Cloud Computing for Research

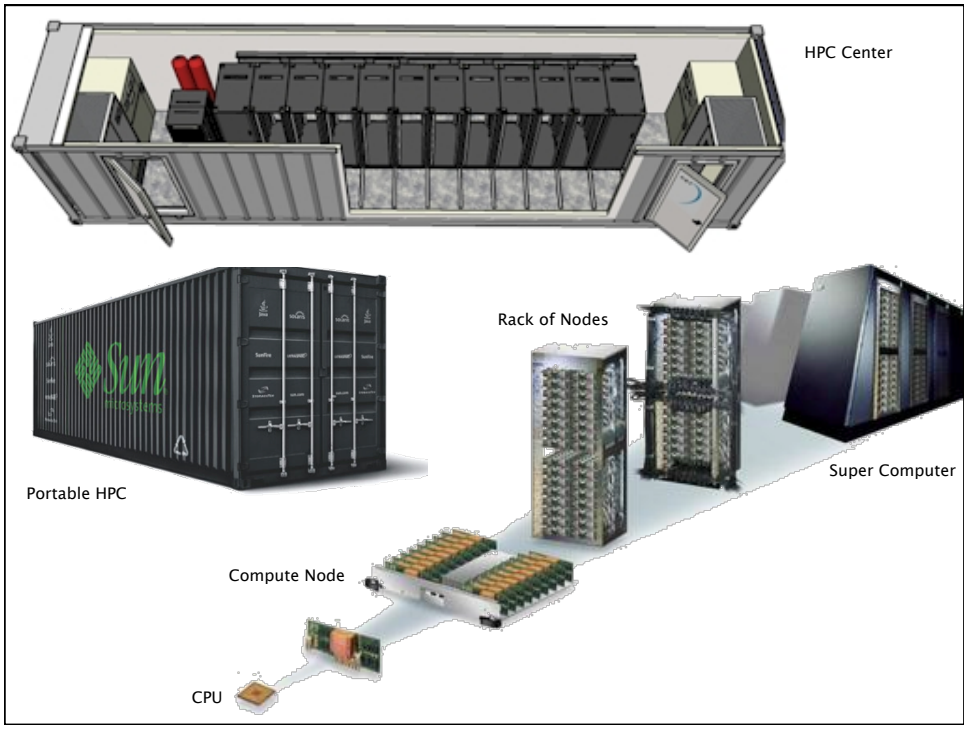
Agenda

- Short Overview “What is the cloud”
- Demo
- Discussion

"Cloud" Computing

(Data, Hardware and Services over the Internet)

Example Could Services


HPC Center
Rack of Nodes
Super Computer
Portable HPC
Compute Node
CPU


facebook
YAHOO!

Computing Resources?

XSEDE
Extreme Science and Engineering Discovery Environment

Future Grid

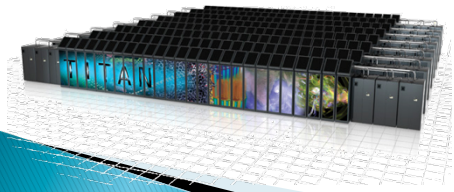
NASA

ICER

Open Science Grid

iPlant Collaborative™

BLUE WATERS
SUSTAINED PETASCALE COMPUTING



amazon web services™

Virtual Machines

- Allows you to run a custom operating system and software setup at the user level
- State of the VM can be saved as a file
- Automatically allows for system wide checkpoint / restart
- Gives more control to the user
- Not all systems have VMs but they probably will in the future

VMs in Science

- Faster start times
- Software Portability
- Reproducability

Computing Resources?

Demo

- Coming soon…
  - Uses HPC Resources to run Virtual Machines though simple browser interfaces.
  - Enables advanced workflows not typically available in standard HPC environments.
  - Enables improved science reproducibility and sharing.
  - Unique environment to facilitate specialized software in a classroom setting.

Questions?

- What are cloud computing resources?
- How are cloud resources typically used?
- Cost and pricing
- Performance and availability
- Commercial resources
  - (Amazon EC2, Azure, Rackspace)
- Non-commercial resources (iPlant/ Atmosphere, XSEDE, the MSU HPCC)
- Experiences and best practices of MSU researchers currently using cloud computing