Using Paraview on Yellowstone

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Outline

• What is Paraview
• Running and Basic Operation
  – Vncserver sessions and vglrun
  – Remote Server access
• Background operation and animations
  – pvbatch
  – Ffmpeg
What is Paraview?

• 3D Visualization and analysis tool
  – Open Source
    • Relies on VTK
  – Multiplatform – Linux, Windows, Mac
    • Developed HPC resources in mind so it can handle massive datasets
    • Can also run it effectively on a laptop
  – Supports Parallel import and rendering operations
  – www.paraview.org
Paraview on Yellowstone I

• First step is to start the vncserver on geyser
  – bsub -Is -q geyser -W 6:00 -n 1 -P project_code $SHELL
  – vncserver -geometry 1600x1200

• Then start your local client
  – vncviewer geyser03.ucar.edu:2

• More detail from
  – http://www2.cisl.ucar.edu/resources/geyser_caldera/visualization
Paraview on Yellowstone II

• First step is to start the vncserver on geyser
  – bsub -Is -q geyser -W 6:00 -n 1 -P project_code $SHELL
  – vncserver -geometry 1600x1200
• Then start your local client
  – vncviewer geyser03.ucar.edu:2
• Load the Paraview module and run the code
  – module load paraview/3.98.1-serial
  – Vglrun paraview
• More detail from
  – http://www2.cis1.ucar.edu/resources/geyser_caldera/visualization

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Yellowstone Workflows
Paraview Interface
Remote Server

- It’s possible to connect to remote server on geyser from a local client
  - I’ve done it on nautilus, but not on geyser

- Basic process
  - Submit a job script that launches a parallel instance of the pvserver
  - On local client File->Connect
    - Need to load configuration file
  - Once your client has connected you may need to manage remote plugins
Batch Operations I

• Save the pipeline as a state file
  – File->Save State

• Create python script via python shell method
  – from paraview import smtrace
  – smtrace.start_trace(CaptureAllProperties=True)
  – load state file
  – smtrace.stop_trace()
  – smtrace.save_trace('scriptname.py')
Batch Operations II

• Revise python script
  – LoadPlugin('/opt/local/paraview/libvtkLFMReader.dylib', ns=gl obals())
  – import glob
  – files=glob.glob('/Users/wiltbemj/mhd_data/WHI-CMIT/*mhd*hdf')
  – RenderView8.ViewSize=[960,720]
  – WriteAnimation('/Users/wiltbemj/Paraview/XYVx.tif', Magnification=1,Quality=2, FrameRate=1.000000)

• Issue batch command
  – vglrun pvpython script.py
Making Movies

• Ffmpeg is very useful for create a variety of movie formats
  – www.ffmpeg.org for more information
  – H264 codec not in standard installation, but can provide high quality small files size mp4 files
  – ffmpeg -f image2 -i "FileName.%04d.tif" -pix_fmt yuv420p test.mp4
DFs in the magnetosphere