BOISE STATE UNIVERSITY RESEARCH CYBERINFRASTRUCTURE STRATEGIC PLAN

DEVELOPED BY THE RESEARCH CYBERINFRASTRUCTURE ADVISORY COUNCIL

MISSION

The mission of the Boise State University Research Cyberinfrastructure Advisory Council is to develop a robust and reliable environment for research: to provide network speed, computational power, storage, and seamless connectivity to researchers and faculty while ensuring centralized support and communication for ongoing CI efforts.

This strategic plan presents actionable tasks towards achieving our mission.

OBJECTIVES

1. PROVIDE A ROBUST AND RELIABLE COMPUTING ENVIRONMENT FOR RESEARCH

   COMPUTATIONAL POWER
   
   • Centralize support for shared use of a collaborative High Performance Computing (HPC) cluster based out of the Supercomputing Center at the Idaho National Labs (INL).
     
     o Establish formal scheduling system.
     
   • Create a centralized research computing center for consolidation of research computing devices that are best served in close proximity to the campus.
     
     o Secure 8,000 to 10,000 square feet of space or build a new research computing center to expand computational equipment for research growth.
     
     o Lease space in a co-location data center facility in the Boise Area and utilize our partnerships with INL and BLM National Integrated Fire Center (NIFC) until the Boise State research computing center is complete.
     
   • Increase access to HPC equipment by undergraduate researchers by providing 20% of an FTE to support Redhawk cluster and student users.
   
   • Submit 4 proposals for funding to increase computation, storage and visualization capacity.
   
   • Conduct baseline survey to document current CI capabilities and expertise and to identify data management needs.
   
   • Establish web-based resource to share current CI capability and expertise.
   
   • Join Internet2 as a full member.
   
   • Create a funding model to support the research facility and staffing.

   STORAGE AND DATA MANAGEMENT
   
   • Provide enterprise-level, secure, redundant, accessible, reliable, and long-term storage capacity to meet the needs of Boise State sponsored research and researchers at an enterprise level.
• Develop research capacity to support data-enabled science that can rapidly access and query local and remote data streams to address cutting-edge research problems.

• Develop condominium style data storage clusters using virtualized storage capabilities to provide dynamic and static data storage for funded research.

CONNECTIVITY AND NETWORK SPEED

• Contract with Globus online to provide high speed access to large datasets that are stored outside of Boise State.

• Double Internet high speed bandwidth as through-put needs increase to connect researchers and computational infrastructure across the state, the nation and the world.

• Monitor and report relative performance metrics across the campus and Idaho Regional Optical Network (IRON) partner sites; make this data available to grant writers.

• Make IPv6 addresses available to the Boise State campus.

• Increase internal bandwidth to 10GB between campus research and academic facilities, and to centralized clustered CI equipment. Incorporate 10GB network speed in all academic/research locations that require this capability to conduct research.

• Create a science DMZ.

• Expand the network connectivity to INL and national networks to 10GB.

• Increase wireless capacity in research areas and teaching labs to 300 Mb (802.11n).

VISUALIZATION

• Promote visualization and visual analytics research:
  o Support campus-wide communication between Office of Information Technology, Division of Research and Economic Development, and colleges.
  o Secure space for a visualization laboratory, ensuring that the lab capitalizes on existing and ongoing OIT investments.

• Ensure communication between OIT and EPSCoR in the advertisement, interview, and hiring of software engineers to manage and support the visualization lab.

• Develop a document outlining the mission, charge, and role of the visualization lab.

• Acquire and install equipment to support the visualization laboratory.

• Implement College of Engineering visualization cluster and multi-tiled display project.

• Sustain the visualization cluster by providing both system and application support and working closely with researchers in providing visualization expertise and support.

• Maintain hardware and software capabilities of the visualization cluster by keeping support contracts current and updating software to minimize downtime, and constant monitoring of resource requests.

• Produce annual report on efforts to expand funding options.
TECHNICAL EXPERTISE AND SUPPORT

- Appoint a full time Office of Information Technology (OIT) Director of Research Computing for support of University research, Brian McDevitt. This position becomes the liaison with researchers, centers and colleges for existing and emerging services, technologies and demands.

- Consolidate 2 research computing staff for CI and research activity support. Add 2 research staff for additional CI and research support in FY 2015. Continue to add 1-2 staff for data analysis, visualization, GIS support over the following 3 years; include additional student employee opportunities.

- Provide Data Management Plan templates for grant proposals, customized to agency requirements and Boise State University CI capabilities.

- Provide front-end cataloging and data curation services to ensure internal and external users can find and access stored data.

- Create a centralized library of boilerplate information about cyberinfrastructure capacity-building and sustainability requirements (centralized computing clusters, storage and support) for use in relevant grant proposals.

- Establish a single point of contact to facilitate communication between researchers and University administrative units about required support for proposed cyberinfrastructure projects (i.e., space planning, power, HVAC, facilities).

- Establish a Boise State Rounds Program, which provides one-on-one CI help.

