Kickstarting Research Support at Under-Resourced Institutions

A Starter Guide to Advance Your Self-Assessment of Research Computing and Data Capabilities

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ABSTRACT

Institutions that are smaller and/or under-resourced, traditionally teaching-focused, and/or developing new Research Computing and Data (RCD) programs often struggle to support computational and data-intense research and instructional activities. When there is no clear support system for these activities, it can hinder progress and collaboration. Research is done in silos (isolated) and researchers are left to fend for themselves to locate and access available resources. IT departments often have only peripheral knowledge of the research activities at their institutions, as they are usually focused on supporting and maintaining the enterprise systems. Addressing these challenges requires a concerted effort from researchers, administrators, IT personnel, and other stakeholders within the institution. By working together and advocating for the importance of computational and data-intensive research, it is possible to overcome these obstacles and create a more supportive environment for research and education.

Following several rounds of community input on the topic above, a committee on "focused tools" for the Campus Research Computing Consortium (CaRCC) [1] Capabilities Model [7] (hereinafter referred to as the Model) has developed an introductory guide. The guide, intended for smaller and/or under-resourced institutions and emerging RCD programs (hereinafter referred to as Smaller Institutions), helps begin engagement to evaluate and build research support for their campuses. The guide is just the starting point, but offers suggestions on how to begin a dialog about where an institution is on their research support journey. The following describes how the guide was developed.

CCS CONCEPTS

• **General and reference** → **Computing standards, RFCs and guidelines**; **Evaluation**; • **Social and professional topics** → **System management**.

KEYWORDS

Research Computing and Data, Research IT, Cyberinfrastructure, Capabilities Model Focused Tools

1 BACKGROUND AND MOTIVATION

Work to produce an RCD support self-evaluation tool began with the development of the Model in 2018 by CaRCC, Internet2 [3], and EDUCAUSE [2]. Having gone through iterative improvements since that time, the Model allows institutions to self-assess their support for computationally and data-intensive research (and research education), to identify potential areas for improvement, to understand how their academic communities view RCD support, and to compare to an anonymized community dataset [4] [5] [6] of participating institutions. The current version of the Model and the latest community datasets are available through a web portal located on the RCD Nexus project website (https://portal.rcd-nexus.org/, NSF #2100003).

The CaRCC Capabilities Model Focused Tools Committee (hereinafter referred to as the Committee) was established in 2022 in response to feedback from participating institutions that Smaller Institutions often find the existing Model a bit overwhelming, and/or they lack the resources to complete the specified level of assessment to have a meaningful impact. The Committee held focus groups and workshops to get more input from the community about how to help Smaller Institutions develop their institutional research support.

The feedback from the community pointed to two things that are needed: 1) It is essential to start with a conversation about research support and align on terminology and goals and 2) We must provide a more focused version of the Model to better meet the needs of Smaller Institutions and emerging RCD programs.

Using the Model as an initial framework, the Committee has been working with IT practitioners, researchers, and campus leadership

to help develop initial RCD programs and support assessment and gap analysis of existing programs. Findings from engagements are detailed below and are being incorporated into the Model.

The following four sections describe how we formed the Committee and how the guide was developed. Section 2 describes how the Model working group, based on community feedback, conducted several focus groups, Birds of a Feather (BoFs) sessions, and workshops to gather more information on support issues at Smaller Institutions and determine how best to support them. Section 2.1 and 2.2 details stakeholder focus groups and workshops that were held to gather feedback and address challenges faced by Smaller Institutions. Section 2.3 recounts the establishment of the Committee to address the RCD support needs of Smaller Institutions. Section 3 comprises an introductory guide developed by the Committee, which outlines processes and resources to support RCD initiatives and emphasizes the importance of understanding institutional needs, building partnerships, and aligning with strategic directions. Finally, Section 4 details multiple engagements that have been facilitated to identify and address issues faced by researchers at Smaller Institutions.

