Nectar Research Cloud services at the University of Auckland

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Summary

- Introductions
- What is a Virtual Machine?
- What is Nectar?
- Who & what are these services for?
- Nectar services at UoA
  - Nectar Research Cloud
  - Nectar's additional services:
    - JupyterHub
    - Binderhub
    - Virtual Desktop
- Live Demos

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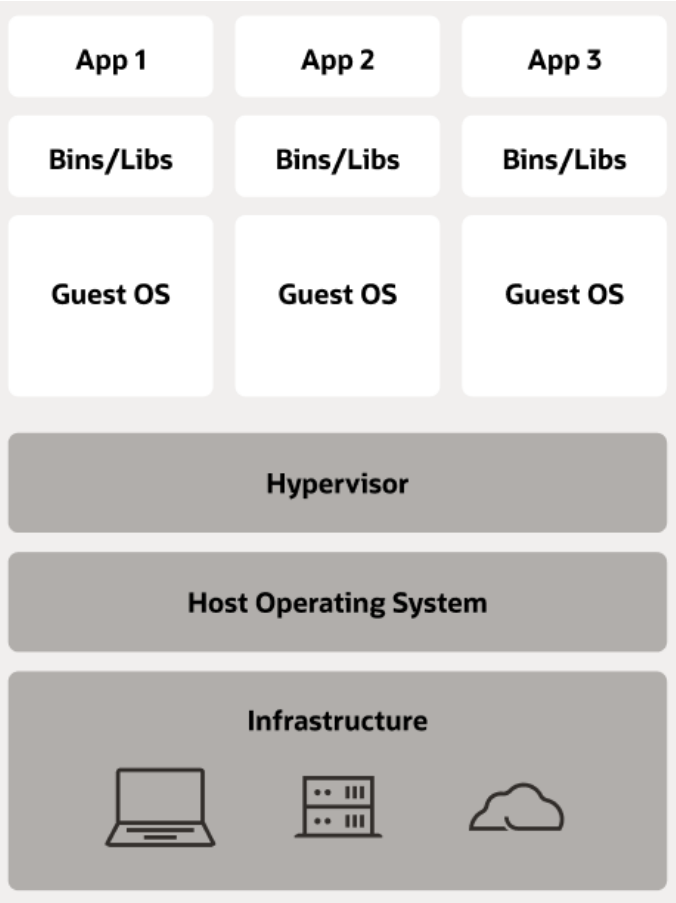
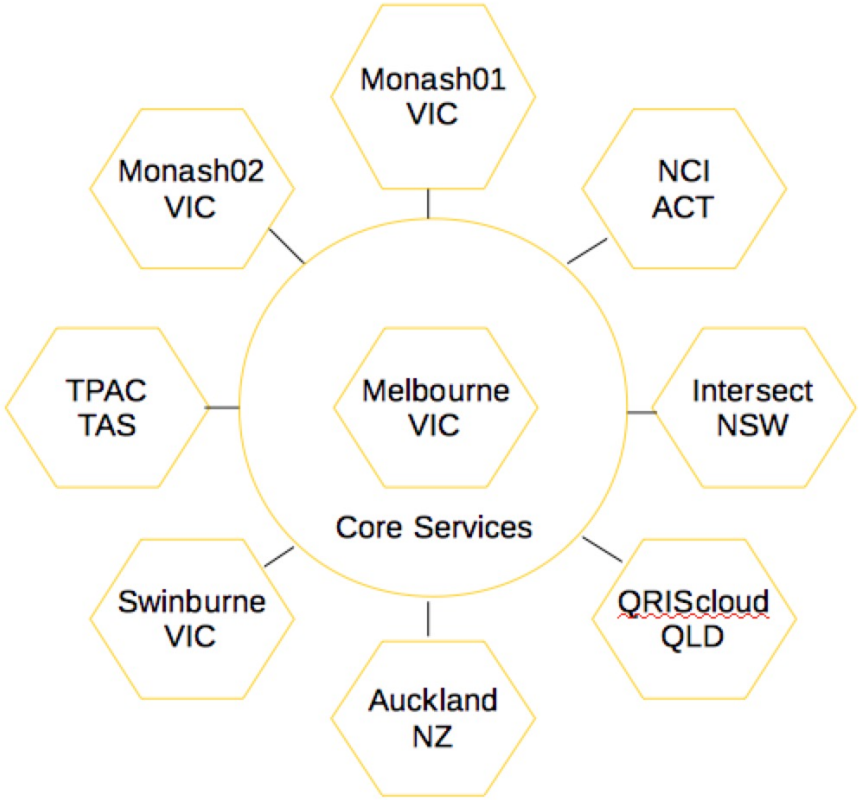
What is a virtual machine?

