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How Can We Advance the RCD Profession?

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Research Computing and Data (RCD)

What does Research Computing and Data Mean to You?

How many here are familiar with the term RCD Professional or CI Professional?

Who in the room works in/with IT?

Who in the room is a researcher?

Who in the room has worked directly with researchers?

Who in the room considers themselves an RCD Professional?

Who in the room is a CIO or similar? Who is a VPR/VCR, Dean ADR?

Where does the RCD Group live? (under the CIO?, VPR/VCR etc., Other?)

Who in the room has heard of CaRCC? CASC? US-RSE? The Carpentries?

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What is Research Computing and Data?

Research Computing and Data* (RCD) is one of the terms, along with Cyberinfrastructure (CI) and *Research IT*, used to describe the compute, storage, networking, physical systems, software, security, support infrastructure, **and people** used to enable digital scholarship though training, services, collaboration, co-discovery, co-creation, and more!

** "Research computing and data" involves people, scholarship, and resources supporting the IT specific to research and scholarship leveraging compute, data, networking, and software, broadly defined, including the professionals who execute and support these efforts. Whereas entities supporting research computing and data historically emerged from operating and supporting high performance computing, the needs, capabilities and technologies have sufficiently broadened the scope of research information technology to include virtualization, support for the cloud, containers, middleware, workflows, data management, data movement, compliance and security, user training, support of instruction using advanced research computing and data, on-boarding into new technologies, and deep engagement ("facilitation") to help guide researchers. https://carcc.org/about/*

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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.

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Why is Advancing the RCD Profession Important?

Researchers 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.

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Who is an RCD Professional?

Live in the uncanny valley between “staff” and “academic” camps.

Often (but not always) will work in a “Research IT” group.

Associated with the terms co-discovery and co-creation.

Wears many hats. In addition to “researcher,” “librarian,” and “IT Staff” we have many facings

- Systems Facing (HPC Sysadmin)
- Researcher Facing (Facilitator)
- Software Facing (including Research Software Engineers - https://us-rse.org)
- Data Facing (includes many in the Libraries)
- Policy and Strategy Facing (RCD Director)

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CaRCC

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Advancing the Profession – CaRCC

The Campus Research Computing Consortium (https://carcc.org) has emerged as the recognized community and resource for the emerging profession.

Supported by individual volunteers, grants (NSF RCN award OAC-1620695, NSF CI CoE pilot award NSF-2100003 and others), in kind contributions, and organizations including Internet2.

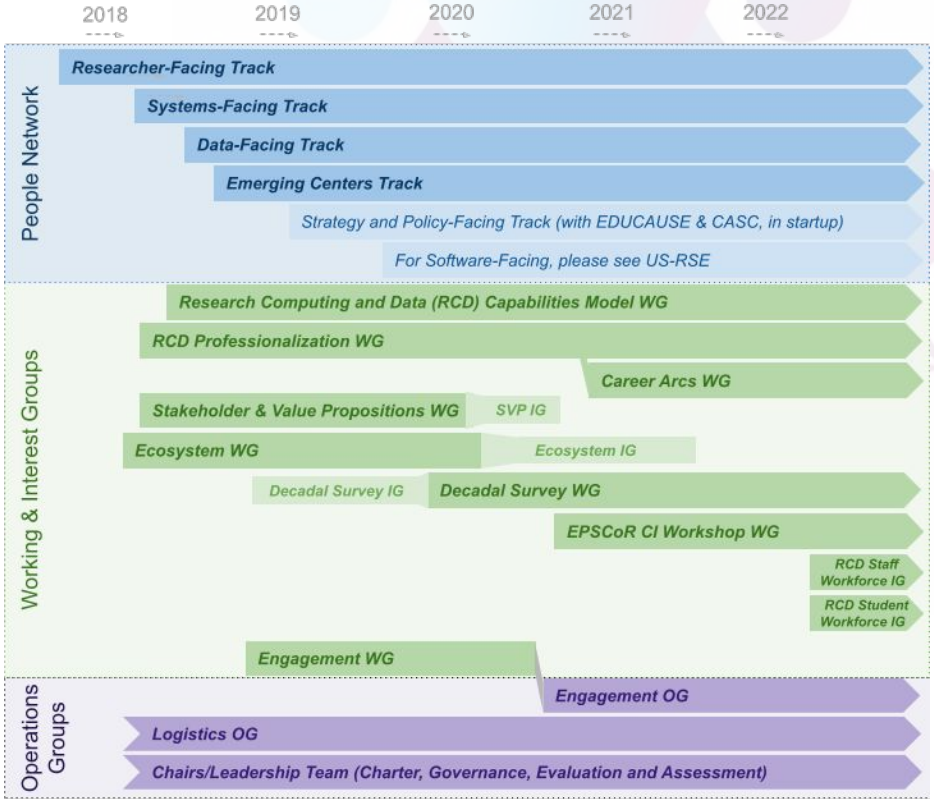
Campus Research Computing Consortium

An organization of dedicated professionals developing, advocating for, and advancing campus ***research computing and data (RCD)*** and associated professions, including **career development and visibility**, and the ability of RCD professionals to **deliver services & resources for researchers**.

