

# Jetstream Tutorial

## 1. Jetstream

Jetstream is a cloud environment designed to supply computing and analysis resources for researchers on demand. There are abundant Virtual Machines on Jetstream designed to do scientific analysis on data from users. [1]

A web-based interface, Atmosphere <https://use.jetstream-cloud.org/>, is hosted for Jetstream to give researchers an interaction with cloud computing environment.

For more information, please visit  
<https://iujetstream.atlassian.net/wiki/display/JWT/Jetstream+Public+Wiki>

## 2. Access Jetstream

Researchers should use XSEDE credentials to access the web interface  
<https://use.jetstream-cloud.org/>.

### 2.1 Create an account in XSEDE

If you do not already have an XSEDE portal account, you need to go to <https://portal.xsede.org/> and click "Create Account" on the left side of your screen. Fill out the form completely and click Submit. You should get notification shortly that your account has been created and that you need to verify your account. Click the link in the email to verify your account and set your username and password. If the link doesn't work, you can go to <https://portal.xsede.org/>, click "Sign In" and then select "Verify Account" under the "Other Sign In Options" in the center.

Once you have verified your account, if you are not already logged in, go back to <https://portal.xsede.org/> and this time click "Sign In" and sign in with the username and password you set in the verification step.

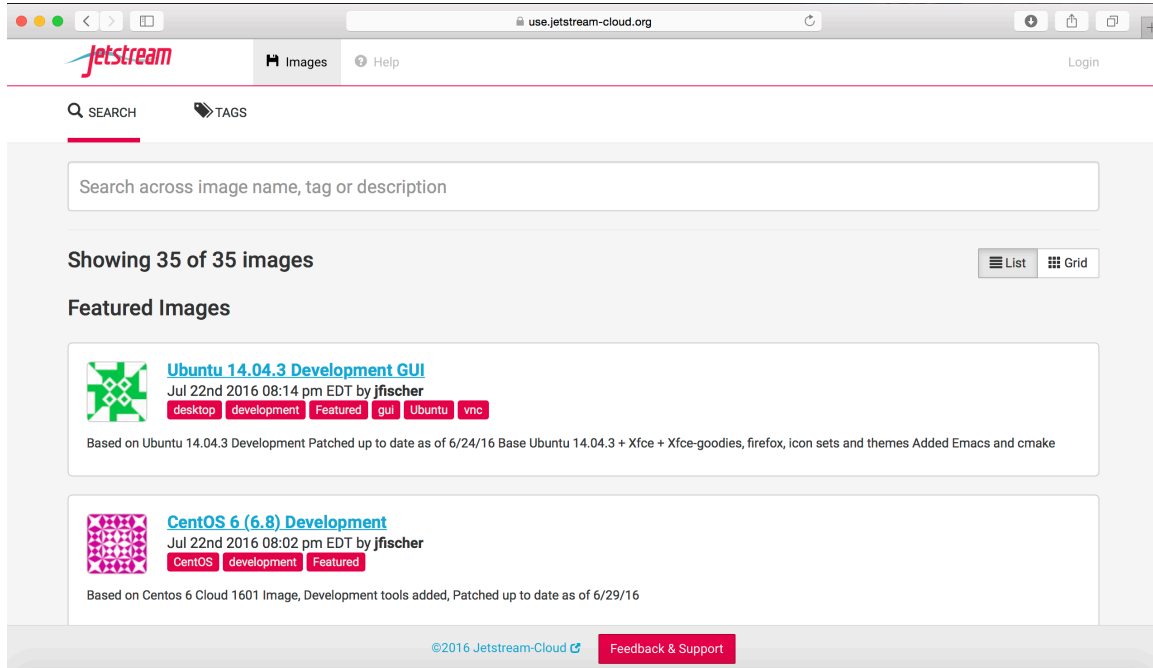
The first time you login to the XSEDE User Portal you will be asked to accept the User Responsibilities form. This form outlines acceptable use to protect shared resources and intellectual property.

