

# *NCRIS Investment Plan*

## Platforms for Collaboration

Facilitator  
Rhys Francis



# *National Collaborative Research Infrastructure Strategy*

Commonwealth Government spend of about \$540M over the five years: 2006-2011

- Evolving bio-molecular platforms and informatics
- Integrated biological systems
- Characterisation
- Fabrication
- Biotechnology products
- Networked biosecurity framework
- Optical and radio astronomy
- Integrated marine capability
- Structure and evolution of the Australian continent
- Population health and clinical data linkage
- Terrestrial ecosystem research network
- Platforms for Collaboration (allocated \$75M)



# *Timeline for Pfc*

- Planning commenced 2006
- Facilitator engaged part time May
- Facilitator full time by September
- Consultations to December
- Options and plan development completed by March
- Presentation to NCRIS April 13
- Decision:
  - Implementation to proceed



# Reference Group

Tom Cochrane: DVC QUT,

James Dalziel: Prof Macquarie

Peter Nissen: Nat Brdbnd Adv for Edu

Linda O'Brien: VP (Information) UoM

John Sheridan: Prof Monash (ex MAS)

John Shipp: University Librarian USyd

Nick Tate, Director ITS, AUScert, UQ

Ah Chung Tsoi, eResearch Director, Monash

now at University of Hong Kong

Nigel Ward: Exec Dir ADL

# *Starting Point - NCRIS Roadmap*

- Data access and discovery, storage and management
- Grid enabled technologies and infrastructures
- Technical expertise
- High performance computing
- High capacity communication networks



# *Related Issues*

- Sharing identities across the system
- Allowing researchers to specify who can do what with their resources
  - At a national and international level
- Expanding e-Research beyond the builder-users of cyber-infrastructure
  - Tools and service commoditisation
- Engaging the broader community
  - AREN and AAF reach and inclusiveness

# *PfC investment principles*

- Build on co-operative arrangements
- Reduce barriers to adoption, support new as well as expert e-Researchers
  - Simple tools for simple things
- Provide robust and enduring services
  - From providers where that is the business
- Prefer services which are of value to multiple communities

# Main investment decisions

<b>AREN</b>	Harmonize AREN with regional and campus networks & policies Foreshadow investment next period
<b>AAF</b>	Assist the establishment of the AAF Adopt for Pfc services
<b>Compute</b>	Extend concept to include several application oriented sites as well as sustaining the (generic) peak facility
<b>Inter-operation</b>	Extend regional service providers to support 3 <sup>rd</sup> party resources/data
<b>Data</b>	Develop roles and missions in data Create ANDS for some key services

# *Three layers*

*Tools and Applications*

*Data*

*Interoperation*

*Compute*

*Foundation services*

# *Two fundamental needs*

- **System wide networking**
  - From desktop to national and global facilities
  - All desktops to all facilities
  - High speed
  - Subscription based (no volume charging)
- **System wide access control**
  - Home institution identification
  - Researcher controlled authorisation
  - Single sign on
  - Community wide roles and rights

*Foundation services*

# *Three further needs*

- **A federated data environment**
  - National reach (location independence)
  - Common authentication/authorisation/search
- **A national interoperation partnership**
  - Compute and Data facilities
  - Large instruments
  - Sensor networks
- **A distributed compute infrastructure**
  - Relatively tightly integrated (SSO)
  - Able to include shared and dedicated facilities

*Operational Infrastructure*

# *The builders & the users*

- Perhaps where e-Research happens now ...

**Builders = Users**

- The challenge is to separate them
  - Services, Tools, Environments, Components, Software for the builders
  - Services and Tools for the users
- Expertise building
  - Training for the builders
  - User and consulting support for the users

*Tools and Applications*

# Further thinking

Consulting and user support

Services (Tools) ((Software))

