



# PARAVIEW USER GUIDE FOR CHPC

Version 1.0

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## 1. Generate ssh keys for passwordless authentication on the cluster using Mac/Linux

- 1.1 In your computer, type “*cd*” and “*pwd*”. #Your location should be your home directory.
- 1.2 Type “*ls .ssh*”. # You will see *known\_hosts* and *known\_hosts.old* file.
- 1.3 Type the command: “*ssh-keygen*” and press “*Enter*”.
- 1.4 Press “*Enter*” until the system stop prompting for information.
- 1.5 Type “*ls .ssh*”. # You will see the new public and private key files.
- 1.6 Type: “*scp .ssh/id\_ed25519.pub username@lengau.chpc.ac.za:./*” #Copy public key into your home directory on the cluster.
- 1.7 On the cluster, login to the system using your username and password.
- 1.8 Execute this command: “*cat id\_ed25519.pub >> .ssh/authorized\_keys*” #Append public key on the authorised keys.
- 1.9 Issue command: “*rm id\_ed25519.pub*” #Delete public key on the system.
- 1.10 Logout and in again on the cluster. The system will no longer ask for the password.

## 2. Use your normal job submission script

- 2.1 Insert this line in the submission script: *#PBS -l select=2:ncpus=36:mpiprocs=36:ngpus=3 -A {Username}*.
- 2.2 Save your PBSPro submission script here: */mnt/lustre/users/username/paraview*.

## 3. Setup ParaView client

- 3.1 Download ParaView client: <https://www.paraview.org/download/?version=v5.11>.
- 3.2 Install ParaView-5.11.1 client on the Desktop.
- 3.3 Type “*mkdir paraview*” to create paraview directory in the desktop.
- 3.4 Copy “*script.sh*” and “*servers.pvsc*” into the paraview directory.
- 3.5 *cd paraview* #Go to paraview directory.
- 3.6 *cp script.sh /Applications/ParaView-5.11.1.app/Contents/MacOS/* on Mac. This step is specific to MacOS, location will be different on Windows/Linux.
- 3.7 Open ParaView client, click “*File*” and then “*Connect*”.
- 3.8 Click “*Load Servers*” button and select “*servers.pvsc*” file in the paraview directory.
- 3.9 Click “*Ok*” #Lengau cluster configuration is added in your ParaView Profile.
- 3.10 Click “*Connect*” button.
- 3.11 Enter your cluster *username* and full path of your *submission script*.
- 3.12 ParaView will connect to the Lengau cluster within 60 seconds. If the job is not running in 5 seconds, then it will stop and wait for nodes to be available.
- 3.13 Click “*Yes*” on the popup message to reconnect when the job is running.
- 3.14 Click “*File*” -> “*Disconnect*” to stop visualisation and kill the job on the cluster.
- 3.15 Click “*View*” -> “*Memory Inspector*” to see memory usage on the nodes.

## 4. Check remote visualisation & parallel data processing on the GPU/CPU Nodes

- 4.1 Click “*View*” Followed by “*Memory Inspector*”. #To check the job is running on 2 or more nodes.
- 4.2 Click “*Sources*” followed by “*Alphabetical*” then “*Wavelet*”. #Create data for rendering.
- 4.3 Click “*Apply*” on the left of the screen. # To render data.
- 4.4 On the left of the screen, select “*Surface*” in the Representation Dropdown menu.
- 4.5 Select Coloring “*vtkProcessID*”. #An array of data.
- 4.6 Move the box to distribute data on different number of MPI processes.

4.7 On top corner, click “*Paraview*” then “*Preferences*”.

4.8 Click “*Render View*” Tab. #Setup remote rendering to run in parallel.

4.9 *Remote/Parallel Rendering Options “0”*. #Ensure remote rendering on the cluster.

4.10 Activate/Click “*Show annotation*”. # Display configuration information on left of the screen.

4.11 To load your own data, Click “*File*” -> “*Open*”.

**NB: First time users need to perform all Sections 1, 2, 3 and 4. Returning users should simply do the following to start visualisation:**

- Open ParaView
- Click “*File*” -> “*Connect*” -> “*Connect*” -> “*OK*” button.
- Wait for job to start running on the cluster.
- Use ParaView!

PS: To see the content correctly you need to clear the cache. "*Command-Option-R*" should work or click on the "*Reload page*" button.