(Your account will be enrolled into an Allocation for semester projects. And we will process the enrollment before project starts. Right now, you can create an account, but cannot log into Jetstream and can do nothing on it)

### 2.2 Log In

After you create an XSEDE account and activate it, you can log in the Atmosphere <https://use.jetstream-cloud.org/>.

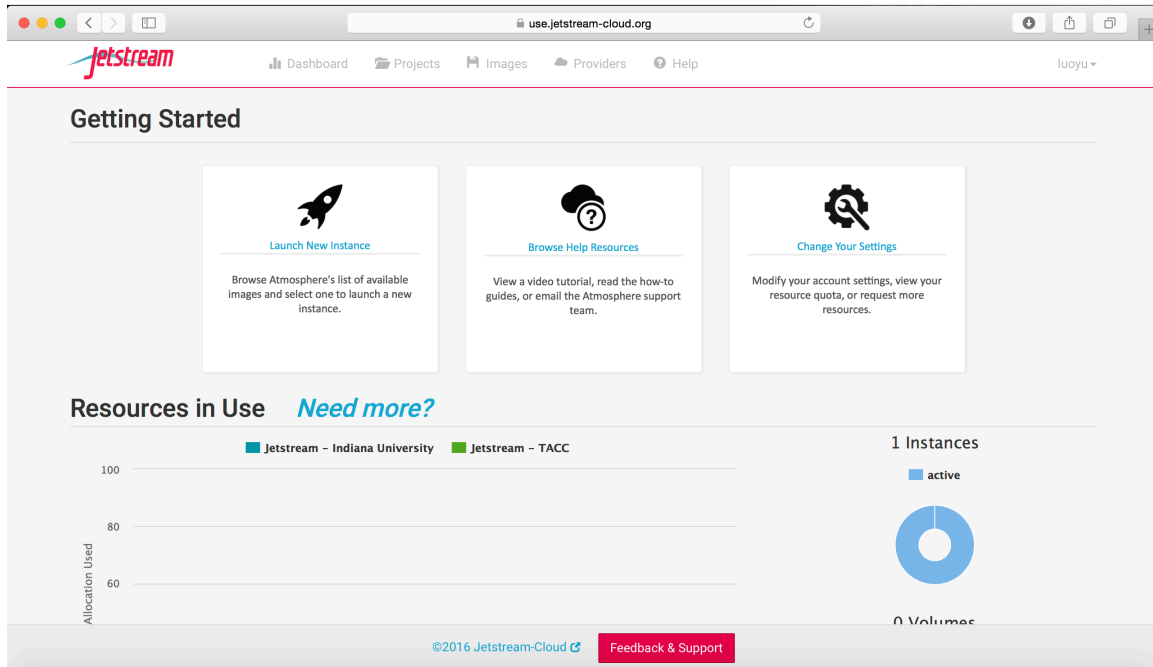
Click on the right upper corner 'Login'



Choose 'XSEDE' and continue,



Type in your XSEDE username and password, and click 'sign in'. Page jumps to:



## 2.3 Create Your Instances (VMs)

There is a library of VMs supported by Jetstream that you can choose one that you are most familiar with. (The recommended VM is **Ubuntu 14.04.3 Development GUI**)

### 2.3.1 VM Sizes

Different sizes of VMs could be launched in Jetstream for different research requirements:

