

REPORT FROM EDUCAUSE AUSTRALASIA (MELBOURNE, 2007)

FOR: BESTGRID STEERING COMMITTEE

A/PROF C. PAUL BONNINGTON (DIRECTOR OF ERESEARCH)

14 MAY 2007 (VERSION 1.0)

EXECUTIVE SUMMARY

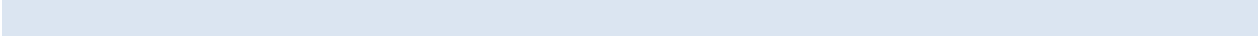
As seems to usually be the case with such events, value was gained in conversations outside the formal presentations than during the workshops and plenary sessions themselves. As well as reporting these networking meetings and highlighting formal presentations of interest to the BeSTGRID Project and wider community, this report also covers some of the Australian approaches to structure and operations that support eResearch both at a national and institutional level.

Summary of Proposed Action Points presented below:

1. Separate the eResearch builders and users, i.e. **train** builders to **help** (new) users.
2. Provide a collection service for Data that collects data from desktop and provides curation and retention.
3. Facilitate sharing **identities** across institutions allowing researchers to specify who can do what with their resources, and who can access internationally
4. Need to ensure that there are no barriers for New Zealand Institutions to join AAF as an identity provider
5. Provide leadership and support in NZ to assist other institutions to become identity provider in the AAF. (True benefit of a federated system is only obtained when all collaborating institutions are on board.)
6. Support NZ participation in Australian and International Federation Architecture and Policy Groups (e.g. Paul Bonnington has been invited to join the AAF Grid Working Group)
7. Help service providers like Libraries, Supercomputer installations, BeSTGRID, and our SAKAI-Virtual Research Environment join the AAF.

8. **Don't over-engineer the IT.** Recognize that only some tools may be of value to some researchers, and give them the flexibility to choose.
9. BeSTGRID explore the use of IAMSuite (Macquarie) to provide a general framework for developers to build and contribute to collaborative web-based tools that support eResearch.
10. Do not attempt to run our own (University or NZ-based) Certificate Authority. Use the APAC National GRID Certificate Authority to provide GRID Certificates that will enable our researchers to participate in International GRID projects. Get local support staff registered so that they can provide staff with certificates on behalf of APAC and communicate widely to researchers that this service exists.
11. Recognise that eResearch Cyberinfrastructure doesn't just support Science and Engineering but is also supporting the digital data of the Arts, Humanities and Social Sciences through "Our Cultural Commonwealth" and "Digital Scholarship". Generating enthusiasm for eResearch tools among this community may need to be addressed differently from Science and Engineering. A separate communication plan to engage with these other disciplines may need to be established.
12. Highlight the BeSTGRID SAKAI-VRE to the Arts, Humanities and Social Sciences
13. Avoid building IT infrastructure to support eResearch for the sake of building infrastructure:
 - a. Recognise that Authentication and Autorisation (IAM) is important but it has to be researcher driven.
 - b. Researchers should be able to 'experiment' with new tools (such as the SAKAI-VRE) but the service should not be 'over-specified'.
 - c. Keep things as simple as possible (like EVO for Video-Conferencing rather than AccessGRID), so that very technical issues such as multicast are not an issue.
14. Ensure our institutional repositories are standards compliant, and searchable so that researchers can build 'mashups' involving our output.
15. Look for a balanced approach to training the researchers how to use the tools versus putting effort into making the tools simpler. Learn from the UK eScience initiative which didn't put enough effort into making the tools simpler (cf. AccessGRID).
16. Look to foster the creation of graduates who could serve as data scientists to ensure that the NZ research enterprise includes a sufficient number of high quality data scientists.
17. Encourage GOVT/Public-funders to recognize the need for national leadership in building infrastructure to support the managing of increasing volumes and complexity of data. Institutions cannot do this alone.

