DEAC Cluster Overview

4/19/2016

Overview

- Introductions
- State of the Cluster Questions
- Spring Purchase
- IBM BladeCenter Replacement Plan
- Upcoming Tasks
- New Governance Strategy
- Feedback, Q&A

State of the Cluster

State of the Cluster

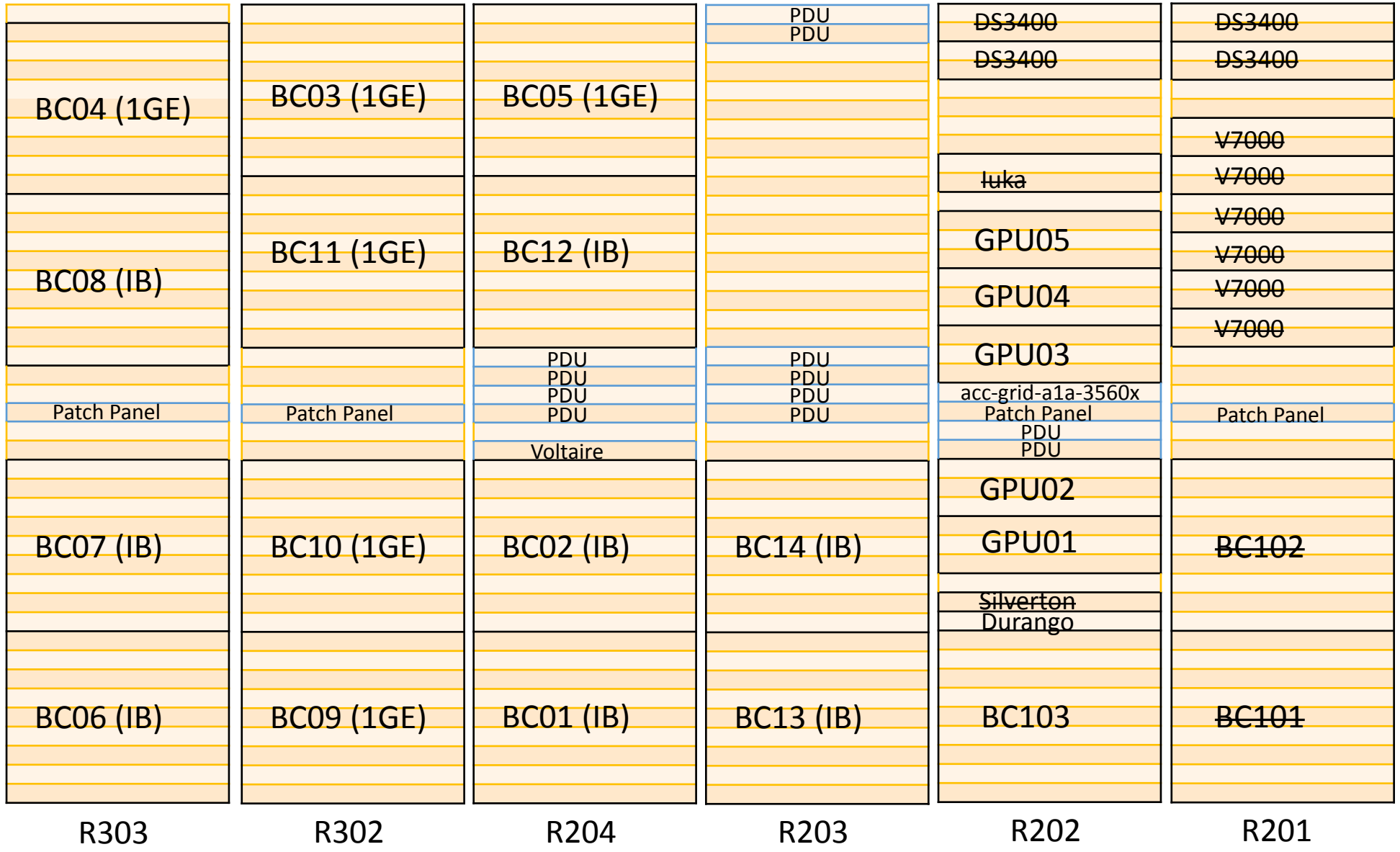
Accomplishments

- New Head Nodes
  - Orion and crew
- Wiki migration
  - Content updated
  - Better navigation and interface
- Slurm Updates
  - GPU resources can now be requested
  - Addition of Onegig partition
- Cluster expansion
  - 6 new compute nodes
  - 2 new ESX servers (allowing new head nodes to exist)
- Cluster monitoring page
  - Developed by student group
  - To be implemented on DEAC website soon