People Network - Year-round virtual conference, with affinity-based tracks, email lists, and community-decided monthly call topics (recorded to YouTube).

Working and Interest Groups - activities that connect RCD professionals & organizations around objectives and topics that advance the campus RCD and the profession

Operational Groups - ensure operational success by coordinating across the network and other groups, and executing project administration



CaRCC Activities and Relative Timeline

https://carcc.org/working-groups/
https://carcc.org/how-to-join/

Who is CaRCC?

CaRCC
Campus Research Computing Consortium

Many contributors

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Venice Bayrd, Montana State University
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Tara Borland, University of Alaska
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Jason Wells, Bentley University
Karen Wetzel, EDUCAUSE
Jim Wilgenbusch, University of Minnesota
Scott Yockel, Harvard University
Nuyun Zhang, Georgia Institute of Technology
Anita Orendt, University of Utah

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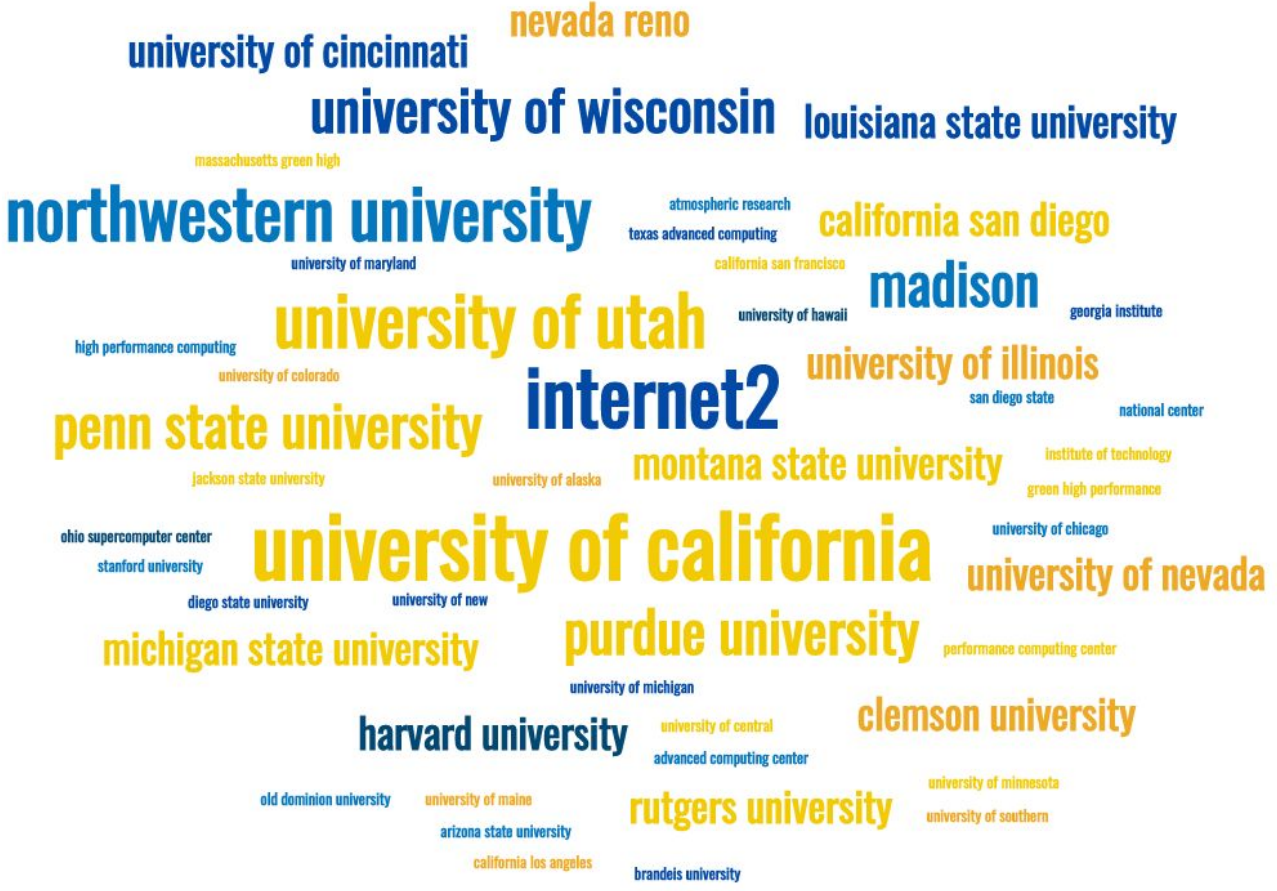
… from many institutions



