

National eResearch Collaboration Tools and Resources

Annual Business Plan

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NeCTAR is an Australian Government project conducted as part of the Super Science initiative and financed by the Education Investment Fund. The University of Melbourne has been appointed the lead agent by the Commonwealth of Australia, Department of Innovation, Industry, Science and Research.

Table of Contents

1	Executive Summary	3
1.1	Expected Progress	3
1.2	Variations from the Final Project Plan	3
1.3	Key Risks and Strategies	4
2	Status of Project	5
2.1	Progress to date	5
2.2	Project Outlook	8
3	Project infrastructure	9
3.1	Infrastructure Provisioning and Commissioning	9
3.2	Utilisation and Uptake	13
3.3	Impact and Outcomes	14
3.4	Management and Governance	15
4	Management and implementation	17
4.1	Governance and Management	17
4.2	Development Planning	17
4.3	Risks and Strategies	20
4.4	Key Performance Indicators	25
5	Milestones	27
5.1	List of Milestones	27
6	Project Resources	30
6.1	Expected EIF funds	30
6.2	Project Co-investment	34
6.3	Staffing Positions	37

List of Figures and Tables

Table 2.1: Contracting Status of NeCTAR Stage 1 Sub-projects	6
Table 4.1: High-level Key Performance Indicators	25
Table 5.1: NeCTAR Project Implementation Milestones (July 2011-March 2014).....	27
Table 6.1: Expected EIF Funds available at the start and end of the planning period	30
Table 6.2 NeCTAR Income and Expenditure by Program and Sub-Project	31
Table 6.3: NeCTAR Co-investment by program and sub-project	34
Figure 6.1: NeCTAR Project Directorate Structure	38

1 Executive Summary

1.1 Expected Progress

The NeCTAR Project is expecting to make substantial progress in the period of this First Annual Business Plan. Through the Stage 1 Request For Proposals (RFP), NeCTAR has elicited outstanding proposals for the creation and development of eResearch infrastructure which addresses needs and priorities identified by the sector. Sub-projects funded under the Stage 1 RFP include 5 Virtual Laboratories, 16 eResearch Tools and 3 Research Cloud nodes.

The NeCTAR sub-projects established under the Stage 1 RFP will execute throughout the period of this Annual Business Plan, with the majority of NeCTAR infrastructure development expected to occur in this period. NeCTAR will also approve proposals for funding arising from the Stage 2 RFP sub-projects during the period of the plan. It is expected that all Stage 2 sub-projects will commence operation before December 31 2012, with substantial development and deployment of infrastructure through the remainder of the period of this Plan.

1.1.1 NeCTAR Platforms: Research Cloud and National Server Program

NeCTAR anticipates that before the end of 2013 a single national cloud platform comprising up to 28,000 CPU cores distributed across up to 8 sites will be available to Australian researchers.

Building on the deployment of the initial node of the Research Cloud at the University of Melbourne, the initial deployments of the Stage 1 Research Cloud nodes will commence operation at the Australian National University (ANU), the Queensland Cyber Infrastructure Foundation (QCIF) and Monash University before January 31 2013. The initial deployments of the Stage 2 Research Cloud nodes are expected to commence operation before the end of Q2 2013.

1.1.2 Research Software Infrastructure: Virtual Laboratories and eResearch Tools

The NeCTAR Stage 1 Virtual Laboratory and eResearch Tool sub-projects will all execute throughout the period of this Plan and will deliver significant infrastructure throughout the period. These sub-projects have each provided detailed schedules for the staged delivery of infrastructure (included in Appendix B). NeCTAR expects to see strong growth in researcher utilisation of the NeCTAR infrastructure, with sub-projects required to report on progress against measures of utilization and uptake throughout the life of the project.

1.2 Variations from the Final Project Plan

The NeCTAR Directorate and the University of Melbourne intend to continue to execute the NeCTAR Project under the terms described in the Final Project Plan. The goals and objectives of the NeCTAR Project remain unchanged from those defined in the NeCTAR Funding Agreement and confirmed in the NeCTAR Final Project Plan.

NeCTAR has previously agreed with the Department a small number of variations from the provisions described in the NeCTAR Final Project Plan. These variations are intended to assist NeCTAR to successfully deliver infrastructure which meets the objectives of the Project.

1.2.1 Variation to the National Server Program

The Department approved on 7 May a request from the NeCTAR Director to reduce the funding allocated for additional nodes of the National Server Program from \$2.0M to \$0.5M

The NeCTAR Final Project Plan allocated \$3.0M for establishment of 3 nodes of the National Server Program (NSP). The first node of the NSP has been established and operating at the University of Melbourne since December 2010. The NeCTAR Project Board recommended that NeCTAR establish no more than one additional NSP node, and that the funding available for an additional node be no more than \$0.5M.

1.2.2 Variation to Funding distributions for the Stage 2 Request For Proposals

The Department approved a request from the NeCTAR Director to vary the funding allocations for the Stage 2 Request For Proposals from that described in the NeCTAR Final Project Plan according to:

- \$1.5M in funding be redirected from the National Server Program to the Stage 2 Research Cloud program, permitting the funding of an additional Research Cloud node in Stage 2; and
- Funding nominated for Stage 2 eResearch Tool proposals (\$1.0M) be redirected to funding proposals under the Stage 2 Virtual Laboratory program;
- Funding cap available per Stage 2 Virtual Laboratory proposal be reduced from \$2.0M to \$1.5M and that the minimum funding per proposal be reduced from \$1.0M to \$0.8M.

1.2.3 Removal of the NeCTAR Initiated Activities

The NeCTAR Final Project Plan (section 6.3) provides provisions for the Director, with approval of the Project Board, to initiate funded activities under the NeCTAR programs. The NeCTAR Project Board approved a recommendation that the NeCTAR Initiated Activities shall be removed from the scope of the NeCTAR Project and that NeCTAR will undertake no activities under the provisions of the NeCTAR Initiated Activities.

1.3 Key Risks and Strategies

NeCTAR identifies a number of key risks as the project moves beyond the requests for proposals with a greater focus on coordination, oversight and leadership across the NeCTAR programs and the portfolio of NeCTAR sub-projects. In particular, NeCTAR identifies key risks arising from potential delays in contract negotiation for Stage 2 proposals, delays in delivery against sub-project schedules and identified sub-project external dependencies.

Details on NeCTAR risk management are included in section 4.2.

2 Status of Project

2.1 Progress to date

2.1.1 Overview

The significant achievements of the NeCTAR Project since approval of the NeCTAR Final Project Plan in August 2011 include:

- NeCTAR Stage 1 Request For Proposals(RFP) issued on 20 September 2011;
- Phase 1 Deployment of the Research Cloud Node at the University of Melbourne in September 2011;
- Establishment of the NeCTAR Expert Panels in October 2011;
- Announcement in January 2012 of the NeCTAR Stage 1 Projects recommended for funding:
 - 5 Virtual Laboratory Projects
 - 16 eResearch Tools Projects
 - 3 Research Cloud Nodes
- Research Cloud Full Access Phase commences at the University of Melbourne in January 2012;
- Commencement of the NeCTAR Early Activity Virtual Laboratory projects;
- Successful establishment of first Stage 1 project contracts in April 2012;
- NeCTAR Stage 2 Request For Proposals issued on May 4 2012; and
- Successful operation of the initial node of the National Server Program since December 2010.

2.1.2 NeCTAR Stage 1 Request For Proposals

2.1.2.1 Proposal negotiation

As approved at the December 2011 meeting of the Project Board and recommended by the NeCTAR Expert Panels, the NeCTAR Directorate has negotiated with the submitting organisations for proposals recommended for funding under the Stage 1 Request For Proposals. The NeCTAR Directorate has sought to address identified shortcomings and issues identified in the submitted proposals, as identified by the Expert Panels and the NeCTAR Directorate.

Broadly, NeCTAR has sought clarifications and improvements to proposals in the areas of:

- Governance and project management;
- Co-investment in support of the operational requirements of the projects;
- Measures of utilisation and uptake by the research community;
- Milestones and Acceptance Criteria; and
- The use of EIF funds to support the creation and development of the proposed infrastructure.

NeCTAR has also negotiated with eResearch Tool and Virtual Laboratory projects for adjustments to the requested allocations of NeCTAR funds in accordance with the Project Board endorsement of the recommendations of the Expert Panels.

2.1.2.2 Contract Negotiation

A NeCTAR Draft Agreement for use with sub-contractors was developed through the following process:

- An initial Draft Agreement was drafted with support from Legal Services at the University of Melbourne
- The initial Draft Agreement was released with the Stage 1 Request For Proposals for feedback and comment
- An updated Draft Agreement was prepared by the Directorate in response to any repeated and major concerns raised by the responders.
- The updated Draft Agreement formed the basis for contract negotiation for all NeCTAR Sub-projects
- Minor variations to the updated Draft Agreement were accepted to accommodate particular needs of the proposing organisations while ensuring compliance with the NeCTAR Funding Agreement and NeCTAR objectives.

2.1.2.3 Status of NeCTAR Stage 1 Proposals Recommended for Funding

NeCTAR Project Milestones agreed with the Department, require executed agreements with 80% of the proposals recommended for funding through the Stage 1 RFP before July 31 2012. NeCTAR successfully established agreements with over 80% of the Stage 1 proposals before July 31 2012. The status of contract agreements with all Stage 1 Sub-projects is shown below. NeCTAR expects to complete agreements with the three proposals awaiting contract execution before September 15.