*Middleware*

*Interoperability*

**Data Federation**

Sensors

Compute infrastructure  
*capability / capacity*

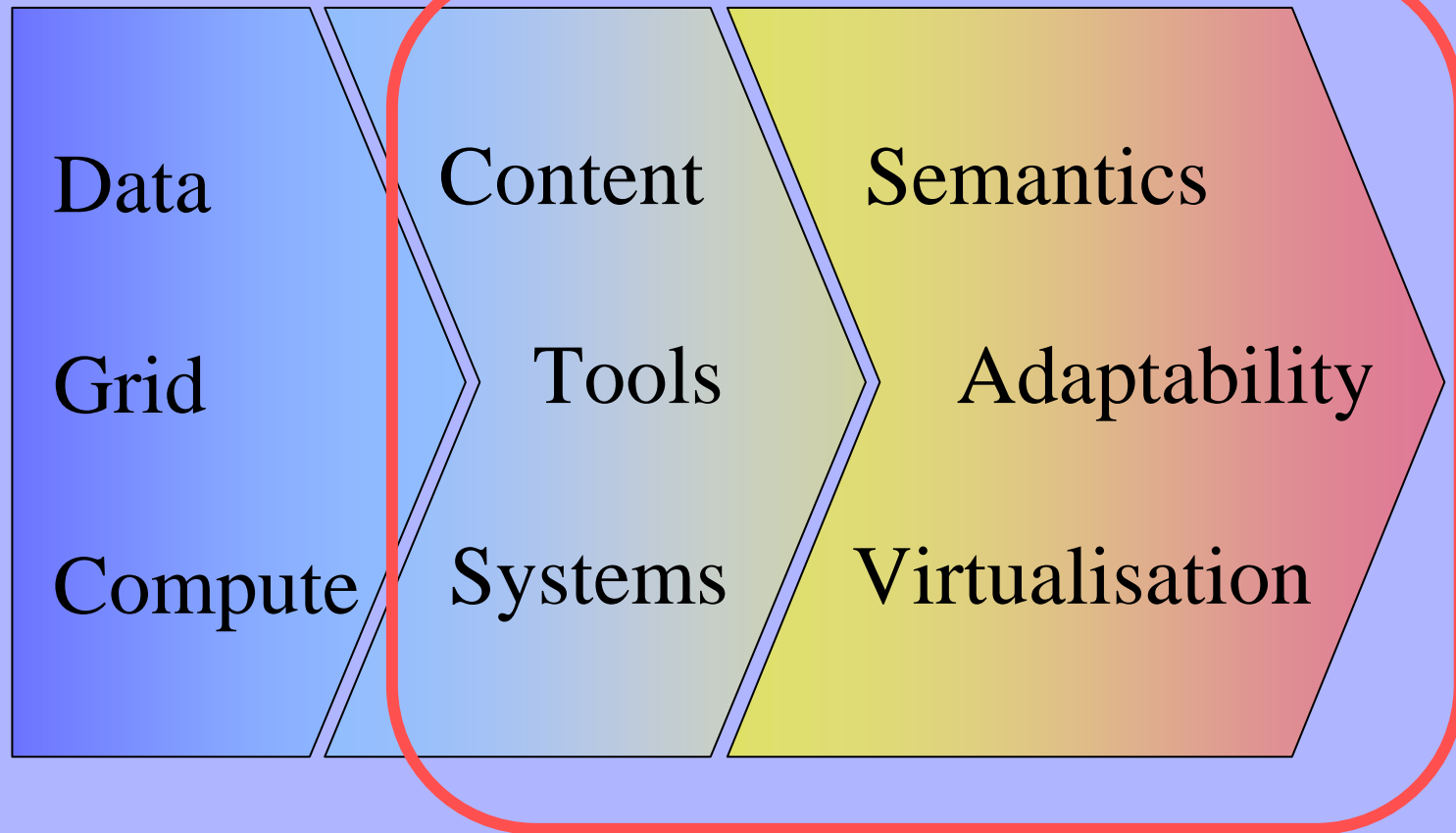
Instruments

AAF (trust)

AREN (connectivity)