CaRCC
Campus Research Computing Consortium

CaRCC's People Network = *Inclusive Community*

An ongoing "remote conference" to share/leverage expertise in various facings (Tracks)

Data-Facing:
Analysis, curation, preservation, compliance, movement

Emerging-Centers:
Newer or emerging RCD service leaders & programs

Researcher-Facing:
Consulting, bridging, facilitation, outreach, training

Systems-Facing:
Hardware, networks, security, compliance, data centers

Software-Facing:
Develop or contribute to research software, scripts, workflows

Strategy/Policy-Facing:
Institutional alignment, culture, funding, policy, community

CaRCC
Campus Research Computing Consortium

Co-Coordinators: *Lauren Michael, UW-Madison*
Bob Freeman, Harvard Business School

RCD Professionalization Timeline

CaRCC
Campus Research Computing Consortium

RCD Nexus
The CaRCC Resource and Career Center

2016

RCN Meetings

RC Directors and Organizational Sociologist deliberate on the "CI Profession"

2017

Facings term introduced

To describe "who" the CI professionals are, we described what entity the staff faced on a regular basis: researchers, systems, software, data, strategy & policy)

2018

CI Professionalization Workshop

30 Institutions gathered to create the Job Elements and Career Guide, validating the "-facings" concept, outlining their roles/responibilities.

2019

HR Job Family Matrix

6 RCD & 2 HR professionals met over 6 weeks and create a HR framework template with a unique RCD job family to be used by any institution.

2020

RCD Workforce Survey

8 professionals met over 5 months and crafted a national survey, which created the first large data set on the composition of the RCD workforce, a resource useful for individuals & hiring managers.

2021

Career Arcs

15 professionals created RCD Career Arcs survey

2022

RCD Workforce & Career Arcs Publications

Career Arcs interviews launched

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Challenges for the RCD Profession

- Individuals do not understand RCD *as a career*
  - No formal career path structure
  - Little awareness of career potential
- RCD groups struggle to recruit and retain staff
  - Where to find people?
  - How to train and develop them?
  - How to ensure RCD profession matches broader workforce diversity?
  - How to compensate and promote them?
- Occupational distinction from
  - IT (i.e. Administrative/Enterprise IT)
  - Researchers in other disciplines

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Staff & Student Professional Development

Building on the good work already happening, addressing current need, and looking to the future

- Supporting current RCD Professionals
- For Students and About Students
- For Institutions

CaRCC
Campus Research Computing Consortium

Staff & Student Professional Development

Building on the good work already happening, addressing current need, and looking to the future

- Supporting RCD Professionals
  - Those doing the job now who need support
  - Building on the community developed in CaRCC and elsewhere
  - Wanting career development
  - And, those who want to become an RCD professional
- Under the CaRCC framework
  - Staff Workforce Development Interest Group
  - Student Workforce Development Interest Group
  - Future
    - Workgroups grown out of the Interest Groups discussions

CaRCC
Campus Research Computing Consortium

CaRCC Advisory Committee

Thanks to our new AC members for their support of CaRCC!!

Amy Neeser (UC Berkeley)
Ann Kovalchick (UC Merced)
Dan Stanzione (TACC/UT Austin)
Erik Lundberg (U Washington)
Jackie Milhans* (Northwestern)
Linda Akli (SURA/XSEDE)
Ana Hunsinger (Internet2)
Ashley Stauffer (Penn State University)
Danielle Cooper (Ithaka S&R)
Henry Neeman (University of Oklahoma)
Jim Bottum*
Susan Mehringer (Cornell University)

**co-chairs*

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Campus Research Computing Consortium

Other Acknowledgements:

Portions of this material are based upon work supported by the National Science Foundation under the following grants:

Grant No. OAC-1440783, “A Model for Advanced Cyberinfrastructure Research and Education Facilitators”

Grant No. OAC-1548562, “XSEDE 2.0: Integrating, Enabling and Enhancing National Cyberinfrastructure with Expanding Community Involvement”

Grant No. OAC-1620695, “RCN: Advancing Research and Education Through a National Network of Campus Cyberinfrastructure, Infrastructures – The CaRC Consortium”

Grant No. OAC-2036534, “Building the research innovation workforce: a workshop to identify new insights and directions to advance the research computing community.”

