

# BLUE WATERS

SUSTAINED PETASCALE COMPUTING

Welcome

Greg Bauer



GREAT LAKES CONSORTIUM  
FOR PETASCALE COMPUTATION

CRAY®

## Administrative

- WiFi – Use SSID UIpublicWiFi
  - If needed ports are blocked we will get guest access. Please contact me.
- Training accounts if you don't have a BW acct.
- NPCF Tour Wed. 4PM – Sign the sign-up sheet.
- Wednesday is [Petascale day](#) (10<sup>15</sup>).
- Slides will be posted to the [workshop page](#) on the portal.

## In the room

- Science and Engineering Support (SEAS)
  - Victor Anisimov
  - Ryan Mokos
  - Tom Cortese
  - Kalyana Chadalavada
  - Manisha Gajbe
  - Robert Brunner
  - Jing Li
  - Gengbin Zheng
  - Omar Padrone
  - Galen Arnold
  - Mark Straka
  - Craig Steffen
  - Dahai Guo

# Schedule

## Day 1

08:45 – 09:00 Welcome - Greg Bauer, NCSA

09:00 – 10:00 Topaware – Bob Fiedler (Cray)

10:00 – 10:20 Break

10:20 – 10:30 Overview of Cray PE topics for the day - Heidi Poxon and Luix DeRose (Cray)

10:30 – 11:15 CrayPat refresher

11:15 – 12:00 lab (CrayPat-lite, loop statistics, Rank reorder)

12:00 – 13:00 Lunch

13:00 – 14:00 Reveal

14:00 – 14:30 CCE and OpenACC update

14:30 – 15:00 lab with Reveal

15:00 – 15:20 Break

15:20 – 16:00 CCDB

16:00 – 17:00 find a bug using CCDB, general lab time

# Schedule

## Day 2

Morning: (8:30 – noon) Robert Crovella (NVIDIA)

1. CUDA 101 – basic CUDA concepts and syntax – enough to write a correct CUDA program (60 minutes)

2. hands-on 1 – familiarization with basic concepts (30 minutes)

10:00 Break (15 minutes)

3. CUDA Basic optimizations – memory utilization and execution configuration (60 minutes)

4. Hands-on 2 – grid example sequence (45 minutes)

Noon – 1:00 Lunch

1:00 – 3:00 DDT debugging at scale Beau Paisley (Allinea)

3:00 – 3:30 Break

3:30 – 5:00 DDT debugging on the GPU



# Schedule

## Day 3

Morning: (8:30 – noon) Robert Crovella (NVIDIA)

1. OpenACC intro (60 minutes)
2. Hands on 3 – OpenACC Laplace example sequence (45 minutes)

10:00 Break (15 minutes)

3. Intro to CUDA libraries (CUBLAS/CUSPARSE) (30 minutes)
4. Hands on 4 – CG porting walkthrough (60 minutes)

Noon - lunch

Afternoon:

1:1 consulting

Hands on time with Allinea and NVIDIA staff

Afternoon:

1 - 3: HDF: Intro and Advanced Topics – Quincey Koziol (The HDF Group)

3:00 Break (15 minutes)

Wrap up

4:00 NPCF / Blue Waters Tour on PETASCALE Day ( $10^{15}$ )

## Blue Waters Status

- In full production for over 15 months.
- For 1<sup>st</sup> year of full production (7/1/2013 to 6/30/2014)
  - Provided 128M XE node-hrs. and 24M XK node-hrs.
  - Over 380K XE jobs and 64K XK jobs executed.
  - Average job size (by node-hrs): 2048 XE nodes and 400 XK nodes.

Category	Number of Teams (as of 10/1/2014)
NSF PRAC	32 : 18 continuing, 6 new, 8 renewed
University of Illinois	15 general, 15 exploratory
GLCPC	10
Education	8
Industry	3

## Use the portal

BLUE WATERS SYSTEM ALLOCATION DETAILS

ALLOCATION USED BY GBAUER: 284,561.85 TOTAL NODE HOURS.

Blue Waters Utilization

Blue Waters Startup

Allocated Used

000,000

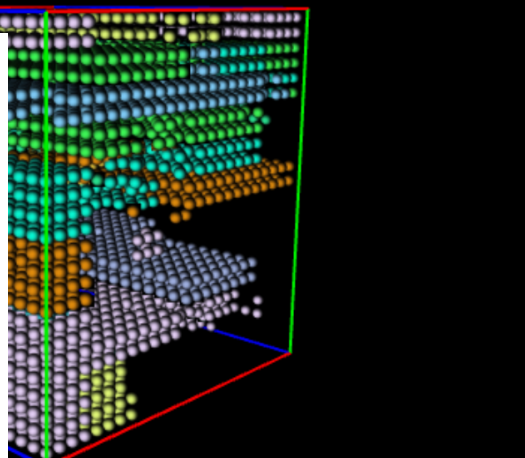
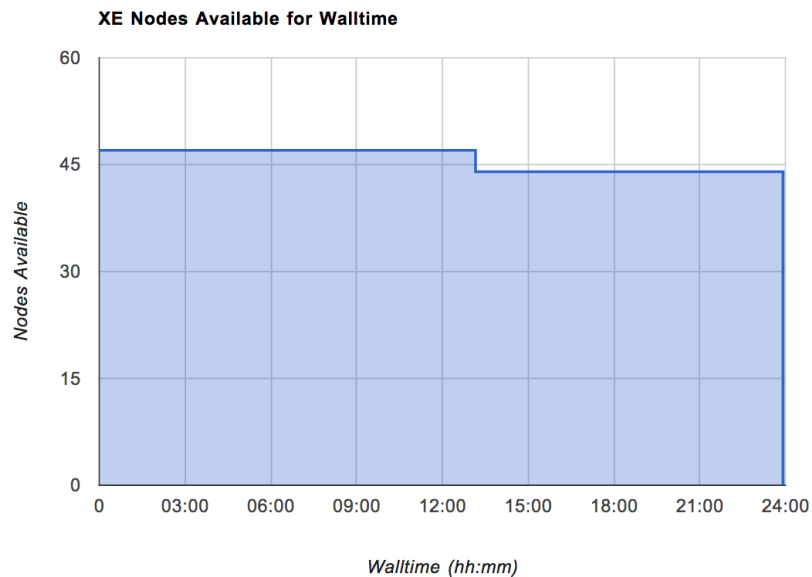
PERCENT OF ALLOCATION USED

Nov 2013

02/2013 16:17

JOBID	USERID
1169822	redwards
1170153	dtoussai

At 2014-10-12 17:40:17, the following backfill windows were available.





## Looking forward

- NCSA/Illinois Enhanced Intellectual Services for Petascale Performance (NEIS-P2).
- Data Sharing Service – next week or two
- Software Upgrade – mid November
- Innovative, Data Intensive Challenge – mid November

## Keep Informed

- Bi-annual training opportunities
- XSEDE and Blue Waters Extreme Scalability Workshop
- Virtual School Events
- Monthly Webconferences