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18. The SAKAI Learning Management System is grounded in the Community Source model. Increasingly the same platform is being used to support Virtual Research Enviroments (SAKAI-VRE). ASAKAI-VRE as an Enterprise platform for support and encourage the deployment of Virtual Research Environments to support collaborative research projects.
 19. Evaluate the Bath University model (R-Drive) for providing transparent and limitless storage for the entire University. Furthermore, the Universities should determine the feasibility of mandating the use of such storage.
 20. That BeSTGRID use a Shibbolised MyProxy server to provide new users with GRID certificates.
 21. Explore further the model Bill Appelbe has for a New Zealand Partnership for Advanced Computing, and facilitate higher level national discussions on the matter.
 22. Engage with University of Melbourne to explore their approaches to fostering collaboration and examine how they use VPAC services to best achieve research outcomes.
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FORMAL PRESENTATIONS

Rather than summarize all sessions at the conference, readers can find all the presentations by browsing the EDUCAUSE website. Of particular interest to the eResearch Task Force may be the following:

RHYS FRANCIS (NCRIS) PLATFORMS FOR COLLABORATION

NCRIS: National Collaborative Research Infrastructure Strategy (A\$540 Million over 5 years))

Message: *Currently, the builders of the eResearch tools are also the users (“builder-users”). To foster new cross-discipline research, the challenge is to separate the builders and users, i.e. **train** builders to **help** (new) users.*

For the next 5 years, the goal is to expand eResearch capability beyond the current “builder-users” of cyberinfrastructure (like the HPC users) to engage with broader communities (e.g. Bio-scientists who haven’t yet made use of HPC) through a **simplification** of tools and service **commoditization**.

Useful Services: The IT service focus for the next 5 years should be **data** (access, discovery, storage and management), **grid** enabled technologies and infrastructure (collaboration tools) and sharing **identities** across institutions (allowing researchers to specify who can do what with their resources, and who can access internationally.) Note: the ‘GRID’ has been bent to computing (by the High-Energy Physicists) and needs to be realigned to enabling **connection** and **collaboration**.

How will this be done: Build on co-operative arrangements, reduce barriers, provide robust and enduring services (particularly those that support multiple communities.) Develop roles and missions in data – need to help researchers **find data**, not necessarily store it. (e.g. Provide a collection service for Data that collects data from desktop and provides curation and retention.)

Fundamental needs of the eResearch community: System-wide networking from the desktop to national and global computing and data facilities. Everything needs to be charged on subscription based models (no volume charging!). System-wide access control needs: simple sign-on, simple community-wide roles and rights, and researcher controlled authorization. There is also a need for a federated data environment with national Interoperation.

Challenge: The constraints are not so much money but developing expertise.

Action:

- Separate the eResearch builders and users, i.e. **train** builders to **help** (new) users.
- Provide a collection service for Data that collects data from desktop and provides curation and retention.

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- Facilitate sharing **identities** across institutions allowing researchers to specify who can do what with their resources, and who can access internationally

PATTY MCMILLAN (MIDDLEWARE ACTION PLAN PROJECT MANAGER)
INFRASTRUCTURE AND SERVICES FOR AUSTRALIAN ERESEARCH: THE
MIDDLEWARE ACTION PLAN AND STRATEGIC ROADMAP

MAPS (Middleware Action Plan) is funded by DEST through the Systemic Infrastructure Initiative.

Background: *Middleware*, or 'glue', is set of common software services between the network and the applications, to connect people to resources. This software provides services such as identification, authentication, authorization, directories, and security. By promoting standardization and interoperability, middleware will make advanced network applications much easier to use. Middleware can be shared by many applications serving various purposes in different environments.

In a nutshell: Middleware connects **distributed** people to **distributed** resources to facilitate collaboration on a global scale, so that resources become one large virtual facility.

Message:

Middleware for Global Engagement: Middleware and other tools needed for a research project may be deployed at multiple levels - with international project team, at a national level, within institutions, locally with the researcher, or somewhere else. The needs to be a **communication program to both users and the support people** about what middleware tools and expertise are available from where and how and when to use them.

There is also a need at national level for **Reference Architecture** for institutions; that is, baseline software and services to provide, and how to interface with national services, how to determine network, storage, processing and capacity required.

