

Submission to House of Representatives Committee on Infrastructure and Communications

2011

Submission 226

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Prepared by Alun Davies – Head of NBN Workgroup New England and Regional Communications Advocate

Position on NBN – Passionately in favour, because I would like to leave our next generation of Australians a legacy and a fighting chance to enjoy the lifestyle we have

Public Hearings – I would be more than happy to be called before House of Representatives Committee on Infrastructure and Communications in Sydney on 29th April to speak and answer questions on my submission and how the implementation of the NBN can benefit Australia

My Qualifications to speak on this subject

- **I Was 40 years in PMG/Telecom/Telstra/TCW, mainly in network/transmission/switching**
- **For the last 8 years I was Network Specialist in Telstra Country Wide New England North West**
- **During this time we moved our network from the worst in Australia into top 10, mainly through use of fibre to combat lightning damage to copper network eg. Wollomombi, Kingstown, Marple, Mole River, Craighleigh, Gulf Creek and Frasers Creek**
- **Due to huge number of complaints we were receiving, worked a lot with Tony Windsor and Richard Torbay on customer communication issues. Eg Mt Tingha and Yetman**
- **After I left TCW ,worked with Tony to form a small NBN workgroup, which included your own local Inverell Councillor David Jones, whose aim was to bring NBN to New England**
- **I have worked with numerous workgroups and people to formulate and implement concepts/projects that maximise use of NBN to benefit Australia**
- **It is a great honor for Armidale and New England but is also a great responsibility. What we achieve in areas of Health, Education, Commerce and Community has to be built on and replicated across Australia**

My Technical Reasoning behind support for the NBN network

1. The need for data speed is increasing in a logarithmic trend and we need to plan for this(see Page 13)
2. Copper is great for speech, but not suited for high speed synchronous data transmission. The transfer of data is severely degraded over distances of less than 5km's. Fibre can transfer data at same rate over distances of 60km's. (see page 14)
3. The ability of fibre to transfer data is almost limitless, over 10,000 time more than Wirless(see page 15)
4. Copper is severely affected by water and lightning, requiring constant maintenance like the Harbour Bridge(see pages 16, 17 and 18)
5. Fibre is not affected by lightning and water ingress, therefore minimal maintenance. In New England which is one of the worst lightning prone areas in Australia, we have had fibre in the ground for 25 years with almost zero damage
6. Our present network is far too complex, with ten's of thousands of data network inhibitors eg. RCM's IRIM's, CMUX's, ISAM's, RAM8's, 4DPGS's, 6/16's, copper multiples and loading coils(see page 19)
7. Fibre takes up minimal space in conduits eg. 2400 pair copper cable is as big as your thigh, a fibre cable that could handle every phone connection in Australia is as big as your thumb
8. A fibre based network, is extremely simple and vastly more future proof than a copper based one. You only need to change equipment on end of fibre to up-grade data speeds eg. 8Mg/bits – 34Mg/bits – 140Mg/bits – 2.5G/bits – 10G/bits – 40G/bits - ?

Summary

- *Fibre is all about a simpler network, which can transfer almost limitless data and is vastly more future proof than copper (see pages 20 and 21)*
- *Relatively speaking and compared to other items in budget such as Social Security and Health it is not that expensive, only \$6B/year which is 2% of GDP(see page 28)*
- *With data comes information, with information comes knowledge and with knowledge comes power to shape the future*
- *We need to leave our children, grand children and great grand children a legacy to help them with the immense problems they will be confronted with in the future eg. Water shortages, food security and energy availability*
- *NBN is about teaming up Australia to give our next generations a fighting chance to enjoy the lifestyle we had*

Points of Reference

I think the best way I can speak in favour of the NBN is to highlight some of the Projects and Concepts we are progressing in Armidale 1st Release Site and New England. Many are quite advanced and not far off physical reality

a) the delivery of government services and programs;

- ❑ Data Farm and Server Forest located in Regional Areas, hopefully associated with NBN Points of Interconnect and Local Medicare Groups to provide the following services
 - Cloud Computing
 - Local Medicare Groups data storage
 - Transfer of medical images
 - Patient records
 - Local Government Data and Services
 - State and Federal Government Data and Services
- ❑ Social Services via NBN to Public Housing to encourage workplace participation

b) Achieving health outcomes;

- Joint Armidale and Kiama remote patient care and monitoring
- Remote patient care and monitoring eg. Waufarin levels in blood, Blood Pressure, Blood Glucose levels and weight
- Transfer of medical images between Radiology – GP's – Hospitals – Universities and Inter State
- Stroke Recovery using NBN and Nintendo Wii
- Smart House, allowing elderly and chronically ill to stay at home longer and be monitored by family and health system eg. Sensors to check if stove has been left on
- Smart Farm, again allowing people to stay longer in the places they love

Again this is all about using the NBN to team up areas of Health to achieve a far more efficient system that delivers good patient service, whether you are at home or in the system(see Page 26)

c) Improving the educational resources and training available for teachers and students;

- Teaming up great institutions such as TAFE, UNE and CTC to deliver (see page 27)
- High Definition 2-Way Video Links to lectures, classes and certification courses
- Virtual Class rooms
- Cloud Computing
- IP-TV
- Presbyterian Ladies College – Autumn Lodge Retirement Village – University of New England, 2-Way HD Video Link for Students and residents eg. Choir, life histories and community issues

d) the management of Australia's built and natural resources and environmental sustainability;

- Integrated communications plan for Murray/Darling Basin(see pages 8, 29, 30 and 31)
- Establishment of Smart Farm(see page 25) for
- Increased food production
- Water efficiency
- Carbon footprint
- Farmer safety and social support/inclusion
- Combined use of Point to Point wireless, Next G Mobile, LTE and Satellite communication technologies for farm use/efficiencies/safety/support(see page 25)
- Export opportunities to entire world on a huge scale(see page 31)

e) Impacting regional economic growth and employment opportunities

Smart Farm

- Cloud Computing (see page 23)
- Smart/House/Business (see page 22)

f) Impacting business efficiencies and revenues, particularly for small and medium business, and Australia's export market

- Cloud Computing (see page 23)
- Combination of a Smart House and Cloud Computing(see Page 25)
- 2-Way High Definition Video Conferencing for training and certification

g) Interaction with research and development and related innovation investments

Smart Farm – UNE, NICTA, CSIRO, RDA's and Regional Communities teaming up for the future benefit of Australia(see page 25)

h) Facilitating community and social benefits; and

- Smart House(see page 23)
- Smart Farm incorporating “Avatars” for mental and business support(see page 25)
- HD video link Autumn Lodge Retirement Village – PLC School – University of New England
- Public Housing broadband links to Government groups to facilitate workforce participation

i) **the optimal capacity and technological requirements for a network to deliver these outcomes**

