

# BLUE WATERS

SUSTAINED PETASCALE COMPUTING

11/28/16

## Blue Waters User Monthly Teleconference



GREAT LAKES CONSORTIUM  
FOR PETASCALE COMPUTATION

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# Agenda

- Future Maintenance
- Changes and Recent Events
- Utilization and Usage
- Opportunities
- PUBLICATIONS!

## Future Maintenance

- On 12/05
  - Blue Waters Core switch upgrade (not HSN).
  - Full outage of all services including ncsa#Nearline.
  - Should improve internal data movement (e.g. between ncsa#BlueWaters and ncsa#Nearline) and possibly external movement as well.

## Upcoming Changes

- Login node monitoring
  - Adjusting parameters of our process watchers to contain excessive, impactful login node usage.
  - Process termination criteria:
    - Any process using more than 25%.
    - Targeted processes 1 hour wall clock time.
    - Other processes 1 hour CPU time 20% CPU utilization.
    - All processes terminated after 100 hours CPU time.

## Recent Changes to Blue Waters

- [Shifter](#) (now available)
  - Docker-like container allowing user-defined images.
  - Improved security model.
  - Now available.
  - Email [help+bw@ncsa.illinois.edu](mailto:help+bw@ncsa.illinois.edu) to get started.



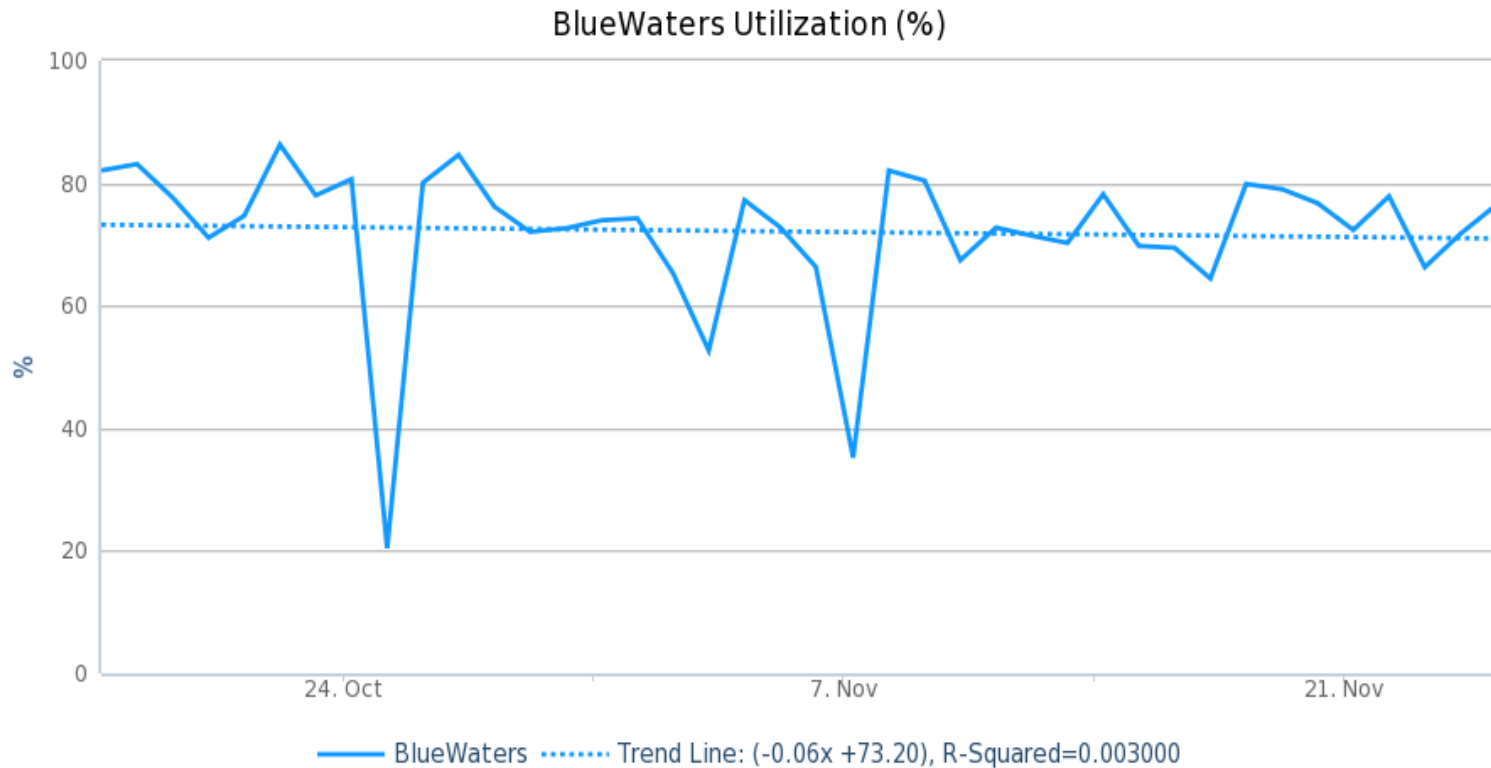


## Recent Events (since last User call)

- 11/17 – Single cabinet EPO.
- 11/07 – Whole row emergency power off (EPO).
- 10/25 – Emergency Maintenance to address security concerns. Included scheduled maintenance to address Lustre quota issue, HPSS software upgrade.

