter-Exchange Network incapable of growing Australia for the next information age beyond the Metropolitan areas.
- Over 700,000 people in non-metropolitan areas (detail in the My Broadband Data Cube) without ADSL facilities because these areas are "low ROI".
- An abnormally high number of early ADSL1 (8 Mb/s) equipment re-installed from metropolitan areas into in non-metropolitan areas providing far less than ADSL2+ (24 Mb/s) service.
- The cause for the Federal Government to roll out a high number of very expensive and very ill-considered "Initiatives" to try to level the competitive telecomms infrastructure in non-metropolitan areas.
- The cause for the Federal Government to have over 15 separate Inquiries to try to comprehend why the non-metropolitan areas have such poor telecommunications infrastructure.
- Dept of Communications not taking on solid experienced engineering advice provided at these Inquiries to have this detail included into the associated Reports and swiftly acted on to fix the problems.
- The "Selling / Renting" of External Plant (Pits, Poles, Conduits etc.), creating immense amounts of totally unnecessary Red Tape.

- Telstra stagnating on rolling out consumer FTTP to replace very aged CTTP technology - causing the very expensive NBN to be launched in retalliation of this long term stagnation.
- The calling in of a Northern Hemisphere Consultancy business to provide totally inappropriate technologies for non-metropolitan Australia.
- The rolling out of the NBN in five separate fundamental strategies over more than a decade to try and expedite the stagnated infrastructure rollout.
- Politically meddling with the NBN technologies to try to make this process less expensive, causing even more Red Tape.
- Not calling in engineering experts like myself to the DoC as consultants to very inexpensively rationalise the NBN / Telstra problem.
- Looking to "Structurally Separate Telstra" to make "Structural Reform" without the experience and wisdom to comprehend why "Structural Separation" will cause an immense amount of extra Red Tape and not solve the problem.
- The requirement for a Telecoms Migration Policy (i.e. more Red Tape) to resolve in complexity of what should be an extremely straightforward and simple process.

As I stated before the intent to privatise the Australian telecommunications Government business was well intentioned but extremely ignorant of the gross inefficiencies that would promulgate if done incorrectly - and these gross inefficiencies have come through to cripple Australia for all the wrong reasons.

Separating Retail Reselling from Infrastructure

Retail Reselling fits perfectly as a Competitive Business; Telecommunication Networks fits perfectly as an Infrastructure Business.

Telstra (and Optus etc.) are all two-headed businesses that sit very uncomfortably with their Sales and Marketing teams having term goals measured in months while those involved with developing the infrastructures need goals measured in years.

Telstra (and Optus etc.) would all perform far more efficiently as Retail Resellers than as infrastructure construction businesses.

Competing infrastructure businesses are inherently extremely inefficient because economies of scale are minimised and expensive networks are unnecessarily duplicated (and often in the wrong locations to be beneficial).

Physically separating Telstra (and Optus etc.) is very simple and straightforward, and will get rid of mountains of Red Tape legal issues / renting etc, while providing all the advantages of a much larger purchasing base - and providing the practicability of a less expensive Wholesale product line to provide a considerably larger Retail Reselling profit margin.

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Appendix 1

Economic Technology Advances

The technology of (analogue and digital) Integrated Circuits (ICs) on silicon chips became commercially available in the late 1960s. This technology advantage was not really recognised until printed circuit technology became commercially viable in the early 1970s.

Before then, vacuum tube (valve-based) telecommunications transmission equipment inherently had a very high maintenance requirement where most equipment was routinely checked on a daily basis, employing thousands of technical and support staff to maintain a very highly reliable Inter-Exchange Transmission Network.

Because there was so much very well established valve technology telecommunications equipment that was gradually being replaced by new equipment that used the new technology of transistors and later ICs, it took until the late 1980s before executive management recognised that the new silicon-based technologies had a virtually nil maintenance requirement.

Silicon IC-based telecommunications transmission equipment inherently had a very low maintenance requirement where most equipment was installed and left alone for decades until it is retired, employing virtually nil technical and support staff.

The technology of mechanical (Sylvester (corded) Switchboards, Line Finder, Strowger, Step-by-Step, Motor Uniselector, Crossbar) switching technologies were all maintenance intensive technologies that physically wore out over decades of use through physical movement of mechanical components.

Mechanically-based telecommunications switching equipment inherently had a very high maintenance requirement where most equipment was routinely checked and repaired on a monthly basis, employing thousands of technical and support staff.

As both valve-based transmission equipment and mechanically-based switching equipment aged, the maintenance requirements gradually became far more intensive and far more expensive signalling the end of economic life and equipment was routinely replaced in a nominal 40 year life cycle.

In the mid-1980s the telecommunications manufacturing business went through a sudden major global restructure. The CCITT (now ITU) had over some decades before generated a very large series of Recommendations for standardised telecommunications transmission, radio and switching interfacing.

