

What you can do in five years with a few million dollars

The  grangenet journey

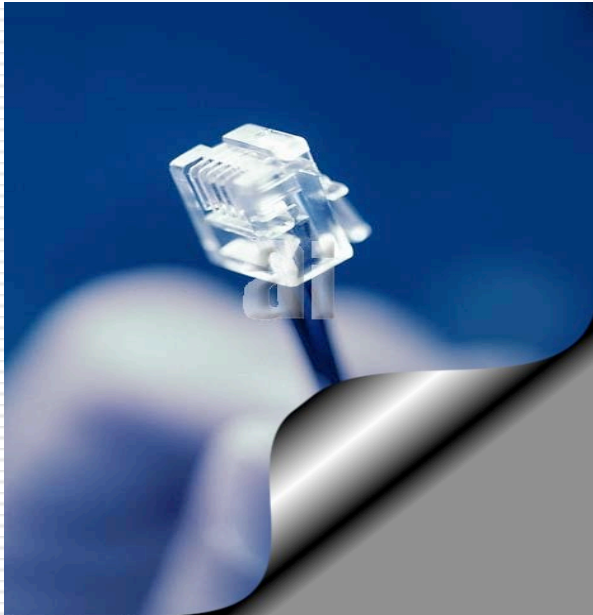
What you can do in five years with a few million dollars

Practically nothing unless you also
have some great people and a clear
idea of where you are going...

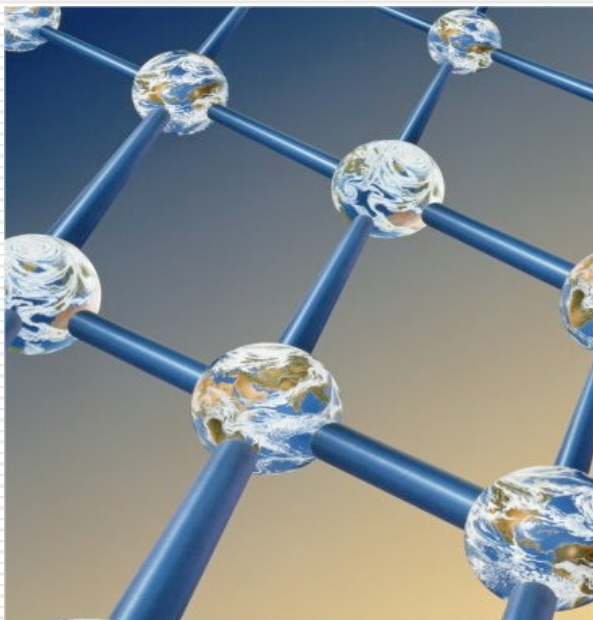
the people who have made GrangeNet

☐	Markus Buchhorn	50%	2002
☐	Ian Farquhar	50%	2003
☐	Chris Myers	100%	2004
☐	Danielle Stevens	80%	2005
☐	John Barlow	Farmer	2002 - 2004
☐	Cloudye Carew-Reid	Family	2003 - 2003
☐	Ruston Hutchens	AARNet	2003 - 2004
☐	Janelle Stewart	Govt	2002 - 2005
☐	Greg Wickham	AARNet	2002 - 2006

grangene**net** objectives

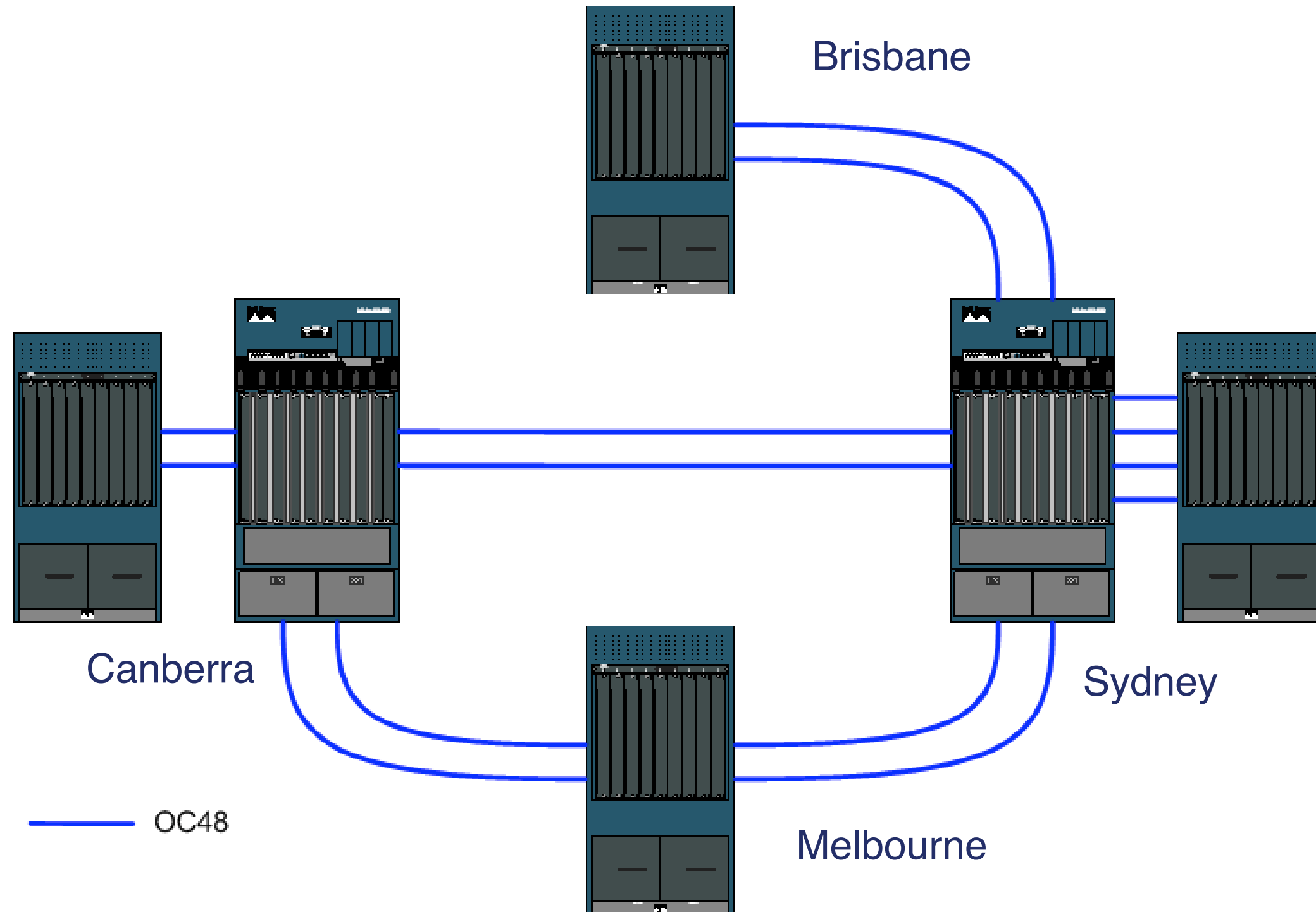


Build and operate a gigabit optical network for Australian research and education