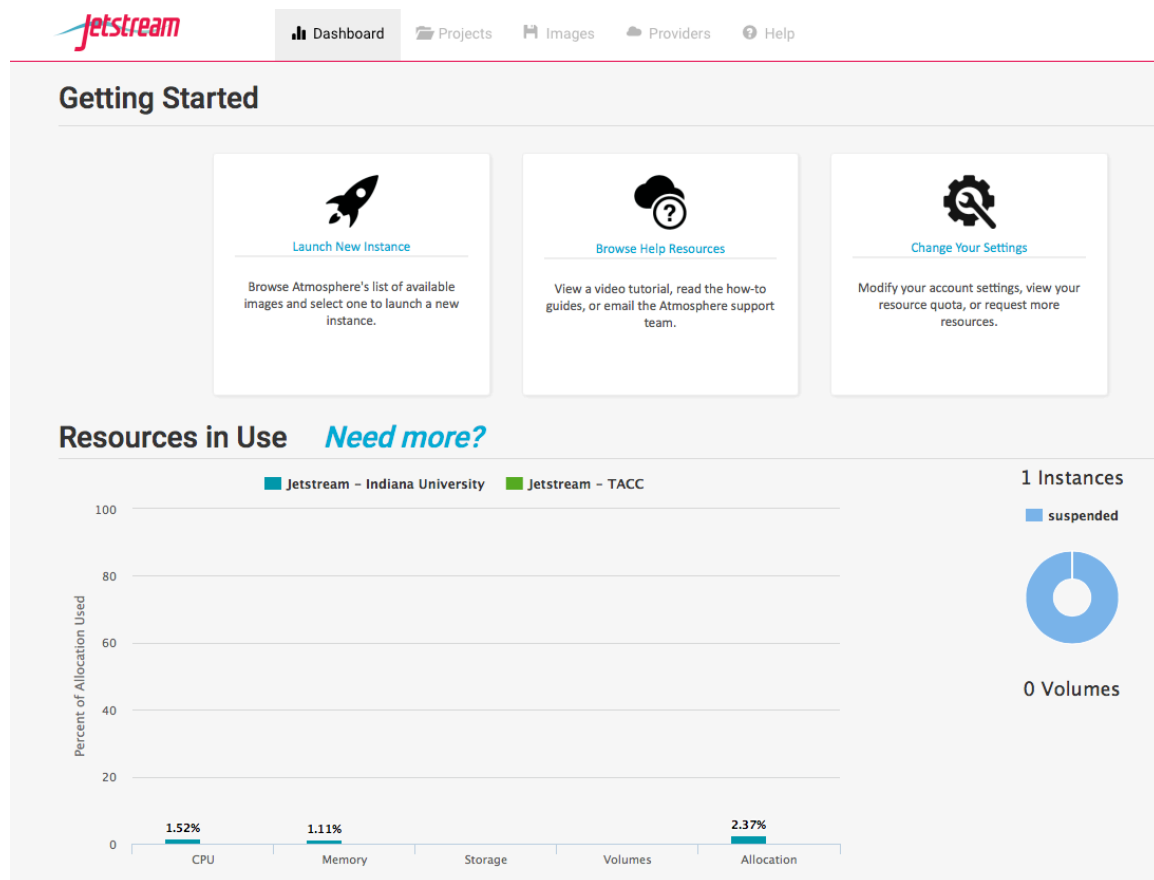
| VM Size  | vCPUs | RAM (GB) | Local Storage (GB) | SU cost per hour* |
|----------|-------|----------|--------------------|-------------------|
| Tiny     | 1     | 2        | 8                  | 1                 |
| Small    | 2     | 4        | 20                 | 2                 |
| Medium   | 6     | 16       | 60                 | 6                 |
| Large    | 10    | 30       | 120                | 10                |
| XLarge   | 24    | 60       | 240                | 24                |
| XX Large | 44    | 120      | 480                | 44                |

The VM is charged in service unit based on how much of the total system resource is used. For more information, please visit page

<https://iujetstream.atlassian.net/wiki/display/JWT/Virtual+Machine+Sizes+and+Configurations>

(\*Attention: each user has limited computing resources. If user consumes his resources of current month, he has to wait till next month or request for more resources. **So please choose the suitable VM size for your project.**)

Also, user could check his resource in Dashboard. The Dashboard will show you how many resources are used and how many are left.



### 2.3.4 Launch New Instance

Click on 'Launch New Instance' on Dashboard, and choose a VM,

## Management, Access, and Use of Big and Complex Data Data Science Program, Indiana University

The screenshot shows the Jetstream web interface. The top navigation bar includes 'Dashboard', 'Projects', 'Images', 'Providers', and 'Help'. The user 'luoyu' is logged in. Below the navigation bar, there are search and filter options. The main content area displays the details for the 'Ubuntu 14.04.3 Development GUI' image. It includes a 'Name' field, 'Created' date and time, 'Created by' user, and a 'Description'. The 'Tags' section lists 'desktop', 'development', 'Featured', 'gui', 'Ubuntu', and 'vnc'. The 'Versions' section shows two versions: 1.3 (created 7/15/2016) and 1.2 (created 5/26/2016). A 'Launch' button is visible on the right side of the image details.