Table 2.1: Contracting Status of NeCTAR Stage 1 Sub-projects

NeCTAR Stage 1 Sub-projects - Contracting Status			
Research Cloud Nodes – Fully Contracted			
Code	Lead Organisation	Title	Contracted
RC003	ANU	NCI-based Node of the NeCTAR Research Cloud Program	22-Jun-12
RC005	QCIF	Queensland NeCTAR Research Cloud Node (QNRCN)	06-Jun-12
RC007	Monash University	NeCTAR Research Cloud at Monash	08-Jun-12
Virtual Laboratories – Fully Contracted			
VL006	Monash University	The Characterisation Virtual Laboratory: Research Environments for Exploring Inner Space	23-May-12
VL010	Astronomy Australia Limited	The All-Sky Virtual Observatory	22-Jun-12
VL011	Deakin University	Humanities Networked Infrastructure (HuNI): Unlocking and Uniting Australia's Cultural Data	17-May-12
VL001	University of Queensland	The Genomics Virtual Laboratory (GVL)	05-Sep-12
VL005	Bureau Of Meteorology	Climate and Weather Science Laboratory	15-Sep-12

eResearch Tools – Fully Contracted			
RT007	University of Melbourne	High throughput computing for globally connected Science	18-May-12
RT012	Monash University	Bioscience Data Platform: TARDIS in the Cloud	08-Jun-12
RT015	Curtin University	Collaborative and Automated Tools for Analysis of marine Imagery and Video (CATAMI)	17-May-12
RT016	Macquarie University	UniCarbKB: and e-infrastructure for glycomics	23-May-12
RT017	Australian Synchrotron	eResearch Tools for the Australian Synchrotron research community	17-May-12
RT020	University of Adelaide	Submission, Harmonisation and Retrieval of Ecological Data - SHaRED	05-Jun-12
RT025	University of Queensland	OzTrack - eResearch Tools for the storage, analysis and visualization of animal tracking data	05-Jun-12
RT029	University of WA	Cloud-based Bioinformatics Tools	11-Apr-12
RT038	University of Queensland	The Aust-ESE Project - eResearch Tools to Support the Collaborative Authoring and Management of Electronic Scholarly Editions	05-Jun-12
RT043	University of New South Wales	Federated Archaeological information Management System	30-May-12
RT022	QCIF	QUADRANT	27-Jun-12
RT031	Schizophrenia Research Institute	Extension and Enhancement of Systems for the Australian Schizophrenia Research Bank (ASRB)	29-Jun-12
RT009	ANU	Drishti and Voluminous - Volume Visualisation Tools	27-Jul-12
RT014	Monash University	Geology from Geodynamics	14-Jul-12
RT035	CSIRO	Cloud-based Image Analysis and Processing Toolbox	12-Jul-12
RT001	University of Melbourne	Human Variome Project Australian Node Clinical and Molecular Data Linkage Tools	31-Aug-12

While NeCTAR has met the project milestone for execution of agreements with Stage 1 sub-projects, the intention of the Directorate was to complete agreements before end June 2012. Delays to execution of contracts have arisen from a number of causes, including:

- Slower than expected rate for NeCTAR to prepare feedback to proposers for changes required to the submitted proposals
 - In response to issues identified by the Expert Panels and the Directorate
- Slower than expected turn-around from sub-projects in response to initial feedback
 - To reach agreement on response among collaborative proposals
 - To implement required changes to project budget
- Longer time than expected for negotiation on contract terms and conditions for some organisations.

2.1.3 Initial Research Cloud and National Server Program nodes

The initial node of the research cloud successfully commenced operation on January 31 2012 in accordance with the Final Project Plan milestones. The initial node of the Research Cloud is based on a deployment of 4000 CPU cores at the University of Melbourne.

The creation and development of the cloud fabric is conducted under the Lead Node Activity led by the University of Melbourne. The Lead Node has deployed a full Infrastructure as a Service (IaaS) offering based on the OpenStack cloud computing platform.

Since January 31, over 1100 distinct research users have registered, using their AAF credentials, with the research cloud dashboard to create and deploy tools, applications and services on the research cloud. Over 1200 CPU cores are currently in active, sustained use, with demand continuing to grow rapidly.

The initial node of the National Server Program has continued to operate at the University of Melbourne since December 2010 with over 15 suites of services approved for deployment on the NSP.

2.2 Project Outlook

The NeCTAR Project is well placed to continue to deliver significant eResearch infrastructure to Australian researchers. Through the Virtual Laboratory and eResearch Tool sub-projects NeCTAR will deliver significant domain and problem-oriented collaborative software infrastructure across a broad range of research domains.

The NeCTAR Research Cloud has attracted significant interest from organizations to host research cloud infrastructure for Australian researchers. In particular the Research Cloud will deliver a computational platform which complements existing investments in research networks, data storage and high performance computing. It is anticipated that the Research Cloud program will provide up to 28,000 CPU cores deployed across up to 8 distributed sites in Australia.

3 Project infrastructure

3.1 Infrastructure Provisioning and Commissioning

3.1.1 NeCTAR Platforms: Research Cloud and National Server Program

NeCTAR anticipates that before the end of 2013 a single national cloud platform comprising up to 28,000 CPU cores distributed across up to 8 sites will be available to Australian researchers.

Building on the deployment of the initial node of the Research Cloud at the University of Melbourne, the Stage 1 Research Cloud nodes will develop and deploy research cloud infrastructure throughout the second half of 2012. Each Research Cloud node will deploy up to 4000 CPU cores. All Stage 1 nodes will commence operation before January 31 2013. It is expected that up to 10,000 CPU cores will be available to Australian researchers across 4 research cloud nodes at the University of Melbourne, the Australian National University (ANU), the Queensland Cyber Infrastructure Foundation (QCIF) and Monash University. Up to an additional 3,000 CPU cores will be deployed during the period of the plan through further stages of deployment at the cloud nodes. Stage 2 Research Cloud nodes are expected to commence development and deployment from early 2013 with operations commencing before Q3 2013.

As described in the NeCTAR Final Project Plan, the Research Cloud program is funding the creation and development of an Infrastructure-as-a-Service offering based on a number of sites around Australia, identified through the NeCTAR Requests For Proposals. Each of the sites will operate as a node within a national federation of research cloud nodes.

NeCTAR has also established the Research Cloud Lead Node activity, currently led by the University of Melbourne, to develop and operate the Research Cloud Infrastructure Framework. All nodes of the Research Cloud will operate within a federated national model under the Research Cloud framework.

Through the Lead Node Activity the OpenStack-based cloud computing fabric provides the following high-level, user facing capabilities which are underpinned by the infrastructure deployment at each of the nodes:

- Well-established APIs for accessing and managing virtualised infrastructure on the research cloud, including a compatibility interface for the Amazon Web Services cloud computing APIs;
- A user-accessible, web-based dashboard for managing and deploying virtual machine instances and allocated resources;
- A cloud-based object-storage service;
- A user authentication framework integrated with the Australian Access Federation (AAF)

NeCTAR will work with the Virtual Laboratory and eResearch Tool projects, as well as the research cloud nodes and other stakeholders, to identify and accelerate the development

and deployment of key tools and services to support research usage of the cloud. Where these services will provide clear improvements to utilisation and ease-of-use for the cloud, NeCTAR may contribute funding to the development of these services through the “eResearch Tools – Common Utilities” funding identified in the Final Project Plan. Candidates to attract NeCTAR funding support include the development of Platform-as-a-Service offerings and resource orchestration tools and services.

It is expected that the majority of Australian researchers will access resources deployed on the cloud through Software-as-a-Service (including the NeCTAR Virtual Laboratories and eResearch Tools) and Platform-as-a-Service offerings, while only technically proficient research early adopters and research software developers and operators will utilise the Infrastructure-as-a-Service offerings.

3.1.2 Research Software Infrastructure: Virtual Laboratories and eResearch Tools

The NeCTAR Virtual Laboratories will provision and commission infrastructure throughout the period of this Plan, with significant portions of the planned infrastructure in place and available for researcher use before 30 June 2013. Sub-projects under these programs have identified schedules for deployment of infrastructure throughout the life of the project. The proposals are summarized in Appendix A.

As predominantly software infrastructure projects, the Virtual Laboratories and eResearch Tools will consist of software development activities, integration and configuration of coordinated existing services and deployment and configuration of the software systems to provide online services to research communities. The Virtual Laboratories and eResearch Tools are expected to deploy their services onto the NeCTAR Research Cloud and National Server Program.

The Virtual Laboratory and eResearch Tool projects are creating infrastructure that focuses on the domain-specific needs of their associated research communities. Across the portfolio of projects there are numerous instances of common technologies, tools and methodologies, including in the areas of workflows, cloud-based computation, human collaboration platforms, visualisation, data linkage and modelling frameworks.

The Genomics Virtual Laboratory (VL001) has identified the Galaxy workflow engine as a key underpinning technology to support bio-informatics workflows in the cloud, and on HPC systems. Workflow technologies also underpin a number of other Virtual Laboratories including the Climate and Weather Science Virtual Laboratory, the Characterisation Virtual Laboratory, the Marine Virtual Laboratory and the Geosciences Virtual Laboratory. While these workflow technologies simplify the process for researchers to orchestrate complex research workflows which span institutional and facility boundaries, each Virtual Laboratory is also intending to create standardised, reference workflows for re-use by researchers. Workflow tools are also of interest to some eResearch Tool projects such as the Cloud-based Image Analysis and Processing Toolbox which is re-deploying Galaxy to support image processing pipelines.

Data linkage is identified as the central technology of the HuNI Virtual Laboratory. HuNI is establishing data linkages across over 20 data collections in the humanities and creative arts. Data linkage technologies are also included in the Human Variome, UniCarbKB and Bioinformatics in the Cloud eResearch Tool projects.

Cloud-based computation technologies are important underlying technologies for supporting the computational needs of many Virtual Laboratories and eResearch Tools. Several projects have identified technologies for managing virtualised computing clusters in the cloud as well as established cloud-computing frameworks, such as Hadoop to support map-reduce workloads. The Galaxy workflow engine used by the Genomics Virtual Laboratory is closely integrated with the Cloudman solution for dynamic cluster management. The High Throughput Computing eResearch Tool is deploying computational clusters in the cloud to support the needs of the high energy physics research community. Research Cloud nodes ANU and Monash University have also expressed an intention to support cloud-based virtual computing clusters for their research community stakeholders, as well as computing frameworks such as Nimrod.

The Research Cloud is also a key technology underlying the Virtual Laboratories and eResearch Tools, as the cloud enables the dynamic, and scalable, provisioning of resources to meet researcher need. NeCTAR will engage with the sub-projects to identify and establish tools and services to ease the management of software infrastructure deployment in the cloud.

