



INTERSECT

Intersect Australia

A model for eResearch Service Delivery

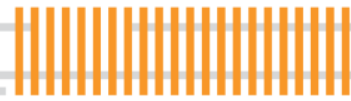
Ian Gibson



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About Ian

- academic background in Computer Science, Electrical Engineering and Pure Mathematics
 - PhD University of NSW in Computer Architecture
 - then worked for startups for a few years
 - 1992-2008 Canon Research lab in Sydney
 - Built and led a multi-disciplinary team of about 80 researchers and engineers creating technology for Canon's global businesses
 - Since 1998 CEO of Intersect
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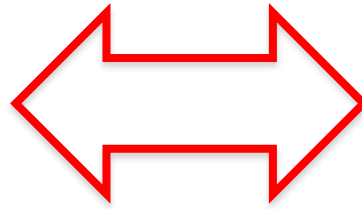


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About this talk



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MONASH University
e-Research Centre



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About Australia

- Australia usually losing the rugby – but who cares
 - The wine is pretty good
 - We have 5 of the 10 worlds most venomous snakes
 - We have (about) 38 universities and about 100,000 researchers in the Higher Education sector
 - We have just elected a new national government
 - We're pretty harmless
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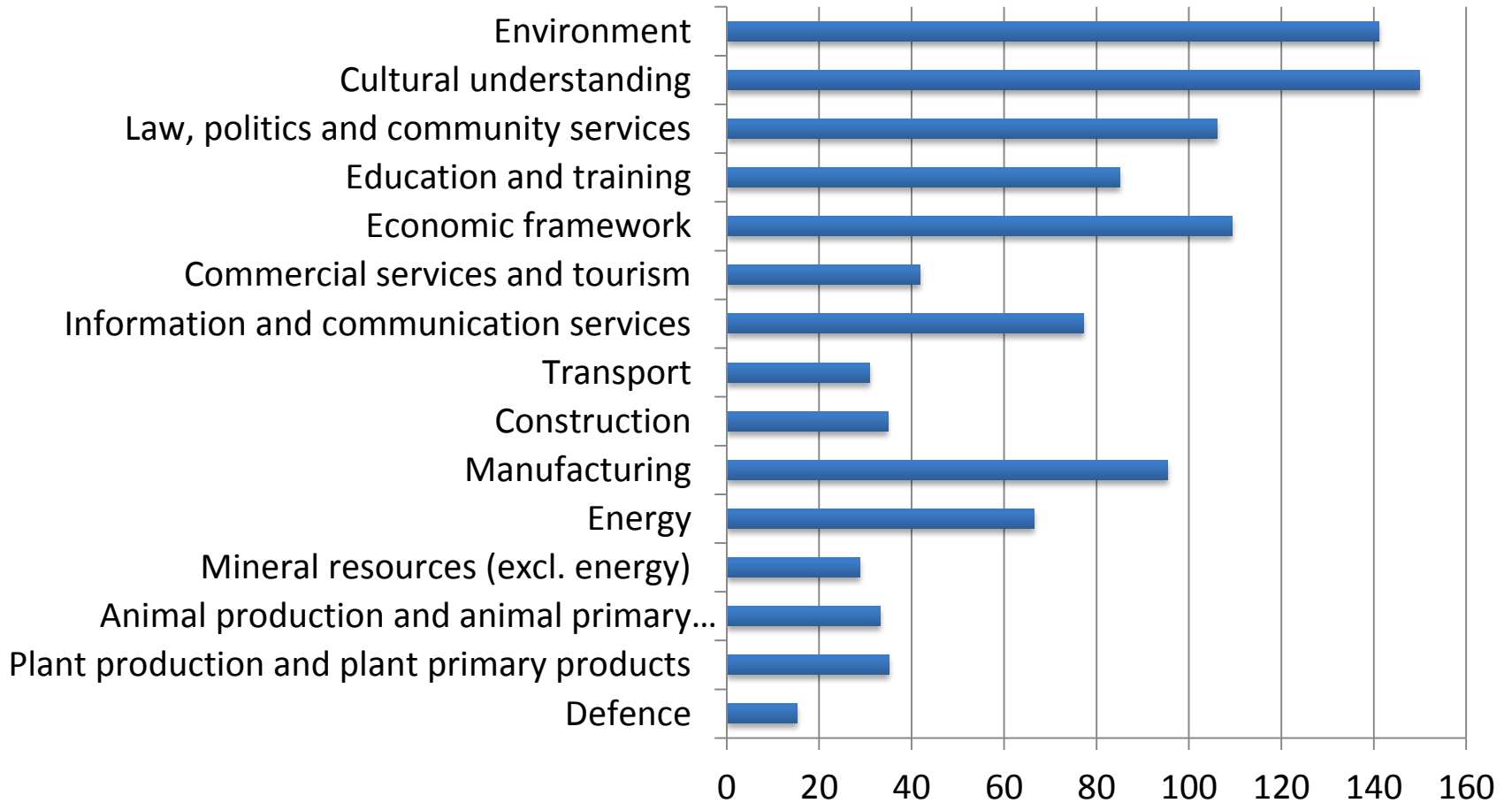
- South Africa = 1,221,037 sq kms
- NSW = 809,444 sq kms

