NERSC Data Management

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Overview

• **File System Review, Data Sharing, Data Transfer**
  – David Turner

• **GlobusOnline Demo**
  – Shreyas Cholia

• **HPSS**
  – Lisa Gerhardt

• **Data Analytics**
  – Yushu Yao
## File Systems Summary

<table>
<thead>
<tr>
<th>File System</th>
<th>Path</th>
<th>Type</th>
<th>Default Quota</th>
<th>Backups</th>
<th>Purge Policy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Global Homes</td>
<td>$HOME</td>
<td>GPFS</td>
<td>40GB/1M inodes</td>
<td>Yes</td>
<td>Not purged</td>
</tr>
<tr>
<td>Global Scratch</td>
<td>$GSCRATCH</td>
<td>GPFS</td>
<td>20TB/2M inodes</td>
<td>No</td>
<td>12 weeks from last access</td>
</tr>
<tr>
<td>Global Project</td>
<td>/project/projectdirs/projectname</td>
<td>GPFS</td>
<td>4TB/4M inodes</td>
<td>Yes, if quota less than 5TB</td>
<td>Not purged</td>
</tr>
<tr>
<td>Hopper Scratch</td>
<td>$SCRATCH and $SCRATCH2</td>
<td>Lustre</td>
<td>5TB/5M inodes (combined)</td>
<td>No</td>
<td>12 weeks from last access</td>
</tr>
<tr>
<td>Edison Scratch</td>
<td>$SCRATCH1, $SCRATCH2, and $SCRATCH3</td>
<td>Lustre</td>
<td>10TB/5M inodes (none in $SCRATCH3)</td>
<td>No</td>
<td>12 weeks from last access</td>
</tr>
</tbody>
</table>
File System Notes

- Do not run batch jobs out of $HOME!
  - Use $SCRATCH/$SCRATCH1/$SCRATCH2/$SCRATCH3, $GSCRATCH, or project directory

- Global scratch currently being replaced

<table>
<thead>
<tr>
<th></th>
<th>Old</th>
<th>New</th>
</tr>
</thead>
<tbody>
<tr>
<td>Capacity</td>
<td>1.1PB</td>
<td>3.6PB</td>
</tr>
<tr>
<td>Peak aggregate BW</td>
<td>15GB/s</td>
<td>80GB/s</td>
</tr>
</tbody>
</table>

- Do not use “touch” to keep files from being purged
- Use HPSS to archive important data
Data Sharing

• Ensure security
  – Do not share passwords
  – Do not share files from $HOME

• Project directories designed for sharing; can also use scratch directories

• Use Unix *group* permissions
  – Request creation of Unix group
  – Set permissions with chgrp/chmod
    • Use setgid bit

• Details on NERSC website
Data Sharing Example

% mkdir foo
% ls -ld foo
```
drwxrwxr-x 2 dpturner dpturner 4096 Sep 10 08:53 foo
```
% chgrp usgc foo
% ls -ld foo
```
drwxrwxr-x 2 dpturner usgc 4096 Sep 10 08:53 foo
```
% chmod u=rwx,g=rxs,o= foo
% ls -ld foo
```
drwxr-s--- 2 dpturner usgc 4096 Sep 10 08:53 foo
```
• New, but based on *old* LLNL and LANL commands
• Appropriate for smaller files

```
joe% give -u bob coolfile
  - File copied *to* spool location
  - Bob gets email telling him Joe has given him a file

bob% take -u joe coolfile
  - File copied *from* spool location
```

• *Spooled files count against giver’s* GSCRATCH quota
Data Transfer

- Mostly global file systems
  - Reduce need to copy files
  - Use local cp instead of remote scp

- Use scp for small-to-medium files over short-to-medium distance
  - Even better if HPN versions installed

```bash
% ssh -v
OpenSSH_5.1p1NMOD_2.9-hpn13v5, OpenSSL 0.9.8e-fips-rhel5 01 Jul 2008
```

- Use bbcp for larger files and/or longer distances
  - Many tuning options
  - Complicated command line
GlobusOnline

- Do-it-all web-based file transfer service
- High-performance
  - Parallel data channels
- Fire and forget model
- Uses gridftp
- Provides a command-line interface for scripting