HPC at W&M and VIMS is active and in constant development

About 150 total users / 50 active users in the last month

Active Departments: Physics, VIMS/CCRM, Applied Science, Math, Biology, Psychology, Chemistry, Computer Science, ...

Consists of three clusters:

SciClone – at W&M
Storm – at Applied Research Center (Jefferson Lab)
Chesapeake – VIMS

Outline

- Overview of each cluster
- Help / resources available
- Filesystems / Backup
- Linux Permissions
SciClone

Typhoon
- 4 cores / node
- 72 nodes -> 288 cores
- 2 or 6 GB mem / core
- Opteron Santa-Rosa
- DDR Infiniband

Hurricane
- 8 cores / node
- 12 nodes -> 96 cores
- 6 GB mem / core
- Intel Westmere
- QDR Infiniband

Vortex
- 12 cores / node
- 36 nodes -> 432 cores
- 2.7 or 10.7 GB mem / core
- Opteron Seoul
- FDR Infiniband

SciClone has 1232 cores total
- 2 Intel & 2 Opteron clusters
- Typhoon uses SLES 10 – rest RHEL 6.2
- Total usage for May 2015 : 74%
- hurricane cluster has 2xM2075 GPUs (Fermi)
- change all passwords on Hurricane

Other servers for filesystems / backup etc.
- Tornado
- Gale
- Gulfstream
- Twister
Storm

- Storm has 1080 cores total
- All Opteron
- RHEL 6.2
- Total usage for May 2015: 67%
- Has Lustre filesystem

Other servers for filesystems / backup etc.

- gust
- rain: 4 cores / node
  98 nodes -> 392 cores
  2-8 GB mem / core
  Opteron Santa-Rosa
  DDR Infiniband

- show:
  8 cores / node
  15 nodes -> 120 cores
  2 GB mem / core
  Opteron Shanghai
  DDR/QDR Infiniband

- hail:
  8 cores / node
  9 nodes -> 72 cores
  2-8 GB mem / core
  Opteron Shanghai
  QDR Infiniband

- wind:
  16 cores / node
  26 nodes -> 416 cores
  2 GB mem / core
  Opteron Magny-Cours
  QDR Infiniband

- ice01:
  48 cores / 96 GB
  Opteron Magny-Cours
  QDR Infiniband

- ice02:
  32 cores / 64 GB
  Opteron Magny-Cours
  QDR Infiniband
Chesapeake

- 380 cores total
- All Opteron
- RHEL 6.2
- Total usage for May 2015: 32%
- Still need to incorporate Indian nodes

Chesapeake has 380 cores total
- All Opteron
- RHEL 6.2
- Total usage for May 2015: 32%
- Still need to incorporate Indian nodes

Chesapeake

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Potomac

- 12 cores / node
- 30 nodes -> 360 cores
- 2.7 GB mem / core
- Opteron Seoul
- QDR Infiniband

Other servers for filesystems / backup etc.

- Rappahannock
- York
- Chickahominy

hpc gateway to all clusters: hpc.wm.edu
Help @ HPC

Can submit a ticket via web or email
Used extensively by HPC group
http://hpc.wm.edu/support
e-mail: help@hpc.wm.edu
FACT: Software is requested and installed more quickly than documentation can be written. Submit a ticket for any software requests. Please make sure you need the software.
Jobprobe shows states of jobs on all three clusters
Nodeprobe show states of nodes on all three clusters
Needs java and must be run within hpc.wm.edu, hpc.vims.edu, or sciclone.wm.edu
HPC Filesystems / Backup