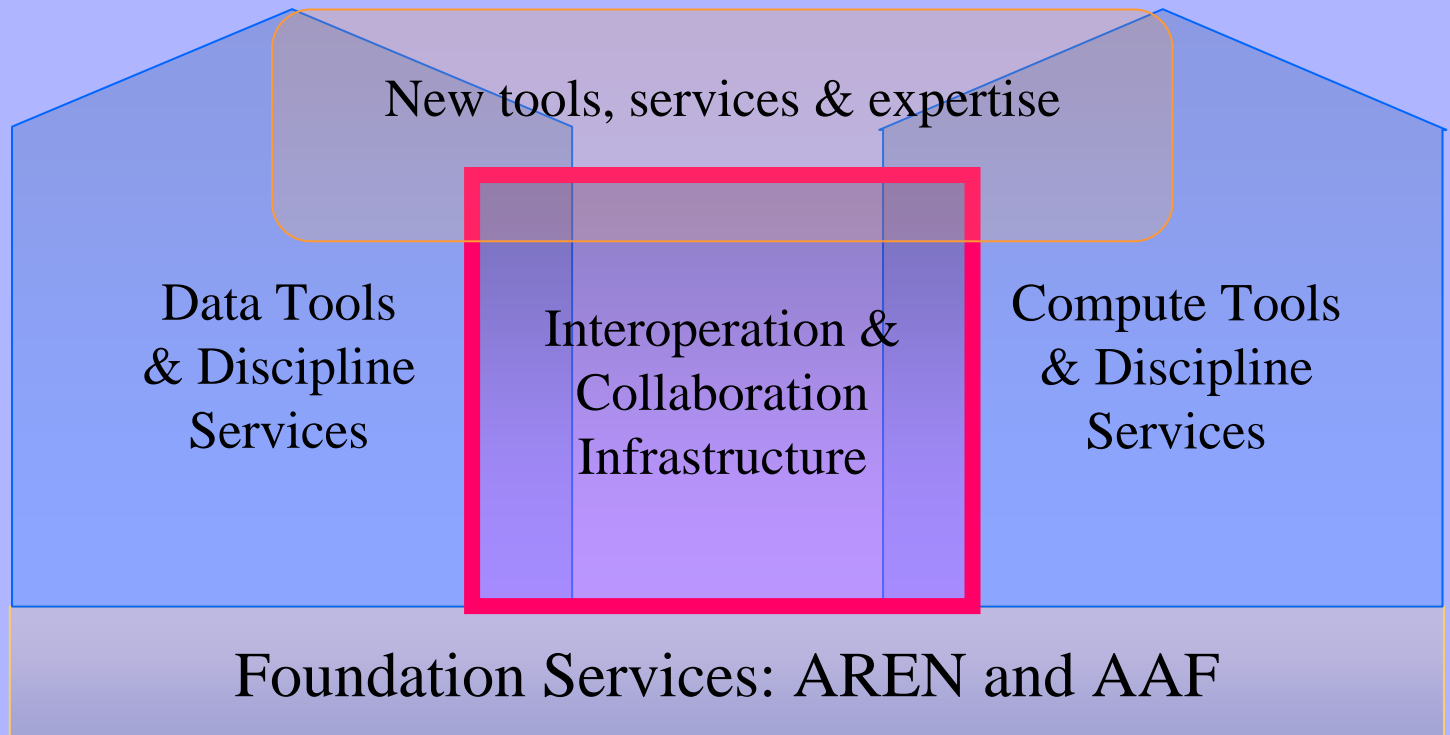
# *What is the problem?*

## Interoperation



# *Proposed arrangement*


Researchers and research communities  
Resource owners and operators  
Users and User-Builders



# Main PFC Activities

- **Data Management: ANDS**
  - Federation services, describing, finding, accessing
  - Stewardship for specific collections
  - Outreach for researchers and institutions
- **Interoperation: ICI**
  - Workflow, portals, collaboration services
  - Data management and data movement services
  - Job submission, VMs, AAA services
- **Computing: APAC**
  - Capability computing, National Facility
  - Shoulder and application oriented systems
  - Techniques and outreach for researchers

# Main PFC Activities



• <b>Data Management: ANDS</b>	<b>21</b>	<b>45</b>
- Federation services	7	17
- Stewardship	7	14
- Outreach	7	14
• <b>Interoperation: ICI</b>	<b>20</b>	<b>32</b>
- Workflow, portals, collaboration	8	13
- Data and data movement	8	13
- Job submission, VMs, AAA	4	6
• <b>Computing: APAC</b>	<b>26</b>	<b>58</b>
- Capability computing	18	38
- Shoulder application systems	3	14
- Techniques, outreach, mgt	4	6

# ARIC

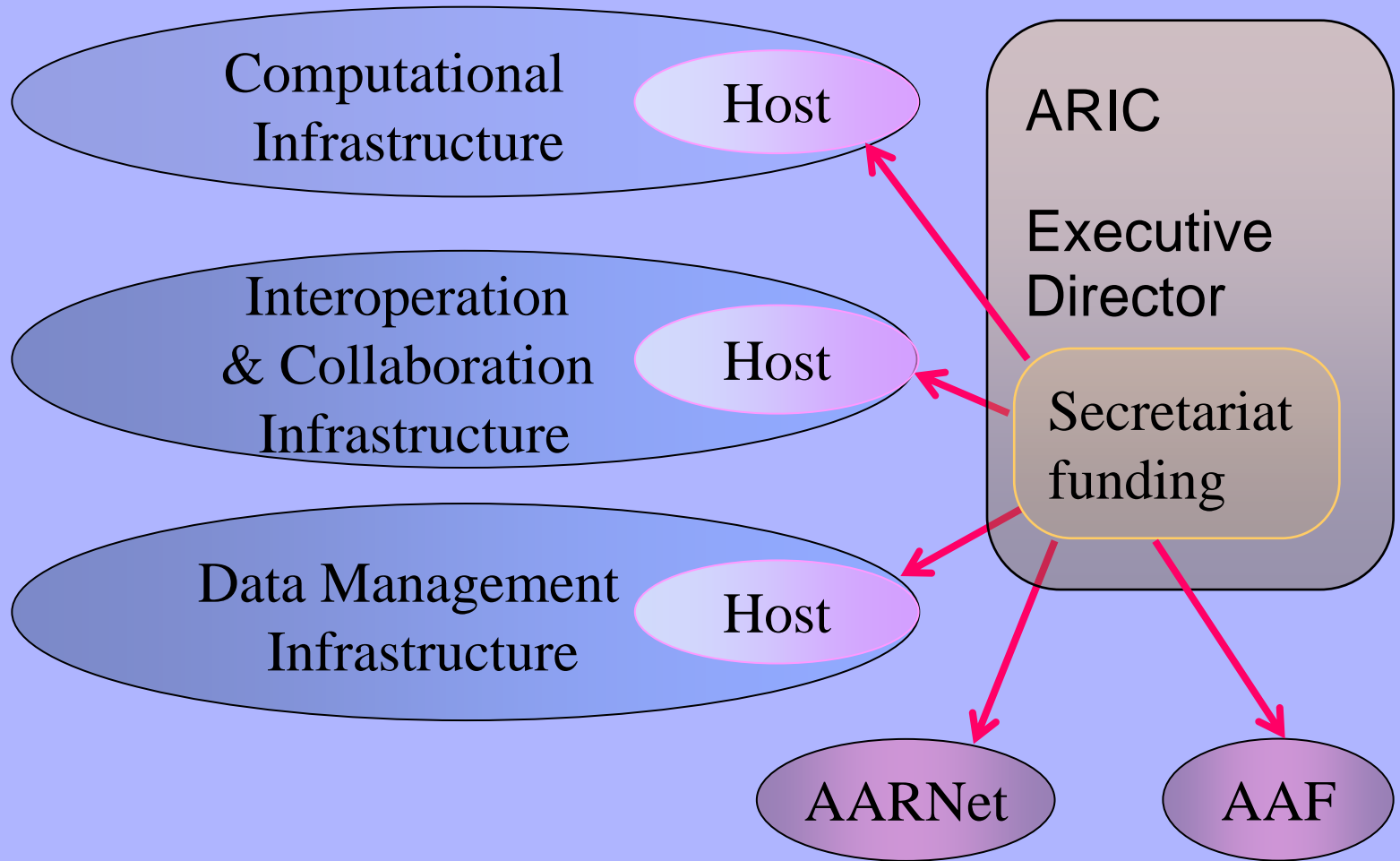
## Australian e-Research Infrastructure Council