DEAC Cluster – Spring FY17 Purchase

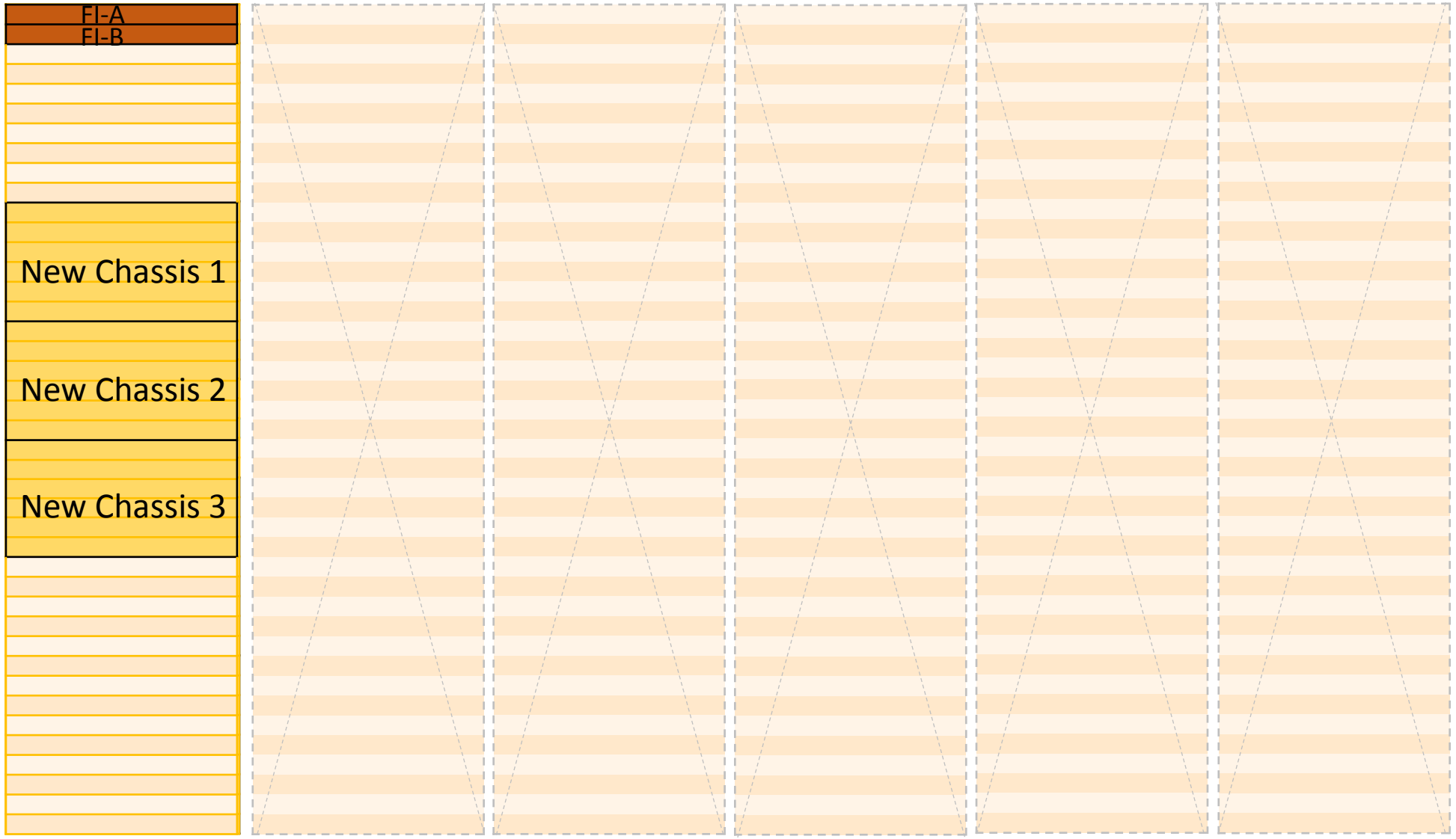
- Spring Compute Purchase Approved
  - 1x new chassis
  - 8x new compute nodes
    - 2 x 480GB SSD each
    - 44 cores each
    - 256GB RAM each
  - 2x new GPU nodes
    - 2x Tesla P100 Nvidia GPU cards each (3584 CUDA cores per card)
    - 512GB RAM each
    - 44 cores each
  - **Total = $168,030.86**
- Purchase not sent out yet
  - Want to do something bigger...
- Remove and replace all legacy IBM hardware!

