

# Free Up Your Desktop!

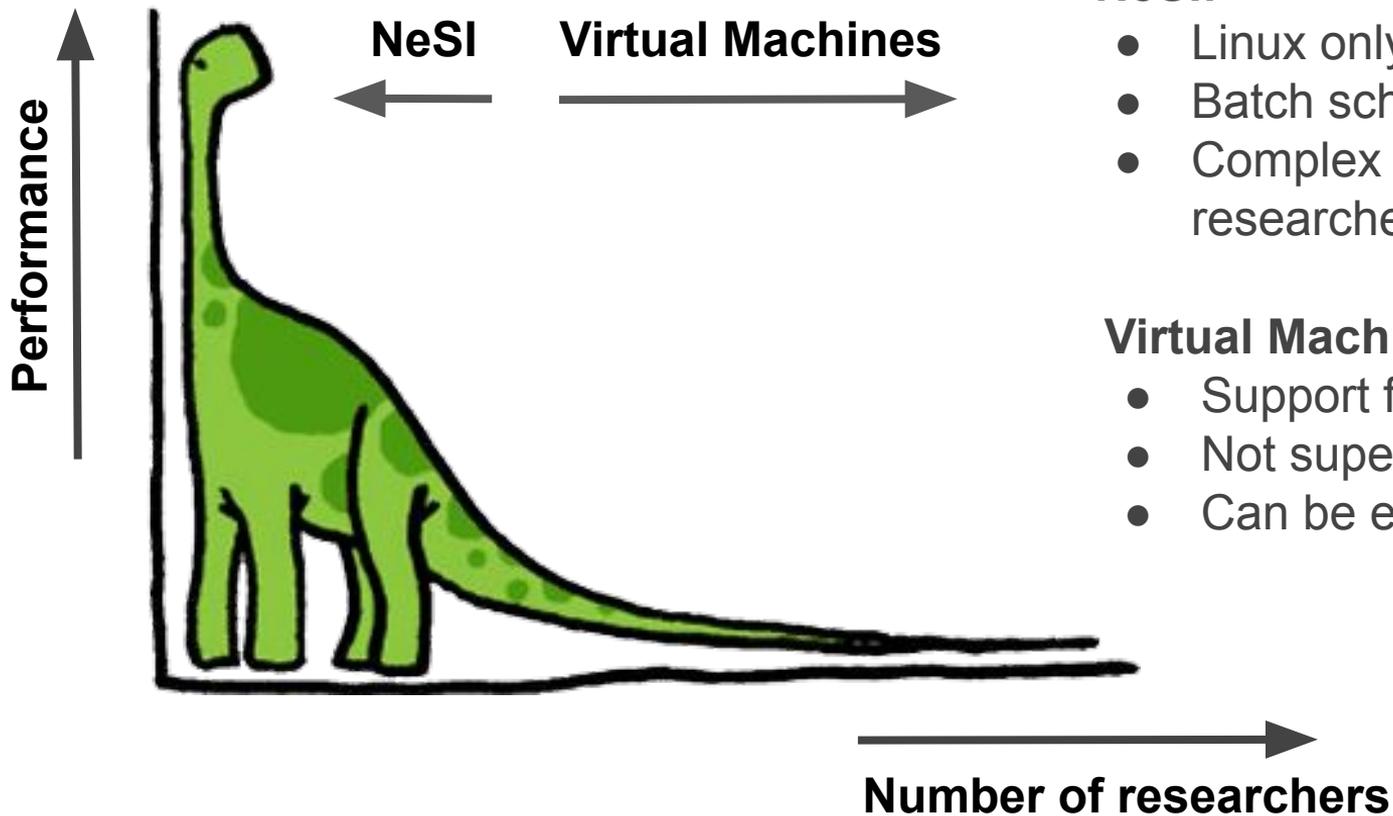
## Using **Research Virtual Machines** For Research



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# Research Compute - the long tail



## NeSI:

- Linux only
- Batch scheduling
- Complex for non-technical researchers

## Virtual Machines:

- Support for Microsoft
- Not super high-performance
- Can be easier to use

# This talk

- What is a virtualisation?
- When to use a virtual machine?
- How to request one?
- How to use it?
- Alternatives
- Questions