This rationalisation together with the new silicon-based transmission and switching technologies incidentally introduced a very wide equipment standardisation that in turn lead to immense economies of large scale production through globalised telecommunications equipment manufacture. Within a few months local Australian design and manufacture was totally replaced by production line assembly, or total imports of globally manufactured equipment not even assembled in Australia.

In 1985 - 1987 the technology of Single Mode Optical Fibre (SMOF), which was very largely lead from within Australia became the industry standard to almost totally replace wideband point-to point radio and coaxial cable long haul transmission systems. Distance was now virtually a non-issue and bandwidth was virtually

unlimited; and combined with the new digital transmission technologies of Plesiochronous Digital Hierarchy (PDH) and later Synchronous Digital Hierarchy (SDH), and ATM and MPLS and IP these all made the Inter-Exchange Network virtually invisible.

The extremely low maintenance Digital Switching "wave" that started in 1981 in Australia was complete by 1993 bringing with it a wide range of digitally-based retail products (including but now way limited to: inexpensive electronic metering, number portability, mobile phone roaming, Internet services, Broadband connectivity etc.) that radically changed the employment structure within the telecom sector.

The PMG / Telecom Australia (pre-1990) was very much an engineering based infrastructure business based on providing intensive service to the existing high maintenance equipment as the first priority. Post-1990, the maintenance component has gradually and radically dropped and the face of telecommunications changed to be commercially driven as a retail reselling organisation with few Engineers and Technical staff and a large majority of Lawyers and Advertising / Marketing; Sales staff.

The real problem is that now Telstra etc. are fundamentally managed as Retail Resellers with retail marketing schedules that span 6 months or at a maximum of 12 months. The prime focus has radically moved from providing all consumers (subscribers, premises etc.) with a fully functional telecomms service, but providing services that provide the highest Return on Investment (ROI).

The outcome of this failed strategy is that there is a (geographical) telecommunications divide, where the metropolitan (high ROI) customers have all services provided and the non-metropolitan (low ROI) customers are in a desert of services.

By the late 1990s, successive Federal Government have recognised this (geographical) telecommunications divide, and have set up a series of Inquiries and initiatives to counter the problem - but - the Reports from these (over 15) Inquiries are extremely expensive wastes of resources as there is a severe lack of Engineering content / knowledge conveyed in these Reports to make any significant improvement to the situation.

The NBN outcome is a really classical mistake because the NBN is a partial network that is fundamentally impractical.

In the early 1980s, virtually zero maintenance IEN digital switching was introduced to replace very high maintenance mechanical switching. This roll out took about 12 years and was the forefront of a range of telecommunications technology changes that initiated the transformation in focus of telecommunications from infrastructure management / maintenance to a wide range of “bundled” retail products.

Almost concurrently in the early 1980’s, virtually zero maintenance digital transmission was introduced to replace high maintenance analogue transmission. This technology introduction also took considerable time because this technology had to be “integrated” to existing analogue transmission and mechanical switching platforms on a geographic basis.

From late 1985 the technology of virtually zero maintenance Single Mode Optical Fibre (SMOF) was introduced to replace wideband point-to-radio, coaxial cable and pair copper technologies extensively used in the IEN. The economic advantages of SMOF were simply astounding and this technology literally dissolved the “tyranny of distance” problems that had hog-tied Telecom Australia / Telstra – particularly in non-metropolitan (not State Capital City) areas.

In the late 1980s, "Mobile Devices" radio base stations (RBS) (back-connected by SMOF) were introduced into the CAN to provide connectivity to personal mobile devices (pagers and mobile phones). Fibre to the Premises (FTTP) for Government and Business was introduced from about 1988 and has gone through several technology advances to provide considerably wider bandwidths for virtually nil cost.

In the early 1990s FTTP for consumers was very heavily considered to totally replace pair Copper to the Premises (CTTP) but this engineering initiative was totally kyboshed by the very rushed competitive (Telstra against Optus) and extremely uneconomic introduction of Hybrid Fibre Coax (HFC) technology in only the metropolitan areas to provide Pay TV infrastructure – primarily for Foxtel to profit from.

This GOC technology became economically practical in the early 1990s primarily for very inexpensively managing the Inter-Exchange Network (IEN) and the development of Internet technology that made it every economic and practical to remotely monitor and control telecommunications equipment in a closed / secure Internet structure.

In the mid-1990s, the Inter-Exchange Network (IEN), which is basically a national mesh of long haul SMOF transmission systems cross-connected by network switches in nominally three layers (District, Regional and National / Competitive Inter-connect) went through a massive technology rebuild to largely replace the ageing Plesiochronous Digital Hierarchy (PDH) transmission equipment with relatively inexpensive (but far wider transmission bandwidth) Synchronous Digital Hierarchy (SDH) transmission equipment.

