



# NeSI Visualisation Cluster at BlueFern

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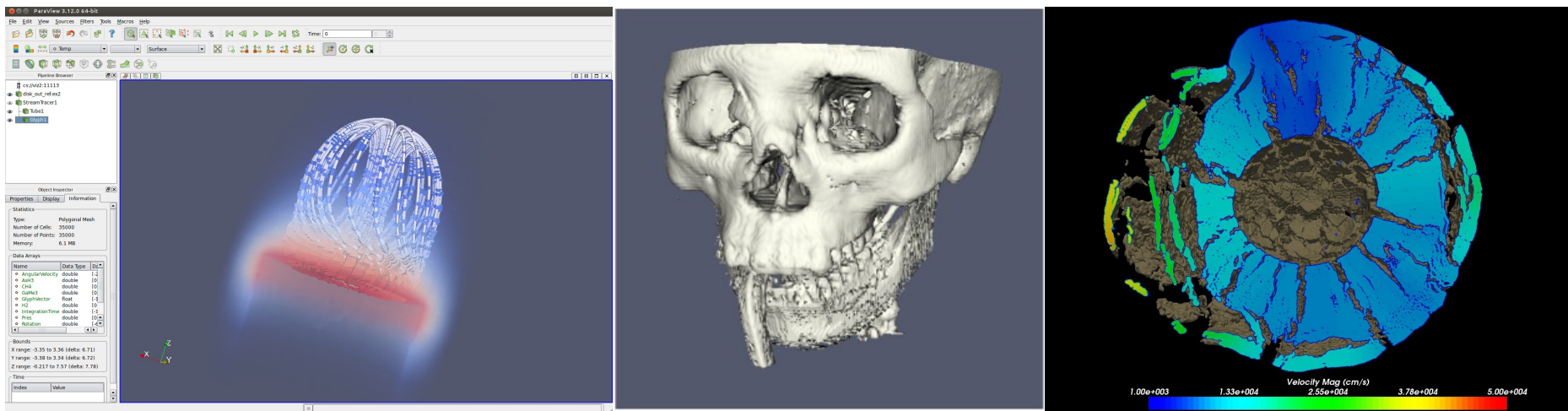