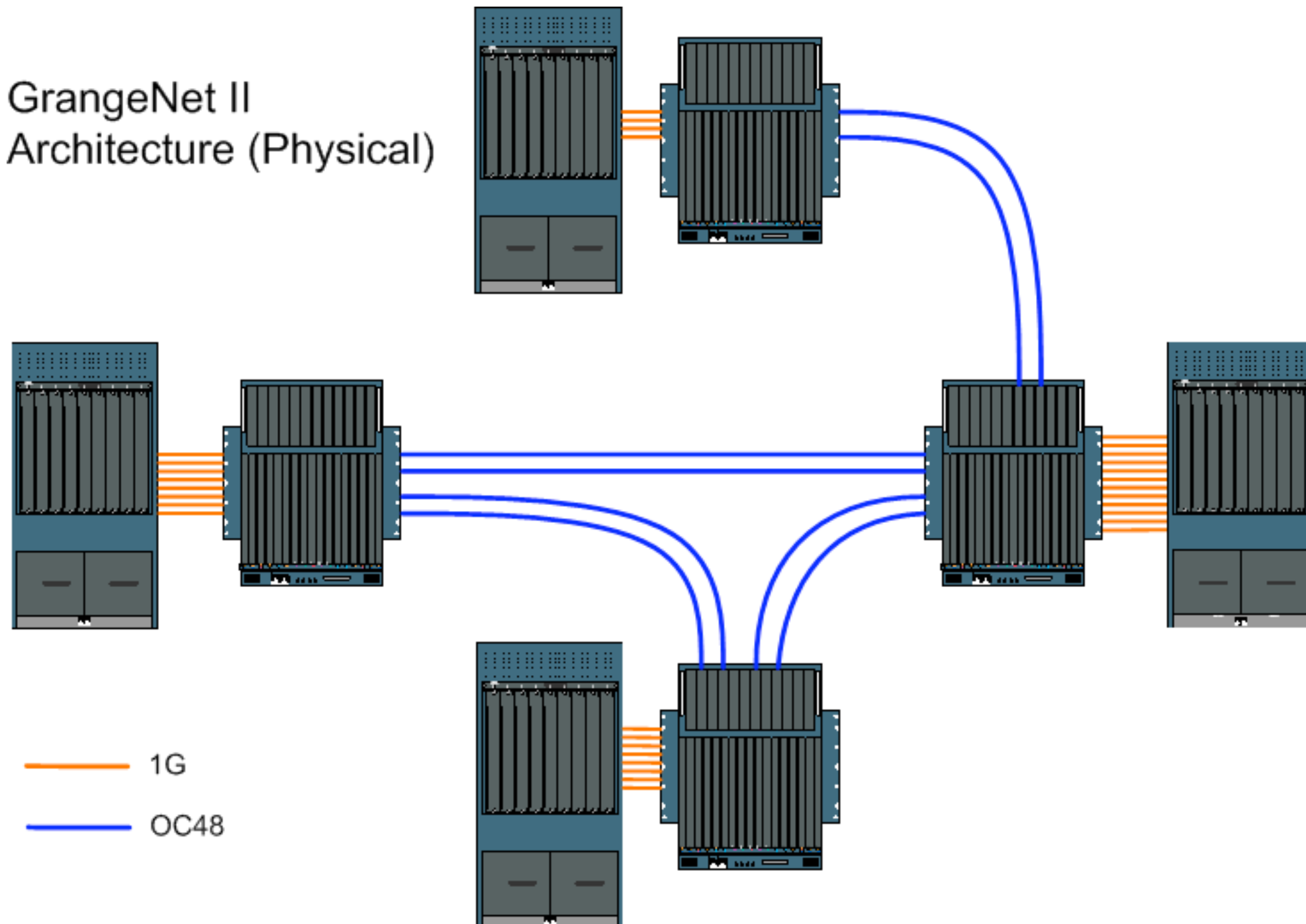
Foster the development of advanced communications & grid services