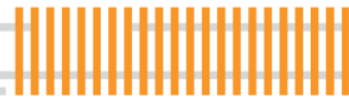




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University research in NSW (USDm)





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Funding

Since 2005, approximately USD400m has been spent by the Australian Government on national, dedicated, collaborative eResearch Infrastructure:

data management, collaboration support, high performance computing, networks, cloud, SW tools and on-line environments, research data storage, etc.

These facilities are delivered through special purpose projects

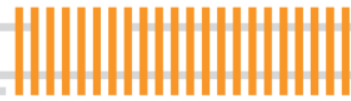


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Research
discipline
specific

Common
infrastructure





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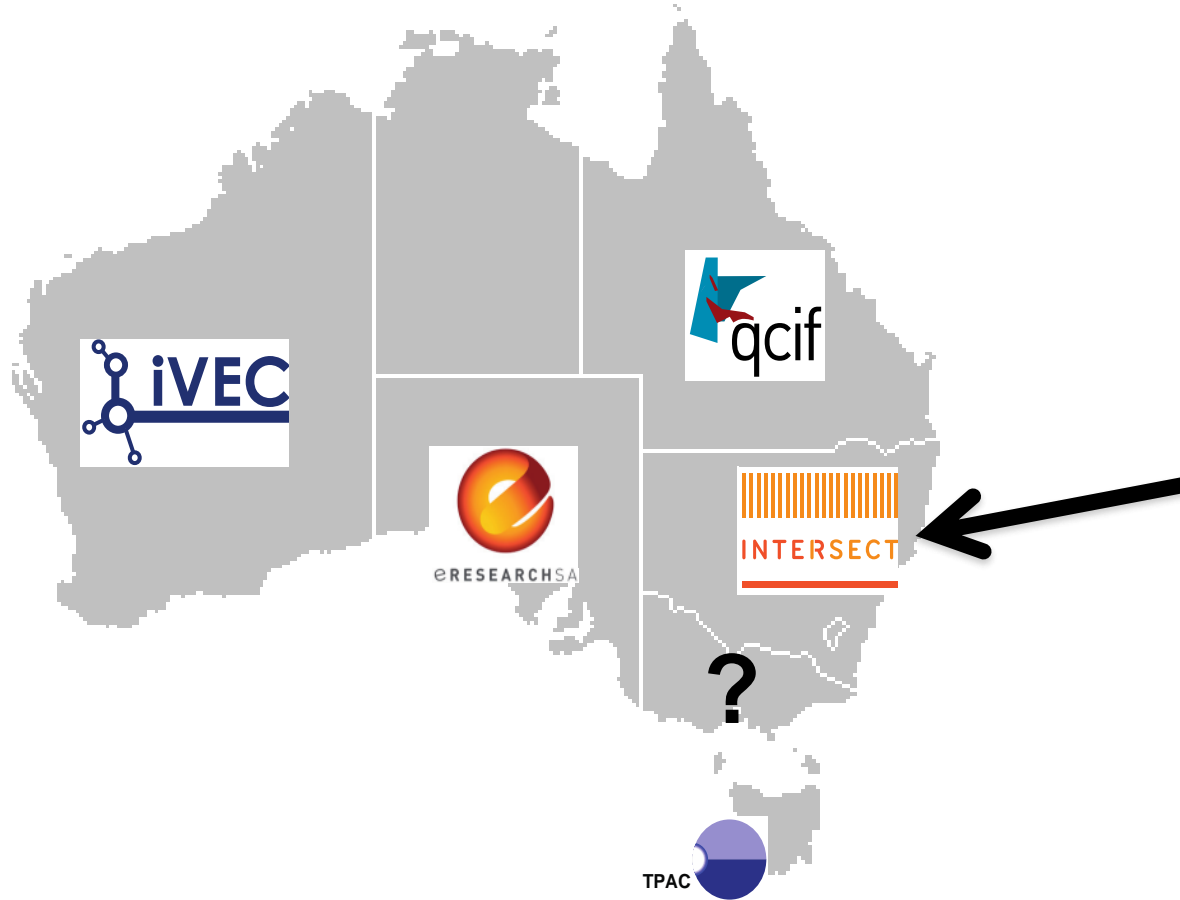