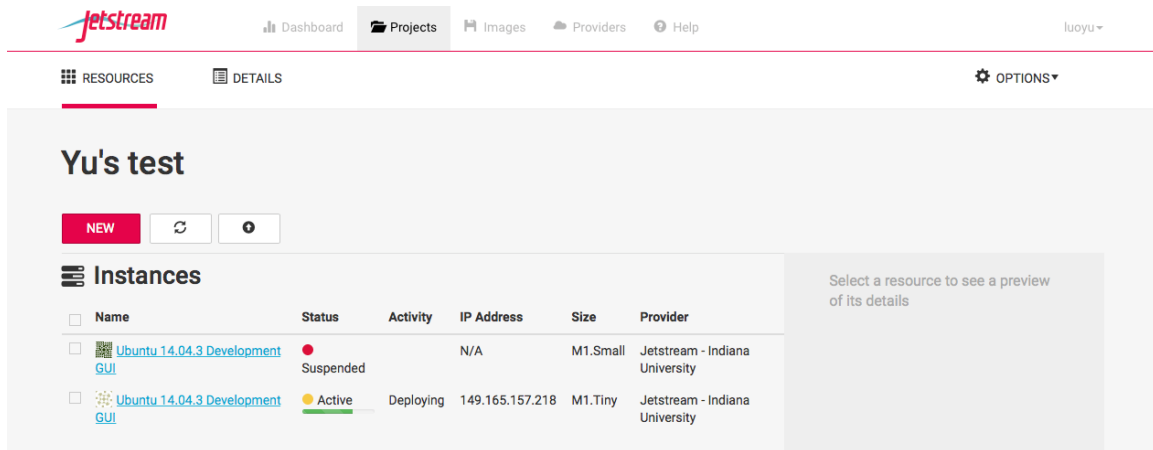
Click on right upper 'Launch', give an instance name, select the image version, select the project (or create a project), select the provider (Indiana University), **select the instance size**, and click 'Launch Instance'.

The screenshot shows the 'Launch an Instance / Basic Options' dialog box. The dialog has two main sections: 'Basic Info' and 'Resources'. In the 'Basic Info' section, the 'Instance Name' is 'Ubuntu 14.04.3 Development GUI', the 'Base Image Version' is '1.3', and the 'Project' is 'Yu's test'. In the 'Resources' section, the 'Provider' is 'Jetstream - Indiana University', the 'Instance Size' is 'm1.tiny (CPU: 1, Mem: 2GB)', and the 'Resources Instance will Use' section shows progress bars for CPU and memory usage. The 'Launch Instance' button is highlighted in red.

After submitting the request, Jetstream will build and deploy the instance for you.