146 [hurricane] df -h

<table>
<thead>
<tr>
<th>Filesystem</th>
<th>Size</th>
<th>Used</th>
<th>Avail</th>
<th>Use%</th>
<th>Mounted on</th>
</tr>
</thead>
<tbody>
<tr>
<td>/dev/mapper/VolGroup00-LogVol00</td>
<td>7.9G</td>
<td>4.8G</td>
<td>2.8G</td>
<td>64%</td>
<td>/</td>
</tr>
<tr>
<td>tmpfs</td>
<td>7.8G</td>
<td>76K</td>
<td>7.8G</td>
<td>1%</td>
<td>/dev/shm</td>
</tr>
<tr>
<td>/dev/sda1</td>
<td>485M</td>
<td>76M</td>
<td>384M</td>
<td>17%</td>
<td>/boot</td>
</tr>
<tr>
<td>/dev/mapper/VolGroup00-LogVol03</td>
<td>7.9G</td>
<td>147M</td>
<td>7.4G</td>
<td>2%</td>
<td>/tmp</td>
</tr>
<tr>
<td>/dev/mapper/VolGroup00-LogVol02</td>
<td>14G</td>
<td>5.5G</td>
<td>7.7G</td>
<td>42%</td>
<td>/usr</td>
</tr>
<tr>
<td>/dev/mapper/VolGroup00-LogVol04</td>
<td>7.9G</td>
<td>1.7G</td>
<td>5.9G</td>
<td>23%</td>
<td>/var</td>
</tr>
<tr>
<td>/dev/mapper/VolGroup00-LogVol06</td>
<td>413G</td>
<td>7.0G</td>
<td>385G</td>
<td>2%</td>
<td>/var/sciclorun/scr01</td>
</tr>
<tr>
<td>/dev/mapper/VolGroup30-LogVol31</td>
<td>917G</td>
<td>482G</td>
<td>390G</td>
<td>56%</td>
<td>/sciclone/home00</td>
</tr>
<tr>
<td>tn00:/usr/local</td>
<td>134G</td>
<td>113G</td>
<td>15G</td>
<td>89%</td>
<td>/usr/local</td>
</tr>
<tr>
<td>tn00:/export</td>
<td>46G</td>
<td>15G</td>
<td>30G</td>
<td>33%</td>
<td>/import</td>
</tr>
<tr>
<td>mh00:/var/spool/mail</td>
<td>7.9G</td>
<td>4.3G</td>
<td>3.3G</td>
<td>57%</td>
<td>/var/spool/mail</td>
</tr>
<tr>
<td>gfs00:/sciclone/home04</td>
<td>591G</td>
<td>429G</td>
<td>157G</td>
<td>74%</td>
<td>/sciclone/home04</td>
</tr>
<tr>
<td>ty00:/sciclone/scr02</td>
<td>273G</td>
<td>81M</td>
<td>273G</td>
<td>1%</td>
<td>/sciclone/scr02</td>
</tr>
<tr>
<td>tn00:/sciclo/home10</td>
<td>7.9G</td>
<td>2.3G</td>
<td>5.3G</td>
<td>31%</td>
<td>/sciclone/scr10</td>
</tr>
<tr>
<td>tn00:/sciclone/scr30</td>
<td>17T</td>
<td>13T</td>
<td>4.7T</td>
<td>72%</td>
<td>/sciclone/scr30</td>
</tr>
<tr>
<td>gfs00:/sciclone/data10</td>
<td>16T</td>
<td>15T</td>
<td>1.9T</td>
<td>89%</td>
<td>/sciclone/data10</td>
</tr>
<tr>
<td>gfs00:/sciclone/vims20</td>
<td>26T</td>
<td>19T</td>
<td>6.7T</td>
<td>74%</td>
<td>/sciclone/vims20</td>
</tr>
<tr>
<td>tw00-i8:/sciclone/data20</td>
<td>73T</td>
<td>57T</td>
<td>16T</td>
<td>79%</td>
<td>/sciclone/data20</td>
</tr>
<tr>
<td>/dev/md1</td>
<td>8.1T</td>
<td>5.0T</td>
<td>2.8T</td>
<td>65%</td>
<td>/sciclone/scr20</td>
</tr>
<tr>
<td>vx00:/sciclone/home10</td>
<td>2.7T</td>
<td>202M</td>
<td>2.6T</td>
<td>1%</td>
<td>/sciclone/home10</td>
</tr>
<tr>
<td>vx00:/sciclone/scr00</td>
<td>318G</td>
<td>4.8G</td>
<td>297G</td>
<td>2%</td>
<td>/sciclone/scr00</td>
</tr>
</tbody>
</table>

