SSERCA
Erik Deumens
Research Computing - UF
Contents

• Evolution from HPC to Big Data
• Enabling collaboration: SSERCA
HPC evolution

• High-performance computing
• Compute-centric
  – 1960-1990 single processor
  – 1990-2000 multiple processors
  – 2000-now multiple multi-core and many-core processors
• Disciplines
  – Physics, chemistry, engineering, geology
To Big Data

• Data analysis driven science
• data centric
  – Data driven approaches
  – Still need computation, is now implicit
    • Computation is considered under control and is assumed
• Non-traditional disciplines
  – Bioinformatics and genetics
  – Social sciences
    • Facebook social network research
  – Archival imaging and searching
    • history, anthropology, language
Growing diversity in need

- **Users**
  - Doing research and time-bound tasks
- **Different tasks**
  - Modeling, analysis, Monte-Carlo estimation, design
- **Task size**
  - HTC: Many jobs short or long
  - HPC: Long runs, RAM intensive, or many processors
- **Input and control**
  - Computers in offices,
  - Factory floors, and
  - Handheld devices in the field
Contents

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SSERCA and FLR

• Sunshine State Education and Research Computing Alliance = SSERCA
  – FIU, FSU, UCF, UF, UM, USF members
  – FAU applied for membership
  – FAMU, UNF affiliates

• Florida Lambda Rail = FLR

• See http://sserca.org
• And http://flrnet.org
Florida Lambda Rail

Florida Lambda Rail

LEGEND
- FLR Optical Pop Site
- FLR Optical Amp Site
- FLR OnRamp
- FLR Backbone Fiber
- FLR Member Fiber
- Ind. and Fiber

KEY FACTS
- Coverage: 1,540 miles
- Capacity: 20 Gbps
- Ownership: 12 Equity Partners
  (9 Public Universities - 3 Private Universities)
- Links to other regional, national, International networks

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Florida LambdaRail
Florida's Research and Education Network

Feb 11, 2014
UCF RCDay
SSERCA mission

• Enable collaboration between researchers
  – In the state of Florida
  – With their colleagues everywhere

• Data centric research
  – Provide rich storage infrastructure
  – With close compute capability at the 6 member facilities
    • FIU, FSU, UCF, UF, UM, USF, (FAU pending)
Storage architecture

• Distributed across the state
  – State Cloud access: RESTful
    • like Dropbox, with sync-client for desktops
  – Campus access: CIFS
  – HPC access: NFS

• Simple way to give access to collaborators

• Make moving data easy!
Distributed storage system
Workflows

• Data
  – From instruments and sensors, or
  – From simulation on HPC or HTC systems
  – Store on the local campus system

• Local storage systems form the SSERCA cloud
  – Choose replication policy
  – System replicates to other SSERCA site(s)
Workflows (2)

• Share
  – Set permission by email address
  – System sends login info to collaborator
• Collaborate, Change, Analyze, Visualize
• Workflow tools:
  – Galaxy http://galaxy.hpc.ufl.edu
  – Globus Online
Questions?