Atmosphere Roadmap 2017-2018

Edwin Skidmore
edwin@cyverse.org
CyVerse/University of Arizona
presentation: https://goo.gl/y4RTgA
What is CyVerse?

VISION: TRANSFORMING SCIENCE THROUGH DATA-DRIVEN DISCOVERY.

MISSION: OUR MISSION IS TO DESIGN, DEPLOY, AND EXPAND A NATIONAL CYBERINFRASTRUCTURE FOR LIFE SCIENCES RESEARCH, AND TO TRAIN SCIENTISTS IN ITS USE.

THE PROJECT

CyVerse is funded by the National Science Foundation’s Directorate for Biological Sciences. We are a dynamic virtual organization led by the University of Arizona to fulfill a broad mission that spans our partner institutions: Texas Advanced Computing Center, Cold Spring Harbor Laboratory, and the University of North Carolina at Wilmington.
Atmosphere: Scientific Discovery in the Cloud

A low-friction service enabling reproducible scientific discovery in the cloud...

...using the tools and the (large) data users want when they want it (on-demand) where they want it (in private or public clouds) and with whom they want (sharing, collaboration, publication).
CyVerse Atmosphere Facts

- 2008 - CyVerse (fka iPlant Collaborative) begins
- 2011 - Atmosphere launched as a beta
  - not originally declared in the original grant
  - emerged out of the need for ad hoc, self-provisioned virtual machines
  - originally leveraged Eucalyptus
- 2012 - support for OpenStack (folsom)
- 2013 - support for multiple clouds
- 2015 - Jetstream (https://use.jetstream-cloud.org)
- 2016 - Massachusetts Open Cloud (https://giji.massopencloud.org)
Atmosphere vs. Horizon compared

https://www.youtube.com/watch?v=ic5j9TOj7IY
Roadmap 2017 Q4

• Dynamic tool installation: Installation and configuration of tools on running instances

• Image owner enhancements
  – Better restrictions and controls
  – Better metrics and reporting

• Project sharing
  – Users in the same XSEDE allocation
  – Workshops and courses

• Atmosphere CLI

• Simple DOI association
Roadmap 2018 Q1

- Advanced networking management
  - static ip reservations and assignment
  - DNS assignment (if enabled)

- OnDemand Virtual Clusters
  - Ability to launch multiple instances
  - Tools to configure instances using relative ordering or user-defined variables (e.g. master/slaves, workers/coordinators)

- Jupyter integration

- Material “look and feel”
Roadmap 2018 Q2

- DOI provider services integration
- Volume enhancements, including
  - Support for bootable volumes
  - Volume “Copying” to other users
  - Volume backups
  - Volume attachment to multiple instances (if implemented in OpenStack)
- ElasticSearch integration
  - Images (e.g. indexing packages and tools)
  - Volumes (e.g. indexing user data)
  - Instances (e.g. indexing logs for performance)
  - Whole system (e.g. indexing for system health and metrics)
- UI plugin support, initially Ceph
Roadmap 2018 Q3

• Instance state workflows: ability for site operators to define rules on instance states and taking actions on behalf of the user (e.g. if an instance has been idle too long, suspend the instance; then shelve an instance after being suspended for a length of time)
• User-defined workflows: ability for users to execute tools on a vm non-interactively
• Container integration
Using Atmosphere

• Immediate Access:
  – CyVerse: No friction access
  – Jetstream: XSEDE allocation process

• Self-host

• Resource Federation: connect your existing OpenStack directly an existing installation of Atmosphere
  – CyVerse (integration w CyVerse Auth)
  – Jetstream (integration with XSEDE Auth/Accounting)
Thank you

CyVerse Atmosphere Development Team

Steve Gregory  Chris Martin
Andy Lenards  Erik Ferlanti (@ TACC)
Julian Pistorius  Mariah Walls (student)
Tharon Carlson  Calvin McLean (student)
Connor Osborn  Michael Cutshall (student)

presentation url: https://goo.gl/y4RTgA