Landcare Research  
Manaaki Whenua



# What is Scientific Visualisation?

- Provide insight into scientific data



Images: ParView tutorial

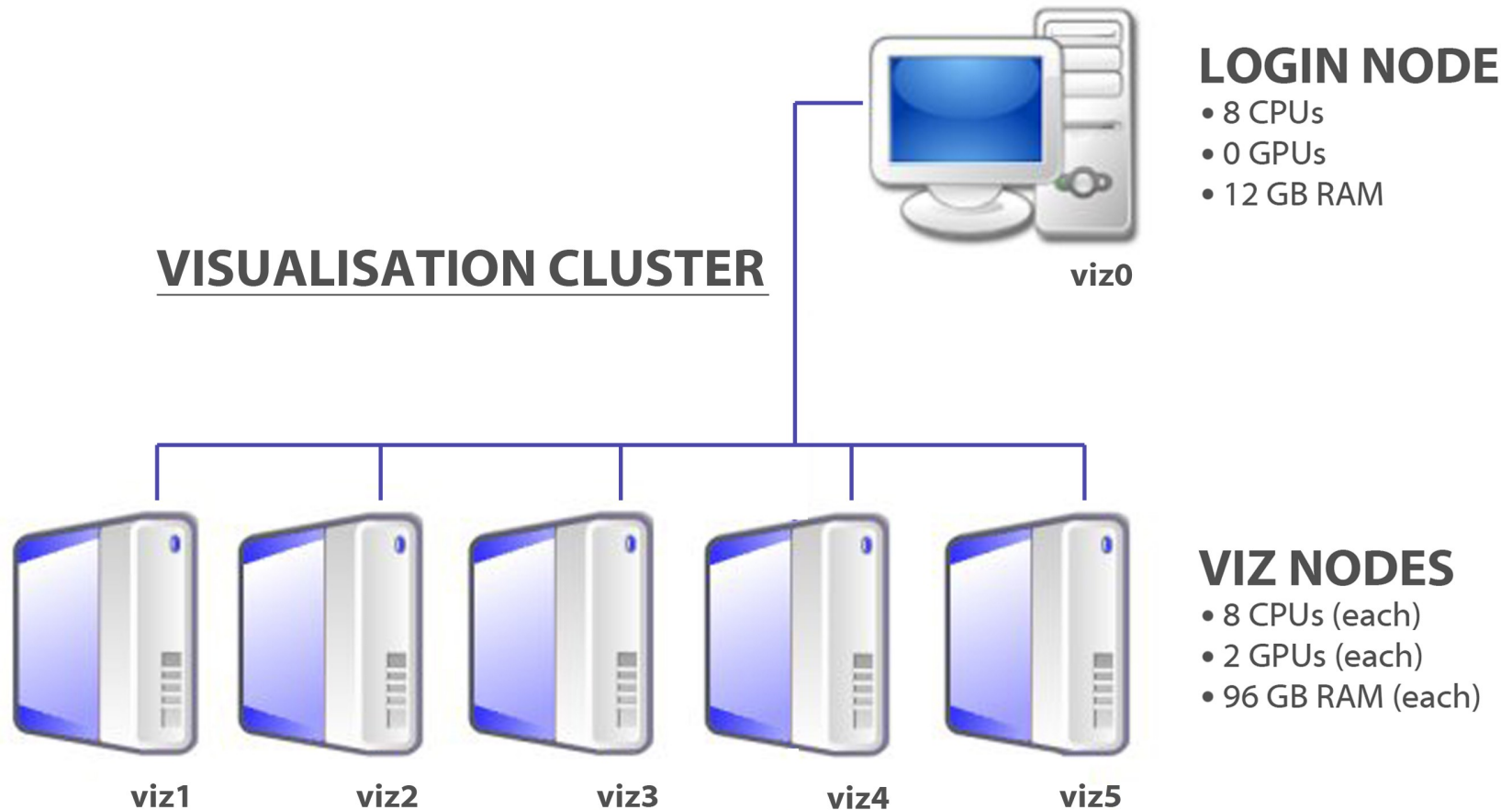
<https://github.com/kmorel/ParaViewTutorial/tree/master/images>

