BRICCCs: Campus Computing for Everyone

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The Emerging CI Landscape

Technology
- Hybrid Cloud Computing
- Composable and Configurable Systems
- Accelerators
- Storage
- Networking
- Compliance and Security
- Interactive computing

Researcher Support
- Onboarding Technology
- Approachable Cybersecurity
- Software Driven Approaches
- Human Networking models
- Software as Code
- Tiered support structures
- Virtual Communities

Data as Opportunity
- AI/ML needs large shared data sets
- Analytics with compute
- API-driven approaches
- Federated learning
- FAIR (and FEAT) data standards
- Data repositories

Access and Education
- Portals and Gateways
- Interactive Computing
- Regional and National consortia
- CI as a discipline
- Scalable Pedagogical Approaches
- Adoption in Classes
- Adopt CI in AI/ML

2022 - 2027
Academic Computing Services

Technology:
- Computing
- Storage
- Networking
- Emerging* Platforms

User Services:
- Allocations and new user start-up
- Technology adoption
- Individual consulting
- Training, classes, workshops

Research Services:
- Research support
- Applications development
- Regional and national CI
- Data as a Resource

*hybrid computing with cloud, quantum computing, interactive computing etc.
Scalable Academic Computing Services

User-centric approach
• Software driven approaches to trouble shoot issues and accessible knowledgebase
• Agile management framework – strengths and weaknesses
• Offer information in several formats and different structures

Tiered Support
• L1 (easy tasks; Students), L2 (software technical solutions; Students + Staff), L3 (scientific solutions; Scientists)
• Identify how will a person live in your infrastructure after funding and pre-funding?
• Develop user and security policies that reflect campus concerns

Community
• Engage with researchers and CI professional to expand pool of expertise
• Develop framework for quick on-boarding, competency development, and certification
• Create opportunities for workforce development, inclusivity, diversity, community building and networking
## Supporting Academic Programs

### Academics
- Faculty supported
- Collaborations & programs developed
- Grants/papers/reports submitted
- Champions in institutions adopting practices

### The People
- Student fellowships
- Training, retention, certification, and initiatives completed
- Researcher and Gap surveys
- Community participation

### Technology
- Computing Support
- Software and application development
- Technology and Emerging platform adoption/enablement strategies implemented

### Outreach
- Support formal and informal efforts
- Dissemination - papers, reports, and presentations
- Symposia, workshop, events

### Timeline
- 2022
- 2027
A Community Fostering Research and Innovation at Smaller Schools and Community Colleges

**Challenge Project Seeks to Address:**
- Expand research cyberinfrastructure adoption at smaller institutions and community colleges
- Develop a communication mechanism to identify and ameliorate local issues
- Offer (local) campus CI expertise for researchers

**Deliverables:**
- Developed a CI adoption plan for two-year institutions
- Targeted technical, policy and learning resources are offered on our website: https://hprc.tamu.edu/briccs/
- Engage with CIO, faculty and administration at smaller institutions
- Rotating annual workshop and site activities
- Assist institutions and groups working on CC* proposals

**Scientific Impact:**
- Building support mechanisms for curricular and research involving CI
- Engaged with the science team in CC* SWEETER Cyberteam
- Engaged community – volunteers are CIOs and senior faculty members
- Assisting in faculty-engagement at smaller schools

**Community Workshop:**
- Join us in mid-October for our BRICCs workshop virtually or at South Plains College in Levelland, TX.
- Workshop collocated with Texas Association of Community Colleges CIO group

**Project Updates:**
- Stay tuned for updates on twitter and the HPRC YouTube channel
- Resources available for faculty and student CI programs
Quad Chart for: BRICCs: Building Research Innovation at Community Colleges

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Workflows Cloud + Containerized Jupyter Notebooks

TAMU HPRC OnDemand (Terra)

Jupyter Notebook
This app will launch a Jupyter Notebook server on the Terra cluster.

Notice: This form has changed. Please pay attention to what options you select and what the defaults are.

Type of environment
- Containers (Singularity)

Select the type of environment in which Jupyter is installed. Help me choose.

Path to singularity image file
`/scratch/data/Singularity/images/tensorflow_2.4.1-gpu-jupyter.sif`

Enter the path to a singularity image file containing the Jupyter app. Recommended that this live under your $SCRATCH directory.

Node type
- GPU

Choose "GPU" if the notebook needs to run on an Nvidia GPU node.

- Jupyter Interactive App drop-down menu to select environment type

https://hprc.tamu.edu

Texas A&M University
Trends on Training and YouTube

- Persistence in a session
- YouTube Viewership

PEARC 2020, JOCSE 2021
RESOURCES

Below are a few BRICCs program resources. This list will continue to grow. Check back frequently!

Reproducibility Resources

- ReproZip can automatically pack your research along with all necessary data files, libraries, environment variables and options into a self-contained bundle.

Data Classification Resources

- The Data Classification Calculator can help determine the appropriate classification for your data. Appropriate data classification is an essential component for the development of a successful data security strategy.

Engagement Resources

- Research Computing Questions
- Funding and Regulations Questions
- Student Engagement and Outreach Questions
- Training Logistics Questions

Education and Training Resources

- TAMIDS Resources
- HPRC Resources
- NMSU ICT Supercomputing Resources

Texas A&M Information Security Controls Catalog

- Texas A&M Information Security Controls Catalog

Campus CI Engagement Reports

- EPOC Materials
- Requirements Review Case Study Template
- Trinity University Campus-Wide Deep Dive
- Arcadia University Bioinformatics Application Deep Dive
Quad Chart for: SWEETER: South West Expertise in Expanding Training, Education, and Research

**Challenge Project Seeks to Address:**
- Multi-disciplinary research will be strengthened by offering opportunities to researchers to collaborate
- There is a need for computing research support at institutions at all levels of learning
- Research projects need more than enablement to succeed

**Deliverables:**
- Research exchange supports 20+ fields of science
- A boots-on-the-ground approach using existing CI resources is adopted
- All institutions are providers and consumers of research CI
- Site ambassadors support campuses
- Educational resources developed
- Engage community colleges
- Rotating annual conference and annual site activities

**Scientific Impact:**
- Holistic vision for researcher success envisioned
- Uses CI as the means for researcher engagement and collaborations
- Enablement is reimagined
- Regional MSI, emergent MSIs non-profits and industry learn together
- Several CI projects implemented

**Team:**
- Texas A&M, UT Austin, New Mexico State, West Texas A&M, UT San Antonio, Texas A&M San Antonio, University of Arizona, Prairie View A&M, UT Rio Grade Valley, LEARN, and the National Center for Genome Research

**Project Updates:**
- Stay tuned for updates at hprc.tamu.edu/sweeter/
- Lots of faculty and student programs
- Need more funds to support programs at other regional MSIs!