2 COMMUNITY INPUT TO RESOURCE DEVELOPMENT

Based on feedback from the community, the Model working group held a number of focus groups, BoFs, and workshops to gather information on how the working group can help. These sessions provided valuable insights into the specific challenges and needs faced by Smaller Institutions. Through these engagements, the working group realized that it is important not only to advocate for filling out the Model itself but also to assist institutions in initiating the engagement process effectively.

The overwhelming consensus was that the engagement process needed to start with a conversational approach to level set and identify the needs of researchers and educators, as well as current support capabilities. This method allows for a more personalized interaction, helping to build trust between different stakeholders and fostering familiarity with the issues at hand. By starting with open, honest dialogue, the working group aims to create a foundation of trust and collaboration that will facilitate more effective and sustainable support for research computing and data initiatives.

2.1 Focus Groups Spring and Summer 2022

To gather detailed feedback and address challenges at Smaller Institutions, the Model working group organized focus groups and workshops. These sessions, including two virtual focus groups with members from the regional network provider in New Jersey, NJEdge, and the Great Plains region, GPN (Great Plains Network), and a BoF session at the GPN annual meeting, facilitated open dialogue and collaborative brainstorming. Insights from these discussions have been actively used to enhance the Model's relevance and impact for Smaller Institutions.

2.2 Feedback Highlights from Focus Groups and Nexus Day:

2.2.1 Engagement Strategy:

- Adopt a conversational approach to better understand institutional needs and aspirations.
- Conduct comprehensive interviews to grasp the specific needs of researchers across disciplines, tailoring support accordingly.

2.2.2 Assessment and Advocacy:

- Provide tailored assessments for varied institutional missions, simplifying complex concepts and offering targeted guidance.
- Identify and engage C-level leaders to advocate for RCD initiatives, emphasizing the benefits to gain their support.

2.2.3 Resource Identification and Partnership Building:

- Establish mechanisms to discover funding opportunities and necessary support areas.
- Strengthen partnerships between central IT and research communities to foster mutual understanding and cooperation.

2.2.4 Communication and Training:

- Clarify the objectives of RCD initiatives and communicate their value effectively to all stakeholders.
- Conduct stakeholder-specific training and create templates to facilitate structured discussions.

2.2.5 Community and Stakeholder Involvement:

- Use surveys to identify key stakeholders and their interests, setting the stage for effective engagement.
- Design flexible engagement strategies that are adaptable to the unique contexts of various campuses.

Through these methods, the Model working group aims to create a more supportive and inclusive environment for research at Smaller Institutions. This ongoing engagement process also involves piloting new approaches and iterating based on stakeholder feedback to refine the engagement strategies further.

2.3 Capabilities Model Focused Tools Committee created Fall 2022

The Committee was established to address the RCD support the needs of Smaller Institutions. Recognizing the unique challenges faced by these institutions, the Committee aims to develop tailored tools and resources that can bridge gaps in research computing and data support. By focusing on the specific needs of these institutions, the Committee seeks to provide practical solutions that can enhance their research capabilities and overall effectiveness.

This Committee can effectively address the RCD support needs of these institutions and contribute to building a more inclusive and supportive RCD ecosystem. Through targeted initiatives and specialized support mechanisms, the Committee works to ensure that Smaller Institutions have access to the same high-quality resources and opportunities as larger, better-funded organizations. By promoting equity and inclusion, the Committee not only helps individual institutions to thrive but also strengthens the broader research community, leading to greater innovation and discovery. The Committee has developed a guide that includes processes as well as information about resources for assessment.

3 THE GUIDE

The guide includes processes as well as information about resources. The following process is suggested:

(1) Identify the institution and an institutional advocate/champion. This may be a campus leader such as the Vice President for Research (VPR) or Chief Information Officer (CIO).

(2) Conduct a pre-interview survey to learn more about the institution and identify other roles for the interview/focus group.

(3) Schedule and conduct an initial interview.