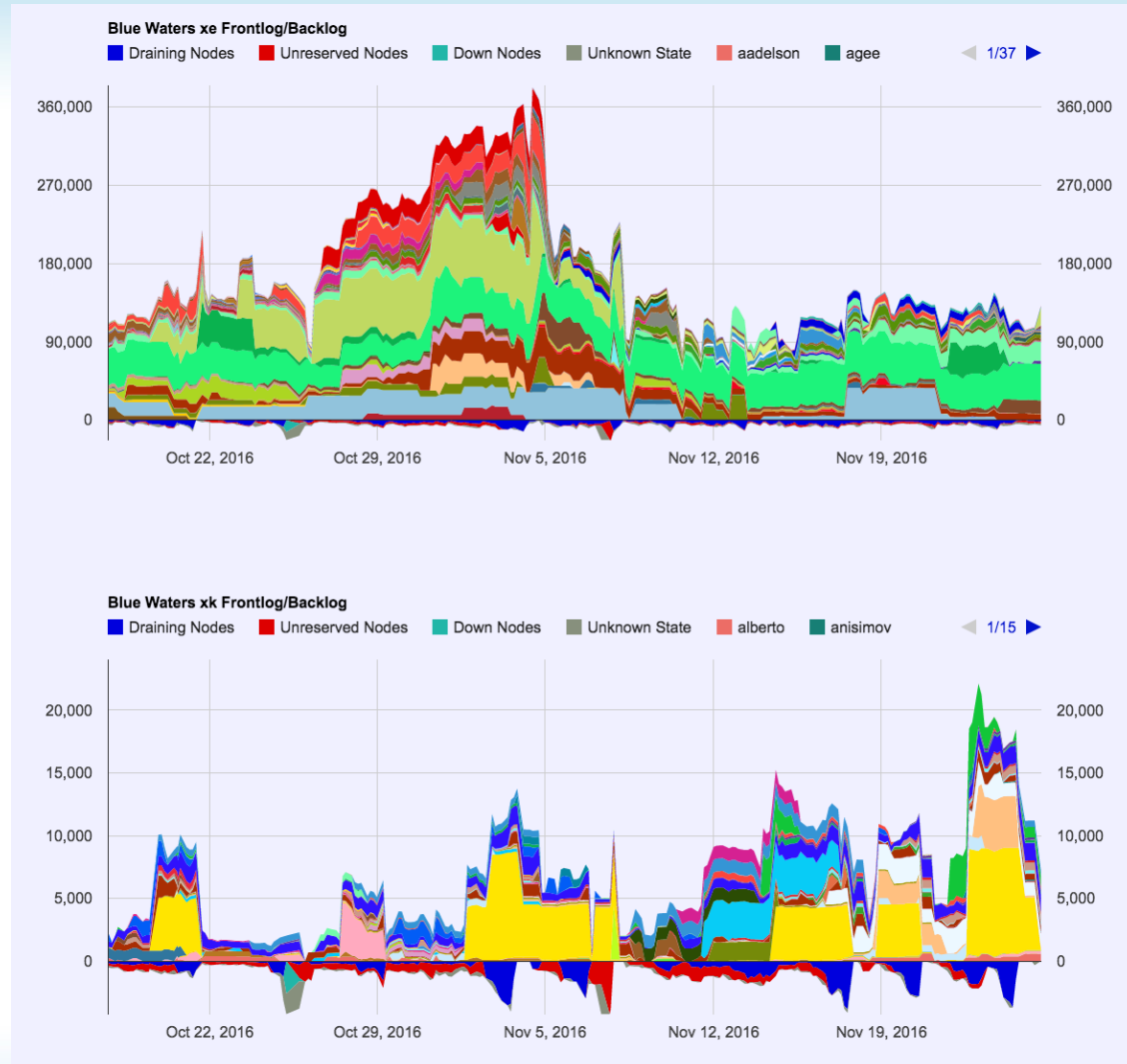
# Usage, Utilization and other Items

- Utilization since last BW User Call (Oct 17)



