Connection Info

Topic: NUG Web Conference
Date and Time:
Thursday, Dec. 12, 2013 11:00 am, Pacific Standard Time
Event number: 660 480 294
Event password: edison
https://nersc-training.webex.com/

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Teleconference information
------------------------------------------------------------------
1-866-740-1260
PIN: 4866820
Topics

• Edison update
• Review of upgrades during Dec. 11 maintenance
• 2014 allocation awards summary
• Best practices: Use of $HOME directories
• Recent issues with data transfers to HPSS
• Annual user survey is underway
• NERSC Achievement Awards nominations requested
• NERSC Holiday schedule
• Additional items and Q&A
• Edison continues to deliver productive hours
  – 347 million hours in 2013 (695 million Hopper equivalent)
  – All Edison time augments AY 2013 allocations

• Still undergoing system evaluation and testing
  – Higher than desired node failure rate
  – Affects at most a few jobs per day

• Goal
  – Most stable, productive system possible for AY 2014
Review of Dec. 11 Maintenance

Elizabeth Bautista
NERSC Operations Technology Group Lead
2014 Allocations Summary

Francesca Verdier
NERSC Allocations Manager
<table>
<thead>
<tr>
<th>Allocation Type</th>
<th>% of DOE Allocation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>“DOE Production”</td>
<td>80% 2.4 B</td>
<td>Allocated by DOE Program managers in the six offices of science. Applicants need to be DOE funded or show their work fits in the DOE mission.</td>
</tr>
<tr>
<td>ALCC</td>
<td>10% 300 M</td>
<td>ASCR Leadership Computing Challenge – a DOE program run by ASCR to promote areas of interest to DOE.</td>
</tr>
<tr>
<td>Director’s Reserve, NISE</td>
<td>10% 300 M</td>
<td>In 2014 NERSC will use 100 M to be competed via the NERSC Initiative for Scientific Exploration program. The rest will be director discretionary.</td>
</tr>
<tr>
<td>Education, Startup</td>
<td>N/A</td>
<td>Small awards made by NERSC from “overhead time”.</td>
</tr>
<tr>
<td>Data Pilot, Dedicated</td>
<td>N/A</td>
<td>For hardware purchased with other funds.</td>
</tr>
</tbody>
</table>
## MPP Allocations 2007 – 2012 (millions of XT4-based hours)

<table>
<thead>
<tr>
<th></th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
</tr>
</thead>
<tbody>
<tr>
<td>DOE Production</td>
<td>73.1</td>
<td>160.5</td>
<td>224</td>
<td>922</td>
<td>880</td>
<td>1,000</td>
<td>2,400</td>
</tr>
<tr>
<td>INCITE</td>
<td>10.4</td>
<td>20</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>DOE reserve /</td>
<td>10.4</td>
<td>20</td>
<td>28</td>
<td>88.5</td>
<td>110</td>
<td>125</td>
<td>300</td>
</tr>
<tr>
<td>ALCC</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NERSC reserve /</td>
<td>10.4</td>
<td>20</td>
<td>28</td>
<td>88.5</td>
<td>110</td>
<td>125</td>
<td>300</td>
</tr>
<tr>
<td>NISE</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Totals</td>
<td>104.4</td>
<td>220.5</td>
<td>280</td>
<td>1,099</td>
<td>1,100</td>
<td>1,250</td>
<td>3,000</td>
</tr>
</tbody>
</table>

![Bar chart showing DOE Production and Total allocations from 2008 to 2014](chart.png)
## 2014 MPP Requests (M hours)

<table>
<thead>
<tr>
<th>Office</th>
<th>Requested</th>
<th>Num</th>
<th>Office Allocation</th>
<th>Req/Alloc</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASCR</td>
<td>121.3</td>
<td>62</td>
<td>122</td>
<td>1.0</td>
</tr>
<tr>
<td>BER</td>
<td>576.2</td>
<td>103</td>
<td>480</td>
<td>1.2</td>
</tr>
<tr>
<td>BES</td>
<td>906.9</td>
<td>272</td>
<td>672</td>
<td>1.3</td>
</tr>
<tr>
<td>FES</td>
<td>419.2</td>
<td>55</td>
<td>403</td>
<td>1.0</td>
</tr>
<tr>
<td>HEP</td>
<td>411.2</td>
<td>57</td>
<td>356</td>
<td>1.2</td>
</tr>
<tr>
<td>NP</td>
<td>318.4</td>
<td>44</td>
<td>274</td>
<td>1.2</td>
</tr>
<tr>
<td>SBIR</td>
<td>5.0</td>
<td>6</td>
<td>33</td>
<td>0.2</td>
</tr>
<tr>
<td><strong>DOE reserve</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Totals</strong></td>
<td><strong>2,713.5</strong></td>
<td><strong>592</strong></td>
<td><strong>2,400</strong></td>
<td><strong>1.1</strong></td>
</tr>
</tbody>
</table>

