Sci-GaIA Final Event - March 2017
Agenda

- Partners
- Software & Technologies
- Galaxy
- Arcade
- HPCaaS
- The future...
Partners
University of Cape Town

• Founding Member
• Core Services
• Compute
• Block Storage
North West University

- Founding Member
- Object Storage
Inter-University Institute for Data Intensive Astronomy

- Largest investor
- Initial demonstrator projects
- Governance
University of the Western Cape

- Technical Support
- Compute (Still Implementing)
UCT eResearch Division

- Primary PAAS implementor
Software & Technologies

ubuntu

openstack

ceph
docker
Open Source

- No licensing costs
- Encourages collaboration
Openstack

- Large community especially in eResearch
  - Nectar (Australia)
  - Consortium GARR
  - Compute Canada
- Hardware agnostic
- Support from big vendors
  - Cisco
  - Rackspace
  - Mirantis
Ceph

- Block Storage
- Object Storage
- Posix Filesystem
- No hardware lockin
- Massively scalable both horizontally and vertically
Galaxy

Web-based platform for data intensive biomedical research.
Progress

- Deployed on ARC
- Used for hackaton during Mozilla Science Global Sprint
- Researchers used for testing
TODO

• Roll out to greater community
• Provide support structures for "new" researchers
The Team

- Eben van Zyl
- Ciellie jansen van Vuuren
- Dr Thomas Sanko (Eng)
- Dr Charlotte Mienie
- Peter van Heusden
- Warren Jacobus
- Timothy Carr
- Anelda van der Walt
Arcade

African Research Cloud Astronomy Demonstration Project
Overview

- First step into MeerKAT science
- Foundation for operations and collaborations
- Use cases for typical astronomy tasks
- Pathfinder for hardcore radio astronomy operations
Mission

- Develop and test end-to-end calibration and imaging pipeline
- Transform MeerKAT data into high quality scientific products
- Demonstrate preparedness and competency in dealing with large data volumes/sets on cloud based systems
- Serve as benchmark for future projects
- Provide a space for scientific and technical collaboration
- Lower the barrier to entry
Team

• Bradley Frank
• John Wu
• Stefan Coetzee
• Timothy Carr
HPCaaS

Your personal cluster in no time at all
Based on ElastiCluster developed by engineers at the University of Zurich
Startup...

1. Create OpenStack Network and Security Groups
2. Create a Data disk
3. Elasticluster Config
4. Start the cluster
   - Optional Steps
5. Expand Cluster
6. Stop Cluster
Create OpenStack Network and Security Groups

Security Group

```bash
nova secgroup-create HPC-secgrp "This is a HPC security group"
nova secgroup-add-rule HPC-secgrp tcp 22 22 0.0.0.0/0
nova secgroup-add-rule HPC-secgrp icmp -1 -1 0.0.0.0/0
nova secgroup-add-rule HPC-secgrp udp 1 65535 192.168.1.0/24
nova secgroup-add-rule HPC-secgrp tcp 1 65535 192.168.1.0/24
```

Network

```bash
neutron net-create HPC-network
neutron subnet-create HPC-network 192.168.1.0/24
```
Create Data Disk

cinder create --metadata fstype=ext4 fslabel=data dio=yes --displ
Elasticcluster Config

[cloud/arc]
provider=openstack
auth_url=https://keystone.arc.ac.za:5000/v2.0
username=[REPLACE_WITH_USERNAME_ARC]
password=[REPLACE_WITH_PASSWORD_ARC]
project_name=[REPLACE_WITH_PROJECT_NAME]
region_name=ZA
request_floating_ip=True

[login/centos]
image_user=centos
image_user_sudo=root
image_sudo=True
user_key_name=[Provide_a_description_of_key]
user_key_private=[/location/of_your_/private_key]
user_key_public=[/location/of_your_/public_key]
Start the cluster

elasticcluster start torque-centos -n HPC-Cluster
Optional

Expand Cluster

elasticcluster resize HPC-Cluster -a 6:compute

Stop Cluster

elasticcluster stop HPC-Cluster
What's Next?

- Script more of the configs
- Add a easy to use frontend
- Provide Ansible Playbooks for application installation
The future....

- Identity Federation
  - SAFIRE
    - EduGain by association with SAFIRE
- RaaS
- Virtual Communities
Research as a Service

- Low end-user requirement (HTML5 Browser)
- Persistent Storage & Configuration
- Catalog of softwares & services

https://github.com/AfricanResearchCloud/RaaS