Lightning Talks

May 30, 2024

#MSCCAnnualMeeting  #MSCCinDC
Our Speakers Today

- **Russell Hofmann**, MS-CC
- **Dana Brunson**, Campus Research Computing Consortium
- **Aimee Rullo**, Nokia
- **Jennifer Taylor**, Jetstream2
- **Michael Kowal**, Nile
- **Ewa Deelman**, CI Compass & ACCESS
- **Mike Zawaki**, Internet2
- **Miron Livny**, University of Wisconsin-Madison
- **Richard Knepper**, Cornell University
- **Scott McGregor**, Cisco
MS-CC CI Plan Community of Practice Materials and Resources from Year 1

Russell Hofmann, CI Facilitator, MS-CC
rhofmann@internet2.edu
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Draft Template for a NSF CI Plan


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Purpose and Goals

This document is an introduction to developing a Cyberinfrastructure Plan (CI Plan), usually in support of an NSF grant proposal. We describe the purpose of CI Plans, some approaches and examples, and present an annotated template for gathering the content elements you will need. We hope this will demystify the process and make you confident that this need not be a daunting task, and can be an easily-achievable first step in a strategic planning journey.

[Skip to the CI Plan Template]

Before you start

1. It is important to understand the difference between a CI Plan and a full Research and Education CI Plan or IT Strategic Plan. CI Plans are a relatively short document in support of a grant proposal, while Research and Education CI Plans and IT Strategic Plans are much more extensive documents with an associated greater investment to develop. Table 1 below summarizes some key differences.

Understanding and Leveraging Influences as you build a Campus CI Plan


https://youtu.be/sl3xa7lTJ3k
Faculty Engagement - Identifying Cross Campus CI Priorities

A brief walkthrough by Russell Hofmann

Purpose

This is intended to be a guide for engaging faculty with the general goal of understanding current cyberinfrastructure needs and usage, rather than for any targeted CI activity. To get a picture of cross-campus CI priorities, you are going to need to do more than one engagement, it can take between 10-30 individual meetings with faculty across various departments before you have clear CI priorities identified. This guide does not address individual faculty CI facilitation.

Potential Outcomes

- **Insight into Needs and Pain Points:** By engaging with faculty, you can gain valuable insight into the specific needs and challenges related to cyberinfrastructure, enabling targeted improvements and solutions.
- **Strategic Alignment:** Understanding faculty’s future goals allows organizations to align their cyberinfrastructure efforts with broader strategic objectives and academic priorities.
- **Facilitating Future Discourse:** These engagements also serve to open doors for ongoing discussions and collaborations to improve campus cyberinfrastructure.
- **Science driver identification:** If any faculty member is engaged in a research or education activity which would directly benefit from cyberinfrastructure improvements, they are a science driver.

CI Plan Community of Practice
Every 3rd Tuesday @ 2pm ET

Russell Hofmann
CI Facilitator, MS-CC
rhofmann@internet2.edu

CaRCC and RCD Nexus: Supporting excellence in research computing and data (RCD)

2024 MS-CC Annual Meeting
Thursday, May 30

Dana Brunson, Internet2
dbrunson@internet2.edu
What do we mean by “Research Computing and Data (RCD)”?

Efforts and programs (largely at colleges and universities, but also at regional networks, national labs, nonprofits, and companies) to provide the technologies, software, data management, security, outreach, and support required by today’s researchers and educators.
What is CaRCC?

CaRCC is an organization of RCD and related professionals working to empower institutional research. CaRCC helps institutional RCD programs be effective and efficient, thereby increasing potential for external research funding opportunities. CaRCC works to:

- Identify and share **best practices and guidelines**.
- Provide **tools and resources** to assess, benchmark, and improve institutional RCD programs.
- Offer **training and workshops** to improve the skills and knowledge of those working in RCD roles.

CaRCC works collaboratively with a number of organizations to serve the broader community.

CaRCC was founded and remains supported by grants from the National Science Foundation (NSF).
RCD Nexus

The CaRCC Resource and Career Center Tools, practices, and professional development resources to support individuals and institutions.

Funded by a $1.75M grant from the NSF (#2100003)

RCD Nexus offers:

- A more robust and sustainable implementation of the CaRCC Capabilities Model assessment tool and a new Community Dataset portal.
- Curated leading practices for staff and student professional development.
- An RCD Job Family Framework to support successful hiring and recruitment.
- An RCD Professional Staffing survey to aid in job satisfaction and employee retention.
- A Career Arcs resource for RCD professionals

rcd-nexus.org
CaRCC is an active, collaborative community

More than 1,600 People
Network members

Leaders and engaged participants representing numerous organizations
Growth of the CaRCC People Network (since 12/2018)
Why be involved with CaRCC?