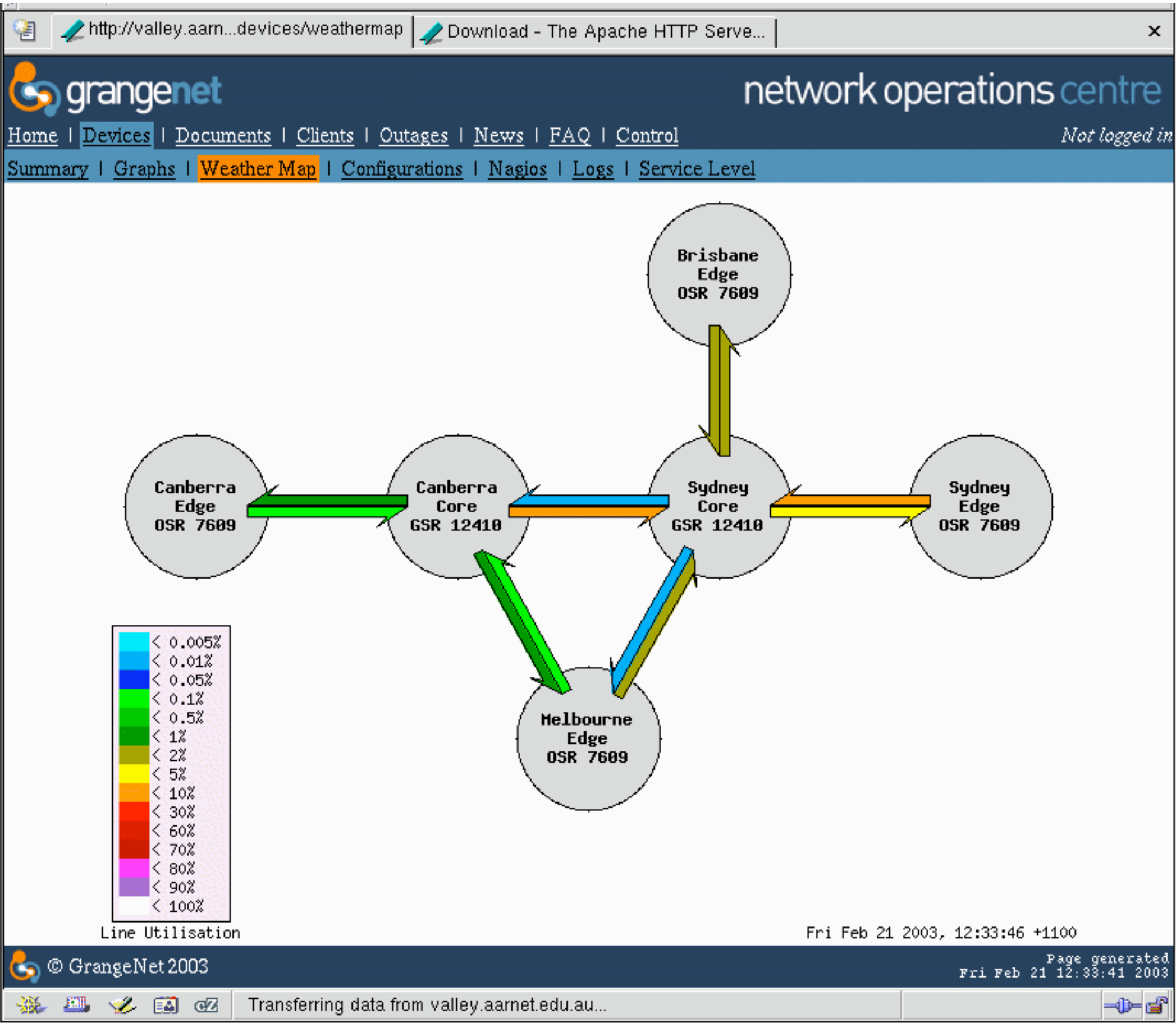
→ Original GrangeNet Architecture



→ GrangeNet II

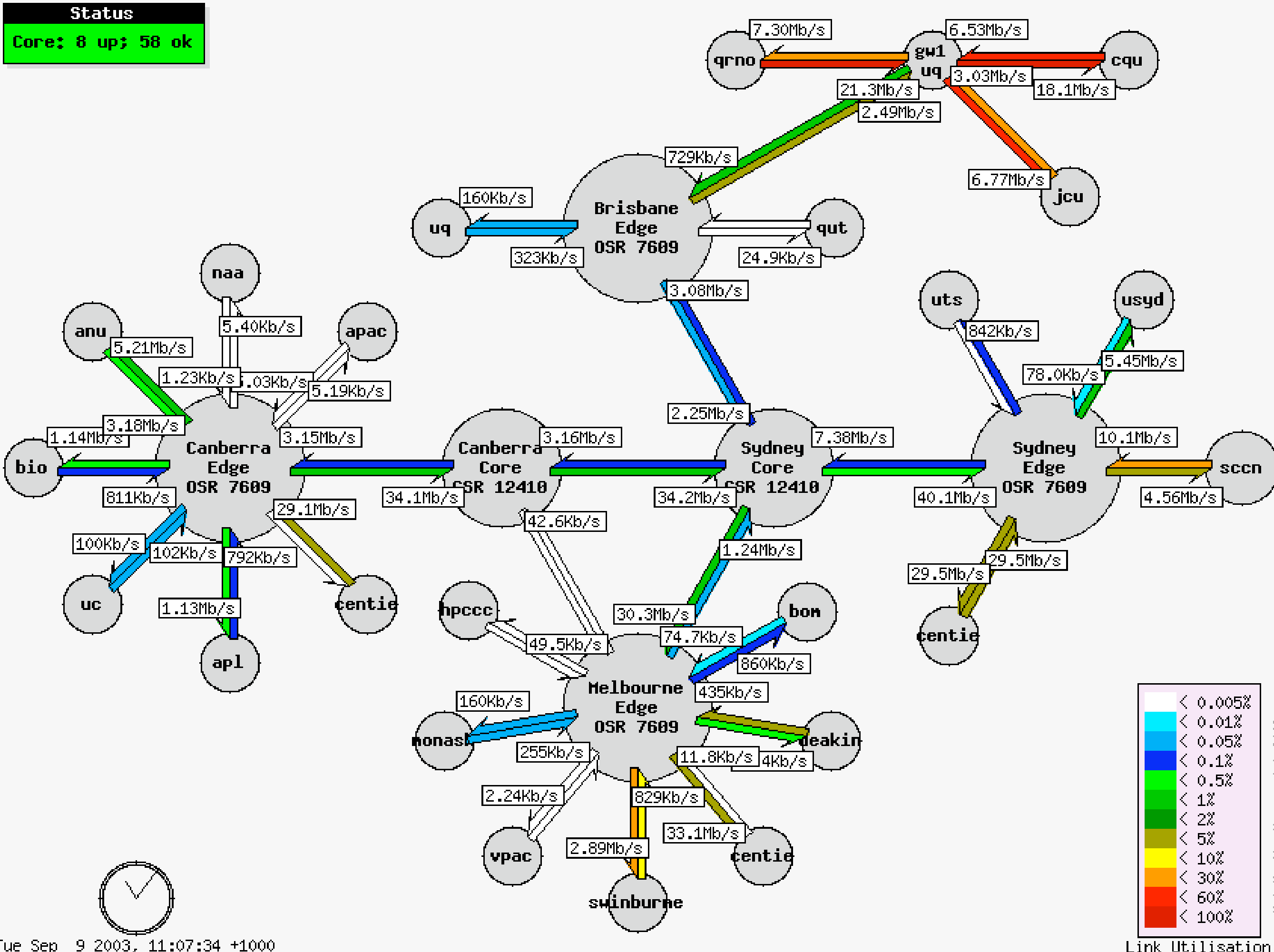
GrangeNet II
Architecture (Physical)