About Intersect...





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What is Intersect?

- A consortium of 11 universities in the state of NSW
- Established in 2008
- Approximately 70 staff
- Annual revenue is USD9m
- We provide a range of eResearch Services to our members

Our Mission:

To provide world class sustainable eResearch services and solutions

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Est: 1850
Income: USD1500m
Students: 51,394
Staff: 7368
THE rank: 62

Intersect's members

Est: 1990
Income: USD225m
Students: 11,234
Staff: 900
THE rank: -



1/2010



8/2010



11/2011



6/2009



1/2011



4/2012

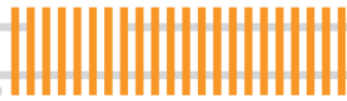


1/2013

Foundation

6/2008





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Why was Intersect established?

- Establish an eResearch capability beyond what is possible internally
 - Attract eResearch Infrastructure funding from other sources
 - Federal, state, industry
 - Capture economies of scale and technology re-use
 - Improve the capability and capacity of each member to undertake their science and research
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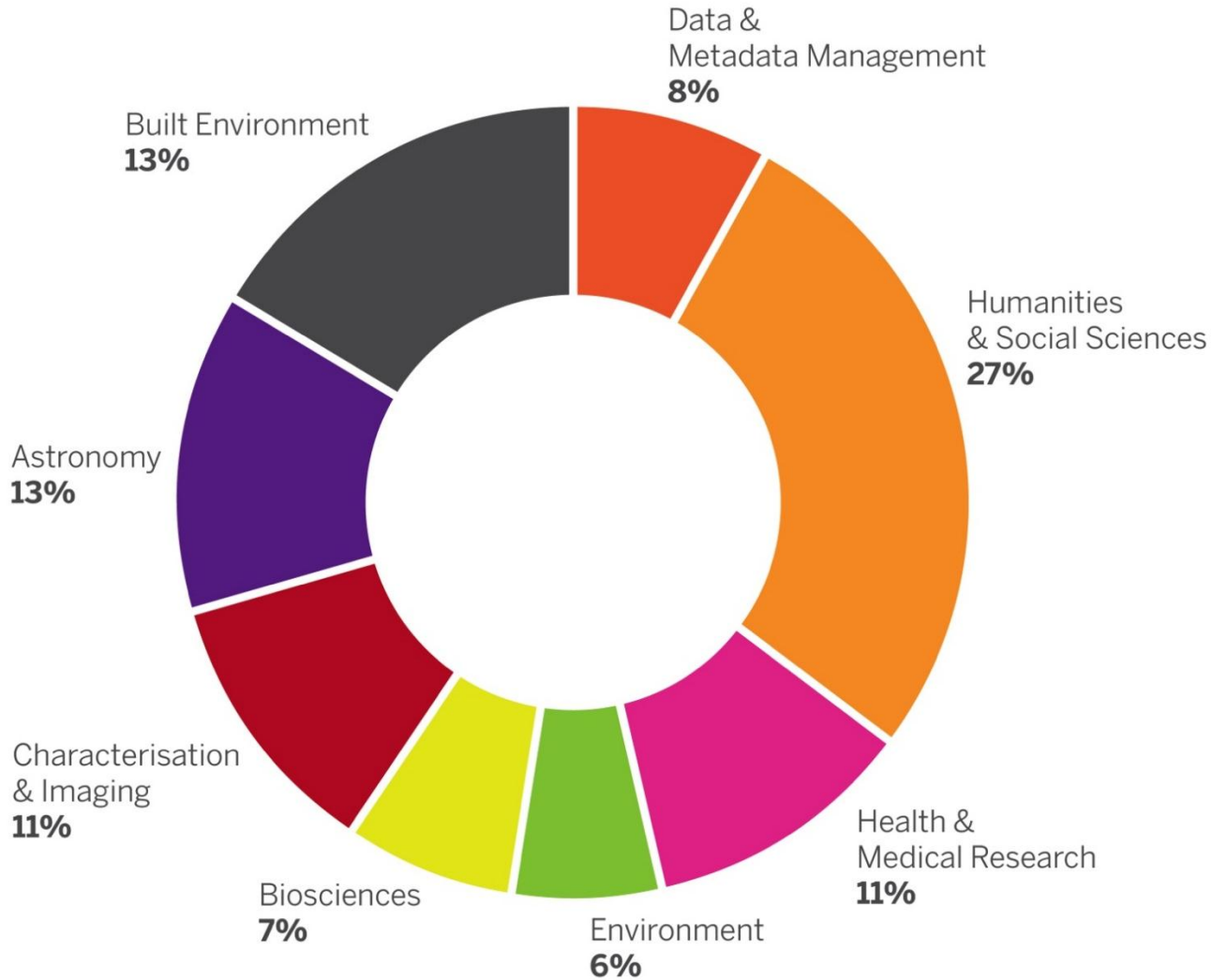
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What does that mean for members?