Because your institution will gain:

- **A voice in defining the future and establishing best practices** for the RCD profession.
- **Access to free tools and resources** so you can provide high-quality technology and support for research on your campus.
- **Opportunities to collaborate** with other leaders who support faculty and research.
- **Access to free training, professional development**, and a strong RCD **professional network**.
CaRCC Interest and Working Groups

Security and Policy Groups
Cybersecurity Interest Group
HIPAA Challenges Interest Group

Institutional Excellence Groups
CaRCC Capabilities Model Working Group
EPSCoR Cyberinfrastructure (CI) Interest Group
Thanks!

Join the people-network at carcc.org

Link to online tool: rcd-nexus.org/tools/rcdcm/

Get help, ask questions: help@carcc.org
Extra slides
CaRCC People Network
CaRCC’s professional network. Offers a year-round virtual conference, with affinity-based tracks, email lists, and community-decided monthly call topics. Recordings are shared on YouTube.

Working and Interest Groups
Activities that connect RCD professionals and organizations around objectives and topics that advance the campus RCD and the profession.

Operations Groups
Ensure operational success by coordinating across the network and other groups, and executing project administration.
CaRCC People Network

An Ongoing Virtual/Remote Conference that supports CaRCC's mission by:

- Fostering, building, and growing an inclusive community of individuals
- Providing opportunities to leverage collective and individual expertise
- Making available resources/products
- Supporting Tracks (*Facings*) that may match one's multiple roles and interests

The first step to getting involved is joining the People Network ([carcc.org/people-network](http://carcc.org/people-network))

- Free membership subscribes you to our email list and you can opt-in to our Slack instance.
- Keeps you in the loop about CaRCC events, discussions, volunteer opportunities
Why is RCD important?

- Research and scholarship is now reliant on technology across most (if not all) disciplines.

- Research is more frequently conducted by widely dispersed communities that are sharing larger, more complex data sets and using more sophisticated tools.

- A rapidly increasing level knowledge and skill is required to make effective use of research computing and data infrastructure, services, support.

- For research that relies on technology, support from a highly skilled workforce is now required.

- This workforce is an emerging profession: The Research Computing and Data (RCD) professional community.

Without a strong RCD workforce, research stalls.
A relatively new, but fast-growing profession

CaRCC’s 2021 survey and related paper “Characterizing the US Research Computing and Data (RCD) Workforce” (Maimone, et al.) estimated there to be approximately 5,000 RCD professionals in the US at that time, with the great majority at colleges and universities.

CaRCC People Network membership has increased by 36% in the time since that paper was published, indicating continued growth in the profession.
Why is Advancing the RCD Profession Important?

- **Researchers and educators** struggle to take advantage of ever-evolving RCD technology.
  - They have no time to become technology experts
  - They rely heavily on RCD professionals for tech services, support and facilitation.

- **Institutions** need support and guidance.
  - To boot-strap, grow, and sustain their programs
  - To explain to leadership how RCD is critical to research
  - To recruit, retain, and develop RCD professional staff

- **RCD professionals** are clamoring for a shared voice.
  - To advocate for the profession
  - For broader understanding of their roles
  - For training, mentoring, and professional development resources
At Nokia, we create technology that helps the world act together.

When the world’s people, machines and devices are in sync with each other, we can realize the full potential of digital:

- Sustainable business growth
- Productivity in industry
- Inclusive digital access
Why Nokia?
Technology Innovator, market leader

- Wire-speed performance – FlexPath custom silicon
- Portfolio breath and depth – optimized for customer use-cases
- Software quality – Nokia approach is unique in the industry
- Secure – DoS/DDoS mitigation, quantum resistant encryption
- Automation – Netconf/yang/gNMI, python, modular NSP automation
- IP/Optical integration – coherent routing, multi-domain automation
- Supply chain – has become a big differentiator

Wide Acceptance - Industry Verticals Served

1.6M+ Routers shipped to date
#1 in IP Edge Routing globally
1400+ CSP & Cloud Provider customers
1000+ Industry & public sector customers

1000+ Industry & public sector customers
1400+ CSP & Cloud Provider customers
1.6M+ Routers shipped to date

Internal

© 2024 Nokia

#1 in IP Edge Routing globally
Our technology innovation is pioneering the future where networks meet cloud technology.

Game-changing research
Researching the future of networks and industrial automation to fuel our future portfolio through Nokia Bell Labs, our industrial research arm.

