



KAREN Capability Fund - Project Milestone Reporting Template

Report Date: [1 July 2008 – 31 December 2008]

<i>Project Name</i>	PlanetLab NZ	
<i>Project Leader</i>	Prof. K. Pawlikowski	
<i>Co-funding Contribution</i>	Yes	
<i>Budget Spend</i>	Planned to date 50%	Actual about 50%
<i>Milestone Achieved</i>	1 and 2	
<i>Project On Track?</i>	Yes	
<i>Project schedule</i>	Planned 50%	Actual over 50%

Health Check – *is the project achieving its objectives so far? If not, indicate the type of risk it is e.g. time, budget, resources etc?*

GREEN	YELLOW	RED
✓		

Milestones Check – *List the project milestones, (as per the contract), and indicate how successful you have been in meeting them (i.e. status). Include the dates that they were met.*

Milestones	Contract Milestone Date	Actual Date Met	Status ☺ ☹ ☠ ✓
Installation of new PlanetLab node at the University of Canterbury	30/06/2008	26/07/2008	✓ done
Installation of new PlanetLab node at the University of Otago	31/12/2008	19/12/2008	✓ done
PlanetLab workshop, and Installation of new PlanetLab node at the University of Otago	31/06/2009		☺ on track

The goals of the Capability Build Fund are to raise awareness and enable effective use of KAREN. REANNZ wants to promote the enabling potential of KAREN and its use through creating a community ethos of sharing knowledge.

Current Status

Two PlanetLab nodes at the University of Canterbury and two PlanetLab nodes at the University of Otago became connected to the global PlanetLab network via KAREN, on 26 July 2008 and 19 December 2008, respectively; see www.planet-lab.org/db/pub/sites.php . Each nodes has been equipped with DELL PowerEdge 860 computer server. Thus, the Milestone 1 and Milestone 2 have been reached; cf. Point 7, Schedule 1, of the CBF Agreement with the REANNZ regarding PlanetLab NZ, of June 5, 2008.

We have also advanced our work towards Milestone 3.

Successes

The technical expertise gained while working towards goals of Milestone 1 and Milestone 2 (installation of PlanetLab nodes at the University of Canterbury and the University of Otago) will be very useful when working on the installation of computer servers

at the University of Auckland (a part of Milestone 3). We have also promised to help our colleagues from Massey University, University of Waikato and Victoria University with installation of PlanetLab nodes over KAREN, if appropriate grants become available.

Now, KAREN is used both nationally and internationally as the communication platform for PlanetLab, the global experimental networking infrastructure, for conducting research on new telecommunication technologies. Our first successful experiments with distributing Akaroa2 (our unique controller of distributed simulation, see www.akaroa.canterbury.ac.nz) over PlanetLab nodes allow us to plan further research activities in this direction.

Following an international workshop on “PlanetLab Panel on NGN/NGI Research and Experimentation”, which we held in Dunedin, on 2 December 2008, during the 9th International Conference on Parallel and Distributed Computing, Applications and Technologies (PDCAT'08), it has become clear that any advanced and serious research on broadband multimedia networks should be accompanied by full scale implementations, and scalability tests, of new networking concepts and solutions. This is why research communities around the world are actively involved in designing of, and experimenting with, such global research infrastructures as PlanetLab, OneLab, GLab, Fire, Geni, etc. Also in New Zealand, network research groups should have easy access to such facilities if they want to remain at the leading edge of research on next generation networks, including research on Future Internet, a global initiative led by European Union. The workshop invited speakers were:

- Prof. Adnan Al-Anbuky (Centre for Computer and Embedded Engineering at AUT, Auckland);
- Dr Brian Carpenter¹ (Department of Computer Science, University of Auckland);
- Prof. Richard Harris (Institute of Information Sciences and Technology at Massey University);
- Dr Peter Komisarczuk (Department of Computer Science, University of Victoria in Wellington)
- Associate Prof. Tony McGregor (Department of Computer Science, University of Waikato in Hamilton)
- Dr Max Ott (NICTA, Sydney, Australia)
- Prof. Krys Pawlikowski (Department of Computer Science & Software Engineering, University of Canterbury)
- Prof. Harsha Sirisena (Department of Electrical and Computer Engineering, University of Canterbury)
- Thomas Zinner (Department of Distributed Systems, Institute of Computer Science,

Research teams from the University of Auckland, University of Canterbury and University of Otago have been lucky to become a part of PlanetLab via KAREN, due to their participation in this PlanetLab NZ project funded by REANNZ from the Capability Build Fund. It would be desirable to install PlanetLab nodes also at the remaining New Zealand universities as well. All sides have agreed to actively search for appropriate funding opportunities which would allow for such expansion of PlanetLab NZ. It has been pointed out too that such experimental networking infrastructures as PlanetLab are also very useful teaching tools, for students at undergraduate and postgraduate level.

