Funding for Research Computing

Erik Deumens

UF Research Computing

Office of IT

Contents

- What is research computing?
- Writing computing support into proposals
- Developing data management plans
- UF Research Computing
- Research Computing Matching Program

Research computing

- What is it?
  - all computing and data management activities related to research
  - high-performance computing (HPC)
    - is a core capability, but
    - is not all of research computing (RC)

UF Research Computing

- Is an organization in the Office of IT
  - HPC Center
    - http://www.hpc.ufl.edu
- With the mission:
  - Support research computing at UF
  - Make researchers at UF more competitive
    - In getting ground breaking results, and
    - grants

UF Research Computing

- Provide high-quality infrastructure for
  - Grant-funded research
  - Scholarly research
  - Interdisciplinary collaborations
- Provide expertise
  - One place to go for help
  - RC will provide the service, or
  - will take you to an expert who can

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Project planning

- Plan to use UF Research Computing services so that
  - Researchers can focus on science and engineering
  - Graduate students can focus on their work and degree
    - System administration is a separate profession

Proposal preparation

- Include services in any of three ways
  - Buy a piece of functional infrastructure
    - Compute capacity
    - Storage capacity
    - For 5 years for use by your group
    - OCO funds, no overhead is charged

Proposal preparation (2)

- Buy compute and storage services
  - Cloud computing on campus
  - Monthly bill
  - Expense, overhead is charged
- Buy consulting services
  - Add a fraction-FTE expert to your team
  - Small consulting projects are free

Proposal preparation (3)

- Use http://www.hpc.ufl.edu/proposals/
  - For templates and text
- Add budget entries
  - Examples for all three types at the above URL
- Copy “Facilities” description of UF services
  - NSF prohibits listing dollar amounts
  - Provide qualitative descriptions of services

Ask for assistance

- Do not hesitate to contact UF Research Computing for
  - Advice
  - Suggestions
  - Descriptions
  - Budget estimates
  - …
    - Emails can be found on later slide

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Planning data management

- UF Research Computing
  - Provides infrastructure for PIs to make a credible plan in the proposal
  - Makes it easy to implement the plan
  - Provides training and tools to manage data
  - Provides web server to publish data

Data lifecycle management

- Data lifecycle management
- this fall DLC committee will develop
  - Architecture
  - Procedures
  - Policies
  - Training

Data categories

- Raw observations
  - Data collection and preservation
- Intermediate stages
  - Data processing continues
  - Limited sharing needed
- Published form
  - Upload to national repository
  - UF web publication

NSF Data Management Plan

- Two page supplementary document
  - Can be very simple
    - E.g. a theoretical modeling effort may publish all data in tables in standard journal publications
  - Can be complex
    - Need hardware and software infrastructure for extended time
    - Use UF Research Computing services for peace of mind

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Research Computing expertise

- Three staff members since 2005
  - Charles Taylor, Craig Prescott, Jon Akers
- Four new members since this summer
  - Distributed storage: Yu Fu
  - Application support: Ying Zhang
  - Biological computing: Alex Moskalenko
  - Education and training: Matt Gitzendanner

Research Computing expertise

- Performance analysis & tuning
- Software engineering & code review
- Algorithm development & implementation
- Training & workshops
  - Consulting
    - Small project: free
    - Big project: buy fraction of FTE

HPC service mission

- Provide compute and storage resources
  - Every faculty member at UF
    - Can get a free account for self and collaborators
    - Caveat: low priority and limits apply
  - Buy-in to get priority or special services
    - Mechanisms for funding exist
    - New ones are being developed
    - Goal: suit all needs and restrictions

HPC service options

- Shared investor
  - Buy a number of NCU and OSU
    - Normalized computing unit $400/core/5yr
    - Optional storage unit $127/TB/yr
  - Access up to 10 times your share
    - Depends on availability, helps with spiked usage pattern
- Hosted investor
  - Buy a share for use by your group only
  - Required for running jobs > 1 month
- Billed investor
  - Compute as needed at “cloud” prices of $0.02/hour

HPC service benefits

- HPC Center provides
  - Space
    - NPB 2250, NPB 1114, Larsen 121
    - Eastside Campus Data Center Nov 2012
  - Power & cooling
  - System administration
  - Training workshops
  - Application support

Computational course support

- A new system will be installed this October
  - Support the many courses being taught
  - That require computing by the students
  - For example
    - Large RAM nodes for computational biology
    - Distributed memory cluster for MPI programming
    - GPUs for CUDA programming

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Research Computing Matching

- NEW! Matching program
  - July 1 through Sept 30, 2011
  - Invest in buying a piece of infrastructure for your research group
  - HPC Center matches every $ you invest
    - Double your buying power
  - Next round: May 2012

Program terms and conditions

- Must be UF faculty member
- Buy compute capacity
  - Commit to a minimum of $3,200 to be eligible
  - Shared ownership of compute resource
    - Includes nodes, RAM, network, scratch disk storage
- Buy long term storage capacity

Program options: computation

- CPU compute capacity
  - Buy a number of CPU cores: NCUs
    - NCU = normalized compute units
    - Includes RAM, network, scratch storage, power
  - $400 per NCU for 5 years
- GPU compute capacity
  - Buy a number of GPUs: NGUs
    - Ask for details about the price; not firm yet

Program options: storage

- Storage capacity
  - Buy a number of OSU
    - OSU = optional storage unit
    - $127 per TeraByte per year
    - This is not scratch storage, that comes with NCUs
  - NEW! We will offer storage that is backed up
    - To other disk storage
    - Tape backup can be obtained through CNS NSAM

Who you gonna call?

~~Ghostbusters!~~

UF Research Computing

- Website: http://www.hpc.ufl.edu
- Director:
  - Erik Deumens deumens@ufl.edu
- Associate director:
  - Charles Taylor taylor@hpc.ufl.edu

Research Computing Advisory Committee

- Website: http://www.it.ufl.edu/governance/advisorycommittees/researchcomputing.html
- Chair:
  - Paul Avery avery@phys.ufl.edu
- Subcommittees:
  - HPC Committee (since 2005)
  - DLC (Data LifeCycle) committee (since 2011)

Tell us what you need…

- A plan is being developed
- Priorities are being explored
- Tell us what your needs are
  - so that we may address them, or
  - can plan for addressing them in the near future

We want to hear from you!