



KAREN Capability Fund - Project Milestone Reporting Template

Report Date: [1 January 2009 – 30 June 2009]

<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 100%	Actual about 100%
<i>Milestone Achieved</i>	All three milestones (1, 2 and 3)	
<i>Project On Track?</i>	Yes	
<i>Project schedule</i>	Planned 100%	Actual 100%

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 Auckland	30/06/2009	15/05/2009	✓ done

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

The third milestone of this PlanetLab NZ was reached in mid May 2009, when the central office of the administration office of the global PlanetLab at Princeton University in the USA confirmed the registration of the third PlanetLab site in New Zealand, at the University of Auckland.. Since then, PlanetLab NZ has consisted of three pairs of PlanetLab nodes operating at the University of Canterbury, the University of Otago and the University of Auckland. They were become connected to the global PlanetLab network via KAREN on the 26th of July 2008, the 19th of December 2008 and the 15th of May 2009, respectively; see www.planet-lab.org/db/pub/sites.php .

As earlier reported, an international workshop on PlanetLab NZ, focusing on “NGN/NGI Research and Experimentation”, was held in Dunedin, on 2 December 2008. The workshop’s presentations are available on www.planetlabnz.canterbury.ac.nz .

Thus, **all three milestones of this project on PlanetLab NZ have been reached**; cf. Point 7, Schedule 1, of the CBF Agreement with the REANNZ regarding PlanetLab NZ, of June 5, 2008.

Successes

At the conclusion of this project, we have three universities in New Zealand fully connected to the experimental communication platform of PlanetLab, which offers the most advanced global experimental networking infrastructure, for conducting research on new telecommunication technologies. This has allowed the networking research teams from Canterbury, Otago and Auckland to join a league of the best research teams worldwide, and to work on a number of cutting-edge research initiatives, such Future Internet, with its future peer-to-peer services, IPTv (IP Television), etc. At the same time, such experimental networking infrastructures as PlanetLab are also very useful teaching tools, for students at undergraduate and postgraduate level.

At the University of Canterbury, we have already succeeded in distributing Akaroa2 (our unique controller of distributed simulation, see www.akaroa.canterbury.ac.nz) over arbitrary number of PlanetLab nodes. This allows us to conduct simulation experiments on a global scale. During this year, we have also advanced our related network research projects and presented (or will present) the preliminary research results at (i) the International Conference on Access Networks (AccessNets'08, in Las Vegas, USA, in October 2008), (ii) the Australasian Telecommunication Networking and Applications Conference (ATNAC 2008, in Adelaide, Australia, in December 2008), (iii) the IEEE International Conference on Computer Communications (IEEE ICC'2009, in Dresden, Germany, in June 2009) and (iv) the International Teletraffic Congress (ITC'2009, in Paris, France, in September 2009).

Following our very successful first international workshop on PlanetLab NZ, held in Dunedin in December 2008, we have also promised our colleagues from the University of Waikato, Victoria University, Massey University and the Auckland University of Technology to help them in joining PlanetLab NZ over KAREN. All sides have agreed to actively search for appropriate funding opportunities which would allow for such expansion of PlanetLab NZ. We have recently applied to REANNZ for an additional funding which would make such an extension of PlanetLab NZ possible.

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>. This archive is constantly updated.

Additionally, members of our research team have attended a number of international conferences and have visited research institutes and universities overseas, informing them about PlanetLab NZ and our research activities conducted with its help. The attended conferences include:

- the 3rd International Conference on Access Networks (AccessNets'08) in Las Vegas, October 2008; attended by Prof. K. 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, representatives of other universities in New Zealand and a number of representatives from overseas;

- Australasian Telecommunication Networking and Applications Conference (ATNAC'08) in Adelaide, Australia, December 2008; attended by Prof. H. Sirisena and Mr W. Liu, a PhD student from Canterbury.
- the IEEE International Conference on Computer Communications (IEEE ICC'2009), in Dresden, Germany, in June 2009; attended by Prof. H. Sirisena.