# Visualisation cluster

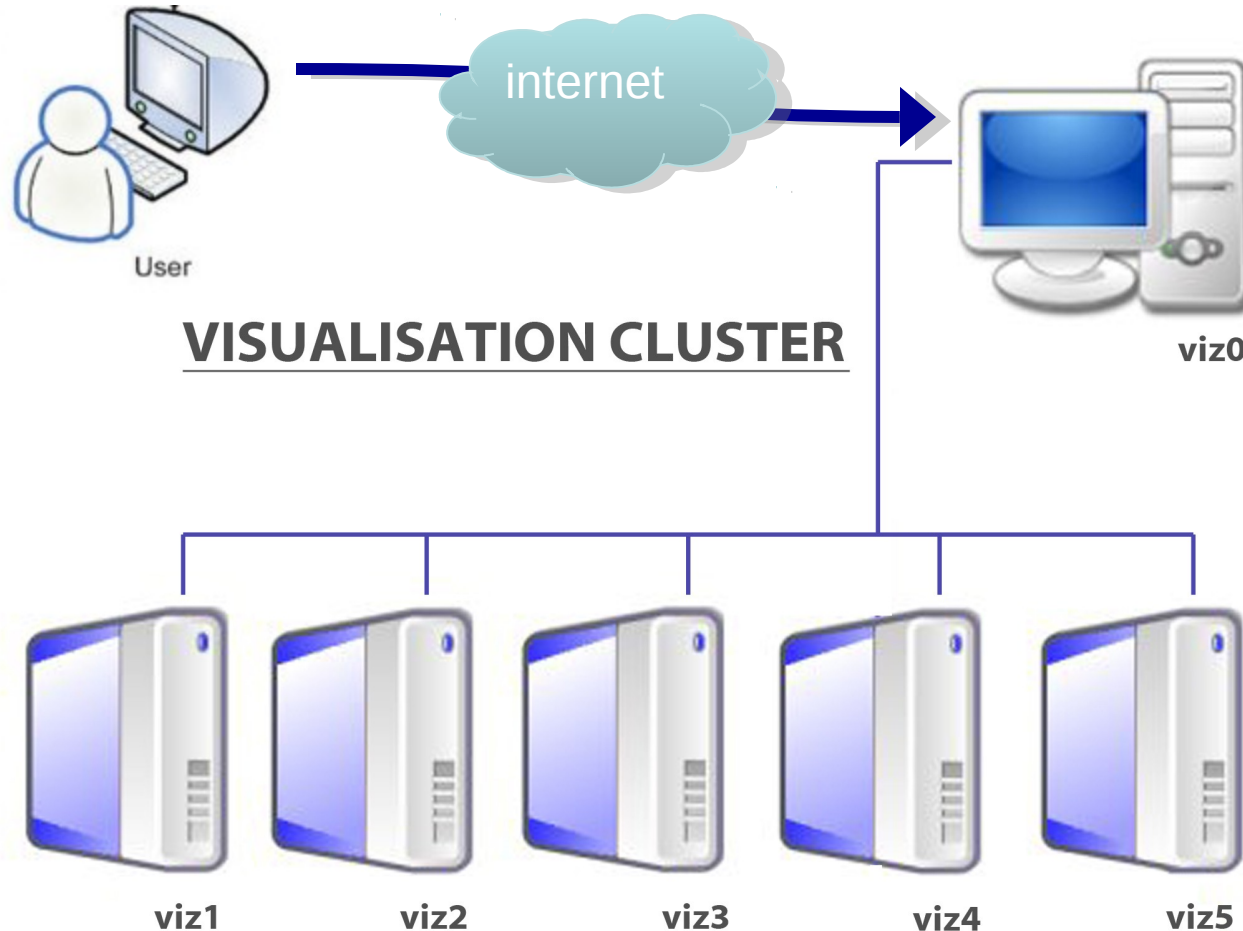
- HPC resource providing:
  - advanced visualisation and rendering capabilities
  - interactive pre/post-processing of very large data sets
- All from your desktop!
- No special graphics hardware on your workstation required
- Client-Server architecture:
  - rendering performed on cluster (server)
  - image sent to user workstation over the network (client)