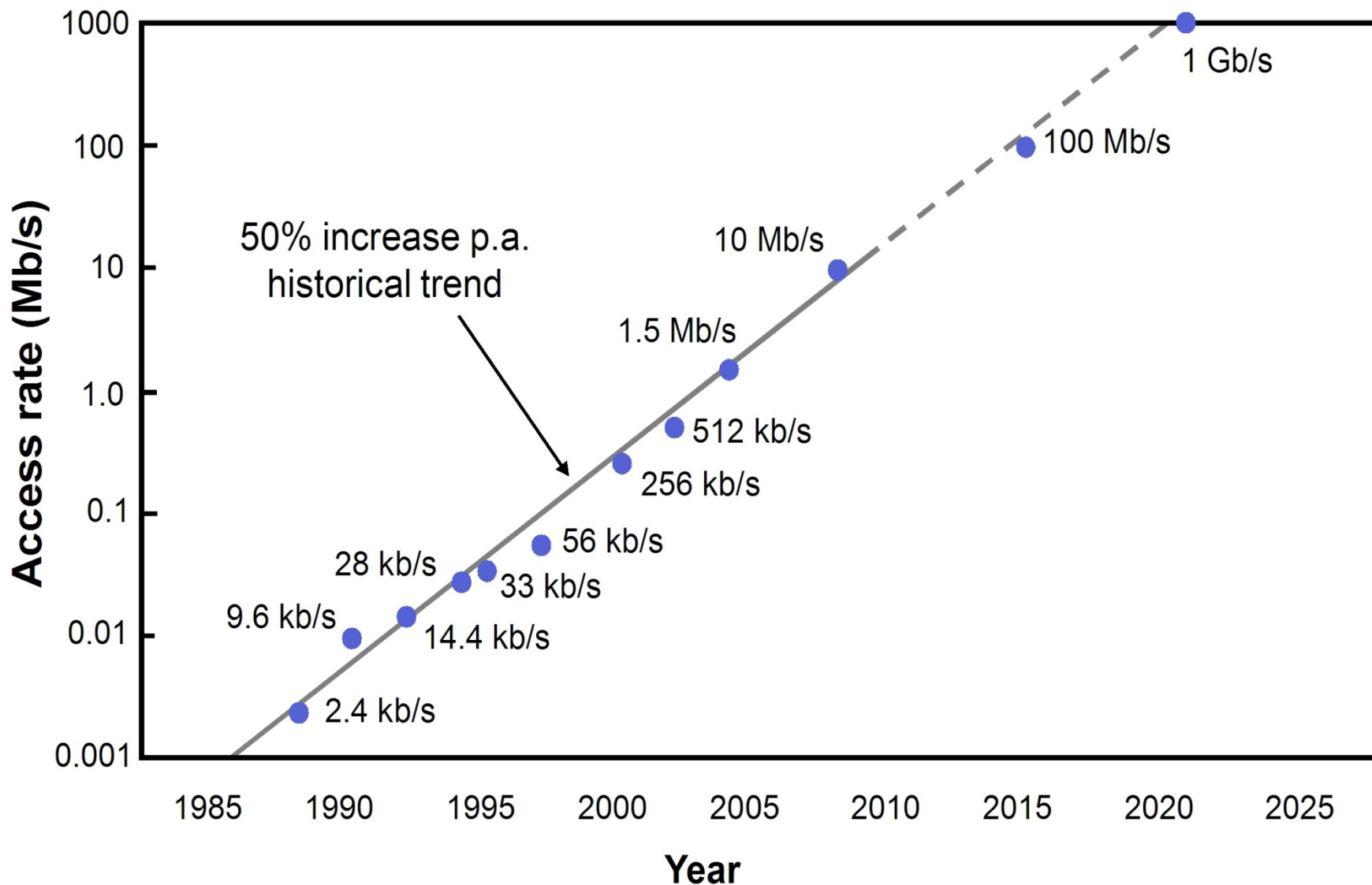
1. The single most important consideration has to be the Point of Interconnect(POI),which has to be reliability of service to customers and regions. There would not be many network staff who have experienced firsthand what happens when a network outage isolates whole towns and communities ie Hospitals, Police, Councils, SES, Elderly, Business's and customers. Having personally managed a few and seeing the absolute pandemonium and chaos they cause, these situations need to be avoided at all costs. NBN especially could well do without them! The recent floods are good example of what can happen
2. In New England North West I would recommend Armidale, Tamworth, Inverell, Gunnedah, Moree and Narrabri be nominated as POI's(see attached diagram)
3. All links to POI's to be on Ring Technology
4. NBN to have their own link to each POI
5. Carriers to be encouraged to combine Fibre routes and build Rings eg. Transgrid and Optus to Armidale and Tamworth(see attached diagram)
6. Each customer to have a minimum of three alternate transmission paths out of POI
7. POI's can switch Telephony locally in the advent of a Transmission failure
8. POI's to have a locally associated Data Farm and Server Forest, similar to cache in computers
9. Ability to quickly isolate POI from network in case of cyber or virus attack
10. POI's to have dual processors and power feeds, similar to AXE Nodes
11. Mobile Base Stations where ever possible to be on separate Transmission paths to POI's
12. Telstra and other carriers should work towards placing 90% of Exchanges or transmission points on Ring Technology

See page 32 For diagram explaining above

Conclusion

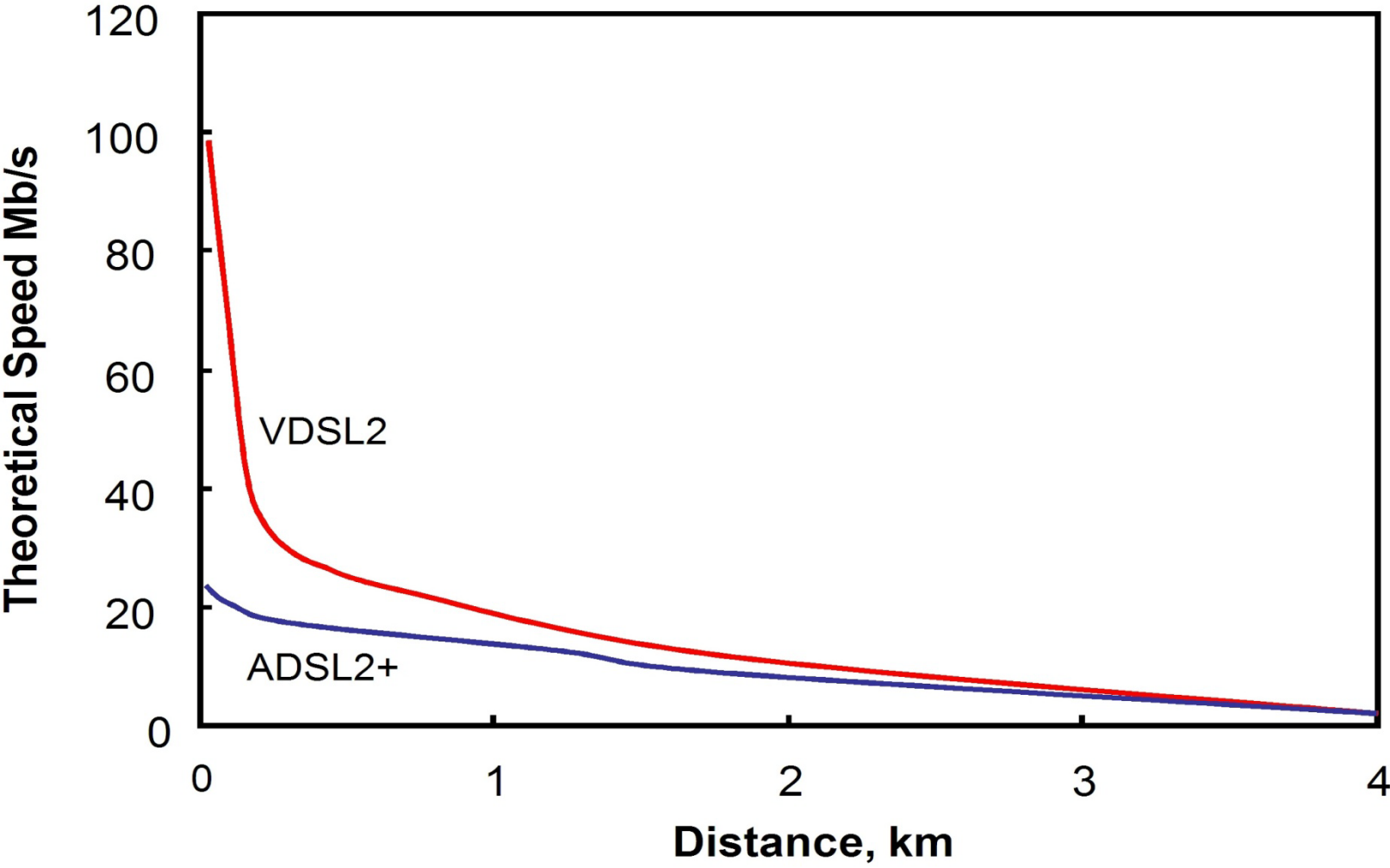
- Fibre and NBN is a natural network transition from copper to fibre, just like aerial to underground
- Fibre and Wireless are extremely complimentary
- The Wireless spectrum is worth its weight in gold, we can not afford to waste it or worse still load it down until it becomes inoperable like Ag-Quip in Gunnedah has done on numerous occasions
- To build the NBN will cost around 2% of GDP and positively impact across all areas
- Copper is a very expensive network to maintain and is ongoing
- It costs ~\$150k to replace IRIM's or CMUX's and there at least 10,000 in Australia, impossible to future proof
- **Building the NBN with its vast capacity for data transfer is all about teaming up Australia for the Future**
- **This is a once in a generation opportunity**
- **We need to seize the moment, our children, grand children and great grand children are depending on us**