NeCTAR will engage with the Virtual Laboratory and eResearch Tool sub-projects to establish prioritised working groups around identified shared technologies and applications. These working groups will be established to facilitate sharing of technologies and expertise, to reduce duplication across the sub-projects and to ease the burden of ongoing operations of the project infrastructure.

A common characteristic of many NeCTAR Virtual Laboratories is the bringing together within a single online-accessible environment of observation/data and modelling/simulation resources. This is a key feature of the All-Sky Virtual Observatory, the Marine Virtual Laboratory, the Climate and Weather Science Virtual Laboratory and the Geosciences Virtual Laboratory. These environments, and these projects, are creating opportunities to improve knowledge sharing across the modelling and observational research communities. Researchers in the respective modelling communities will have access to important observational data for model forcing and validation. Observational researchers will have simplified access to well-validated models and model outputs. A further impact these environments provide is through the opportunity for greater collaboration between the observational and modelling-based research communities.

3.1.3 Interrelationships between NeCTAR sub-projects

3.1.3.1 eResearch Tools supporting Virtual Laboratory projects

As described in Sections 4.2.2 and 5.1.1 of the NeCTAR Final Project Plan, two million dollars of NeCTAR funding was allocated for eResearch Tools to meet identified needs arising from successful responses to the Virtual Laboratory Requests for Proposals. EResearch Tool

proposals submitted to the Stage 1 RFP were requested to indicate where they have been submitted in support of a Virtual Laboratory proposal. The Stage 1 eResearch Tool projects which have been submitted in support of Virtual Laboratory proposals are shown below.

Virtual Laboratory	Supporting eResearch Tools
VL001: The Genomics Virtual Laboratory	RT029: Cloud-based Bioinformatics Tools RT035: Cloud-based Image Analysis and Processing Toolbox
VL006: The Characterisation Virtual Laboratory	RT012: Bioscience Data Platform: TARDIS in the Cloud RT009: Drishti and Voluminous - Volume Visualisation Tools
E01: Geosciences Virtual Laboratory	RT014: Geology from Geodynamics
E02: Marine Virtual Laboratory	RT015: Collaborative and Automated Tools for Analysis of marine Imagery and Video (CATAMI)

3.1.3.2 External Dependencies

Proposals submitted to the NeCTAR RFP were requested to indicate key dependencies on external infrastructure such as capabilities provided by the Australian Access Federation (AAF) and the Australian National Data Service (ANDS). The key dependencies nominated by the sub-projects are included below.

External Dependency	NeCTAR Sub-project
Australian Access Federation	VL006: The Characterisation Virtual Laboratory VL001: The Genomics Virtual Laboratory E02: Marine Virtual Laboratory RT007: High throughput computing for globally connected Science RT009: Drishti and Voluminous - Volume Visualisation Tools RT012: Bioscience Data Platform: TARDIS in the Cloud RT015: Collaborative and Automated Tools for Analysis of marine Imagery and Video (CATAMI) RT022: QUADRANT RT029: Cloud-based Bioinformatics Tools RT035: Cloud-based Image Analysis and Processing Toolbox
Australian National Data Service	RT015: Collaborative and Automated Tools for Analysis of marine Imagery and Video (CATAMI)

3.1.3.3 Ongoing coordination and interdependencies

NeCTAR will engage with the Virtual Laboratory and eResearch Tool sub-projects throughout the life of the NeCTAR Project to identify further opportunities for linkage and collaboration between the NeCTAR sub-projects and to monitor future issues which may arise from emerging common dependencies, including through the NeCTAR Projects Workshops and establishment of common-interest working groups.

The NeCTAR Director and Deputy Director are also advising projects through participation on steering committees of opportunities for increased re-use of eResearch Tools within the Virtual Laboratories.

3.2 Utilisation and Uptake

3.2.1 eResearch Platforms: Research Cloud and National Server Program

NeCTAR has utilised a number of communications channels to communicate the benefits of the Research Cloud to Australian researchers. Currently, the Infrastructure as a Service (IaaS) offering provided by the implementation of the research cloud requires some technical proficiency for use. The Research Cloud has attracted over 1100 distinct users who have registered with the Research Cloud dashboard to deploy applications, tools and services on the Research Cloud.

NeCTAR has partnered with the Australian National Data Service (ANDS) to host a series of research cloud workshops around Australia targeted at technically proficient early adopter researchers and the eResearch software development community. These workshops have been instrumental in driving uptake within the identified early adopter community.

As described in the NeCTAR Final Project Plan, NeCTAR provides a mechanism for on-demand allocation of small quantities of resources to Australian researchers. The availability of small quantities of on-demand resources has been a significant driver in rapid uptake and utilisation by the research community and by the providers of eResearch services.

As the focus of the Research Cloud program moves beyond the provision of the Infrastructure as a Service offering, higher-level services will be deployed on the Research Cloud which streamline the utilisation of the research cloud by a wider cohort of research users. A selection of key early services to be supported will be identified through the Research Cloud governance bodies.

As additional cloud nodes are commissioned the organisations supporting those nodes will become more active in supporting researchers through:

- NeCTAR funded Application Migration programs to support the migration of existing research applications and services to the Research Cloud.
- Node support to local research stakeholders to utilise the Research Cloud for their computing needs.

3.2.2 Virtual Laboratories and eResearch Tools

NeCTAR has ensured that Virtual Laboratory and eResearch Tool sub-projects include specific strategies of engagement to drive broad utilization and uptake in their identified research communities.

Sub-projects are required to deliver infrastructure through a staged delivery model with sign-off by research users on key user-facing infrastructure deliverables. This is intended to provide opportunities for feedback to the sub-project from the intended research users throughout the lifetime of the sub-project.

All sub-projects are required to identify key measures of utilisation and uptake by researchers and to report against these measures throughout the life of the project. Furthermore, sub-projects are encouraged to utilise blogging to report progress in development of the infrastructure and the benefits to be delivered to researchers. The

NeCTAR website provides an aggregated feed of the sub-project blogs to improve visibility of the infrastructure development across the portfolio of NeCTAR sub-projects and to facilitate improved communication between the sub-projects.

The NeCTAR Virtual Laboratory and eResearch Tool projects have a strong focus on delivering against research domain specific needs. Sub-projects are required to prepare and submit a full communication and engagement plan in support of raising awareness and driving uptake within the target research domain. Research participants in the sub-projects are also expected to act as champions and advocates for the sub-project within their research domains, supporting uptake by the broader research community. The NeCTAR Directorate (Communications Manager) will support the development and implementation of sub-project communications plans through the provision of template plans and targeted communications workshops with sub-projects.

3.3 Impact and Outcomes

The NeCTAR Virtual Laboratories are providing exemplars to research communities across Australia of the benefits of deeply integrated, research-domain focused environments which provide shared access to the community's research resources. The Virtual Laboratories are creating new opportunities for collaboration around shared access to research tools, models, applications, data and research knowledge.

The emerging benefits and impacts of the NeCTAR Virtual Laboratories include:

- Fostering new opportunities for research collaboration:
 - Bringing together observational and modelling research communities across a number of research disciplines
 - Making new research possible through simultaneous access to data, tools and models;
- Providing shared access to research tools and data where derived knowledge may be captured and shared in-situ
 - Improving the efficiency of research through orchestrated research workflows;
- Improving the realisation of benefits from underlying research infrastructure:
 - By providing access to those capabilities within environments which support the methodologies and established practices of each research domain; and
- Sustained and supported by research communities and capability partners through well established governance with deep researcher engagement and participation.

The NeCTAR eResearch Tool projects are improving the robustness of research community owned and developed research tools, especially to enable wider use and access through deployment on the Research Cloud. Researcher will have improved and simplified access to shared research tools through a Software-as-a-Service model where tools are developed, configured and deployed onto the research cloud where they may be accessed and used by researchers as needed, easing the burden of software support.

Taken together, the NeCTAR Research Cloud and National Server Program are providing a nationally distributed and accessible computational platform for research. The Research

Cloud provides an on-demand, accessible and scalable platform for deployment of research tools, applications and services at significant scale, which provide the following benefits to Australian researchers:

- Scalable computing resources available on-demand, as needed:
 - Reducing the burden of managing computing services
- Nationally, and internationally accessible resources:
 - Reducing barriers to collaboration across institutional and national boundaries
- Fostering research innovation by reducing barriers to rapid deployment and sharing of research tools, applications and data.
- Providing an opportunity to invest at scale in support of highly diverse research needs

3.4 Management and Governance

NeCTAR maintains effective oversight and management of the NeCTAR Programs through the various mechanisms described in the NeCTAR Final Project Plan, including:

- Establishment of the NeCTAR Platforms Steering Committee to provide oversight and governance across the operations of the Research Cloud and National Server Programs;
- Directorate participation (non-voting) in the governance bodies of the Virtual Laboratory and eResearch Tool sub-projects; and
- Milestone reporting requirements for all NeCTAR sub-projects.

3.4.1 Access and Pricing

The NeCTAR Research Cloud and National Server Programs have open models of access with resource allocation available to all Australian researchers, subject to merit requirements and available capacity. The Virtual Laboratories and eResearch Tools have all been required to provide access and pricing policies consistent with the 2011 Strategic Roadmap for Research Infrastructure. The policies have been articulated in the agreed proposals for each sub-project.

EResearch Tools developed as part of the NeCTAR project are freely available for the life of the NeCTAR project to all Australian Researchers for non-commercial purposes. Exceptions to this occur where there are limitations to the number of users in which case a merit based allocation will occur, such as with the Voluminous service in RT009 Drishti and Voluminous, or where access to the data first requires ethics approval, such as with the RT031 Australian Schizophrenia Research Bank.

The software code developed for all eResearch Tools is available freely through an open-source license where possible, with the exception of RT022 Quadrant where there are potential security concerns due to the sensitivity of the data.

Access to the data varies between being freely accessible (RT016 UniCarbKB), being licensed as openly as possible where IP and ethical issues do not interfere with its dissemination

(RT043 Federated Archaeological Information Management System), to access levels being specified on upload by the data owner (RT025 OzTrack and RT038 Aust-ESE.)