Middleware for Access Management: There is a need (at a national level) to agree on data schemas for a Australasian Access Federation (AAF); i.e. whether it be 'eduPerson' (which is becoming the international defacto standard) or 'auEduPerson' (an extended eduPerson schema for Australia and possibly NZ). Efforts are needed to identify and address barriers to institutions in joining the AAF as identity providers (Identity management systems, adopting new data schemas, training, consultation). Identify and prioritize potential service providers (like Libraries, HPC computing facilities, GRIDs, virtual research environment portals) and help them join the AAF.

Action:

- Need to ensure that there are no barriers for New Zealand Institutions to join AAF as an identity provider

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- Provide leadership and support in NZ to assist other institutions to become identity provider in the AAF. (True benefit of a federated system is only obtained when all collaborating institutions are on board.)
- Support NZ participation in Australian and International Federation Architecture and Policy Groups (e.g. Paul Bonnington has been invited to join the AAF Grid Working Group)
- Help service providers like Libraries, Supercomputer installations, BeSTGRID, and our SAKAI-Virtual Research Environment join the AAF.

ANDREW TRELOAR (MONASH)

DART: DEVELOPING A SYSTEM TO SUPPORT A COMPLETE ERESEARCH LIFECYCLE)

Summary: www.dart.edu.au (Involving Monash, James Cook University and University of Queensland). DART: is a proof of concept project funded by DEST through Systemic Infrastructure Initiative. DART stands for Dataset, Acquisition/ Accessibility/Annotation eResearch Technology.

What DART tried to achieve was link data sets with publication and to allow annotation. It focused on collaborative research.

DART Achievements: Progress in data capture and instrument integration, replication of very large datasets. Also have placed Information Management staff into research teams, to address their data and information management requirements.

DART Lessons: Importance of **demonstrators** (demonstrating end-end benefits). There were integration challenges and under-estimated amount of complexity of effort required. Value of end-end approach didn't evidence itself as much as expected (particular researchers got excited only by particularly parts of the cycle).

Action:

- **Don't over-engineer the IT.** Recognize that only some tools may be of value to some researchers, and give them the flexibility to choose.

NEIL WITHERIDGE (MACQUARIE ELEARNING CENTRE OF EXCELLENCE)

IAMSUITE: AN IDENTITY AND ACCESS MANAGEMENT INFRASTRUCTURE FOR ERESEARCH COLLABORATION

Warning: Technical!

Background: Virtual Organizations (VO) Tools help Research Teams **organize** their geographically distributed Project Resources and Collaborators into a single Virtual Organization (VO) so that they can all begin to share distributed resources, data and identity. The tools mainly focus on

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identifying WHO are the members of a VO and WHAT resources are **shared** among the members.

Message: There is a move to simplify the use of VO tools so that researchers are more likely to use the tools. GRID Services rely on VO infrastructure (through a tool called VOMS – Virtual Organisation Management System) and so this is moving from commandline to Web Based interfaces.

Federated Identity and Access Management Systems (IAM) can be leveraged to create a VO infrastructure – but again there is a need for ease of use. Shibboleth is a technology that can ‘federate’ services. IAMSuite is a Shib-based IAM tool to provide Shib-enabled Simple Sign-on for VO infrastructure. It provides an integrated and shared environment that is based on portlets in GRIDpshere (to provide a friendly web-based front-end for users). It provides a general framework for developers to build and contribute to collaborative applications.

For example, IAMSuite has a Shibboleth-enabled ‘MyProxy’ server so people without PKI certificates can use GRID services; that is, it generates a Certificate for GRID services. There is a test-bed used in the Monash GRID services.

Action:

- BeSTGRID explore the use of IAMSuite (Macquarie) to provide a general framework for developers to build and contribute to collaborative web-based tools that support eResearch.

DIRK VAN DER KNIFF

GRID INFRASTRUCTURE AT THE UNIVERSITY OF MELBOURNE: EXPERIENCES 2003-2006

Warning: Technical!