Historical Evolution of Accepted Data Speeds



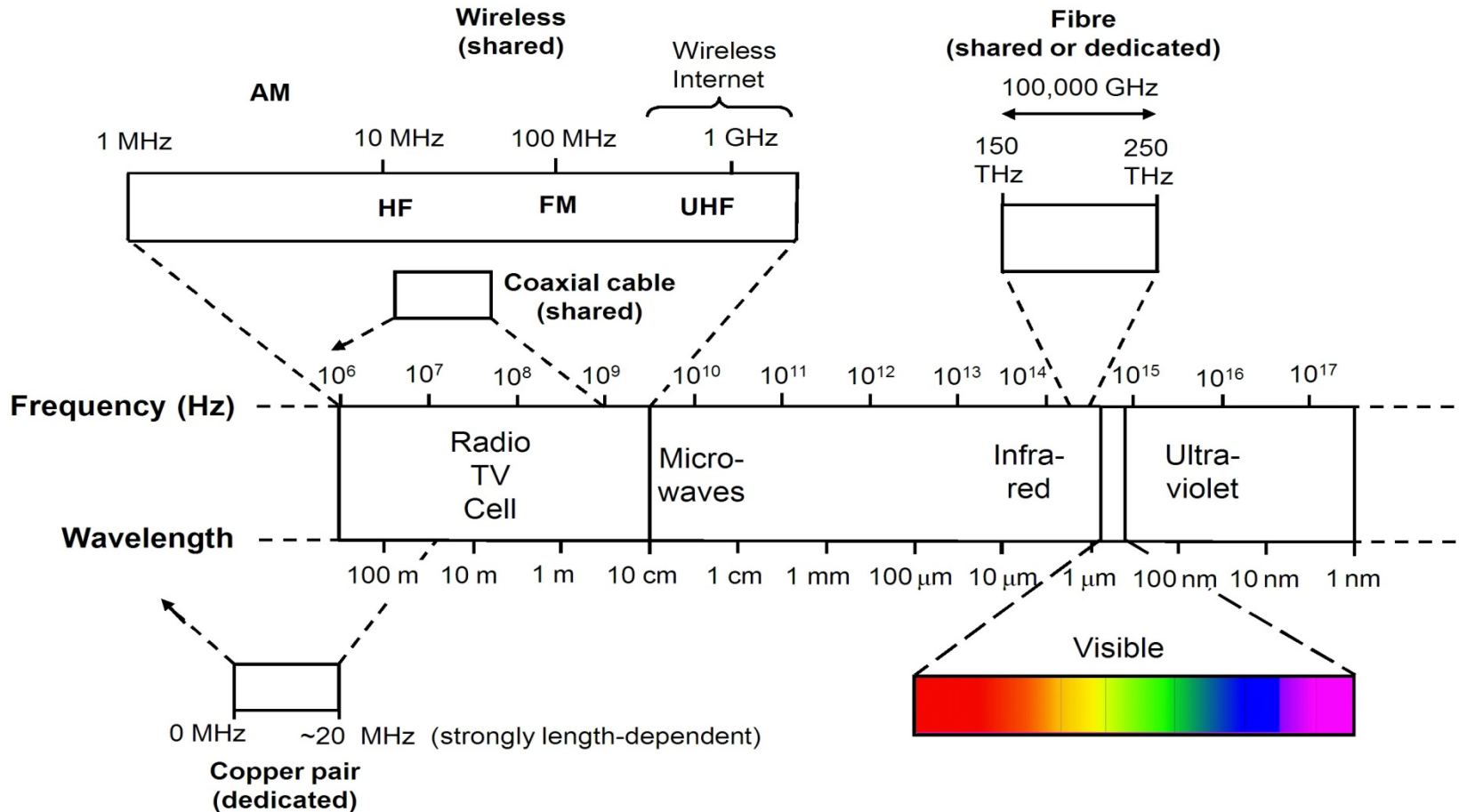
Source NBN Co

DSL Theoretical Data Speed vs Distance Using Copper



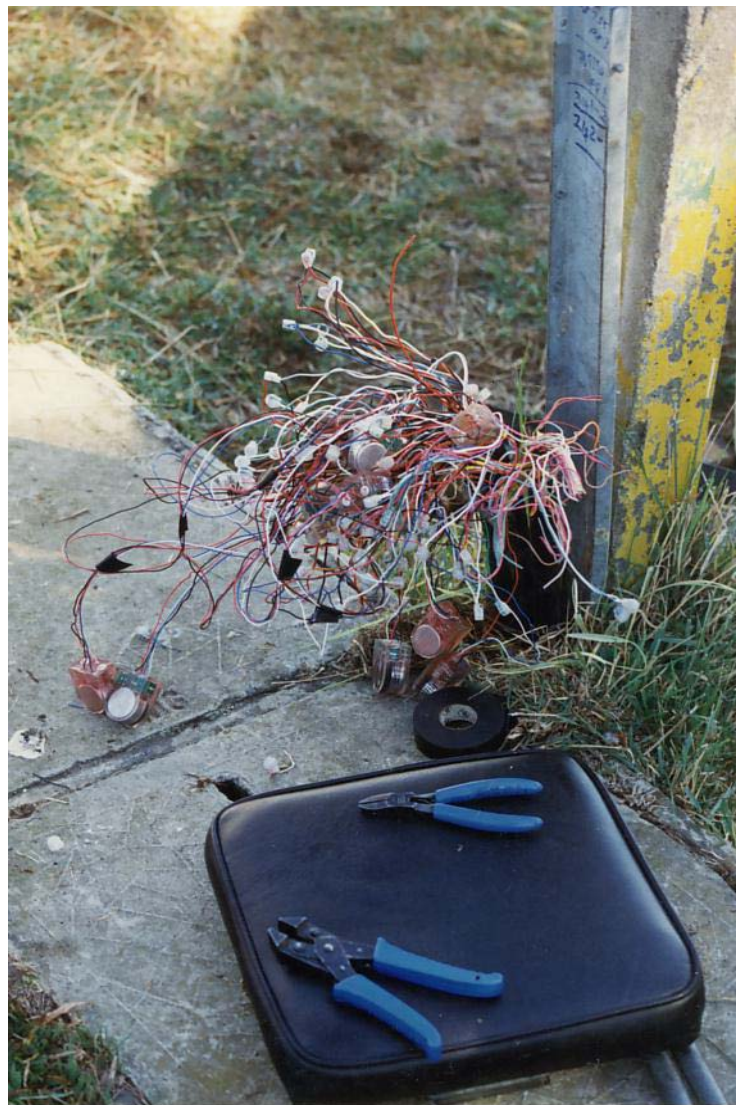
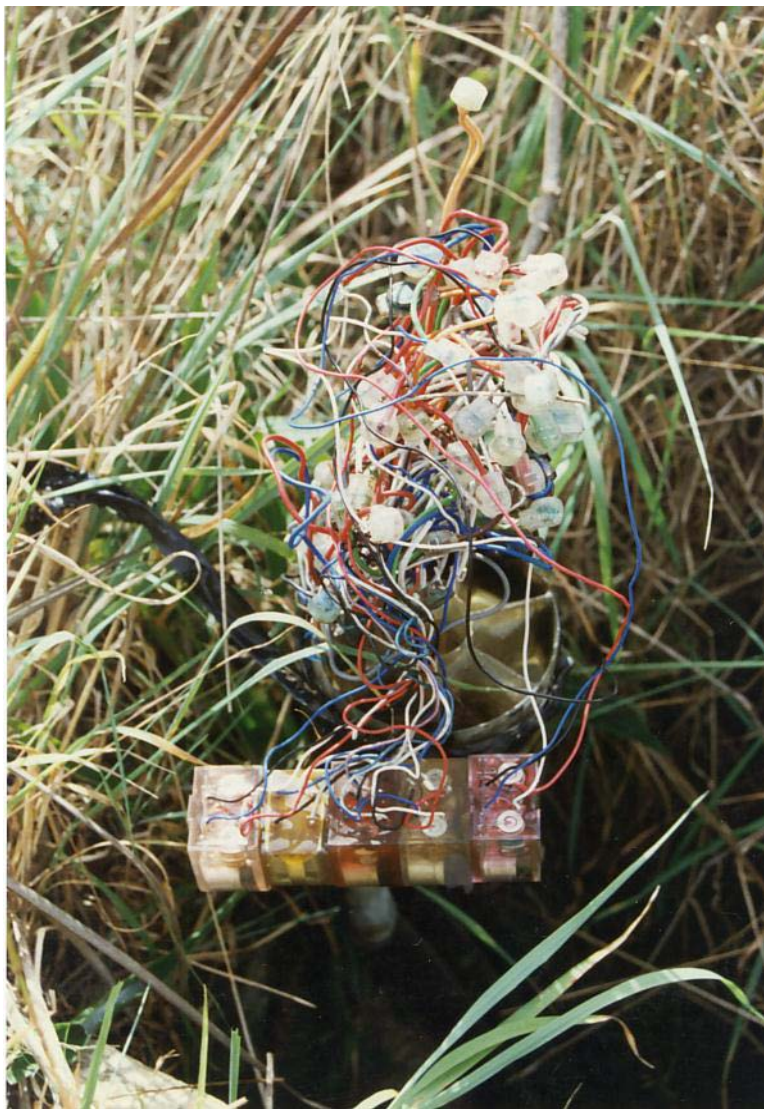
Source Rod Tucker IBES