# Visualisation cluster



# Visualisation cluster



## LOGIN NODE

- 8 CPUs
- 0 GPUs
- 12 GB RAM

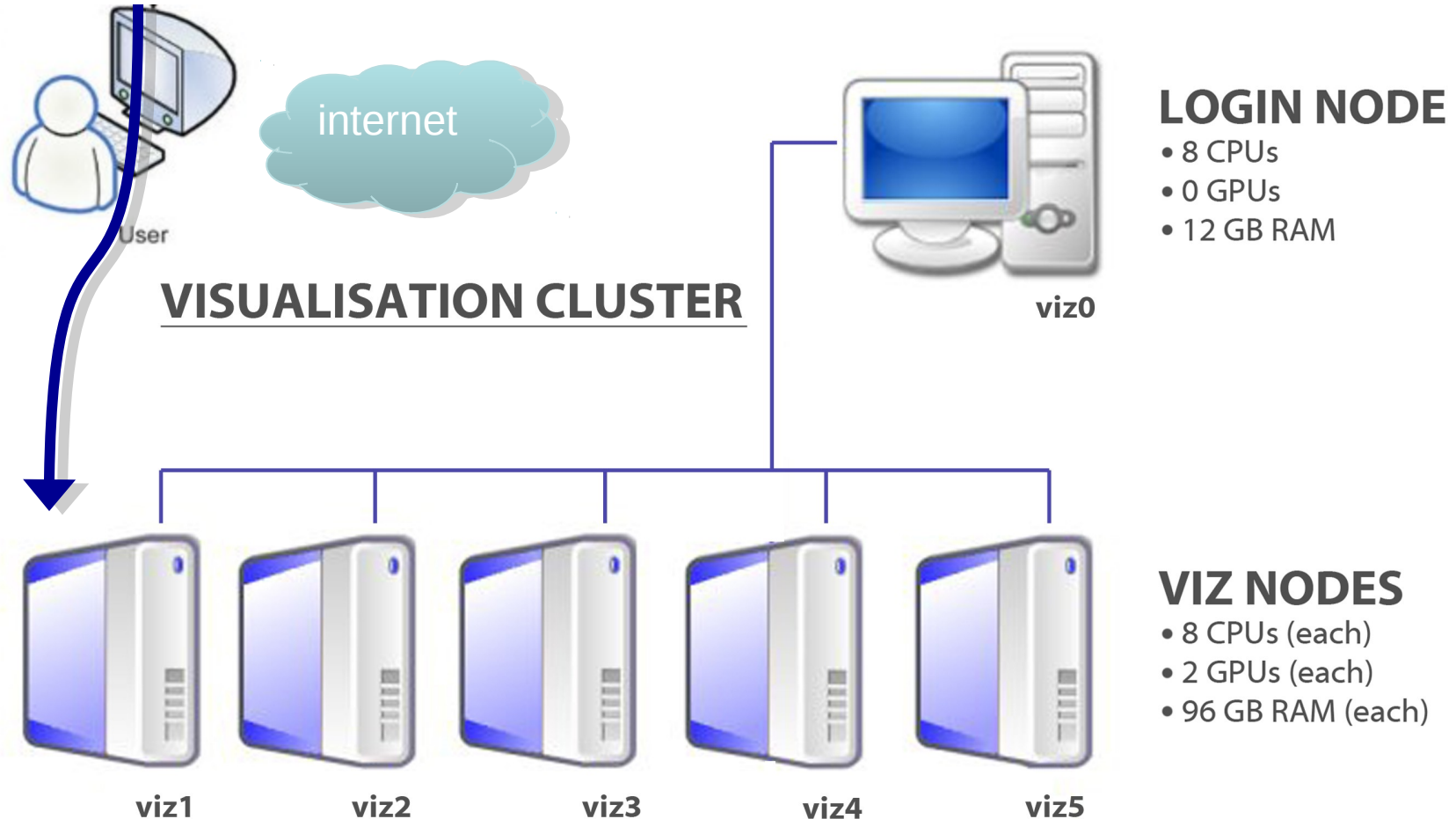
## VIZ NODES

- 8 CPUs (each)
- 2 GPUs (each)
- 96 GB RAM (each)

