

National Research Network project



Overview and Update

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Overview



- Background + context
- Policy & network objectives
- NRN component projects
 - Focus on innovation
- Related projects
- NBN
- Future thinking

Background



- May 2009 Federal Budget (GFC stimulus \$\$\$)
 - Education Investment Fund (EIF) ... Super Science
 - > \$300m ICT (eResearch) infrastructure investments

Research data management	ANDS	\$50m
Research data storage	RDSI	\$50m
High-performance computing	NCI	\$130m
Applications & tools	NeCTAR	\$47m
Data networks	NRN	\$37m

NRN – “*Extension and upgrading of the **Australian Research and Education Network (AREN)***” or

“connecting it all together”

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Background



- Feb-June 2010 – DIISR Consultation
- July 2010 – UniSA Lead Agent agreement
- August 2010 –
 - Project announcement
 - Eight funded projects, pre-selected by DIISR from consultation report
 - Steering Committee + Project Director
- Sep-Nov 2010 – Consultation – component projects
- Dec 2010 – Implementation begins

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Australian Research and Education Network (AREN)



- *“Extension and upgrading of the AREN”*
- “network of networks” of publicly funded high speed R&E networks – currently:
 - AARNet – National and most states
 - VERNet – Victoria
 - SABRENet – South Australia
 - Institutional WAN links – e.g. UTas regional
- Concept, not a formal entity

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NRN Strategic Framework - Policy



- Policy Objectives
 - Interconnect Data-Intensive Facilities
 - Facilitate Research Collaboration
 - Create Accessible Infrastructure
 - Create Sustainable Infrastructure
 - Facilitate Future Investments
- EIF / Super Science Principles
 - As per DIISR statements

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NRN Strategic Framework - Network



- **Network Objectives**

1. **Reach**

Extend the AREN to significant research sites in Australia

2. **Capacity**

Enhance the bandwidth of existing AREN connections

3. **Redundancy**

Enhance the reliability of the AREN

4. **Utility**

Enhance the utility of the AREN

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Component Projects - Where the money going?



Component project	NRN contrib	Reach	Capacity	Redundancy	Utility
Tasmanian Regional	\$1.4m	X	X		
Sydney Basin	\$6m	X	X	X	
Qld Sunshine Backbone Tails	\$2.5m	X	X	X	
WA capacity and connectivity	\$4.7m		X	X	x
Brisbane Metro	\$2m			X	
Adelaide to Perth	\$7m		X		X
Victorian Research Network	\$5m				X
Research Data Storage Infrastructure (RDSI) connectivity	\$8m				X

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What is the current status of the component projects?



Component project	Who?	Status
Tasmanian Regional	UTas	Completed
Victorian Research Network	VERNet	Implementation
Sydney Basin	AARNet / NAUDIT	Contracting
Qld Sunshine Backbone Tails	AARNet / QRNO	Contracting
Adelaide to Perth	AARNet	Contracting
WA capacity and connectivity	AARNet / WARNO / CSIRO	Approval
Brisbane Metro	AARNet / QRNO	Proposal development
Research Data Storage Infrastructure (RDSI) connectivity	TBA	Consultation / scoping

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Two kinds of projects



- Reach, Capacity & Redundancy
 - Filling gaps – completing the status quo
 - Improvements: quality / reliability / performance
 - Tas, Qld, NSW, WA*, Adel-Perth
- Utility
 - Doing new things – innovation (= riskier)
 - Adel-Perth, WA*, VRN, RDSI
 - More 'interesting'

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Adelaide to Perth (to Murchison)



- Extending AARNet's optical network from Adelaide, via Perth, to the ASKAP site
- Currently:
 - Adel-Perth – 10Gbps
 - Perth-Murchison – nil
- New system 80x100Gbps max capacity (8Tbps)
 - 3 x 40Gbps initially
- Perth to Murchison part of WA NRN project
- Enables research on a fundamentally new scale



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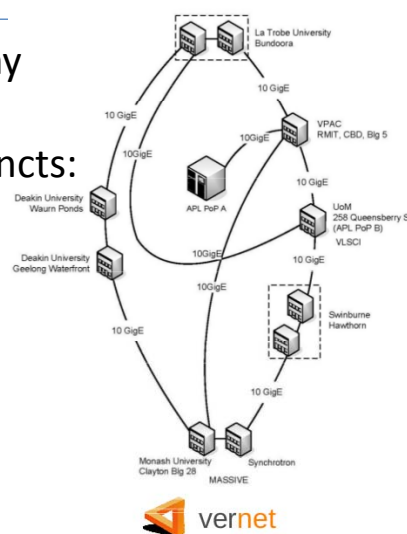
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Victorian Research Network