Services provided by the Virtual Laboratories are available free of charge to Australian researchers for the life of the NeCTAR Project (Jun 2014) and access varies as below:

- VL001 Genomics Virtual Laboratory: Access through AAF; access to the LifeScope product within the Virtual Laboratory is restricted by license conditions to Genomics Information Network members who are customers of specific products.
- VL005 Climate and Weather Science Laboratory: A research-use license agreement must be issued by the Bureau of Meteorology for access to the Met Office Unified Model. They are able to be issued to any Australian University.
- VL006 Characterisation Virtual Laboratory: Access to researchers at publicly funded institutions for non-commercial purposes.
- VL010 All Sky Virtual Observatory: Access to all Australian astronomers.
- VL011 Humanities Networked Infrastructure (HuNI): Access to all Australian researchers.

All Virtual Laboratories and Early Activity Virtual Laboratories will be using and creating open source licensed software.

4 Management and implementation

4.1 Governance and Management

During the period of this Annual Business Plan the NeCTAR Project will continue to operate under the governance arrangements identified in the Final Project Plan. The NeCTAR Project Board is the independent body providing strategic guidance to The University of Melbourne and the NeCTAR Director with regards to the NeCTAR Project objectives, delivery and progress.

The NeCTAR Project Board as at June 2012 comprises the following members:

- Dr Graham Mitchell AO (Chair)
- Professor Andrew Cheetham, Pro Vice Chancellor (Research), University of Western Sydney (Deputy Chair)
- Dr. Paul Arthur, Deputy Director, National Centre of Biography, Australian National University
- Professor Max Lu, Deputy Vice Chancellor (Research), University of Queensland
- Professor Robyn Owens, Deputy Vice Chancellor (Research), University of Western Australia
- Dr Roger Proctor, eMII Director, Integrated Marine Observing System (IMOS)
- Mr Paul Sherlock, Director of Information Strategy & Technology Services, University of South Australia
- Professor Liz Sonenberg, Pro Vice Chancellor (Research Collaboration), University of Melbourne
- Professor John Taylor, Director, CSIRO eResearch & Computational and Simulation Sciences (CSIRO)

Dr. Paul Arthur was invited to join the NeCTAR Project Board in March 2012 to fill a vacancy created with the departure of Professor Iain McCalman.

Management and governance of the Research Cloud and National Servers Program will be supported through the NeCTAR Platforms Steering Committee with support from the Platforms Technical Advisory Group, as described in the NeCTAR Final Project Plan.

The NeCTAR Directorate will maintain oversight of the Virtual Laboratory and eResearch Tool sub-projects through the sub-project reporting requirements and participation (non-voting) on the governance bodies of the individual sub-projects.

4.2 Development Planning

As the NeCTAR Stage 1 projects commence implementation and the Stage 2 RFP processes are completed in Q3 2012, NeCTAR will commence discussions with the Project Board through Q1 2013 to develop planning processes to maximise the strategic long-term benefits delivered to Australian researchers through the NeCTAR programs and sub-projects. These will include the establishment of strategic planning processes to consider:

- Improving coordination across the NeCTAR sub-projects to realise collaborative opportunities and to identify common challenges;
- The development of sustainability models for the infrastructure created through the NeCTAR sub-projects; and
- Ensuring a strong focus on benefit realisation within the NeCTAR sub-projects particularly through strategies to support strong uptake and utilisation of the infrastructure by Australian researchers.

Processes to achieve these outcomes approved by the Project Board will be established and commence implementation through Q2 2013, continuing through the life of the NeCTAR Project. The processes will address models for sustainable operation of NeCTAR program-level infrastructure, such as the Research Cloud and National Servers Program, as well as the needs of the NeCTAR Virtual Laboratory and eResearch Tool sub-projects.

4.2.1 Research Cloud and National Servers Program

The NeCTAR Final Project Plan provides a high-level description of the access and pricing policies for the Research Cloud and NSP as well as policies and processes for allocation of resources. NeCTAR will work through the Platforms Steering Committee and the Project Board to refine these policies and processes throughout the lifetime of the Project, with a particular focus on developing sustainable policies and models to support the future development and operation of the Research Cloud and National Server Program infrastructure.

Furthermore, it is noted that no proposals for additional nodes of the National Servers Program were received under the NeCTAR Stage 1 RFP. The NeCTAR Directorate will engage with the Project Board and relevant stakeholders to determine how best to achieve the goals of the National Server Program, which remain unchanged from those expressed in the Final Project Plan. As described in Section 1.2.1 above the Project Board and the Department have approved a recommendation that NeCTAR establish no more than one additional NSP node, and that the funding available for an additional node be no more than \$0.5M. The Project Board have requested that NeCTAR request the University of Melbourne undertake a risk analysis of the NSP node deployment at the University of Melbourne before end 2012 in order to inform a final decision on expenditure of the \$0.5M in unallocated NSP funding. A final plan for completion of the National Server Program will be developed by the NeCTAR Directorate with the support of the NeCTAR Platforms Steering Committee and Technical Advisory Group, and submitted for approval by the NeCTAR Project Board before 31 March 2013.

4.2.2 Virtual Laboratories and eResearch Tools

The NeCTAR Directorate will enhance coordination and improved alignment of infrastructure across the Virtual Laboratory and eResearch Tools through combined workshops, and participation in meetings of sub-project steering committees. The NeCTAR Directorate will be well placed to identify emerging common challenges and also opportunities from collaboration and sharing of tools across the NeCTAR Virtual Laboratories and eResearch Tools.

The NeCTAR Virtual Laboratory and eResearch Tool sub-projects have emerged from independent domain and discipline-oriented needs as expressed in proposals submitted from the Australian researcher community. NeCTAR identifies that there is opportunity to improve the delivery of benefits to Australian researchers by identifying areas of overlapping interest and common technical challenges across the portfolio of software infrastructure projects.

NeCTAR will establish a series of NeCTAR Project Workshops, commencing in late 2012 and through Q1 and Q2 2013, facilitated by the NeCTAR Director and Deputy Director to enhance direct communication across the Virtual Laboratory and eResearch Tool programs to identify:

- Opportunities for re-use of tools and technologies across the programs;
- Shared tools and technologies which may be enhanced through collaborative arrangements;
- Common challenges and gaps in underlying capabilities which may be addressed through concerted effort or direct investment by NeCTAR under the common tools component of the eResearch Tools program; and
- Strategies to maximise benefit realisation across the Virtual Laboratory and eResearch Tool programs.

Community based working groups will emerge from the workshops in areas of identified common interest, such as: Workflow Tools, Visualisation, Cloud-based computational frameworks (eg. clusters in the cloud, Hadoop, ...). It is expected that the first sets of working groups will be established through Q1 2013, and operate through 2013.

The NeCTAR Projects Workshops will also be used to engage the VL and RT projects to identify strategies for improving benefit realisations across the Virtual Laboratory and eResearch Tools programs.

4.2.3 eResearch Tools – Common Utilities

As described in Section 4.2.2 of the Final Project Plan,

the Director may identify, and recommend to the NeCTAR Project Board for approval, key utilities that are required to improve the overall functionality of other NeCTAR activities. Such utilities may be agreed and commenced at any time, and are not constrained to the established Stage 1 and Stage 2 RFP cycles. The NeCTAR Director will consult with members of the Project Board and relevant sub-committees in initiating utilities which will then be managed in accordance with the processes applied to the eResearch Tools program.

The NeCTAR Directorate identifies two particular areas which will be prioritised through this funding:

- Addressing high priority common challenges arising across the Virtual Laboratory and eResearch Tool sub-projects

- The development and deployment of infrastructure which supports higher-level services on the Research Cloud

The NeCTAR Directorate will work with the Virtual Laboratory and eResearch Tool sub-projects, including through the NeCTAR Projects Workshops, to prioritise common challenges which may be addressed through funding available under the eResearch Tools program.

One area which has already been identified for consideration are requirements for a common, federated and delegated, authorization framework. The NeCTAR Director has consulted with the Department, RDSI, the AAF and specific NeCTAR Virtual Laboratory sub-projects around possible solutions and approaches.

NeCTAR will also consult with the Research Cloud nodes through the Platforms Steering Committee and other stakeholders, including the Virtual Laboratory and eResearch Tool sub-projects to identify and prioritise higher-level software services to be supported through this funding, including infrastructure to support the management, deployment, scaling and monitoring of research software infrastructure and services on the Research Cloud.

4.3 Risks and Strategies

NeCTAR identifies a number of key risks as the project moves beyond the requests for proposals with a greater focus on coordination, oversight and leadership across the NeCTAR programs and the portfolio of NeCTAR sub-projects.

In particular, the following risks are identified as of particular relevance for the period of this Annual Business Plan.

Key Risk: Delays in finalisation of Stage 2 sub-project agreements

Impact: Delays in delivery of infrastructure. Difficulties to complete in project timeframes.

Mitigation: Build on experiences from the Stage 1 agreement negotiations, including:

- Early preparation of proposal feedback, including issues to be addressed
- Updated contract Terms and Conditions refined through Stage 1 negotiations

Key Risk: Failure to establish common cloud operations across cloud nodes

Impact: Fragmentation of service offerings, reduced inter-operability, barrier to national-scale collaborative platforms deployed on cloud, duplication of effort at nodes.

Mitigation: Establish strong governance and technical leadership across the research cloud nodes. Establish centralised technical coordination and operation through Lead Node Activity.

Key Risk: Duplication of infrastructure across Virtual Laboratory and eResearch Tool sub-projects

Impact: Reduction in delivered value across NeCTAR programs.

Mitigation: Identify opportunities for coordination and de-duplication across NeCTAR sub-projects through Directorate oversight and through channels for communication and alignment across sub-projects, including NeCTAR Project Workshops.

Key Risk: Delays in sub-project execution and delivery of infrastructure

Impact: Reduced delivery of value to the research community. Failure to complete delivery in project timeframes.

Mitigation: Active monitoring of sub-project progress through milestone and periodic reporting. Directorate participation in sub-project steering committee meetings.

Key Risk: Dependencies on key external capabilities, including: improved authentication (AAF), Data Storage capacity available through RDSI Project, ANDS project deliverables

Impact: Delays or non-delivery of key infrastructure with external dependencies.