*home* – nightly backup

*data* – weekly backup

*scr* – not backed up
Sharing Files & Folders: Permissions

see
https://www.nersc.gov/users/storage-and-file-systems/unix-file-permissions
for more information

33 [hurricane] pwd
/sciclone/home04/ewalter

34 [hurricane] ls -ld results

35 [hurricane] ls -l results

**directories need to be ‘x’ to be entered/passed through**
Sharing Files & Folders : Permissions II

I want to share my results directory and files with those in the seadas group:

Am I in the seadas group?:

46 [hurricane] groups ewalter
ewalter : hpcf wmall hpcstaff www seadas vasp wm sysadmin hpcadmin hpsmh

Change the group for the directory and all files below:

47 [hurricane] chgrp -R seadas results/

49 [hurricane] ls -ld results/
drwx------ 2 ewalter seadas 512 Jun 16 14:37 results/

50 [hurricane] ls -l results/
total 3
-rw------- 1 ewalter seadas 194 Jun 16 14:37 ww.dat
-rw------- 1 ewalter seadas 194 Jun 16 14:37 yy.dat
-rw------- 1 ewalter seadas 194 Jun 16 14:37 zz.dat

51 [hurricane] chmod g+rX -R results/

Make:
files group readable
folders group readable and executable

52 [hurricane] ls -ld results/
drwxr-x--- 2 ewalter seadas 512 Jun 16 14:37 results/
53 [hurricane] ls -l results/
total 3
-rw-r----- 1 ewalter seadas 194 Jun 16 14:37 ww.dat
-rw-r----- 1 ewalter seadas 194 Jun 16 14:37 yy.dat
-rw-r----- 1 ewalter seadas 194 Jun 16 14:37 zz.dat
What happens when a new file is created?

78 [hurricane] cd results/

80 [hurricane] touch newfile
81 [hurricane] ls -l
    total 3
     -rw-------- 1 ewalter  hpcf       0 Jun 16 15:13  newfile
     -rw-r----- 1 ewalter  seadas 194 Jun 16 14:37  ww.dat
     -rw-r----- 1 ewalter  seadas 194 Jun 16 14:37  yy.dat
     -rw-r----- 1 ewalter  seadas 194 Jun 16 14:37  zz.dat

This is bad since the new file isn’t in the seadas group!

88 [hurricane] chmod g+s results/     add “setgid” to folder only
89 [hurricane] cd results/

91 [hurricane] touch newfile
92 [hurricane] ls -l
    total 3
     -rw-------- 1 ewalter  seadas       0 Jun 16 15:14  newfile
     -rw-r----- 1 ewalter  seadas 194 Jun 16 14:37  ww.dat
     -rw-r----- 1 ewalter  seadas 194 Jun 16 14:37  yy.dat
     -rw-r----- 1 ewalter  seadas 194 Jun 16 14:37  zz.dat

file group inherits the group from the folder it is in
Sharing Files & Folders: Permissions IV

The user’s umask controls what permissions files and folders are given when created:

93 [hurricane] umask 77

135 [hurricane] touch file077
136 [hurricane] ls -l file077
-rw-------- 1 ewalter seadas 0 Jun 16 15:24 file077

137 [hurricane] umask 022
138 [hurricane] touch file022
139 [hurricane] ls -l file0*
-rw-r--r-- 1 ewalter seadas 0 Jun 16 15:24 file022
-rw-------- 1 ewalter seadas 0 Jun 16 15:24 file077

140 [hurricane] umask 027
141 [hurricane] touch file027
142 [hurricane] ls -l file0*
-rw-r--r-- 1 ewalter seadas 0 Jun 16 15:24 file022
-rw-r----- 1 ewalter seadas 0 Jun 16 15:24 file027
-rw-------- 1 ewalter seadas 0 Jun 16 15:24 file077

HPC default umask is 077
Can be changed in your startup file (.cshrc etc.)
QUESTIONS?