The Electromagnetic Spectrum



Source Rod Tucker IBES

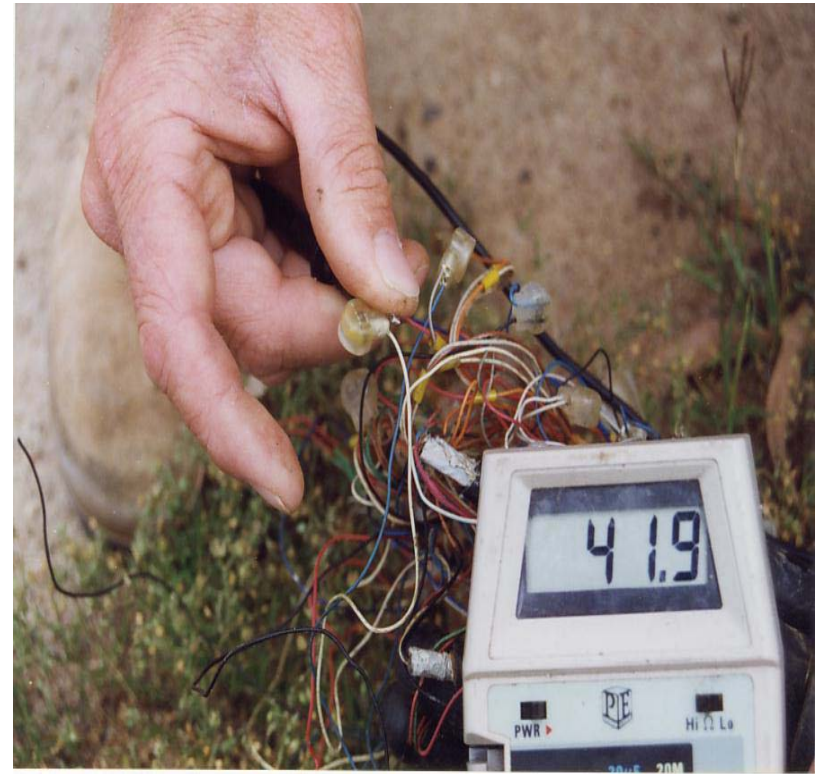
Lightning Damage – Copper Joints



Lightning Damage – Slave Cable



Water Damage – Copper Joints

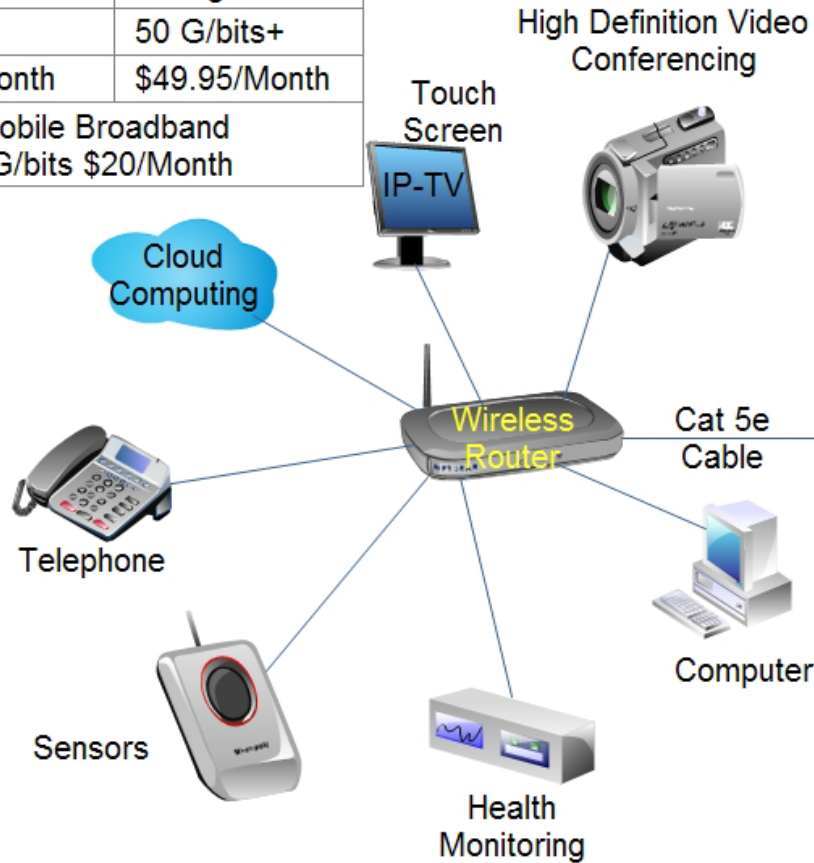


Green Boxes RCM, RIM, CMUX and ISAM



Your House Connection to National Broadband Network

At My House ADSL 2+	At My House NBN
8 Mg/bits D	25 Mg/bits D
384 K/bits U	10 Mg/bits U
50G/bits	50 G/bits+
\$49.95/Month	\$49.95/Month
Mobile Broadband 2G/bits \$20/Month	