Transformative impact
for Nokia business groups and customers that creates sustainable growth

Standards and patents
Defining global standards on cellular, multimedia, device, network, spectrum regulation and ESG, and leading in IP development with over 20,000 patent families.

Industry ecosystems and partnerships
Building rich global ecosystems with our customers and partners and sharing expertise to drive development of future technology.

Incubation and ventures
Driving non-linear growth by incubating Nokia ventures and investing in innovative growth-stage companies through NGP Capital, our venture capital fund.
## 1. Discovery
Powering scientific research, and collaboration

- Essential for the advancement of knowledge and country/regional development, economic growth & prosperity
- National/regional/global research & education networks (NREN) are extremely demanding (speed, capacity, security)
- Connecting universities, government labs, experimental labs and clouds with high-speed IP/Optical and DC networking

## 2. Education
Making schools and higher education campuses smarter

- Serving students, staff and academics
- Smart classrooms & apps
- 5G/4.0 living labs
- Campus operations/security/communications
- Campus e-services (billboards, ticketing, food ordering/delivery, transportation)
- Broadband access for student homes/dormitories

## 3. Broadband Access
Bridging the digital divide

- COVID-19 has widened the digital divide and has accelerated home/remote learning
- Need for affordable broadband access at home and at school
- Government funding creates opportunities for local communities and school districts
- Communication technology enables solutions
CLOUD COMPUTING FOR EVERYONE

Jennifer Taylor
Education, Outreach, and Training for Jetstream2
Research Cloud Services at Indiana University

MS-CC Annual Meeting | May 30, 2024
Jetstream2 is a flexible, user-friendly cloud computing environment designed for everyone from researchers with minimal high-performance computing experience to software engineers looking for the latest in cloud-native approaches.

Jetstream2 is available to any US-based researcher or educator at no cost through support from the National Science Foundation (NSF)'s Advanced Cyberinfrastructure Coordination Ecosystem: Services & Support (ACCESS) program.
WHO IS JETSTREAM2?
WHY USE JETSTREAM2?

• **On-demand resources**, no queues or runtime limits
• **Create your own virtual machines** from a variety of sizes
  • CPU, GPU, Large Memory available; 1TB storage by default
• **Interactive computing environment** with graphical desktop
  • Great for users who are less familiar with command line
• **Full admin access** to install software and use instances how you want
• **Software collection** includes R/R Studio, Anaconda, Jupyter, Matlab, and more
• **Full internet access with persistent IPs**, ideal for web hosting or gateways
• **Resources are available at no cost** thanks to our support from the NSF
All use of Jetstream2 resources begins with ACCESS!

1. **Register** for an ACCESS ID.
   • You’ll use this to apply for and log in to your resources

2. **Apply** for an allocation (like a small grant)
   • Any educator or researcher at a U.S.-based academic or non-profit research institution can apply. Graduate students, too!

3. **Receive** allocation credits to “spend” on computing resources such as Jetstream2

4. **Log in** to Jetstream2 and launch your first virtual machine!
Education
  • Give students access to powerful computing and tools
  • Individual virtual machines for training and analysis

Software & application development
  • Write, debug, and execute code
  • Use GPUs to develop, train, and refine machine learning models

Sharing data
  • Science gateways and application portals
  • File servers, databases, websites
Get started with Jetstream2

Jetstream2 is a flexible, user-friendly cloud computing environment available to US-based researchers and educators at no cost through support from the National Science Foundation's Advanced Cyberinfrastructure Coordination Ecosystem: Services & Support (ACCESS) program. **Follow the steps below to get started!**

1. **Create your account.**
   As a resource provider for the NSF’s ACCESS program, Jetstream2 users must first register for an ACCESS ID. You'll then use this ID to apply for your allocation, distribute credits, manage your project members, and log in to Jetstream2.

   [Register for your ACCESS ID](#)

2. **Request an allocation.**
   Once you’ve created an ACCESS ID, enroll in our Jetstream2 Trial Allocation program to get familiar with the environment. Once you're ready, you can apply for your own allocation and receive credits toward Jetstream2 resources.

   [Learn about allocations](#)

3. **Get started.**
   When you have your ACCESS ID and an allocation, it’s time to become a Jetstream2 user! Our Getting Started Guide contains step-by-step instructions on accessing your resources, creating your first instance, and more.

   [Start using Jetstream2](#)
Thank you!

help@jetstream-cloud.org

Jennifer Taylor, jlrobiso@iu.edu
Secure Networks for the 21st Century

Reclaim time, reduce institutional risk, and redirect capital expense

nilesecure.com

nile
More than a century ago...
Why Not Networking?
What does Consuming Networks from a Network Utility Look Like for HBCUs and TCUs?