- Intersect offers a wide range of eResearch Services:
 - **A catalogue of eResearch tools**
 - **Software and systems engineering**
 - **Human based services – consulting, advice, training etc**
 - **Infrastructure services – cloud, HPC, storage etc**
 - We fill a gap in the market between internal IT Services, external providers and what research groups can provide themselves
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Activities by research discipline (2012)



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Some projects

Project	Field	What
ASVO	Astronomy	All-Sky Virtual Observatory
ASRB	Medical	Australian Schizophrenia Research Bank
FAIMS	Archaeology	Federated Archaeology Data
HUNI	Humanities	Network of cultural data collections
UnicarbKB	Biology	Metabolomics knowledge base and tools
CVL	Characterisation	Bringing together microanalysis tools and data
HCS	Linguistics	Several linguistic corpora and analysis tools
Industrial Ecology	Materials Science	What is the ecological impact of manufactured materials
Biodiversity	Climate Adaptation	Linking climate model outputs with adaptation and impacts models



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Some projects

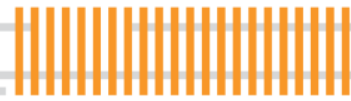
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taxitamer	Humanities	Sakkie + Paul Bonnington + spatial enabled mobile app = taxi driver control



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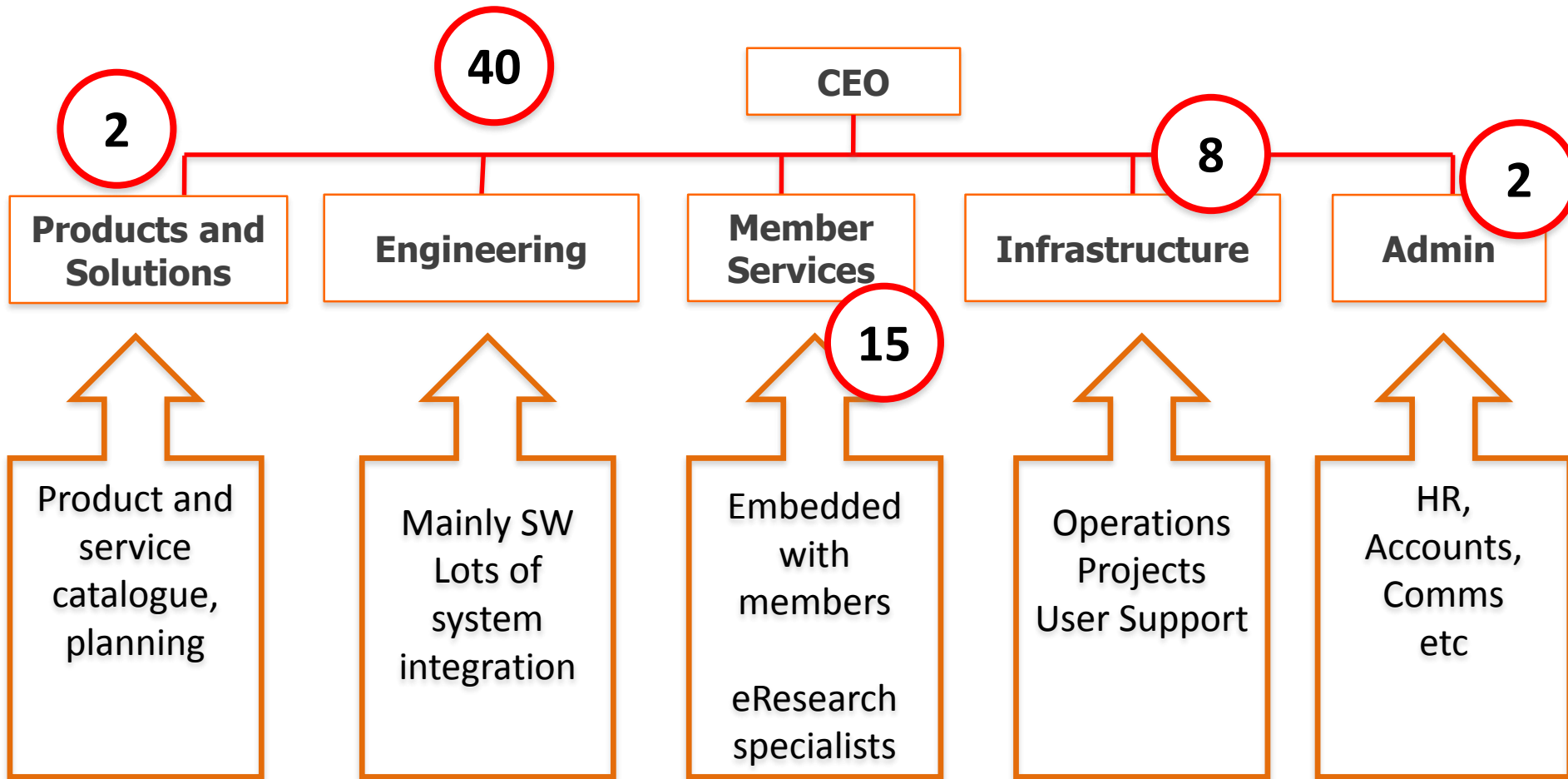
Delivery – A “hub and spoke” model

- Centralise core capability
 - Engineering, infrastructure admin etc in head office
 - Builds company culture of excellence
 - Ensures quality control
 - Locate staff with member universities to enable communication and engagement etc
 - The first point of contact for the university
 - In particular, for remote universities this is critical
 - Most researchers using our services, don't know they are sourced from us
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Company Structure





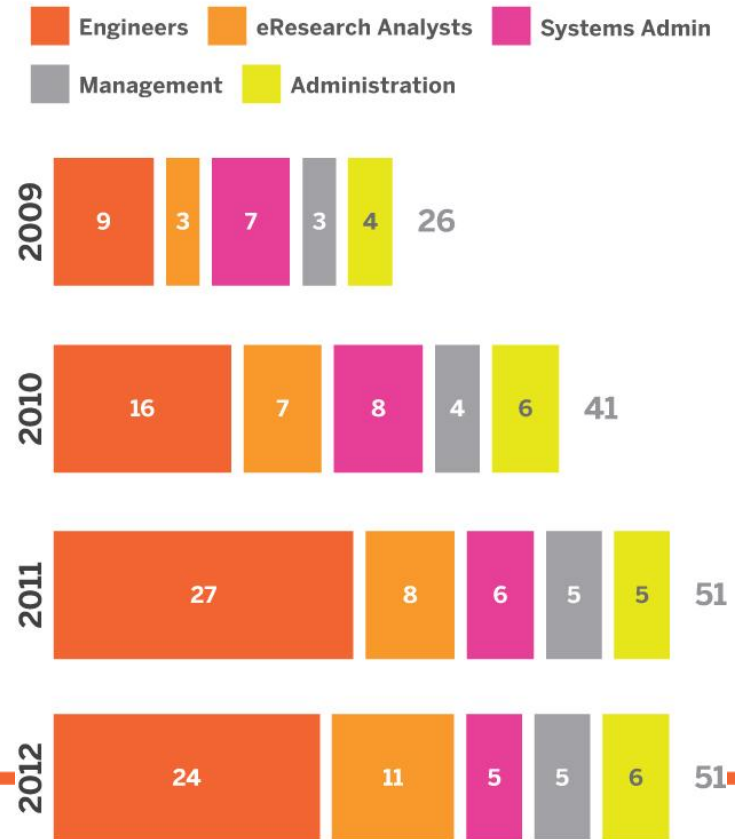
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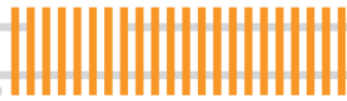
Staff profile