Communications

Information about our project on PlanetLab NZ, its goals and our current activities have been available on the Internet since in October 2008, since launching a website of this project at <http://www.planetlabnz.canterbury.ac.nz>. Additionally, during last three months members of our team attended a number of international conferences and visited research institutes and

¹ Due to unexpected personal problems of this speaker, the talk was presented by Prof. K. Pawlikowski

universities overseas. During all these events, we had numerous opportunities for presenting our research activities within PlanetLab NZ. We also distributed our poster informing about KAREN and PlanetLab NZ. The attended conferences include:

- the 3rd International Conference on Access Networks (AccessNets'08) in Las Vegas, October 2008; attended by Prof. Pawlikowski;
- the 9th International Conference on Parallel and Distributed Computing, Applications and Technologies (PDCAT'08), in Dunedin, December 2008; attended by Prof. K. Pawlikowski and Prof. H. Sirisena from Canterbury, Dr B. Carpenter from Auckland and Dr Z. Huang from Otago; and
- Australasian Telecommunications Networking and Application Conference (ATNAC'08) in Adelaide, Australia, December 2008; attended by Prof. H. Sirisena and W. Liu, a PhD student from Canterbury.

In mid November 2008, Prof. Pawlikowski travelled to Europe, as a member of six person delegation of MoRST, to Germany, Poland and France. The main purpose of this delegation was to inform European scientists about New Zealand research initiatives and activities in the area of ICT, and to seek new links for international cooperation. The presentation prepared by Prof. Pawlikowski gave an overview of our project on PlanetLab NZ and was given at:

- University of Wuerzburg, Germany;
- Gdansk University of Technology, Poland; and during
- ICT Congress 2008 of European Union, in Lyon, France.

All these visits were associated with meetings with scientists who also use such global telecommunication testbeds as PlanetLab in their research projects. A few European research groups expressed their interest in a closer collaboration with our team. However, it appears that, for cooperation with say GLab, PlanetLab NZ would need to be spanned over more than three universities in New Zealand. Thus, further developments depend on future funding.

In the meantime, to help with future users of PlanetLab nodes at other universities, we have written a user manual which will be available soon on the website of our project. Additionally, a short paper on our initial experiments aimed at distribution of Akaroa 2 over PlanetLab will be presented by our international collaborator (a PhD exchange student from Japan) at the IEICE Conference in Japan, in March 2009.

Top Issues

List of any issues, difficulties or roadblocks:

Mr Elliot Fisher, who worked in this project as a specialist programmer until mid November 2008 and was expected to continue his work in 2009 as well, has left the University of Canterbury and Christchurch. However, we have been able to find a replacement: Mr Adam Chang, a Masters student in the Department of Computer Science and Software Engineering.

Installation of additional PlanetLab nodes in New Zealand (at Massey University, University of Victoria and University of Waikato) would make our PlanetLab NZ much more powerful and wider accessible research tool, both for network research communities and students at these universities. It would also allow us to establish links of formal cooperation with very powerful experimental network infrastructures in Europe. However, any future realisation of this plan depends on availability of appropriate fundings.

Top Risks

List of any known or anticipated risks to project:

None

What's Coming Up

Next steps in project, please be as technical as possible:

We are preparing ourselves for installation of two additional nodes of PlanetLab NZ at the University of Auckland. The date and logistics of this operation will be discussed soon with Associate Prof. Nevil Brownlee and his research group from the Department of Computer Science there. Most likely, this operation will be conducted in February or March 2009. The necessary computer equipment has been already ordered (two computer servers of type HP Compaq dc7900).

At the University of Canterbury, having successfully demonstrated that Akaora2, our simulation controller, can be distributed over PlanetLab, we plan to further enhance Akaora2 functionalities, making it even more powerful tool for studying performance of new networking technologies. We are also intensifying our research programs in which PlanetLab, accessible via KAREN, can be used as a tool for experimenting with new concepts and techniques of networking. These include evaluation of search algorithms in structured and unstructured P2P networks, and network resilience techniques for Next Generation Networks. Additionally, we are planning to investigate a possibility of using PlanetLab NZ for accessing experimental wireless networks, to support our research on next generations of multimedia mobile wireless networks.