NO

Switches
NAC
VLANs
Licensing
TAC Cases
Day-long Deployments
Malware proliferation
Compatibility Matrices
Coverage Holes
What does Consuming Networks from a Network Utility Look Like for HBCUs and TCUs?

- TCO goes way down
- Performance goes way up
- Reliability soars
- Security becomes embedded
- Upskill Workforce: from maintenance to innovation
“The ability to simplify means to eliminate the unnecessary, so that the necessary may speak.”
—Hans Hofman
A U.S. National Science Foundation (NSF) Cyberinfrastructure (CI) Center of Excellence for Navigating the Major Facilities Data Lifecycle

Ewa Deelman
CI Compass, PI
Information Sciences Institute
University of Southern California

MS-CC Annual Meeting 5/30/24
What is CI Compass?

Mission

CI Compass provides expertise and active support to cyberinfrastructure practitioners at U.S. NSF Major Facilities (MF) to accelerate the data lifecycle and ensure the integrity and effectiveness of the cyberinfrastructure upon which research and discovery depend.

Activities

Engagements
- Workshops
  - MF CI & Topical
  - Student Program
    - CICF
  - Other
    - Webinars, surveys, reports
  - Internal
    - Planning, project mgmt

Topical Working Groups
- FAIR Data TWG
- Cloud Computing TWG

Team of Experts dedicated to the advancement of cyberinfrastructure for science, engineering, and education.
CI Compass Fellowship Program (CICF)

Goal: Broaden student participation in CI research, development, deployment, and operations

Virtual Spring Program
- Free to undergraduate students. Possibility of course credit.
- Technical Skills Component: Students are taught technical skills relevant to CI.
- Data Lifecycle Component: Students research MFs and the data lifecycle to understand the importance and context of MFs, and the related data and CI. They present their results at the end of the Spring Program.

(Optional/Invited) Summer Program
- We collaborate with MFs to provide CI-related summer projects for some of our student fellows.
- In-person or virtual, depending on the MF/project.
- Students are paid for their participation.

CI Compass Student Fellows Edward Lin, Mahee Shah, and Raja Allmdar Tariq Ali stand together in Boulder, Colorado, where they spent Summer 2023 working with the National Center for Atmospheric Research (NCAR).
**CICF curriculum**

- We meet with the students for an hour on Tuesdays and Thursdays, with office hours immediately following class time.
- Students also watch a ~1hr pre-recorded Technical Skills lecture before the following Technical Skills lab (i.e. flipped classroom)
- Students do a group project researching the CI and data lifecycle of one MF and present their work at the end of Spring.
- Below is the Syllabus for the 2024 Spring Program. The Technical Skills Component is highlighted in blue, and the Data Lifecycle Component is highlighted in green.

<table>
<thead>
<tr>
<th>Week</th>
<th>Tuesday</th>
<th>Thursday</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Major Facilities, Cyberinfrastructure, and the Data Life Cycle</td>
<td>Command Line</td>
</tr>
<tr>
<td>2</td>
<td>Overview of scientific computing</td>
<td>Guest Speaker from TACC</td>
</tr>
<tr>
<td>3</td>
<td>Scientific computing, Python, Jupyter, Python Data Analysis Packages</td>
<td>FAIR Data</td>
</tr>
<tr>
<td>4</td>
<td>Best Practices in Software Development, Part 1</td>
<td>Guest Speaker from MagLab</td>
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<tr>
<td>5</td>
<td>Best Practices in Software Development, Part 2</td>
<td>MF/DLC Research Project Group Work</td>
</tr>
<tr>
<td>6</td>
<td>Cloud Computing, Part 1</td>
<td>Guest Speaker from ORCID</td>
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<tr>
<td>7</td>
<td>Cloud Computing, Part 2</td>
<td>MF/DLC Research Project Group Work</td>
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<tr>
<td>8</td>
<td>Spring Break</td>
<td>Spring Break</td>
</tr>
<tr>
<td>9</td>
<td>Software Architecture and Systems; Digital Archives</td>
<td>Guest Speakers from OOI and NEON</td>
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<tr>
<td>10</td>
<td>Data Workflows</td>
<td>Professional Skills, Networking</td>
</tr>
<tr>
<td>11</td>
<td>Machine Learning (Classical)</td>
<td>Neural Networks</td>
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<tr>
<td>12</td>
<td>Research Project Group Presentation Day 1</td>
<td>Research Project Group Presentations Day 2</td>
</tr>
</tbody>
</table>
CICF impact

Testimonials from Student Fellows

"I didn't know anything about scientific computing, cyberinfrastructure, or Major Facilities before the program. The fellowship introduced me to these and made me curious about how to potentially have a career in scientific computing or cyberinfrastructure and I am more open to working at a Major Facility."