Grant No. OIA-2033483, “Building Research Cyberinfrastructure in EPSCoR Jurisdictions: Assessment, Planning and Partnerships”

Grant No. OAC-2100003, “CI CoE: Demo Pilot: Advancing Research Computing and Data: Strategic Tools, Practices, and Professional Development”

CaRCC
Campus Research Computing Consortium

RCD Nexus

RCD Nexus - CaRCC's Resource and Career Center

An NSF-supported CI Center of Excellence Pilot

Dana Brunson, PI - Internet2 - Executive Director for Research Engagement
Scott Yockel, co-PI - Harvard - University Research Computing Officer
Claire Mizumoto, co-PI - UC San Diego - Director, Research IT Services
Thomas Cheatham co-PI - University of Utah - Professor of Pharmacy & Director of RC/CHPC
Patrick Schmitz, co-PI - Semper Cogito

CaRCC
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RCD Nexus
The CaRCC Resource and Career Center

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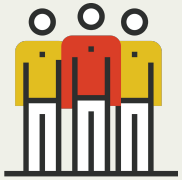
How the RCD Nexus Addresses the Needs

- RCD Nexus advances and enables the nation's capacity for computational and data-intensive research
- Creating tools, practices, and professional development resources:
  - Enhanced RCD Capabilities Model and Community Dataset Portal
  - An RCD Workforce Staffing survey
  - Advance the adoption of RCD Job Family Framework
  - Curate leading practices for Staff Professional Development
  - Curate leading practices for Involving Students in RCD/Workforce Development
- Gathering these into an RCD Resource and Career Center
- Helping bridge the gap for smaller institutions struggling to get RCD programs started to support their researchers.

Internet2 Supports Research

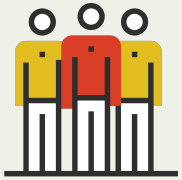


Research Engagement at Internet2

Research Engagement at Internet2 works to enhance global research computing and data capability (RCD), capacity, and resources to better support and advance research activity.

We do this by providing consulting and training, facilitating a professional community to develop tools and best practices, and supporting RCD professionals as research partners.

https://internet2.edu/research-engagement



Research Engagement at Internet2

Internet2 Supports Research

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

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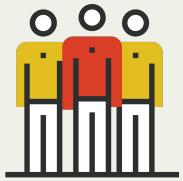
RCD professionals are clamoring for a shared voice to advocate for the profession; for broader understanding of their roles; and for training, mentoring, and professional development resources.



Research Engagement at Internet2

Internet2 Supports Research

Internet2 supports research by supporting the community of research projects and such as:

Open Science Grid (OSG) Open Science Data Federation (OSDF) utilizes storage caches directly connected to the Internet2 backbone and backbone network/routing support,

FABRIC is an **adaptive programmable research infrastructure** that allows access to public cloud services provided by Internet2,

ERN (Ecosystem for Research Networking) and the **Broadening The Reach (BTR)** effort is supported by Internet2 and engages with smaller, under-resourced institutions to identify and support research and education activities,

SC/SCinet Internet2 has supported SCinet for over 20 years and **Matt Zekauskas is the 2022 SCinet Chair.**

OSG

FABRIC

ECOSYSTEM for RESEARCH NETWORKING

SCinet

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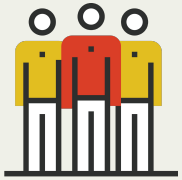

Research Engagement at Internet2

Internet2 Supports Research Computing and Data Professionals

Research Computing and Data (RCD) professionals accelerate research and we help support many of the organizations that RCD professionals care about.

We do this though grant leadership, ongoing contributions, and infrastructure support to name a few.

https://internet2.edu/research-engagement

CAMPUS CHAMPIONS

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Research Engagement at Internet2

Internet2 Supports CaRCC and the RCD Nexus, an NSF CI CoE Pilot

CaRCC is an organization of dedicated professionals developing, advocating for, and advancing campus research computing and data (RCD) and associated professions, including career development and visibility, and the ability of RCD professionals to deliver services & resources for researchers.

https://carcc.org

RCD Nexus is supported by the National Science Foundation under Grant OAC-2100003

RCD Nexus
The CaRCC Resource and Career Center

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Research Engagement at Internet2

Internet2 Supports the RCD Capabilities Model

The **Research Computing and Data (RCD) Capabilities Model** is a self-assessment tool designed to be useful to campus leadership, campus research computing and data practitioners, and researchers to assess support for computationally and data intensive research.

It can be used to **benchmark** and to identify and understand areas of strength and weakness in an institution's support when conducting **strategic planning and prioritization** exercises.

https://rcd-nexus.org/rcdcm

RCD Nexus is supported by the National Science Foundation under Grant OAC-2100003

RCD Nexus
The CaRCC Resource and Career Center

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The RCD+ Ecosystem

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https://spaces.at.internet2.edu/display/RE/RCD+Ecosystem