Introduction to GPU Training

Helen He

February 28, 2020

Safety and Sustanability

Reduce, Reuse, Recycle

- Please help us minimize waste going to the landfill by correctly disposing of food, beverage, and other waste.
- Sustainable Berkeley Lab (sbl.lbl.gov) requests we sort trash into:
  - Compostable
  - Paper
  - Landfill
  - Other recycling

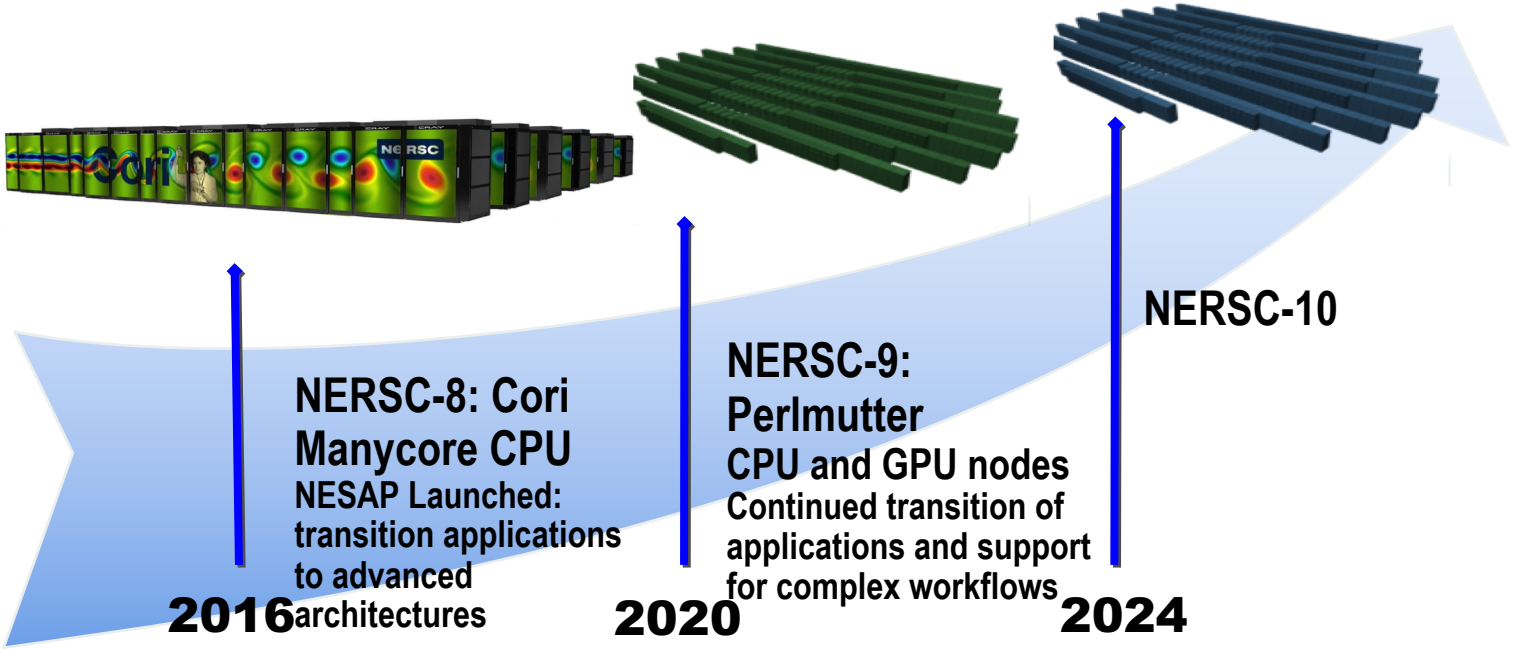
In the event of fire

- Horn/strobes will sound
- Evacuate immediately through the main center exit, or the southeast or northeast exit if elsewhere in the building.
- If possible without delaying your evacuation, take personal belongings such as your wallet, keys and coat. You may not be able to return.
- Follow instructions of Building Emergency Team members

In the event of earthquake

- Duck, Cover, and Hold On to something solid.
- If there is nothing to duck under, take shelter next to a solid wall, or squat down in place, and cover your head with your arms.
- In the machine room, move away from the computer racks, but stay within the blue “moat”.
- Once shaking has stopped, evacuate as just described.

NERSC Systems Roadmap



Agenda

Time	Topic	Presenter
9:00 - 9:05 am	Logistics and Introduction	Helen He
9:05 - 9:35 am	Why GPUs?	Jack Deslippe
9:35 - 10:05 am	How to Use Cori GPU	Kelly Rowland
10:05 - 10:35 am	NVidia Software Stack, Part 1	Max Katz
10:35 - 10:50 am	Break	
10:50 - 11:20 am	NVidia Software Stack, Part 2	Max Katz
11:20 - 12:20 pm	Programming for GPUs with Directives	Helen He
12:20 - 1:30 pm	Lunch (on your own)	
1:30 - 1:50 pm	Debugging on GPU	Woo-Sun Yang
1:50 - 2:30 pm	Profiling on GPU	Max Katz
2:30 - 3:30 pm	Hands-on Build/Run/Profile GPU Codes	All attendees

https://www.nersc.gov/users/training/events/introduction-to-gpu-february-28-2020/ (talks being recorded)

Using Cori-GPU for the hands-on (1)

- Documentation: https://docs-dev.nersc.gov
- Not an advanced GPU programming hands-on session (such as porting and optimization with OpenACC or OpenMP), but mostly to familiar yourself with:
  - building and running various programming model codes (CUDA, openACC, OpenMP) in various languages (C/C++, Fortran, Python) using different compilers (PGI, GCC, Clang, CCE) and getting profiling data from.

```
% cp -r $CFS/training/2020/GPU_Feb2020 .
```

Using Cori-GPU for the hands-on (2)

- Your gpu access is enabled via “m3502” project until next Thur
- 12 Cori-GPU nodes reserved for today, 9am - 4pm

```
% module load esslurm
% salloc -C gpu -N 1 -t 60 -c 10 --gres=gpu:1 -A
m3502 --reservation=gpu_training  (until 4pm today)
% salloc -C gpu -N 1 -t 60 -c 10 --gres=gpu:1 -A
m3502    (after 4pm today until next Thur)
```

Survey

- Please provide your feedback and help us to improve:
  https://docs.google.com/forms/d/1clussfQ2SGUSvQlHWp3vr4xRDDAULMFyvZgUaRe-65A/

- Survey link can also be found on the training page:
  https://www.nersc.gov/users/training/events/introduction-to-gpu-february-28-2020/

Upcoming GPU Trainings

- Ongoing 9-part CUDA training
  - Monthly, January to September
  - Mar 18: CUDA Optimization (part 1)
  - Apr 16: CUDA Optimization (part 2)
  - …
- Upcoming 3-part OpenACC training
  - Monthly, April to June
  - April 17: Introduction to OpenACC
  - May 28: OpenACC Data Management
  - …
- Details at the NERSC Training Events page
  - https://www.nersc.gov/users/training/events/