# Centre for eResearch (CeR)

We work hand-in-hand with researchers

We offer:

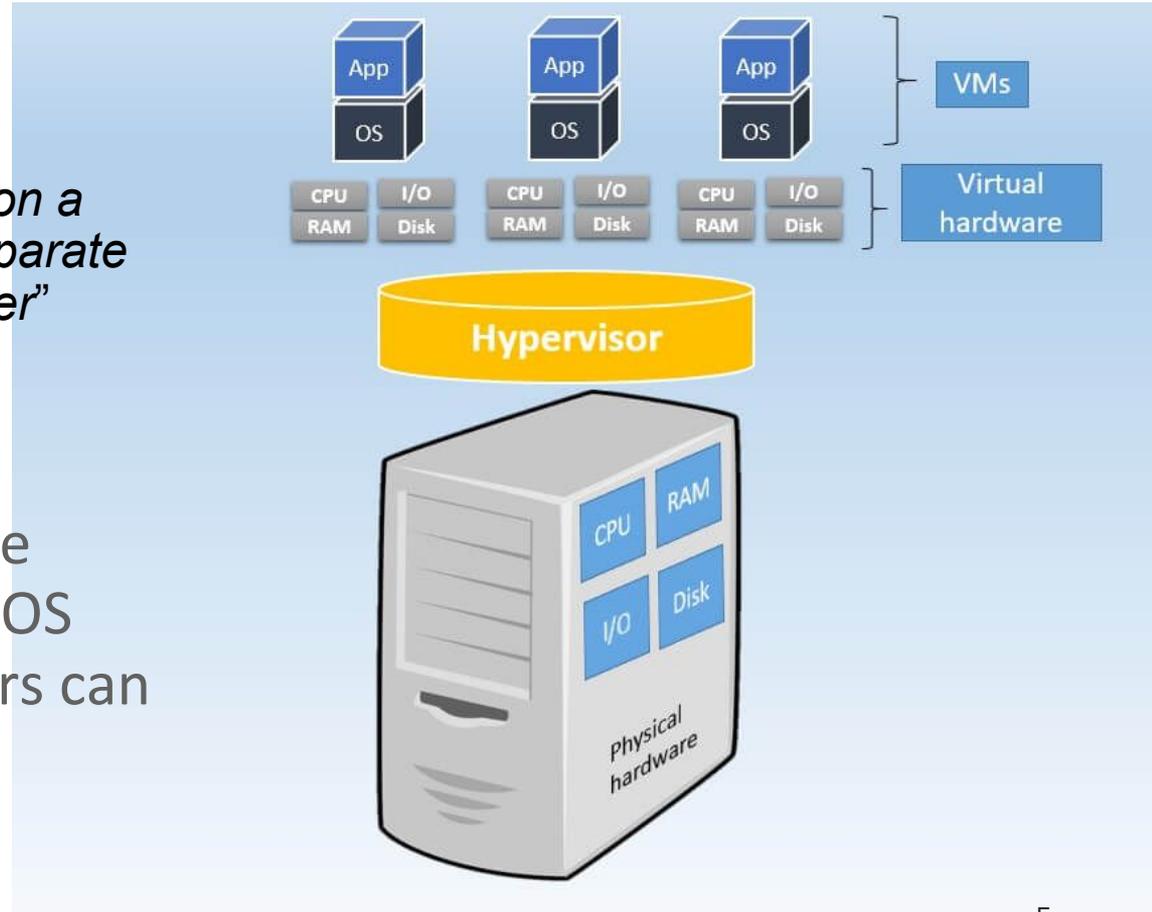
- Computing environments for research
- Storage solutions
- Visualisation and analytics services
- Training and community development

<http://eresearch.auckland.ac.nz>

# Virtualisation

*“A **virtual machine** is a program on a computer that works like it is a separate computer inside the main computer”*  
(Wikipedia)

- We can simulate a whole computer including the OS
- Several virtual computers can run on one larger, more powerful computer