- Computing environment that functions as an isolated system
- Own CPU, memory, network interface, and storage
- Created from a pool of hardware resources



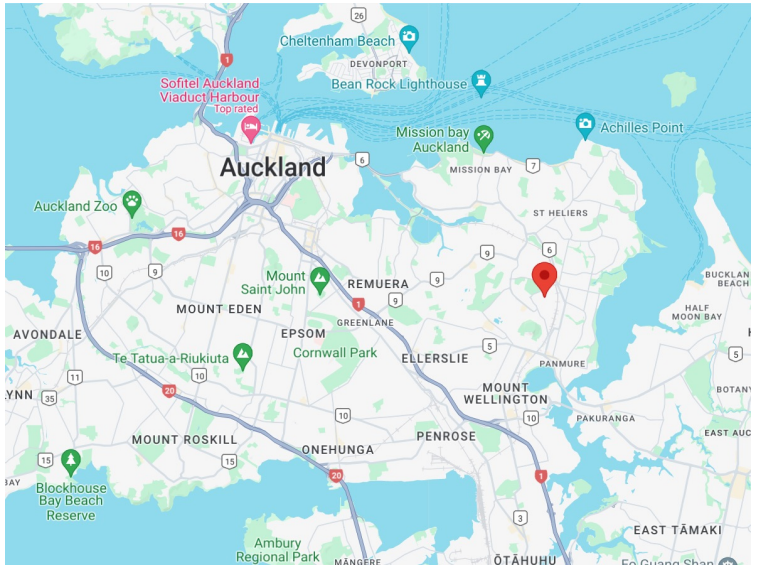
What is Nectar?

- The University of Auckland is a partner of Nectar Research Cloud
- Provides a secure platform to access computing resources and cloud storage and collaborate without purchasing or hosting your own hardware.



What is the Nectar Research cloud?

- Nectar `Instances` are virtual machines (VMs), like your desktop computer/laptop running in University on-premise data centres
- Self-service, public, outside the university firewall
- Accessible via SSO and Tuakiri.



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Who and what are these services for?

- Every researcher is automatically (without application) able to access a trial project allocation
- 2 cores for 3 months OR 1 core for 6 months
- 10GB of storage
- Self-service
- Appy for allocation and more resources

Name	VCPUS	RAM	Root Disk	Ephemeral Disk	Public	SU/hour
t3.xsmall	1	1 GB	10 GB	0 GB	Yes	0.014
p3.xsmall	1	2 GB	30 GB	0 GB	Yes	0.007
t3.small	2	2 GB	10 GB	0 GB	Yes	0.029
c3.xsmall	1	2 GB	30 GB	0 GB	No	0.043
m3.xsmall	1	2 GB	30 GB	0 GB	Yes	0.029
r3.xsmall	1	4 GB	30 GB	0 GB	No	0.052
akl.win.m3.small	2	4 GB	80 GB	0 GB	No	0.086
m3.small	2	4 GB	30 GB	0 GB	Yes	0.057
t3.medium	4	4 GB	10 GB	0 GB	Yes	0.057
p3.small	2	4 GB	30 GB	0 GB	Yes	0.014
c3.small	2	4 GB	30 GB	0 GB	No	0.087
p3.medium	4	8 GB	30 GB	0 GB	Yes	0.029
akl.win.r3.small	2	8 GB	80 GB	0 GB	No	0.156
r3.small	2	8 GB	30 GB	0 GB	No	0.104

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Common applications on VMs

- Apache HTTP Server
- Python Flask
- Bioconda
- BioLinux
- Etherpad
- LAMP stack
- R-Studio
- Jupyter notebooks

Nectar additional services

- Key differences between UoA Nectar Research Cloud and additional services
  - **Off-the-Shelf** Login and start playing
  - **Hosted on ARDC or Australian Partner's hardware**
  - **Compute resources limited** compared to Research Cloud
  - **Limited duration**
  - **Don't require allocation request**