"I was not at all interested by undergraduate research or a graduate degree before starting. I am now researching potential research opportunities in my field and am now interested in learning more about what earning a graduate degree would entail and how it could benefit my future and ability to make an impact."

Before I was very nervous and overwhelmed because it didn't really feel like I was meant to pursue research or further schooling. Now, I feel confident in my ability to become a scientist/academic and have a detailed plan on how I can take next steps towards that goal. Without this program, I would likely still be in a nervous/overwhelmed/paralyzed state and would never independently have learned as much as I did this Spring.

<table>
<thead>
<tr>
<th>Institution (17 schools from 11 states)</th>
<th>State</th>
</tr>
</thead>
<tbody>
<tr>
<td>California Polytechnic State University, San Luis Obispo</td>
<td>CA</td>
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<tr>
<td>Merced College</td>
<td>CA</td>
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<tr>
<td>UC Riverside</td>
<td>CA</td>
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<tr>
<td>University of California Merced</td>
<td>CA</td>
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<tr>
<td>University of California, Berkeley</td>
<td>CA</td>
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<tr>
<td>Ball State University</td>
<td>IN</td>
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<tr>
<td>University of Notre Dame</td>
<td>IN</td>
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<tr>
<td>Carroll College</td>
<td>MT</td>
</tr>
<tr>
<td>University of North Carolina at Chapel Hill (3 students)</td>
<td>NC</td>
</tr>
<tr>
<td>New Jersey Institute of Technology</td>
<td>NJ</td>
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<tr>
<td>Eastern New Mexico University</td>
<td>NM</td>
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<tr>
<td>Brooklyn College</td>
<td>NY</td>
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<tr>
<td>Rochester Institute of Technology (2 students)</td>
<td>NY</td>
</tr>
<tr>
<td>The Ohio State University</td>
<td>OH</td>
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<tr>
<td>University of Oklahoma Norman</td>
<td>OK</td>
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<tr>
<td>Villanova University</td>
<td>PA</td>
</tr>
<tr>
<td>Texas Tech University</td>
<td>TX</td>
</tr>
</tbody>
</table>
Want to get involved?

• Help us spread the word to interested undergraduate students!

• We are currently recruiting Faculty Mentors

**During Fall Semester**
- Help recruit Student Fellows
- (Applications open mid-September)

**During Spring Semester**
- Provide course credit or auditing options for students (institutional requirements permitting)
- Hold periodic meetings with mentees and CI Compass

Faculty mentors will receive a stipend for their time and support from the CI Compass team

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Connect with us!

Website: [www.ci-compass.org](http://www.ci-compass.org)

Email: cicf@ci-compass.org

X (formally Twitter): [@CiCompass](https://twitter.com/CiCompass)

LinkedIn: [linkedin.com/company/ci-compass](https://www.linkedin.com/company/ci-compass)

YouTube: [@cicompass](https://www.youtube.com/cicompass)
ACCESS

Ewa Deelman, University of Southern California

Co-PI on ACCESS Support

Leading Workflow Tools
Providing equitable, scalable support to best enable research on NSF-funded cyberinfrastructure

Established to help researchers and educators, with or without supporting grants, to utilize the nation’s advanced computing systems and services – **at no cost**.

**Single entry point for over 20 compute, cloud, storage, and networking systems**

- Not just for traditional high-performance computing (HPC)
- Education
- Machine learning and data science
- Science gateways building
- Software development

Includes CI Professionals & support tools
Getting an account
You may use an existing University account to register or get a new one.

Getting an allocation
ACCESS allocations are available to any researcher or educator at a U.S. academic, non-profit research, or educational institutions
- Computing systems: Varying core counts & memory sizes
- Accelerators: GPUs, vector processors, FPGAs
- Data storage systems: Archival, object, tiered
- Data repositories
- Software & workflow managers
- High performance networking
- System performance monitoring
ACCESS  https://access-ci.org/

Getting help

- Traditional documentation
- Ticket system
- Training
- Support via a community driven question/answer system at ask.CI,
- Affinity groups around many topics.
- The MATCH services connects researchers with consultants, mentors, and student.
- Tools:

OnDemand

Web portal to allow researchers to submit jobs and transfer data
ACCESS Pegasus

- Hosted workflow management system
- Manage multiple tasks (also dependencies) via Jupyter Notebooks
- Don’t need an allocation to get started
- Workflow can run on one resource or across them

- Domain application examples
- Weekly office hours
- User affinity group with Slack channel
MATCH Services

ACCESS MATCH Services connects researchers with consultants, mentors, and students to help solve their research problems.