- An independent Chair
- An Executive Director
- A DEST Principal Adviser
- ~8 members drawn from providers and users of e-Research capabilities

A small secretariat to assist programme management

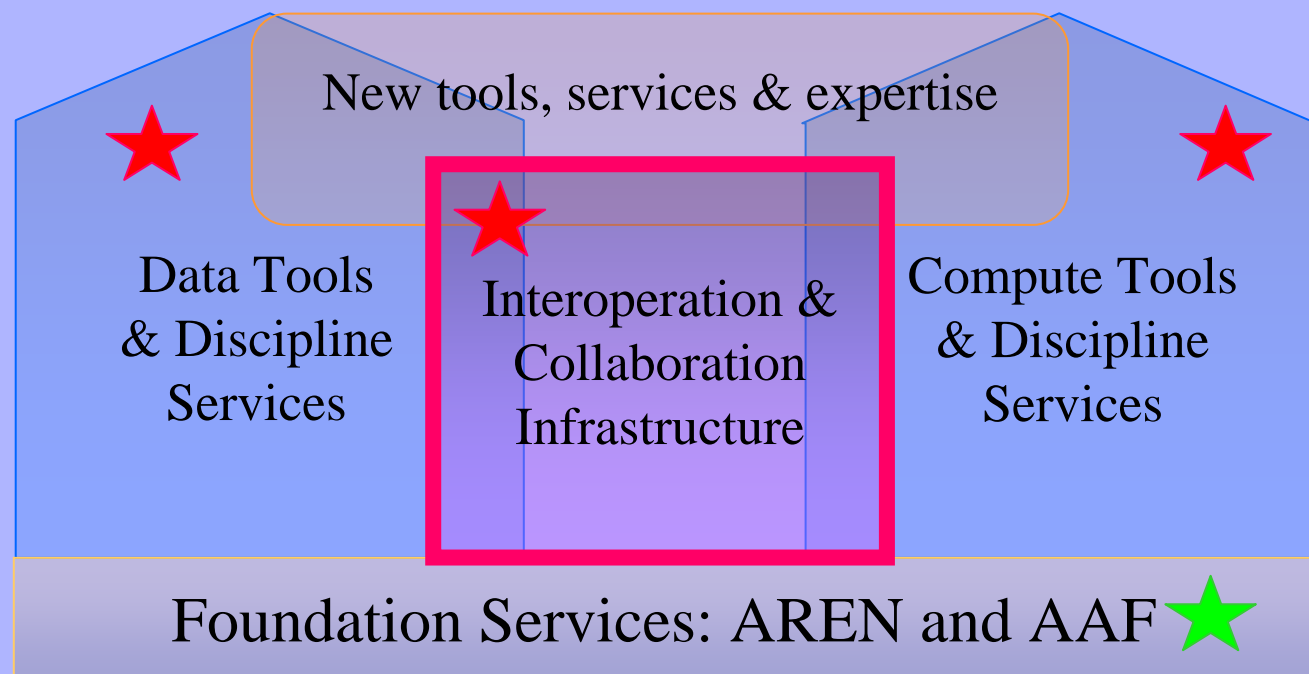
Determine strategic directions and component variations  
Convene an e-Research community forum for advice  
Approve the annual business plan prepared by the Executive Director and supported activities  
Make recommendations to DEST and NCRIS

# Overall Arrangement



# *New entities/arrangements*

Researchers and research communities  
Resource owners and operators  
Users and User-Builders