Mitigation: Actively engage with associated Projects (eg. RDSI, AAF, ANDS) to coordinate and align the delivery of key capabilities required by NeCTAR sub-projects.

4.3.1.1 Mitigation of these delays for Stage 2 proposals

NeCTAR intends to establish agreements with 80% of Stage 2 sub-projects before 31 November 2012, with an expectation to complete agreements with all sub-projects before end December 2012. NeCTAR expects to successfully complete negotiations more rapidly than for Stage 1 as the number of proposals to be approved in Stage 2 (up to 9 proposals) is less than the number approved in Stage 1 (25 proposals) and NeCTAR has successfully agreed terms and conditions with a large number of organisations and institutions from Stage 1. Furthermore, the preparation of initial feedback to proposers will commence immediately after proposals are shortlisted by the Expert Panels. Initial feedback will be provided to proposers soon after announcement of proposals recommended for funding.

4.3.2 Risk Management Strategy Review

Specific risks associated with the NeCTAR Project are described in section 3 of the Nectar Interim Project Plan, and approaches to management of risk are further articulated in Section 8.2 of the NeCTAR Final Project Plan.

The risk management strategies identified in the Interim Plan are included below, along with an assessment report on the identified strategies to June 30 2012. During the reporting period the principal activity to address the risk management strategies was through the development of the Nectar Request For Proposals (RFP).

Risk Area 1: Financial including sustainability			
	Risks	Mitigation	Assessment
1.1	Potential for cost overruns	The Funding Agreement limits total EIF funding, and each Sub-Contract will limit EIF funding available to each Sub- Project	This mitigation strategy was successfully implemented in the design of the Request For Proposals (RFP), with a Capped Level of Effort approach adopted for subproject implementation (RFP Section A-5.1).

1.2	Limitations of EIF funds use limiting operational availability of invested infrastructure	EIF Funds will be contributed to Sub-Projects to cover part costs and limited in use to appropriate expenditure items. All other expenditure items will be the responsibility of Sub-Project participants.	This strategy was successfully implemented in the design of the RFP and sub-contracts, with careful guidance and requirements that EIF funds may only be expended on the creation and development of infrastructure, and a clear requirement for identified co-investment to fund operational requirements. Each proposal is required to itemize and report all expenditure of EIF funds and operational co-investment.
1.3	Inability to attract key co-investors	Co-investment will be actively encouraged through the pursuit of open control and access policies operating the infrastructure. Co-investment will be encouraged by the availability of priority allocation of resources to nationally significant research endeavours, as agreed with co-investors.	This strategy was successfully implemented in the RFP, with a requirement for open control and access policies in sub-projects (RFP Section B1-2.4). Co-investment in research cloud proposals was successfully encouraged through the availability of priority allocation processes for the co-investing parties (RFP Section B3-3.4). Furthermore, the level of co-investment was part of the competitive requirement in the selection criteria for proposals.
1.4	Operational sustainability	<p>Project infrastructure will in all cases be implemented by organisations that commit to its operational support for the life of the Project.</p> <p>In the case of the Research Tools and Virtual Laboratory programs, the infrastructure will be operated by the Sub- Project participants and can be expected to operate for its useful lifetime.</p> <p>In the case of the Research Cloud and National Server Programs, further funding support will be required to sustain their continued operation for open research access.</p> <p>The Project will ensure that both these infrastructures operate through to June 2014.</p>	This strategy was successfully implemented in the RFP, based on a slight modification of the strategy. NeCTAR did not require that the implementing organization was also responsible for operational support, but that a designated operator for the infrastructure be nominated, and to commit to operations to June 2014.

1.5	Future of Project initiatives	<p>The Project Board will work with stakeholders and Sub- Project participants to seek solutions to contribute to the sustainability of the Project initiatives, beyond the life of the Project.</p> <p>Significant industry interest in a leading edge technology demonstration will assist industry engagement.</p> <p>A successful Project is more likely to lead to a case for further funding and a growing interest in replication of the infrastructure so that industry can be expected to actively build the required relationships.</p>	<p>This risk strategy was not implemented in the reporting period, and will be addressed as NeCTAR successfully establishes and executes sub-projects.</p>
1.6	Treatment of depreciation	<p>The Project will seek to secure arrangements where Project infrastructure can be integrated over the lifetime of the Project into the business operations of project participants.</p>	<p>This strategy was successfully implemented in the RFP, with equipment costs, particularly for the Research Cloud and NSP, fully integrated into the business operations of the participants.</p>

Risk Area 2: Suitability for Purpose			
	Risk	Mitigation	Assessment
2.1	Infrastructure does not meet the requirements of researchers	<p>A significant portion of the infrastructure developed by the Project will be co-developed with researchers to provide functions that are a direct result of their research need.</p> <p>Significant sector consultation will drive Project-initiated infrastructure development to ensure large-scale demand determines Project priorities and the delivered functionality.</p> <p>The requirement for co-investment from researchers and research organisations is intended to constrain developments to functions regarded as valuable by the relevant communities.</p>	<p>This strategy was incorporated into the RFP. Sub-projects were required to be partnerships, with the research community they are targeting represented in that partnership (RFP Section D-5.3). In addition, a series of briefing sessions for the RFP emphasized the need for research community participation. The Expert Panel, which is convened to evaluate the stage 1 proposals, is briefed on the need for research community participation and this forms part of their evaluation criteria.</p> <p>Additionally, Nectar seeks to address this risk through requiring the staged deployment of infrastructure and research user signoff of production deliverables.</p> <p>This will nonetheless be an ongoing risk to be addressed throughout the execution of the sub-projects.</p>
2.2	Research cloud is not	<p>The Project Board will be able to advise on the balance of other</p>	<p>This strategy was successfully implemented through the requirement</p>

	sufficiently large to meet demand	Programs in relation to the Research Cloud. The Cloud will be implemented with institutions intending to self invest in cloud capabilities to maximise overall capacity.	for co-investment by research cloud proposers. Additionally, Nectar has structured the RC program to enable independent growth of capacity at the nodes through future stakeholder buy-in.
2.3	Adequacy of access arrangements	Access policies to be developed to consider ways each approved use has sufficient capacity to achieve intended research outcomes. The access policies and arrangements will be determined with sector consultation and modelled on those used by suppliers of existing, similar, successful infrastructures.	This strategy was successfully implemented in the Nectar RFP through a requirement for access policies aligned with the requirements identified in the development of the 2011 Roadmap for Research Infrastructure.

Risk Area 3: Project management			
	Risk	Mitigation	Assessment
3.1	Adequacy of project leadership and management	Once appointed, it is intended that the Project Director shall be named in this Agreement at Item 1 of Schedule 1, in accordance with Clause 8 of this Agreement (Specified Personnel). The Project Director will be appointed with the agreement of the Project Board, the University of Melbourne and DIISR. Other key personnel will have relevant seniority and experience and work under the direction of the Project Director and to the policies of the University of Melbourne, The University of Melbourne will ensure its proven project management methodologies and policies are applied to the Project.	This strategy was successfully implemented as identified, and the Director appointed in accordance with the mitigation strategy. Nonetheless, there was a delay in the selection and approval of the Director, and this had impacts on the subsequent schedule for delivery of the Final Project Plan. The Nectar directorate has been closely supported by the University's Project Services group, ensuring the use of strong project management practices. Additionally, Nectar identified in the Final Project Plan the appointment of a Deputy Director to support project leadership.
3.2	Delays in design and construction	Experienced and dedicated personnel will be deployed as needed to ensure sufficient attention and effort is available to progress the Project in a timely manner. Overall, the project will to the greatest extent possible deploy standardised and proven technologies.	This mitigation strategy was successfully implemented in the RFP, especially in the Research Cloud and NSP, through selection of cloud middleware with broad industry representation and support, and support for standardised APIs. Virtual Laboratories and eResearch Tools are also required to build substantially on existing and proven tools and capabilities, reducing the time to deployment of usable infrastructure.

3.3	Adequacy of sub-contracting arrangements	The University of Melbourne is a substantial organization with a long history in infrastructure development and deployment. It will undertake the Project using its well- established processes and contractual arrangements.	Contracting arrangements have been fully evaluated and further developed to meet the needs of this project. These arrangements have been developed by the NeCTAR employed Contracts Manager alongside University of Melbourne Legal Services and the formulation of the NeCTAR Tender Board. Additionally, a template contract was drafted and included for feedback in the issued RFP (Section C).
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4.4 Key Performance Indicators

The NeCTAR Final Project Plan nominates a number of high-level performance indicators and indicates that these will be developed throughout the life of the project (Appendix D and Below).

Table 4.1: High-level Key Performance Indicators

	Objective	Performance Indicator	Point of capture	Data type
1	Enhance research collaboration through the development of eResearch infrastructure capable of having national impact and, through this, enhance national research outcomes.	Number of collaborative agreements/relationships established for the construction and management of NeCTAR infrastructure	Sub-contract	Quantitative
		Number of collaborations between Australian and/or international researchers that are supported by the NeCTAR infrastructure	Sub-contract	Quantitative
		Degree of research community satisfaction that creation of the NeCTAR infrastructure has impacted positively on its ability to produce quality research outcomes	Independent evaluation	Quantitative & Qualitative
2	Deploy eResearch infrastructure and services not otherwise available to publicly-funded researchers.	Value of NeCTAR infrastructure by location	Sub-contract	Quantitative
		Percentage utilisation of NeCTAR services capacity, where applicable	Sub-contract	Quantitative
		Degree of research community satisfaction that identified gaps in national eResearch infrastructure capability were appropriately addressed	Independent evaluation	Qualitative
3	Extend the use of these eResearch capabilities to a wider cross-section of publicly-funded	Number of research problem-focused tools developed per discipline	NeCTAR	Quantitative
		Number, type and location of applicants for NeCTAR services and tools (where applicable)	Sub-contract	Quantitative
		Number, type and location of users of NeCTAR services and tools	Sub-contract	Quantitative

	researchers more quickly than would otherwise occur.			
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5 Milestones

5.1 List of Milestones

As described in Section 7 of the NeCTAR Final Project Plan the NeCTAR Project is to be implemented through a staged approach. The Stage 1 and Stage 2 Requests For Proposals are the principal mechanism for eliciting proposals from the research sector for the creation of infrastructure under the four NeCTAR programs.