(4) Work with the institutional advocate to gather a team together for a focus group.
- Identify stakeholder (group/person) for each CaRCC Facing (one person may have multiple roles).
- Create opportunities to engage with researchers about their research.
  - Administer surveys to solicit input.
  - Attend departmental meetings and ask about research activities.
  - Hold social information gathering sessions and promote participation.
- Suggest contacting departmental IT staff and IT director/managers and inquire about research support, service offerings, campus infrastructure, etc.
- Suggest contacting CIO/VPR and ask about resources to fill out the Model.
- Suggestions on who should answer what questions:
  - VPR/CIO - Strategy
  - IT - Software/Systems
  - Researchers/RCD professionals - Research
  - Librarians/IT/Researchers - Data

(5) Hold seminars/presentations to raise awareness of regional and national resources (communities, CAPS Model).

(6) Reference information and things to consider for the person using the process:
- The key to success in the pre-survey/interview/Model is identifying and recruiting the right people to answer the questions in each topic/area. Note that one person may have multiple roles. It is important to understand the administrative/power/financial structure of the institution to identify who will have the most impact in being exposed to/filling out the Model. The following are some suggestions to learn about research (needs) at an institution.
  - Consider any exceptional requirements posed by research and scholarship.
  - Understand research requirements for the campus through dialogue with researchers and research support units (ADR's or equivalent are useful campus personnel to engage).
  - Establish a way for researchers to provide input to the process.
  - Establish a multi-role partnership involving faculty researchers, the IT organization, library, and other campus administrators involved in research funding and support (one person may have multiple roles).
  - Consider the institution's areas of interest and strategic direction (is the institution looking to increase research and innovation focus?).

The CaRCC Capabilities Model Focused Tools Engagement Script and Guide is located here: https://zenodo.org/records/10960062

4 ENGAGEMENTS

This guide has been used to facilitate a number of engagements and has helped identify and address issues faced by researchers at Smaller Institutions. By providing a structured approach to understanding and documenting the specific needs of these institutions, the guide has enabled more effective communication and collaboration between researchers and support staff. These engagements have highlighted critical areas where additional resources and tailored support are necessary, ensuring that the unique challenges of Smaller Institutions are adequately addressed.

By bringing these challenges to the attention of the administration and IT departments, the Committee is helping to bridge the gap between research needs and institutional support. This proactive approach ensures that administrative and IT stakeholders are aware of the specific needs of researchers and can allocate resources more effectively. As a result, the Committee's efforts are fostering a more supportive and responsive environment for research activities, ultimately enhancing the overall research capabilities and success of Smaller Institutions.

5 SUMMARY

The guide is a tool designed to help begin engagements with institutions in order to identify key stakeholders, set expectations, and help build trusted relationships between parties. It suggests a process of engagement, starting with initial survey questions through interviews and the presentation of ideas. This work is intended to help start a conversation about what research support is and help identify key questions about individual programs.

Through our engagements, the Committee has refined the pre-survey and introductory guide to focus less on simply completing the Model and more on providing a holistic view of the overall RCD support strategies, what help is needed, and what community resources are available to them. The Committee will continue to develop this process and work on providing additional tools. One idea is to create more flexibility in the Model to focus on areas specific to these Smaller Institutions and emerging RCD programs. The Committee hopes that this helps further engagements and exploration for building/supporting research support at institutions. Individuals and institutions are free to use any part of this work to enhance the research support engagement process.

6 FUTURE WORK

The Committee is developing a more focused version of the Model tailored to fit the needs of Smaller Institutions and emerging RCD programs that will be called "Chart Your Own Journey." This new version will enable institutions to focus on specific areas of interest or need based on their priorities and resources.

Another area of interest is to develop metrics or indicators to measure the impact of the engagements and the implementation of recommendations from the guide. (i.e. quantify improvements in research productivity, resource allocation, collaboration, and

institutional support to demonstrate the tangible benefits of the initiative.)

ACKNOWLEDGMENTS

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