★ NCRIS contracts

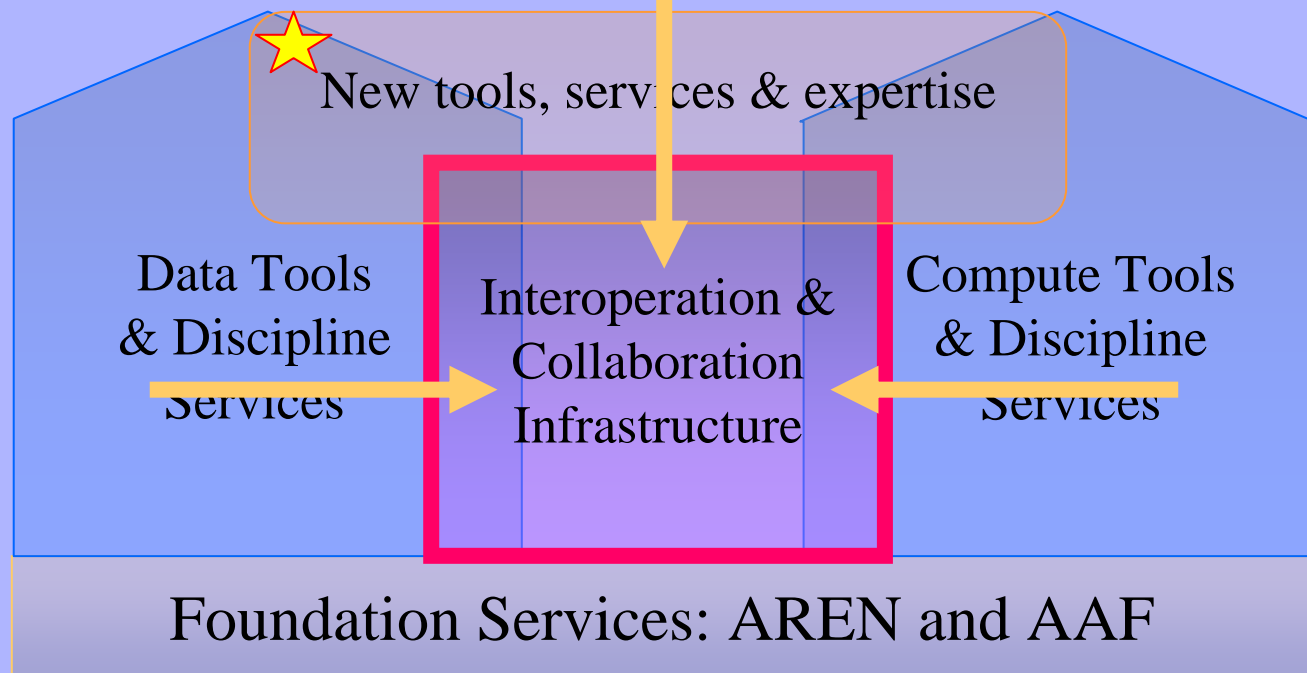
★ Potentially a new entity



# NEAT

## National e-Research Architecture Taskforce

Researchers and research communities  
Resource owners and operators  
Users and User-Builders



➔ More services in everyday operation

# *Three major additions*

- ★ AAF - the Australian Access Federation and the deployment and use of its services across NCRIS
- ★ ANDS - which can assisting institutions develop and implement strategies for research data
- ★ COMPUTING - a tier of compute infrastructure focussing on capability needs rather than generic needs



# *Three major changes*

- ★ ICI - repurposing the grid to researchers across the spectrum, using data and web services
- ★ RNSPs - new role for regional service providers to include linking major research resources
- ★ NEAT - an e-Research architecture development process to align research communities, middleware and operational services



# *Three contextual issues*

- Harmonisation of campus, regional and national network and *authorisation* infrastructures
- Policies and environments that enhance e-Research and collaboration
- Support for the growth, enhancement and sharing of e-Research expertise; rewards, incentives and recognition





# *Computation*

# Capability Computing

- Peak system a strategic requirement
- However
  - Demands high levels of user expertise
  - Capability is for few users
- Decision points
  - Need \$4M per annum to buy capability
  - Double that to operate, add outreach etc
  - So \$9-10M pa - but can share costs
  - Some institutions will buy large shares
  - Expertise is rare, currently works well
  - Has international standing and reputation
  - ANU have agreed to continue to operate

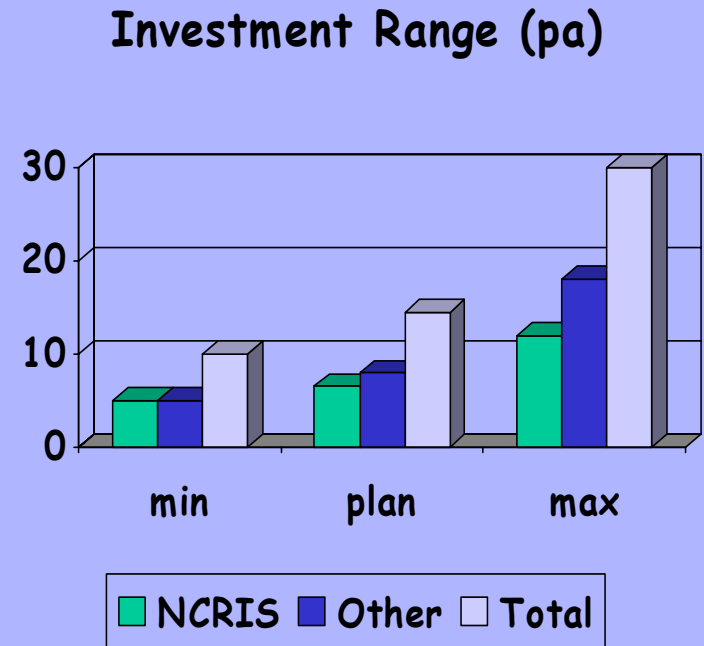
# *Shoulder systems*

- **Shoulder/Application/Regional Systems**
  - Support applications and tools for a broader community with less expert users
  - Locate near investments and expertise in applications and related research
  - Contenders: Bio, Nano, Image processing, Physics, Chemistry, Materials, Engineering
- **Issues**
  - Need (applications/tools/communities) mix
  - Need to lift strength in regional providers
  - Could see 8-10 but do 3 (readiness?)



# Investment positioning

Function	NCRIS	Total
Capability	\$18M	\$38M
Shoulders	\$4M	\$12M
Tools	\$2M	\$4M
Outreach	\$2M	\$2M



## Ongoing refinement

- Peak versus capability in National Facility...
- Generic vs application focussed systems...