Background: ATLAS is a particle physics experiment that will explore the fundamental nature of matter and the basic forces that shape our universe. The ATLAS detector at CERN will search for new discoveries in the head on collisions of protons of extraordinarily high energy. **ATLAS is one of the largest collaborative efforts ever attempted in the physical sciences.** There are 1800 physicists (including 400 students) participating from more than 150 universities and laboratories in 35 countries (including Melbourne, Sydney and Wollongong in Australia).

Message: *Central ITS and Departments can successfully collaborate to build infrastructure to support large scale research projects.*

The central University of Melbourne of Research Computing Services (RCS) collaborated with Physics department and Physicists at CERN to deploy a GRID computing environment at the University of Melbourne. The Research Computing Services unit is part of central ITS:

- RCS is a Research IT Service provider that doesn't do IT development work.

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- RCS knows enough about what is happening in the research tools space to stay abreast of the latest needs of researcher.
- RCS doesn't try to reinvent the wheel but rather RCS a technology builder group of systems experts.
- RCS has quite a different view of computing than the physicists.

The ATLAS project will generate 15 Petabytes per year (which is of the order of all data ever produced previously in the history of mankind!) and requires distributed computing power of the order of about 100,000 CPUS.

There was a Victorian Partnership for Advanced Computing grant to enable Melbourne to establish a GRID participate in the ATLAS experiment.

GRID Computing: The GRID the only way to do computation in this experiment. Understandably, there is a distributed Tier model for the data and Melbourne will be building one of the few global Tier 2 centres. In general, GRIDs are becoming useful since 90% of Scientific computational jobs are embarrassingly 'parellisable'. BIOMED jobs (AVIAN BIRD FLU) are also run on the GRID/Cluster at Melbourne.

- There is a choice of three GRID technologies involved in ATLAS; LCG, Grid3 (USA), NorduGRID (Scandinavia). LCG uses g-lite, and sites must run a standard set of test jobs to join the GRID.
- For the APAC National GRID, LCG was not a high priority and so Melbourne went alone to deploy LCG at this stage.
- APAC National GRID Certificate Authority provides the GRID certificates that are recognized internationally.

Action:

- Do not attempt to run our own (University or NZ-based) Certificate Authority. Use the APAC National GRID Certificate Authority to provide GRID Certificates that will enable our researchers to participate in International GRID projects. Get local support staff registered so that they can provide staff with certificates on behalf of APAC and communicate widely to researchers that this service exists.

TONY HEY (CORPORATE VICE-PRESIDENT FOR TECHNICAL COMPUTING,
MICROSOFT)
ESCIENCE AND SCHOLARLY COMMUNICATION

Message: We are at the verge of the new paradigm shift in research: the eResearch paradigm or data-centric research. *We will collect more research data in the next 5 years than information produced in all of human history.* eResearch is a 'shorthand' for a set of technologies to support this collaborative networked science that is data-centric. High performance computing and Information Management are key technologies to support this eResearch revolution.

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Research Workflow: Global Collaboratories increasingly relying on tools for Scientific Workflow to distributed the Scientific analysis. Example: Project Neptune (Seafloor Sensor network for Ecosystems) www.neptune.washington.edu, and the Comb-e-Chem Project (Workflow in molecular analysis) for automatic annotation and the remote control of services and instruments. IT professionals need to recognize that Scientist want to continue to use all the old tools (like FORTRAN codes) since they are mature and well-understood tools. eResearch builders need to accommodate old tools.

Cyberinfrastructure that supports research: GRIDs of computational centers, comprehensive libraries of digital objects, well-curated collections of scientific data, online instruments and vast sensor networks, and convenient software toolkits. And it doesn't just support Science: for example they same tools are supporting the Humanities and Social Sciences: "Our Cultural Commonwealth". Furthermore, Arts and Hummanties are producing Digital Data which they call "Digital Scholarship". Virtual Research Enviroments are particularly useful in these disciplines.