# Virtual vs. Real Computer

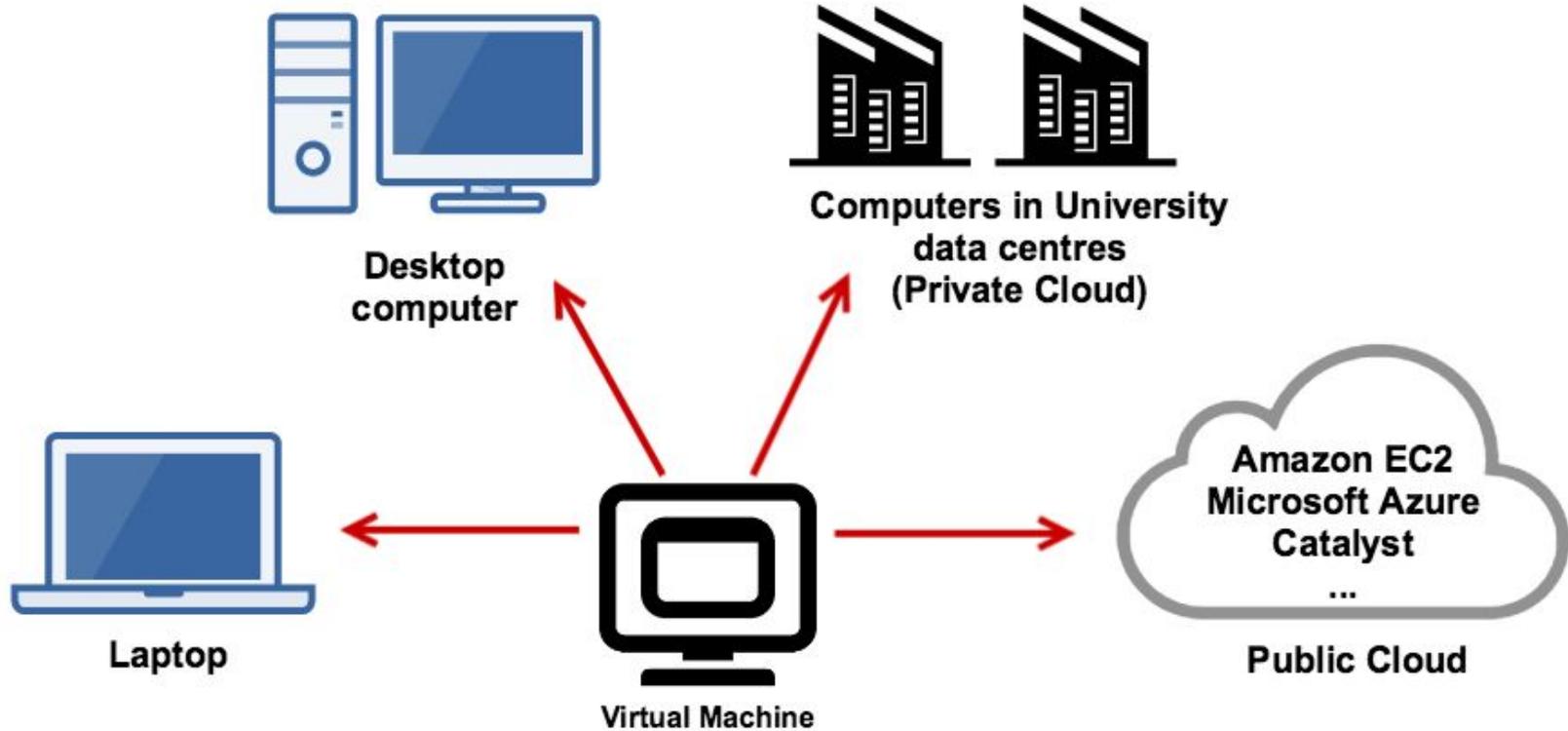
“Real machine”: physical computer

“Virtual machine” (VM): simulated computer

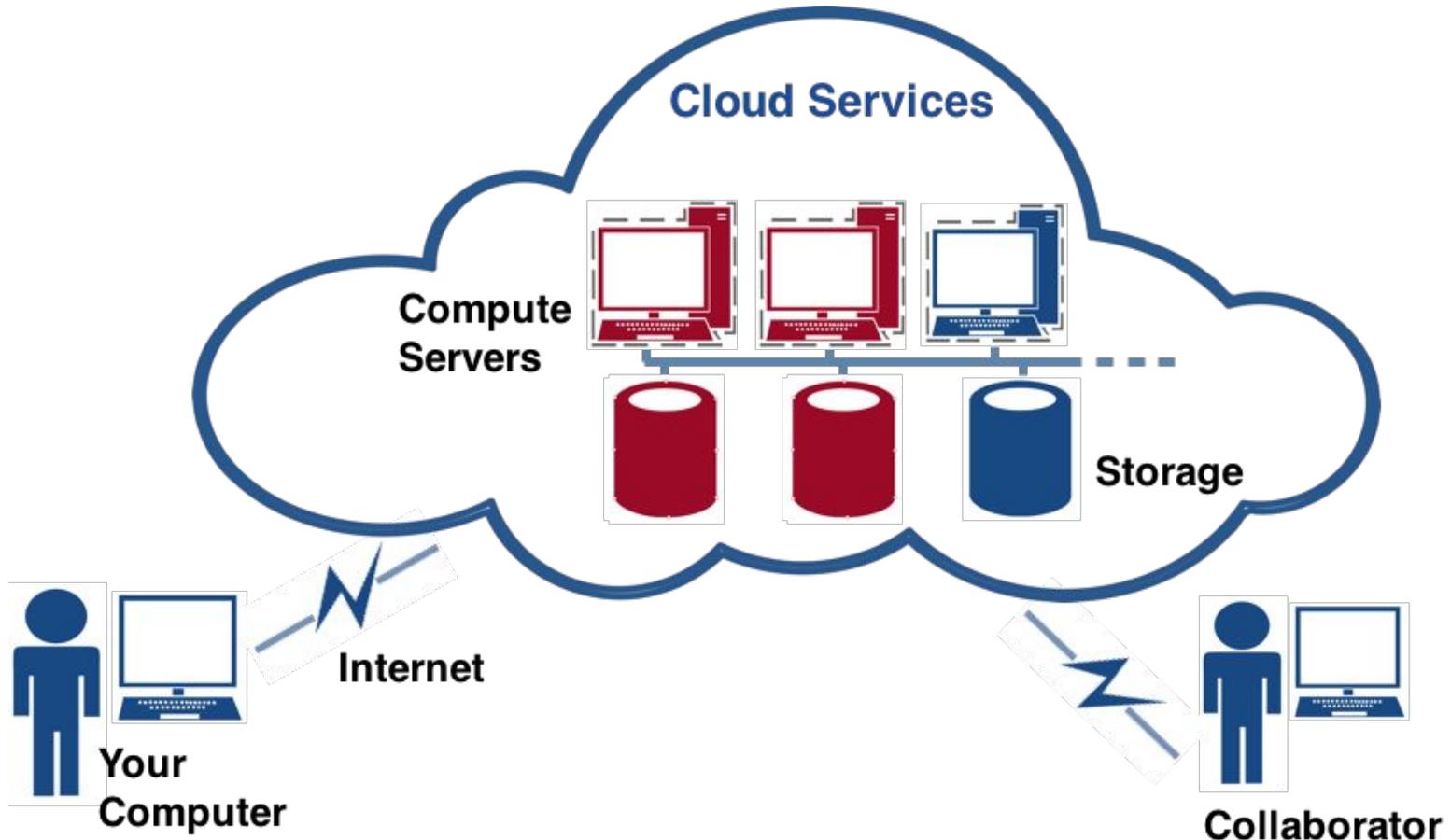
Differences and similarities:

- **Similarities:** Both have an operating system, network access (a real IP address), and hard disk storage.
- **Differences:** No hardware maintenance for VMs. “Snapshots” of VMs useful for backup and restore purposes.

