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.

Objectives: to enhance research collaboration through the development of eResearch infrastructure.
NeCTAR Research Cloud

A scalable, self-service platform
• Any Researcher, Any Discipline, Any Where

A single national cloud
• Eight distributed nodes - up to 30,000 CPU cores
  • University of Melbourne
  • Australian National University
  • Queensland Cyberinfrastructure Foundation
  • Monash University
  • Intersect
  • iVEC
  • University of Tasmania
  • eResearch SA
Research Cloud as a Platform for Innovation

Research Innovation through Collaboration

• More areas of research relying on growing strategic collaborations:
  • Across institutional and national boundaries
  • To build critical mass – competitive advantage

Research Cloud supports wide collaboration

• Easily share research tools, applications and knowledge across institutional boundaries
• Hosting online environments to support researcher collaboration
  • Connecting researchers with remote facilities... and with each other
• An opportunity to invest at scale to support highly diverse research collaboration needs
The Research Cloud Experience @ Melbourne

#UoMITSRResearch @MelbITSRResearch #NeCTARau

NeCTAR NSP & Research Cloud BoF, 16:00 – 17:00
Monday 29th October 2012
UoM/Parville: Intellectually rich, diverse discipline-diverse and geographically dense research precinct

Get fanatical about building communities surrounding the research cloud

Devs + Ops + Techs + Academics + Students

Events, events events
Monthly Research Cloud Forum, #NADojos, …

Community support model, forums, how are you giving & contributing?
The research cloud as a platform for innovation: make it easy to try and free to fail

- Sharing code
- Sharing data
- Sharing infrastructure

Conversation and focus eventually changes #eRes2012 is the example
#NADojo Melbourne “I used rely on mainframes to run my experiments. One time I worked Saturday night because it was the only time I could get access. I can’t build a computer, but the fact that there’s instant access alone is enough for me to use the cloud”

#NADojo Brisbane “These types of forums are import not only to bring us together and share out experiences. These are new technologies, and things like this give us a chance to get a step up, while meeting the community.”
#1 problem for first time users: closed by default, how to open it up?
Snapshot behaviour not consistent across images
What’s actually backed up?
Advanced: Building & getting custom images into the cloud
Moving instances between projects
Capacity & performance (recent storage load issues)
Two major upgrades (Essex in June, Folsom mid-Nov)
Basic functions (launching, snapshots, etc.) get more reliable with each release
Running since Feb 1st 2012
1920 cores & 8 TB memory
2x datacentres
x2 capacity in mid-Nov

1,419 users, 1,600 cores
10,270 VMs started (17802 cores worth, 90%<1month)
VMs running from minutes to months
70 allocations from 1’s to 100’s cores
Every state
43 institutions & research orgs
600 tickets
350 forum posts
7500 visits to the support site

Projects: HuNI, GenomicsVL, GeophysicsVL, Bioplatforms
training course, Victorian Uni eResearch…
The National Servers Program is the hoster of critical e-Research services for the Australian research community.

1 node Hosted @ Melbourne across 2 data centres

The service underpins other services

The service is considered a core to other eResearch services and activities

The service supports a broad community

You have good user support & maintenance in place.

Hosts projects such as the AAF, ANDS, ARCS AeKOS, PARADISEC, …

<table>
<thead>
<tr>
<th>Month</th>
<th>Availability</th>
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</thead>
<tbody>
<tr>
<td>June 2012</td>
<td>100%</td>
</tr>
<tr>
<td>July 2012</td>
<td>99.97%</td>
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<tr>
<td>August 2012</td>
<td>99.37%</td>
</tr>
<tr>
<td>September 2012</td>
<td>99.91%</td>
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Moving into Phase II of the NSP, dealing with some of the issues we’ve had in Phase I.

Self-service - users are now free to control all stages of the VM lifecycle (creation, modification, and deletion) themselves without requiring NSP sysadmin intervention

Out-of-band console access, enabling users to troubleshoot their VMs in the event that they cannot use in-band access like SSH/RDP

Self Service - Snapshots for backup and recovery

Advanced network options – users can now control firewall rules, create load-balancers, and VPN connections
From Essex to Folsom

- 6 monthly release cycle
- Continual improvement
- Other organisations share our requirements
- In the Folsom Release:
  - Fixes for many common user complaints, including a complete overhaul of state transitions in Compute
  - New dashboard
  - Preparations for federated Object Storage
  - Improved commandline clients for all projects
  - Improvements for upgrade between versions
  - Virtual Volumes became a separate core project
  - New Image management API
  - SSL improvements to all components
  - Software Defined Networking now a core project

1000 attendees,

Essex deployed at Melbourne

1400 attendees,
From one node ... to eight

Melbourne – Online, 4000 cores 2012
Monash – 2012

iVEC* - 2013

eRSA* - 2013

QCIF – 512 Cores 2012

Intersect* - 2013

ANU - 2013

TPAC* - 2013

*Under contract negotiation
Let’s talk weather!

What can we do to make the cloud more usable for researchers?

What are your gripes?

What are your stories of awesome?

How do I deal with data on the cloud?

What about extra services? Patching? Orchestration?