The NeCTAR Project Implementation Milestones were developed in the NeCTAR Final Project Plan based on the Stage1 and Stage 2 Requests For Proposals and timelines arising from Departmental approval of the initial Research Cloud node and National Server Program node at the University of Melbourne and the approved Early Activity Virtual Laboratories.

Table 5.1 below provides updated Project Milestones including additional detailed implementation milestones for the period of this Annual Business Plan.

Table 5.1: NeCTAR Project Implementation Milestones (July 2011-March 2014)

NeCTAR Project Implementation Milestones	Due Date
Appointment of final Directorate project staff	31 July 2011
Issuance of RFP for Stage 1 Proposals (all programs), including selection criteria and template sub-contract	15 September 2011
Early Activity Virtual Laboratories submitted to DIISR for approval	31 September 2011
Establishment of Selection Committees (Expert Panels)	30 October 2011
First Annual Report submitted to DIISR for approval	30 September 2011
Selected Stage 1 contractors advised to DIISR for approval	30 November 2011
Appointment of Deputy Director(s)	15 December 2011
EIF Milestone Report 6	31 December 2011
Payment Milestone Report 2	30 January 2012
NeCTAR Stage 1 Review complete	31 March 2012
First Annual Business Plan submitted for approval	31 March 2012
NeCTAR Stage 1 Review complete	31 March 2012
Issuance of RFP for Stage 2 Proposals for VL, NSP and RC	30 April 2012
EIF Milestone Report 8	30 June 2012
Advice to DIISRTE that 80% of Stage 1 Sub-project agreements are executed	30 July 2012
Selected Stage 2 contractors advised to DIISRTE for approval	31 August 2012
Payment Milestone Report 3	31 August 2012
Second Annual Report submitted for approval	30 September 2012
EIF Milestone Report 10	31 December 2012
Second Annual Business Plan submitted for approval	31 March 2013
Final Plan for expenditure of earned interest approved	31 July 2013
Commence development of models for sustainability of NeCTAR infrastructure	31 March 2013
EIF Milestone Report 12	30 June 2013
EIF Milestone Report 13	30 September 2013
Third Annual Report submitted to DIISRTE for approval	30 September 2013
Project Evaluation complete	30 December 2013

Final Report submitted to DIIS RTE for approval	31 March 2014
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Research Cloud and NSP Implementation Milestones	Due Date
NeCTAR Research Cloud Phase 1 Go-Live	30 September 2011
Research Cloud Phase 1 Review completed	15 December 2011
Stage 1 Research Cloud and NSP Nodes commence implementation	31 February 2012
Research Cloud Full-Access Phase commences	31 February 2012
Establishment of NeCTAR Platforms Steering Committee	30 November 2012
Stage 2 Research Cloud Nodes commence implementation	15 December 2012
Establishment of NeCTAR Platforms Technical Advisory Group	30 February 2013
Commissioning of Stage 1 Research Cloud Infrastructure	31 February 2013
Second Nectar Research Cloud Workshop	31 March 2013
Commissioning of Stage 2 Research Cloud Infrastructure commences	31 May 2013
Finalisation of Deployment Model for NSP	31 July 2013
Final Allocation of NSP funds	31 August 2013
Third Nectar Research Cloud Workshop	31 August 2013
Commissioning of Stage 2 Research Cloud Infrastructure complete	30 September 2013

Virtual Laboratory and eResearch Tool Implementation Milestones	Due Date
Early Activity Virtual Laboratories submitted to DIISR for approval	31 September 2011
Stage 1 eResearch Tools and Virtual Laboratories commence implementation	31 February 2012
First Nectar Projects Workshop (VL and RT projects)	15 December 2012
Stage 2 eResearch Tools and Virtual Laboratories commence implementation	15 December 2012
eResearch Tools Common Utilities – first proposals for funding approved	31 March 2013
Second Nectar Projects Workshop (VL and RT projects)	31 March 2013
Provision of feedback on Stage 2 Request For Proposals	31 March 2013
Establishment of common tools working groups across VL and RT sub-projects	30 April 2013
eResearch Tools Common Utilities - funding fully allocated	30 September 2013

Some Implementation Milestones provided in the NeCTAR Final project Plan have been deferred to the period of this Annual Business Plan. These include:

- Selected Stage 2 contractors advised to DIISR for approval – Deferred from 30 July 2012 to 31 August 2012.
 - Based on experience of the Stage 1 RFP process additional time was allocated for evaluation by the Expert Panels and subsequent approval by the NeCTAR Project Board.
- Establishment of NeCTAR Platforms Steering Committee – Deferred from 30 January 2012 to 30 November 2012
 - Establishment of the committee was deferred to accommodate finalisation of agreements with the Stage 1 and Stage 2 Research Cloud nodes.
- Stage 2 Research Cloud and NSP Nodes commence implementation – Deferred from 31 September 2012 to 15 December 2012.

- Deferred due to deferred finalisation of Stage 2 RFP approvals.
- Establishment of NeCTAR Platforms Technical Advisory Group – Deferred from 31 February 2012 to 30 February 2013
 - Deferred due to deferral of establishment of Platforms Steering Committee
- Commissioning of Stage 1 Research Cloud Infrastructure – Deferred from 31 March 2012 to 31 February 2013
 - Deferred due to delays in finalisation of agreements with Stage 1 Research Cloud nodes, and procurement processes at the Stage 1 nodes.
- Commissioning of Stage 2 Research Cloud Infrastructure commences – Deferred from 30 November 2012 to 31 May 2013
 - Deferred due to expected time for procurement and commissioning based on agreed proposals with Stage 2 contractors.

The adjustment of these milestones reflects lessons learnt during the Stage 1 RFP process and confirmation of schedules for deployment of infrastructure by sub-contracting parties, especially the Research Cloud nodes. The deferral of these milestones will not impact negatively on the achievement of the NeCTAR Project outcomes and objectives, which remain as agreed in the NeCTAR Final Project Plan.

6 Project Resources

6.1 Expected EIF funds

The expected EIF funds on hand to the NeCTAR Project at the beginning and end of the period of this Annual Business Plan (1 July 2012 and 30 June 2013) are shown in Table 6.1.

Table 6.1: Expected EIF Funds available at the start and end of the planning period

EIF Funds received or expended	Amount of EIF Funds
EIF Funds received (July 1 2010 – June 30 2011)	\$23,000,000
Interest earned on EIF Funds (July 1 2010 – June 30 2011)	\$843,648
Expenditure of EIF Funds (July 1 2010 – June 30 2011)	\$903,642
EIF Funds + Earned Interest on hand at 1 July 2011	\$22,940,006
EIF Funds received (July 1 2011 – June 30 2012)	\$12,000,000
Interest earned on EIF Funds (July 1 2011 – June 30 2012)	\$1,102,022
Expenditure of EIF Funds (July 1 2011 – June 30 2012)	\$2,980,894
Expected EIF Funds + Earned Interest on hand at 1 July 2012	\$33,061,134
Expected EIF Funds received (July 1 2012 – June 30 2013)	\$12,000,000
Interest earned on EIF Funds (July 1 2012 – June 30 2013)	\$719,673
Expected Expenditure of EIF Funds (July 1 2012 – June 30 2013)	\$29,359,133
Expected EIF Funds + Earned Interest on hand at 1 July 2013	\$16,421,674
Expected EIF Funds received (July 1 2013 – June 30 2014)	\$0
Interest earned on EIF Funds (July 1 2013 – June 30 2014)	\$360,000
Expected Expenditure of EIF Funds (July 1 2013 – June 30 2014)	\$16,781,674
Expected EIF Funds + Earned Interest on hand at 31 December 2013	\$0

The schedule of expected funds received in Table 6.1 is based on the schedule of milestone payments agreed between the Department and the University of Melbourne in the NeCTAR Funding Agreement. The expected expenditure of NeCTAR EIF funds in the identified periods is based on actual and projected expenditure across the various NeCTAR programs, as detailed in Table 6.2 below. It is expected that expenditure of NeCTAR EIF funds to 30 June 2012 will principally be in the areas of the NeCTAR Directorate and the pre-approved sub-projects identified in the Final Project Plan for the establishment of the initial nodes of the National Server Program and Research Cloud at the University of Melbourne. Other NeCTAR sub-projects established through the Early Activities provisions and the Stage 1 Request For Proposals are expected to have only minor expenditure of EIF funds to 30 June 2012.

Also shown in Table 6.1 is the expected expenditure of NeCTAR EIF funds from 1 July 2012 to 30 June 2013 across the NeCTAR programs. Expected expenditure across the pre-approved sub-projects, the Early Activities and the Stage 1 and Stage 2 RFP sub-projects is based on the agreed milestones and payment schedules for the approved sub-projects.