# *Inter-operation*

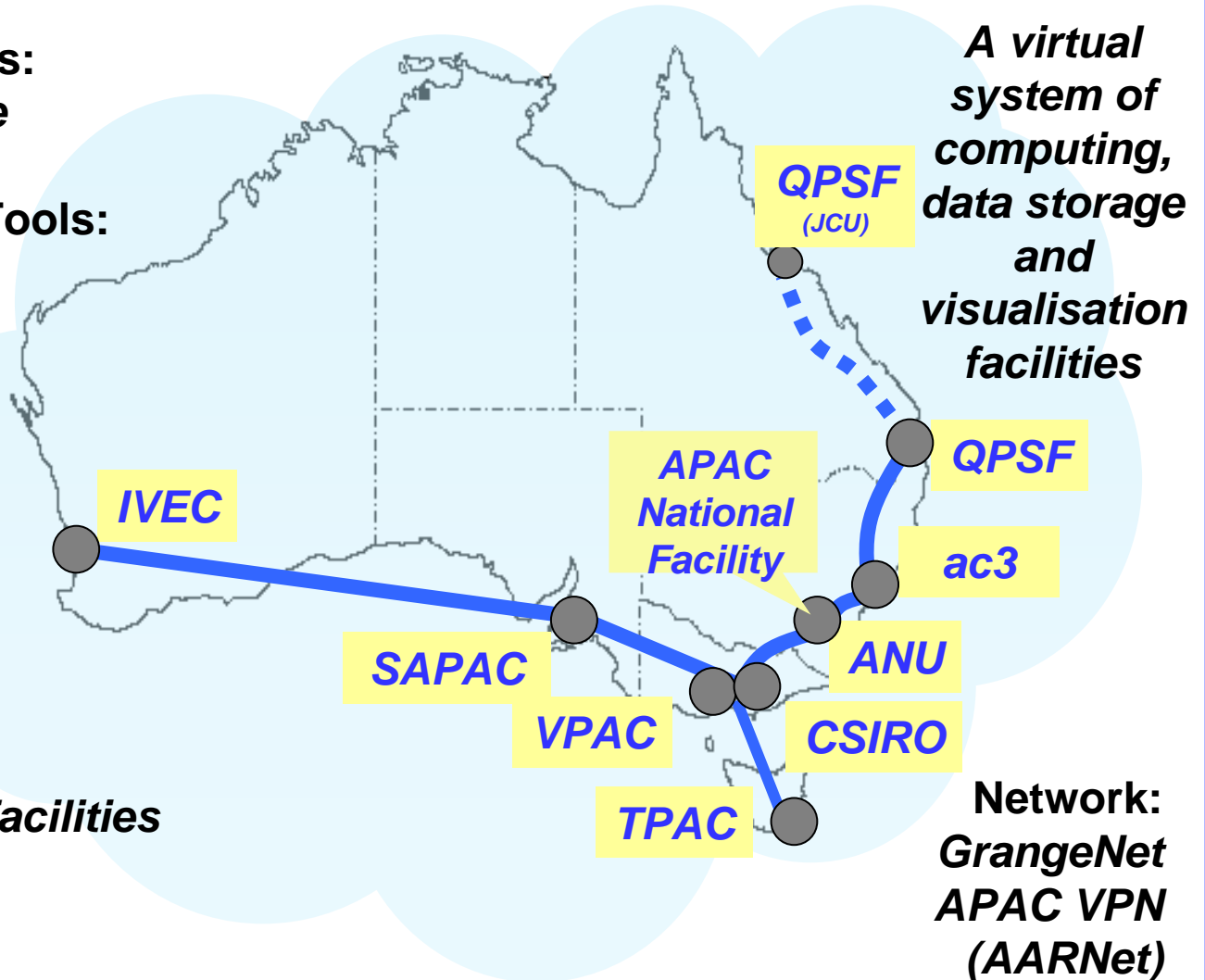
# Current Infrastructure

Portal Tools:  
*GridSphere*

Workflow Tools:  
*Kepler*

Security:  
*APAC CA*  
*MyProxy*  
*VOMRS*

Systems:  
*Gateways*  
*Partners' Facilities*



A virtual system of computing, data storage and visualisation facilities

Network:  
*GrangeNet*  
*APAC VPN*  
*(AARNet)*

# *ICI activities*

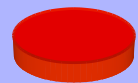
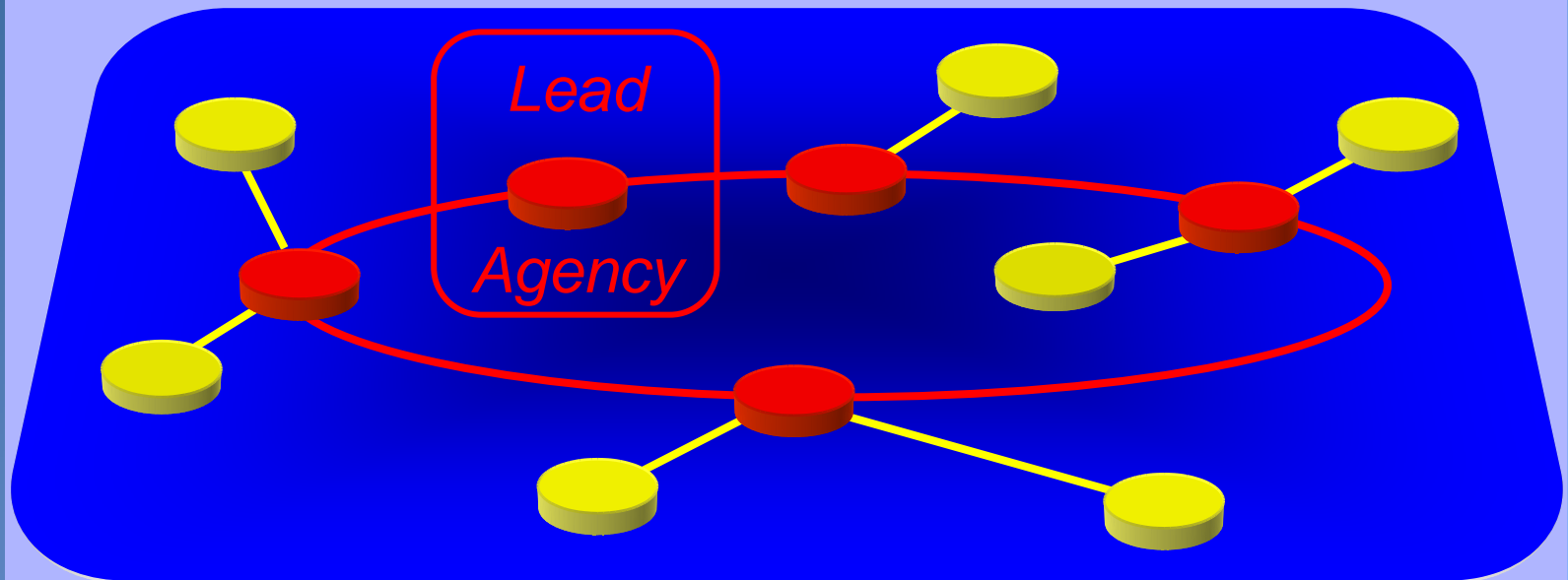
## **Operational aspect -**

- **Information, Portals & Collaboration Services**
- **Data management and Data Transport Services**
- **Job submission, Gateway VMs, AAA**
- **Help desk**

## **Development aspect -**

- **Next generation tools and services**
- **NEAT determined**

# *ICI - goal is greater reach*



ICI Partners operate the core infrastructure



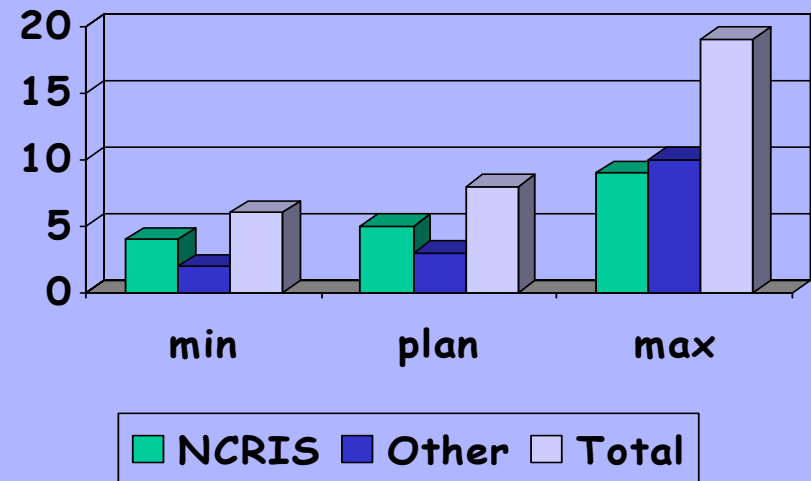
ICI Affiliates provide/access resources

# Investment Positioning

## Ongoing refinement

- New Partners - some self funding
- New Affiliates - more work
- Integration of new services
- Integration of new resources
- In-house expertise development

Investment Range (pa)





# *Data Management*

# *Some of the consultations...*

APAC National Facility

ATLAS Experiment

Australian Bureau of Statistics

Australian Science and Technology Heritage Centre, University of Melbourne

BlueNet

Bureau of Meteorology

Centre for Cultural Research at the University of Western Sydney

Centre for Public Culture and Ideas, Griffith University

Council of Australian University Librarians

CSIRO

Geoscience Australia/Corporate Information Management and Access

Institute of Molecular Bioscience – The University of Queensland

Melbourne Health – Molecular Medicine Informatics Model

Molecular and Materials Structure Network

Monash University

National Library of Australia

Radio and Optical Astronomy Research Capability

Reserve Bank of Australia

Securities Industry Research Centre of Asia-Pacific

Sesame Scientific Data Management System, Bio21 Molecular Science and Biotechnology Institute

