Jetstream Overview: A national research and education cloud

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Jetstream1 System Overview

Jetstream (production)
- Compute: 320 Nodes, 7,680 Cores, 40 TB RAM, 640 TB local disk
- Storage: 960 TB

Jetstream (production)
- Compute: 320 Nodes, 7,680 Cores, 40 TB RAM, 640 TB local disk
- Storage: 960 TB

Jetstream (development)
- Compute: 16 Nodes, 2 TB RAM, 324 Cores, 32 TB local disk

TACC Cyberinfrastructure

IU Cyberinfrastructure

U of Arizona Cyberinfrastructure

Internet2

XSEDE

http://wiki.jetstream-cloud.org/Network+configuration+and+policies
Quick Jetstream1 Facts

- vCPU ranges from 1 core to 44 cores
- Ram on flavors ranges from 2gb to 120gb
- Atmosphere gives 100gb of block storage per user by default (may request more)
- API side allows 1TB per allocation by default (shared between all allocation users – may request more)
- GPUs (NVIDIA V100) available on a limited basis as ¼ vGPU, ½ vGPU, or 1 vGPU
The Jetstream1 Atmosphere web interface
JS1 Atmosphere Image Catalog
Atmosphere – Custom Images
API Access to Jetstream

- What was unexpected
  - Demand for **programmable cyberinfrastructure**
  - Great platform for learning **system administration skills**
  - Great platform for **teaching & learning cloudy technologies**

- **Command line clients**
- **Horizon dashboard** very popular; but, incomplete
- **Programmatic control**; python is popular ([https://docs.openstack.org/openstacksdk/latest/](https://docs.openstack.org/openstacksdk/latest/))
- **Slack channel** for collaboration API users of Jetstream
- Paved the way for 3rd party interfaces like Exosphere
## CLI / API Interface

### Openstack Server List

<table>
<thead>
<tr>
<th>ID</th>
<th>Name</th>
<th>Status</th>
<th>Networks</th>
<th>Image</th>
<th>Flavor</th>
</tr>
</thead>
<tbody>
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<td>f1c3086f-0a8b-478f-a63e</td>
<td>staff-wiki</td>
<td>ACTIVE</td>
<td>cvmfs-api-net=10.0.0.8,</td>
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### Openstack Flavor List

<table>
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<th>ID</th>
<th>Name</th>
<th>RAM</th>
<th>Disk</th>
<th>Ephemeral</th>
<th>VCPUs</th>
<th>Is Public</th>
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<tbody>
<tr>
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<td>4</td>
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<td>0</td>
<td>10</td>
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<td>44</td>
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</tbody>
</table>
CLI / API Interface, cont

Upsides
- Most complete interface to using OpenStack
- CLI and SDK allow for programmatic use of OpenStack
- Generally very fast (though still dependent on busy-ness of cloud)

Downsides:
- Not all functionality is present in python-openstackclient
- There are still some inconsistencies in client
- Not very novice friendly
Horizon Interface

<table>
<thead>
<tr>
<th>Instance Name</th>
<th>Image Name</th>
<th>IP Address</th>
<th>Flavor</th>
<th>Key Pair</th>
<th>Status</th>
<th>Availability Zone</th>
<th>Task</th>
<th>Power State</th>
<th>T ime since created</th>
<th>Actions</th>
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<td>m1.quad</td>
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<td>Active</td>
<td>zone-1</td>
<td>None</td>
<td>Running</td>
<td>1 day, 3 hours</td>
<td>Delete SnapShot</td>
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<tr>
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<tr>
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<tr>
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</tr>
</tbody>
</table>

**Specs**

- **Flavor Name**: ml-quad
- **IAM**: 16
- **RAM**: 16GB
- **VCPUs**: 4
- **Disk**: 20GB

**IP Addresses**

- JX-Network: 16.0.6.9, 140.189.172.117

**Security Groups**

- exosphere
- ALLIN
- IP-4 from 0.0.0.0/1
- ALLOW IP-4 from 0.0.0.0/1
- ALLOW IP-4 from 0.0.0.0/1
- ALLOW IPv4 from 0.0.0.0/1
- ALLOW IPv4/Drop from 0.0.0.0/1

**Metadata**

- Key Name: User ID
- Image Name: 64412ae6-8587-8587-8587-8587-8587-8587
- Image ID: 64412ae6-8587-8587-8587-8587-8587-8587

**RESEARCH TECHNOLOGIES**
UNIVERSITY INFORMATION TECHNOLOGY SERVICES
Horizon GUI interface

• Allows most things you can do from the CLI
• Nice for some tasks
  • Network visualizer is something we tend to use as a troubleshooting tool
  • Easier to look at security groups on Horizon (IMHO)
• Downsides:
  • Considerably slower than using CLI
  • Not all features are present that are in CLI
  • Can’t do things programmatically
  • Not very novice friendly nor intuitive
Exosphere
Exosphere GUI interface

- 3rd party GUI interface for OpenStack clouds
- Developers have a past connection to Jetstream but are working with multiple cloud providers
- Attempting to fill the gap between interfaces built for system administrators like OpenStack Horizon, and intuitive-but-proprietary services like DigitalOcean
- More about Exosphere:
  - https://gitlab.com/exosphere/exosphere
And introducing…
Jetstream2 Proposed Architecture
Where can I get help?

• Wiki / Documentation: http://wiki.jetstream-cloud.org

• API CLI Tutorial: https://github.com/jlf599/JetstreamAPITutorial

• User guides: https://portal.xsede.org/user-guides

• Email: help@xsede.org
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Jetstream2 partners

http://jetstream-cloud.org/
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