Table 6.2 NeCTAR Income and Expenditure by Program and Sub-Project

INCOME AND EXPENDITURE	ACTUAL		PROJECTED		TOTAL EXPENDITURE
	2010/2011	2011/2012	2012/2013	2013/2014	
INCOME					
EIF Funds	23,000,000	12,000,000	12,000,000	0	47,000,000
EIF Interest	843,648	1,102,022	719,673	360,000	3,025,343
Other cash (outside co-investment)	0	0	0	0	0
TOTAL INCOME	23,843,649	13,102,022	12,719,673	360,000	50,025,343
EXPENDITURE					
NeCTAR Directorate (a)					
Administration	136,407	236,694	367,695	453,813	1,194,610
Leadership	150,348	243,903	418,898	332,861	1,146,010
Coordination	36,991	69,976	233,708	90,473	431,148
Employees	266,084	506,360	618,136	513,642	1,904,222
Total	589,830	1,056,933	1,638,437	1,390,789	4,675,989
Sub-projects pre-approved in Final Project Plan					
National Server Program					
Lead NSP Node / The University of Melbourne	313,812	415,663	270,526	0	1,000,000
Research Cloud Program					
Lead Research Cloud Node Activity / The University of Melbourne	0	265,239	496,884	237,877	1,000,000
Initial Research Cloud Node / The University of Melbourne	0	1,145,167	354,833	0	1,500,000
App Migration for Initial RC Node / The University of Melbourne	0	0	350,000	150,000	500,000
Total	313,812	1,826,069	1,472,243	387,877	4,000,000
Stage 1 Research Cloud Node					
RC003 - NCI based Node of the Nectar Research Cloud Program / ANU	0	0	1,689,000	304,000	1,993,000
RC005 - Nectar Research Cloud at Monash / Monash University	0	0	1,320,000	680,000	2,000,000
RC007 - Queensland Nectar Research Cloud Node (QNRN) / QCIF	0	0	1,400,000	600,000	2,000,000
Total	0	0	4,409,000	1,584,000	5,993,000
Stage 2 Research Cloud Node					
RC201 - Intersect NSW Research Cloud Node / Intersect	0	0	1,106,451	670,892	1,777,343
RC202 - Tasmanian Research Cloud / UTAS	0	0	590,000	326,500	916,500
RC203 - eRSA South Australia Research Cloud / eResearch SA	0	0	599,660	473,497	1,073,157
RC204 - iVEC supported Nectar Research Cloud / iVEC	0	0	1,575,000	158,000	1,733,000
Total	0	0	3,871,111	1,628,889	5,500,000

Early Activity Virtual Laboratories (a)					
E001 - Virtual Genomics Laboratory / University of Queensland	0	0	600,000	100,011	700,011
E002 - Marine Virtual Laboratory / UTAS	0	0	414,000	276,000	690,000
E003 - Virtual Geophysics Laboratory / CSIRO	0	37,859	469,341	126,800	634,000
Total	0	37,859	1,483,341	502,811	2,024,011
Virtual Laboratory Program					
Stage 1 Virtual Laboratories					
VL001 -The Genomics Virtual Laboratory / University of Queensland	0	0	995,110	639,000	1,634,110
VL005 - Climate and Weather Science Laboratory / Bureau of Meteorology	0	0	1,325,000	441,205	1,766,205
VL006 - The Characterisation Virtual Laboratory: Research Environments for Exploring Inner Space / Monash University	0	0	964,070	654,038	1,618,108
VL010 - The All-Sky Virtual Observatory / Astronomy Australia Ltd	0	0	994,113	658,088	1,652,201
VL011 -Humanities Networked Infrastructure (HuNI): Unlocking and Uniting Australia's Cultural Data / Deakin University	0	0	1,129,000	200,000	1,329,000
Total	0	0	5,407,293	2,592,331	7,999,624
Stage 2 Virtual Laboratories					
VL201 - The Industrial Ecology Laboratory / University of Sydney	0	0	589,821	508,318	1,098,139
VL206 - Marine Virtual Laboratory / Integrated Marine Observing	0	0	574,956	726,151	1,301,107
VL212 - Biodiversity and Climate Change / Griffith University	0	0	618,032	618,031	1,236,063
VL215 - Endocrine Genomics Virtual Laboratory (EndoVL) / The University of Melbourne	0	0	876,940	155,000	1,031,940
VL222 - Above and Beyond Speech, Language and Music: A virtual lab for Human Communication Science (HCS vLab) / University of Western Australia	0	0	999,564	333,187	1,332,751
Total	0	0	3,659,313	2,340,687	6,000,000
eResearch Tools Program					
Stage 1 eResearch Tools					
RT001 - Human Variome Project Australian Node Clinical and Molecular Data Linkage Tools / The University of Melbourne	0	0	344,100	153,300	497,400
RT007 - High throughput computing for globally connected Science / The University of Melbourne	0	0	484,800	233,400	718,200
RT009 - Drishti and Voluminous- Volume Visualisation Tools / ANU	0	0	172,801	141,413	314,213
RT012 - Bioscience Data Platform: TARDIS in the Cloud / Monash University	0	0	280,817	85,466	366,283
RT014 - Geology from Geodynamics / Monash University	0	0	87,000	277,582	364,582
RT015 - Collaborative and Automated Tools for Automated Tools for Analysis of Marine Imagery and Video (CATAMI) / Curtin University	0	0	340,600	147,000	487,600
RT016 - UniCarbKB: an e-infrastructure for	0	0	305,000	144,750	449,750

glycomics / Macquarie University					
RT017 - eResearch Tools for the Australian Synchrotron research community / Australian Synchrotron	0	0	586,304	55,083	641,387
RT020 - Submission, Harmonisation and Retrieval of Ecological Data - SHaRED / University of Adelaide	0	3,087	251,163	577,120	831,370
RT022 - Quadrant / QCIF	0	0	354,687	151,000	505,687
RT025 - OzTrack - eResearch Tools for the storage, analysis and visualisation of animal tracking data / University of Queensland	0	0	434,061	173,626	607,687
RT029 - Cloud-based Bioinformatics Tools / University of Western Australia	0	56,947	204,651	29,000	290,598
RT031 - Extension and Enhancement of Systems for the Australian Schizophrenia Research Bank (ASRB) / SRI	0	0	573,000	66,000	639,000
RT035 - Cloud-based Image Analysis and Processing Toolbox / CSIRO	0	0	455,000	262,500	717,500
RT038 - The Aust-ESE Project - eResearch Tools to Support the Collaborative Authoring and Management of Electronic Scholarly Editions / University of Queensland	0	0	442,312	176,926	619,238
RT043 - Federated Archaeological Information Management System / University of New South Wales	0	0	602,100	347,400	949,500
Total	0	60,034	5,918,396	3,021,566	8,999,995
TOTAL COMMITTED EXPENDITURE	903,642	2,980,894	27,859,133	13,448,949	45,192,619
Currently Uncommitted Expenditure (b)					
Expected RT - Common Utilities (c)	0	0	500,000	800,000	1,300,000
Allocation of Interest Earned (to be approved by Project Board) (d)	0	0	1,000,000	2,025,343	3,025,343
National Server Program - Uncommitted Funds (e)	0	0	0	500,000	500,000
Under Commitment of Allocated Funds to RFP Programs (f)	0	0	0	7,382	7,382
TOTAL EXPENDITURE	903,642	2,980,894	29,359,133	16,781,674	50,025,344

Notes on Table 6.2:

- (a) An overallocation of \$24,011 in the Early Activity program has been redirected from NeCTAR Directorate contingency funds. NeCTAR obtained approval from DIISRTE for allocation of an additional \$22,938 to the Early Activity Program. During subsequent finalisation of agreements a small update to proposal budget led to an inadvertent increase in funding allocated (\$2,024,011).
- (b) Projected expenditure of currently uncommitted NeCTAR funds is estimated based on current planning and expectations.
- (c) "eResearch Tools – Common Utilities" expenditure will be in accordance with principles expressed in the NeCTAR Final Project Plan, and as approved by the NeCTAR Project Board and DIISRTE.
- (d) Interest earned on NeCTAR EIF funds will be allocated for the purposes of the NeCTAR Project and as approved by the NeCTAR Project Board.

- (e) Uncommitted funds in the National Server Program will be allocated for the purposes of the NSP, as approved by the NeCTAR Project Board and DIISRTE.
- (f) A small under-commitment of funds (\$7,382) allocated to sub-projects through the Stage 1 and Stage 2 RFPs arose during negotiation of final sub-project proposals. The NeCTAR Directorate will seek approval of the Project Board and the Department to allocate this funding to the eResearch Tools – Common Utilities allocation.

6.2 Project Co-investment

As identified in section 5.2.3 of the NeCTAR Final Project Plan, success of the NeCTAR Project depends on attracting co-investment from the research community sufficient to ensure maintenance and ongoing operation of the developed infrastructure, and to ensure engagement and support of the end users. The NeCTAR Final Project Plan identifies that it is expected that the majority of co-investment in NeCTAR sub-projects will be through in-kind contributions, though cash co-investment is also encouraged from participants in the NeCTAR sub-projects. The Final Project Plan also identifies a target co-investment ratio for NeCTAR sub-projects of 1:1 with the NeCTAR EIF contributions.

The NeCTAR Request For Proposals (RFP) process and documentation has been successful in eliciting proposals from the sector which have achieved the target co-investment levels, ensuring that the operational requirements of the NeCTAR infrastructure will be fully met. Through the RFP process NeCTAR has successfully established agreements with sub-projects which include detailed commitments of co-investment to support the operational requirements of the infrastructure. Each NeCTAR sub-project is required to report on the extent and source of co-investment contributions throughout the execution of the sub-project.

Appendix A includes a list of all the sub-projects established through the NeCTAR Request For Proposals, including the overall level of committed co-investment for each sub-project. The total commitment of co-investment by program and sub-project is summarised in Table 6.3.