**Percent of hours requested**

**Percent of projects**
## 2014 MPP Awards

<table>
<thead>
<tr>
<th>Office/Program</th>
<th>Requested (M hours)</th>
<th>Awarded (M hours)</th>
<th>Reserve (M hours)</th>
<th>Req/Award</th>
<th>Num Requests</th>
<th>Num Awards</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASCR</td>
<td>121.3</td>
<td>91.4</td>
<td>30.6</td>
<td>1.3</td>
<td>62</td>
<td>62</td>
</tr>
<tr>
<td>BER biosciences</td>
<td>145.9</td>
<td>56.3</td>
<td>43.8</td>
<td>2.6</td>
<td>38</td>
<td>22</td>
</tr>
<tr>
<td>BER climate</td>
<td>430.3</td>
<td>290.6</td>
<td>89.4</td>
<td>1.5</td>
<td>65</td>
<td>65</td>
</tr>
<tr>
<td>BES chemistry</td>
<td>416.6</td>
<td>249.0</td>
<td>40.0</td>
<td>1.7</td>
<td>130</td>
<td>129</td>
</tr>
<tr>
<td>BES geosciences</td>
<td>63.4</td>
<td>45.3</td>
<td>3.7</td>
<td>1.4</td>
<td>13</td>
<td>13</td>
</tr>
<tr>
<td>BES materials</td>
<td>391.7</td>
<td>245.0</td>
<td>44.0</td>
<td>1.6</td>
<td>125</td>
<td>123</td>
</tr>
<tr>
<td>BES user facilities</td>
<td>35.2</td>
<td>35.2</td>
<td>9.8</td>
<td>1.0</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Fusion</td>
<td>419.2</td>
<td>361.0</td>
<td>42.0</td>
<td>1.2</td>
<td>55</td>
<td>55</td>
</tr>
<tr>
<td>HEP</td>
<td>411.2</td>
<td>325.1</td>
<td>30.9</td>
<td>1.3</td>
<td>57</td>
<td>57</td>
</tr>
<tr>
<td>NP</td>
<td>318.4</td>
<td>257.5</td>
<td>16.5</td>
<td>1.2</td>
<td>44</td>
<td>44</td>
</tr>
<tr>
<td>SBIR</td>
<td>5.0</td>
<td>5.0</td>
<td>28.0</td>
<td>1.0</td>
<td>6</td>
<td>6</td>
</tr>
</tbody>
</table>
2014 MPP DOE Production Request Distribution
(592 requests total)

**Largest requests and awards:**
- 144.9 M hours (BER climate) – awarded 75 M hours (largest award)
- 93.5 M hours (NP QCD) – awarded 55 M hours (3rd largest award)
- 74.2 M hours (HEP QCD) – awarded 65 M hours (2nd largest award)
- 65.0 M hours (Fusion) – awarded 55 M hours (3rd largest award)

- **10 projects requested 25% of total requests**
- **37 projects requested 50% of total**
- **100 projects requested 75% of total**
### 2014 HPSS Requests (M SRUs)

<table>
<thead>
<tr>
<th>Office</th>
<th>SRUs requested</th>
<th>SRUs awarded</th>
<th># projects</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASCR</td>
<td>36.6</td>
<td>44.5</td>
<td>65</td>
</tr>
<tr>
<td>BER</td>
<td>152.0</td>
<td>162.8</td>
<td>107</td>
</tr>
<tr>
<td>BES</td>
<td>17.1</td>
<td>19.0</td>
<td>272</td>
</tr>
<tr>
<td>FES</td>
<td>7.3</td>
<td>8.1</td>
<td>55</td>
</tr>
<tr>
<td>HEP</td>
<td>81.7</td>
<td>81.7</td>
<td>64</td>
</tr>
<tr>
<td>NP</td>
<td>38.3</td>
<td>42.4</td>
<td>49</td>
</tr>
<tr>
<td>SBIR</td>
<td>0.2</td>
<td>0.2</td>
<td>6</td>
</tr>
<tr>
<td><strong>Totals</strong></td>
<td><strong>333.0</strong></td>
<td><strong>358.6</strong></td>
<td><strong>618</strong></td>
</tr>
</tbody>
</table>