Get Additional Help

MATCH Plus
- Help from a student/mentor team
- 3-6 month engagement
- Free

We will match you with a support team based on your needs. Solve research needs like expanding code, transitioning from lab computers to HPC, or introducing new technologies.

REQUEST AN ENGAGEMENT
For more information:
alana.romanella@colorado.edu

Contribute Your Expertise

THE CSSN
Computational Science Support Network
Be an active part of the ACCESS research support community.
Join the CSSN, our community is stronger and smarter with every new member.

Curate your Community Persona
Contribute to the Knowledge Base
Participate in MATCH Engagements
Apply for CCEP Travel Rewards
Get invites to special events

Affinity Groups
Join groups within ACCESS with common interests for discussion and the best links to communications, events, and documentation.
Add to the discussions and start new groups to develop topics of interest. ACCESS Resource Provider Affinity Groups receive up to the minute information about the associated resources including downtime, training events, new applications and features.

ALL GROUPS

Apply for Travel Grants for Contributions
eduroam in 5 minutes
(maybe even fewer than 5)

Mike Zawacki - Internet2
mzawacki@internet2.edu
What is it?

- Federated authentication service for global wireless access for the research and education community
- Invented by and for the R&E community in the EU, now a global community available in over 100 countries - Internet2 operates eduroam in the US.
- Participating institutions provide access to their wireless networks to users from other eduroam connected institutions.
- Users are authenticated by their home institutions.
What is it?

- Over 1,400 subscribers
- 3,300+ service locations in the US
  - 2nd highest number in the world!
- Growing deployments in K12s, libraries, and museums
Who's it for?

- Higher Education *(from R1s to community colleges, tech schools, etc!)*
- Research organizations
- K12s (through partnerships with state education networks)
- Institutions and companies that want to make it easier for all the above to visit them
Who's it for?

- People who learn
- People who educate
- Entities that support learners and educators
How does it help us?

- Simplify network access, reduces support burden for IT staff
- Offers more security for both users and participating institutions compared to guest networks (especially wide open guest networks)
- Professional development/conferences
- Traveling activities - STEM competitions, athletics, debate teams
- Dual enrollment students, continuing education for teachers/staff
- Providing an additional layer of security for all users, especially underserved students who rely on publicly available wifi
What do you need to use it?

- A connection to the internet (through any provider!)
- Enterprise wireless environment
- A RADIUS server (Microsoft NPS, Aruba Clearpass, Cisco ISE, FreeRADIUS, many other flavors)
- All new eduroam subscribers have 5 hours of consultation time included with the service
Where can I learn more?

Today:

State Ballroom social hour 5pm - 6pm!
Where can I learn more?

Eduroam US website
incommon.org/eduroam

Eduroam US knowledgebase
tiny.cc/eduroamKB

mzawacki@internet2.edu
Join us for Open Capacity!

Miron Livny
Vilas Research Professor
John P. Morgridge Professor of Computer Science
Director UW Center for High Throughput Computing
Technical Director of the OSG
Open means Fair-Share

• No proposals
• No allocations by a committee
• No fees or budgets
We believe that Open Capacity can advance the science of campus researchers who have computational workloads that consist of a list of jobs

• Extract a feature from each of these images!
• Run an inference on each of these documents!
• Perform a simulation for each of these parameters!
• Train a model with each of these settings!
• Compare each of these pairs of genes!
Become a consumer and/or a provider of Open Capacity

• **Register** as an Open Science Pool (OSPool) user and place your workload at an OSG operated Access Point (AP)

• **Contribute** computing capacity to the OSPool (powered by the HTCondor Software Suite)

• **Federate** your data sets in the Open Science Data Federation (OSDF) (powered by the Pelican Platform).
The Open Science Pool (OSPool) is an OSG service that federates open computing capacity contributions in support of Throughput Computing workloads.
OSPool: Serving Open Science throughput computing

On May 28

375K jobs completed

Placed by 45 researchers
Triggering 4M file transfers
Consuming 932K core hours

View active OSPool Projects
In 12-month open capacity offered by 54 institutions at 86 sites completed

› 190M jobs placed by
› 485 researchers from
› 215 projects from
› 95 institutions that triggered
› 5.1B file transfers

✔ 5.7 jobs completions per second
✔ 164.9 file transfers per second
OSP\textsuperscript{2} Pool Active Projects \textbf{112}

Data updated: 4/20/2024, 2:48:13 PM

The below projects used OSP\textsuperscript{2} Pool resources to advance their research in the past year and ran more than 100 jobs. To run your own research on the OSP\textsuperscript{2} Pool sign up now on the OSG Portal.
We also work 1-1 on projects with:

• Southwestern Indian Polytechnic Institute (SIPI) – capacity for GIS courses

• Salish Kootenai College (SKC) – capacity of a Jupyter Hub (SKCHub)
https://path-cc.io/contact/

Contact

PATH is a unique partnership between the Center for High Throughput Computing (CHTC) and the OSG Consortium.