DEAC Cluster – IBM Hardware Replacement – Current Configuration



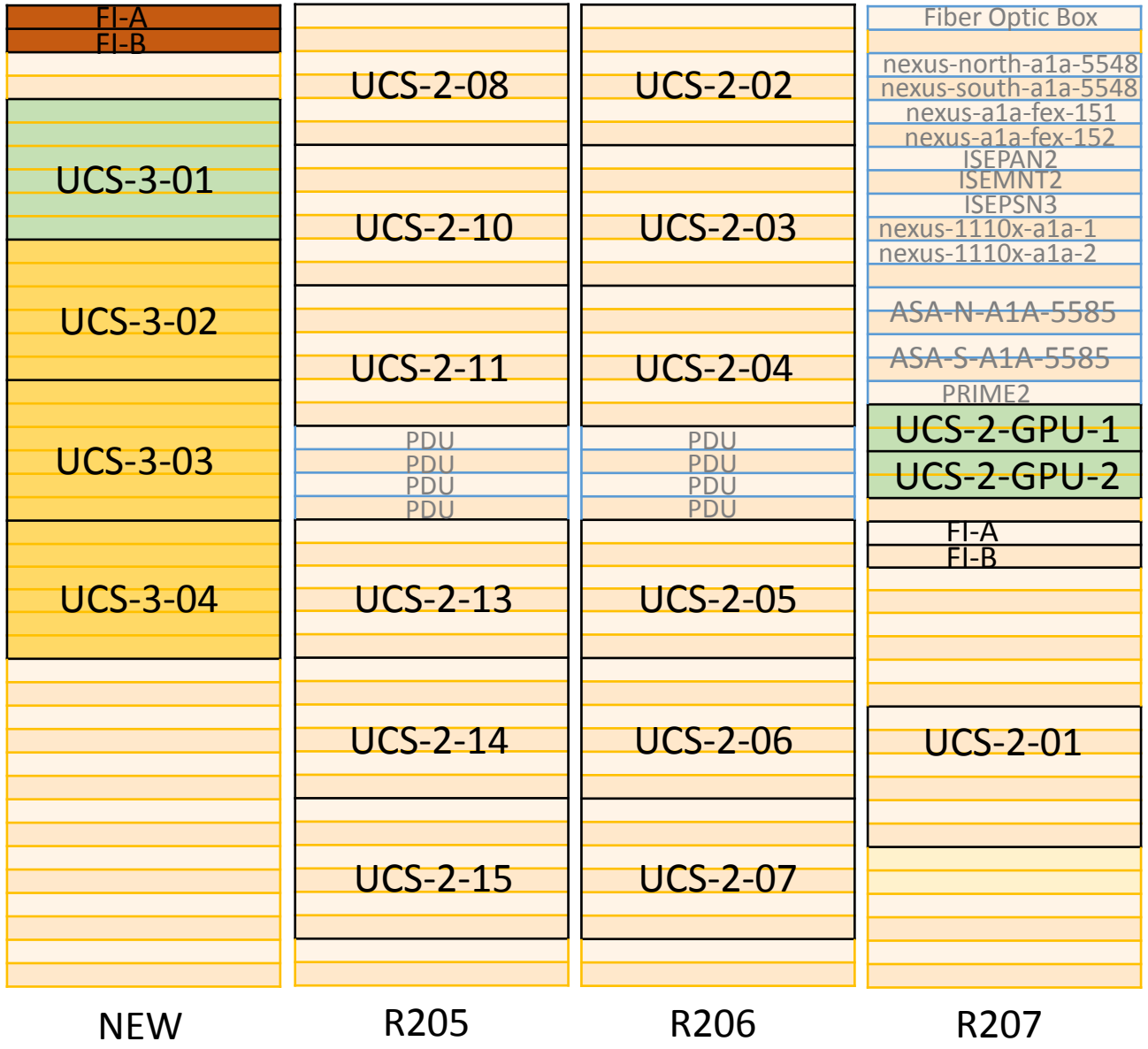
Racks Vacated: 5

DEAC Cluster – IBM Hardware Replacement – Replacement Hardware



Racks Vacated: 5

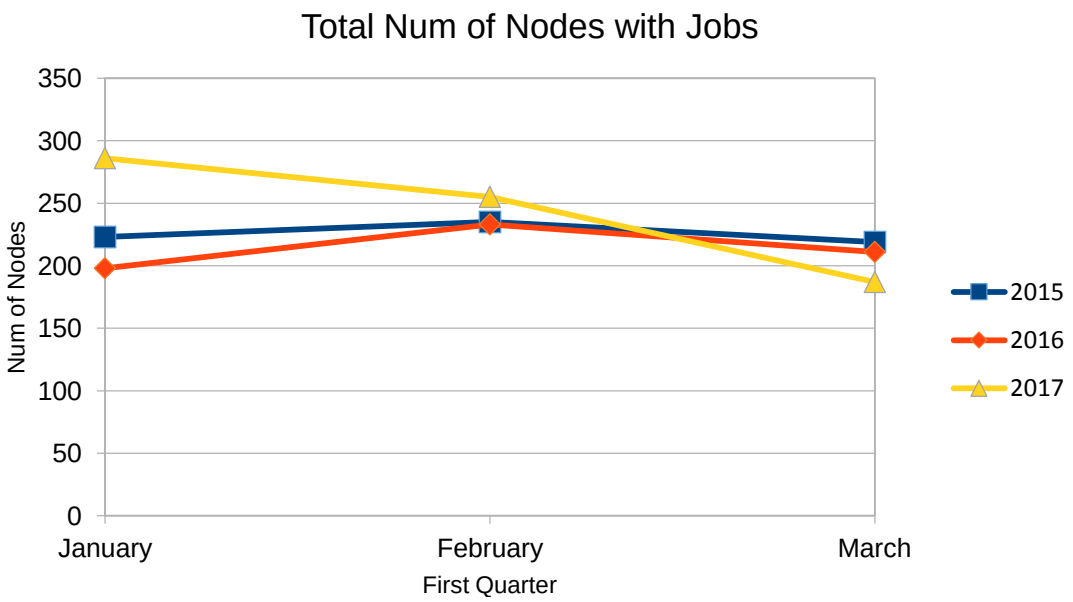
DEAC Cluster – IBM Hardware Replacement – Replacement Hardware with Existing UCS