- 10Gbps Layer 3 any-to-any network connecting researchers in five precincts:
 - CBD / Parkville
 - Hawthorn
 - Clayton
 - Bundoora
 - Geelong



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Victorian Research Network



- Uses existing VERNet Layer 1 / 2 network – no new fibre builds
- Accessible to all PFRIs
- Flat access fee for all users
 - Volume and bandwidth independent
- “enough” bandwidth to meet each researcher’s assessed needs - VERNet manages capacity
- Core bandwidth upgradeable to meet aggregate demand
- New approach to R&E network provisioning

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Research Data Storage Infrastructure (RDSI)



- National facility for the storage, curation and sharing of signification research data collections
- Will comprise ~6 data centres (“nodes”) located around the country
- Aggregate capacity “many” Petabytes
- Researcher perspective – one integrated facility
 - Shouldn’t care (too much) where data is actually stored
- Which means nodes will need to talk to one another...

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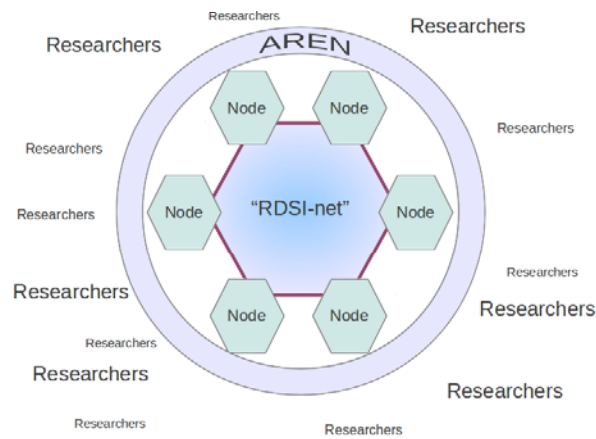
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“RDSI-net”



- NRN will “join the nodes” (method TBA)



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Related activities



- NBN ‘Blackspots’
 - NextGen Pty Ltd – wholesale regional backhaul
 - Provides for R&E access e.g. via AARNet
 - Good public policy at work
- AARNet upgrades
 - Tasmania
 - ASKAP – Geraldton-Murchison fibre
 - International
- NBN – inevitably

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NRN and the NBN



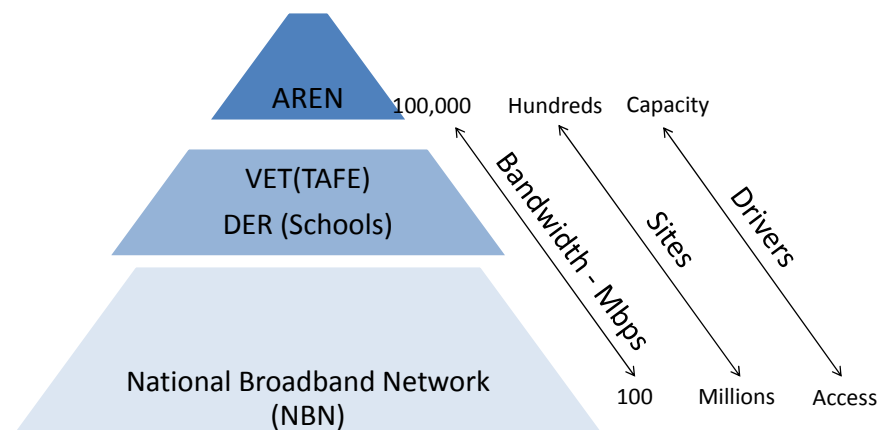
- Q: Doesn't the (\$37b) NBN make the (\$37m) NRN obsolete?
A: No – They are complementary
- NRN – 10 – n x 100 Gbps (uncontested)
 - Upgrades and enhancements to the AREN
- NBN – 0.1 – 1 Gbps – (highly contested)
 - “Access network” for the AREN

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R&E Network Pyramid



The future



- “Utility” priority
 - Getting more from what we’ve achieved so far
 - Incremental upgrades, extensions + diversity
 - Shift from capital to recurrent spend
- Cloud computing – commercial services & networks
 - $\text{Cost} = \text{Unit price} + \text{network speed/charges}$
- Mobile
 - The growth sector
 - Not (yet) a major factor in AREN thinking
 - Interaction between campus WiFi (Eduroam) and commercial 3G, LTE etc
- AREN governance – we need some.