## Management, Access, and Use of Big and Complex Data

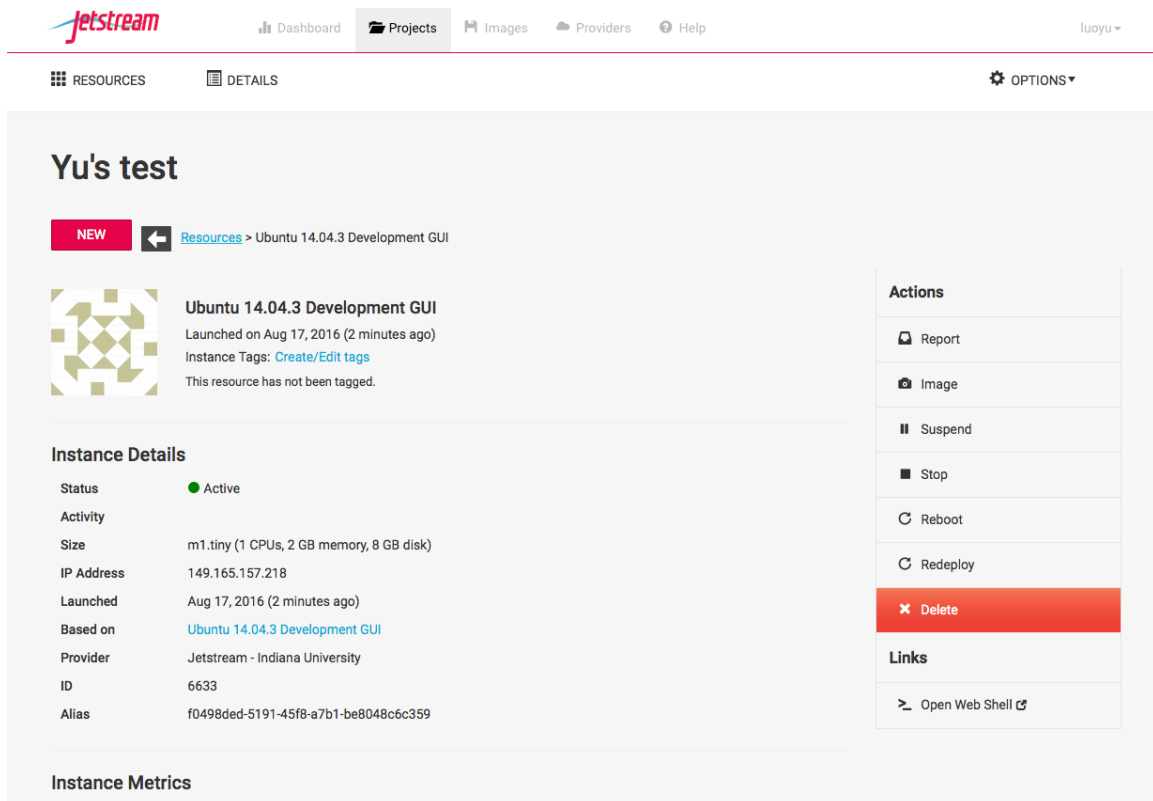
### Data Science Program, Indiana University



The screenshot shows the Jetstream dashboard with the 'Projects' tab selected. Under the 'Instances' section, there is a table listing two instances. The first instance, 'Ubuntu 14.04.3 Development GUI', is in a 'Suspended' state. The second instance, also 'Ubuntu 14.04.3 Development GUI', is in an 'Active' state and is currently 'Deploying'. The table columns include Name, Status, Activity, IP Address, Size, and Provider. A sidebar on the right prompts the user to 'Select a resource to see a preview of its details'.

| Name                           | Status    | Activity  | IP Address      | Size     | Provider                       |
|--------------------------------|-----------|-----------|-----------------|----------|--------------------------------|
| Ubuntu 14.04.3 Development GUI | Suspended |           | N/A             | M1.Small | Jetstream - Indiana University |
| Ubuntu 14.04.3 Development GUI | Active    | Deploying | 149.165.157.218 | M1.Tiny  | Jetstream - Indiana University |

When the instance is ready, you can get all details of instance on screen.



This screenshot shows the detailed view of the 'Ubuntu 14.04.3 Development GUI' instance. The instance is 'Active' and was launched on August 17, 2016. The 'Instance Details' section provides specific information: Status is Active, Activity is shown, Size is m1.tiny (1 CPUs, 2 GB memory, 8 GB disk), IP Address is 149.165.157.218, and it was launched 2 minutes ago. The 'Actions' sidebar on the right offers various management options: Report, Image, Suspend, Stop, Reboot, Redeploy, Delete (highlighted in red), and a link to Open Web Shell. The breadcrumb trail indicates the path from Resources to this specific instance.

| Instance Details |  |
|------------------|--|
| Status           | Active                                   |
| Activity         |  |
| Size             | m1.tiny (1 CPUs, 2 GB memory, 8 GB disk) |
| IP Address       | 149.165.157.218                          |
| Launched         | Aug 17, 2016 (2 minutes ago)             |
| Based on         | Ubuntu 14.04.3 Development GUI           |
| Provider         | Jetstream - Indiana University           |
| ID               | 6633                                     |
| Alias            | f0498ded-5191-45f8-a7b1-be8048c6c359     |

| Actions        |
|----------------|
| Report         |
| Image          |
| Suspend        |
| Stop           |
| Reboot         |
| Redeploy       |
| Delete         |
| Links          |
| Open Web Shell |