Table 6.3: NeCTAR Co-investment by program and sub-project

Cash and In-kind Contribution							
Source	Contribution	ACTUAL		PROJECTED			Total Agreed Contribution
		2010/2011	2011/2012	2012/2013	2013/2014	Total Contribution	
NeCTAR Directorate							
The University of Melbourne	Cash	41,843	164,155	103,739	190,263	294,002	1,209,810
	In-Kind	97,145	167,123	254,595	190,947	445,542	
National Server Program							
Lead NSP Node / The University of Melbourne	Cash	0	0	0	0	0	655,969
	In-Kind	67,166	143,388	207,856	237,559	445,415	
NSP Node 2 / The University of Melbourne	Cash			0	0	0	0
	In-Kind	0		0	0	0	
Total	Cash	0	0	0	0	0	655,969

	In-Kind	67,166	143,388	207,856	237,559	445,415	
Research Cloud Program							
Lead Research Cloud Node Activity / The University of Melbourne	Cash	0	296,339	289,699	346,008	635,707	3,463,353
	In-Kind	0	341,462	1,174,845	1,015,000	2,189,845	
Stage 1 Research Cloud Node							
RC003 - NCI based Node of the Nectar Research Cloud Program / ANU	Cash	0	0	670,000	0	670,000	2,911,086
	In-Kind	0	0	228,644	2,012,442	2,241,086	
RC005 - Nectar Research Cloud at Monash / Monash University	Cash	0	0	0	0	0	1,535,000
	In-Kind	0	0	506,000	1,029,000	1,535,000	
RC007 - Queensland Nectar Research Cloud Node (QNRCN) / QCIF	Cash	0	0	0	0	0	2,489,000
	In-Kind	0	0	560,000	1,929,000	2,489,000	
Total	Cash	0	0	670,000	0	670,000	6,935,086
	In-Kind	0	0	1,294,644	4,970,442	6,265,086	
Stage 2 Research Cloud Node							
RC201 - Intersect NSW Research Cloud Node / Intersect (* in negotiation)	Cash	0	0	0	0	0	0
	In-Kind	0	0	0	0	0	
RC202 - Tasmanian Research Cloud / UTAS	Cash	0	0	0	0	0	1,630,632
	In-Kind	0	0	234,113	1,396,519	1,630,632	
RC203 - eRSA South Australia Research Cloud / eResearch SA	Cash	0	0	208,010	491,990	700,000	1,768,434
	In-Kind	0	0	191,073	877,361	1,068,434	
RC204 - iVEC supported Nectar Research Cloud / iVEC	Cash	0	0	0	0	0	1,898,000
	In-Kind	0	0	406,000	1,492,000	1,898,000	
Total	Cash	0	0	208,010	491,990	700,000	5,297,066
	In-Kind	0	0	831,186	3,765,880	4,597,066	
Early Activity Virtual Laboratories							
E001 - Virtual Genomics Laboratory / University of Queensland	Cash	0	0	0	0	0	701,733
	In-Kind	0	0	639,815	61,918	701,733	
E002 - Marine Virtual Laboratory / UTAS	Cash	0	0	0	0	0	690,000
	In-Kind	0	0	690,000	0	690,000	
E003 - Virtual Geophysics Laboratory / CSIRO	Cash	0	0	0	90,000	90,000	795,650
	In-Kind	0	0	517,770	187,880	705,650	
Total	Cash	0	0	0	90,000	90,000	2,187,383
	In-Kind	0	0	1,847,585	249,798	2,097,383	
Virtual Laboratory Program							
Stage 1 Virtual Laboratories							
VL001 -The Genomics Virtual Laboratory / University of Queensland	Cash	0	0	0	0	0	2,147,900
	In-Kind	0	0	1,054,900	1,093,000	2,147,900	
VL005 - Climate and Weather Science Laboratory / Bureau of Meteorology	Cash	0	0	0	0	0	1,900,000
	In-Kind	0	0	1,198,000	702,000	1,900,000	
VL006 - The Characterisation Virtual Laboratory: Research Environments for Exploring Inner Space / Monash University	Cash	0	0	0	0	0	1,836,740
	In-Kind	0	0	763,214	1,073,526	1,836,740	

VL010 - The All-Sky Virtual Observatory / Astronomy Australia Ltd	Cash	0	229,663	0	0	0	1,908,200
	In-Kind	0	31,250	544,641	1,102,646	1,647,287	
VL011 - Humanities Networked Infrastructure (HuNI): Unlocking and Uniting Australia's Cultural Data / Deakin University	Cash	0	0	0	0	0	2,500,000
	In-Kind	0	0	2,000,000	500,000	2,500,000	
Total	Cash	0	229,663	0	0	0	10,292,840
	In-Kind	0	31,250	5,560,755	4,471,172	10,031,927	
Stage 2 Virtual Laboratories							
VL201 - The Industrial Ecology Laboratory / University of Sydney	Cash	0	0	0	0	0	2,337,551
	In-Kind	0	0	845,533	1,492,018	2,337,551	
VL206 - Marine Virtual Laboratory / Integrated Marine Observing	Cash	0	0	0	0	0	1,555,903
	In-Kind	0	0	505,683	1,050,220	1,555,903	
VL212 - Biodiversity and Climate Change / Griffith University	Cash	0	0	0	600,000	600,000	1,915,971
	In-Kind	0	0	228,174	1,087,797	1,315,971	
VL215 - Endocrine Genomics Virtual Laboratory (EndoVL) / The University of Melbourne	Cash	0	0	0	0	0	4,140,214
	In-Kind	0	0	2,836,000	1,304,214	4,140,214	
VL222 - Above and Beyond Speech, Language and Music: A virtual lab for Human Communication Science (HCS vLab) / University of Western Australia	Cash	0	0	0	403,000	403,000	2,318,995
	In-Kind	0	0	605,630	1,310,365	1,915,995	
Total	Cash	0	0	0	1,003,000	1,003,000	12,268,634
	In-Kind	0	0	5,021,020	6,244,614	11,265,634	
eResearch Tools Program							
Stage 1 eResearch Tools							
RT001 - Human Variome Project Australian Node Clinical and Molecular Data Linkage Tools / The University of Melbourne	Cash	0	0	0	0	0	553,100
	In-Kind	0	0	221,300	331,800	553,100	
RT007 - High throughput computing for globally connected Science / The University of Melbourne	Cash	0	0	0	0	0	1,556,200
	In-Kind	0	0	1,556,200	0	1,556,200	
RT009 - Drishti and Voluminous-Volume Visualisation Tools / ANU	Cash	0	0	0	0	0	330,469
	In-Kind	0	0	110,913	219,556	330,469	
RT012 - Bioscience Data Platform: TARDIS in the Cloud / Monash University	Cash	0	0	0	0	0	392,309
	In-Kind	0	0	255,001	137,308	392,309	
RT014 - Geology from Geodynamics / Monash University	Cash	0	0	0	0	0	372,000
	In-Kind	0	0	41,000	331,000	372,000	
RT015 - Collaborative and Automated Tools for Automated Tools for Analysis of Marine Imagery and Video (CATAMI) / Curtin University	Cash	0	0	0	0	0	561,510
	In-Kind	0	58,825	252,776	249,909	502,685	
RT016 - UniCarbKB: an e-infrastructure for glycomics / Macquarie University	Cash	0	0	50,000	0	50,000	524,564
	In-Kind	0	0	360,697	113,867	474,564	
RT017 - eResearch Tools for the Australian Synchrotron research community / Australian Synchrotron	Cash	0	0	0	0	0	889,064
	In-Kind	0	0	395,140	493,924	889,064	
RT020 - Submission, Harmonisation and	Cash	0	0	0	0	0	1,326,063

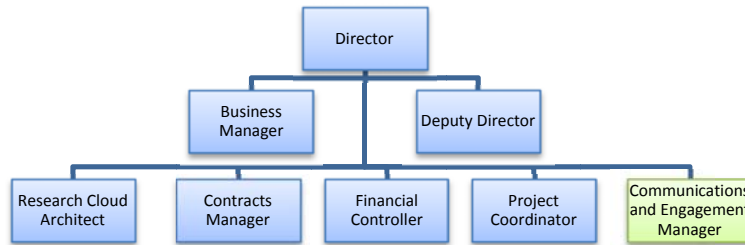
Retrieval of Ecological Data - SHaRED / University of Adelaide	In-Kind	0	0	633,063	693,000	1,326,063	
RT022 - Quadrant / QCIF	Cash	0	0	15,608	0	15,608	514,000
	In-Kind	0	0	215,392	283,000	498,392	
RT025 - OzTrack - eResearch Tools for the storage, analysis and visualisation of animal tracking data / University of Queensland	Cash	0	0	24,000	38,040	62,040	604,520
	In-Kind	0	0	410,700	131,780	542,480	
RT029 - Cloud-based Bioinformatics Tools / University of Western Australia	Cash	0	0	20,000	0	20,000	324,000
	In-Kind	0	26,047	88,953	189,000	277,953	
RT031 - Extension and Enhancement of Systems for the Australian Schizophrenia Research Bank (ASRB) / SRI	Cash	0	0	0	0	0	1,019,070
	In-Kind	0	0	775,900	243,170	1,019,070	
RT035 - Cloud-based Image Analysis and Processing Toolbox / CSIRO	Cash	0	0	0	0	0	646,500
	In-Kind	0	0	440,000	206,500	646,500	
RT038 - The Aust-ESE Project - eResearch Tools to Support the Collaborative Authoring and Management of Electronic Scholarly Editions / University of Queensland	Cash	0	0	62,000	0	62,000	603,318
	In-Kind	0	0	304,244	237,074	541,318	
RT043 - Federated Archaeological Information Management System / University of New South Wales	Cash	0	0	0	0	0	1,552,800
	In-Kind	0	0	852,200	700,600	1,552,800	
Total	Cash	0	0	171,608	38,040	209,648	11,769,487
	In-Kind	0	84,872	6,913,479	4,561,488	11,474,967	
Expected RT - Common Utilities		0	0	0	0	0	0
GRAND TOTAL CO-INVESTMENT		206,154	1,458,252	24,549,022	27,866,200	52,415,223	54,079,629

6.3 Staffing Positions

6.3.1 NeCTAR Directorate

The structure of the Project Directorate is shown in Figure 6.1 below. The high-level roles and responsibilities for the majority of staff are as described in Appendix B of the NeCTAR Final Project Plan. The positions described are to be budgeted from NeCTAR EIF funds, with the exception of the Communications and Engagement Manager which is funded through co-investment from the University of Melbourne.

Figure 6.1: NeCTAR Project Directorate Structure



Since the successful establishment of the NeCTAR programs and the development of the Request For Proposals, NeCTAR has replaced the role of the Program Manager identified in the Final Project Plan with the NeCTAR Business Manager and established all Directorate staff as reporting to the Director. The Business Manager has delegated responsibilities from the Director and is responsible for managing the Directorate office and programs. NeCTAR has also established the role of the NeCTAR Research Cloud Architect who provides advice to the Director on Research Cloud architecture and implementation.

6.3.2 NeCTAR Sub-Projects

Staffing positions associated with the NeCTAR Sub-projects are described in the contractual agreements for execution of the sub-projects. The terms of the agreements established between the University of Melbourne and sub-project participants require that NeCTAR EIF funds be contributed to staff salaries only in support of the creation and development of infrastructure and according to the “Fair Rates” described in the NeCTAR Request For Proposals documentation.