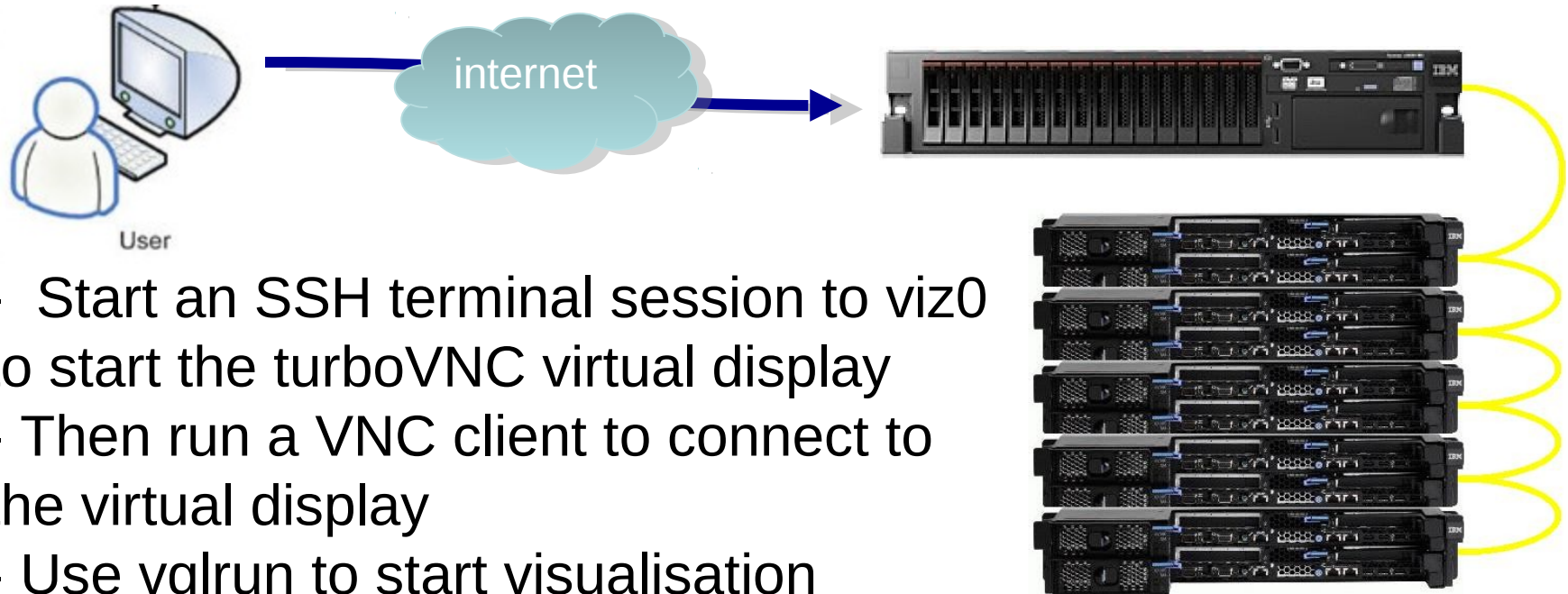




# Visualisation cluster



# Using The Visualisation cluster



- Start an SSH terminal session to viz0 to start the turboVNC virtual display
- Then run a VNC client to connect to the virtual display
- Use vglrun to start visualisation programmes
- All big data and heavy lifting is done on the cluster – only a video stream goes to the user desktop.