# Where do virtual machines run?



# Connecting to a virtual machine



# What can I do with a virtual machine?

- Run software like R, Matlab, Ansys, python, etc
- Access to your data on Uni file shares
- Databases
- Host websites
- Develop software



# When is a virtual machine useful

- Offload computational tasks from desktop computer
- Simulations run for days
- Laptop/desktop computer isn't good enough (CPU, RAM, storage)
- Use your own dedicated work environment
- Effective collaboration, e.g. shared development workspaces
- Reproducible research

# When to use a VM over other compute resources?

## PROS

- Flexibility (sizing of CPU, RAM, disk)
- Easy to request and set up
- Less maintenance
- Cost saving through shared hardware
- Collaboration

## CONS

- Licensing (may be different)
- Heavy Graphics - need GPUs
- Runs virtually (speed)
- Shared hardware

# How do I request a virtual machine for research?



Talk to us - it's free \*

**HackyHour** (Every Thursday, 3pm, Cafe Strata)

<https://research-hub.auckland.ac.nz/#/content/1>

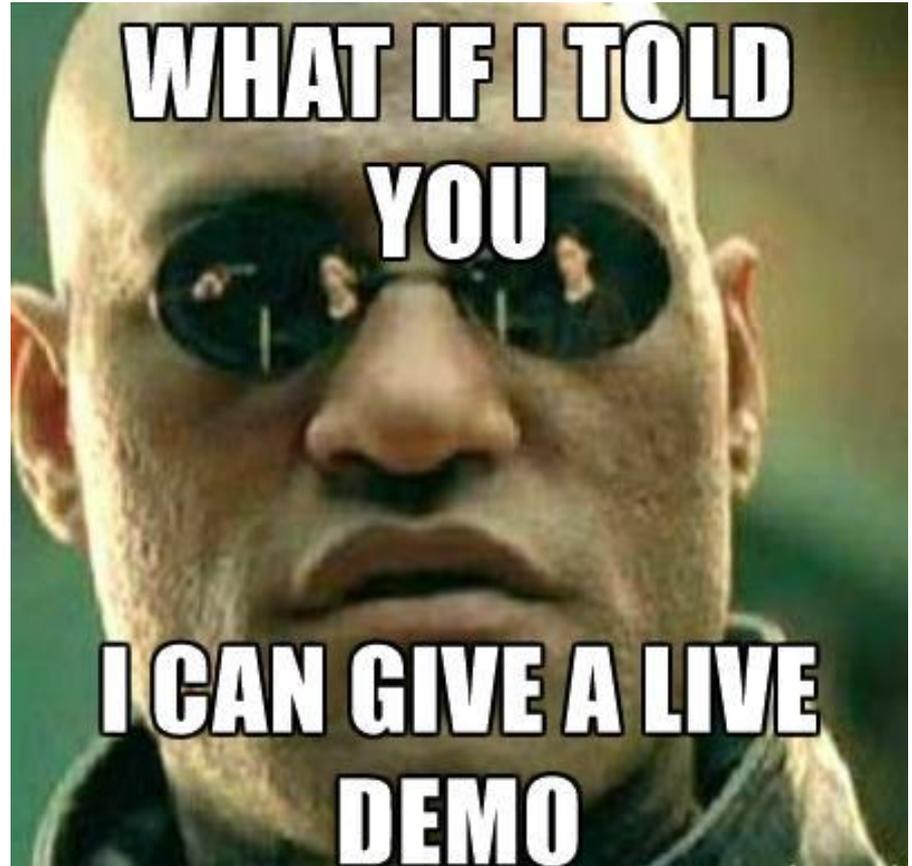
(\*) in almost all cases

Annual Survey

OS  
CPU  
Research-Goals  
Disk-Space  
Backups  
Software  
Data-Sensitivity  
Who  
Memory  
Availability

**A few days later...**

*Ok, you  
got me a  
VM...  
how do I  
use it?*



# Alternatives

- Nectar
- Amazon EC2, Microsoft Azure (but currently you need to spend \$\$)
- High Performance Computing Cluster (HPC => NeSI)

~~Questions?~~

Let's do that at the end...