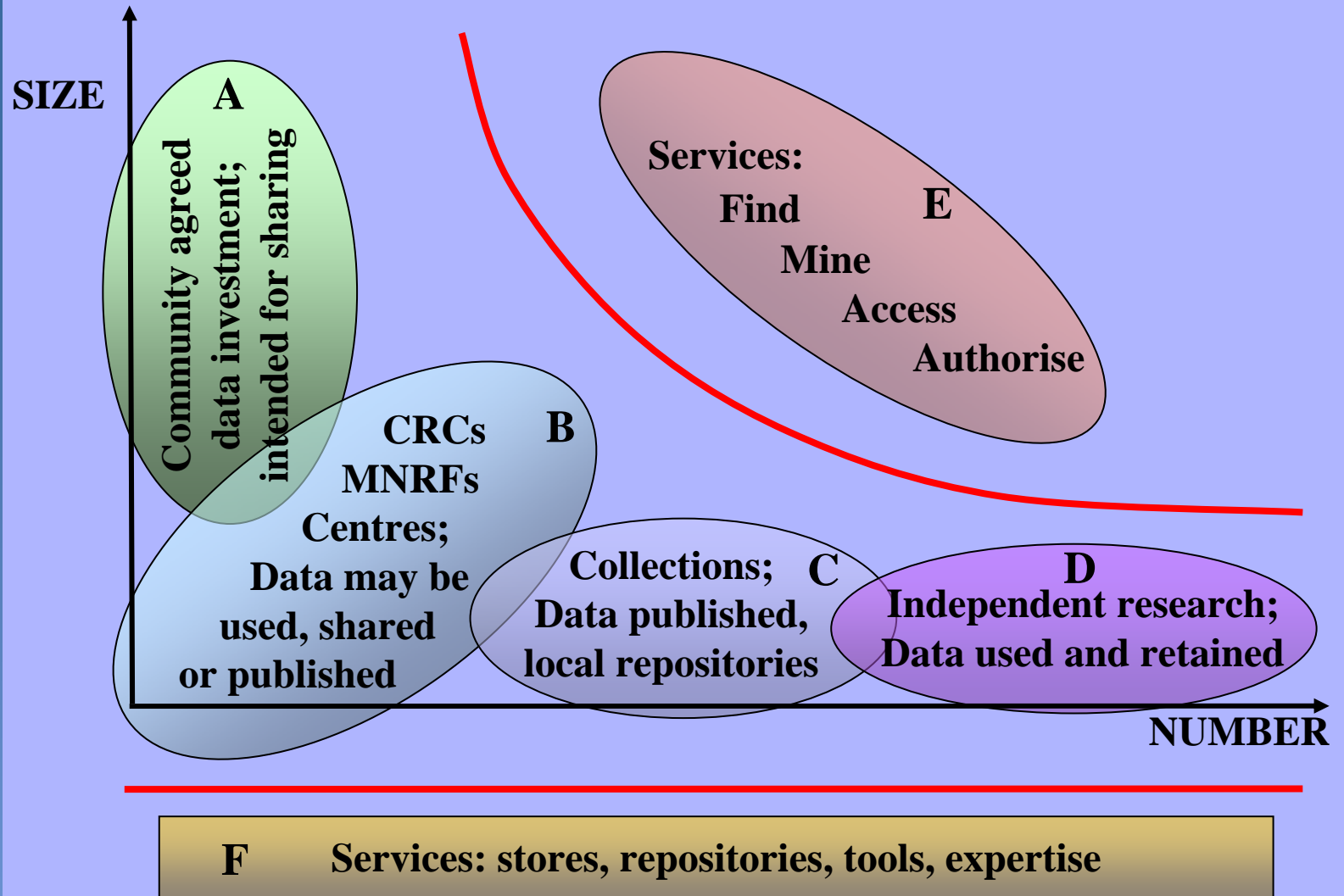
Tasmanian Partnership for Advanced Computing

The Australian Social Science Data Archive

University of Melbourne

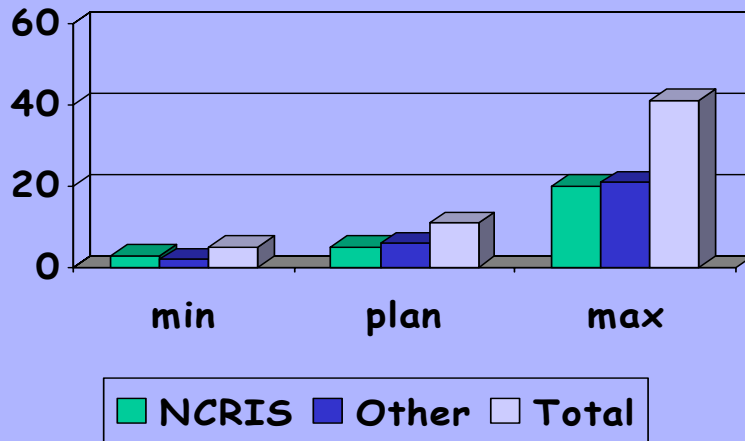
Victorian Partnership for Advanced Computing

# Data missions



# Investment Positioning

Investment Range (pa)



## Ongoing refinement

- Services require an entity to operate
- New non-expert data services are vital
- ANDS needs to be more like a co-operative than an enterprise

	NCRIS	Other	Total
Federated services	\$2M	\$0M	\$2M
New services (NEAT)	\$5M	\$10M	\$15M
Stewardship	\$7M	\$7M	\$14M
Outreach	\$7M	\$7M	\$14M

# *Change Vectors*

- Harmonising national, regional and campus bandwidth, authorisation and charging policies rather than 'more backbone'
- Provisioning for less expert users in computational systems through 'application' focused computational systems/services
- Development of regional service providers that do bring 3<sup>rd</sup> party resources into the interoperation infrastructure
- Understanding the roles and missions in data, develop federating and collections services





*Thank you*

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