The far wider transmission bandwidth of this SDH-based equipment also provided the facility for Internet Protocol (IP) transmission and facilitated IP switching / routing at a minimum cost, paving the way for the later introduction of Voice over IP (VoIP) to dramatically minimise the cost of telephony / mobile connectivity.

In the late 1990s following the technology development of Internet and with the realisation that dial-up modem technology was far too slow for Website connectivity, the new technology of Asynchronous (directional data rate) Digital Service Line (ADSL) was very inexpensively introduced to operate over the pre-existing (and ageing) pair copper telephone sub-CAN (Exchange Switching Area) infrastructures.

Almost concurrently, the technology of Cable Internet became available providing upwards of 24 Mb/s to a large majority of premises in metropolitan areas. The prime problem was/is that the Coaxial Cable portion of the HFC infrastructure was minimally engineered because of infrastructure competition. This poorly engineered metropolitan-only CAN infrastructure resulted in most premises set back from streets (up to say 10% of all metropolitan premises) being unable to connect with HFC because the line amplifiers were omitted to minimise project time and blowout costs.

ADSL came out in three phases as this technology improved. ADSL1 as the first phase in about 1997/8 had a maximum downstream data rate of 8 Mb/s. In about 2000/1, ADSL2 came out with a maximum downstream data rate of 12 Mb/s. In about 2003/4, ADSL2+ came out with a maximum downstream data rate of 24 Mb/s.

The pair copper CAN was never re-engineered for ADSLxx and this is a prime reason why the ADSLxx Broadband downstream data rates range from under 1 Mb/s up to 24 Mb/s in a very high proportion of sub-CAN ESAs all over Australia as clearly demonstrated in the Data Cube[4] data.

In 2005 the simplistic Cable Internet structure of one metropolitan telecomms exchange site holding all the Broadband Routing equipment became far too overcrowded and the threat of the NBN network infrastructure takeover became real. Telstra totally restructured the Cable Internet Broadband routers to be in all (400) Local metropolitan exchange buildings together with a considerably expanded SMOF redundant network and Regional Switch pairs to ward off this NBN threat and make Cable Internet available for up to over 4.5 M premises.

Since the late 1990s, the Federal Government has facilitated a large number of very poorly considered "Initiatives" to fix the problems caused by the Davidson Report.

The GOC is the service management hub of the telecommunications network in much the same manner as parents are the infrastructure centre of a family. Each telecommunications infrastructure business has its own GOC. Telstra has its GOC in Carlton, Melbourne. Optus has its GOC in North Ryde, Sydney. NBN has its GOC in Docklands, Melbourne.

Each GOC has what is called a Service Control Network (SCN) that is effectively a national, but externally closed Internet infrastructure connecting to control to every piece of equipment in every telecommunications centre owned / managed by that infrastructure business.

It should be extremely obvious that splitting part of the CAN infrastructure away from one service provider (i.e. Telstra) and migrating this CAN part of infrastructure to another service provider (i.e. NBN), without also migrating / transferring the Service Control Network (SCN) for all this equipment, and also migrating / transferring all the associated Inter-Exchange Network (IEN) infrastructure concurrently is a fatally flawed and extremely expensive and extremely slow concept.

The way I see it, the MAP framework and associated policy have both been written in total ignorance of the physical practicalities and this MAP will do absolutely nothing to resolve the problem of migrating network infrastructures because the MAP refers to parts of the sub-CAN without relating the associated IEN and SCN components.

In reading through this document it became fairly clear to me that this is a policy document is very “wordy” (contains a large amount of words that are to a large degree superfluous) and/or was written with a critically severe lack of Australian telecommunications industry engineering knowledge.

[4] https://www.mybroadband.communications.gov.au/resources.aspx

The national broadband network will offer all Australian premises access to high speed broadband and telephony services and deliver structural reform of the industry via the structural separation of Telstra's copper and hybrid-fibre coaxial (HFC) networks.

There are fundamental problems here: "high speed broadband and telephony services" actually means "fixed access telecommunications services". Differentiating between telephony and broadband is a misnomer.

Further; "***deliver structural reform of the industry via the structural separation of Telstra's copper and hybrid-fibre coaxial (HFC) networks***" is basically flawed because separating the (pair) copper to the premises (CTTP) and Hybrid of (Single Mode Optical) Fibre and Coaxial Cable (HFC) partial CAN infrastructures from Telstra does not deliver any structural reform or separation at all; it merely takes the ageing and loss making CTTP and HFC infrastructure from the Telstra books and places this in the NBN books.

The infrastructure referred to here is a fractional part of the telecommunications Customer Access Network (CAN) and totally misses out on including the Inter-Exchange (Backhaul) Network (IEN)[5] which is the absolutely essential complimentary part of the overall telecommunications that makes end-to-end calls possible.

Telstra's (pair) Copper to the Premises (CTTP) and are each separate parts of the Customer Access Network (CAN). The CAN consists of several other infrastructure components[6].

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