# Visualisation software on the Cluster

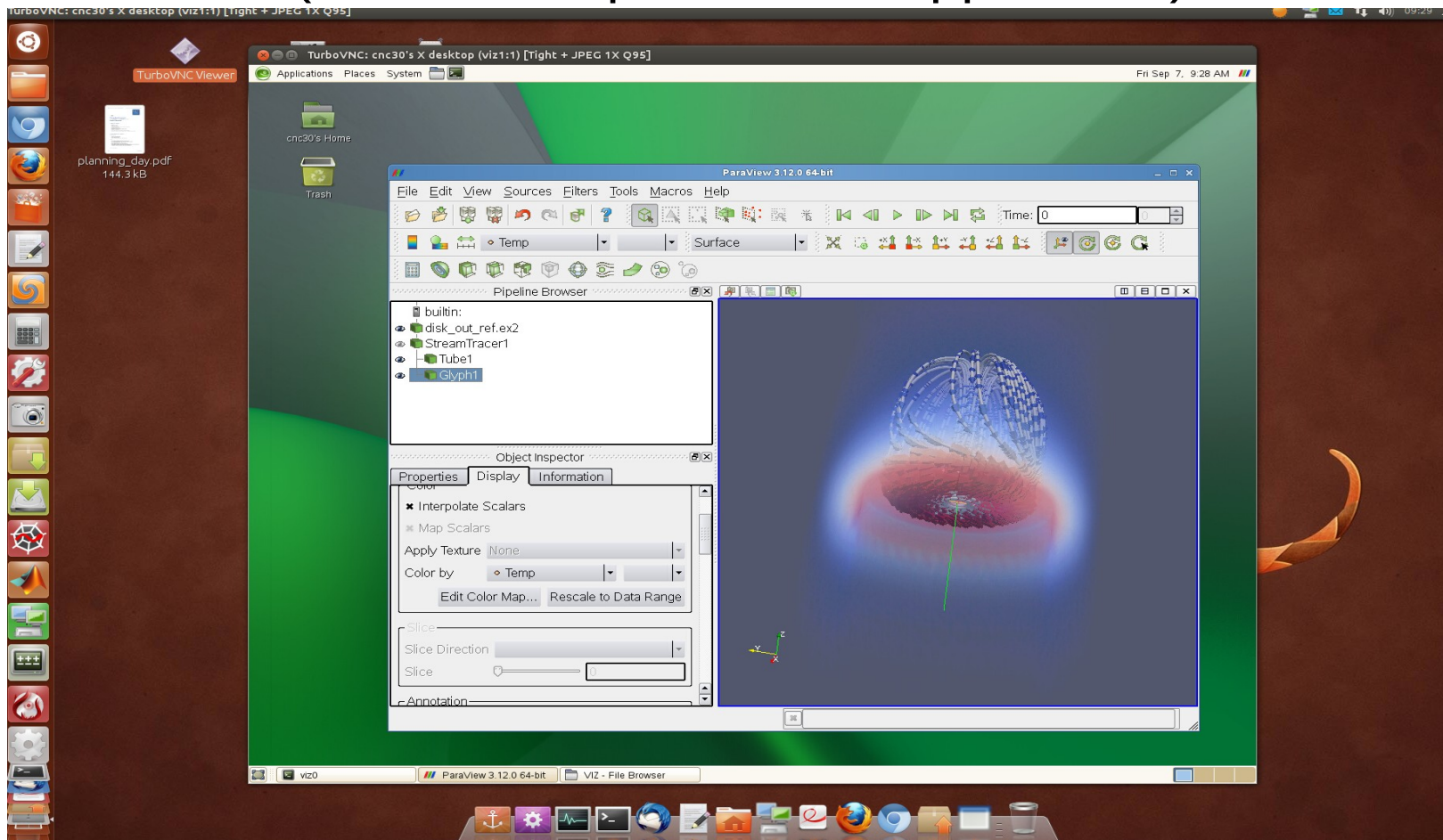
- TurboVNC  
Images sent back to the your desktop over the network using a lightweight visualisation client
- ParaView
- ViSit
- Ensight
- Fluent
- Smokeview
- Installations upon request





# Live Demo: Remote visualisation session

- TurboVNC (as an example of VNC application)