Status
Core: 8 up; 58 ok

Status
Core: 8 up; 58 ok



Status
Core: 8 up; 58 ok

Legend: Link Utilisation

< 0.005%
< 0.01%
< 0.05%
< 0.1%
< 0.5%
< 1%
< 2%
< 5%
< 10%
< 30%
< 60%
< 100%

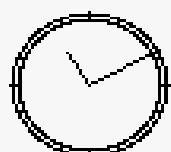
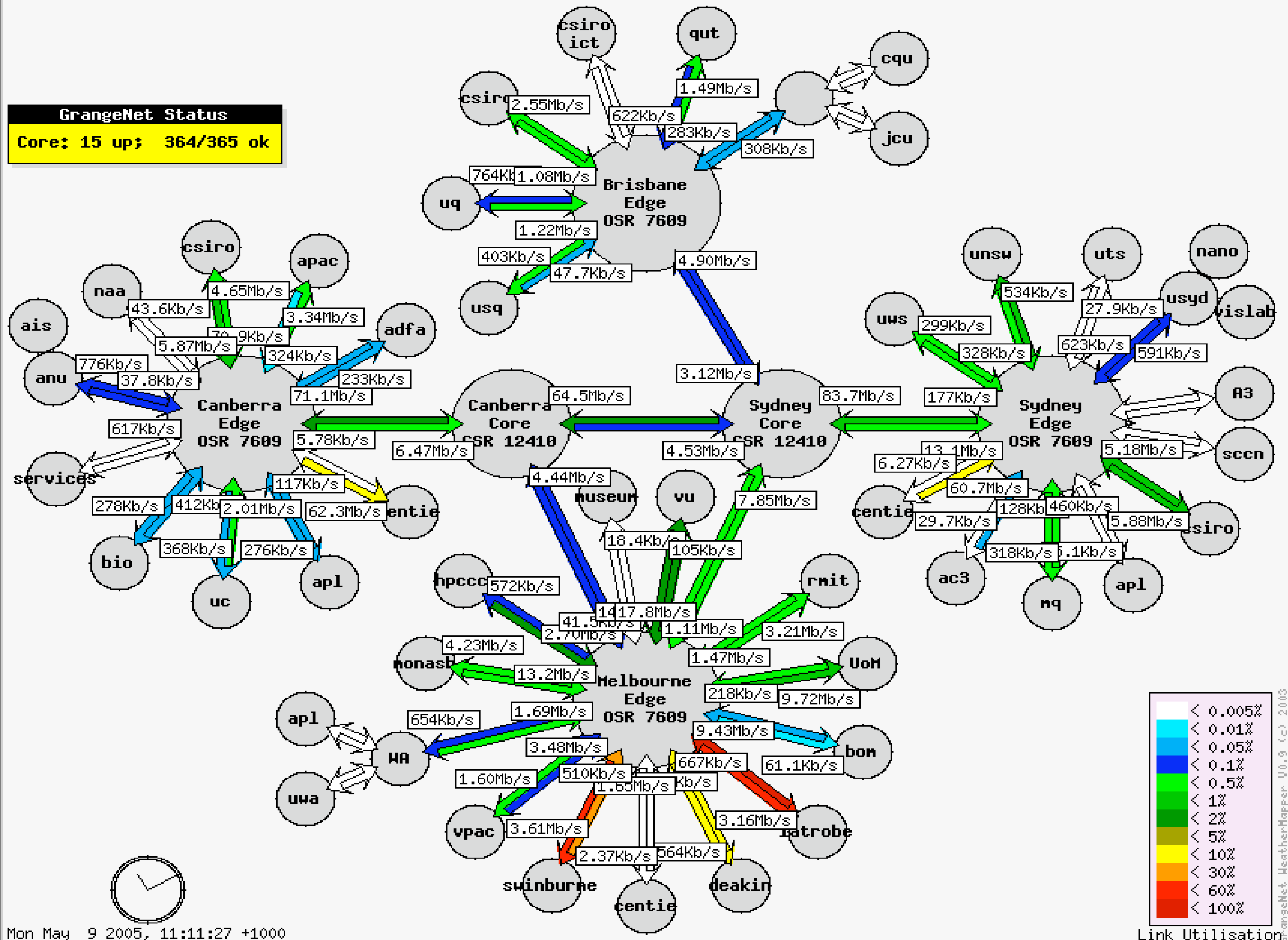
Network Nodes and Links:

- Canberra Edge OSR 7689**
 - naa: 5.40Kb/s
 - anu: 5.21Mb/s
 - bio: 1.14Mb/s
 - uc: 100Kb/s
 - apl: 1.13Mb/s
 - centie: 29.1Mb/s
 - Canberra Core CSR 12418: 34.1Mb/s
- Canberra Core CSR 12418**
 - Canberra Edge OSR 7689: 3.15Mb/s
 - Sydney Core CSR 12418: 3.16Mb/s
 - Melbourne Edge OSR 7689: 42.6Kb/s
- Sydney Core CSR 12418**
 - Canberra Core CSR 12418: 34.2Mb/s
 - Sydney Edge OSR 7689: 7.38Mb/s
 - Melbourne Edge OSR 7689: 1.24Mb/s
- Sydney Edge OSR 7689**
 - Canberra Core CSR 12418: 3.08Mb/s
 - uts: 842Kb/s
 - usyd: 5.45Mb/s
 - centie: 29.5Mb/s
 - sccn: 4.56Mb/s
- Brisbane Edge OSR 7689**
 - uq: 160Kb/s
 - qut: 24.9Kb/s
 - Sydney Edge OSR 7689: 2.25Mb/s
 - Melbourne Edge OSR 7689: 30.3Mb/s
- Melbourne Edge OSR 7689**
 - hpccc: 49.5Kb/s
 - bon: 860Kb/s
 - leakin: 4Kb/s
 - centie: 33.1Mb/s
 - swinburne: 2.89Mb/s
 - vpac: 2.24Kb/s
 - nonast: 255Kb/s
- Other Connections:**
 - qrno to gw1: 7.30Mb/s
 - gw1 to uq: 21.3Mb/s
 - gw1 to cqu: 6.53Mb/s
 - gw1 to jcu: 6.77Mb/s
 - uq to gw1: 2.49Mb/s
 - cqu to gw1: 3.03Mb/s
 - gw1 to qut: 729Kb/s
 - qut to gw1: 2.49Mb/s