Your House

h-Health
h-Education
h-Commerce
h-Social Inclusion

Network Boundary Point

Fibre Termination Unit
on side of house



Street Fibre
Including Lead-In

Fibre Connect Cabinet



Street Fibre



RSP's Telstra,
Optus, IINet etc

National
Broadband
Network

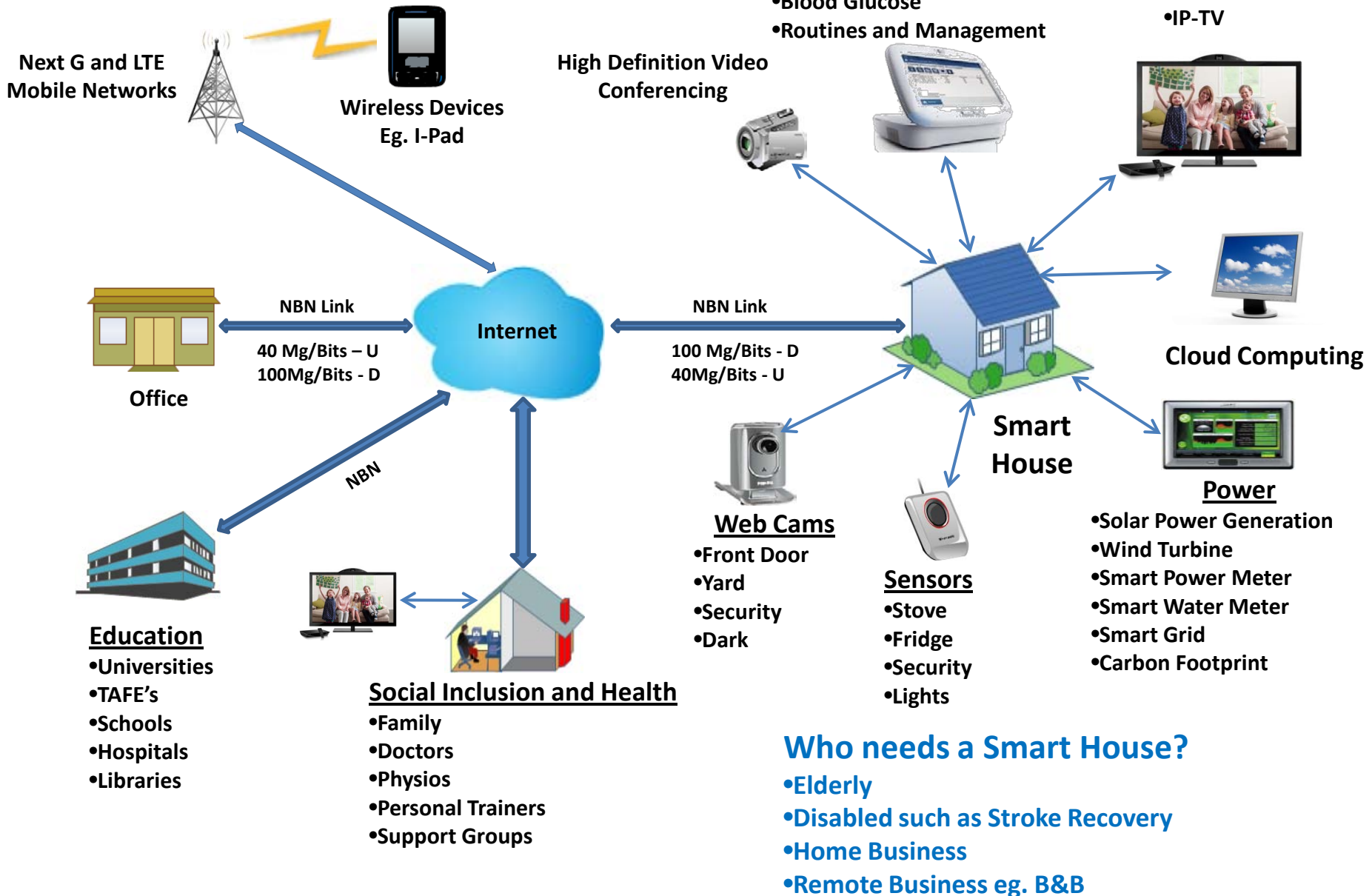
\$0 cost to customer

NBN Street Equipment



Fibre Connect Cabinet

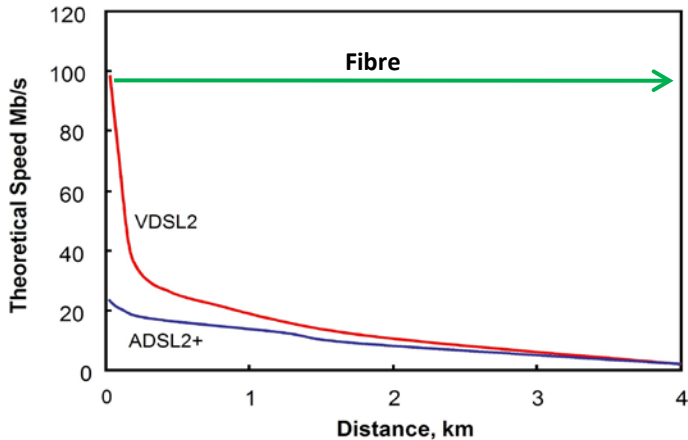
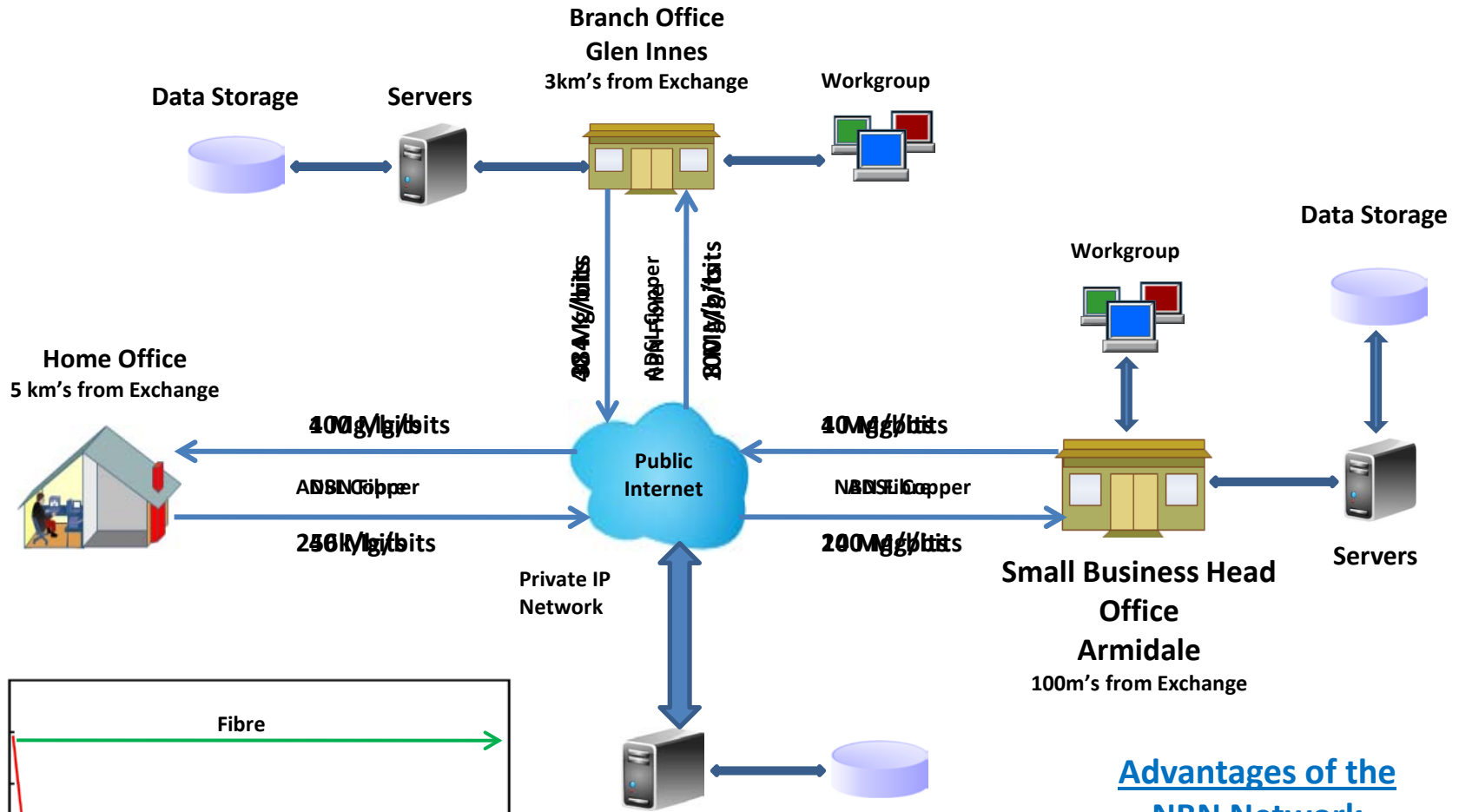
Smart House



Who needs a Smart House?

- Elderly
- Disabled such as Stroke Recovery
- Home Business
- Remote Business eg. B&B

