Panel: Role of State, Federal & Regional Government in creating new infrastructure; Models that are working; Support?

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CIO & Vice Provost for Computing and Information Technology

CASC - Sustainable Funding Workshop
Arlington, VA
October 2, 2013
Perspective

• Former NSF program official
• Former NSF Center deputy director
• Current university CIO
• Current Internet2 Fellow
Federal Role

- **Mission agencies** – display a concern over sustainability of mission critical cyberinfrastructure
- **Non-mission agencies** – e.g., programmatically and peer review driven, bi-modal funding routes: DACI and individual programs, no long-term strategy
- **Impact on campus and faculty**
  - Mission funded faculty at Clemson upgrade like clock work
  - Faculty funded by non-mission agencies less predictable
## HPC Center Evolution

<table>
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<th>Year</th>
<th>Events</th>
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| 1980 | - Small number of university centers  
      - FCCSET (agency knowledge transfer) |
| 1983 | - Phase 1 centers – NSF bought access  
      - Colorado State, Minnesota, Purdue |
| 1985 | - Phase II – NSF established five centers  
      - “fully funded” |
| 1990s | - Emergence of state centers  
       - 1989 – “several” institutions formed CASC |
| 2000 | - Campus centers begin growth curve  
      - CASC = 60 members |
| 2010 | - Campus HPC centers proliferate  
      - CASC at 74 members  
      - Stimulus funding for infrastructure and people |

*Updated from 5/10 Cornell workshop*
State Government – some models

- Massachusetts – MGHPC
  - Economic development
- Florida – SSERCA and FLR
- Ohio – OSC and OAR.net
- For many states it is a struggle
Statewide grassroots effort led by MUSC, The Citadel, and College of Charleston, urging the state to invest in advanced computing.
Sustainability - considerations

- Strategic alignment of mission
- Communicating value and strategy
- Business model
- Evaluation, mid-course correction and “reinvention”
Institutional Alignment
“Cyberinfrastructure is the primary backbone that ties together innovation in research, instruction, and service to elevate Clemson to the Top 20”

Doris Helms, *Clemson Univ. Provost [Ret. 2013]*
**Investment and Governance Framework**

**Maslow’s Hierarchy**

- **Physiological**
- **Safety**
- **Self-Actualization**

**Effective reference point for educating Administrators & Trustees**


Courtesy: John Cobb, ORNL
Trustees Presentation - outline

Funding
- 25% of sponsored research awards used Clemson Palmetto cluster

Degrees Conferred and Publications
- PhD degrees conferred and refereed publications growing

Economic Development

“Paying for ourselves”
- CIO and growing number of staff bringing in salary dollars

Faculty Voices: “The HPC resources at Clemson are…”
- Support Environment; made me more scientifically productive
- A competitive advantage in faculty recruiting
- Enabling publications
- Fostering interdisciplinary research
- Integrating research with entire university
Clemson Approach – 2008

- **Assumptions**
  - No state help; competition v cooperation among universities

- **Networking**
  - Founded LLC and bought fiber with private funds

- **Computing**
  - Funding split between:
    - Central academic budget &
    - Faculty grants & start-up packages
    - (NO funds initially from OVPR)
  - Upgrade twice a year

- **Staffing**
  - Baseline funded through CIO budget – 3 FTE – split across system administration and user support
Clemson Approach – 5 years later

**Assumptions**
- No state assistance – consistent; some movement toward university collaboration

**Federal**
- Faculty receive funding for computing base is growing
- CC-NIE campus networking awards (*new*)

**Campus - OVPR**
- Added recurring funding line for hardware purchases (*2013*)
- Proposal to divert % of research funding increase into “cyberinfrastructure” – VPR agreed in principle; details being worked out and including CU-CAT in discussion

**Staffing growth**
- + 4 FTE, CIO re-prioritize
- + 3 FTE, external funds
Future?
Demons are Coming
Self Organize

Condo of Condos Founding Consortium Members

Spin off activities
- HPC Acq
- IAM
- EPSCoR workshop
- Distributed file system
- Hiring at some campuses
DISCUSSION