SC20

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Northeast Cyberteam - Methods, Results and Expansion via the Connect.CI Portal

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Julie Ma
Program Manager, Northeast Cyberteam
Co-Program Manager, CAREERS Cyberteam

Northeast Cyberteam - Goal

Make high performance computing more readily accessible to researchers at small and medium sized institutions in Northern New England where there may not be critical mass to support Research Computing Facilitators on campus

Steering Committee:
John Goodhue, PI, MGHPCC (top right)*
Adrian Del Maestro, Co-PI, University of Vermont (center left)
Bruce Segee, Co-PI, University of Maine (bottom left)
Scott Valcourt, Co-PI University of New Hampshire (center right)
Sia Najafi, Senior Personnel, Worcester Polytechnic Institute (not pictured)
Ralph Zottola, Senior Personnel, University of Alabama (top left)
Julie Ma, Program Manager, MGHPCC (bottom right)*

** MGHPCC = Massachusetts Green High Performance Computing Center, a data center in western Massachusetts operated by a consortium comprised of Boston University, Harvard, MIT, Northeastern University and University of Massachusetts*

What is a Research Computing Facilitator (RCF)?

- RCFs combine technical knowledge and strong interpersonal skills with a service mindset
- Advise/Assist researchers at crossroads of transitioning work beyond their desktop
- Widely recognized as critical to successful utilization of cyberinfrastructure, but in very short supply
- Shortage is most significant barrier to productive use of research computing at small and mid-sized institutions

Research Computing Facilitators - Why?

- Why are Research Computing Facilitators Needed*?
  - Facilitate Transition of Research to Advanced Computing Resources
  - Effective Support Requires Scholarly Expertise
  - Research Problems Require Varied Technology Solutions
  - Researchers Possess Varied Technical Knowledge
  - Appropriate Technology Solutions Require an Understanding of Research Needs
- Why are Research Computing Facilitators in Short Supply?
  - Currently very few programs specifically designed to train Research Computing Facilitators at institutions of higher learning
  - Many students are unaware of Research Computing Facilitation as a profession
  - Most Research Computing Facilitators “fell into” this role after initially pursuing a different path
  - So many domains, so little time…

**Source: Lauren Michael and Bruce Maas. Research Computing Facilitators: The Missing Human Link in Needs-Based Research Cyberinfrastructure. Research bulletin. Louisville, CO: ECAR, May 16, 2016*

Northeast Cyberteam: Two-Pronged Approach

- Experiential Learning
  - Projects that pair a student-facilitator with mentor, and assign to researcher in need of assistance
  - Move science forward
- Tools and Resources
  - Streamline/scale management of projects
  - Build pool of knowledge resources
    => Promote self-service learning – critical skill for RCFs

Project Workflow

- Researcher/Educator requests support by submitting a project profile on the portal
- Steering Committee reviews/approves project at weekly meeting
- Project approved and made visible on the Cyberteam portal
- Program assists with identifying/recruiting student facilitator and mentor with subject matter expertise
- Students share plans and results in monthly Zoom session
- Program Manager/Steering Committee member conducts exit interview and captures information in project profile
- Typical duration: 3-6 months
- 44 projects launched at 21 small/mid-sized institutions over the past 3 1/2 years

Northeast Cyberteam Portal

- Support Cyberteam Operations
  - Track Project Workflows
  - Register Participants
  - Match Mentors and Students with Projects
- Capture Lessons Learned
  - Facilitate Reproducibility
  - Reporting
- Single Point of Entry to all Cyberteam Learning Resources

Common Tag Infrastructure Enables Efficient Search for all Related Projects, Personnel, Tools with a Single Click

Self-Service Learning Modes

Facilitators (and Users) Need Just in Time Access to Deep Knowledge that is Widely Dispersed throughout the Community

Three Modes:

- Frequently Asked Questions Whose Answers Evolve Over Time
  -> Ask.CI
- Relatively Static Information (e.g. Training on Linux, Programming Languages, Schedulers)
  -> Learning Resources Wiki
- Dynamic, Situation-Specific, Immediate Help Needed
  -> Regional Help Desk

Ask.Cyberinfrastructure.org (Ask.CI)

- What is it?
  - Public, Searchable, Archived Q&A Platform for Research Computing
  - Crowd-sourced Content Generation/Management
  - Joint project of Northeast Cyberteam and Campus Champions
  - Launched at PEARC18
  - Discourse Platform Permits Flexibility

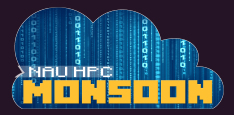
- Why use it?
  - Reduce duplication of effort
  - Promote Self-Service Learning