Cloud Computing

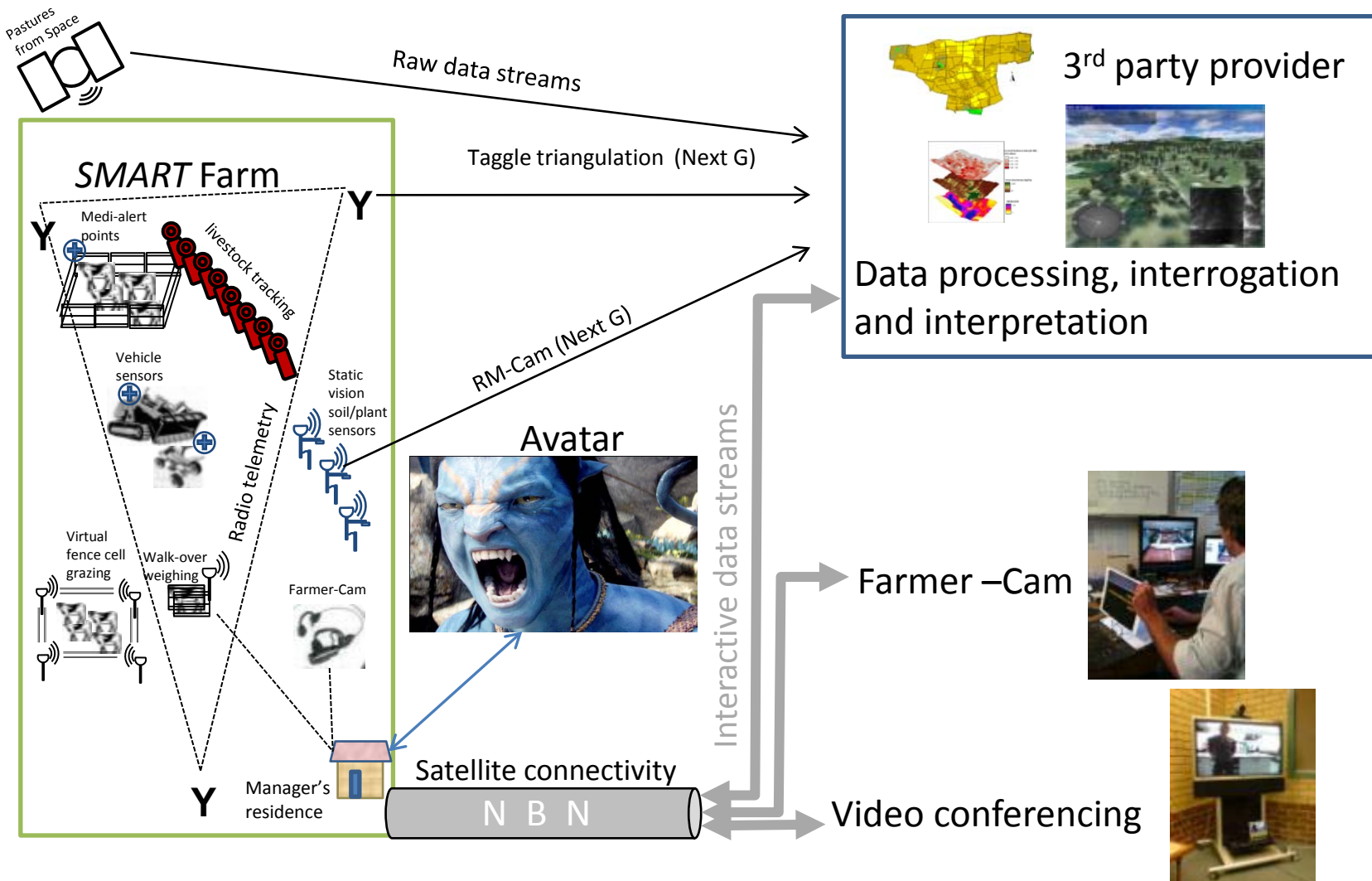


- Telstra – Next IP
- Amazon
- Microsoft
- Google
- HP

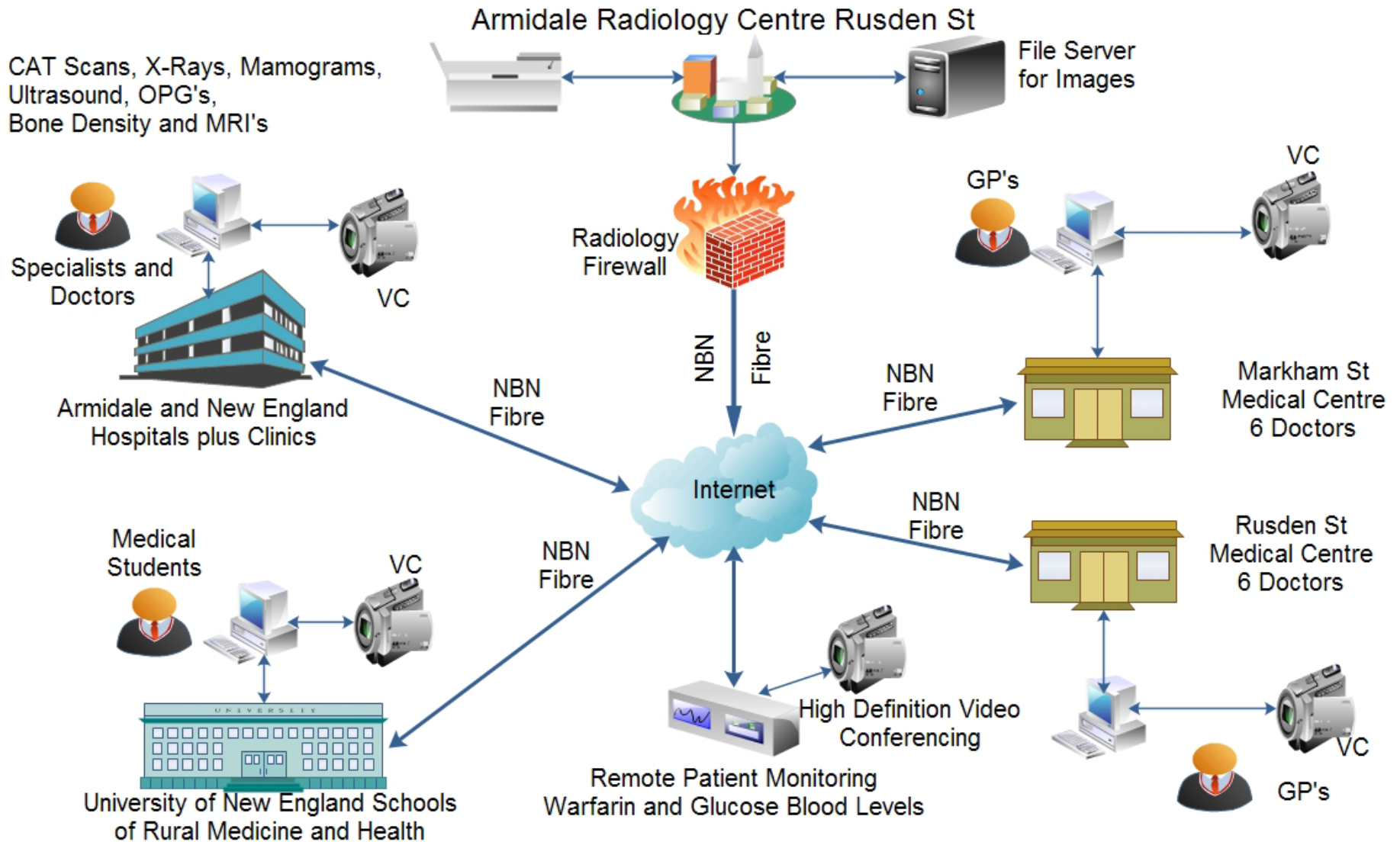
Advantages of the NBN Network

- Speed
- Distance
- Synchronicity
- Capacity
- Scalability
- Simplicity

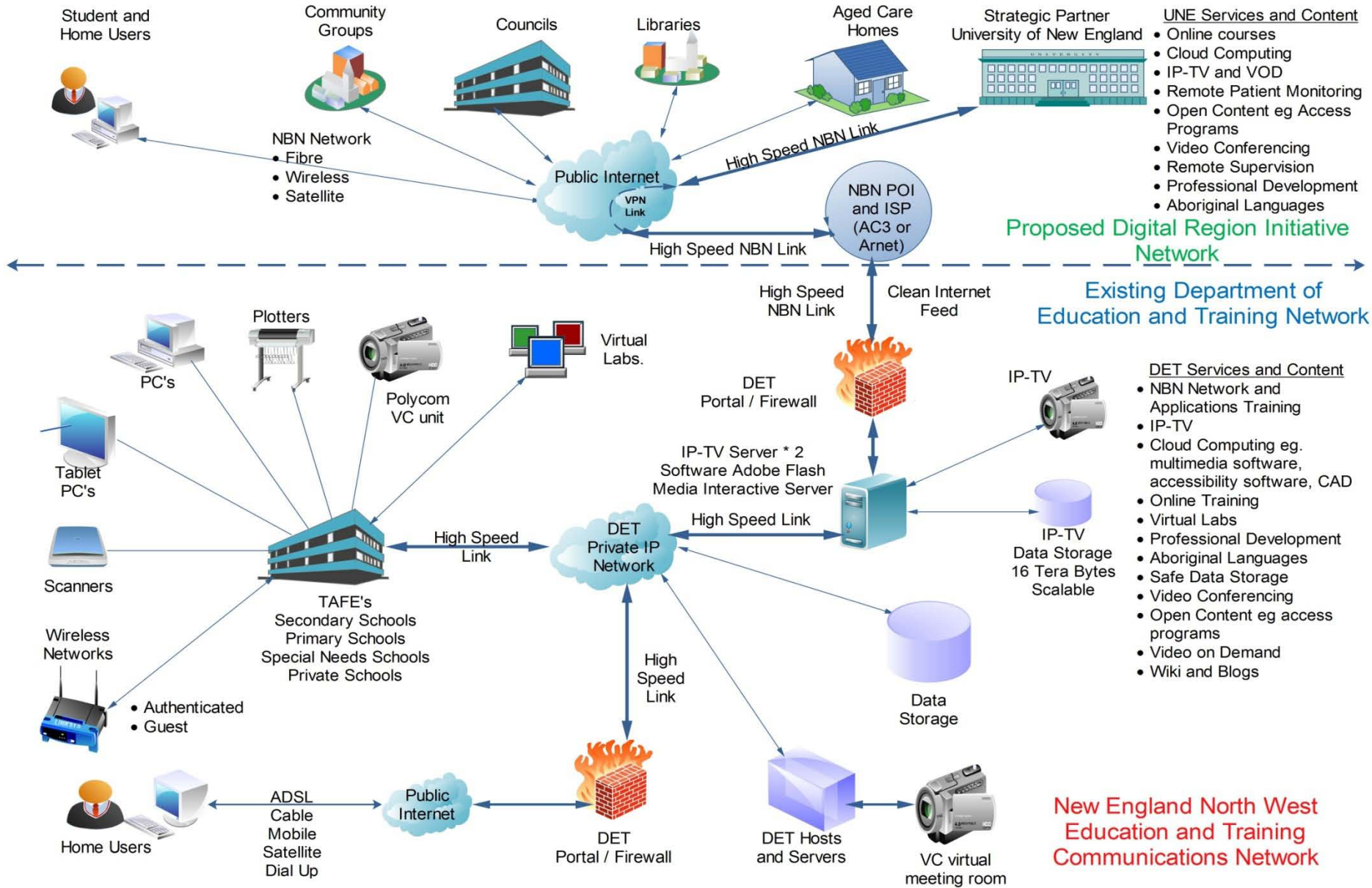
Candidate technologies and connectivity