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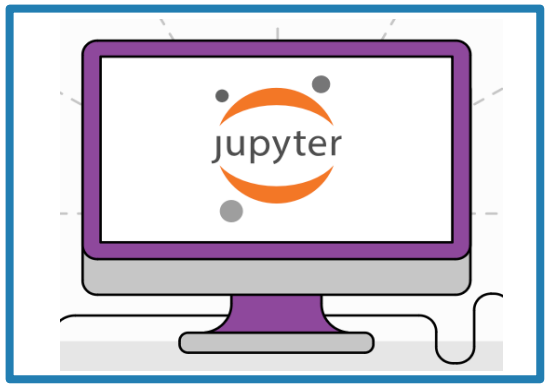
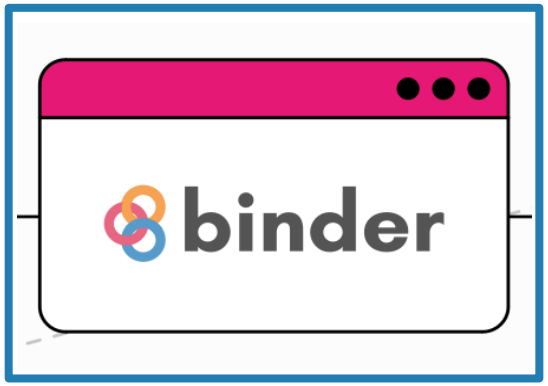
Nectar additional services



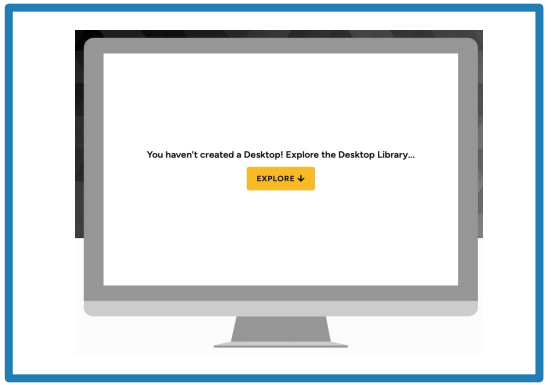
JupyterHub

- Off-the-shelf, self-service (Nectar) Jupyter Notebooks
- Multiple programming environments and languages, with popular scientific packages pre-installed
- Hosted in Australia
- Accessible to UoA via Tuakiri
- Ideal to design and test code quickly and easily



BinderHub

- Self-service (Nectar) BinderHub
- Allows researchers to interactively share Jupyter Notebooks stored in a remote Git repository displaying code and outputs.



Virtual Desktop

- Off-the-shelf, self-service (Nectar) virtual desktops
- Linux based OS with scientific software pre-installed or customisable
- Accessible to UoA via Tuakiri
- Ideal for processing that may take up to a couple of weeks or to free up laptop/desktop.

ResearchHub

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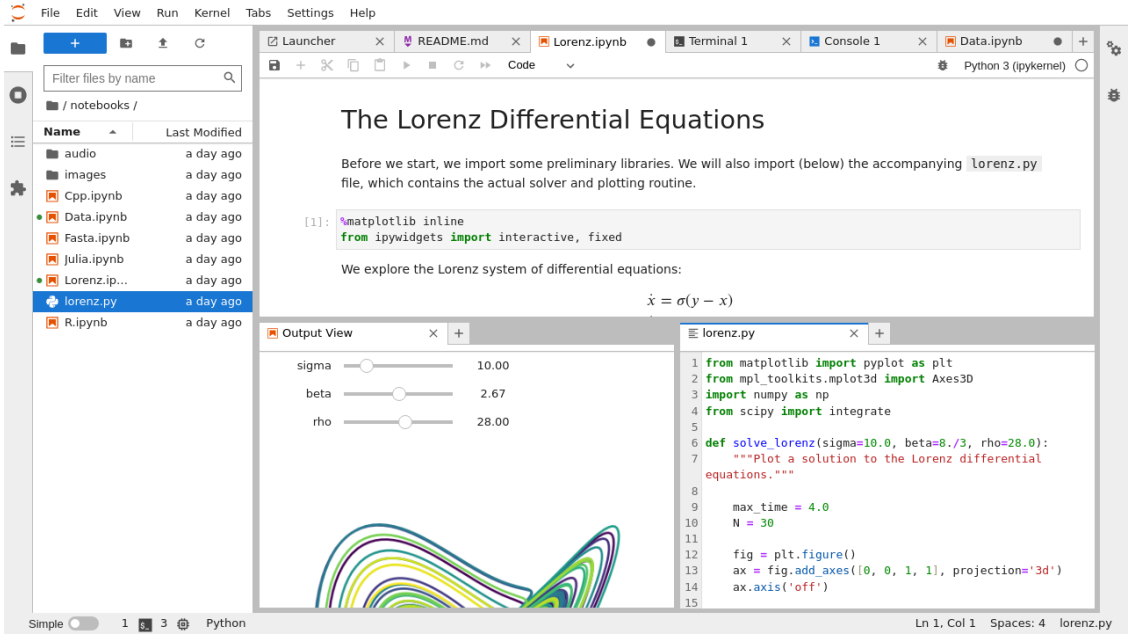
JupyterHub