# Remote visualisation session

- Remote session with TurboVNC

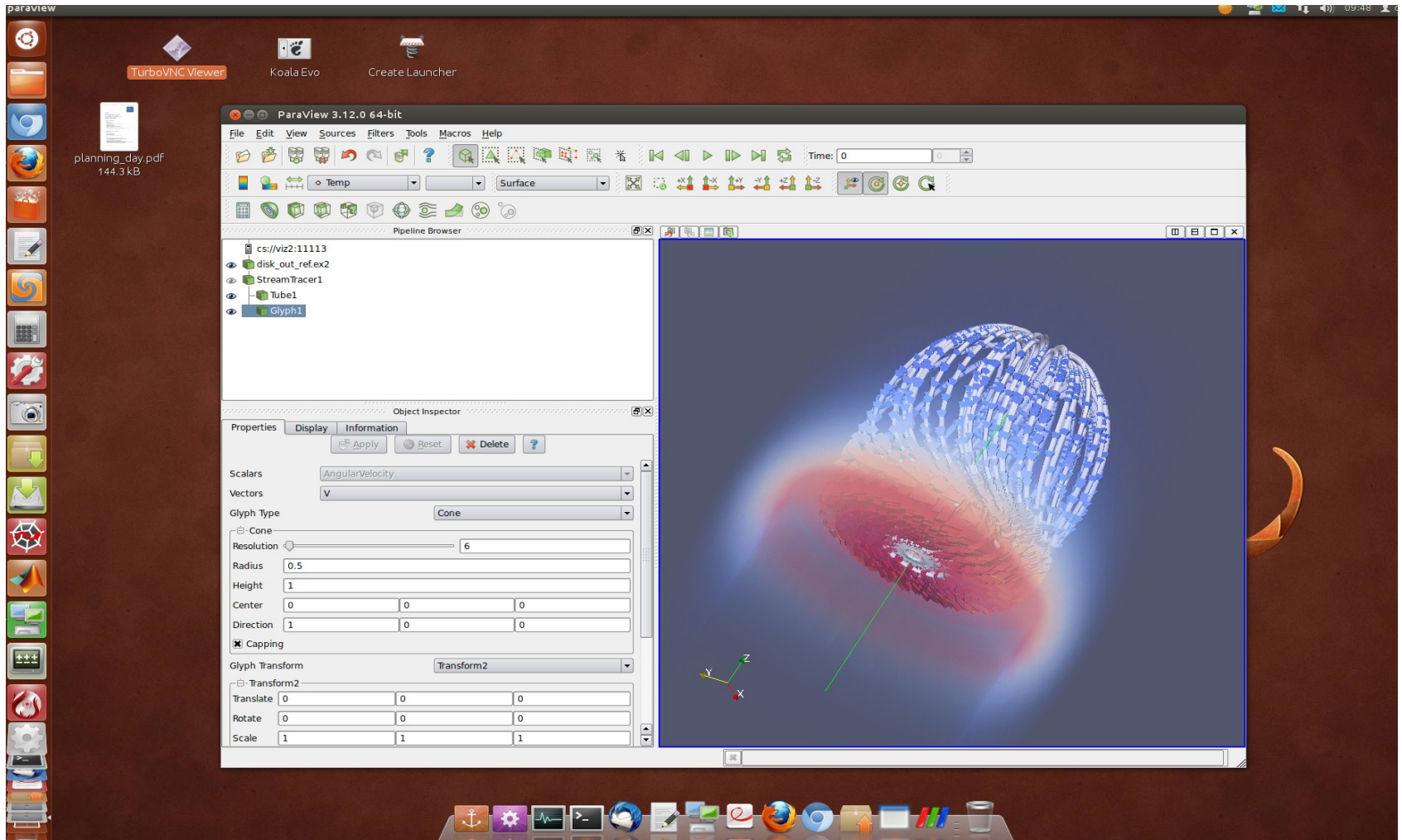
More info: <http://wiki.canterbury.ac.nz/display/BlueFern>

## Summary:

- Login to viz0: `ssh username@viz0.canterbury.ac.nz`
- Request resources: `viz-tvnc -N`
- Open TurboVNC and connect to your allocated node
- Start Paraview: `vglrun paraview`
- Or Ensignt, Fluent, ViSit: `vglrun ensight100/fluent/visit`



# Live Demo: ParaView Client/Server



# ParaView Client/Server configuration

- ParaView Client/Server on Visualisation cluster  
More info: <http://wiki.canterbury.ac.nz/display/BlueFern>

## Summary:

- Login to viz0: `ssh username@viz0.canterbury.ac.nz`
- Request resources: `viz-paraview -r 2 -x`
- Connect ParaView Client to the Server on your allocated node



# For more information

Visualisation Cluster:

<http://wiki.canterbury.ac.nz/display/BlueFern>

**Getting on to the NeSI systems is easy**

Talk to a NeSI partner: Auckland, NIWA or BlueFern®

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

<http://www.niwa.co.nz/our-services/hpcf>

<http://www.bluefern.canterbury.ac.nz/>





# Extra Slides



# Firewall configurations

If your organization has a firewall blocking outgoing connections, ask your system administrator to:

- open ssh port 22  
for access to the login node
- open TCP port range 5901-5910  
for remote visualisation session with VNC
- open TCP port range 11111-11120  
for ParaView Client/Server:



# What is VirtualGL?

- With VirtualGL, the OpenGL commands and 3D data are instead redirected to a 3D graphics accelerator on the application server, and only the rendered 3D images are sent to the client machine.
- VirtualGL eliminates the workstation and the network as barriers to data size. Users can now visualize huge amounts of data in real time without needing to copy any of the data over the network or sit in front of the machine that is rendering the data.
- VirtualGL forces the OpenGL commands to be delivered to a server-side graphics card rather than a client-side graphics card.