- Typical “eResearch” workforce
- Background in, and understanding of university research
- Spectrum of research discipline backgrounds
- Solid commercial engineering experience



Staff numbers at June 30 (2009 - 2012)



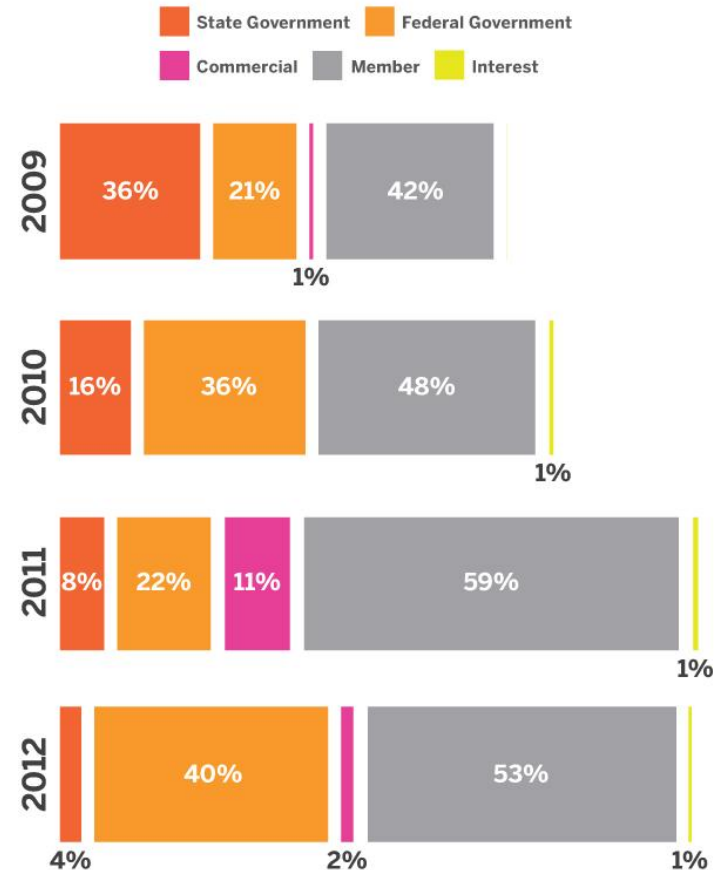


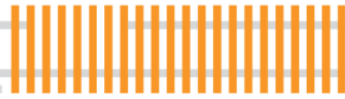
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Money: how does it work?

- Intersect is a not-for-profit company
- Each year we aim for a break even budget
 - Turnover this year USD9m
 - 80% costs are in staff
- Members pay an annual membership fee
 - USD100k to USD500k per annum
- Membership fees about 25% of total cost

Where the money comes from

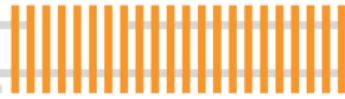




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Software and Systems Engineering

- Staff: We have an engineering team of about 40 staff
 - Project managers, software engineers, business analysts, test engineers, UI designers etc plus an army of students
 - Critical mass of capability
 - Projects:
 - Small and large projects (\$5k to >\$1m)
 - We have completed about 50 projects to date
 - All to production quality
 - Agile project methodology
 - What:
 - We build *many* systems to manage research data
 - Virtual laboratories: bring data and tools together in the way researchers want
 - Mobile apps
 - Reuse:
 - Significant code reuse at the technology level
 - We “productise” those applications that seem to have broader appeal
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Human Services