- Jupyter notebooks with programming languages and libraries for data analysis
- **7.5GB RAM 4 vCPUs**
- **10GB** storage and for your workspace
- Sessions remain active 1hour after closing browser
- Notebooks are saved



Ideal for:

- Testing and developing code or scripts without having to install/maintain own environment

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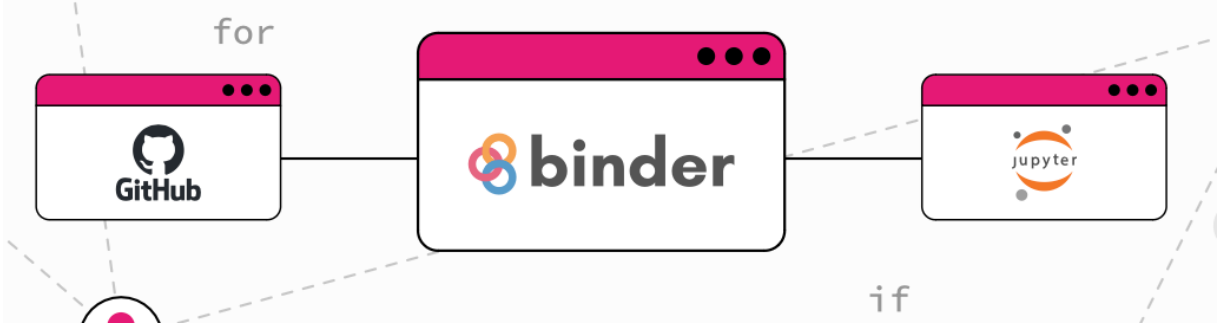
BinderHub

- Share reproducible interactive computational environments.
- Shared environments come with **8GB RAM 4 vCPUs** and **8GB** ephemeral storage
- Data is not retained
- With browser open instance will run for 12 hours. Closing browser terminates the session.



Ideal for:

- Enables verification and replication
- Interactively sharing results

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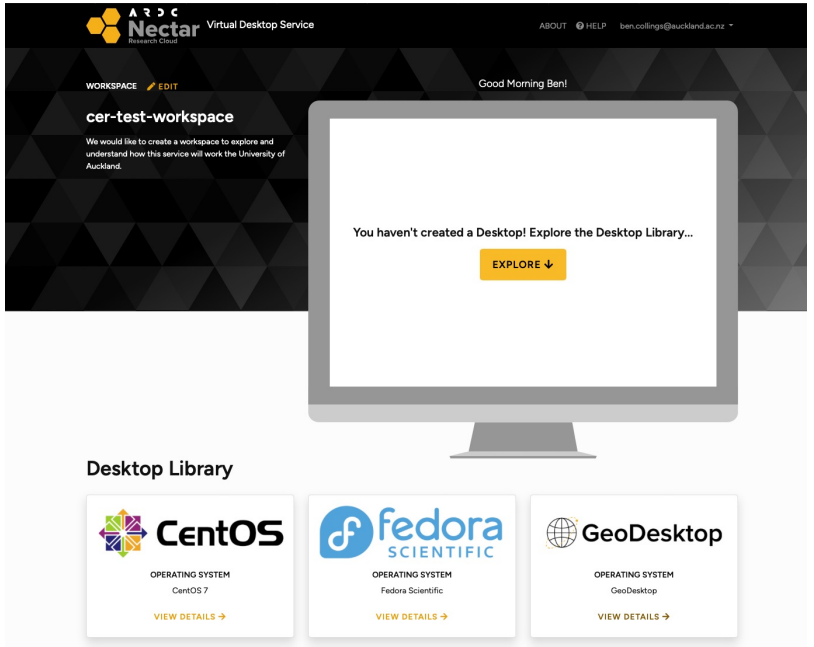
Virtual Desktop

- A virtual machine accessible through a browser
- Several Linux operating systems to choose from with tools/libraries for research programming or customise with your own software packages
- **16GB RAM 8 vCPUs** can be boosted to 32GB 16 vCPUs.
- **50GB** storage including Operating system
- Shelf-life of **14 days***

*can be extended 14 days at a time (boosted instances timeframe is 7 days)



Ideal for:

- Decoupling week-long data processing from Laptop/Desktop

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Comparison table

Service	Time-frame	RAM	vCPU	Storage	Useage
Virtual Machine	Up to 1 year (renewable)	Up to 128 GB	Up to 64 *GPUs available	Up to TBs	Long-running and hardware intensive tasks
JupyterHub	While browser open	7.5 GB	4	10 GB	Fast testing and prototyping ideas
Binderhub	12 hours	8 GB	4	8 GB	Sharing and reproducibility
Virtual Desktop	14 days	16/32 GB	8/16	50 GB	Week-long processing

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Demos!