Computational Systems Update

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NUG – Feb 2015
• Hopper (XE-6) and Edison (XC-30) are the largest computational resources that NERSC provides

• Hopper – 2014
  – O/S, Systems S/W has been upgraded to CLE-4.2
    • Improvements to system resilience and DVS performance, upgrade paths for Lustre and O/S
  – Filesystem Improvements:
    • Scratch filesystems have been upgraded to the Lustre 2.4
    • GPFS upgraded
  – Workload Manager has been upgraded
  – Serial Queue implemented
Systems Update

- **Hopper – Future**
  - Upgrade O/S to CLE-5.2 (same level as Edison)
  - Minimal changes after that – on the path to retirement
  - Hopper retires at OSF – shutdown once Edison move to CRT is complete

- **Edison – 2014**
  - O/S upgraded to CLE-5.2
    - Allows for future upgrade paths and newer O/S releases, improved system, ALPS, and DVS resiliency, improved DVS performance
  - Filesystem improvements
    - Newer Lustre releases
    - Stability improvements to all Scratch filesystems
• **Edison – 2014 (contd.)**
  – ALL memory on Edison replaced to fix H/W issue – we are now running at full performance (2 3-day outages)
  – Workload Manager upgrades
    • Improved stability and features.
  – Serial queue

• **Edison – Future**
  – Move to CRT in Fall 2015
  – Change WLM to SLURM (see Cori Phase 1) after the move
• **Carver – 2014 (contd.)**
  - Upgraded O/S to SL6 – continued to provide SL5 environment to users via CHOS
    - RAS improvements
    - Ease of management of the system
  - Workload manager upgrade
    - Major stability and performance improvement
    - Pre-emptive queue support

• **Carver – Future**
  - Will be retired at OSF in Fall 2015 (Sept 30)
Systems Update

• Other activities
  – Continue supporting the HEP and NP community with PDSF – expanded to over 2600 cores
    • Supporting ALICE, ATLAS and Dayabay, LUX ...
    • Improvements to Networking and storage
  – Expanded Genepool to over 8000 cores
    • Users have access to SL5, SL6 and Debian environments
  – Supporting the Materials Project on Carver
  – Provided a Intel Xeon Phi testbed (Babbage)
  – Deployed the SciDB cluster
  – Dirac (GPU cluster) retired in Dec 2014

• PDSF, Genepool, Babbage, and the Materials Project systems will move to CRT in late Summer 2015
2015 Activities

• **Move to CRT**
  – Edison, PDSF, Genepool, Babbage and the MatGen system will move to CRT
  – Expanded capability for Genepool and PDSF to be installed in CRT
    • Fully FDR-IB connected systems
    • High B/W access to NERSC Global Filesystems

• **Cori Phase 1 System**
  – Expected deployment in Summer 2015 (in CRT)
  – Haswell-based system with Aries network
Cori Phase 1

• System will be very similar to Edison
• Intended to replace Hopper and provide data-intensive capabilities
• Access to the Cori Filesystem when installed
• Will be fully integrated into Cori when Cori is deployed (2016)
• Includes
  – Burst Buffer capabilities
  – WLM support for Data intensive workflows
Cori Phase 1 & Cori

• **New Workload Manager**
  – We will be using SLURM (tested extensively over the last year)
  – SLURM provides all the same functionality as Torque/Moab – with a few differences in implementation
  – SLURM is open source, and extensible
  – SLURM will perform better at handling the mixed Data-HPC needs of the Cori Ph1/Cori system
  – Simple transition from Torque/Moab to SLURM
  – Plan to give users access to test instances of SLURM soon

• **Cori (KNL nodes) to be deployed in mid-2016**
  – Phase 1 nodes and BB functionality will be integrated into Cori
  – Details of the Cori configuration wrt. Phase 1 nodes and BB will be forthcoming.
# Systems Summary

<table>
<thead>
<tr>
<th>System status</th>
<th>Date</th>
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<tbody>
<tr>
<td>PDSF/Genepool/Mtrls. Move to CRT</td>
<td>Jun. 2015</td>
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<tr>
<td>Carver Retires</td>
<td>Sept. 30, 2015</td>
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<tr>
<td>Cori Phase 1 available for users to run</td>
<td>Sept. 2015</td>
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<tr>
<td>Edison goes down to move to CRT</td>
<td>Oct. 2015</td>
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<tr>
<td>Edison comes back up in CRT</td>
<td>Nov. 2015</td>
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<tr>
<td>Hopper Retires</td>
<td>Dec. 2015</td>
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<tr>
<td>Cori Phase 2 Delivered</td>
<td>June 2016</td>
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Thank you.