Tue Sep 9 2003, 11:07:34 +1000

GrangeNet Status

Core: 15 up; 364/365 ok

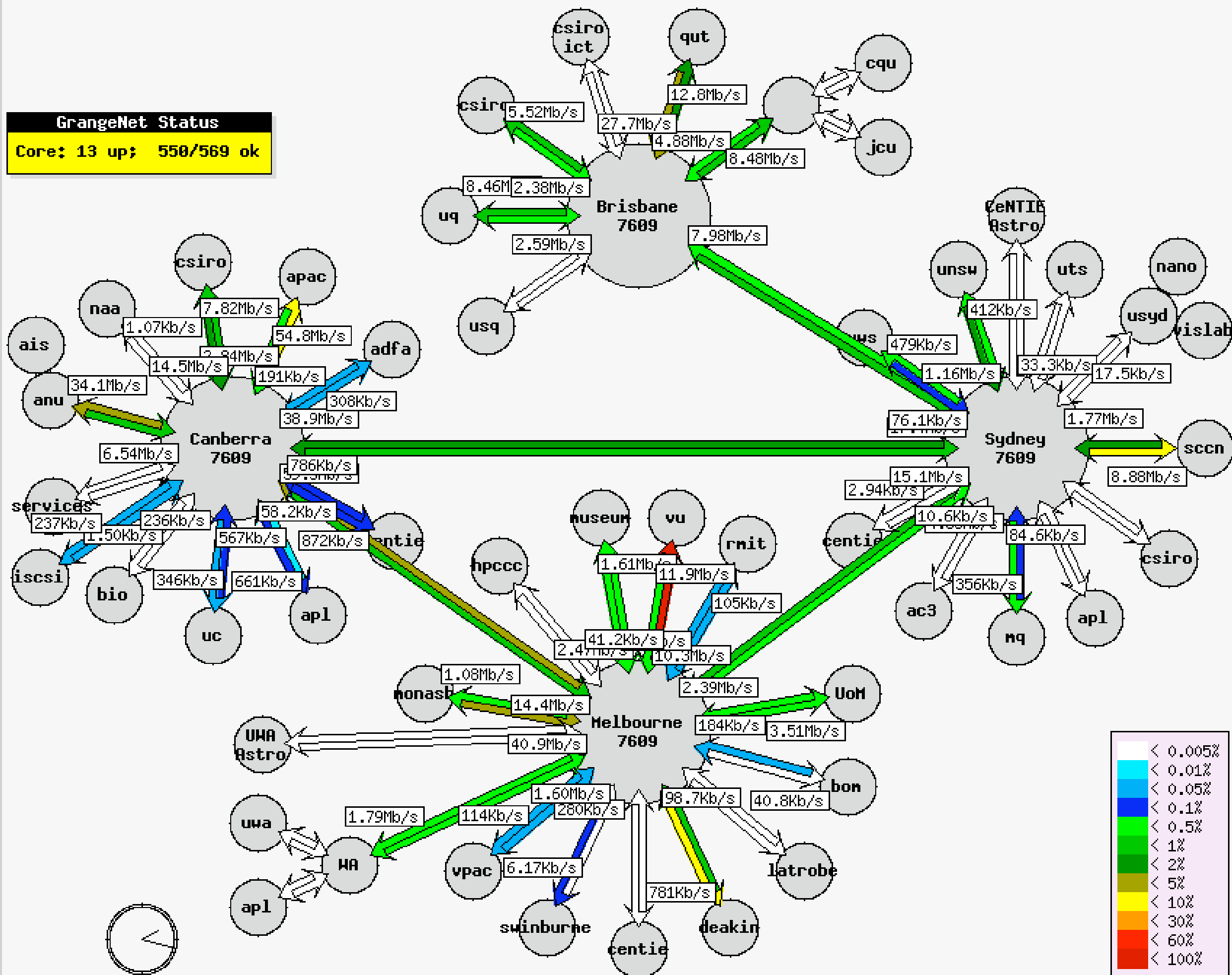


Mon May 9 2005, 11:11:27 +1000

Link Utilisation

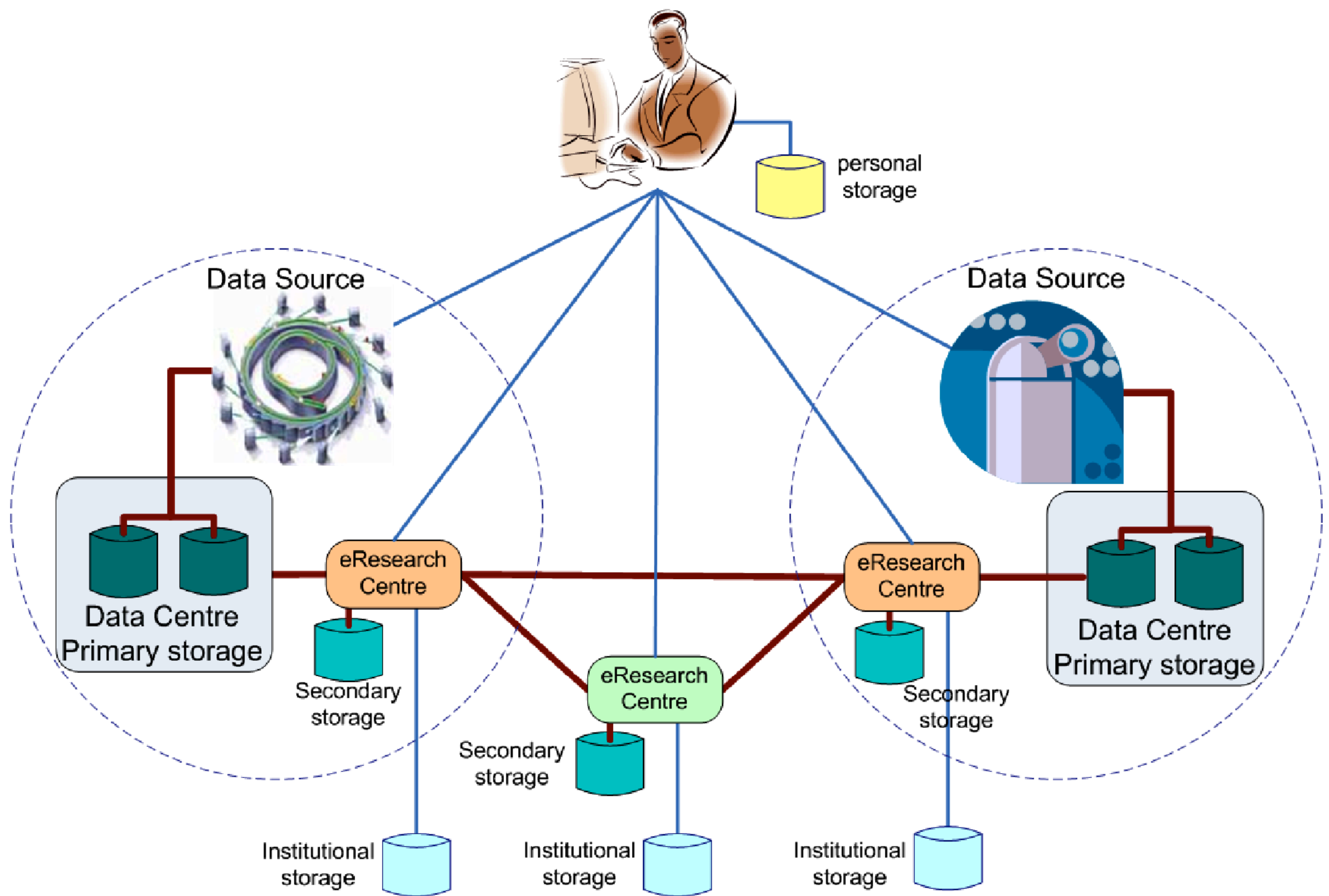
GrangeNet Status

Core: 13 up; 550/569 ok



→ measuring success

- Overall satisfaction with the performance of the network.
97% satisfied or very satisfied
- Overall satisfaction with the GrangeNet technical team.
94% satisfied or very satisfied
- Currently use GrangeNet in collaborative projects with other GrangeNet members?
65.6%, answered a little or a lot.
- Have increased international R&D?
70%
- Use GrangeNet for new and novel projects.
80%



