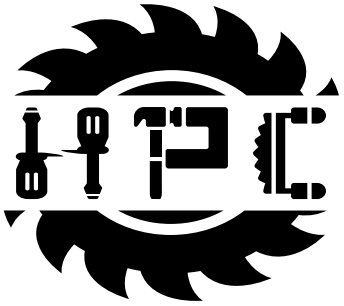

CARPENTRY

HPC Carpentry
BPHTE Lightning Talk
SC23

Presenters:

- **Andrew Reid (he/him), NIST**
- **Alan O'Cais (he/him), CECAM**
- **Trevor Keller (they/them), NIST**
- **Wirawan Purwanto (he/him), ODU**
- **Annajiat Alim Rasel (he/him), BRAC U**

HPC Carpentry
BPHTE Lightning Talk

Outline

This is necessarily a brief introduction to our effort

- Begin with a discussion of the Carpentries generally
  - Describe how our effort fits into and builds on tis
    - Briefly describe the history of the effort
- Describe our inventory of lessons and strategic plan

CARPENTRY

The Carpentries

Motivated by a problem in research practice – increasingly foundational computational research work was done by a variety of practitioners, often short-timers, with a variety of skill sets, and a variety of practices.

Founded by Greg Wilson starting in the late 1990s, with various structural changes in response to feedback over the years – current umbrella organization (2018) encompasses several sub-organizations – software carpentry, library carpentry, and data carpentry.

Central idea: The skills necessary to demonstrate the value of better practices can be taught in a workshop setting working hands-on with the actual systems – learners build "muscle memory" of having done key steps in the process, and come away with the power to move themselves forward.

- Pedagogically sound – relies on peer-reviewed educational literature
  - Formal instructor training
- Open-source – uses instructor and learner feedback to modify lessons
- Inclusive – anyone can contribute feedback, pull-requests

HPC Carpentry

HPC has a similar problem to research computing generally – researchers with HPC requirements often do not have training in operating HPC systems, and struggle to effectively scale up/out their operations even when the hardware resources are available.

Flip side: HPC facility operators are frustrated by non-knowledgeable users making inappropriate use of shared resources, disrupting other users, and requiring significant hand-holding before they can become effective.

Candidate solution: Use Carpentries techniques to build the bridge for HPC users.

Central idea: The skills necessary to demonstrate the value of better practices can be taught in a workshop setting working hands-on with the actual systems – learners build “muscle memory” of having done it, and come away with the power to move themselves forward.

HPC Carpentry

Some Important Contributions

- Peter Steinbach, “HPC In A Day”
- ComputeCanada contributions
- SC17 BoF
  - Andy Turner, Christina Koch, Tracy Teal, Bob Freeman, Chris Bording
- CarpentryCon 2018 discussions
- SC18 BoF
  - Andy Turner, Christina Koch, Peter Steinbach, Alan O’Cais, Jeffrey Stafford, John Simpson, Daniel Smith, Bob Freeman
- Well-attended informal session at SC19
- CarpentryCon 2020@Home
  - Trevor Keller, Christina Koch, others?
- SC21 BoF – high-value feedback from HPC operators
- Present in the Carpentries Incubator, Winter 2021
- Begin working towards Lesson Program Incubation
- CarpentryCon 2022
  - Lightning talk, sprint, breakout session
- June 2023 – formal acceptance into Lesson Program Incubation

HPC Carpentry

Our Lessons

- HPC Intro (Queuing system basics) (Carpentries Incubator)
- HPC Shell (deprecated in favor of Carpentries)
- HPC Parallel Novice (Parallelization using Python)
- HPC Workflow
- HPC Chapel

Strategic Plan

- Build two two-day workshop tracks
  - HPC Shell, Intro, and Workflow lessons, with Admahl's Law application, for HPC users
  - HPC Shell, Intro, and Development lessons, for coders to learn parallel frameworks
- Continue to curate and host additional material across a spectrum of candidate users

Our principal audience is novice HPC users. Where possible and practical, we are also interested in serving less-novice HPC users, as well as HPC facility operators. The more participants we have, the better we can do!

HPC Carpentry

Getting Involved

The GitHub Project Page:
`github.com/hpc-carpentry`

The Slack:
`#hpc-carpentry` on **`swcarpentry.slack.com`**

The Topicbox E-mail List:
`carpentries.topicbox.com/groups/discuss-hpc`

The main website:
`hpc-carpentry.org`

HPC Carpentry

Evaluation of Existing Material

We are interested in feedback from people who have used the existing material.

- Did you use HPC Carpentry material stand-alone, or in conjunction with other material?
- What sequence did you teach things in?

HPC Carpentry

Prioritizing Effort Going Forward

Our existing material is not uniformly developed. Where should we focus development effort going forward?

- Languages, like Python, Julia, Chapel
- Frameworks, like MPI, Dask
- Containers

HPC Carpentry

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