#### Percent of SRUs requested

- **ASCR**: 10.9%
- **BER**: 45.7%
- **BES**: 5.1%
- **FES**: 2.2%
- **HEP**: 24.8%
- **NP**: 11.4%

#### Percent of Projects

- **ASCR**: 10.8%
- **BER**: 17.2%
- **BES**: 44.3%
- **FES**: 1.3%
- **HEP**: 10.6%
- **NP**: 15.7%
2014 HPSS Request Distribution
(611 requests total)

- **Largest HPSS requests:**
  - 35 M SRUs (BER Biology) – awarded 35 M
  - 27.2 M SRUs (BER Climate) – awarded 27.2 M
  - 19.2 M SRUs (NP Theory) – awarded 19.2 M
  - 15 M SRUs (ASCR Math) – awarded 20 M
  - 12 M SRUs (HEP Astro) – awarded 12 M

- **3 projects requested 24% of the total amount requested**
- **12 projects requested 50% of total**
- **37 projects requested 75% of total**
Best Practices: Use of Home Directories

David Turner
NERSC User Services
Sluggish Performance: Causes

• Interactive commands sometimes very slow
  – cd, ls, vi, df, etc.
  – Usually in $HOME
    • but many interactive commands read configurations and write histories in $HOME, regardless of where they run

• Two common causes
  – Batch jobs running in $HOME
    • or running in scratch or project, but reading/writing in $HOME
  – Multiple file transfer clients running in $HOME
    • typically interactive
    • e.g., eight copies of hsi reading from HPSS

• Both exacerbated when close to quota limit
Sluggish Performance: Solutions

• Do not run batch jobs in $HOME
  – Run in $SCRATCH (or variant), or /project
  – Don’t perform heavy I/O to/from $HOME
  – Simple “Hello, world” batch jobs OK in $HOME

• Limit number of data transfer clients accessing $HOME
  – No more than two simultaneous clients

• NERSC is reviewing NGF quota issues
  – Likely modifications to quota policies sometime after new Allocation Year begins (Tuesday, January 14, 2014)
HPSS Data Transfer Best Practices
(Recent Issues with Transfers to HPSS)

Lisa Gerhardt
NERSC User Services
Group Small Files Together

- Best file size between 1 GB – 100s of GB
- Group smaller files together with ‘htar’ (or ‘tar’ before storing in HPSS)
- Small files sent to HPSS with hsi <list_of_many_small_files> will end up scattered all over the system
  - Long retrieval times
  - Storage seems deceptively quick
Globus Online and Unreliable Networks

- Please stage large files to the global scratch file system using the Data Transfer Nodes, then transfer to HPSS
  - /global/scratch2/sd/\(<your\_user\_name>\) /

- Globus Online will resume interrupted transfers, but this feature doesn’t work with HPSS
  - Instead whole transfer must begin again
  - Avoid this by writing files first to Data Transfer Nodes, then moving the files to HPSS
Annual User Survey

• 2013 Survey is open through Jan. 13
• We need your input!
  – Very important to NERSC
  – Helps us improve our systems and services
  – Results reported to DOE; we need a high response rate
  – We very much listen and address issues raised

☑ Excellent
☐ Very good
☐ Good
☐ Average
☐ Poor
NERSC Achievement Awards

- These are prestigious awards
  - For work significantly performed at NERSC
- Nominations needed by early next week
- Announced at NUG 2014 in February

- NERSC/NUGEX selection committee
- NERSC Award for High-Impact Scientific Achievement
- NERSC Award for Innovative Use of HPC
- Open and Early Career (grad student & postdoc)
NERSC Holiday Schedule

• NERSC systems and services will be available during the holidays
  – But if you need anything special during this period, ask for it now
• NERSC Computer Operations staff will be available 24x7
  – 800-66-NERSC, menu option 1
  – Password changes (self-service at https://nim.nersc.gov)
  – System status (www.nersc.gov status pages!)
• NERSC Consulting and Account Support
  – Available Dec. 23, 27, 30 – 8-5 PST
  – Please use email or https://help.nersc.gov/
  – Holidays: Dec. 24,25,26,31 and Jan. 1
Other Issues or Questions?
• **NUG Teleconference**
  
  – Next scheduled: Thu. Jan. 9, 2014
  – Allocation year rollover on Jan. 14, 2014
  – Send suggested topics and comments to ragerber@lbl.gov
National Energy Research Scientific Computing Center