CASC Advisory Review Series: Top Priorities and Challenges in the Academic Research Computing and Data Ecosystem

Executive Summary for the Series

The Coalition for Academic Scientific Computation (CASC) is a nonprofit organization dedicated to achieving academic research goals through advanced computing technology. This document identifies current top priority areas requiring immediate action resulting from recent CASC member surveys and discussions. The key outputs of this report are recommended actions for improving communications and information sharing with funding agencies in general, with specific suggestions towards improvements in three selected top-priority areas.

This series of reports on top priorities and challenges for the research computing and data (RCD) community details cross-cutting recommendations as well as identifying a set of areas which represent specific priorities and challenges for members of the ecosystem to address. Each of the series reports will detail concerns for its area and offer a set of recommendations for actions by the CASC membership as well as the broader community in order to address critical issues. In any given year, the top issues may change, so it is the intention of CASC to conduct surveys like this periodically and summarize such issues for consideration.

Report Summaries

Recommendations for Aligning Funding Agency, Institutional, and Community Needs:
CASC, in partnership with its member institutions and relevant funding agencies, should establish and maintain processes for timely input to priority-setting processes, bolster communication channels among participating parties, work to improve internal communications within institutions about these priorities, and take steps to facilitate dialogue with industry.

Recommendations in Specific Top-Priority Areas:
Improve Cybersecurity and Compliance: Institutions with significant investments in Research Computing and Data (RCD), including CASC members, should create a structured approach to cybersecurity and compliance, optionally including the use of security enclaves, and audit their programs in these areas regularly. Research sponsors at the federal level should include academic RCD representation on relevant advisory bodies to ensure adequate input, and take steps to provide consistent guidance on topics in these areas to federal program officers. State governments should work to minimize extra regulatory layers and customize requirements only when necessary. CASC should establish a standing cybersecurity and compliance working group to advise members on these topics.

Address Staffing Challenges to Recruit, Retain, and Develop a Skilled, Diverse Workforce: Institutions should standardize job descriptions and define career paths for professionalization of the workforce and work to improve internal communication with HR departments at their institutions.

Research sponsors should take steps to expand RCD workforce participation, diversity, equity, and inclusion on their own and in multi-organization partnerships. CASC should improve information sharing for jobs and career paths, engage with and promote participation by a more diverse set of institutions in the RCD community, and approach workforce development on a community-wide basis.

Support Team Science and End-to-End Workflows: Institutions should provide sustained support for resources that serve the entire institution, develop methods to coordinate the activities of core research and campus-based RCD resources, recognize RCD professionals' role, including training them to stay at the leading edge of their fields, and develop a culture focused on the use of teams. Research sponsors should provide funding opportunities for campuses to address emerging RCD infrastructure needs, incentivize participation of RCD professionals in funded research projects, continue to provide funds to develop tools designed to lower barriers to Team Science and promote and support the development of networks of relevant RCD professionals. CASC should highlight examples of how member institutions are addressing challenges related to the support of Team Science at its annual meetings and through its publications and website, and should explore ways to partner with other organizations who also have a stake in advancing support for Team Science.

Special Thanks

CASC thanks the community members who participated in the input process for this report.

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