- For enquiries about the PATH project, please contact the PATH leadership.
- For help with CHTC technologies such as the HTCondor Software Suite (HTCSS), contact chtc@cs.wisc.edu.
- Campuses interested in providing resources to the Open Science Pool (OSPool) can contact support@osg-htc.org
- Users interested in using an Access Point to leverage resource like the OSPool can contact support@osgconnect.net
- PIs interested in getting credit accounts on PATH-managed hardware should visit the dedicated page.

This work is supported by the National Science Foundation under Cooperative Agreements OAC-2030508, OAC-2331480. Any opinions, findings, conclusions or recommendations expressed in this material are those of the authors and do not necessarily reflect the views of the National Science Foundation.
<table>
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<tr>
<th>Project</th>
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</table>
January 2024
First deployment of HTCondor VMs in online GIS course

- Introduction to GIS (ArcGIS Pro)
- 11 VMs in use (13 available)
- Windows desktop interface

**Key Insights:**
- Successful!
- Positive feedback—superior performance
- Local access to broadband remains limiting factor
Feedback from
Introduction to GIS course

Positive Results
• Remote desktop interface makes accessing the system easy
• Access via multiple Operating Systems
• VMs are sufficiently robust for all geospatial analysis capabilities
• VMs allow instructor and student to be on the same machine for teaching and troubleshooting
• Instructor can view desktop of individual student's machine

Ongoing Issue
• Broadband access remains problematic in rural areas.
Lessons Learned

• Cloud-based VMs can be effective for GIS
• Student access to broadband is limiting factor
• Commercial services are problematic
  • Expensive $$$ (Citrix, eLumin)
  • Poor customer service 😞 (Citrix)
• TCUs need a low-cost solution
I-WRF: Containerized Framework for Weather Modeling, Verification, and Visualization

Rich Knepper, CAC Director
rich.knepper@cornell.edu
607-255-0313
www.cac.cornell.edu
WRF Software

- WRF is weather modeling software with a broad range of applications
  - Weather prediction, climate modeling
  - Simulation of events based on characteristics such as land use or cover
  - Chemistry, wildfire, renewable energy generation
  - Validation and visualization tools for verifying and seeing results
- In development since 2000, with a user base of more than 30,000
- Deployment across a wide range of HPC systems, so much as to be included in benchmark suites
WRF Challenges

• Despite this, around 50% of users attending tutorials at NCAR report difficulty configuring the software for use
• Compiling WRF software requires understanding multiple compiler frameworks, a wide range of WRF configuration options
• Output from WRF is not immediate ingestible by verification and visualization tools

• These technical barriers mean that potential researchers and scholars run into hurdles before they can even get to the weather and climate stuff

Stanczyk, Jan Matejko, 1862. Wikimedia commons
I-WRF Goals

Application containers support simplicity, portability, and scalability
- Run on a wide range of systems without installation/configuration issues
- Include data management and interoperability with validation and visualization tools
- Allow for large-scale problems with multi-node processing

Another goal is to bring more researchers into Atmospheric Science
- I-WRF allows a user to try WRF without dealing with installing and compiling software
- Model weather on your laptop, in the cloud, or on an HPC resource
Supporting broader engagement in Atmospheric Science

• Users can run sample WRF simulations on a laptop or free cloud resource
• Sample simulation is an event used for NCAR tutorials: 2016 Hurricane Matthew event

• Making the WRF software easier to run - and relevant to
• Increasing recruitment into Atmospheric Sciences
• Building a pipeline of researchers into the discipline
• Bridging the diversity gap in weather and climate research
I-WRF details


- Overview website: https://i-wrf.org


- Github site: https://github.com/NCAR/i-wrf

- Help through help@cac.cornell.edu
This presentation available at the MS-CC annual meeting site and at https://docs.google.com/presentation/d/16wb9V-K9mOjQLQg1QQLdtTBzu3NjlXvY
Cisco and Social Justice – A Primer