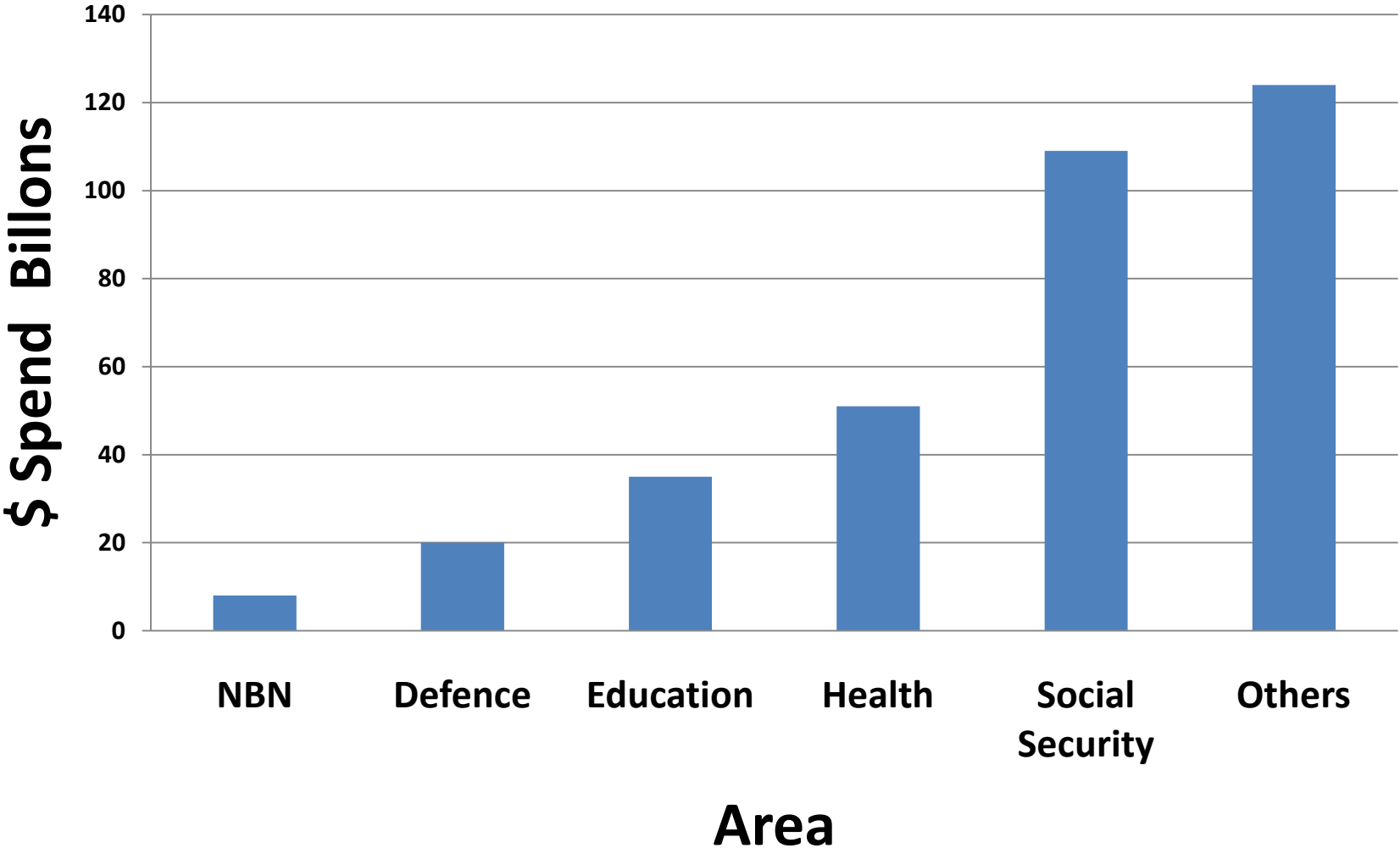
Use of NBN to benefit Health Industries(GP's, Hospitals and Schools of Rural Medicine and Health UNE) by remote Patient Monitoring and transfer of Radiology Images



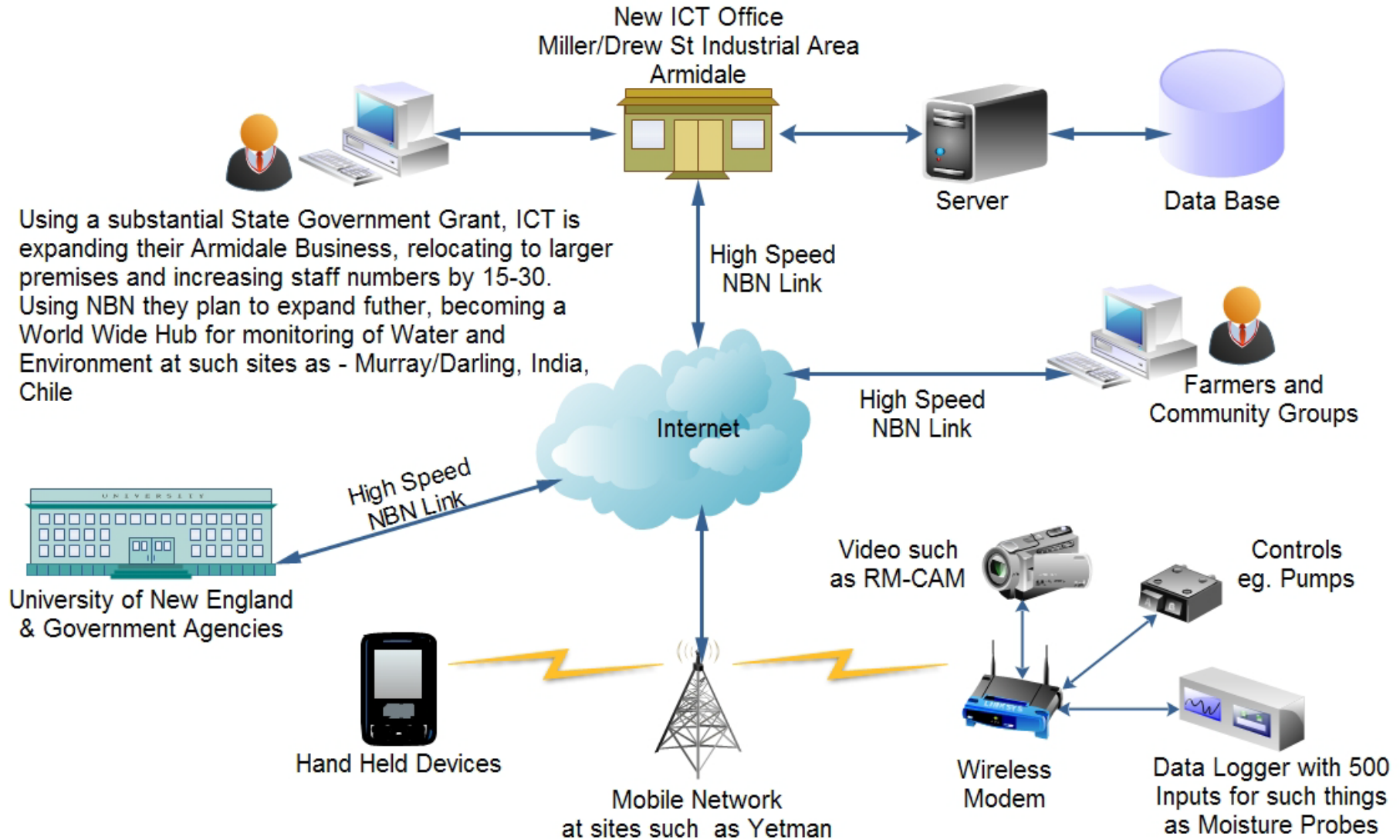
Proposed Armidale TAFE and UNE Communications Network using NBN