### 2.3.4 Logging In To Your VM

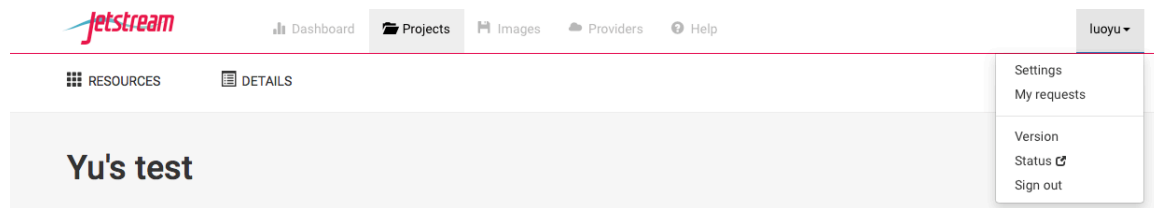
Visit this page for more information

<https://iujetstream.atlassian.net/wiki/display/JWT/Logging+in+with+SSH>

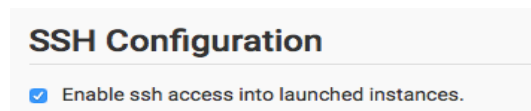
If you don't know how to generate/get SSH Key, please follow "Generate SSH Key" tutorial.

#### 2.3.4.1.1 Add SSH Key to account

1. If you haven't added SSH Keys to your account, please click on upper right 'username' and click 'Settings'



2. Click 'Show More', select 'Enable ssh access into launched instances', and click **blue plus sign** to add your SSH Key into it.



#### 2.3.4.2.1 SSH for MacOS X

1. Open a terminal window from your Mac,
2. Copy your instance IP Address from details, and type follow line on terminal:

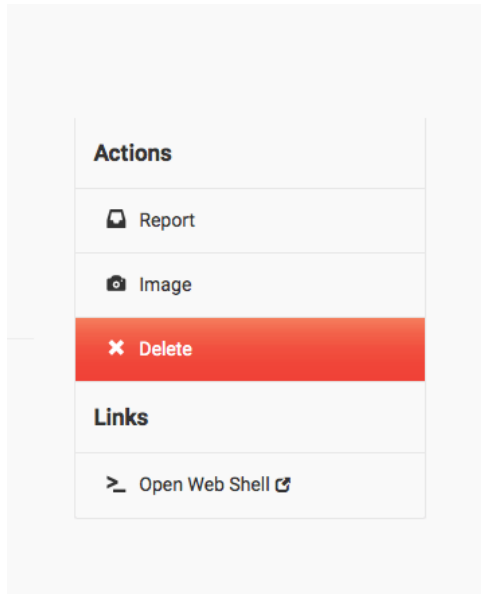
```
ssh your_xsede_username@instance_ip_address
```

#### 2.3.4.2.2 SSH for Windows using PuTTY

1. If you haven't added SSH Key to the account, please follows the above step to add it to you Jeststream account.
2. Launch PuTTY.
3. Enter the IP Address.
4. Load your Private Key file for authentication in **SSH>Auth.**
5. Click **open.**
5. Enter your XSEDE username.
6. Enter your XSEDE password.

#### 2.3.4.3 Web Shell

Click '>\_ Open Web Shell' on the low right side.



### 2.3.5 Stop or Suspend Your Instance

As I mentioned above, the running instance is consuming your resources. When you finish or stop processing the VM, please Stop or Suspend the instance. You can Resume or Start it when you want to use instance again.

### 3. Jetstream Public Wiki

If you want to know more about Jetstream, you can visit the Jetstream Public Wiki for details.

<https://iujetstream.atlassian.net/wiki/display/JWT/Jetstream+Public+Wiki>

### Reference

[1] <https://iujetstream.atlassian.net/wiki/display/JWT/Jetstream+Public+Wiki>