# Backlog

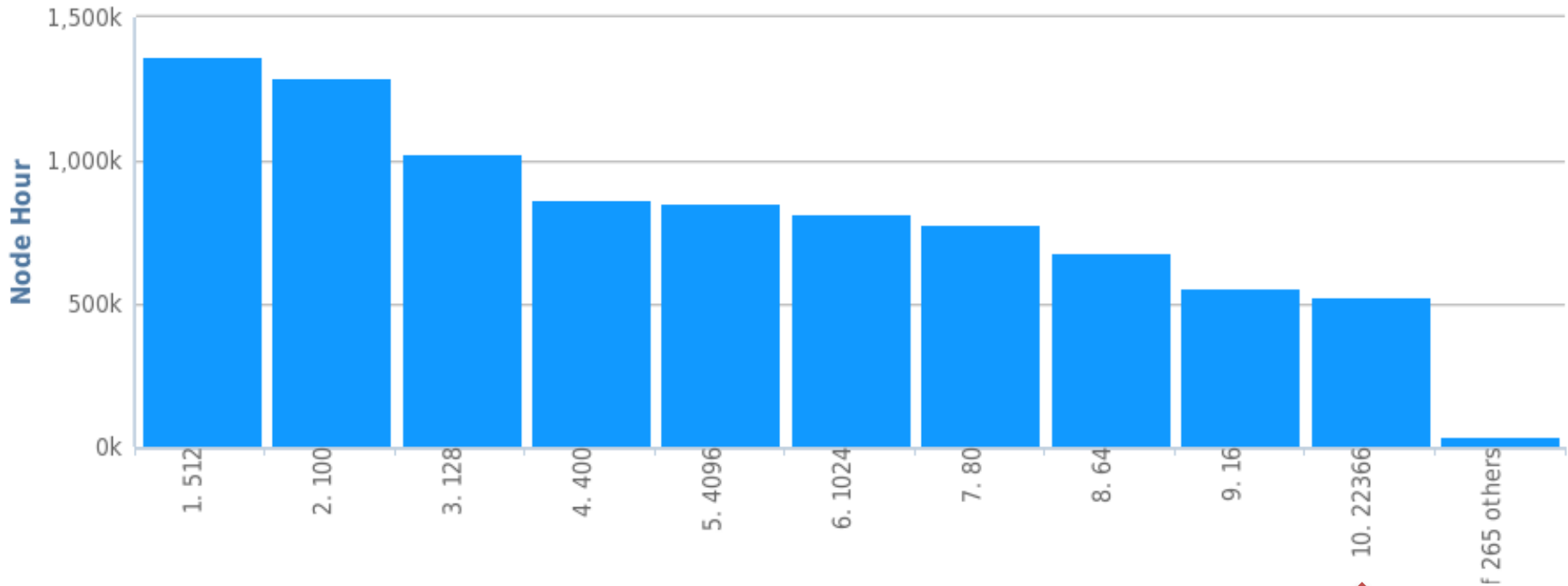
- Since BW User Call 11/17
- Vertical axis in units of **nodes**. Colors are different users.
- Mix of jobs and 3 – 4 x machine node count to get good sustained utilization.
- Red below the x-axis indicated unreserved nodes.
- Blue below the x-axis indicates draining.





# Workload Details

Node Hours: Total: by Node Count



- Data combines XE and XK jobs.
- Since last BW User Call (Oct 17)



## Revisit of Congestion Protection

- Recent spate of congestion protection events.
- Seen as throttling messages in stderr from aprun:

```
Application 61435 network throttled: 4459 nodes throttled, 25:31:21 node-seconds
```

- System limits network injection from all nodes on the HSN to avoid data loss due to resource exhaustion.
  - 20 seconds severe throttling followed by 20 minutes modest throttling. Can repeat until congestion is alleviated.
- Impacts all running applications.
- SEAS staff work to identify and correct applications or workloads.
- For more information see <https://bluewaters.ncsa.illinois.edu/balanced-injection> and the attached documents. Requires login to see the documents.

## Upcoming Opportunities


- The GLCPC (Great Lakes Consortium for Petascale Computation) recently posted its call for proposals. Researchers from the member institutions are eligible to apply for a Blue Waters allocation. The application deadline is **Friday, December 2nd**. More information can be found at:  
<http://www.greatlakesconsortium.org/2016cfp.html>
- Applications are now being accepted for Blue Waters Fellowships. Applications are due **February 3, 2017**. More information is available at:  
<https://bluwaters.ncsa.illinois.edu/fellowships>
- Applications are now being accepted for Blue Waters undergraduate internships. Applications are due **February 3, 2017**. More information is available at:  
<https://bluwaters.ncsa.illinois.edu/internships>

## SC16 Salt Lake City Recap



- Bill Gropp Kennedy keynote talk. Look for video. Good discussion of the future of IO in HPC.
- Lots of discussion on OpenACC and OpenMP4 on GPUs.
- Several PRAC teams presented or participated.

## Request for Science Successes

- We need to be current on products that result from time on Blue Waters such as:
  - Publications, Preprints (e.g. [arXiv.org](https://arxiv.org) ), Presentations.
  - Very interested in data product sharing.
- Appreciate updates sooner than annual reports.
  - Send to [gbauer@illinois.edu](mailto:gbauer@illinois.edu)
- NSF PRAC teams send information to PoCs.
- See the [Share Results](#) section of the portal as well.
- **Be sure to include [proper acknowledgment](#)**
  - Blue Waters - National Science Foundation (ACI 1238993)
  - NSF PRAC – OCI award number