- Delivered primarily via “eResearch Analyst” team
 - The eResearch Analyst team has seen many examples of best practice and worst practice
 - They provide an external perspective that cant be easily achieved through internal appointments
 - Higher value is achieved through common activities leveraged for all members
 - Some things that occupy the day of an eResearch Analyst:
 - Consulting and advice,
 - Scoping, planning and requirements analysis,
 - Advocacy, awareness, courses (eg HPC),
 - Finding money and assisting with grants etc.
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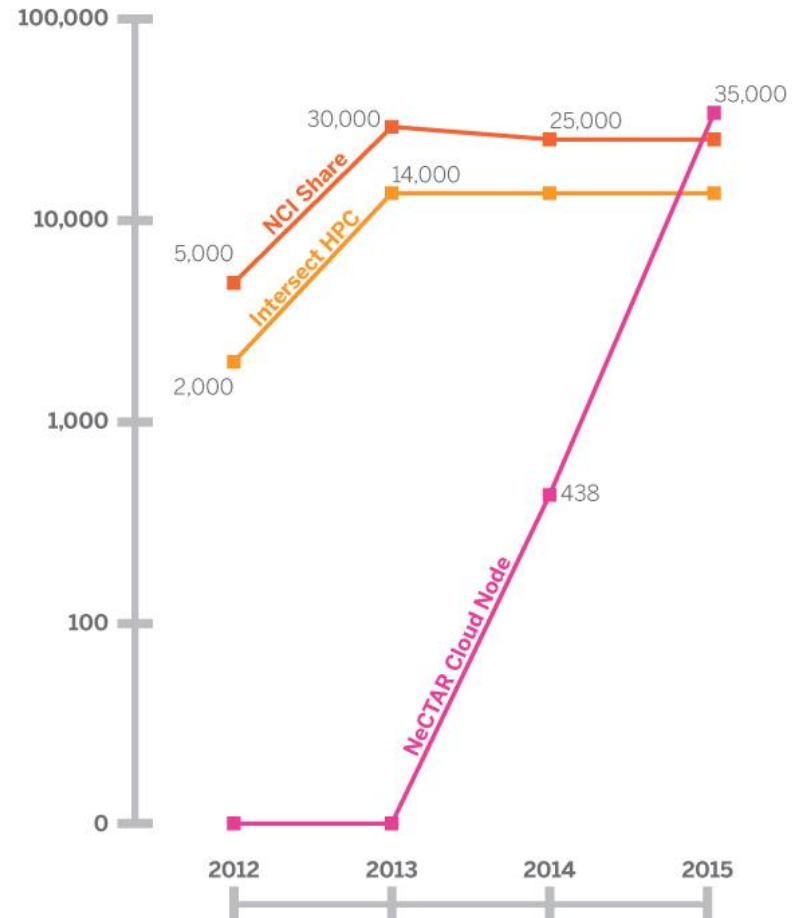
High Performance Computing

Intersect has several computing facilities for use by members

1. A share of the National Computation Infrastructure
2. Our own HPC Cluster
3. A 4000 core research cloud cluster (soon)

High Performance Computing

Service Units '000s





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Peak facility

- Fujitsu PRIMEHPC FX10
- Recently benchmarked at #24 in the world
- Approx 1.2 Pflop peak performance
- Cost: \$28m



