The Australian Science Gateways Ecosystem

Dr Michelle Barker
National eResearch Collaborative Tools and Resources (NeCTAR)
Cairns, Australia
Michelle.barker@nectar.org.au

ABSTRACT

This talk examines Australian government initiatives to facilitate the development of science gateways, and identifies the successes and challenges in this approach.

Since 2011 the Australian Government has funded the development of science gateways through the National eResearch Collaborative Tools and Resources (NeCTAR) program (www.nectar.org.au). NeCTAR has funded the development of twelve science gateways in diverse disciplines that provide highly collaborative, research-domain oriented, integrative research software infrastructure to meet researcher-defined needs. The virtual laboratories enable over 10,000 users to access data, models, analytical and workflow tools through a single online platform.

NeCTAR also funds the Research Cloud, which provides computing infrastructure, software and services to enable Australia’s research community to store, access, and run data, remotely, rapidly and autonomously. NeCTAR Cloud’s self-service structure allows over 7,500 users to access their own data at any time and collaborate with others from their desktop in a fast and efficient way. NeCTAR aims to enhance research collaboration through the development of eResearch infrastructure.

This paper explores the structure of the NeCTAR Virtual Laboratory program, its successes and challenges, and future plans. Key features of the program include creation of platforms where tools, models and data meeting, enabling automating and sharing of research methodologies and democratisation of access. As such, the Virtual Laboratories deliver transformative research impacts and are exemplars for sector adoption of capability. Virtual Laboratories exist in disciplines including climate and weather science, genomics, characterisation, biodiversity and climate change, astronomy, human communication science, marine studies, geophysics, endocrine disorders, and cultural studies.

Some of the enabling factors include governance structures that emphasise ownership of the Virtual Laboratories by the research community, strong user engagement in development and a support program that assists in enabling issues across the Virtual Laboratories. This has run project in areas such as provenance, authentication, security, data movement and user support. Challenges exist in sustaining a strategic approach to research software infrastructure, particularly strengthening the focus on shared research software services, improving research software quality, reliability and sustainability, and building capability within the research communities.

This paper will also provide opportunities for comparison and identification of potential alignment with other national/regional/disciplinary programs. Europe and USA have both initiated funding programs that have some similarities to the NeCTAR Virtual Laboratories program; however, these also take some different approaches on some issues.