GrangeNet funded projects

□ 2002 - 2004

□ \$13.2M (\$3.7M)

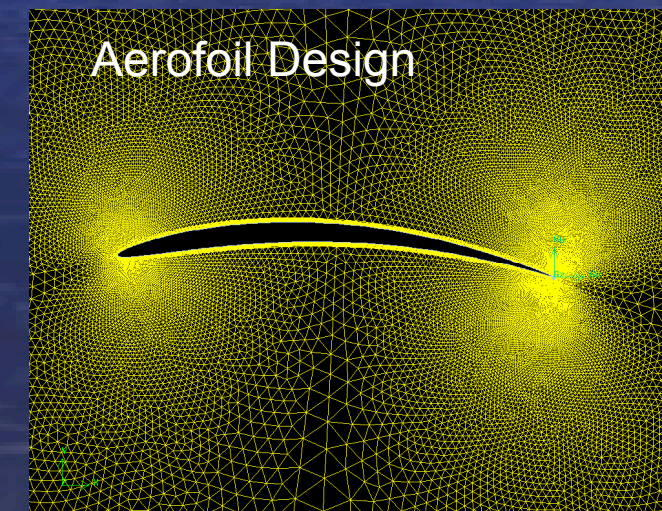
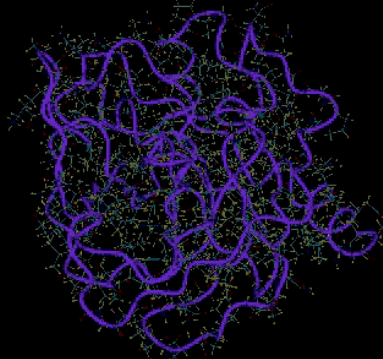
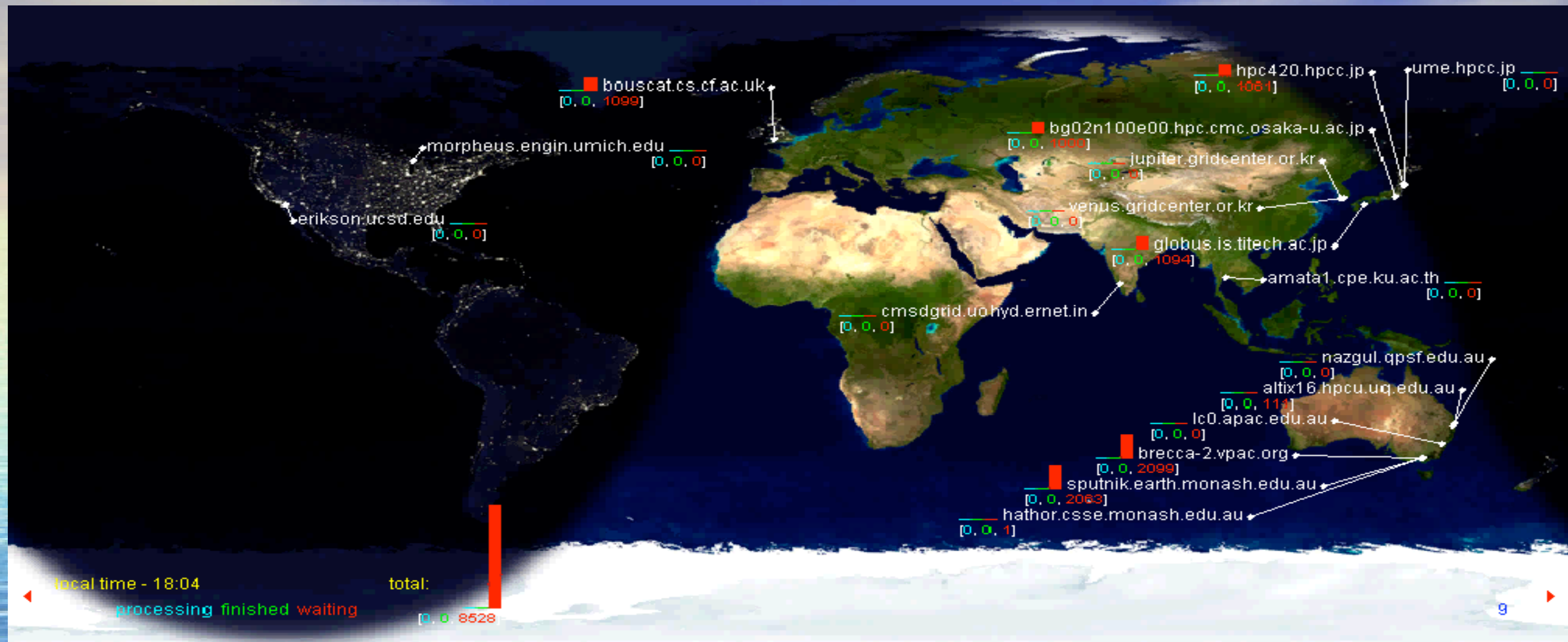
- NANO tele-presence
- ANU data grid
- APAC compute grid
- CSIRO compute grid
- ANT (NIMROD)
- FilmEd
- QPSF compute grid
- Syd VisLab Access Grid
- VPAC compute & data grids

□ 2005 & 2006

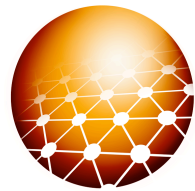
□ \$2.7M (\$1.1M)

- NANO tele-microscopy
- MMSN tele-science
- PARADISEC data grid
- CAUDIT-PKI middleware
- DAS
- Virgil
- AGATE Access Grid