Research Publishing: Research publications are becoming 'live' documents that are leading to different types of peer-review. This is similar to how Amazon.com contributors can rate books online and offer suggestions for similar books and articles. For example, "Faculty of 1000: New Forms of Peer Review", and <http://www.connotea.org/> Connotea and Free online reference management for all researchers, clinicians and scientists. Furthermore, Blogs are important for previously unpubishable stuff (such as 'wrong results' which can be just as important) and WIKIs for collaboration, dialog and discussion.

Open Access Research Repositories and the Changing Role for Libraries: Public-funders are increasingly requiring mandatory deposit of Scientific Data for public funded projects: Open access rules that guaranteed public access to publicly-funded research results shortly after publication. These Open Access Research Repositories will in future that contain text, data, images, software, research reports, powerpoints etc. Libraries and researchers can add value by creating 'eResearch Mashups'. Standards and interoperability is needed (such as OAI, ORE) to ensuring the extra value can be added.

Libraries are now the guardians of an Institutions Research outputs and services such a 'Google Scholar Rank' are using these to rank institutions, and to provide search capability. For libraries, this means new technologies and new skills to be developed in parallel with the current content management services for both print and electronic resources.

Experience from the UK eScience Initiative (which Tony previously headed): Avoid building IT infrastructure to support eResearch for the sake of building infrastructure, and take a 'researcher-centric' approach. Tools need to be simpler - researchers should be able to 'experiment' with new tools but the services should not be 'over-developed'.

Action:

- Recognise that eResearch Cyberinfrastructure doesn't just support Science and Engineering but is also supporting the digital data of the Arts, Humanities and Social Sciences through "Our Cultural Commonwealth" and "Digital Scholarship". Generating enthusiasm for eResearch tools among this community may need to been addressed

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differently from Science and Engineering. A separate communication plan to engage with these other disciplines may need to be established.

- Highlight the BeSTGRID SAKAI-VRE to the Arts, Humanities and Social Sciences
- Avoid building IT infrastructure to support eResearch for the sake of building infrastructure:
 - Recognise that Authentication and Autorisation (IAM) is important but it has to be researcher driven.
 - Researchers should be able to 'experiment' with new tools (such as the SAKAI-VRE) but the service should not be 'over-specified'.
 - Keep things as simple as possible (like EVO for Video-Conferencing rather than AccessGRID), so that very technical issues such as multicast are not an issue.
- Ensure our institutional repositories are standards compliant, and searchable so that researchers can build 'mashups' involving our output.

ADRIAN BURTON (AUSTRALIAN PARTNERSHIP FOR SUSTAINABLE REPOSITORIES)
NATIONAL PERSPECTIVES ON ERESEARCH – POLICY, INFRASTRUCTURE, TRENDS
AND DEMONSTRATORS

Message: eResearch – is research which is improved and transformed by the application of advanced information and communication technologies. This is leading to faster research, better (more collaboration) and different (bioinformatics).

But eResearch is not just the application of IT to do brute-force. Raw data be identified, described and given attributes. And if this is done by pre-agreed standards, then interdisciplinary cross-pollination is possible.

Infrastructure is needed at both institutional and national levels: such as, high-speed networks, HPC, GRIDcomputing, data storage, **expertise in ICT**, digital-data creators and curation, enrichment of data (to participate in more sophisticated exchanges), online collections of research inputs and outputs, applications and tools, and overall enrichment of the information eco-system. The NCRIS roadmap is a roadmap on "From Data to Wisdom".

ICT Expertise: There are two types

- expertise for individual researchers on the eResearch tools and
- expertise in ICT graduates on data science, information science, and eResearch technologies

On the first type: (Apple-pie objective) The UK spent a lot of money on eResearch infrastructure and tried to be user focused but the tools weren't simple enough (i.e. AccessGRID) for the end-user. What is needed is easier tools as well as some training. "Everyone wants a fridge in their house, but nobody suggests that you need to understand how the fridge works"

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On the second type: NSF even go further to suggest "The Foundation, working with collection managers and the community at large, should act to develop and mature the career path for **data scientists** and to ensure that the research enterprise includes a sufficient number of high quality data scientists"

Action:

- Look for a balanced approach to training the researchers how to use the tools versus putting effort into making the tools simpler. Learn from the UK eScience initiative which didn't put enough effort into making the tools simpler (cf. AccessGRID).
- Look to foster the creation of graduates who could serve as data scientists to ensure that the NZ research enterprise includes a sufficient number of high quality data scientists.

