High Performance Computing Sustainability Across the GPN Region

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Research Computing

- Research and creative activity are critical to the life of the university
- Computing is central to research
- Providing an excellent research computing environment gives faculty and the university as a whole a competitive advantage
- Finding ways to sustain a leading-edge computing environment is a critical success factor
- This starts at the desktop but can reach out to campus, ***regional and national resources.***

Sustaining a Research Computing environment

- Funding for
  - Local computing, storage and visualization facilities
  - Network connectivity (campus, regional, national)
  - Staff/Expertise (ad hoc consulting, longer term dedicated project support)
  - Support services and processes that connect users to expertise
  - Training for support staff
  - Training the next generation of computational scientists
- Challenging economic times
  - Local/state budgets
  - Changing national research funding picture
  - Changing national infrastructure investment picture

Cyberinfrastructure Sustainability

- CI = computing, storage, networking, expertise needed for research and discovery

- Begins at home with
  - High level administration support
  - Strong user community engagement
  - Appropriate services and resources to meet research goals
  - Diverse funding
- External cooperation and specialization can help
  - National
    - National supercomputer centers
    - CI Days program
    - Internet2, NLR, Educause
  - Regional (more Friday morning: GPN CI Advisory Comte. report)

“Sustainable HPC Workshop”

- NSF Workshop on Sustainable Funding and Business Models for High Performance Computing Centers at Cornell May 3-5, 2010
- https://mw1.osc.edu/srcc/index.php/Main_Page
- Discussion topics
  - Organizational Models & Staffing
  - Funding Models
  - Metrics of Success and Return on Investment
  - Industry & Vendor Relationships
  - Succession Planning (Continuity of leadership)

Core Lessons Learned – Funding, Organization and Metrics[1]

- **Funding**
- Must be diverse to maintain stable income
- Get support and involvement of CIO, VPR, CFO and Provost
- Work with institution's leadership to develop rates for services and internal support and co-investment to provide services broadly, including to users who may have difficulty paying the fully costed rates.
- Create a strong value proposition for the services you offer that includes value for each constituent group (consumers and providers)
- Listen to your customers and be willing to adapt & evolve services to meet changing needs and user bases
- Understand the technical requirements and financial limitations of researchers at your institution and develop services that meet these requirements at competitive rates
- Seek economies of scale and scope wherever possible
- Understand component costs through a detailed cost analyses of services
    1. See

Scope/Mission/Organization

- Research computing support centers can provide many lines of business, such as hosting facilities, cycles/storage, visualization, education/outreach/training, software development, internal research, support for discipline-specific virtual research organizations & collaborations, and economic development.
- Your center's scope (local, regional, national) is a critical decision and determines the form of the organization and relative strengths of funding options.
- Create advisory boards to represent user needs, for service definition, for financial decision making and fund raising, and for communicating with specific interest groups within the constituent base.
- Be aware of the impact seeking tenure on the performance of key faculty participants in a research computing support unit.
- Be aware of and use IT support resources embedded in schools and departments to effectively extend the range of your ability to support your center's/unit's research computing users

Metrics

- Have a clear mission statement that supports the goals of all constituent groups
- Develop metrics that reflect the mission and value proposition of the support unit, and the goals of constituent groups
- Use metrics to quantitatively direct the evolution of services and to provide input to support decisions about funding
- Adopt or develop metrics that allow comparisons to other support units such as core labs, libraries, network/telecomm, clean rooms, etc.
- Use these common metrics to make the case for parity in internal funding and to benchmark external funding levels

Regional CI Frameworks

- Regional HPC centers
- Regional (intra- and inter-state) CI efforts: GPN, SURA, LONI, etc.
- RONs as a model and base for broader CI provisioning and support
  - Focused support organization
  - Institutional contacts and engagement
  - Researcher contacts and engagement
  - Inter-institutional sharing of resources, and expertise
- Activities that
  - bridge from campus to national resources
  - Develop CI capabilities on campuses
- Planning for extending GPN CI underway – report tomorrow morning

Regional CI can…

- Coordinate efforts across multiple institutions with shared interests,
- Foster a collaborative context in which researchers can address problems of regional interest and importance, and
- Bridge the cyberinfrastructure divide between users at resource poor institutions and regional and national resources

Goals for Regional CI

- Supporting the development of CI at the campus level in a regionally coherent way at primary research institutions with the possibility of outreach to four year and two year institutions and to industry,
- Aggregating regional CI resources and making them available through a common set of policies and procedures,
- Providing a seamless path for researchers to scale their research from campus work environments to regional HPC and national capability computing centers,
- Building knowledge management structures and training programs that will allow the efficient sharing of CI and computational science expertise across the region, and
- Supporting the integration of CI into educational programs at institutions of higher education primarily through the cooperative development and delivery of computational science curricula.

Sustainability for regional CI…

- Regional CI supports focused regional efforts
- Local control, local expertise
- Potential for strong “local” support
- Potential for institutional and state support
- Right scope for making economic development arguments
- Can leverage existing activities and entities

- To be continued…

CI planning within GPN

- Process initiated by GPN Executive Committee
- Objectives are to assess needs, develop proposed responses and make recommendations
- Milestones:
  - Establish a CI Advisory Committee
  - Develop instruments and conduct surveys to establish interests and needs
  - Meet with stakeholders at campus level
  - Develop initial recommendations for EC action
- Status report tomorrow morning

Thanks!