NIMROD - from Quantum chemistry to aircraft design



tele-microscopy



N A N O



DEMO





& endangered languages

Pacific And Regional Archive for Digital Sources in Endangered Cultures

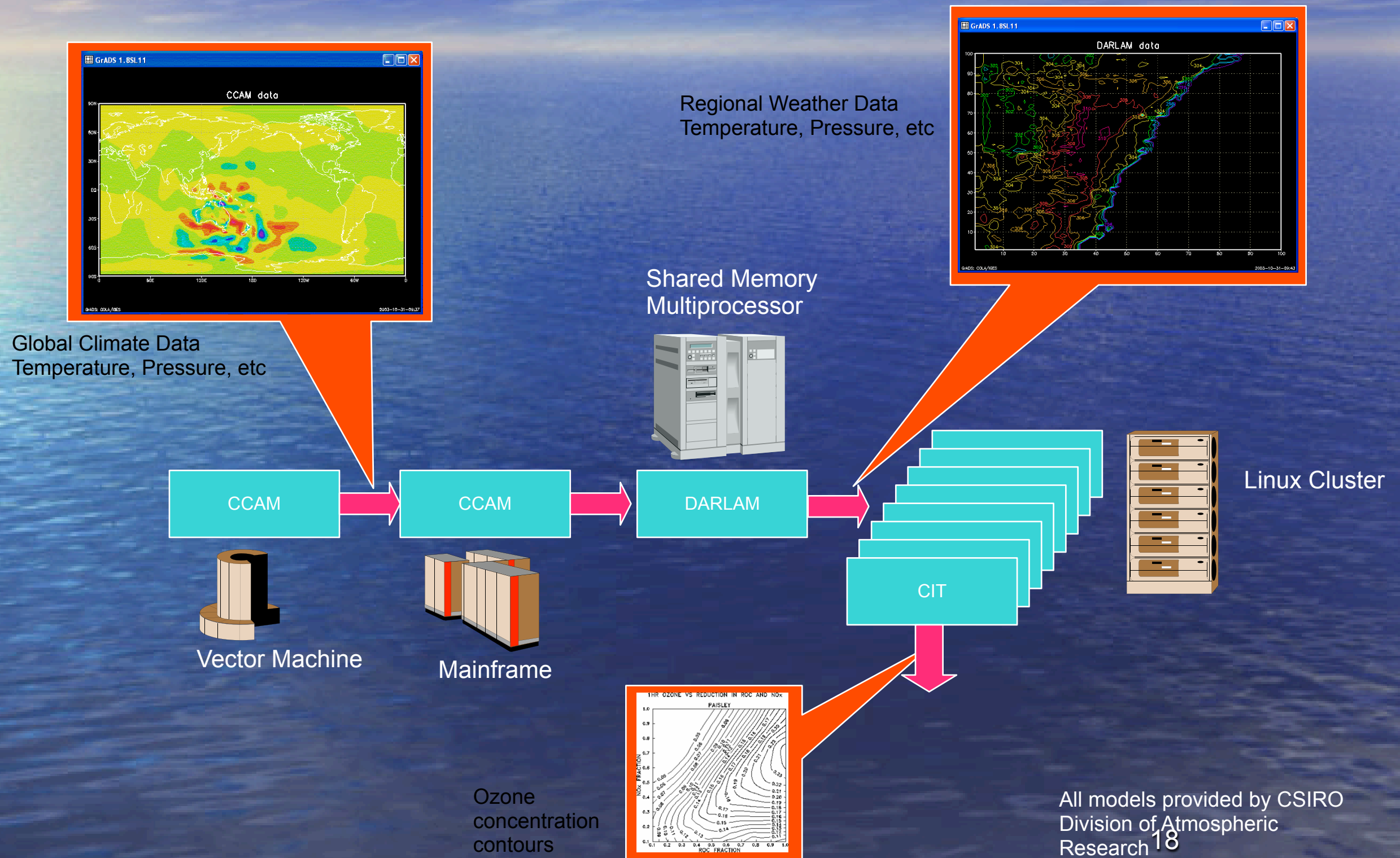


There is significant social, cultural and scientific data within languages and their interrelationships, telling us about the evolution of cultures in the region, and the movement of populations over time.

2500 languages in the Asia Pac today

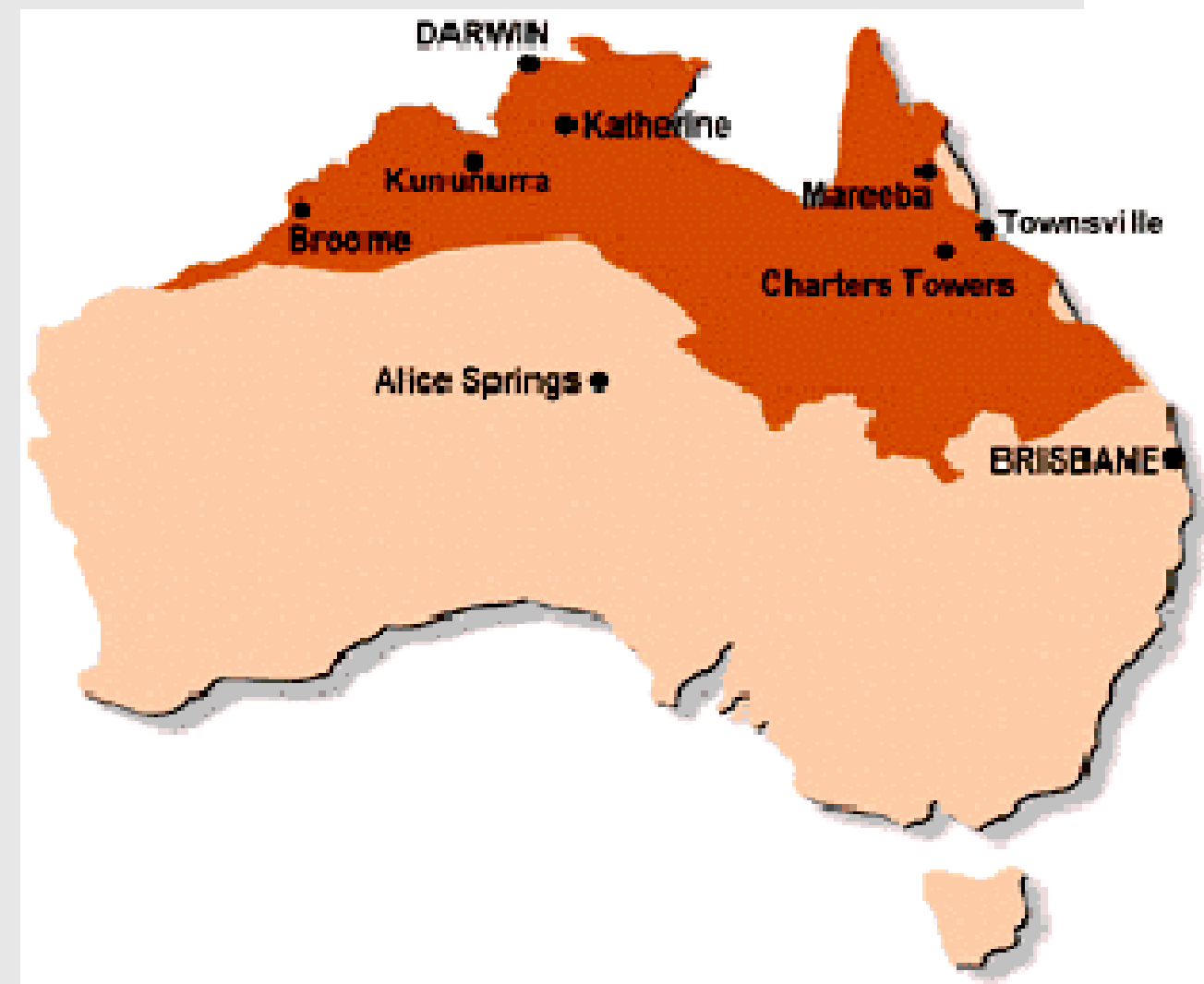
200 in the decades to come.