Scott McGregor
Director, Social Justice
5/29/2024
It is more than a slogan…

We’re committed to Powering an Inclusive Future for All

See our 12 Social Justice Actions

…it is our business strategy.
# Social Justice Actions: Core Strategies Internally- and Externally-Facing

<table>
<thead>
<tr>
<th>Action 1</th>
<th>Cisco will influence our ecosystem to support policy, legislation and organizations working to ensure equal rights for AA / Black people in 2020 and beyond.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Action 2</td>
<td>Cisco will increase the representation of AA/Black employees at all levels of the company.</td>
</tr>
<tr>
<td>Action 3</td>
<td>Cisco will expand our pay parity program to include additional forms of compensation and promotion practices to ensure fairness for all employees.</td>
</tr>
<tr>
<td>Action 4</td>
<td>Cisco will focus on increasing the diversity of its Board Members.</td>
</tr>
<tr>
<td>Action 5</td>
<td>Cisco will deliver anti-discrimination education for our workforce and will make content available to all partners and suppliers by 2022.</td>
</tr>
<tr>
<td>Action 6</td>
<td>Cisco will enable leaders to get proximate to AA/B employees and Cisco Networking Academy students to create a culture of sponsorship and drive adoption of The Multiplier Effect by partners and suppliers by 2022.</td>
</tr>
<tr>
<td>Action 7</td>
<td>Cisco will require preferred suppliers in 2021 to report annually on the full spectrum diversity of their US workforce provided to Cisco.</td>
</tr>
<tr>
<td>Action 8</td>
<td>Cisco will commit to the strategic recovery, sustainability and legacy of HBCUs, post-COVID &amp; beyond.</td>
</tr>
<tr>
<td>Action 9</td>
<td>Cisco will provide access to capital, education and customers for AA/Black-owned financing companies.</td>
</tr>
<tr>
<td>Action 10</td>
<td>Cisco will commit $50M over 5 years to increase the diversity in our partner ecosystem.</td>
</tr>
<tr>
<td>Action 11</td>
<td>Cisco will invest $50M in innovation through incubation and venture capital.</td>
</tr>
<tr>
<td>Action 12</td>
<td>Cisco will ensure technology solutions and day-to-day operations maximize human rights benefits, mitigate potential human rights harms, and respect ethical principles.</td>
</tr>
</tbody>
</table>
Cisco will commit to the strategic recovery, sustainability and legacy of HBCUs, post-COVID & beyond.

### Social Justice Action 8: Commit to HBCUs

*in partnership with the Student Freedom Initiative*

<table>
<thead>
<tr>
<th>Action Strategy</th>
<th>Activities</th>
<th>Impact</th>
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</thead>
<tbody>
<tr>
<td>1 Finance education for STEM students in need</td>
<td>Establish an “Access to Education” endowment for 4-year HBCU students majoring in STEM $10M/annually over 5 years for juniors and seniors</td>
<td>500 students in perpetuity</td>
</tr>
<tr>
<td>2 Reinforce institutional excellence</td>
<td>Support technology modernization at 4-year HBCUs by donating Cisco product technology and driving full adoption Support all HBCUs in achieving NIST compliance in their IT infrastructure</td>
<td>100% of HBCUs receiving NIST compliance assessment and supporting technology</td>
</tr>
<tr>
<td>3 Promote student success beyond graduation</td>
<td>Expand NetAcad relationships, including free instructor training, for all HBCUs Support recruitment and training for 40 instructors in career aligned courses for classes starting Spring 2022 Provide insights into hiring trends and needs to support professional opportunities for students</td>
<td>100% of HBCUs have the opportunity to deploy a NetAcad</td>
</tr>
<tr>
<td>4 Inform and engage Cisco employees and external communities</td>
<td>Build an impact dashboard to track company-wide engagement with HBCUs Create HBCU Advisory Board Create a learning pathway for legacy of HBCUs Develop internal and external communications plan</td>
<td>Cisco’s efforts inspire other partners, employees, and customers to join us in creating an impact for HBCUs</td>
</tr>
</tbody>
</table>
Cisco will commit to the strategic recovery, sustainability and legacy of HBCUs, post-COVID & beyond. Our Inclusive Future Action Office has partnered with the Student Freedom Initiative and multiple technology partners to deliver financial aid, cybersecurity expertise, in addition to networking and educational opportunities.
We need your insights!

Please take a few moments to take this quick poll about the Lightning Talks

Social Hour with Lightning Talks Discussion

May 30, 2024
We need your insights!

Please take a few moments to take the AI Survey

Please take a few moments to provide your thoughts on MS-CC Activities

Please take a few moments to take this quick poll about CI