CHRISTOPHER BLACKALL (AUSTRALIAN PARTNERSHIP FOR SUSTAINABLE REPOSITORIES)
DIGITAL REPOSITORIES AND THE AUSTRALIAN HIGHER EDUCATION SECTOR:
WHERE TO NEXT?

Message: *With regards to the networked scholarly information and communication infrastructure, the question is Where to next?* In Australia there is a Working Group on Data for Science www.apsr.edu.au looking at this question. Previous Australian policy themes (2000-2007) have been around High performance/GRID Computing (APAC and AARNET), Institutional Repositories (SII: MAMS, MAPS etc), and eLearning. The first two streams have converged into "eResearch". In the future we are likely to see the eLearning and eResearch themes converging on how are governed and funded.

Australia is managing increasing volumes and complexity of data to enhance the country's scientific, economic and social prosperity and to protect it from threats. Future governance is based around: Network of Federated Digital Repositories, expert committees, standards-based technologies, open-equable access, skills for data management. To get there requires strategy around People, Processes and Policies (PPP) and Technology.

But institutions cannot do this alone – for example, shared federated repositories. The concern becomes who is taking leadership on national and international levels in this area?

Action:

- Encourage GOVT/Public-funders to recognize the need for national leadership in building infrastructure to support the managing of increasing volumes and complexity of data. Institutions cannot do this alone.

CHARLES SEVERENCE (SAKAI FOUNDATION AND UNIVERSITY OF MICHIGAN)
ENTERPRISE SOFTWARE

Background: What is Enterprise Software - Software that solves an enterprise problem rather than a department problem.

Enterprise software is sometimes bloated and overly complex. It is important to take a user-centric approach to its development. The Community Source model is a development model for Enterprise Software which can substantially shorten the development-cycle for the software.

Why are community source deployments so fast? You get honest advice from people in community source. You get told the weak and strong parts of product from the providers, since they seek developers to help and not your money.

Action:

- The SAKAI Learning Management System is grounded in the Community Source model. Increasingly the same platform is being used to support Virtual Research Environments (SAKAI-VRE). ASAKAI-VRE as an Enterprise platform for support and encourage the deployment of Virtual Research Environments to support collaborative research projects.

SIDE CONVERSATIONS

CHRIS RUSBRIDGE (EDINBURGH DIGITAL CURATION CENTRE)

Two important points: Institutions need to be developing infrastructure that supports *“Not losing data, and reusing data” that is produced by the institution.*

Some success stories with using databases as a framework for preservation of Research Data – but they are few and far between. In many cases, scientists prefer to go back into the lab to recreate results rather than search databases. However, there is no “Journal of Negative Results” – there could be substantial savings in scientific efforts if such a journal exists (i.e. reduce the amount of wasted effort). Curation of Research Data with support database technology would essentially amount to a ‘Journal of Negative Results’ for global communities.

Funding: UK Research funding moving to ‘Full Economic Costing’ – grants need to include costs for Data Storage and Computational Resources. Bath University have used this to implement the “R-drive”: Apparently limitless Network Attached Storage for the entire University that is transparently made available to every desktop and server. The University has mandated that all important Research Data must be copied onto the ‘R’-drive. (A sophisticated Hierarchical Tape storage system sits behind it all).

Action:

- Evaluate the Bath University model (R-Drive) for providing transparent and limitless storage for the entire University. Furthermore, the Universities should determine the feasibility of mandating the use of such storage.

BRUC LEE LIONG (MAQUARIE)

Warning: Very Technical!

The MyProxy technology can be used to act as a temporary CA for GRID users, alleviating the need for GRID users to have PKI X.509 Certificates. A Shibbolised MyProxy can be used to convert a user's institutional credentials (e.g. from UoA Campus Community) to a new GRID certificate, which they can use to access GRID Storage resources (such as SRB) and other GRID services. Institutions and GRIDs need to tune the Shibbolised MyProxy and configure to special needs.