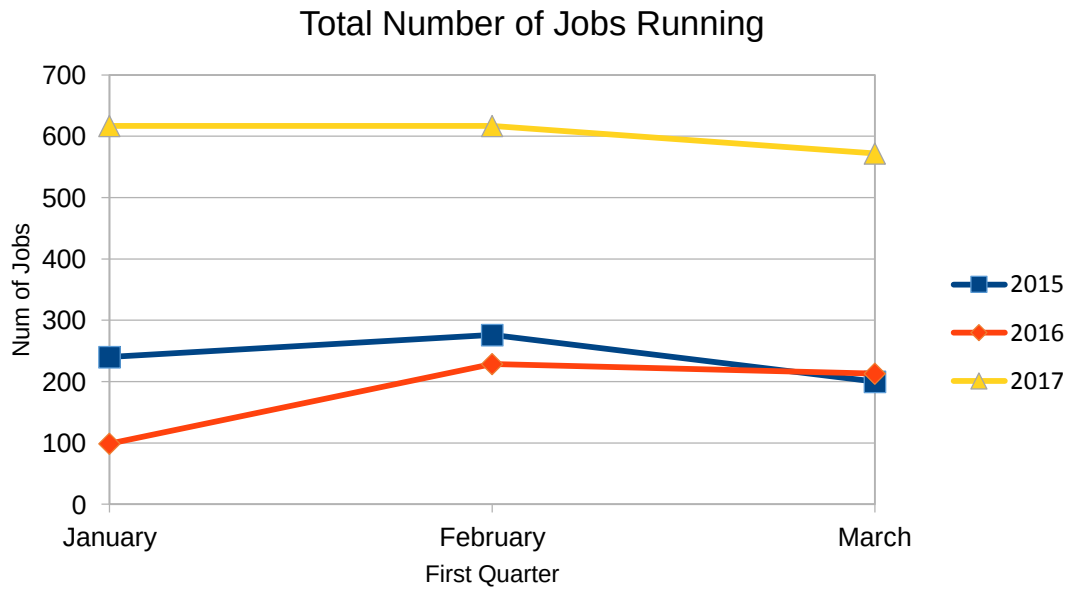


- IBM BladeCenter Resources
  - 194 nodes, 1552 cores, 11.25TB memory
  - 5.38 TFLOPs
- UCS Equivalent
  - 2.33 TFLOPs per 8 nodes
  - 19 nodes (3x Chassis) = 5.53TFLOPs
    - 836 cores, 4.25TB memory
- Other equipment
  - Replace legacy GPUs
  - Retire remaining admin chassis
  - Retire primary administrative server
  - Add new Fabric Interconnects

IBM replacement hardware HX Fabric Interconnects Spring FY17 Purchase Racks Vacated: 5

DEAC Cluster – IBM Hardware Replacement – Why now?





- FY17 Q1 Statistics
  - Job submission highest in 3 years
  - Node utilization lowest percentage in 3 years
  - Job queue largest average in 3 years
- Explanation
  - Users submitting smaller, parallelized jobs
  - Users specifying tengig only nodes
- Singular Large Purchase
  - **Grand Total = $417,826.69**
  - $15,000 additional savings
- Benefits
  - Reduced Administrative Overhead
  - More homogeneous configuration
  - **$37,500 annual savings** in Data Center costs
  - Better alignment for future efforts

DEAC Cluster – Upcoming Tasks

- 10.x network migration
  - Fall 2017 effort
  - Reduced administrative overhead (network and HPC)
  - Simplified configuration
  - Additional benefits
- RHEL7 OS Upgrade
  - Time savings
- Summer intern
  - Assist with Hardware Installations
  - Software recompilations

DEAC Cluster – Questions

Q/A