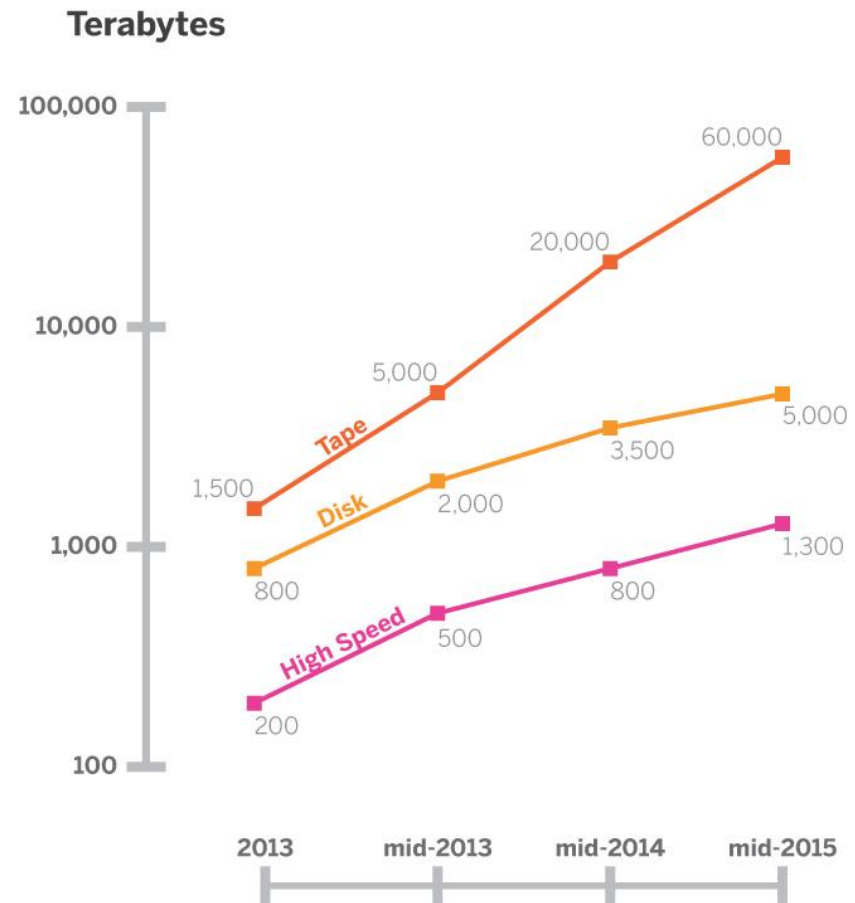


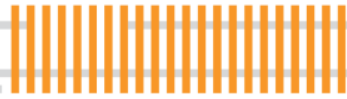
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Research Data Storage

- Significant investment in improving management and accessibility of research data
- Enabled and funded by the RDSI project
- Multi petabyte now, expected to grow substantially

Data Storage





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Measuring success

- **Tier 1:** Operational effectiveness
 - Return on investment
 - engineering quality
 - Cost and reliability of services etc
 - **Tier 2:** Achievement against strategic goals
 - Members increase in capability
 - Members research metrics: eg grant success rates
 - New research enabled, new collaborations supported
 - Uptake rates for our services
 - **Tier 3:** contribution to research impact
 - Mainly identified through case studies
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Does the Intersect model work?

- Plenty of metrics and examples to show that it does work!
 - Overall leverage of funding from various sources – substantial return on investment for members ~400%
 - Year on year 20% growth without increase in cost to members
 - Clear increase in:
 - capability internally within members
 - visibility of issues relating to good practice in research data management
 - usage of eResearch tools and practices
 - Played significant part in readying universities for utilising cloud services for research
 - Many, many case studies of new research being enabled
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Research impact

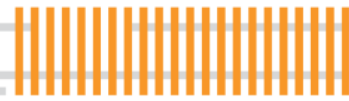
Australian Schizophrenia Research Bank (ASRB)



“Revolutionised the way schizophrenia research data is collected, stored and disseminated”



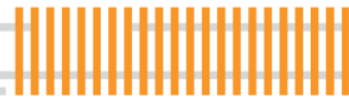
NSW Premiers Award for Outstanding cancer research:
Big Data Big Impact Award



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But...

- The Intersect model is based on the assumption that members are happy to source these services externally
 - We have a fairly fragile business position in that members could choose not to renew
 - We have to work very hard at communications and engagement to stay relevant and visible within our member universities
 - We can be seen as a “vendor” rather than a subsidiary or partner
 - The Intersect model does not work universally through Australia
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What next?

- Transition from establishment to sustainability
 - Sustainable, production quality processes
 - Scaled up efficiency of operations, support and maintenance
 - Ensure we keep innovating – keep an agile, startup culture
 - More key partnerships where they provide value for members
 - Engagement with other research institutes, including government
 - Identify new ways of leveraging funding
 - The next wave of eResearch...
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**Trade &
Investment**



Australian Government
Department of Industry



R D S I
Research Data Storage
Infrastructure



nectar



Thankyou