Bruce Lee Liong's advice to BeSTGRID is to use a Shibbolised MyProxy for provision of Certificate to GRID users - USA moving in this direction, and so is UK, and this includes related tools like VOMS. Researchers get edgy about X.509 PKI Certificates because they need system admins to supply the certificate - Shibbolised MyProxy removes this barrier.

Action:

- That BeSTGRID use a Shibbolised MyProxy server to provide new users with GRID certificates.

BILL APPLEBE AND DAVID BANNON (VPAC VICTORIAN PARTNERSHIP FOR ADVANCED COMPUTING)

Background: Victorian Partnership for Advanced Computing (VPAC) is a leading, independent Advanced Computing R&D service provider. VPAC is a not for profit registered research agency established in 2000 by a consortium of Victorian Member Universities. VPAC's members include:

- Deakin University
- La Trobe University
- Monash University
- RMIT University
- Swinburne University of Technology
- The University of Melbourne
- University of Ballarat and
- Victoria University

VPAC's mission is to provide independent expert services, training and support in Advanced Computing to VPAC Members, Industry and other organisations. VPAC provides professional R&D services in the application of Advanced Computing in the fields of Computational

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Engineering, Computational Software Development, Geospatial Sciences, Grid Computing and Life Sciences to assist Members, Industry and other organisations to create innovations in research and development.

Scope: VPAC focus on Advanced Computing which means any application of computing that is outside the scope of traditional "off the shelf" or "packaged" applications such as email, spreadsheets, word processing, and accounting packages. VPAC never take on any problem that they know how to do - they don't want to be seen as a threat to any University IT Operation - even though they often outperform University IT depts - they want to do the 'harder' things.

Support: VPAC is funded by a subscription based model which is contractual. Based around Services. From \$400,000pa to \$50,000pa. VPAC just does service delivery, no research. Current income around \$8mill, $\frac{3}{4}$ of that comes from commercial contracts (most do not generate a profit). Industrial partners include GM Holden and GM North America, but most are within Victoria. I could be thought of as a quasi-not-for-profit operation.

How does VPAC differ from other state partnerships in Advanced Computing? They say: Better, bigger, more successful. The key to their success is that everyone who works for VPAC works only for VPAC (only one master.) There is no secondment activity: secondment appears to have failed elsewhere in Australia. VPAC comprises 60 people across 4 sites, all hand-grown (nobody does training for Advanced Computing). They run Summer internship programmes and the best students stay on. They hire on promise not on skills.

APAC Role: VPAC main role for the Australian Partnership for Advanced Computing (APAC), and in future the NCRIS Platforms for Collaboration, is the design and implementation of the APAC National GRID (which serves as the Blueprint for BeSTGRID). VAPC take APAC funding and distribute it to members on annual project basis; however, members must use it to fund people and not equipment or other operational costs.

Director of eResearch: Bill pointed out that there are two models for Institutional Directors of eResearch

1. One model has as the key performance indicator the ability to attract as much external funding as possible for University.
2. The other model is based around collaboration, fostering as much of this as possible.

NZPAC: With the arrival of the KAREN network, New Zealand is ready to move into a new phase for High Performance computing. Bill has already had dealings in the past with Peter Hunters group. Bill Appelbe is very willing to propose a model for a New Zealand Partnership for Advanced Computing. He has already had thoughts on such a model, and it prepared to bring to NZ and present it to Institutions and Funders and the Government. Bill will prepare a draft discussion paper, proposing such a model.

He sees the risks for Advanced Computing in New Zealand are sustainability, how to maintain momentum, how to be equitable, and ensuring members get good return on investment.

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Action:

- Explore further the model Bill Appelbe has for a New Zealand Partnership for Advanced Computing, and facilitate higher level national discussions on the matter.
- Engage with University of Melbourne to explore their approaches to fostering collaboration and examine how they use VPAC services to best achieve research outcomes.

A/Prof Paul Bonnington

Director BeSTGRID