Distributed Atmospheric Sciences



Savanna Burnoff

- **Extensive savanna eco-systems in northern Australia**
 - 25 % of Australia
 - Vegetation: spinifex / tussock grasslands; forest / open woodland
 - Warm, semiarid tropical climate
 - Primary land uses:
 - > Pastoralism
 - > Mining
 - > Tourism
 - > Aboriginal land management



(Tropical Savannas CRC)

Motivation

- **Extensive savanna eco-systems in northern Australia**
- **Changing fire regime**
- **Fires lead to abrupt changes in surface properties**
 - Surface energy budgets
 - Partitioning of convective fluxes
 - Increased soil heat flux
 - Modified surface-atmosphere coupling
- **Sensitivity study: do the fire's effects on atmospheric processes lead to changes in highly variable precipitation regime of Australian Monsoon?**
- **Many potential impacts (e.g. agricultural productivity)**



Use of Grid Computing

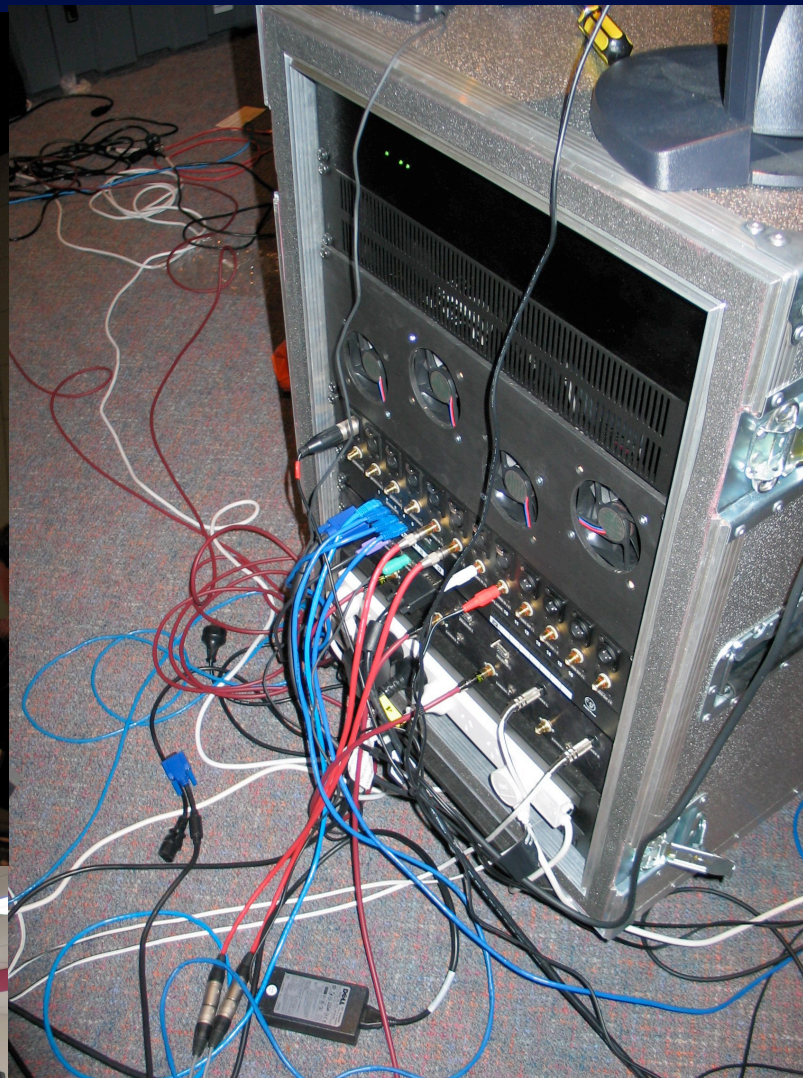
- 90 parallel independent model runs
- Single CPU model version of parallelized C-CAM (MPI)
- Distribution of forcing data repositories to cluster sites (~80 GB), 250 MB forcing data per month
- Machine independent dataformats (NetCDF)
- Architecture specific, validated C-CAM executables
- ~1.5 month CPU time for one experiment (90 exp. total)
- Robust, portable, self-controlling model system incl. all processing tools and restart files
- PRAGMA Testbed
 - Can we get enough nodes to complete experiment?
 - Can we maintain a testbed for 1.5 Months?
 - Can we maintain a node up for 0.5 days?
 - Can we make this routine for climate modelers?



→ GrangeNet projects

- Portable Access Grid
- Distributed Data Storage Project
- eduroam
- DVTS collaborative video in AG
- IPv6 involvement
- CAIA/GrangeNet Gaming server

→ Portable Access Grid





report card

- Satisfied customers
- Over 1.5 PB of traffic
- Funded 16 significant research projects
- Successful technology projects
- Met 54 milestones
- On budget and on time



Why is GrangeNet shutting down?

□ Cost

- It costs about \$4.5M pa to run GrangeNet - excluding tech refresh.
- GrangeNet is a project under DCITA's Advanced Network Program which was originally for 3 years. Funding was extended to 5 years but is now at an end.

□ Need

- Original concept
 - ✓ kick start thinking on how to use free and infinite network capacity
 - ✓ Enable researchers to implement collaborative tools and grids
- There is still a need for a "research network" but it has to be x10 or x100 faster than the production services.

□ Commercial reality

- The GrangeNet backbone is leased from PowerTel - the 5 year IRU expires in November.
- The ONS15801 optical kit is obsolete and needs replacement - \$5M

the next 6 months

- eduroam will be handed over to AARnet on 31 July
- Network will be shutdown 30 November
 - Network managers will be contacted later in the year
- Funded projects complete by 31 December
- Final report & lights out - Jan - Mar 2007
- Still waiting for AARNet to decide how they will continue the storage project
- Not aware of AARNet's IPv6 and multicast plans or capabilities.

thanks to...

- the GrangeNet staff



Australian Government

**Department of Communications,
Information Technology and the Arts**