Australian Budget



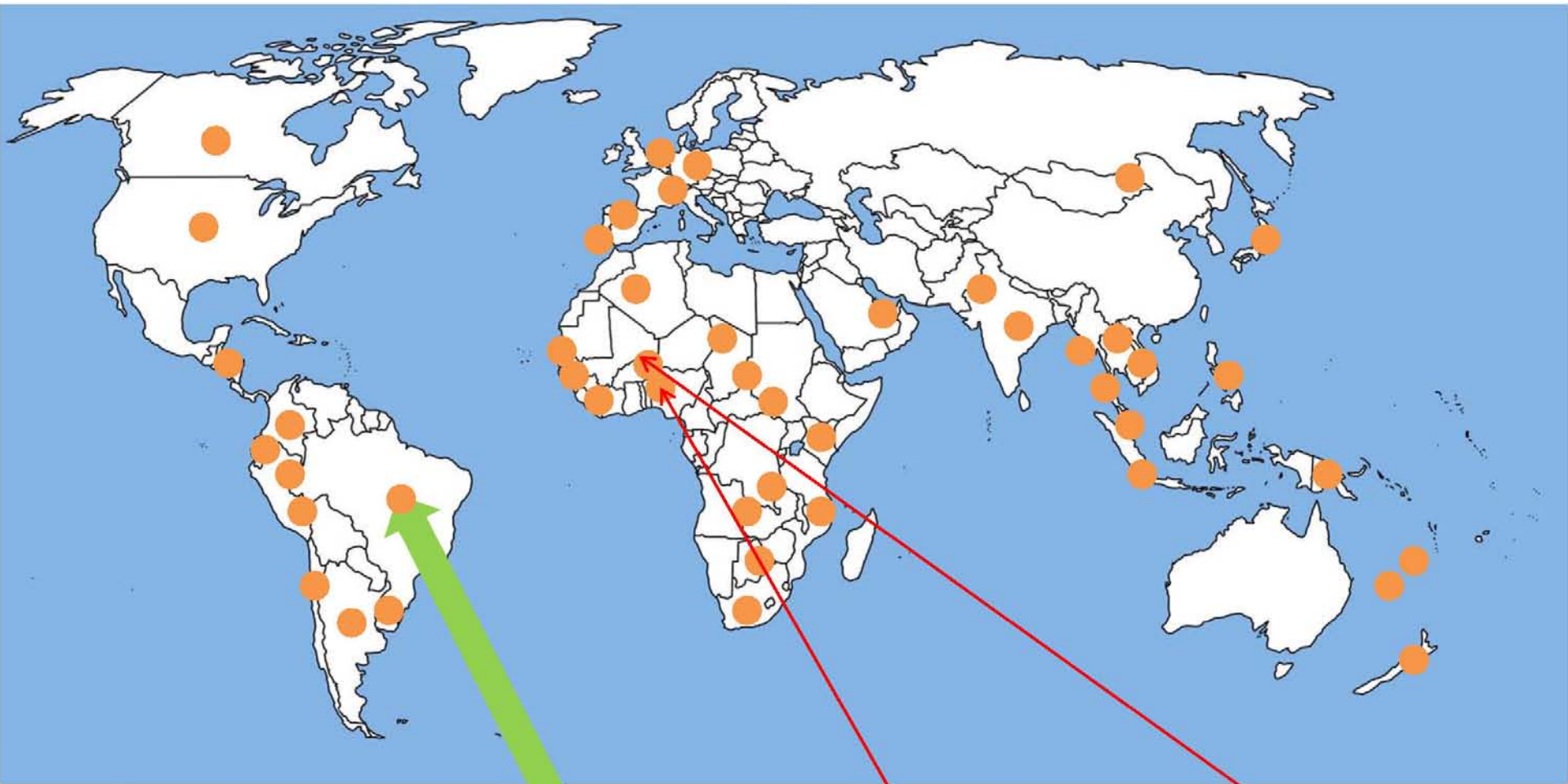
ICT Business Armidale Water and Environment Monitoring/Management



The Murray-Darling Basin



Export Sales – 45 Countries



Brazil

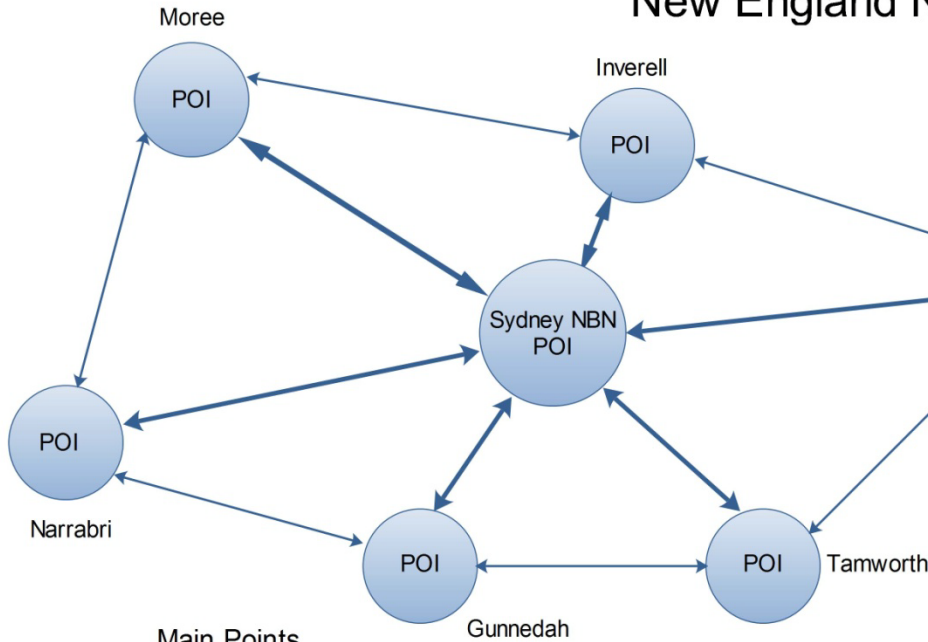
Benin

Burkina Faso

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Points of Interconnect (POI's) Proposed Network Architecture New England North West



Main Points

- All links to POI's to be on Ring Technology
- NBN to have their own link to each POI
- Carriers to be encouraged to combine Fibre routes and build Rings
- Each customer to have a minimum of three alternate transmission paths out of POI
- POI's can switch Telephony locally in the advent of a Transmission failure
- POI's to have a locally associated Data Farm and Server Forest, similar to cache in computers
- Ability to quickly isolate POI from network in case of cyber or virus attack
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- Mobile Base Stations where ever possible to be on separate Transmission paths to POI's

Armidale
See diagram below for more detailed connection map of POI