2. MECHANISMS FOR COORDINATION OF THE RESEARCH CI STRATEGY

- Establish a Boise State University Research Cyberinfrastructure Advisory Council to inform the research CI strategy.

- Provide annual updates to the Information Technology Governance Council of the proposed Research CI Strategy.

- Develop and implement a customer satisfaction tool for regular feedback by faculty and researchers.

- Conduct regular meetings with the Boise State EPSCoR CI team to ensure that: (1) EPSCoR CI investments at Boise State are in line with strategic objectives laid out in this campus CI plan, (2) Boise State University Research Cyberinfrastructure Advisory Council is informed of CI-related EPSCoR activities, and (3) that elements and action items within the campus CI plan are updated as EPSCoR-related opportunities arise.

3. ENHANCE REGIONAL COLLABORATION WITH OTHER INSTITUTIONS OF HIGHER EDUCATION, FEDERAL AND STATE AGENCIES

- Negotiate an agreement to connect Boise State University to the BLM site at the National Interagency Fire Center for shared use of their off-campus data center.

- Utilize InCommon to foster collaboration among campus stakeholders and external research stakeholders.
• Communicate regularly with statewide research capacity building initiatives, such as EPSCoR, to identify opportunities for collaboration to achieve or accelerate elements of this strategic plan.

4. **Enhance Industry Collaborations**
   - Identify opportunities to strengthen the relationship between the university and the private sector through enhanced cyber infrastructure capabilities.
   - Identify ways in which technology support can enhance intellectual property development and technology transfer practices.
   - Provide support for Boise State University colleges and centers that have private sector partnerships as needed.
   - Participate in the Idaho Technology Council and other regional industry groups.
   - Participate with industry partners in the annual Bronco Appathon and Treefort events.

5. **Provide Education and Outreach to Increase Baseline CI Knowledge and Technology Adoption To Support Student, Faculty and Staff Research**
   - Provide CI training programs, supercomputing workshops and symposia, led by industry leaders to educate researchers and instructors on CI topics.
   - Provide CI education and support to research staff, faculty, and students via open forums with published topics for discussion.
   - Provide opportunities for students to work in CI support as student employees.
   - Develop a CI Support Center staffed with student employees from Computer Science and other Engineering programs. This support center would work closely with faculty to identify internship credits. This support model would establish senior student employees training sophomore and junior employees.
   - Present two Data Management Plan seminars per academic year to educate faculty and students about data management lifecycle, OIT data management plan requirements, DMPtool software and federal data management plan requirements.

6. **Grow Cyberinfrastructure Visibility**
   - Lead the state-wide Cyberinfrastructure Advisory Council (CIAC) to develop state-wide initiatives involving research infrastructure and visibility.
   - Continue active participation in IRON (Idaho Regional Optical Network) to enhance technology development and connectivity across the state for higher education, research, industry, and medicine.

 Presented to and Approved by ITGC: September 19, 2013
APPENDIX

I. Research Cyberinfrastructure Strategic Plan Implementation Leads

Division of Research and Economic Development:
Mark Rudin, Vice President for Research, Division of Research and Economic Development
Harold Blackman, Associate Vice President for Research, Division of Research and Economic Development
Mary Andrews, Director, University and Industry Ventures
Kimberly Page, Associate Director, Office of Sponsored Programs

Office of Information Technology:
Max Davis-Johnson, Associate Vice President, Chief Information Officer
Christine Hurst, Director, Technology Operations
Brian McDevitt, Associate Director, Technology Operations
Ken Blair, Research Support Systems Engineer
Matt O’Brien, Network Manager
Doug Ooley, Director, Information Security Services

Academic Representative:
Alejandro Flores, Assistant Professor, Geosciences, faculty liaison to the statewide Cyberinfrastructure Advisory Council (CIAC) and EPSCoR CI team

II. Committees referenced in this document

Boise State University Research Cyberinfrastructure Advisory Council
Members: Mark Rudin, Harold Blackman, Kimberly Page, Max Davis-Johnson, Christine Hurst, Brian McDevitt, Lejo Flores

Purpose: The mission of the Boise State University Research Cyberinfrastructure Advisory Council is to develop a robust and reliable environment for Boise State University researchers and faculty: to provide network speed, computational power, storage, and connectivity seamlessly while ensuring centralized support and communication for ongoing CI efforts.

Statewide Cyberinfrastructure Advisory Council (CIAC)
Members: One faculty representative and one OIT representative from Boise State, University of Idaho and Idaho State University. Boise State University’s representatives are Lejo Flores (geosciences) and Max Davis-Johnson

Purpose: To develop a coordinated, statewide cyberinfrastructure plan

EPSCoR CI team
Members: Vijay Dialani, Lejo Flores, Nancy Glenn

Purpose: To develop CI research capacity at Boise State University in support of the university's growing research emphasis in computational science and engineering, and its role in the Managing Idaho Landscapes for Ecosystem Services (MILES) grant. Specifically, to support data-enabled ecosystem characterization, alternative future analysis, and visualization.