In November 2008, Prof. K. Pawlikowski travelled to Europe, as a member of MoRST delegation to Germany, Poland and France. The 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. Prof. Pawlikowski visited the University of Wuerzburg in Germany; Gdansk University of Technology in Poland, and participated in the ICT Congress 2008 of European Union, in Lyon, France. The travel was funded by MoRST and the University of Canterbury. Then, in April-May 2009, Prof. Pawlikowski visited the University of Vienna in Austria, the Budapest University of Technology and Economics in Hungary, Wroclaw University of Technology and Gdansk University of Technology in Poland, and the University of Wuerzburg in Germany. The second trip was partially funded by the University of Canterbury and partially by the visited universities.

The main purpose of these two travels to Europe by Prof. Pawlikowski was to meet scientists involved in designing and using global experimental telecommunication facilities in their research. Prof. Pawlikowski gave technical presentations about KAREN and PlanetLab NZ, as well as informed about current research activities conducted with help of PlanetLab NZ.

Additionally, a short paper on our initial experiments with PlanetLab NZ, aimed at distribution of Akaroa2 over PlanetLab, was 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:

Following Prof. Pawlikowski's visits in Europe, research teams of the EU Center of Excellence on FN (Future Networks) from Austria, Germany and Poland have expressed their interest in a closer collaboration with our PlanetLab NZ team. We have also initiated contacts with researchers working on PlanetLab Japan; with a possible visit of one of their top researchers in Christchurch in September 2009. About that time we would like to organized the 2nd International Workshop on PlanetLab NZ.

However, any further international collaboration between PlanetLab NZ and Planet Europe, PlanetLab Japan and/or GLab would be possible only if PlanetLab NZ became a federation of more than current three sites (at the University of Canterbury, the University of Otago and the University of Auckland). Thus, before an international links are established, we need to secure funds for maintaining and extending the current PlanetLab NZ.

Our colleagues from the University of Waikato, Victoria University of Wellington, Massey University and the Auckland University of Technology have expressed their strong interest in having PlanetLab NZ nodes installed at their sites. With three-four additional sites, PlanetLab NZ would also become more powerful and wider accessible research tool, both for network research communities and students at these universities. One outcome of Prof. Pawlikowski's visits on Europe is a possible cooperation in developing special applications in which PlanetLab would be used as a platform for teaching of new telecommunication and networking technologies.

All these additional activities require funds for continuation of the current activities and for possible expansion of PlanetLab NZ. We have recently applied to REANNZ for an additional funding which would make such an extension of PlanetLab NZ possible.

Top Risks

List of any known or anticipated risks to project:

Further continuation of this research program and extension of PlanetLab NZ by including research groups from other universities is impossible without appropriate funding. We have recently applied to REANNZ for an additional funding for connecting the University of Waikato, Victoria University of Wellington and the Auckland University of Technology to PlanetLab NZ.

What's Coming Up

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

Our plan of installing PlanetLab nodes at the University of Canterbury, the University of Otago and the University of Auckland has been successfully finalized. The Department of Computer Science at the University of Otago has two nodes of PlanetLab NZ operating on DELL PowerEdge 860 computer servers. Similar two nodes of PlanetLab NZ, also based on DELL PowerEdge 860 computer servers, operate in the Department of Computer Science at the University of Auckland. The two nodes of PlanetLab NZ operating in the Department of Computer Science and Software Engineering at the University of Canterbury are based on HP Compaq dc7900 computer servers. All these computers satisfy the current technical requirements of global PlanetLab, and they are connected directly to global PlanetLab via KAREN. To obtain their full experimental functionality, the computers are not hidden behind universities' firewalls.

PlanetLab NZ has allowed the networking research teams from Canterbury, Otago and Auckland to join the most advanced research activities on future telecommunication technologies and to work on a number of cutting-edge research initiatives such Future Internet, with its future peer-to-peer services, IPTv (IP Television), etc. Our current research projects at the University of Canterbury are reported on www.planetlabnz.canterbury.ac.nz. In particular, 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 predicting 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 use PlanetLab NZ for teaching purposes.