    => Faster Time to Science
  - Creates a resource for groups that can't afford their own Q&A list
    - Small/Medium sized institutions
    - Domain-centric communities of interest
  - Increase collaboration in the global community and elevate the practice
  - Currently averaging 34K unique pageviews/month, 450+ users from ~225 institutions

Ask.CI “Locales”

- Personalized, dedicated categories for locale-specific topics
- Locale can be an institution, a community of practice, an affinity group… any entity that can benefit from public, participatory Q&A site
- Allows locale operators to experiment with making institution-specific public Q&A available to their constituents
- Maintained on Ask.Ci
  - Institution/community provides moderator
  - Facilitates transfer of topics from locale to main Q&A and Discussion Zone

Locale Partners: Geographically Distributed, Public/Private, R1/R2



YOUR LOGO HERE

Northeast Cyberteam: Lessons Learned

- Value of RCFs to researchers at small/medium sized institutions confirmed
- 3-6 month projects can have meaningful impact
- Large institutions willing to share knowledge
- Mentors are relatively easy to find
- Sharing resources across institutional boundaries has high value and is not as cumbersome as anticipated
- Active program management is necessary
- Regional Focus Has Benefits
  - Co-location of mentor, student, researcher not necessary as day to day interaction can take place over zoom
  - Substantial benefit derived from occasional face to face meetings
- Effective Steering Committee is Key
  - Anchor leads appropriately positioned in Institution
  - Weekly operations zoom call
  - Twice-yearly in person strategic planning meetings

Portal Expansion – Why?

- Mentor Matching/Finding Experts
  - Search benefits from broad participation by the research computing community
    - Deep knowledge is widely distributed throughout the community
  - Need extends beyond Northeast Cyberteam
- Broader Participation Benefits Crowd-Sourced Knowledge Repositories
  - Ask.CI
  - Learning Resources
- Share Lessons Learned and Encourage Collaboration
- Initial Focus on NSF-funded Cyberteams, Currently Developing Portal View for Other Communities of Practice

Portal Expansion Pilot: Independent Entry Points/Views based on URL

careers-ct.cyberinfrastructure.org

rmacc.cyberinfrastructure.org

sweeter.cyberinfrastructure.org

kycyberteam.cyberinfrastructure.org

greatplains.cyberinfrastructure.org

mines.cyberinfrastructure.org

All Portal Views Can Be Accessed from https://Connect.Cyberinfrastructure.org

Opportunities to Collaborate

- Connect.CI Portal (https://Connect.Cyberinfrastructure.org)
  - Join an Existing Cyberteam or as an “at-large” Member
  - Create a Portal View for Your Community of Practice
- Ask.CI Q&A Platform (https://Ask.Cyberinfrastructure.org)
  - Post or Vote on Content – Contest Underway for SC20!
  - Create a Locale for Your Institution

Many Thanks To…

- SC20
- NSF
- Cyberteam Students, Mentors and Researchers
- Ask.CI Moderators, Locale Partners and Contributors
- Portal Developers
  - Advisors/Systems: Chris Hill, MIT; Ermal Toto, WPI
  - Development Lead: Eric Brown
  - Student Cohorts:
    - Cuong Nguyen, Andrew Schade
    - Rahul Pande, Ke Shao, Tim Wu
    - Mariana Pachon Puentes, Alex Tavares
    - Sarah Akbar, Lucas Varella, Julia Sheats
- Portal Partners
  - CAREERS CT: Andy Sherman, Kaylea Nelson, Galen Collier, John Huffman, Chris Carothers, Wayne Figurelle, Karlis Kaugars, Neil McGlohan, Jeff Nucciarone, Anita Schwartz
  - Great Plains CT: Tim Middelkoop, James Deaton, Kevin Brandt
  - Kentucky CT: Jim Griffioen, Tony Elam,Vikram Gazula, Bushan Chitre
  - RMACC CT: Thomas Hauser, Shelley Knuth
  - SWEETER CT: Dhruva Chakravorty, Lisa Perez
  - TRECIS CT: Chris Simmons
  - Mines RC: Torey Battelle

Thank You and Stay in Touch…

- Please visit the MGHPCC booth!
  - Further discussion about Northeast Cyberteam, Ask.CI or the Connect.CI Portal
  - Hear talks about fascinating science happening at the MGHPCC institutions (Boston University, Harvard, MIT, Northeastern and UMass) enabled by computation and data resources housed at MGHPCC
  - Visit a Minecraft model of the MGHPCC universe

- Julie Ma, jma@mghpcc.org
- Northeast Cyberteam Portal - https://necyberteam.org
- Portal Pilot Partners - https://connect.cyberinfrastructure.org
- Ask.CI - Ask.CI https://ask.cyberinfrastructure.org or https://Ask.CI